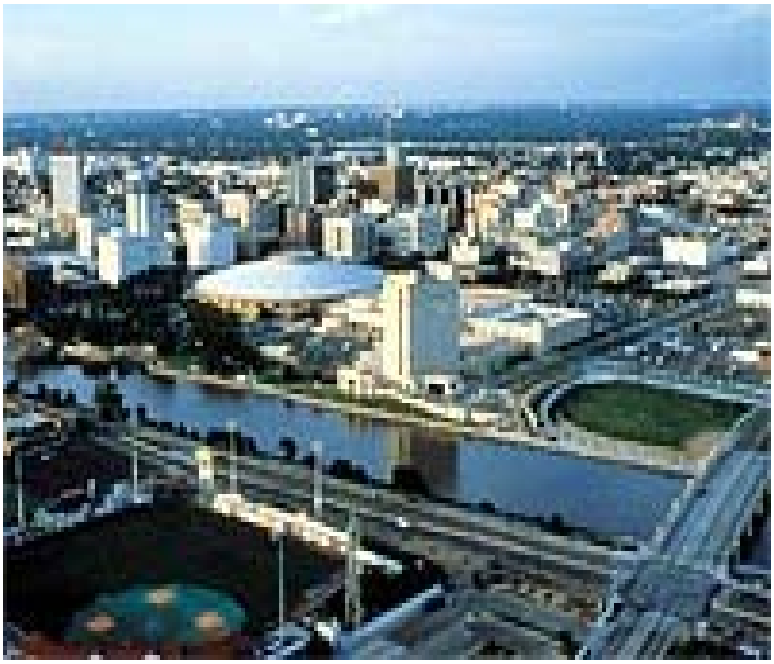
Drainage Report

Chisholm Trial Church of Christ Addition,

To Wichita, Sedgwick County, Kansas



March, 2009
(Revised)

516 S. Market
Wichita, Kansas 67202
(316) 264-0242

Table of Contents

Drainage Report

Chisholm Trial Church of Christ Addition

Introduction

The subject property is located at the quarter section line on the south of 37th street North and between Oliver and Woodlawn. The tract of land is approximately 39 acres and is zoned single-family, which is used by a church. This area is partially developed and it has been used by church. The proposed use of the land is to develop into a facility for church. The proposed developments consist of added buildings, parking lots and other recreational facilities.

Current Conditions

The site is in the City of Wichita. The site consists of a building and a parking lot around it. There are two existing driveways from the property to 37th Street. Most of the area is covered with grass and drains to the south. The soils are of Type D, with an average slope of 1.8%. There is existing shallow ditch on west of the property which runs north to south. The existing tributary 6 of East fork Chisholm Creek on east side of property runs north south on the property. The site drains to an existing pond south of the property which is owned and maintained by the board of Park Commissions. Flood map shows that an area within the floodplain which is shown on the drainage plan and preliminary plat. Although a portion of the site is in floodplain, there is no sign of existing wetlands.

There are two pipes, 48" and 60", crossing 37th street along tributary 6 on east side of the property and a 24" on west side along the ditch. Pipes crossing the 37th street are carrying water from north of 37th street to the property. The attached offsite drainage map shows the drainage area. The offsite runoff through these pipes is presented in drainage plan.

The attached plat with topography shows existing features including contours, utilities, proposed easements and the floodplain.

Proposed Improvements

The Chisholm Church of Christ Addition is subjected to the offsite runoff from north of 37th street and from part of the Whispering brook Addition. The drainage area and runoffs are presented in drainage plan. The 100 year peak runoff from offsite drainage area was calculated and is used to find the flood plain. The existing 2 yr, 5 yr, 10 yr and 25 yr runoff from developed offsite areas are also calculated and are shown drainage plan. The proposed improvements are small additions to the church and will not have significant impact on the current drainage situations. We feel the detention is not necessary at this

point as there is not much development and tributary 6 drains to the existing lake. Reserve A shown in attached plat is drawn based on 100 yr flood plain from hydraulic analysis and the access of 20' on either side.

Best management practices for erosion control will include ditch checks in the proposed swales, inlet protection at all inlets, silt fence where applicable, and sediment barriers within the detention ponds. The erosion control plan is attached in Tab 2.

Drainage plan illustrates there is no significant increased in runoff after development of this site. The attached calculations show the existing and developed peak runoffs, including assumed coefficients and conditions.

Hydraulic Model

An Analysis of hydraulic characteristics is developed to estimate the elevation of the flood plain with in the property at different locations along the tributary 6 of East Fork of Chisholm Creek. Cross Section data were collected to model the channel located on the tract of land. The Water surface profile was then modeled using HEC-RAS computer program. The Cross Section data used in modeling and water surface profile and floodplain is attached in hydraulic study plan. Similar hydraulic analysis was completed for the ditch on west side of the property and 100 year flood plain was established as shown in hydraulic study section.
The cross sections, water profiles and and other flow data for tributary 6 and ditch on west side are presented in hydraulic study section.

Site Hydrological Analysis

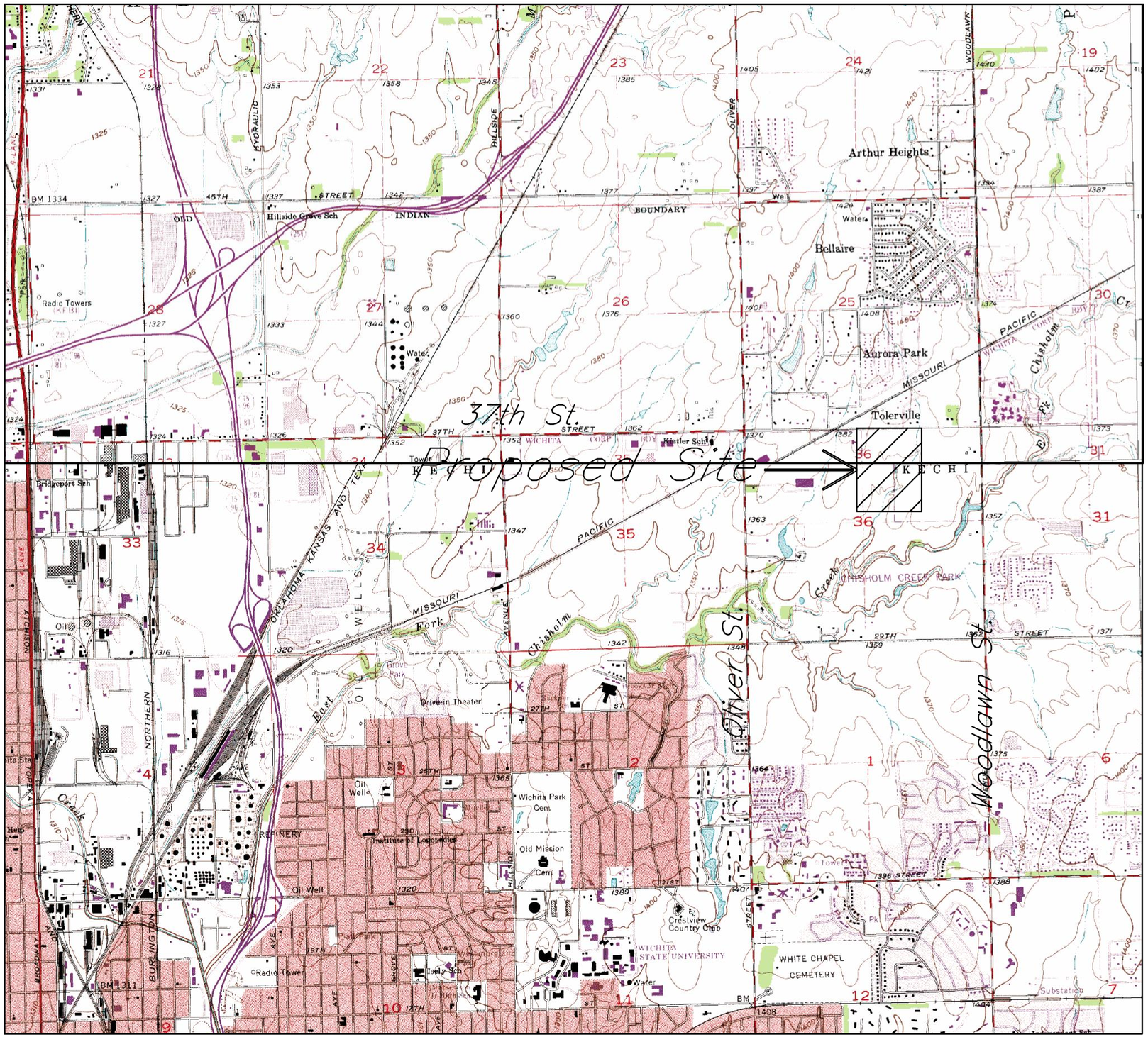
Existing and offsite conditions have been modeled using the TR-55 method. The Values for Rainfall Intensity and Runoff Coefficients were established using the *Drainage and Strom Sewer Policy for Design Criteria and Documentation, City of Wichita, Kansas.* Existing times of concentration were calculated from existing ground conditions and can be found in hydrological analysis section. Proposed times of concentration have been modeled using the proposed site runoff and accounting for the use of storm sewer pipe and channels to route runoff from the area.

Future Development

There is an addition of a building on the south of the existing building at this point but eventually site will have more buildings and parking lots added to it. The site in future will serve as single family residential area.
The future site will require internal storm sewer planning through pipes or surface drainage system to bring the water to the ditch. The future development will require a detailed analysis of the proposed conditions and most likely the addition of storm water

detention pond. The Chisholm Trial Church will own the proposed reserve and is responsible for the maintenance.

USGS Map with Area Highlighted
Preliminary plat



Chisholm Church of Christ Addition

USGS Map

Wichita, Kansas

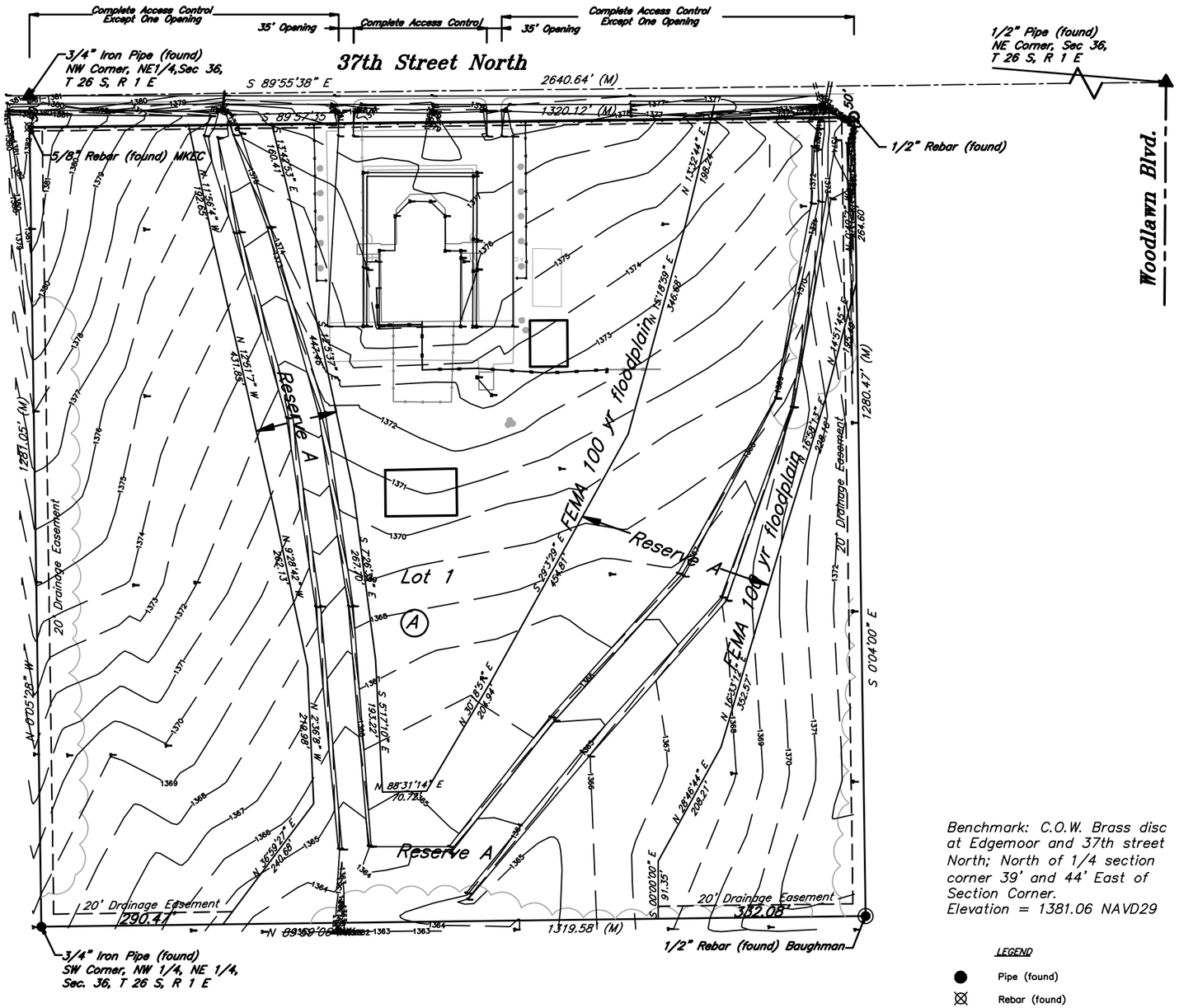
kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242

PROJECT NUMBER			
KEM NO. 09008	FILE usgs	DATE 02/2009	SHEET 1
DESIGN KM	DRAWN GP	REVISED	OF 1

Chisholm Trail Church of Christ Addition

WICHITA, SEDGWICK COUNTY, KANSAS

Part of the Northeast 1/4, Section 36, Township 26 South, Range 1 East of the 6th. P.M.



Benchmark: C.O.W. Brass disc at Edgemoor and 37th street North; North of 1/4 section corner 39' and 44' East of Section Corner. Elevation = 1381.06 NAVD29

LEGEND

- ● Pipe (found)
- ⊠ Rebar (found)
- ▲ Section Corner (Pipe found)
- ◉ Rebar (found)
- (P) Platted
- (D) Deeded
- (M) Measured

State of Kansas) ss
County of Sedgwick)

I, Bradley C. Ward, a licensed land surveyor of the State of Kansas, do hereby certify that the following described tract of land was surveyed on the 5th day of February, 2009 and the accompanying final plat prepared and that all the monuments shown herein actually exist and their positions are correctly shown to the best of my knowledge and belief:

The Northwest 1/4 of the Northeast 1/4 of Section 36, Township 26 South, Range 1 East; Exempt 88-5081-TX.

All easements and rights-of-way within said lots are hereby vacated by virtue of KSA 12-512(b) amended.

Bradley C. Ward, L.S. #920 *Date*

State of Kansas) ss
County of Sedgwick)

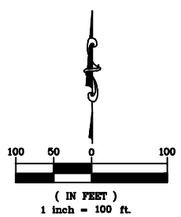
Know all men by these presents, that we, the undersigned, have caused the land described in the surveyor's certificate to be platted into a Lot and Block to be known as Chisholm Trail Church of Christ Addition, Wichita, Sedgwick County, Kansas. Any easements are hereby granted as indicated for constructing, maintaining, operating, and repairing public utilities. A drainage plan has been developed for the plat and all drainage easements, rights-of-way, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer, and unobstructed to allow for the conveyance of stormwater. Reserve A shall be owned and maintained by Chisholm Trail Church of Christ for use as a storm water detention pond and as a floodplain. And further that the land contained herein is held and shall be conveyed subject to any applicable restrictions, reservations and covenants now on file or hereafter filed in the Office of the Register of Deeds of Sedgwick County, Kansas.

Access Control is hereby granted as follows:
1. There shall be a maximum of 4 openings on 37th Street North.

By: _____
Willard Crigler *Date*
Elder of Building Committee,
Chisholm Trail Church of Christ

State of Kansas) ss
County of Sedgwick)
This instrument was acknowledged before me on this _____day of _____ 2009, by Willard Crigler, Elder of Building Committee, Chisholm Trail Curch of Christ.

_____
Notary Public
My Commission Expires: _____



State of Kansas) ss
City of Wichita)

This plat of Chisholm Trail Church of Christ Addition, Wichita, Sedgwick County, Kansas, has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas. Dated this _____ day of _____, 2009. Wichita-Sedgwick County Metropolitan Area Planning Commission.

_____
Darrell Downing, Chairman

_____
John L. Schlegel, Secretary

State of Kansas) ss
City of Wichita)

This plat approved and all dedications shown hereon accepted by the City Council of the City of Wichita, Kansas, this_____ day of_____, 2009.

At the Direction of the City Council

_____
Carl Brewer, Mayor

_____
Karen Sublett, City Clerk

Entered on transfer record this _____ day of _____, 2009.

_____
Kelly B. Arnold, County Clerk

State of Kansas) ss
County of Sedgwick)

This is to certify that this plat has been filed for record in the Office of the Register of Deeds this_____day of_____, 2009, at _____ o'clock__M; and is duly recorded.

_____
Bill Meek, Register of Deeds

_____
Tonya Buckingham, Deputy

Reviewed in accordance with K.S.A. 58-2005 on this_____day of_____, 2009.

