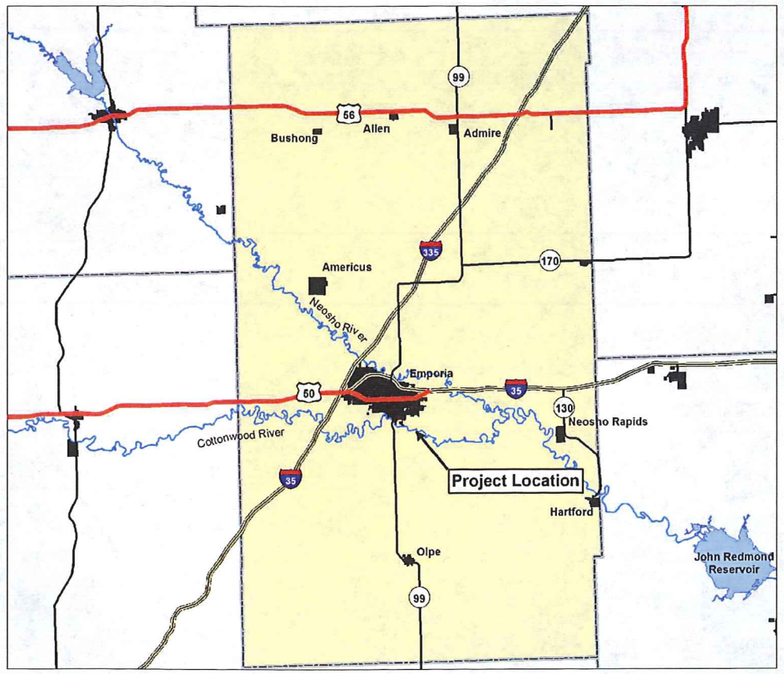
COTTONWOOD RIVER - REACH 2, GROUP D
LYON COUNTY, KANSAS
TOM FOWLER - SITE 16

SE 1/4 SECTION 23, T19S, R11E / NE 1/4 SECTION 26, T19S R11E



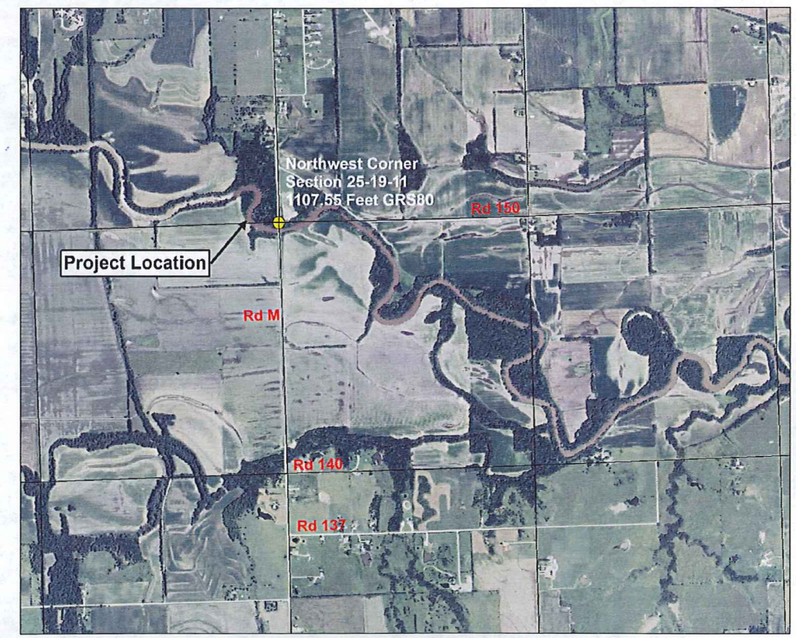
LYON COUNTY MAP
NOT TO SCALE

Sheet Index

Sheet Number	Sheet Title
1	Cover Sheet
2 - 3	Plan Sheets
4	Detail Sheet
5 - 7	Cross Section Sheets

SITE QUANTITIES

Quantities List	
Rock / Cubic Yards	676
Rock / Tons	1,016
Soil moving / Cubic Yards	4,851
Bare Root Trees / Each	125
Native Grass Seeding / Acres	0.8
Wildrye / Pounds Pure Live Seed	20.0
Cover Crop Seeding / Acres	0.8
Oats / Pounds Pure Live Seed	32.0
Mulching / acres	0.8
Mulching / Pounds	3,200

