Rev 08/18

Bridge No. X0142
Job No. NW0020
Replaces Bridge No.

Missouri Department of Transportation

Bridge Survey Report

Bridge over THE WEST FORK OF THE GRAND RIVER Route W
County WORTH Sec. 24 Twp. 65N Rg. 33W ; 4.5 miles *E of PARNELL
*On road from PARNELL (West of site) to OXFORD (East of site) at Sta. 186+08

*Give adjacent towns each way, not terminal points of route. ** Delete all but one of N-E-S-W or circle appropriate direction.

Surveyed by ROBERT PERRY / EAN KLASING Date MARCH/APRIL 2023

EXISTING MoDOT BRIDGE AT OR NEAR PROPOSED SITE

(Data provided shall not come from existing bridge plans)

Beginning Station 186+08.0 (ft) Ending Station 188+70.75 (ft)
Beginning Deck Elevation C/L=943.5 (overlay) (ft) Ending Deck Elevation C/L=932.9 (overlay) (ft)

Top of Sound Concrete Curb or Wing near Beginning Station
- Elevation 944.05 +/- (ft)
- Station 186+08.3 (ft)
- Offset 10.1' LT. (ft)

Top of Sound Concrete Curb or Wing near Ending Station
- Elevation 933.35 +/- (ft)
- Station 188+70.35 (ft)
- Offset 10.4 LT. (ft)

Does drift collect on structure? Y Does the bridge back up water during flood? N/A
Is the bridge overtopped during flood? N Frequency N/A
Is the roadway overtopped during flood? Y Frequency Once in 30+ years

HIGH WATER ELEVATIONS AT PROPOSED BRIDGE SITE

If high water elevations are not available at proposed bridge site, give elevations where found and note location.

	Extreme High Water (Give date of occurrence)	Ordinary High Water Mark (See EPG 127.4.1.1)
Elevations	924.4+/-	916.5.0 +/-
Date(s)	N/A	4-4-23 Observation
Location	East Side Bridge	Bridge Pier In Stream
Source of information	Local Oral Testimony	Dark Water Staining Ln on Pier
Head (or backwater from)	Head	Head
Frequency (give dates)	N/A	N/A
*** Character of drift	Heavy	Heavy

****Light – passes 12 ft opening; Medium – passes 24 ft opening; Heavy – requires over 24 ft opening*

IMPROVEMENTS WITHIN SURVEY AREA OF PROPOSED BRIDGE (WITHIN 1 FOOT ABOVE EXTREME HIGH WATER ELEVATION)

Note the location and type of any improvements in the vicinity of the proposed bridge, including residences, businesses, other buildings, crop fields, etc.

Site surrounded by Crops, Woodland and/or Pasture.

OTHER BRIDGES ACROSS SAME STREAM

Information required for bridges as indicated on the Bridge Survey Location Request.
Sketches of structure not required. See the Bridge Survey Location Request for additional data needed.

	No. 1	No. 2
Distance along thalweg from proposed structure, upstream or down (ft)		
Railroad, highway or pedestrian bridge.		
Extreme High Water Elevation at structure.....		
Does the bridge back up water during floods?.....		

Additional Remarks:

Oral testimony on April 5th, 2023 from local farmer (Jim Fletchall, Ph #660-254-0521), stated that in 30+ years, he has never witnessed flood water over the bridge, but water overtopped the roadway twice on the east side of the bridge around low spot in roadway. He did not give any estimates of depth of floodwater over roadway, nor exact limits, just generalized to be near existing culvert pipe that crosses under roadway in the curve of road, approximately 800' east of east end of bridge. There is also a faint staining line noticeable on the concrete bridge piers at an elevation of 921 that suggests some extended time of floodwater was maintained at or near that elevation as well.

DATA FOR PROPOSED BRIDGE

Are the banks caving/sloughing at the site? Yes

Does the stream appear to be cutting or filling? Cutting

Elevation of extreme low water N/A (ft) During what months is stream dry? N/A

Type of surface material of streambed (gravel, sand, silt, etc.) Silt and Sand

Location of dam(s) having a definite spillway within 1 mile of the bridge site? No

If crossing is over drainage ditch, provide the corporate name of drainage district: No

Roadway Design Frequency and Required Permits

Roadway Design Frequency:	-Year (See EPG 748.2.2)

Corps of Engineers 404 Permit:	☐ Yes	☐ No
State Department of Natural Resources 401 Permit:	☐ Yes	☐ No
Environmental Protection Agency NPDES Permit:	☐ Yes	☐ No

PHOTOGRAPHS OF SITE CONDITIONS

For grade crossings and retaining walls provide photographs documenting site characteristics as deemed necessary.

For stream crossings provide photographs documenting the site characteristics. Photos should be taken in an overlapping manner to provide a 360º panoramic view at or near the proposed stream crossing. Photos should also be taken to show the channel, banks and streambed both upstream and downstream of the proposed bridge, as well as the waterway through the existing bridge. If the existing roadway is overtopped at extreme high water, provide photographs showing the roadway on either side of the existing bridge. If the land use or stream characteristics are significantly different at upstream or downstream valley profiles, provide additional photographs to document these conditions. Additional photographs may also be necessary to provide information on other site-specific conditions. It is especially important to show any nearby improvements that may be affected by flooding or changes in stream velocity. Photos of other bridges near the proposed structure should also be included. These photos should show the bridge profile including details of the superstructure and substructure type. These photos should also show any bank or channel improvements or issues in the area.

Brief Description of Photographs (directions and locations):

N. Side Road, East Side of Bridge Facing West across Bridge

On Bridge Deck Facing East:

On Bridge Facing North (Upstream):

On Bridge Facing West:

On Bridge Facing South (Downstream):

Southwest Quadrant Bridge Viewing NE under bridge across Stream:

Southwest Quadrant Bridge Viewing East across stream:

Northeast Quadrant Bridge Viewing SW across stream, under Bridge:

Northeast Quadrant Bridge Viewing West across stream:

Along East side of Stream, N. of bridge, viewing North (Upstream):

