

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X      X XXXXXX   XXXX      XXXX      XX      XXXX
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PROJECT DATA

Project Title: Wapping Road Dam_Dec08
Project File : WappingRoadDam_De.prj
Run Date and Time: 10/31/2008 8:42:48 AM

Project in English units

Project Description:

Project: Wapping Road Dam Feasibility Study
Start Date: 06-25-08
By: Raju
V

Base Model:

FEMA HEC-2 Model Paper Copy dated April 1980.

PLAN DATA

Plan Title: FEMA HEC-2

Plan File : h:\3574-01\H & H\HEC-RAS\WappingRoadDam_De.p30

Geometry Title: FEMA HEC-2 Model

Geometry File : h:\3574-01\H & H\HEC-RAS\WappingRoadDam_De.g01

Flow Title : FEMA Flows

Flow File : h:\3574-01\H & H\HEC-RAS\WappingRoadDam_De.f01

Plan Summary Information:

Number of: Cross Sections =	41	Multiple Openings =	0
Culverts =	0	Inline Structures =	0
Bridges =	7	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: FEMA Flows

Flow File : h:\3574-01\H & H\HEC-RAS\WappingRoadDam_De.f01

Flow Data (cfs)

* River	Reach	RS	*	10YR	50YR	100YR	500YR *
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* Jones River	Main Channel	3.919	*	45	60	70	90	*
* Jones River	Main Channel	3.638	*	45	60	70	85	*
* Jones River	Main Channel	3.312	*	75	100	116	140	*
* Jones River	Main Channel	2.740	*	390	540	650	820	*
* Jones River	Main Channel	2.390	*	460	610	740	940	*
* Jones River	Main Channel	1.663	*	460	604	730	930	*
* Jones River	Main Channel	1.394	*	530	682	821	1060	*
* Jones River	Main Channel	0.874	*	530	680	820	1050	*
* Jones River	Main Channel	0.803	*	540	700	830	1070	*
* Jones River	Main Channel	0.598	*	620	810	940	1200	*

Boundary Conditions

* River	Reach	Profile	*	Upstream	Downstream	*
* Jones River	Main Channel	10YR	*	Normal S = 0.01	Known WS = 19.8	*
* Jones River	Main Channel	50YR	*	Normal S = 0.01	Known WS = 20.6	*
* Jones River	Main Channel	100YR	*	Normal S = 0.01	Known WS = 21.2	*
* Jones River	Main Channel	500YR	*	Normal S = 0.01	Known WS = 22	*

GEOMETRY DATA

Geometry Title: FEMA HEC-2 Model
Geometry File : h:\3574-01\H & H\HEC-RAS\WappingRoadDam_De.g01

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 3.919

INPUT

Description: FEMA XS-AD

Station Elevation Data				num=	14
Sta	Elev	Sta	Elev	Sta	Elev
1650	55	1750	50	1800	40
1994	33.8	2000	33	2005	33.2
2065	36	2160	40	2320	50

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
1650	.08	1990	.04	2010	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
1990	2010	100	100	100	.1	.3	

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 3.900

INPUT

Description: FEMA XS-AC

Station Elevation Data				num=	10
Sta	Elev	Sta	Elev	Sta	Elev
1770	55	1865	45.9	1956	35.6
1998.8	33	2002	33	2008	35.8

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
1770	.08	1956	.04	2008	.08

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
1956	2008	62	62	62	.1	.3	

Ineffective Flow				num=	2
Sta L	Sta R	Elev	Permanent		
1770	1956	37.4	F		
2008	2400	37.4	F		

BRIDGE

RIVER: Jones River
REACH: Main Channel RS: 3.889

INPUT

Description: GROVE ST
Distance from Upstream XS = .1
Deck/Roadway Width = 61.8
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates

num= 5

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1865		45.9			1965		42.9			1982		37.4		
2000		42.3			2100		42							

Upstream Bridge Cross Section Data

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1770	55	1865	45.9	1956	35.6	1965	34	1967.4	34
1998.8	33	2002	33	2008	35.8	2100	42	2400	50

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1770	.08	1956	.04	2008	.08

Bank Sta: Left Right Coeff Contr. Expan.
1956 2008 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1770	1956	37.4	F
2008	2400	37.4	F

Downstream Deck/Roadway Coordinates

num= 5

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1865		45.9			1965		42.9			1982		37.4		
2000		42.3			2100		42							

Downstream Bridge Cross Section Data

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1770	55	1865	45.9	1956	35.6	1965	34	1967.4	34
1998.8	33	2002	33	2008	35.8	2100	42	2400	50

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1770	.08	1956	.025	2008	.08

Bank Sta: Left Right Coeff Contr. Expan.
1956 2008 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1770	1956	37	F
2008	2400	37	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 37.4
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow
Submerged Inlet Cd =

Submerged Inlet + Outlet Cd = .8
Max Low Cord = 37

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 3.888

INPUT

Description:

Station Elevation Data num= 10
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

1770 55 1865 45.9 1956 35.6 1965 34 1967.4 34
1998.8 33 2002 33 2008 35.8 2100 42 2400 50

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val

1770 .08 1956 .025 2008 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1956 2008 26.4 26.4 26.4 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
1770 1956 37 F
2008 2400 37 F

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 3.883

INPUT

Description: FEMA XS-AB

Station Elevation Data num= 14
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

1770 55 1800 50 1830 45 1900 40 1911.5 38.7
1961.5 35.9 1963.5 34.2 1965 33.5 1990 32.6 2010 32.6
2022 34.2 2086.5 36.8 2270 40 2400 50

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val

1770 .08 1965 .025 2010 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1965 2010 30 30 30 .3 .5

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 3.877

INPUT

Description: FEMA XS-AA

Station Elevation Data num= 8
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

1800 60 1900 55.2 1994.5 39.5 1997 33.8 2000 32.2
2003.6 32.5 2005.5 39.9 2100 55

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val

1800 .08 1997 .04 2003.6 .08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1997	2003.6		61	61	61	.1	.3
Ineffective Flow	num=	2					
Sta L	Sta R	Elev	Permanent				
1800	1997	43.5	F				
2003.6	2100	43.5	F				

BRIDGE

RIVER: Jones River
REACH: Main Channel RS: 3.870

INPUT

Description: RAILROAD BRIDGE

Distance from Upstream XS = .1

Deck/Roadway Width = 60.8

Weir Coefficient = 2.7

Upstream Deck/Roadway Coordinates

num=	3								
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1900	55.2				2000	55.2			
					2100	55			

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	8					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1800	60	1900	55.2	1994.5	39.5	1997	33.8	2000	32.2
2003.6	32.5	2005.5	39.9	2100	55				

Manning's n Values

num=	3			
Sta	n Val	Sta	n Val	Sta
1800	.08	1997	.04	2003.6
				.08

Bank Sta: Left Right Coeff Contr. Expan.

1997	2003.6		.1	.3
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Ineffective Flow num= 2

Sta L Sta R Elev Permanent

1800 1997 43.5 F

2003.6 2100 43.5 F

Downstream Deck/Roadway Coordinates

num=	3								
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1900	55.2				2000	55.2			
					2100	55			

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	8					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1800	60	1900	55.2	1994.5	39.5	1997	33.8	2000	32.2
2003.6	32.5	2005.5	39.9	2100	55				

Manning's n Values

num=	3			
Sta	n Val	Sta	n Val	Sta
1800	.1	1997	.03	2003.6
				.1

Bank Sta: Left Right Coeff Contr. Expan.