_____
Tricia L. Robello, L.S. #1246
Deputy County Surveyor
Sedgwick County, Kansas

Filename: 09008 *Prepared: 02/07/09*

kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242

Aerial Photograph
Drainage Plan
Preliminary Plat
Offside Drainage Area
Erosion Control Plan

Chisholm Church of Christ Addition

Aerial Map

Park City, Kansas

kemiller engineering
516 S. Market,
Wichita, KS 67202
316/264-0242

PROJECT NUMBER			
KEM NO. 09008	FILE aerial	DATE 02/2009	SHEET 1
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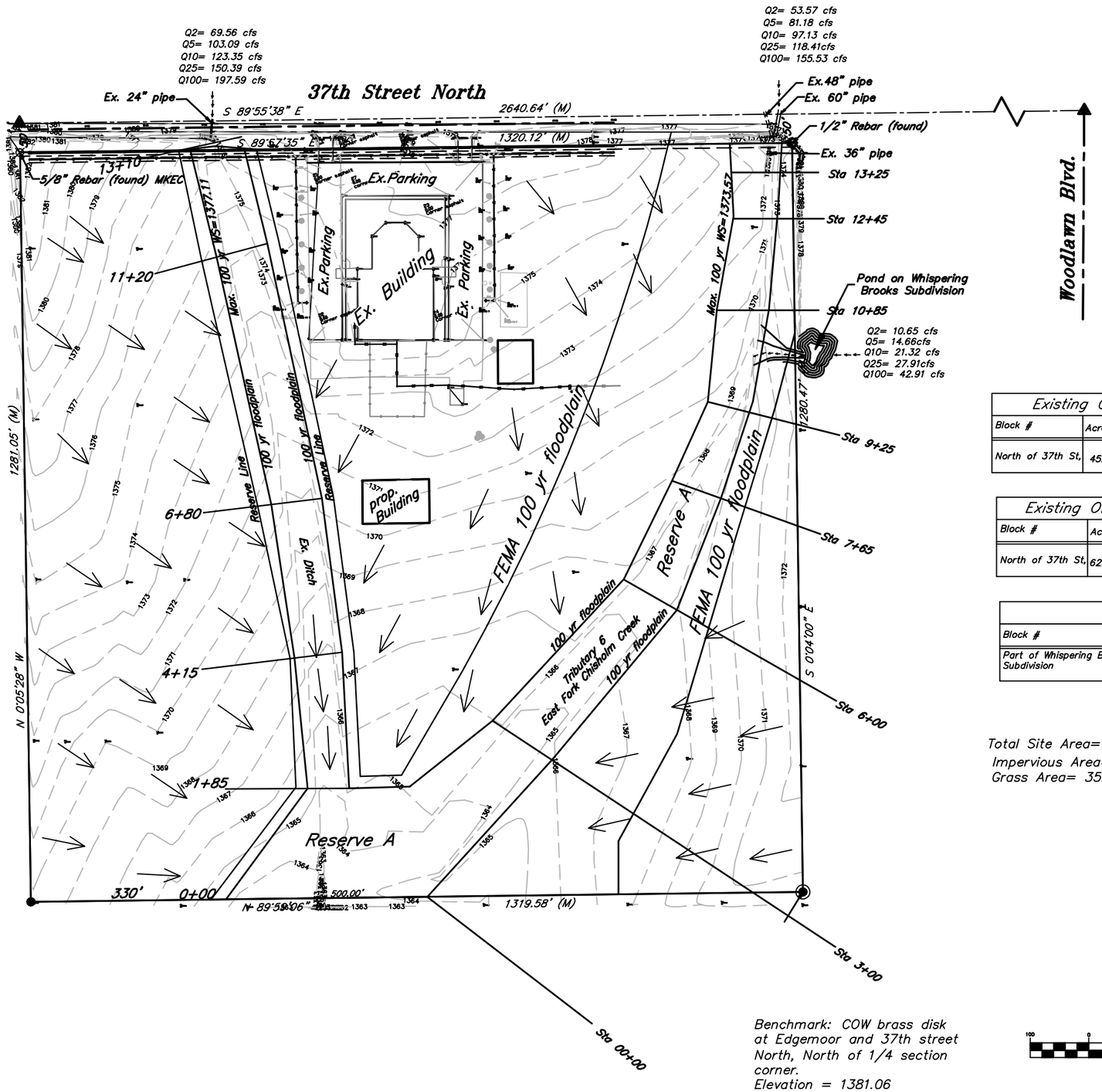

Existing OffSite drainage to Tributory 6 (Lag/CN Method)														
Block #	Acres	CN	Storm	Tc	24 hr rainfall (in)					Q2	Q5	Q10	Q25	Q100
					d2	d5	d10	d25	d100					
North of 37th St.	45.0	87	Type II 24 hr	60 min	3.6	4.8	5.52	6.48	8.16	53.57 cfs	81.18 cfs	97.13 cfs	118.41 cfs	155.53 cfs

Existing OffSite drainage to Ditch on West (Lag/CN Method)														
Block #	Acres	CN	Storm	Tc	24 hr rainfall (in)					Q2	Q5	Q10	Q25	Q100
					d2	d5	d10	d25	d100					
North of 37th St.	62.16	87	Type II 24 hr	67 min	3.6	4.8	5.52	6.48	8.16	69.56 cfs	103.09 cfs	123.35 cfs	150.39 cfs	197.59 cfs

Existing OffSite drainage to Tributory 6 (Rational Method)																
Block #	Acres	Tc	C2	I2	C5	I5	C10	I10	C25	I25	C100	I100	Q2	Q5	Q10	Q25	Q100
Part of Whispering Brooks Subdivision	8.69	15 min	0.32	3.83	0.37	4.56	0.47	5.22	0.53	6.06	0.67	7.37	10.65 cfs	14.66 cfs	21.32 cfs	27.91 cfs	42.91 cfs

Total Site Area= 38.8 Acres
Impervious Area= 2.96 Acres
Grass Area= 35.84 Acres

Benchmark: COW brass disk at Edgemoor and 37th street North, North of 1/4 section corner.
Elevation = 1381.06

100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

Chisholm Trail Church of Christ Addition
Drainage plan
Wichita, Kansas

kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242

PROJECT NUMBER			
KEM NO. 09008	FILE drainage	DATE 03/2009	SHEET 1
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WICHITA, SEDGWICK COUNTY, KANSAS

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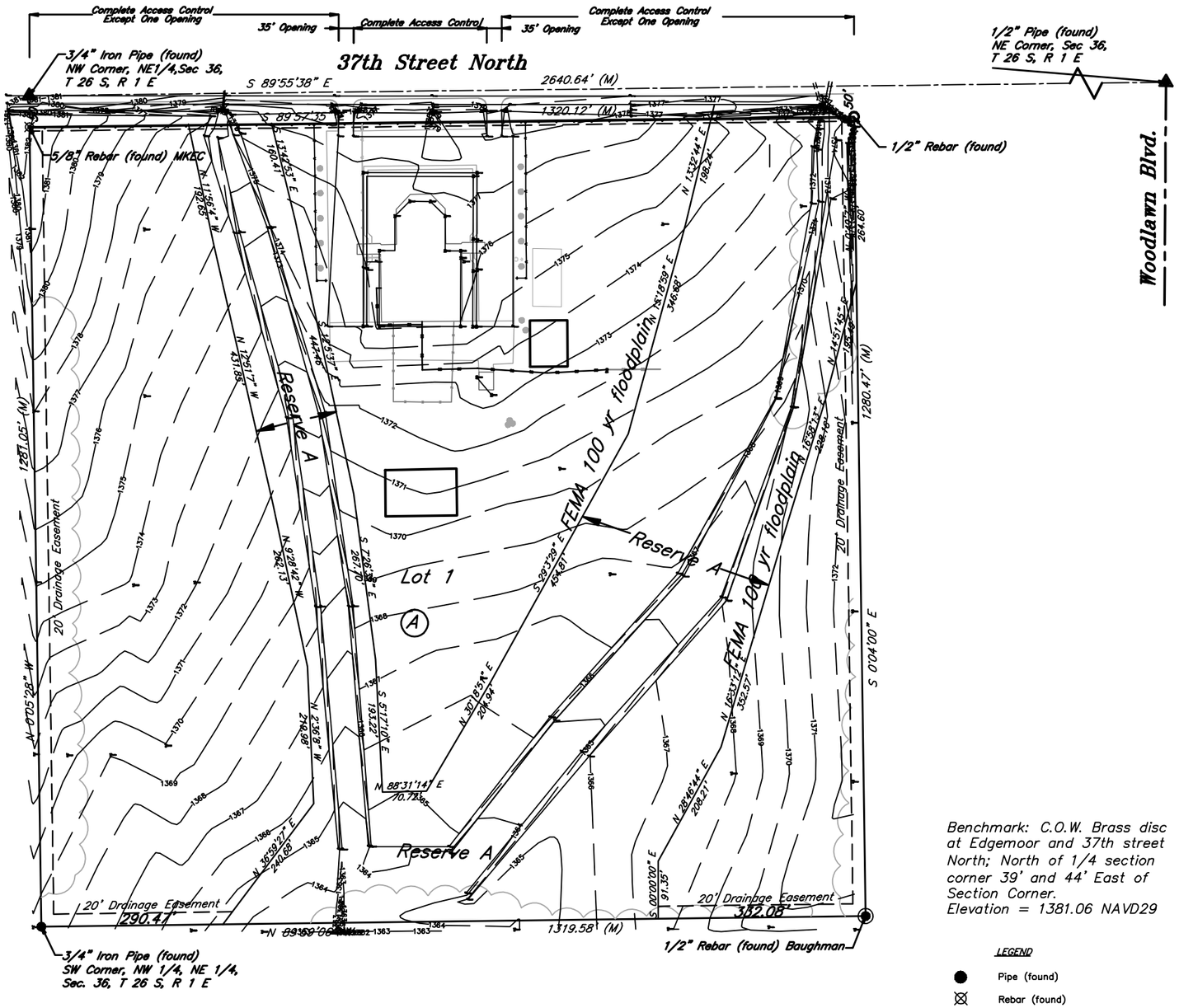

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Chisholm Trail Church of Christ

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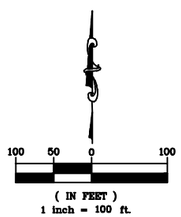
County of Sedgwick)
This instrument was acknowledged before me on this _____day of _____ 2009, by Willard Crigler, Elder of Building Committee, Chisholm Trail Curch of Christ.

_____
Notary Public
My Commission Expires: _____



State of Kansas) ss
City of Wichita)

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_____
Darrell Downing, Chairman

_____
John L. Schlegel, Secretary

State of Kansas) ss
City of Wichita)

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At the Direction of the City Council

_____
Carl Brewer, Mayor

_____
Karen Sublett, City Clerk

Entered on transfer record this _____ day of _____, 2009.

_____
Kelly B. Arnold, County Clerk

State of Kansas) ss
County of Sedgwick)

This is to certify that this plat has been filed for record in the Office of the Register of Deeds this_____day of_____, 2009, at _____ o'clock__M; and is duly recorded.

_____
Bill Meek, Register of Deeds

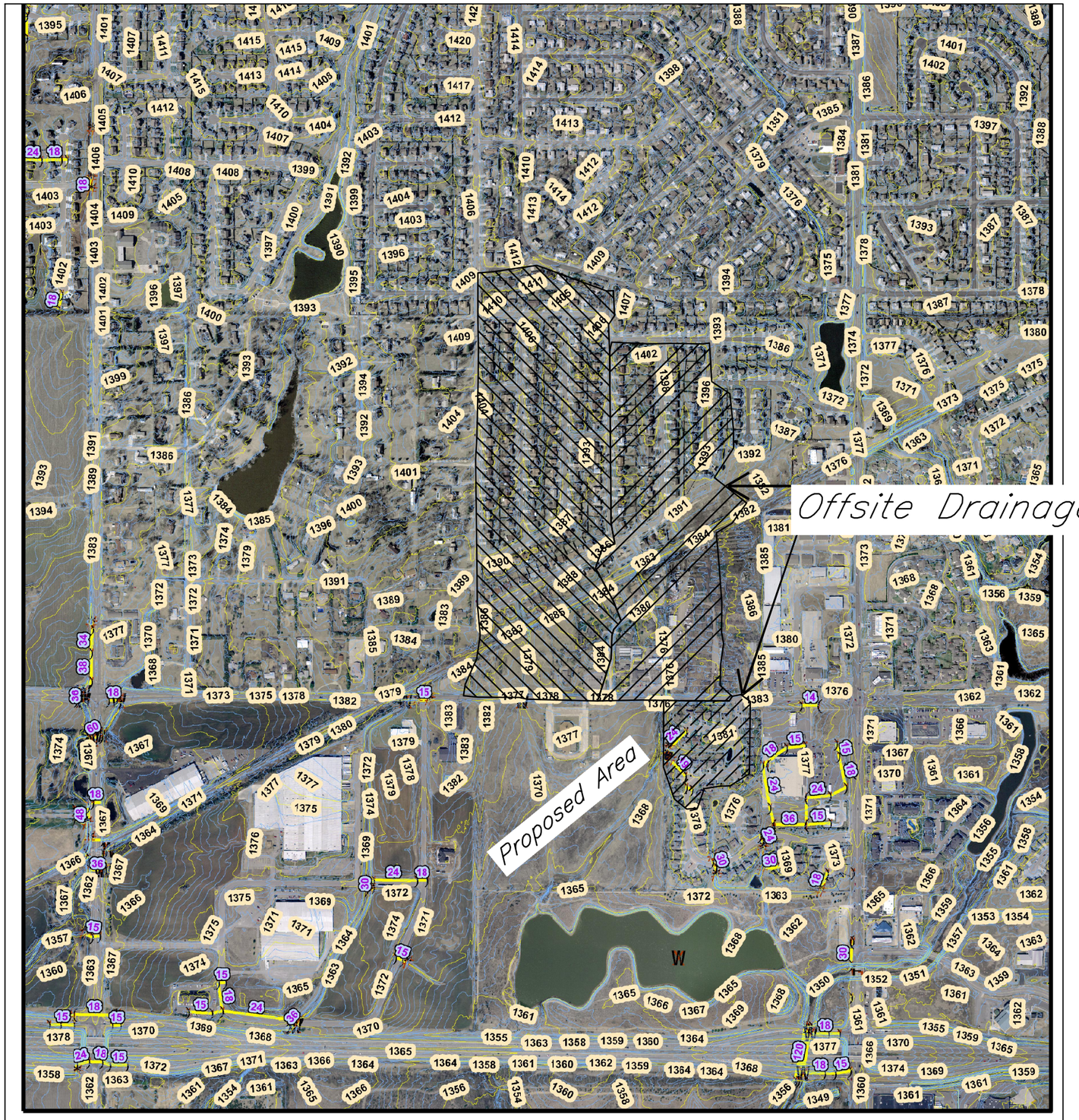
_____
Tonya Buckingham, Deputy

Reviewed in accordance with K.S.A. 58-2005 on this_____day of_____, 2009.

_____
Tricia L. Robello, L.S. #1246
Deputy County Surveyor
Sedgwick County, Kansas

Filename: 09008 *Prepared: 02/07/09*

kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242



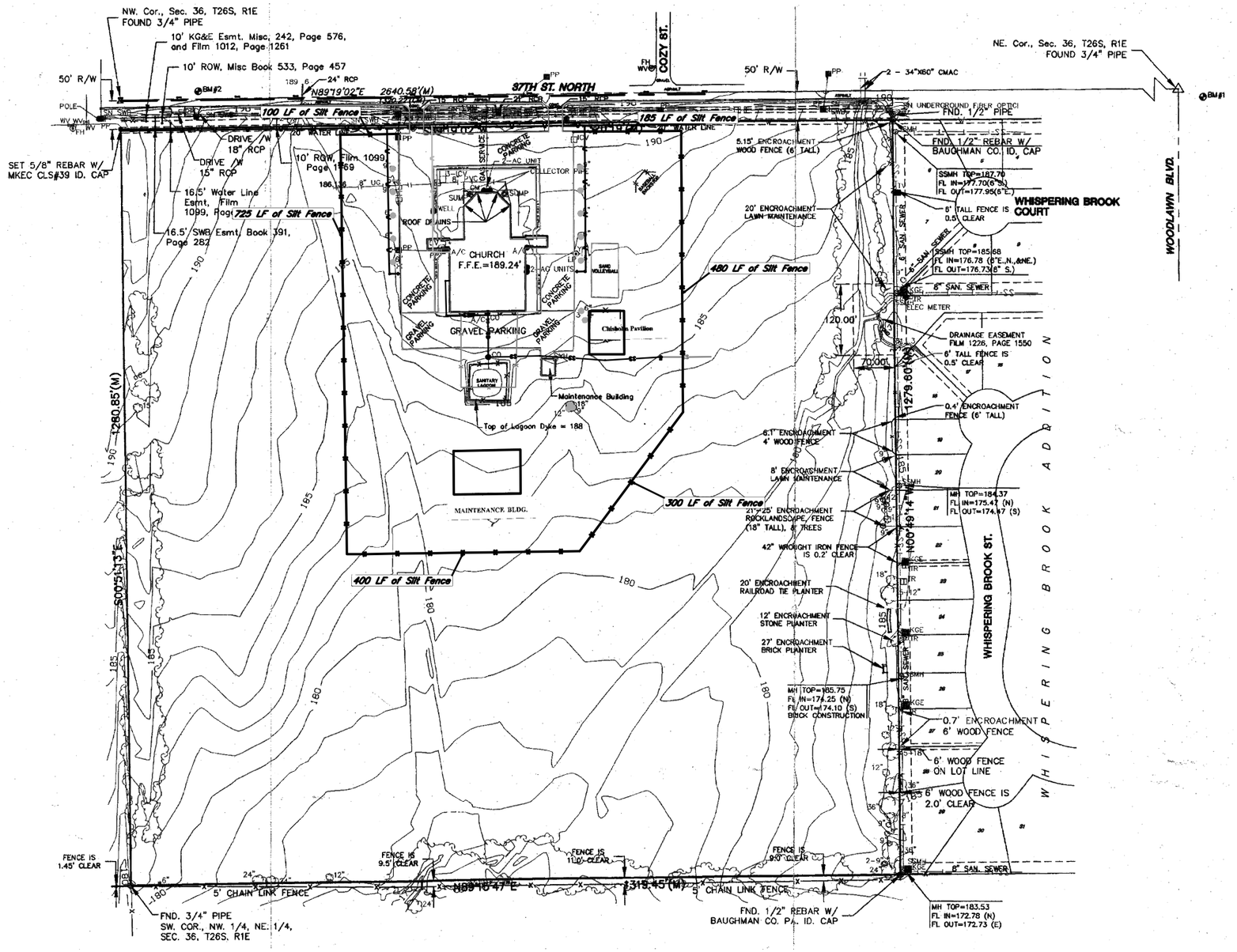
Chisholm Trail Church of Christ Addition

Offsite Drainage area

Wichita, Kansas

kemiller engineering
516 S. Market,
Wichita, KS 67202
316/264-0242

PROJECT NUMBER			
KEM NO. 09008	FILE drainage	DATE 03/2009	SHEET 1
DESIGN KM	DRAWN GP	REVISED	OF 1



General Notes

1. The BMP's shown on this sheet are considered minimum standards. Whenever sediment enters the streets, storm sewers, ditches, or ponds, contractor will install additional BMP's, as needed, to correct the problem.
2. The soil erosion BMP's shown hereon must be in place at all times during construction until such time as the site is re-established with paving or grass.
3. Back of Curb Protection: Can include hay bale, silt fence, Curlex barrier, or approved alternate as shown on BMP standard details. This BMP must remain in place until the area between the curb and right-of-way line has been permanently stabilized.
4. The General Contractor is responsible for the installation and maintenance per the prevention maintenance plan.
5. Concrete trucks will be permitted to wash out only at approved locations, then maintain and clean up as conditions require, by contractor. No hazardous materials are expected to be encountered. Any spills (diesel, fuel, oil, etc.) will be cleaned up and removed immediately. Portable toilets will be supplied and maintainted at various sites along the project. Disposal of sewage will be handled by a contracting firm specializing in this activity.

