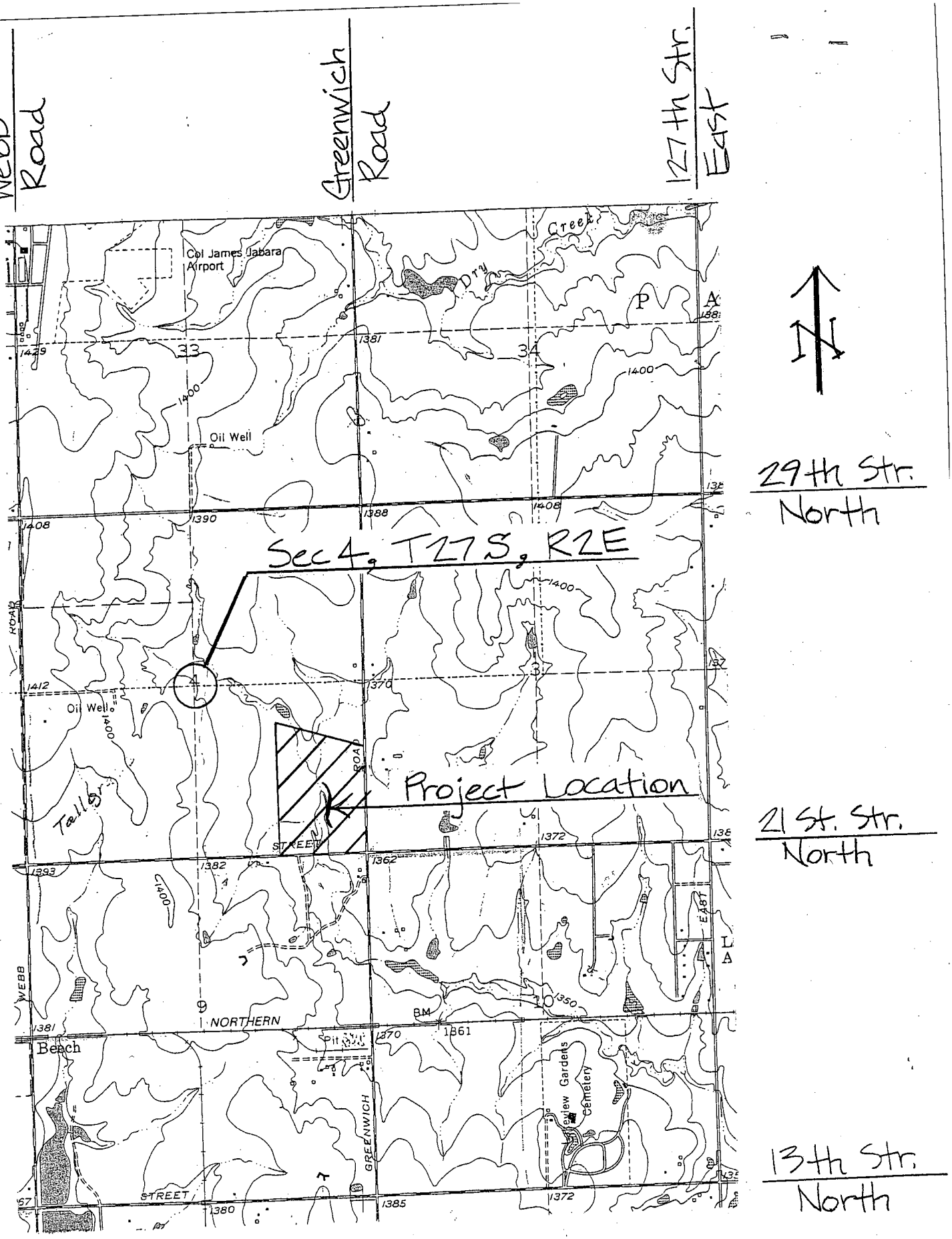

FIGURE 1

Project Location in Sedgwick County

Rating Curve for Existing 3-8x4.5x105.75 RCB at 21st Street North

CURRENT DATE: 07-22-2003
CURRENT TIME: 11:39:08

FILE DATE: 07-10-2001
FILE NAME: 10X4

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CU VL	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1356.42	1356.27	105.75	3 RCB	8.00	4.50	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (CFS) FILE: 10X4 DATE: 07-10-2001

