

**HARDIN CO. HMA RESURFACING/COLD-IN-PLACE RECYCLING**  
**STPN-175-8(36)--2J-42**

LETTING DATE  
 11/20/2018



**Highway Division**

PLANS OF PROPOSED IMPROVEMENT ON THE

**PRIMARY ROAD SYSTEM**

**HARDIN COUNTY**

**HMA RESURFACING/COLD-IN-PLACE RECYCLING**

N Jct US 65 to WCL of Eldora

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL

XX

PROJECT IDENTIFICATION NUMBER

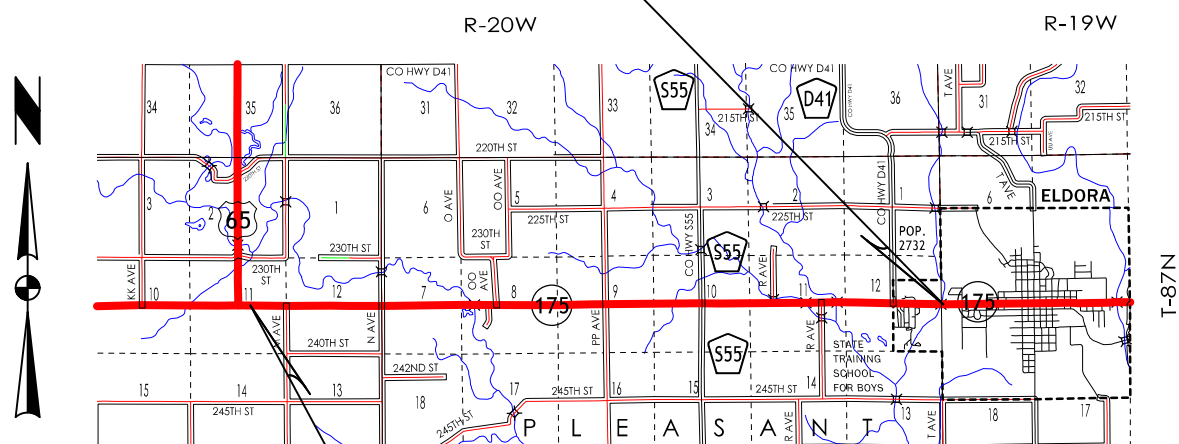
16-42-175-010

PROJECT NUMBER

STPN-175-8(36)--2J-42

R.O.W. PROJECT NUMBER

Sta. 1396+20 (MP 185.98)  
End Construction



Sta. 1015+75 (MP 178.8)  
Begin Construction

**DESIGN EVENTS**

- D2 - Design Field Exam - Date: 04-06-2018
- DM5 - Check Plan Review - Date: 08-14-2018
- D7 - Final Pave Plan - Date: 09-04-2018

**DESIGN DATA RURAL**

2019 AADT	1900	V.P.D.
2039 AADT	2000	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	13	%
Total Design ESALs	--	

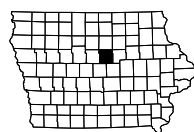
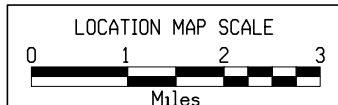
**INDEX OF SEALS**

SHEET NO.	NAME	TYPE
A.1	Tony Gustafson	Primary Signature Block

**PRELIMINARY PLANS**

Subject to change by final design.

**D2 PLAN - Date: 4/6/2018**



# FIELD EXAM CHECKLIST

- 1 - Duration of project?
- 2 - Speed Limit
- 3 - Speed Limit during construction
- 4 - Is sight distance a problem?
- 5 - Patching quantities-full depth, partial depth, and surface.
- 6 - Does patching need to be done in the project area or do the construction limits need to be extended?  
Who will provide locations of patches by milepost?
- 7 - Are rumble strips going to be placed with this project or a separate project?
- 8 - Leveling and strengthening locations and lengths (i.e. station to station).
- 9 - Areas of haul-outs.
- 10 - Any survey needed? (culvert extensions, safety dikes, right turn lanes, horizontal curves, ext..)
- 11 - Do any of the utilities need to be relocated (power/telephone poles) either permanently or temporarily for construction?
- 12 - Names and addresses of affected utility companies.
- 13 - Locations of entrances to be reshaped.
- 14 - Are there existing drainage problems?

# FIELD EXAM CHECKLIST

- 15 - Note any special features not shown on plan.
- 16 - Note condition of existing culverts.
- 17 - Names of affected special events.
- 18 - Locations of mailboxes to be relocated to a minimum of 8' from the pavement edge.
- 19 - Number and location of EF joints.
- 20 - Disposition of bridge handrail and guardrail, including posts.
- 21 - Inventory of existing guardrail.
- 22 - Remove & Reinstall Signs - District Maintenance or by the Contractor?
- 23 - Longitudinal joint repair locations (station to station).
- 24 - Locations and quantities of engineering fabric to be placed over random cracks.
- 25 - Tabulation of adjustment of fixtures.
- 26 - Clearing and grubbing quantities - by unit or by area?
- 27 - Resurfacing Projects - Is District Survey able to preserve Section Corners & Points?  
If "no", then add these items under Construction Survey.

# FIELD EXAM CHECKLIST

Contractor furnish borrow? (Yes) / (No)

Full depth patches to be PCC? (Yes) / (No)

Full depth PCC patches to be doveled? (Yes) / (No)

Soils to determine and provide tabulation of subdrains? (Yes) / (No)

Pollution Prevention Plan required? (Yes) / (No)

Field Office? (Yes) / (No)

Construction Survey and or Point Preservation by DOT or Contractor? See Dist. 1 Surveyor for this (DOT) / (Contractor).

Survey by Office of Design? (Yes) / (No)

Pavement markings for turn lanes as determined by the District? (Yes) / (No)

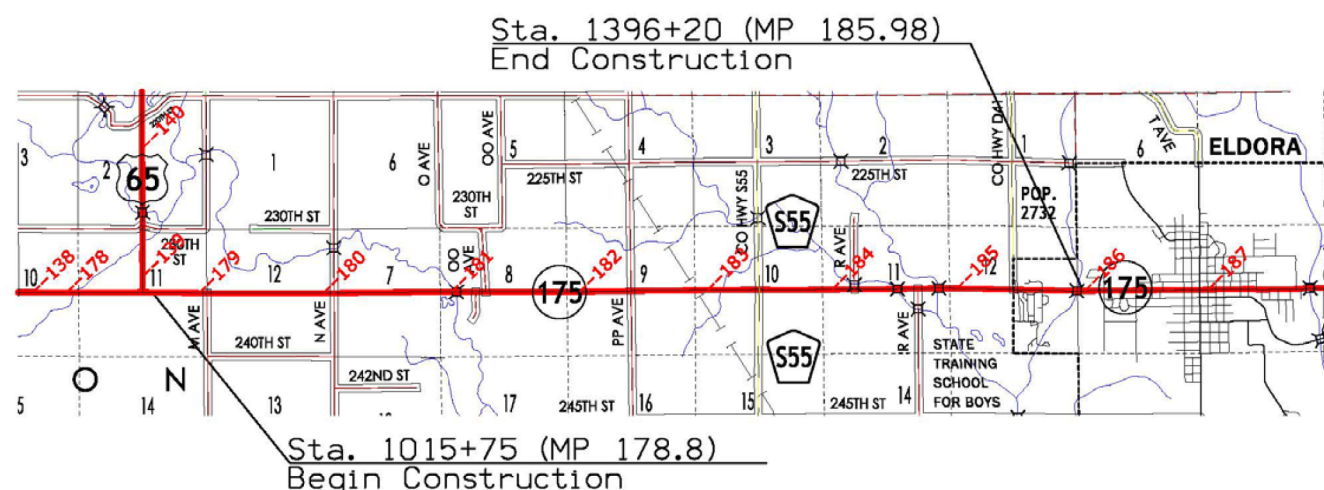
Any RWIS or Traffic Recorder Sites within project limits? (Yes) / (No)

IOWA DEPARTMENT OF TRANSPORTATION

**TO OFFICE:** District 1  
**ATTENTION:** Scott Dockstader  
**FROM:** Allison Smyth  
**OFFICE:** District 1  
**SUBJECT:** 2019-3R Project Concept - FINAL

**DATE:** July 3, 2017  
**PROJECT:** Hardin County  
 Proj #: STPN-175-8(36)—2J-42  
 PIN: 16-42-175-010

**LOCATION MAP:**



**PARTICIPANTS:**

Tony Gustafson and Allison Smyth of the District 1 Office and Brad Fleming of Iowa Falls/Williams Maintenance.

**Alternatives**

Two alternatives were considered:

- 3 inch Cold-in-Place Recycling with 3 inch HMA Resurfacing
- 9 inch PCC Reconstruction

**Alternative 1 is the preferred alternative** in order to achieve a durable, cost effective rehabilitation.

**Project Data**

ROUTE: IA 175 From N Jct US 65 to E of Otter Creek in Eldora  
 LENGTH: 7.2 miles  
 PLANNING CLASSIFICATION: Access Route  
 MAINTENANCE SERVICE LEVEL: C  
 TRAFFIC: 2019 --- 1900 ADT with 13% trucks  
 2039 --- 2000 ADT with 13% trucks  
 PRESENT PAVEMENT SURFACE: HMA  
 PRESENT PAVEMENT WIDTH: 24 ft.  
 PRESENT SHOULDER WIDTH: 7 ft. TYPE: Granular

Segment <i>MP to MP Direction</i>	Pavement Type <i>Surface Section</i>	Pavement Structure Number			PCI	IRI	Friction	Rut Depth	Fault/Roll-down	Subgrade Support (k Value)
		Section Avg.	80th Percentile	Joint Avg.						
178.58 to 185.22 Both	HMA Composite	6	4	5	66	2014 80	2013 51			146

Pavement Structure Number 0=Very Poor Condition; 10=Very Good Condition  
 Pavement Condition Index (PCI) 0=Very Poor Condition; 100=Very Good Condition Target ≥ 50  
 International Roughness Index (IRI) >170=Very Poor Condition; <95=Very Good Condition Target < 95  
 Friction < 33=Very Poor Condition; > 37=Good Condition Target > 37  
 Subgrade Strength Index (K Value) 50=Very Poor Condition; 250=Very Good Condition

● Interstate = 4-8, Other Primary = 2-5

**PAVEMENT HISTORY:**

Work Type	Year	Width	Depth/Pavement Type	Subdrains	Coarse Aggregate		
				Coverage	Source	Type	Class
MP 178.58 to MP 185.22							
	1995	24'	2" AAC				
	1977	24'	1" AAC				
	1965	24'	3" AAC				
	1931	18'	7" PC7				

**EXISTING CONDITIONS AND CAUSES OF DISTRESS:**

The existing roadway was built in 1931. The pavement is 24 feet wide with 7-foot wide granular shoulders. The base layer of pavement is 7 inches of PCC concrete. The roadway was widened and overlaid with 3 inches of AAC in 1965. The next overlay was in 1977, and added another inch, then in 1995 2 more inches were added. Overall the pavement is in poor condition.

**DESIGN CONSIDERATIONS:**

Crash History

During the five-year period from January 1, 2012 through December 31, 2016, there were 11 crashes in the corridor.

CRASH SUMMARY					
	Segment		Intersection		Animal
	Total	Winter	Total	Winter	
Fatal					
Major	1		1		
Minor	1				
Possible/Unknown	3	1			
PDO	37	2	1		31
Total	42	3	2	0	31

Key findings include:

- For the corridor (intersections and segments) the crash rate is 183.4 crashes/HMVM which is significantly higher than the statewide rural average of 89 crashes/HMVM.
- 74% of all crashes are animal related crashes.
- 5% of all crashes are intersection related crashes.
- 7% of all crashes are winter road condition related crashes.

Design Features

*Alignment*

The alignment review is to identify geometric features that presently do not meet the design value for the posted speed limit, and to determine a course of action. Within the project limits, the regulatory (posted) speed limit is 55 mph.

Horizontal curves must have a degree of curvature less than or equal to 6° for 55 mph. There is one horizontal curve within the project limits, and it meets this requirement.

Roadway superelevation on the horizontal curves is consistent with the 8% maximum superelevation design criteria charts. No cross slope correction will be included.

The project contains nineteen crest vertical curves and twenty-four sag vertical curves, and all meet the minimum vertical curve criteria. No profile adjustments will be made with this project.

*Intersections*

Turn lane warrants were reviewed at all paved side roads. No turn lanes will be included with this project.

Paving of side road approaches will be included at the request of Hardin County, and at their cost.

*Roadway Elements*

The proposed pavement is 32-foot-wide (2-12 foot lanes and 2-4 foot shoulders) with 3-foot wide granular shoulders.

Base widening is required to create the paved shoulders.

Centerline and shoulder rumble strips will be included with this project.

There is one pedestrian crossing the project, located at the State Training School for Boys. **The office of Design will provide the survey and design.** Advanced signing for the pedestrian crossing exists only for westbound traffic, and will be reviewed.

No destination lighting will be impacted by the project.

There are no overhead or post-mounted beacons within the project limits.

No traffic signals are present.

No ITS (dynamic message signs, cameras, etc.) or maintenance equipment (traffic sensors, ARWIS stations, etc.) will be impacted by the project.

*Sideslopes*

Foreslopes, ditches, and clear zones within the project limits do not conform to current design criteria. Foreslopes were constructed to a 1.5:1 slope with a standard 5-foot ditch depths. The 1.5:1 foreslopes do not meet current 3R design criteria. To maximize available clear zones beyond the foreslope, trees, shrubs and overgrowth in the ROW will be cleared and grubbed. Foreslope flattening is not recommended at this time.

No additional ROW is expected.

Transverse slopes at entrances, dikes, and side roads will not be modified.

One side road intersection, at M Avenue, requires a safety dike. **Marshalltown RCE will provide survey for the location by December 20, 2017.**

Clearing and grubbing will be required on this project.

*Structures*

There are two bridges (Maint. No. 4281.1S175 & 4284.8S175) and two large box culverts (Maint. No. 4284.5S175 & 4285.9S175) within the project limits. The Office of Bridges and Structures recommends replacing the approaches to re-establish CF joints at bridge No. 4281.1S175. The box culvert needs no repairs at this time. For Bridge No. 4284.8S175, OBS suggests milling and resurfacing up to the bridge (remove the CF joint material).

For Maint. No. 4281.1S175: Replace both bridge approaches, guardrail on all four corners, and paved shoulders at the guardrail per the current Design Detail 7156. Traffic will be reduced to one lane and the construction staged to one side at a time. Traffic Signals will control traffic via Standard Road Plan TC-217. This traffic control area will be designated as a site to shorten the length of lane closures.

The approach on the west side has an existing 22-foot long PCC patch 62 feet from the end of the bridge. The Cold-in Place Recycling will stop at Station 1129+29 and the resurfacing will run out from Station 1129+29 to Station 1130+79. At Station 1130+79, a new EF joint will be constructed. The PCC patch will be left in place, and the BR-201 bridge approach will be constructed at a length of 62' (the last 10' of the standard bridge approach will not be built).

For the east approach, a standard BR-201 will be constructed (full 70' length). Following the bridge approach will be a 150' runout (from Station 1134+94 to 1136+44) before resuming the Cold-in-Place Recycling.

For Maint. No. 4284.8S175, the guardrail will be replaced at all four corners of the bridge, and paved shoulders will be constructed in front of the guardrail per Design Detail 7156. Bridge End Drains per DR-401, Scour Protection for Bridge End Drain, will be installed at the northwest and southwest end of the bridge. 10-foot long Patches at both ends will replace the EF joints.

Cold-in-Place Recycling will stop at Station 1329+17 and the resurfacing will be runout to Station 1330+67. From Station 1330+67 to Station 1331+29 and Station 1332+99 to Station 1333+59, the roadway surface will be scarified and resurfaced three inches (1.5 inches intermediate course and 1.5 inches surface coarse). From Station 1333+59 to Station 1335+09 a runout will be constructed to match the Cold-In-Place Recycling that will resume at Station 1335+09.

There are 21 existing small box culverts on this project. **Iowa Falls Maintenance will provide a list of any culvert repairs for this project by September 30, 2017.**

**FEASIBLE ALTERNATES:**

Structural analysis yields the following pavement rehabilitation options:

Rehabilitation Alternative	Design Life	Existing Roadway Modification	Paving Thickness	Pavement Drainage Requirements	Subbase Strength Layer Requirements
Cold-in-Place Recycled Asphalt with HMA Overlay	20	3" Cold-in-Place Recycle	3" HMA	100% Subdrain Coverage	
PCC Reconstruction	40	Remove roadway	9" PCC	100% Subdrain Coverage	6" Granular Subbase (On top of 2' Select or 12" Special)

The proposed rehabilitation will provide a 24-foot pavement with 7 (+/-) foot partially paved shoulders (4 foot paved/3 foot granular). 100% subdrain coverage will be provided. Base widening is required to support the paved shoulders. The roadway will be completed with centerline and shoulder rumble strips, along with waterborne pavement markings.

The estimated costs for these alternatives are:

Cold-in-Place Recycle/HMA Overlay	\$3,187,300
PCC Reconstruction	\$8,639,600

Detailed costs estimates are available here: [link](#)

**RECOMMENDATIONS:**

The recommended method of rehabilitation is the Cold-in-Place Recycled Asphalt with HMA Overlay. This includes 3 inch Cold-in-Place Recycling of the existing 24-foot pavement, 3-inch thick x 4-foot wide base widening on both sides of the pavement, 3 inch HMA Resurfacing over widened roadway, and 3-foot wide granular shoulders.