1997	2003.6		.1	.3
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Ineffective Flow num= 2

Sta L Sta R Elev Permanent

1800 1997 36.9 F

2003.6 2100 36.9 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .95

Elevation at which weir flow begins = 43.5

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 36.9

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth
inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Jones River

REACH: Main Channel RS: 3.865

INPUT

Description:

Station Elevation Data num= 8
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

1800 60 1900 55.2 1994.5 39.5 1997 33.8 2000 32.2
2003.6 32.5 2005.5 39.9 2100 55

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val

1800 .1 1997 .03 2003.6 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1997 2003.6 100 100 100 .1 .3

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
1800 1997 36.9 F
2003.6 2100 36.9 F

CROSS SECTION

RIVER: Jones River

REACH: Main Channel RS: 3.846

INPUT

Description: 100' D/S OF RAILROAD BRIDGE (FEMA XS-Y)

Station Elevation Data num= 11
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

1800 50 1850 35 1940 34.3 1990 35.6 1992 33.3
2000 33.1 2004 33 2010 35.9 2060 36.2 2170 40
2300 50

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val

1800 .1 1990 .03 2010 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1990 2010 940 1100 1140 .1 .3

CROSS SECTION

RIVER: Jones River

REACH: Main Channel RS: 3.638

INPUT

Description: FEMA XS-Y

Station Elevation Data num= 14
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

1600 50 1680 40 1880 35 1940 33.4 1980 33.4
1989.5 34.5 1994 32.6 2000 31.6 2004 29.5 2008 30.9
2010.5 34.1 2060 33.6 2100 35 2150 45

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1600 .1 1989.5 .03 2010.5 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1989.5 2010.5 1480 1720 1480 .1 .3

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 3.312

INPUT
 Description: FEMA XS-X
 Station Elevation Data num= 14
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 1540 50 1750 45 1800 40 1850 35 1943 31.5
 1993 31.3 1995 29.9 2000 29.3 2005 29.8 2007 31
 2057 31.4 2100 35 2120 40 2450 45

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1540 .1 1993 .03 2007 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1993 2007 960 1080 960 .1 .3

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 3.108

INPUT
 Description: FEMA XS-W
 Station Elevation Data num= 13
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 1600 40 1670 35 1941 31.6 1985 31.4 1987 32.8
 1991 32.8 1994 25.8 2000 27 2007 28.4 2009 31.5
 2059 32.3 2200 35 2250 40

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1600 .1 1991 .03 2009 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1991 2009 720 1120 1020 .1 .3

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 2.896

INPUT
 Description: FEMA XS-V
 Station Elevation Data num= 12
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 1500 40 1700 35 1943 31 1980 29.3 1983 31.8
 1987 32.3 1993 29 2000 27.3 2005 28 2013 29.8
 2063 30.2 2450 40

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1500 .1 1987 .03 2013 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1987 2013 820 820 820 .1 .3

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 2.740

INPUT

Description: FEMA XS-U

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	40	1941	34.6	1991	31.1	1993	28.8	2000	28.8
2008	28.9	2009	30.4	2059	30.8	2380	40		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1600	.1	1991	.03	2009	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1991	2009		100	100		.1	.3

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 2.721

INPUT

Description: FEMA XS-T

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	40	1900	31.4	1994.7	32.5	1994.8	28.4	1997.2	28.2
2000	28	2005.4	28.6	2005.5	32.5	2100	31	2380	40

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1600	.1	1994.7	.03	2005.5	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1994.7	2005.5		10.6	10.6		.1	.3

Ineffective Flow		num= 2			
Sta L	Sta R	Elev	Permanent		
1600	1994.7	31	F		
2005.5	2380	31	F		

BRIDGE

RIVER: Jones River
REACH: Main Channel RS: 2.720

INPUT

Description:

Distance from Upstream XS = .1
Deck/Roadway Width = 10.4
Weir Coefficient = 2.8

Upstream Deck/Roadway Coordinates

num= 3									
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	
1900	31.4		2000	32.5		2100	31		

Upstream Bridge Cross Section Data

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	40	1900	31.4	1994.7	32.5	1994.8	28.4	1997.2	28.2
2000	28	2005.4	28.6	2005.5	32.5	2100	31	2380	40

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1600	.1	1994.7	.03	2005.5	.1

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1994.7	2005.5		.1	.3

Ineffective Flow		num= 2			
Sta L	Sta R	Elev	Permanent		

1600	1994.7	31	F
2005.5	2380	31	F

Downstream Deck/Roadway Coordinates

num= 3

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1900	31.4				2000	32.5				2100	31			

Downstream Bridge Cross Section Data

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	40	1900	31.4	1994.7	32.5	1994.8	28.4	1997.2	28.2
2000	28	2005.4	28.6	2005.5	32.5	2100	31	2380	40

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.1	1994.7	.015	2005.5	.1

Bank Sta: Left Right Coeff Contr. Expan.

1994.7	2005.5	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1994.7	31	F
2005.5	2380	31	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .95

Elevation at which weir flow begins = 32

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd =

Submerged Inlet + Outlet Cd = .8

Max Low Cord = 31

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Jones River

REACH: Main Channel RS: 2.719

INPUT

Description:

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	40	1900	31.4	1994.7	32.5	1994.8	28.4	1997.2	28.2
2000	28	2005.4	28.6	2005.5	32.5	2100	31	2380	40

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.1	1994.7	.015	2005.5	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1994.7	2005.5	100	100	100	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1994.7	31	F

2005.5 2380 31 F

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 2.700

INPUT

Description: FEMA XS-S

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	40	1944	29.9	1994	30.3	1998	27.8	2000	26.9
2004	28.4	2006	29.9	2054	30.1	2380	40		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1600	.1	1994	.015	2006	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1994	2006		1500 1640	1800		.3	.5

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 2.390

INPUT

Description: FEMA XS-R

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1800	35	1850	30	1996	29	1997	27	2000	27
2004	27	2005	29	2150	30	2220	35	2350	40

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1800	.1	1996	.03	2005	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1996	2005		1720 1600	1040		.1	.3

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 2.087

INPUT

Description: FEMA XS-Q

Station Elevation Data		num= 14							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1450	50	1650	45	1800	35	1936	30.9	1986	28.5
1988	26.3	2000	24.8	2013	26.9	2015	28.3	2018	27.4
2044	27.2	2094	28.7	2350	35	2450	50		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1450	.1	1986	.03	2015	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1986	2015		1880 2240	1320		.1	.3

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 1.663

INPUT

Description: FEMA XS-P

Station Elevation Data		num= 11							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

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*****
1500    50    1550    40    1680    30    1967    25.5    1970    24
2000    22.8  2030    24    2037    25.5    2150    26.5    2200    30
2800    50

Manning's n Values          num=      3
Sta   n Val      Sta   n Val      Sta   n Val
*****
1500    .1    1967    .03    2037    .1

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr.   Expan.
        1967    2037          1200    1420    1320          .1          .3

