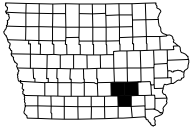


WAPELLO/MAHASKA/KEOKUK COUNTY

HMA Resurfacing/Heater Scarification

STP-149-1(100)--2C-90

LETTING DATE
DEC 15 2026



PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

WAPELLO/MAHASKA/KEOKUK COUNTY

HMA Resurfacing/Heater Scarification

Approx. 1.1 mi N of US 63 to 0.4 mi S of IA 23

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



For Project Location Map
Refer to Sheet No. A.02

REVISIONS

TOTAL
..
PROJECT IDENTIFICATION NUMBER
24-90-149-010
PROJECT NUMBER
STP-149-1(100)--2C-90
R.O.W. PROJECT NUMBER

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.2	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 7	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1 - 3	Estimated Project Quantities and Reference Information
C.4	Standard Road Plans
C.4	Index of Tabulations
C.4	General Notes
C.5 - 14	Tabulations
CS Sheets	Soils Tabulations
CS.1 - 2	Soils Tabulations
D Sheets	Mainline Plan and Profile Sheets
D.1 - 5	IA 149 Plan Sheets
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.1	511 Travel Restriction
J.1	Staging Notes
J.1	Coordinated Operations
R Sheets	Erosion Control Sheets
RC.1 - 5	Est. Quantities, PPP, General Notes and Tabulations
U Sheets	500 Series, Mod.Stds. and Detail Sheets
U.1	500 Series, Modified Standards and Detail Sheets
U.2	500 Series, Modified Standards and Detail Sheets
U.3	IA 149 and IA 23 Intersection Pavement Markings Layout

PROJECT EVENT DATES

D-7 - 10-06-2026

KEOKUK COUNTY	
DESIGN DATA RURAL	
2025	AADT 3002 V.P.D.
2045	AADT 3150 V.P.D.
2045	DHV 330 V.P.H.
TRUCKS	11 %
Total	
Design ESALs	993,480

WAPELLO COUNTY	
DESIGN DATA RURAL	
2025	AADT 3002 V.P.D.
2045	AADT 3150 V.P.D.
2045	DHV 330 V.P.H.
TRUCKS	11 %
Total	
Design ESALs	993,480

INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	X	Primary Signature Block	X

PRELIMINARY PLANS

Subject to change by final design.

DM5 PLAN - Date: 09/03/2026

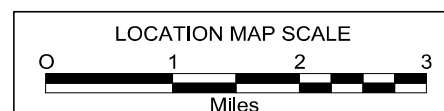
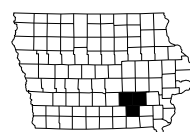
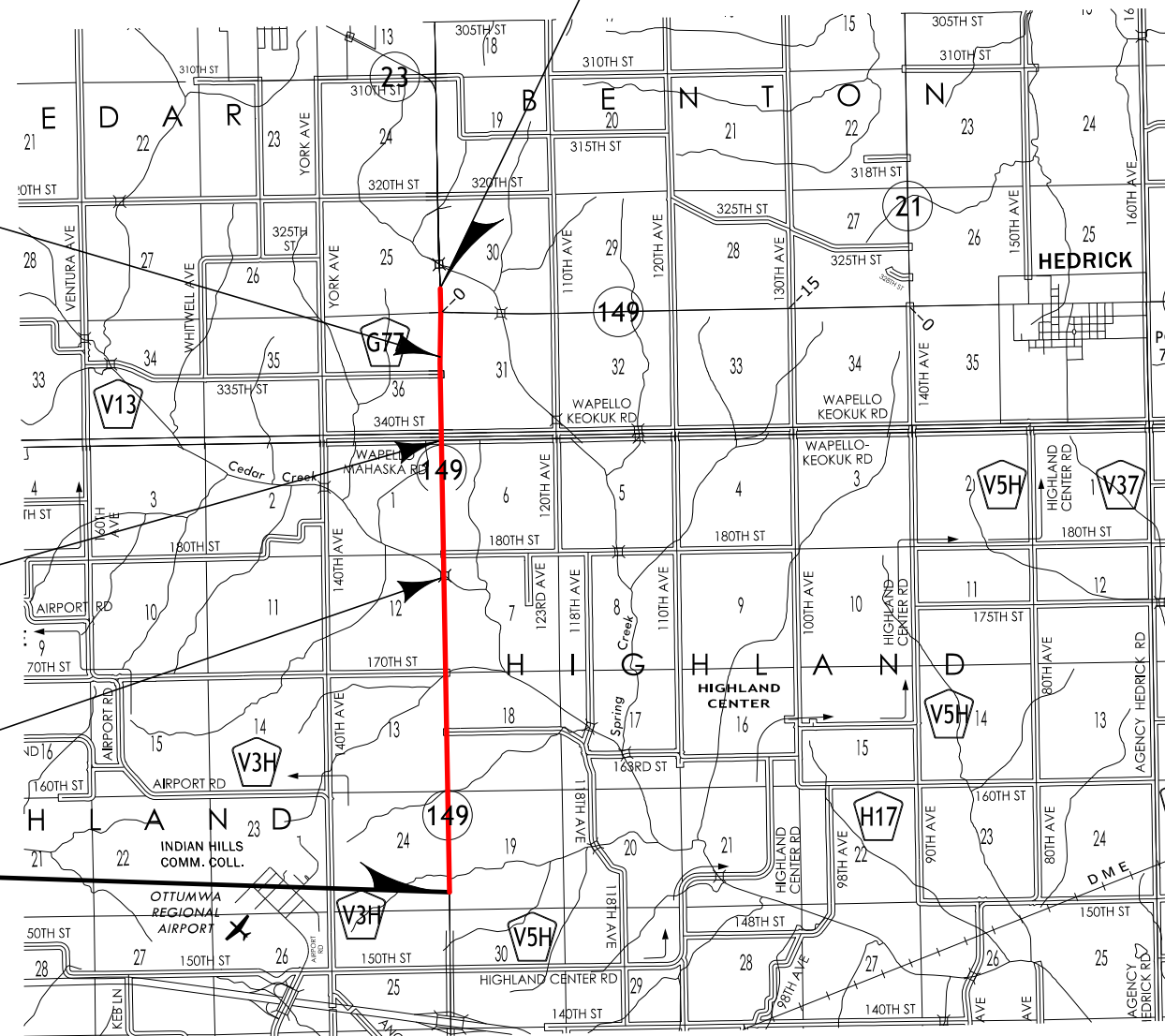
END PROJECT
STA. 2018+16
REF. LOC. 0.20

STATION EQUATION
821+42.60 (BK) = 1985+47.32 (AH)

STATION EQUATION
1553+24.20 (BK) = 853+04.90 (AH)

FHWA #050691
MAINT #9009.95149

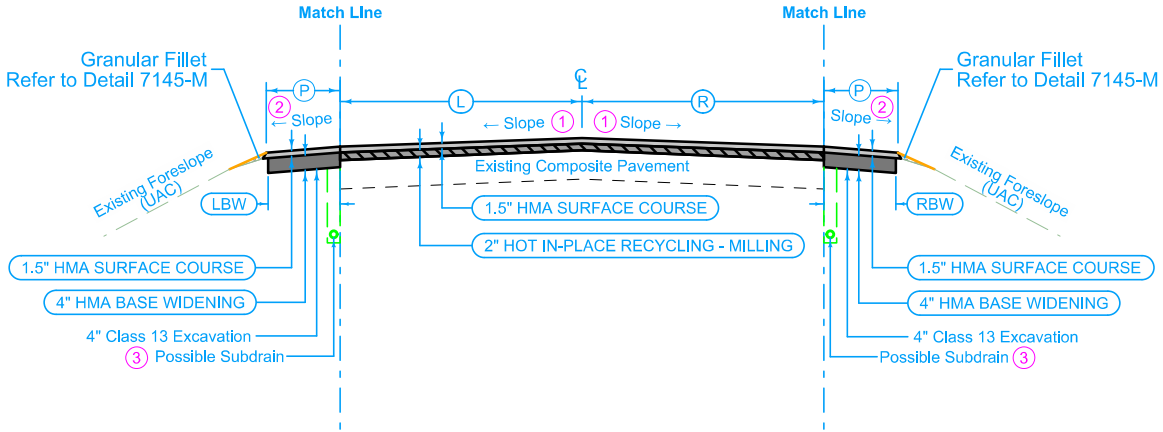
BEGIN PROJECT
STA. 1349+45
REF. LOC. 7.12



Combination Shoulder (with 4' Widening)

3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		(P) Feet	(LBW) Feet
1349+45	1486+40	4	4
1501+57	1553+24.20 (E1)	4	4
853+04.90 (E1)	852+20	4	4

STATION EQUATION (E1) 1553+24.20 (BK) = 853+04.90 (AH)



Combination Shoulder (with 4' Widening)

3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		(P) Feet	(RBW) Feet
1349+45	1486+40	4	4
1501+57	1553+24.20 (E1)	4	4
853+04.90 (E1)	852+20	4	4

STATION EQUATION (E1) 1553+24.20 (BK) = 853+04.90 (AH)

3R_MillingOverlay_ MODIFIED				
STATION TO STATION		(L) Feet	(R) Feet	Remarks
1349+45	1486+40	12	12	
1501+57	1553+24.20 (E1)	12	12	
853+04.90 (E1)	852+20	12	12	

STATION EQUATION (E1) 1553+24.20 (BK) = 853+04.90 (AH)

- ① Finished slope shall match existing pavement except the minimum allowable slope is 2.0% and the maximum allowable slope is 3.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Finished slope of Shoulder shall have a minimum allowable slope of 4% and a maximum allowable slope of 6%. Section may be modified as directed by the Engineer through areas of special shaping.
- ③ UAC existing subdrain. All subdrain shall remain functional at all times (do not plug or crush). New subdrain shall be in contact with the granular material below the existing mainline pavement (see Tab 104-9 on CS sheets for proposed locations).

General Notes:

1. Section and Stationing is shown in the Direction of NB Traffic.
2. Stationing on typical sections does not include gapping for paved sideroads and paved entrances. Refer to Details.
3. See Tab 100-25 for Pavement quantities.
4. See Tab 106-5 for Base Widening quantities.
5. See Tab 112-9 for Granular Shoulder quantities.

IA 149 Mainline Hot In-Place Recycling, HMA Resurfacing,
and Paved Shoulders

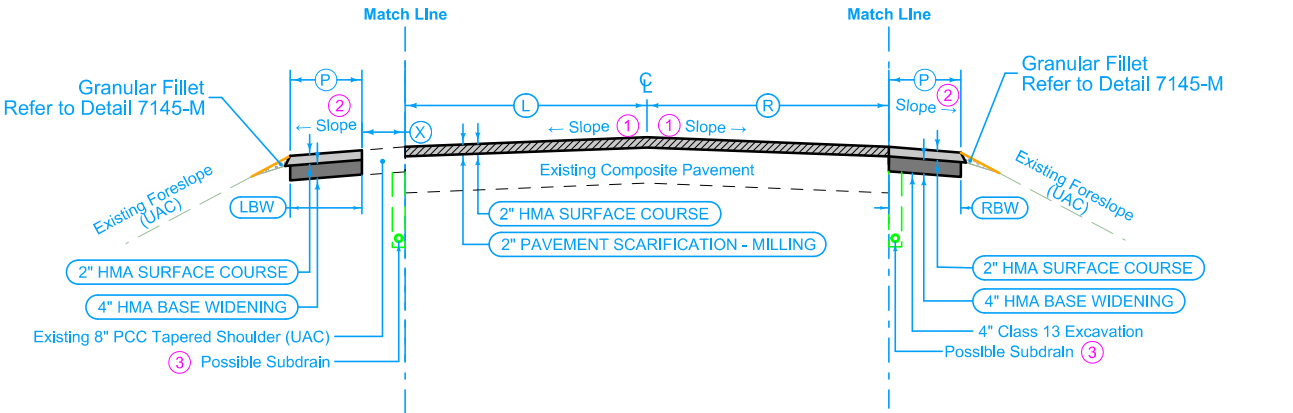
(Beginning of Project to Area around Bridge FHWA 50691 at MP 9.9)
(From Area around Bridge FHWA 50691 at MP 9.9 to Wapello / Mahaska/ Keokuk County line)

Combination Shoulder

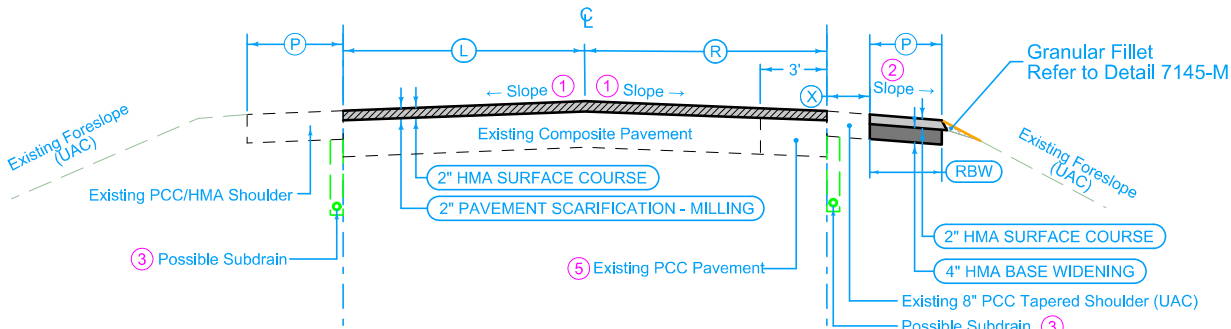
3R_Shldr_C_Overlay_ Modified				
STATION TO STATION		(X) Feet	(P) Feet	(LBW) Feet
1486+40	1486+65	2-4	4	4
1501+38	1501+57	4-2	4	4

Existing PCC Shoulder (UAC)

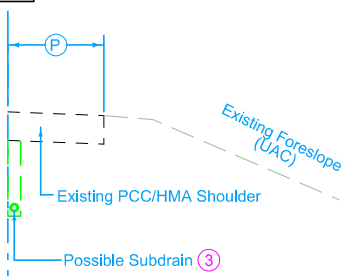
3R_Shldr_C_Overlay_ Modified				
STATION TO STATION		(P) Feet	(G) Feet	
1486+65	1489+00	UAC	UAC	
1499+57	1501+38	UAC	UAC	



3R_MillingOverlay_ MODIFIED					
STATION TO STATION		(C) Feet	(L) Feet	(R) Feet	Remarks
1486+40	1488+00	24	12	12	
1499+57	1501+57	24	12	12	



3R_MillingOverlay_ MODIFIED					
STATION TO STATION		(C) Feet	(L) Feet	(R) Feet	Remarks
1488+00	1489+00	24	12	12	



Combination Shoulder (with 4' Widening)

3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		(P) Feet	(RBW) Feet
1486+40	1488+00	4	4
1500+35	1501+57	4	4

Combination Shoulder (with 4' Widening)

3R_Shldr_C_Overlay_ Modified				
STATION TO STATION		(X) Feet	(P) Feet	(RBW) Feet
1488+00	1488+25	2-4	4	4
1500+15.50	1500+35	4-2	4	4

Existing PCC Shoulder (UAC)

3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		(P) Feet	(G) Feet
1488+25	1489+00	UAC	UAC
1499+57	1500+15.50	UAC	UAC

- ① Finished slope shall match existing pavement except the minimum allowable slope is 2.0% and the maximum allowable slope is 3.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Finished slope of Shoulder shall have a minimum allowable slope of 4% and a maximum allowable slope of 6%. Section may be modified as directed by the Engineer through areas of special shaping.
- ③ UAC existing subdrain. All subdrain shall remain functional at all times (do not plug or crush). New subdrain shall be in contact with the granular material below the existing mainline pavement (see Tab 104-9 on CS sheets for proposed locations).
- ④ The surface of the existing granular shoulder is estimated to be 1.0" below the surface of the edge of the existing pavement.
- ⑤ The 3' width existing PCC in the traveled lane will be milled 2" and 2" of HMA Surface Course will be placed.