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1356.42	0	0	0	0	0	0	0	0	1
1357.81	110	110	0	0	0	0	0	0	1
1358.63	220	220	0	0	0	0	0	0	1
1359.32	330	330	0	0	0	0	0	0	1
1359.92	440	440	0	0	0	0	0	0	1
1360.49	550	550	0	0	0	0	0	0	1
1361.01	660	660	0	0	0	0	0	0	1
1361.50	770	770	0	0	0	0	0	0	1
1362.08	880	880	0	0	0	0	0	0	1
1362.71	990	990	0	0	0	0	0	0	1
1363.37	1100	1100	0	0	0	0	0	0	3
1363.37	1100	1100	0	0	0	0	0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: 10X4 DATE: 07-10-2001

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1356.42	0.00	0	0	0.00
1357.81	0.00	110	0	0.00
1358.63	0.00	220	0	0.00
1359.32	0.00	330	0	0.00
1359.92	0.00	440	0	0.00
1360.49	0.00	550	0	0.00
1361.01	0.00	660	0	0.00
1361.50	0.00	770	0	0.00
1362.08	0.00	880	0	0.00
1362.71	0.00	990	0	0.00
1363.37	-0.00	1100	0	0.01

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

Rating Curve for Existing 3-8x4.5x105.75 RCB at 21st Street North

CURRENT DATE: 07-22-2003
CURRENT TIME: 11:39:08

FILE DATE: 07-10-2001
FILE NAME: 10X4

CULVERT # 1

PERFORMANCE CURVE FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1356.42	1356.42	0.00	0.00	0-NF	0.00	1356.42	0.00	0.00
110	1357.81	1356.42	1.29	1.39	2-M2	0.00	0.00	0.00	5.27
220	1358.63	1356.42	2.06	2.21	2-M2	0.00	0.00	0.00	6.64
330	1359.32	1356.42	2.72	2.90	2-M2	0.00	0.00	0.00	7.61
440	1359.92	1356.42	3.34	3.50	2-M2	0.00	0.00	0.00	8.37
550	1360.49	1356.42	3.92	4.07	2-M2	0.00	0.00	0.00	9.02
660	1361.01	1356.42	4.49	4.59	2-M2	0.00	0.00	0.00	9.58
770	1361.50	1356.42	5.07	5.08	2-M2	0.00	0.00	0.00	10.09
880	1362.08	1356.42	5.66	5.56	2-M2	0.00	0.00	0.00	10.55
990	1362.71	1356.42	6.29	6.01	2-M2	0.00	0.00	0.00	10.97
1100	1363.37	1356.42	6.95	6.59	7-FF	0.00	0.00	0.00	11.36

El. inlet face invert 1356.42 ft El. outlet invert 1356.27 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1356.42
OUTLET STATION (FT)	105.75
OUTLET ELEVATION (FT)	1356.27
NUMBER OF BARRELS	3.00
SLOPE (V-FT/H-FT)	0.0014
CULVERT LENGTH ALONG SLOPE (FT)	105.75

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	4.50 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

Rating Curve for Existing 3-8x4.5x105.75 RCB at 21st Street North

CURRENT DATE: 07-22-2003
CURRENT TIME: 11:39:08

FILE DATE: 07-10-2001
FILE NAME: 10X4

TAILWATER

CONSTANT WATER SURFACE ELEVATION
1356.42

ROADWAY OVERTOPPING DATA

WEIR COEFFICIENT	3.00
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1363.37

Rating Curve for Existing 3-8x4.5x105.75 RCB at 21st Street North

Rating Curve for Proposed 4-10x5x50 RCB connecting South and Middle South Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:45:15

FILE DATE: 07-22-2003
FILE NAME: STR#2

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CU LV	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1358.00	1357.90	50.00	4 RCB	10.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

FILE: STR#2 CULVERT HEADWATER ELEVATION (FT) DATE: 07-22-2003

DISCHARGE	1	2	3	4	5	6	ROADWAY
0	1358.00	0.00	0.00	0.00	0.00	0.00	1365.00
110	1359.39	0.00	0.00	0.00	0.00	0.00	1365.51
220	1360.21	0.00	0.00	0.00	0.00	0.00	1365.81
330	1360.89	0.00	0.00	0.00	0.00	0.00	1366.06
440	1361.50	0.00	0.00	0.00	0.00	0.00	1366.29
550	1362.05	0.00	0.00	0.00	0.00	0.00	1366.50
660	1362.58	0.00	0.00	0.00	0.00	0.00	1366.69
770	1363.07	0.00	0.00	0.00	0.00	0.00	1366.87
880	1363.59	0.00	0.00	0.00	0.00	0.00	1367.05
990	1364.13	0.00	0.00	0.00	0.00	0.00	1367.21
1100	1364.81	0.00	0.00	0.00	0.00	0.00	1367.38