CROSS SECTION

RIVER: Jones River
REACH: Main Channel          RS: 1.394

INPUT
Description: FEMA XS-0
Station Elevation Data      num=      9
Sta   Elev      Sta   Elev      Sta   Elev      Sta   Elev      Sta   Elev
*****
1600    35    1750    30    2000    20.5    2017    20.6    2021    22.9
2043    24.9    2071    25.3    2350    30    2450    35

Manning's n Values          num=      3
Sta   n Val      Sta   n Val      Sta   n Val
*****
1600    .1    2000    .03    2021    .1

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr.   Expan.
        2000    2021          1280    1720    1100          .1          .3

CROSS SECTION

RIVER: Jones River
REACH: Main Channel          RS: 1.068

INPUT
Description: FEMA XS-N
Station Elevation Data      num=     10
Sta   Elev      Sta   Elev      Sta   Elev      Sta   Elev      Sta   Elev
*****
1650    35    1750    30    1865    25    1975    24.5    1985    21
2000    19.1    2015    21    2026    24.5    2300    30    2350    35

Manning's n Values          num=      3
Sta   n Val      Sta   n Val      Sta   n Val
*****
1650    .1    1975    .03    2026    .1

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr.   Expan.
        1975    2026          840    640    440          .1          .3

CROSS SECTION

RIVER: Jones River
REACH: Main Channel          RS: 0.947

INPUT
Description:
Station Elevation Data      num=     12
Sta   Elev      Sta   Elev      Sta   Elev      Sta   Elev      Sta   Elev
*****
1450    40    1550    35    1800    30    1888    26.4    1938    26.2
1970    21    2000    18.5  2030    21    2062    26.2    2112    29.5
2200    30    2300    35

Manning's n Values          num=      3
Sta   n Val      Sta   n Val      Sta   n Val
*****
1450    .1    1938    .03    2062    .1

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr.   Expan.
        1938    2062          100    100    100          .1          .3

```

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.928

INPUT

Description: U/S FACE OF WAPPING ROAD (FEMA XS-I)

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1500	35	1520	32	1900	31.5	1986	30	1988	18.5
2000	18.4	2012	19	2013	30	2100	30.1	2500	35

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1500	.1	1988	.03	2012	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1988	2012		57.6	57.6	.1	.3

Ineffective Flow		num= 2			
Sta L	Sta R	Elev	Permanent		
1500	1988	30.1	F		
2012	2500	30.1	F		

BRIDGE

RIVER: Jones River
 REACH: Main Channel RS: 0.920

INPUT

Description: WAPPING ROAD

Distance from Upstream XS = .1

Deck/Roadway Width = 57.4

Weir Coefficient = 2.7

Upstream Deck/Roadway Coordinates

num= 8									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1900	31.5		1980	30.8	1988	32.4			
1989	36		2012	36	2013	32.2			
2020	30.8		2100	30.1					

Upstream Bridge Cross Section Data

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1500	35	1520	32	1900	31.5	1986	30	1988	18.5
2000	18.4	2012	19	2013	30	2100	30.1	2500	35

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1500	.1	1988	.03	2012	.1

Bank Sta:	Left	Right	Coeff Contr.	Expan.
	1988	2012	.1	.3

Ineffective Flow		num= 2			
Sta L	Sta R	Elev	Permanent		
1500	1988	30.1	F		
2012	2500	30.1	F		

Downstream Deck/Roadway Coordinates

num= 8									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1900	31.5		1980	30.8	1988	32.4			
1989	36		2012	36	2013	32.2			
2020	30.8		2100	30.1					

Downstream Bridge Cross Section Data

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1500	35	1520	32	1900	31.5	1986	30	1988	18.5
2000	18.4	2012	19	2013	30	2100	30.1	2500	35

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1500 .1 1988 .03 2012 .1

Bank Sta: Left Right Coeff Contr. Expan.
 1988 2012 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 1500 1988 26.5 F
 2012 2500 26.5 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins = 30.1
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8
 Max Low Cord = 26.5

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth

inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Jones River

REACH: Main Channel RS: 0.917

INPUT

Description: D/S FACE OF WAPPING ROAD

Station Elevation Data num= 10
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 1500 35 1520 32 1900 31.5 1986 30 1988 18.5
 2000 18.4 2012 19 2013 30 2100 30.1 2500 35

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1500 .1 1988 .03 2012 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1988 2012 50 50 50 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 1500 1988 26.5 F
 2012 2500 26.5 F

CROSS SECTION

RIVER: Jones River

REACH: Main Channel RS: 0.907

INPUT

Description: 50' D/S OF WAPPING ROAD

Station Elevation Data num= 9
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 1957.9 45 1958 27.9 1966.5 27.9 1966.6 21.5 2000 18.3
 2031.5 25.2 2045 30 2081 30 2600 35

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1957.9 .1 1966.5 .03 2045 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1966.5 2045 50 50 100 .1 .3

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.8983

INPUT

Description:

Station Elevation Data num= 11
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 1800 35 1859 30 1860 45 1994 45 1994.5 35
 1996.8 18.5 2003.8 18.5 2151 18.5 2151.1 29.5 2300 30
 2500 35

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1800 .1 1996.8 .03 2003.8 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1996.8 2003.8 .1 .1 .1 .1 .3

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.8982

INPUT

Description:

Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 1800 35 1859 30 1860 45 1994 45 1994.5 35
 1996.8 29 1996.9 25.5 1999.6 25.6 1999.7 35 2002.1 35
 2002.2 26.5 2003.8 26.5 2003.9 30 2005.2 29.3 2100 29.3
 2147 29.3 2147.1 24.5 2151 24.5 2151.1 29.5 2160 29.5
 2300 30 2500 35

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1800 .11 1996.8 .03 2151 .11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1996.8 2003.8 1 1 2 .1 .3

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.8981

INPUT

Description:

Station Elevation Data num= 22
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 1800 35 1859 30 1860 45 1994 45 1994.5 35
 1996.8 29 1996.9 25.5 1999.6 25.6 1999.7 35 2002.1 35
 2002.2 26.5 2003.8 26.5 2003.9 30 2005.2 29.3 2100 29.3
 2147 29.3 2147.1 24.5 2151 24.5 2151.1 29.5 2160 29.5
 2300 30 2500 35

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

 1800 .11 1996.8 .02 2151 .11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1996.8	2003.8		.1 .1	.1	.1	.3

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.898

INPUT

Description: FEMA XS-H
 Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1800	35	1859	30	1860	45	1994	45	1994.5	35
