LETTING DATE -

Culvert Repair

STP-006-4(204)--2C-50

JASPER COUNTY

Index of Sheets

No.	Description
Sheets	Bridge Plan
A.1	Title Sheet
A.2	Location Map Sheet
V.1	Estimated Quantities - Design ####
V.2 - XX	Design -
SPS Sheets	Bridge Plan Soils Sheet
SPS.1	Bridge Plan Soils Sheet
Road Sheets	Road Plan
A.??-?.??	Road Plans
C.1	Estimated Quantities - Road
C.2	Standard Plans - Road
RC.1 - 5	Estimated Quantities - Erosion Control

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

JASPER COUNTY

Culvert Repair

U.S. 6 over Unnamed Ditch
0.2 mi. E. of Co. Rd. T12
-

Refer to the Plan Sheets for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

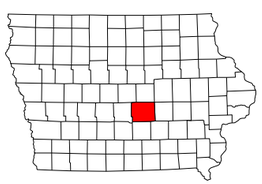
IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

Revisions

	TOTAL
	XX
PROJECT IDENTIFICATION NUMBER	
25-50-006-010	
PROJECT NUMBER	
STP-006-4(204)--2C-50	
R.O.W. PROJECT NUMBER	
-	
PROJECT DIRECTORY NUMBER	
5000601025	

Preliminary
Not For Construction

Revisions to this Design Plan and/or Project Specifications should be submitted by _____



Design Data Rural

20?? AADT	V.P.D.
20?? AADT	V.P.D.
20?? DHV	V.P.H.
TRUCKS	%
Total Design ESALs	

Index of Seals

Sheet No.	Name	Type
A.1	Mark C. Currie	Structural Design

Structural Design

LICENSED PROFESSIONAL ENGINEER
Mark C. Currie
22475
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

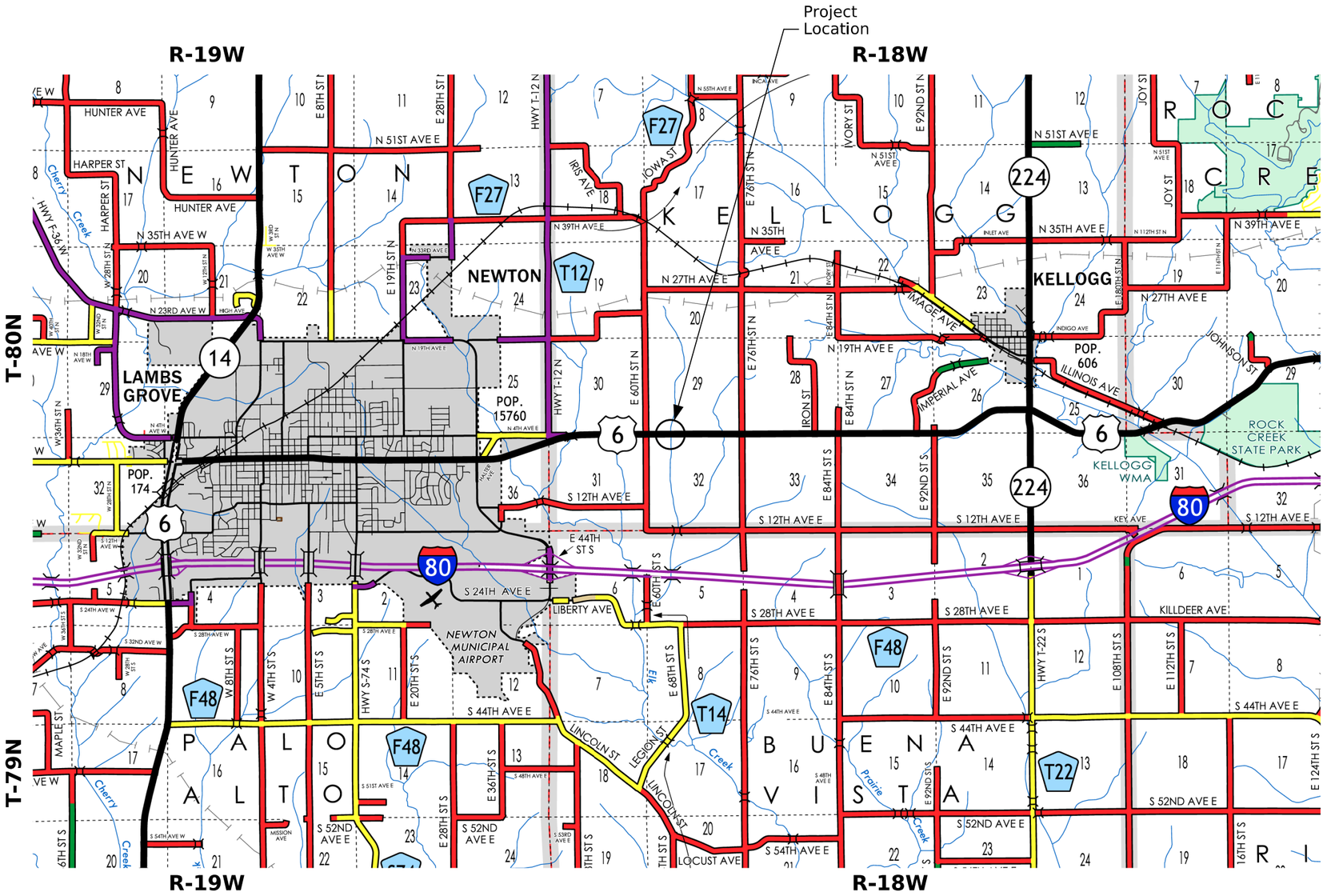
Signature Date

Mark C. Currie

Printed or Typed Name

My license renewal date is December 31, 2025

Pages or sheets covered by this seal: _____



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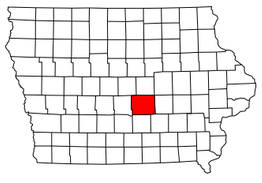
Jasper County Location Map

Not To Scale



LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD

- INTERSTATE HIGHWAY (80)
- UNITED STATES HIGHWAY (65)
- STATE HIGHWAY (237)
- COUNTY HIGHWAY (S27)

- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE

- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES (ABBEY ROAD)
- UNINCORPORATED PLACE (ELWOOD)

FILE NO. -	ENGLISH	DESIGN TEAM Veenstra & Kimm, Inc.	Jasper COUNTY	PROJECT NUMBER STP-006-4(204)–2C-50	SHEET NUMBER A.2

1:44:52 PM 12/2/2025 rlemke pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\5000601025\Bridge\(204)_RCB Culvert New - Single Box\ORD_50006204_Concept.dgn

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	**Title Sheets**
A.1	Title Sheet
A.2	Location Map Sheet
A.3 - 17	Project Concept
A.18 - 21	Field Exam Notes
B Sheets	**Typical Cross Sections and Details**
B.1 - 2	Typical Cross Sections and Details
D Sheets	**Mainline Plan and Profile Sheets**
D.1	Plan & Profile Legend & Symbol Information Sheet
D.2	US 6
G Sheets	**Survey Sheets**
G.1	Survey Information
G.2	Control Point Vicinity Map
G.3	Horizontal and Vertical Project Control Coordinate Listing
V Sheets	**Bridge and Culvert Situation Plans**
V.1	Situation Plan

VEENSTRA & KIMM INC.
6775 Vista Drive
West Des Moines, Iowa 50266

515.225.8000 // 800.241.8000
www.v-k.net

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 1 DATE: October 3, 2025

ATTENTION: Jeremey Vortherms PROJECT: Jasper County
STP-006-4(204)--2C-50
PIN: 25-50-006-010

FROM: Mark Currie

OFFICE: Veenstra & Kimm, Inc.

SUBJECT: Project Concept Statement; (Draft, D0)

This project involves the replacement of the US 6 culvert over Drainage Ditch, 0.25 mi E of E 60th St.

It is recommended to remove the culvert and replace it with 14' x 10' x 78' RCB at 9 degree skew and reconstruct the roadway with a typical 44' section, with traffic maintained via detour route at an estimated cost of $495,062. Additional right of way/right of entry may be required. Traffic will be maintained via detour using Iowa Speedway Dr south to Interstate 80, then east to IA 224 and back to US 6.

Recipients of this letter should review the attached Draft Project Concept Statement that was developed by Veenstra & Kimm, Inc. It is requested that you submit any comments or concerns by Friday, October 10, 2025. Any comments received during this time period will be incorporated into the final concept.

