LETTING DATE
July 21, 2026

RCB Culvert Replacement - Single Box
STPN-224-1(020)--2J-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 0327 Cast in Place Alt.
V.2-V.4	Design 0327 Cast in Place Alternate
V.5	Estimated Quantities - Design 0327 Precast Alternate
V.6-V.7	Design 0327 Precast Alternate
SPS Sheets	Bridge Plan Soils Sheet
SPS.1	Bridge Plan Soils Sheet
Road Sheets	Road Plan
B.1-W.4	Road Plans
C.1-C.2	Estimated Quantities - Road
C.5	Standard Plans - Road
	<<<H SHEETS

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
JASPER COUNTY
RCB Culvert Replacement - Single Box

IA 224 over East Burr Oak Creek
0.1 mi S of N 75th Ave E

Refer to the Plan Sheets for list of applicable specifications.

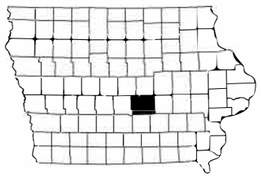
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

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

Preliminary
Not For Construction

Iowa DOT Bridges and Structures
Consultant Coordinator Contact:
Bryant Thelen

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



Design Data Rural

2024 AADT	660	V.P.D.
20-- AADT	--	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	18	%
Total Design ESALs	--	

Index of Seals

Sheet No.	Name	Type
A.1	Chad W. Meyer	Structural Design
V.1	Chad W. Meyer	Hydraulic Design
SPS.1 & CS.1	Zachary A. Bonzer	Geotechnical Design
A.1	Colton D. Hoffmann	Roadway Design

Revisions

TOTAL	46
PROJECT IDENTIFICATION NUMBER	26-50-224-010
PROJECT NUMBER	STPN-224-1(020)--2J-50
R.O.W. PROJECT NUMBER	
PROJECT DIRECTORY NUMBER	5022401026

English Culvert Standards

Standard	Issued	Revised
RCB G2-20	7-20	
RCB G3-20	7-20	
RCB 16-12-20	7-20	
PWH 0-1-20	7-20	
PWH 0-2-20	7-20	
PWH 0-3-20	7-20	
PWH 0-4-20	7-20	
PWH 0-5-20	7-20	
PRCB G1-20	12-20	
PRCB G2-20	12-20	1-23
PRCB 16-20	12-20	10-21
PES 3-20-T1	12-20	10-21
PES 4-20-T1	12-20	1-23
PES 3-20-T3	12-20	10-21
PES 4-20-T3	12-20	1-23
PES 10-20-T3	12-20	10-21
PES 11-20	12-20	
PEP 12-20	12-20	

Standard Road Plans

Standard Road Plans are listed on Sheet Number C.5

Roadway Design

LICENSED PROFESSIONAL ENGINEER
Colton D. Hoffmann
26427
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.

04-21-2026
Signature Date
Colton D. Hoffmann
Printed or Typed Name

My license renewal date is December 31, 2027

Pages or sheets covered by this seal: B.1, C.1 - C.13, D.1, G.1 - G.4, H.1, J.1 - J.3, RC.1 - RC.3, RR.1, T.1, W.1 - W.4

Structural Design

LICENSED PROFESSIONAL ENGINEER
Chad W. Meyer
17394
IOWA

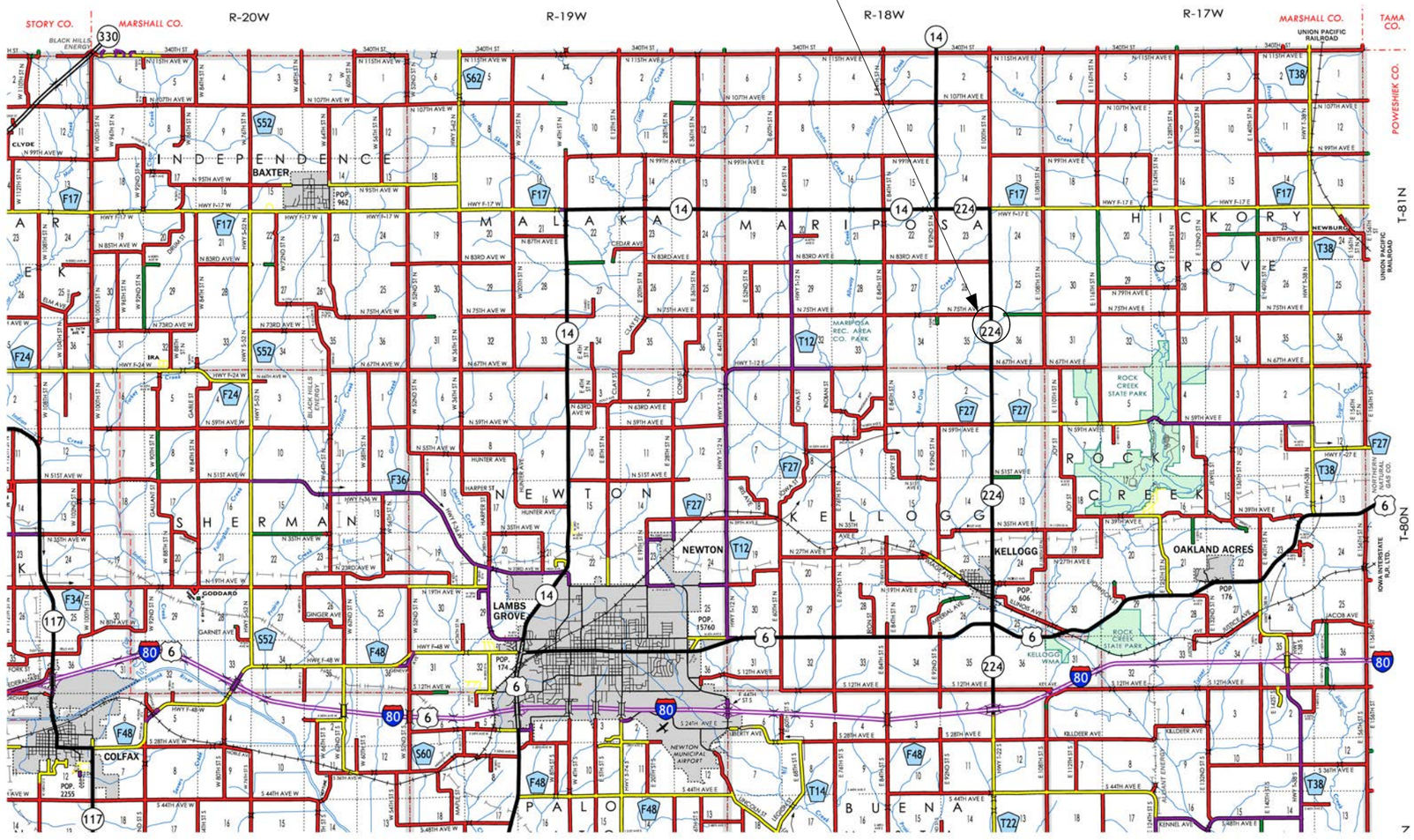
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

04-21-2026
Signature Date
Chad W. Meyer
Printed or Typed Name

My license renewal date is December 31, 2026

Pages or sheets covered by this seal: A.1 - A.2, V.1 - V.7

Design No. 0327
Asset ID No. 900905



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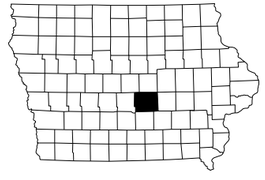
Jasper County Location Map

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
- STATE PARKS
- STATE INSTITUTIONS
- FEDERAL LAND

FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	JASPER COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER A.2	

9:35:33 PM 2/20/2026 jkane pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\5022401026\Bridge\(020)_RCB Culvert Replacement - Single Box\SHT_50224020_McClure_327_900905_Z09.dgn

Estimated Culvert Quantities and Reference Notes

Item No.	Item Code	Item	Unit	Quantities Estimated	Estimate Reference Notes
1	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1	Includes all costs associated with removing the existing 10' x 7' and 10' x 9' RCB culvert as needed to facilitate construction of the new RCB culvert.
2	2402-2720000	EXCAVATION, CLASS 20	CY	3,890	Includes filling and compacting low areas around proposed culvert. Includes excavation necessary to place 1'-0" working blanket.
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET	CY	132	Granular material shall be in accordance with Section 4118 of the Standard Specifications. Includes 132 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction.
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	346.9	Includes all resilient joint filler required.
5	2404-7775000	REINFORCING STEEL	LB	68,218	---
6	2533-4980005	MOBILIZATION	LS	1	---

Summary of Reinforcing Steel

Location	Quantity	Total
Headwalls 0° Skew	2 @ 6,664	13,328
11'-0" Barrel Sections	2 @ 5,367	10,734
30'-0" Barrel Sections	3 @ 14,636	43,908
5r1 Bars ✱✱	4 @ 62	248
	Total (LB)	68,218

✱✱ One set of 5r1 Bars, 17-5r1 x 3'-6" = 62 lbs.

Concrete Placement Quantities

Location	Footing	Walls	Slab	Total
Headwalls 0° Skew	2 @ 32.9	2 @ 13.0	✱ 2 @ 1.9	95.6
11'-0" Barrel Sections	2 @ 10.0	2 @ 6.5	2 @ 8.2	49.4
30'-0" Barrel Sections	3 @ 27.2	3 @ 17.8	3 @ 22.3	201.9
Total (CY)	167.4	92.4	87.1	346.9

✱ Includes parapet and top of wingwall.

Roadway Quantities shown elsewhere in these plans.

Design History at this Site
(Includes this Design)

Des. No.	Type of Work
Unknown	Original Design
2358	Culvert Extension
0327	RCB Culvert Replacement (This Design)

Design For 5 Degree LA

Single 16' x 10' x 112' Cast-In-Place Reinforced Concrete Box Culvert

Estimate Quantity

STA. 273+28.05 (IA 224)

Turn-in Date: May 2026

Jasper County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327 Design Sheet No. 1 of 4 FHWA/Asset 900905

General Notes:

It is the intent of this design to construct a 16' x 10' x 112'-0" cast-in-place reinforced concrete box culvert skewed 5° left ahead at station 273+28.05.

Electronic copies of original design plans are available to the Contractor as part of the E-files supplied with the contract documents.

Faint lines on plans indicate existing structure.

Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

The R.C.B. Culvert sections are designed for HL-93 live load and earth fills of 13 feet.

All reinforcing bars and bars notes as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

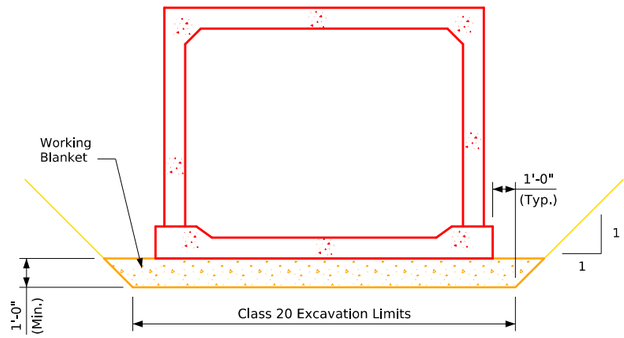
Excess Class 20 Excavation material suitable for backfilling shall be stockpiled at the construction site, as directed by the Engineer.

Class 20 Excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Standards:
For details and notes not shown refer to the following Iowa D.O.T. - Highway Standards:

Standard	Issued	Revised
RCB G2-20	7-20	
RCB G3-20	7-20	
RCB 16-10-20	7-20	
PWH 0-1-20	7-20	
PWH 0-2-20	7-20	
PWH 0-3-20	7-20	
PWH 0-4-20	7-20	
PWH 0-5-20	7-20	



Working Blanket Detail

Working Blanket shall terminate 3'-0" short of the curtain wall.

Traffic Control Plan
The roadway will be closed to thru traffic. Refer to the Traffic Control Plan shown elsewhere in these plans.

Design For 5 Degree LA

Single 16' x 10' x 112' Cast-In-Place Reinforced Concrete Box Culvert

General Notes

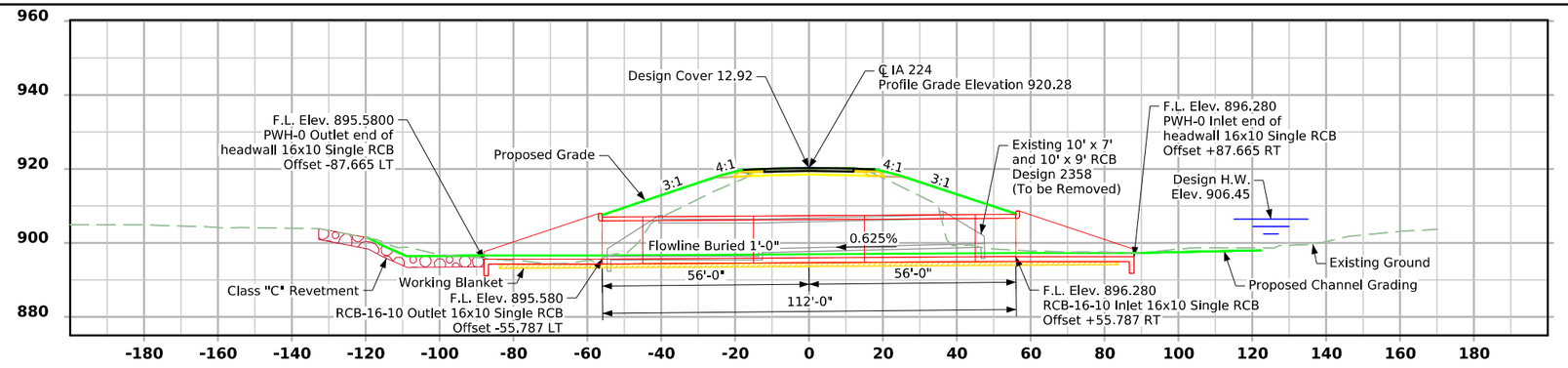
STA. 273+28.05 (IA 224)

Turn-in Date: May 2026

Jasper County

IOWA DEPARTMENT OF TRANSPORTATION

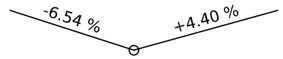
Design No. 0327 Design Sheet No. 2 of 4 FHWA/Asset 900905



STA 273+28.05

Longitudinal Section Along ℄ Culvert

Control Point: 202, CP / 1/2IN Rebar BPC,
Elev. 903.67, N.7760523.26, E.19476395.85



VPI Sta. = 274+50.00 VC = 500'
VPI Elev. = 910.51

Proposed Profile Grade IA 224

Utilities Note:

Utilities shown on this sheet are for information only.See Road Design sheets for utility information.