General Notes:

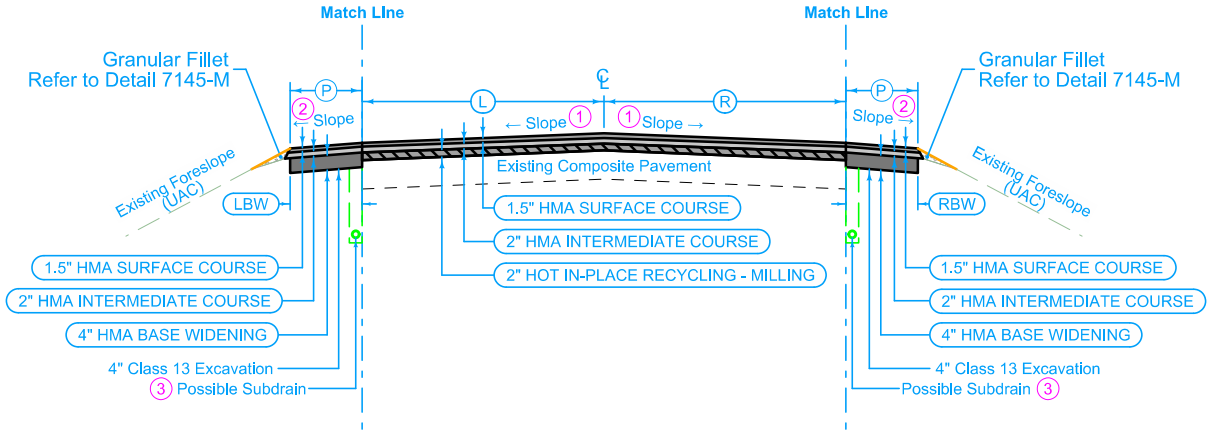
- Section and Stationing is shown in the Direction of NB Traffic.
- Stationing on typical sections does not include gapping for paved sideroads and paved entrances. Refer to Details.
- See Tab 100-25 for Pavement quantities.
- See Tab 106-5 for Base Widening quantities.
- See Tab 112-9 for Granular Shoulder quantities.

IA 149 Mainline HMA Resurfacing
and Paved Shoulders

(Area around Bridge FHWA 50691 at MP 9.9)

Combination Shoulder (with 4' Widening)

3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		(P) Feet	(LBW) Feet
852+20	821+55	4	4



Combination Shoulder (with 4' Widening)

3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		(P) Feet	(RBW) Feet
852+20	821+55	4	4

3R_MillingOverlay_ MODIFIED				
STATION TO STATION		(L) Feet	(R) Feet	Remarks
852+20	821+55	12	12	

- ① Finished slope shall match existing pavement except the minimum allowable slope is 2.0% and the maximum allowable slope is 3.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Finished slope of Shoulder shall have a minimum allowable slope of 4% and a maximum allowable slope of 6%. Section may be modified as directed by the Engineer through areas of special shaping.
- ③ UAC existing subdrain. All subdrain shall remain functional at all times (do not plug or crush). New subdrain shall be in contact with the granular material below the existing mainline pavement (see Tab 104-9 on CS sheets for proposed locations).

- General Notes:
- Section and Stationing is shown in the Direction of NB Traffic.
 - Stationing on typical sections does not include gapping for paved sideroads and paved entrances. Refer to Details.
 - See Tab 100-25 for Pavement quantities.
 - See Tab 106-5 for Base Widening quantities.
 - See Tab 112-9 for Granular Shoulder quantities.

IA 149 Mainline Hot In-Place Recycling, HMA Resurfacing Pavement, & Paved Shoulders
(From Wapello / Mahaska / Keokuk County line to IA 149/IA 23 Intersection)

Combination Shoulder

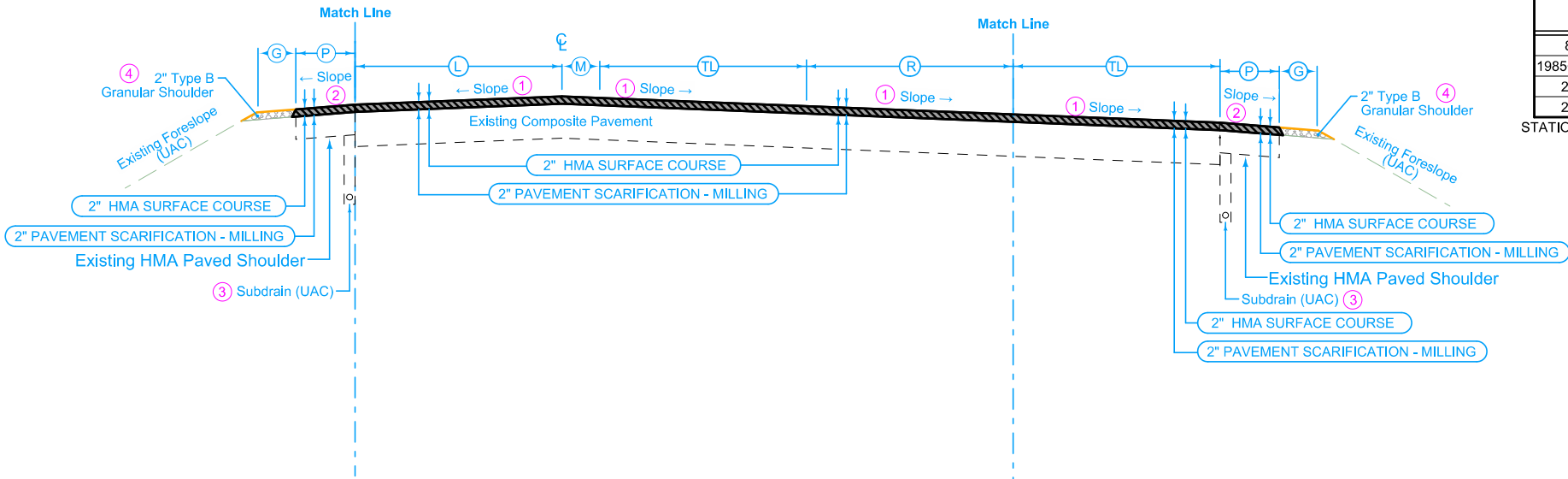
3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		Ⓟ Feet	Ⓞ Feet
821+55	821+42.60 (E2)	4	6
1985+47.32 (E2)	2007+68	4	6

STATION EQUATION (E2) 821+42.60 (BK) = 1985+47.32 (AH)

Turning Lanes and Combination Shoulder

3R_Shldr_C_Overlay_ Modified				
STATION TO STATION		ⓉⓁ Feet	Ⓟ Feet	Ⓞ Feet
821+55	821+42.60 (E2)	0	4	6
1985+47.32 (E2)	2001+08	0	4	6
2001+08	2002+85	0-12	4	6
2002+85	2006+57	12	4	6

STATION EQUATION (E2) 821+42.60 (BK) = 1985+47.32 (AH)



3R_MillingOverlay_ Modified						
STATION TO STATION		Ⓛ Feet	Ⓜ Feet	ⓉⓁ Feet	Ⓡ Feet	Remarks
821+55	821+42.60 (E2)	12	0	0	12	
1985+47.32 (E2)	1994+48	12	0	0	12	
1994+48	2004+20	12	0-16	0	12	
2004+20	2005+82	12	16-4	0-12	12	
2005+82	2007+68	12	4	12	12	

STATION EQUATION (E2) 821+42.60 (BK) = 1985+47.32 (AH)

- ① Finished slope shall match existing pavement except the minimum allowable slope is 2.0% and the maximum allowable slope is 3.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Finished slope of Shoulder shall have a minimum allowable slope of 4% and a maximum allowable slope of 6%. Section may be modified as directed by the Engineer through areas of special shaping.
- ③ UAC existing subdrain. All subdrain shall remain functional at all times (do not plug or crush). New subdrain shall be in contact with the granular material below the existing mainline pavement (see Tab 104-9 on CS sheets for proposed locations).
- ④ The surface of the existing granular shoulder is estimated to be 1.0" below the surface of the edge of the existing pavement.

General Notes:

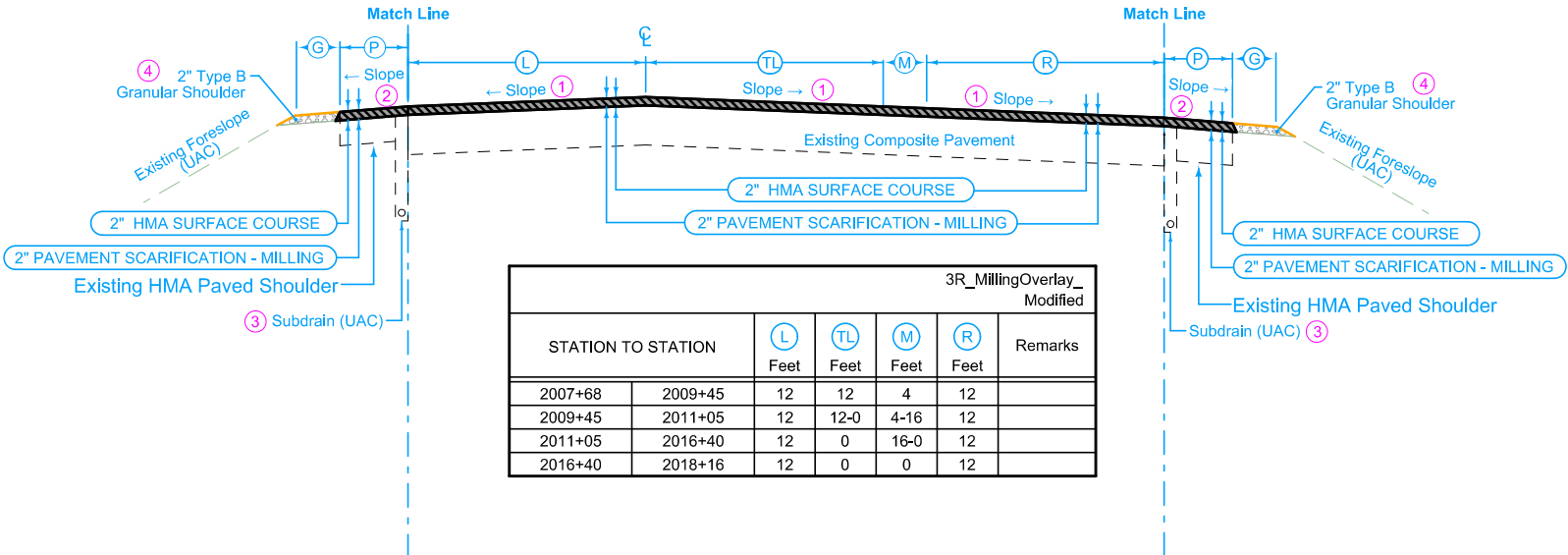
- Section and Stationing is shown in the Direction of NB Traffic.
- Stationing on typical sections does not include gapping for paved sideroads and paved entrances. Refer to Details.
- See Tab 100-25 for Pavement quantities.
- See Tab 106-5 for Base Widening quantities.
- See Tab 112-9 for Granular Shoulder quantities.