Cc:

A. Smyth	K. Nicholson	Y. Jia
C. Brakke	J. Nelson	M. Nop
J. Ellis	S. Majors	D. Stokes
B. Hofer	W. Sorenson	E. Wright
K. Brink	C. Poole	J. Laaser-webb
S. Anderson	N. Cuva	J. Holst
J. Bartholomew	M. Dell	R. Harris
N. Pohlen	D. Breitbach	B. Smith
M. Van Dyke	D. Heeren	G. Cagle
B. Hucker	B. Worrel	L. Narigon
A. Buss	A. Swisher	J. Vortherms
J. Hoskins	D. Skogerboe	F. Leong
B. Adey	S. Passick	S. Nixon
T. Quam	A. Wright	D. Tamrakar
J. Becker	J. Garton	B. Beavers
D. Newell	B. Walter	

DRAFT PROJECT CONCEPT STATEMENT

US 6 – Culvert over Drainage Ditch, 0.25 mi E of E 60th St.
Jasper County
STP-065-5(044)--2C-85
PIN: 25-85-065-020
Maint. No. N/A
FHWA No. N/A

Mark C. Currie, P.E., S.E.
515-225-8000

October 3, 2025

I. STUDY AREA

A. Project Description

This project involves the replacement of the US 65 culvert over Drainage Ditch, 0.25 mi E of E 60th St.

One alternative was considered:
1. Remove existing culvert and replace with 14’ x 10’ x 78’ RCB at 9 degree skew with a drop inlet structure and parallel wing headwall at the outlet.

Alternative 1 is the preferred alternative due to cost-effectiveness of culvert.

Traffic will be maintained with a detour via Iowa Speedway Dr south to Interstate 80, then east to IA 224, then north to US 6.

The preliminary project cost is $495,062.

B. Need for Project

The existing structure, an 8’ x 6’ RCB culvert that was extended with 12’ x 6’ tapered inlet and outlet in 1950, is near the end of its useful life. The culvert is undersized and has caused flooding in the area in the past. The culvert was designed for H20 live load.


Looking East along US 6


Looking North at Existing Culvert

C. Present Facility

US 6 is a two-lane roadway. The existing structure is an 8’ x 6’ x 39.5’ RCB culvert that was extended with a 12’ x 6’ tapered inlet and outlet in 1950. The original upstream channel was rerouted per the existing plans.

The existing slope of the culvert is nearly 6% causing excessive exit velocities that lead to stream degradation downstream and erosion of the immediate bend. A previous site visit found a 2.5’ drop at the outlet.

US 6 in the project area was originally constructed with 18’ wide PCC pavement in 1926. US 6 was then widened to 24’ and resurfaced with ACC in 1951. Shoulders 4’ wide were paved at a later time. The roadway has 10’ wide effective shoulders composed of 4’ paved and 6’ gravel.

D. Traffic Estimates

The 2027 construction year and 2047 design year average daily traffic estimates are 2,700 ADT with 6% trucks and 2,900 ADT with 6% trucks, respectively.

E. Sufficiency Ratings

US 6 is classified as an access route and is a maintenance service level “C” road. The culvert does not have a federal bridge sufficiency rating.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from 2020 through 2025, there were a total of 7 crashes; 6 of them were property damage and one involved possible injury. Property damaged totaling $31,500 was reported.

II. PROJECT CONCEPT

A. Project Description

Alternative #1 – Replace with a 14’ x 10’ RCB, 9 degree skew, detour

Remove the existing 8’ x 6’ RCB and replace with a single 14’ x 10’ x 78’ RCB with 9 degree skew, parallel wing headwall at the outlet, and 15’ drop inlet structure. The typical cross section will consist of a 24’ roadway with 10’ effective shoulders (4’ paved and 6’ granular) and 4:1 foreslopes.

US 6 over Unnamed Creek
STP-006-4(204)--2C-50
County: Jasper County
Drainage Area: 1.31 sq mi. or 841 ac.
August 26, 2025

	TR-55 (HSG C) (cfs)	Iowa Runoff Chart (cfs)	WRIR 87-4132 (Reg. 2) (cfs)	SIR 13-5086 (Single Var.) (cfs)	SIR 15-5055 Streamstats (cfs)
Q_2	650		153	186	167
Q_5	902	377	311	437	433
Q_{10}	1,131	528	444	684	684
Q_{25}	1,483	603	644	1,071	1,060
Q_{50}	1,779	754	804	1,337	1,370
Q_{100}	2,090	905	982	1,601	1,710
Q_{200}	2,431			2,102	2,050
Q_{500}	2,904			2,340	2,530

WRIR 87-4132, SIR 13-5086 from Streamstats are ran for comparison purposes only.
IaDOT policy limits use of Rept. 13-5086 and 87-4132 to drainage areas greater 2 sq. mi.

The existing extension built in 1950 had a drainage area of 690 acres per the plans. Delineation using elevation contours and verified through Streamstats revealed a drainage area of 1.31 sq. mi. or 841 acres. Using the Iowa Runoff Chart and the delineated drainage area, the Q_{50} design discharge was calculated as 760 cfs. Using Streamstats 2015-5055, the Q_{50} was determined to be 1370 cfs, which represents an 80% increase in discharge. The existing culvert is clearly undersized, as flooding has been observed in the area and the measurable stream degradation downstream resulting from excessive stream exit velocities.

The roadway will be constructed on the existing vertical and horizontal alignment. No profile grade raise is required as the minimum cover is met.

The proposed culvert length was established using 6:1 foreslopes to meet the 26’ acceptable clear zone. This matches the design criteria used for the culvert recently constructed 1 mile west of the project on US 6. A 4:1 foreslope would require a longer culvert to meet a 32’ acceptable clear zone.

The steep slope (6%) of the existing structure has created a drop on the downstream that measured 2.5’ during the site visit. The DOT BDM policy requires an energy dissipator when a culvert slope exceeds 2%. Due to the immediate bend at the downstream end, a rip rap basin or flume basin cannot be used; therefore, a drop inlet structure with a ‘butterfly wing’ headwall is proposed. A slight channel shift will be required to align the ditch to the culvert inlet.

The removal of the existing culvert will require the reconstruction of 70’ of new 9” PCC pavement and granular shoulder. Erosion control and rural seeding and fertilizing will be installed on all disturbed areas.

Right-of-way will be required for this project on the south side of US 6 due to the length of the proposed culvert and the additional armoring required at the bend to prevent further erosion. It appears there is sufficient right-of-way to the north to construct the drop inlet structure.

The field entrance and possible pipe at the northeast corner of the culvert shall be retained and the ditch will be shaped to drain into the ditch north of the culvert.

BRIDGE ESTIMATE:				
Item	**Quantity**	**Unit**	**Rate**	**Amount**
Existing Culvert Removal	97	CY	$80	$7,760
New RCB Culvert Concrete Only	128	CY	$1,200	$153,600
Butterfly Wing Headwall	10	CY	$1,200	$12,000
Drop Inlet Structure	13	CY	$1,200	$15,600
Headwalls	50	CY	$1,200	$60,000
Engineering Fabric	400	SY	$4	$1,600
Revetment	214	TON	$50	$10,700
Mobilization	1	LS	10%	$26,126
	Base Cost:			$287,386
	Contingency:		20%	$57,477
	0 Years Inflation:		4.5%	
	BRIDGE TOTAL:			**$344,863**

ROADWAY ESTIMATE:				
Item	**Quantity**	**Unit**	**Rate**	**Amount**
Excavation, Class 10	334	SY	$15	$5,010
Removal of Pavement	1067	SY	$10	$10,670
Modified Subbase	249	CY	$50	$12,450
PCC Pavement	249	SY	$60	$14,940
Granular Shoulders	94	SY	$20	$1,880
Erosion Control	1	LS	$10,000	$10,000
Clearing & Grubbing	1	LS	$5,000	$5,000
ROW Acquisition/Temporary Easement	1	LS	$30,000	$30,000
Traffic Control	1	LS	10%	$8,995
Additional Roadway Items	1	LS	15%	$14,842
Mobilization	1	LS	10%	$11,379
	Base Cost:			$125,166
	Contingency:		20%	$25,033
	0 Years Inflation:		4.5%	
	ROADWAY TOTAL:			**$150,199**

PROJECT TOTAL:	**$495,062**

Other Alternatives Considered

Replace with single 14' x 10' RCB culvert with energy dissipator
This alternative would remove the existing 8' x 6' RCB and replace with a single 14' x 10' RCB with 9 degree skew with an energy dissipator inside the culvert using the broken back culvert concept or letdown. This would require a parallel wing headwall at both the inlet and outlet, extending the total length of the culvert and requiring more right-of-way acquisition. This option is not typically constructed in Iowa and would make inspection and maintenance challenging.

Install flume basin and rip rap basin to dissipate energy
A flume basin and rip rap basin has been widely used by DOT as an energy dissipator in the past; however, the immediate bend downstream limits the applicability of these options. A scour floor could also be employed at the bottom of the parallel wing headwall, but BDM policy limits the use of scour floor to less than 3' drop.

Replace with single 16' x 9' RCB culvert
This alternative would remove the existing 8' x 6' RCB and replace with a single 16' x 9' RCB with 9 degree skew. This would need to be 86' long (vs 78' for the preferred alternative) using a 6:1 foreslope to meet the acceptable clear zone of 26'.

B. Detour Analysis
The preference for construction is to close the road and provide an offsite detour route. It is anticipated that the detour will be in place for approximately 60 days. The identified detour route would follow Iowa Speedway Dr south to Interstate 80, then east to IA 224, then north to US 6. The out-of-distance travel is 13.3 miles.