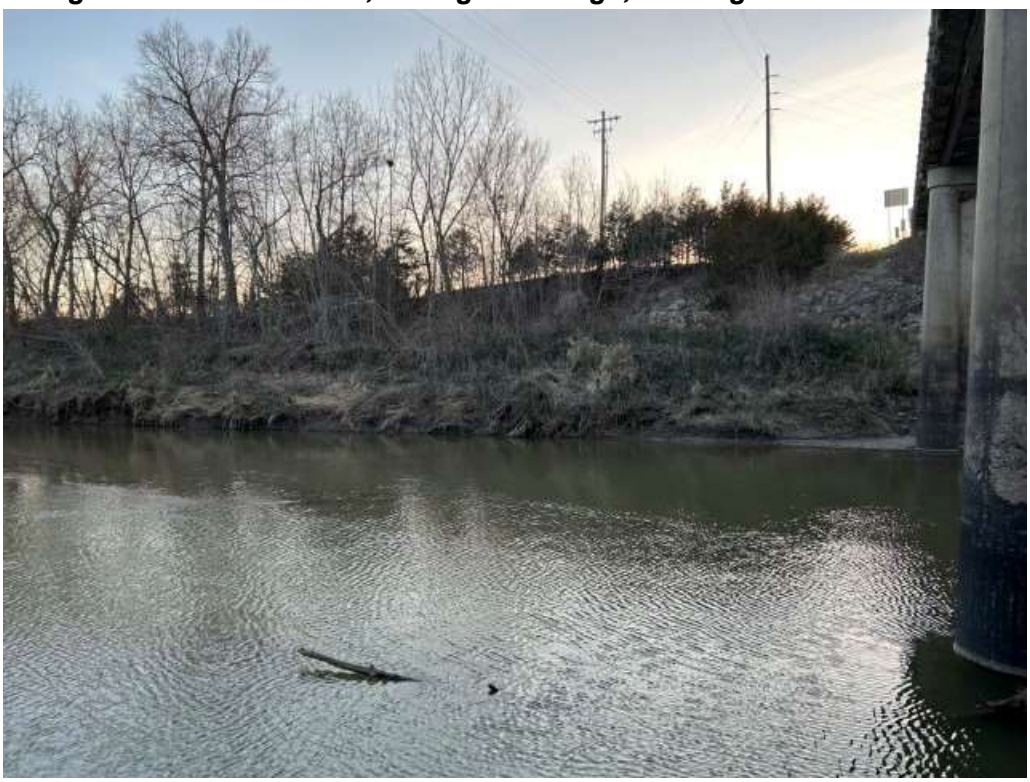
Along East side of Stream, N. of bridge, viewing South (Downstream):

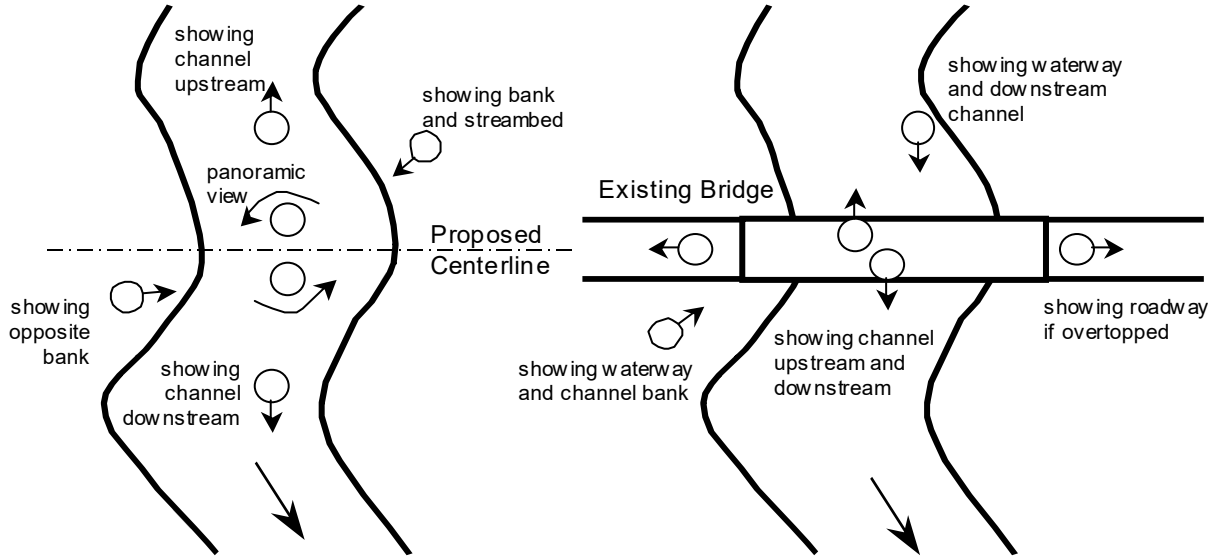
Along East side of Stream, S. of bridge, viewing South (Downstream):

Along East side of Stream, N. Edge of bridge, viewing NW (Upstream):

Along East side of Stream, N. Edge of bridge, viewing W:

Along East side of Stream, S. Edge of bridge, viewing W:





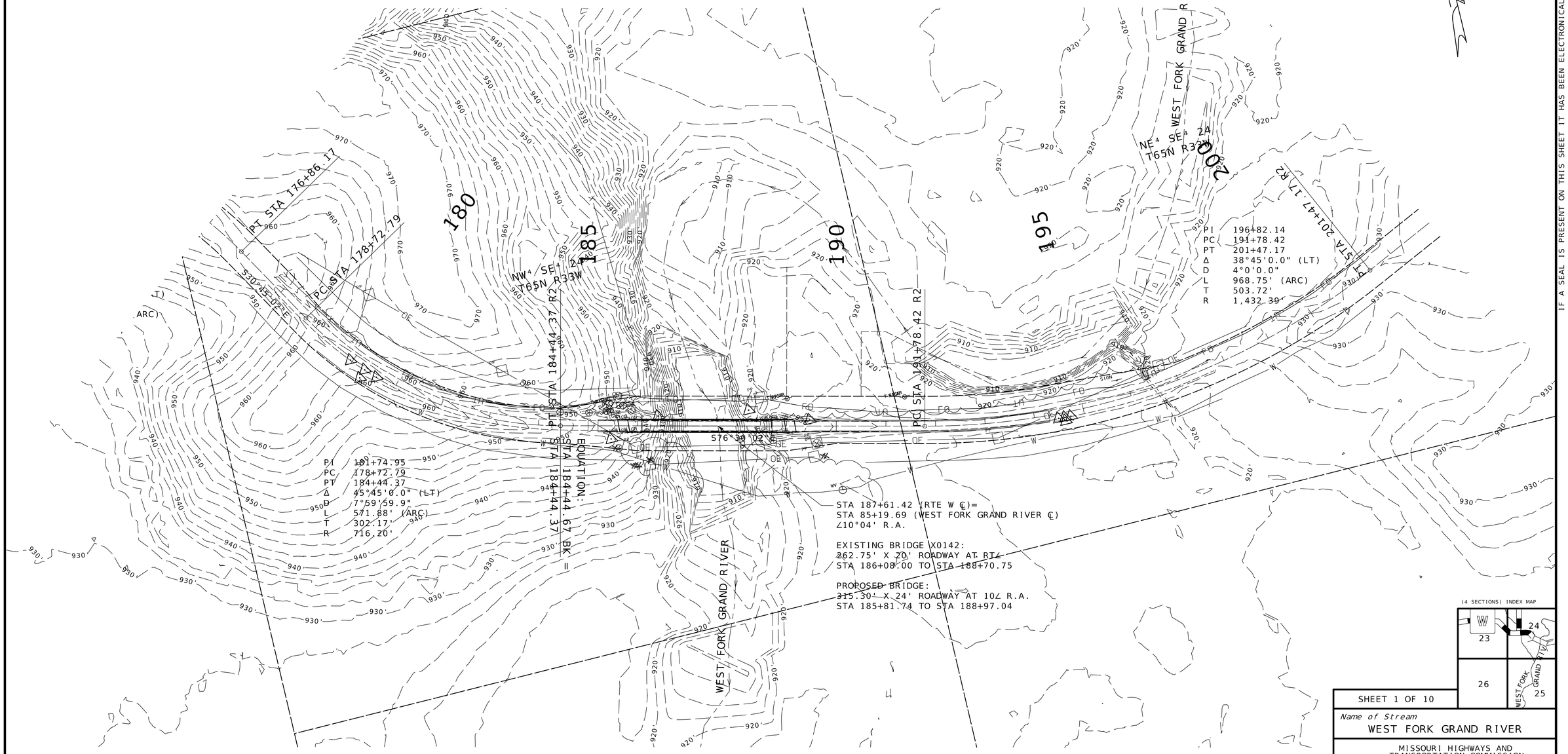
GENERAL INSTRUCTIONS FOR BRIDGE SURVEYS

In order to provide the best possible structure design, it is important that this report be completed as fully and accurately as possible. Consultation with bridge office to resolve questions or issues that require considerable judgment is encouraged.