General Utility Symbols:

E - Electric Line	FO - Fiber Optic Line
G - Gas Line	GHP - Gas High Pressure
SAN. - Sanitary Sewer	ST S - Storm Sewer
T - Telephone Line	TV - TV
W - Water Line	-●- - Power Poles

Hydraulic Data

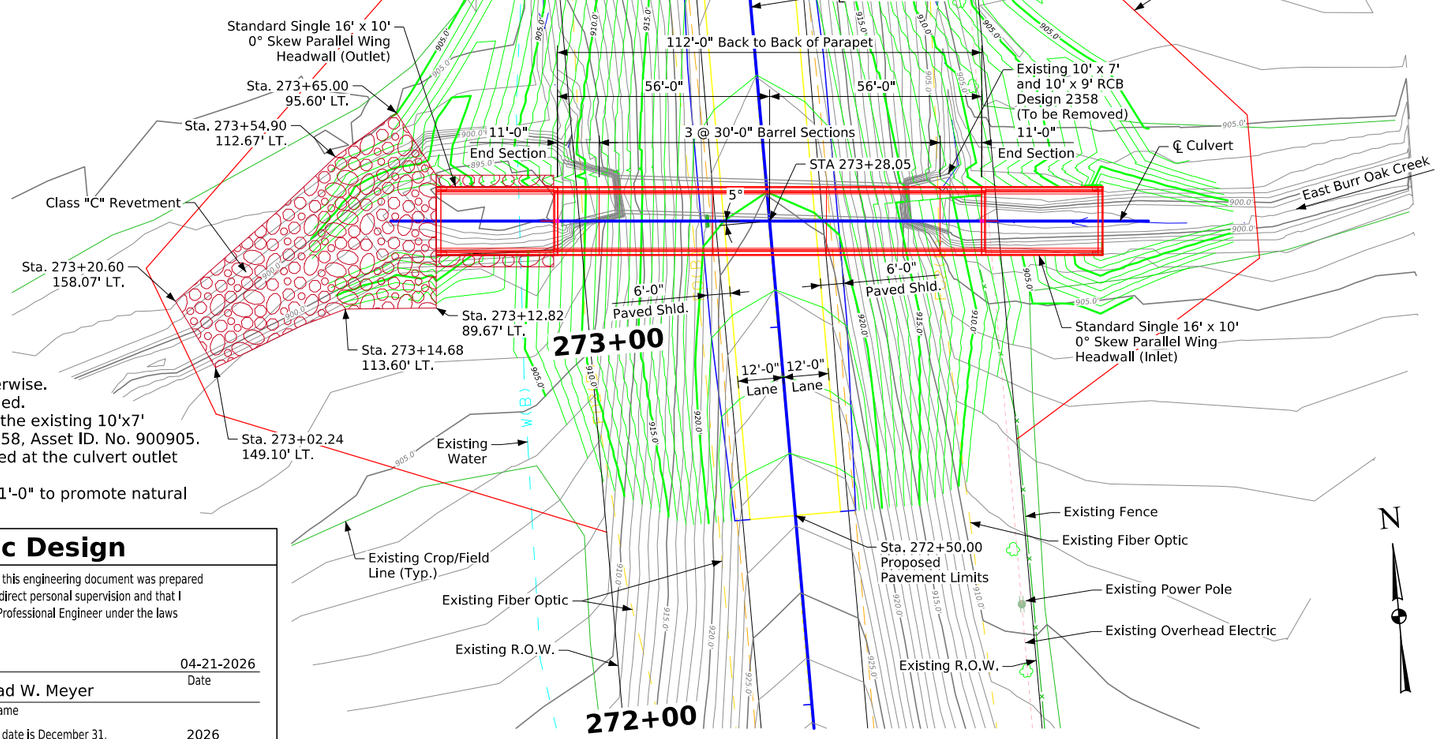
RIDB: Not Applicable
Drainage Area = 2.42 Acres
Stream Slope = 20.06 Ft./Mi.
Q_{50} = 1,120 cfs
HW Elev. = 906.45
Exit Velocity = 9.8 fps

Q_{100} = 1,359 cfs
HW Elev. = 907.85
Exit Velocity = 11.0 fps

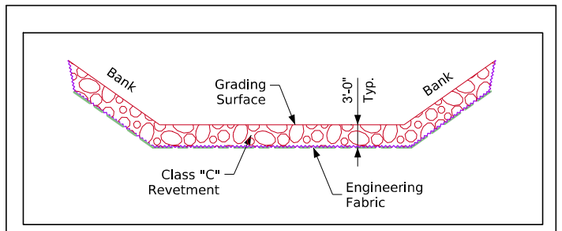
Traffic Estimate

2024 AADT	660 V.P.D.
20-- AADT	-- V.P.D.
20-- DHV	-- V.P.H.
TRUCKS	18 %
Total Design ESALs	--

Notes:
All units are in feet unless noted otherwise.
Class "C" revetment stone is embedded.
This design is for the replacement of the existing 10'x7' and 10'x9' RCB, Jasper Design No. 2358, Asset ID. No. 900905.
Class "C" revetment has been provided at the culvert outlet to mitigate high stream velocities.
Culvert flowlines have been lowered 1'-0" to promote natural siltation.



Situation Plan



Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "C" (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Inlet	0	0	0
Outlet	459	287	287
Totals	459	287	287

Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Quantities shown for information only. See Road Sheets.
Revetment estimated at 1.6 Tons/CY.

Location

IA 224 over East
Burr Oak Creek
T-81N R-18W
Section 35/36
Mariposa Township
Jasper County
Bridge Maint. No. 5007.4B224
Asset ID No. 900905
Latitude 41.788485°
Longitude -92.902714°

Sta. 273+28.05
Build 16' x 10' x 112' RCB
Skew 5° LT Ahead
Length LT 56'
Length RT 56'
F.L. LT 895.58
F.L. RT 896.28
DA 2.42 Acres
DES # 0327

Hydraulic Design

Chad W. Meyer 17394 LICENSED PROFESSIONAL ENGINEER 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.

04-21-2026
Signature Date
Chad W. Meyer
Printed or Typed Name
My license renewal date is December 31, 2026
Pages or sheets covered by this seal: V.1 Hydraulic Data

Design For 5 Degree LA

Single 16' x 10' x 112' Cast-In-Place Reinforced Concrete Box Culvert

Situation Plan

STA. 273+28.05 (IA 224) Turn-in Date: May 2026

Jasper County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327 Design Sheet No. 3 of 4 FHWA/Asset 900905

FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	Jasper COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER V.3

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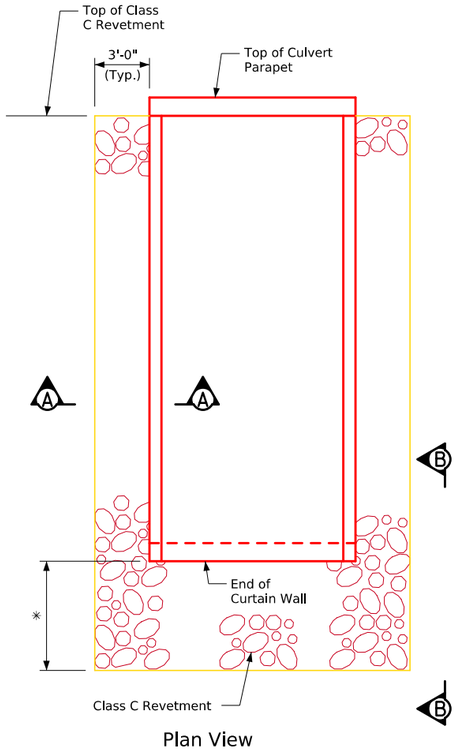
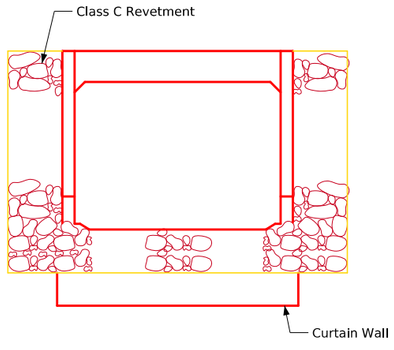
✳ = See culvert plans for limits of revetment and engineering fabric.



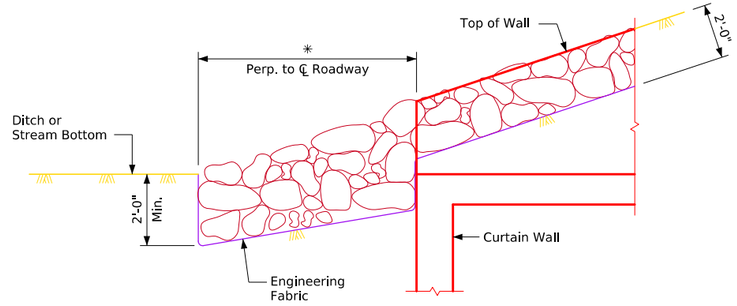
Plan View



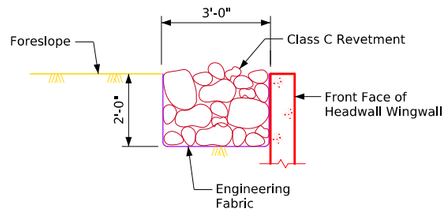
Elevation View

0° Skew Headwalls

✳ = See culvert plans for limits of revetment and engineering fabric.



View B-B



Section A-A

Typical Details

Construction Notes:

Class C Revetment shall be used and placed according to Article 2507.03, of the Standard Specifications. The engineering fabric shall meet the material requirements in accordance with Article 4196.01,B,3, of the Standard Specifications.

Design For 5 Degree LA

Single 16' x 10' x 112' Cast-In-Place Reinforced Concrete Box Culvert

Revetment Protection Details

STA. 273+28.05 (IA 224)

Turn-in Date: May 2026

Jasper County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327 | Design Sheet No. 4 of 4 | FHWA/Asset 900905

REVISED 1-2016 - ADDED NOTE "SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC."
REVISED 02-2017 - ADDED SECTION DIRECTORS "A-A" TO ZERO SKEW PLAN VIEW DETAIL.
REVISION 01-2021 - CHANGED DESIGN SPECIFICATIONS TO AASHTO LRFD 8TH ED.
ENGLISHSINGLECULVERTS.DGN - 1092 - THIS SHEET ISSUED 04-12.

FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	Cast-In-Place Culvert Revetment Protection Details	Modified Standard Sheet 1092	Jasper COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER V.4

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Estimated Culvert Quantities and Reference Notes

Item No.	Item Code	Item	Unit	Quantities Estimated	Estimate Reference Notes
1	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1	Includes all costs associated with removing the existing 10' x 7' and 10' x 9' RCB culvert as needed to facilitate construction of the new RCB culvert.
2	2402-2720000	EXCAVATION, CLASS 20	CY	3,440	Includes filling and compacting low areas around proposed culvert. Includes excavation necessary to place 6" granular material and 1'-0" working blanket.
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET	CY	200	Granular material shall be in accordance with Section 4118 of the Standard Specifications. Includes 129.9 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction.
4	2415-2111610	PRECAST CONCRETE BOX CULVERT, 16 FT. X 10 FT.	LF	121	Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, granular leveling material, joint material, and grout as required.
5	2415-2201610	PRECAST CONCRETE BOX CULVERT STRAIGHT END SECTION, 16 FT. X 10 FT.	EACH	2	Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, granular leveling material, joint material, and grout as required. Includes 0 degree Skew 2 precast end sections, 2 precast lintel beams, and 2 precast curtain walls.
6	2533-4980005	MOBILIZATION	LS	1	---

Roadway Quantities shown elsewhere in these plans.

Design History at this Site
(Includes this Design)

Des. No.	Type of Work
Unknown	Original Design
2358	Culvert Extension
0327	RCB Culvert Replacement (This Design)

Design For 5 Degree LA

Single 16' x 10' x 121' Precast Reinforced Concrete Box Culvert

Estimate Quantity

STA. 273+28.05 (IA 224)

Turn-in Date: May 2026

Jasper County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327 | Design Sheet No. 1 of 3 | FHWA/Asset 900905

FILE NO. 32707 | ENGLISH | DESIGN TEAM McClure | Jasper COUNTY | PROJECT NUMBER STPN-224-1(020)--2J-50 | SHEET NUMBER V.5

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General Notes:

It is the intent of this design to construct a 16' x 10' x 121'-0" precast reinforced concrete box culvert skewed 5° left ahead at station 273+28.05.

Electronic copies of original design plans are available to the Contractor as part of the E-files supplied with the contract documents.

Faint lines on plans indicate existing structure.

Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

The precast R.C.B. Culvert sections are designed for HL-93 live load and earth fills of 13 feet.

The precast R.C.B. barrel and end sections shall conform to Iowa D.O.T. Single Precast R.C.B. Culvert Standards. At the Contractor's option, precast barrel sections may conform to ASTM C1577.

Excess Class 20 Excavation material suitable for backfilling shall be stockpiled at the construction site, as directed by the Engineer.

Class 20 Excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.

When de-watering presents a problem for placing the curtain walls as detailed, alternate methods such as steel sheet pile may be approved but at no additional cost. See Standard Sheet PES 11-20 for details.

The length in linear feet of precast reinforced concrete box culvert will be based on the plan quantity. For the number of linear feet given on the plan, the Contractor will be paid the contract unit price per linear foot. The payment shall be full compensation for furnishing all material, labor and equipment necessary to complete the work except for bid items "Precast Concrete Box Culvert Straight End Section", "Class 20 Excavation", "Class C Revetment", and "Granular Material for Blanket".

For each precast concrete box culvert straight end section installed the Contractor will be paid the contract price per each. The payment shall be full compensation for furnishing all material (including lintel beams and curtain walls), labor and equipment necessary to complete the work except for bid items "Precast Concrete Box Culvert", "Class 20 Excavation", "Class C Revetment", and "Granular Material for Blanket".

