



AGENDA
CHARTER TOWNSHIP OF MERIDIAN
MERIDIAN TRANSPORTATION COMMISSION
March 21, 2019 6:00 p.m.

1. CALL MEETING TO ORDER
2. APPROVAL OF AGENDA
3. APPROVAL OF MINUTES
 - A. February 21, 2019
4. PUBLIC REMARKS
5. COMMUNICATIONS
 - A. Received and on file
 - Vice-Chair Vagnozzi – Uber/Lyft
6. PUBLIC HEARING
 - A. Central Park Drive (Okemos Road to Grand River Avenue), reduce existing 4 lanes to 3 lanes
7. COMMISSION DISCUSSION
 - A. Central Park Drive (Okemos Road to Grand River Avenue), reduce existing 4 lanes to 3 lanes
 - B. Okemos Road bridge replacement
 - C. Downtown Okemos traffic impact
8. COMMISSION COMMENTS
9. NEXT MEETING DATE
 - A. May 23, 2019 Central Fire Station Community Room
 - B. Township Board Meeting April 9, 2019
10. ADJOURNMENT

DRAFT

CHARTER TOWNSHIP OF MERIDIAN
MERIDIAN TRANSPORTATION COMMISSION (MTC)
MEETING MINUTES OF FEBRUARY 21, 2019

PRESENT: Chair Hackbarth, Vice-Chair Vagnozzi, Commissioners Deschaine (6:06p.m.), Potter, Hudson, Kolbasa (6:06 p.m.) and Lovell

ABSENT: None

STAFF: Mark Kieselbach, Director of Community Planning and Development

1. Call Meeting to Order

Chair Hackbarth called the meeting to order at 6:02 p.m.

2. Approval of Agenda

Vice-Chair Vagnozzi moved to approve the agenda.

Seconded by Commissioner Hudson.

VOICE VOTE: Motion carried unanimously.

3. Approval of Minutes

Vice-Chair Vagnozzi moved to approve the minutes of January 24, 2019 as written.

Seconded by Commissioner Lovell.

VOICE VOTE: Motion carried unanimously.

4. Public Remarks

Fred Wurtzel stated he thought the Commission should take more time to review the issues related to Redi-Ride. While CATA has been working well with the Township they should not be the sole source provider on the millage.

Ody Norkin stated a sole source provider should not be allowed. CATA has operated for years without a contract and no oversight by the Township. The millage language should use the term "service provider."

5. Communications

The Commission accepted the communications that had been received and placed on file. Director Kieselbach indicated a representative from the Michigan Department of Transportation (MDOT) had contacted Director Perry regarding the letter from the Planning Commission and Transportation Commission requesting a study of the Grand River Avenue/Central Park Drive/Dobie Road intersection. The MDOT representative said they would conduct a study and let the Township know the results by the end of April.

6. Commission Discussion

A. Redi-Ride Millage

Chair Hackbarth opened discussion on the proposed resolution (copy on file) which outlined the Transportation Commission's recommendation to renew and restore the Redi-Ride millage.

Vice-Chair Vagnozzi went through his proposed changes to the resolution (copy on file).

Discussion:

- Number of students using Redi-Ride.
- Place restrictions on children using Redi-Ride.
- Liability issue for children using Redi-Ride.
- Add additional capacity for students.
- Seek proposals to determine the cost to provide the service.

Amendments to the Resolution:

- The language "with no additional cost to the Township" was added at the end of the fourth WHEREAS.
- Number One under RESOLVED was revised to add "and restore."
- The language "and add capacity during peak demand times" was added at the end of Number Two under RESOLVED.
- Number Four under RESOLVED was revised to read "Review relevance of ballot language that references support for fixed route service."
- Number Three under FURTHER RESOLVED was updated to include "Township oversight of specific compliance metrics" of service provided, accountability in "reporting disposition of" requests or complaints of riders.
- Number Four was added under FURTHER RESOLVED, which states "Require new technology including online and mobile access for scheduling and tracking rides within 12 months of signing a service agreement."

Vice-Chair Vagnozzi moved to approve the Resolution as amended (copy on file).

Seconded by Commissioner Lovell.

Roll Call Vote: Yeas: Chair Hackbarth, Vice-Chair Vagnozzi, Commissioners Lovell, Potter, and Deschaine.

Nays: Commissioners Hudson and Kolbasa.

7. Commission Comments

Commissioner Potter stated he would like the Commission to pursue a motion activated sign at Okemos Road crossing of the inter-urban pathway. He also asked if the developer for the Village of Okemos project could make a presentation to the Commission regarding traffic.

Commissioner Deschaine asked that the Commission discuss electric scooters at a future meeting. He mentioned of the eleven Board goals for 2019 two (local roads and Redi-Ride) related directly to the work of the Commission.

8. Next Meeting Dates

Transportation Commission next meeting is March 21, 2019 at the Central Fire Station Community Room.

Township Board next meeting is March 5, 2019.

9. Adjournment

Chair Hackbarth called for a motion to adjourn the meeting.

Commissioner Deschaine moved to adjourn the meeting.

Seconded by Commissioner Potter.

VOICE VOTE: Motion carried unanimously.

Meeting adjourned at 7:30p.m.

The Washington Post

Opinions

Uber and Lyft are losing money. At some point, we'll pay for it.

By [Megan McArdle](#)

Legend has it that in 1929, businessman Joseph Kennedy, the father of the future president, realized it was time to get out of the stock market when the [shoeshine boy](#) started offering him trading tips.

