

cc:

J. F. Adam
D. L. Maifield
B. R. Smith
G. A. Novey
B. C. Worrel
E. C. Wright
M. A. Swenson
S. J. Gent
C. C. Poole
J. P. Rost
D. L. Newell
T. J. Gustafson
M. Clayton
C. N. Quick
J. D. LaVine

M. J. Kennerly
R. L. Stanley
A. A. Welch
P. Lu
A. Loonan
T. D. Crouch
J. W. Smith
D. E. Sprengeler
S. P. Anderson
S. C. Marler
E. J. Ranney
W. W. Musgrove
J. L. Tibodeau
FHWA
M. E. Khoda

K. D. Nicholson
M. D. Masteller
N. L. McDonald
D. R. Claman
N. M. Miller
M. J. Sankey
R. A. Younie
J. Vortherms
B. D. Hofer
L. C. Funnell
D. R. Tebben
L. A. Starbuck
G. L. Martens
W. A. Sorenson
M. Ross

FINAL PROJECT CONCEPT STATEMENT

IA 415 Bridge over NW 66th Ave.,
2.1 miles north of I-80.

Polk County
BRF-415-1(52)--38-77
PIN: 12-77-415-030
Maint. No.7703.7S415
FHWA No. 41080

Highway Division
Office of Design

Kevin K. Patel, P.E.
515-239-1540

April 4, 2013

I. STUDY AREA

A. Project Description

This project involves the removal/replacement of the IA 415 bridge (Maint. No 7703.7S415) over NW 66th Ave., 2.1 miles north of I-80.

The three alternatives considered were:

1. Remove the existing bridge and construct an at grade intersection with traffic signals, at a cost of \$5,928,400.
2. Remove and replace the existing bridge with new dual bridges. Raise the grade of IA 415 and construct a tight diamond interchange at a cost of \$13,070,000.
3. Remove the existing bridge. Construct dual bridges over IA 415, remove the existing ramps and close the interchange, creating a grade separation, at a cost of \$6,980,600.

A public information meeting was held on February 28th, 2013 to present the three options shown in this concept and to receive comments, suggestions and recommendations from the public. Based upon public input it is recommended that alternative 1 (the at-grade intersection) be carried forth. The cost of this option is estimated to be approximately \$5,928,400.

B. Need for Project

The bridge is classified as structurally deficient due to the structural capacity. It is posted for 40 Tons for all vehicles. The bridge does not provide required vertical clearance and clearance signs are in place on the approach roadways under the bridge. Cracking and leaching are found widely spread over the top and bottom of the deck and abutments. Provided with the condition and the age of the bridge, remove the bridge and replace it with an at-grade intersection would be a practical and economical solution.



On NW 66th Ave. looking east.



On NW 66th Ave. looking west.

C. Present Facility

The existing structure is a 33' long x 82' wide concrete rigid frame bridge which was constructed in 1942. In 1942 the existing southbound lanes were constructed. In 1962 the northbound lanes were then added to provide a 4-lane roadway. The existing cross section has 24' wide PCC pavements, 6' wide inside paved shoulders, 10' wide outside partial paved shoulders with variable foreslopes and a 28' median.

D. Traffic Estimates

The 2017 and 2037 average daily traffic estimates are 24,300 ADT with 3 % trucks and 38,500 ADT with 4% trucks, respectively.

E. Sufficiency Ratings

IA 415 is classified as a "commercial and industrial" route and is a maintenance service level "B" road with a sufficiency rating of 90. The federal bridge sufficiency rating is 37.

F. Access Control

Access control rights will be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2007 through December 31, 2011, there were 27 crashes including, one fatal crash, one personal injury crash, three possible unknown crashes and twenty two personal property crashes. Seven of these crashes involved the bridge, and seven of them in some way involved a ramp.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Remove the existing bridge and construct a signalized intersection.