The purpose of a bridge survey is to provide data needed to establish three important points: the general dimensions of the structure (length, height, skew, and arrangement of spans); the type, size and depth of foundation; and the cost of construction. For stream crossings these three points are very intimately related to the required waterway. A restricted waterway means serious scour, and footings must extend deep or be very substantially founded.

Detailed instructions on completing the Bridge Survey Report and associated plan and profile sheets are contained in EPG 747 Bridge Reports and Layouts of the *Engineering Policy Guide*.

PLAN



(4 SECTIONS) INDEX MAP

SHEET 1 OF 10

Name of Stream

WEST FORK GRAND RIVER

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REPORT OF BRIDGE SURVEY

SEC. 24 T. 65N R. 33W

ROUTE W ; WORTH COUNTY

SURVEY MADE BY TREKK DESIGN GROUP
SPRING 2023

PREPARED BY JESSICA RAMSEY

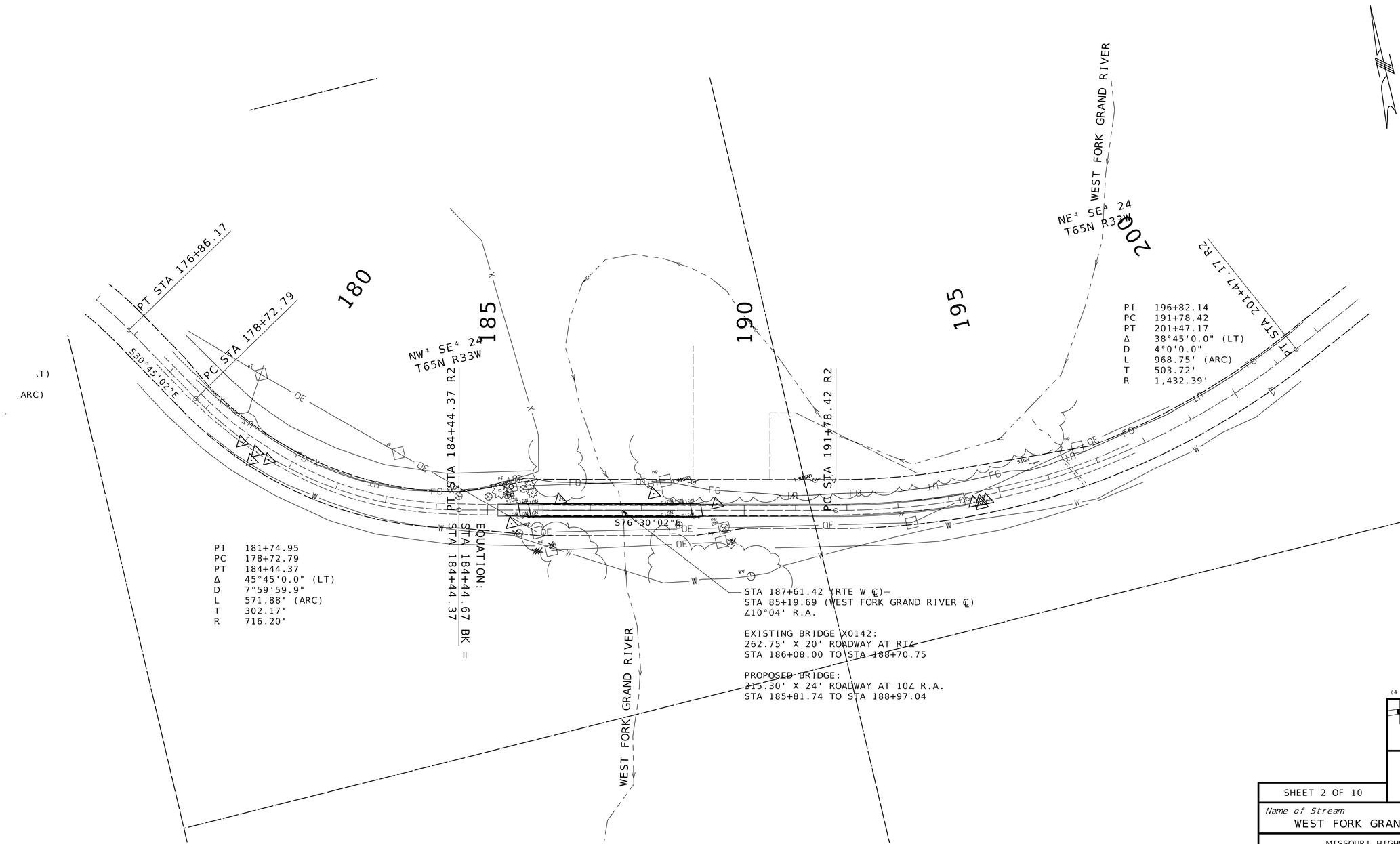
CHECKED BY JOYCE REYNOLDS
Transportation Project Manager

PROJ. NO. STA. 187+61.42

JOB NO. JNW0020 BRIDGE NO.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

PLAN



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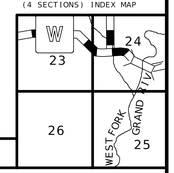