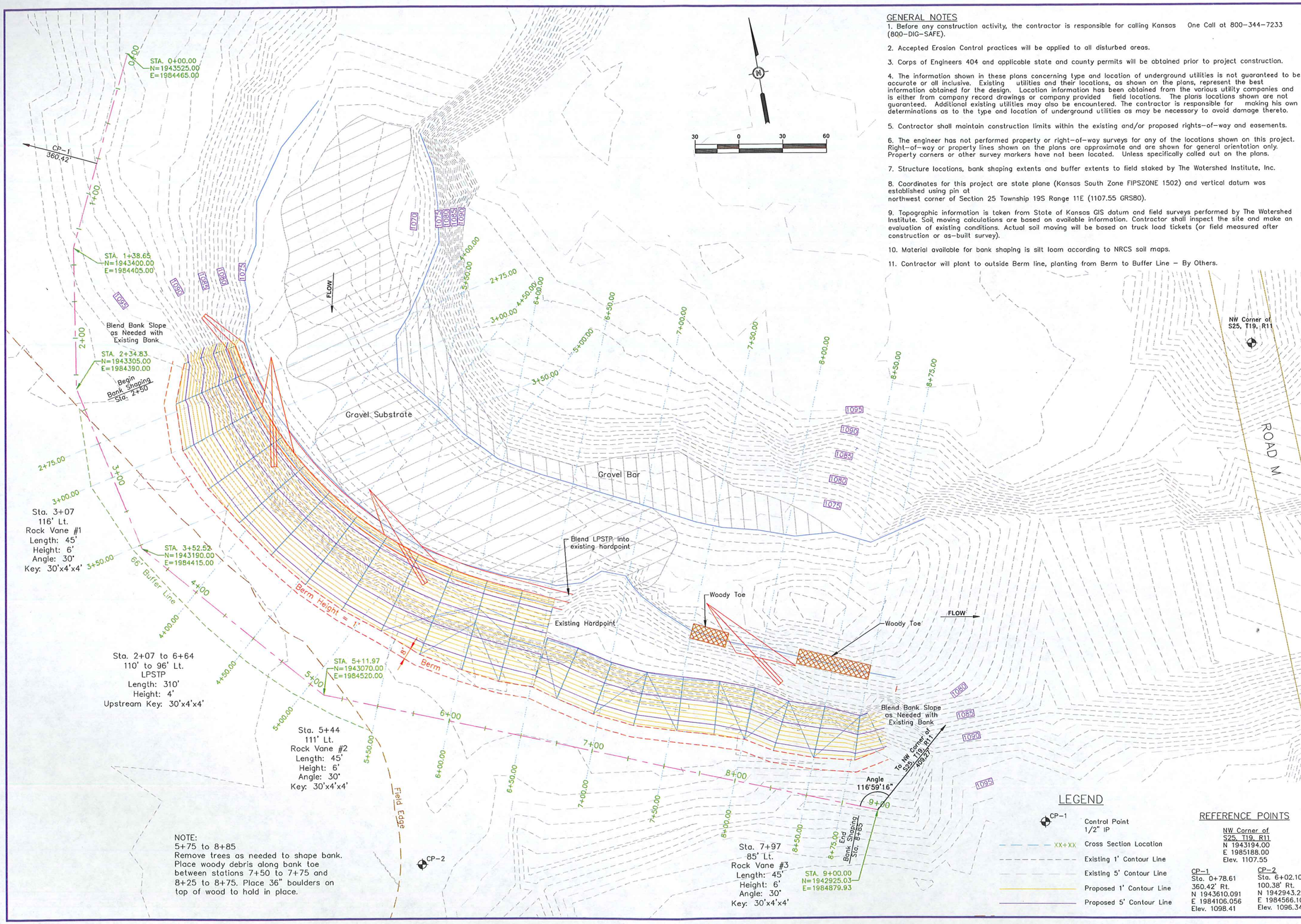


SITE LOCATION MAP
NOT TO SCALE

THE WATERSHED INSTITUTE AND LAND TRUST
1200 SW Executive Dr. Topeka, Kansas 66615 785-272-2252

BROWNING ENVIRONMENTAL SOLUTIONS, INC.
16377 S. KAW STREET OLATHE, KS 66062
913-708-0670

JOHN H. BROWNING
10599
11-16-12
KANSAS
PROFESSIONAL ENGINEER



GENERAL NOTES

1. Before any construction activity, the contractor is responsible for calling Kansas One Call at 800-344-7233 (800-DIG-SAFE).

2. Accepted Erosion Control practices will be applied to all disturbed areas.

3. Corps of Engineers 404 and applicable state and county permits will be obtained prior to project construction.

4. The information shown in these plans concerning type and location of underground utilities is not guaranteed to be accurate or all inclusive. Existing utilities and their locations, as shown on the plans, represent the best information obtained for the design. Location information has been obtained from the various utility companies and is either from company record drawings or company provided field locations. The plans locations shown are not guaranteed. Additional existing utilities may also be encountered. The contractor is responsible for making his own determinations as to the type and location of underground utilities as may be necessary to avoid damage thereto.

5. Contractor shall maintain construction limits within the existing and/or proposed rights-of-way and easements.

6. The engineer has not performed property or right-of-way surveys for any of the locations shown on this project. Right-of-way or property lines shown on the plans are approximate and are shown for general orientation only. Property corners or other survey markers have not been located. Unless specifically called out on the plans.