Rating Curve for Proposed 4-10x5x50 RCB connecting South and Middle South Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:45:15

FILE DATE: 07-22-2003
FILE NAME: STR#2

CULVERT # 1

PERFORMANCE CURVE FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1358.00	1358.00	0.00	0.00	0-NF	0.00	1358.00	0.00	0.00
110	1359.39	1359.30	0.92	1.39	3-M1	0.00	0.00	0.00	1.96
220	1360.21	1360.07	1.46	2.21	3-M1	0.00	0.00	0.00	2.53
330	1360.89	1360.71	1.91	2.89	3-M1	0.00	0.00	0.00	2.94
440	1361.50	1361.28	2.32	3.50	3-M1	0.00	0.00	0.00	3.25
550	1362.05	1361.80	2.70	4.05	3-M1	0.00	0.00	0.00	3.53
660	1362.58	1362.30	3.08	4.58	3-M1	0.00	0.00	0.00	3.75
770	1363.07	1362.76	3.43	5.07	3-M1	0.00	0.00	0.00	3.96
880	1363.59	1363.20	3.78	5.59	4-FF	0.00	0.00	0.00	4.40
990	1364.13	1363.63	4.11	6.13	4-FF	0.00	0.00	0.00	4.95
1100	1364.81	1364.20	4.44	6.81	4-FF	0.00	0.00	0.00	5.50

El. inlet face invert 1358.00 ft El. outlet invert 1357.90 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1358.00
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	1357.90
NUMBER OF BARRELS	4.00
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	5.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

Rating Curve for Proposed 4-10x5x50 RCB connecting South and Middle South Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:45:15

FILE DATE: 07-22-2003
FILE NAME: STR#2

TAILWATER

TAILWATER RATING CURVE

FLOW(CFS)	W.S.E.(FT)
0	1358.00
110	1359.30
220	1360.07
330	1360.71
440	1361.28
550	1361.80
660	1362.30
770	1362.76
880	1363.20
990	1363.63
1100	1364.20

ROADWAY OVERTOPPING DATA

WEIR COEFFICIENT	3.00
EMBANKMENT TOP WIDTH (FT)	50.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1365.00

Q	B	q	Y crit.	E	Weir Elevation	Culvert Hydrl. Elevation	**Control Elevation**
0	24.00	0.00	0.00	0.00	1358.00	1357.00	**1358.00**
110	24.00	4.58	0.87	1.30	1359.30	1358.39	**1359.30**
220	24.00	9.17	1.38	2.07	1360.07	1359.21	**1360.07**
330	24.00	13.75	1.80	2.71	1360.71	1359.90	**1360.71**
440	24.00	18.33	2.19	3.28	1361.28	1360.50	**1361.28**
550	24.00	22.92	2.54	3.80	1361.80	1361.07	**1361.80**
660	24.00	27.50	2.86	4.30	1362.30	1361.61	**1362.30**
770	24.00	32.08	3.17	4.76	1362.76	1362.10	**1362.76**
880	24.00	36.67	3.47	5.20	1363.20	1362.66	**1363.20**
990	24.00	41.25	3.75	5.63	1363.63	1363.28	**1363.63**
1100	24.00	45.83	4.03	6.04	1364.04	1364.20	**1364.20**

Rating Curve to Analyze 3-8x4.5x400 Extended RCB at 21st Street for Proposed Conditions

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:23:41

FILE DATE: 07-22-2003
FILE NAME: STR#1

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CULV	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS / SHAPE / MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1357.00	1356.27	400.00	3 RCB	8.00	4.50	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (CFS) FILE: STR#1 DATE: 07-22-2003

