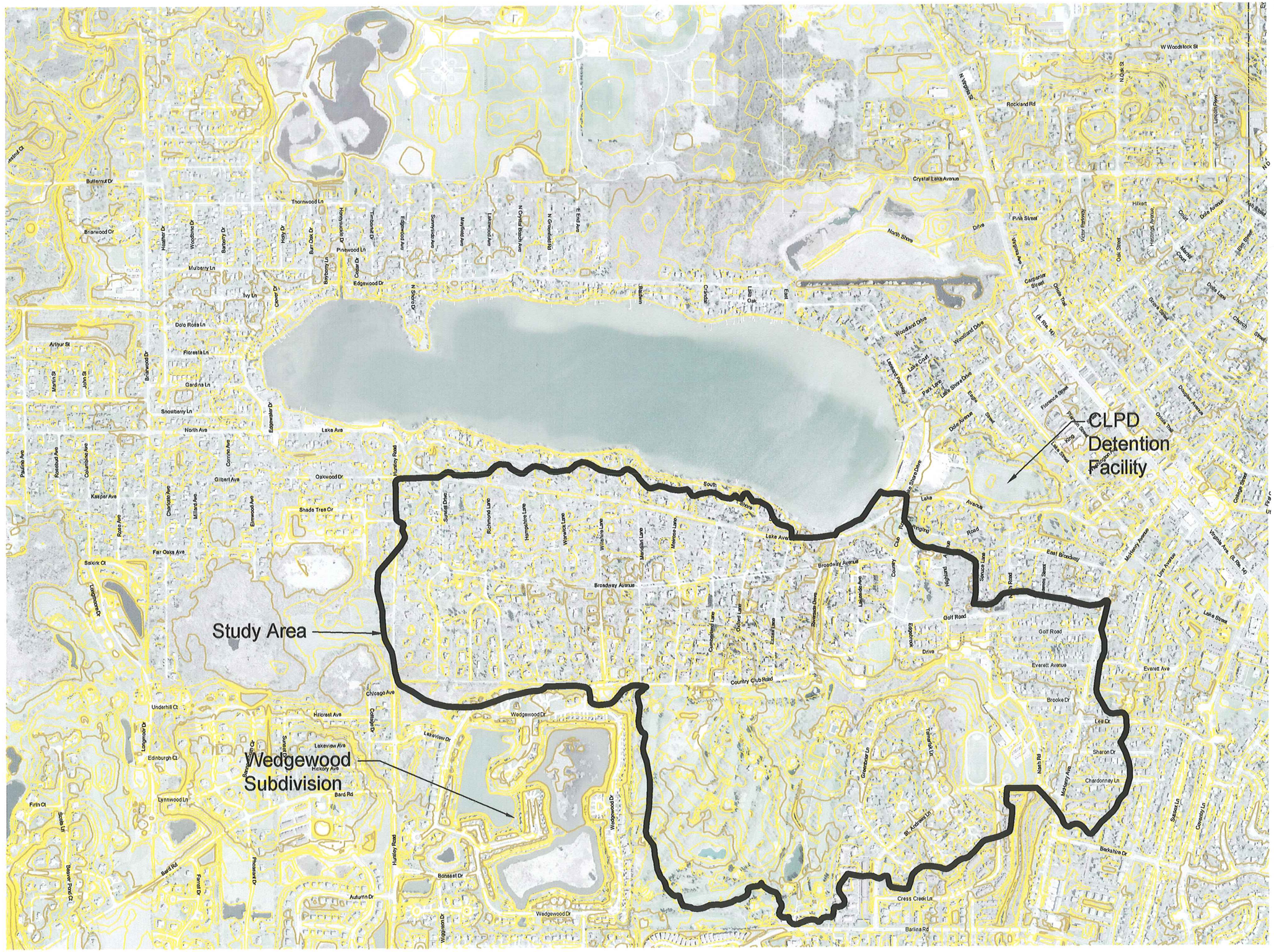


0 500 1000

Scale in Feet

N

LEGEND

Study Area Boundary

Existing Contours

No.	Revision/Issue	Date
1	Per City Comments	04/13/10

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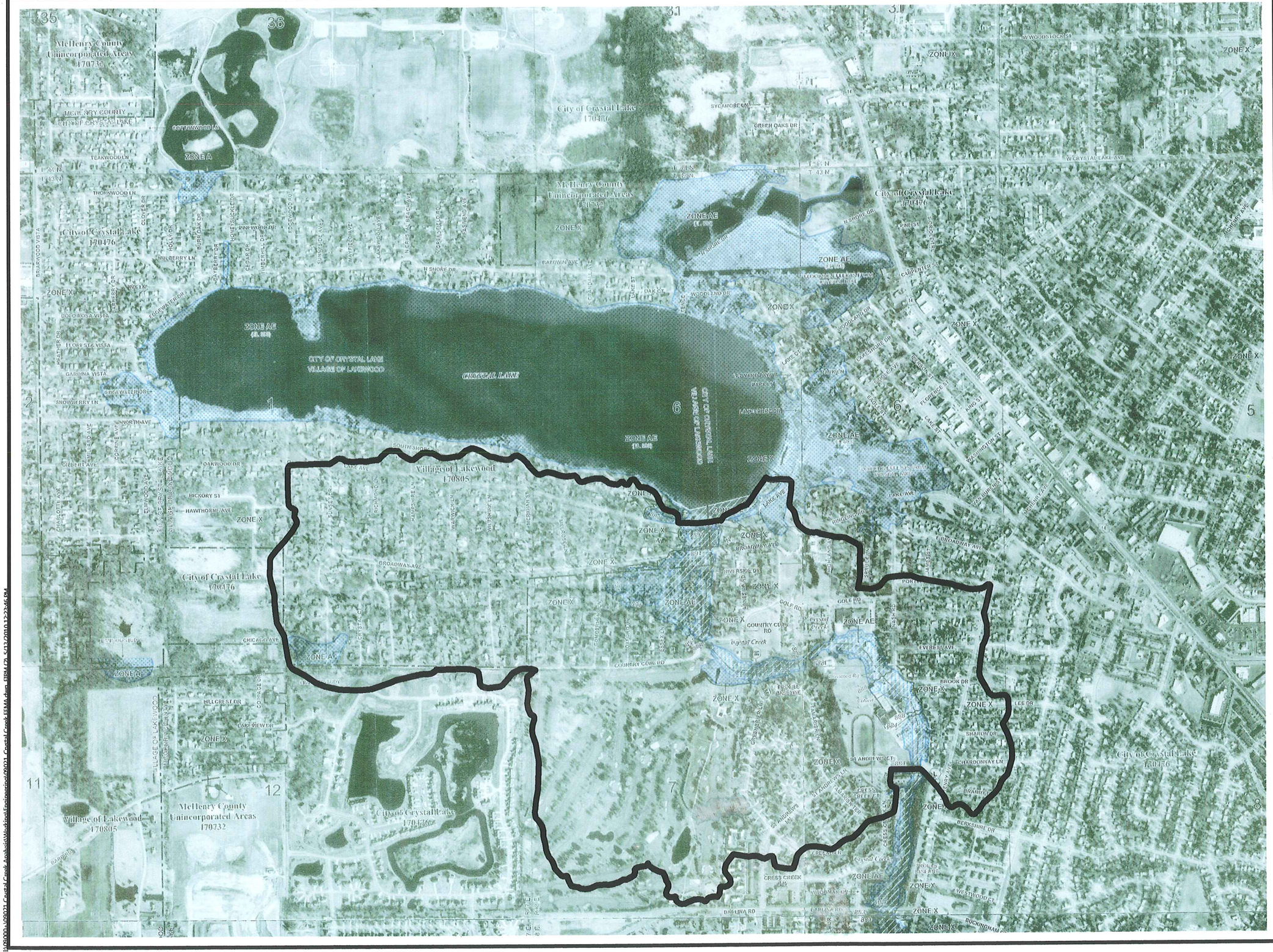
Crystal Creek Flooding Analysis

Study Area

PROJECT NO.	09021	SHEET NO.
DESIGNED BY	GCS/DAK	1
DRAWN BY	CFR	
CHECKED BY	GCS	
APPROVED BY	GCS	
ISSUE DATE	08/28/2009	

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LEGEND

Study Area Boundary

No.	Revision/Issue	Date

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Crystal Creek Flooding Analysis

