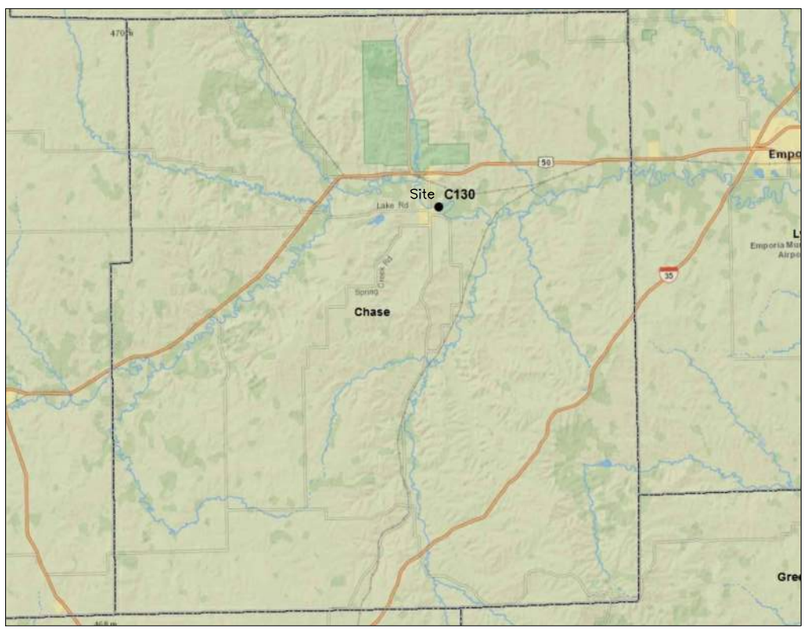
COTTONWOOD RIVER
STREAMBANK STABILIZATION
SITE C130
CHASE COUNTY, KANSAS

NW 1/4 SECTION 28, TOWNSHIP 19 SOUTH, RANGE 8 EAST



CHASE COUNTY MAP
NOT TO SCALE

Sheet Index

Sheet Number	Sheet Title
1	Cover Sheet
2 - 3	Plan Sheets
4	Detail Sheets
5 - 6	Cross Section Sheets

SITE QUANTITIES

Quantities List	
Rock / Cubic Yards	1,952
Rock / Tons	3,141
Soil moving / Cubic Yards	9,389
Tree Removal / Lump Sum	1
Bare Root Trees / Each	225
Streambank Slope Native Grass Seeding / Acres	1.0
Streambank Slope Wildrye / Pounds Pure Live Seed	25.0
Streambank Slope Cover Crop Seeding / Acres	1.0
Streambank Slope Oats / Pounds Pure Live Seed	40.0
66-Foot Buffer Cover Crop Seeding / Acres	1.6
66-Foot Buffer Oats / Pounds Pure Live Seed	64.0
Streambank Slope Mulching / Acres	1.0
Streambank Slope Mulching / Pounds	4,000