LEGEND

- Flow Direction
- IP — Inlet Protection – to be provided at all inlets subject to silt laden runoff.
- DC — Ditch check
- Temporary Seeding.
- Silt Fence or Hay Bale Barrier – to be installed along property lines where runoff from construction site can run onto other properties.
- Stabilized Construction Entrance – to be used at all locations where vehicles or equipment enter or exit property.
- Back of Curb Protection – to be installed whenever curb is backfilled to less than 3 inches from top and disturbed earth exists adjacent thereto. (See City Standard Details.)

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Chisholm Trail Church of Christ Addition

Erosion Control Plan

Wichita, Kansas

kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242

PROJECT NUMBER			
KEM NO. 09008	FILE Erosion	DATE 03/2009	SHEET 1
DESIGN KM	DRAWN NS	REVISED	OF 1

Hydrological Analysis
Hydraulic Analysis

Existing Onsite Runoff Area information

Area Name	Description	Land use	Maximum Elevation	Minimum Elevation	Area (acres)
A	Chisholm Trial Church of Christ Addition	Undeveloped covered with short grass	1380	1361	38.8

Time of concentration

Area	Max Elevn	Min Elevn	Flow Length(L)	Rational Runoff Coefficients(C)					Time of Concentration, Mins
				2 year	5 year	10-yr	25-yr	100 year	
Pre Developed									
North of 37th St. for Trib. 6	1412	1376	3108' Mixed flow	0.41	0.45	0.54	0.59	0.71	60
Post Developed (Single family Residential)									
North of 37th St for Ditch on west	1411	1376	3854.59' Mixed flow	0.41	0.45	0.54	0.59	0.71	67
Part of Whispering Brook Addition	1384	1370	827' Mixed flow	0.32	0.37	0.47	0.53	0.67	15

** Calculation is shown in drainage plan.

Tributary 6
East Fork Chisholm Creek

Subcatchment Area A: North of 37th St

Runoff = 53.57 cfs @ 12.61 hrs, Volume= 7.609 af, Depth> 2.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=3.60"

Area (ac)	CN	Description
44.000	87	1/4 acre lots, 38% imp, HSG D
27.280		Pervious Area
16.720		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.0					**Direct Entry,**

Subcatchment Area A: North of 37th St

Runoff = 81.18 cfs @ 12.61 hrs, Volume= 11.646 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 yr Rainfall=4.80"

Area (ac)	CN	Description
45.000	87	1/4 acre lots, 38% imp, HSG D
27.900		Pervious Area
17.100		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.0					**Direct Entry,**

Subcatchment Area A: North of 37th St

Runoff = 97.13 cfs @ 12.60 hrs, Volume= 14.026 af, Depth> 3.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=5.52"

Area (ac)	CN	Description
45.000	87	1/4 acre lots, 38% imp, HSG D
27.900		Pervious Area
17.100		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.0					**Direct Entry,**

Subcatchment Area A: North of 37th St

Runoff = 118.41 cfs @ 12.60 hrs, Volume= 17.241 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 yr Rainfall=6.48"

Area (ac)	CN	Description
45.000	87	1/4 acre lots, 38% imp, HSG D
27.900		Pervious Area
17.100		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.0					**Direct Entry,**

Subcatchment Area A: North of 37th St

Runoff = 155.53 cfs @ 12.60 hrs, Volume= 24.467 af, Depth> 6.52"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=8.16"

Area (ac)	CN	Description
45.000	87	1/4 acre lots, 38% imp, HSG D
27.900		Pervious Area
17.100		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.0					**Direct Entry,**

Ditch on west side

Subcatchment Area A: North of 37th Street

Runoff = 69.56 cfs @ 12.71 hrs, Volume= 10.721 af, Depth> 2.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=3.60"

Area (ac)	CN	Description
62.160	87	1/4 acre lots, 38% imp, HSG D
38.539		Pervious Area
23.621		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.0					**Direct Entry,**

Subcatchment Area A: North of 37th St

Runoff = 103.09 cfs @ 12.70 hrs, Volume= 16.047 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 yr Rainfall=4.80"

Area (ac)	CN	Description
62.160	87	1/4 acre lots, 38% imp, HSG D
38.539		Pervious Area
23.621		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.0					**Direct Entry,**

Subcatchment Area A: North of 37th St

Runoff = 123.35 cfs @ 12.70 hrs, Volume= 19.328 af, Depth> 3.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 yr Rainfall=5.52"

Area (ac)	CN	Description
62.160	87	1/4 acre lots, 38% imp, HSG D
38.539		Pervious Area
23.621		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.0					**Direct Entry,**

Subcatchment Area A: North of 37th St

Runoff = 150.39 cfs @ 12.70 hrs, Volume= 23.761 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 yr Rainfall=6.48"

Area (ac)	CN	Description
62.160	87	1/4 acre lots, 38% imp, HSG D
38.539		Pervious Area
23.621		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.0					**Direct Entry,**

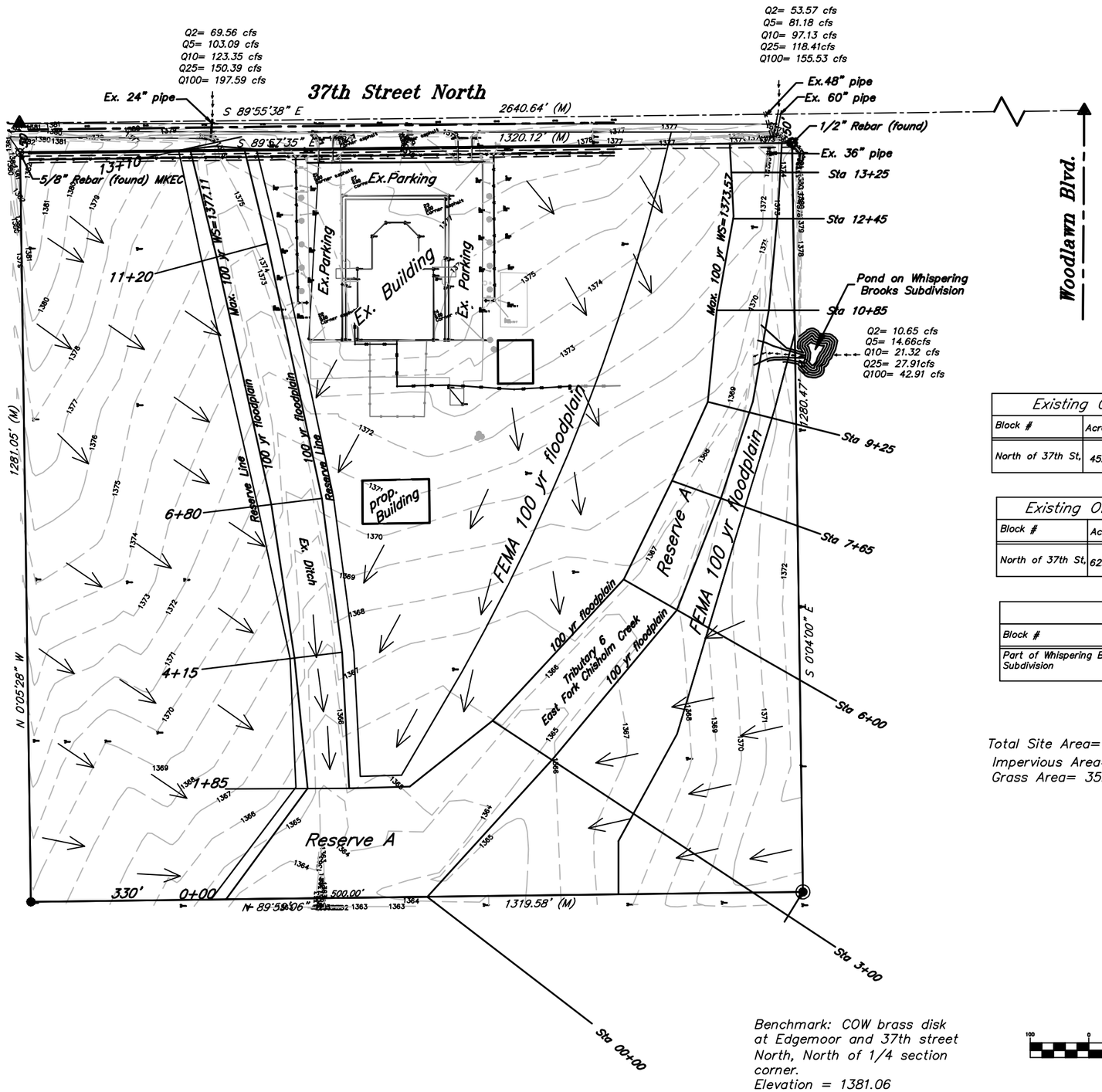
Subcatchment Area A: North of 37th St

Runoff = 197.59 cfs @ 12.69 hrs, Volume= 33.746 af, Depth> 6.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=8.16"

Area (ac)	CN	Description
62.160	87	1/4 acre lots, 38% imp, HSG D
38.539		Pervious Area
23.621		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.0					**Direct Entry,**



Existing OffSite drainage to Tributory 6 (Lag/CN Method)														
Block #	Acres	CN	Storm	Tc	24 hr rainfall (in)					Q2	Q5	Q10	Q25	Q100
					d2	d5	d10	d25	d100					
North of 37th St.	45.0	87	Type II 24 hr	60 min	3.6	4.8	5.52	6.48	8.16	53.57 cfs	81.18 cfs	97.13 cfs	118.41 cfs	155.53 cfs

Existing OffSite drainage to Ditch on West (Lag/CN Method)														
Block #	Acres	CN	Storm	Tc	24 hr rainfall (in)					Q2	Q5	Q10	Q25	Q100
					d2	d5	d10	d25	d100					
North of 37th St.	62.16	87	Type II 24 hr	67 min	3.6	4.8	5.52	6.48	8.16	69.56 cfs	103.09 cfs	123.35 cfs	150.39 cfs	197.59 cfs

Existing OffSite drainage to Tributory 6 (Rational Method)																
Block #	Acres	Tc	C2	I2	C5	I5	C10	I10	C25	I25	C100	I100	Q2	Q5	Q10	Q25	Q100
Part of Whispering Brooks Subdivision	8.69	15 min	0.32	3.83	0.37	4.56	0.47	5.22	0.53	6.06	0.67	7.37	10.65 cfs	14.66 cfs	21.32 cfs	27.91 cfs	42.91 cfs

Total Site Area= 38.8 Acres
Impervious Area= 2.96 Acres
Grass Area= 35.84 Acres

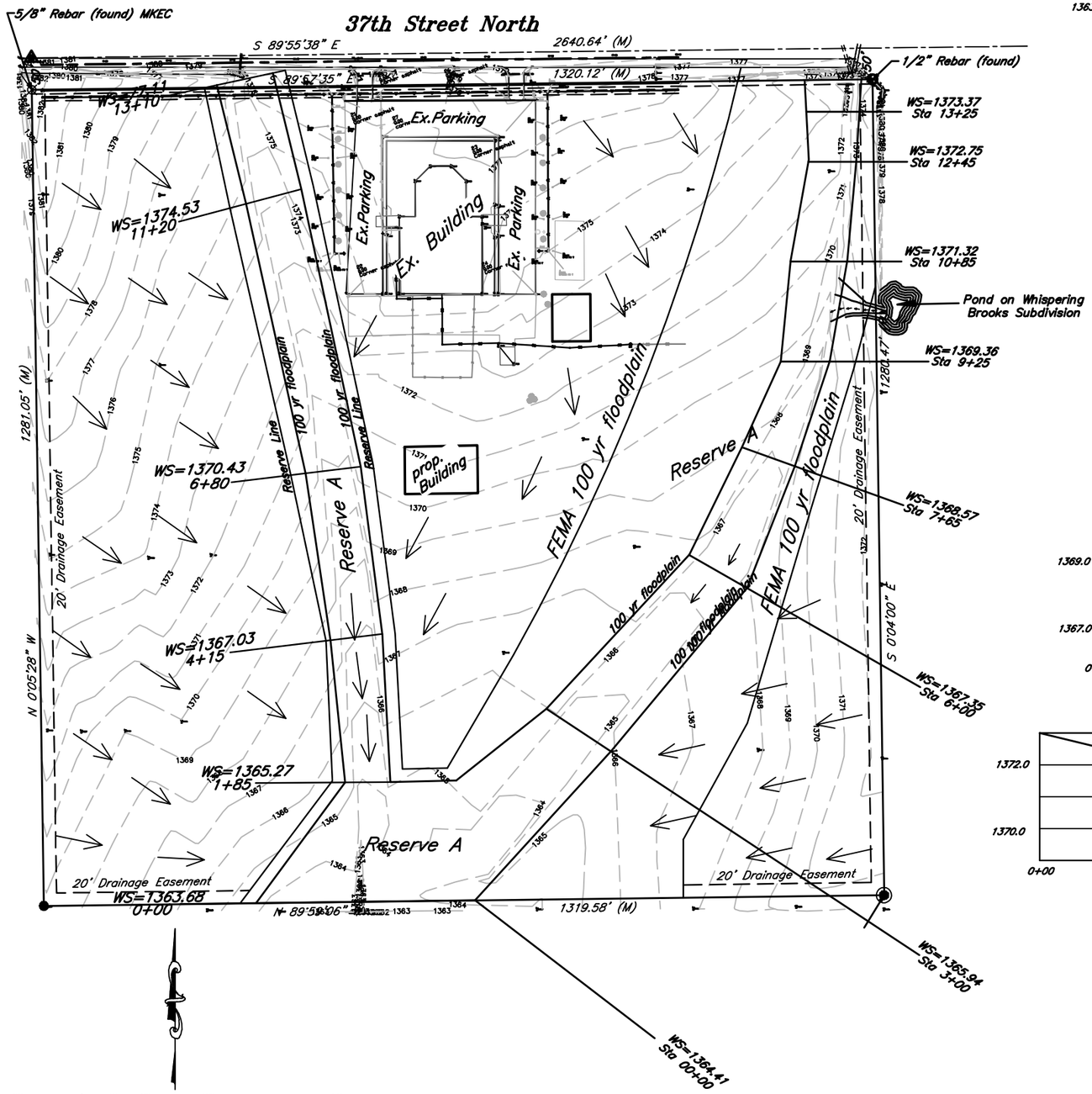
Benchmark: COW brass disk at Edgemoor and 37th street North, North of 1/4 section corner.
Elevation = 1381.06

100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

Chisholm Trail Church of Christ Addition
Drainage plan
Wichita, Kansas

kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242

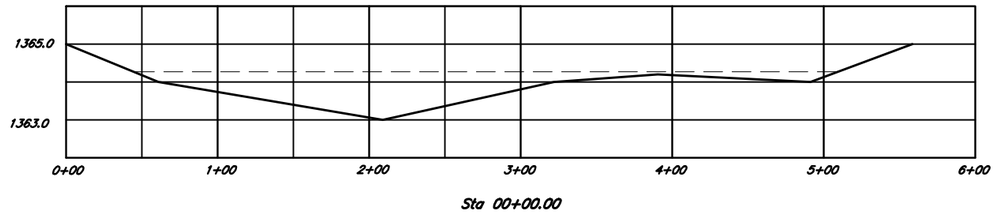
PROJECT NUMBER			
KEM NO. 09008	FILE drainage	DATE 03/2009	SHEET 1
DESIGN KM	DRAWN GP	REVISED	OF 1



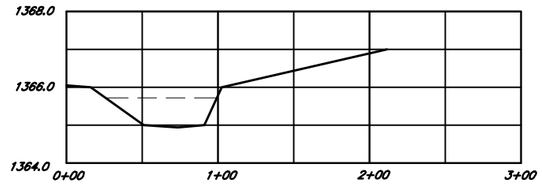
100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