I had my own such moment a couple of years back when I started hearing people say they were selling their cars because “it’s cheaper to take Uber everywhere!”

It wasn’t that I doubted them, mind you. I just started to wonder about the math.

Uber and Lyft are functionally taxicabs — better dispatched and more convenient but, still, taxicabs, pretty much. There’s a reason that, before the Uber/Lyft revolution, almost no one [said](#), “I’m going to sell my car and take taxis everywhere!” Unless you are a hermit or live in a dense urban core, a month of taking cabs costs more than a month of Corolla ownership.

Boosters of the ride-share revolution like to point out that most of the nation’s cars spend most of their time parked; there ought to be money in liberating all that unused capital. True enough — except that someone has to drive the car, including the time spent circling as they wait for rides.

In 2014, journalist Timothy B. Lee spent a week driving for Lyft. He drove for 50 hours but spent only 14 of those hours actually [ferrying](#) passengers. All that circling wears out the car and burns both gas and the driver’s valuable time.

Lee might have gotten better at optimizing his rides if he’d driven for longer, but still, those costs remain considerable. So how can Uber and Lyft, both of which are planning initial public offerings this year, be price-competitive with car ownership outside of places such as Manhattan?

Answer: heavy subsidies, from both the companies and the drivers themselves.

Uber and Lyft have long used investor money to subsidize operations. Lyft’s IPO [documents](#), filed last week, indicate that in 2018 the company booked \$8.1 billion in rides, collected \$2.2 billion in revenue — and lost more than \$900 million after expenses. Uber is also losing money, although perhaps not [quite as much](#).

This despite the fact that many drivers seem to be underpricing their services. Whenever a driver arrives to pick you up in a massive truck or a luxury automobile, you’re either looking at a driver who took up driving as a form of charity work or one who doesn’t understand that ride-sharing income should be calculated after deducting gas and vehicle depreciation. Not every driver makes quite such a blatant error, but there’s considerable evidence that [earnings](#) are low after accounting for expenses, and [drivers](#) don’t necessarily realize that.

Thus, the ride-sharing market offers a real-life illustration of the old economist’s joke: “We’re losing money on every unit, but we’ll make it up in volume!” Unfortunately for us riders, there’s only so much cheap investment money, and only so many inexperienced drivers, out there. Once Uber and Lyft have burned through those, they’re going to have to charge us what the rides are actually worth. Customers will be in for a rude shock.

Nor are theirs the only customers due to relearn that there’s no such thing as a free lunch. After 13 years, the music-streaming service Spotify finally (barely) [turned a profit](#) last quarter on its nearly 100 million subscribers, only to forecast substantial losses for the coming year. Netflix is burning through borrowed cash as it races to build out its content library. In the journalism business, a host of digital start-ups are [running out](#) of investment funds without ever having run into a viable business model.

That's not to say that all the subsidized businesses are headed for the same kind of trouble that has beset BuzzFeed or the [Huffington Post](#). There's obviously a market for ride sharing, for streaming and, yes, even for digital journalism. And in some of those businesses, notably streaming, the massive economies of scale really might deliver Facebook-style windfalls to early investors.

But Lyft and Uber are a different story. They're not selling a song or a movie that can be endlessly replicated for little incremental cost; they're selling a physical service that's pretty expensive to deliver. At some point, we're going to have to pay for it.

Heavy users of ride sharing should start getting used to the idea that the cost will soon go up, and plan their lives accordingly. And investors should prepare for demand to drop when customers and drivers discover the true price of the service.

In other words, as a modern-day Joseph Kennedy might say: Don't buy frothy stocks unless you're willing to lose a bundle. And don't sell your car unless you're ready to walk.

Read more from [Megan McArdle's archive](#), [follow her on Twitter](#) or [subscribe to her updates on Facebook](#).

Read more:

[The Post's View: Uber and Lyft won't solve traffic. Local governments must step in.](#)

[Catherine Rampell: Who will win the ridesharing war? Probably not consumers.](#)

[Christine Emba: Uber and its leadership just learned what it takes to grow up](#)

[The Post's View: The Uber debate](#)

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Megan McArdle

Megan McArdle is a Washington Post columnist and the author of "[The Up Side of Down: Why Failing Well Is the Key to Success.](#)" Follow [🐦](#)

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Mark Kieselbach

From: Conklin, William <WConklin@ingham.org>
Sent: Thursday, March 14, 2019 6:28 PM
To: Mark Kieselbach
Cc: Jones, Kelly
Subject: RE: Central Park Drive
Attachments: SHEET_18_CONST_Plan_Central_Park_STA 100+23 To 118+00.pdf; SHEET_19_CONST_Plan_Central_Park_STA 118+00 To 136+00.pdf; SHEET_20_CONST_Plan_Central_Park_STA 136+00 To 153+00.pdf; SHEET_21_CONST_Plan_Central_Park_STA 153+00 To 171+00.pdf; SHEET_22_CONST_Plan_Central_Park_STA 171+00 To 184+29.pdf; SHEET_23_CONST_Plan_Newman_STA 10+63 To 26+00.pdf; SHEET_24_CONST_Plan_Newman_STA 26+00 To 29+19.pdf

The attached plans and this email should be submitted to Meridian Township's Transportation Commission for consideration of the proposed "Road Diet" (conversion of existing 4 lanes to 3 lanes) on Central Park Drive between Okemos Road and Grand River Ave. (M-43) and on Newman Road between Marsh Road and Central Park as part of planned asphalt resurfacing of these roads in 2019.