1996.8	18	2003.8	18	2003.9	30	2005.2	29.3	2100	29.3
2100.1	18	2151	18	2151.1	29.5	2160	29.5	2300	30
2500	35								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1800	.11	1994.5	.02	2151.1	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1996.8	2003.8		125 125	80	.1	.3

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.874

INPUT

Description: 50' D/S OF DAM
 Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1450	35	1600	25	1936	21.8	1986.5	21.7	1993.5	19.8
1993.6	17.4	2006.5	17.4	2006.6	19.8	2009	19.8	2009.1	24.7
2010	24.7	2010.1	21.1	2044.5	21.2	2045	40	2150	40
2150.1	23	2225	21.6	2250	23.9	2264	18.5	2300	18
2340	19	2378	24.7	2400	30				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1450	.11	1993.5	.02	2006.6	.06	2150.1	.02	2250	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1986.5	2009		50 50	50	.3	.5

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.864

INPUT

Description: FEMA XS-G
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1450	35	1600	25	1900	21.7	1991	21.3	1993.3	21.4
1995	21.3	1995.1	16.6	2005	16.6	2005.1	21.4	2009.3	21.4
2076	20.9	2076.1	30	2140	30	2140.1	22	2225	20.6
2250	22.9	2264	17.5	2300	17	2340	18	2378	24.7
2385	27.8	2400	30						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1450	.11	1991	.04	2009.3	.08	2250	.03	2378	.11

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1995	2005.1		25 25	25	.3	.5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 1450 1995 17 F

2005 2400 17 F

BRIDGE

RIVER: Jones River
REACH: Main Channel RS: 0.862

INPUT

Description: PL BRIDGE
Distance from Upstream XS = .1
Deck/Roadway Width = 24.8
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates

num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

1900 21.7 2000 20.9 2076 20.9

Upstream Bridge Cross Section Data

Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

1450 35 1600 25 1900 21.7 1991 21.3 1993.3 21.4
1995 21.3 1995.1 16.6 2005 16.6 2005.1 21.4 2009.3 21.4
2076 20.9 2076.1 30 2140 30 2140.1 22 2225 20.6
2250 22.9 2264 17.5 2300 17 2340 18 2378 24.7
2385 27.8 2400 30

Manning's n Values num= 5
Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val

1450 .11 1991 .04 2009.3 .08 2250 .03 2378 .11

Bank Sta: Left Right Coeff Contr. Expan.
1995 2005.1 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
1450 1995 17 F
2005 2400 17 F

Downstream Deck/Roadway Coordinates

num= 3
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

1900 21.7 2000 20.9 2076 20.9

Downstream Bridge Cross Section Data

Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

1450 35 1600 25 1900 21.7 1991 21.3 1993.3 21.4
1995 21.3 1995.1 16.6 2005 16.6 2005.1 21.4 2009.3 21.4
2076 20.9 2076.1 30 2140 30 2140.1 22 2225 20.6
2250 22.9 2264 17.5 2300 17 2340 18 2378 24.7
2385 27.8 2400 30

Manning's n Values num= 5
Sta n Val Sta n Val Sta n Val Sta n Val Sta n Val

1450 .11 1995 .04 2005.1 .08 2140.1 .03 2340 .11

Bank Sta: Left Right Coeff Contr. Expan.
1995 2005.1 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
1450 1995 17 F
2005.1 2400 17 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 18.6
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
 Energy
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method
 Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8
 Max Low Cord = 17

Additional Bridge Parameters
 Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.860

INPUT
 Description: D/S FACE PL BRIDGE & 100'D/S OF DAM
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1450	35	1600	25	1900	21.7	1991	21.3	1993.3	21.4
1995	21.3	1995.1	16.6	2005	16.6	2005.1	21.4	2009.3	21.4
2076	20.9	2076.1	30	2140	30	2140.1	22	2225	20.6
2250	22.9	2264	17.5	2300	17	2340	18	2378	24.7
2385	27.8	2400	30						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1450	.11	1995	.04	2005.1	.08	2140.1	.03	2340	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1995 2005.1 100 100 240 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1450	1995	17	F
2005.1	2400	17	F

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.841

INPUT
 Description:
 Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1500	50	1550	25	1720	22	1933	21.4	1983	21.9
1991	15.7	2009	16.2	2018	20.8	2068	20.1	2100	20.5
2100.1	30	2200	30	2200.1	23	2308	19.7	2338	22.5
2348	19.5	2353	18.8	2358	17	2370	16.7	2382	16.7
2386	17.7	2396	18	2421	21	2433	23.2	2442	25.4
2650	35								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1500	.11	1991	.04	2009	.08	2200.1	.03	2382	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1983 2018 200 200 200 .3 .5

CROSS SECTION

RIVER: Jones River
 REACH: Main Channel RS: 0.803

INPUT

Description: FEMA XS-F

Station Elevation Data		num= 11							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1650	25	1925	19.5	1950	20.3	1974.5	19.3	1993	16.9
1995	16.2	2000	15.4	2023	16.1	2025.5	19.3	2075	20
2600	25								

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1650	.11	1974.5	.04	2023	.08	2075	.11		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1974.5	2025.5		880	1080		.1	.3

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 0.598

INPUT

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1523.7	54.3	1624	16.5	1991	16	1993	15	2000	14.8
2007	15	2009	16	2194	17.1	2525	23	2600	25

Manning's n Values		num= 3							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1523.7	.11	1991	.04	2009	.11				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1991	2009		2240	2240		.3	.5

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 0.174

INPUT

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1700	25	1906	18.9	1915	17.8	1917	17	2000	13.2
2035	17.1	2038	18.8	2058	18.5	2100	25		

Manning's n Values		num= 3							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1700	.11	1915	.04	2058	.11				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1915	2058		800	800		.3	.5

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 0.023

INPUT

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1800	25	1832.5	22	1866.5	18.4	1908	14	2000	12.6
2092	14	2134.5	18.4	2184.5	20.9	2290	25		

Manning's n Values		num= 3							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1800	.11	1866.5	.04	2134.5	.11				

CROSS SECTION

INPUT

num= 11

Manning's n Values

num= 3

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1977	2023		19	19	19		.3	.5

BRIDGE

INPUT

Description: ELM ST

Distance from Upstream XS =	.1
Deck/Roadway Width =	18.8
Weir Coefficient =	2.6
Upstream Deck/Roadway Coordinates	

Upstream Bridge Cross Section Data

Manning's n Values

num= 3

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1977	2023		.3	.5

Downstream Deck/Roadway Coordinates

num= 5

Downstream Bridge Cross Section Data