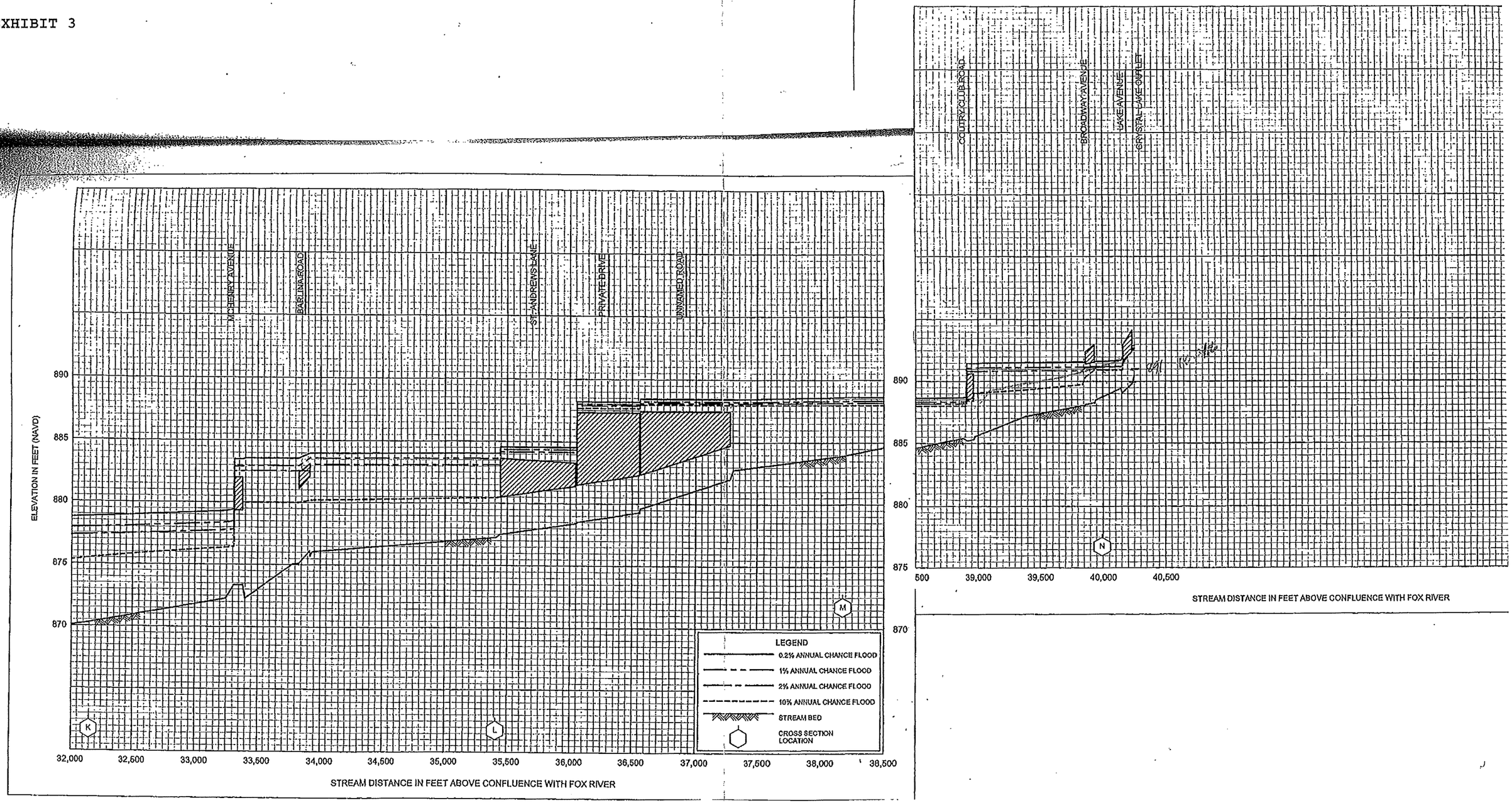
FEMA Floodplain and Floodway Map

PROJECT NO:	09021	SHEET NO:
DESIGNED BY	GCS/DAK	2
DRAWN BY	CFR	
CHECKED BY	GCS	
APPROVED BY	GCS	
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EXHIBIT 3


MCHENRY AVENUE
BARLINA ROAD
ST. ANDREWS LANE
PRIVATE DRIVE
UNNAMED ROAD
COUNTRY CLUB ROAD
BROADWAY AVENUE
LAKE AVENUE
CRYSTAL LAKE OUTLET
ELEVATION IN FEET (NAVD)
890
885
880
875
870
K
L
M
N
32,000
32,500
33,000
33,500
34,000
34,500
35,000
35,500
36,000
36,500
37,000
37,500
38,000
38,500
39,000
39,500
40,000
40,500
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH FOX RIVER
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH FOX RIVER

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EXHIBIT 4
Crystal Lake Watersheds
Flooding Complaint Areas

Legend

- Sanitary Lift Station
- Storm Sewers
- Lippold Field Tiles
- Crystal Lake Watershed Boundary
- Crystal Lake Drainage District (1,310 acres)

Major Watersheds

- Sub-Watersheds
- Flood Complaint Areas
- Lakewood (299 acres)
- Cove Pond (640 acres)
- Woodland Wetland (55 acres)
- East (384 acres)
- Direct Crystal Lake (175 acres)
- Lippold (2,305 acres)

Note: Watershed boundaries based on McHenry County 2005 2-foot topography.

N W E S

0 400 800 1,200 1,600 Feet

Scale: 1 inch = 700 feet

Crystal Lake Drainage District

Lippold

Cove Pond

Woodland Wetland

East

Crystal Lake

Lakewood

Lakewood

Crystal Lake

1A

1B

1C

2

3

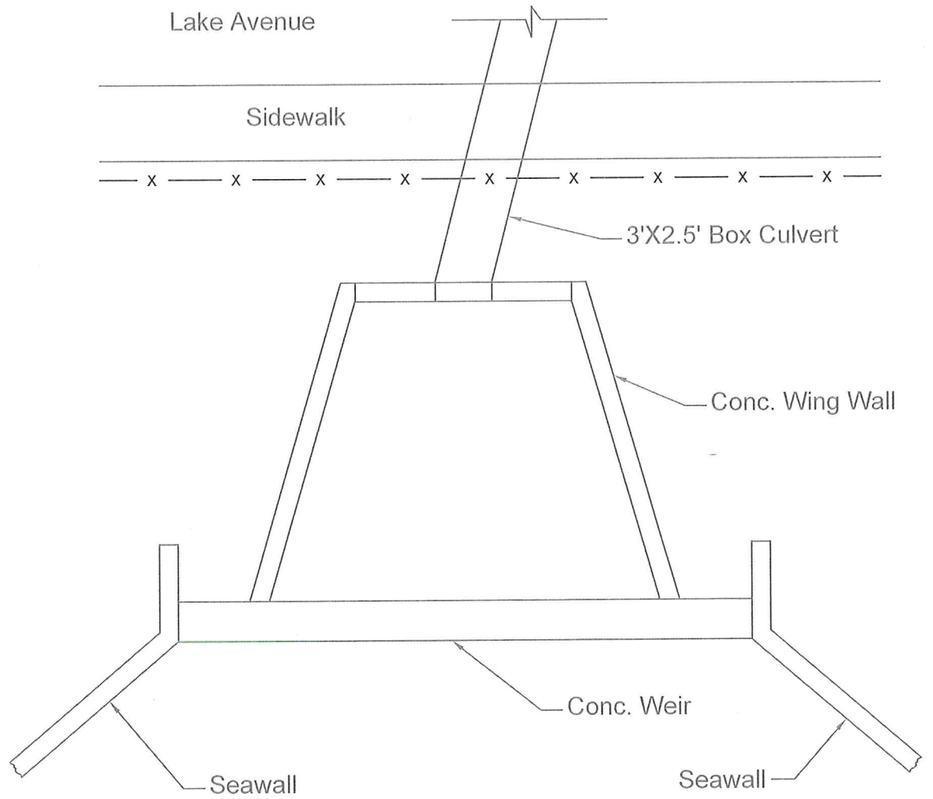
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Crystal Creek