IA 149 Mainline HMA Resurfacing
and Paved Shoulders

(IA 149/IA 23 Intersection at End of Project)

Combination Shoulder

3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		(P) Feet	(G) Feet
2007+68	2018+16	4	6



3R_MillingOverlay_ Modified						
STATION TO STATION		(L) Feet	(TL) Feet	(M) Feet	(R) Feet	Remarks
2007+68	2009+45	12	12	4	12	
2009+45	2011+05	12	12-0	4-16	12	
2011+05	2016+40	12	0	16-0	12	
2016+40	2018+16	12	0	0	12	

Combination Shoulder

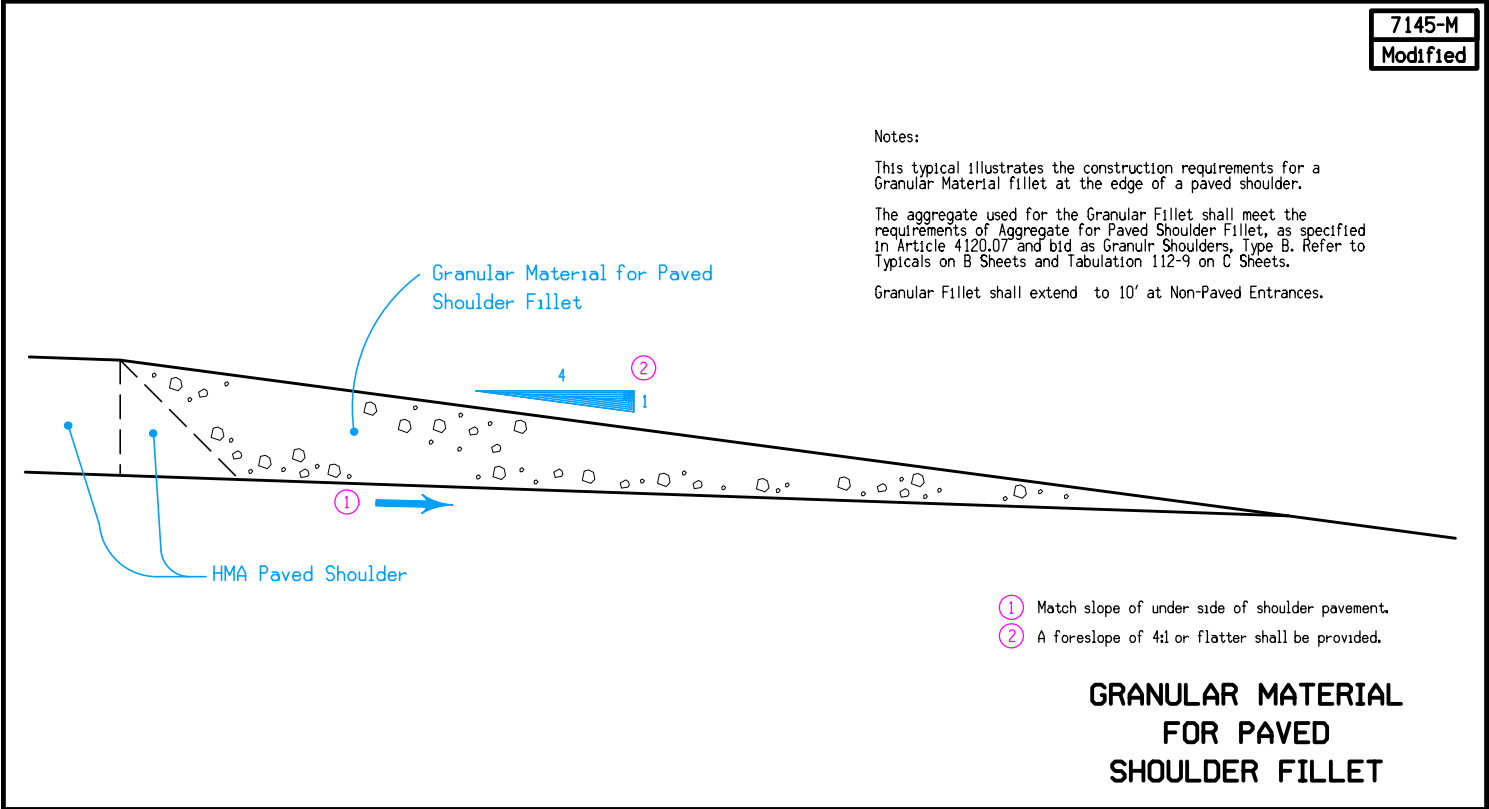
3R_Shldr_C_Overlay_ Modified			
STATION TO STATION		(P) Feet	(G) Feet
2008+76	2018+16	4	6

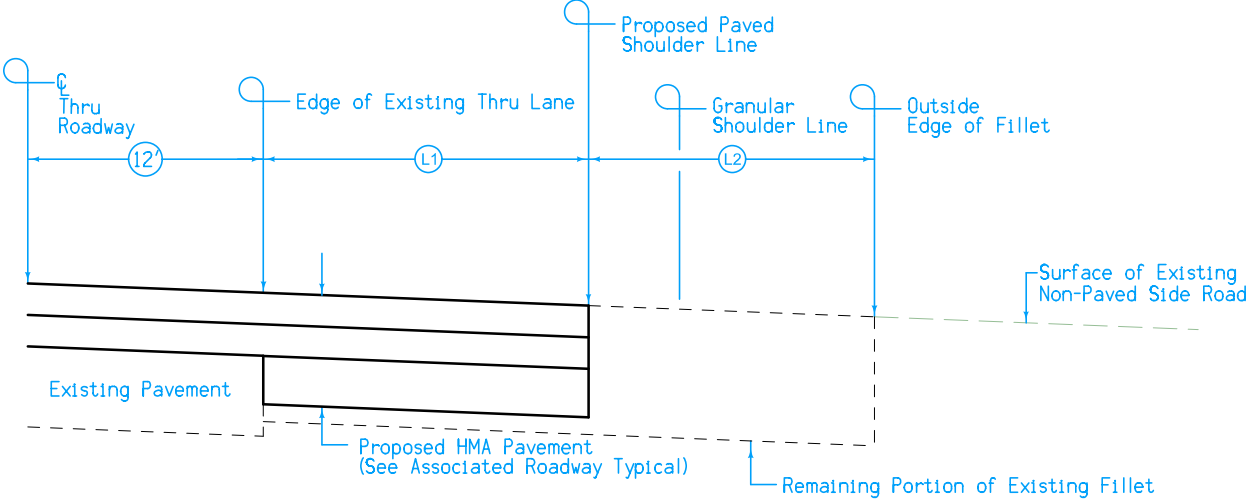
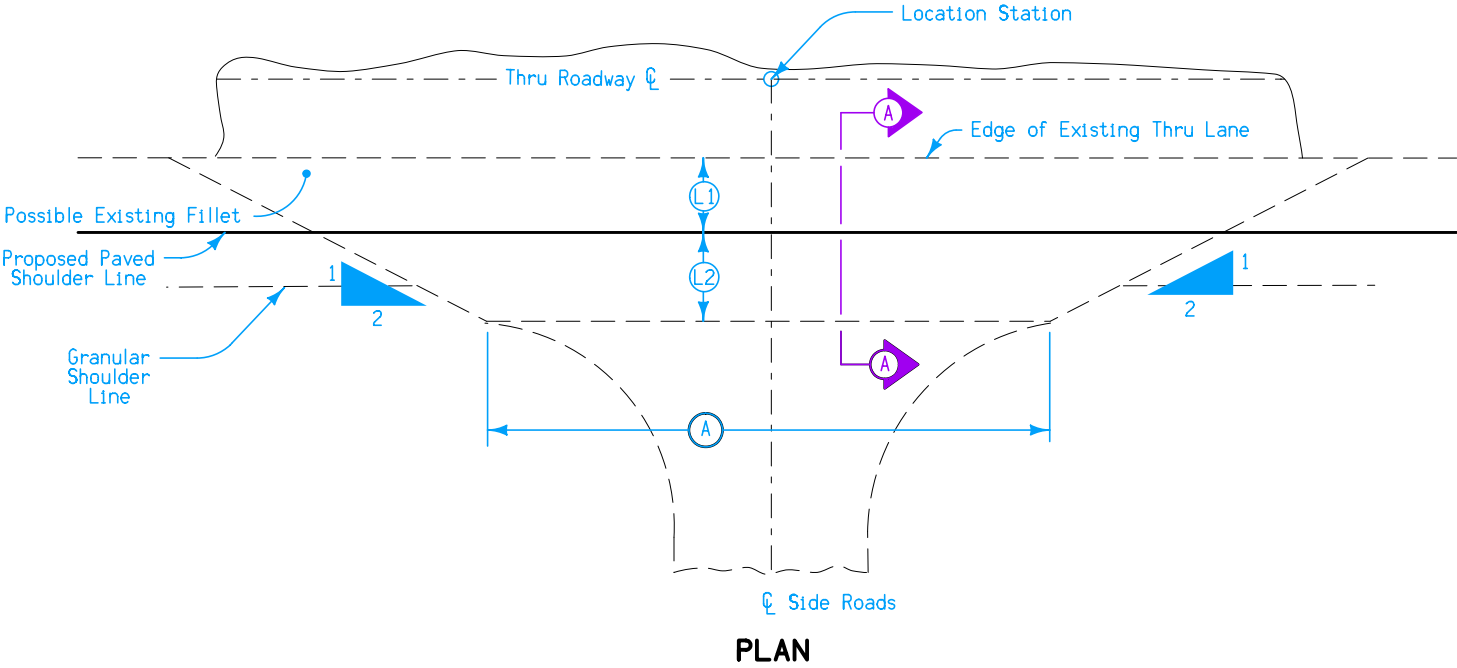
- ① Finished slope shall match existing pavement except the minimum allowable slope is 2.0% and the maximum allowable slope is 3.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Finished slope of Shoulder shall have a minimum allowable slope of 4% and a maximum allowable slope of 6%. Section may be modified as directed by the Engineer through areas of special shaping.
- ③ UAC existing subdrain. All subdrain shall remain functional at all times (do not plug or crush). New subdrain shall be in contact with the granular material below the existing mainline pavement (see Tab 104-9 on CS sheets for proposed locations).
- ④ The surface of the existing granular shoulder is estimated to be 1.0" below the surface of the edge of the existing pavement.

General Notes:

- Section and Stationing is shown in the Direction of NB Traffic.
- Stationing on typical sections does not include gapping for paved sideroads and paved entrances. Refer to Details.
- See Tab 100-25 for Pavement quantities.
- See Tab 106-5 for Base Widening quantities.
- See Tab 112-9 for Granular Shoulder quantities.

**IA 149 Mainline HMA Resurfacing
and Paved Shoulders**
(IA 149/IA 23 Intersection at End of Project)





SECTION A-A

GENERAL NOTES:

1. Refer to Tab 100-25 (HMA Pavement) and 106-5 (Base Widening) on the C Sheets for HMA Pavement, Widening, and Excavation Quantities associated with Dimension (L1).

2. Refer to Tab 100-25 (HMA Pavement) for HMA Pavement Quantities associated with Dimension (L2).

FILLET FOR NON-PAVED SIDE ROADS
(EXISTING PAVED FILLET GREATER THAN PROPOSED PAVED SHOULDER LINE)

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Roadway Items : Roadway Items

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
1	2101-0850001	CLEARING AND GRUBBING	ACRE	0.48	Refer to Tab. 110-17 on C Sheets. Woodland, per Iowa Code 314.23, will not be impacted. Tree clearing date restrictions are not required for this project.
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	35	Refer to Tab. 3R-CULV on C Sheets.
3	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	8,608.044	Refer Tab. 112-9 on C Sheets. Tabulation includes 20% contingency.
4	2125-2225050	RESHAPING DITCHES	STA	1	Refer to Tab. 3R-CULV on C Sheets.
5	2212-5070310	PATCHES, FULL-DEPTH REPAIR	SY	327	Refer to Tab. 102-6C on C Sheets. Item includes 2 Full-Depth PCC Patches and 14 Full Depth HMA Patches. Tabulation includes 5% contingency.
6	2212-5070330	PATCHES BY COUNT (REPAIR)	EACH	17	
7	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING	CY	2,207.1	Refer to Tab. 106-5 on C Sheets.
8	2213-8201040	BASE WIDENING, 4 IN. HOT MIX ASPHALT MIXTURE	SY	19,864.3	
9	2214-5145150	PAVEMENT SCARIFICATION, NOMINAL THICKNESS	SY	21,915.8	
10	2303-1042500	HOT MIX ASPHALT HIGH TRAFFIC, INTERMEDIATE COURSE, 1/2 IN. MIX	TON	1,261.554	Includes 4,466.7 SY from Tab. 102-16 on C Sheets. Includes 17,449.1 SY from Tab. 100-25 on C Sheets. Refer to Tab. 100-25 on C Sheets. Tabulation includes 5% contingency for irregularities.
11	2303-1043504	HOT MIX ASPHALT HIGH TRAFFIC, SURFACE COURSE, 1/2 IN. MIX, FRICTION L-4	TON	8,832.863	
12	2303-1258284	ASPHALT BINDER, PG 58-28H, HIGH TRAFFIC	TON	492.756	
13	2303-1264224	ASPHALT BINDER, PG 64-22H, HIGH TRAFFIC	TON	112.909	
14	2303-6911000	HOT MIX ASPHALT PAVEMENT SAMPLES	LS	1	
15	2303-7000610	PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA MIXTURE LABORATORY VOIDS (FORMULA - BY PAY FACTOR)	EACH	10,094.42	

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
16	2303-7000620	PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA MIXTURE FIELD VOIDS (FORMULA - BY PAY FACTOR)	EACH	10,094.42	
17	2317-7000120	PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA PAVEMENT SMOOTHNESS (BY SCHEDULE)	EACH	16,860.29	
18	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1	Refer to Tab. 110-2 and 3R-CULV on C Sheets.
19	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT	CY	48	Refer to Tab. 3R-CULV on C Sheets.
20	2416-0100024	APRONS, CONCRETE, 24 IN. DIA.	EACH	7	
21	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.	LF	40	Includes 40 LF from Tab. 3R-CULV on C Sheets.
22	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	LF	24,138	Refer to Tab. 104-9A on CS Sheets.
23	2502-8221306	SUBDRAIN OUTLET, DR-306	EACH	94	
24	2527-9263155	PRE-CUT SYMBOLS AND LEGENDS, PREFORMED THERMOPLASTIC MARKING MATERIAL	EACH	7	Refer to Tab. 108-29 on C Sheets.
25	2527-9263209	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	2,222.75	Refer to Tab. 108-22 on C Sheets.
26	2527-9263225	PERMANENT TAPE MARKINGS, PREFORMED THERMOPLASTIC MARKING MATERIAL	STA	169.98	
27	2527-9270112	GROOVES CUT FOR PAVEMENT MARKINGS	STA	574.41	
28	2527-9270120	GROOVES CUT FOR SYMBOLS AND LEGENDS	EACH	7	Refer to Tab. 108-29 on C Sheets.
29	2528-8445110	TRAFFIC CONTROL	LS	1	Refer to Traffic Control Plan on J Sheets.
30	2528-8445115	PILOT CARS	EACH	0	See Proposal.
31	2528-8445116	FLAGGER WITH AFAD	EACH	0	See Proposal.
32	2533-4980005	MOBILIZATION	LS	1	--
33	2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE	STA	538	Refer to Tab. 112-10 on C Sheets.
34	2548-0000110	ASPHALT EMULSION FOR FOG SEAL (SHOULDER RUMBLE STRIPS)	GAL	583.3	
35	2548-0000310	MILLED CENTERLINE RUMBLE STRIPS, HMA SURFACE	STA	276.82	
36	2548-0000315	ENGINEERED EMULSION FOR FOG SEAL (CENTERLINE RUMBLE STRIPS)	GAL	300.2	

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
37	2599-9999018	('SQUARE YARDS' ITEM) HOT IN-PLACE RECYCLED ASPHALT PAVEMENT	SY	58,698.9	Refer to Tab. 100-25 on C Sheets. Refer to Special Provisions for Hot In-Place Recycling for additional information.
38	2599-9999020	('TONS' ITEM) ASPHALT REJUVENATING AGENT	TON	90.063	

100-27
MODIFIED

EXISTING POSTED SPEED LIMIT						
Road Identification	Begin Station	End Station	Proposed Posted Speed Limit			Remarks
			35 or less	40 - 45	over 45	
DIVISION 1, RURAL						
IA 149, NB Traffic	1349+45.00	1553+24.20			X	
Station Equation 1553+24.20 (BK) = 853+04.90 (AH)						
IA 149, NB Traffic	853+04.90	821+42.60			X	(1)
Station Equation 821+42.60 (BK) = 1985+47.32 (AH)						
IA 149, NB Traffic	1985+47.32	2007+69.26			X	
IA 23, NB Traffic	2007+69.84	2018+16.00			X	
IA 149, SB Traffic	1349+45.00	1553+24.20			X	
Station Equation 1553+24.20 (BK) = 853+04.90 (AH)						
IA 149, SB Traffic	853+04.90	821+42.60			X	(1)
Station Equation 821+42.60 (BK) = 1985+47.32 (AH)						
IA 149, SB Traffic	1985+47.32	2007+69.26			X	
IA 23, SB Traffic	2007+69.84	2018+16.00			X	
NOTES:						
(1) Stationing is shown in the Direction of NB Traffic.						