The curtain wall and the Type 3 lintel beam or Type 1 parapet shall be precast.

The Contractor shall furnish and install culvert ties for all joints. The main section joints will have one tie on each side of the barrel and the last barrel section will be attached to the end sections with two ties per side. The end section joints will have two ties per side.

Culvert ties shall be included in the cost for precast concrete box culvert. Tie rods will be 1 inch diameter steel and shall meet requirements of ASTM A709 Grade 36 or equal. See Standard Sheet G2-20 for details.

Culvert tie assemblies shall be galvanized after fabrication.

The limits for excavation for the precast concrete box culvert shall be as shown on the "Granular Leveling Material and Working Blanket Detail".

A minimum of 6" of Granular Leveling Material and 1'-0" of Working Blanket shall be used as bedding for the precast box culvert. The bedding shall be shaped to a flat base using a template. All costs including material and labor associated with providing and installing the Granular Leveling Material and Working Blanket shall be included in the bid item "Granular Material for Blanket".

The Granular Leveling Material shall meet the requirements of Section 4117 of the Standard Specifications.

The precast box culvert shall be built to the dimensions and specifications shown in these plans.

The Contractor shall submit details (i.e. Shop Drawings) of the proposed precast concrete box sections for this project. The details shall include the following information as found on Standard Sheet 1089P:

A. A Situation Plan drawing showing the back to back parapet dimension for the line of the culvert sections.
B. Dimension the number of precast sections and section lengths.
C. A detail of the precast barrel sections showing a cross section view of the section, steel locations, dimensions, etc.
D. A detail of the precast concrete culvert end section showing a cross section view of the sections, steel locations, dimensions, etc. similar to the end section details shown in the Iowa D.O.T. Standards.

The Contractor shall provide all information shown on Standard Sheet 1089P.

The Contractor shall allow 30 working days for the Engineer's Shop Drawing review.

Since precast concrete box culvert end sections have the foreslope located at the bottom of the parapet instead of the top (as in the case of cast in place RCB culverts) the main barrel section has been lengthened.

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Installation Notes:

Precast concrete box culvert sections shall be laid with the groove end of each section up-grade, and the sections shall be tightly joined. Concrete ties to be used only to hold box sections together, not for pulling sections tight. Joint openings between sections should be as tight as practicable and limited to a maximum of ¾ inch openings. The joint on the bottom of the culvert shall be sealed with a flexible water tight 1 inch butyl rope gasket as per Materials I.M. 491.09.

Butyl rope gasket shall be installed in accordance with the recommendations of the Manufacturer and shall extend vertically 6 inches above the bottom fillet. All joints shall be trimmed clean on the inside after sealing.

Burr threads of Concrete Box Ties without damaging galvanizing to prevent nut rotation after tightening is complete.

The Contractor shall place a 2 foot wide piece of engineering fabric around the top and sides of each precast joint. The fabric shall be centered with 1 foot on each side of the joint, the fabric shall be attached to the walls and top of each section to prevent the fabric from slipping off the joint during backfilling operations. Attachment methods shall be approved by the Engineer.

The Granular Leveling Material shall be installed in accordance with Article 2402.03, H, 4, of the Standard Specifications. If larger granular material is to be installed below the Granular Leveling Material, the Contractor shall place engineering fabric below the Granular Leveling Material to separate the layers. The fabric shall be oversized by a minimum of 1 foot on all edges to contain the Granular Leveling Material.

All costs including material and labor associated with providing and installing the engineering fabric as described above for the joints and underlayment of the Granular Leveling Material shall be included in the bid items "Precast Concrete Box Culvert" and "Precast Box Culvert Straight End Section". The engineering fabric shall be in accordance with Article 4196.01, B, 3, of the Standard Specifications.

Class E revetment will be placed around both precast concrete box culvert end sections, as shown in these plans.

During backfilling the compaction adjacent to the bottom corner radii or chamfer shall be accomplished with a mechanical hand compactor.

The Contractor shall furnish and install lifting hole plugs for each section. Lifting holes shall be plugged with a precast concrete plug or plastic plug approved by the Engineer, sealed and covered with a 2'-0" x 2'-0" piece of engineering fabric centered over the hole and attached to the section to prevent the fabric from slipping.

Specifications:

Design:

AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017.

Construction:

Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, current series, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions

Design Stresses:

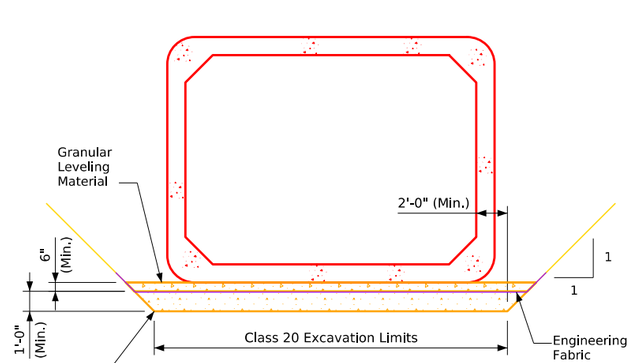
Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017:

Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60.

Concrete in accordance with AASHTO LRFD Section 5, f'c for barrel sections as noted on Culvert Barrel Detail Standards, for End Section Design f'c = 5.0 ksi.

Standards:
For details and notes not shown refer to the following Iowa D.O.T. - Highway Standards:

Standard	Issued	Revised
PRCB G1-20	12-20	
PRCB G2-20	12-20	1-23
PRCB 16-20	12-20	10-21
PES 3-20-T1	12-20	10-21
PES 4-20-T1	12-20	1-23
PES 3-20-T3	12-20	10-21
PES 4-20-T3	12-20	1-23
PES 10-20-T3	12-20	10-21
PES 11-20	12-20	
PEP 12-20	12-20	



Granular Leveling Material and Working Blanket Detail

Granular Leveling Material and Working Blanket shall terminate 3'-0" short of the precast curtain wall.

Traffic Control Plan
The roadway will be closed to thru traffic. Refer to the Traffic Control Plan shown elsewhere in these plans.

Design For 5 Degree LA

Single 16' x 10' x 121' Precast Reinforced Concrete Box Culvert

General Notes

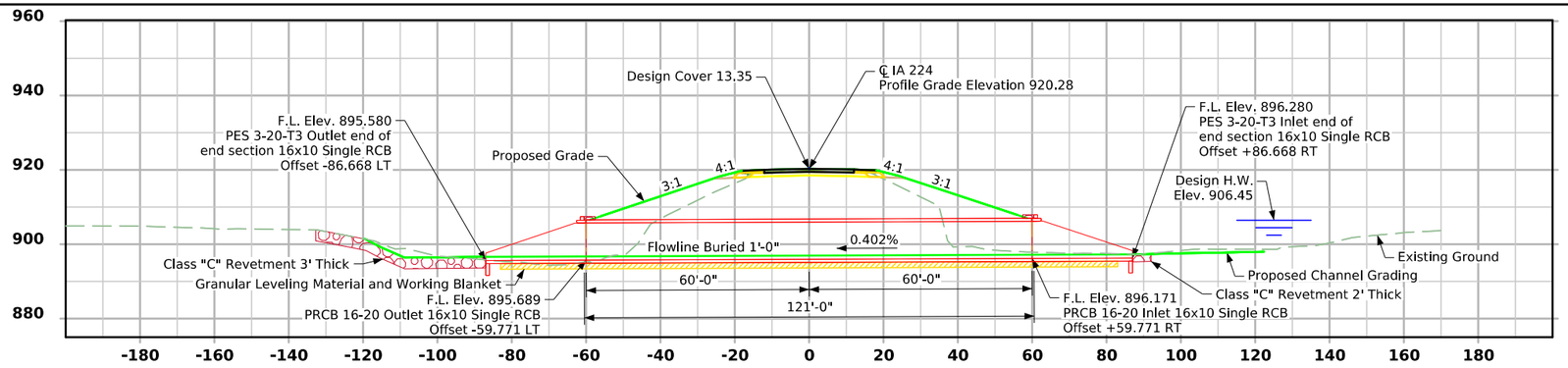
STA. 273+28.05 (IA 224)

Turn-in Date: May 2026

Jasper County

IOWA DEPARTMENT OF TRANSPORTATION

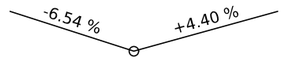
Design No. 0327 Design Sheet No. 2 of 3 FHWA/Asset 900905



STA 273+28.05

Longitudinal Section Along ℄ Culvert

Control Point: 202, CP / 1/2IN Rebar BPC,
Elev. 903.67, N.7760523.26, E.19476395.85



VPI Sta. = 274+50.00 VC = 500'
VPI Elev. = 910.51

Proposed Profile Grade IA 224

Utilities Note:

Utilities shown on this sheet are for information only.See Road Design sheets for utility information.

General Utility Symbols:

E - Electric Line
G - Gas Line
SAN. - Sanitary Sewer
T - Telephone Line
W - Water Line
FO - Fiber Optic Line
GHP - Gas High Pressure
ST S - Storm Sewer
TV - TV
- Power Poles

Hydraulic Data

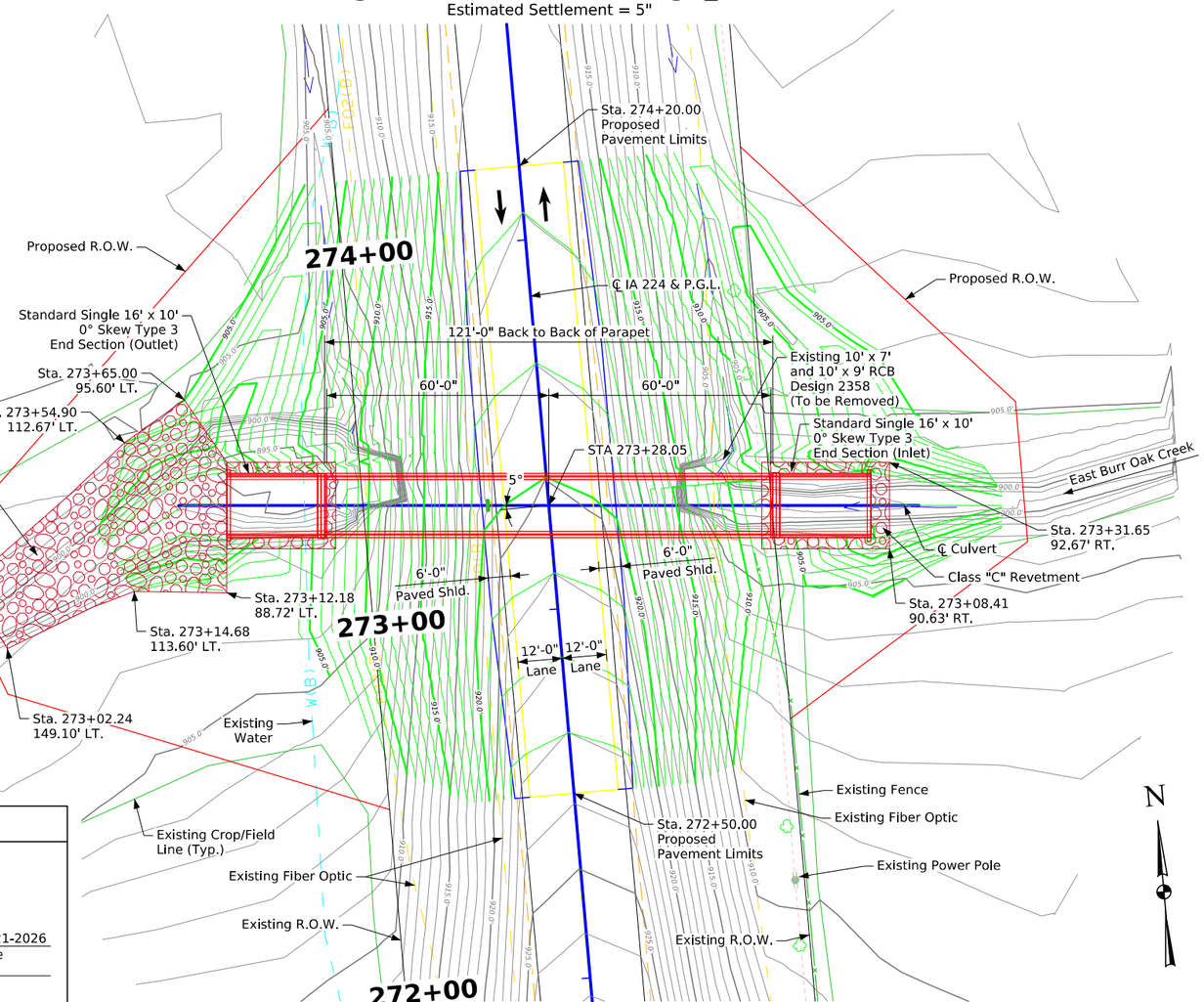
RIDB: Not Applicable
Drainage Area = 2.42 Acres
Stream Slope = 20.06 Ft./Mi.
Q_{50} = 1,120 cfs
HW Elev. = 906.45
Exit Velocity = 9.8 fps

Q_{100} = 1,359 cfs
HW Elev. = 907.85
Exit Velocity = 11.0 fps

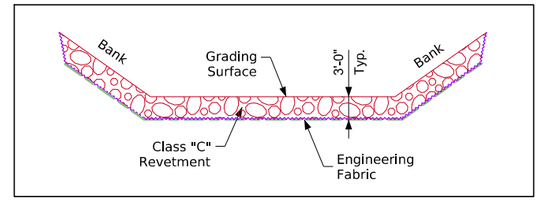
Traffic Estimate

2024 AADT	660	V.P.D.
20-- AADT	--	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	18	%
Total Design ESALs	--	

Notes:
All units are in feet unless noted otherwise.
Class "C" revetment stone is embedded.
This design is for the replacement of the existing 10'x7' and 10'x9' RCB, Jasper Design No. 2358, Asset ID. No. 900905.
Class "C" revetment has been provided at the culvert outlet to mitigate high stream velocities.
Culvert flowlines have been lowered 1'-0" to promote natural siltation.



Situation Plan



Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "C" (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Inlet	42	38	26
Outlet	464	300	290
Totals	506	338	316

Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Quantities shown for information only. See Road Sheets.
Revetment estimated at 1.6 Tons/CY.