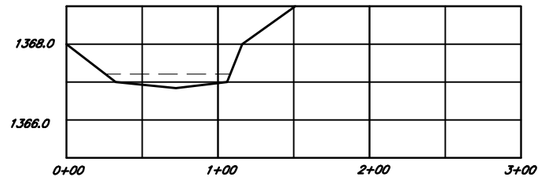
Tributary 6
Channel X-Sections



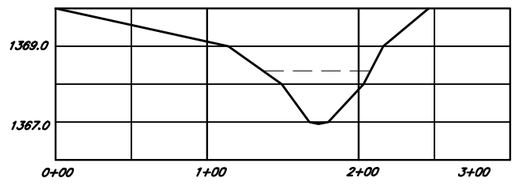
Sta 00+00.00



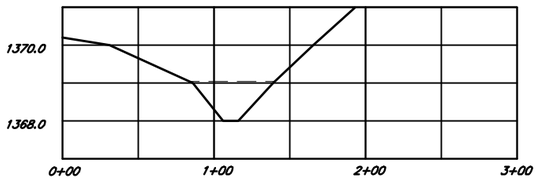
Sta 3+00.00



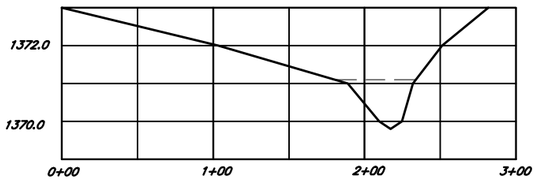
Sta 6+00.00



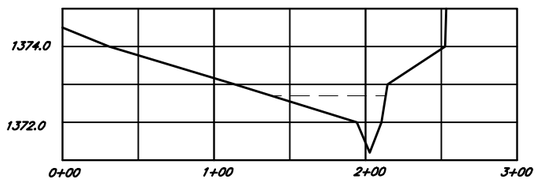
Sta 7+65.00



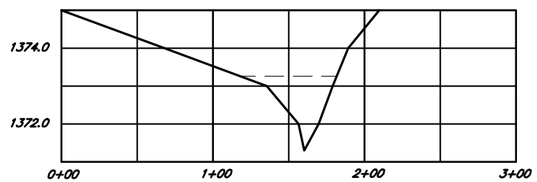
Sta 9+25.00



Sta 10+85.00



Sta 12+45.00



Sta 13+25.00

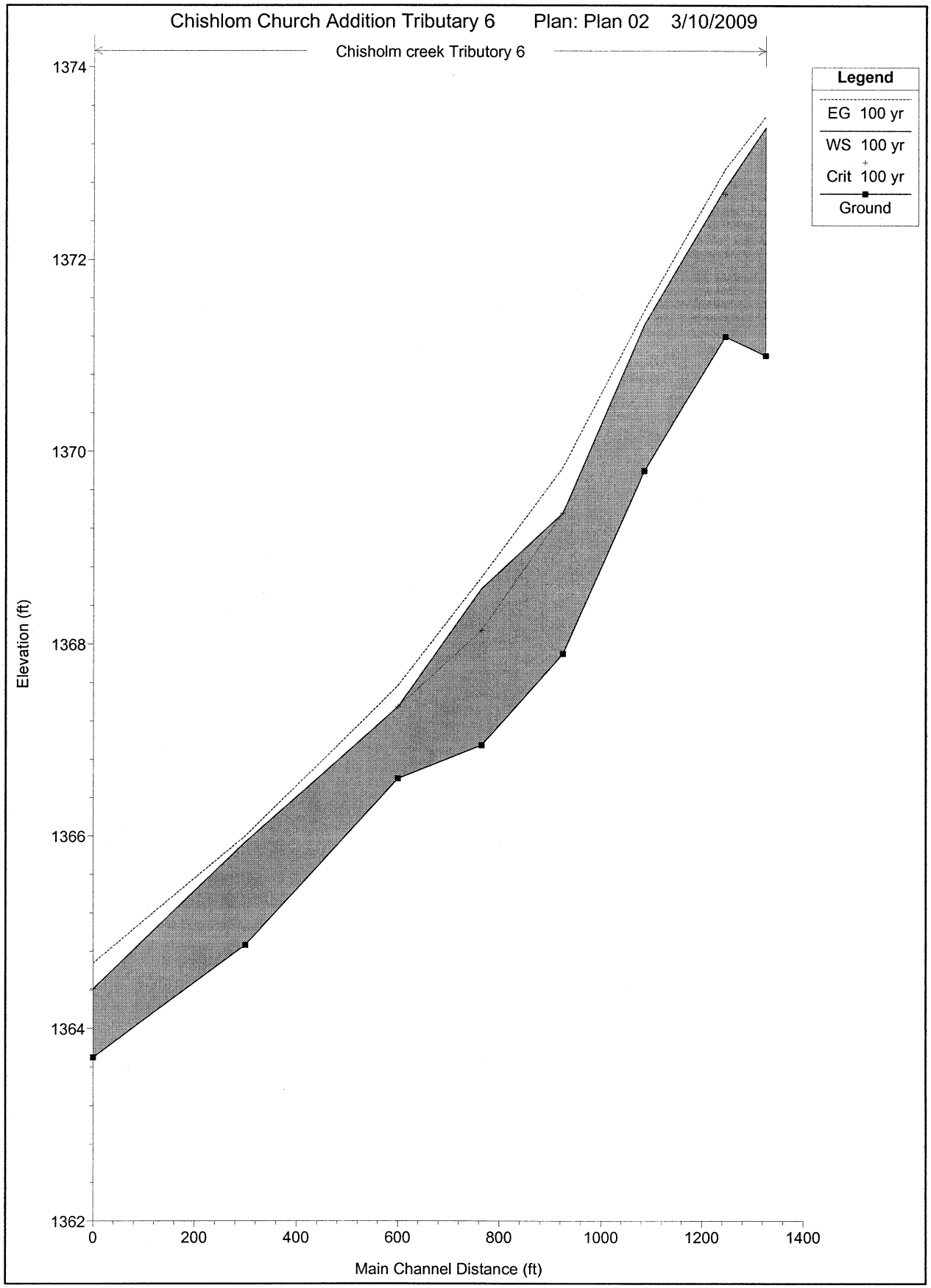
Note: Cross Sections for West Ditch and tributary 6 are attached in hydraulic model

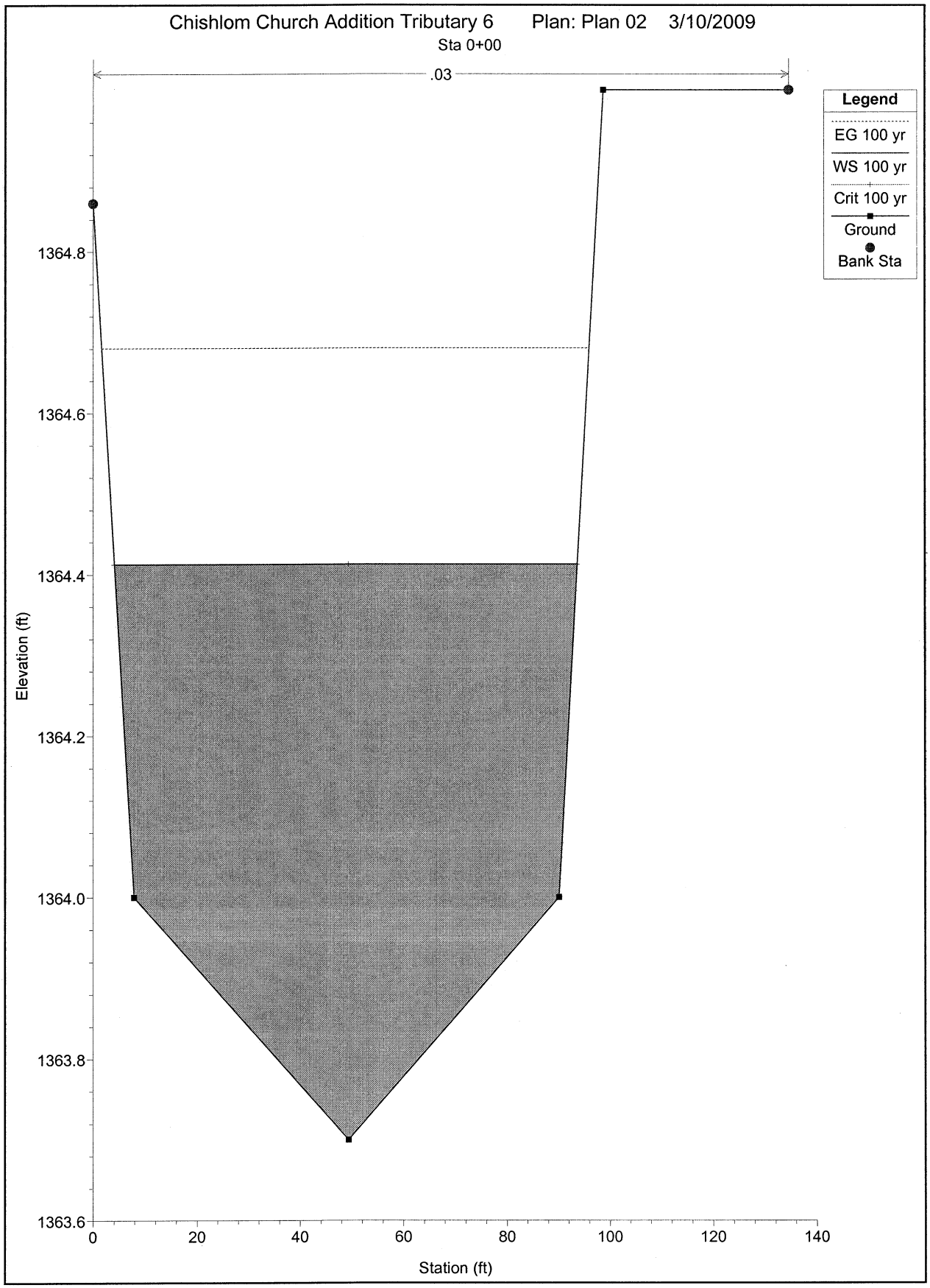
Chisholm Trail Church of Christ Addition
Hydraulic Study
Wichita, Kansas

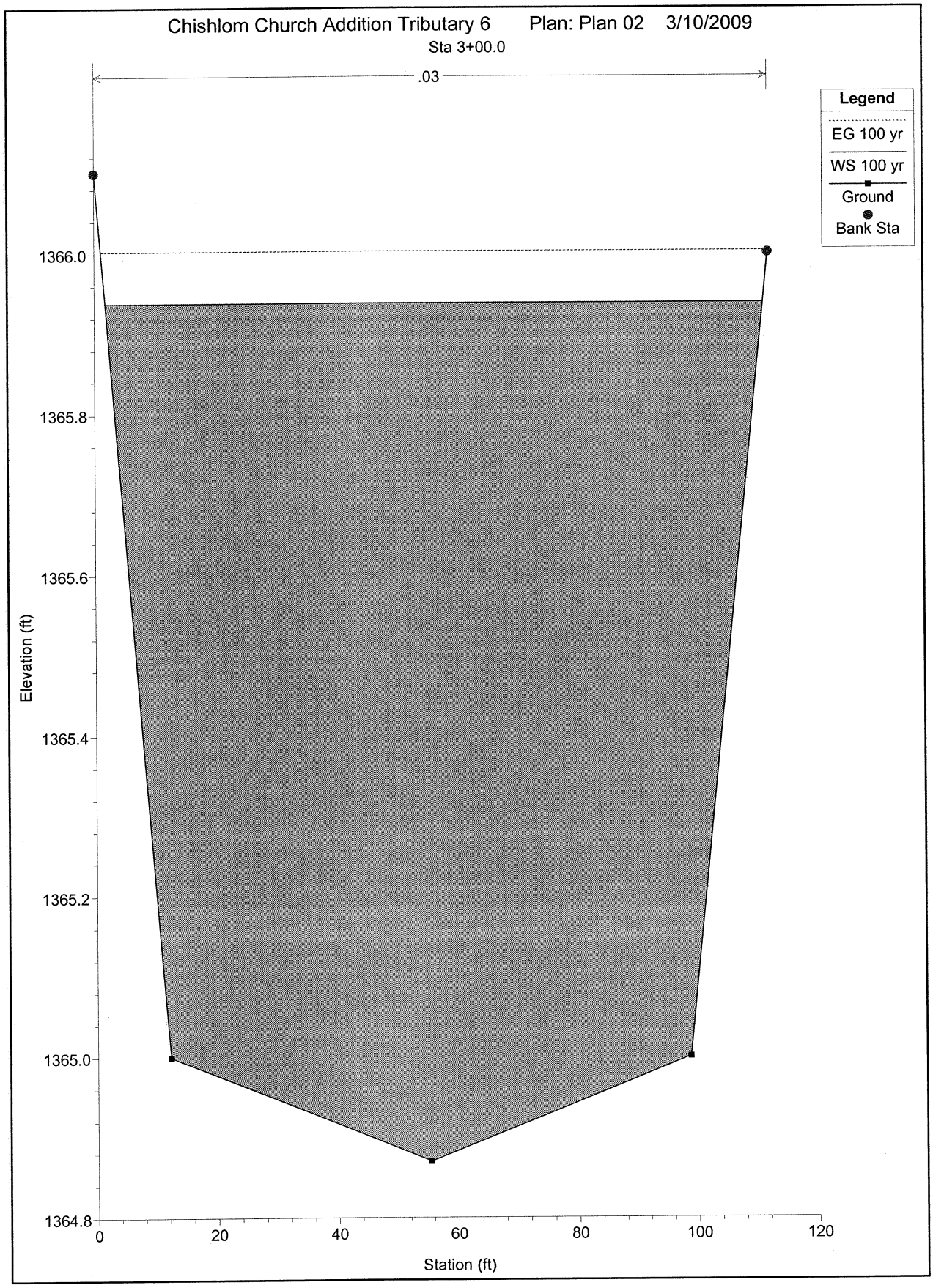
kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242

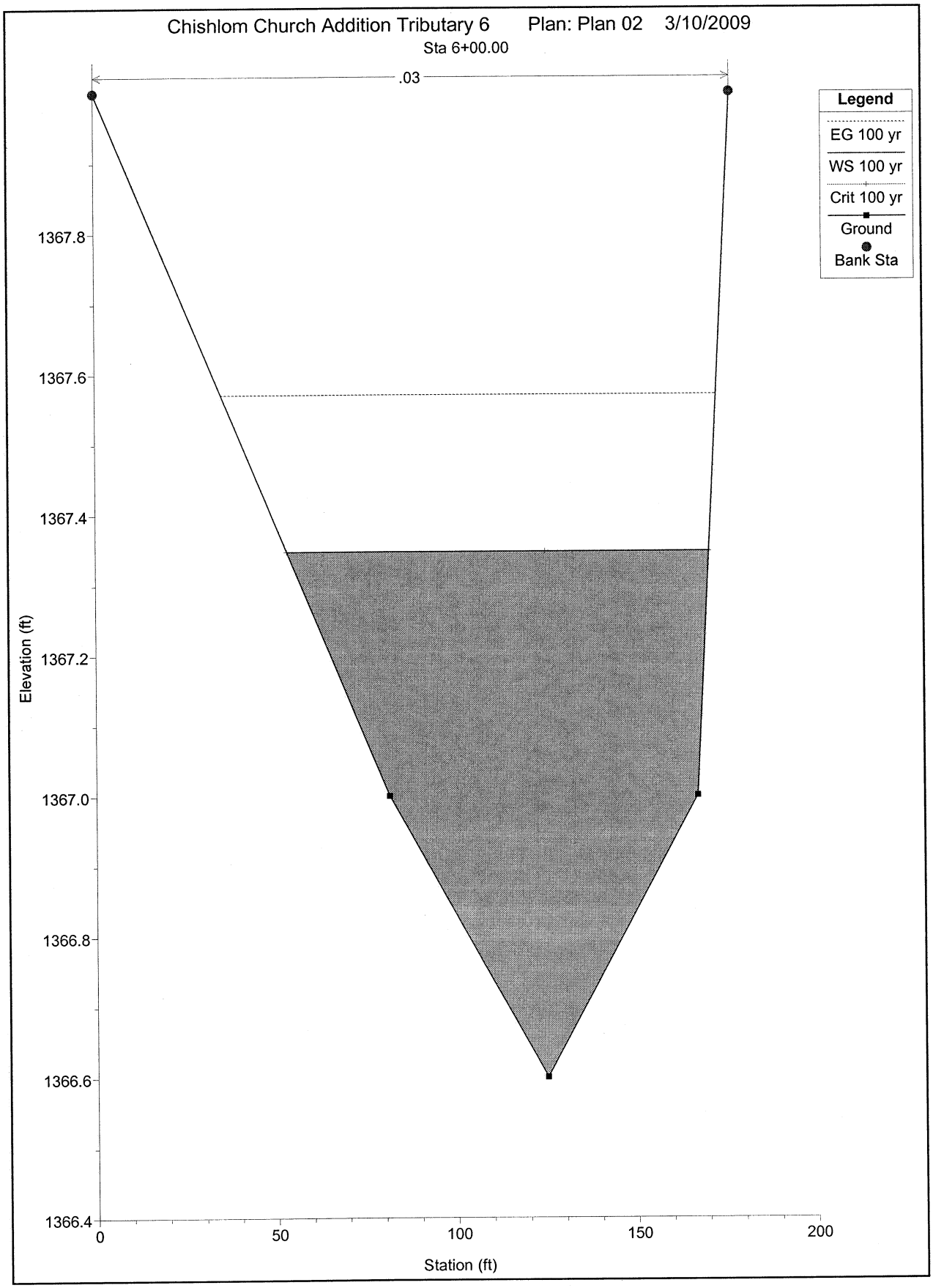
PROJECT NUMBER			
KEM NO. 09008	FILE xsections	DATE 03/2009	SHEET 1
DESIGN KM	DRAWN GP	REVISED	OF 1