SITE LOCATION MAP
NOT TO SCALE

THE WATERSHED INSTITUTE
1200 SW Executive Dr. Topeka, KS 66615 (913) 685-4600

GREDELL Engineering Resources, Inc.
Environmental Engineering LAND - AIR - WATER
9718 Rosehill Road Telephone: (913) 808-5004
Lenexa, Kansas Fax: (913) 307-2028
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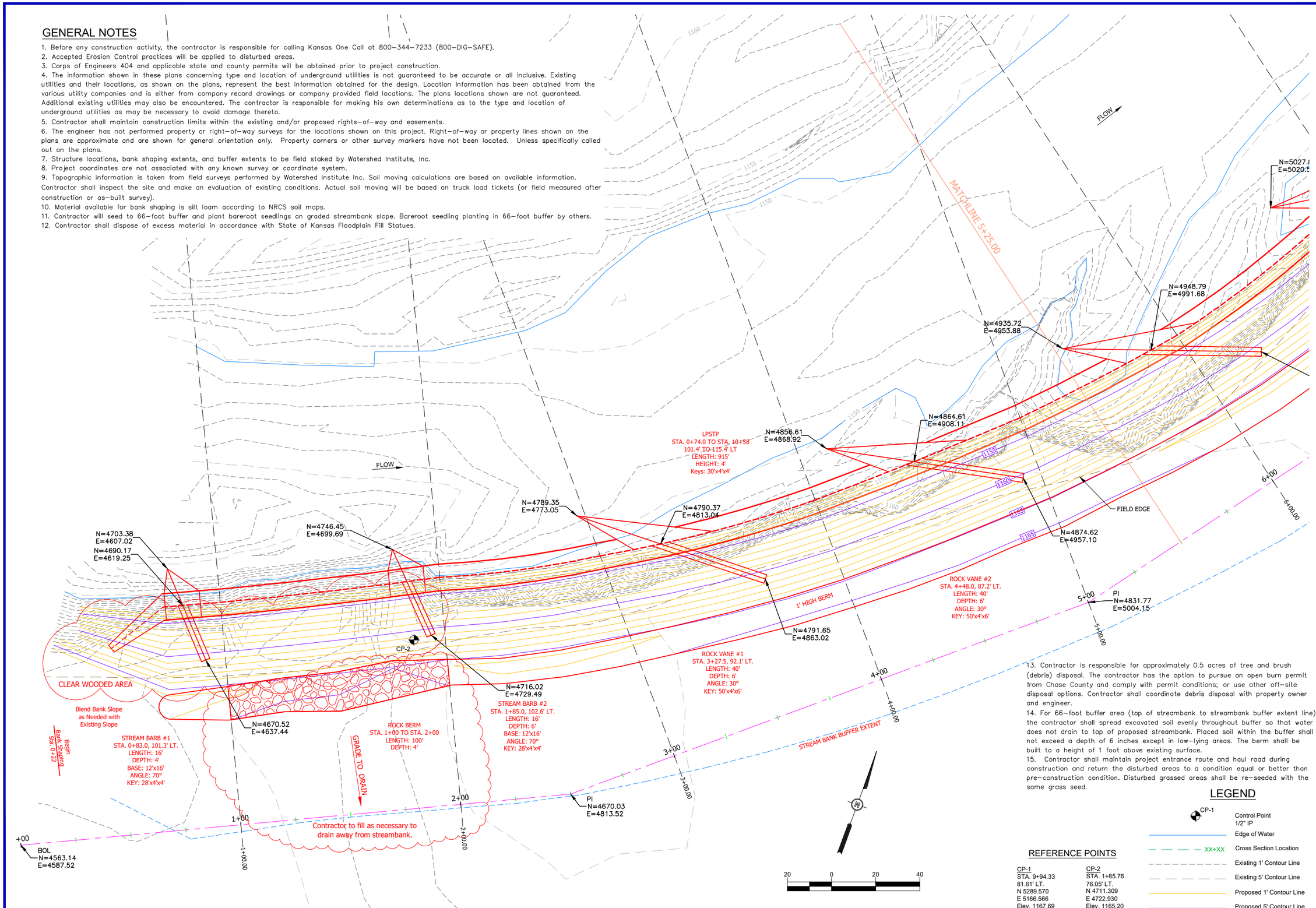
JOHN N. BROWNING LICENSED 10599 07-22-2025 KANSAS PROFESSIONAL ENGINEER

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 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 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 be field staked by Watershed Institute, Inc.
8. Project coordinates are not associated with any known survey or coordinate system.
9. Topographic information is taken from field surveys performed by Watershed Institute Inc. 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 seed to 66-foot buffer and plant bareroot seedlings on graded streambank slope. Bareroot seedling planting in 66-foot buffer by others.
12. Contractor shall dispose of excess material in accordance with State of Kansas Floodplain Fill Statues.