7. Structure locations, bank shaping extents and buffer extents to field staked by The Watershed Institute, Inc.

8. Coordinates for this project are state plane (Kansas South Zone FIPSZONE 1502) and vertical datum was established using pin at
northwest corner of Section 25 Township 19S Range 11E (1107.55 GRS80).

9. Topographic information is taken from State of Kansas GIS datum and field surveys performed by The Watershed Institute. Soil moving calculations are based on available information. Contractor shall inspect the site and make an evaluation of existing conditions. Actual soil moving will be based on truck load tickets (or field measured after construction or as-built survey).

10. Material available for bank shaping is silt loam according to NRCS soil maps.

11. Contractor will plant to outside Berm line, planting from Berm to Buffer Line – By Others.

LEGEND

CP-1	Control Point 1/2" IP
XX+XX	Cross Section Location
	Existing 1' Contour Line
	Existing 5' Contour Line
	Proposed 1' Contour Line
	Proposed 5' Contour Line

REFERENCE POINTS

NW Corner of S25, T19, R11
N 1943194.00
E 1985188.00
Elev. 1107.55

CP-1
Sta. 0+78.61
360.42' Rt.
N 1943610.091
E 1984106.056
Elev. 1098.41

CP-2
Sta. 6+02.10
100.38' Rt.
N 1942943.217
E 1984566.102
Elev. 1096.34

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COTTONWOOD RIVER - REACH 2, GROUP D
STREAMBANK STABILIZATION
LYON COUNTY, KANSAS

TOM FOWLER - SITE 16
PLAN SHEET

JOHN N. BROWNING
LICENSED
10599
11-16-12
KANSAS
PROFESSIONAL ENGINEER

DESIGNED	BAE
DRAWN BY:	JAG
APPROVED BY:	JNB
DESIGN PROJ:	14668.096
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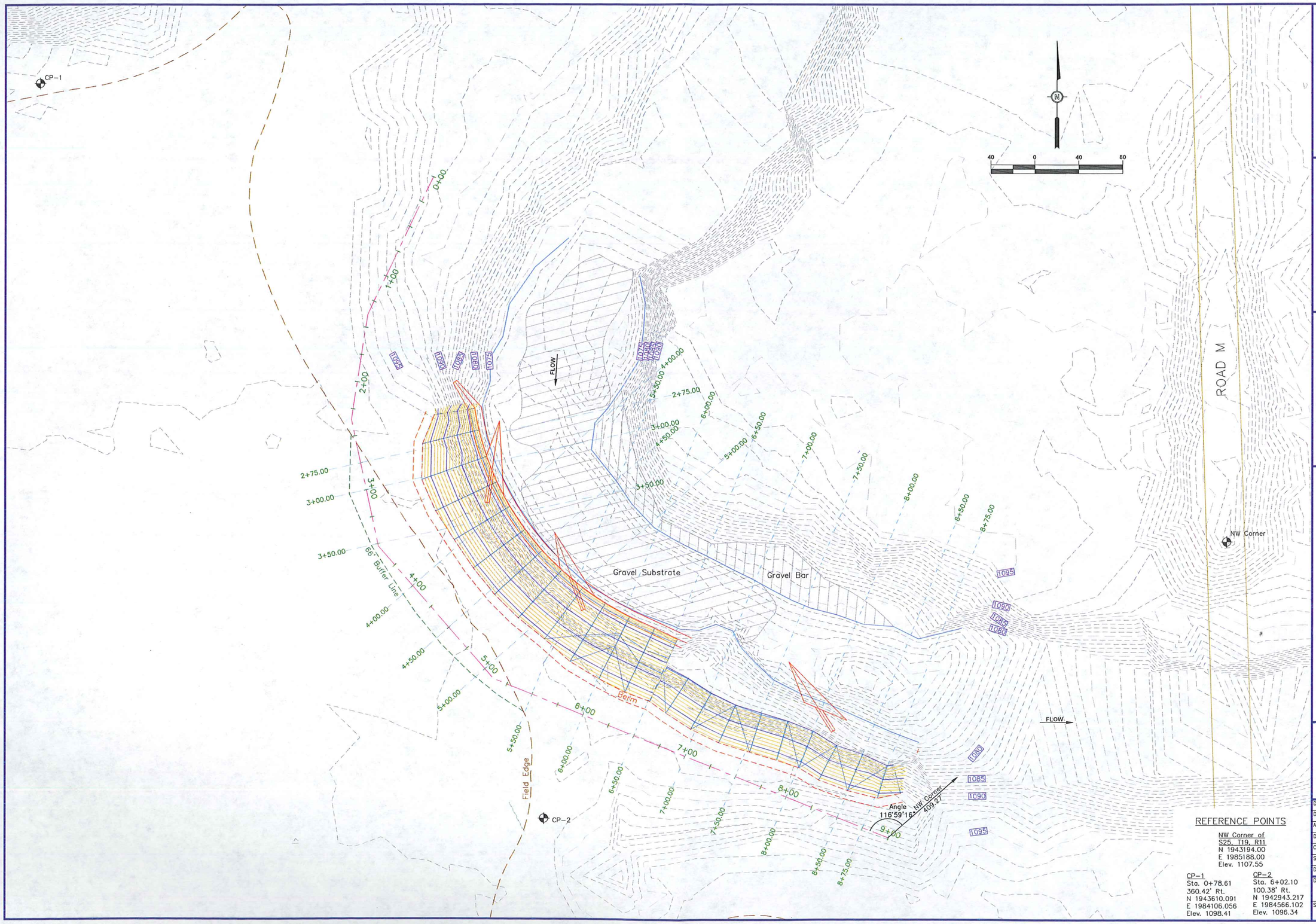
SCALE:	AS NOTED
DATE:	11/30/2012
DRAWING NO:	CO2
SHEET NO:	2 of 7