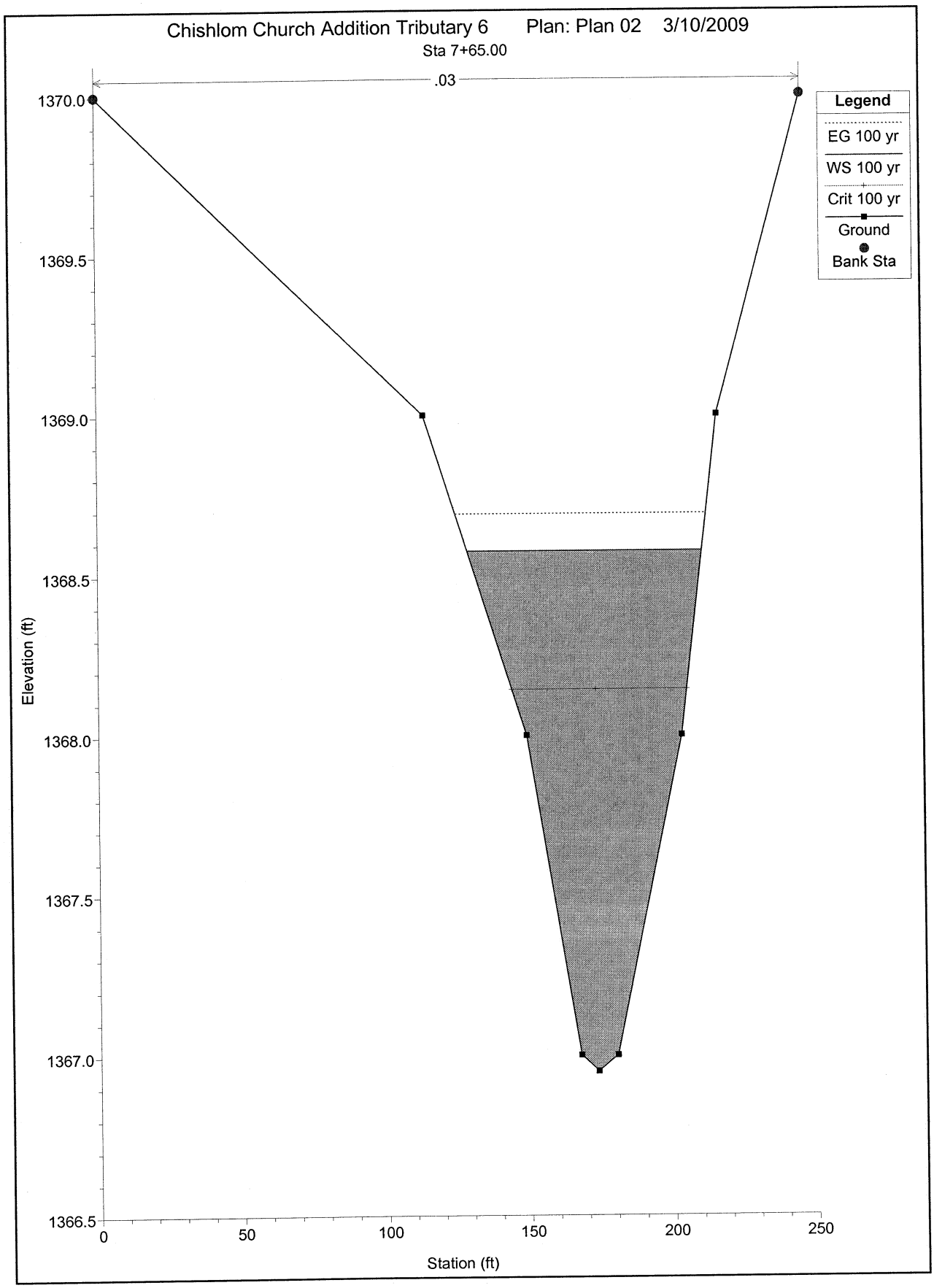
Tributary 6
East Fork Chisholm Creek

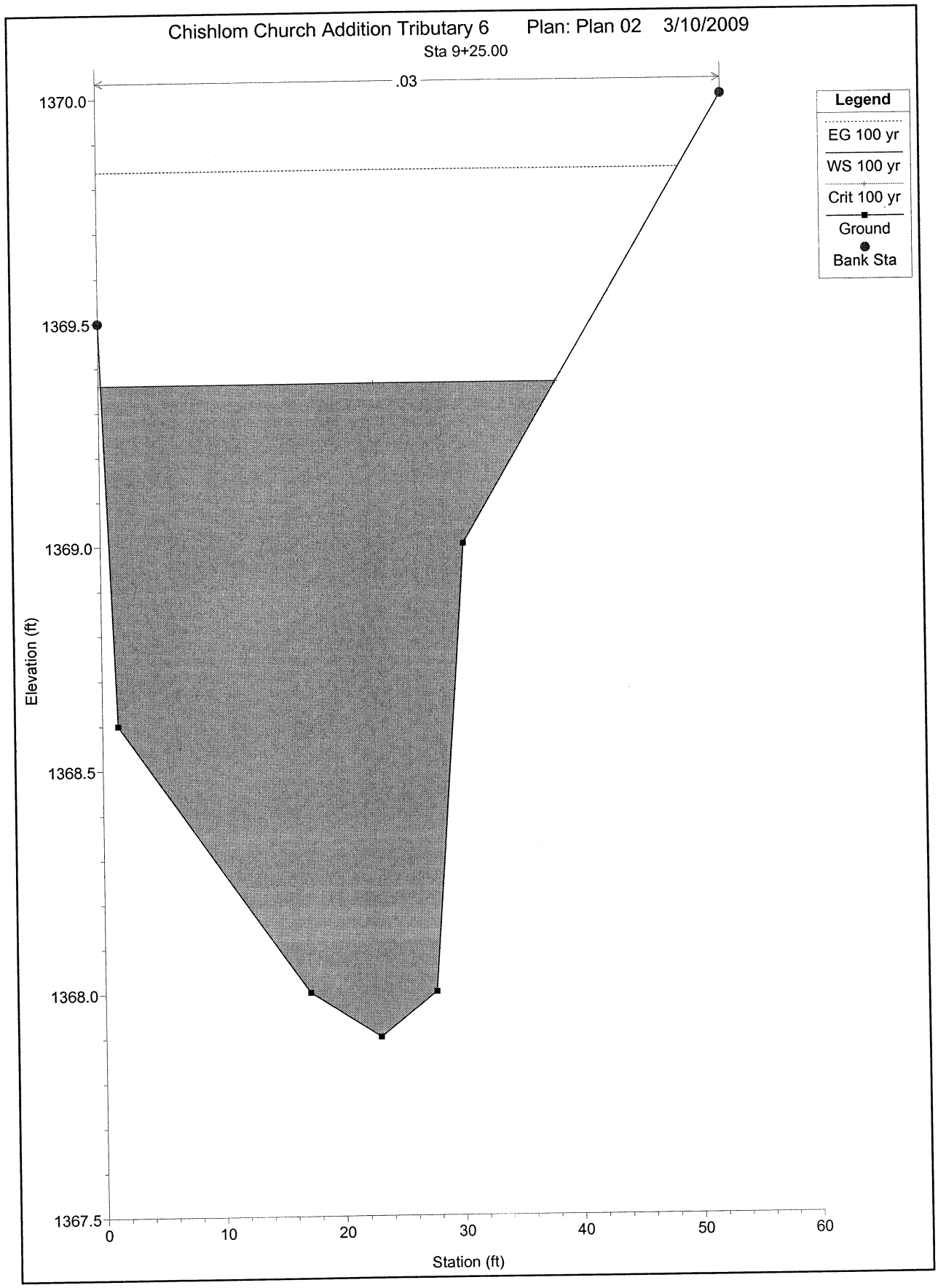

Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Chisholm creek Tributory 6
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Elevation (ft)
1374
1372
1370
1368
1366
1364
1362
0
200
400
600
800
1000
1200
1400
Main Channel Distance (ft)

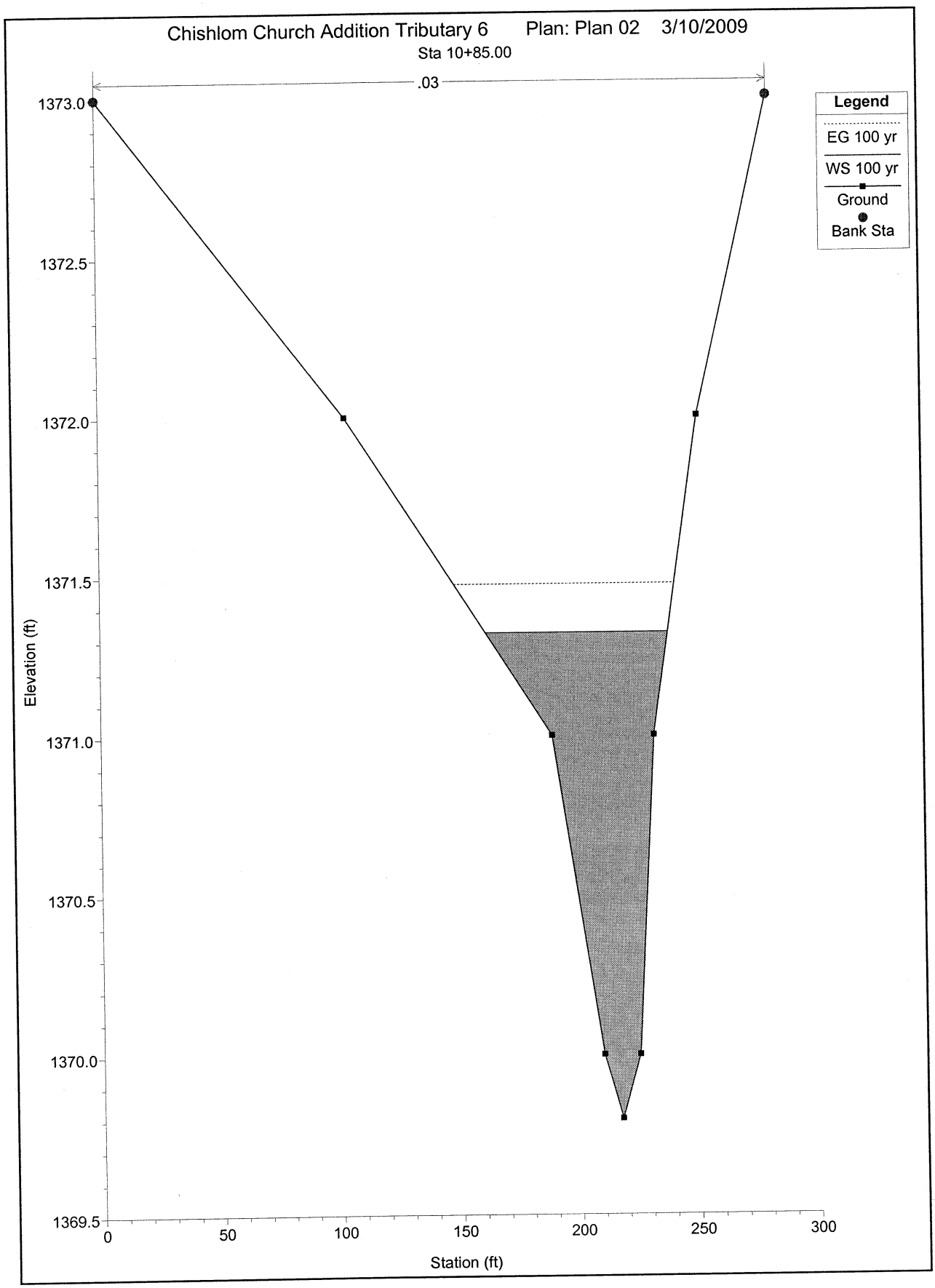

Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Sta 0+00
.03
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta
1364.8
1364.6
1364.4
1364.2
1364.0
1363.8
1363.6
Elevation (ft)
0
20
40
60
80
100
120
140
Station (ft)


Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Sta 3+00.0
.03
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
1366.0
1365.8
1365.6
1365.4
1365.2
1365.0
1364.8
Elevation (ft)
0
20
40
60
80
100
120
Station (ft)


Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Sta 6+00.00
.03
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta
1367.8
1367.6
1367.4
1367.2
1367.0
1366.8
1366.6
1366.4
Elevation (ft)
0
50
100
150
200
Station (ft)


Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Sta 7+65.00
.03
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta
1370.0
1369.5
1369.0
1368.5
1368.0
1367.5
1367.0
1366.5
Elevation (ft)
0
50
100
150
200
250
Station (ft)


Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Sta 9+25.00
.03
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta
1370.0
1369.5
1369.0
1368.5
1368.0
1367.5
Elevation (ft)
0
10
20
30
40
50
60
Station (ft)


Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Sta 10+85.00
.03
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
1373.0
1372.5
1372.0
1371.5
1371.0
1370.5
1370.0
1369.5
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)


Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Sta 12+45.00
.03
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta
Elevation (ft)
1375
1374
1373
1372
1371
0
50
100
150
200
250
300
Station (ft)


Chishlom Church Addition Tributary 6 Plan: Plan 02 3/10/2009
Sta 13+25.00
.03
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (ft)
1376
1375
1374
1373
1372
1371
0
50
100
150
200
250
Station (ft)

```
Geom Title=geometry
Program Version=4.00
Viewing Rectangle= 0 , 1 , 1 , 0

River Reach=Chisholm creek  ,Tributory 6
Reach XY= 13
0.21467391304348 0.49780944986690.236413043478260.45976597160603
0.269733059594730.423854191188450.27717391304348 0.3728094498669
0.288043478260870.334765971606030.297554347826090.28857031943212
0.29891304347826 0.25324423247560.300271739130440.20025510204082
0.300271739130440.145907275953860.302989130434780.09971162377995
0.302989130434780.046722493345160.300271739130440.00460292812777
0.300271739130440.00867901508429
Rch Text X Y=0.4612825,0.7213672
Reverse River Text= 0

Type RM Length L Ch R = 1 ,1325    ,76.8,80,80.9
BEGIN DESCRIPTION:
Sta 13+25.00
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 09:29:14
#Sta/Elev= 10
       0    1375   68.04    1374  135.47    1373  156.52    1372  160.23
1371
  169.86    1372  178.96    1373  189.26    1374  209.89    1375  211.52
1376
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0  211.52     .03       0
Bank Sta=0,211.52
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,1245    ,158.4,160,169.4
BEGIN DESCRIPTION:
Sta 12+45.00
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 09:26:56
#Sta/Elev= 9
       0  1374.5    30.6    1374   113.7    1373   194.3    1372  202.65
1371.2
   210.5    1372   219.4    1373   252.5    1374   253.2    1375
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0   253.2     .03       0
Bank Sta=0,253.2
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,1085    ,160.5,160,159.5
BEGIN DESCRIPTION:
Sta 10+85.00
10+85.00
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 09:25:14
#Sta/Elev= 9
       0    1373  103.35    1372  188.92    1371  209.64    1370  217.19
1369.8
  224.74    1370  231.85    1371  251.17    1372  281.55    1373
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0  281.55     .03       0
Bank Sta=0,281.55
XS Rating Curve= 0 ,0
```

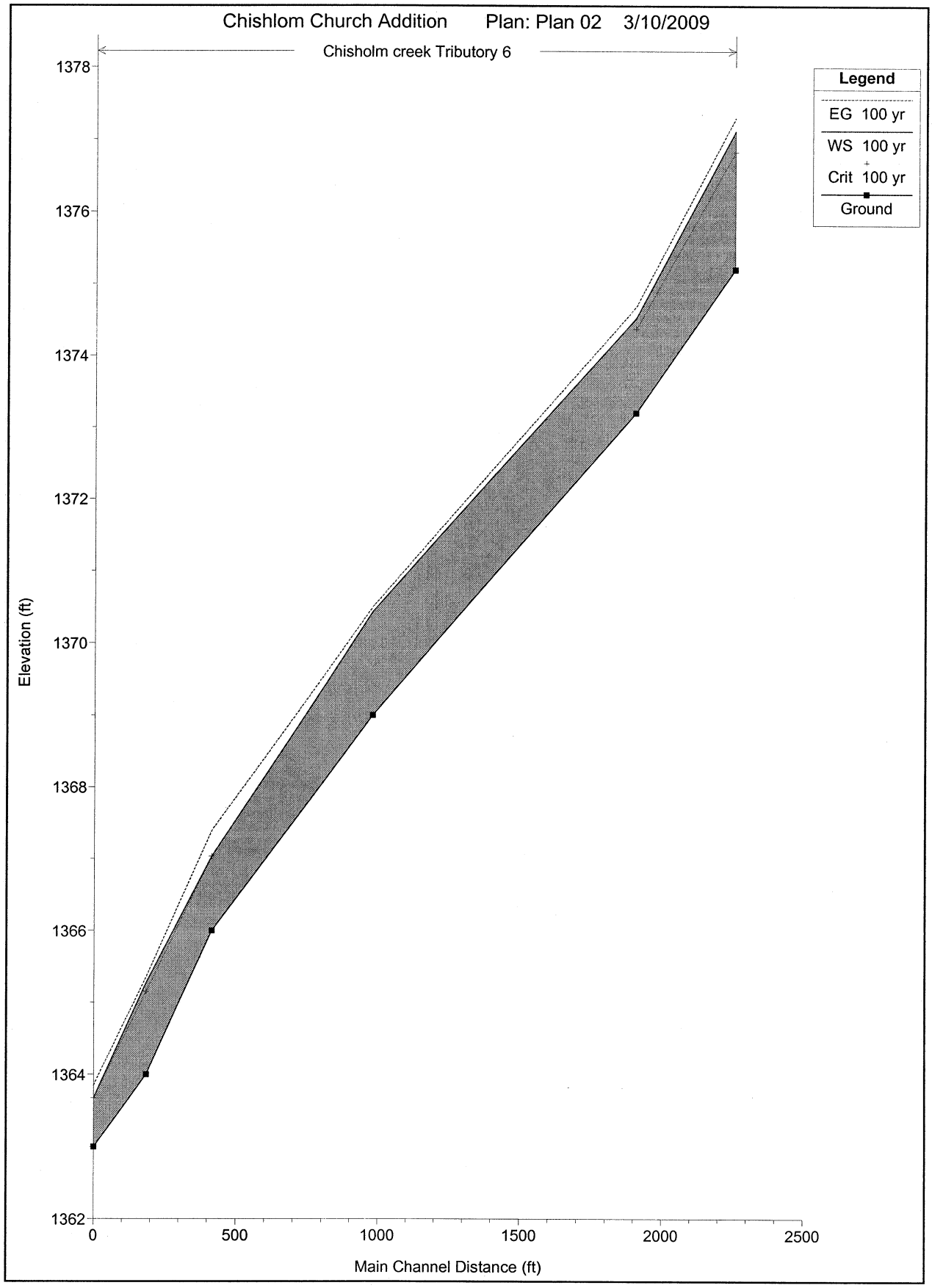
```
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,925      ,162.3,160,158.9
BEGIN DESCRIPTION:
Sta 9+25.00
END DESCRIPTION:
Node Last Edited Time=Feb/25/2009 21:21:13
#Sta/Elev= 7
       0  1369.5     1.3  1368.6    17.2    1368      23  1367.9    27.7
1368
    30.4    1369    52.4    1370
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0    52.4     .03       0
Bank Sta=0,52.4
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,765      ,167.7,165,164.1
BEGIN DESCRIPTION:
Sta 7+65.00
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 09:22:46
#Sta/Elev= 9
       0    1370   113.9    1369  149.22    1368  167.44    1367  173.34
1366.95
  180.02    1367  203.17    1368  216.12    1369  246.23    1370
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0  246.23     .03       0
Bank Sta=0,246.23
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,600      ,294.6,300,308.1
BEGIN DESCRIPTION:
Sta 6+00.00
END DESCRIPTION:
Node Last Edited Time=Mar/10/2009 13:24:29
#Sta/Elev= 5
       0    1368   81.45    1367   124.9  1366.6  167.05    1367  176.85
1368
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0  176.85     .03       0
Bank Sta=0,176.85
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,300      ,300,300,300
BEGIN DESCRIPTION:
Sta 3+00.0
END DESCRIPTION:
Node Last Edited Time=Mar/03/2009 16:54:14
#Sta/Elev= 5
       0  1366.1    12.2    1365    55.5 1364.87    98.7    1365   112.2
1366
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0   112.2     .03       0
Bank Sta=0,112.2
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,0        ,,,
```

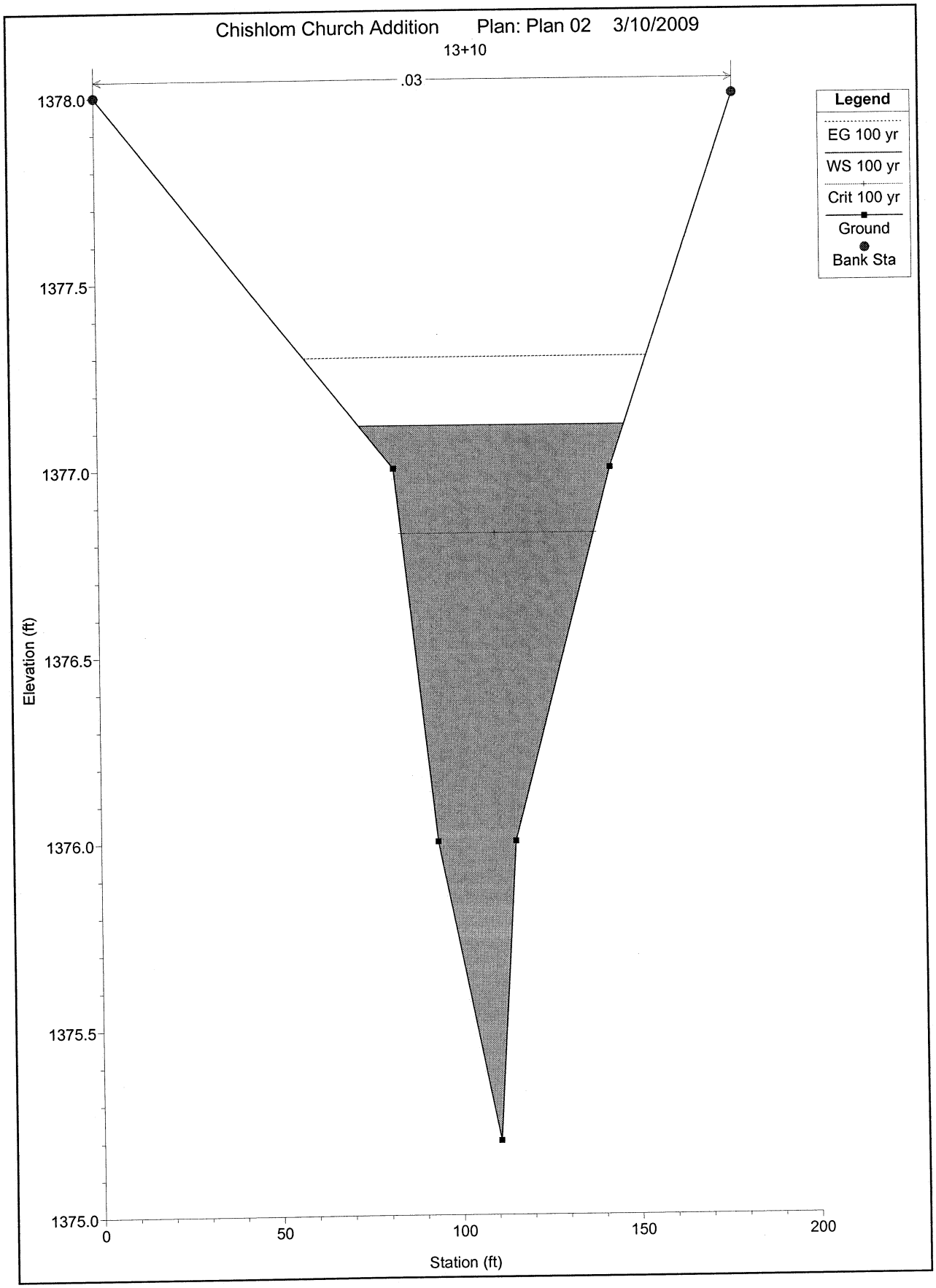
```
BEGIN DESCRIPTION:
Sta 0+00
END DESCRIPTION:
Node Last Edited Time=Feb/25/2009 21:22:19
#Sta/Elev= 6
       0 1364.86     7.9    1364    49.4  1363.7    90.1    1364    98.8
1365
   134.7    1365
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0   134.7     .03       0
Bank Sta=0,134.7
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Chan Stop Cuts=-1


Use User Specified Reach Order=0
User Specified Reach Order=Chisholm creek  ,Tributory 6
GIS Ratio Cuts To Invert=-1
```