102-5 04-18-17																					
EXISTING PAVEMENT																					
No.	Location					Year	Type	Project Number	Surface		Base		Subbase		Removal		Coarse Aggregate			Reinforcement	Remarks
	County	Route	Dir. of Travel	Begin Ref. Loc. Sign	End Ref. Loc. Sign				Type	Depth	Type	Depth	Type	Depth	Type	Depth	Source	Type	Durability Class	Type	
DIVISION 1, RURAL																					
1	90	IA-149	1	6.71	10.26	1995		STPN-63-2(54)--2J-90	AAC	1.5	AAC	1.5			MIL	3	DOUDS MINE	C.LST.			
1	90	IA-149	1	6.71	10.26	1971		FN-63-2(26)	AAC	3											
1	90	IA-149	1	6.71	10.26	1960		FN-159*<2>	AAC	3							DOUDS MINE	C.LST.			
1	90	IA-149	1	6.71	10.26	1927		FA-159	PC7	7							LINWOOD	C.LST.	I		
2	90	IA-149	1	10.26	11.06	1995		STPN-63-2(54)--2J-90	AAC	1.5	AAC	1.5			MIL	3	DOUDS MINE	C.LST.			
2	90	IA-149	1	10.26	11.06	1971		FN-63-2(26)	AAC	3											
2	90	IA-149	1	10.26	11.06	1960		FN-159*<2>	AAC	3							DOUDS MINE	C.LST.			
2	90	IA-149	1	10.26	11.06	1927		FA-159	PC7	7							LINWOOD	C.LST.	I		
3	54	IA-149	1	11.06	11.69	1995		STPN-63-2(54)--2J-90	AAC	1.5	AAC	1.5			MIL	3	DOUDS MINE	C.LST.			
3	54	IA-149	1	11.06	11.69	1981		FN-63-1(10)--2G-54	AAC	1.5	RAC	1					BONEPARTE	C.LST.			F-DP AC 71
3	54	IA-149	1	11.06	11.69	1971		FN-63-3(11)--21-62	AAC	1							LANGSTRATT	C.LST.			
3	54	IA-149	1	11.06	11.69	1960		FN-1133	AAC	1.5	AAC	1.5					DOUDS MINE	C.LST.			
3	54	IA-149	1	11.06	11.69	1952		P-510*<1>	BAC	1.5	TBB	1.5					OTIS QRY.	C.LST.			
3	54	IA-149	1	11.06	11.69	1929		P-510	PC7	7							LE GRAND	C.LST.	1		EDDYVILLE
4	90	IA-149	2	6.13	7.13	2022	S	STP-149-1(90)--2C-90	HMA	1.5	HMA	1.5	HMA	0.5	MIL	2.5					(1)
4	90	IA-149	2	6.13	7.13	2003		NHSX-63-2(66)--3H-90	AAC	2	BAC	2					LYLE MINE	C.LST.			
4	90	IA-149	2	6.13	7.13	2003	W	NHSX-63-2(66)--3H-90	AAC	2	BAC	2	BAC	7			LYLE MINE	C.LST.			
4	90	IA-149	2	6.13	7.13	1978		RF-63-2(27)--35-90	PCC	8.5	CTB	4					SELMA/GARDNER	C.LST.	2		
NOTES:																					
Note 1: 1" Interlayer, 3" HMA 4" HMA 2' WIDEN BOTH SIDES																					

DRAINAGE STRUCTURE REPAIR WORK

① UNCL = Unclassified Pipe CMP = Corrugated Metal Pipe RCP = Reinforced Concrete Pipe LCP = Arch or Elliptical Low Clearance Pipe SARC = Steel Arch Pipe

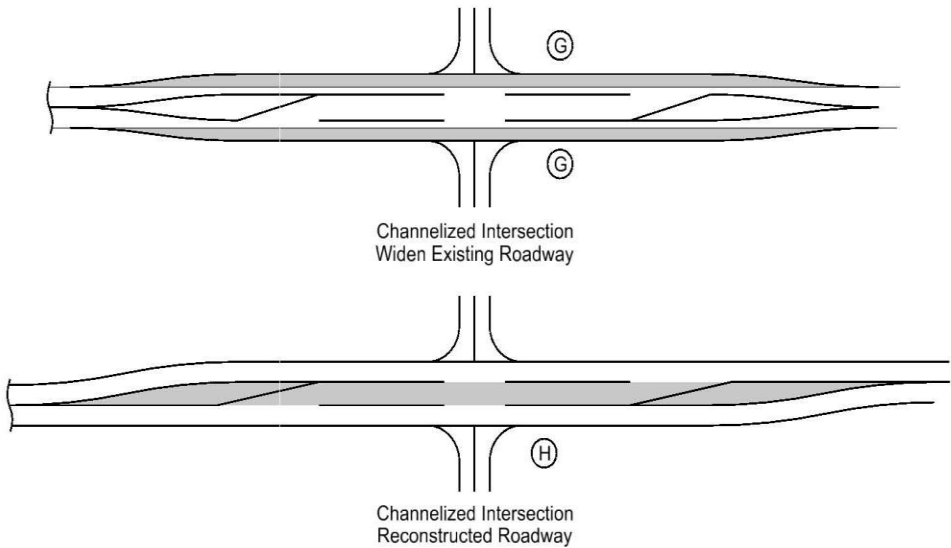
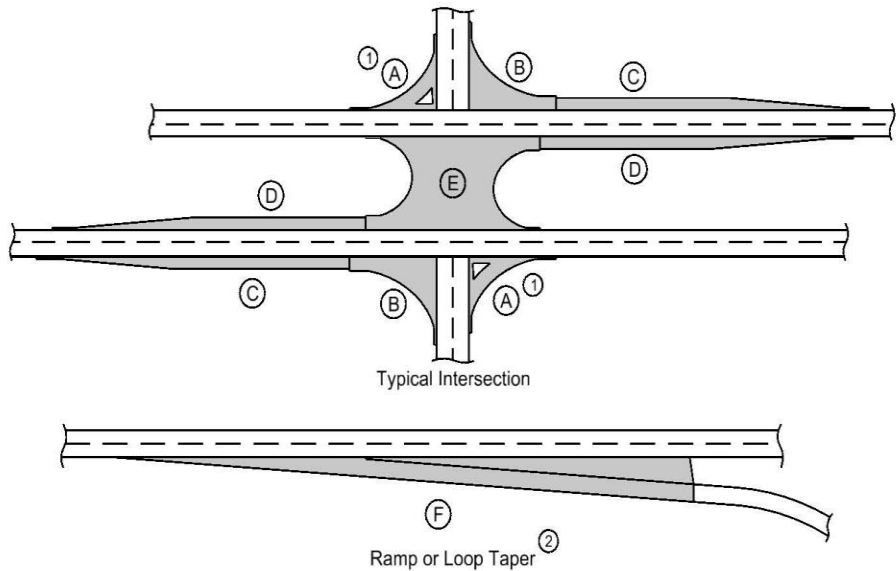
Note (1): Proposed Culvert specifications are based on the most recently documented condition of the culvert. The Contractor shall confirm actual field conditions and notify the Engineer of any discrepancies before installation.

FILE NO.	ENGLISH	DESIGN TEAM	SCHROCK\MCNAMARA\JACKSON	WAPELLO	COUNTY	PROJECT NUMBER	STP-149-1(100)--2C-90	SHEET NUMBER	C.6
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102-6C 04-18-17																				
FULL-DEPTH PATCHES																				
Possible Standards: PR-101, PR-102, PR-103, PR-104, PR-105, and PR-140.																				
Location				Dimension			PCC Patches				HMA Patches	Composite HMA	Subbase Patches	Subbase Patch w/ 'EF' Joint	Patch Subdrain	'CD' Joints	'CT' Joints	'EF' Joints	Anchor Lugs Removal	Remarks
Count	Station	Reference Location Sign	Lane	Length	Width	Patch Thickness	With Dowels	Without Dowels	C R C	Ramp with Dowels										
							PR-103 SY	PR-102 SY	PR-104 SY	PR-105 SY										
			L, R, or B	FT	FT	IN					SY	TON	SY	SY	PR-101 or PR-140 No.	No.	No.	PR-101 No.	No.	
DIVISION 1 - RURAL																				
HMA																				
1		10.54	L	20.0	15.0						33.3									Existing PCC Patches
1		9.023	L	13.0	14.0						20.2									Existing PCC Patches
1		8.995	L	12.0	14.0						18.7									Existing PCC Patches
1		8.843	L	11.0	14.0						17.1									Existing PCC Patches
1		7.881	L	16.0	16.0						28.4									Existing PCC Patches
1		7.86	L	8.0	16.0						14.2									Existing PCC Patches
1		7.619	L	16.0	14.0						24.9									Existing PCC Patches
1		9.023	R	13.0	14.0						20.2									Existing PCC Patches
1		8.995	R	12.0	14.0						18.7									Existing PCC Patches
1		8.843	R	7.0	14.0						10.9									Existing PCC Patches
1		7.86	R	8.0	16.0						14.2									Existing PCC Patches
1		7.84	R	9.0	15.0						15.0									Existing PCC Patches
1		7.837	R	8.0	15.0						13.3									Existing PCC Patches
1		7.619	R	16.0	14.0						24.9									Existing PCC Patches
PCC																				
1		9.751	L	12.0	14.0	12.0	18.7													New Patch needed
1		9.751	R	12.0	14.0	12.0	18.7													New Patch needed
16			SUBTOTAL FULL-DEPTH PATCHES, REPAIR				37.3				274.1									
1			5% CONTINGENCY				1.9				13.7									
17			TOTAL FULL-DEPTH PATCHES, REPAIR				39.2				287.8									

102-16 MODIFIED															
NOTCHES AND RUNOUTS FOR RESURFACING															
Refer to MODIFIED STANDARD ROAD PLANS PR-201 and PR-202 (ON U SHEETS)															
① Bid item. Refer to 100-25 for remaining values.															
Location	Location Station	Direction of Traffic	Type of Notch or Runout	S1	S2	I1	I2	Z1	Z2	L	M1	M2	Pavement Scarification ① (HMA Millings)		Remarks
				IN	IN	IN	IN	IN	IN	IN	IN	TONS	SY		
DIVISION 1 - RURAL															
IA 149 (Mainline)	1349+45.00	BOTH	Type 'N1-M1'	1.5	1.5			2.0	2.0	350.0		1.5	38.063	933.3	Beginning of 'HIR and HMA Resurfacing' / Beginning of Project
IA 149 (Mainline)	1486+40.00	BOTH	Type 'R5-M1'	2.0	1.5				2.0	275.0	2.0		39.875	733.3	Runout for transition from 'HIR + 1.5" HMA Resurfacing' to '2" Mill and Fill'.
IA 149 (Mainline)	1488+00.00	NB	Type 'N2-M1'	2.0						100.0	2.0		1.813	33.3	Stop '2" Mill and Fill' at existing PCC.
IA 149 (Mainline)	1489+00.00	BOTH	Type 'N2-M1'	2.0						100.0	2.0		12.688	233.3	Stop '2" Mill and Fill' at existing PCC.
IA 149 (Mainline)	1499+57.00	BOTH	Type 'N2-M1'	2.0						100.0	2.0		14.500	266.7	Resume '2" Mill and Fill' at existing PCC.
IA 149 (Mainline)	1501+57.00	BOTH	Type 'R5-M1'	2.0	1.5				2.0	275.0	2.0		39.875	733.3	Runout for transition from '2" Mill and Fill' to 'HIR + 1.5" HMA Resurfacing'.
IA 149 (Mainline)	852+20.00	BOTH	Type 'R5-M2'	1.5	1.5		2.0	2.0	2.0	450.0					Runout for transition from 'HIR + 1.5" HMA Resurfacing' to 'HIR + 3.5" HMA Resurfacing'.
IA 149 (Mainline)	821+55.00	BOTH	Type 'R5-M3'	2.0	1.5		2.0		2.0	375.0	2.0		54.375	1000.0	Runout for transition from 'HIR + 3.5" HMA Resurfacing' to '2" Mill and Fill'.
IA 149 (Mainline)	7+40.00	BOTH	Type 'N2-M1'	2.0						100.0	2.0		14.500	266.7	Stop '2" Mill and Fill' for IA 149.
IA 23 (Mainline)	2018+16.00	BOTH	Type 'N2-M1'	2.0						100.0	2.0		14.500	266.7	Stop '2" Mill and Fill' for IA 23 / End of Project.
TOTALS (DIVISION 1 - RURAL)													230.188	4466.7	DIVISION 1 - RURAL
Notes:															
(1) Refer to Modified Standard Road Plan PR-201 (Runouts for Resurfacing) on U Sheets.															
(2) Refer to Modified Standard Road Plan PR-202 (Notches for Resurfacing) on U Sheets.															

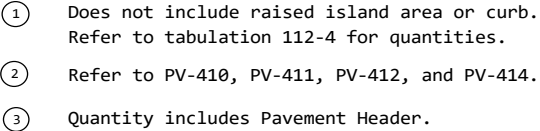
HMA PAVEMENT



- 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.