C. Recommendations
It is recommended that the present structure be removed and replaced as described in Alternative No. 1.

D. Construction Sequence
It is anticipated all work on this project will be awarded to one prime contractor. Veenstra & Kimm, Inc. will coordinate the plan preparation with the assistance of the Project Management Bureau, the Design Bureau, and the Bridges and Structures Bureau.

E. ADA Accommodations
There are no bike paths or sidewalks adjacent to US 6; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This will not be a traffic critical project.

The Accelerated Bridge Construction (ABC) Rating Score is 36 for an off-site detour with 13.3 miles out-of-distance travel. The score is less than the first stage filter threshold of 50; therefore, no further evaluation is considered.

No bike path or sidewalk will be required as part of this project.

Standard survey coverage will be required.

Right-of-Way will be required for this project.

A listing of existing utilities present within the project limits are shown in Attachment A.

The District cultural resources manager has not yet completed a cultural resources review on this project.

The Location and Environment Bureau has not reviewed this project at this time. Once their review is completed, comments will be incorporated into the final concept statement.

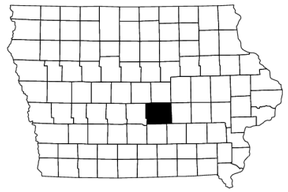
G. Program Status

Site data has been developed by Veenstra & Kimm, Inc. This project is listed in Masterworks with $1,000,000 for replacement in FY 2027. A schedule of events will be developed following approval of the Project Concept.

Following page has a map of the county and location of project area.

Attachment A - utilities

JASPER COUNTY



N

LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD

- INTERSTATE HIGHWAY
- UNITED STATES HIGHWAY
- STATE HIGHWAY
- COUNTY HIGHWAY

- RAILROAD
- PIPELINE
- AIRPORT
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- BRIDGE

- STATE BOUNDARY
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- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES
- UNINCORPORATED PLACE (ABBEY ROAD, ELWOOD)

- STATE PARKS
- STATE INSTITUTIONS
- FEDERAL LAND

Detour Route

Project Location

Detour Route
8.5 miles

Jasper County Map

Not to Scale

FILE NO. -	ENGLISH	DESIGN TEAM Veenstra & Kimm, Inc.	Jasper COUNTY	PROJECT NUMBER STP-006-4(204)--2C-50	SHEET NUMBER A.9

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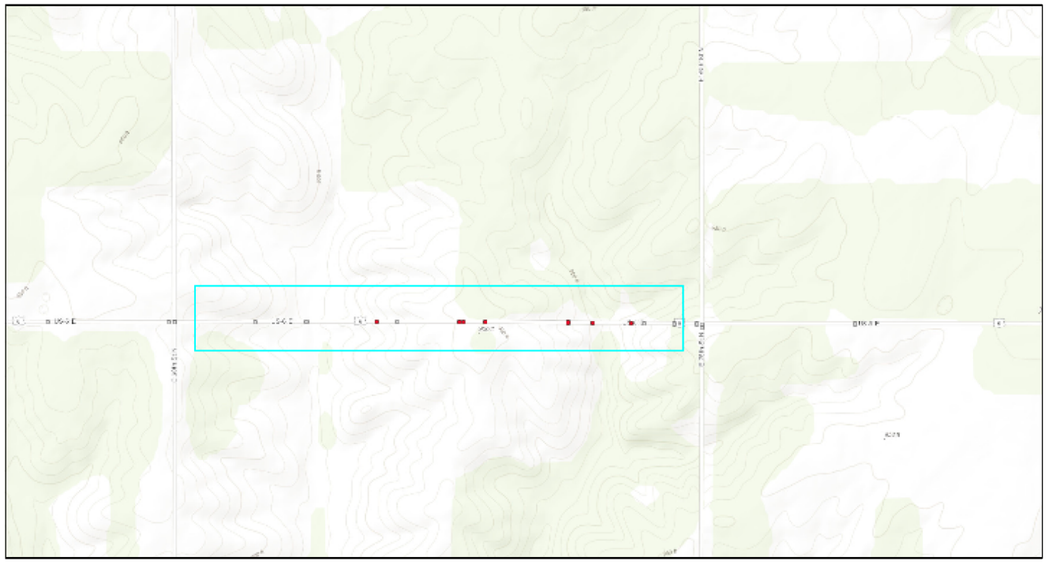
Iowa Crash Analysis Tool
Crash Characteristics
2020-2025

Crash Severity	7
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	1
Property Damage Only	6

Injury Status Summary	4
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	0
Possible (complaint of pain/injury)	1
Uninjured	0
Unknown	0
Not Reported	3

Property/Vehicles/Occupants	
Property Damage Total (dollars):	31,500.00
Average (per crash dollars):	4,500.00
Total Vehicles:	9.00
Average (per crash):	1.29
Total Occupants:	10.00
Average (per crash):	1.43

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.14
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.14



Iowa Crash Analysis Tool
Crash Characteristics
2020-2025

Time of Day/Day of Week

Day of Week	12 AM to 2 AM	2 AM to 4 AM	4 AM to 6 AM	6 AM to 8 AM	8 AM to 10 AM	10 AM to Noon	Noon to 2 PM	2 PM to 4 PM	4 PM to 6 PM	6 PM to 8 PM	8 PM to 10 PM	10 PM to 12 AM	Not reported	Total
Sunday	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Monday	0	0	0	0	0	0	0	0	1	0	0	1	0	2
Tuesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wednesday	0	0	1	0	0	0	0	0	1	0	0	0	0	2
Thursday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Friday	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Saturday	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	1	0	1	0	0	0	0	1	3	0	0	1	0	7

Month	7
January	0
February	0
March	0
April	2
May	1
June	0
July	0
August	0
September	2
October	0
November	1
December	1
Not reported	0

Lighting	7
Daylight	4
Darkness	3
Morning Twilight (dawn 30 minutes after sunri...	0
Evening Twilight (dusk 30 minutes before suns...	0
Unknown	0

Weather Conditions	7
Clear	3
Cloudy	0
Fog, smoke, smog	0
Freezing rain/drizzle	0
Rain	0
Sleet, hail	0
Snow	0
Blowing snow	0
Severe winds	1
Blowing sand, soil, dirt	0
Not reported	3
Other	0
Unknown	0

Contributing Circumstance - Environment	7
None apparent	2
Weather conditions	1
Visual obstruction	1
Non-motorist action	0
Glare	0
Animal in roadway	1
Severe crosswind	0
Not reported	2
Other	0
Unknown	0

Light Condition	7
Daylight	3
Dusk	0
Dawn	0
Dark - roadway lighted	0
Dark - roadway not lighted	1
Dark - unknown roadway lighting	0
Unknown	0
Not reported	3

Surface Conditions	7
Dry	4
Wet	0
Ice/frost	0
Snow	0
Slush	0
Mud/dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	3
Other	0
Unknown	0

Iowa Crash Analysis Tool
Crash Characteristics
2020-2025

Major Cause	7		7
Animal	4	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	FTYROW: From yield sign	0
FTYROW: Making left turn	1	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless/erratic/care...	0	Followed too close	0
Passing: On wrong side	0	Passing: Where prohibited by signs/markings	0
Passing: With insufficient distance/inadequa...	0	Passing: Through/around barrier	0
Passing: Other passing	0	Made improper turn	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Other electronic device ...	0	Driver Distraction: Passenger	0
Driver Distraction: Unrestrained animal	0	Driver Distraction: Reaching for object(s)/f...	0
Driver Distraction: Inattentive/lost in thou...	0	Driver Distraction: Other interior distracti...	0
Driver Distraction: Exterior distraction	0	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
Over correcting/over steering	0	Failed to keep in proper lane	0
Failure to signal intentions	0	Traveling on prohibited traffic way	0
Vehicle stopped on railroad tracks	0	Other: Vision obstructed	0
Other: Improper operation	0	Other: Disregarded warning sign	0
Other: Disregarded signs/road markings	0	Other: Illegal off-road driving	0
Downhill runaway	0	Separation of units	0
Towing improperly	0	Cargo/equipment loss or shift	1
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	0	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	1
Unknown	0	Not reported	0
Other: No improper action	0		

Iowa Crash Analysis Tool
Crash Characteristics
2020-2025

Manner of Crash Collision	7
Non-collision (single vehicle)	3
Head-on (front to front)	1
Rear-end (front to rear)	0
Angle (oncoming left turn)	1
Broadside (front to side)	0
Sideswipe (same direction)	0
Sideswipe (opposite direction)	0
Rear to rear	0
Rear to side	0
Not reported	2
Other	0
Unknown	0

Location of First Harmful Event	7
On roadway	4
Shoulder	0
Median	0
Roadside	0
Gore	0
Outside trafficway	0
In parking lane/zone	0
Continuous left turn lane	0
Separator	0
Not reported	0
Other	0
Unknown	3

Event Summary - Non-Collision **Total Vehicles: 9**

Sequence						
First Harmful	Most Harmful	1st	2nd	3rd	4th	
0	0	0	0	0	0	Overturn/rollover
1	0	0	0	1	0	Jackknife
0	0	0	0	0	0	Non-contact vehicle (phantom)
0	0	0	0	0	0	Vehicle went airborne
0	0	0	0	0	0	Fell/jumped from vehicle