SHEET 2 OF 10

Name of Stream

WEST FORK GRAND RIVER

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SEC. 24 T. 65N R. 33W

ROUTE W ; WORTH COUNTY

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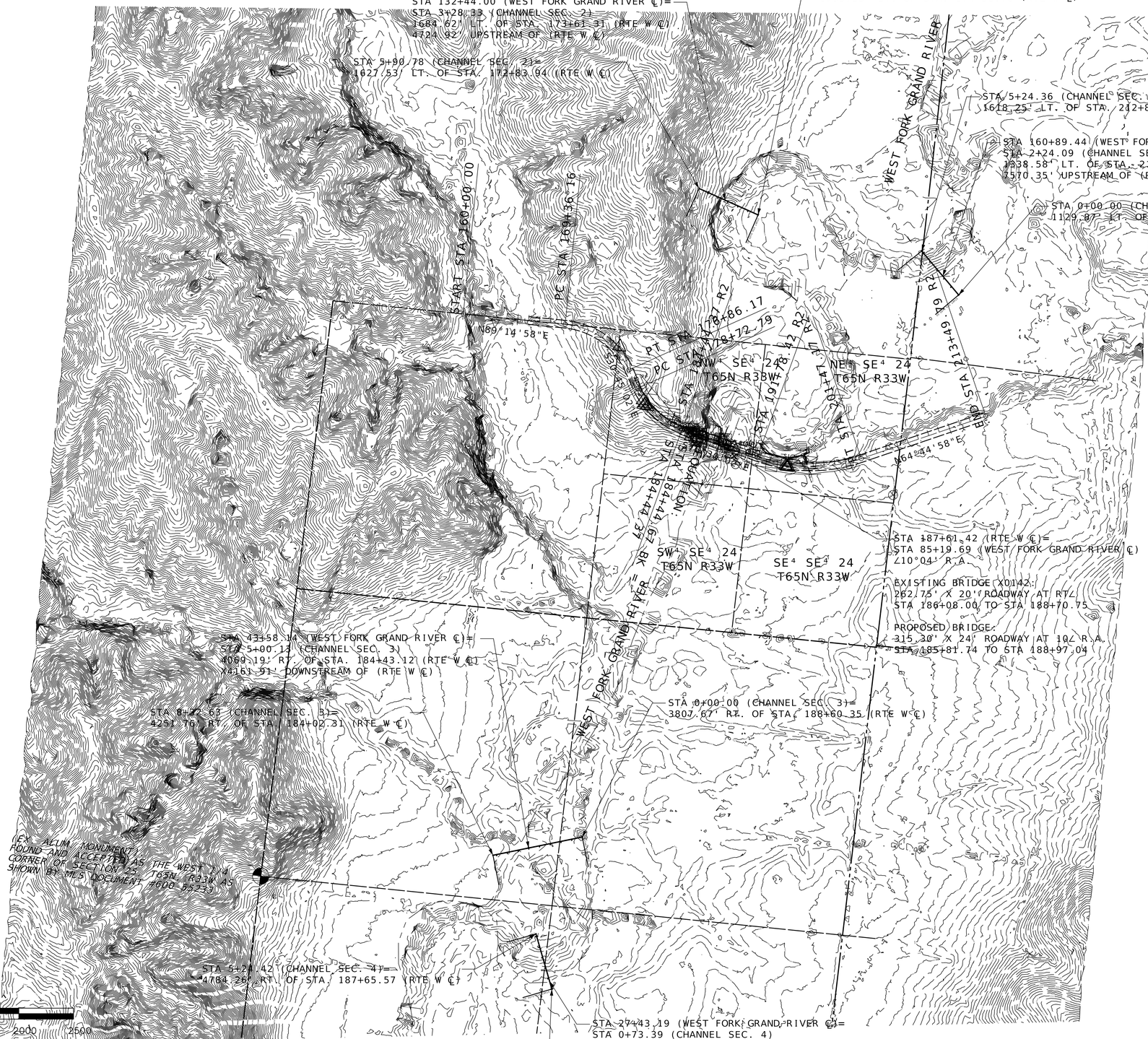

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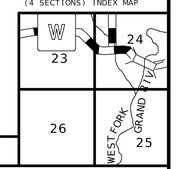

SHEET 3 OF 10

Name of Stream

WEST FORK GRAND RIVER

MISSOURI HIGHWAYS AND
TRANSPORTATION COMMISSION
REPORT OF BRIDGE SURVEY

SEC. 24 T. 65N R. 33W

ROUTE W ; WORTH COUNTY

SURVEY MADE BY TREKK DESIGN GROUP
SPRING 2023

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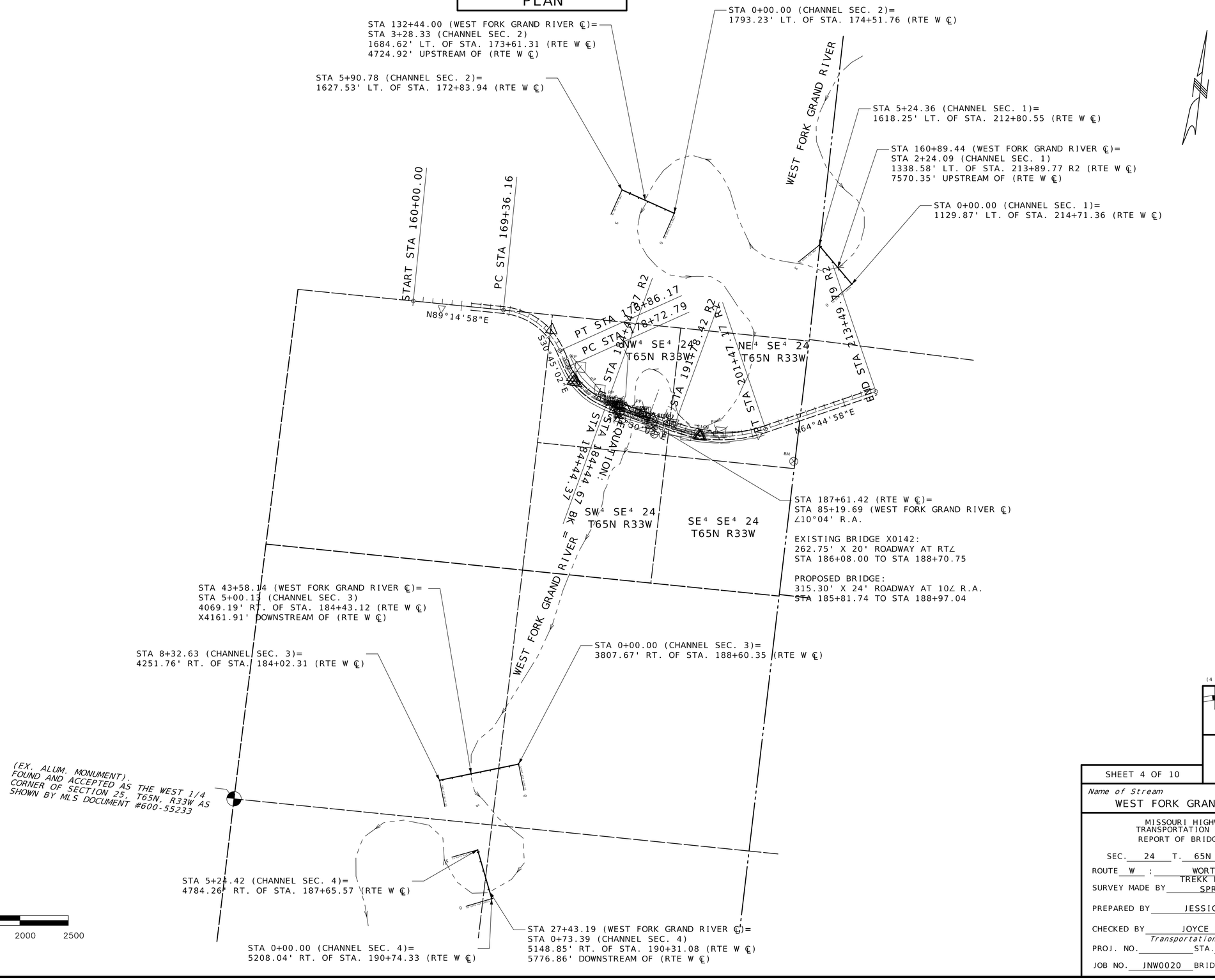

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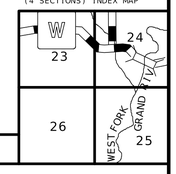

SHEET 4 OF 10

Name of Stream

WEST FORK GRAND RIVER

MISSOURI HIGHWAYS AND
TRANSPORTATION COMMISSION
REPORT OF BRIDGE SURVEY

SEC. 24 T. 65N R. 33W

ROUTE W ; WORTH COUNTY

SURVEY MADE BY TREKK DESIGN GROUP
SPRING 2023

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Transportation Project Manager

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TYPICAL SECTIONS

ROUTE W TRAFFIC DATA	
AADT	243
CONSTRUCTION YEAR AADT (2025)	249
DESIGN YEAR AADT (2045)	283
DIRECTIONAL DISTRIBUTION (E./W.)	47.3%/52.7%
PEAK HOUR	15.64%
PERCENT TRUCKS	11.52%
GROWTH RATE	0.63%
DESIGN SPEED	55 MPH.