Remove the existing bridge and construct a signalized intersection by lower the profile grade of IA 415 approximately 9 ft. and raising the grade of NW 66th Ave. approximately 8 ft. at the intersection. This will require approximately 2,650 ft. of reconstruction on IA 415. The existing ramps will be removed. Left and right turn lanes will be constructed on all legs of the intersection.

The IA 415 typical cross section will consist of a 24 ft. wide roadway (26 ft. wide pavement) with 10 ft. effective outside shoulders (2 ft. outside pavement, 4 ft. additional paved and 4 ft. granular) and 6 ft. wide effective inside shoulders (4 ft. paved and 2 ft. granular). A 3 ft. wide raised median on the inside of the left turn lanes will be constructed and a 6 ft. wide painted median on the outside of the turn lanes will be placed.

The profile grade on NW 66th Ave., east of the intersection will be lowered approximately 10 ft. to improve the vertical profile through the intersection. This will require approximately 1,730 ft. of reconstruction on NW 66th Ave. The typical section of N.W. 66th Ave. will consist of 24 ft. wide roadway. A 3.5 ft. curb and gutter section will be constructed on 66th Ave. for the east bound lanes and also for the west end of the west bound lanes. The westbound lanes east of the bridges will have a 10 ft. wide granular shoulder.

The triple box culvert under NW 66th Ave. will need to be extended and the entrances in the northwest and northeast quadrants may need to be relocated. It is anticipated that the existing storm sewer on NW 66th Ave., west of IA 415 will need to be removed and replaced. East of IA 415, new storm sewer will need to be constructed on the south side of NW 66th Ave. in the area of the new curb and gutter section. It appears there are median drain pipes that will need to be replaced as well as a 24 inch pipe crossing under IA 415 south of the intersection.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

New traffic signals and lighting will be required at the intersection.

Right of Way will be required for this alternative.

IA 415 traffic will be maintained with two-lane, two-way operation utilizing median crossovers in the northbound or southbound lanes through staged construction. Sheet piling and temporary concrete barrier rail will be required due to the narrow median and elevation differential between the two lanes. NW 66th Ave. traffic will be relocated on an off-site detour during construction.

<u>Item</u>	<u>Estimated Cost</u>
Bridge Removal	20,000
Removal of Pavement	135,300
PCC Pavement	972,400
Modified Subbase	281,500
Class 10 Roadway and Borrow	726,900
Class 10 Waste	238,400
Excavation Class 13 Waste	92,700
Paved Shoulder	145,800
Granular Shoulder	192,700
Earth Shoulder Construction	11,700
Curb and Gutter	36,000
Guardrail Removal	1,100
Class 20 Excavation	2,400
Structural Concrete for RCB Extensions	331,400
Concrete Roadway Pipes	16,000
Storm Sewer and Intakes	248,000
Longitudinal Subdrains and Outlets	41,800
Seeding and Fertilizing	17,000
Traffic Signals	150,000
Right of Way	30,000
Staged Construction	500,000
Traffic Control - 5%	184,600
Mobilization - 5%	184,600
M & C - 30%	<u>1,368,100</u>
Alternate No. 1 Project Total	\$5,928,400

Alternative #2 - Replace bridges and construct a tight diamond interchange

Replace the existing 33' long x 82' wide concrete rigid frame bridge with twin 184'8" x 40' pretensioned prestressed concrete beam bridges.

The typical cross section adjacent to the bridge will consist of a 24 ft. wide roadway (26 ft. wide pavement) with 10 ft. effective outside shoulders (2 ft. outside pavement, 4 ft. additional paved and 4 ft. granular) and 6 ft. wide effective inside shoulders (4 ft. paved and 2 ft. granular).

The bridges will be constructed on the existing horizontal alignment. The profile grade will need to be raised a minimum of 5 ft. which will require approximately 4,900 ft. of roadway reconstruction. New bridge approaches will be constructed. The existing bridge guardrail will be replaced and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment for slope protection will be placed under the bridges. Construct new bridge end drains on each corner of the bridges.