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1357.00	0	0	0	0	0	0	0	0	1
1358.39	110	110	0	0	0	0	0	0	1
1359.21	220	220	0	0	0	0	0	0	1
1359.90	330	330	0	0	0	0	0	0	1
1360.50	440	440	0	0	0	0	0	0	1
1361.07	550	550	0	0	0	0	0	0	1
1361.61	660	660	0	0	0	0	0	0	1
1362.10	770	770	0	0	0	0	0	0	1
1362.66	880	880	0	0	0	0	0	0	1
1363.28	990	990	0	0	0	0	0	0	1
1364.20	1100	1100	0	0	0	0	0	0	1
1364.50	1136	1136	0	0	0	0	0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: STR#1 DATE: 07-22-2003

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1357.00	0.00	0	0	0.00
1358.39	0.00	110	0	0.00
1359.21	0.00	220	0	0.00
1359.90	0.00	330	0	0.00
1360.50	0.00	440	0	0.00
1361.07	0.00	550	0	0.00
1361.61	0.00	660	0	0.00
1362.10	0.00	770	0	0.00
1362.66	0.00	880	0	0.00
1363.28	0.00	990	0	0.00
1364.20	0.00	1100	0	0.00

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

Rating Curve to Analyze 3-8x4.5x400 Extended RCB at 21st Street for Proposed Conditions

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:23:41

FILE DATE: 07-22-2003
FILE NAME: STR#1

CULVERT # 1

PERFORMANCE CURVE FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1357.00	1357.00	0.00	0.00	0-NF	0.00	1357.00	0.00	0.00
110	1358.39	1357.00	1.29	1.39	2-M2	0.00	0.00	0.00	5.27
220	1359.21	1357.00	2.05	2.21	2-M2	0.00	0.00	0.00	6.64
330	1359.90	1357.00	2.72	2.90	2-M2	0.00	0.00	0.00	7.61
440	1360.50	1357.00	3.34	3.50	2-M2	0.00	0.00	0.00	8.37
550	1361.07	1357.00	3.92	4.07	2-M2	0.00	0.00	0.00	9.02
660	1361.61	1357.00	4.49	4.61	2-M2	0.00	0.00	0.00	9.58
770	1362.10	1357.00	5.07	5.10	2-M2	0.00	0.00	0.00	10.09
880	1362.66	1357.00	5.66	5.58	2-M2	0.00	0.00	0.00	10.55
990	1363.28	1357.00	6.28	6.15	7-FF	0.00	0.00	0.00	10.97
1100	1364.20	1357.00	6.95	7.20	7-FF	0.00	0.00	0.00	11.36

El. inlet face invert 1357.00 ft El. outlet invert 1356.27 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1357.00
OUTLET STATION (FT)	400.00
OUTLET ELEVATION (FT)	1356.27
NUMBER OF BARRELS	3.00
SLOPE (V-FT/H-FT)	0.0018
CULVERT LENGTH ALONG SLOPE (FT)	400.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	4.50 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

Rating Curve to Analyze 3-8x4.5x400 Extended RCB at 21st Street for Proposed Conditions

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:23:41

FILE DATE: 07-22-2003
FILE NAME: STR#1

TAILWATER

CONSTANT WATER SURFACE ELEVATION
1357.00

ROADWAY OVERTOPPING DATA

WEIR COEFFICIENT	3.00
EMBANKMENT TOP WIDTH (FT)	100.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1364.50

Q	B	g	Y crit.	E	Weir Elevation	Culvert Hydrl. Elevation	**Control Elevation**
0	40.00	0.00	0.00	0.00	1359.00	1358.10	**1359.00**
110	40.00	2.75	0.62	0.93	1359.93	1359.48	**1359.93**
220	40.00	5.50	0.98	1.47	1360.47	1360.35	**1360.47**
330	40.00	8.25	1.28	1.93	1360.93	1361.06	**1361.06**
440	40.00	11.00	1.55	2.33	1361.33	1361.70	**1361.70**
550	40.00	13.75	1.80	2.71	1361.71	1362.28	**1362.28**
660	40.00	16.50	2.04	3.06	1362.06	1362.84	**1362.84**
770	40.00	19.25	2.26	3.39	1362.39	1363.30	**1363.30**
880	40.00	22.00	2.47	3.70	1362.70	1363.98	**1363.98**
990	40.00	24.75	2.67	4.00	1363.00	1364.63	**1364.63**
1100	40.00	27.50	2.86	4.30	1363.30	1365.42	**1365.42**

Rating Curve for 4-10x5x50 RCB Connecting Middle Two Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:55:12