Traffic will be maintained during construction via single lane closures with pilot cars, and TC-217 at the Bridge Approach reconstruction area.

Survey is required.

Temporary Easement may be required.

Access Control is not required.

An agreement may be needed with Hardin County. No agreement will be needed with the city of Eldora.

No railroad involvement.

**Patch tabs will be provided by the Marshalltown RCE by May 1, 2018.**

**DEVELOPMENT SCHEDULE:**

The proposed development schedule is:

D00	Pre-Design Concept	07/07/2017
D01	Survey Plan/Photo	12/20/2017
D02	Field Exam	04/06/2018
D05	Plans to Right-of-Way	05/26/2018
D07	Paving Final Plans	09/04/2018
L02	Letting	11/20/2018

**ESTIMATED COST:**

The Cold-in-Place Recycle/HMA Overlay cost estimate is \$3,187,300.

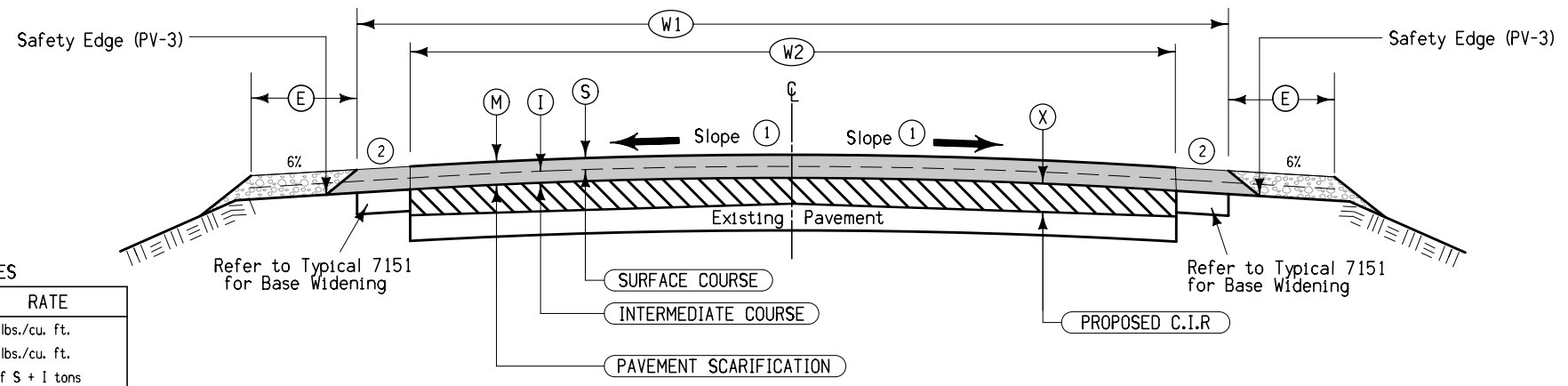
**FUNDS PROGRAMMED:**

Proposed funding for this project is \$3,187,300 in 3R funding.

cc:

C. Purcell	M. J. Kennerly	K. D. Nicholson
D. L. Maifield	S. J. Megivern	N. L. McDonald
G. A. Novey	M. A. Swenson	R. A. Younie
D. R. Tebben	K. Brink	D. L. Newell
J. W. Laaser-Webb	W. A. Sorenson	D. E. Sprengeler
E. C. Wright	M. E. Ross	A. A. Welch
N. M. Miller	C. C. Poole	M. J. Sankey
B. E. Azeltine	B. D. Hofer	T. D. Crouch
S. J. Gent	S. Anderson	P. C. Keen
M. Masteller	J. Selmer	B. Smith
C. Brakke	T. Hanson	F. Todey
V. Brewer	M. Clayton	M. Donovan
J. Garton	T. J. Gustafson	J. Lavine
A. Loonan	L. Starbuck	J. Tibodeau
B. Fleming		

- C.I.R. (Cold In-Place Recycling)
- HMA RESURFACING
- Granular Shoulder



Notes:

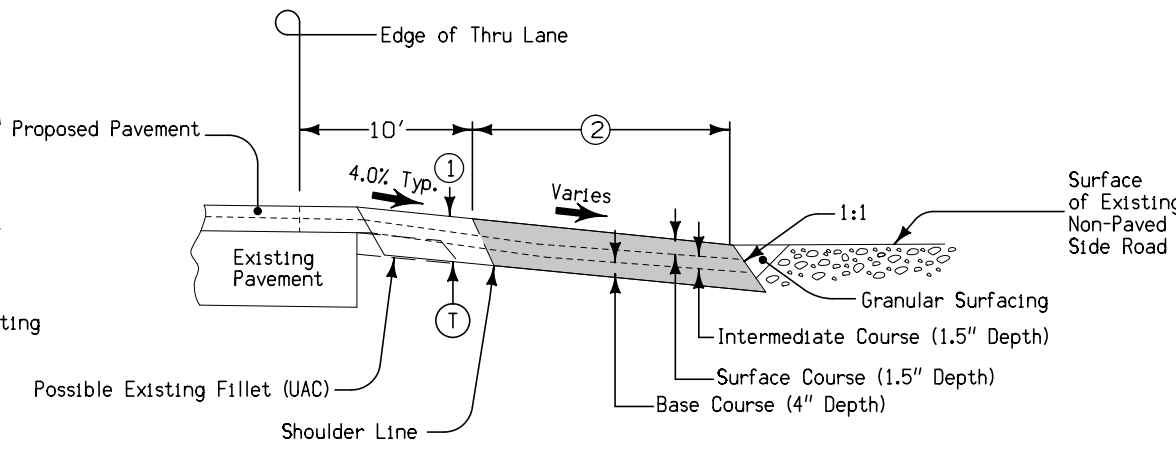
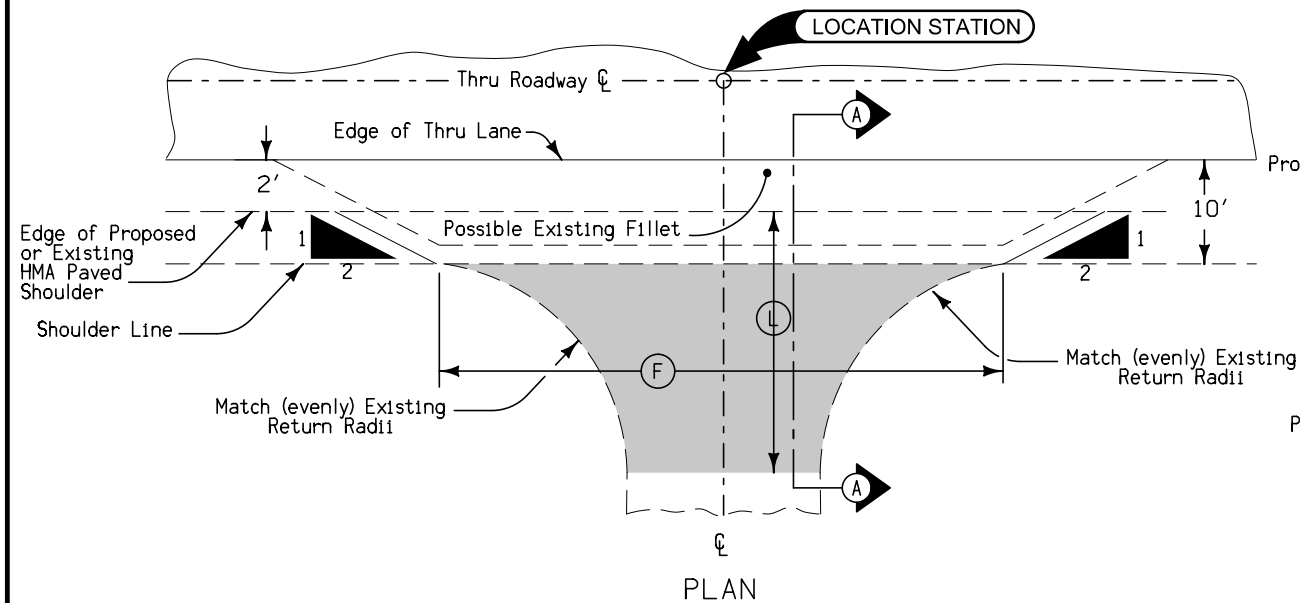
- ① Match finished slope to existing pavement, except that the maximum allowable slope is 3.0 %, minimum allowable slope is 2.0 %. Section may be modified as directed by the Engineer through areas of special shaping.
- Refer to tabulation listing of superelevated curves and Standard Road Plans for additional requirements through superelevated curves.
- ② Paved shoulder slope shall be 4%.

DESIGN RATES	
ITEM	RATE
Surface Course	145 lbs./cu. ft.
Intermediate Course	145 lbs./cu. ft.
Binder Rate estimate	6% of S + I tons
Stabilizing Agent	0.0011 tons/Sq.Yd./ (X)

LOCATION				HMA Resurfacing				Cold In-place Recycling			
				S Inches	I Inches	W1 Feet	E Feet	W2 Feet	X Inches	CIR SY	Stabilizing Agent Tons
ROAD IDENTIFICATION	DIR.	STATION TO STATION									
IA 175	WB/EB	1015+75.00	1129+29.00	1.5	1.5	32	3	24	3	30277.33	99.9
		1136+44.00	1329+17.00	1.5	1.5	32	3	24	3	51394.67	169.6
		1335+09.00	1396+20.00	1.5	1.5	32	3	24	3	16296.00	53.8
							<b>Totals</b>			<b>97968.00</b>	<b>323.3</b>

**TYPICAL CROSS SECTION  
PROPOSED: COLD IN-PLACE RECYCLING  
and HMA RESURFACING**





Special shaping of existing surface prior to placement of fillet or fillet extension may be required by the Engineer and is incidental to other work on the project.

- ① Match existing slope.
- ② Bid Item

Proposed HMA Area (100% County Funded)

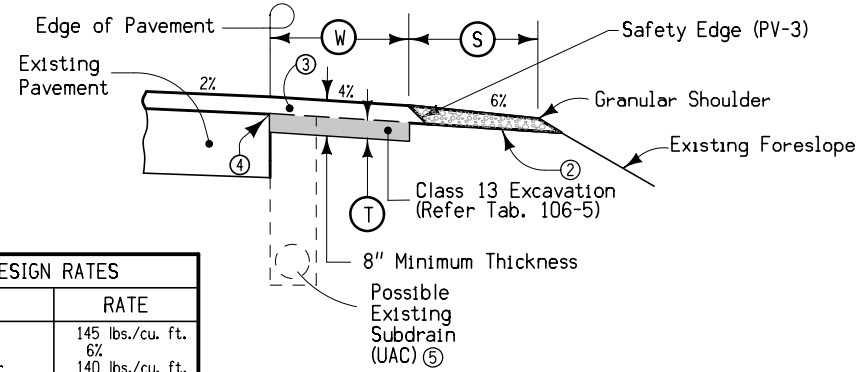
SECTION A-A

Location					①	①	②	HOT MIX ASPHALT			Binder	Class 13 Excavation	Remarks
Rd. ID	County	Station	Side Road	Side	Feet	Inches	Feet	② Tons	② Tons	② Tons	② Tons	② CY	
IA 175	Hardin	1029+71±	M. Ave.	Rt	100	7	40	16.77	16.77	44.71	4.69	22.84	
		1082+14±	N. Ave.	Rt	100	7	40	16.77	16.77	44.71	4.69	22.84	
		1082+14±	N. Ave.	Lt	100	7	40	16.77	16.77	44.71	4.69	22.84	
		1145+03±	O. Ave.	Lt	100	7	40	16.77	16.77	44.71	4.69	22.84	
		1205+00±	Pp. Ave.	Rt	100	7	40	16.77	16.77	44.71	4.69	22.84	
		1205+00±	Pp. Ave.	Lt	100	7	40	16.77	16.77	44.71	4.69	22.84	
		1257+54±	Co.Rd. S55	Rt	--	--	--	--	--	--	--	--	Paved Sideroad
		1257+54±	Co.Rd. S55	Lt	--	--	--	--	--	--	--	--	Paved Sideroad
		1323+33±	R. Ave.	Rt	100	7	40	16.77	16.77	44.71	4.69	22.84	
		1362+94±	Co.Rd. D41	Lt	--	--	--	--	--	--	--	--	Paved Sideroad

Proposed HMA Areas  
HMA estimated @ 145 #/cu.ft.  
Binder estimated 6% of HMA tons

**TYPICAL SECTION FOR  
FILLET EXTENSION FOR  
NON-PAVED SIDE ROADS**  
  
**DIVISION 2- 100% HARDIN  
COUNTY PARTICIPATION**

7151  
Modified



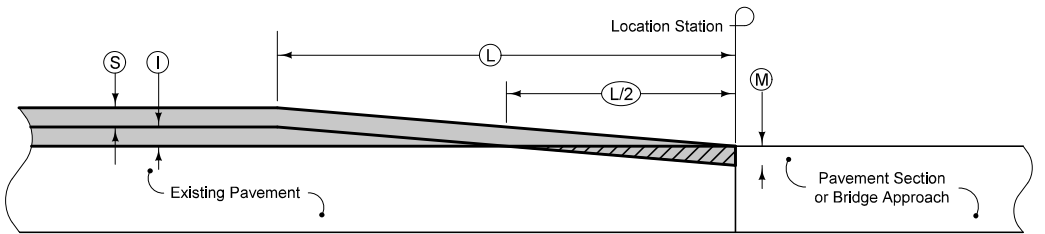
DESIGN RATES	
ITEM	RATE
HMA Base	145 lbs./cu. ft.
Binder Rate	6%
Gran. Shoulder	140 lbs./cu. ft.

Road ID	Station To Station	Side	W Feet	S Feet	T Depth Inch	Bid Item ① Granular Shoulder Tons	Remarks
IA 175	1015+75	1396+20	Both	4	3	3	2663.15
						Total	3728.41
							x 40%

- NOTES:
- ① Per LOCATION.
  - ② Included with the minimum surface preparations, shape existing shoulder surface to a uniform cross slope prior to placing granular shoulder material and to ensure the granular shoulder material thickness is not less than the proposed resurfacing thickness.
  - ③ Proposed HMA quantities above the HMA Base Widening are included with mainline quantities.
  - ④ Provide a vertical edge. Incidental to Class 13 Excavation.
  - ⑤ All existing subdrains shall remain functional at all time; do not plug or crush.

**TYPICAL SECTION  
BASE WIDENING AND  
GRANULAR SHOULDER  
WITH RESURFACING**

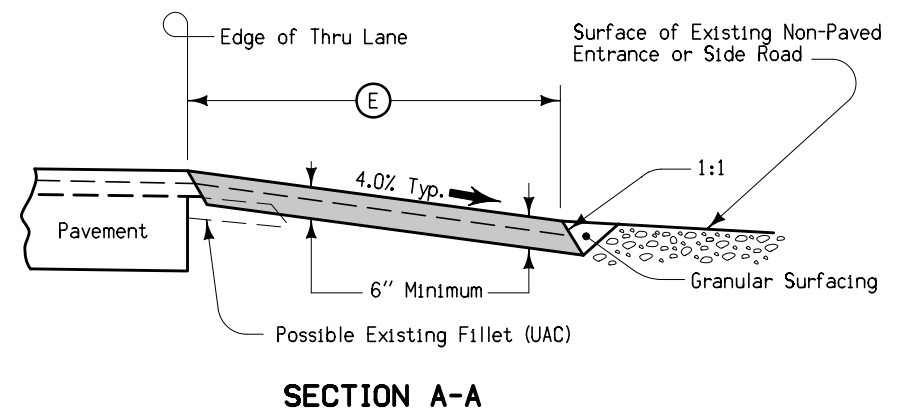
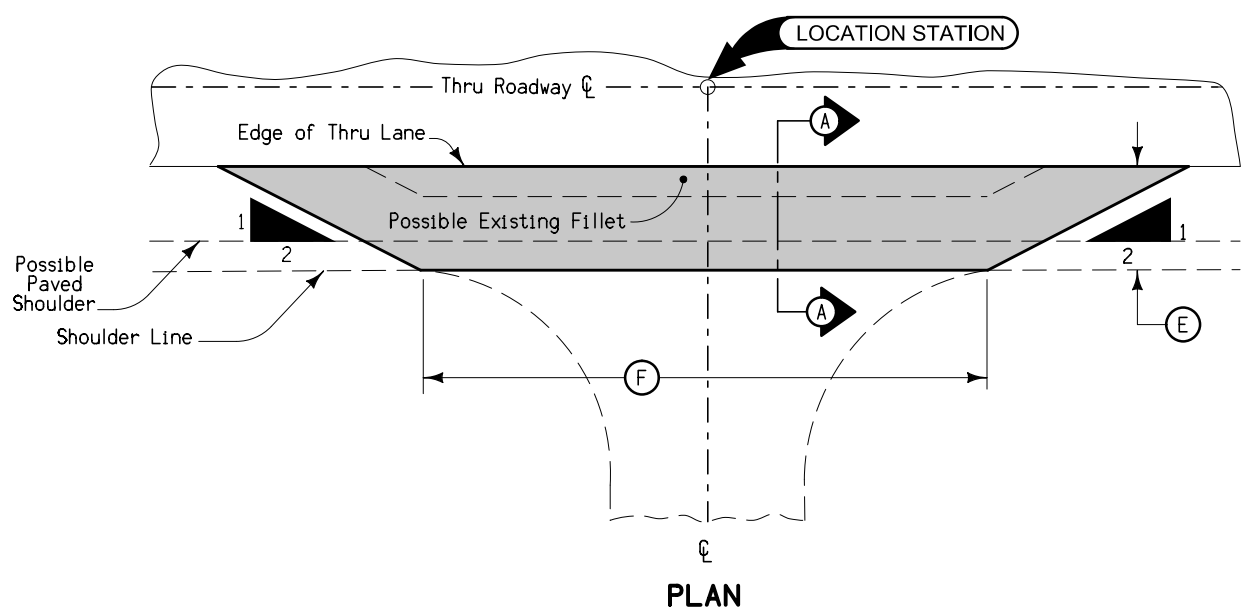
7308C  
MODIFIED



- Ⓢ Surface Course
- Ⓜ Intermediate Course
- Ⓣ Milling

LOCATION STATION	LANE	L Feet	S Inches	I Inches	M Inches	REMARKS
1015+75.00±	---	150	1.5	1.5	1.5	BOP
1130+96.00±	---	150	1.5	1.5	1.5	To Bridge Approach
1135+00.00±	---	150	1.5	1.5	1.5	From Bridge Approach
1330+61.00±	---	150	1.5	1.5	1.5	To Bridge Approach
1333+69.00±	---	150	1.5	1.5	1.5	From Bridge Approach
1396+20.00±	---	150	1.5	1.5	1.5	EOP

**TRANSITION FROM  
DOUBLE COURSE RESURFACING IN  
C. I. R. TO EXISTING PAVEMENT  
OR MILLED AREAS**



Special shaping of existing surface prior to placement of fillet may be required by the Engineer and is incidental to other work on the project.