```
Station Elevation Data      num=      11
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
*****
```

1870	25	1973	21	1977	15.8	1997	12.5	1997.1	14.5
2003	14.5	2003.1	12.5	2023	17.6	2031	20.4	2100	20.6
2340	25								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1870	.11	1977	.04	2023	.11

Bank Sta: Left Right Coeff Contr. Expan.
1977 2023 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1870	1977	19.9	F
2023	2340	19.9	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 20.6
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 19.6

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 0.001

INPUT
Description: ELM ST
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1870	25	1973	21	1977	15.8	1997	12.5	1997.1	14.5
2003	14.5	2003.1	12.5	2023	17.6	2031	20.4	2100	20.6
2340	25								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1870	.11	1977	.04	2023	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1977 2023 20 20 20 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1870	1977	19.9	F
2023	2340	19.9	F

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 0.0004

INPUT
Description: FEMA XS-A
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1850	25	1983	19.1	1984	17.4	2000.1	17.4	2023.8	17.4
2023.9	19.2	2024	17.4	2026.2	17.4	2026.3	19.2	2034	19.2
2080	19.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1850	.11	1983	.04	2023.9	.11

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1983	2023.9	50	50	50	.3	.5
------	--------	----	----	----	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1850	1983	17.4	F
2023.9	2080	17.4	F

BRIDGE

RIVER: Jones River
 REACH: Main Channel RS: 0.0003

INPUT
 Description: DAM
 Distance from Upstream XS = .1
 Deck/Roadway Width = 49.8
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 4

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1983	19.1				2000	19.2				2000.1	17.4			
2023.8	17.4													

Upstream Bridge Cross Section Data
 Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1850	25	1983	19.1	1984	17.4	2000.1	17.4	2023.8	17.4
2023.9	19.2	2024	17.4	2026.2	17.4	2026.3	19.2	2034	19.2
2080	19.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1850	.11	1983	.04	2023.9	.11

Bank Sta: Left Right Coeff Contr. Expan.

1983	2023.9	.3	.5
------	--------	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1850	1983	17.4	F
2023.9	2080	17.4	F

Downstream Deck/Roadway Coordinates

num= 4

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1983	19.1				2000	19.2				2000.1	17.4			
2023.8	17.4													

Downstream Bridge Cross Section Data
 Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1850	25	1983	19.1	1984	10	2023.8	10	2023.9	19.2
2024	17	2026.2	17	2026.3	19.2	2034	19.2	2080	19.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1850	.11	1983	.015	2026.2	.015

Bank Sta: Left Right Coeff Contr. Expan.

1983	2026.2	.3	.5
------	--------	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-------	-------	------	-----------

1850 1983 17.4 F
2026.2 2080 17.4 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 17.4
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 18.7

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 0.0002

INPUT

Description: S-1 DAM BELOW ELM ST

Station Elevation Data		num= 10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1850	25	1983	19.1	1984	10	2023.8	10	2023.9	19.2
2024	17	2026.2	17	2026.3	19.2	2034	19.2	2080	19.2

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1850	.11	1983	.015	2026.2	.015

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1983	2026.2		100	100	.3	.5

Ineffective Flow		num= 2	
Sta L	Sta R	Elev	Permanent
1850	1983	17.4	F
2026.2	2080	17.4	F

CROSS SECTION

RIVER: Jones River
REACH: Main Channel RS: 0.0001

INPUT

Description: 100' D/S OF ELM STREET

Station Elevation Data		num= 6							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1850	25	1975.5	18	2000	7	2024.5	7	2030.5	13.4
2075.5	13.5								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1850	.11	1975.5	.015	2030.5	.11

Bank Sta:	Left	Right	Coeff Contr.	Expan.
	1975.5	2030.5	.3	.5

SUMMARY OF MANNING'S N VALUES

River: Jones River

* Reach	* River Sta.	* n1	* n2	* n3	* n4	* n5
Main Channel	3.919	.08	.04*	.08*	*	*
Main Channel	3.900	.08	.04*	.08*	*	*
*Main Channel	3.889	*Bridge	*	*	*	*
Main Channel	3.888	.08	.025*	.08*	*	*
Main Channel	3.883	.08	.025*	.08*	*	*
Main Channel	3.877	.08	.04*	.08*	*	*
*Main Channel	3.870	*Bridge	*	*	*	*
Main Channel	3.865	.1	.03*	.1*	*	*
Main Channel	3.846	.1	.03*	.1*	*	*
Main Channel	3.638	.1	.03*	.1*	*	*
Main Channel	3.312	.1	.03*	.1*	*	*
Main Channel	3.108	.1	.03*	.1*	*	*
Main Channel	2.896	.1	.03*	.1*	*	*
Main Channel	2.740	.1	.03*	.1*	*	*
Main Channel	2.721	.1	.03*	.1*	*	*
*Main Channel	2.720	*Bridge	*	*	*	*
Main Channel	2.719	.1	.015*	.1*	*	*
Main Channel	2.700	.1	.015*	.1*	*	*
Main Channel	2.390	.1	.03*	.1*	*	*
Main Channel	2.087	.1	.03*	.1*	*	*
Main Channel	1.663	.1	.03*	.1*	*	*
Main Channel	1.394	.1	.03*	.1*	*	*
Main Channel	1.068	.1	.03*	.1*	*	*
Main Channel	0.947	.1	.03*	.1*	*	*
Main Channel	0.928	.1	.03*	.1*	*	*
*Main Channel	0.920	*Bridge	*	*	*	*
Main Channel	0.917	.1	.03*	.1*	*	*
Main Channel	0.907	.1	.03*	.1*	*	*
Main Channel	0.8983	.1	.03*	.1*	*	*
Main Channel	0.8982	.11	.03*	.11*	*	*
Main Channel	0.8981	.11	.02*	.11*	*	*
Main Channel	0.898	.11	.02*	.11*	*	*
Main Channel	0.874	.11	.02*	.06*	.02*	.11*