Location

IA 224 over East
Burr Oak Creek
T-81N R-18W
Section 35/36
Mariposa Township
Jasper County
Bridge Maint. No. 5007.4B224
Asset ID No. 900905
Latitude 41.788485°
Longitude -92.902714°

Sta. 273+28.05
Build 16' x 10' x 121' RCB
Skew 5° LT Ahead
Length LT 60'
Length RT 60'
F.L. LT 895.58
F.L. RT 896.28
DA 2.42 Acres
DES # 0327

Hydraulic Design

LICENSED PROFESSIONAL ENGINEER
Chad
W. Meyer
17394
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 Chad W. Meyer — Date 04-21-2026
Printed or Typed Name
My license renewal date is December 31, 2026
Pages or sheets covered by this seal: V.1 Hydraulic Data

Design For 5 Degree LA

Single 16' x 10' x 121' Precast Reinforced Concrete Box Culvert

Situation Plan

STA. 273+28.05 (IA 224)
Turn-in Date: May 2026

Jasper County
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327 Design Sheet No. 3 of 3 FHWA/Asset 900905

LEGEND

$-H_2O-$	WATER	DIAMOND CORE	SOIL REMEDIATION AREA
— DRY	DRY	SAND	LIMESTONE (LS.)
-◁	PLUGGED	GRAVELLY SAND	BROKEN & WEATHERED LS.
M—	MOISTURE	BOULDERS	SANDSTONE \ SILTSTONE
■	SHELBY		SHALE
■	BLOW COUNT		SANDY SOIL
▬	DENS. CORE		
Ⓢ	SAMPLE		

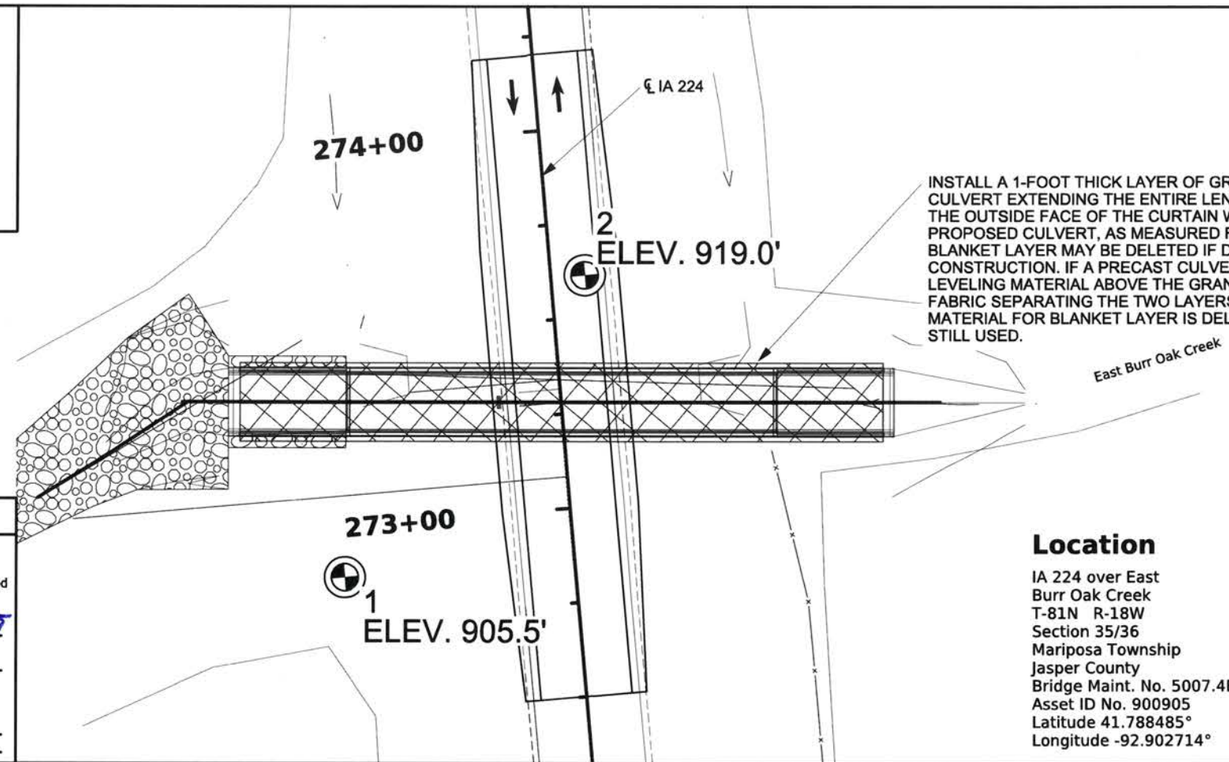
BLOW COUNT
LAYER - NO. BLOWS
B2 ■ 5

N

0 FEET 20

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



INSTALL A 1-FOOT THICK LAYER OF GRANULAR MATERIAL FOR BLANKET DIRECTLY BELOW THE RCB CULVERT EXTENDING THE ENTIRE LENGTH OF THE CULVERT BARREL TO WITHIN 3 FEET INWARD OF THE OUTSIDE FACE OF THE CURTAIN WALL AND TO A WIDTH OF 2 FEET BEYOND THE SIDES OF THE PROPOSED CULVERT, AS MEASURED FROM THE INSIDE FACE. THE GRANULAR MATERIAL FOR BLANKET LAYER MAY BE DELETED IF DETERMINED TO BE UNNECESSARY AT THE TIME OF CONSTRUCTION. IF A PRECAST CULVERT OPTION IS USED, INSTALL 6 INCHES OF GRANULAR LEVELING MATERIAL ABOVE THE GRANULAR MATERIAL FOR BLANKET LAYER WITH AN ENGINEERING FABRIC SEPARATING THE TWO LAYERS. IF A PRECAST CULVERT OPTION IS USED AND THE GRANULAR MATERIAL FOR BLANKET LAYER IS DELETED, THE 6 INCHES OF GRANULAR LEVELING MATERIAL IS STILL USED.

GEOTECHNICAL DESIGN

LICENSED PROFESSIONAL ENGINEER
ZACHARY A. BONZER
P23811
IOWA

I hereby certify that this engineering document was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly licensed Professional Engineers under the laws of the State of Iowa.

Signature Date 12-12-2025

ZACHARY A. BONZER
Printed or Typed Name
License Number P23811
My license renewal date is December 31, 2026

Pages or sheets covered by this seal: SPS.1

Location

IA 224 over East
Burr Oak Creek
T-81N R-18W
Section 35/36
Mariposa Township
Jasper County
Bridge Maint. No. 5007.4B224
Asset ID No. 900905
Latitude 41.788485°
Longitude -92.902714°

Design For 5 Degree LA

Single 16' x 10' Reinforced Concrete Box Culvert

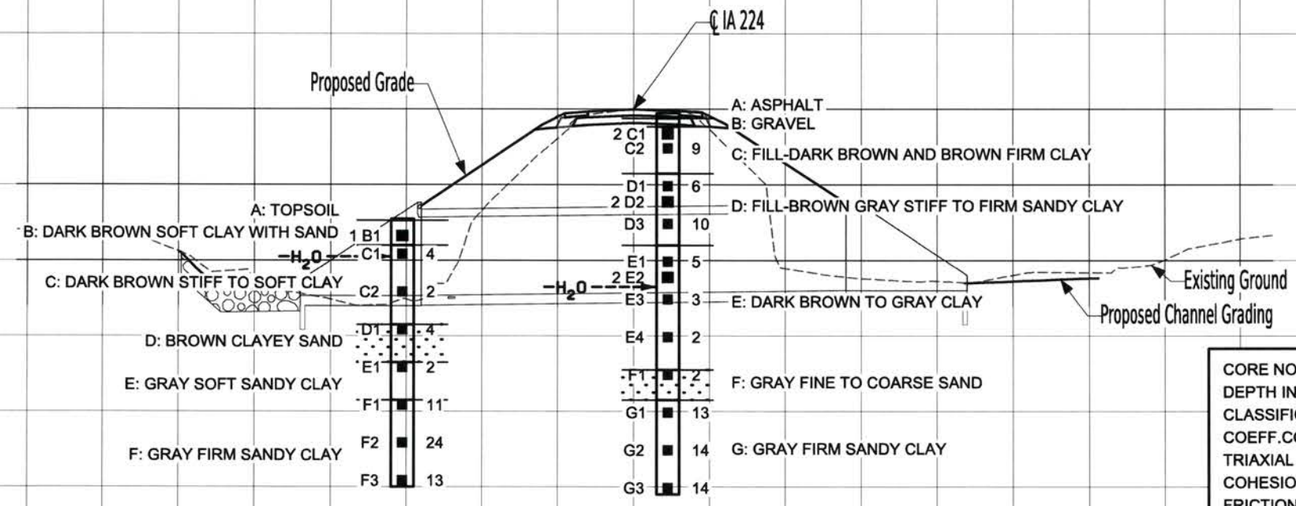
Soil Profile Sheet

STA. 273+28.05 (IA 224)

Jasper County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327 Design Sheet No. 1 of 1 FHWA/Asset 900905



BORING	1	2
LAYER	THICKNESS	THICKNESS
A	0.2	0.7
B	3.3	1.1
C	10.5	6.2
D	5.0	9.5
E	5.0	16.5
F	11.5	4.0
G	-	12.5

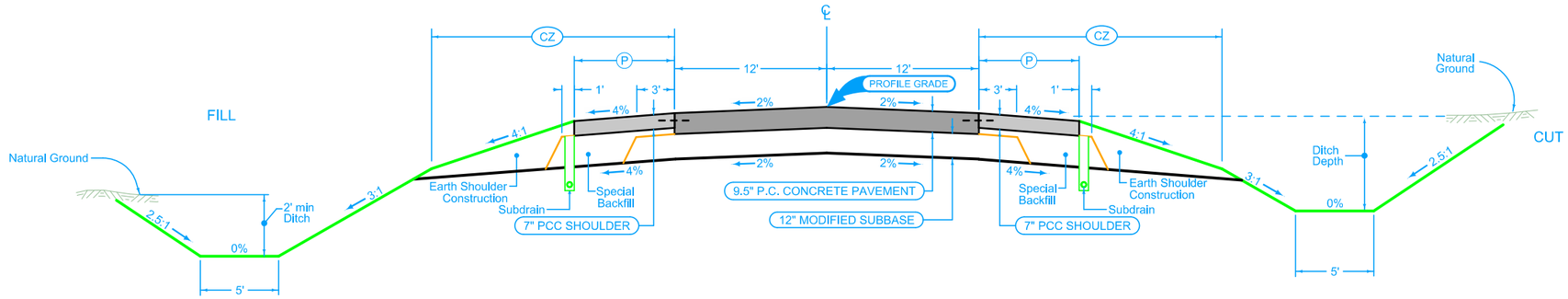
Water Level Observations (Ft.)

Boring No.	Date Drilled	While Drilling	End of Drilling	Delayed Water Level
1	10/21/25	9.0'	24.0'	5.0' on 10/22/25
2	10/16/25	23.0'	-	-

SHELBY TUBE CORE DATA

CORE NO.	1 B1	2 C1	2 D2	2 E2
DEPTH IN FEET	1.5-3.5	2.0-4.0	11.5-13.5	21.5-23.5
CLASSIFICATION (AASHTO)	A-6(14)	-	A-6(9)	A-7-6(33)
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-
TRIAXIAL COMPRESSION	CU	UC	UC	CU
COHESION - PSF	331	2025	1150	1080
FRICTION COEFF.	-	-	-	-
MOISTURE CONTENT %	24.6	18.7	14.0	33.9
DRY DENSITY - PCF	103	111	113	90

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)



LOCATION			DIMENSIONS	
ROAD IDENTIFICATION	STATION TO STATION		(P) Inches	(CZ) Feet
IA 224	272+50.00	273+00.00	4'-6'	4'-12'
IA 224	273+00.00	273+70.00	6'	12'
IA 224	273+70.00	274+20.00	6'-4'	12'-4'

Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2
PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 17' spacing

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Roadway Items : Roadway Items

Item no.	Item Code	Item	Unit	Quantities Estimated Roadway Items	Estimate Reference Notes
1	2102-0425070	SPECIAL BACKFILL	TON	118.6	REFER TO TYPICAL SECTIONS AND TAB 112-09.
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	2,235	REFER TO T-SHEETS. CONTRACTOR SHALL PROVIDE BORROW MATERIAL ACCORDING TO SECTION 2102 OF THE STANDARD SPECIFICATIONS.
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	401	REFER TO T-SHEETS.
4	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	439	THIS ITEM IS INCLUDED FOR CHANNEL SHAPING AT THE INELT AND OUTLET OF THE PROPOSED CULVERT AND FOR EMBEDDING THE REVETMENT. QUANTITY INCLUDES 152 CY OF CUT FOR CHANNEL GRADING AND 287 CY OF CUT FOR REVETMENT EMBEDDING.
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	463	REFER TO T-SHEETS. TOPSOIL SHALL BE STRIPPED AT A DEPTH OF 9 INCHES AND PLACED TO A COMPACTED DEPTH OF 6 INCHES ON FINAL GRADE.
6	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	128.2	REFER TO TAB 104-04 AND STANDARD ROAD PLAN DR-111 FOR DETAILS.
7	2115-0100000	MODIFIED SUBBASE	CY	188.9	REFER TO TYPICAL SECTION AND TAB 100-24.
8	2122-5190007	PAVED SHOULDER, P.C. CONCRETE, 7 IN.	SY	204.6	REFER TO TYPICAL SECTIONS AND TAB 112-09.
9	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	3.4	REFER TO TYPICAL SECTIONS AND TAB 112-09.
10	2301-1033095	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 9.5 IN.	SY	453.3	REFER TO TYPICAL SECTION AND TAB 100-24.
11	2402-0425040	FLOODED BACKFILL	CY	285.4	REFER TO TAB 104-04 AND STANDARD ROAD PLAN DR-111 FOR DETAILS. CUBIC YARDS SHOWN ON THE CONTRACT DOCUMENTS AS DETERMINED BY THE TEMPLATE FILL VOLUME. SHRINKAGE WILL NOT BE INCLUDED IN THE MOISTURE CONTROL QUANTITY.
12	2402-0875150	COMPACTION WITH MOISTURE CONTROL (STRUCTURES)	CY	2,412.2	REFER TO TAB 104-04 AND STANDARD ROAD PLAN DR-111 FOR DETAILS.
13	2418-0000010	TEMPORARY STREAM DIVERSION	EACH	1	REFER TO STANDARD ROAD PLAN EW-402.
14	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	LF	340	REFER TO TYPICAL SECTION AND TAB 104-09A.
15	2507-3250005	ENGINEERING FABRIC	SY	286.5	FABRIC TO BE PLACED UNDER REVETMENT. REFER TO V.3 SHEET FOR DETAILS.