13. Contractor is responsible for approximately 0.5 acres of tree and brush (debris) disposal. The contractor has the option to pursue an open burn permit from Chase County and comply with permit conditions; or use other off-site disposal options. Contractor shall coordinate debris disposal with property owner and engineer.
14. For 66-foot buffer area (top of streambank to streambank buffer extent line), the contractor shall spread excavated soil evenly throughout buffer so that water does not drain to top of proposed streambank. Placed soil within the buffer shall not exceed a depth of 6 inches except in low-lying areas. The berm shall be built to a height of 1 foot above existing surface.
15. Contractor shall maintain project entrance route and haul road during construction and return the disturbed areas to a condition equal or better than pre-construction condition. Disturbed grassed areas shall be re-seeded with the same grass seed.

LEGEND

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

REFERENCE POINTS

CP-1	CP-2
STA. 9+94.33	STA. 1+85.76
81.61' LT.	76.05' LT.
N 5289.570	N 4711.309
E 5166.566	E 4722.930
Elev. 1167.69	Elev. 1165.20

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COTTONWOOD RIVER
CHASE COUNTY, KANSAS
SITE C130
PLAN SHEET

JOHN N. BROWNING LICENSED 10599 07-22-2020 KANSAS PROFESSIONAL ENGINEER

DESIGNED	PGB
DRAWN BY:	JAG
APPROVED BY:	JNB
DESIGN PROJ:	14668.119
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SCALETAG	AS NOTED
DATE:	11/04/19
DRAWING NO:	CO2
SHEET NO:	2 of 6

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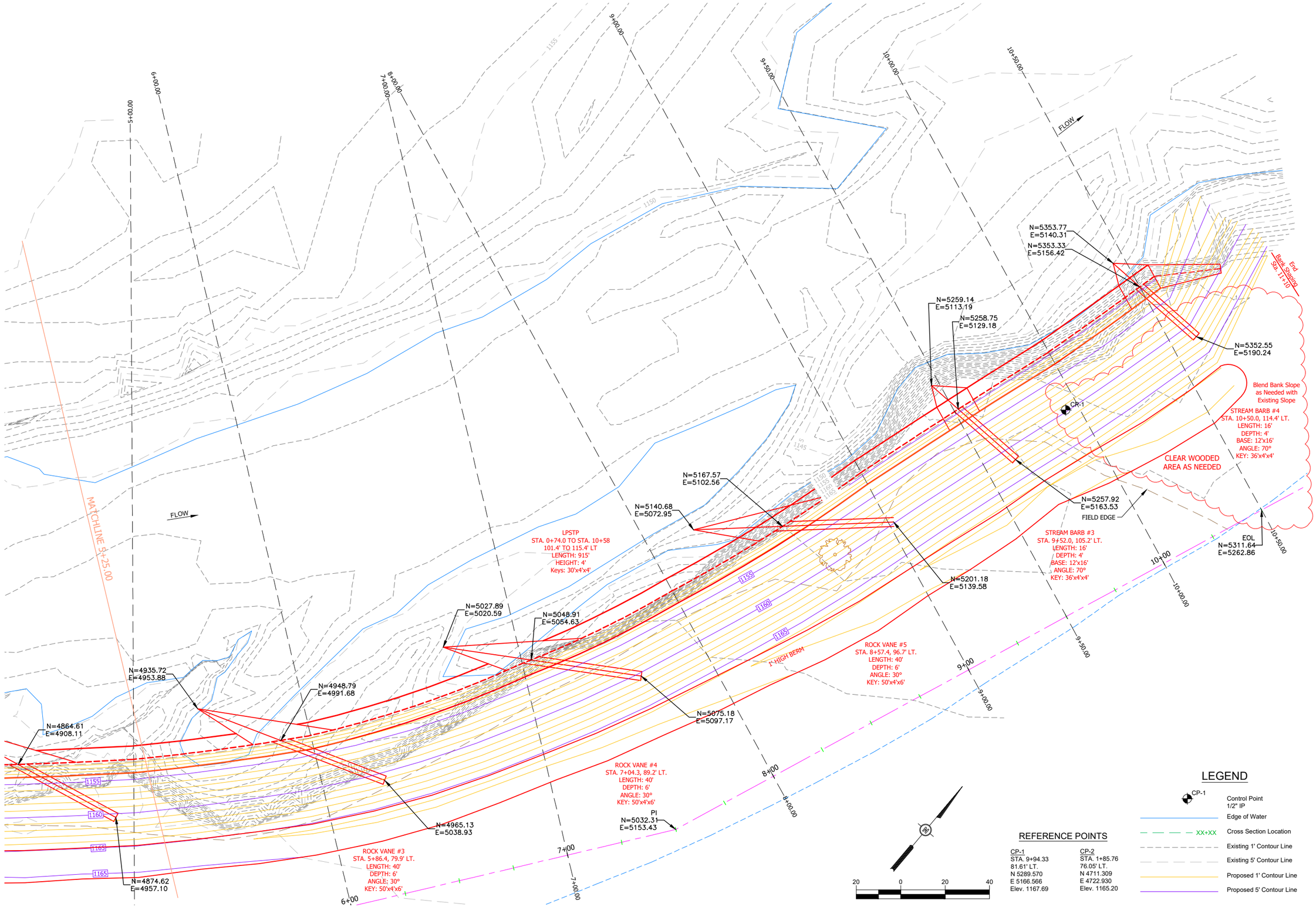