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COTTONWOOD RIVER - REACH 2, GROUP D STREAMBANK STABILIZATION LYON COUNTY, KANSAS

TOM FOWLER - SITE 16
PLAN SHEET

JOHN N. BROWNING
10599
11-16-12
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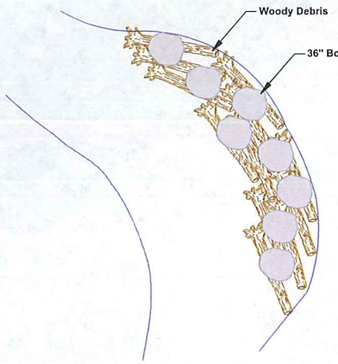
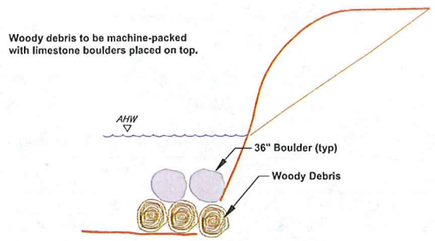
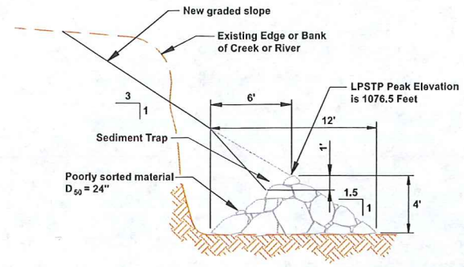


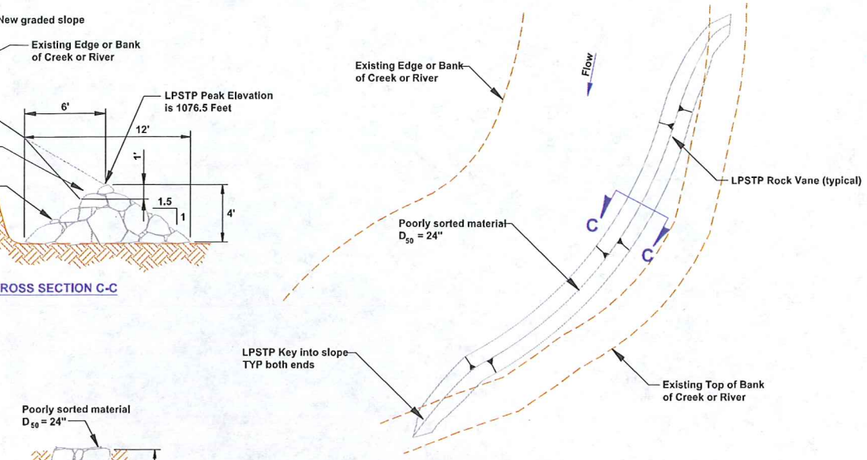
WOOD TOE PLAN VIEW



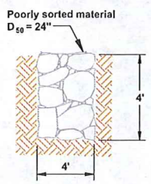
WOOD TOE SECTION VIEW



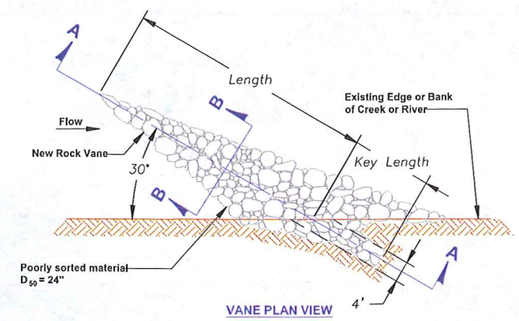
LPSTP CROSS SECTION C-C



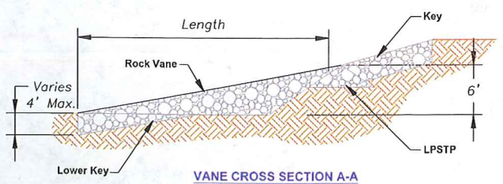
LONGITUDINAL PEAKED STONE TOE PROTECTION (LPSTP) PLAN VIEW