Event Summary - Collision With — **Total Vehicles: 9**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Thrown or falling object
4	3	3	0	0	0	Animal
0	0	0	0	0	0	Non-motorist (see non-motorist section - NOT ...
1	2	0	1	1	0	Vehicle in traffic
0	0	0	0	0	0	Re-entering roadway
0	0	0	0	0	0	Parked motor vehicle
0	0	0	0	0	0	Work zone maintenance equipment
0	0	0	0	0	0	Railway vehicle/train
0	0	0	0	0	0	Struck/struck by object/cargo/person from oth...
0	0	0	0	0	0	Other non-fixed object

Event Summary - Collision With Fixed Object — **Total Vehicles: 9**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Bridge overhead structure
0	0	0	0	0	0	Bridge pier or support
0	0	0	0	0	0	Bridge/bridge rail parapet
0	0	0	0	0	0	Curb/island/raised median
0	0	0	0	0	0	Ditch
0	0	0	0	0	0	Embankment
0	0	0	0	0	0	Ground
0	0	0	0	0	0	Culvert/pipe opening
0	0	0	0	0	0	Guardrail - face
0	0	0	0	0	0	Guardrail - end
0	0	0	0	0	0	Concrete traffic barrier (median or right sid...
0	0	0	0	0	0	Other traffic barrier
0	0	0	0	0	0	Cable barrier
0	0	0	0	0	0	Impact attenuator/crash cushion
0	0	0	0	0	0	Utility pole/light support
0	0	0	0	0	0	Traffic sign support
0	0	0	0	0	0	Traffic signal support
0	0	0	0	0	0	Other post/pole/support
0	0	0	0	0	0	Fire hydrant
0	0	0	0	0	0	Mailbox
0	0	0	0	0	0	Tree
0	0	0	0	0	0	Landscape/shrubbery
0	0	0	0	0	0	Snow bank
0	0	0	0	0	0	Fence
0	0	0	0	0	0	Wall
0	0	0	0	0	0	Building
0	0	0	0	0	0	Other fixed object

Iowa Crash Analysis Tool
Crash Characteristics
2020-2025

Event Summary - Miscellaneous Events — **Total Vehicles: 9**

First Harmful	Most Harmful	Sequence 1st	2nd	3rd	4th	
0	0	0	0	0	0	Fire/explosion
0	0	0	0	0	0	Immersion
0	0	0	0	0	0	Hit and run
0	0	0	0	0	0	Eluding law enforcement
0	0	0	0	0	0	Gas inhalation/asphyxiation
0	0	0	0	0	0	Vehicle out of gear/rolled

Fixed Object Struck	**9**		
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	Guardrail - end	0
Concrete traffic barrier (median or right sid...	0	Other traffic barrier	0
Cable barrier	0	Impact attenuator/crash cushion	0
Utility pole/light support	0	Traffic sign support	0
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	0	Fence	0
Wall	0	Building	0
Other fixed object	0	None (no fixed object struck)	9

Drug/Alcohol Related	**7**
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug and Alcohol (< Statutory)	0
Drug and Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	7

Non-Motorist Type	**0**
Pedestrian	0
Pedalcyclist (bicycle/tricycle/unicycle/pedal...	0
Pedalcycle passenger	0
In or on building	0
Horse and buggy	0
Skater, personal conveyance, wheelchair	0
Not reported	0
Other non-motorist	0
Unknown	0

FILE NO. - | ENGLISH | DESIGN TEAM Veenstra & Kimm, Inc. | Jasper COUNTY | PROJECT NUMBER STP-006-4(204)--2C-50 | SHEET NUMBER A.12
8:56:38 AM 12/4/2025 smessler pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\5000601025\Design\CADD_Files\Sheet_Files\ORD_50006204_A1_VK_ddd_Z09.dgn

Road Classifiction	7
Interstate	0
US Route	7
Iowa Route	0
Secondary Road	0
Municipal Road	0
Institutional Road	0
Other	0
Unknown	0

Work Zone Type	0
Lane closure	0
Lane switch/crossover	0
Work on shoulder or median	0
Intermittent or moving work	0
Not reported	0
Other	0
Unknown	0

Work Zone Location	0
Before work zone warning sign	0
Advance warning area	0
Transition area	0
Within or adjacent to work activity	0
Termination area	0
Not reported	0
Other	0
Unknown	0

Work Zone Activity	0
Construction	0
Maintenance	0
Utility	0
Not reported	0
Other	0
Unknown	0

Workers Present	0
Workers only	0
No workers present	0
Workers and officer present	0
Law enforcement only	0
No one present	0
Not reported	0
Other	0
Unknown	0

Intersection Classification	4
Interstate - Interstate	0
Interstate - US Route	0
Interstate - IA Route	0
Interstate - Secondary	0
Interstate - Municipal	0
Interstate - Institutions	0
US Route - US Route	0
US Route - IA Route	0
US Route - Secondary	0
US Route - Municipal	0
US Route - Institutions	0
IA Route - IA Route	0
IA Route - Secondary	0
IA Route - Municipal	0
IA Route - Institutions	0
Secondary - Secondary	0
Secondary - Municipal	0
Secondary - Institutions	0
Municipal - Municipal	0
Municipal - Institutions	0
Institutions - Institutions	0
Not Indicated as an Intersection	4
Unlocated or Unknown	0

Contributing Circumstance - Road	7
None apparent	4
Surface condition (e.g., wet, icy)	0
Debris	0
Ruts/holes/bumps	0
Work Zone (roadway-related)	0
Slippery, loose, or worn surface	0
Obstruction in roadway	0
Traffic control obscured	0
Shoulders (none, low, soft, high)	0
Non-highway work	0
Traffic backup, prior crash	0
Traffic backup, regular congestion	0
Traffic backup, prior non-recurring incident	0
Disabled vehicle	0
Not reported	3
Other	0
Unknown	0

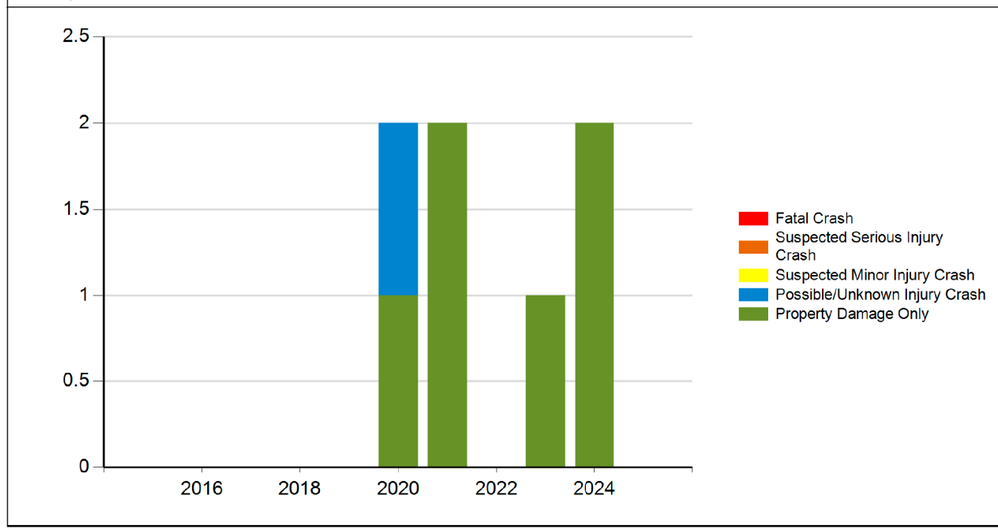
Work Zone Related	0
Yes	0
No	0
Unknown	0
Not reported	0

Iowa Crash Analysis Tool
Crash Characteristics
2020-2025

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	1	1	2
2021	0	0	0	0	2	2
2022	0	0	0	0	0	0
2023	0	0	0	0	1	1
2024	0	0	0	0	2	2
2025	0	0	0	0	0	0
Total	0	0	0	1	6	7