As with the prior Road Diet on Lake Lansing Road, Okemos to Marsh Roads, and that also planned with resurfacing in 2019 on Lake Lansing Road, Hagadorn Road to Saginaw Highway (BL 69) and previously approved by the Township, a road diet typically involves converting a 4 lane road having 2 through/turn lanes in each direction to 3 lanes with a two-way center left turn lane, and one through/right turn lane in each direction. The remaining pavement width is allocated for use as paved shoulder on both sides, delineated by a solid white lane line between the vehicle lane and the paved shoulder, which may be used for non-motorized travel.

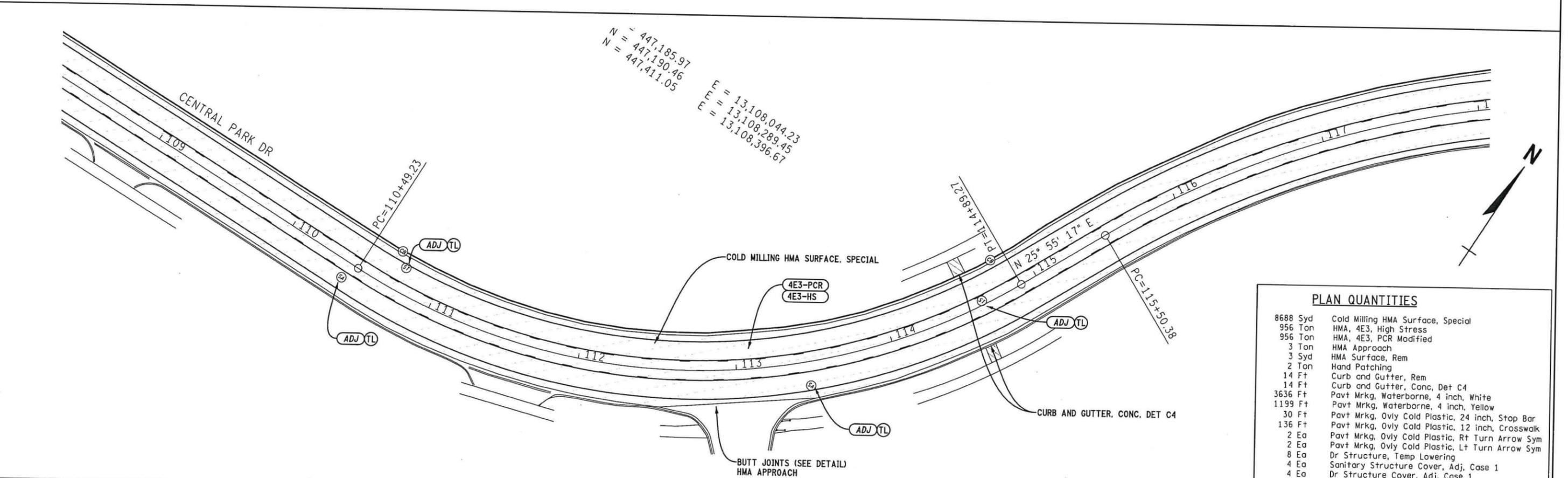
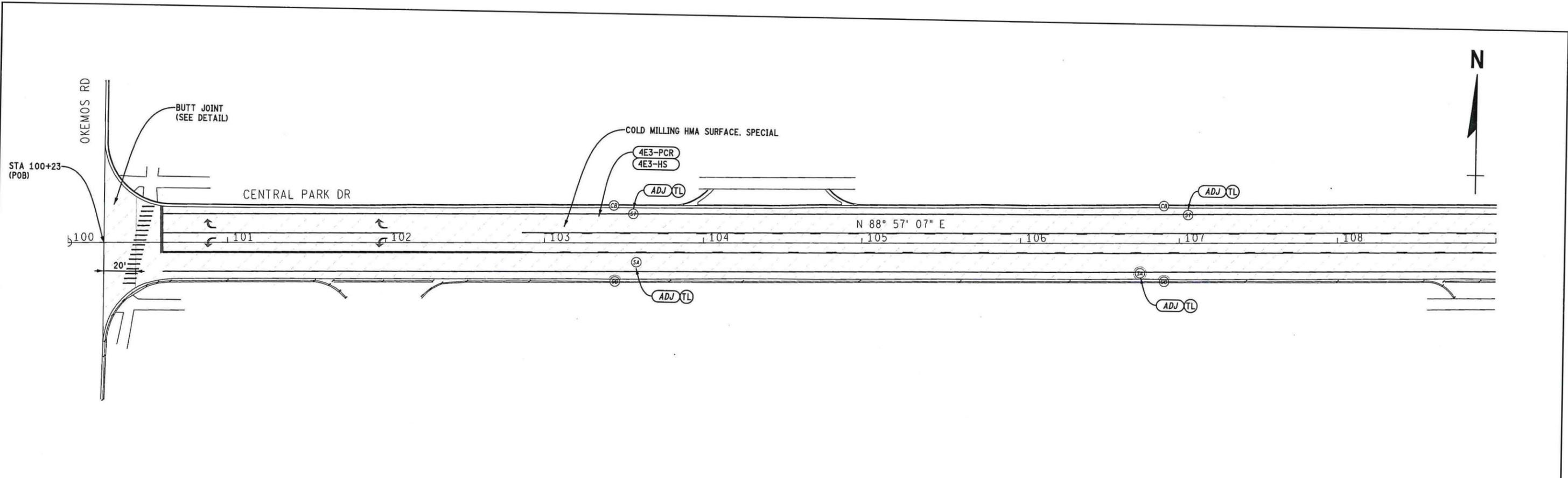
Central Park carries an average of under 8,000 vehicles per day, which varies somewhat with location. Newman Road carries an average of less than 5,000 vehicles per day. Federal guidance for considering road diets advises that single through/turn lanes having minimal turn locations, such as along Central Park, have a typical traffic capacity of approximately 15,000 vehicles per day. Thus the road diet configuration is expected to have more than sufficient capacity.