Calculations assume a Surface Course unit weight (lbs/cf) of 147, an Intermediate Course unit weight (lbs/cf) of 147, and a HMA Millings unit weight (lbs/cf) of 135

Location				Mainline			Area ③								Bid Items										Remarks
Road Identification	Direction of Travel	Station to Station		Width	Length	Area	A ①	B	C	D	E	G	H	Hot Mix Asphalt Pavement				Binder			Hot In-Place Recycling	Asphalt Rejuvenating Agent 0.175 GAL/SY/IN HIR 8.35 lbs/gallon	Pavement Scarification (HMA Millings)		
														Surface Course, High Traffic, 1/2 in. Mix, Friction L-4		Intermediate Course, High Traffic, 1/2 in. Mix		Surface PG 58-28H 6% / TON HMA	Surface PG 64-22H 6% / TON HMA	Intermediate PG 58-28H 6% / TON HMA					
				FT	FT	SY	SY	SY	SY	SY	SY	SY	SY	TONS	SY	TONS	SY	TONS	TONS	TONS	SY	TONS	TONS	SY	
DIVISION 1, RURAL																									
IA 149 (Mainline)	BOTH	1349+45.00	1486+40.00	24.0	13695.0	36520.0								3019.748	36520.0			181.185			36520.0	53.365			
IA 149 (Mainline)	BOTH	1486+40.00	1488+00.00	24.0	160.0	426.7								47.040	426.7			2.822					43.200	426.7	
IA 149 (Mainline)	BOTH	1488+00.00	1489+00.00	21.0	100.0	233.3								25.725	233.3			1.544					23.625	233.3	
IA 149 (Mainline)	BOTH	1499+57.00	1501+57.00	24.0	200.0	533.3								58.800	533.3			3.528					54.000	533.3	
IA 149 (Mainline)	BOTH	1501+57.00	1553+24.20	24.0	5167.2	13779.2								1139.368	13779.2			68.362			13779.2	20.135			
Station Equation: 1553+24.2(BK) = 853+04.9(AH)																									
IA 149 (Mainline)	BOTH	853+04.90	852+20.00	24.0	84.9	226.4								18.720	226.4			1.123			226.4	0.331			
IA 149 (Mainline)	BOTH	852+20.00	821+55.00	24.0	3065.0	8173.3								675.833	8173.3	901.110	8173.3	40.550		54.067	8173.3	11.943			
IA 149 (Mainline)	BOTH	821+55.00	821+42.60	24.0	12.4	33.1								3.646	33.1				0.219				3.348	33.1	(2)
Station Equation: 821+42.6(BK) = 1985+47.32(AH)																									
IA 149 (Mainline)	BOTH	1985+47.32	1994+48.00	24.0	900.7	2401.8								264.800	2401.8				15.888				243.184	2401.8	(2)
IA 149 (Mainline)	BOTH	1994+48.00	2007+68.00	24.0	1320.0	3520.0		361.4	611.3				1520.7	662.977	6013.4			39.779				608.857	6013.4	(2)	
IA 149 (West,ML)	BOTH	5+82.20	7+40.00	24.0	157.8	420.8								46.393	420.8			2.784				42.606	420.8	(2)	
IA 23 (Mainline)	BOTH	2007+70.00	2018+16.00	24.0	1046.0	2789.3	221.2						1099.2	453.098	4109.7				27.186				416.111	4109.7	(2)
IA 149 (NB SHLDR)	NB	1349+45.00	1486+40.00	4.0	13695.0	6086.7								503.291	6086.7			30.197							
IA 149 (NB SHLDR)	NB	1486+40.00	1488+25.00	4.0	185.0	82.2								9.065	82.2			0.544							
IA 149 (NB SHLDR)	NB	1500+15.50	1501+57.00	4.0	141.5	62.9								6.934	62.9			0.416							
IA 149 (NB SHLDR)	NB	1501+57.00	1553+24.20	4.0	5167.2	2296.5								189.895	2296.5			11.394							
Station Equation: 1553+24.2(BK) = 853+04.9(AH)																									
IA 149 (NB SHLDR)	NB	853+04.90	852+20.00	4.0	84.9	37.7								3.120	37.7			0.187							
IA 149 (NB SHLDR)	NB	852+20.00	821+55.00	4.0	3065.0	1362.2								112.639	1362.2	150.185	1362.2	6.758		9.011					
IA 149 (NB SHLDR)	NB	821+55.00	821+42.60	4.0	12.4	5.5								0.608	5.5				0.036				0.558	5.5	
Station Equation: 821+42.6(BK) = 1985+47.32(AH)																									
IA 149 (NB SHLDR)	NB	1985+47.32	1994+48.00	4.0	900.7	400.3								44.133	400.3				2.648				40.531	400.3	
IA 149 (NB SHLDR)	NB	1994+48.00	2006+57.00	4.0	1209.0	537.3								59.241	537.3			3.554				54.405	537.3		
IA 149 (SHDLR,RET,RT)	EB	5+82.20	7+40.00	10.0	199.0	221.1								24.378	221.1			1.463				22.388	221.1		
IA 149 (SHLDR,RET,LT)	WB	5+82.20	7+40.00	10.0	213.8	237.6								26.191	237.6			1.571				24.053	237.6		
IA 23 (NB SHLDR)	NB	2008+76.00	2018+16.00	4.0	940.0	417.8								46.060	417.8				2.764				42.300	417.8	
IA 149 (SB SHLDR)	SB	1349+45.00	1486+40.00	4.0	13695.0	6086.7								503.291	6086.7			30.197							
IA 149 (SB SHLDR)	SB	1501+38.00	1501+57.00	4.0	19.0	8.4								0.931	8.4			0.056							
IA 149 (SB SHLDR)	SB	1501+57.00	1553+24.20	4.0	5167.2	2296.5								189.895	2296.5			11.394							
Station Equation: 1553+24.2(BK) = 853+04.9(AH)																									
IA 149 (SB SHLDR)	SB	853+04.90	852+20.00	4.0	84.9	37.7								3.120	37.7			0.187							



Location				Mainline			Area ③							Bid Items										Remarks		
Road Identification	Direction of Travel	Station to Station		Width	Length	Area	A ①	B	C	D	E	G	H	Hot Mix Asphalt Pavement				Binder			Hot In-Place Recycling	Asphalt Rejuvenating Agent 0.175 GAL/SY/IN HIR 8.35 lbs/gallon	Pavement Scarification (HMA Millings)			
														Surface Course, High Traffic, 1/2 in. Mix, Friction L-4		Intermediate Course, High Traffic, 1/2 in. Mix		Surface PG 58-28H 6% / TON HMA	Surface PG 64-22H 6% / TON HMA	Intermediate PG 58-28H 6% / TON HMA						
														TONS	SY	TONS	SY	TONS	TONS	TONS					SY	TONS
IA 149 (SB SHLDR)	SB	852+20.00	821+55.00	4.0	3065.0	1362.2								112.639	1362.2	150.185	1362.2	6.758		9.011						
IA 149 (SB SHLDR)	SB	821+55.00	821+42.60	4.0	12.4	5.5								0.608	5.5				0.036					0.558	5.5	
Station Equation: 821+42.6(BK) = 1985+47.32(AH)																										
IA 149 (SB SHLDR)	SB	1985+47.32	1994+48.00	4.0	900.7	400.3								44.133	400.3				2.648					40.531	400.3	
IA 149 (SB SHLDR)	SB	1994+48.00	2007+68.00	4.0	1320.0	586.7								64.680	586.7				3.881					59.400	586.7	
IA 23 (SB SHLDR)	SB	2007+70.00	2018+16.00	4.0	1046.0	464.9								51.254	464.9				3.075					47.070	464.9	
SUBTOTAL														8412.251	95867.9	1201.480	10897.8	397.203	107.532	72.089	58698.9	85.774	1766.722	17449.1		
5% CONTINGENCY														420.613		60.074		19.860	5.377	3.604	4.289					
TOTALS (DIVISION 1 - RURAL)														8832.863	95867.9	1261.554	10897.8	417.063	112.909	75.693	58698.9	90.063	1766.722	17449.1		

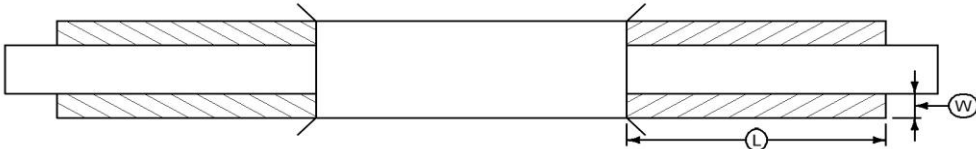
NOTES:

- (1) Stationing is shown in the Direction of NB Traffic.
- (2) Refer to U Sheets for Pavement Marking Details and general layout of the IA 149 and IA 23 intersection.

106-5
10-21-14

AREAS FOR PAVEMENT OR BASE WIDENING

Refer to Standard Road Plans PV-105 or PV-203



① Bid Item

② Estimated for two applications to achieve lifts and one application of 0.10 Gal/SY adjacent to existing pavement. Priming of subgrade or finished base is not required. Calculations assume a HMA unit weight (lbs/cf) of 145, a Special Backfill unit weight (lbs/cf) of 140, and a Tack Coat unit weight (gal/sy) of 0.05.

Station to Station	Side	Pavement Type	L	W	T	HMA Base Widening	HMA Base Widening	PCC Base Widening	PCC Pavement Widening	Tack Coat		Tack Coat	Asphalt Binder	Class 13 Excavation, Widening	Special Backfill	Remarks
			Length	Width	Thickness	①	①	①	①	Lifts	Vertical Edge	②	①	①	①	
			FT	FT	IN	TONS	SY	SY	SY	GAL	GAL	GAL	TONS	CY	TONS	
DIVISION 1 - RURAL																
1349+45.00	1486+40.00	NB	HMA	13695.00	4.0	4.0		6086.7		608.67	50.72	659.39		676.3		
1486+40.00	1488+25.00	NB	HMA	185.00	4.0	4.0		82.2		8.22	0.69	8.91		9.1		
1500+15.50	1553+24.19	NB	HMA	5308.69	4.0	4.0		2359.4		235.94	19.66	255.60		262.2		
Station Equation: 1553+24.20(BK)= 853+04.90(AH)																
853+04.90	852+20.00	NB	HMA	84.90	4.0	4.0		37.7		3.77	0.31	4.09		4.2		(1)
852+20.00	821+55.00	NB	HMA	3065.00	4.0	4.0		1362.2		136.22	11.35	147.57		151.4		(1)
1349+45.00	1489+40.00	SB	HMA	13995.00	4.0	4.0		6220.0		622.00	51.83	673.83		691.1		
1486+40.00	1486+65.00	SB	HMA	25.00	4.0	4.0		11.1		1.11	0.09	1.20		1.2		
1501+38.00	1553+24.20	SB	HMA	5186.20	4.0	4.0		2305.0		230.50	19.21	249.71		256.1		
Station Equation: 1553+24.20(BK)= 853+04.90(AH)																
853+04.90	852+20.00	SB	HMA	84.90	4.0	4.0		37.7		3.77	0.31	4.09		4.2		(1)
852+20.00	821+55.00	SB	HMA	3065.00	4.0	4.0		1362.2		136.22	11.35	147.57		151.4		(1)
DIVISION 1 -RURAL TOTAL																
						4" THICK	19864.3									
NOTES:																
(1) Stationing is shown in the Direction of NB Traffic.																

- Calculations assume a HMA unit weight (lbs/cf) of 145, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

FILE NO.	ENGLISH	DESIGN TEAM	SCHROCK\MCNAMARA\JACKSON	WAPELLO COUNTY	PROJECT NUMBER	STP-149-1(100)--2C-90	SHEET NUMBER	C.11
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PAVEMENT MARKING LINE TYPES

See PM-110

***MNY4 - Factor of 0.67 as value includes number of 4-inch passes to cover median nose area.

*BCY4 - Place on the same side of the roadway to match existing markings near the project.

**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

ELW6: Edge Line Right (White) @ 1.00
SLW6: Solid Lane Line (White) @ 1.00

NPY6: No Passing Zone Line (Yellow) @ 1.25
SLW2: Stop Line (White) @ 4.00

BCY6: Broken Centerline (Yellow) @ 0.25
CHW10: Channelizing Line (White) @ 1.67
#N/A