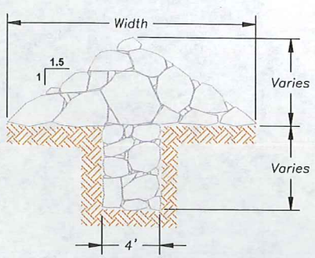
LPSTP KEY SECTION VIEW



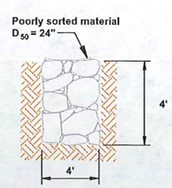
VANE PLAN VIEW



VANE CROSS SECTION A-A



VANE CROSS SECTION B-B



ROCK VANE KEY SECTION VIEW

Cover Crop Seeding Table

Species	PLS (lbs/acre)	Percent of Mix	PLS (lbs/acre)	Acres	Total PLS (lbs)
Oats	40.0	100	40.00	0.8	32.00

Notes:
Cover Crop to be planted following construction
Seeding area begins at LPSTP or edge of water and ends at outside of berm.

Native Grass Seeding Table

Species	Variety	PLS (lbs/acre)	Percent of Mix	PLS (lbs/acre)	Acres	Total PLS (lbs)
Virginia Wildrye	Omaha	25.0	100	25.00	0.8	20.00

Notes:
Native Grass to be planted between August 15-October 1; December 1-April 15
Seeding area begins at LPSTP or edge of water and ends at outside of berm.
Mulch to be applied with native grass seeding.

Structure Specification Sheet

Project Name	Stream	County	State	Bank	
Group D - Site 16	Cottonwood River	Lyon	Kansas	Length	Height
				Shaped / Total	23
				625 / 900	

Structure Number	Type	Spacing (ft)	Angle (Degrees)	Height (ft)	Length (ft)	Key Length (ft)	Volume (yd^3)	Key Volume (yd^3)	Tons	Material Specifications
1	LPSTP	-	-	4	310	30	276	18	441	Poorly Sorted Limestone Rock (D_{50} = 24")
1	Rock Vane	125	30	6	45	30	90	29	179	Poorly Sorted Limestone Rock (D_{50} = 24")
2	Rock Vane	265	30	6	45	30	90	29	179	Poorly Sorted Limestone Rock (D_{50} = 24")
3	Rock Vane	-	30	6	45	30	90	29	179	Poorly Sorted Limestone Rock (D_{50} = 24")
1	Wood Toe	-	-	-	75	-	25	-	38	36-Inch Limestone Boulders
							571	**105**	**1016**	
						Total yds3	**676**			

Site Information					
Bank Erodibility Hazard Index	26.8	BkF Elev	1,087.3	At Station	1+25
Near Bank Stress Rating	1.44	Rosgen Classification		C6c-	
Estimated Annual Erosion (ft/yr)	2.1	Width/Depth Ratio		15.8	
Schumm Channel Stage	IV	Entrenchment Ratio		41.9	
Radius of Curvature (ft)	423	Channel Width (ft)		181	
Tortuosity	2.33	Shear Stress (lbs/ft^2)		0.35	
Hydraulic Radius (ft)	11.1	Slope = (ft/ ft)		0.00051	
Mean Depth (ft)	11.5	Wetted Perimeter (ft)		187.4	
Cross Sectional Area (ft^2)	2,091	Manning's n		0.033	
Bank Full Discharge (cfs)	10,622	Mean Velocity (ft/sec)		5.08	
Q_5 Discharge (cfs)	24,420	Drainage Area (mi^2)		1,839	

Quantities List	
Rock / Cubic Yards	676
Rock / Tons	1,016
Soil moving / Cubic Yards	4,851
Bare Root Trees / Each	125
Native Grass Seeding / Acres	0.8
Wildrye / Pounds Pure Live Seed	20.0
Cover Crop Seeding / Acres	0.8
Oats / Pounds Pure Live Seed	32.0
Mulching / acres	0.8
Mulching / Pounds	3,200

Landowner	Tom Fowler
Address	1314 Exchange Ct.
City, State Zip	Emporia, KS 66801
Phone	620-343-3606
Legal	SE 1/4 Sec. 23-T19S-R11E / NE 1/4 Sec. 26-T19S-R11E
Date	November 6, 2012

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COTTONWOOD RIVER - REACH 2, GROUP D
STREAMBANK STABILIZATION
LYON COUNTY, KANSAS
TOM FOWLER - SITE 16
DETAIL SHEET