Main Channel	0.864	.11	.04*	.08*	.03*	.11*
*Main Channel	0.862	*Bridge	*	*	*	*
Main Channel	0.860	.11	.04*	.08*	.03*	.11*
Main Channel	0.841	.11	.04*	.08*	.03*	.11*
Main Channel	0.803	.11	.04*	.08*	.11*	*
Main Channel	0.598	.11	.04*	.11*	*	*
Main Channel	0.174	.11	.04*	.11*	*	*
Main Channel	0.023	.11	.04*	.11*	*	*
Main Channel	0.004	.11	.04*	.11*	*	*
*Main Channel	0.003	*Bridge	*	*	*	*
Main Channel	0.001	.11	.04*	.11*	*	*
Main Channel	0.0004	.11	.04*	.11*	*	*
*Main Channel	0.0003	*Bridge	*	*	*	*
Main Channel	0.0002	.11	.015*	.015*	*	*
Main Channel	0.0001	.11	.015*	.11*	*	*

SUMMARY OF REACH LENGTHS

River: Jones River

* Reach	* River Sta.	* Left	* Channel	* Right
Main Channel	3.919	100	100*	100*
Main Channel	3.900	62	62*	62*
*Main Channel	3.889	*Bridge	*	*
Main Channel	3.888	26.4	26.4*	26.4*
Main Channel	3.883	30	30*	30*
Main Channel	3.877	61	61*	61*
*Main Channel	3.870	*Bridge	*	*
Main Channel	3.865	100	100*	100*
Main Channel	3.846	940	1100*	1140*
Main Channel	3.638	1480	1720*	1480*
Main Channel	3.312	960	1080*	960*
Main Channel	3.108	720	1120*	1020*
Main Channel	2.896	820	820*	820*
Main Channel	2.740	100	100*	100*

*Main Channel	*	2.721	* 10.6*	10.6*	10.6*
*Main Channel	*	2.720	*Bridge	*	*
*Main Channel	*	2.719	* 100*	100*	100*
*Main Channel	*	2.700	* 1500*	1640*	1800*
*Main Channel	*	2.390	* 1720*	1600*	1040*
*Main Channel	*	2.087	* 1880*	2240*	1320*
*Main Channel	*	1.663	* 1200*	1420*	1320*
*Main Channel	*	1.394	* 1280*	1720*	1100*
*Main Channel	*	1.068	* 840*	640*	440*
*Main Channel	*	0.947	* 100*	100*	100*
*Main Channel	*	0.928	* 57.6*	57.6*	57.6*
*Main Channel	*	0.920	*Bridge	*	*
*Main Channel	*	0.917	* 50*	50*	50*
*Main Channel	*	0.907	* 50*	50*	100*
*Main Channel	*	0.8983	* .1*	.1*	.1*
*Main Channel	*	0.8982	* 1*	1*	2*
*Main Channel	*	0.8981	* .1*	.1*	.1*
*Main Channel	*	0.898	* 125*	125*	80*
*Main Channel	*	0.874	* 50*	50*	50*
*Main Channel	*	0.864	* 25*	25*	25*
*Main Channel	*	0.862	*Bridge	*	*
*Main Channel	*	0.860	* 100*	100*	240*
*Main Channel	*	0.841	* 200*	200*	200*
*Main Channel	*	0.803	* 880*	1080*	880*
*Main Channel	*	0.598	* 2240*	2240*	2240*
*Main Channel	*	0.174	* 800*	800*	800*
*Main Channel	*	0.023	* 100*	100*	100*
*Main Channel	*	0.004	* 19*	19*	19*
*Main Channel	*	0.003	*Bridge	*	*
*Main Channel	*	0.001	* 20*	20*	20*
*Main Channel	*	0.0004	* 50*	50*	50*
*Main Channel	*	0.0003	*Bridge	*	*
*Main Channel	*	0.0002	* 100*	100*	100*
*Main Channel	*	0.0001	* *	*	*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Jones River

* Reach	* River Sta.	* Contr.	* Expan.	*

*Main Channel	*	3.919	* .1*	.3*
*Main Channel	*	3.900	* .1*	.3*
*Main Channel	*	3.889	*Bridge	*
*Main Channel	*	3.888	* .3*	.5*
*Main Channel	*	3.883	* .3*	.5*
*Main Channel	*	3.877	* .1*	.3*
*Main Channel	*	3.870	*Bridge	*
*Main Channel	*	3.865	* .1*	.3*
*Main Channel	*	3.846	* .1*	.3*
*Main Channel	*	3.638	* .1*	.3*
*Main Channel	*	3.312	* .1*	.3*
*Main Channel	*	3.108	* .1*	.3*
*Main Channel	*	2.896	* .1*	.3*
*Main Channel	*	2.740	* .1*	.3*
*Main Channel	*	2.721	* .1*	.3*
*Main Channel	*	2.720	*Bridge	*
*Main Channel	*	2.719	* .3*	.5*
*Main Channel	*	2.700	* .3*	.5*
*Main Channel	*	2.390	* .1*	.3*
*Main Channel	*	2.087	* .1*	.3*
*Main Channel	*	1.663	* .1*	.3*
*Main Channel	*	1.394	* .1*	.3*
*Main Channel	*	1.068	* .1*	.3*
*Main Channel	*	0.947	* .1*	.3*
*Main Channel	*	0.928	* .1*	.3*
*Main Channel	*	0.920	*Bridge	*
*Main Channel	*	0.917	* .1*	.3*
*Main Channel	*	0.907	* .1*	.3*
*Main Channel	*	0.8983	* .1*	.3*
*Main Channel	*	0.8982	* .1*	.3*
*Main Channel	*	0.8981	* .1*	.3*
*Main Channel	*	0.898	* .1*	.3*
*Main Channel	*	0.874	* .3*	.5*
*Main Channel	*	0.864	* .3*	.5*
*Main Channel	*	0.862	*Bridge	*

*Main Channel	*	0.860	*	.3*	.5*
*Main Channel	*	0.841	*	.3*	.5*
*Main Channel	*	0.803	*	.1*	.3*
*Main Channel	*	0.598	*	.3*	.5*
*Main Channel	*	0.174	*	.3*	.5*
*Main Channel	*	0.023	*	.3*	.5*
*Main Channel	*	0.004	*	.3*	.5*
*Main Channel	*	0.003	*Bridge	*	*
*Main Channel	*	0.001	*	.3*	.5*
*Main Channel	*	0.0004	*	.3*	.5*
*Main Channel	*	0.0003	*Bridge	*	*
*Main Channel	*	0.0002	*	.3*	.5*
*Main Channel	*	0.0001	*	.3*	.5*

Profile Output Table - Summary Output

* Reach	* River Sta	* Profile	* Q Total (cfs)	* Min Ch El (ft)	* W.S. Elev (ft)	* Crit W.S. (ft)	* E.G. Elev (ft)	* Vel Chnl (ft/s)	* Top Width (ft)
* Main Channel	* 0.0001	* 10YR	* 620.00	* 7.00	* 19.80	* 9.55	* 19.82	* 1.07	* 132.27
* Main Channel	* 0.0001	* 50YR	* 810.00	* 7.00	* 20.60	* 10.01	* 20.62	* 1.29	* 146.61
* Main Channel	* 0.0001	* 100YR	* 940.00	* 7.00	* 21.20	* 10.30	* 21.23	* 1.41	* 157.37
* Main Channel	* 0.0002	* 10YR	* 620.00	* 10.00	* 19.79	* 11.96	* 19.83	* 1.52	* 112.60
* Main Channel	* 0.0002	* 50YR	* 810.00	* 10.00	* 20.59	* 12.34	* 20.64	* 1.75	* 130.61
* Main Channel	* 0.0002	* 100YR	* 940.00	* 10.00	* 21.19	* 12.58	* 21.24	* 1.86	* 144.14
* Main Channel	* 0.0003	* Bridge							
* Main Channel	* 0.0004	* 10YR	* 620.00	* 17.40	* 19.48	* 19.48	* 20.26	* 7.16	* 105.60
* Main Channel	* 0.0004	* 50YR	* 810.00	* 17.40	* 19.84	* 19.84	* 20.69	* 7.65	* 113.63
* Main Channel	* 0.0004	* 100YR	* 940.00	* 17.40	* 20.04	* 20.04	* 20.95	* 8.01	* 118.16
* Main Channel	* 0.001	* 10YR	* 620.00	* 12.50	* 20.41	* 16.20	* 20.49	* 2.29	* 60.45
* Main Channel	* 0.001	* 50YR	* 810.00	* 12.50	* 20.82	* 16.61	* 20.94	* 2.78	* 138.86
* Main Channel	* 0.001	* 100YR	* 940.00	* 12.50	* 21.07	* 16.86	* 21.21	* 3.08	* 154.46