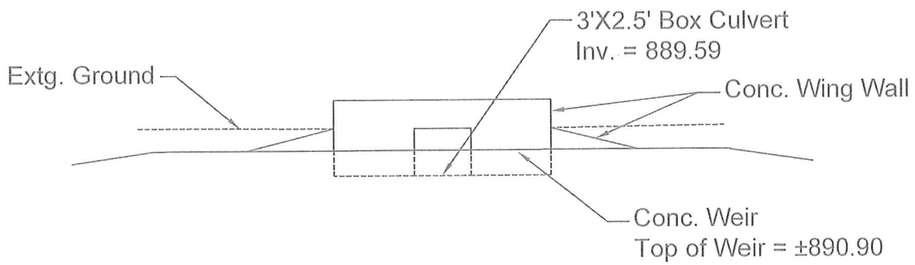
Robin Hill Dr
S Country Club Rd
S Cherry Valley Rd
Oak Ridge Rd
Stonegate Dr
Red Barn Rd
Great Hill Rd
Foxfire Dr
Chesterfield Rd
Ripley Rd
Red Oak Dr
East Dr
W Hillside Rd
Madison St
US 14
Market St
Teckler Rd
Dunn Rd
Lexington Trl
Vermont Trl
Hillcrest Dr
W Upland Dr
Daisy Ln
Meadow Dr
N Oak St
Abendroth Dr
Waukegan Rd
Redbird Dr
Lochwood Dr
Cascade Dr
Midlane Dr
Ryan Way
Tile Line Rd
Highline Rd
Butternut Dr
Thornwood Ln
Chestnut Dr
Elm Ln
Heather Dr
Woodbine Dr
Barberry Dr
Holly Dr
Burr Oak Dr
Pinewood Ln
Mulberry Ln
Bayberry Ln
Cedar Dr
Edgewood Dr
Dole Rosa Ln
Floresta Ln
Gardina Ln
Snowberry Ln
North Ave
Lake Ave
Oakwood Dr
Gilbert Ave
Kasper Ave
Fair Oaks Ave
Blakewood Dr
Corrine Ave
Elmwood Ave
Charlotte Ave
Millard Ave
Rose Ave
Georgine St
Linder Ave
Arthur St
Delta Ave
Delaware St
Pauline Ave
Rosebud Ave
Columbine Ave
Hickory Dr
Ridge Ave
Orchard Row
Rockland Rd
W Woodstock St
N Oak St
Lincoln Pkwy
Pine Ct
Peterson Pkwy
Marian Pkwy
Evergreen Pkwy
Center St
Elmhurst Ave
Crystal Lake Avenue
Hilkert
Pine Street
North Shore Drive
Melville Ave
Hastings Avenue
Dole Avenue
Ash Street
Elm Street
Merrill Court
Maple Street
Grove Street
Dole Lane
Church Street
Paddock Street
Franklin Avenue
Woodland Drive
Lake Court
Park Lane
Lake Shore Drive
Eighth Street
Third Street
Pearl Street
Orchard Trail
Doughboy Avenue
Rosedale Avenue
South Street
Hill Avenue
Fairview Avenue
Grand Avenue
College Street
Union Street
First Court
Second Court
Utley Street
Wallace Avenue
Mary Lane
Harold Street
Keim Street
Eugene Street
Terra Cotta Ave
Lake Avenue
Broadway Street
Lakeside Ave
Country Club Road
Golf Road
Richardson Drive
Riverside Drive
Cumberland Lane
Oxford Lane
Essex Lane
Williams Lane
Millstone Lane
Hampshire Lane
Richmond Lane
Sunset Drive
Huntley Road
Sunset Dr
Hillcrest Ave
Chicago Ave
College Dr
Bard Rd
Pheasant Dr
Greenage Dr
State Rte
Lincoln Hwy
East Broadway
Spruce Lane
Nash Road
James Street
Mt Henry Avenue
Rte 14
10
11
13
14
15
16
17
unk



Outfall Structure Photo



Plan



0 4 8

Scale in Feet

LEGEND

No.	Revision/Issue	Date
2	Per City Comments	05/12/10
1	Per City Comments	04/13/10