The configurations of the main intersections on Central Park at Okemos, at Marsh, and at Grand River will not change except the current outer through/right turn lanes on Central Park at Marsh will become right turn only. This should not change the capacity of the intersection as the outer lanes on Central Park at Marsh are used significantly for right turns, and again the inner through lane will have sufficient capacity for through traffic.

Similarly at Central Park and Newman, the current 2 approaching lanes (not including 2 departing) on each leg (inner through/left turn and outer through/right turn) will be replaced by the center left turn lane and one through/right turn lane. Given existing relatively low turn movement volumes, and more than sufficient through capacity as described above, this will have little or no net change in intersection capacity.

For the above reasons, no formal traffic study has been performed on the proposed Central Park/Newman road diets. In summary, with existing traffic flow well below single lane typical capacity and only minor changes to the intersections, no net change in traffic flow is expected with the proposed road diets.

ICRD staff will attend the March 21 Transportation Commission meeting to answer any further questions on the subject projects.

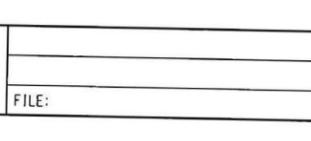


PLAN QUANTITIES	
8688 Syd	Cold Milling HMA Surface, Special
956 Ton	HMA, 4E3, High Stress
956 Ton	HMA, 4E3, PCR Modified
3 Ton	HMA Approach
3 Syd	HMA Surface, Rem
2 Ton	Hand Patching
14 Ft	Curb and Gutter, Rem
14 Ft	Curb and Gutter, Conc, Det C4
3636 Ft	Pavt Mrkg, Waterborne, 4 inch, White
1199 Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
30 Ft	Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar
136 Ft	Pavt Mrkg, Ovly Cold Plastic, 12 inch, Crosswalk
2 Ea	Pavt Mrkg, Ovly Cold Plastic, Rt Turn Arrow Sym
2 Ea	Pavt Mrkg, Ovly Cold Plastic, Lt Turn Arrow Sym
8 Ea	Dr Structure, Temp Lowering
4 Ea	Sanitary Structure Cover, Adj, Case 1
4 Ea	Dr Structure Cover, Adj, Case 1
6 Ea	Erosion Control, Inlet Protection, Fabric Bag
16 Syd	Sidewalk, Rem

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



INGHAM COUNTY
ROAD DEPARTMENT

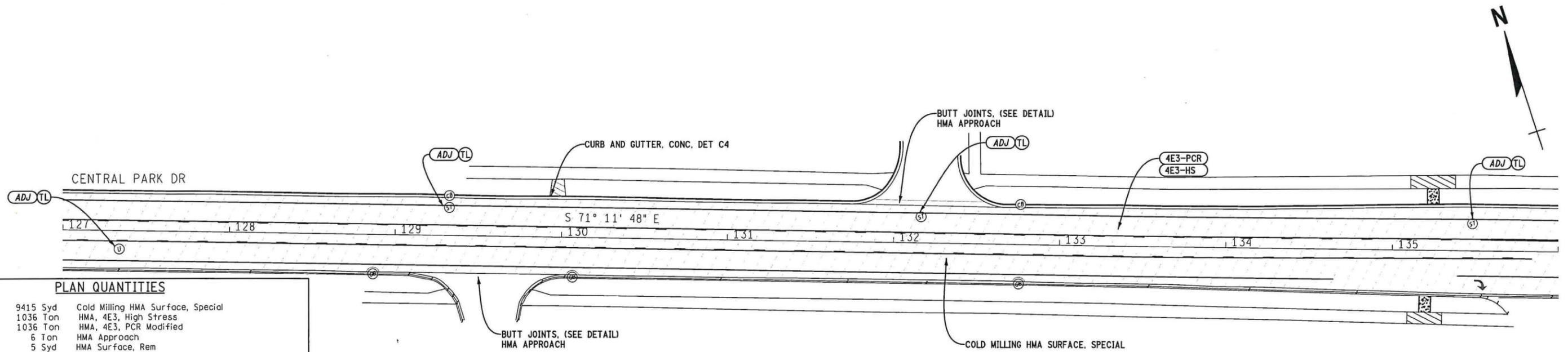
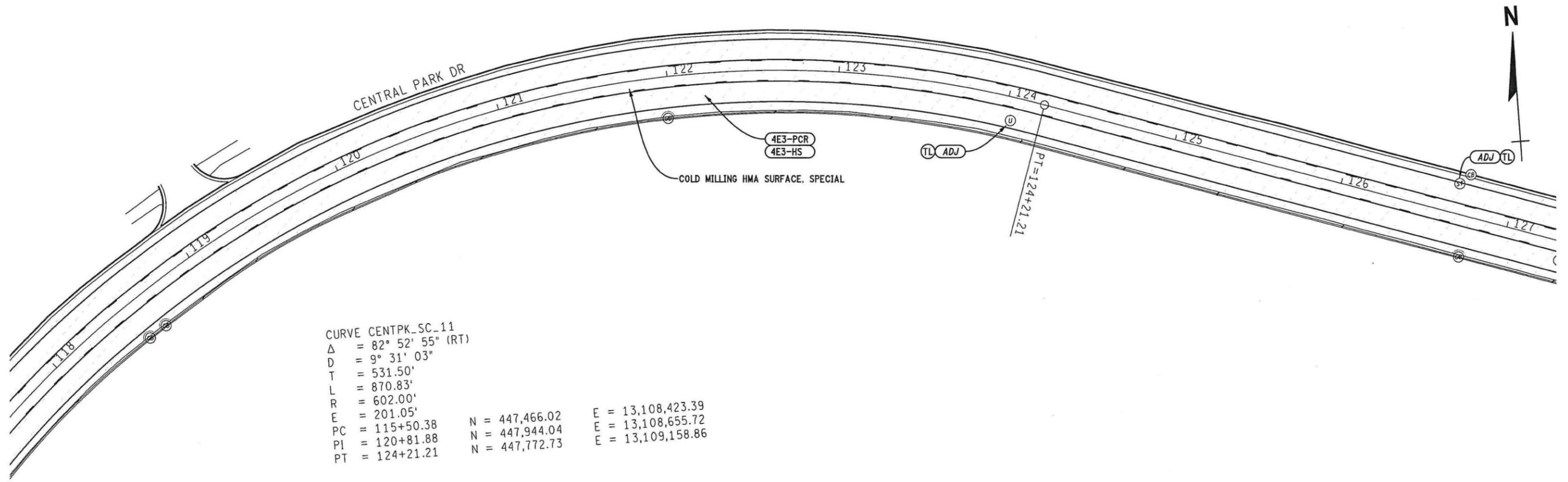