The existing ramps will be removed and new ramps will be constructed. Based upon the new horizontal and vertical geometry of the ramp, the construction of these ramps on the south side of the interchange will impact the adjacent Margo Frankel Woods State Park (4f land). The ramp on the northwest quadrant of the interchange will also impact the existing ditch, thus requiring it to be relocated.

Access control requirements will necessitate that 4 entrances on the north side of the interchange and at least 3 entrances along NW. 66th Ave be closed or relocated.

With the new construction and relocation of the ramps new culverts will be required.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

Right of way will be required for this project.

IA 415 traffic will be maintained with two-lane, two-way operation utilizing median crossovers in the northbound or southbound lanes through staged construction. NW 66th Ave. traffic will be relocated on an off-site detour during construction.

<u>Item</u>	<u>Estimated Cost</u>
Bridge Costs	
New Bridge	\$ 1,296,200
Bridge Removal	20,000
Staging - 10%	131,600
Mobilization - 10%	144,800
M & C - 15%	<u>238,900</u>
Bridge Total	\$ 1,831,400

Roadway Costs

Bridge Approaches	131,600
Removal of Pavement	198,100
PCC Pavement	1,604,000
Modified Subbase	447,900
Paved Shoulder	205,000
Granular Shoulder	228,500
Earth Shoulder Construction	41,800
Class 10 Roadway and Borrow	2,096,600
Excavation Class 13 Waste	108,100
Guardrail (Includes Removal)	35,500
Paved Shoulders for Guardrail	17,800
Class 10 for Guardrail Blisters	26,400
Bridge End Drains	23,200
Culvert Extensions	277,600
Concrete Roadway Pipes	9,400
Longitudinal Subdrains and Outlets	50,400
Clearing and Grubbing	35,800
Seeding and Fertilizing	17,000
Right of Way	1,800,000
Wetland Mitigation	50,000
Staged Construction	500,000
Traffic Control - 5%	370,200
Mobilization - 5%	370,200
M & C - 30%	2,593,500
Roadway Total	\$ 11,238,600

Alternate No. 2 Project Total **\$13,070,000**

Alternative #3 - Replace bridges remove ramps and close interchange

Replace the existing 33' long x 82' wide concrete rigid frame bridge with twin 140' x 40' pretensioned prestressed concrete beam bridges.

Remove the existing ramps and close the interchange thus prohibiting access to IA 415. NW 66th Ave. will be used as constructed.

The typical cross section adjacent to the bridge will consist of a 24 ft. wide roadway (26 ft. wide pavement) with 10 ft. effective outside shoulders (2 ft. outside pavement, 4 ft. additional paved and 4 ft. granular) and 6 ft. wide effective inside shoulders (4 ft. paved and 2 ft. granular).

The bridges will be constructed on the existing horizontal alignment. The vertical profile on IA 415 will need to be raised a minimum of 5 ft. which will require approximately 3,100 ft. of roadway reconstruction. New bridge approaches will be constructed. The existing bridge guardrail will be replaced and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the

existing foreslopes and to construct the new guardrail blisters. Class E revetment for slope protection will be placed under the bridges. Construct new bridge end drains on each corner of the bridges.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

Right of way will not be required for this project.

IA 415 traffic will be maintained with two-lane, two-way operation utilizing median crossovers in the northbound or southbound lanes through staged construction. NW 66th Ave. traffic will be relocated on an off-site detour during construction.

<u>Item</u>	<u>Estimated Cost</u>
Bridge Costs	
New Bridge	\$ 1,804,000
Bridge Removal	20,000
Mobilization - 10%	182,400
M & C - 15%	<u>300,960</u>
Bridge Total	\$ 2,307,400
Roadway Costs	
Bridge Approaches	131,600
Removal of Pavement	122,000
PCC Pavement	774,500
Modified Subbase	223,700
Paved Shoulder	138,500
Granular Shoulder	35,300
Earth Shoulder Construction	9,300
Class 10 Roadway and Borrow	1,157,500
Excavation Class 13 Waste	68,400
Guardrail (Includes Removal)	35,500
Paved Shoulders for Guardrail	17,800
Class 10 for Guardrail Blisters	26,400
Bridge End Drains	23,200
Concrete Roadway Pipes	6,200
Longitudinal Subdrains and Outlets	33,800
Seeding and Fertilizing	9,700
Staged Construction	500,000
Traffic Control - 5%	140,700
Mobilization - 5%	140,700
M & C - 30%	<u>1,078,400</u>
Roadway Total	\$ 4,673,200
Alternate No. 3 Project Total	\$ 6,980,600