DCY6: Double Centerline (Yellow) @ 2.00
#N/A

CHY10: Channelizing Line (Yellow) @ 1.67
#N/A

Location						Length by Line Type (Unfactored)														#N/A			Remarks
Road ID	Station to Station		Dir. of Travel	Marking Type	Side			ELW6	NPY6**	BCY6*	DCY6	CHY10	SLW6	SLW2	CHW10				Applications	TOTAL	Grooves Cut		
					L	C	R	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	#	STA	STA		
DIVISION 1 - RURAL																							
IA 149	1349+45.00	1486+40.00	SB	Waterborne/Solvent Paint	X			136.95												3	410.85	136.95	
IA 149	1486+40.00	1489+00.00	SB	Waterborne/Solvent Paint	X			2.60												3	7.80	2.60	
IA 149	1489+00.00	1499+57.00	SB	Waterborne/Solvent Paint	X			10.57												3	31.71	10.57	
IA 149	1499+57.00	1501+57.00	SB	Waterborne/Solvent Paint	X			2.00												3	6.00	2.00	
IA 149	1501+57.00	1553+24.20	SB	Waterborne/Solvent Paint	X			51.67												3	155.02	51.67	
IA 149	1349+45.00	1486+40.00	NB	Waterborne/Solvent Paint			X	136.95												3	410.85	136.95	
IA 149	1486+40.00	1489+00.00	NB	Waterborne/Solvent Paint			X	2.60												3	7.80	2.60	
IA 149	1489+00.00	1499+57.00	NB	Waterborne/Solvent Paint			X	10.57												3	31.71	10.57	
IA 149	1499+57.00	1501+57.00	NB	Waterborne/Solvent Paint			X	2.00												3	6.00	2.00	
IA 149	1501+57.00	1553+24.20	NB	Waterborne/Solvent Paint			X	51.67												3	155.02	51.67	
IA 149	1349+45.00	1354+65.00	SB	Waterborne/Solvent Paint		X			5.20											2	10.40		
IA 149	1354+65.00	1357+21.00	BOTH	Waterborne/Solvent Paint		X				2.56										2	5.12		
IA 149	1357+21.00	1367+08.00	NB	Waterborne/Solvent Paint		X			9.87											2	19.74		
IA 149	1367+08.00	1384+46.00	BOTH	Waterborne/Solvent Paint		X					17.38									2	34.76		
IA 149	1384+46.00	1386+33.00	SB	Waterborne/Solvent Paint		X			1.87											2	3.74		
IA 149	1386+33.00	1396+65.00	BOTH	Waterborne/Solvent Paint		X				10.32										2	20.64		
IA 149	1396+65.00	1405+77.00	NB	Waterborne/Solvent Paint		X			9.12											2	18.24		
IA 149	1405+77.00	1406+77.00	BOTH	Waterborne/Solvent Paint		X					1.00									2	2.00		
IA 149	1406+77.00	1415+31.00	SB	Waterborne/Solvent Paint		X			8.54											2	17.08		
IA 149	1415+31.00	1425+39.00	BOTH	Waterborne/Solvent Paint		X				10.08										2	20.16		
IA 149	1425+39.00	1434+26.00	NB	Waterborne/Solvent Paint		X			8.87											2	17.74		
IA 149	1434+26.00	1444+14.00	SB	Waterborne/Solvent Paint		X			9.88											2	19.76		
IA 149	1444+14.00	1449+14.00	BOTH	Waterborne/Solvent Paint		X				5.00										2	10.00		
IA 149	1449+14.00	1459+45.00	NB	Waterborne/Solvent Paint		X			10.31											2	20.62		
IA 149	1459+45.00	1464+37.00	BOTH	Waterborne/Solvent Paint		X					4.92									2	9.84		
IA 149	1464+37.00	1471+12.00	SB	Waterborne/Solvent Paint		X			6.75											2	13.50		
IA 149	1471+12.00	1474+19.00	BOTH	Waterborne/Solvent Paint		X					3.07									2	6.14		
IA 149	1474+19.00	1476+38.00	NB	Waterborne/Solvent Paint		X			2.19											2	4.38		
IA 149	1476+38.00	1479+12.00	BOTH	Waterborne/Solvent Paint		X				2.74										2	5.48		
IA 149	1479+12.00	1484+88.00	SB	Waterborne/Solvent Paint		X			5.76											2	11.52		
IA 149	1484+88.00	1486+40.00	BOTH	Waterborne/Solvent Paint		X				1.52										2	3.04		
IA 149	1486+40.00	1489+00.00	BOTH	Waterborne/Solvent Paint		X				2.60										2	5.20		
IA 149	1489+00.00	1494+43.00	NB	Waterborne/Solvent Paint		X			5.43											2	10.86		
IA 149	1494+43.00	1499+57.00	NB	Waterborne/Solvent Paint		X			5.14											2	10.28		
IA 149	1499+57.00	1501+57.00	NB	Waterborne/Solvent Paint		X			2.00											2	4.00		
IA 149	1501+57.00	1501+73.00	NB	Waterborne/Solvent Paint		X			0.16											2	0.32		
IA 149	1501+73.00	1518+87.00	BOTH	Waterborne/Solvent Paint		X					17.14									2	34.28		
IA 149	1518+87.00	1524+69.00	SB	Waterborne/Solvent Paint		X			5.82											2	11.64		
IA 149	1524+69.00	1553+24.20	BOTH	Waterborne/Solvent Paint		X				28.55										2	57.10		
Station Equation: 1553+24.20(BK)= 853+04.90(AH)																							
IA 149	853+04.90	852+20.00	SB	Waterborne/Solvent Paint	X			0.85												3	2.55	0.85	(1)
IA 149	852+20.00	821+55.00	SB	Waterborne/Solvent Paint	X			30.65												4	122.60	30.65	(1)
IA 149	821+55.00	821+42.60	SB	Waterborne/Solvent Paint	X			0.12												3	0.37	0.12	(1)
IA 149	853+04.90	852+20.00	NB	Waterborne/Solvent Paint			X	0.85												3	2.55	0.85	(1)
IA 149	852+20.00	821+55.00	NB	Waterborne/Solvent Paint			X	30.65												4	122.60	30.65	(1)
IA 149	821+55.00	821+42.60	NB	Waterborne/Solvent Paint			X	0.12												3	0.37	0.12	(1)
IA 149	853+04.90	852+20.00	BOTH	Waterborne/Solvent Paint		X				0.85										2	1.70		(1)
IA 149	852+20.00	821+55.00	BOTH	Waterborne/Solvent Paint		X				30.65										3	91.95		(1)
IA 149	821+55.00	821+42.60	BOTH	Waterborne/Solvent Paint		X				0.12										2	0.25		(1)
Station Equation: 821+42.60(BK)= 1985+47.32(AH)																							
IA 149	1985+47.32	2007+68.00	SB	Waterborne/Solvent Paint		X		22.21												3	66.62	22.21	
IA 23	2007+68.00	2018+16.00	SB	Waterborne/Solvent Paint		X		10.48												3	31.44	10.48	
IA 149	1985+47.00	2007+68.00	NB	Waterborne/Solvent Paint			X	22.21												3	66.63	22.21	
IA 23	2007+68.00	2018+15.00	NB	Waterborne/Solvent Paint			X	10.47												3	31.41	10.47	
IA 149	1985+47.00	1989+98.00	BOTH	Waterborne/Solvent Paint		X				4.51										2	9.02		
IA 149	1989+98.00	1994+09.00	BOTH	Waterborne/Solvent Paint		X					4.11									2	8.22		
IA 149</																							

PAVEMENT MARKING LINE TYPES

*BCY4 - Place on the same side of the roadway to match existing markings near the project. ***MNY4 - Factor of 0.67 as value includes number of 4-inch passes to cover median nose area.
**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

SLW6: Edge Line Right (White) @ 1.00			NPY6: No Passing Zone Line (Yellow) @ 1.25			BCY6: Broken Centerline (Yellow) @ 0.25			DCY6: Double Centerline (Yellow) @ 2.00			CHY10: Channelizing Line (Yellow) @ 1.67													
SLW2: Solid Lane Line (White) @ 1.00			SLW2: Stop Line (White) @ 4.00			#N/A			#N/A			#N/A													
Location						Length by Line Type (Unfactored)														Remarks					
Road ID	Station to Station		Dir. of Travel	Marking Type	Side			ELW6	NPY6**	BCY6*	DCY6	CHY10	SLW6	SLW2	CHW10								Applications	TOTAL	Grooves Cut
					L	C	R	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA				#	STA	STA
IA 23	2008+19.00	2012+59.00	SB	Waterborne/Solvent Paint	X								4.40							2	8.80	4.40			

PAVEMENT MARKING SYMBOLS AND LEGENDS

Road Identification		Location																			SCHOOL	XING	STOP	AHEAD	ONLY	BIKE	LANE	EXIT	Groove Cuts	Remarks		
		Station	Side																													
																													STAW		RTAW	LTAW
DIVISION 1 - RURAL																																
IA 149	2005+60.27	NB		1																										1		
IA 149	2006+35.27	NB		1																										1		
IA 149	2006+21.52	NB				1																								1		
IA 149	2006+96.52	NB				1																								1		
IA 23	2008+40.82	SB				1																								1		
IA 23	2009+56.15	SB				1																								1		
IA 23	2012+30.65	SB				1																								1		
	SUBTOTALS:				2	5																									7	
PRE-CUT SYMBOLS AND LEGENDS, PREFORMED THERMOPLASTIC MARKING:																																
GROOVES CUT FOR SYMBOLS AND LEGENDS:																																

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 149	1349+45.00	1354+50.00	Right	24.0	4.0	535.0	1349+45.00	DR-306	24.8	
2.0	IA 149			Right	24.0	4.0	30.0	1354+50.00	DR-306	1.4	
3.0	IA 149	1354+50.00	1358+75.00	Right	24.0	4.0	455.0	1354+50.00	DR-306	21.1	
4.0	IA 149			Right	24.0	4.0	30.0	1358+75.00	DR-306	1.4	
5.0	IA 149	1358+75.00	1364+50.00	Left	24.0	4.0	605.0	1358+75.00	DR-306	28.0	
6.0	IA 149			Left	24.0	4.0	30.0	1364+50.00	DR-306	1.4	
7.0	IA 149	1364+50.00	1370+50.00	Left	24.0	4.0	630.0	1364+50.00	DR-306	29.2	
8.0	IA 149			Left	24.0	4.0	30.0	1370+50.00	DR-306	1.4	
9.0	IA 149	1370+50.00	1374+50.00	Left	24.0	4.0	430.0	1370+50.00	DR-306	19.9	
10.0	IA 149			Left	24.0	4.0	30.0	1374+50.00	DR-306	1.4	
11.0	IA 149	1374+50.00	1378+00.00	Left	24.0	4.0	380.0	1374+50.00	DR-306	17.6	
12.0	IA 149			Left	24.0	4.0	30.0	1378+00.00	DR-306	1.4	
13.0	IA 149	1378+00.00	1383+00.00	Right	24.0	4.0	530.0	1378+00.00	DR-306	24.5	
14.0	IA 149			Right	24.0	4.0	30.0	1383+00.00	DR-306	1.4	
15.0	IA 149	1383+00.00	1389+00.00	Left	24.0	4.0	630.0	1383+00.00	DR-306	29.2	
16.0	IA 149			Left	24.0	4.0	30.0	1389+00.00	DR-306	1.4	
17.0	IA 149	1389+00.00	1394+00.00	Left	24.0	4.0	530.0	1389+00.00	DR-306	24.5	
18.0	IA 149			Left	24.0	4.0	30.0	1394+00.00	DR-306	1.4	
19.0	IA 149	1394+00.00	1397+00.00	Left	24.0	4.0	330.0	1394+00.00	DR-306	15.3	
20.0	IA 149			Left	24.0	4.0	30.0	1397+00.00	DR-306	1.4	
21.0	IA 149	1397+00.00	1402+00.00	Right	24.0	4.0	530.0	1397+00.00	DR-306	24.5	
22.0	IA 149			Right	24.0	4.0	30.0	1402+00.00	DR-306	1.4	
23.0	IA 149	1402+00.00	1407+00.00	Right	24.0	4.0	530.0	1402+00.00	DR-306	24.5	
24.0	IA 149			Right	24.0	4.0	30.0	1407+00.00	DR-306	1.4	
25.0	IA 149	1407+00.00	1413+00.00	Right	24.0	4.0	630.0	1407+00.00	DR-306	29.2	
26.0	IA 149			Right	24.0	4.0	30.0	1413+00.00	DR-306	1.4	
27.0	IA 149	1413+00.00	1419+20.00	Right	24.0	4.0	650.0	1413+00.00	DR-306	30.1	
28.0	IA 149			Right	24.0	4.0	30.0	1419+20.00	DR-306	1.4	
29.0	IA 149	1419+20.00	1423+00.00	Right	24.0	4.0	410.0	1419+20.00	DR-306	19.0	
30.0	IA 149			Right	24.0	4.0	30.0	1423+00.00	DR-306	1.4	
31.0	IA 149	1424+00.00	1427+00.00	Right	24.0	4.0	330.0	1424+00.00	DR-306	15.3	
32.0	IA 149			Right	24.0	4.0	30.0	1427+00.00	DR-306	1.4	
33.0	IA 149	1427+00.00	1432+00.00	Right	24.0	4.0	530.0	1427+00.00	DR-306	24.5	
34.0	IA 149			Right	24.0	4.0	30.0	1432+00.00	DR-306	1.4	
35.0	IA 149	1432+00.00	1436+50.00	Right	24.0	4.0	480.0	1432+00.00	DR-306	22.2	
36.0	IA 149			Right	24.0	4.0	30.0	1436+50.00	DR-306	1.4	
37.0	IA 149	1436+50.00	1441+00.00	Right	24.0	4.0	480.0	1436+50.00	DR-306	22.2	
38.0	IA 149			Right	24.0	4.0	30.0	1441+00.00	DR-306	1.4	
39.0	IA 149	1441+00.00	1445+00.00	Right	24.0	4.0	430.0	1441+00.00	DR-306	19.9	
40.0	IA 149			Right	24.0	4.0	30.0	1445+00.00	DR-306	1.4	
41.0	IA 149	1445+00.00	1450+50.00	Right	24.0	4.0	580.0	1445+00.00	DR-306	26.9	
42.0	IA 149			Right	24.0	4.0	30.0	1450+50.00	DR-306	1.4	
43.0	IA 149	1450+50.00	1453+00.00	Right	24.0	4.0	280.0	1450+50.00	DR-306	13.0	
44.0	IA 149			Right	24.0	4.0	30.0	1453+00.00	DR-306	1.4	
45.0	IA 149	1453+00.00	1457+50.00	Right	24.0	4.0	480.0	1453+00.00	DR-306	22.2	
46.0	IA 149			Right	24.0	4.0	30.0	1457+50.00	DR-306	1.4	
47.0	IA 149	1457+50.00	1461+00.00	Right	24.0	4.0	380.0	1457+50.00	DR-306	17.6	

Note 1: ALL LONGITUDINAL SUBDRAINS ARE TYPE 13 UNLESS OTHERWISE NOTED IN REMARKS COLUMN
Note 2: ALL LONGITUDINAL SUBDRAIN MAY BE ADJUSTED BOTH VERTICALLY AND HORIZONTALLY IN THE FIELD AS NECESSARY

GEOTECHNICAL DESIGN

LICENSED PROFESSIONAL ENGINEER

Mark A. Dell

21208

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

Mark A. Dell

Date

8/12/26

Mark A. Dell

Printed or Typed Name

My license renewal date is December 31, 20 27

Pages or sheets covered by this seal: CS.1-2

FILE NO.