FILE DATE: 07-22-2003
FILE NAME: STR#3

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CU LV	SITE DATA: INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1358.10	1358.00	50.00	4	RCB	10.00	5.00	.012	CONVENTIONAL
2									
3									
4									
5									
6									

SUMMARY OF CULVERT FLOWS (CFS) FILE: STR#3 DATE: 07-22-2003

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1358.10	0	0	0	0	0	0	0	0	1
1359.48	110	110	0	0	0	0	0	0	1
1360.35	220	220	0	0	0	0	0	0	1
1361.06	330	330	0	0	0	0	0	0	1
1361.70	440	440	0	0	0	0	0	0	1
1362.28	550	550	0	0	0	0	0	0	1
1362.84	660	660	0	0	0	0	0	0	1
1363.30	770	770	0	0	0	0	0	0	1
1363.98	880	880	0	0	0	0	0	0	1
1364.63	990	990	0	0	0	0	0	0	1
1365.42	1100	1100	0	0	0	0	0	0	1
1366.00	1528	1528	0	0	0	0	0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: STR#3 DATE: 07-22-2003

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1358.10	0.00	0	0	0.00
1359.48	0.00	110	0	0.00
1360.35	0.00	220	0	0.00
1361.06	0.00	330	0	0.00
1361.70	0.00	440	0	0.00
1362.28	0.00	550	0	0.00
1362.84	0.00	660	0	0.00
1363.30	0.00	770	0	0.00
1363.98	0.00	880	0	0.00
1364.63	0.00	990	0	0.00
1365.42	0.00	1100	0	0.00

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

Rating Curve for 4-10x5x50 RCB Connecting Middle Two Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:55:12

FILE DATE: 07-22-2003
FILE NAME: STR#3

CULVERT # 1

PERFORMANCE CURVE FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1358.10	1358.00	0.00	-0.10	0-NF	0.00	1358.10	0.00	0.00
110	1359.48	1359.39	0.92	1.38	3-M1	0.00	0.00	0.00	1.98
220	1360.35	1360.21	1.46	2.25	3-M1	0.00	0.00	0.00	2.49
330	1361.06	1360.89	1.91	2.96	3-M1	0.00	0.00	0.00	2.85
440	1361.70	1361.50	2.32	3.60	3-M1	0.00	0.00	0.00	3.14
550	1362.28	1362.05	2.70	4.18	3-M1	0.00	0.00	0.00	3.40
660	1362.84	1362.58	3.08	4.74	3-M1	0.00	0.00	0.00	3.60
770	1363.30	1363.07	3.43	5.20	3-M1	0.00	0.00	0.00	3.60
880	1363.98	1363.59	3.78	5.88	4-FF	0.00	0.00	0.00	4.40
990	1364.63	1364.13	4.11	6.53	4-FF	0.00	0.00	0.00	4.95
1100	1365.42	1364.81	4.44	7.32	4-FF	0.00	0.00	0.00	5.50

El. inlet face invert 1358.10 ft El. outlet invert 1358.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1358.10
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	1358.00
NUMBER OF BARRELS	4.00
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	5.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

Rating Curve for 4-10x5x50 RCB Connecting Middle Two Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 13:55:12

FILE DATE: 07-22-2003
FILE NAME: STR#3

TAILWATER

TAILWATER RATING CURVE

FLOW(CFS)	W.S.E.(FT)
0	1358.00
110	1359.39
220	1360.21
330	1360.89
440	1361.50
550	1362.05
660	1362.58
770	1363.07
880	1363.59
990	1364.13
1100	1364.81

ROADWAY OVERTOPPING DATA

WEIR COEFFICIENT	3.00
EMBANKMENT TOP WIDTH (FT)	50.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1366.00

Q	B	q	Y crit.	E	Weir Elevation	Culvert Hydrl. Elevation	**Control Elevation**
0	40.00	0.00	0.00	0.00	1360.00	1359.00	**1360.00**
110	40.00	2.75	0.62	0.93	1360.93	1360.11	**1360.93**
220	40.00	5.50	0.98	1.47	1361.47	1360.74	**1361.47**
330	40.00	8.25	1.28	1.93	1361.93	1361.37	**1361.93**
440	40.00	11.00	1.55	2.33	1362.33	1362.02	**1362.33**
550	40.00	13.75	1.80	2.71	1362.71	1362.62	**1362.71**
660	40.00	16.50	2.04	3.06	1363.06	1363.19	**1363.19**
770	40.00	19.25	2.26	3.39	1363.39	1363.68	**1363.68**
880	40.00	22.00	2.47	3.70	1363.70	1364.28	**1364.28**
990	40.00	24.75	2.67	4.00	1364.00	1365.13	**1365.13**
1100	40.00	27.50	2.86	4.30	1364.30	1366.03	**1366.03**