B. Detour Analysis

IA 415 traffic will be maintained with two-lane, two-way operation utilizing median crossovers in the northbound or southbound lanes through staged construction. Sheet piling and temporary concrete barrier rail will be required due to the narrow median and elevation differential between the two lanes.

NW 66th Ave will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 180 days. The detour would follow NW 26th Street from the intersection of NW 66th Ave., north to the intersection with IA 140 (Oralabor Rd.), then east to U.S. 69 and south back to NE 66th Ave. Out of distance travel is 4.3 miles. The total distance user cost is anticipated to be \$418,400. Compensation for non-state roadways will be \$74,700 as calculated by the Gas Tax Method. Detour signing costs will be \$10,000.

C. Recommendations

It is recommended that the present structure be removed and an at grade intersection constructed, as described in Alternative No. 1.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Office of Design will coordinate the plan preparation with assistance from the Office of Bridges and Structures.

E. Special Considerations

There are no bike paths or sidewalks adjacent to IA 415 or N.W. 66th Ave.; therefore no ADA accommodations are planned in conjunction with this project.

Right of Way will be required for this project.

The Office of Location and Environment has completed their review and have the following recommendations:

Federal and state law requires that impacts to wetlands and streams be avoided and minimized. Project design should focus on the least environmentally damaging, practicable alternative.

Project specific recommendations:

1. Based on the information provided in the Draft Concept dated March 14, 2012, we have determined that a Section 404 Permit will be required for this work. We expect the work to be covered by Nationwide Permit #14.
2. Wetland mitigation will not be required.
3. Stream mitigation will be required for the extension to the triple box culvert under NW 66th Ave. We request to use the ROW where the existing SB off-ramp is located (NW quad) for stream mitigation. We will coordinate with the Office of Design, Bridges and Structures, District 1 regarding any proposed stream mitigation.
4. Because clearing and grubbing is anticipated, and the project area meets desktop criteria for Indiana bat, further review for Indiana bat will be necessary. The results of this review will be sent separately.
5. A sovereign lands permit may be required if additional ROW is purchased south of NW 66th Ave (the DNR-owned Margo Frankel Woods State Park).

If the project concept changes, additional ROW or borrow becomes necessary, or extra work is identified during construction, further review by this office may be required.