Quantities included with mainline quantities.

Refer to Standard Road Plan PV-202 for general details.

NORMAL FILLET SIZES	
TYPE OF ACCESS	Ⓞ Min. - ft.
Residential Entrance	40
Farm Entrance	60
Commercial Entrance	80
Non-Paved Road	100
Paved Road	Variable*

\* See layout drawing for details of construction of special areas.

PLAN

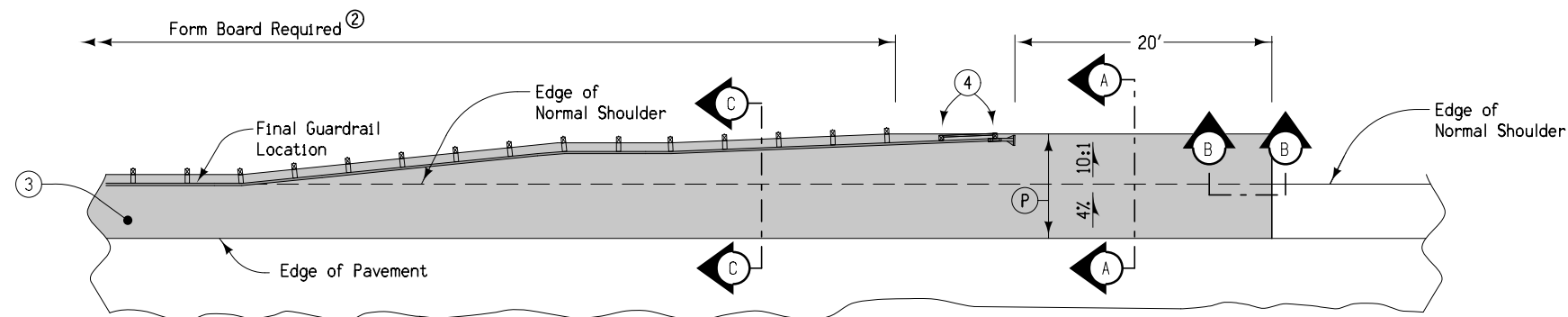
SECTION A-A

Location Station	Side	Ⓞ Feet	Ⓞ Feet	HMA SY	Remarks
1016+17	Rt	60	4	30.22	
1016+25	Lt	60	4	30.22	
1029+71	Rt	100	4	48.00	M. Ave.
1045+09	Lt	40	4	21.33	
1061+79	Lt	40	4	21.33	
1062+54	Lt	40	4	21.33	
1076+71	Lt	40	4	21.33	
1076+71	Rt	60	4	30.22	
1082+02	Lt	100	4	48.00	N.Ave.
1082+02	Rt	100	4	48.00	N.Ave.
1111+07	Lt	60	4	30.22	
1114+19	Rt	60	4	30.22	
1126+65	Rt	60	4	30.22	
1140+80	Rt	40	4	21.33	
1143+07	Rt	60	4	30.22	

Location Station	Side	Ⓞ Feet	Ⓞ Feet	HMA SY	Remarks
1144+92	Lt	100	4	48.00	O. Ave.
1152+07	Rt	40	4	21.33	
1161+52	Rt	40	4	21.33	
1164+93	Rt	40	4	21.33	
1172+46	Rt	40	4	21.33	
1172+46	Lt	40	4	21.33	
1198+90	Rt	40	4	21.33	
1204+78	Rt	100	4	48.00	Pp. Ave.
1204+78	Lt	100	4	48.00	Pp. Ave.
1216+98	Rt	40	4	21.33	
1224+87	Lt	40	4	21.33	
1244+37	Rt	40	4	21.33	
1251+09	Lt	40	4	21.33	
1264+78	Rt	40	4	21.33	
1274+12	Rt	40	4	21.33	

Location Station	Side	Ⓞ Feet	Ⓞ Feet	HMA SY	Remarks
1287+31	Lt	40	4	21.33	
1297+03	Lt	100	4	48.00	
1299+93	Rt	40	4	21.33	
1313+27	Rt	60	4	30.22	
1323+24	Rt	100	4	48.00	R. Ave.
1325+92	Rt	40	4	21.33	
1336+38	Lt	40	4	21.33	
1348+14	Rt	60	4	30.22	

FILLET FOR NON-PAVED ENTRANCES OR SIDE ROADS



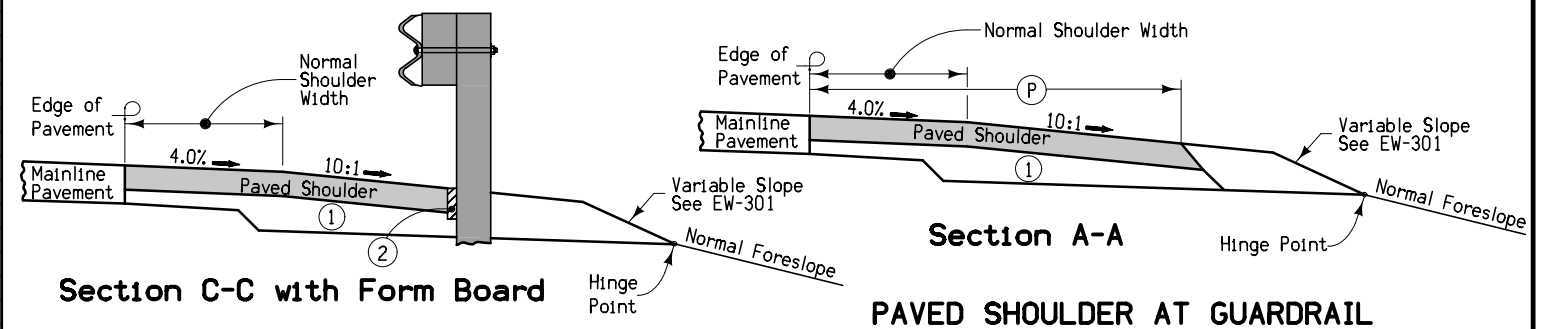
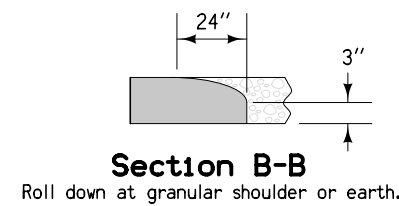
6" HMA Paved Shoulder at guardrail. 7" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at W/2 from edge of mainline pavement when W is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal & reinstallation of guardrail will be allowed with no additional payment.

Refer to Shoulder tabulation (112-9) for quantities.

Road Identification	Location		Side	Type	Feet	Subgrade <sup>①</sup> Treatment		Paved Shoulder SY	Class 13 Excavation CY	Remarks
	Station To	Station From				Special Backfill Cu. Yds.	Modified Subbase CY			
Ia 175 Bridge at 1132+95.5	1130+38.80	1130+71.00	Lt	--	5.7	--	--	20.4	3.4	
	1130+71.00	1131+06.00	Lt	--	5.7 to 4.2	--	--	19.3	3.2	
	1130+24.00	1130+56.00	Rt	--	5.7	--	--	20.3	3.4	
	1130+56.00	1130+94.00	Rt	--	5.7 to 4.2	--	--	20.9	3.5	
	1130+94.00	1131+26.30	Rt	--	4.2	--	--	15.1	2.5	
	1134+71.00	1134+88.00	Rt	--	4.2	--	--	7.9	1.3	
	1134+88.00	1135+26.00	Rt	--	4.2 to 5.7	--	--	20.9	3.5	
	1135+26.00	1135+58.00	Rt	--	5.7	--	--	20.3	3.4	
	1134+50.70	1135+03.00	Lt	--	4.2	--	--	24.4	4.1	
	1135+03.00	1135+40.00	Lt	--	4.2 to 5.7	--	--	20.4	3.4	
1135+40.00	1135+72.70	Lt	--	5.7	--	--	20.7	3.5		
Ia 175 Bridge at 1332+50	1330+14.00	1330+46.60	Lt	--	5.7	--	--	20.6	3.4	
	1330+46.60	1330+71.00	Lt	--	5.7 to 4.2	--	--	13.4	2.2	
	1329+89.00	1330+21.60	Rt	--	5.7	--	--	20.6	3.4	
	1330+21.60	1330+59.00	Rt	--	5.7 to 4.2	--	--	20.6	3.4	
	1330+59.00	1330+71.00	Rt	--	4.2	--	--	5.6	0.9	
	1333+19.00	1333+46.00	Rt	--	4.2	--	--	12.6	2.1	
	1333+46.00	1333+83.00	Rt	--	4.2 to 5.7	--	--	20.4	3.4	
	1333+83.00	1334+16.00	Rt	--	5.7	--	--	20.9	3.5	
	1333+19.00	1333+71.00	Lt	--	4.2	--	--	24.3	4.0	
	1333+71.00	1334+08.00	Lt	--	4.2 to 5.7	--	--	20.4	3.4	
1334+08.00	1334+41.00	Lt	--	5.7	--	--	20.9	3.5		



- ① 6" subgrade treatment.
- ② When guardrail posts are installed prior to construction of paved shoulder, nail 1" x 6" untreated form boards along the face of guardrail posts for the length shown. This board is to prevent shoulder material from contacting the sides of the posts and altering the function of the guardrail. Form board not required for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20' beyond the end of guardrail.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement.
- ⑤ 'KT-1' joint for PCC shoulder.  
'B' joint for HMA shoulder.

ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

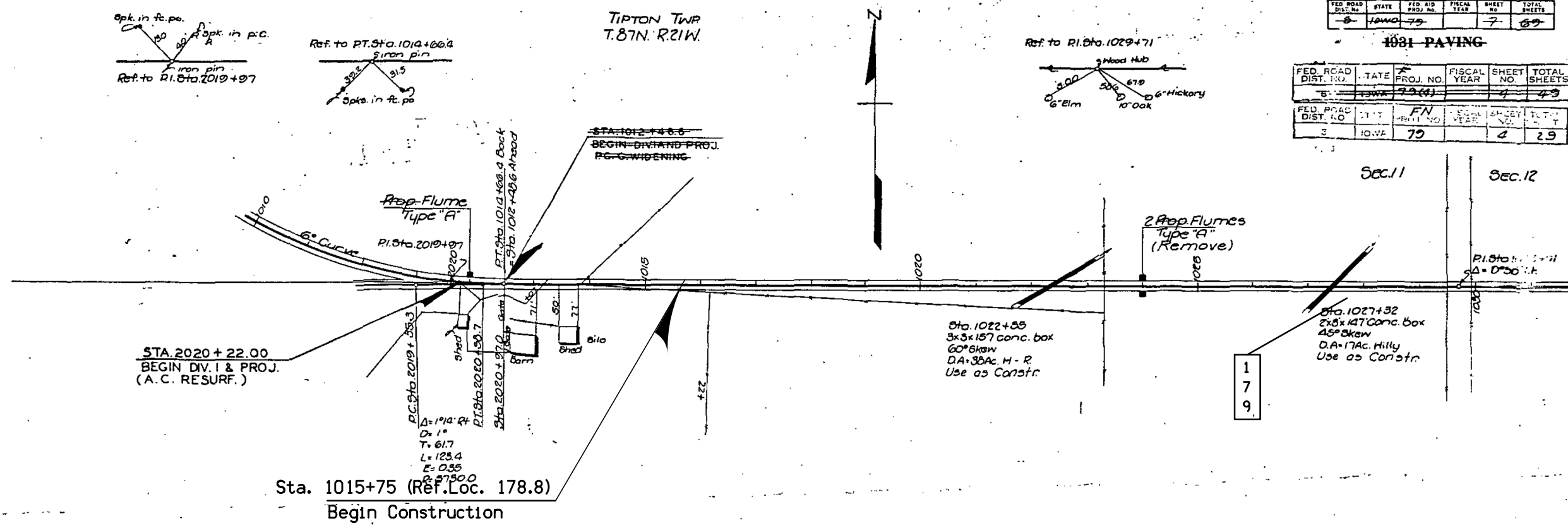
TIPTON TWP  
T.87N. R.21W.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IAWA	79		7	69

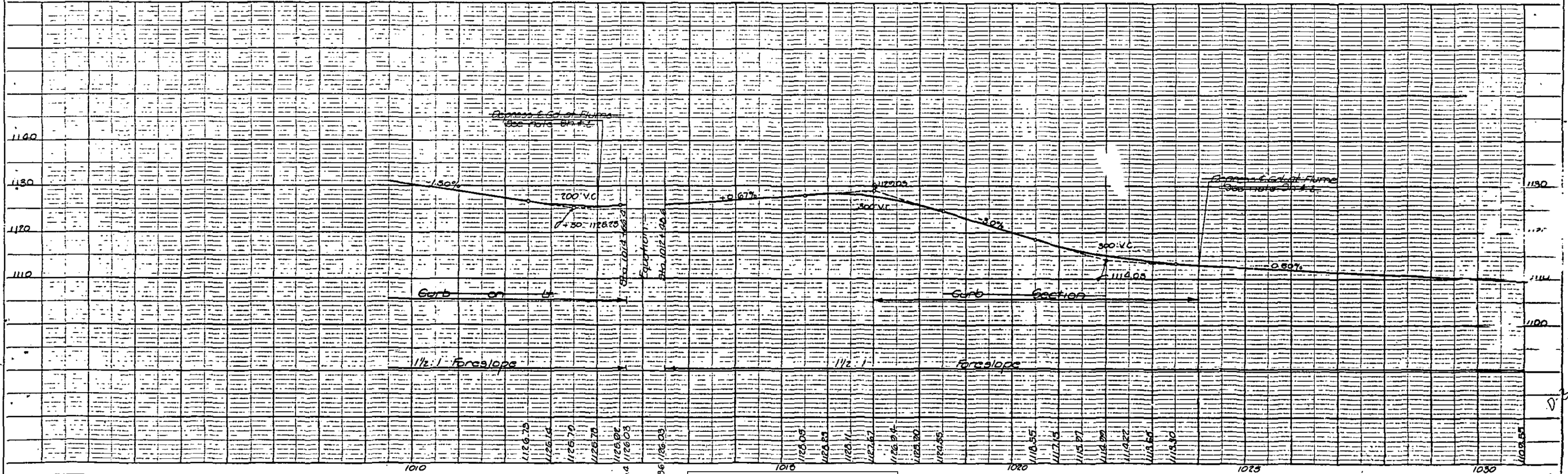
**1931 PAVING**

FED. ROAD DIST. NO.	STATE	FN PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IAWA	79(4)		4	49

FED. ROAD DIST. NO.	STATE	FN PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IAWA	79		4	29



1  
7  
9

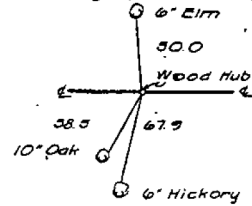


This Sheet For Information Only

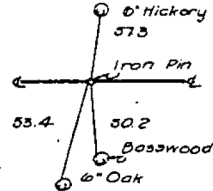
Hardin Co. Proj. No. 79(4) COUNTY PROJ. NO. 79(4) SHEET NO. 7 1931 PAVING  
Hardin Co. FN. Proj. No. 79 (A.C. Resurfacing) SHEET No. 4

ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

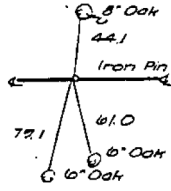
Ref. to P.I. Sta. 1029+71



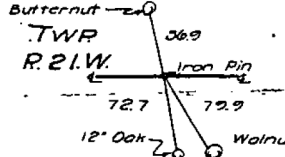
Ref. to P.O.T. Sta. 1037+36.9



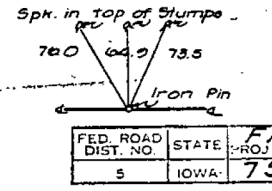
Ref. to P.O.T. Sta. 1041+31.6



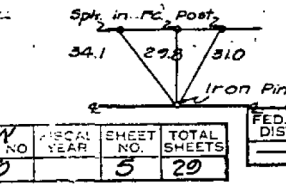
Ref. to P.O.T. Sta. 1046+63.3



Ref. to P.O.T. Sta. 1050+75.5



Ref. to P.O.T. Sta. 1061+34.4



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79	79	5	69

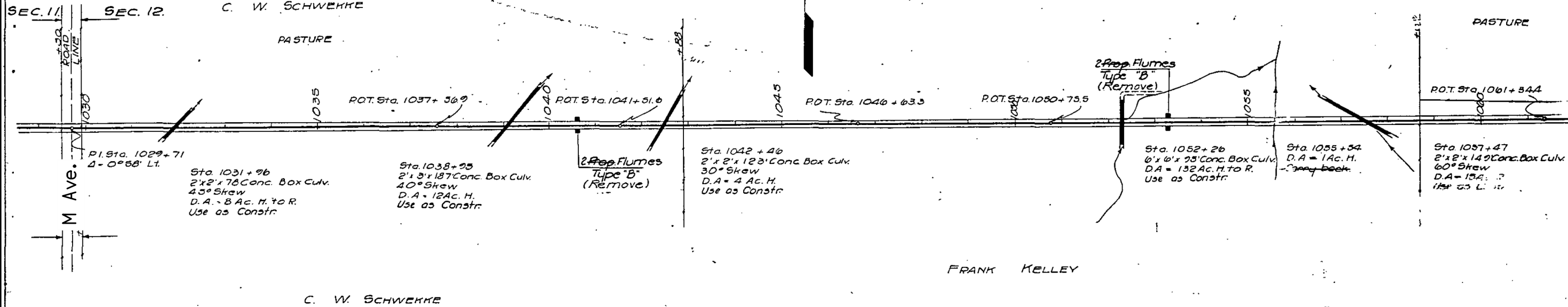
1991 PAVING

FED. ROAD DIST. NO.	STATE	F. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79(4)	79	5	49

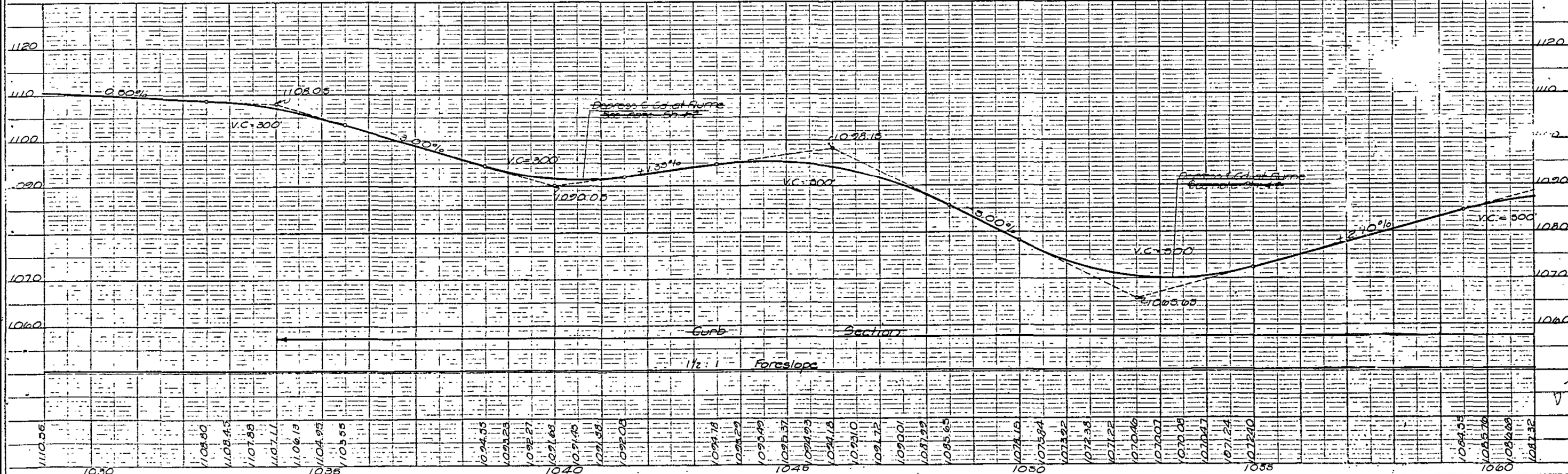


TIPTON TWP. T.87.N. R.21.W.

FRANK KELLEY MARY PATTON



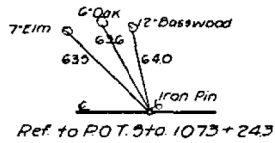
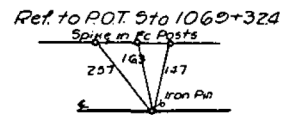
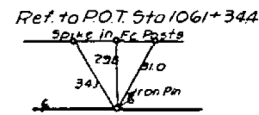
BENCH MARKS:  
 No. 93 Sta. 1043+70 Spike in root of 12" Butternut 150' Rt. E.I. 1103.11  
 No. 94 Sta. 1061+00 Spike in root of 26" White Oak 80' Rt. E.I. 1080.36



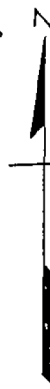
This Sheet For Information Only

Hardin Co. Proj. No. 79 (A.C. Resur.) SHEET NO. 5

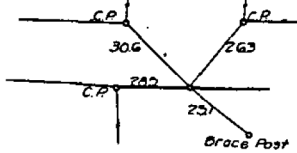
ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.



TIPTON TWP  
T.87N. R.21W.



Ref. to P.I. Sta to 1082+146

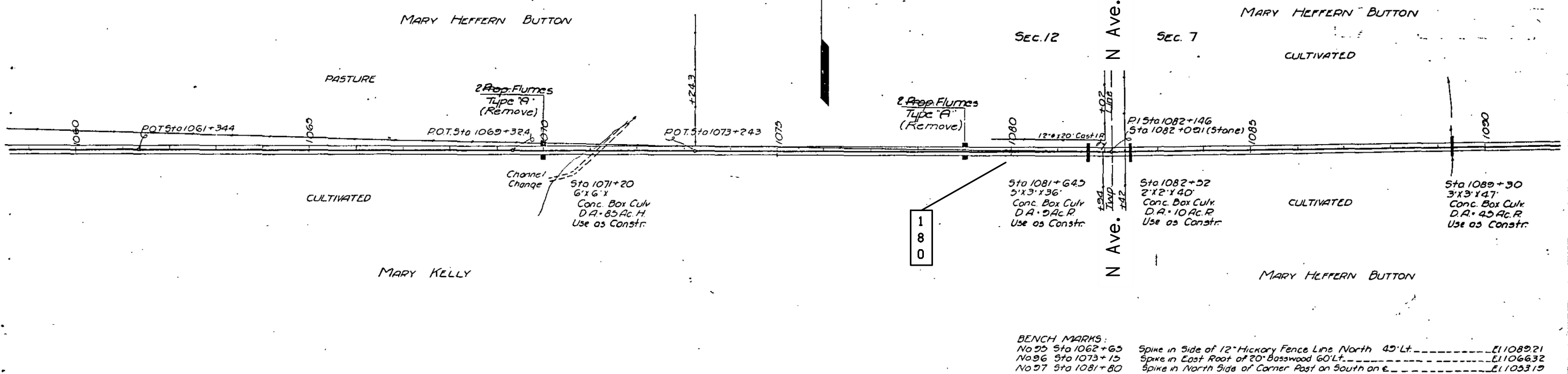


FED. ROAD DIST. NO.	STATE	F.N. PROJ. NO.	YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		6	29

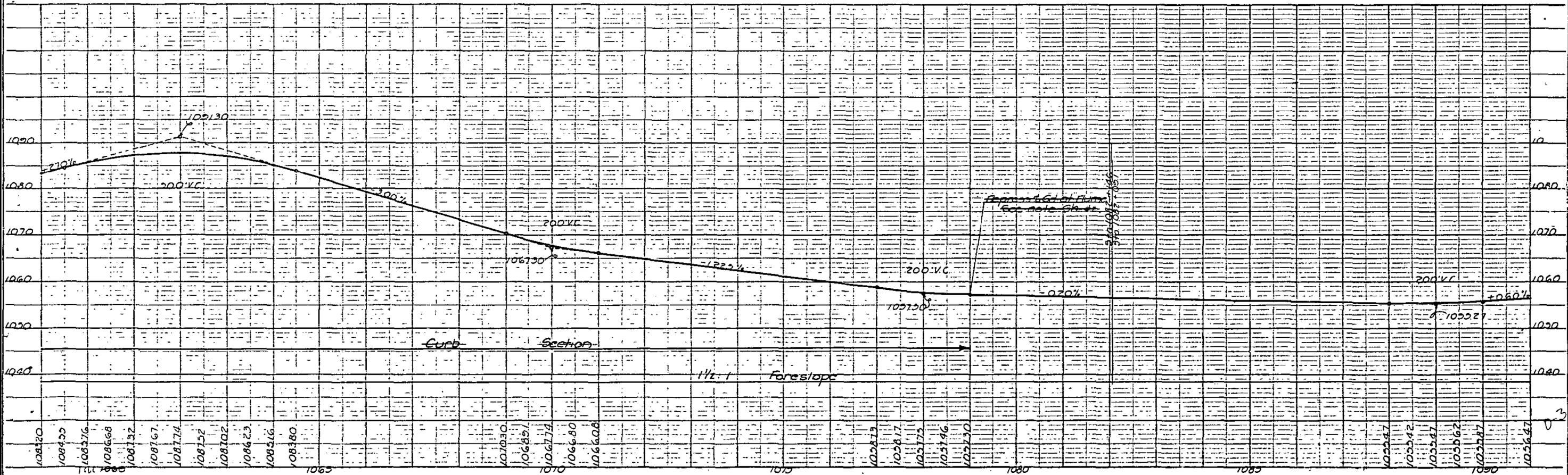
FED. ROAD DIST. NO.	STATE	F.N. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		6	29

1981 PAVING

FED. ROAD DIST. NO.	STATE	F.N. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	78(4)		6	45



BENCH MARKS:  
 No 95 Sta 1062+65 Spike in Side of 12" Hickory Fence Line North 45' Lt. ----- E1108921  
 No 96 Sta 1073+15 Spike in East Foot of 20" Basswood 60' Lt. ----- E1106632  
 No 97 Sta 1081+80 Spike in North Side of Corner Post on South on e. ----- E1105319



This Sheet For Information Only

Hardin Co. F. Proj. No. 79(4) Sheet No. 6  
 Hardin Co. F.N. Proj. No. 79 (A.C. Resurfacing) SHEET NO. 6

ESTABLISHED WIDTH OF  
RIGHT OF WAY \_\_\_\_\_ FT.

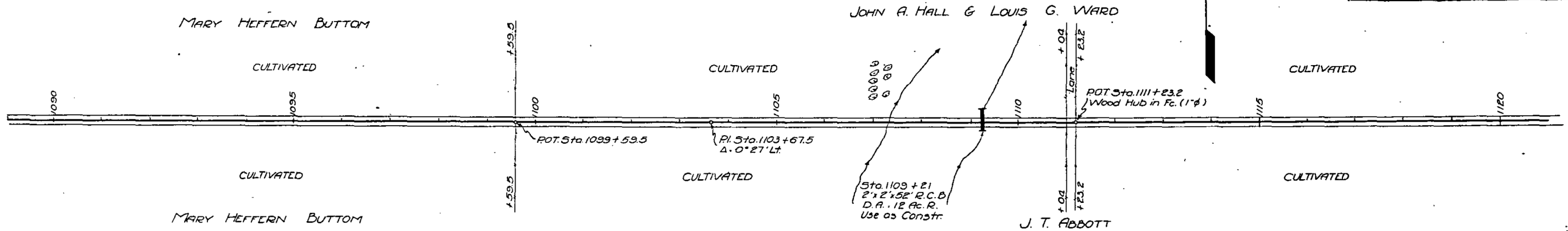
PLEASANT TWP  
T. 87 N. R. 20 W.  
SEC. 7

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		10	64

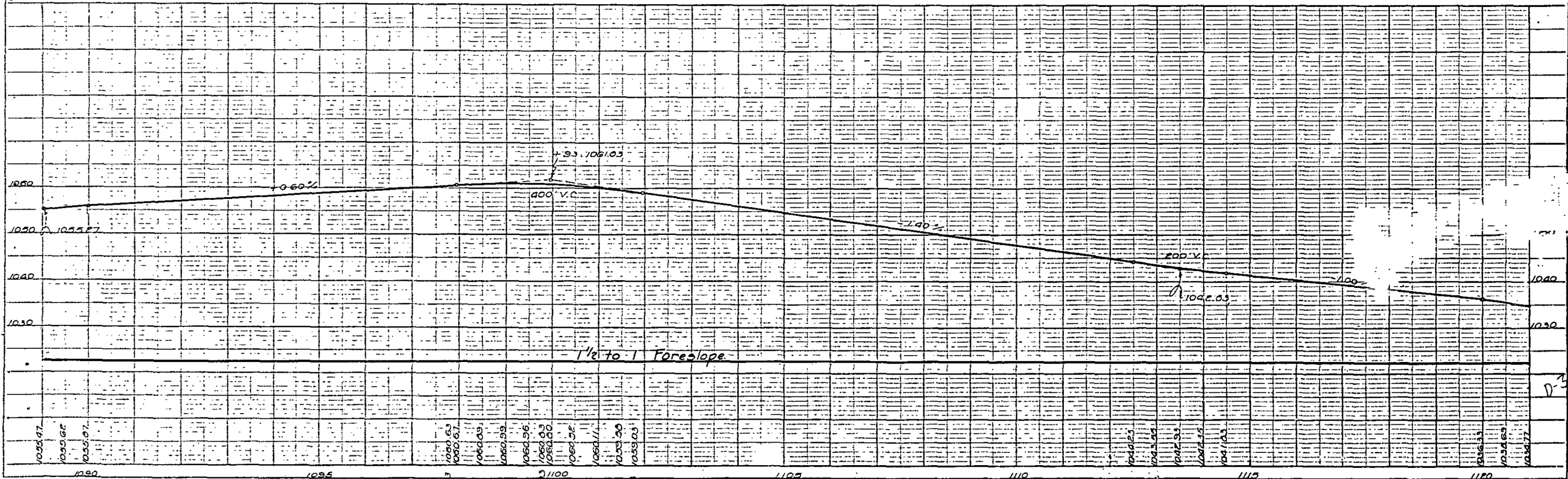
1931 PAVING

FED. ROAD DIST. NO.	STATE	FN PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79 (4)		7	43

FED. ROAD DIST. NO.	STATE	FN PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		7	29



BENCH MARKS:  
No. 90 Sta. 1099+54 Spike in N. side 48" stump in fence line Rt. ----- Elev. 1063.00  
No. 99 Sta. 1107+00 Spike in side apple tree 2nd from S. on W. 75' Lt. ----- Elev. 1051.93