DATE: 02/05/2019
DESIGN UNIT: JONES
TSC: ICRD

CS:
JN: 500864

PLAN
CENTRAL PARK DR
STA 100+23 TO 118+00

DRAWING SHEET
PLAN 18



PLAN QUANTITIES

9415 Syd	Cold Milling HMA Surface, Special
1036 Ton	HMA, 4E3, High Stress
1036 Ton	HMA, 4E3, PCR Modified
6 Ton	HMA Approach
5 Syd	HMA Surface, Rem
3 Ton	Hand Patching
24 Ft	Curb and Gutter, Rem
24 Ft	Curb and Gutter, Conc, Det C4
3604 Ft	Pavt Mrkg, Waterborne, 4 inch, White
987 Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
1 Ea	Pavt Mrkg, Ovly Cold Plastic, Rt Turn Arrow Sym
6 Ea	Dr Structure, Temp Lowering
2 Ea	Sanitary Structure Cover, Adj, Case 1
4 Ea	Dr Structure Cover, Adj, Case 1
10 Ea	Erosion Control, Inlet Protection, Fabric Bag
50 Syd	Sidewalk, Rem
495 Sft	Sidewalk, Conc, Modified, 4 inch

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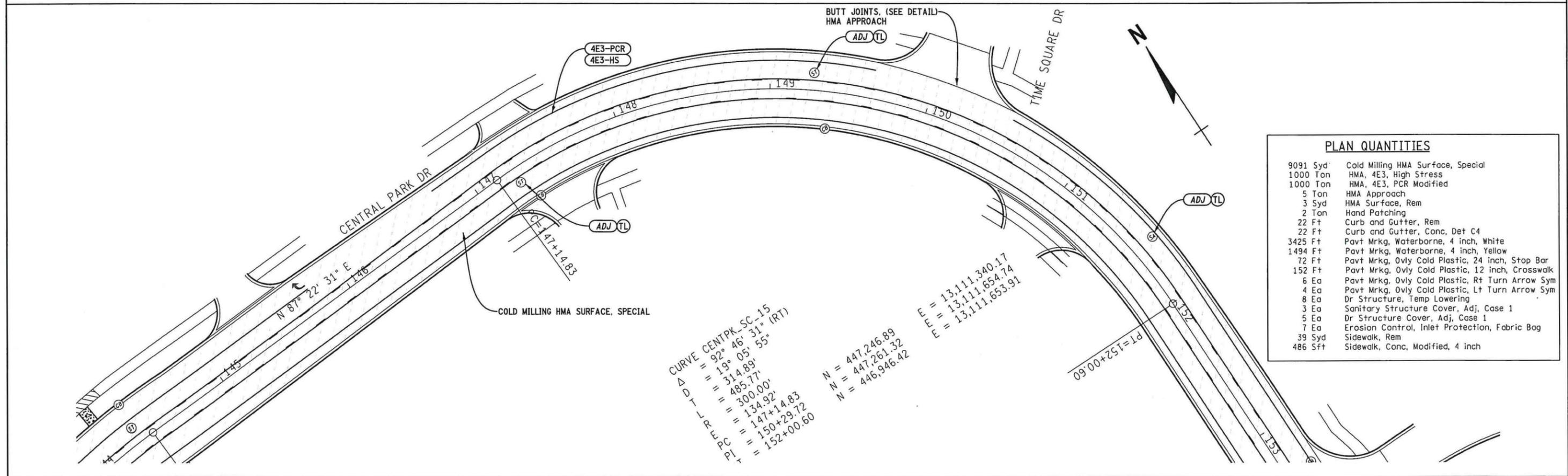
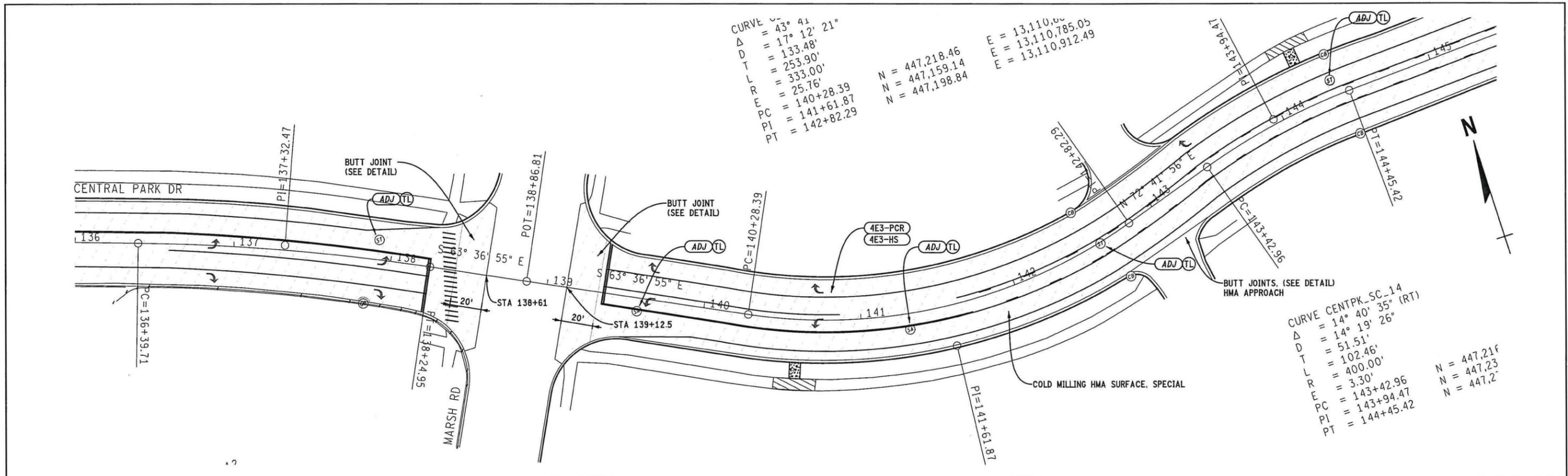