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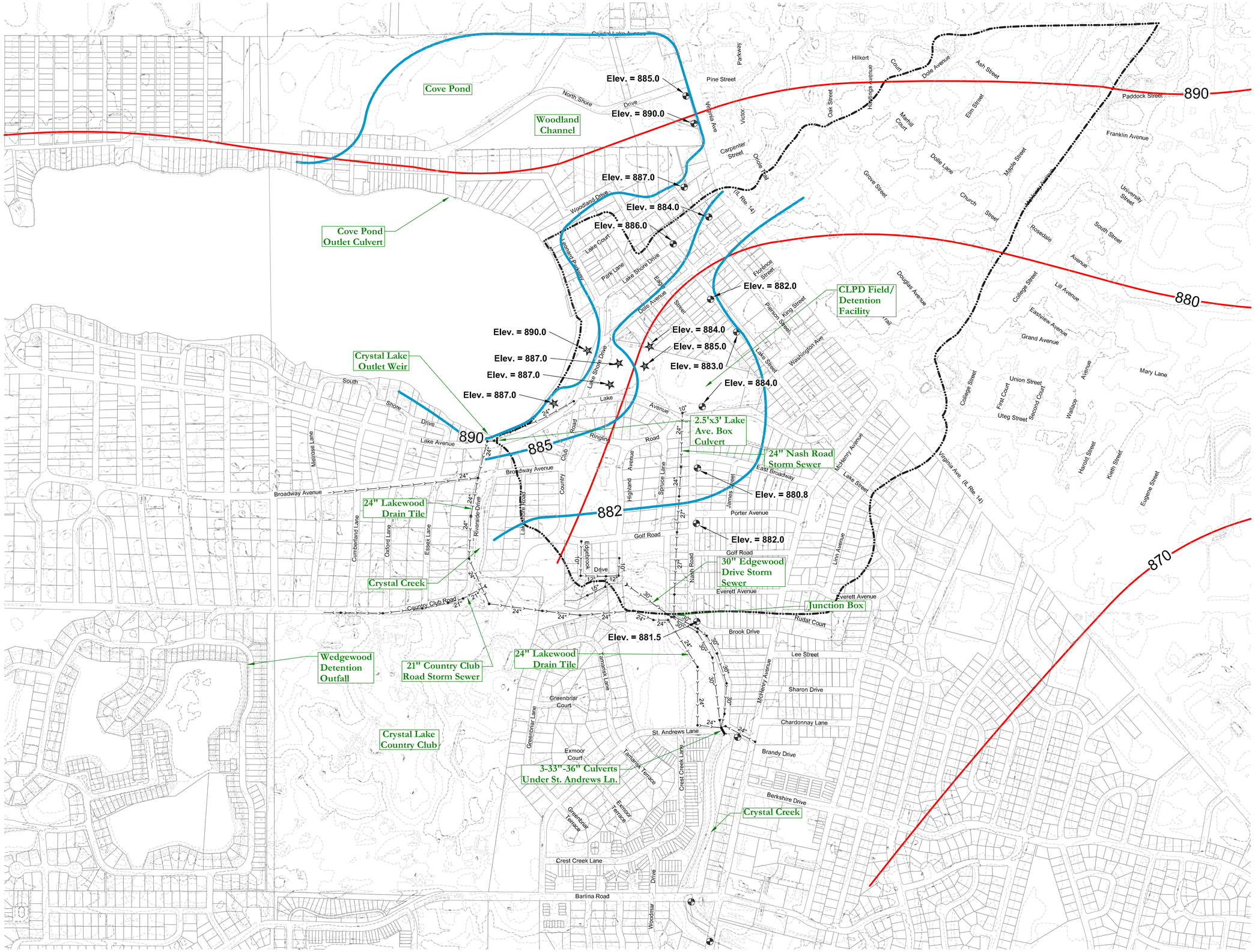
Crystal Creek Flooding Analysis

Crystal Lake Outfall Structure

PROJECT NO: 09021		SHEET NO:
DESIGNED BY	GCS/DAK	5
DRAWN BY	CFR	
CHECKED BY	GCS	
APPROVED BY	GCS	
ISSUE DATE	08/28/2009	

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0 400 800

Scale in Feet

N

LEGEND

- Existing Storm Sewer Pipe
- Former Surface Water Crystal Lake Watershed
- ISWS Groundwater Level (Meyer 1994)
- Groundwater Based on Historical Soil Borings
- TSC 2006 Boring Locations
- SMC 1997 Boring Locations

No.	Revision/Issue	Date
2	Per City Comments	05/12/10
1	Per City Comments	04/13/10

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Crystal Creek Flooding Analysis