JOHN N. BROWNING LICENSED 10599 11-16-12 KANSAS PROFESSIONAL ENGINEER

DESIGNED	BAE
DRAWN BY:	JAG
APPROVED BY:	JNB
DESIGN PROJ:	14668.096
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SCALE:	AS NOTED
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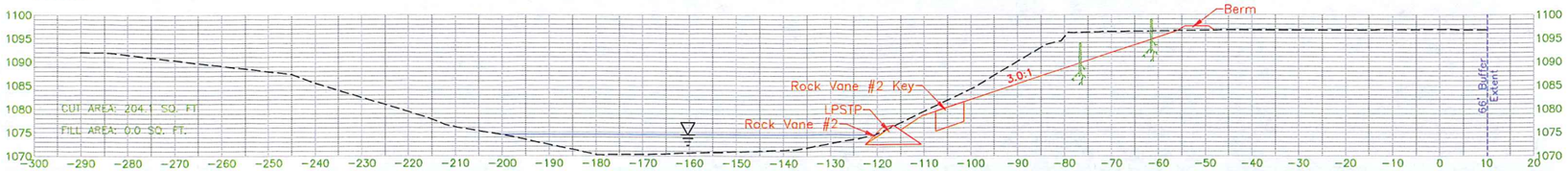

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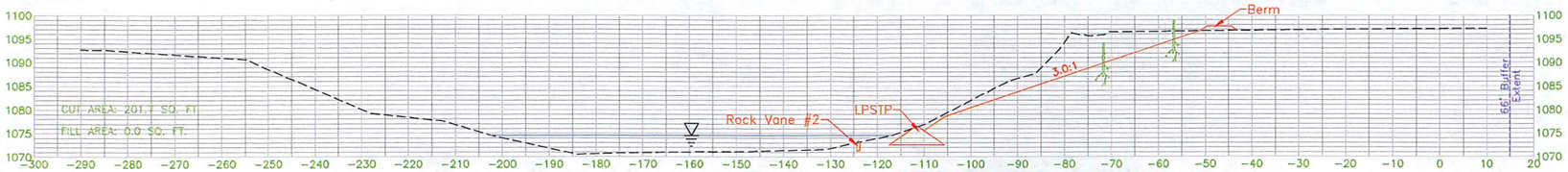

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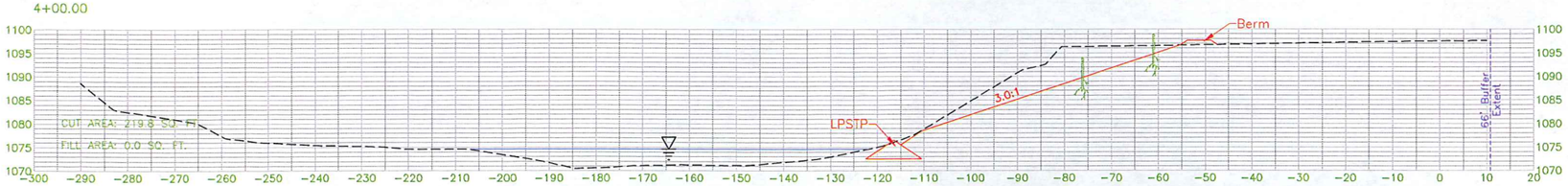

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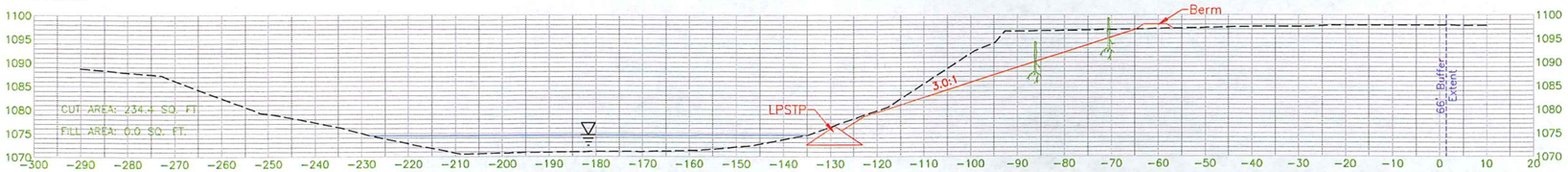

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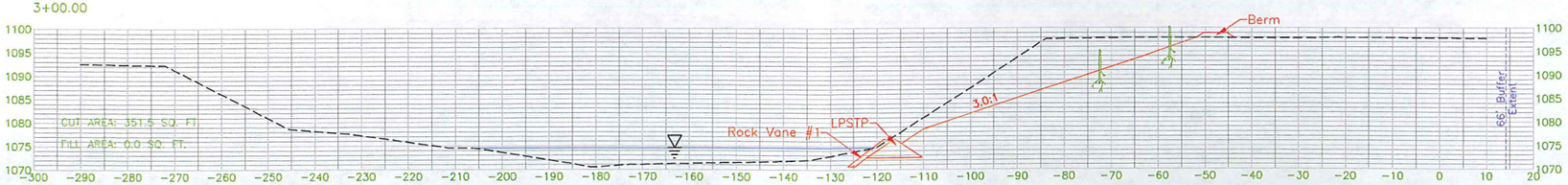