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
16	2507-6800032	REVETMENT, CLASS C	TON	459	REFER TO V.3 FOR DETAILS ON PLACEMENT.
17	2510-6745850	REMOVAL OF PAVEMENT	SY	532.1	REFER TO TAB 110-1.
18	2526-8285000	CONSTRUCTION SURVEY	LS	1	---
19	2527-9263209	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	5.5	REFER TO TAB 108-22.
20	2528-2518000	SAFETY CLOSURE	EACH	2	REFER TO TAB 108-13A.
21	2528-8445110	TRAFFIC CONTROL	LS	1	REFER TO TRAFFIC CONTROL PLAN ON SHEET J.1.
22	2528-9290050	PORTABLE DYNAMIC MESSAGE SIGN (PDMS)	CDAY	14	PORTABLE DYNAMIC MESSAGE SIGNS (PDMS) SHALL BE INSTALLED 7 DAYS PRIOR TO CLOSURE OF IA 224 FOR BOTH NORTHBOUND AND SOUTHBOUND TRAFFIC. REFER TO STANDARD ROAD PLAN TC-252 FOR ADDITIONAL INFORMATION.
23	2548-0000320	MILLED CENTERLINE RUMBLE STRIPS, PCC SURFACE	STA	1.7	REFER TO TAB 112-10 AND STANDARD ROAD PLAN PV-13.
24	2602-0000020	SILT FENCE	LF	425	REFER TO TAB 100-17 AND STANDARD ROAD PLAN EC-201 FOR DETAILS. VERFIY THE SPECIFIC LOCATIONS WITH THE ENGINEER PRIOR TO PLACEMENT.
25	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	189	REFER TO TAB 100-17 AND 100-18 AND STANDARD ROAD PLAN EC-201 FOR DETAILS. VERFIY THE SPECIFIC LOCATIONS WITH THE ENGINEER PRIOR TO PLACEMENT.
26	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	307	REFER TO TAB 100-17 AND 100-18 AND STANDARD ROAD PLAN EC-201 FOR DETAILS.
27	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	62	REFER TO TAB 100-17 AND 100-18 AND STANDARD ROAD PLAN EC-201 FOR DETAILS.

111_25
4/21/26

INDEX OF TABULATIONS

Tabulation	Tabulation Title	Sheet No.
100_01D	PROJECT DESCRIPTION	C.4
100_24	PCC PAVEMENT	C.6
104_04	ROADWAY ITEMS FOR DRAINAGE STRUCTURES INSTALLED BY CULVERT CONTRACTOR	C.7
104_09A	LONGITUDINAL SUBDRAIN SHOULDER	C.8
105_04	STANDARD ROAD PLANS	C.5
108_13A	SAFETY CLOSURES	C.9
108_22	PAVEMENT MARKING LINE TYPES	C.10
110_01	REMOVAL OF PAVEMENT	C.11
111_25	INDEX OF TABULATIONS	C.3
112_09	SHOULDERS	C.12
112_10	MILLED RUMBLE STRIPS	C.13
108_23A	TRAFFIC CONTROL PLAN	J.1
111_01	COORDINATED OPERATIONS	J.2
100_17	TABULATION OF SILT FENCES	RC.1
100_18	SILT FENCES FOR DITCH CHECKS	RC.2
232_03A	EROSION CONTROL (RURAL SEEDING)	RC.3
232_11	EROSION CONTROL (STABILIZING CROP SEEDING)	RC.3

100_01D
8/15/22

PROJECT DESCRIPTION

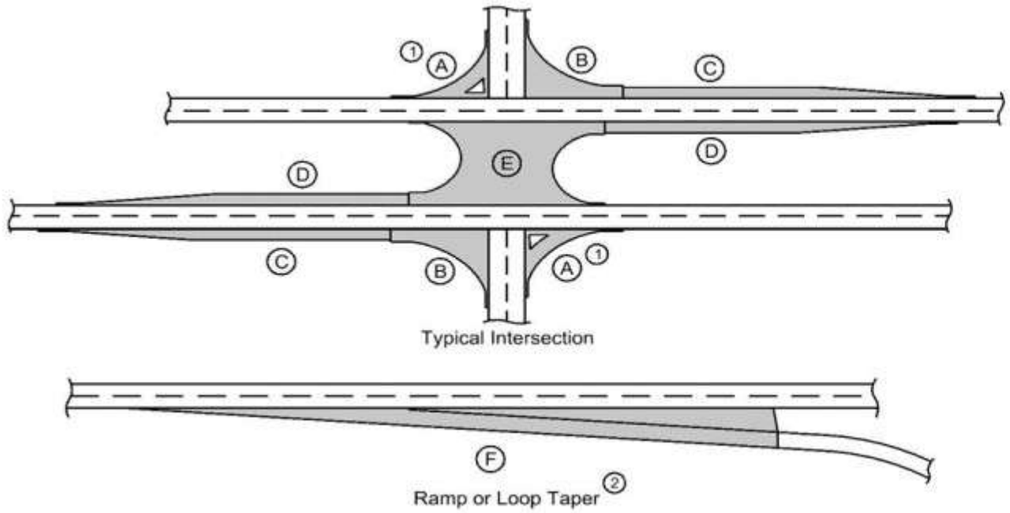
This project involves the replacement of an existing 10' x 7' culvert with a single 16' x 10' reinforced concrete box culvert under IA 224 over East Burr Oak Creek.

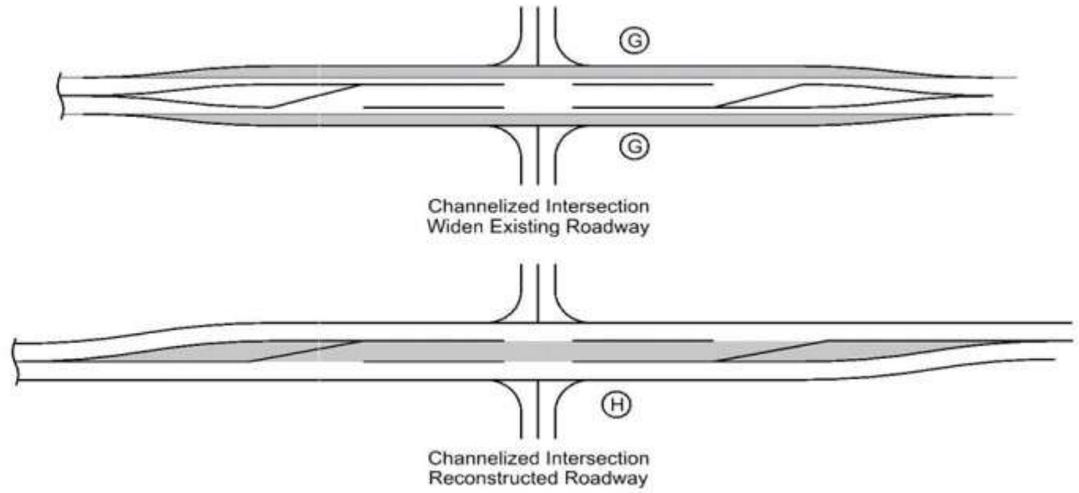
STANDARDS

The following Standards apply to construction work on this project.

Number	Date	Title
DR-111	04-17-18	Box Culvert (Backfill)
DR-303	10-17-17	Subdrains (Longitudinal)
EC-201	04-20-21	Silt Fence
EW-402	04-18-17	Temporary Stream Diversion
PM-110	10-15-24	Line Types
PV-13	04-16-24	Milled Centerline Rumble Strips
PV-101	10-21-25	Joints
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-18-23	Work Within 15 ft of Traveled Way
TC-252	10-21-25	Routes Closed to Traffic

PCC PAVEMENT





(1) Does not include raised island area or curb. Refer to tabulation 112-4 for quantities.
(2) Refer to PV-410, PV-411, PV-412, and PV-414.
(3) Quantity includes Pavement Header.

Line No.	Road Identification	Direction of Travel	Station From	Station To	Width (FT)	Length (FT)	Area (SY)	Area A(1) (SY)(3)	Area B (SY)(3)	Area C (SY)(3)	Area D (SY)(3)	Area E (SY)(3)	Area F(2) (SY)(3)	Area G (SY)(3)	Area H (SY)(3)	Area by Thickness - Thickness(IN)	Area by Thickness - Area (SY)	Polymer Grid (SY)	Special Backfill (TON)	Modified Subbase (CY)	Granular Subbase (SY)	Remarks
1.0	IA 224	Both	272+50.00	274+20.00	24.0	170.00	453.30									9.5	453.3			188.90		
Total:						**170**	**453.3**													**188.9**		

ROADWAY ITEMS FOR DRAINAGE STRUCTURES INSTALLED BY CULVERT CONTRACTOR

* Not a Bid Item
(1) Backfill according to DR-111

Location	Design No.	Size	Kind	Dike Lt.	Dike Rt.	Dike Station	Dike Top Elevation	Dike Type	Compacting Backfill Adjacent (CY)	Compaction w/ Moisture Control (CY)	Compaction w/ Moisture and Density (CY)	Floodable Backfill* (A) (CY)	Porous Backfill* (B) (CY)	Flooded Backfill (1) (A+B) (CY)	Excavation Type	Excavation Quantity (CY)	Revetment Type	Revetment Quantity (TONS)	Engineering Fabric (SY)	Remarks
273+28.05	327	16' x 10'	RCB						128.2	2412.2		281.6	3.8	285.4			Class C	459.000	287.0	

LONGITUDINAL SUBDRAIN SHOULDER

* Not a bid item.

Line No.	Road or Lane Identification	Station From	Station To	Side	Depth (IN) (D)	Subdrain Size (IN)	Length (FT)	Outlet Station	Outlet Type	Porous Backfill* (CY)	Remarks
1.0	IA 224	272+50.00	274+20.00	Right	36.0	4.0	170.0			12.7	CONNECT TO EXISTING SUBDRAIN
2.0	IA 224	272+50.00	274+20.00	Left	36.0	4.0	170.0			12.7	CONNECT TO EXISTING SUBDRAIN
Total:							**340**			**25.4**	

108_13A
3/27/25

SAFETY CLOSURES

Refer to Section 2528 of the Standard Specifications

Station	Road Closure Qty.	Hazard Closure Qty.	Remarks
272+00.00	1		
274+20.00	1		

PAVEMENT MARKING LINE TYPES

Line factors based on 6-inch wide continuous line.
*BCY4 - Place on the same side of the roadway to match existing markings near the project.
**NPY4 - Estimating purposes only. No Passing Zone Lines will be located in the field.
***MNY6 - Factor of 1.00 includes number of 6-inch passes to cover median nose area.

BCY4: Broken Centerline (Yellow) @ 0.17 | BCY6: Broken Centerline (Yellow) @ 0.25 | BLC6: Broken Line Contrast (White/Black) @ 0.50 | BLW4: Broken Lane Line (White) @ 0.17 | BLW6: Broken Lane Line (White) @ 0.25
CBW6: Crosswalk Bar (White) @ 10.00 | CHW8: Channelizing Line (White) @ 1.33 | CHW10: Channelizing Line (White) @ 1.67 | CHY8: Channelizing Line (Yellow) @ 1.33 | CHY10: Channelizing Line (Yellow) @ 1.67
CLW6: Crosswalk Line (White) @ 2.00 | DCY4: Double Centerline (Yellow) @ 1.34 | DCY6: Double Centerline (Yellow) @ 2.00 | DDY4: Double Dotted Line (Yellow) @ 0.44 | DDY6: Double Dotted Line (Yellow) @ 0.67
DLW4: Dotted Line (White) @ 0.22 | DLW6: Dotted Line (White) @ 0.33 | DLY4: Dotted Line (Yellow) @ 0.22 | DLY6: Dotted Line (Yellow) @ 0.33 | ELW4: Edge Line Right (White) @ 0.67
ELW6: Edge Line Right (White) @ 1.00 | ELY4: Edge Line Left (Yellow) @ 0.67 | ELY6: Edge Line Left (Yellow) @ 1.00 | LDW8: Lane Drop (White) @ 0.33 | LDW10: Lane Drop (White) @ 0.42
MNY6: Median Nose (Yellow) @ 1.00 | NPY4: No Passing Zone Line (Yellow) @ 0.84 | NPY6: No Passing Zone Line (Yellow) @ 1.25 | RLW4: Ramp Edge Line Right (White) @ 0.67 | RLW6: Ramp Edge Line Right (White) @ 1.00
RLY4: Ramp Edge Line Left (Yellow) @ 0.67 | RLY6: Ramp Edge Line Left (Yellow) @ 1.00 | SLW2: Stop Line (White) @ 4.00 | SLW4: Solid Lane Line (White) @ 0.67 | SLW6: Solid Lane Line (White) @ 1.00
SPW4: Sloped Curb 4" (White) @ 2.16 | SPW6: Sloped Curb 6" (White) @ 2.28 | SPY4: Sloped Curb 4" (Yellow) @ 2.16 | SPY6: Sloped Curb 6" (Yellow) @ 2.28 | STW6: Standard Curb 6" (Yellow) @ 2.03
STY6: Standard Curb 6" (Yellow) @ 2.03 | YLW2: Yield Line (White) @ 1.15

Line No.	Road ID	Station From	Station To	Lane	Marking Type	Left	Center	Right	Groove Marking Needed?	Groove Qty. (STA)	ELW6 (STA)	ELW6 Factored (STA)	NPY6** (STA)	NPY6** Factored (STA)	Remarks
1.0	IA 224	272+50.00	274+20.00	NB	Waterborne/Solvent Paint			X	No		1.70	1.70			
2.0	IA 224	272+50.00	274+20.00	Both	Waterborne/Solvent Paint		X		No				1.70	2.13	
3.0	IA 224	272+50.00	274+20.00	SB	Waterborne/Solvent Paint			X	No		1.70	1.70			

Totals (Factored)
Painted Pavement Markings, Waterborne or Solvent-Based: 5.5 STA

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5.