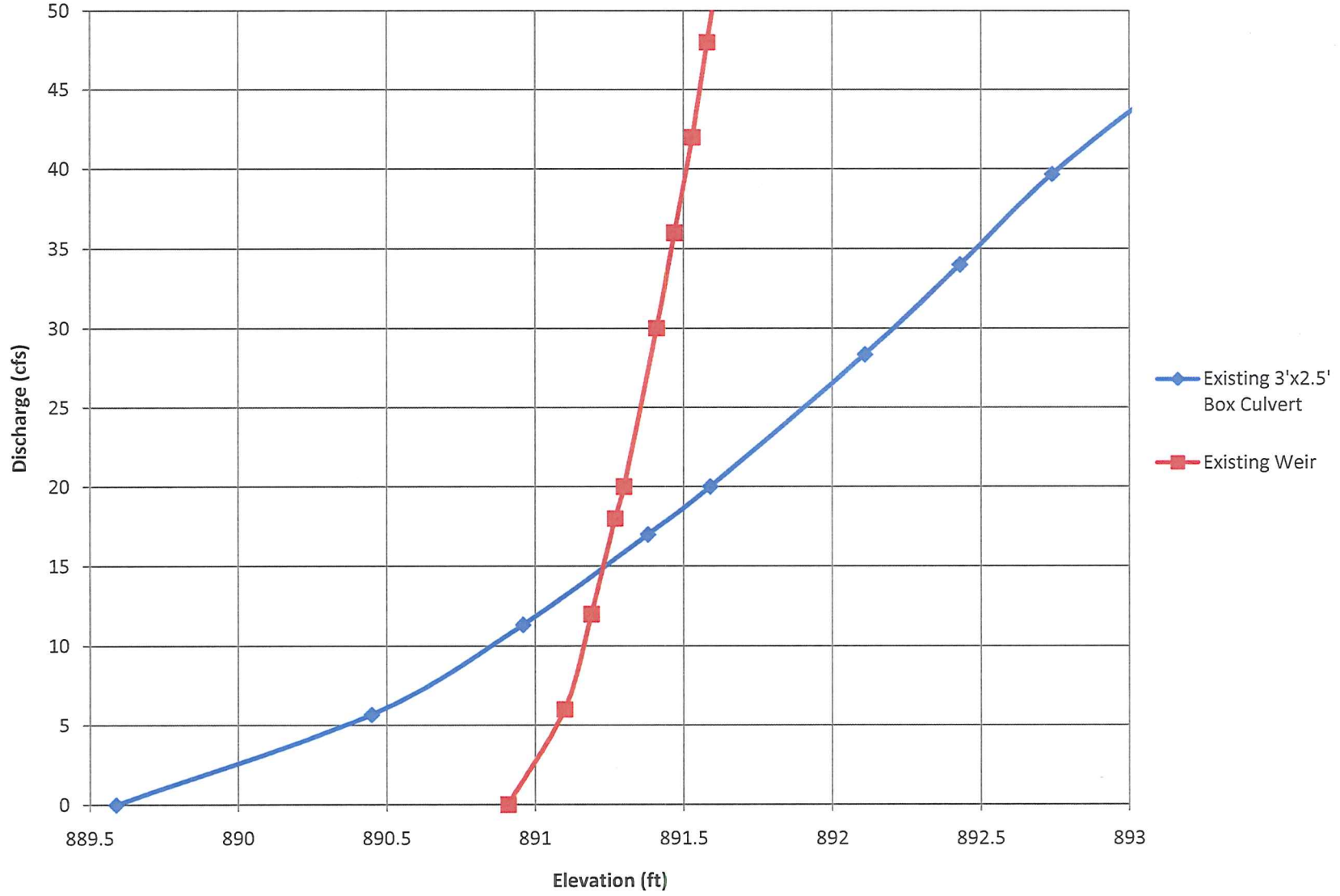
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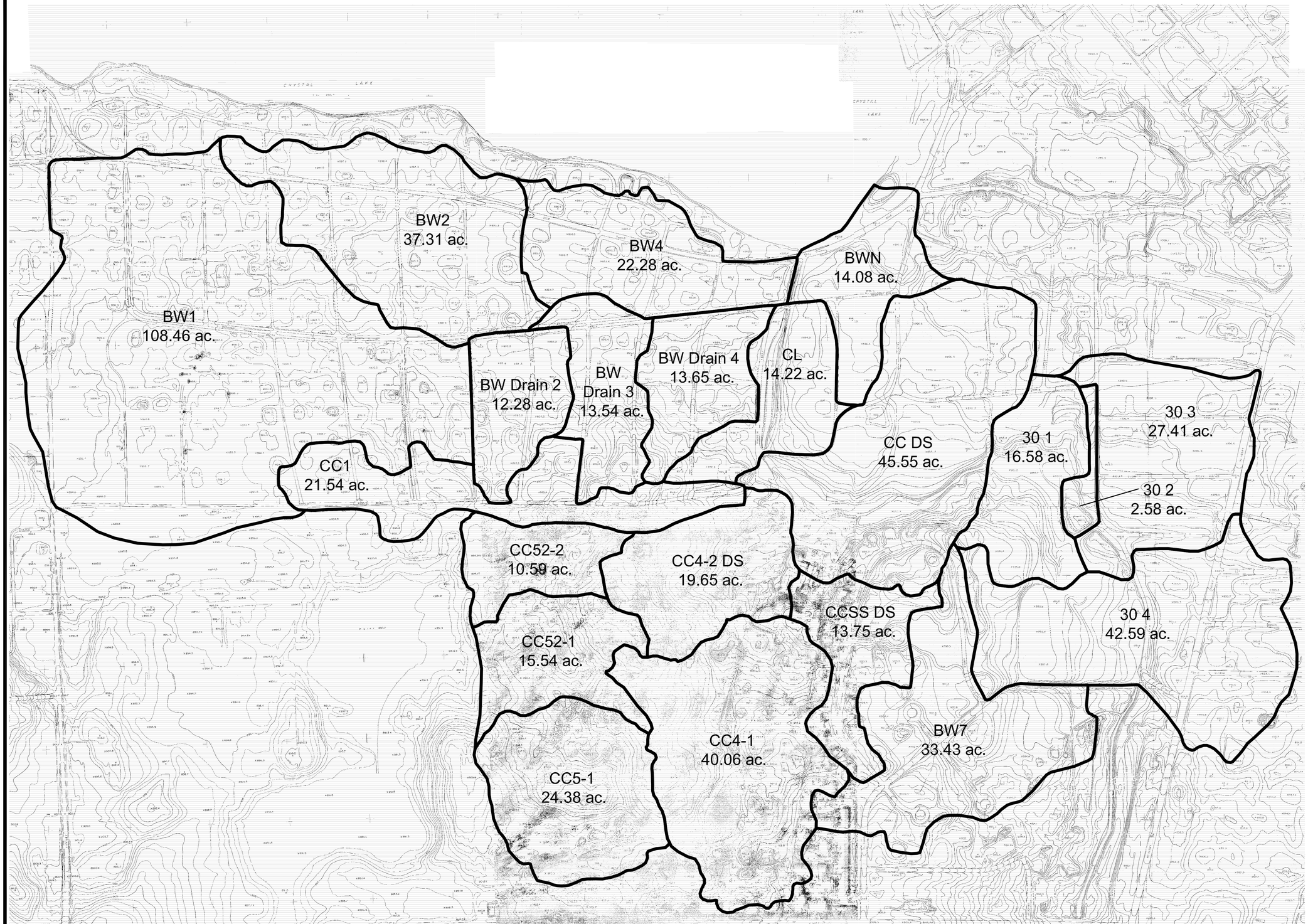
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DRAWN BY	ALC/CFR	
CHECKED BY	GCS	
APPROVED BY	GCS	
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Exhibit 7: Existing Outlet Structure





0 300 600

Scale in Feet

N

LEGEND

Watershed Boundary

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Crystal Creek Flooding Analysis

XP-SWMM Watershed Boundaries

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APPROVED BY	GCS	
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0 300 600

Scale in Feet

N

LEGEND

Existing Contours

(1) Alternative Location

No.	Revision/Issue	Date
2	Per City Comments	05/12/10
1	Per City Comments	04/13/10