Rating Curve for 4-10x5x50 RCB Connecting Middle North and North Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 14:05:07

FILE DATE: 07-22-2003
FILE NAME: STR#4

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CU VL	SITE DATA: INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1359.00	1358.90	50.00	4 RCB	10.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (CFS) FILE: STR#4 DATE: 07-22-2003

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1359.00	0	0	0	0	0	0	0	0	1
1360.11	110	110	0	0	0	0	0	0	1
1360.74	220	220	0	0	0	0	0	0	1
1361.37	330	330	0	0	0	0	0	0	1
1362.02	440	440	0	0	0	0	0	0	1
1362.62	550	550	0	0	0	0	0	0	1
1363.19	660	660	0	0	0	0	0	0	1
1363.68	770	770	0	0	0	0	0	0	1
1364.28	880	880	0	0	0	0	0	0	1
1365.13	990	990	0	0	0	0	0	0	1
1366.03	1100	1100	0	0	0	0	0	0	1
1366.50	1453	1453	0	0	0	0	0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: STR#4 DATE: 07-22-2003

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1359.00	0.00	0	0	0.00
1360.11	0.00	110	0	0.00
1360.74	0.00	220	0	0.00
1361.37	0.00	330	0	0.00
1362.02	0.00	440	0	0.00
1362.62	0.00	550	0	0.00
1363.19	0.00	660	0	0.00
1363.68	0.00	770	0	0.00
1364.28	0.00	880	0	0.00
1365.13	0.00	990	0	0.00
1366.03	0.00	1100	0	0.00

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

Rating Curve for 4-10x5x50 RCB Connecting Middle North and North Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 14:05:07

FILE DATE: 07-22-2003
FILE NAME: STR#4

CULVERT # 1

PERFORMANCE CURVE FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1359.00	1359.00	0.00	0.00	0-NF	0.00	1359.00	0.00	0.00
110	1360.11	1359.93	0.92	1.11	3-M1	0.00	0.00	0.00	2.67
220	1360.74	1360.47	1.46	1.74	3-M1	0.00	0.00	0.00	3.50
330	1361.37	1361.06	1.91	2.37	3-M1	0.00	0.00	0.00	3.82
440	1362.02	1361.70	2.32	3.02	3-M1	0.00	0.00	0.00	3.93
550	1362.62	1362.28	2.70	3.62	3-M1	0.00	0.00	0.00	4.07
660	1363.19	1362.84	3.08	4.19	3-M1	0.00	0.00	0.00	4.19
770	1363.68	1363.30	3.43	4.68	3-M1	0.00	0.00	0.00	4.37
880	1364.28	1363.98	3.78	5.28	3-M1	0.00	0.00	0.00	4.37
990	1365.13	1364.63	4.11	6.13	4-FF	0.00	0.00	0.00	4.95
1100	1366.03	1365.42	4.44	7.03	4-FF	0.00	0.00	0.00	5.50

El. inlet face invert 1359.00 ft El. outlet invert 1358.90 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1359.00
OUTLET STATION (FT)	50.00
OUTLET ELEVATION (FT)	1358.90
NUMBER OF BARRELS	4.00
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	50.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 FT
BARREL RISE	5.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

Rating Curve for 4-10x5x50 RCB Connecting Middle North and North Ponds

CURRENT DATE: 07-22-2003
CURRENT TIME: 14:05:07

FILE DATE: 07-22-2003
FILE NAME: STR#4

TAILWATER

TAILWATER RATING CURVE

FLOW(CFS)	W.S.E.(FT)
0	1359.00
110	1359.93
220	1360.47
330	1361.06
440	1361.70
550	1362.28
660	1362.84
770	1363.30
880	1363.98
990	1364.63
1100	1365.42

ROADWAY OVERTOPPING DATA

WEIR COEFFICIENT	3.00
EMBANKMENT TOP WIDTH (FT)	50.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1366.50