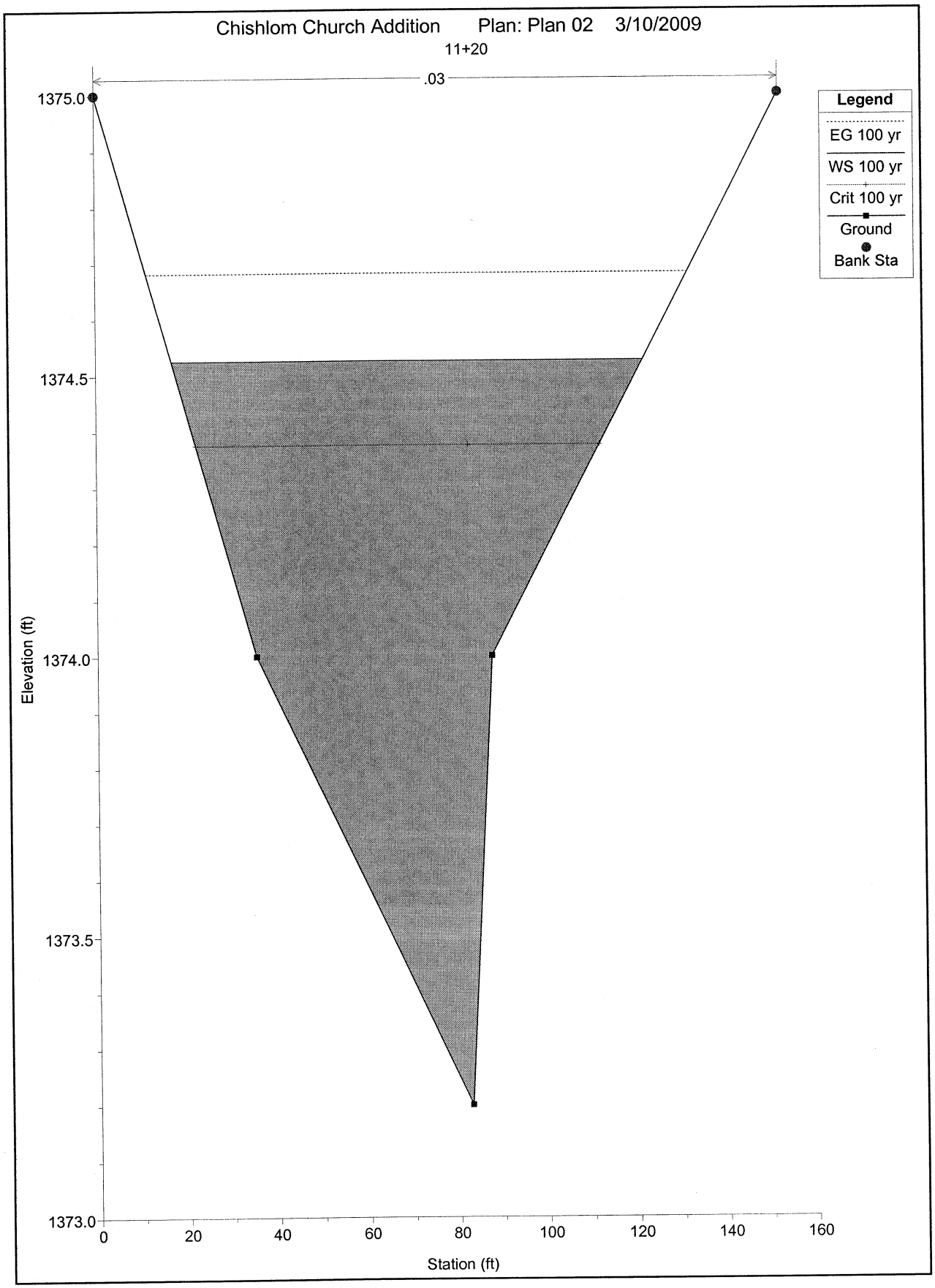
```
Version 4.0 Beta
Plan 02
       1        1        0       24       60        F
       1        2        0        0
       8        8        0        0        0        0        0        0
       0        0        0        F        F        0        0        0        0
0        0        0
       0        0        F        F        0        0        0        F        0
0        F
       0
       0        0
       1        1        0        F        T        F        0        8       30
       1
       0      .01        F      .01       20       .3      .01        F        5
T
Expansion and Contraction Coefficients
      .1       .3        1
       1        1        1        F        F        1
Flow Data
       2        0100 yr
  155.53        1  198.44        4
Flow and Seasonal Roughness Flag (plan)
       F        F
Reach Boundaries
       T        T        1        8        Chisholm creek          F        F
       0        0
       2        0
NODE   1Tributory 6     1325         76.8       80     80.9        0
       1        F
      10
       0     1375    68.04     1374   135.47     1373   156.52     1372   160.23
1371
  169.86     1372   178.96     1373   189.26     1374   209.89     1375   211.52
1376
       1        F        F        0
       0      .03
                                          F        F        0   211.52        F
F
       0        0        F
       0        F
NODE   1Tributory 6     1245         158.4      160    169.4        0
       1        F
       9
       0   1374.5     30.6     1374   113.7     1373   194.3     1372   202.65
1371.2
   210.5     1372    219.4     1373   252.5     1374   253.2     1375
       1        F        F        0
       0      .03
                                          F        F        0    253.2        F
F
       0        0        F
       0        F
NODE   1Tributory 6     1085         160.5      160    159.5        0
       1        F
       9
       0     1373   103.35     1372   188.92     1371   209.64     1370   217.19
1369.8
  224.74     1370   231.85     1371   251.17     1372   281.55     1373
       1        F        F        0
       0      .03
                                          F        F        0   281.55        F
```

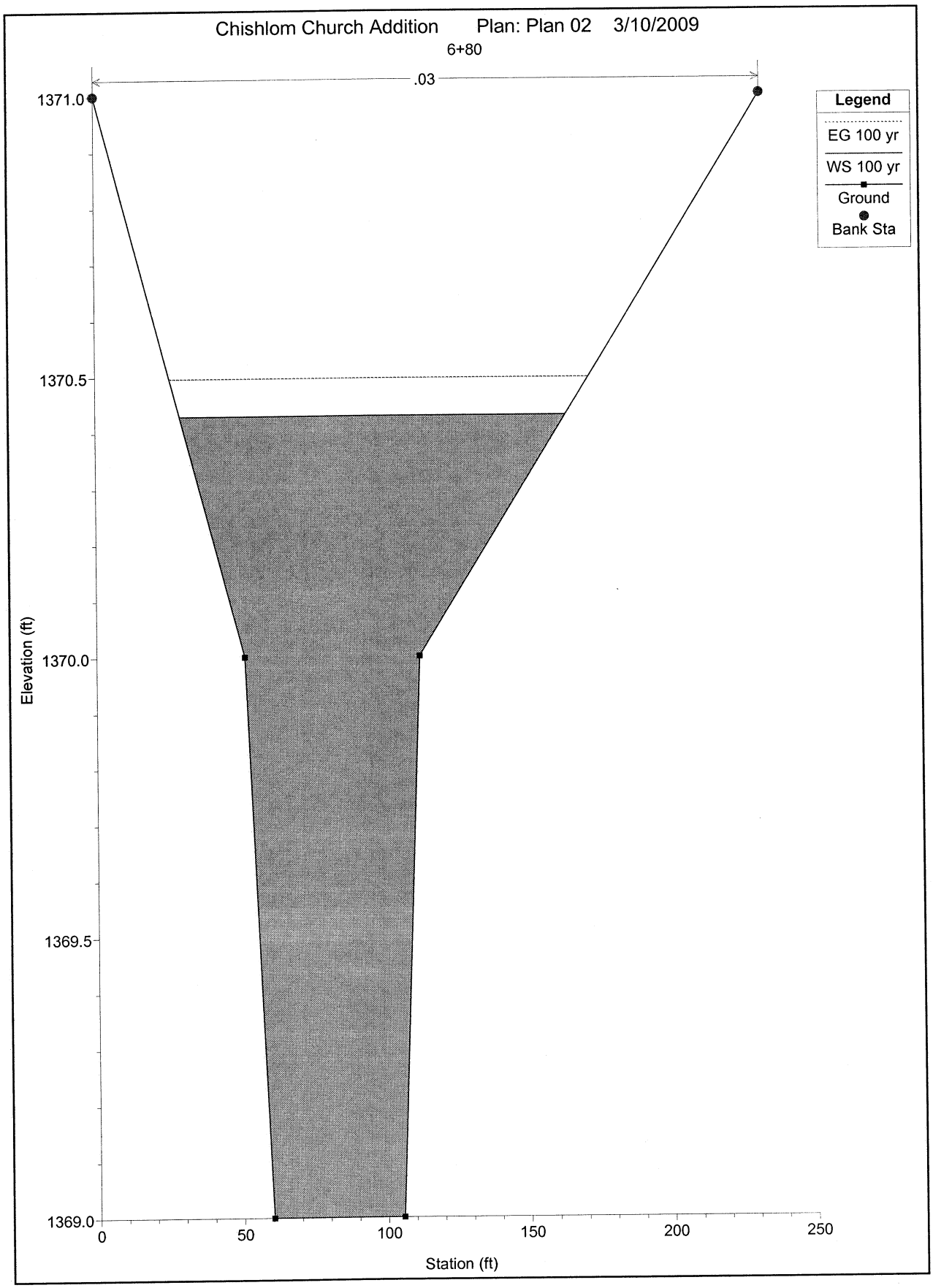
```
F
       0       0       F
       0       F
NODE   1Tributory 6     925        162.3     160   158.9       0
       1       F
       7
       0  1369.5     1.3  1368.6    17.2    1368      23  1367.9    27.7
1368
    30.4    1369    52.4    1370
       1       F       F       0
       0     .03
                                          F       F       0    52.4       F
F
       0       0       F
       0       F
NODE   1Tributory 6     765        167.7     165   164.1       0
       1       F
       9
       0    1370   113.9    1369   149.22    1368  167.44    1367  173.34
1366.95
  180.02    1367  203.17    1368   216.12    1369  246.23    1370
       1       F       F       0
       0     .03
                                          F       F       0  246.23       F
F
       0       0       F
       0       F
NODE   1Tributory 6     600        294.6     300   308.1       0
       1       F
       5
       0    1368   81.45    1367   124.9  1366.6  167.05    1367  176.85
1368
       1       F       F       0
       0     .03
                                          F       F       0  176.85       F
F
       0       0       F
       0       F
NODE   1Tributory 6     300         300      300     300       0
       1       F
       5
       0  1366.1    12.2    1365    55.5 1364.87    98.7    1365   112.2
1366
       1       F       F       0
       0     .03
                                          F       F       0   112.2       F
F
       0       0       F
       0       F
NODE   1Tributory 6     0                                      0
       1       F
       6
       0 1364.86     7.9    1364    49.4  1363.7    90.1    1364    98.8
1365
   134.7    1365
       1       F       F       0
       0     .03
                                          F       F       0   134.7       F
F
       0       0       F
       0       F
```

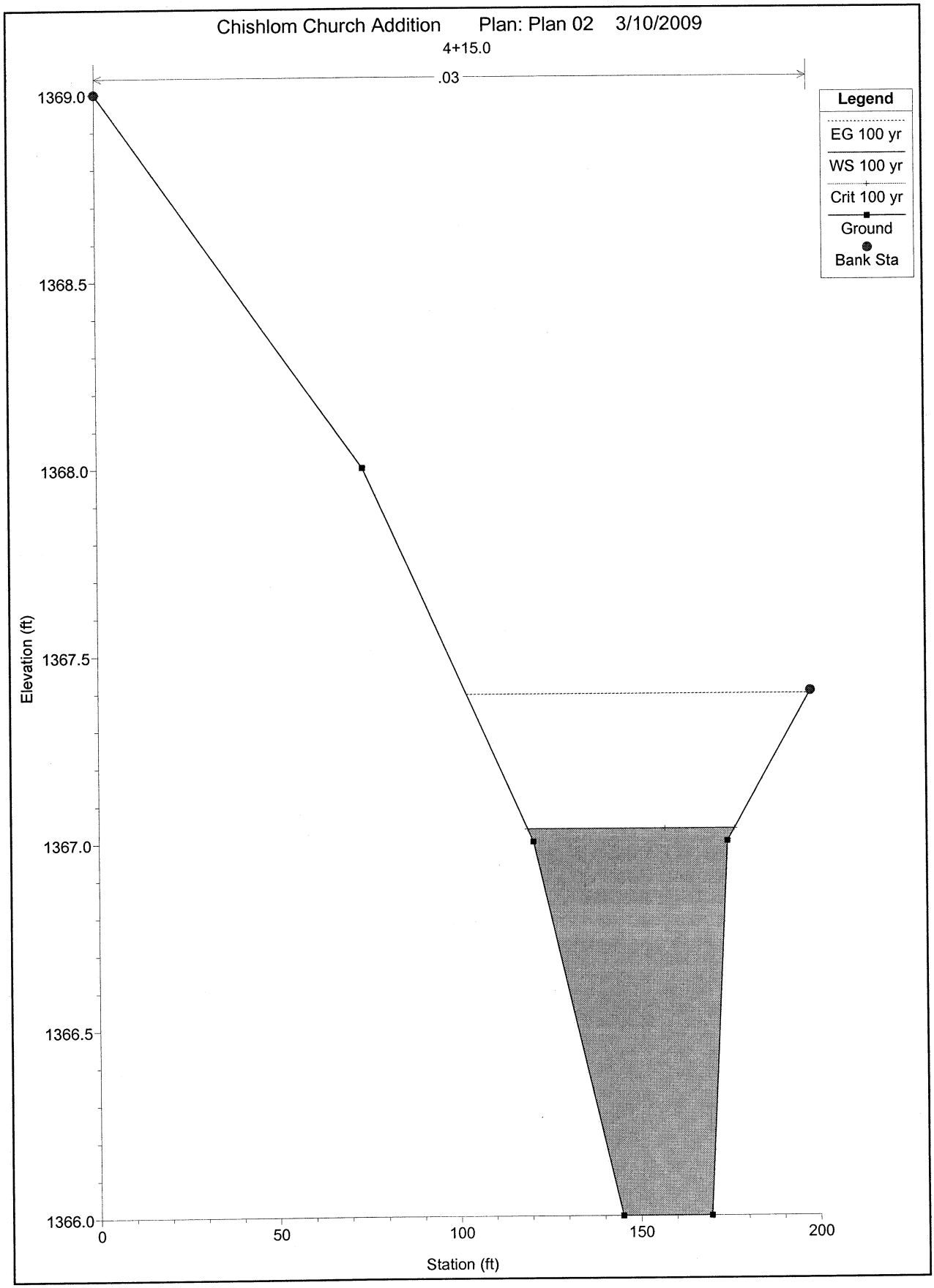
Ditch on west side

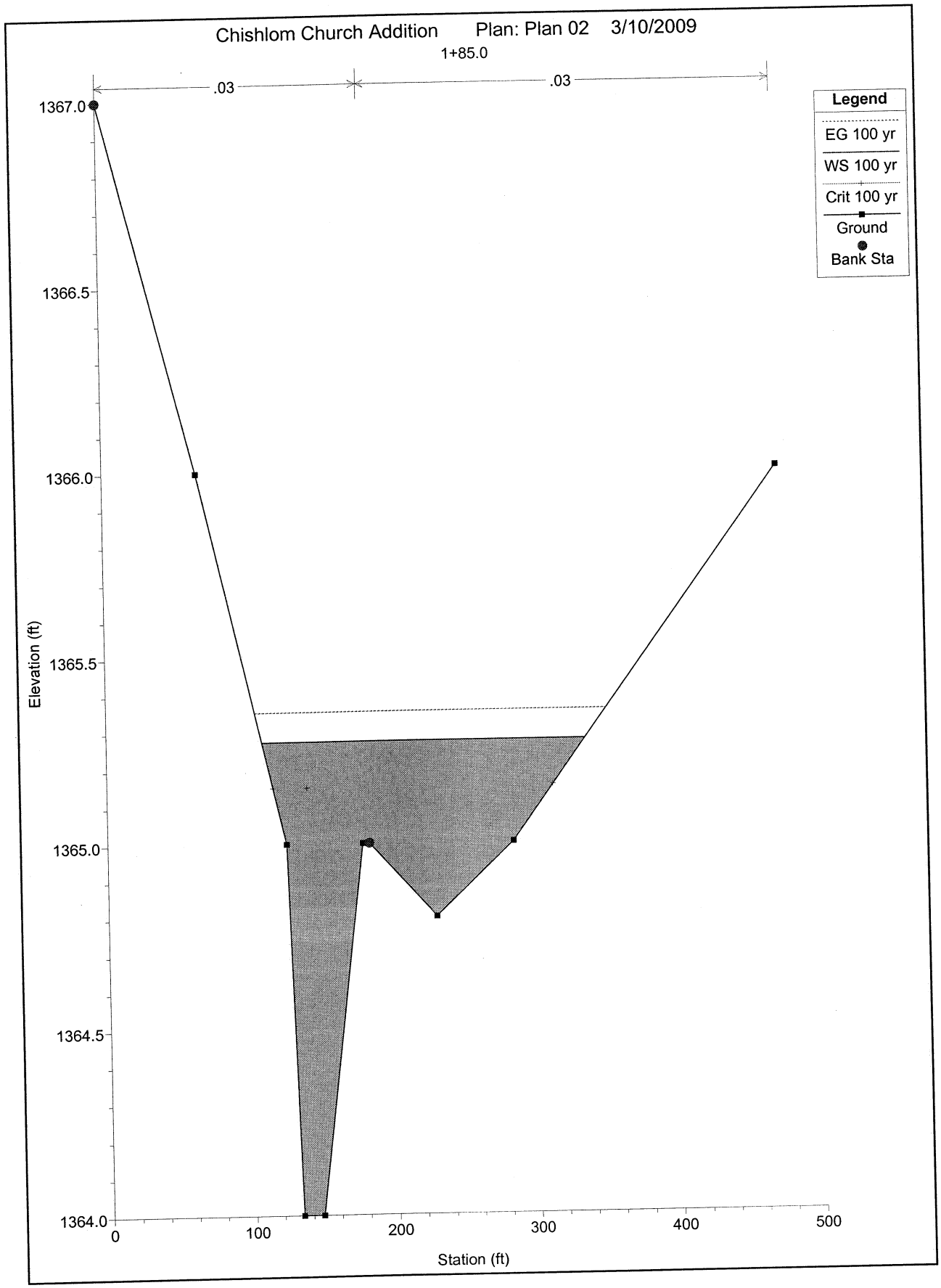

Chishlom Church Addition Plan: Plan 02 3/10/2009
Chisholm creek Tributory 6
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Elevation (ft)
1378
1376
1374
1372
1370
1368
1366
1364
1362
0
500
1000
1500
2000
2500
Main Channel Distance (ft)