ENGLISH

DESIGN TEAM

Dell/Immel/Hershey

Wapello COUNTY

PROJECT NUMBER

STP-149-1(100)--2C-90

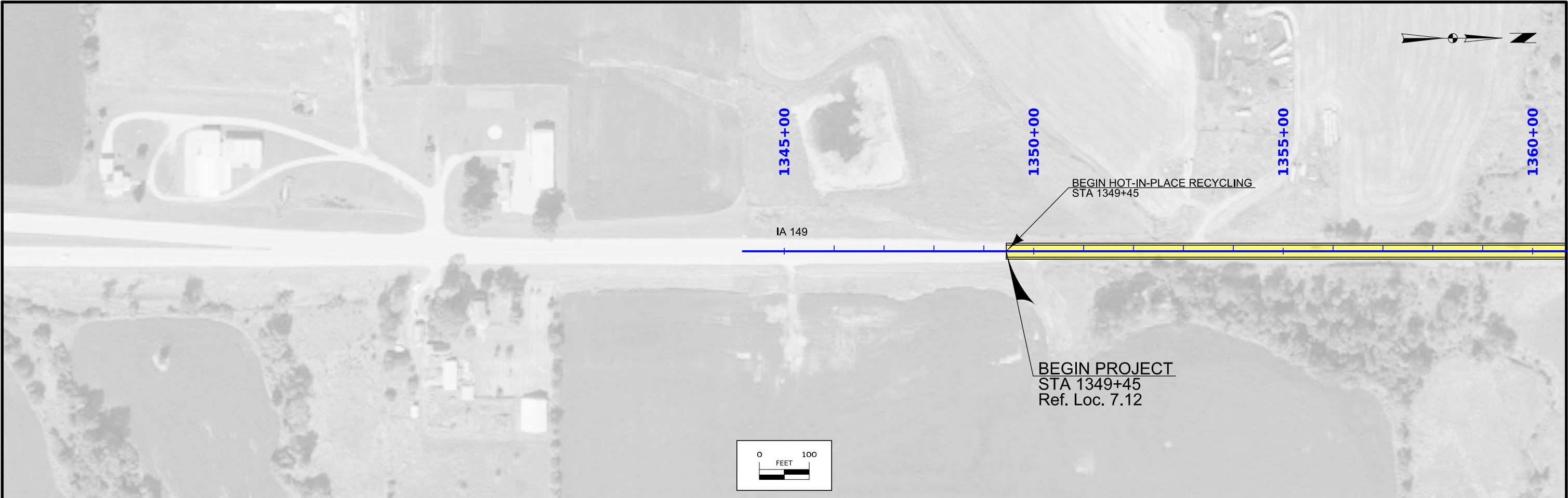
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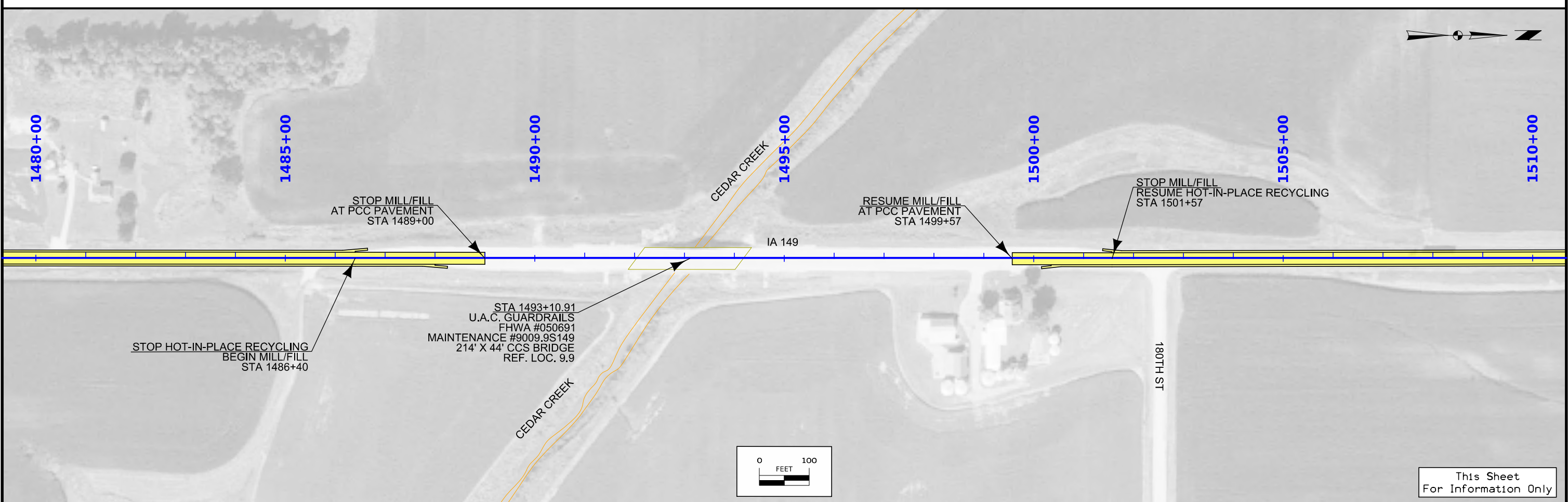
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cameron.hershey@iowadot.us

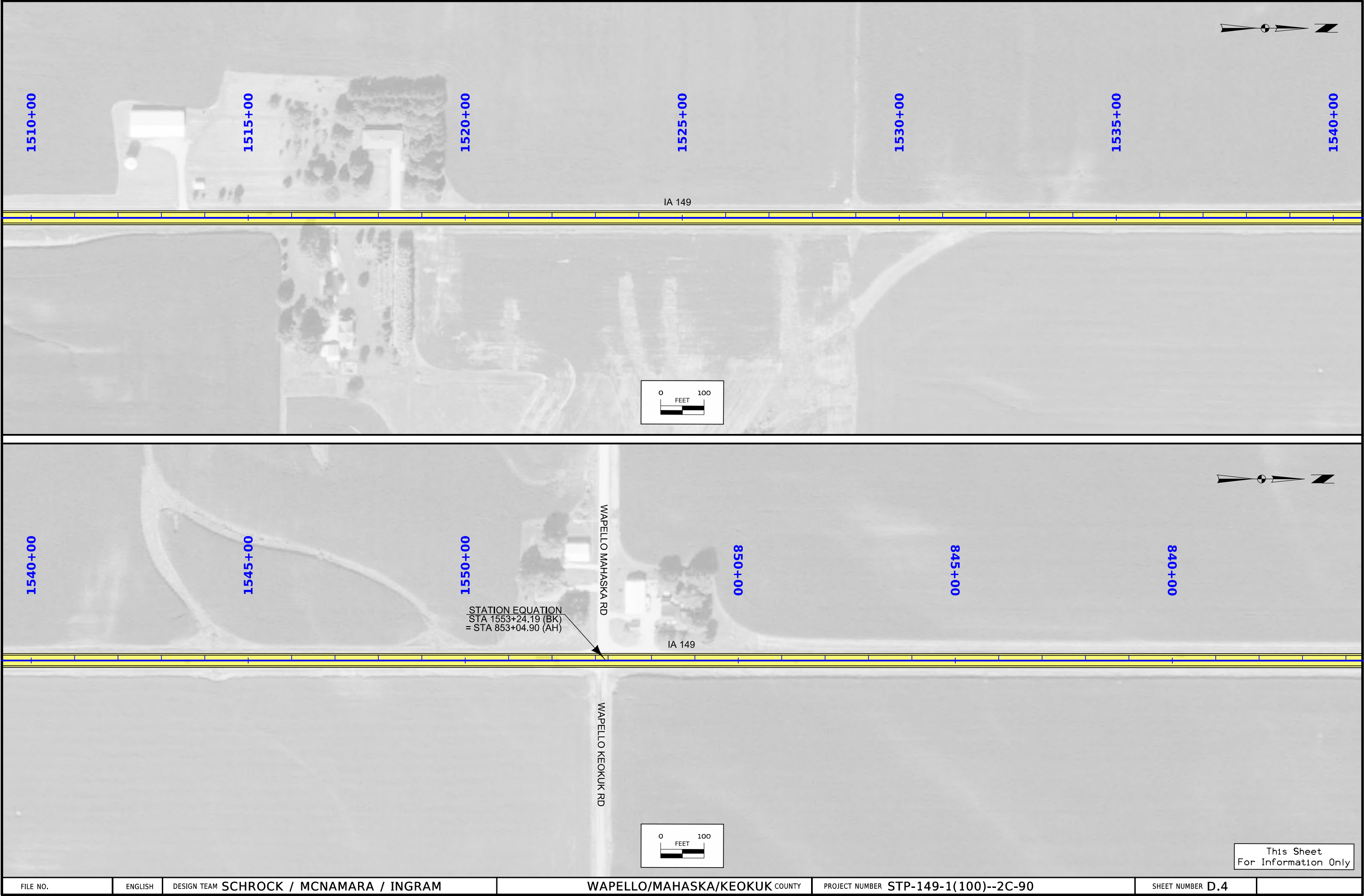
104_09A 5/6/24											
LONGITUDINAL SUBDRAIN SHOULDER											
* Not a bid item.											
Line No.	Road or Lane Identification	Station From	Station To	Side	Depth (IN) (D)	Subdrain Size (IN)	Length (FT)	Outlet Station	Outlet Type	Porous Backfill* (CY)	Remarks
48.0	IA 149			Right	24.0	4.0	30.0	1461+00.00	DR-306	1.4	
49.0	IA 149	1461+00.00	1466+00.00	Right	24.0	4.0	530.0	1461+00.00	DR-306	24.5	
50.0	IA 149			Right	24.0	4.0	30.0	1466+00.00	DR-306	1.4	
51.0	IA 149	1466+00.00	1471+00.00	Right	24.0	4.0	530.0	1466+00.00	DR-306	24.5	
52.0	IA 149			Right	24.0	4.0	30.0	1471+00.00	DR-306	1.4	
53.0	IA 149	1471+00.00	1476+00.00	Right	24.0	4.0	530.0	1471+00.00	DR-306	24.5	
54.0	IA 149			Right	24.0	4.0	30.0	1476+00.00	DR-306	1.4	
55.0	IA 149	1476+00.00	1480+00.00	Right	24.0	4.0	430.0	1476+00.00	DR-306	19.9	
56.0	IA 149			Right	24.0	4.0	30.0	1480+00.00	DR-306	1.4	
57.0	IA 149	1480+00.00	1486+40.00	Right	24.0	4.0	670.0	1480+00.00	DR-306	31.0	
58.0	IA 149			Right	24.0	4.0	30.0	1486+40.00	DR-306	1.4	
59.0	IA 149	1501+57.00	1506+00.00	Left	24.0	4.0	473.0	1501+57.00	DR-306	21.9	
60.0	IA 149			Left	24.0	4.0	30.0	1506+00.00	DR-306	1.4	
61.0	IA 149	1506+00.00	1511+00.00	Left	24.0	4.0	530.0	1506+00.00	DR-306	24.5	
62.0	IA 149			Left	24.0	4.0	30.0	1511+00.00	DR-306	1.4	
63.0	IA 149	1511+00.00	1516+00.00	Left	24.0	4.0	530.0	1511+00.00	DR-306	24.5	
64.0	IA 149			Left	24.0	4.0	30.0	1516+00.00	DR-306	1.4	
65.0	IA 149	1516+00.00	1521+00.00	Left	24.0	4.0	530.0	1516+00.00	DR-306	24.5	
66.0	IA 149			Left	24.0	4.0	30.0	1521+00.00	DR-306	1.4	
67.0	IA 149	1521+00.00	1525+00.00	Right	24.0	4.0	430.0	1521+00.00	DR-306	19.9	
68.0	IA 149			Right	24.0	4.0	30.0	1525+00.00	DR-306	1.4	
69.0	IA 149	1525+00.00	1530+00.00	Right	24.0	4.0	530.0	1525+00.00	DR-306	24.5	
70.0	IA 149			Right	24.0	4.0	30.0	1530+00.00	DR-306	1.4	
71.0	IA 149	1530+00.00	1535+00.00	Right	24.0	4.0	530.0	1530+00.00	DR-306	24.5	
72.0	IA 149			Right	24.0	4.0	30.0	1535+00.00	DR-306	1.4	
73.0	IA 149	1535+00.00	1540+00.00	Right	24.0	4.0	530.0	1535+00.00	DR-306	24.5	
74.0	IA 149			Right	24.0	4.0	30.0	1540+00.00	DR-306	1.4	
75.0	IA 149	1540+00.00	1545+00.00	Right	24.0	4.0	530.0	1540+00.00	DR-306	24.5	
76.0	IA 149			Right	24.0	4.0	30.0	1545+00.00	DR-306	1.4	
77.0	IA 149	1545+00.00	1550+00.00	Right	24.0	4.0	530.0	1545+00.00	DR-306	24.5	
78.0	IA 149			Right	24.0	4.0	30.0	1550+00.00	DR-306	1.4	
79.0	IA 149	1550+00.00	1553+00.00	Right	24.0	4.0	330.0	1550+00.00	DR-306	15.3	
80.0	IA 149			Right	24.0	4.0	30.0	1553+00.00	DR-306	1.4	
81.0	IA 149	852+85.00	850+00.00	Left	24.0	4.0	255.0	852+85.00	DR-306	11.8	STATION EQUATION:(E1)1553+24.2 (BK)=853+05 (AH)
82.0	IA 149			Left	24.0	4.0	30.0	850+00.00	DR-306	1.4	
83.0	IA 149	850+00.00	845+00.00	Right	24.0	4.0	470.0	850+00.00	DR-306	21.8	
84.0	IA 149			Right	24.0	4.0	30.0	845+00.00	DR-306	1.4	
85.0	IA 149	845+00.00	840+00.00	Right	24.0	4.0	470.0	845+00.00	DR-306	21.8	
86.0	IA 149			Right	24.0	4.0	30.0	840+00.00	DR-306	1.4	
87.0	IA 149	840+00.00	835+00.00	Right	24.0	4.0	470.0	840+00.00	DR-306	21.8	
88.0	IA 149			Right	24.0	4.0	30.0	835+00.00	DR-306	1.4	
89.0	IA 149	835+00.00	830+00.00	Right	24.0	4.0	470.0	835+00.00	DR-306	21.8	
90.0	IA 149			Right	24.0	4.0	30.0	830+00.00	DR-306	1.4	
91.0	IA 149	830+00.00	827+30.00	Right	24.0	4.0	240.0	830+00.00	DR-306	11.1	
92.0	IA 149			Right	24.0	4.0	30.0	827+30.00	DR-306	1.4	
93.0	IA 149	826+00.00	821+55.00	Right	24.0	4.0	415.0	826+00.00	DR-306	19.2	
94.0	IA 149			Right	24.0	4.0	30.0	821+55.00	DR-306	1.4	
Total							24138.0	DR-306:94		1117.8	