INGHAM COUNTY
ROAD DEPARTMENT



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PLAN		DRAWING	SHEET
CENTRAL PARK DR			
STA 118+00 TO 136+00		PLAN	19



PLAN QUANTITIES	
9091 Syd	Cold Milling HMA Surface, Special
1000 Ton	HMA, 4E3, High Stress
1000 Ton	HMA, 4E3, PCR Modified
5 Ton	HMA Approach
3 Syd	HMA Surface, Rem
2 Ton	Hand Patching
22 Ft	Curb and Gutter, Rem
22 Ft	Curb and Gutter, Conc, Det C4
3425 Ft	Pavt Mrkg, Waterborne, 4 inch, White
1494 Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
72 Ft	Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar
152 Ft	Pavt Mrkg, Ovly Cold Plastic, 12 inch, Crosswalk
6 Ea	Pavt Mrkg, Ovly Cold Plastic, Rt Turn Arrow Sym
4 Ea	Pavt Mrkg, Ovly Cold Plastic, Lt Turn Arrow Sym
8 Ea	Dr Structure, Temp Lowering
3 Ea	Sanitary Structure Cover, Adj, Case 1
5 Ea	Dr Structure Cover, Adj, Case 1
7 Ea	Erosion Control, Inlet Protection, Fabric Bag
39 Syd	Sidewalk, Rem
486 Sft	Sidewalk, Conc, Modified, 4 inch

FINAL ROW PLAN REVISIONS			(SUBMITTAL DATE:)		
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INGHAM COUNTY ROAD DEPARTMENT