TRAFFIC HANDLING

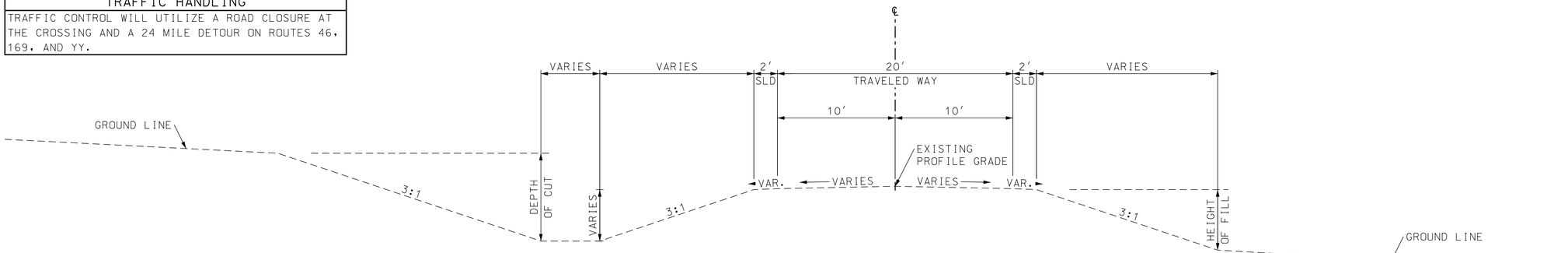
TRAFFIC CONTROL WILL UTILIZE A ROAD CLOSURE AT THE CROSSING AND A 24 MILE DETOUR ON ROUTES 46, 169, AND YY.

BENCHMARK (NAVD88)

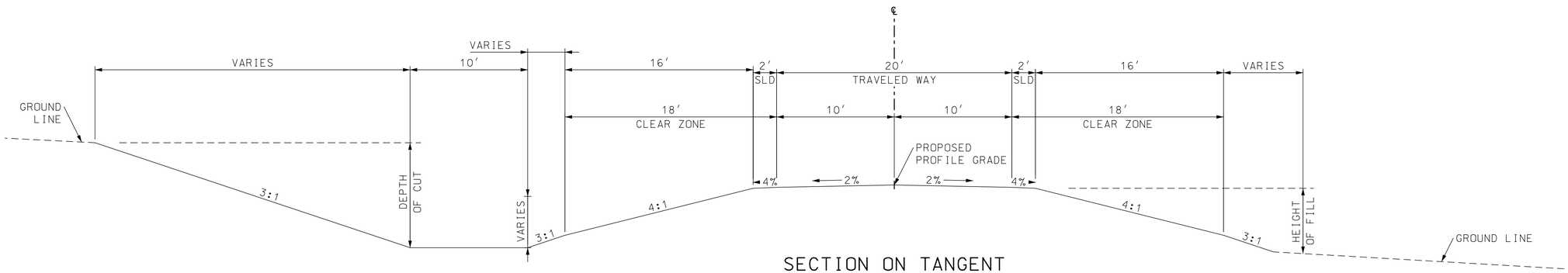
BM905 BENCHTIE ON S. SIDE OF POWER POLE SIDE OF ROUTE W 35′ ± RT. STA. 189+61 ± ℄ ROUTE W ELEV. 923.90′

CONTROL POINTS

CP100	CP602	CP603	CP604	CP605
E: 2774527.89	E: 2773534.81	E: 2773033.50	E: 2772635.51	E: 2772171.51
N: 1549090.82	N: 1549236.43	N: 1549357.58	N: 1549413.45	N: 1549650.85
ELVEV: 930.34	ELVEV: 923.67	ELVEV: 928.57	ELVEV: 946.09	ELVEV: 960.17



SECTION ON TANGENT
EXISTING TYPICAL SECTION RTE. W
STA. 185+20.00 TO 194+30.00



SECTION ON TANGENT
PROPOSED TYPICAL SECTION RTE. W
STA. 185+20.00 TO 194+30.00

SCALE
0 2.5 5 10 15 20

MISSOURI COORDINATE SYSTEM, 1983
WESTERN ZONE
PROJECTION FACTOR = 1.0000983827
GRID FACTOR = 0.999901627
BEARINGS ARE REFERENCED TO NAD83.
ELEVATIONS ARE REFERENCED TO VERTICAL DATUM NAVD88.