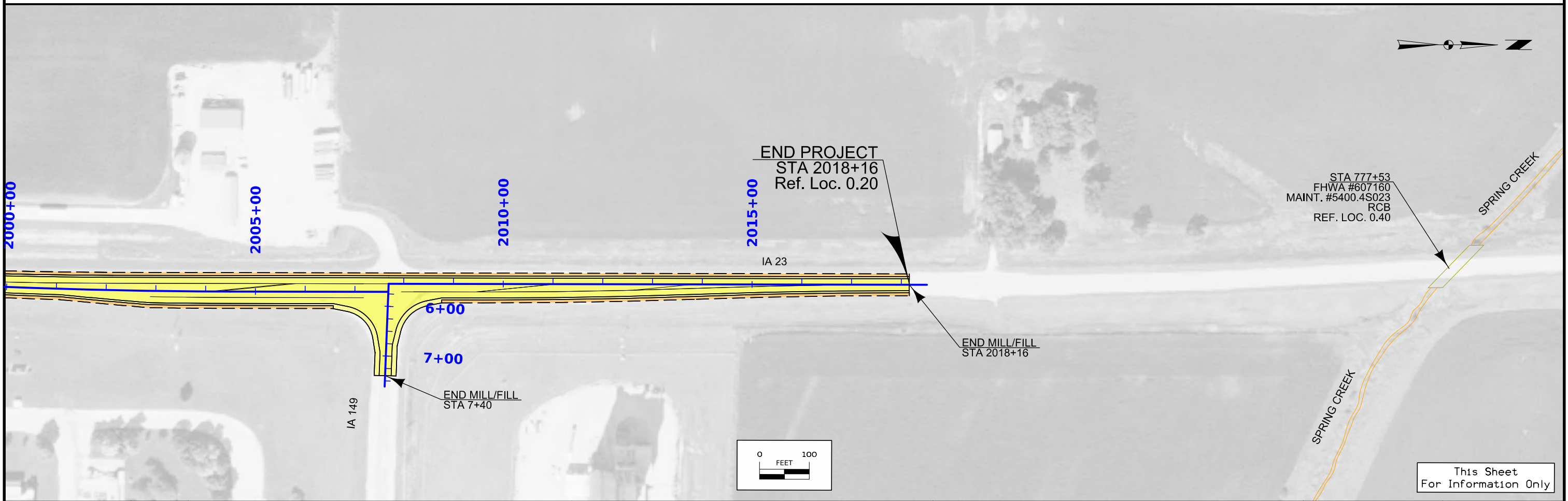
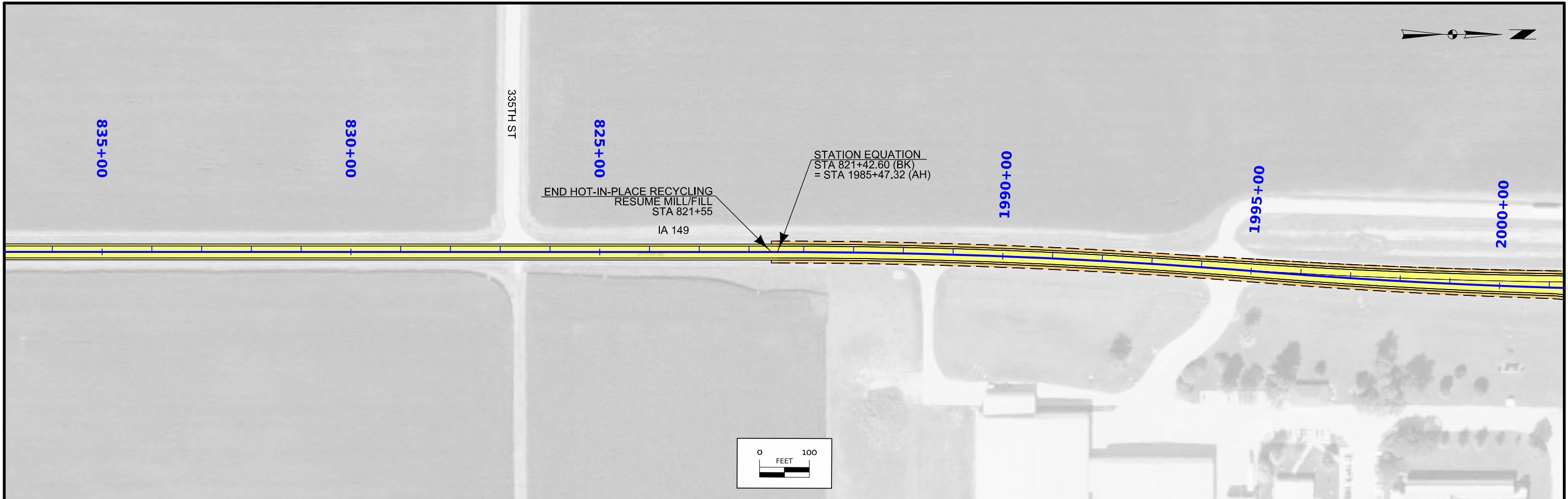




FILE NO.	ENGLISH	DESIGN TEAM SCHROCK / MCNAMARA / INGRAM	WAPELLO/MAHASKA/KEOKUK COUNTY	PROJECT NUMBER STP-149-1(100)--2C-90	SHEET NUMBER D.3	This Sheet For Information Only
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FILE NO.	ENGLISH	DESIGN TEAM	SCHROCK / MCNAMARA / INGRAM	WAPELLO/MAHASKA/KEOKUK COUNTY	PROJECT NUMBER	STP-149-1(100)--2C-90	SHEET NUMBER	D.4	
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FILE NO.	ENGLISH	DESIGN TEAM	SCHROCK / MCNAMARA / INGRAM	WAPELLO/MAHASKA/KEOKUK COUNTY	PROJECT NUMBER	STP-149-1(100)--2C-90	SHEET NUMBER	D.5
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TRAFFIC CONTROL PLAN

1. Through traffic on IA 149 shall be maintained at all times.
2. Access to all properties shall be maintained at all times.
4. If necessary to complete sideroad pavement; lane closures and street closures shall be in accordance with TC-212, TC-251, and TC-252. Safety Closures or Type III barricades placed to protect work area shall not be counted or paid for separately.

108-23A
08-01-08

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.

111-01
04-17-12

Project

Type of Work

To Be Determined

511 TRAVEL RESTRICTIONS

108-25
10-21-14

[illegible]

STAGING NOTES

Suggested Sequence of Construction:

1. Clearing and Grubbing, Culvert Repair, Patching.
2. Longitudinal Subdrain Installation.
3. HMA Base Widening. (See General Note A)
4. Hot In-Place Recycling (HIR).
5. HMA Resurfacing.
6. Granular Shoulder Replacement.
7. Grooving for Pavement Markings.
8. Rumble Strips.

General Notes:

- A. The HMA Base Widening operation shall be done prior to the Hot In-Place Recycling (HIR) operation. This will allow for a wider/stabilized construction platform for the HIR operation. This will effectively develop a heated/sealed joint at the interface of the Base Widening/HIR material which will help mitigate future reflective cracking.
- B. Pavement Markings shall be placed on each drivable surface as construction progresses.

108-26A
08-01-08

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Roadside Items : Roadside Items

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadside Items	
1	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	1,500	Refer to Standard Road Plan EC-204. Item is included for temporary perimeter sediment control, inlet protection, and water velocity reduction on slopes or ditches at locations to be determined during construction. Verify specific locations with the Engineer prior to beginning placement.
2	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	1,500	Refer to Standard Road Plan EC-204. Item is included for temporary perimeter sediment control, inlet protection, and water velocity reduction on slopes or ditches at locations to be determined during construction. Verify specific locations with the Engineer prior to beginning placement.
3	2602-0000351	REMOVAL OF PERIMETER AND SLOPE OR DITCH CHECK SEDIMENT CONTROL DEVICE	LF	3,000	

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.

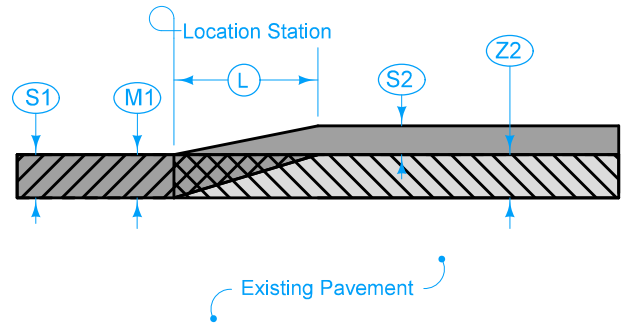
281_03
11/9/23

STORM WATER BEST MANAGEMENT PRACTICES

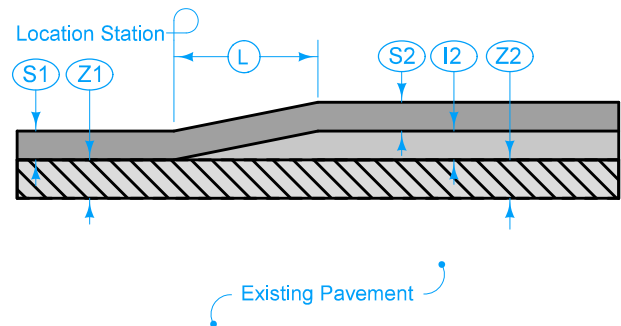
When the following best management practices are used, they are intended to account for disturbed areas where storage volume cannot be provided: Perimeter and Slope Sediment Control Device and Seeding.

111_25 10/20/26 INDEX OF TABULATIONS		
Tabulation	Tabulation Title	Sheet No.
111_25	INDEX OF TABULATIONS	RC.4
105_04	STANDARD ROAD PLANS	RC.5

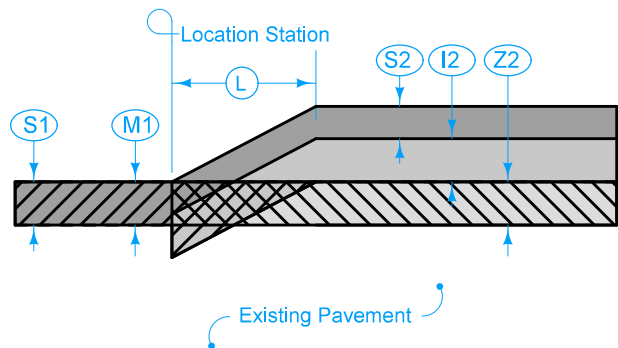
105_04 10/20/26 STANDARDS The following Standards apply to construction work on this project.		
Number	Date	Title
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices



TYPE 'R5-M1'
RUNOUT FOR TRANSITION
FROM - SURFACE COURSE TO
HOT IN-PLACE RECYCLING - SURFACE COURSE



TYPE 'R5-M2'
RUNOUT FOR TRANSITION
FROM HOT IN-PLACE RECYCLING - SURFACE COURSE TO
HOT IN-PLACE RECYCLING - INTERMEDIATE COURSE - SURFACE COURSE



TYPE 'R5-M3'
RUNOUT FOR TRANSITION
FROM - SURFACE COURSE TO
HOT IN-PLACE RECYCLING - INTERMEDIATE COURSE - SURFACE COURSE

- S# HMA Surface Course
- I# HMA Intermediate Course
- Z# Hot In-Place Recycling
- M# Milling
- L Runout Length

Posted Speed Limit (mph)	Runout Ratio (ft per inch)
Over 40	50
20 to 40	25
Under 20	10*

* Based on turning maneuvers at side roads and intersections.

Contract Item:
Pavement Scarification

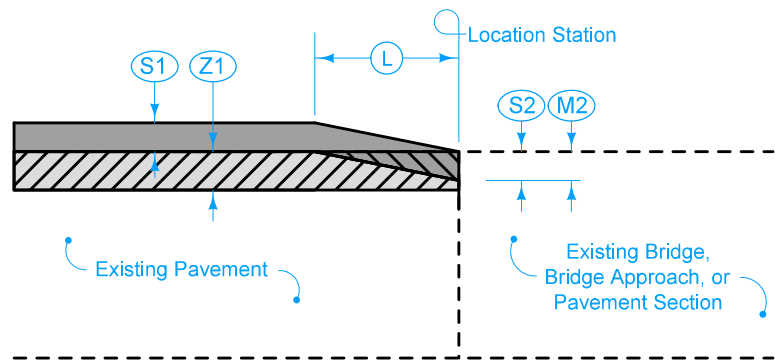
Tabulations:
100-25
102-16

MODIFIED

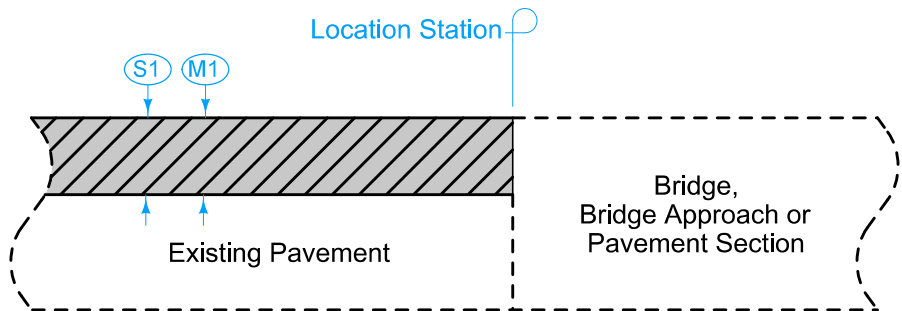
MODIFICATIONS: Created Runouts 'R5-M1', 'R5-M2', and 'R5-M3'.
Removed runouts not applicable to this project.

RUNOUTS FOR RESURFACING

PR-201 SHEET 1 of 1



TYPE 'N1-M1'
SURFACE NOTCH - HOT IN-PLACE RECYCLING
RUNOUT FOR SINGLE COURSE RESURFACING



TYPE 'N2-M1'
SINGLE COURSE
RESURFACING OF MILLED AREAS

- S#** HMA Surface Course
- I#** HMA Intermediate Course
- Z#** Hot In-Place Recycling
- M#** Milling
- L** Runout Length

Posted Speed Limit (mph)	Runout Ratio (ft per inch)
Over 40	50
20 to 40	25
Under 20	10*

* Based on turning maneuvers at side roads and intersections.

Contract Item:
Pavement Scarification

Tabulations:
100-25
102-16

MODIFIED

MODIFICATIONS: Created Notches 'N1-M1', and 'N2-M1'.
Removed notches not applicable to this project.

**NOTCHES FOR RESURFACING
(WITH OR WITHOUT RUNOUT)**
PR-202 SHEET 1 of 1