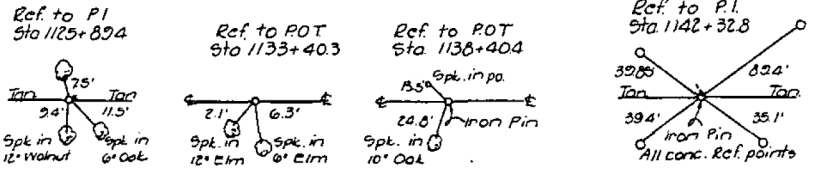


This Sheet  
For Information Only

Hardin Co. F.N. Proj. No. 79 (A.C. Resurfacing) SHEET NO. 7 OF 7  
1931 PAVING



ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

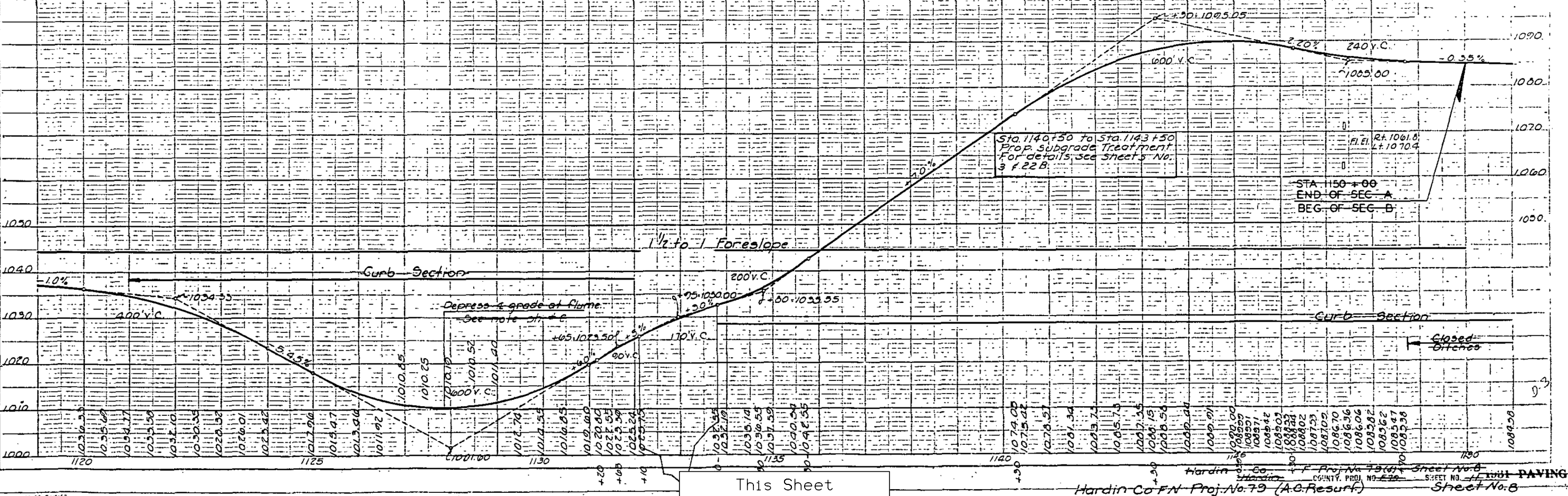
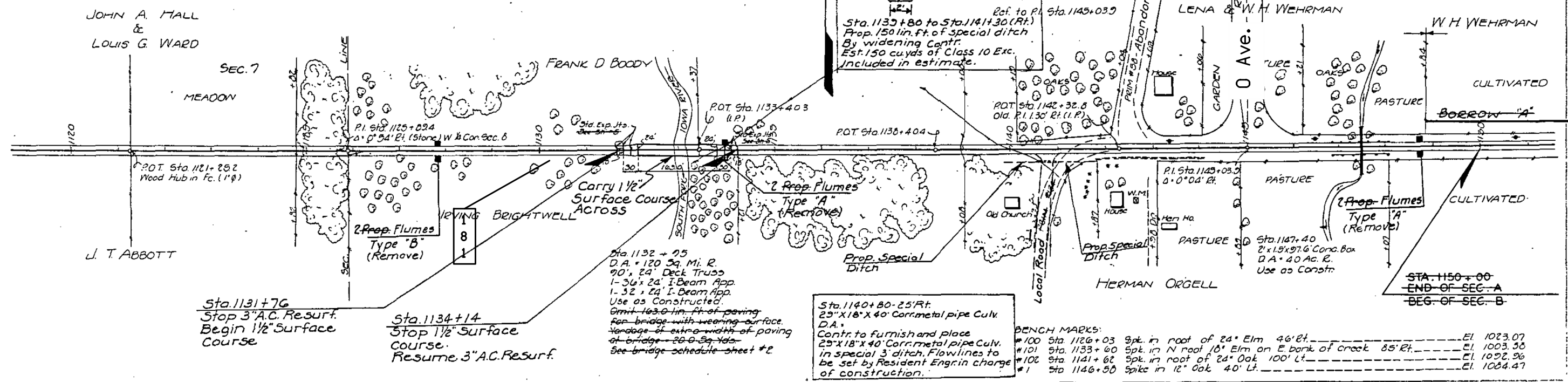


PLEASANT TWP  
T-87-N R-20-W  
SEC. 8

STATE	IOWA	79	8	29			
FED. DIST. NO.	5	PROJ. NO.	79(4)	SHEET NO.	11	TOTAL SHEETS	69

1931 PAVING

FED. DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79(4)	8	11	69

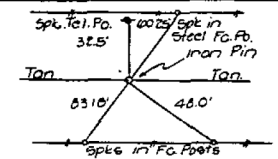


This Sheet  
For Information Only

Hardin Co. Proj. No. 79 (A.C. Resurf.) Sheet No. 8  
Hardin Co. Proj. No. 79 (A.C. Resurf.) Sheet No. 8

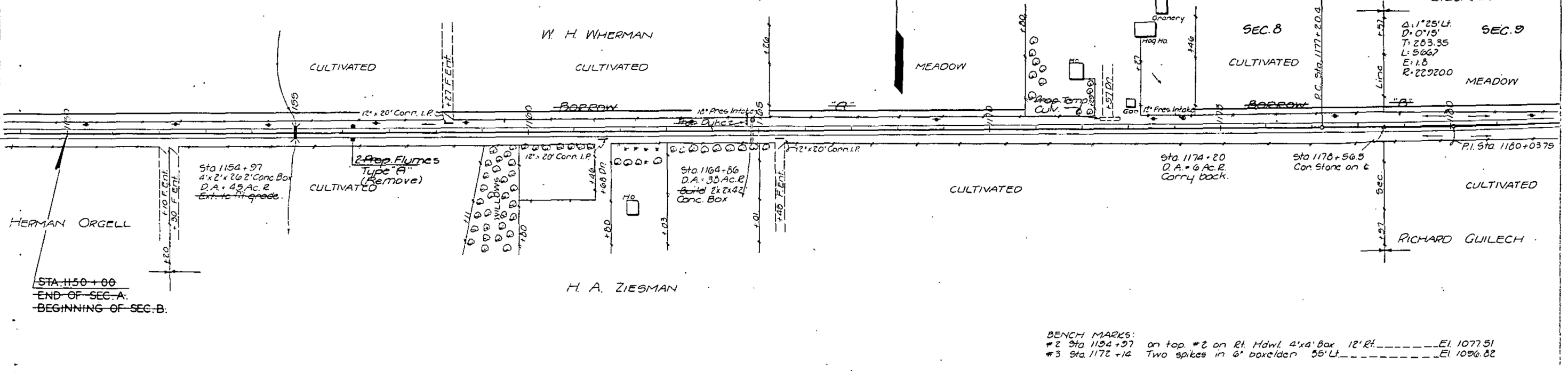
ESTABLISHED WIDTH OF  
RIGHT OF WAY \_\_\_\_\_ FT.

PLEASANT TWP  
T-87-N R-20-W

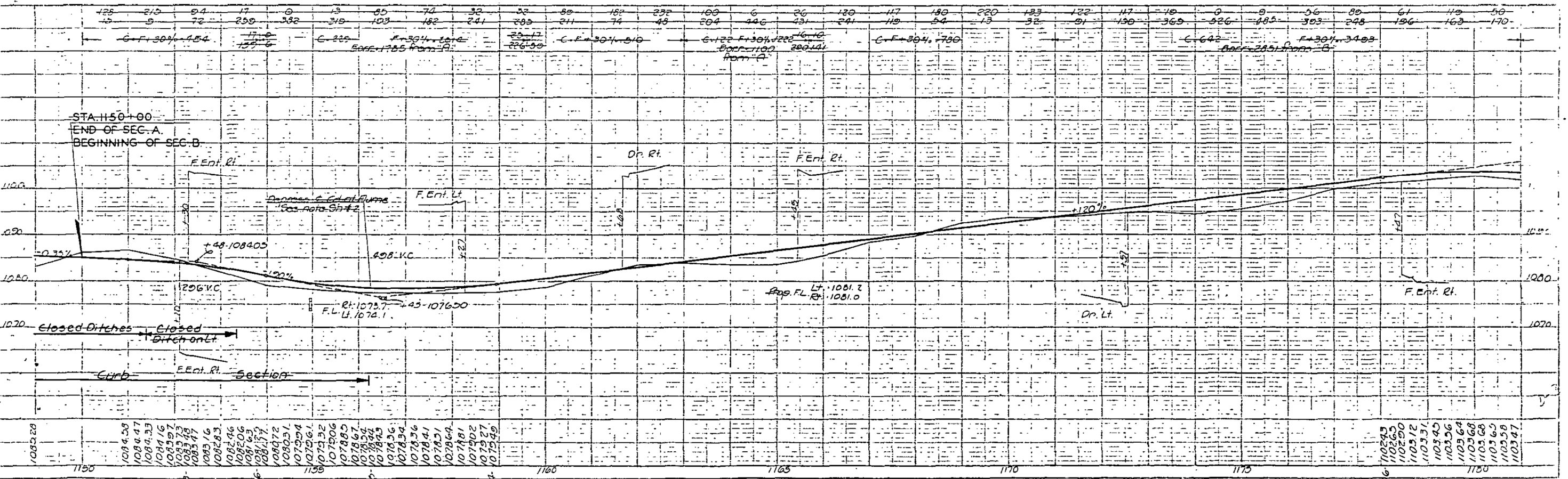


FED. ROAD DIST. NO.		STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5		IOWA	79(4)	9	29	49

1931 PAVING  
C.F. MAX, & A.R. ZIESMAN



BENCH MARKS:  
 #2 Sta 1154+97 on top #2 on Rt. Hdwl. 4'x4' Box 12' Rt. ----- El. 1077.51  
 #3 Sta 1172+14 Two spikes in 6' boxelder 55' Lt. ----- El. 1096.82



This Sheet  
For Information Only

Hardin Co. F. Proj. No. 79(4) Sheet No. 29 of 49  
 Hardin Co. FN. Proj. No. 79 (C.A.C. Result) Sheet No. 9

ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

Ref. to P.I. Sta. 1180+03.75

PLEASANT TWP T. 87. N. R. 20. W. SEC. 9 Ref. to P.I. Sta. 1197+34.5

FN		TOTAL	
5	10.2	79	10 29

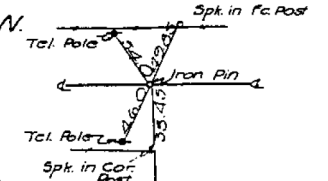
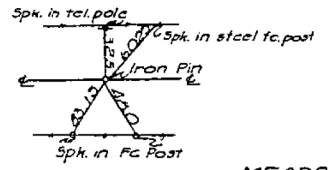
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	Iowa	5258		16	49

1931 PAVING

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	Iowa	5258		16	49

D = 1°25' Lt.  
D = 0°15'  
T = 283.35  
L = 566.7  
R = 18  
R = 2920.0

PT. STA. 1182+87.1



C. F., MAX, & A. R. ZIESMAN

MEADOW

CULTIVATED

CULTIVATED

18" x 20" x 26' Conc. Arch

2 Prop. Flumes Typ "A" (Remove)

2 Prop. Flumes Typ "B" (Remove)

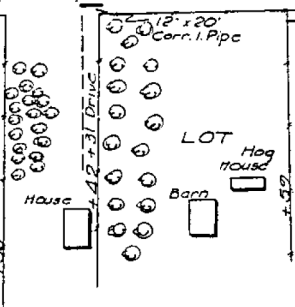
BORROW

6" Prec. Tile

P.I. Sta. 1180+03.75

Sta. 1188+38  
2' x 2' x 26.2' Conc. Box  
D.A. 32 AC. H.  
Ext. to Rt. grade

P.I. Sta. 1197+34.5  
Δ = 0°39 1/2' Rt.



PASTURE  
Sta. 1204+76  
D.A. 22 AC. H.  
Carry ahead

18" intake in place Prop. Temp. QUV

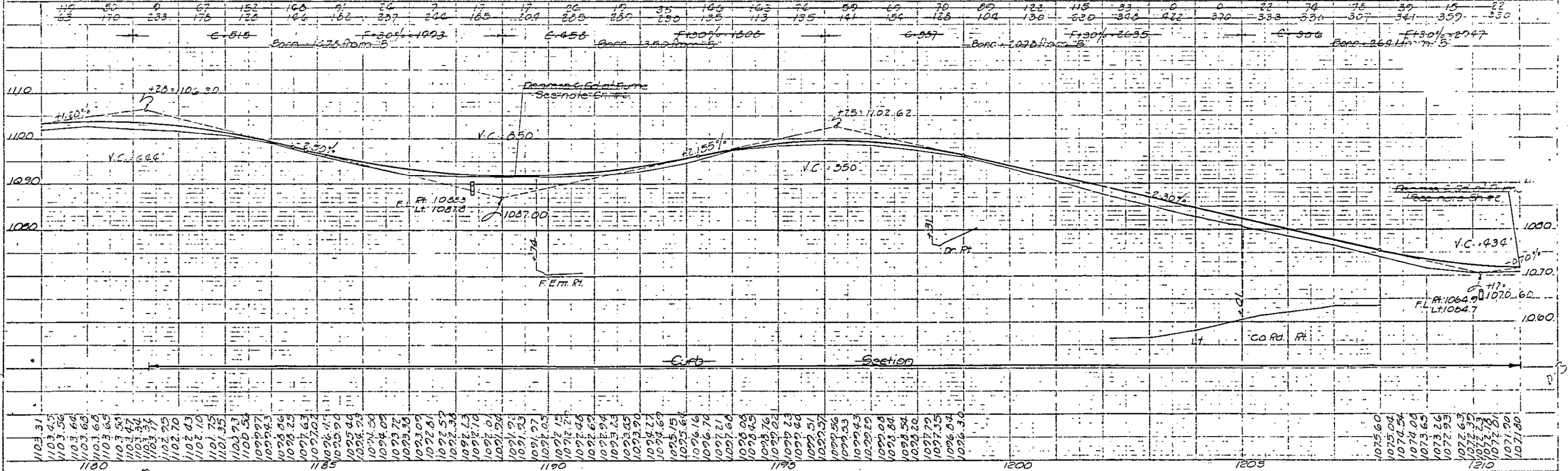
BORROW "B"  
Sta. 1210+17.5  
4' x 2' x 26.7' Conc. Box  
D.A. 30 AC. H.  
Extend to Rt. grade

1  
8  
2

RICHARD GUILICH

HOWELL M. BOYD

BENCH MARKS:  
No. 4. Sta. 1188+38.1' in Lt. Howl. 2' x 2' Box 15' Lt. E.I. 109144  
No. 5. Sta. 1198+40 Spike in 18" Maple by Dr. Pt. E.I. 109827



This Sheet For Information Only

Hardin Co. Proj. No. 19 (A.C. Resurfacing) Sheet No. 16  
1931 PAVING Sheet No. 10

ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

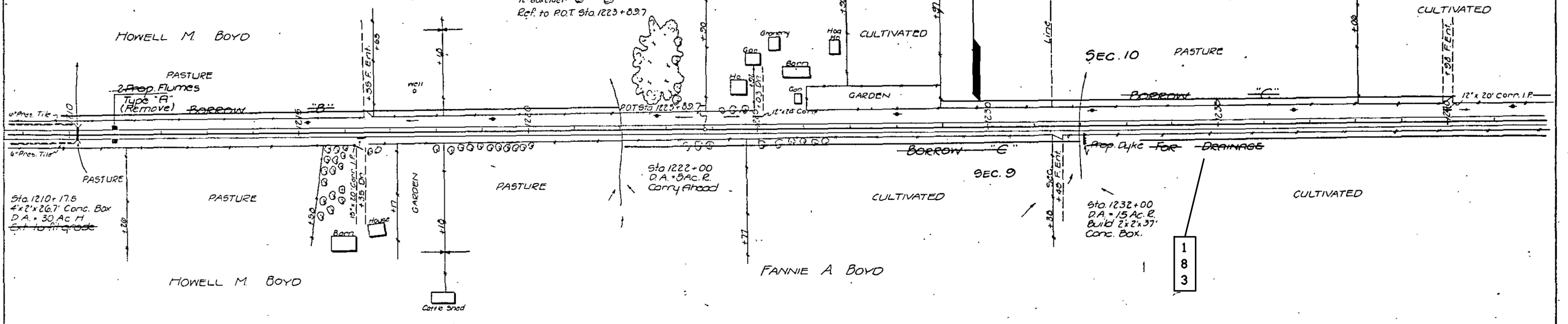
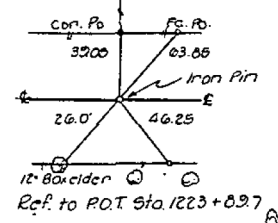
PLEASANT TWP  
T-87-N R-20-W

FED. ROAD DIST. NO.	STATE	EN	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		11	29

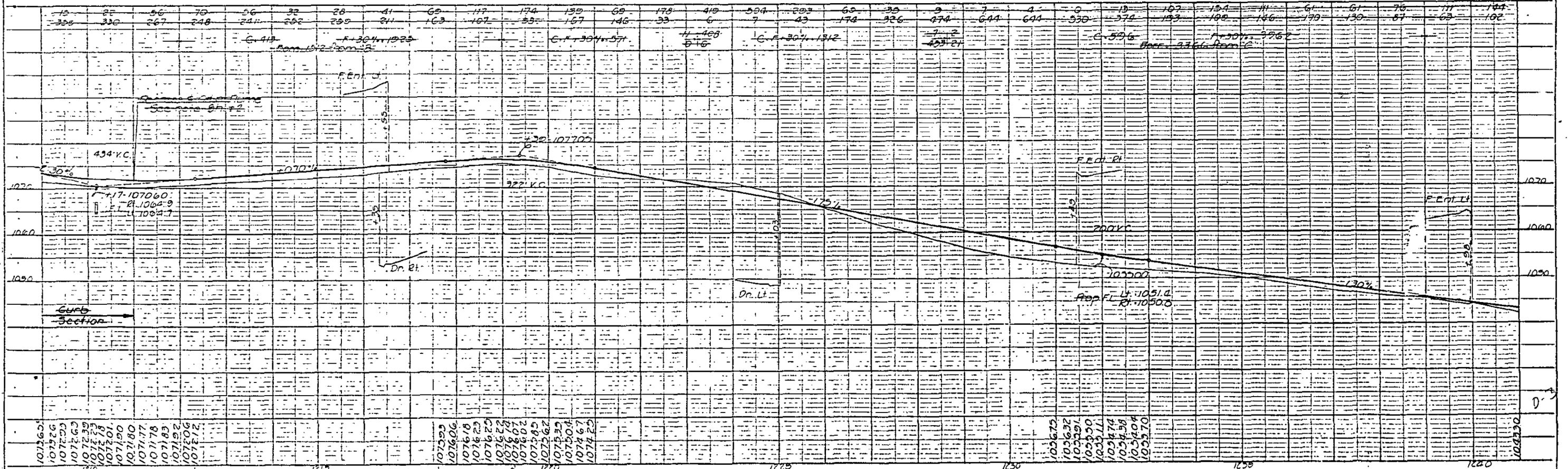
FED. ROAD DIST. NO.	STATE	EN	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		11	29