* Main Channel	* 0.003	* Bridge							
* Main Channel	* 0.004	* 10YR	* 620.00	* 12.50	* 16.20	* 16.20	* 17.17	* 7.90	* 40.87
* Main Channel	* 0.004	* 50YR	* 810.00	* 12.50	* 16.60	* 16.60	* 17.73	* 8.53	* 42.73
* Main Channel	* 0.004	* 100YR	* 940.00	* 12.50	* 16.86	* 16.86	* 18.08	* 8.88	* 43.93
* Main Channel	* 0.023	* 10YR	* 620.00	* 12.60	* 17.48		* 17.49	* 0.70	* 250.41
* Main Channel	* 0.023	* 50YR	* 810.00	* 12.60	* 18.09		* 18.09	* 0.78	* 262.00
* Main Channel	* 0.023	* 100YR	* 940.00	* 12.60	* 18.46		* 18.47	* 0.82	* 269.85
* Main Channel	* 0.174	* 10YR	* 620.00	* 13.20	* 17.58		* 17.65	* 2.13	* 120.31
* Main Channel	* 0.174	* 50YR	* 810.00	* 13.20	* 18.19		* 18.26	* 2.22	* 125.08
* Main Channel	* 0.174	* 100YR	* 940.00	* 13.20	* 18.56		* 18.64	* 2.28	* 133.45
* Main Channel	* 0.598	* 10YR	* 620.00	* 14.80	* 18.72		* 18.73	* 1.44	* 667.01
* Main Channel	* 0.598	* 50YR	* 810.00	* 14.80	* 19.21		* 19.22	* 1.51	* 695.82
* Main Channel	* 0.598	* 100YR	* 940.00	* 14.80	* 19.55		* 19.55	* 1.54	* 715.32
* Main Channel	* 0.803	* 10YR	* 540.00	* 15.40	* 19.18		* 19.47	* 4.33	* 49.97
* Main Channel	* 0.803	* 50YR	* 700.00	* 15.40	* 19.58		* 19.94	* 4.81	* 84.37
* Main Channel	* 0.803	* 100YR	* 830.00	* 15.40	* 19.85		* 20.26	* 5.16	* 132.62
* Main Channel	* 0.841	* 10YR	* 530.00	* 15.70	* 19.95	* 18.07	* 20.04	* 1.75	* 107.63
* Main Channel	* 0.841	* 50YR	* 680.00	* 15.70	* 20.44	* 18.33	* 20.52	* 1.78	* 188.21
* Main Channel	* 0.841	* 100YR	* 820.00	* 15.70	* 20.79	* 18.55	* 20.86	* 1.82	* 237.06
* Main Channel	* 0.860	* 10YR	* 530.00	* 16.60	* 20.16	* 18.35	* 20.22	* 1.39	* 105.17
* Main Channel	* 0.860	* 50YR	* 680.00	* 16.60	* 20.63	* 18.54	* 20.70	* 1.44	* 110.97
* Main Channel	* 0.860	* 100YR	* 820.00	* 16.60	* 20.96	* 18.71	* 21.04	* 1.52	* 145.50
* Main Channel	* 0.862	* Bridge							
* Main Channel	* 0.864	* 10YR	* 530.00	* 16.60	* 17.87	* 18.35	* 19.61	* 11.74	* 81.83
* Main Channel	* 0.864	* 50YR	* 680.00	* 16.60	* 18.22	* 18.54	* 19.32	* 8.30	* 89.10
* Main Channel	* 0.864	* 100YR	* 820.00	* 16.60	* 18.42	* 18.71	* 19.50	* 7.72	* 90.74

	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
* Main Channel	*	0.874	*	10YR	*	530.00	*	17.40	*	19.50	*	20.06	*	21.48	*	13.51	*	94.96	*
* Main Channel	*	0.874	*	50YR	*	680.00	*	17.40	*	20.00	*	20.21	*	20.83	*	10.00	*	102.75	*
* Main Channel	*	0.874	*	100YR	*	820.00	*	17.40	*	20.28	*	20.37	*	20.94	*	9.24	*	106.43	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.898	*	10YR	*	530.00	*	18.00	*	18.35	*	19.37	*	29.09	*	26.51	*	57.96	*
* Main Channel	*	0.898	*	50YR	*	682.00	*	18.00	*	18.45	*	19.62	*	29.20	*	26.59	*	57.97	*
* Main Channel	*	0.898	*	100YR	*	821.00	*	18.00	*	18.54	*	19.84	*	29.31	*	26.66	*	57.99	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.8981	*	10YR	*	530.00	*	25.50	*	29.81	*	29.81	*	30.13	*	6.50	*	248.72	*
* Main Channel	*	0.8981	*	50YR	*	682.00	*	25.50	*	29.95	*	29.95	*	30.25	*	6.37	*	288.33	*
* Main Channel	*	0.8981	*	100YR	*	821.00	*	25.50	*	30.05	*	30.05	*	30.36	*	6.59	*	303.53	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.8982	*	10YR	*	530.00	*	25.50	*	30.00	*	29.81	*	30.15	*	4.55	*	300.00	*
* Main Channel	*	0.8982	*	50YR	*	682.00	*	25.50	*	30.07	*	29.95	*	30.27	*	5.17	*	304.84	*
* Main Channel	*	0.8982	*	100YR	*	821.00	*	25.50	*	30.16	*		*	30.38	*	5.43	*	309.24	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.8983	*	10YR	*	530.00	*	18.50	*	30.16	*		*	30.16	*	1.29	*	312.98	*
* Main Channel	*	0.8983	*	50YR	*	682.00	*	18.50	*	30.28	*		*	30.29	*	1.63	*	319.21	*
* Main Channel	*	0.8983	*	100YR	*	821.00	*	18.50	*	30.38	*		*	30.40	*	1.93	*	324.72	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.907	*	10YR	*	530.00	*	18.30	*	30.16	*		*	30.17	*	0.82	*	139.15	*
* Main Channel	*	0.907	*	50YR	*	682.00	*	18.30	*	30.27	*		*	30.29	*	1.04	*	151.47	*
* Main Channel	*	0.907	*	100YR	*	821.00	*	18.30	*	30.38	*		*	30.40	*	1.24	*	162.33	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.917	*	10YR	*	530.00	*	18.40	*	30.12	*	21.05	*	30.18	*	1.91	*	123.19	*
* Main Channel	*	0.917	*	50YR	*	682.00	*	18.40	*	30.22	*	21.50	*	30.32	*	2.43	*	137.01	*
* Main Channel	*	0.917	*	100YR	*	821.00	*	18.40	*	30.31	*	21.89	*	30.44	*	2.90	*	148.58	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.920	*		*	Bridge	*		*		*		*		*		*		*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.928	*	10YR	*	530.00	*	18.40	*	21.05	*	21.05	*	22.29	*	8.94	*	24.63	*
* Main Channel	*	0.928	*	50YR	*	682.00	*	18.40	*	21.50	*	21.50	*	22.97	*	9.72	*	24.75	*
* Main Channel	*	0.928	*	100YR	*	821.00	*	18.40	*	21.88	*	21.88	*	23.54	*	10.34	*	24.85	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	0.947	*	10YR	*	530.00	*	18.50	*	22.52	*		*	22.65	*	2.94	*	78.72	*
* Main Channel	*	0.947	*	50YR	*	682.00	*	18.50	*	23.18	*		*	23.31	*	2.90	*	86.84	*
* Main Channel	*	0.947	*	100YR	*	821.00	*	18.50	*	23.75	*		*	23.88	*	2.86	*	93.87	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	1.068	*	10YR	*	530.00	*	19.10	*	23.42	*		*	23.73	*	4.47	*	44.49	*
* Main Channel	*	1.068	*	50YR	*	682.00	*	19.10	*	23.90	*		*	24.27	*	4.84	*	47.41	*
* Main Channel	*	1.068	*	100YR	*	821.00	*	19.10	*	24.34	*		*	24.74	*	5.06	*	50.05	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	1.394	*	10YR	*	530.00	*	20.50	*	25.35	*		*	25.45	*	3.28	*	201.76	*
* Main Channel	*	1.394	*	50YR	*	682.00	*	20.50	*	25.90	*		*	26.01	*	3.57	*	248.36	*