Severity/Year

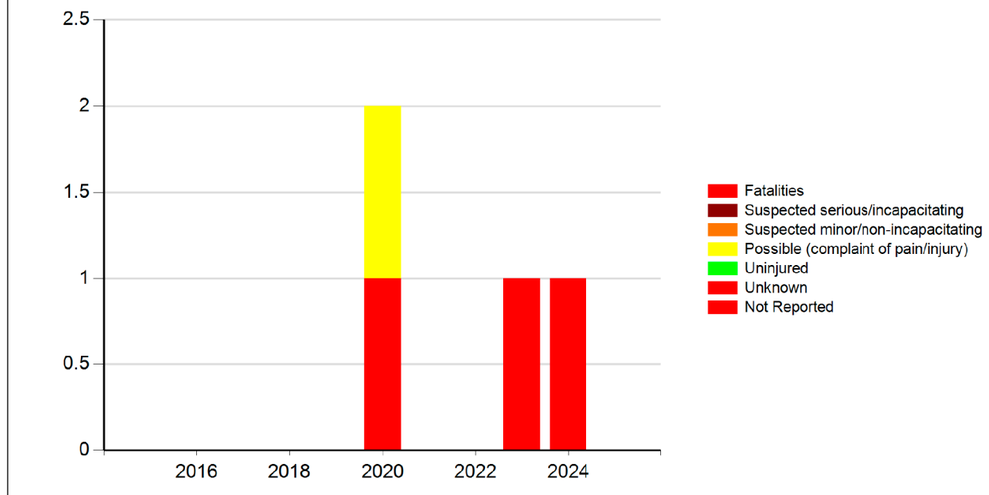


Iowa Crash Analysis Tool
Crash Characteristics
2020-2025

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Uninjured	Unknown	Not Reported	Total
2015	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0
2020	0	0	0	1	0	0	1	2
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	1	1
2024	0	0	0	0	0	0	1	1
2025	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	3	4

Injury Status/Year



Iowa Crash Analysis Tool
Crash Characteristics
2020-2025

Meeting the following criteria

Jurisdiction: Counties (Jasper)
Year: 2020, 2021, 2022, 2023, 2024, 2025
Map Selection: Yes
Filter: None

Analyst Information

General input

FHWA or Structure Number	NA
PIN Number	25-50-006-010
Project Number	STP-006-4(204)--2C-50
Design Number	TBD
County Name	Jasper
Route Carried	US 6
Feature Crossed	Unnamed Ditch
Location Description	0.25 mi E of E 60th St

Required SI&A Input for Calculation of ABC Rating Score

SI&A Item No.	SI&A Item	SI&A Item Value	SI&A Units
5B	Route Signing Prefix	2	
19	Bypass, Detour Length	13	miles
29	Average Daily Traffic **(On)**	2,900	
29	Average Daily Traffic **(Under)**	0	
45	Number of Spans in Main Unit	1	
46	Number of Approach Spans	0	
109	Average Daily Truck Traffic	6	%

Note: If the ABC Rating Score is less than 50 and the structure is an interstate bridge or the detour is greater than or equal to 30 miles then the score is set to 50.

Concept Measure Scores

Concept Measure		Score		
Average Annual Daily Traffic	Combined value of 100% on and 25% under = 2,900	1	0	No traffic impacts
			1	Less than 5000
			2	5000 to less than 10,000
			3	10,000 to less than 15,000
			4	15,000 to less than 20,000
			5	20,000 or more
Out of Distance Travel	Value in miles = 13	3	0	No detour
			1	Less than 5
			2	5 to less than 10
			3	10 to less than 15
			4	15 to less than 20
			5	20 or more
User Costs	Value in $ = $15,961.24	2	0	No user costs
			1	Less than $10,000
			2	$10,000 to less than $50,000
			3	$50,000 to less than $75,000
			4	$75,000 to less than $100,000
			5	$100,000 or more
Economy of Scale	Value is total number of spans = 1	0	0	1 span
			1	2 or 3 spans
			2	4 or 5 spans
			3	6 spans or more

ABC Rating Score Factors and Weights

Concept Measure	Score	Weight Factor	Adjusted Score	Maximum Score	Adjusted Score
Average Annual Daily Traffic	1	10	10	5	50
Out of Distance Travel	3	10	30	5	50
User Costs	2	10	20	5	50
Economy of Scale	0	5	0	3	15
		Total Score	60	Max. Score	165
		Calculated ABC Rating Score	36		
		ABC Rating Score	36		

Roadway	US 6		
PIN Number	25-50-006-010	**Submittal Date**	09/26/25
Project Number	STP-006-4(204)--2C-50		**Approval Date**
District	District 1	**Assistant District Engineer**	Jeremy Vortherms
County	JASPER	**or**	
Route	US 6	**Office Director**	
Location	Culvert over Unnamed Creek, 0.25 mi E of E 60th St		
Work Type	Culvert Replacement		
Segment Manager			
Designer	Veenstra & Kimm, Inc.		

Design Manual Section 1C-1
Last Updated: 04-29-19

Rural Two-Lane Highways (Rural Arterials)

Design Element		Preferred	Acceptable	Project Values
Design speed (mph)		60	50	60
Maximum superelevation rate (Refer to Section 2A-2)		6%	8%	6%
Design lane width (ft)		12	12	12
Full depth paved width (ft)		14	12	14
Right turn lane (ft)		12	10	N/A
Climbing Lane (ft)		12	12	N/A
Left turn lane (ft)		12	10	N/A
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%
	Auxiliary and turn lanes	3%	3% maximum	N/A
	Crown break at centerline	4%	4% maximum	N/A
Shoulder cross-slope (on tangent sections)		4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4%
Curb type (Refer to Section 3C-2)	Design speed = 50 or 55 mph	6-inch sloped	6-inch standard	N/A
	Design speed ≥ 60 mph	4-inch sloped	6-inch sloped	N/A
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	6:01
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3:1
	Curbed roadways	2%	not steeper than 3:1	N/A
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1
Transverse Slopes	w/ drainage structures	8:1	6:1	N/A
	w/o drainage structures	10:1	6:1	N/A
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	N/A
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	N/A
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft. offset left and right	28'
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	N/A
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	N/A
	Over railroad	23.3	23.3	N/A
	Sign trusses and pedestrian bridges	17.5	17	N/A
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service		B	B	B

*FHWA notification via email is required if acceptable critera is not met on the NHS system (No formal design exeption is required)

Design year ADT = 2900

Design Manual Section 1C-1
Last Updated: 04-29-19

Effective Shoulder Width and Type for Two-Lane Highways

Preferred (values shown in feet)			Acceptable (values shown in feet)			Project Values
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	N/A
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	N/A
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width	
Climbing Lanes	6	4	Climbing Lanes	4	0	N/A
Two-Lane Highways	Effective Shoulder Width	Paved Width	Two-Lane Highways	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated	10	10				
On roadways approaching urban areas (due to increased bike traffic)	10	10	Design year ADT > 2000 vpd	8	0*	Effective = 10' Paved = 4'
On all curves with a superelevation rate of 7.0% or greater	10	10				
On roadways with design year ADT > 5000	10	6	Design year ADT between 400 - 2000 vpd	6	0*	
On all other NHS	10	6				
On non-NHS routes with design year ADT > 3000	10	6	Design year ADT < 400 vpd	4	0*	
On non-NHS routes with design year ADT < 3000	8	0*				

*Requires safety edge-Refer to Section 3C-6

Curbs should be located beyond the outer edge of the effective shoulder width in rural areas

Refer to Section 3C-2 for curb offsets in urban areas

Notes:

Acceptable values for clear zone asusmed based on adjacent culvert structure

Roadway Design Speed (mph) = 60

Design Manual Section 1C-1
Last Updated: 04-29-19

Design Criteria for High Speed Roadways

Design Element			Preferred Criteria, Design Speed, mph						Acceptable Criteria, Design Speed, mph						Project Values
			50	55	60	65	70	75	50	55	60	65	70	75	
Stopping sight distance (ft) (Refer to Section 6D-1)			425	495	570	645	730	820	425	495	570	645	730	820	570
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e_{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	1330
		e_{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210	N/A
Minimum vertical curve length (ft) (Refer to Section 2B-1)			150	165	180	195	210	225	150	165	180	195	210	225	180
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		84	114	151	193	247	312	84	114	151	193	247	312	151
	sag vertical curves	roadways without fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	136
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	
Minimum gradient (%)	(Refer to Section 2B-1)		0.5						0.3% with a curb, 0.0% without a curb						0.5
Maximum gradient (%) (Refer to Section 2B-1)		Urban roadways	4		3				7	6	6	--	--	--	
		Rural roadways							5	5	4	4	4	4	3
		Interstates							5	5	4	4	4	4	
Clear zone			See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						26'

Bridge Bureau Attachment for Concept Statement

Date: October 3, 2025
By: Veenstra & Kimm, Inc.
Location: US 6 over Drainage Ditch

County: Jasper County
Phase No.: STP-006-4(204)--2C-50
Project Code: 25-50-006-010

1. Regulatory/Coordination
   a. Iowa DNR Flood Plain permit = No
   b. Iowa DNR Sovereign Lands permit = No
   c. Local Record of Coordination = No
   d. Flood Insurance Study = No
   e. Drainage District = No
   f. Corps of Engineers Section 408 = Yes, per PERMT (DNR)
   g. State Water Trail or Paddling Route = No
   h. Historic Structure = No
   i. Federally owned land in vicinity = No
   j. USGS or Iowa Flood Center (IFC) gage or sensor impacted? No
   k. Obstruction Evaluation/Airport Airspace Analysis per FAA website = No

2. Hydrologic/Hydraulic Analysis/RIDB Dataset
   a. Design discharge methodology = Streamstats (2015-5055)
   b. Hydraulic analysis done = Yes, Iowa Culvert Hydraulics
   c. If DA > 10 sq. mi. Riverine Infrastructure Database (RIDB) dataset is required with B1 submittal = No

3. Structure/Roadway Layout Considerations
   a. A roadway profile grade raise is not required for box culvert fill.
   b. A slight channel shift is proposed to align the channel with the new culvert inlet.
   c. Length of culvert requires permanent easement on the downstream end.