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- Edge of Water
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COTTONWOOD RIVER
CHASE COUNTY, KANSAS

SITE C130
PLAN SHEET

JOHN N. BROWNING LICENSED 10599 07-22-2020 KANSAS PROFESSIONAL ENGINEER

DESIGNED	PGB
DRAWN BY:	JAG
APPROVED BY:	JNB
DESIGN PROJ:	14668.119
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SCALETAG	AS NOTED
DATE:	11/04/19
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Last edit on: EDITDATE

Structure Specification Sheet

Project Name	Stream	County	State	Streambank	
C130	Cottonwood River	Chase	Kansas	Length	Height
				Shaped / Total	
				1,088 / 1,125	18.0

Structure							Key		
Number	Type	Spacing (ft)	Angle (Degrees)	Height (ft)	Length (ft)	Key Length (ft)	Volume (yd^3)	Volume (yd^3)	Tons	Material Specifications
1	LPSTP	-	-	4	915	60	814	36	1,397	Poorly Sorted Limestone Rock (D_{50} = 24")
1	Rock Berm	-	-	4	100	-	193	-	290	Poorly Sorted Limestone Rock (D_{50} = 24")
1	Stream Barb	100	70	4	16	28	48	17	105	Poorly Sorted Limestone Rock (D_{50} = 24")
2	Stream Barb	120	70	6	16	28	62	17	128	Poorly Sorted Limestone Rock (D_{50} = 24")
1	Rock Vane	120	30	6	40	50	80	45	200	Poorly Sorted Limestone Rock (D_{50} = 24")
2	Rock Vane	120	30	6	40	50	80	45	200	Poorly Sorted Limestone Rock (D_{50} = 24")
3	Rock Vane	120	30	6	40	50	80	45	200	Poorly Sorted Limestone Rock (D_{50} = 24")
4	Rock Vane	120	30	6	40	50	80	45	200	Poorly Sorted Limestone Rock (D_{50} = 24")
5	Rock Vane	100	30	6	40	50	80	45	200	Poorly Sorted Limestone Rock (D_{50} = 24")
3	Stream Barb	100	70	4	16	36	48	22	112	Poorly Sorted Limestone Rock (D_{50} = 24")
4	Stream Barb	-	70	4	16	36	48	22	112	Poorly Sorted Limestone Rock (D_{50} = 24")
							1,613	339	3,141	
						Total yds3	1,952			