1981 PAVING

FED. ROAD DIST. NO.	STATE	EN	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		11	29



BENCH MARKS:  
 #6 Sta 1210+17.5 Cross on Rt. Hdwl. 4'x2' Box Cul. 11' R.I. ----- El. 1068.59  
 #7 Sta 1224+20 Spike in 24" maple 40' Lt. ----- El. 1072.50



This Sheet  
For Information Only

Hardin Co. EN. Proj No 79 (A.C. Resurfacing) Hardin Co. F. Proj. No. 79(4) COUNTY, PROJ. NO. SHEET NO. 11 1981 PAVING Sheet No. 11

ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

Ref. to Pl. Sta. 1250+76.4

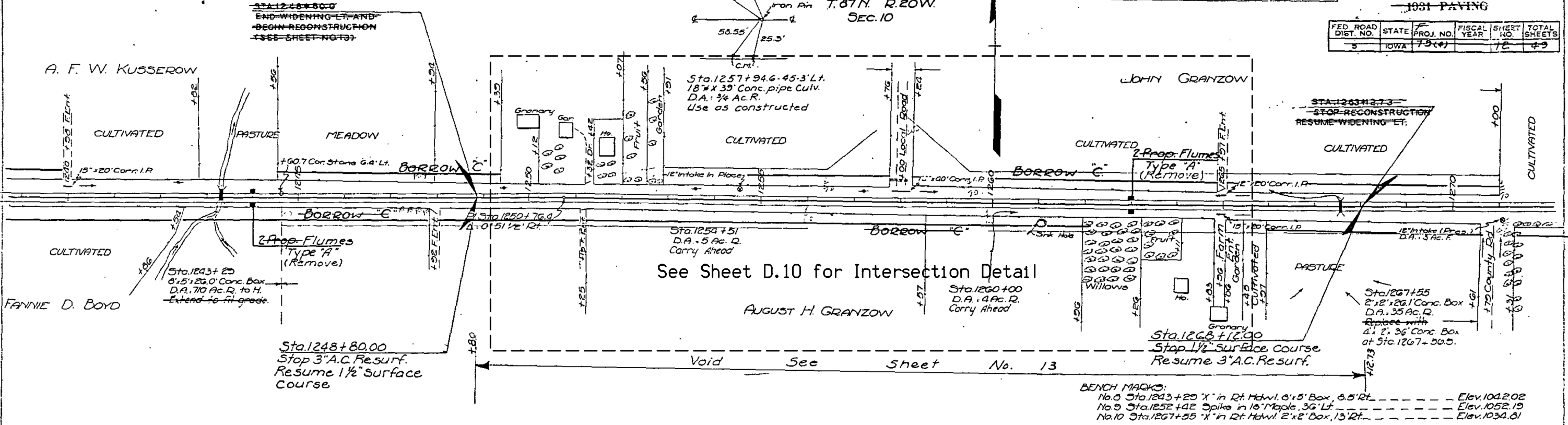
PLEASANT TWP  
T. 67 N. R. 20 W.  
SEC. 10

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		12	20

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		15	69

1991 PAVING

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	79		12	49

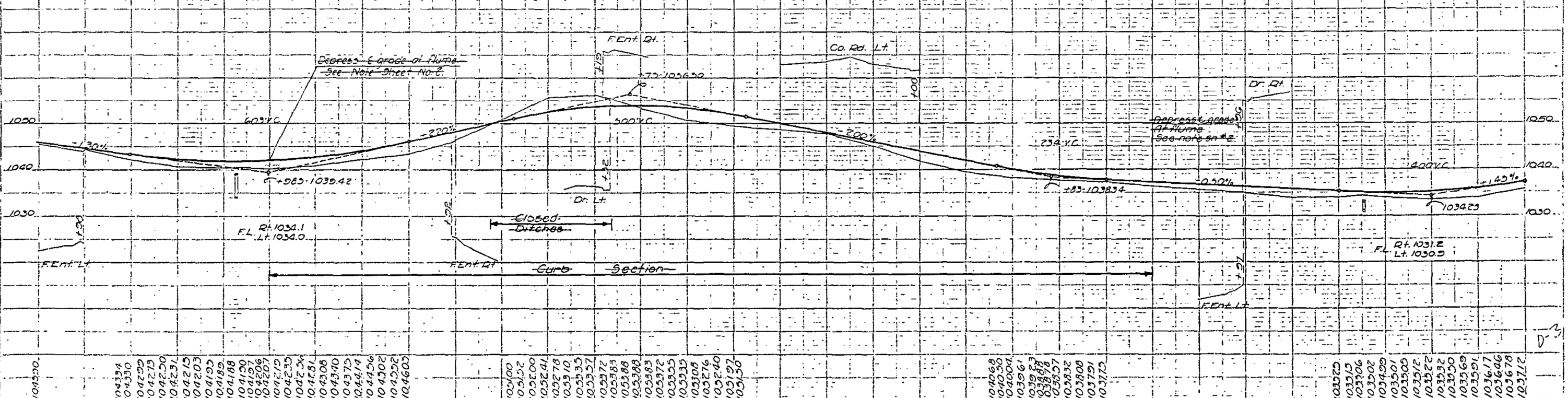


See Sheet D.10 for Intersection Detail

Void See Sheet No. 13

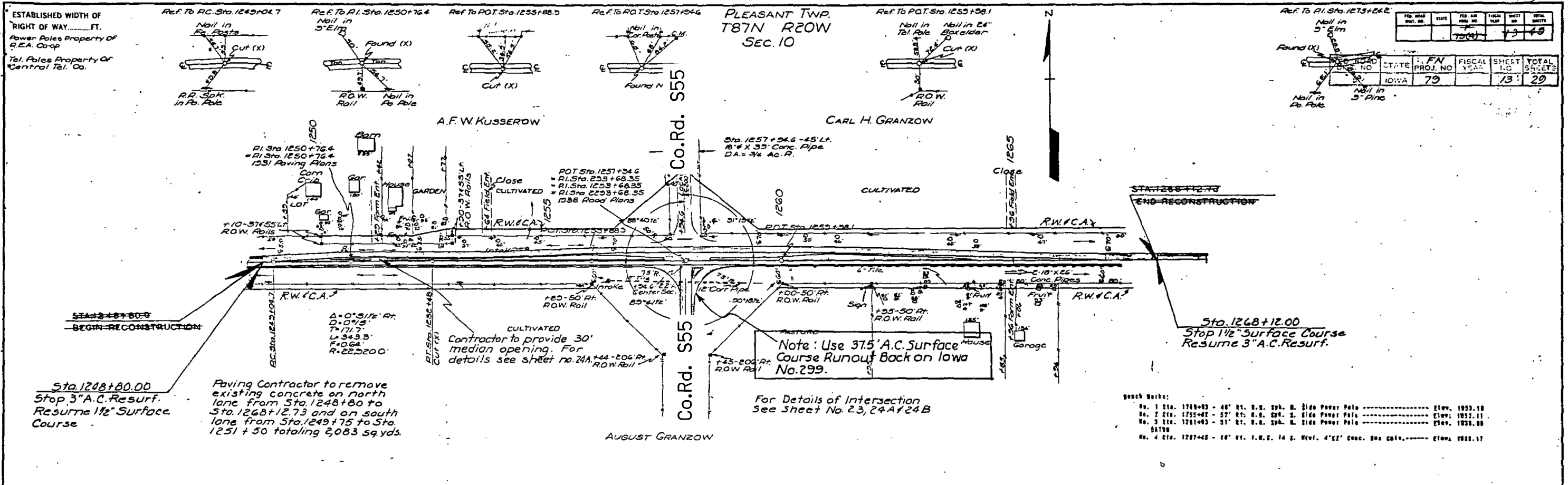
BENCH MARKS:  
 No. 9 Sta. 1243+20 'X' in Rt. Hdwl. 6" x 5" Box, 8.5' Rt. --- Elev. 1042.02  
 No. 9 Sta. 1252+122 Spike in 18" Maple, 36" Lt. --- Elev. 1052.19  
 No. 10 Sta. 1267+55 'X' in Rt. Hdwl. 2" x 2" Box, 13' Rt. --- Elev. 1034.81

11	114	37	0	0	7	39	26	0	23	302	541	209	29	13	26	172	226	128	9	0	11	39	80	82	10	76	17	24	20	28	15
63	192	215	319	385	374	386	370	504	200	30	0	10	274	467	341	119	106	237	419	467	307	136	130	136	193	269	263	200	224	28	207



This Sheet For Information Only

Hardin Co. - FN Proj. No. 79 (A.C. Resurf.) Sheet No. 12



230	233	250	448	154	154	237	115	222	281	256	248	144	172	
10	10	9	173	56	212	230	200	130	115	104	104	110	310	
Sta. 1249+75 to Sta. 1251+50 Propose 175 Ft. of subgrade treatment. See sheets No. 3 and 228 for details.				CE = 6834				F (1886 + 30%) = 2452						
				Save for shoulders = 249				Waste = 3933 in old channel Lt. Sta. 1303+50						
<p>FORMERLY</p> <p>FIELD ENCL.</p> <p>LOCAL ROAD LT.</p> <p>FORMERLY</p>													1060	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													1050	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													1040	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													1030	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													1020	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													1010	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													1000	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													990	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													980	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													970	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													960	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													950	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													940	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													930	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													920	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													910	
<p>Prop. Use as Constructed Lt. Ditch</p> <p>Prop. Use as Constructed Lt. Ditch</p>													900	

This Sheet For Information Only

Hardin Co. FN Proj. No. 79 (A.C. Resurfacing)  
Hardin Co. E. Proj. No. 78(4)

Sheet No. 13  
Sheet No. 13

ESTABLISHED WIDTH OF RIGHT OF WAY FT.

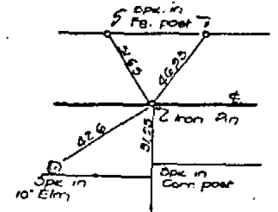
PLEASANT TWP.  
T.87N. R.20W.

FED. ROAD DIST. NO.	STATE	FN PROJ. NO.	FISC. YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	70		14	29

FED. ROAD DIST. NO.	STATE	FISC. YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	70	14	29

1991 PAVING

FED. ROAD DIST. NO.	STATE	FN PROJ. NO.	FISC. YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	70(4)		14	49



Sta. 1284+00 to Sta. 1285+50  
Paving Contr. to remove 300 sq. yds. of present pavement and replace 400 sq. yds.

JOHN GRANION

E. P. SHELDON.

SEC. 10

SEC. 11

STA. 1293+00.0  
STOP WIDENING IT & BT. AND  
BEGIN RECONSTRUCTION  
(SEE SHEET NO. 15.)

CHAS. O. RYAN

AUGUST H. GRANION

J. P. SHELDON

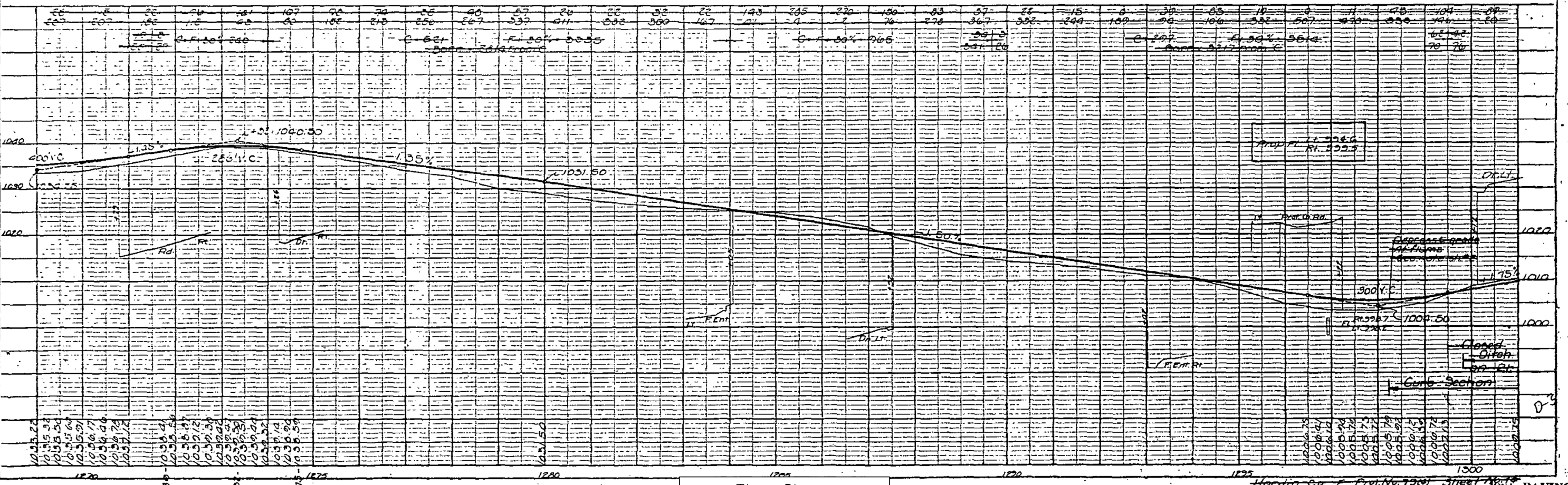
E. LESTER WILLIAMS

Sta. 1293+00  
Stop 3" AC. Resurfacing

Sta. 1290+00  
6'x3'x26" Conc. Box  
D.A. = 275 Ac. R.  
Ext. to fit grade and  
turn on west with  
6'x3'x26" Conc. Box.  
Culv. Contr. to extend present  
structure Lt. 26.3' with twin  
6'x3' R.C.B. Extend Rt. 11' with  
6'x3' R.C.B. and place two 24" x 30"  
Culv. metal pipe in inlet for  
detour of Sta. 1296+50.  
Compaction of backfill by  
50% comp. + 24cu. yds. SOLT.

Bench Marks:  
#11 Sta. 1284+00 Spk. in 5' x 10' Pipe SOLT.  
#12 Sta. 1296+00 X in Rt. Hd. 6' x 5' Culv. SOLT.

El. 1023.48  
El. 1003.55



This Sheet  
For Information Only

Hardin Co. EN Proj. No. 70  
HARDIN COUNTY PROJ. NO. 70  
SHEET NO. 14  
1991 PAVING





ESTABLISHED WIDTH OF RIGHT OF WAY.....FT.

Power Poles Property of REA  
Tel. Poles Property of Bell Tel. Co.

Ref. To POT.Sta. 1323+33.6

PLEASANT TWP  
T87N R20W

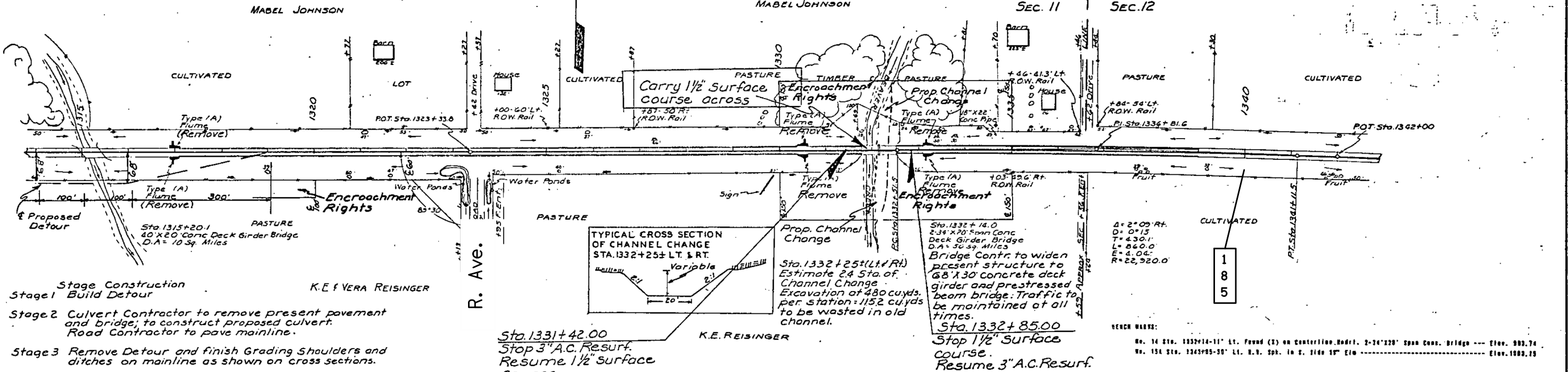
Ref. To RC.Sta. 1332+51.5

Ref. To P.I.Sta. 1336+81.6

Ref. To RT.Sta. 1341+11.5

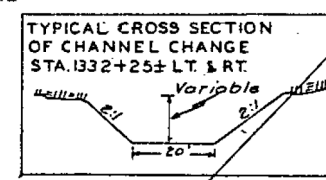
Ref. To POT.Sta. 1342+00

FED. ROAD DIST. NO.	STATE	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
75(4)	79	16	29	



**Stage Construction**  
**Stage 1** Build Detour  
**Stage 2** Culvert Contractor to remove present pavement and bridge, to construct proposed culvert. Road Contractor to pave mainline.  
**Stage 3** Remove Detour and finish Grading Shoulders and ditches on mainline as shown on cross sections.