4. Special construction issues
   a. Stream degradation is apparent on the downstream end. Energy dissipator in the form of a drop inlet structure is proposed.

5. Special survey = No

6. Aesthetic enhancements = No

7. Other
   a. Maintenance of Traffic - Road closure, detour route to be provided

Special Survey:

None.

12-22-2025
Field Exam Notes

D2 virtual field exam meeting was held on December 22, 2025. Those present included from Jimmy Ellis, Yanxiao Jia, Christian Kennel, Daniel Hofer, John Bartholomew, Phil Mesher, Brad Hofer, David Claman, Sharihaboshra Diya and Jacob Imming from Iowa DOT, from Blake Walter from NEPA; Janee Becker, Jill Garton, Claire Asberry and Brandy Beavers from the LEB; Frank Leong, Benjamin Adey, Sean Passick, Devendra Tamrakar and Shannon Hardman from Iowa DOT District 1, and Mark Currie, Edward Gapatan, Russ Lemke and Steven Messler from Veenstra & Kimm, Inc.

Mark discussed the existing culvert and its history, and continued to discuss the culvert replacement concept and the proposed detour route which was previously used on a nearby project. Discussion continued to updates made from the original concept including additional roadway reconstruction for culvert replacement, longer culvert and custom retaining wall headwall at outlet due to updated survey showing lower flowline and closer than anticipated bend at the outlet.

Potential right of way needs was discussed next for armoring the bend on the south end with revetment in lieu of stream cutoff/re-alignment.
- Brandy B. agreed not to cut off or align the stream downstream
- Brandy B. added to put revetment above ordinary high-water mark, if possible

Discussion of drop inlet alternative using parallel wing headwall with raised inlet vs butterfly wing shown as in plans (derived from BDM commentary example)
- It was concluded that it will ultimately depend on the grading needs at the outlet

Brandy B. asked about the culvert being fish passable and requiring the culvert to be buried.
- The concept replacement is not fish passable since presently there is already a big jump at the outlet end preventing fish passage. The jump just moved to the inlet end.

Discussion of drop inlets requiring pedestrian hand railing per BDM due to appreciable culvert height
- Jim E. commented to put a note on the TSL to consider adding pedestrian railing in the Final Design

Cast-in-place option only due to custom inlet and outlet headwalls (No precast option). Double reinforced pavement replacement per PR-120

FIELD EXAM NOTES

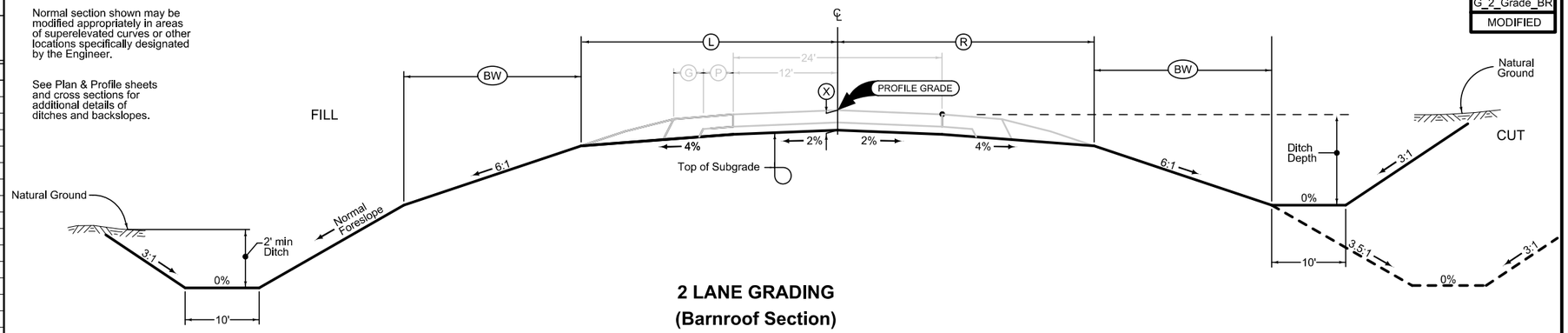
FIELD EXAM NOTES

FIELD EXAM NOTES

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet
US 6	1541+29.70	1543+33.70	31.0	31.0	15	7.8

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.



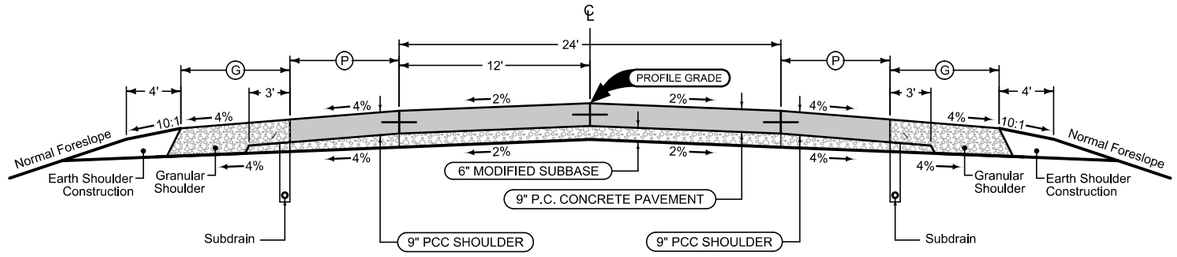
G_2_Grade_BR
MODIFIED

2 LANE GRADING
(Barnroof Section)

Full Depth PCC Shoulder

Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17' spacing

STATION TO STATION		(P) Feet	(G) Feet
1541+85.00	1542+76.00	4	6



Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2

STATION TO STATION	
1541+85.00	1542+76.00

Full Depth PCC Shoulder

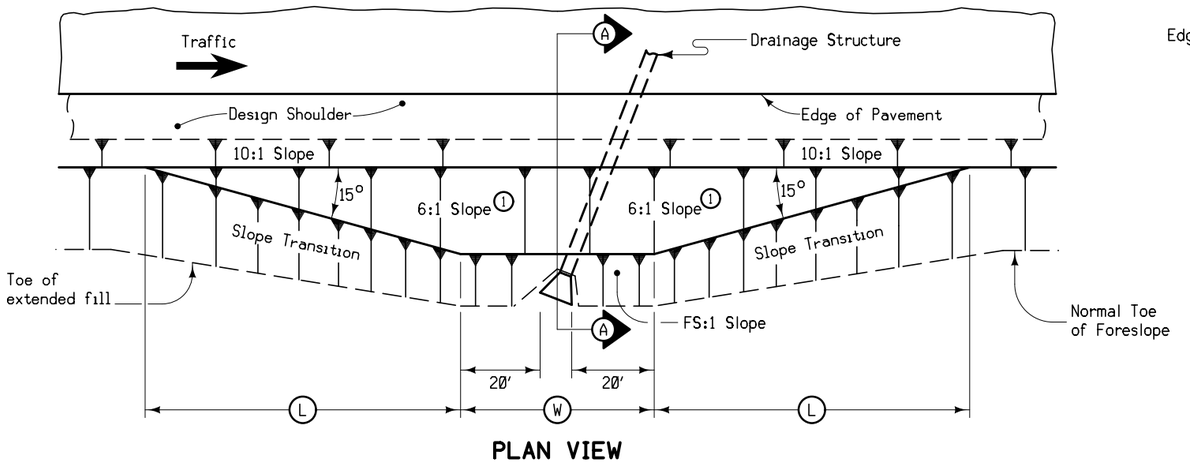
Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17' spacing

STATION TO STATION		(P) Feet	(G) Feet
1541+85.00	1542+76.00	4	6

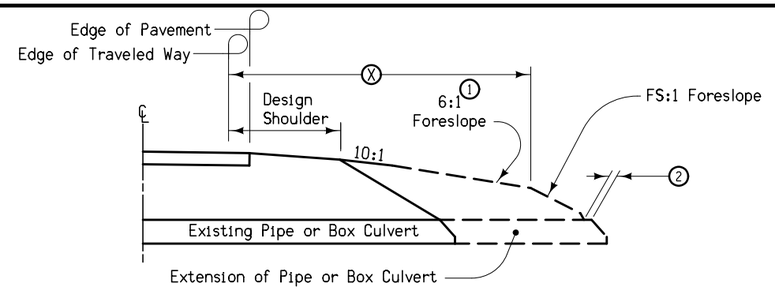
See Tab 100-24 or 100-25 for pavement quantities.

See Tab 112-9 for shoulder quantities.

US 6



PLAN VIEW



SECTION A-A

STRUCTURE LOCATION		(W)	(L)	(X)	(FS)
STATION (3)	SIDE	Feet	Feet	Feet	
1542+25.70	L	90	45	26	3
1542+25.70	R	114	45	26	3

4312
10-15-19

At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten as indicated so as to cover the structure. Minimum earth cover is 6 inches.

(1) Slope may be flatter than 6:1.