Site Information

Bank Erodibility Hazard Index	41.9	BkF Elev	1,157.2	At Station 3+50
Near Bank Shear Stress (lb./sq. ft)	1.55	Rosgen Classification		C4
Estimated Annual Erosion (ft/yr.)	3.4	Width/Depth Ratio		28.2
Schumm Channel Stage	IV	Entrenchment Ratio		6.2
Radius of Curvature (ft)	692	Channel Width (ft)		179
Tortuosity	3.88	Shear Stress (lbs./sq. ft)		0.64
Hydraulic Radius (ft)	6.2	Slope = (ft/ ft)		0.00165
Mean Depth (ft)	6.3	Wetted Perimeter (ft)		181.5
Cross Sectional Area (sq. ft)	1,130	Manning's n		0.028
Bank Full Discharge (cfs)	8,227	Mean Velocity (ft/sec)		7.28
Q_5 Discharge (cfs)	23,705	Drainage Area (sq. mi)		1,368.1

Quantities List

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Rock / Tons	3,141
Soil moving / Cubic Yards	9,389
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66-Foot Buffer Cover Crop Seeding / Acres	1.6
66-Foot Buffer Oats / Pounds Pure Live Seed	64.0
Streambank Slope Mulching / Acres	1.0
Streambank Slope Mulching / Pounds	4,000

Streambank Slope 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	1.0	25.00

Notes:
Native Grass to be planted between August 15-October 1; December 1-April 15

Streambank Slope Cover Crop Seeding Table

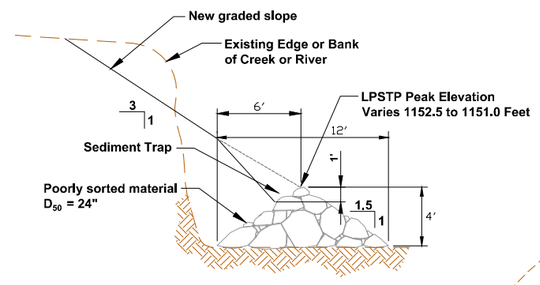
Species	PLS (lbs/acre)	Percent of Mix	PLS (lbs/acre)	Acres	Total PLS (lbs)
Oats	40.0	100	40.00	1.0	40.00

Notes:
Cover Crop to be planted following construction

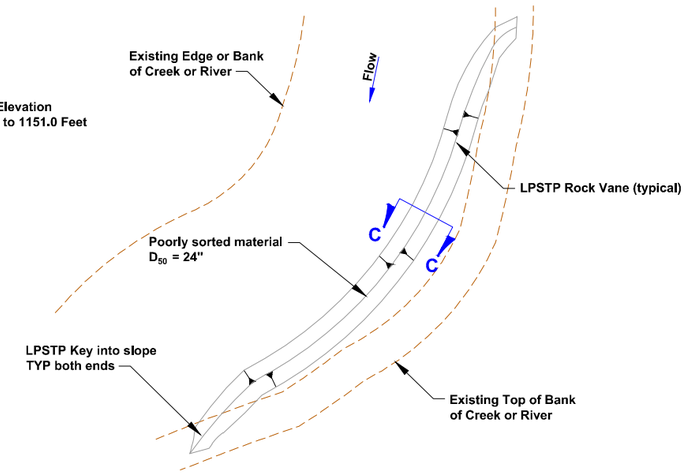
66-Foot Buffer Cover Crop Seeding Table

Species	PLS (lbs/acre)	Percent of Mix	PLS (lbs/acre)	Acres	Total PLS (lbs)
Oats	40.0	100	40.00	1.6	64.00

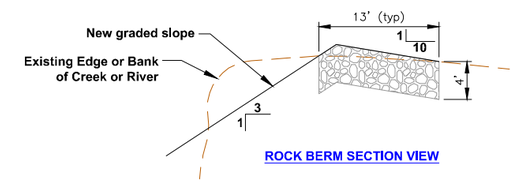
Notes:
Cover Crop to be planted following construction