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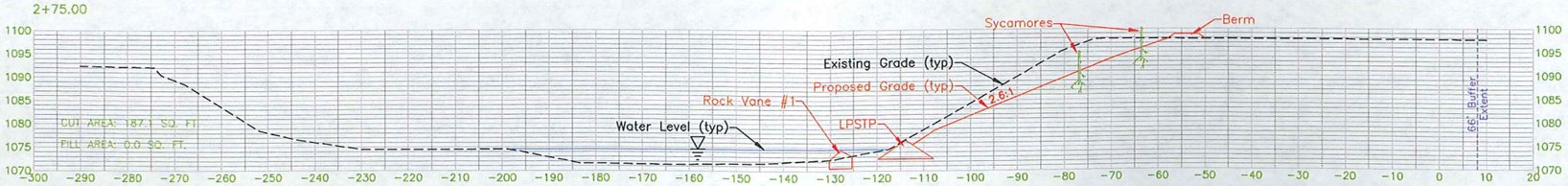

The first sycamore row is located 21-feet down-slope from top of bank. The second sycamore row is located 6-feet down-slope from top of bank. Within row spacing is 10-feet and between row spacing is 15-feet. Sycamores to be planted between March 1 - May 1.

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913/768-0870

COTTONWOOD RIVER - REACH 2, GROUP D
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LYON COUNTY, KANSAS

TOM FOWLER - SITE 16
CROSS SECTIONS

JOHN N. BROWNING
10599
11-16-12
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DRAWN BY:	JAG
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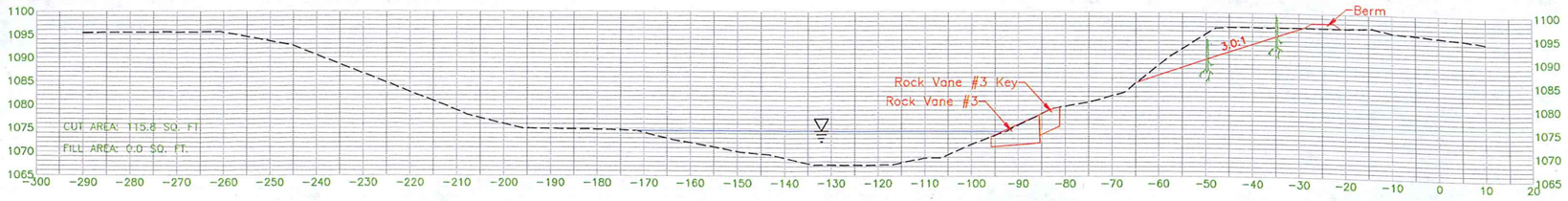

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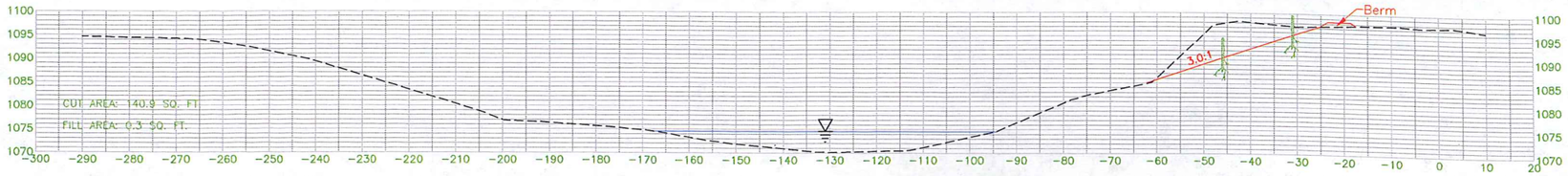

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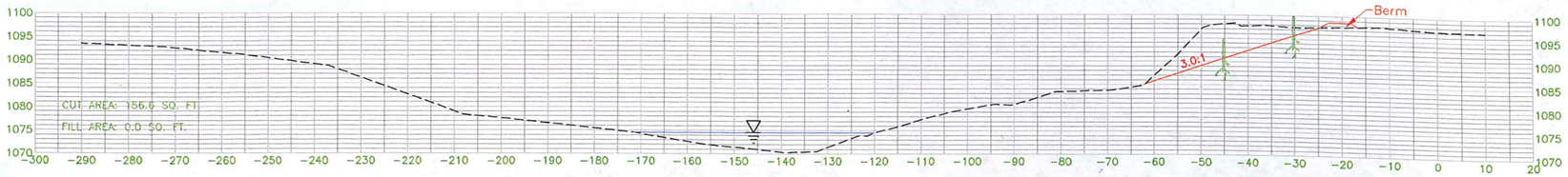

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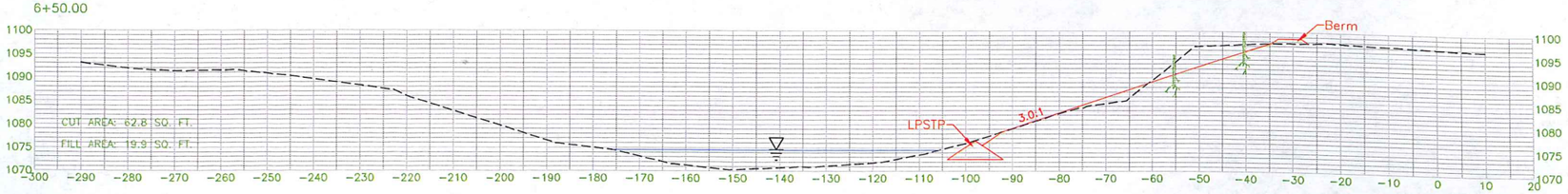