(2) 6 inch minimum for pipe installations or to top of headwall on RCB.

(3) At ℄ of roadway.

(W) = Pipe or RCB opening width plus 20 feet each side.

BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE

SURVEY SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- Terrace
- Earth Dam or Dike (Existing)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Existing Utility Access (Manhole)
- Fire Hydrant
- WH Water Hydrant (Rural)
- Septic Tank
- C Cistern
- LP L.P. Gas Tank (No Footing)
- UST Underground Storage Tank
- Latrine
- Satellite TV Dish
- WHU Water Hook Up
- RT Radio Tower
- TA Tower Anchor
- Guardrail (Beam or Cable)
- GP Guard Post (one or two)
- Guard Post (over two)
- FP Filler Pipe
- GV Gas Valve
- WV Water Valve
- SL Speed Limit Sign
- MM Mile Marker Post
- SIGN Sign
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box
- EB Electric Box

UTILITY LEGEND

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.		
Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
SHADING	**Design Color No.**		**Transparency**
Pink, Dark	(13)		Temporary Pavement Shading 50%
Yellow	(4)		Proposed Pavement Shading 50%
Orange	(6)		Proposed Granular Shading 50%
Orange	(70)		Proposed Shoulder Granular Shading 50%
Yellow	(68)		Proposed Shoulder Paved Full Depth Shading 50%
Yellow	(132)		Proposed Shoulder Paved Partial Depth Shading 50%
Brown, Light	(236)		Grading Shading 50%
Orange, Light	(134)		Proposed Granular Entrance Shading 50%
Yellow	(220)		Proposed Paved Entrance Shading 50%
Tan	(8)		Proposed Sidewalk Shading 50%
Blue, Light	(230)		Proposed Sidewalk Landing Shading 50%
Pink	(11)		Proposed Sidewalk Ramp Shading 50%
Red	(3)		Proposed Structure Shading 50%
Red	(3)		Delineates Restricted Areas 0%

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(10)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

- Reference Point / Station — Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way Symbol
- Proposed Right-of-Way Line
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary) Symbol
- Easement (Temporary) Line
- Easement
- C/A Access Control
- Property Line Symbol
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D, E, F, & K)

FILE NO. -	ENGLISH	DESIGN TEAM **Veenstra & Kimm, Inc.**	**Jasper** COUNTY	PROJECT NUMBER **STP-006-4(204)--2C-50**	SHEET NUMBER **D.1**

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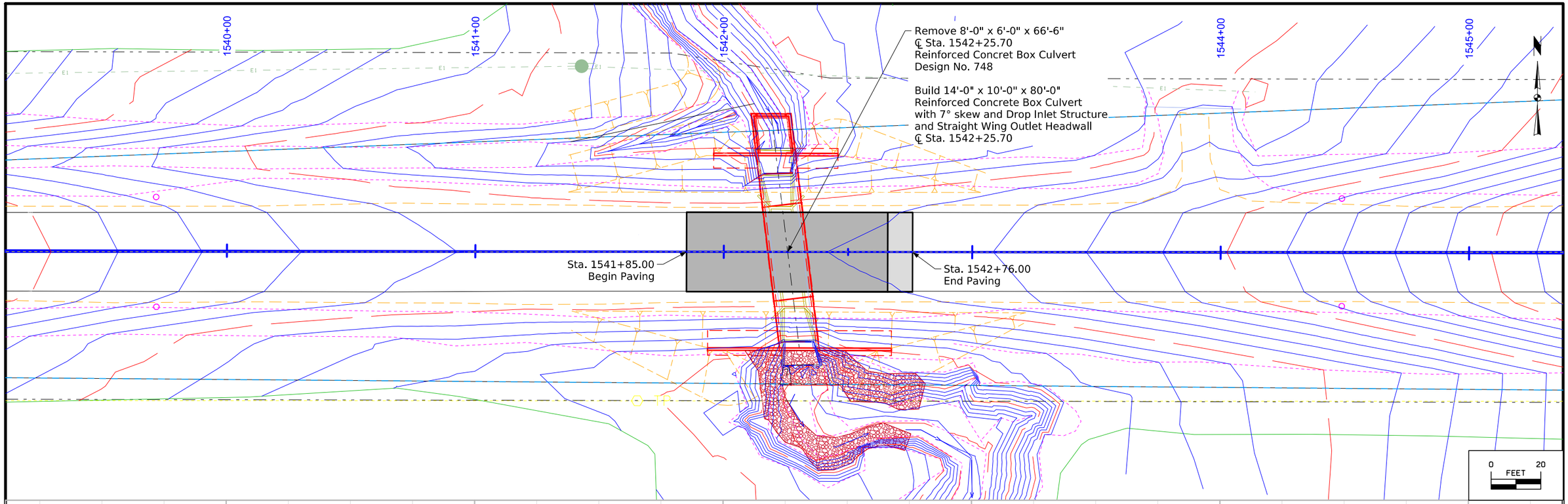

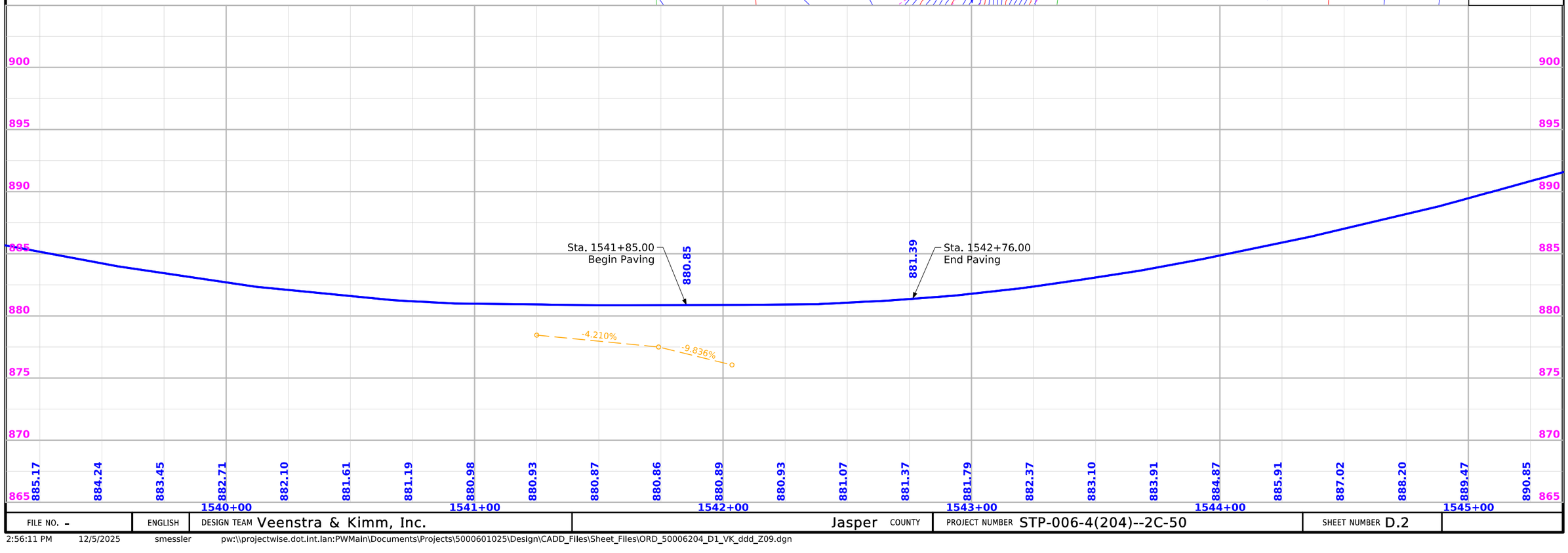

FILE NO. -	ENGLISH	DESIGN TEAM Veenstra & Kimm, Inc.	Jasper COUNTY	PROJECT NUMBER STP-006-4(204)--2C-50	SHEET NUMBER D.2	

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SURVEY INDEX

County: Jasper
PIN: 25-50-006-010
Project Number: STP-006-4(204)--2C-50
Location: 0.25 mi E of E 60th St
Type of Work: Culvert
Project Directory: 5000601025

Survey Personnel

Jerett Still – Party Chief
Craig Beedle – PLS
TJ Coyle – Assistant Survey Party Chief

Date(s) of Survey

Begin Date 09/18/2025
End Date 10/06/2025

General Information

Measurement units for this survey are US survey feet. This survey is for proposed revetment for Jasper County Culvert under HWY 6; 0.25 mi E of E 60th St.

Utility Information

For logging data and other utility details see Utility Survey and Ownership Report in the Utility folder of the PrelimSurvey project directory.