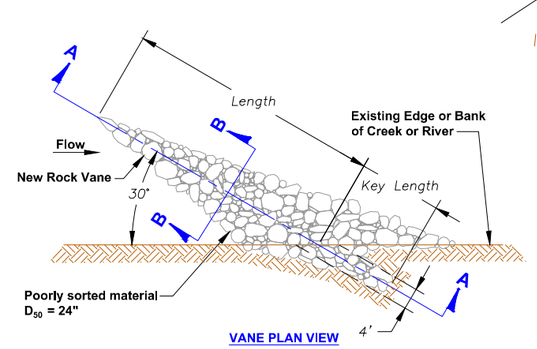
LPSTP 2 CROSS SECTION C-C



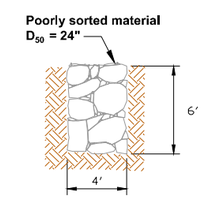
LONGITUDINAL PEAKED STONE TOE PROTECTION (LPSTP) PLAN VIEW



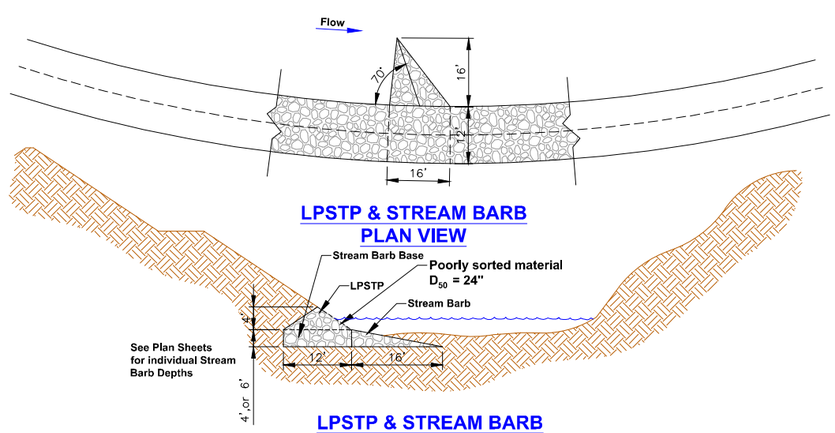
ROCK BERM SECTION VIEW



VANE PLAN VIEW

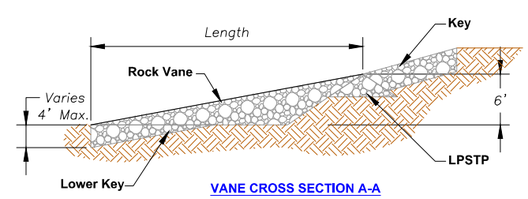


VANE KEY SECTION VIEW



LPSTP & STREAM BARB PLAN VIEW

LPSTP & STREAM BARB CROSS SECTION



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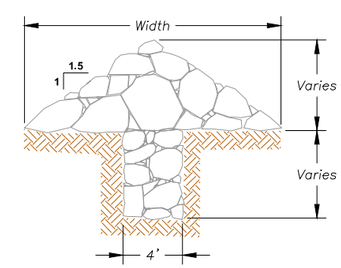

VANE CROSS SECTION B-B

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COTTONWOOD RIVER
CHASE COUNTY, KANSAS