* Not a bid item.

Line No.	Station From	Station To	Side	Pavement Type	Area (SY)	Saw Cut* (LF)	Remarks
1.0	272+50.00	274+20.00		HMA	532.1	56.0	

SHOULDERS

(1) Lane(s) to which the shoulder is adjacent.
(2) See Typ. 7156, 7157, or 7158.
(3) Bid Item.
(4) Applies only for Paved Shoulders constructed on project with existing granular shoulders.
(5) Bid Item. Typ. 7156, 7157, or 7158.
(6) Does not include shrink.
(7) Paved shoulder thickness specified in Remarks.
(8) Subbase type specified in Remarks.

Roadway Identification	Direction of Travel (1)	Station From	Station To	Side	P Width (FT)	P SG Width (2) (FT)	G Width (FT)	L Length (FT)	Class 13 Excavation (CY)(3)(4)	HMA (TON)	HMA (TON/STA)	Binder (TONS)	Paved Shoulder (3) (SY)	Shoulder at Grdrail (5)(7)	Reinforced Paved Shoulder(3) (SY)	Special Backfill HMA Alt. (3) (TON)	Special Backfill HMA Alt. (TON/STA)	Special Backfill PCC Alt. (3) (TON)	Special Backfill PCC Alt. (TON/STA)	Pavement Scarification (SY)	Polymer Grid (SY)	Subbase (3) (8) (CY)	Granular Shoulder (3) (TON)	Granular Shoulder (TON/STA)	Shoulder Const. Alt (3) (STA)	Shoulder Const. Alt HMA (6) (CY)	Shoulder Const. Alt PCC (6) (CY)	Remarks
IA 224	NB	272+50.00	273+00.00	Right	4' - 6'			50.00					27.8					15.700							0.50		10.50	
IA 224	NB	273+00.00	273+70.00	Right	6'			70.00					46.7					27.900							0.70		14.70	
IA 224	NB	273+70.00	274+20.00	Right	6' - 4'			50.00					27.8					15.700							0.50		10.50	
IA 224	SB	272+50.00	273+00.00	Left	4' - 6'			50.00					27.8					15.700							0.50		10.50	
IA 224	SB	273+00.00	273+70.00	Left	6'			70.00					46.7					27.900							0.70		14.70	
IA 224	SB	273+70.00	274+20.00	Left	6' - 4'			50.00					27.8					15.700							0.50		10.50	
Total:								**340**					**204.6**					**118.6**							**3.4**		**71.4**	

MILLED RUMBLE STRIPS

* Calculated at 18" width for Shoulder.
** For use with penetrating Engineered Fog Seal. Calculated at 2" wider than rumble strips.

Line No.	Road Identification	Station From	Station To	Shoulder Pavement Type	Rumble Strip Lane	Rumble Strip Type	Fog Seal Type	L (IN)	PCC Length (STA)	HMA Length (STA)	Fog Seal* Shoulder (GAL)	Fog Seal (SY)**	Effective Shoulder Width PCC (FT)	Effective Shoulder Width HMA (FT)	Effective Shoulder Width Granular\Earth (FT)	Remarks
1.0	IA 224	272+50.00	274+20.00		Centerline	Milled			1.70							
Total:									**1.7**							

GEOTECHNICAL DESIGN

LICENSED PROFESSIONAL ENGINEER
ZACHARY A. BONZER
P23811
IOWA

I hereby certify that this plan was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly licensed Professional Engineers under the laws of the State of Iowa.

Signature 12-12-2025 Date

Zachary A. Bonzer
Printed or Typed Name

My license renewal date is

Pages or sheets covered by this seal: CS.1 - CS.4

103_06
8/15/22

EMBANKMENT WITH MOISTURE CONTROL

Moisture Control is required for all Class 10 fill placed in all locations and depths. Topsoil will not require Moisture Control.

SHRINKAGE DATA

Material	%	Remarks
Class 10	30.0	
Topsoil	40.0	
Estimated Boulder Quantity	0.0	10 CY Class 12 Excavation

LONGITUDINAL SUBDRAIN SHOULDER

* Not a bid item.

Line No.	Road or Lane Identification	Station From	Station To	Side	Depth (IN) (D)	Subdrain Size (IN)	Length (FT)	Outlet Station	Outlet Type	Porous Backfill* (CY)	Remarks
1.0	IA 224	272+50.00	274+20.00	Left	42.0	4.0	200.0	272+50.00	DR-306	18.5	Note 1, 2, 3
1.1							30.0	274+20.00	DR-306	0.3	
2.0	IA 224	272+50.00	274+20.00	Right	42.0	4.0	200.0	272+50.00	DR-306	18.5	Note 1, 2, 3
2.1							30.0	274+20.00	DR-306	0.3	

Notes:

1. Subdrains may be adjusted both vertically and horizontally in the field as necessary.
2. All longitudinal subdrains are Type 7 with PCC or Type 8 with HMA (ACC).
3. Any existing longitudinal subdrains encountered during construction that are not removed shall remain functioning.

CONSTRUCTION LIMITS

PERMANENT ACQUISITION

EXISTING R.O.W.

W(B)

F02(B)

272+00

273+00

274+00

275+00

F0

F0(B)

STA 272+50.00 (ML_224)
BEGIN PROJECT

STA 274+20.00 (ML_224)
END PROJECT

IA 224

POB 271+00.00

POE 276+00.00

SIDA

EXISTING R.O.W.

PERMANENT ACQUISITION

CONSTRUCTION LIMITS

0 20
FEET

935
930
925
920
915
910
905
900
895

STA 272+50.00
BEGIN PROJECT
ELEV. = 923.87

STA 274+20.00
END PROJECT
ELEV. = 917.77

-6.54%

+4.40%

VPI = +50.00
EL = 910.51
L = 500.00'
K = 46

RT +20
906.25

LT +20
903.75

RT +30
901.00

LT +40
898.00

+5.83% RT Ditch Grade

+7.19% LT Ditch Grade

928.50 926.86 925.30 923.87 922.57 921.42 920.40 919.51 918.77 918.16 917.68 917.35 917.15 917.08 917.16 917.37 917.72

272+00 273+00 274+00 275+00

FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	JASPER COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER D.1

11:31:44 AM 2/20/2026 choffmann pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\5022401026\DistrictDesign\XXXX-XXX-X(XXX)–XX-XX\SHT_D_50224010Z09.dgn

SURVEY INDEX

County: Jasper
PIN: 26-50-224-010
Project Number: STPN-224-1(020)—2J-50
Location: 0.15 mi S of N 75th Avenue
Type of Work: Box Culvert Replacement
Project Directory: 5022401026

Survey Personnel

Patrick Shelquist – Survey Project Manager
Will Riordan – Survey Party Chief
Steve Kaiser – Engineering Technician

Date(s) of Survey

Begin Date	10/08/2025
End Date	11/26/2025

General Information

This survey is for IA Hwy 224 Box Culvert over East Burr Oak Creek 0.15 mi S of N 75th Avenue. This survey request was for the IA Hwy 224 corridor and approximately 600' of creek to the west. This project is a Full Field DTM survey.

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

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. Control points were measured using standard control observation of 180 seconds. Points were then tightened through a resection using a total station.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 9 (U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018 (Conus)

Alignment Information

The horizontal alignment for Iowa Highway 224 used for this survey is a retracement of the alignment shown on the Farm To Market System Jasper County Project Number 273 approved on March 22, 1960. Survey stationing was equated to the plan PI at Sta. 281+47.7 and carried back without equation throughout the survey.

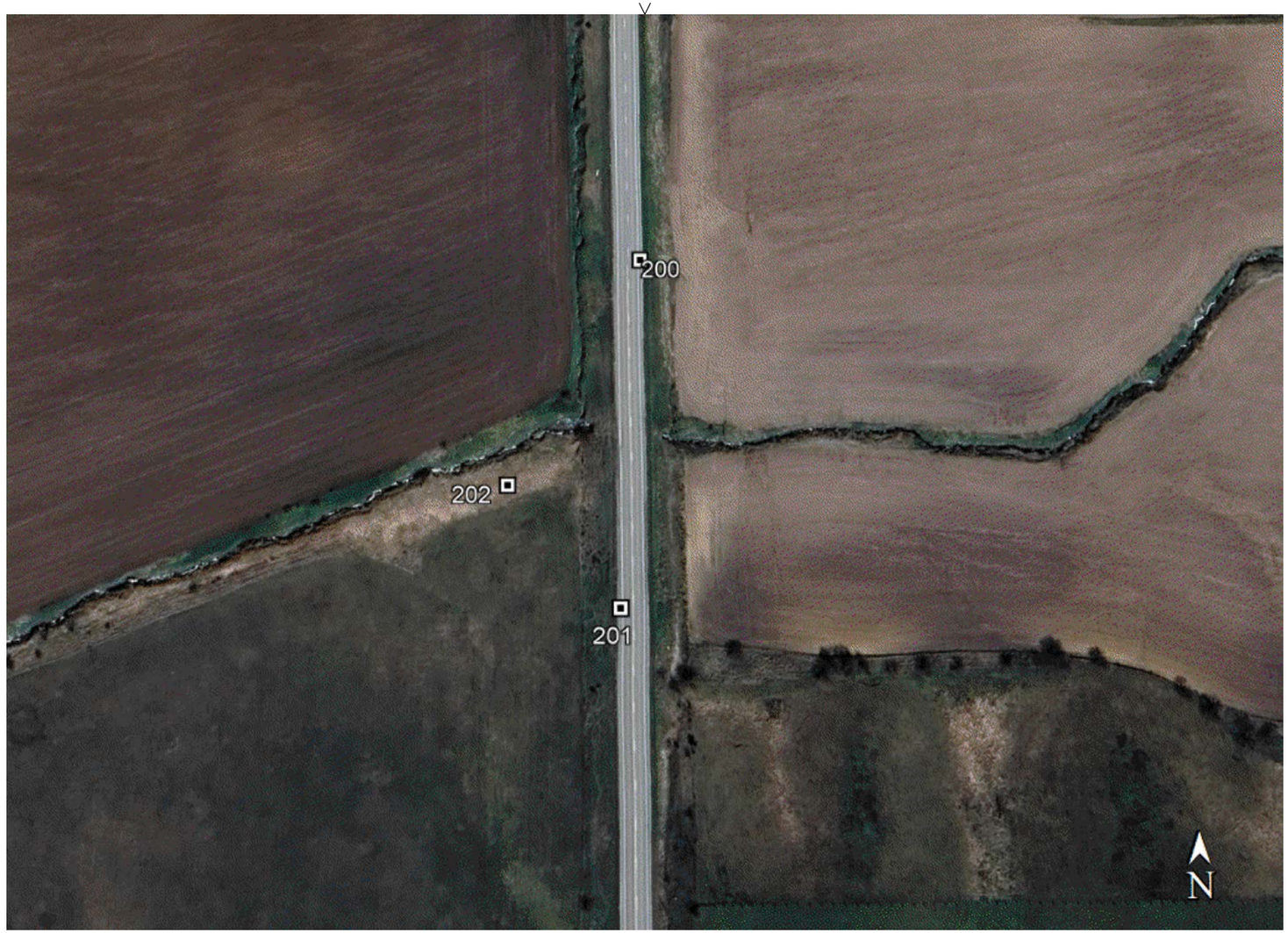
Survey stationing relates to plan stationing as follows:

PI Sta. 281+47.7 Plans Project No. 273
Survey PI Sta. 281+47.7

PI Sta. 255+00.8 Plans Project No. 273
Survey PI Sta. 255+04.82

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 9 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2018 (Conus)

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 9 (U.S. Survey Foot)

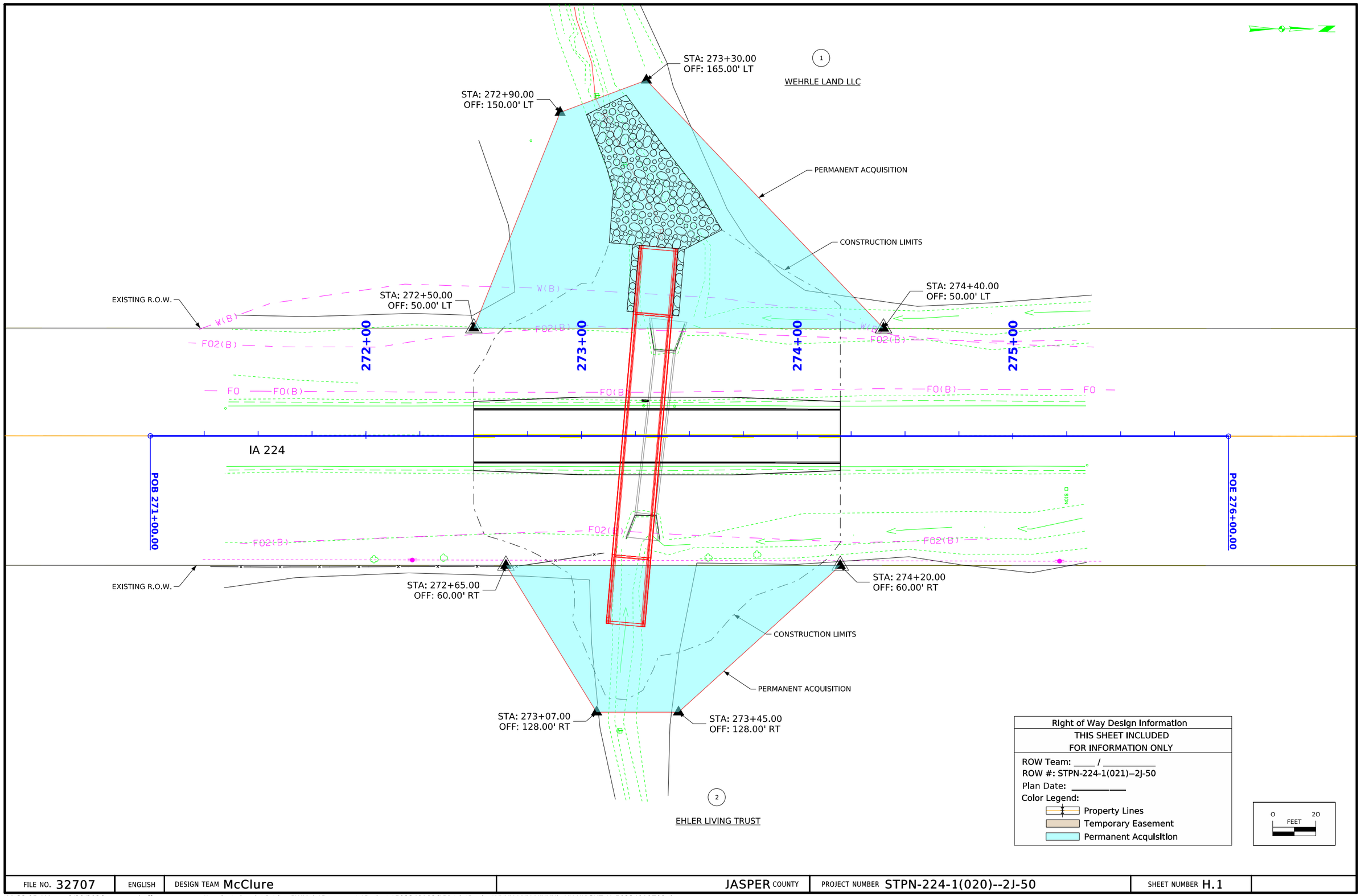
VERT. DATUM: NAVD88
Geoid Model: 2018 (Conus)