Project Control

Vertical Control
Vertical control was established by verifying one NGS monument. Vertical datum for this survey is relative to NAVD88. Geoid 2018 was used in processing. The height was computed at MH1063 and MH0207. Vertical control was checked with IARTN checks. This survey observed MH1063 and MH0207.
MH0207 – disk set in concrete monument
Elevation = 922.629
MH1063 - disk set in concrete monument
Elevation = 1030.378

Horizontal Control
The project coordinate system for this survey is Iowa RCS zone 09 (U.S. Survey Feet). This survey control is relative to IARTN reference stations IARTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011). Coordinates were determined conducting a 5-minute observation in the morning, afternoon, and evening. Coordinates were then averaged between the three to determine the final coordinate.
Real Time Network reference stations. For additional details of the control survey, contact the Preliminary Survey department.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 09 (U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3 or 2018u2

Alignment Information

The horizontal alignment for U.S. Hwy 6 is a retrace of the existing alignment. Survey stationing was equated to Sta. 1542+25.70 and carried back and ahead without equation throughout the survey.

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points. Primary control is for use with RTK base stations and for RTN validation. Future surveys will use primary project control to establish temporary control as needed for construction or other surveying applications.

HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 09 (U.S. Survey Foot)

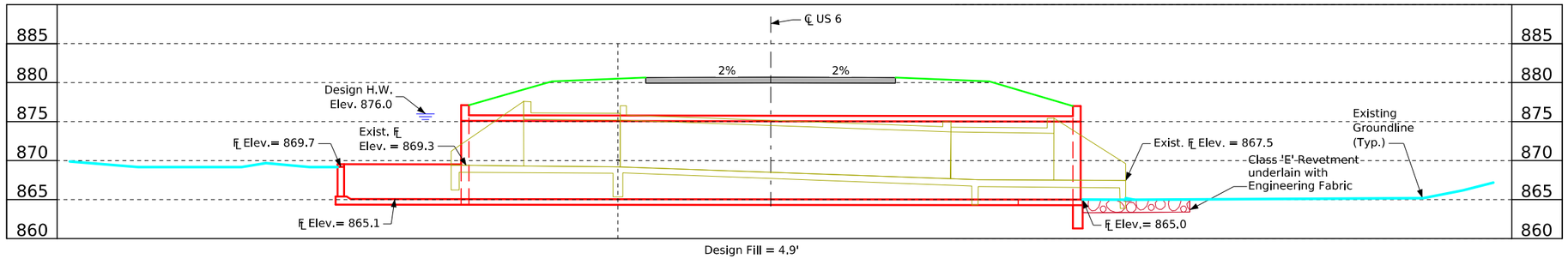
VERT. DATUM: NAVD88 - Geoid Model: 2018u3 or 2018u2

Coordinate listing from next sheet will be used with IaRTN for monument recovery. No other reference ties are given.

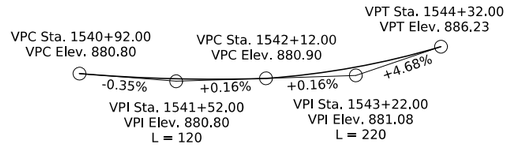
HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
Ia. Regional Coordinate System Zone 09 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3 or 2018u2

Point Name	Northing	Easting	Elevation	Code Description
cp500	7729411.22	19456926.31	885.35	CP 5/8" rebar 1' deep; 220.86' East of Box Culvert and 5.84' North of Edge of Asphalt
cp501	7729367.89	19456926.30	885.41	CP 5/8" rebar 1' deep; 212.46' East of Box Culvert and 5.77' South of Edge of Asphalt
cp502	7729410.88	19456448.99	881.79	CP 5/8" rebar 1' deep; 244.08' West of Box Culvert and 6.25' North of Edge of Asphalt
cp503	7729366.66	19456449.18	881.75	CP 5/8" rebar 1' deep; 252.59' West of Box Culvert and 6.24' South of Edge of Asphalt

Control Point 501, 7729367.89, 19456926.30, 885.41, CP 5/8" Rebar



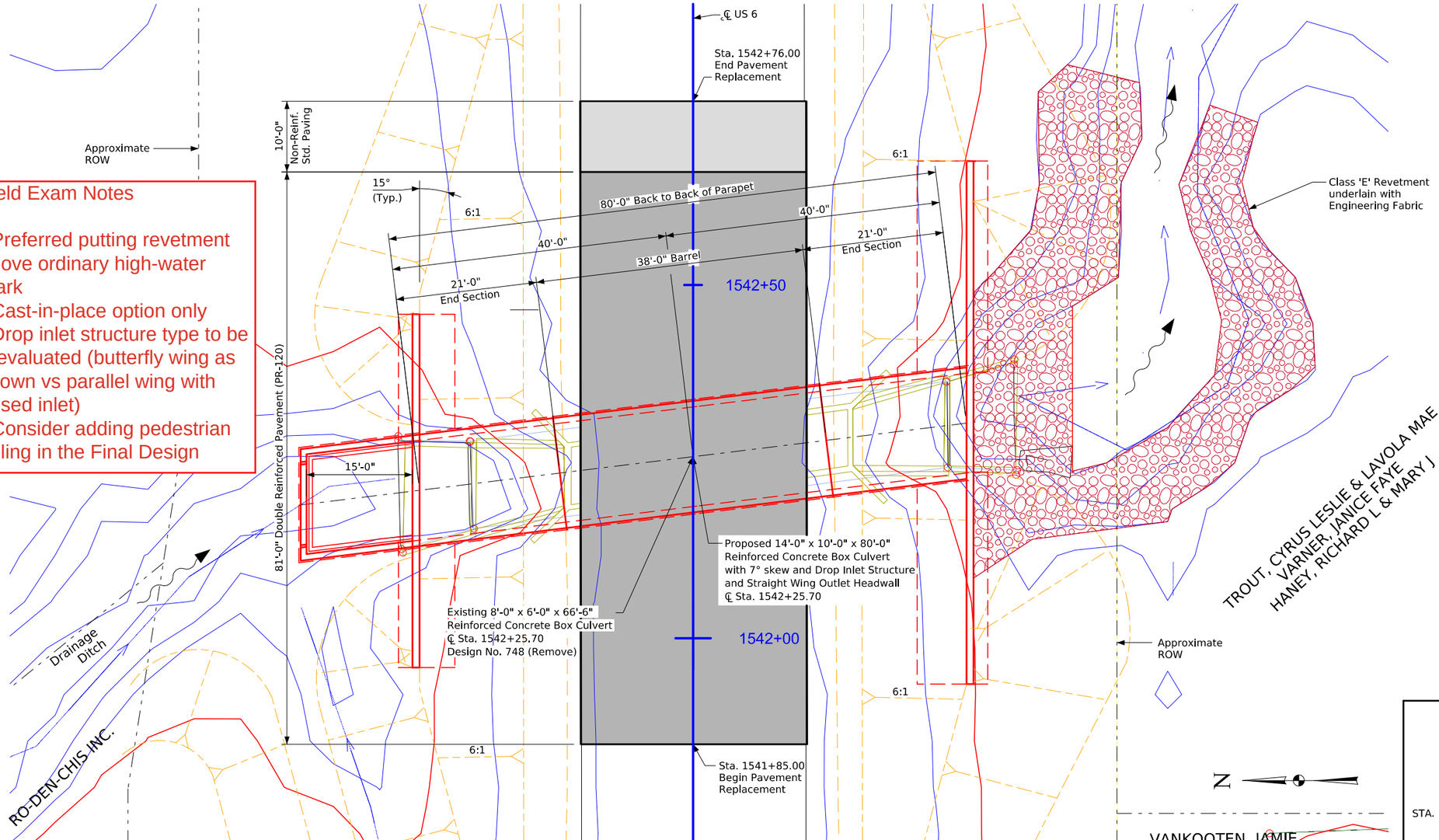
Longitudinal Section along ℄ Culvert



Proposed Profile Grade US 6

Field Exam Notes

- Preferred putting revetment above ordinary high-water mark
- Cast-in-place option only
- Drop inlet structure type to be reevaluated (butterfly wing as shown vs parallel wing with raised inlet)
- Consider adding pedestrian railing in the Final Design



Situation Plan

Hydraulic Data

Drainage Area = 1.31 Acres
Q_{50} = 1370 CFS
HW Elev. = 876.0
Stream Slope = 52.7 Ft./Mi.

Utilities Legend:

— E1 — - Overhead Electric

Designer Notes

1. Drainage mut be maintained through existing ditch/channel throughout construction.
2. Custom drop inlet headwall.
3. Custom outlet headwall.

Location

US 6 over Drainage Ditch
T-80N R-18W
Section 29/32
Kellogg Township
Jasper County
Latitude ~~41.702972~~°
Longitude -~~92.975133~~°

41.702845,
-92.975230

Traffic Estimate

2027 AADT	2,700	V.P.D.
2047 AADT	2,900	V.P.D.
2047 DHV	300	V.P.H.
Trucks	6	%

Design For 7 degrees (R.A.)

14'-0" x 10'-0" x 80'-0" Reinforced Concrete Box Culvert

Situation Plan

STA. 1542+25.70 (US 6)

Turn-in Date: -

Jasper County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. - | Design Sheet No. 1 of 1 | FHWA/Asset

FILE NO. -	ENGLISH	DESIGN TEAM Veenstra & Kimm, Inc.	Jasper COUNTY	PROJECT NUMBER STP-006-4(204)—2C-50	SHEET NUMBER V.1

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