SITE C130
DETAILS

JOHN N. BROWNING LICENSED 10599 07-22-2020 KANSAS PROFESSIONAL ENGINEER

DESIGNED	BAE
DRAWN BY:	JAG
APPROVED BY:	JNB
DESIGN PROJ:	14668.119
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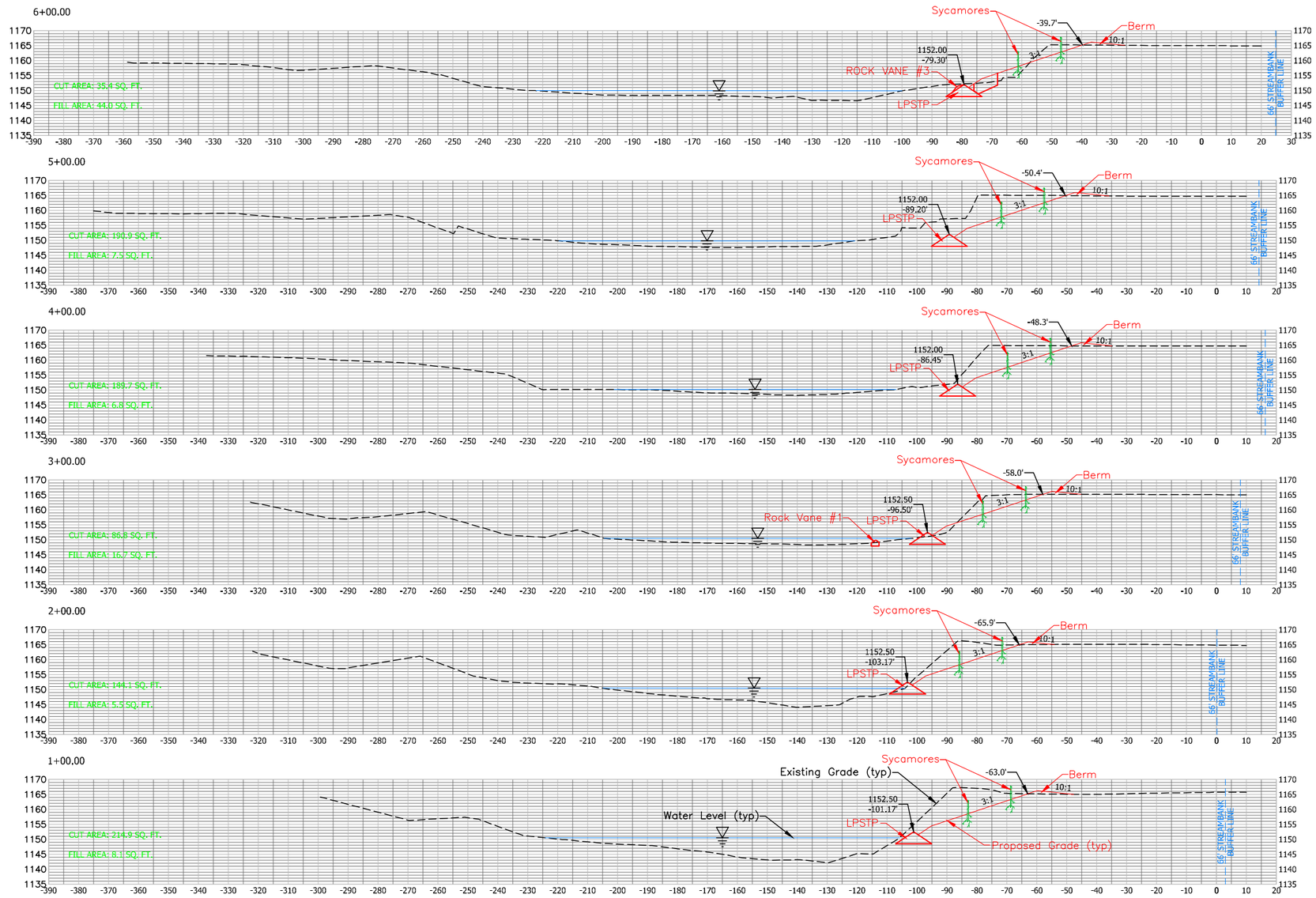
SCALE:	AS NOTED
DATE:	11/04/2019
DRAWING NO:	CO4
SHEET NO:	4 of 6



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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COTTONWOOD RIVER
CHASE COUNTY, KANSAS

SITE C130
CROSS SECTIONS

JOHN N. BROWNING LICENSED 10599 07-22-2020 KANSAS PROFESSIONAL ENGINEER

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APPROVED BY:	JNB
DESIGN PROJ:	14668.119
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DATE:	11/04/19
DRAWING NO:	CO5
SHEET NO:	5 of 6