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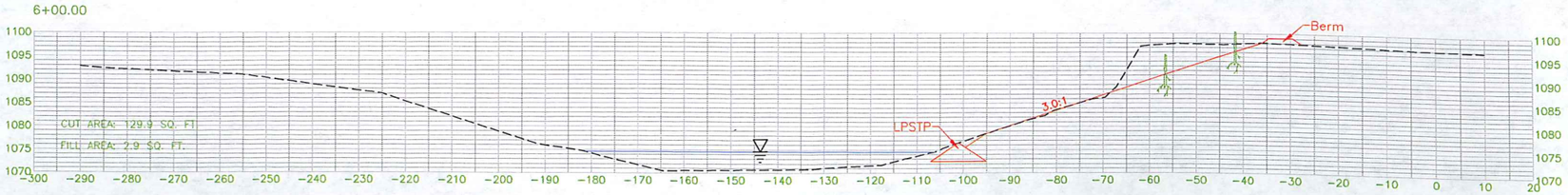

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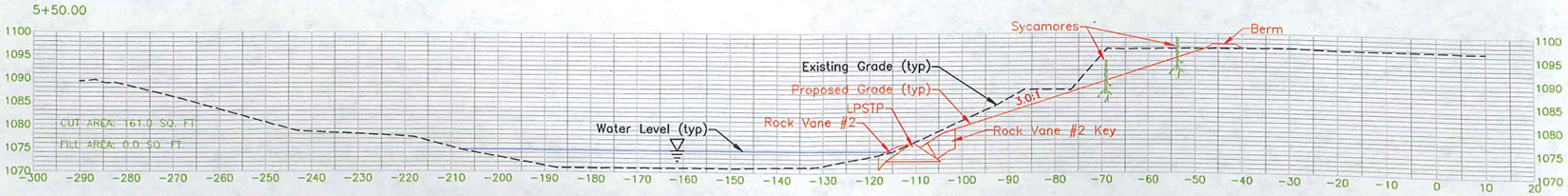

The first sycamore row is located 21-feet down-slope from top of bank. The second sycamore row is located 6-feet down-slope from top of bank. Within row spacing is 10-feet and between row spacing is 15-feet.
Sycamores to be planted between March 1 - May 1.

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10599
11-16-12
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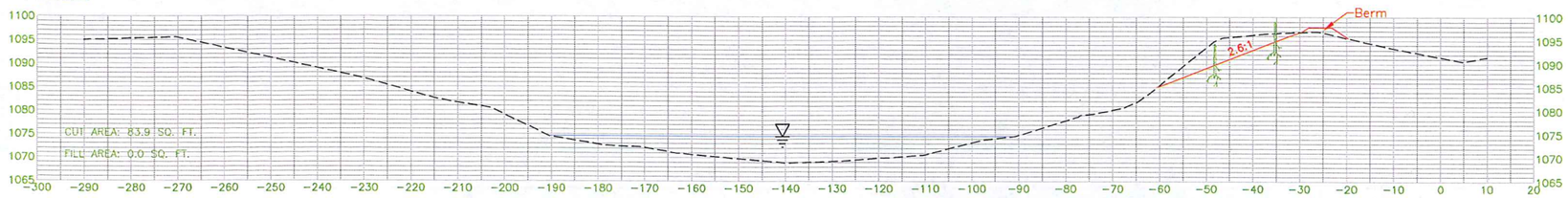

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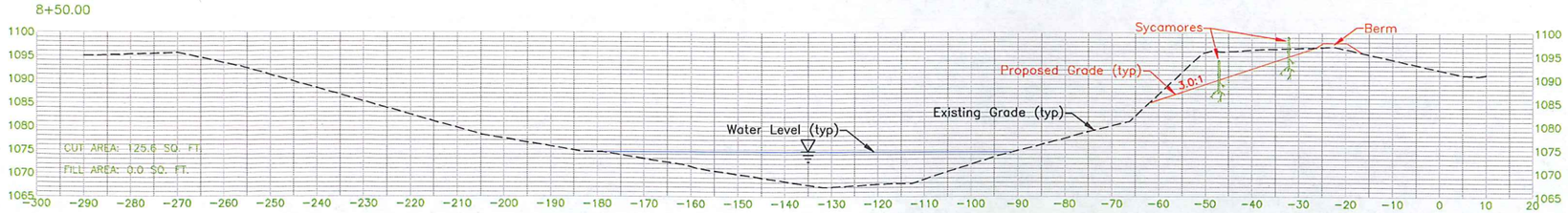

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