F. Program Status

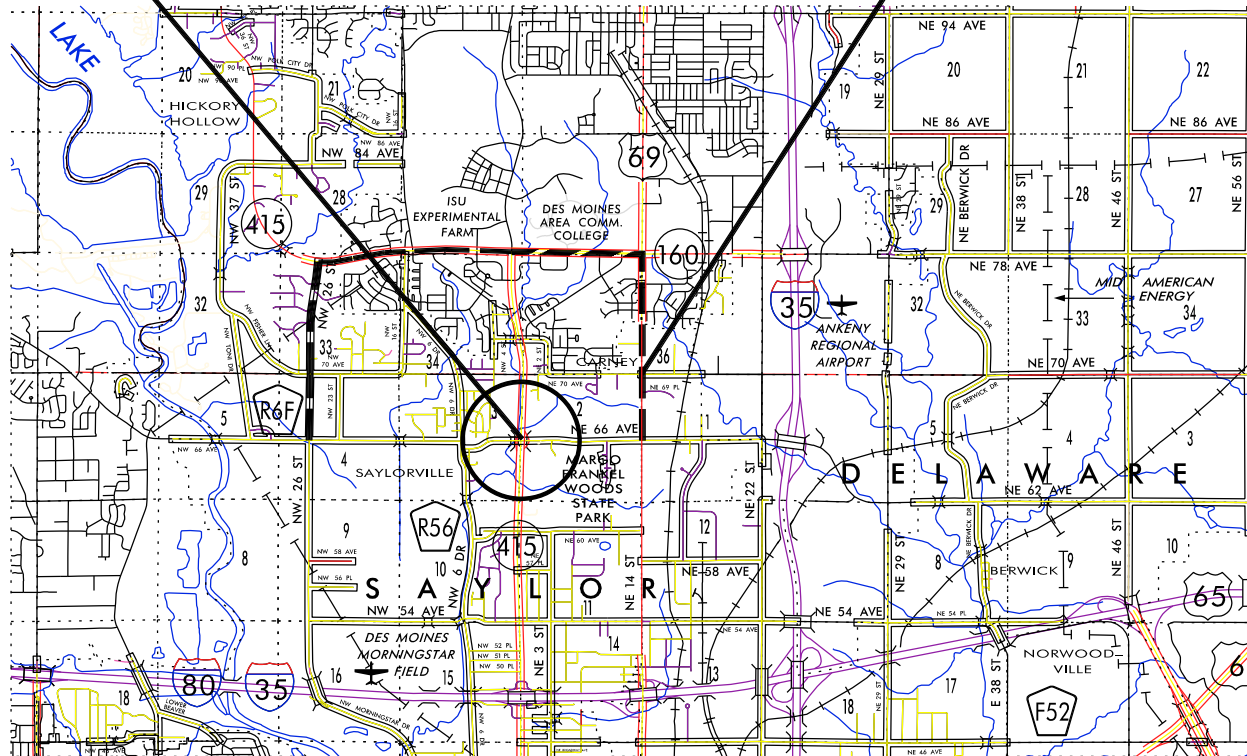
Site data has been developed by the Office of Design. This project is listed in the 2013-2017 Iowa Transportation Improvement Program, with \$1,500,000 programmed for replacement/repair in FY 2017. In addition to the use of bridge reserve funding, general program funds will be necessary to supplement the cost of this project.. A schedule of events will be developed following approval of the Project Concept.