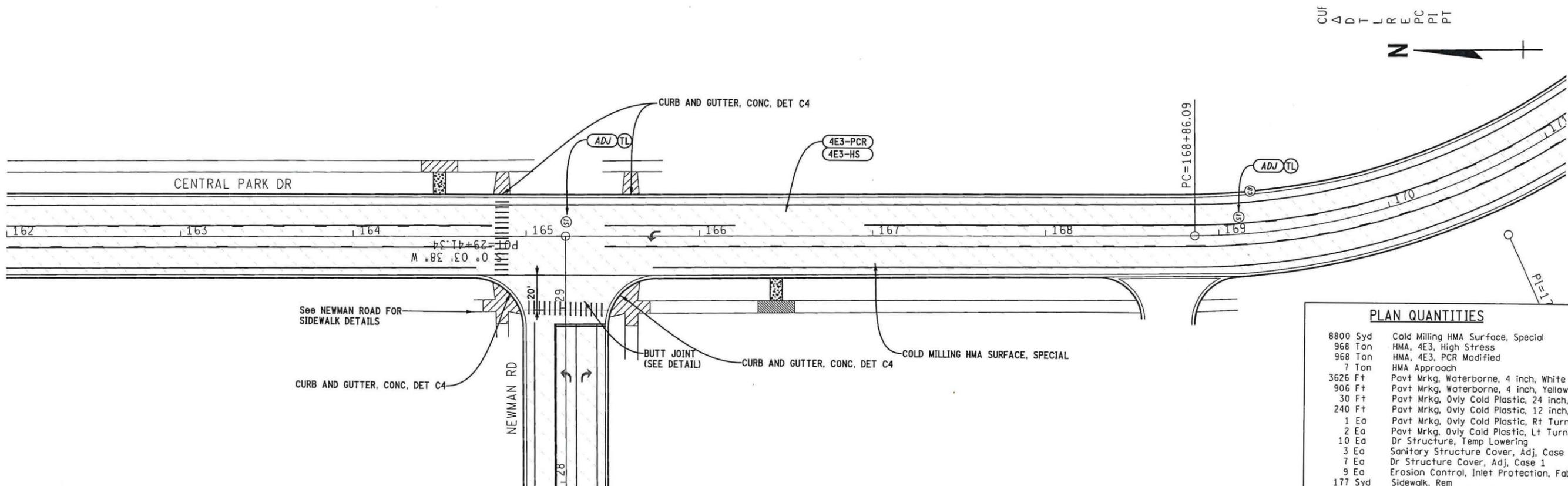
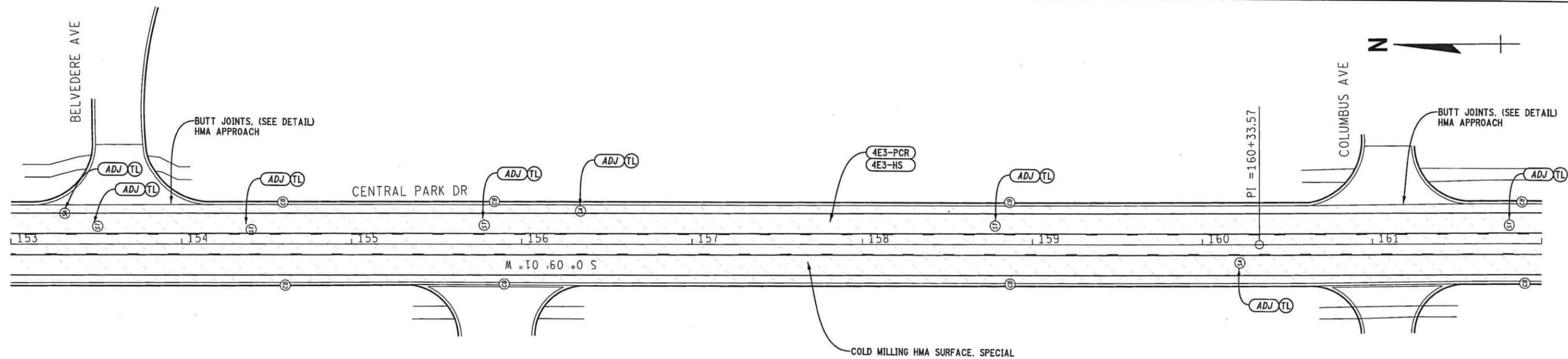


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 JN: 500864

PLAN
 CENTRAL PARK DR
 STA 136+00 TO 153+00

DRAWING SHEET
 PLAN 20



PLAN QUANTITIES	
8800 Syd	Cold Milling HMA Surface, Special
968 Ton	HMA, 4E3, High Stress
968 Ton	HMA, 4E3, PCR Modified
7 Ton	HMA Approach
3626 Ft	Pavt Mrkg, Waterborne, 4 inch, White
906 Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
30 Ft	Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar
240 Ft	Pavt Mrkg, Ovly Cold Plastic, 12 inch, Crosswalk
1 Ea	Pavt Mrkg, Ovly Cold Plastic, Rt Turn Arrow Sym
2 Ea	Pavt Mrkg, Ovly Cold Plastic, Lt Turn Arrow Sym
10 Ea	Dr Structure, Temp Lowering
3 Ea	Sanitary Structure Cover, Adj, Case 1
7 Ea	Dr Structure Cover, Adj, Case 1
9 Ea	Erosion Control, Inlet Protection, Fabric Bag
177 Syd	Sidewalk, Rem
805 Sft	Sidewalk, Conc, Modified, 4 inch

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INGHAM COUNTY
ROAD DEPARTMENT