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
200	7760781.06	19476546.51	916.95	CP / MAG NAIL
201	7760381.47	19476519.85	930.46	CP / MAG NAIL
202	7760523.26	19476395.85	903.67	CP / 1/2IN REBAR BPC

ALIGNMENT COORDINATES

101-16
10-20-09

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
IA224_1		271+00.00	7760346.622	19476532.582															
IA224_2		276+00.00	7760846.621	19476533.149															



FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	JASPER COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER H.1

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108_23A
8/15/22

TRAFFIC CONTROL PLAN

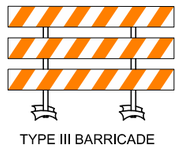
IA 224

- ROUTE WILL BE CLOSED DURING CONSTRUCTION
- OFFSITE DETOUR SHALL BE INSTALLED AND MAINTAINED AS SHOWN

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
NHSN-006-4(200)--2R-50	Culvert Replacement
NHSX-014-4(073)--3H-50	PCC Pavement - Grade and Replace



TYPE III BARRICADE

Ⓐ

R11-4
60" x 30"

Ⓑ

R11-2
48" x 30"

Ⓒ

M4-10R
48" X 18"

Ⓓ

M4-10L
48" X 18"

Ⓔ

W20-3
48" x 48"

Ⓕ

W20-2
48" x 48"

Ⓖ

M4-8 24" x 12"
M1-5 30" x 24"
M6-1L 21" x 15"

Ⓗ

M4-8 24" x 12"
M1-5 30" x 24"
M6-1R 21" x 15"

Ⓘ

M4-8 24" x 12"
M1-5 30" x 24"
M5-1L 21" x 15"

Ⓙ

M4-8 24" x 12"
M1-5 30" x 24"
M5-1R 21" x 15"

Ⓚ

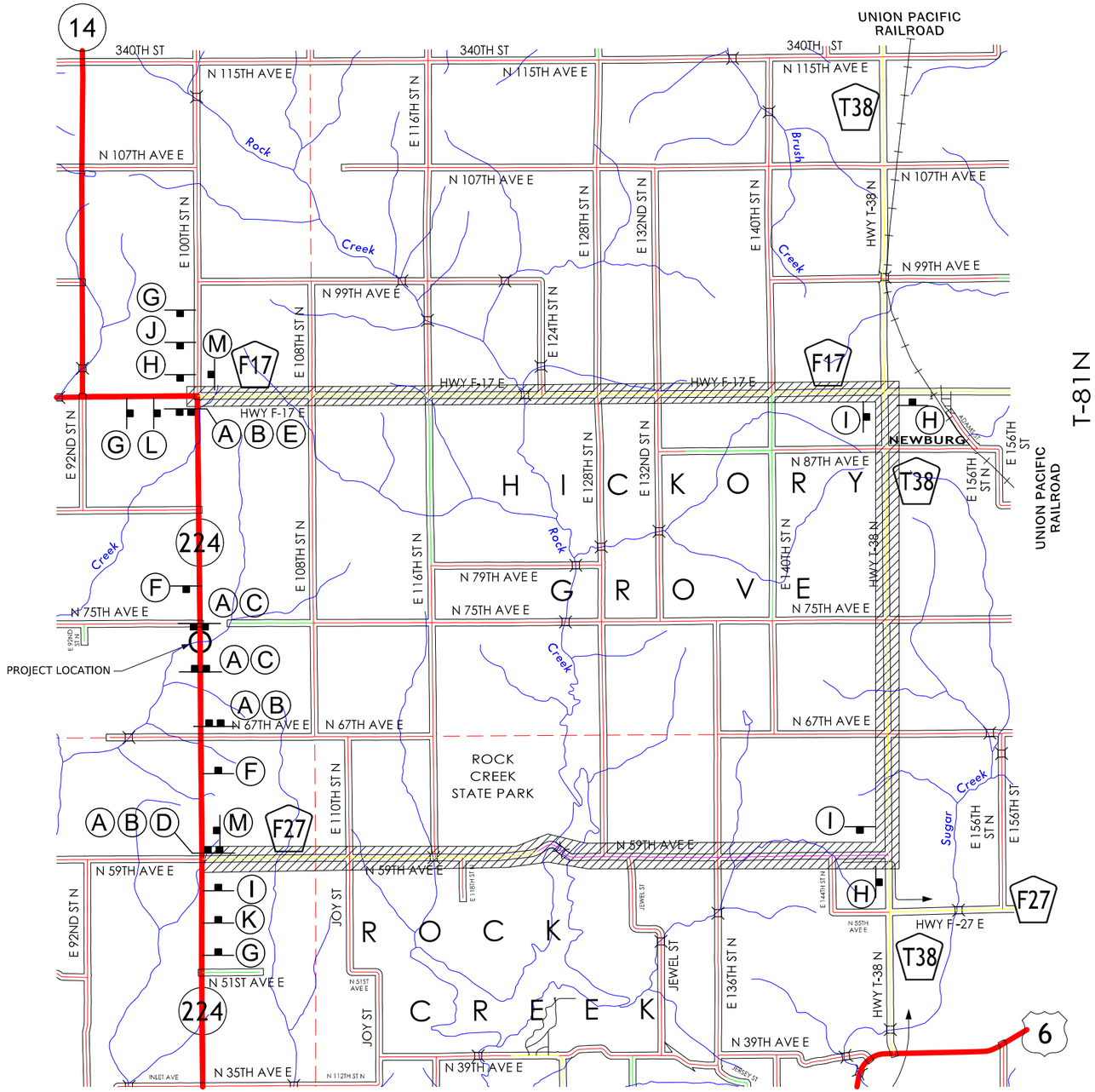
M4-8 24" x 12"
M1-5 30" x 24"
M5-1 21" x 15"

Ⓛ

M4-8A 24" x 18"

Ⓜ

DETOUR ROUTE



FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	JASPER COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER J.3

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100_17
8/15/22

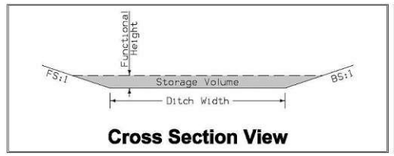
TABULATION OF SILT FENCES

Refer to EC-201

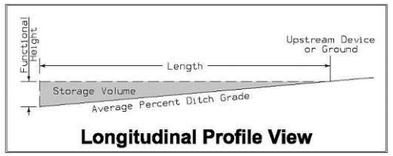
Station From	Station To	Side	Length (FT)	Remarks
272+50.00	274+20.00	Right	170.00	
272+50.00	274+20.00	Right	170.00	
Total:			**340**	

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201



Cross Section View



Longitudinal Profile View

* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: [0.5*Spacing*(0.5*H^2*FS+DW*H+0.5*H^2*BS)]

Line No.	Basin No.	Type	Station	Side	Installation (LF)	Maintenance (LF)	Removal (LF)	Foreslope (FS:1)	Backslope (BS:1)	Ditch Width (FT)	Avg. % Slope Ditch Grade	Volume (CF)	Remarks
1.0	1		273+40.00	Right	18.0	1.8	9.0	4.0	2.5	5.0			
2.0	2		273+57.00	Left	18.0	1.8	9.0	4.0	2.5	5.0			
3.0	1		273+63.00	Right	18.0	1.8	9.0	4.0	2.5	5.0			
4.0	2		273+80.00	Left	18.0	1.8	9.0	4.0	2.5	5.0			
5.0	1		273+83.00	Right	18.0	1.8	9.0	4.0	2.5	5.0			
6.0	2		274+03.00	Left	18.0	1.8	9.0	4.0	2.5	5.0			
7.0	1		274+06.00	Right	18.0	1.8	9.0	4.0	2.5	5.0			
Total:					**126**	**12.6**	**63**						

232_03A
9/28/22

EROSION CONTROL (RURAL SEEDING)

Area to be seeded is estimated to be less than 1 acre. If the contractor determines the area exceeds 2 acres, notify the Engineer. Approved quantity in excess of 2 acres will be paid for as extra work according to Article 1109.03,B of the Standard Specifications.

Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed, fertilizer, and mulch on the disturbed area lying 8 feet adjacent to shoulder and median as follows:

Place seed and fertilize according to the requirements of Article 2601.03,C,3 and Section 4169 of the Standard Specifications.

Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed, furnishing and applying seed, fertilizer, and mulch are all incidental to mobilization and will not be paid for separately.

232_11
6/21/23

EROSION CONTROL (STABILIZING CROP SEEDING)

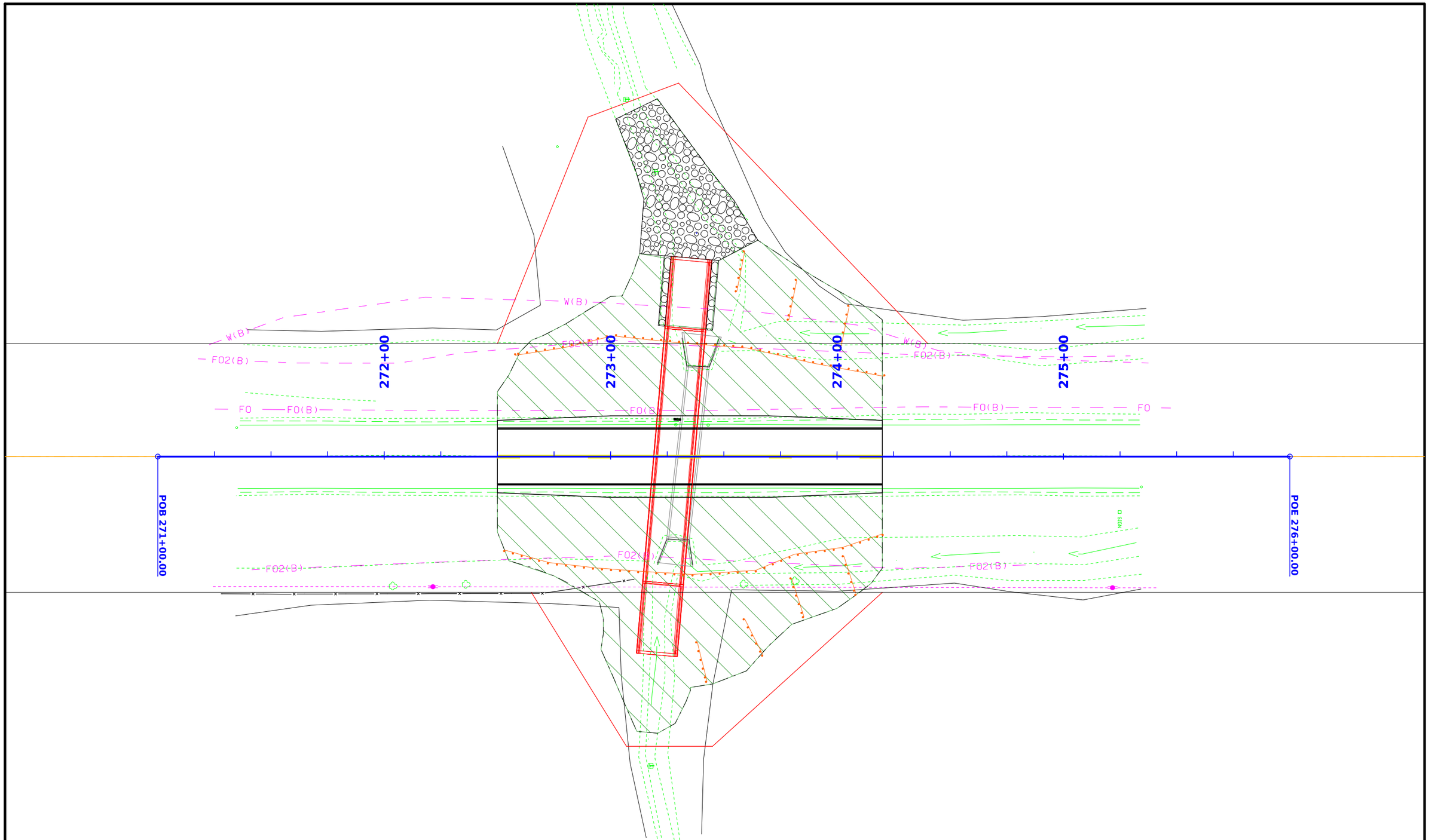
Area to be seeded is estimated to be less than 1 acre. If the contractor determines the area exceeds 2 acres, notify the Engineer. Approved quantity in excess of 2 acres will be paid for as extra work according to Article 1109.03,B of the Standard Specifications.

If outside of permanent seeding dates in Section 2601 of the Standard Specifications, or if required by a storm water permit, place stabilizing crop, fertilizer, and mulch on the disturbed area as follows:

Place seed and fertilize according to the requirements of Article 2601.03,C,1 and Section 4169 of the Standard Specifications.

Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed, furnishing and applying seed, fertilizer, and mulch are incidental to mobilization and will will not be paid for separately.