SHEET 5 OF 10

Name of Stream
WEST FORK GRAND RIVER

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REPORT OF BRIDGE SURVEY

SEC. 24 T. 65N R. 33W
ROUTE W ; WORTH COUNTY
SURVEY MADE BY TREKK DESIGN GROUP
SPRING 2023
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Transportation Project Manager
PROJ. NO. STA. 187+61.42
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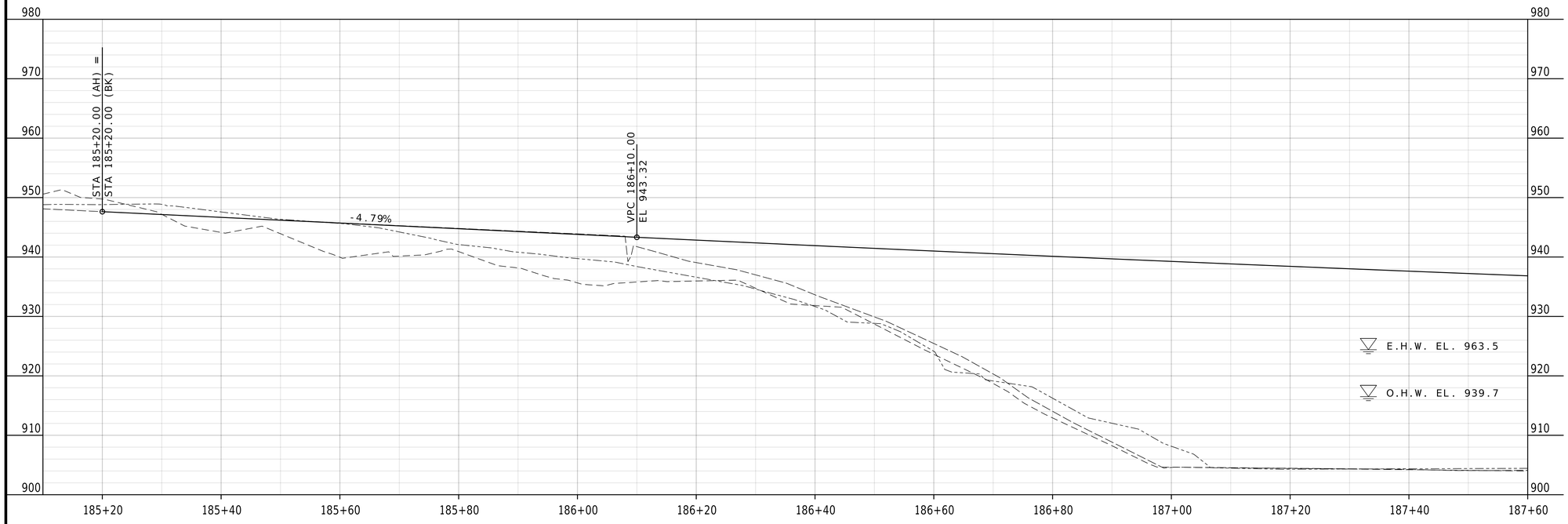
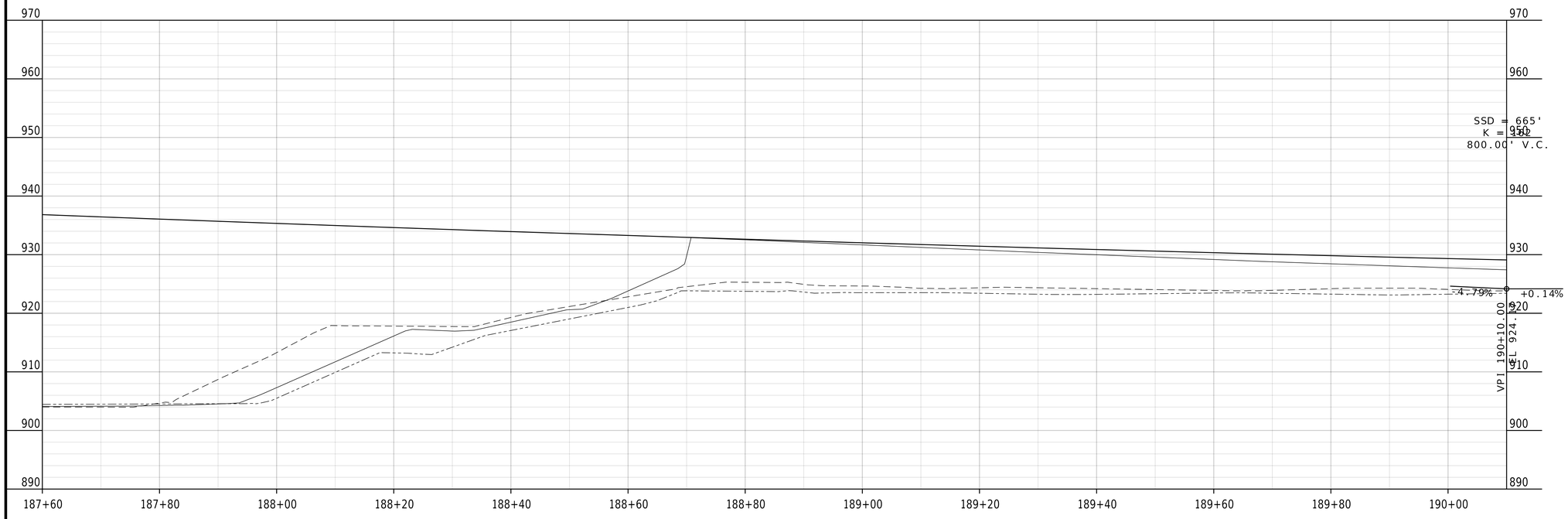
PROFILE





THREE LINE PROFILE

HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=10'

PROFILE KEY

- PROPOSED PROFILE ROUTE 46
- EXISTING PROFILE ROUTE 46
- UPSTREAM OFFSET PROFILE AT NATURAL GROUND (40')
- DOWNSTREAM OFFSET PROFILE AT NATURAL GROUND (40')

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SHEET 6 OF 10

Name of Stream
WEST FORK GRAND RIVER

MISSOURI HIGHWAYS AND
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REPORT OF BRIDGE SURVEY

SEC. 24 T. 65N R. 33W

ROUTE W ; WORTH COUNTY

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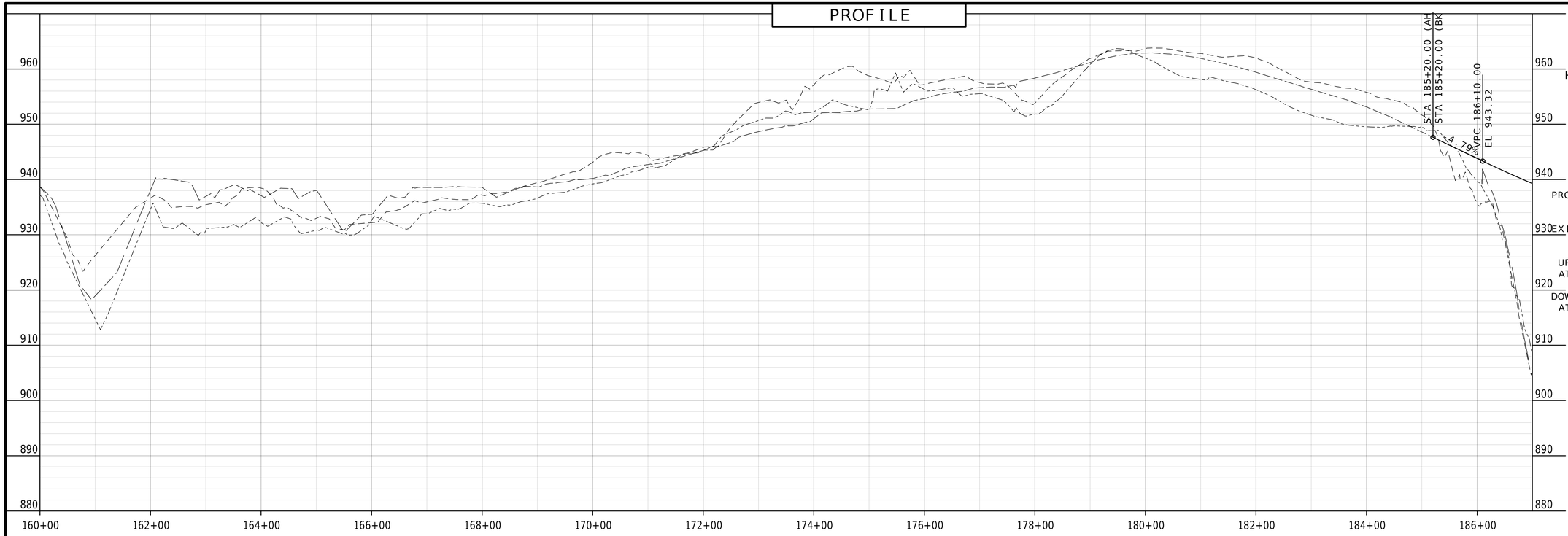
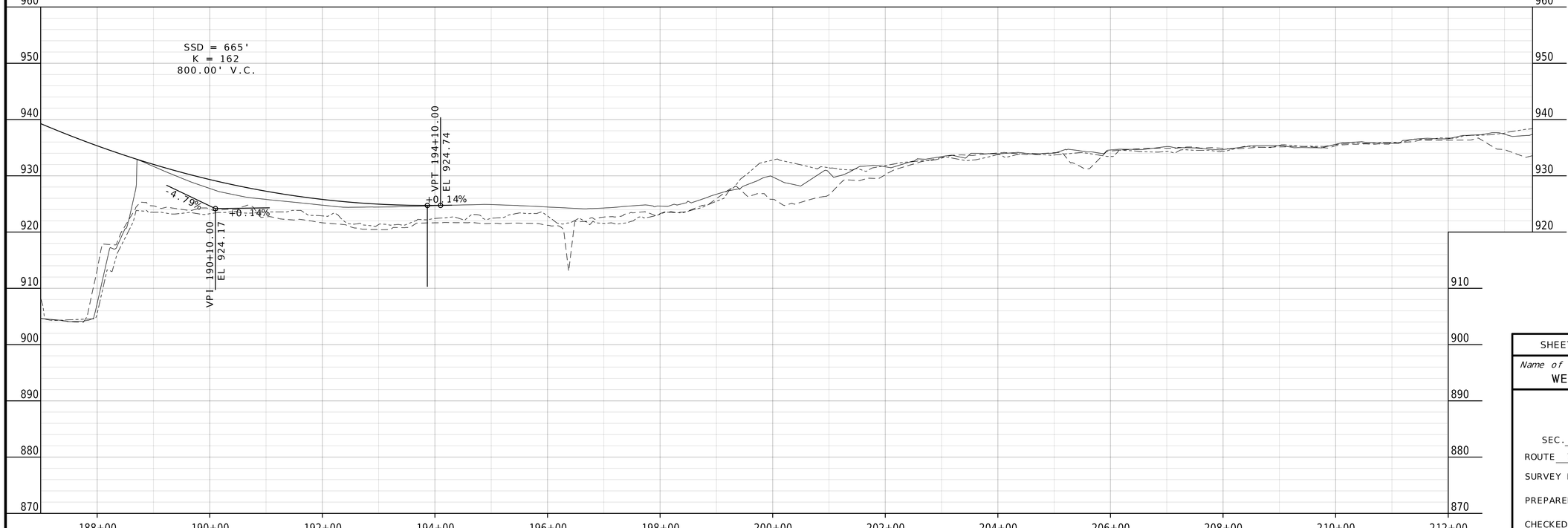
PROFILE