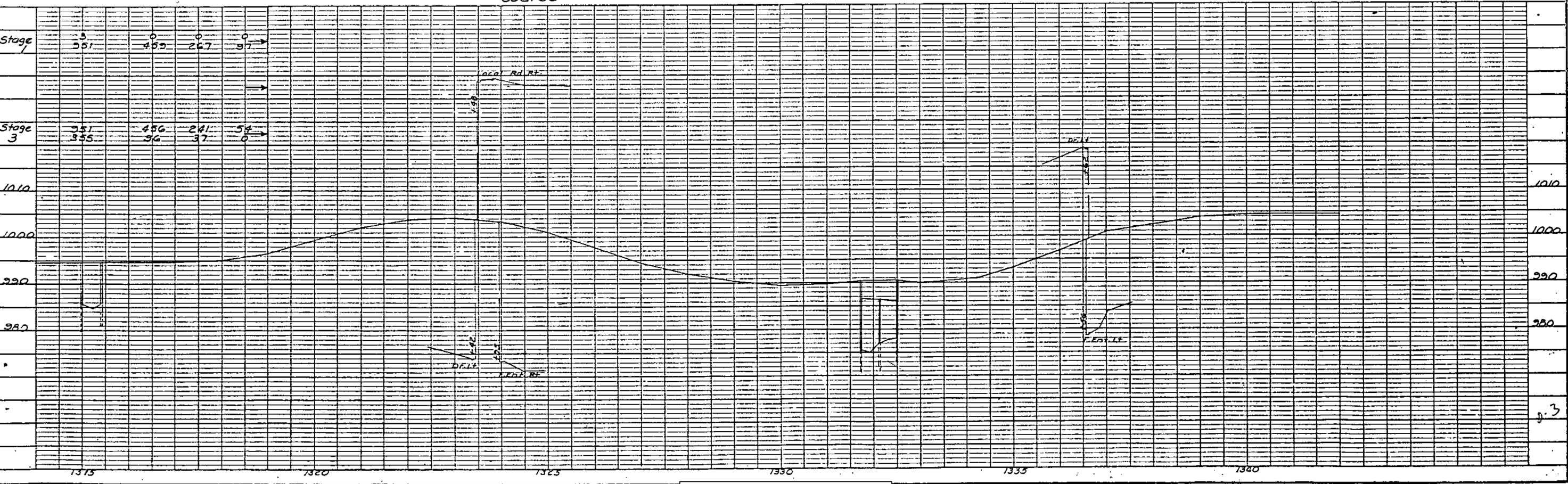
K.E. F. VERA REISINGER



Sta. 1331+42.00  
 Stop 3" A.C. Resurf.  
 Resume 1 1/2" surface course

K.E. REISINGER

Sta. 1332+85.00  
 Stop 1 1/2" surface course.  
 Resume 3" A.C. Resurf.

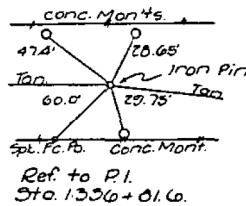


This Sheet For Information Only

Hardin Co. F.N. Proj. No. 79 (A.C. Resurf.)  
 Sheet No. 16

ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

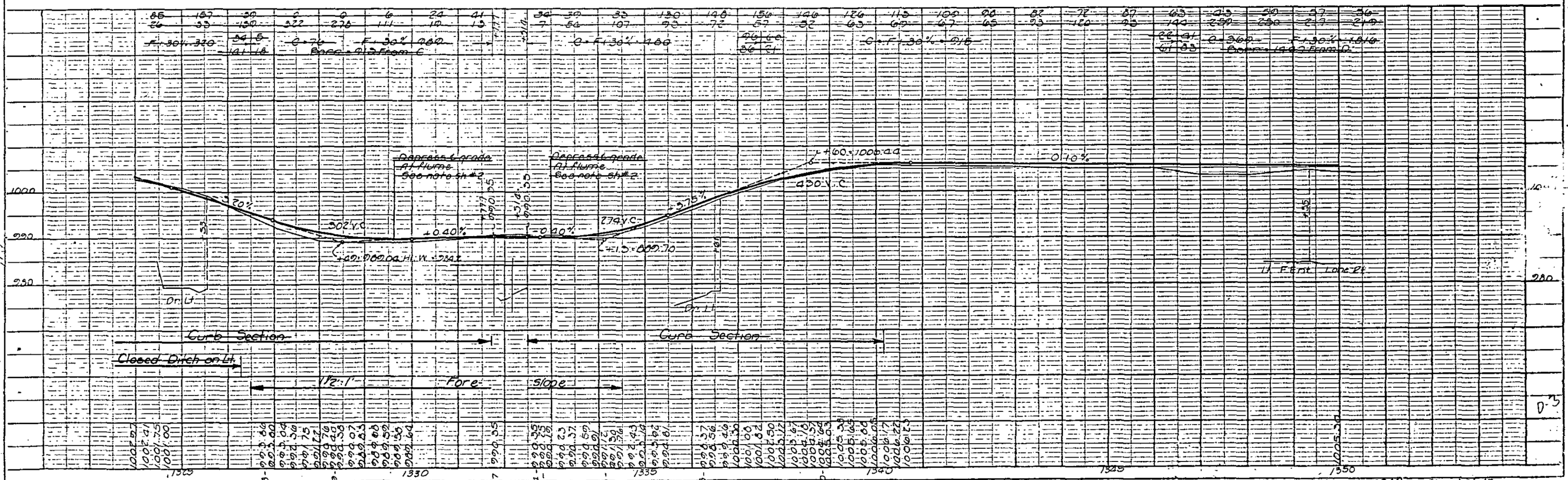
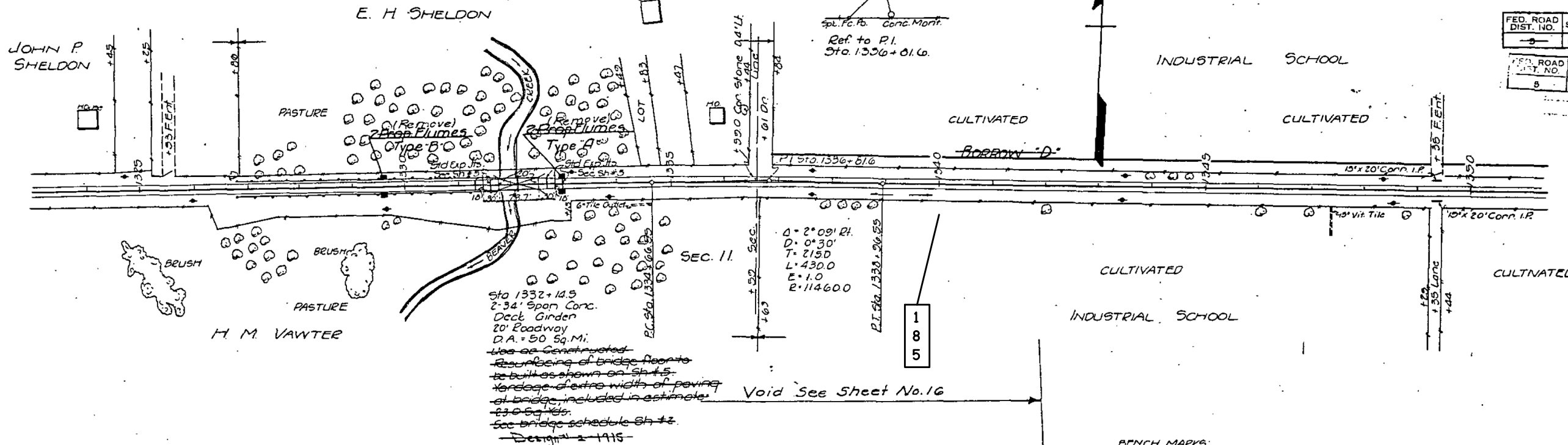
PLEASANT TWP  
T-87-N R-20-W  
SEC. 12



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	70(7)	70	17	43

FED. ROAD DIST. NO.	STATE	FN PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	70	70	17	29

FED. ROAD DIST. NO.	STATE	FN PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	70	70	17	29



This Sheet For Information Only

Hardin Co. Proj. No. 70(7) Sheet No. 17  
Hardin Co. Proj. No. 70 (A.C. Rasmussen) SHEET NO. 17

ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

PLEASANT TWP  
T-87-N R-20-W  
SEC.

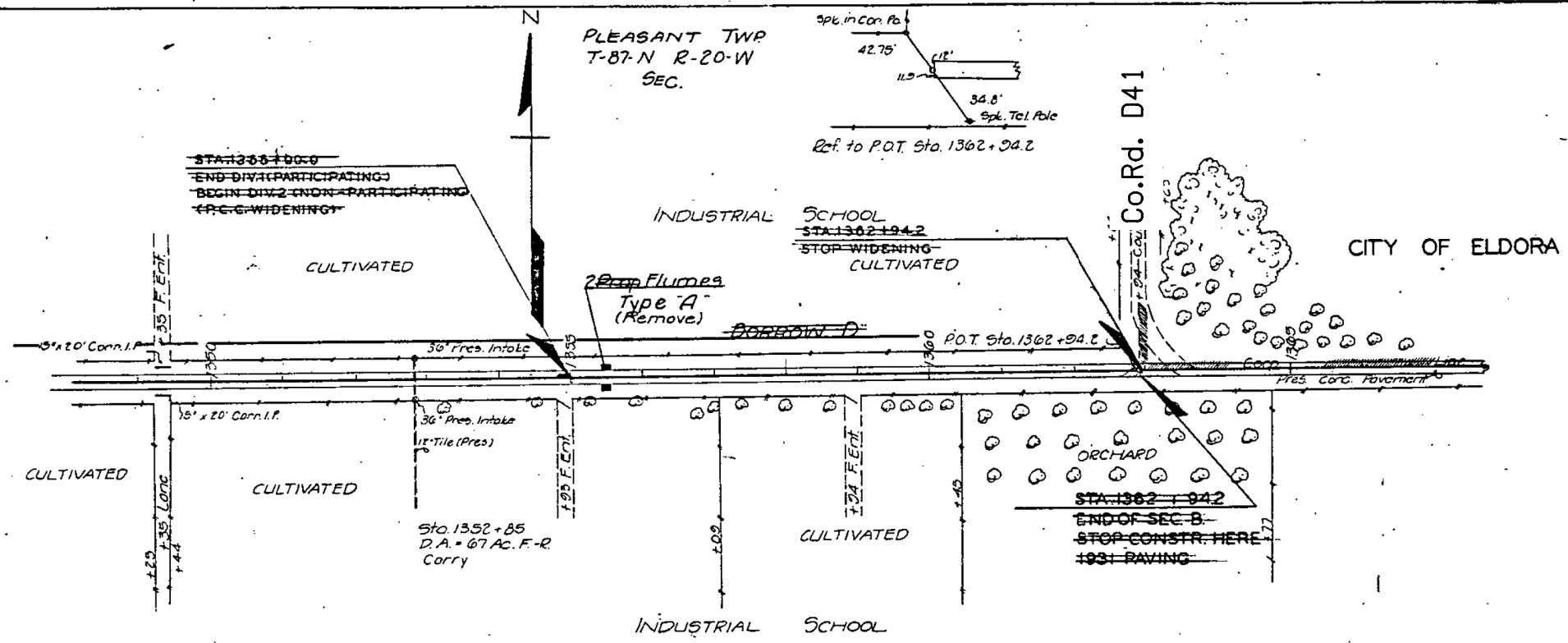
18

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO	79-41	79	18	29

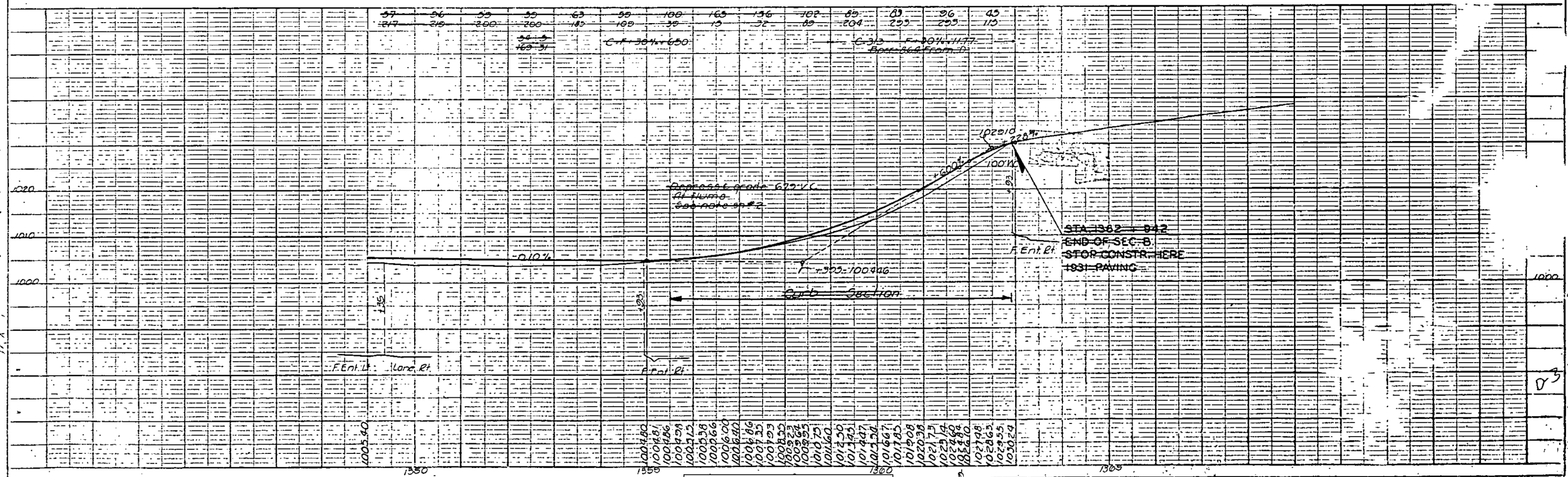
1931 PAVING

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO	79-41	79	18	29

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO	79-41	79	18	29



BENCH MARKS:  
#16 Sta. 1362+34 Two spikes in 12" E --- den 53' Rt. --- El. 102.70



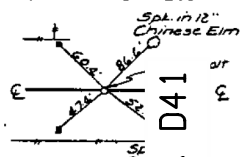
This Sheet  
For Information Only

Hardin Co. Proj. No. 79-41 Sheet No. 18  
Hardin Co. Proj. No. 79-41 (A.C. Resurf.) Sheet No. 18

ESTABLISHED WIDTH OF RIGHT OF WAY \_\_\_\_\_ FT.

Power Poles Property of Iowa Elec. Light & Power Co.  
Tel. Poles Property of Central Iowa Tel. Co.

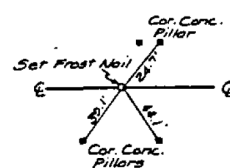
Ref. To P.O.T. Sta. 1362+94.2



PLEASANT TWP.  
T87N R20W  
SEC. 12

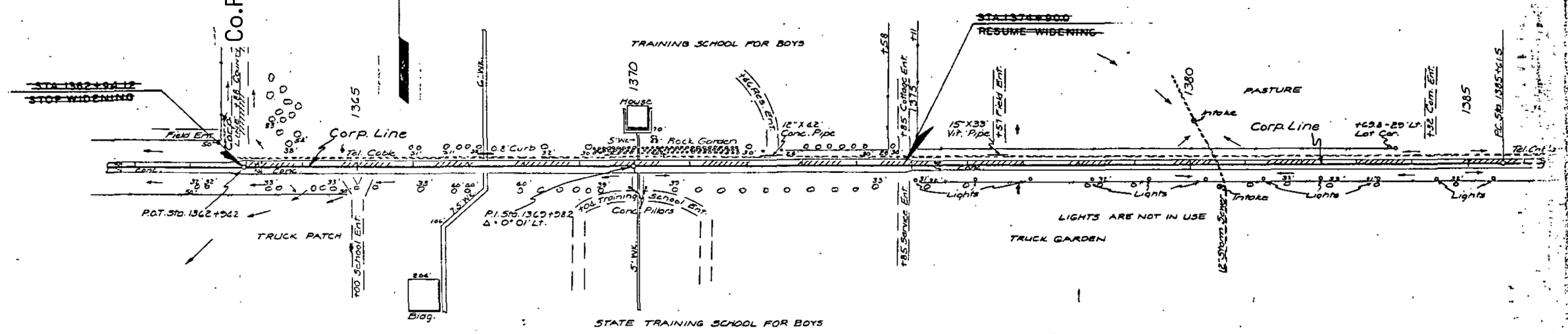
CITY OF ELDORA

Ref. To P.I. Sta. 1369+08.8



PROJ. NO.	79(4)	STATE	IOVA	FISCAL YEAR	19	SHEET NO.	19	TOTAL SHEETS	25
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DATE	
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PLAN	
DATE	
BY	
DATE	
BY	



Branch Marks:  
Data:  
No. 7 Sta. 1365+00 - 101' Lt. U.R. Spk. in S.E. Root 24" Cottonwood - Grade: elevation --- Elev: 1024.83  
No. 8 Sta. 1374+00 - 95' Lt. U.R. Spk. in N. Side 24" Ash ----- Elev: 1023.31  
No. 9 Sta. 1381+00 - 33' Lt. U.R. Spk. in N. Side 24" Maple ----- Elev: 1018.88

DATE	
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PROFILE	
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DATE	
BY	