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Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

107-28
04-21-15

Station	Cut					Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Topsoil Cut Volume	Template Pavement Removal Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink							
ML224																						
272+50.00	84	31	33	19	31	80	80	104	-73	0	0	33	24	34	-1							
272+75.00	121	30	71	20	30	260	260	338	-308	0	0	71	41	57	14							
273+00.00	115	29	67	20	29	420	420	546	-517	0	0	67	41	58	9							
273+25.00	138	51	67	20	51	562	562	731	-680	0	0	67	52	73	-6							
273+50.00	212	100	92	20	100	465	465	604	-504	0	0	92	65	91	1							
273+75.00	209	107	83	20	107	192	192	250	-143	0	0	83	55	78	5							
274+00.00	118	53	49	16	53	48	48	63	-10	0	0	49	34	48	1							
274+20.00																						
ML224																						
Totals:	997	401	463	134	401	2,027	2,027	2,636	-2,235	0	0	463	313	439	25							

#

FILE NO. 32707 | DESIGN TEAM McClure | JASPER COUNTY | PROJECT NUMBER STPN-224-1(020)--2J-50 | SHEET NUMBER T.1

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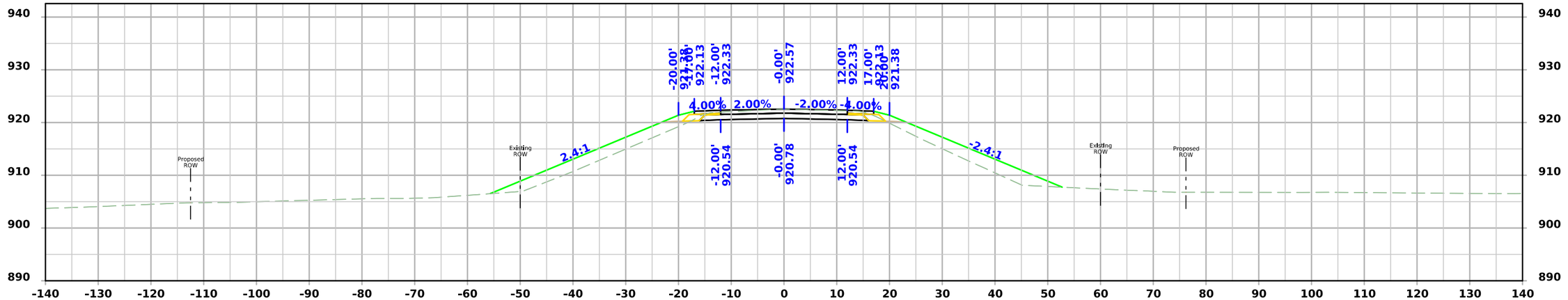
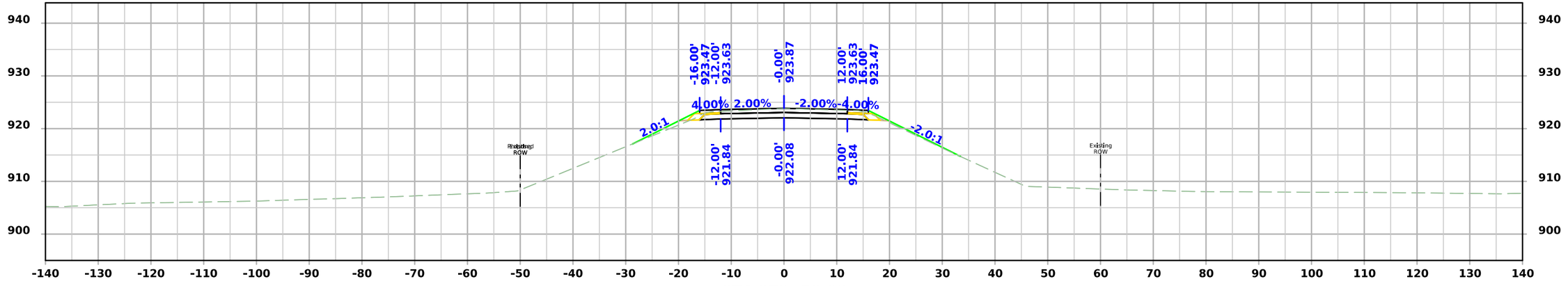
ML - IA224



STA 272+75.00



STA 272+50.00

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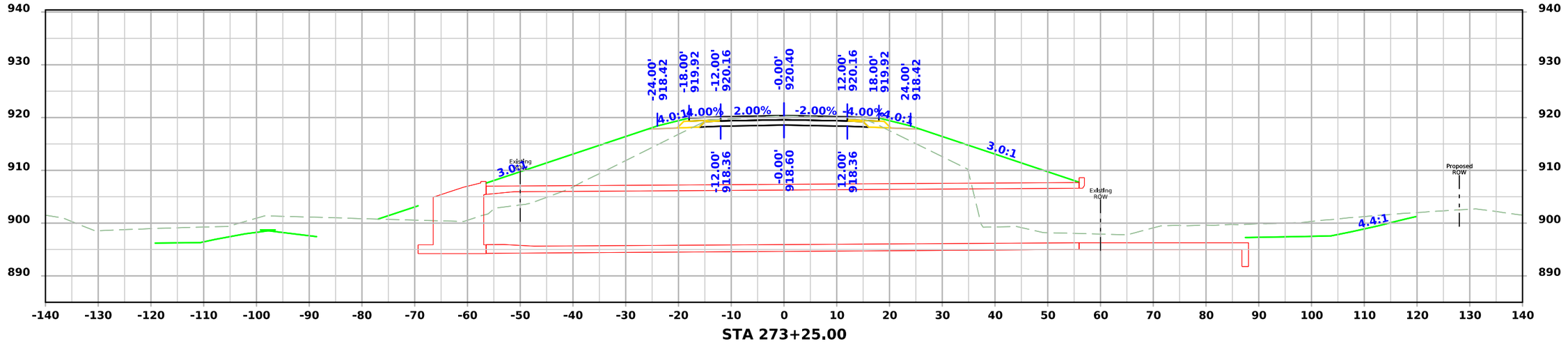
ML - IA224



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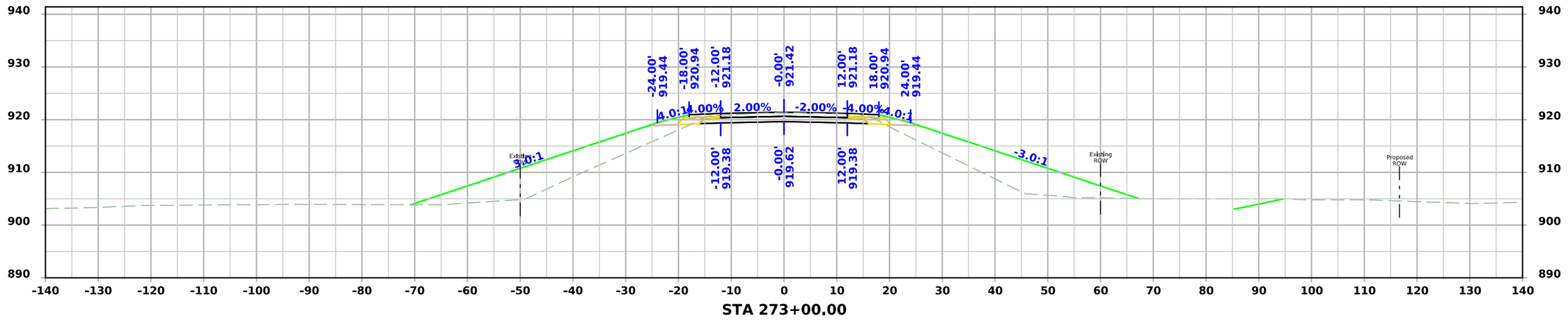

STA 273+00.00

FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	JASPER COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER W.2

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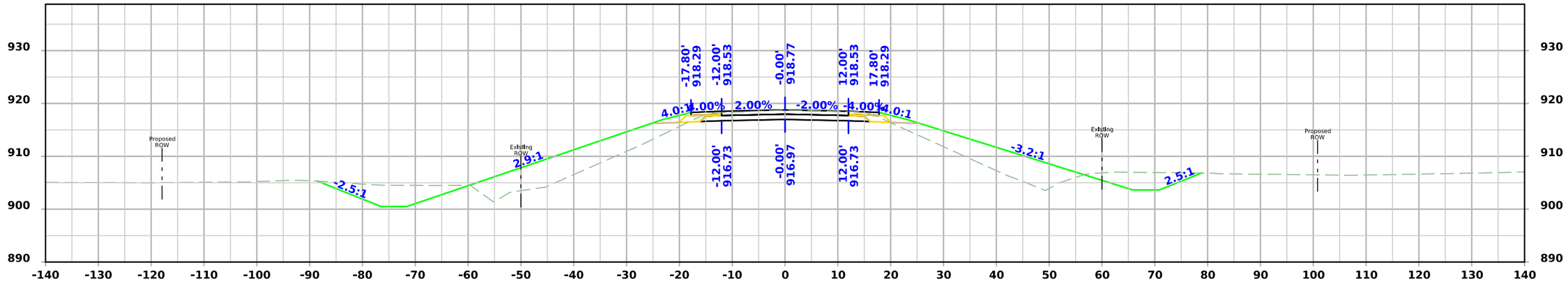

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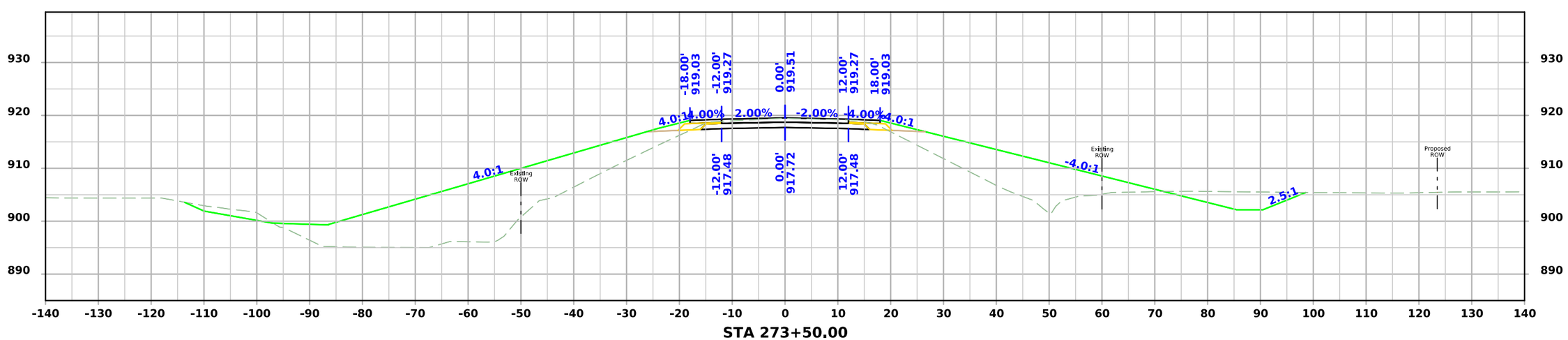

STA 273+50.00

FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	JASPER COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER W.3

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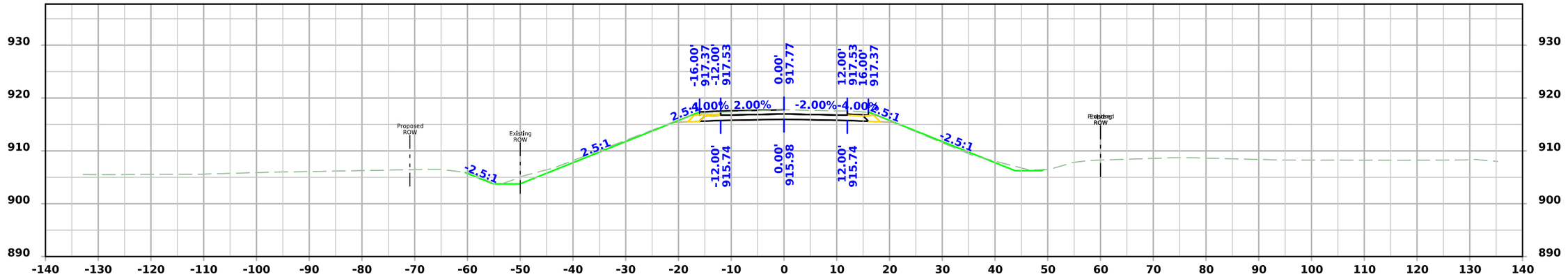
ML - IA224



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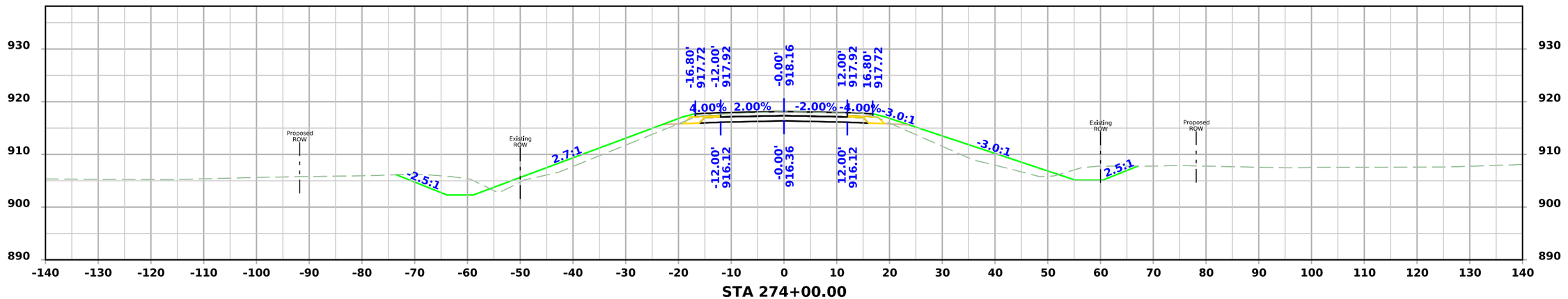

STA 274+00.00

FILE NO. 32707	ENGLISH	DESIGN TEAM McClure	JASPER COUNTY	PROJECT NUMBER STPN-224-1(020)--2J-50	SHEET NUMBER W.4

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