CONTRACTED PROFILE

HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=10'

PROFILE KEY

PROPOSED PROFILE ROUTE 46

EXISTING PROFILE ROUTE 46

UPSTREAM OFFSET PROFILE AT NATURAL GROUND (40')

DOWNSTREAM OFFSET PROFILE AT NATURAL GROUND (40')

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SHEET 7 OF 10

Name of Stream
WEST FORK GRAND RIVER

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REPORT OF BRIDGE SURVEY

SEC. 24 T. 65N R. 33W

ROUTE W ; WORTH COUNTY

SURVEY MADE BY TREKK DESIGN GROUP
SPRING 2023

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PROJ. NO. STA. 187+61.42

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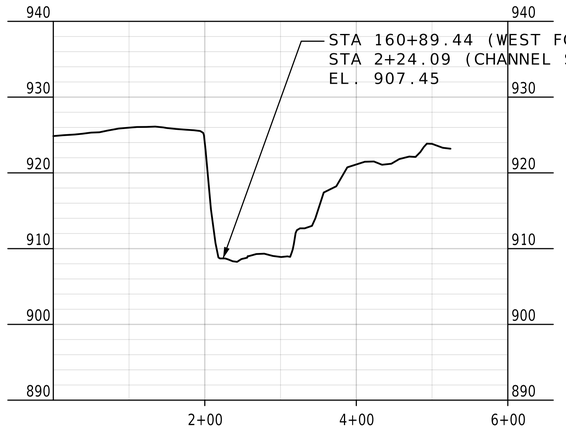
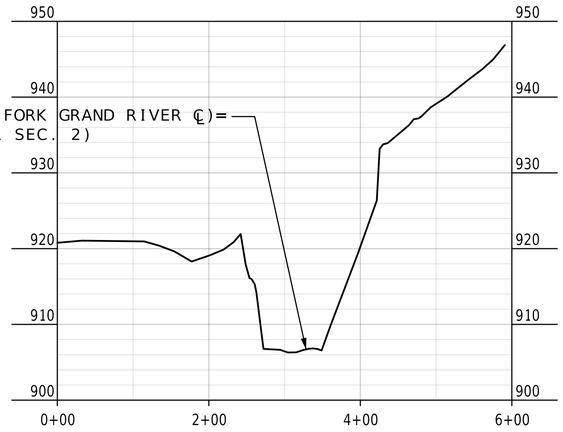
PROFILE

CHANNEL SECTION 1
7570.35' UPSTREAM

HORIZONTAL SCALE: 1'=100'
VERTICAL SCALE: 1'=10'



STA 132+44.00 (WEST FORK GRAND RIVER ℄)=
STA 3+28.33 (CHANNEL SEC. 2)
EL. 905.59

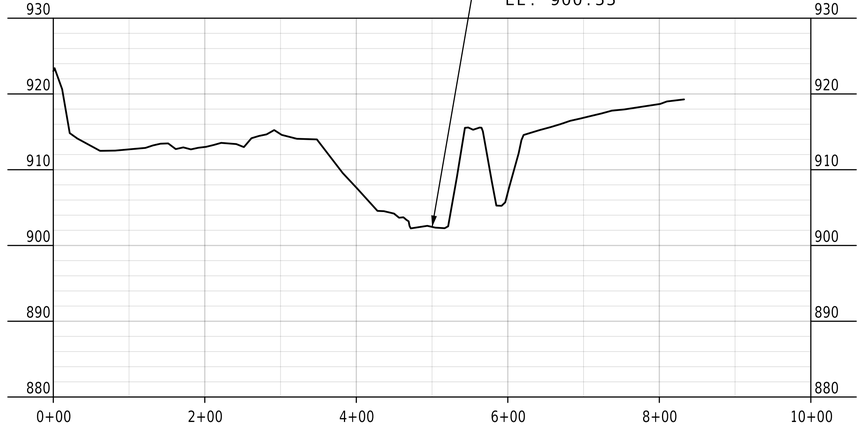


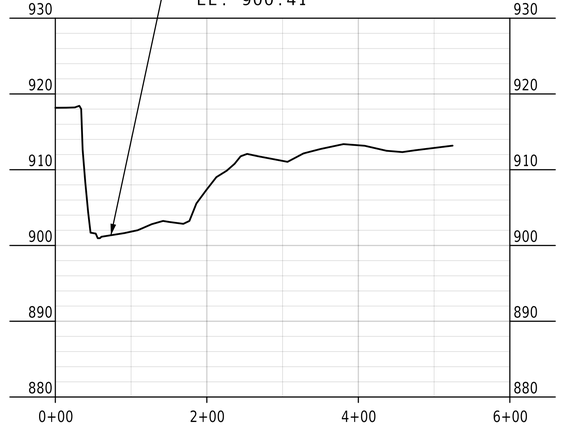
CHANNEL SECTION 2
4724.92' UPSTREAM

HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=10'

CHANNEL SECTION 3
4161.91' DOWNSTREAM

HORIZONTAL SCALE: 1'=100'
VERTICAL SCALE: 1'=10'





CHANNEL SECTION 4
5776.86' DOWNSTREAM

HORIZONTAL SCALE: 1'=100'
VERTICAL SCALE: 1'=10'