KKP: jmb

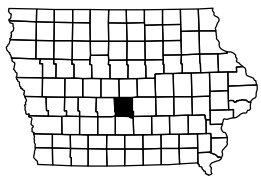
POLK COUNTY

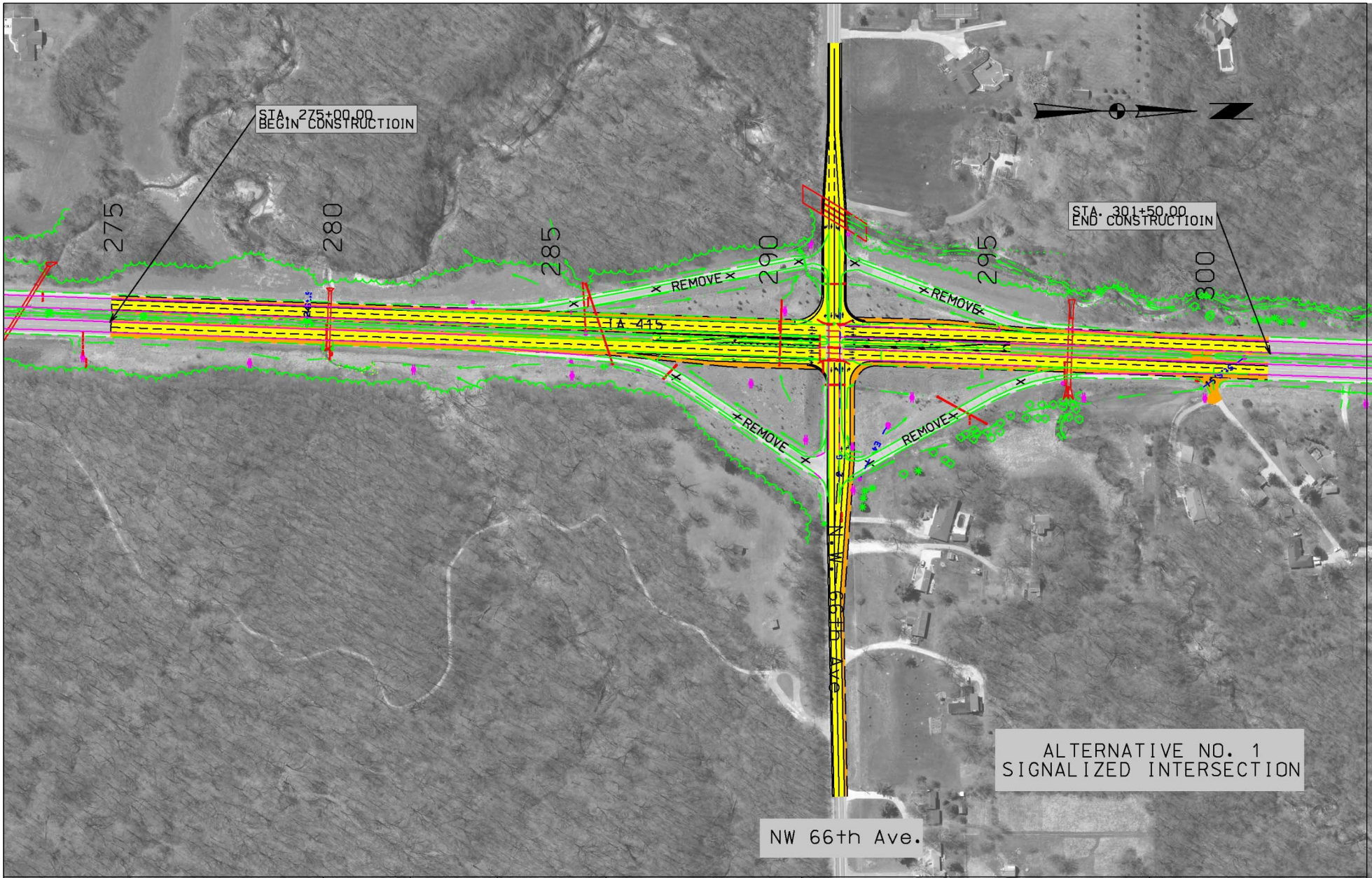
STA 291+58.40
FHWA 41080
MAINT.7703.7S415
DESIGN 1642