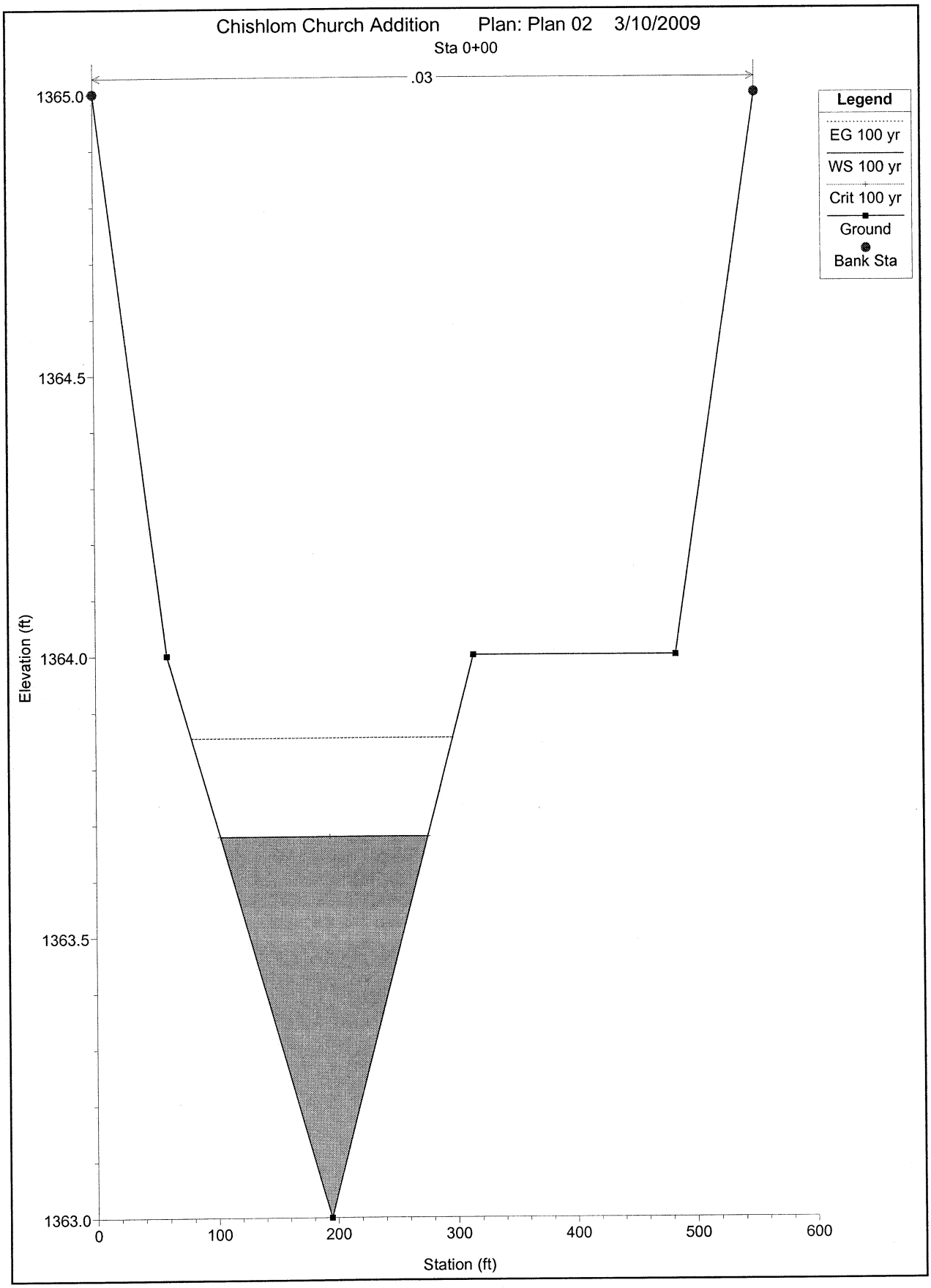

Chishlom Church Addition Plan: Plan 02 3/10/2009
13+10
.03
1378.0
1377.5
1377.0
1376.5
1376.0
1375.5
1375.0
Elevation (ft)
0
50
100
150
200
Station (ft)
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta


Chishlom Church Addition Plan: Plan 02 3/10/2009
11+20
.03
1375.0
1374.5
1374.0
1373.5
1373.0
Elevation (ft)
0
20
40
60
80
100
120
140
160
Station (ft)
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta


Chishlom Church Addition Plan: Plan 02 3/10/2009
6+80
.03
1371.0
1370.5
1370.0
1369.5
1369.0
Elevation (ft)
0
50
100
150
200
250
Station (ft)
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta


Chishlom Church Addition Plan: Plan 02 3/10/2009
4+15.0
.03
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta
1369.0
1368.5
1368.0
1367.5
1367.0
1366.5
1366.0
Elevation (ft)
0
50
100
150
200
Station (ft)


Chishlom Church Addition Plan: Plan 02 3/10/2009
1+85.0
.03
.03
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta
1367.0
1366.5
1366.0
1365.5
1365.0
1364.5
1364.0
Elevation (ft)
0
100
200
300
400
500
Station (ft)


Chishlom Church Addition Plan: Plan 02 3/10/2009
Sta 0+00
.03
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Bank Sta
1365.0
1364.5
1364.0
1363.5
1363.0
Elevation (ft)
0
100
200
300
400
500
600
Station (ft)

```
Geom Title=geometry
Program Version=4.00
Viewing Rectangle= 0 , 1 , 1 , 0

River Reach=Chisholm creek  ,Tributory 6
Reach XY= 13
0.21467391304348 0.49780944986690.236413043478260.45976597160603
0.269733059594730.423854191188450.27717391304348 0.3728094498669
0.288043478260870.334765971606030.297554347826090.28857031943212
0.29891304347826 0.25324423247560.300271739130440.20025510204082
0.300271739130440.145907275953860.302989130434780.09971162377995
0.302989130434780.046722493345160.300271739130440.00460292812777
0.300271739130440.00867901508429
Rch Text X Y=0.4612825,0.7213672
Reverse River Text= 0

Type RM Length L Ch R = 1 ,1310     ,348.4,350,359.4
BEGIN DESCRIPTION:
13+10
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 12:56:53
#Sta/Elev= 7
       0    1378    82.6    1377    93.9    1376   110.6  1375.2   115.6
1376
  143.11    1377   178.2    1378
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0   178.2     .03       0
Bank Sta=0,178.2
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,1120     ,930.5,925,922.5
BEGIN DESCRIPTION:
11+20
11+20
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 12:55:20
#Sta/Elev= 5
       0    1375    35.5    1374   82.78  1373.2   87.83    1374   152.3
1375
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0   152.3     .03       0
Bank Sta=0,152.3
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,680      ,559.6,565,573.1
BEGIN DESCRIPTION:
6+80
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 12:53:55
#Sta/Elev= 6
       0    1371    51.6    1370    60.2    1369   105.5    1369   112.4
1370
   232.2    1371
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0   232.2     .03       0
Bank Sta=0,232.2
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1
```

```
Type RM Length L Ch R = 1 ,415      ,230,230,230
BEGIN DESCRIPTION:
4+15.0
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 13:00:42
#Sta/Elev= 7
       0    1369   73.96    1368  120.75    1367  145.04    1366   169.6
1366
  174.58    1367  198.07  1367.4
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0  198.07     .03       0
Bank Sta=0,198.07
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,185      ,185,185,185
BEGIN DESCRIPTION:
1+85.0
1+85.0
1+85
END DESCRIPTION:
Node Last Edited Time=Mar/10/2009 14:06:03
#Sta/Elev= 10
       0    1367    65.8    1366   125.5    1365  133.18    1364  147.18
1364
   178.7    1365   183.3    1365  229.42  1364.8  284.19    1365  472.52
1366
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0   183.3     .03       0
Bank Sta=0,183.3
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,0        ,,,
BEGIN DESCRIPTION:
Sta 0+00
END DESCRIPTION:
Node Last Edited Time=Mar/09/2009 13:35:02
#Sta/Elev= 6
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1364
  551.56    1365
#Mann= 3 , 0 , 0
       0     .03       0       0     .03       0  551.56     .03       0
Bank Sta=0,551.56
XS Rating Curve= 0 ,0
Exp/Cntr=0.3,0.1

Chan Stop Cuts=-1


Use User Specified Reach Order=0
User Specified Reach Order=Chisholm creek  ,Tributory 6
GIS Ratio Cuts To Invert=-1
```

```
Version 4.0 Beta
Plan 02
       1        1        0       18       41        F
       1        1        0        0
       6        6        0        0        0        0        0        0
       0        0        0        F        F        0        0        0        0
0        0        0
       0        0        F        F        0        0        0        F        0
0        F
       0
       0        0
       1        1        0        F        T        F        0        6       30
       1
       0      .01        F      .01       20       .3      .01        F        5
T
Expansion and Contraction Coefficients
      .1       .3        1
       1        1        1        F        F        1
Flow Data
       1        0100 yr
  197.59        1
Flow and Seasonal Roughness Flag (plan)
       F        F
Reach Boundaries
       T        T        1        6        Chisholm creek           F        F
       0        0
       2        0
NODE   1Tributory 6      1310        348.4      350    359.4        0
       1        F
       7
       0     1378     82.6     1377     93.9     1376    110.6   1375.2    115.6
1376
  143.11     1377    178.2     1378
       1        F        F        0
       0      .03
                                          F        F        0    178.2        F
F
       0        0        F
       0        F
NODE   1Tributory 6      1120        930.5      925    922.5        0
       1        F
       5
       0     1375     35.5     1374    82.78   1373.2    87.83     1374    152.3
1375
       1        F        F        0
       0      .03
                                          F        F        0    152.3        F
F
       0        0        F
       0        F
NODE   1Tributory 6       680        559.6      565    573.1        0
       1        F
       6
       0     1371     51.6     1370     60.2     1369    105.5     1369    112.4
1370
   232.2     1371
       1        F        F        0
       0      .03
                                          F        F        0    232.2        F
F
       0        0        F
```

```
        0       F
NODE    1Tributory 6      415           230      230      230        0
        1       F
        7
        0    1369   73.96    1368  120.75    1367  145.04    1366   169.6
1366
  174.58    1367  198.07  1367.4
        1       F       F       0
        0     .03                          F       F       0  198.07       F
F
        0       0       F
        0       F
NODE    1Tributory 6      185           185      185      185        0
        1       F
       10
        0    1367    65.8    1366   125.5    1365  133.18    1364  147.18
1364
   178.7    1365   183.3    1365  229.42  1364.8  284.19    1365  472.52
1366
        2       F       F       0
        0     .03   183.3     .03                F       F       0   183.3       F
F
        0       0       F
        0       F
NODE    1Tributory 6        0                                          0
        1       F
        6
        0    1365   59.23    1364   194.4    1363  314.65    1364  483.89
1364
  551.56    1365
        1       F       F       0
        0     .03                          F       F       0  551.56       F
F
        0       0       F
        0       F
```

```
Flow Title=Flow 01
Program Version=4.00
Number of Profiles= 1
Profile Names=100 yr
River Rch & RM=Chisholm creek,Tributory 6     ,1310
  197.59
Boundary for River Rch & Prof#=Chisholm creek,Tributory 6     , 1
Up Type= 0
Dn Type= 2
DSS Import StartDate=
DSS Import StartTime=
DSS Import EndDate=
DSS Import EndTime=
DSS Import GetInterval= 0
DSS Import Interval=
DSS Import GetPeak= 0
DSS Import FillOption= 0
```

FEMA Flood Map
Flood study (Hydraulic and Hydrological study plan)

MAP SCALE 1" = 500'

500 1000 FEET

0 150 300 METERS

PANEL 0357E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS AND INCORPORATED AREAS

PANEL 357 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
WICHITA, CITY OF	200328	0357	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
20173C0357E

EFFECTIVE DATE
FEBRUARY 2, 2007

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

97° 16' 52.5"
37° 45' 00"

652000m E

653000m E

4179000m N

JOINS PANEL 0219

1366

UNION PACIFIC RAILROAD

East Fork Chisholm Creek Tributary No. 3

East Fork Chisholm Creek Tributary No. 4

East Fork Chisholm Creek Tributary No. 6

East Fork Chisholm Creek Tributary No. 5

East Fork Chisholm Creek

ZONE AE

ZONE A

ZONE X

1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CULVERT

LIMIT OF DETAILED STUDY

City of Wichita
200328

E 36TH ST N

E 35TH ST N

E 34TH CT N

E 32ND CT N

E 30TH ST

E 29TH ST N

E NORWOOD LN

N GREAT PLAINS ST

N RIDGEWOOD ST

N SIEFKIN ST

N HILLCREST ST

N HOMESTEAD ST

N WOODLAWN BLVD

N OLIVER AVE

E BROOKVIEW ST

Culvert

Dam

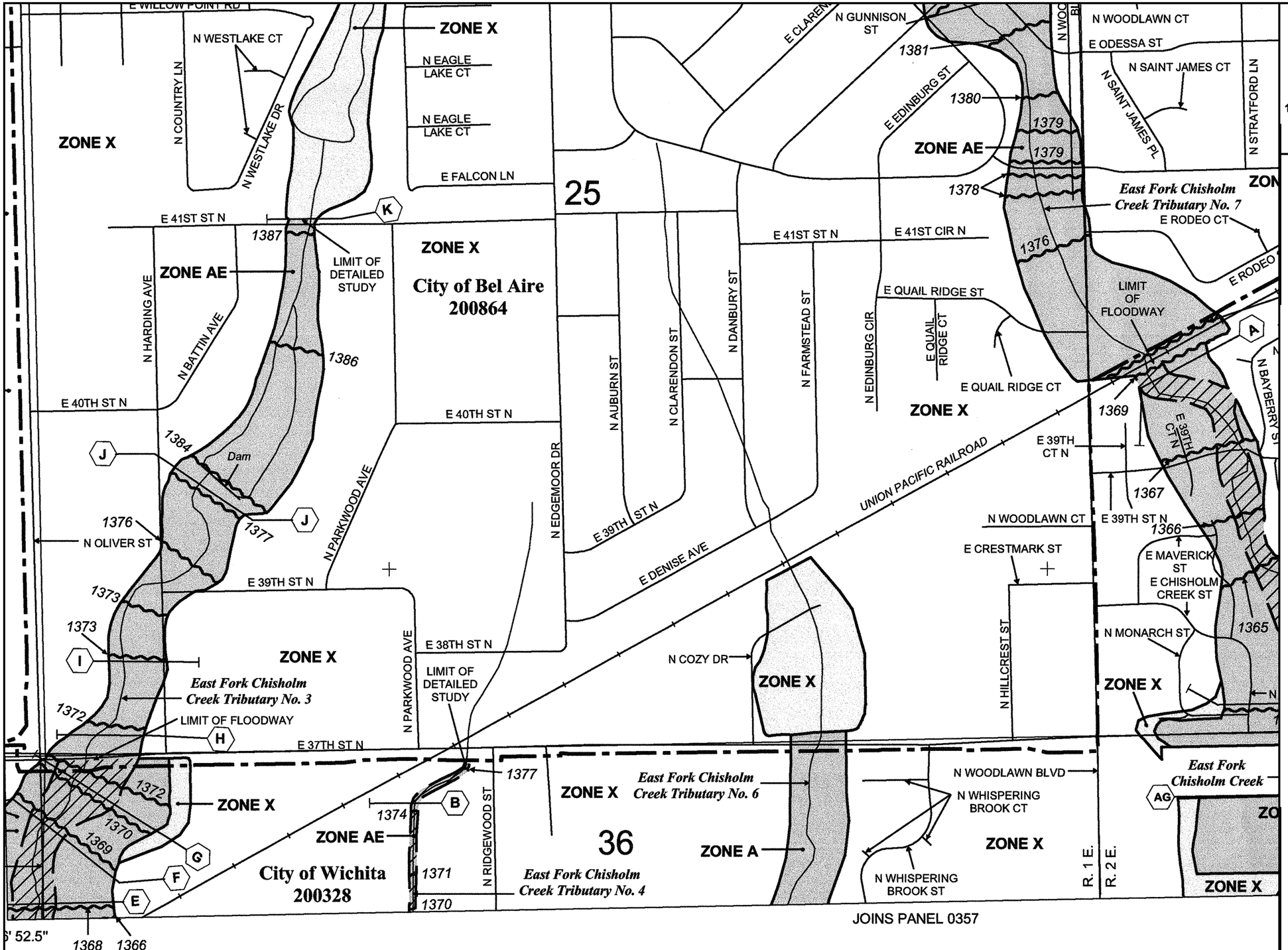
R. 1 E.