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SHEET 8 OF 10

Name of Stream
WEST FORK GRAND RIVER

MISSOURI HIGHWAYS AND
TRANSPORTATION COMMISSION
REPORT OF BRIDGE SURVEY

SEC. 24 T. 65N R. 33W

ROUTE W ; WORTH COUNTY

SURVEY MADE BY TREKK DESIGN GROUP
SPRING 2023

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PROJ. NO. STA. 187+61.42

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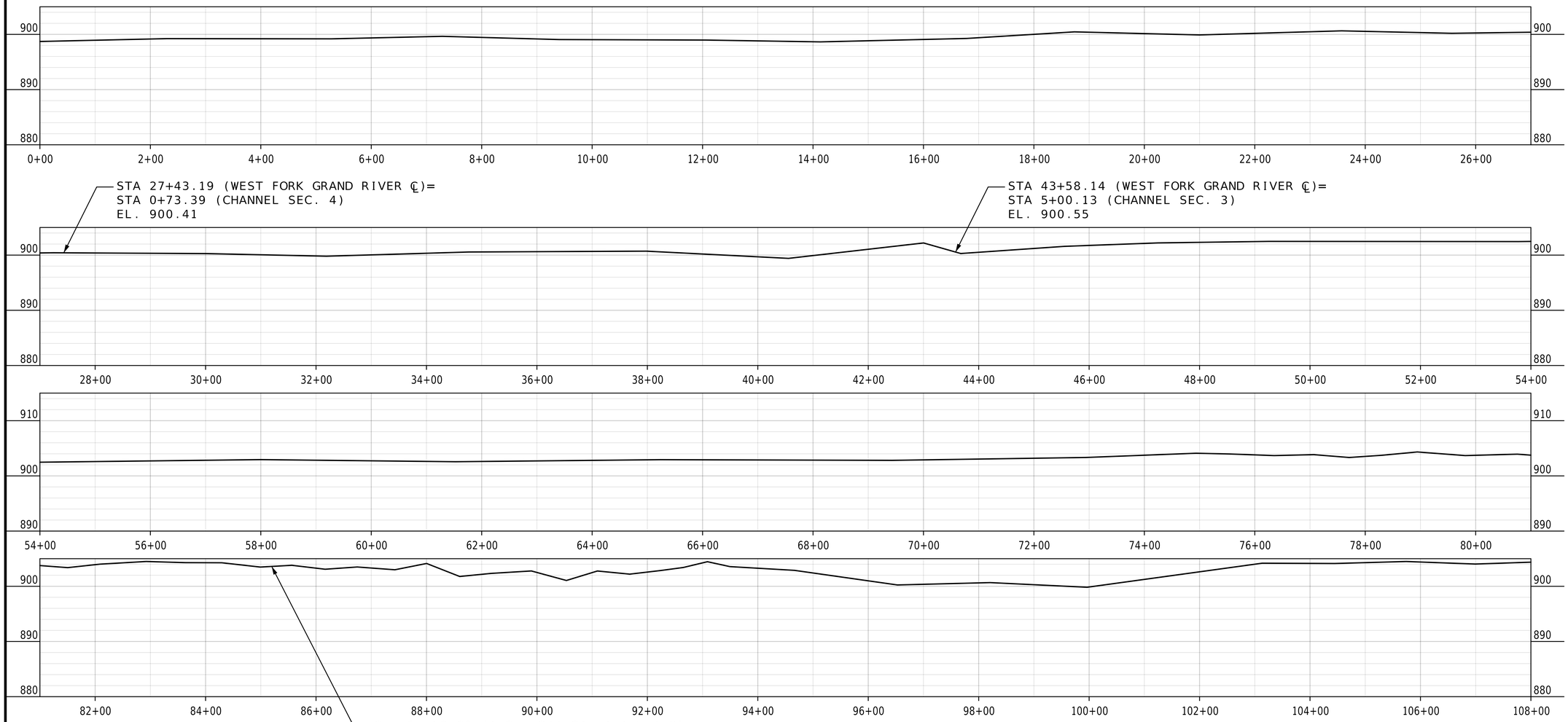
PROFILE

STREAMBED PROFILE
WEST FORK GRAND RIVER

HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=10'



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SHEET 9 OF 10

Name of Stream
WEST FORK GRAND RIVER

MISSOURI HIGHWAYS AND
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REPORT OF BRIDGE SURVEY

SEC. 24 T. 65N R. 33W

ROUTE W ; WORTH COUNTY

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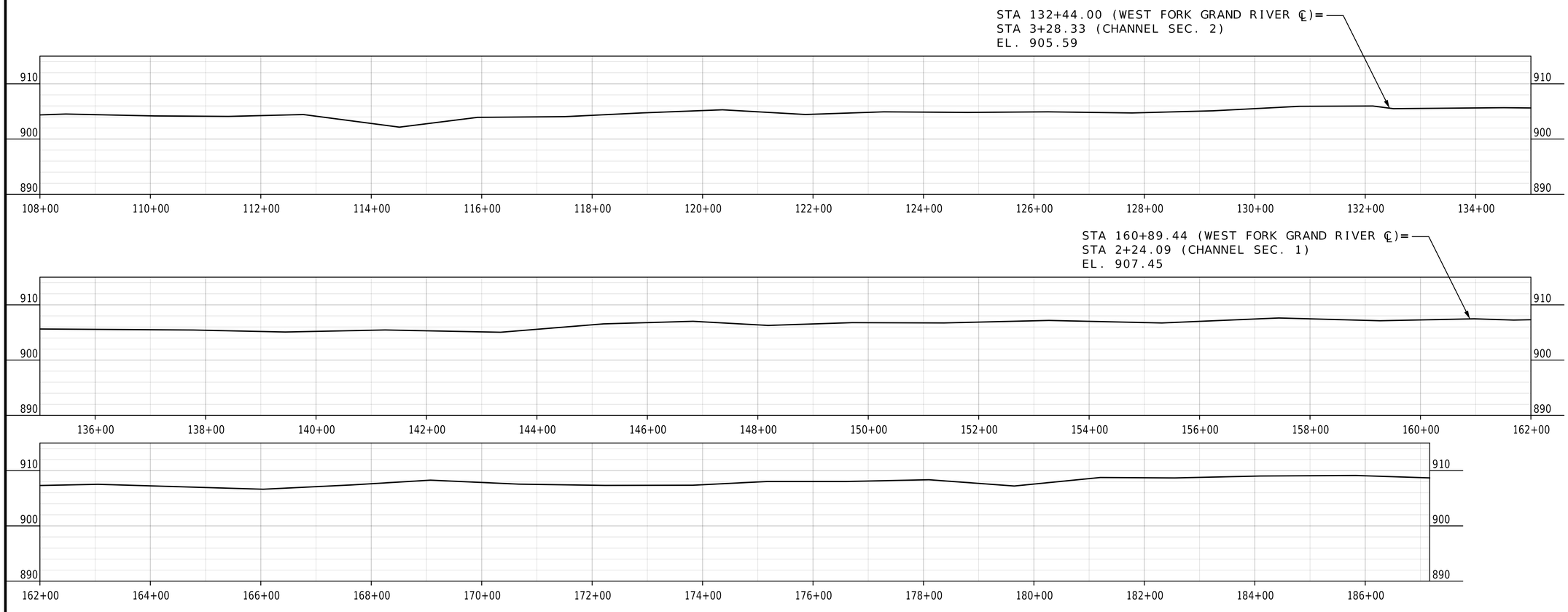
PROFILE

STREAMBED PROFILE
WEST FORK GRAND RIVER

HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=10'



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SHEET 10 OF 10

Name of Stream
WEST FORK GRAND RIVER

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