* Main Channel	*	1.394	*	100YR	*	821.00	*	20.50	*	26.34	*		*	26.46	*	3.76	*	286.55	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	1.663	*	10YR	*	460.00	*	22.80	*	26.23	*		*	26.32	*	2.44	*	199.09	*
* Main Channel	*	1.663	*	50YR	*	604.00	*	22.80	*	26.74	*		*	26.83	*	2.58	*	265.30	*
* Main Channel	*	1.663	*	100YR	*	730.00	*	22.80	*	27.14	*		*	27.24	*	2.64	*	296.90	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	2.087	*	10YR	*	460.00	*	24.80	*	28.71	*		*	29.05	*	5.01	*	112.50	*
* Main Channel	*	2.087	*	50YR	*	610.00	*	24.80	*	29.02	*		*	29.46	*	5.78	*	131.70	*
* Main Channel	*	2.087	*	100YR	*	740.00	*	24.80	*	29.23	*		*	29.76	*	6.41	*	144.58	*
	*		*		*		*		*		*		*		*		*		*
* Main Channel	*	2.390	*	10YR	*	460.00	*	27.00	*	31.27	*		*	31.32	*	3.27	*	330.53	*
* Main Channel	*	2.390	*	50YR	*	610.00	*	27.00	*	31.69	*		*	31.74	*	3.38	*	340.67	*
* Main Channel	*	2.390	*	100YR	*	740.00	*	27.00	*	32.02	*		*	32.07	*	3.48	*	348.55	*
	*		*		*		*		*		*		*		*		*		*

* Main Channel	* 2.700	* 10YR	* 390.00	* 26.90	* 32.25	* 31.27	* 32.46	* 4.80	* 261.04
* Main Channel	* 2.700	* 50YR	* 540.00	* 26.90	* 32.69	* 31.69	* 32.94	* 5.52	* 290.22
* Main Channel	* 2.700	* 100YR	* 650.00	* 26.90	* 33.01	* 31.93	* 33.28	* 5.86	* 311.58
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 2.719	* 10YR	* 390.00	* 28.00	* 32.38	* 32.38	* 33.08	* 7.37	* 258.33
* Main Channel	* 2.719	* 50YR	* 540.00	* 28.00	* 32.85	* 32.85	* 33.49	* 7.68	* 308.01
* Main Channel	* 2.719	* 100YR	* 650.00	* 28.00	* 33.06	* 33.06	* 33.73	* 8.16	* 322.24
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 2.720	*	* Bridge	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 2.721	* 10YR	* 390.00	* 28.00	* 32.33	* 32.33	* 32.82	* 6.55	* 248.42
* Main Channel	* 2.721	* 50YR	* 540.00	* 28.00	* 32.68	* 32.68	* 33.11	* 6.81	* 296.67
* Main Channel	* 2.721	* 100YR	* 650.00	* 28.00	* 32.81	* 32.81	* 33.28	* 7.31	* 305.73
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 2.740	* 10YR	* 390.00	* 28.80	* 32.91	*	* 33.05	* 3.65	* 167.65
* Main Channel	* 2.740	* 50YR	* 540.00	* 28.80	* 33.18	*	* 33.38	* 4.52	* 180.69
* Main Channel	* 2.740	* 100YR	* 650.00	* 28.80	* 33.34	*	* 33.59	* 5.11	* 188.50
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 2.896	* 10YR	* 75.00	* 27.30	* 33.18	*	* 33.18	* 0.35	* 369.79
* Main Channel	* 2.896	* 50YR	* 100.00	* 27.30	* 33.55	*	* 33.55	* 0.40	* 407.03
* Main Channel	* 2.896	* 100YR	* 116.00	* 27.30	* 33.78	*	* 33.79	* 0.43	* 430.64
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.108	* 10YR	* 75.00	* 25.80	* 33.19	*	* 33.19	* 0.59	* 290.82
* Main Channel	* 3.108	* 50YR	* 100.00	* 25.80	* 33.56	*	* 33.56	* 0.66	* 340.06
* Main Channel	* 3.108	* 100YR	* 116.00	* 25.80	* 33.80	*	* 33.80	* 0.69	* 371.21
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.312	* 10YR	* 75.00	* 29.30	* 33.22	*	* 33.23	* 0.80	* 181.48
* Main Channel	* 3.312	* 50YR	* 100.00	* 29.30	* 33.60	*	* 33.60	* 0.89	* 196.01
* Main Channel	* 3.312	* 100YR	* 116.00	* 29.30	* 33.83	*	* 33.84	* 0.93	* 205.13
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.638	* 10YR	* 45.00	* 29.50	* 33.36	*	* 33.39	* 1.31	* 17.72
* Main Channel	* 3.638	* 50YR	* 60.00	* 29.50	* 33.74	*	* 33.77	* 1.40	* 92.64
* Main Channel	* 3.638	* 100YR	* 70.00	* 29.50	* 33.98	*	* 34.00	* 1.40	* 134.26
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.846	* 10YR	* 45.00	* 33.00	* 34.19	*	* 34.34	* 3.16	* 15.22
* Main Channel	* 3.846	* 50YR	* 60.00	* 33.00	* 34.50	*	* 34.65	* 3.11	* 49.00
* Main Channel	* 3.846	* 100YR	* 70.00	* 33.00	* 34.66	*	* 34.80	* 3.10	* 76.28
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.865	* 10YR	* 45.00	* 32.20	* 34.49	* 33.77	* 34.71	* 3.69	* 7.42
* Main Channel	* 3.865	* 50YR	* 60.00	* 32.20	* 34.72	* 34.02	* 35.02	* 4.38	* 7.57
* Main Channel	* 3.865	* 100YR	* 70.00	* 32.20	* 34.83	* 34.16	* 35.20	* 4.86	* 7.65
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.870	*	* Bridge	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.877	* 10YR	* 45.00	* 32.20	* 33.77	* 33.77	* 34.34	* 6.04	* 6.88
* Main Channel	* 3.877	* 50YR	* 60.00	* 32.20	* 34.02	* 34.02	* 34.70	* 6.63	* 7.08
* Main Channel	* 3.877	* 100YR	* 70.00	* 32.20	* 34.16	* 34.16	* 34.92	* 7.00	* 7.18
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.883	* 10YR	* 45.00	* 32.60	* 34.51	*	* 34.51	* 0.58	* 66.53
* Main Channel	* 3.883	* 50YR	* 60.00	* 32.60	* 34.90	*	* 34.91	* 0.62	* 76.73
* Main Channel	* 3.883	* 100YR	* 70.00	* 32.60	* 35.15	*	* 35.15	* 0.64	* 83.08
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.888	* 10YR	* 45.00	* 33.00	* 34.51	* 33.77	* 34.52	* 1.10	* 43.07
* Main Channel	* 3.888	* 50YR	* 60.00	* 33.00	* 34.90	* 33.86	* 34.91	* 1.03	* 46.12
* Main Channel	* 3.888	* 100YR	* 70.00	* 33.00	* 35.14	* 33.92	* 35.16	* 1.00	* 48.02
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.889	*	* Bridge	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.900	* 10YR	* 45.00	* 33.00	* 33.76	* 33.76	* 33.97	* 3.69	* 28.78

* Main Channel	* 3.900	* 50YR	* 60.00	* 33.00	* 33.87	* 33.87	* 34.10	* 3.91	* 32.25
* Main Channel	* 3.900	* 100YR	* 70.00	* 33.00	* 33.93	* 33.93	* 34.18	* 4.04	* 34.25
*	*	*	*	*	*	*	*	*	*
* Main Channel	* 3.919	* 10YR	* 45.00	* 33.00	* 34.68	* 34.04	* 34.76	* 2.26	* 18.10
* Main Channel	* 3.919	* 50YR	* 60.00	* 33.00	* 34.86	* 34.19	* 34.96	* 2.59	* 19.21
* Main Channel	* 3.919	* 100YR	* 70.00	* 33.00	* 34.96	* 34.29	* 35.08	* 2.78	* 33.92