R. 2 E.

35

36

1369 1368 1368 1367 1367 1365 1364 1363 1359 1358 1358 1357 1356 1356 1355 1354 1354 1354 1353 1352 1351 1350 1350 1349 1349 1348 1347 1363



MAP SCALE 1" = 500'

250 0 500 1000 FEE

150 0 150 300

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0219E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS AND INCORPORATED AREAS

PANEL 219 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

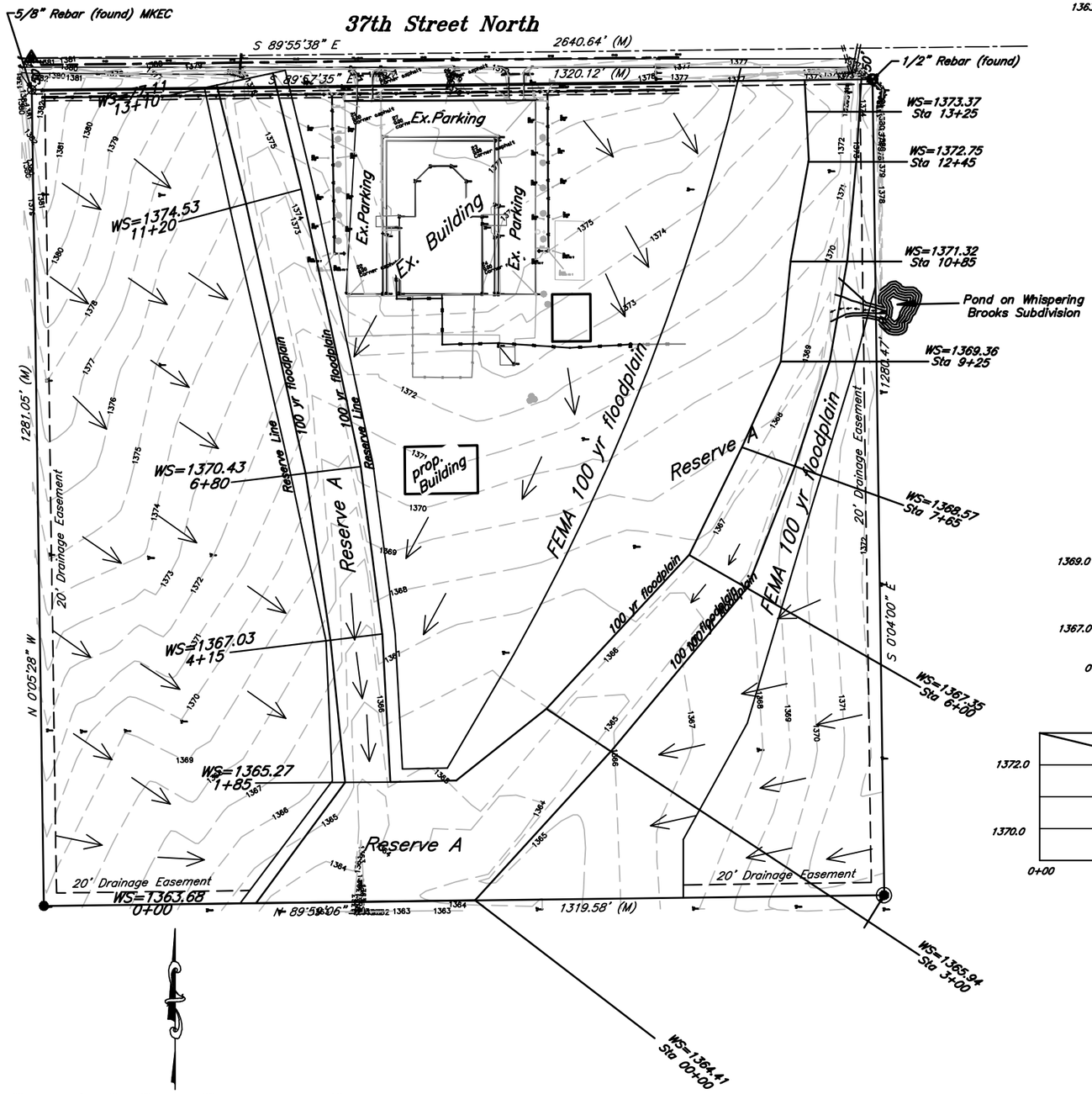
COMMUNITY	NUMBER	PANEL	SUFFIX
BEL AIRE, CITY OF	200864	0219	E
SEDGWICK COUNTY	200321	0219	E
WICHITA, CITY OF	200328	0219	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
20173C0219E

EFFECTIVE DATE
FEBRUARY 2, 2007

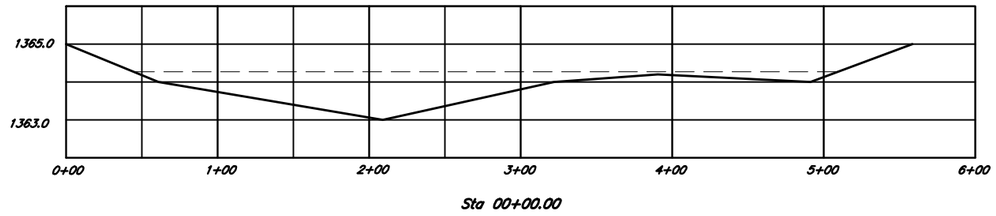
Federal Emergency Management Agency



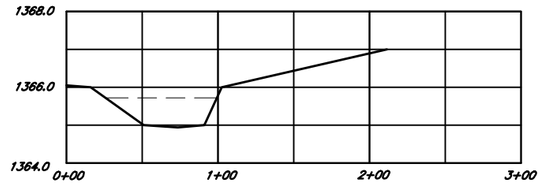
100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

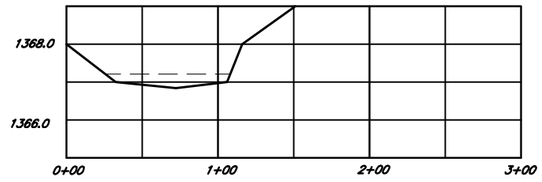
Tributary 6
Channel X-Sections



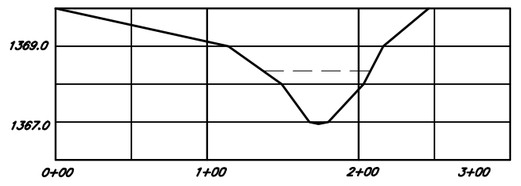
Sta 00+00.00



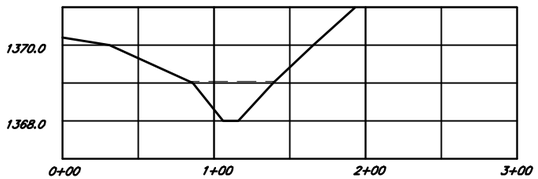
Sta 3+00.00



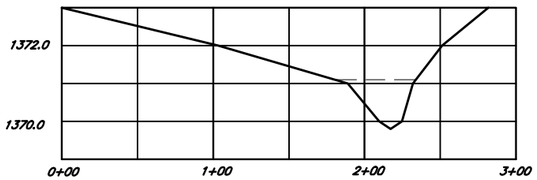
Sta 6+00.00



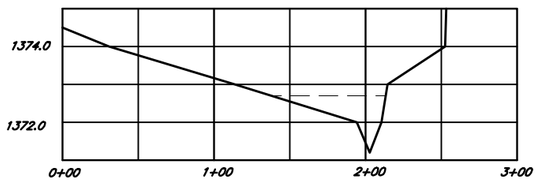
Sta 7+65.00



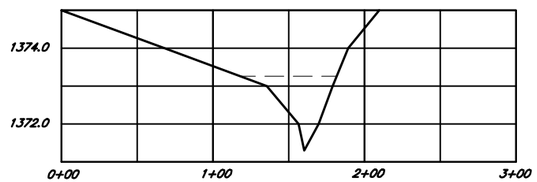
Sta 9+25.00



Sta 10+85.00



Sta 12+45.00



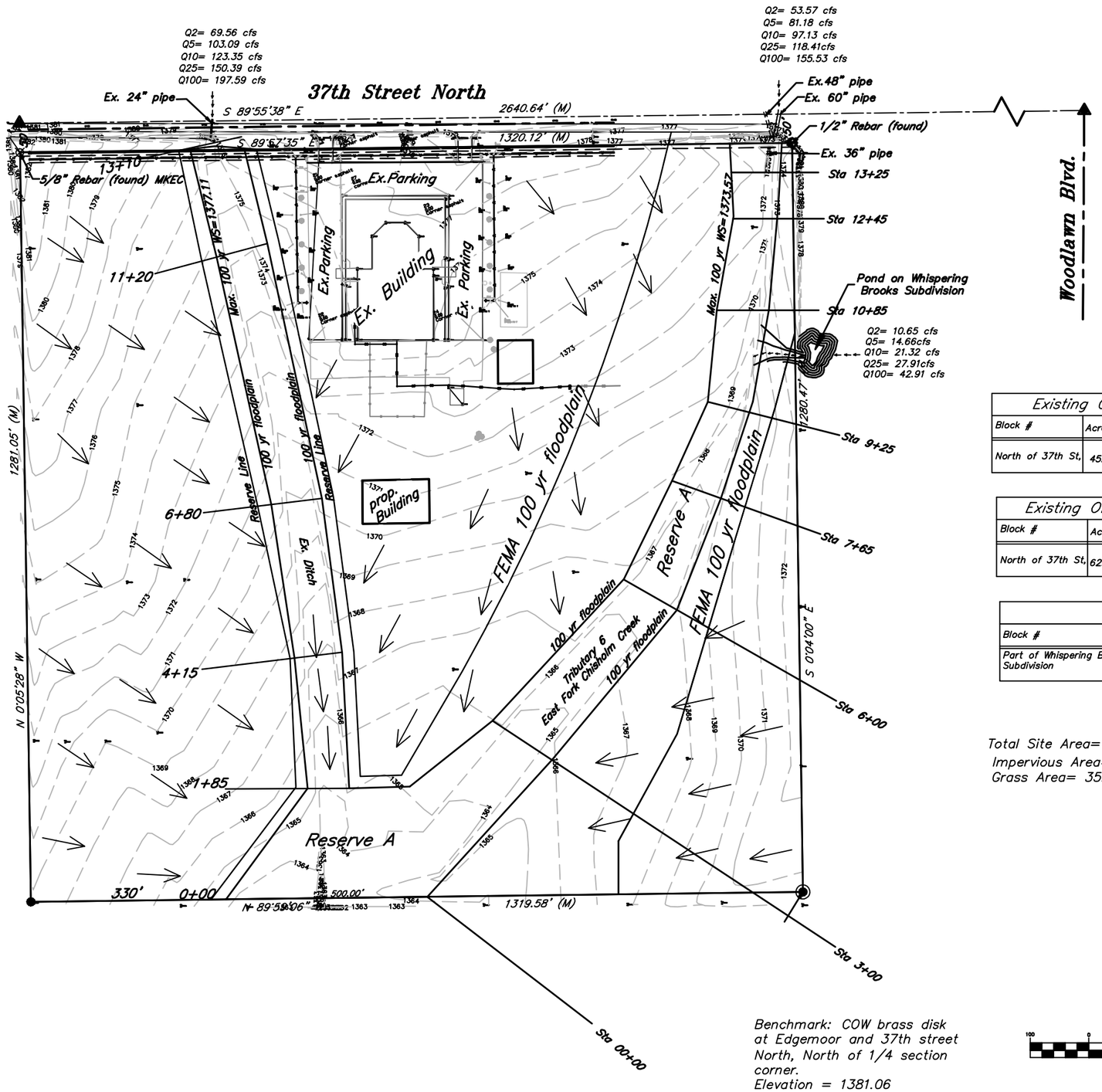
Sta 13+25.00

Note: Cross Sections for West Ditch and tributary 6 are attached in hydraulic model

Chisholm Trail Church of Christ Addition
Hydraulic Study
Wichita, Kansas

kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242

PROJECT NUMBER			
KEM NO. 09008	FILE xsections	DATE 03/2009	SHEET 1
DESIGN KM	DRAWN GP	REVISED	OF 1



Existing OffSite drainage to Tributory 6 (Lag/CN Method)														
Block #	Acres	CN	Storm	Tc	24 hr rainfall (in)					Q2	Q5	Q10	Q25	Q100
					d2	d5	d10	d25	d100					
North of 37th St.	45.0	87	Type II 24 hr	60 min	3.6	4.8	5.52	6.48	8.16	53.57 cfs	81.18 cfs	97.13 cfs	118.41 cfs	155.53 cfs

Existing OffSite drainage to Ditch on West (Lag/CN Method)														
Block #	Acres	CN	Storm	Tc	24 hr rainfall (in)					Q2	Q5	Q10	Q25	Q100
					d2	d5	d10	d25	d100					
North of 37th St.	62.16	87	Type II 24 hr	67 min	3.6	4.8	5.52	6.48	8.16	69.56 cfs	103.09 cfs	123.35 cfs	150.39 cfs	197.59 cfs

Existing OffSite drainage to Tributory 6 (Rational Method)																
Block #	Acres	Tc	C2	I2	C5	I5	C10	I10	C25	I25	C100	I100	Q2	Q5	Q10	Q25	Q100
Part of Whispering Brooks Subdivision	8.69	15 min	0.32	3.83	0.37	4.56	0.47	5.22	0.53	6.06	0.67	7.37	10.65 cfs	14.66 cfs	21.32 cfs	27.91 cfs	42.91 cfs

Total Site Area= 38.8 Acres
Impervious Area= 2.96 Acres
Grass Area= 35.84 Acres

Benchmark: COW brass disk at Edgemoor and 37th street North, North of 1/4 section corner.
Elevation = 1381.06

100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

Chisholm Trail Church of Christ Addition
Drainage plan
Wichita, Kansas

kemiller engineering
516 S. Market, Wichita, KS 67202 316/264-0242

PROJECT NUMBER			
KEM NO. 09008	FILE drainage	DATE 03/2009	SHEET 1
DESIGN KM	DRAWN GP	REVISED	OF 1

Public Works, Eng. Div. Storm water checklist
Electronic copies of Report

Public Works, Engineering Division
Stormwater Management Subdivision Submittal Checklist

Reviewer: _____ Date: _____

Subdivision Name: ~~Chisholm Trail Church~~ of Christ Addition Location: 5833 E 37th Street North

Total Land Area Of Ownership: 38.81 Acres

Type: X Residential _____ Commercial _____ Industrial _____ Recreation _____ Municipal _____ Other

Applicant: Chisholm Trail Church Contact: Carver Briley Phone #: 691-1255

Engineer: K E Miller Eng. PA Contact: Kirk Miller Phone # 264-0242

Please check the appropriate box: I = Included; NA = Non-Applicable; R= Required prior to development

(If "NA" is checked, an explanation must be entered)

	Applicant			Engr	
Tab 1. Project Narrative	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Site Location Map, using USGS Map	X		Attached		
B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain	X		Report		
C. Discussion of offsite conditions	X		Report		
D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series	X		Attached		
E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design	X		Report		
F. Copy of the plat	X		Attached		
G. Prelim. four corner lot grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final paving and stormwater drain plans.One plan sheet and PDF shall be submitted to the Subdivision Engineer.)	X		Attached		
H. Professional Engineer seal, signature and date on cover of report	X				
I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover	X				

	Applicant			Engr	
Tab 2. Existing Conditions Runoff Calculations	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color)	X		Attached		
B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering)	X		Attached		
C. Existing topography (no greater than 2-foot contours, 1-foot recommend)	X		Attached plat		
D. Total Site Area and Total Impervious Area (acres)	X		Attached Drainage plan		
E. Benchmarks used for site control	X		Attached plat		
F. Streams, creeks, and waterway labeled		X			
G. Predominant soils from USDA soil surveys, and/or on site soil borings	X		Report		
H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted		X	No Such Features		
I. Location of existing roads, buildings, parking lots and other impervious areas	X		Drainage Plan/ plat		

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J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements	X		Attached Drainage Plan		
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	X		Attached drainage Plan		
L. Flow paths	X		Attached Drainage Plan		
M. Location and dimensions of existing channels, bridges or culvert crossings		X			
N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration	X		Attached Drainage Plan		
O. Assumed pre-developed runoff curve numbers	X		Report/ Drainage Plan		
P. Existing time of concentrations used in calculations	X		Drainage Plan		
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site		X			
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)		X			
S. Cross-section data for open channels			Attached Hydraulic study		
T. Ground water elevations, if applicable		X	Not Required		

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Tab 3. Post-Development Hydrologic Analysis	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events)	X		Attached Drainage plan		
B. Proposed time of concentrations used in calculations		X			
C. Assumed post-developed runoff curve numbers		X			
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)		X			
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration		X			
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities		X			
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary		X			
H. Dam safety analysis, where necessary		X			
I. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)		X			
J. Design water surface elevations and normal pool elevation for ponds.		X			
K. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.		X			
L. Proposed limits of clearing and grading		X	Proposed building/plan		
M. Location of existing and proposed roads, buildings, parking lots and other impervious areas.	X		attached plat		
N. Location of existing and proposed utilities (e.g., water, sewer) and easements	X		Attached plat		
O. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	X		Attached plat		
P. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings		X	No Downstream Improv		

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Q. Preliminary selection and location of stormwater controls		X			
R. Emergency overflow structure's flow path		X			
S. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown)		X			
T. The 100-year 24-hour HWL delineated on the plan for detention pond		X			
U. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds		X			
V. Stormwater Management Facilities located within a Reserve		X			
W. Maintenance of stormwater management facility specified in the platters text as the responsibility of the Homeowner or Business Association		X			
X. Off-site drainage easements or agreements required		X			

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Tab 4. Floodplain Submittal	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Provide source of flood profile	X		FEMA flood map		
B. Nearest base flood elevations		X			
C. Delineation of pre-developed regulatory floodplain/floodway limits	X		Attached Hydraulic study		
D. Delineation of post-developed regulatory floodplain and floodway limits	X		Attached Hydraulic study		
E. Floodplain boundary determination per elevation (project limits shown)	X				
F. Provide source of floodway data table and discharges		X			
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions	X				
H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions	X		Attached Hydraulic study		
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)	X		Attached Hydraulic study		
J. Flood plains and floodways located within a Reserve	X		Attached Hydraulic Study		

	Applicant			Engr	
Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	**I/R**	**NA**	**Explanation / Location in Plan**	**I/R**	**NA**
		X			
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)		X			
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)		X			
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) CLOMR shall be included and approved for fill placed in the regulatory floodway		X			
D. Kansas Department of Transportation		X			
E. Sedgwick County Right-of-way Permit		X			

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