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Crystal Creek Flooding Analysis

Crystal Lake and Crystal Creek Drainage Improvement Alternatives

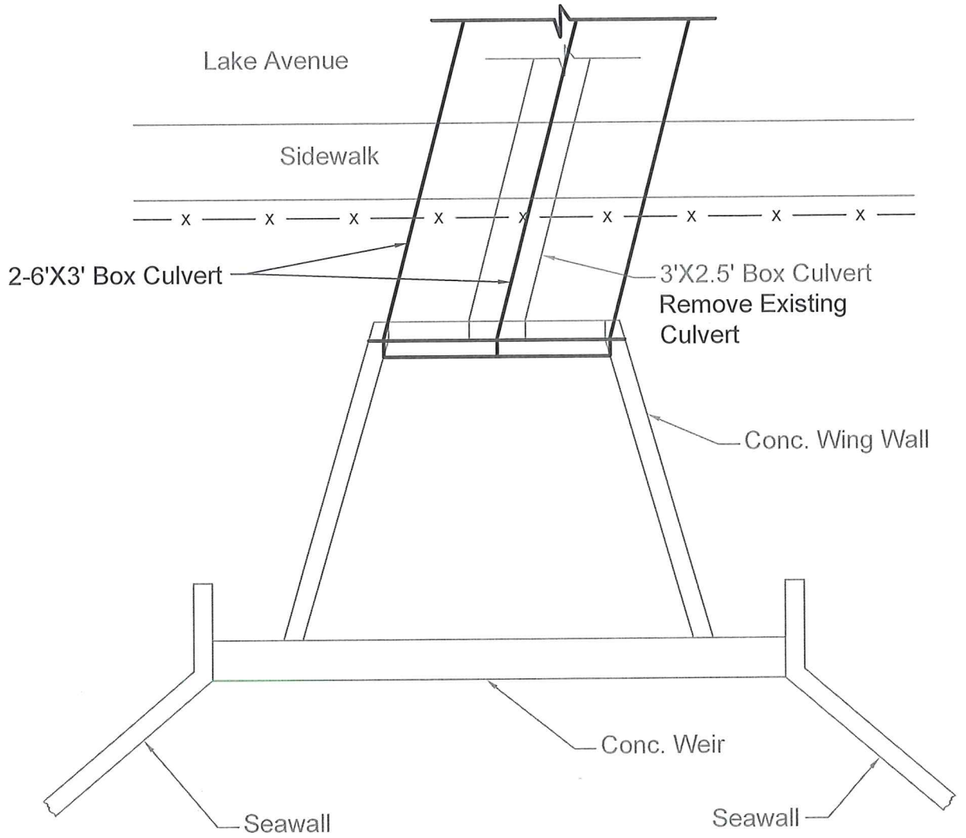
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DESIGNED BY	GCS/DAK	9
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CHECKED BY	GCS	
APPROVED BY	GCS	
ISSUE DATE	08/28/2009	

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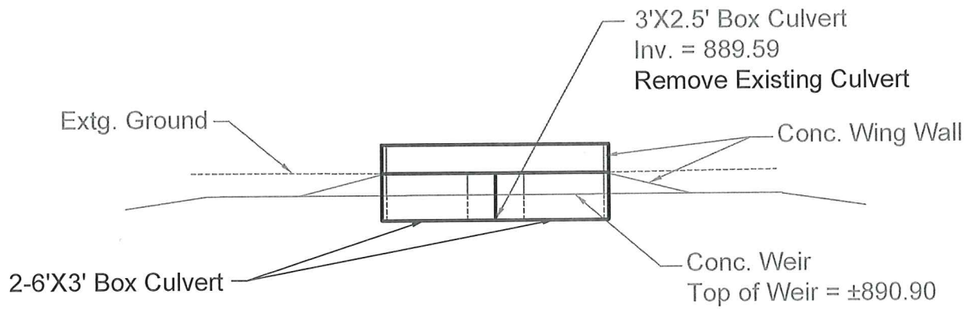
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Outfall Structure Photo



Plan



0 4 8

Scale in Feet

LEGEND

No.	Revision/Issue	Date
2	Per City Comments	05/12/10
1	Per City Comments	04/13/10

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Crystal Creek Flooding Analysis