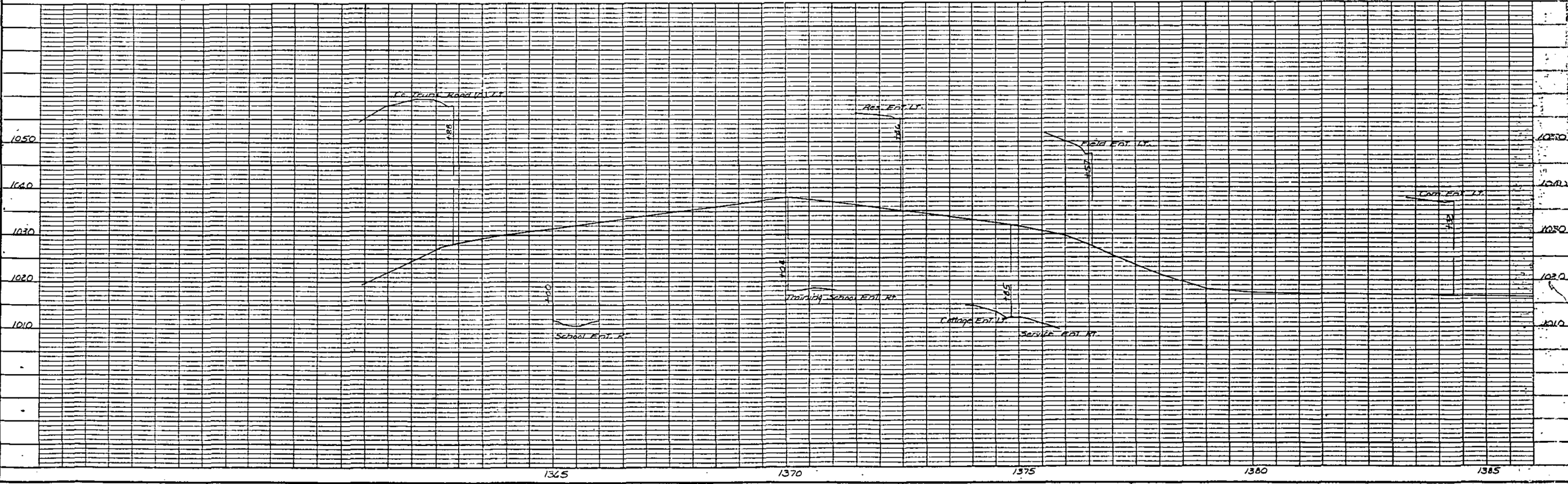
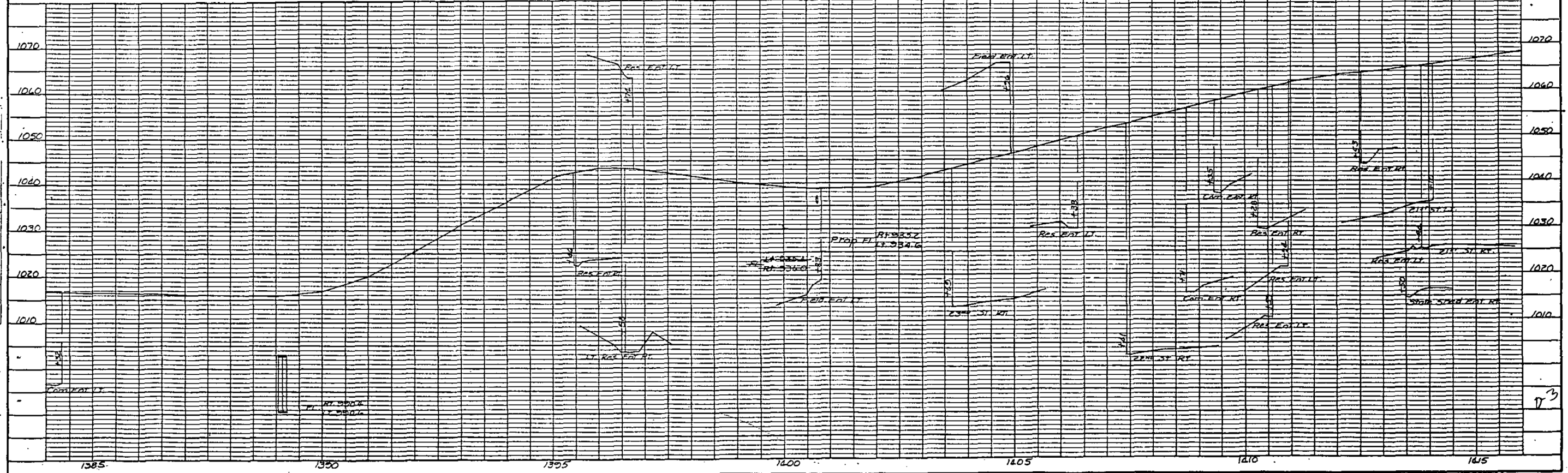
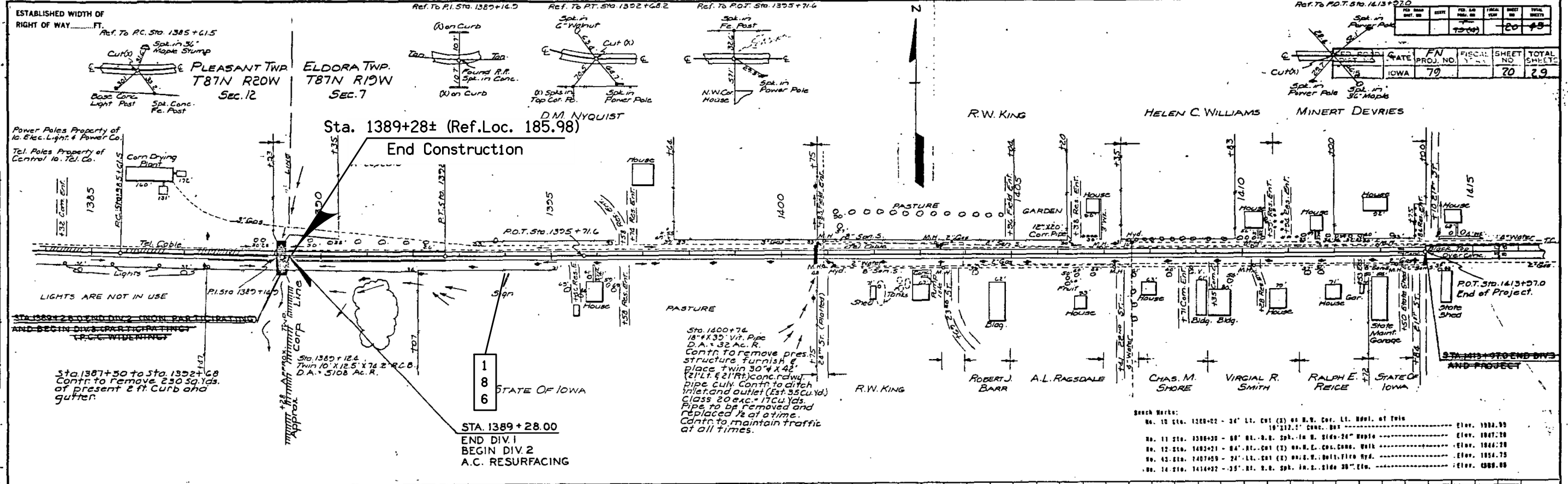


PLATE 1 - PLAN PROFILE D. P. R. & R. E. STANDARD  
100 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000



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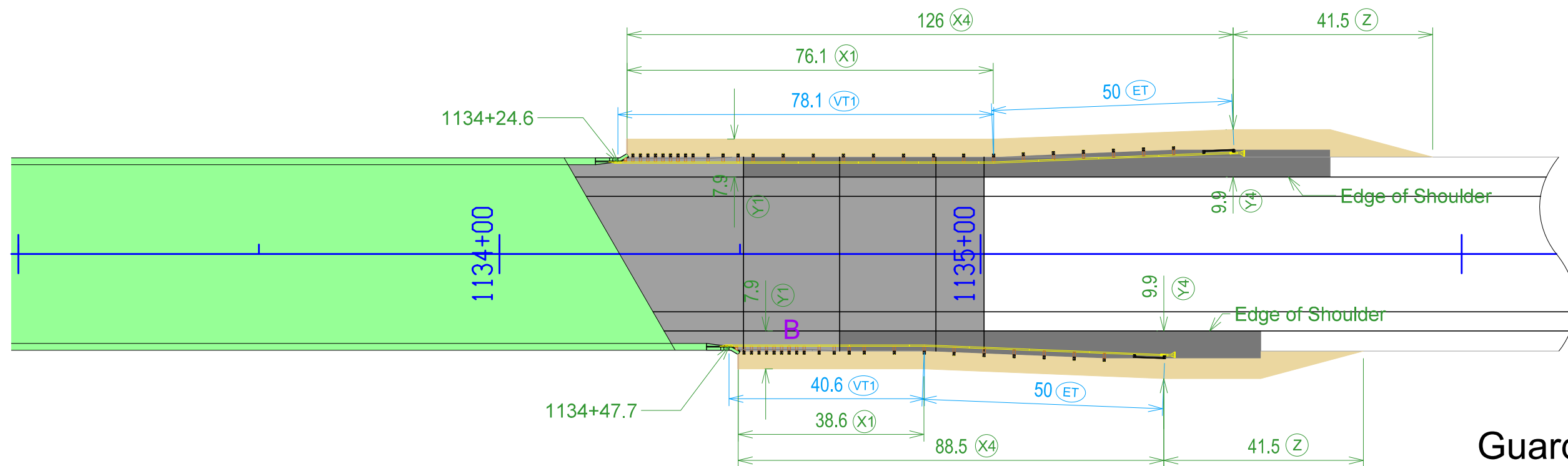
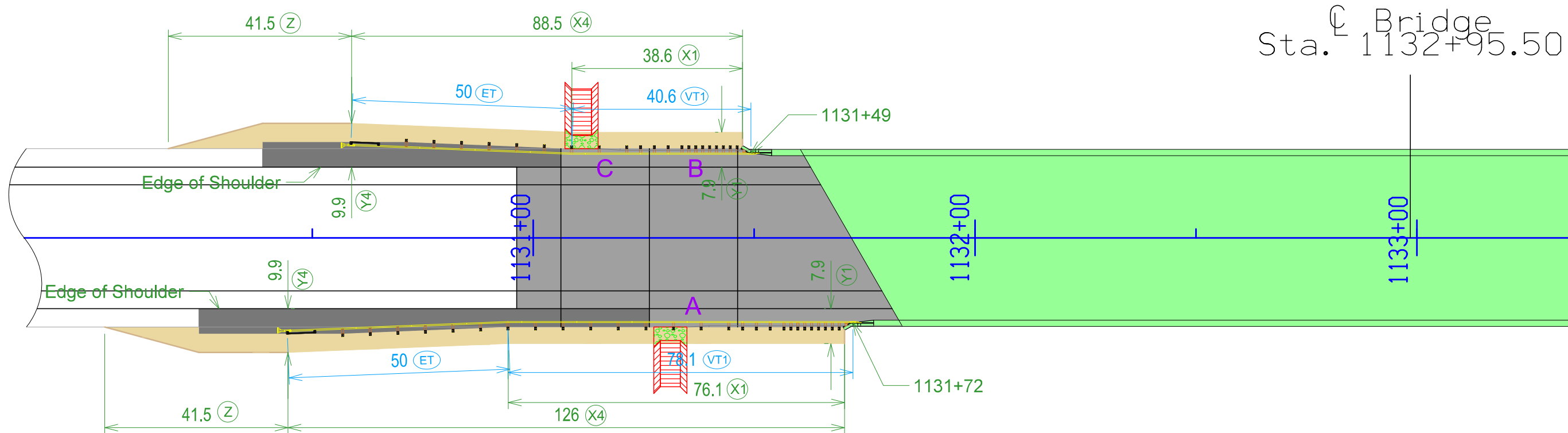
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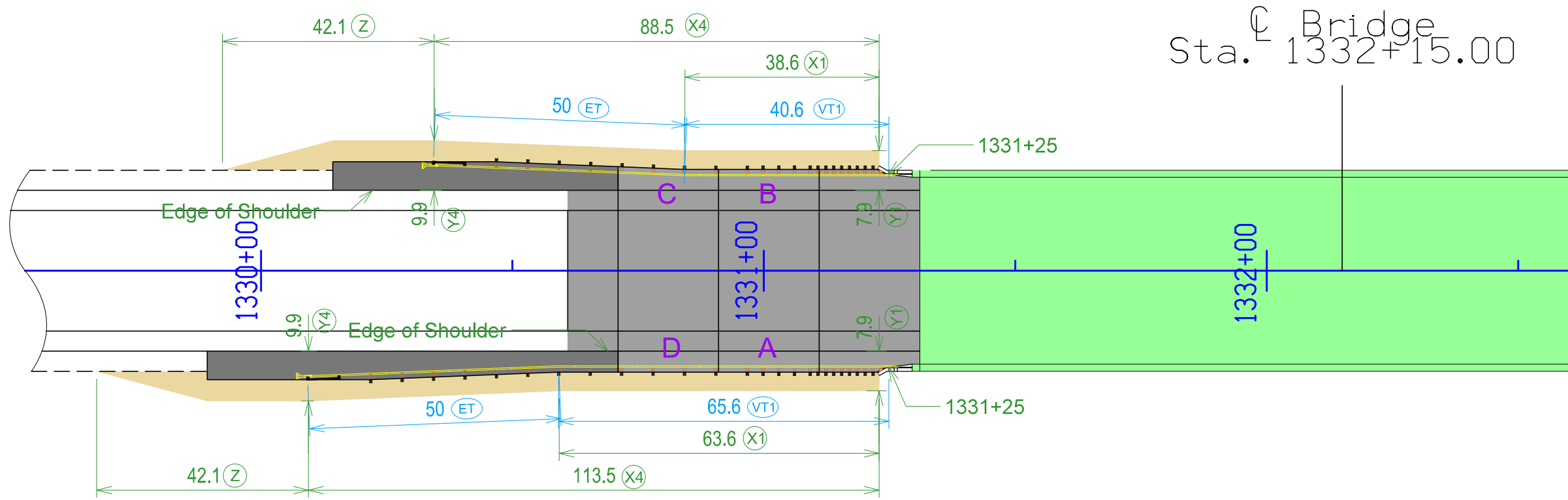
PLATE 1—PLAN-PROFILE D. P. R. & E. STANDARD  
 NO. 131 ADAPTED FROM U.S. & S.A. ENGINEERING CO. CHICAGO

Hardin Co. FN. Proj. No. 79 (A.C. Resurf.)  
 Hardin Co. FN. Proj. No. 1366

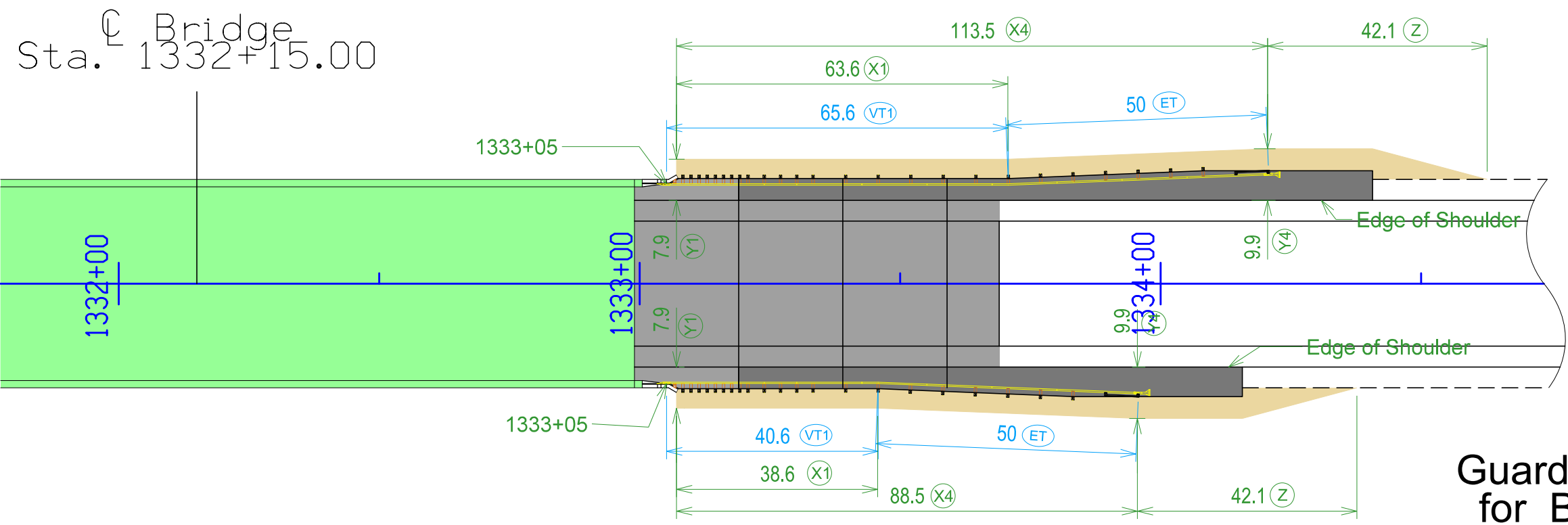
Sheet No. 20  
 Sheet No. 29



**Guardrail Details  
for Bridge over  
South Fork Iowa River**



Sta.  $\text{\textcircled{C}}$  Bridge  
1332+15.00



Sta.  $\text{\textcircled{C}}$  Bridge  
1332+15.00

**Guardrail Details  
for Bridge over  
Beaver River**