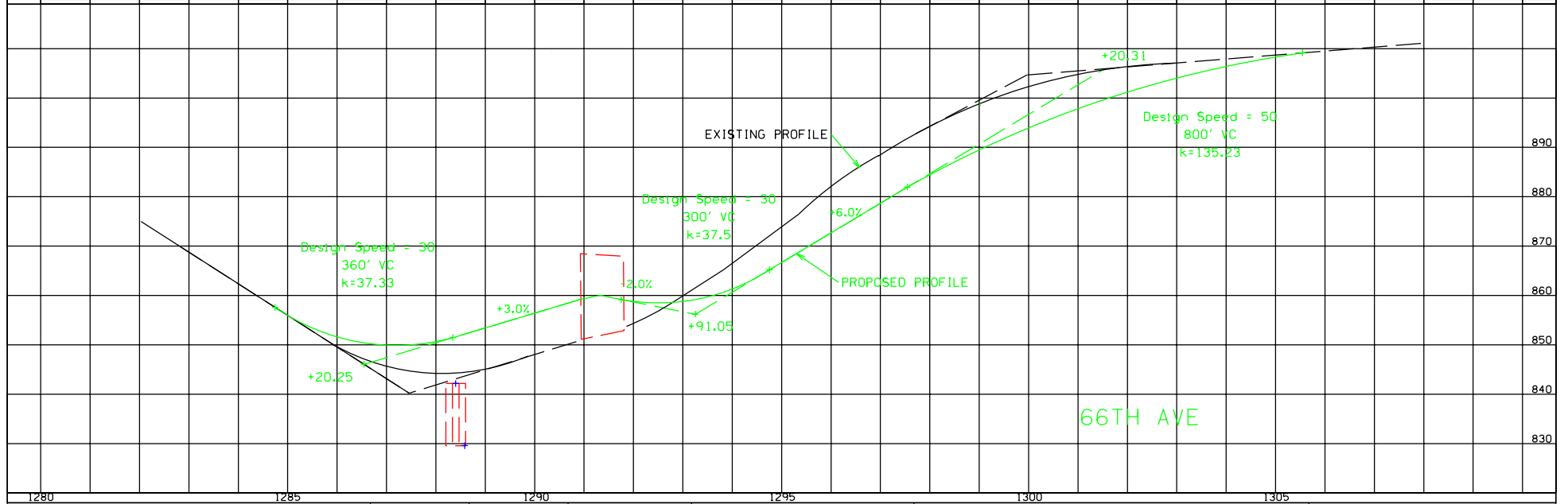
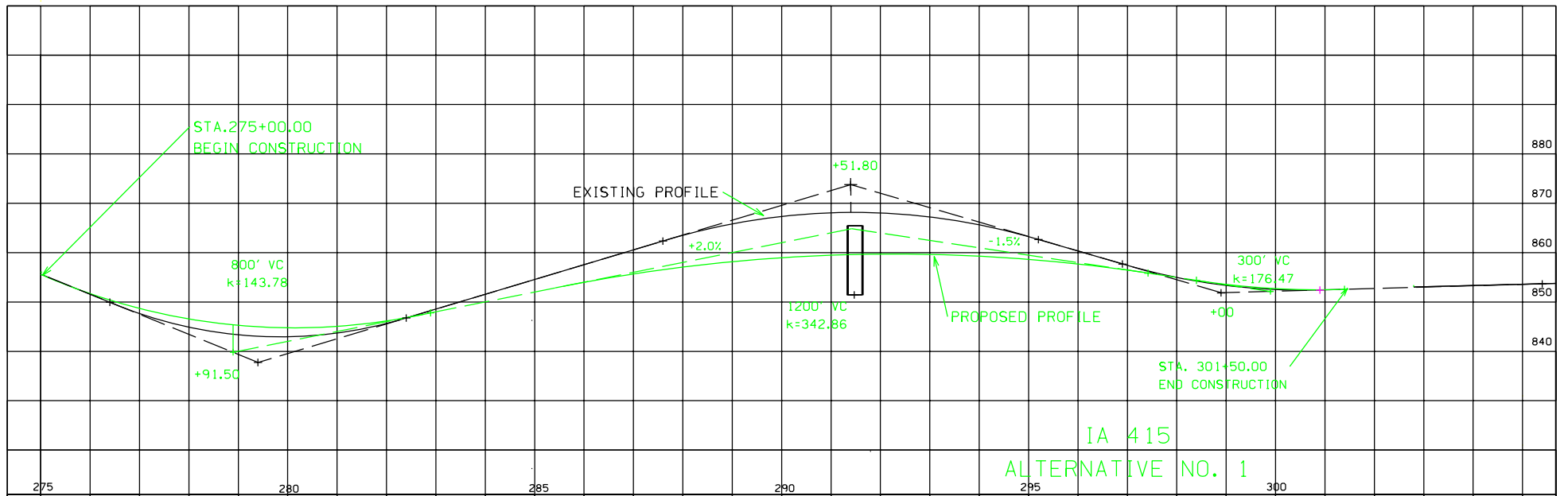
NW 66th AVE.
DETOUR



NW 66th AVE. 2.1 MILES NORTH OF I-80
BRF-415-1(52)-38-77
PIN: 12-77-415-030







1280	1285	1290	1295	1300	1305						
ROAD DESIGN	CADD	PRODUCED	STATE OF IOWA	FHWA REGION 7	FISCAL YEAR	POLK	COUNTY	PROJECT NUMBER	BRF-415-1(52)--38-77	SHEET NUMBER	2