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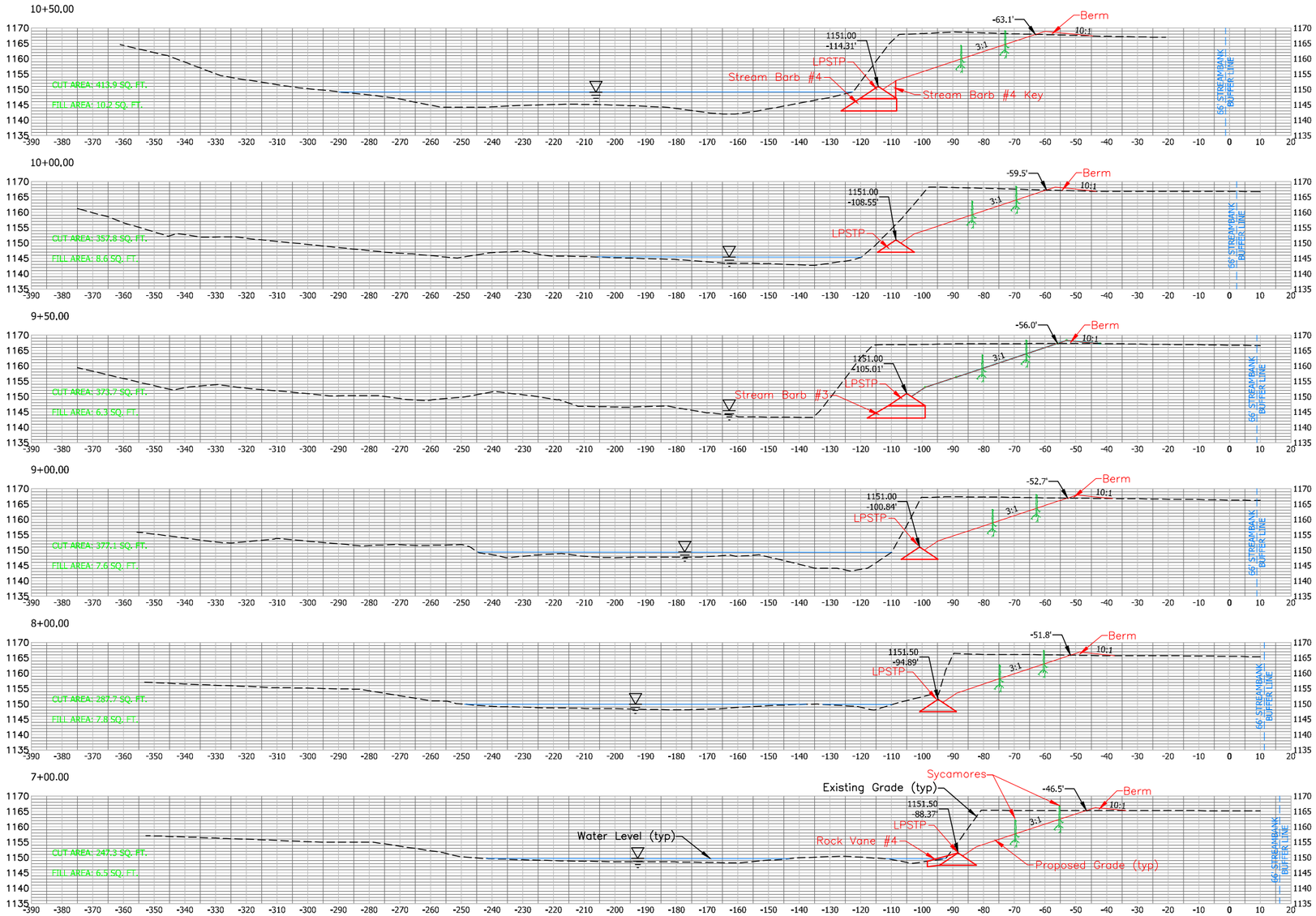

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COTTONWOOD RIVER
CHASE COUNTY, KANSAS

SITE C130
PLAN SHEET

JOHN N. BROWNING LICENSED 10599 07-22-2020 KANSAS PROFESSIONAL ENGINEER

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DESIGN PROJ:	14668.119
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SHEET NO:	6 of 6

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