Alternative 1
Increased Culvert Capacity
Under Lake Avenue

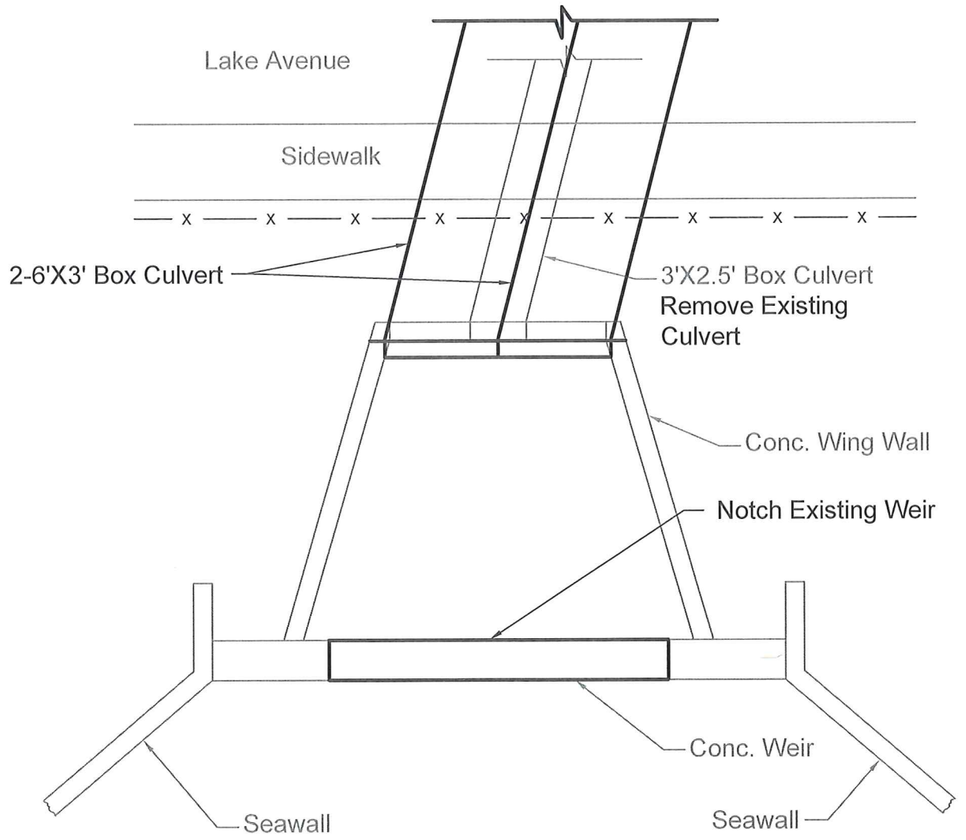
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DESIGNED BY	GCS/DAK	10
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APPROVED BY	GCS	
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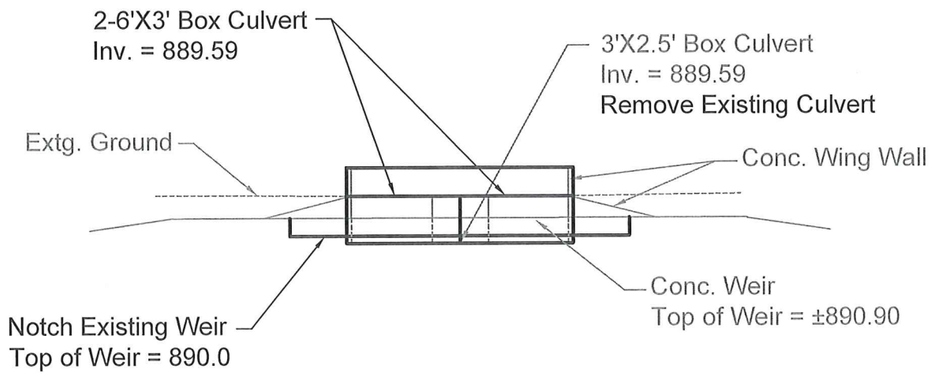
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Outfall Structure Photo



Plan



0 4 8

Scale in Feet

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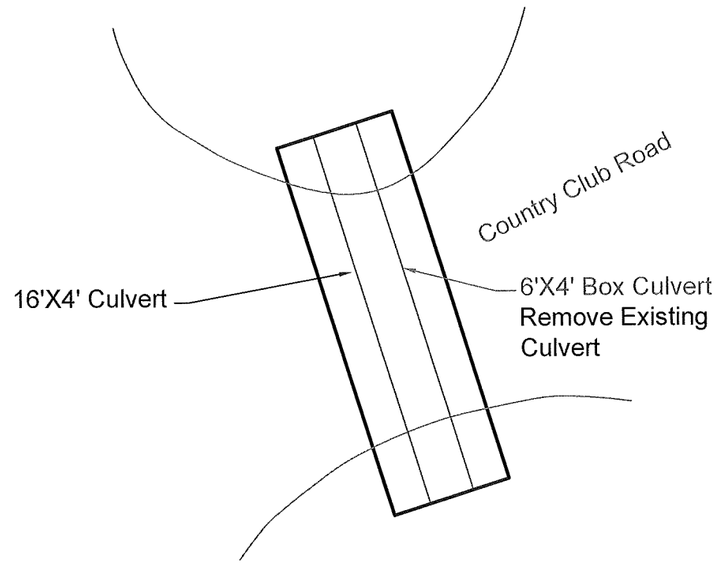
Crystal Creek Flooding Analysis

Alternative 2
Notch Outlet Weir and
Increased Culvert Capacity
Under Lake Avenue

PROJECT NO:	09021	SHEET NO:
DESIGNED BY	GCS/DAK	11
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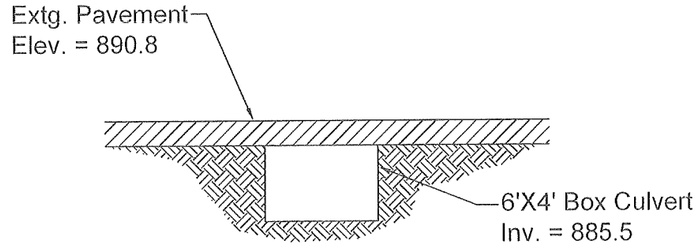
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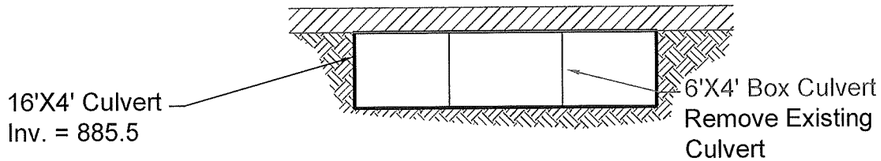
Plan
Scale: 1"=10'

Photo Coming

Culvert Photo



Existing Section



Proposed Section

0 4 8
Scale in Feet

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Crystal Creek Flooding Analysis

Alternative 3
Increased Culvert Capacity
Under Country Club Road

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