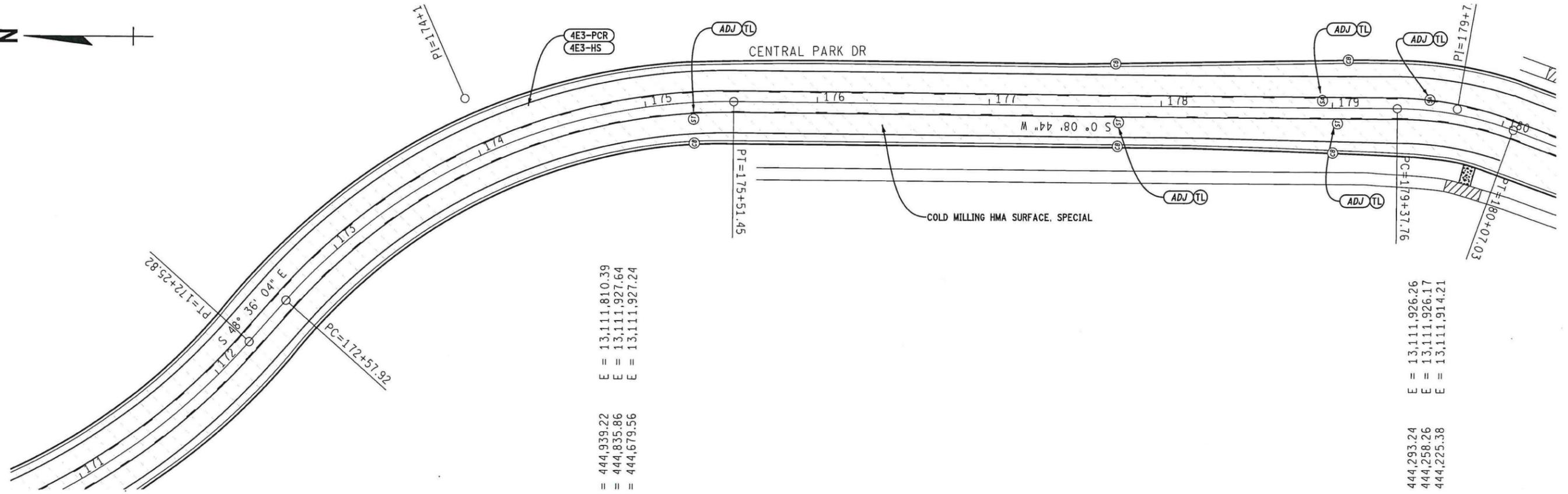


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JN: 500864

PLAN
CENTRAL PARK DR
STA 153+00 TO 171+00

DRAWING SHEET
PLAN 21

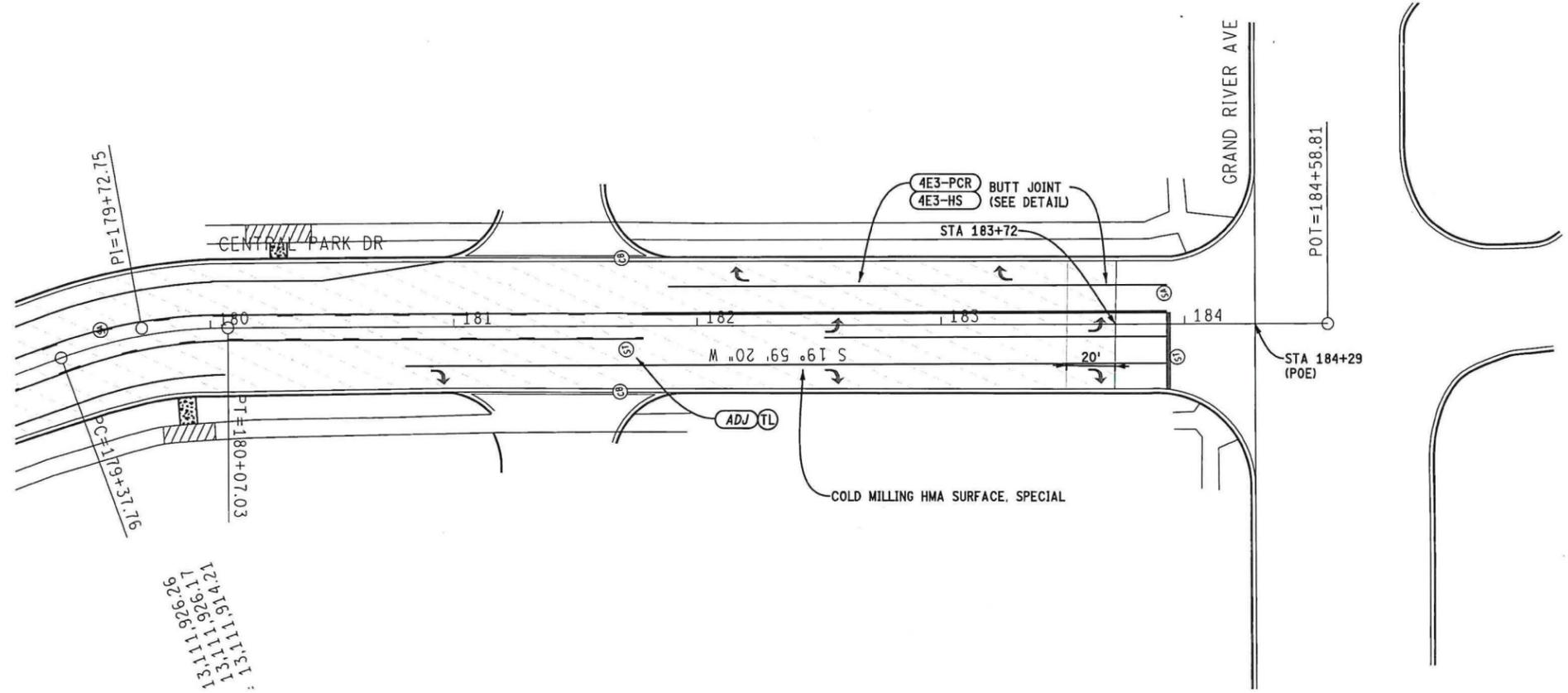


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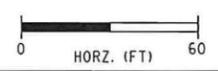
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 92362611131

PLAN QUANTITIES	
6732 Syd	Cold Milling HMA Surface, Special
741 Ton	HMA, 4E3, High Stress
741 Ton	HMA, 4E3, PCR Modified
3 Syd	HMA Surface, Rem
2 Ton	Hand Patching
22 Ft	Curb and Gutter, Rem
22 Ft	Curb and Gutter, Conc, Det C4
2971 Ft	Pavt Mrkg, Waterborne, 4 inch, White
1382 Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
32 Ft	Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar
5 Ea	Pavt Mrkg, Ovly Cold Plastic, Rt Turn Arrow Sym
2 Ea	Pavt Mrkg, Ovly Cold Plastic, Lt Turn Arrow Sym
6 Ea	Dr Structure, Temp Lowering
2 Ea	Sanitary Structure Cover, Adj, Case 1
4 Ea	Dr Structure Cover, Adj, Case 1
7 Ea	Erosion Control, Inlet Protection, Fabric Bag
39 Syd	Sidewalk, Rem
468 Sft	Sidewalk, Conc, Modified, 4 inch

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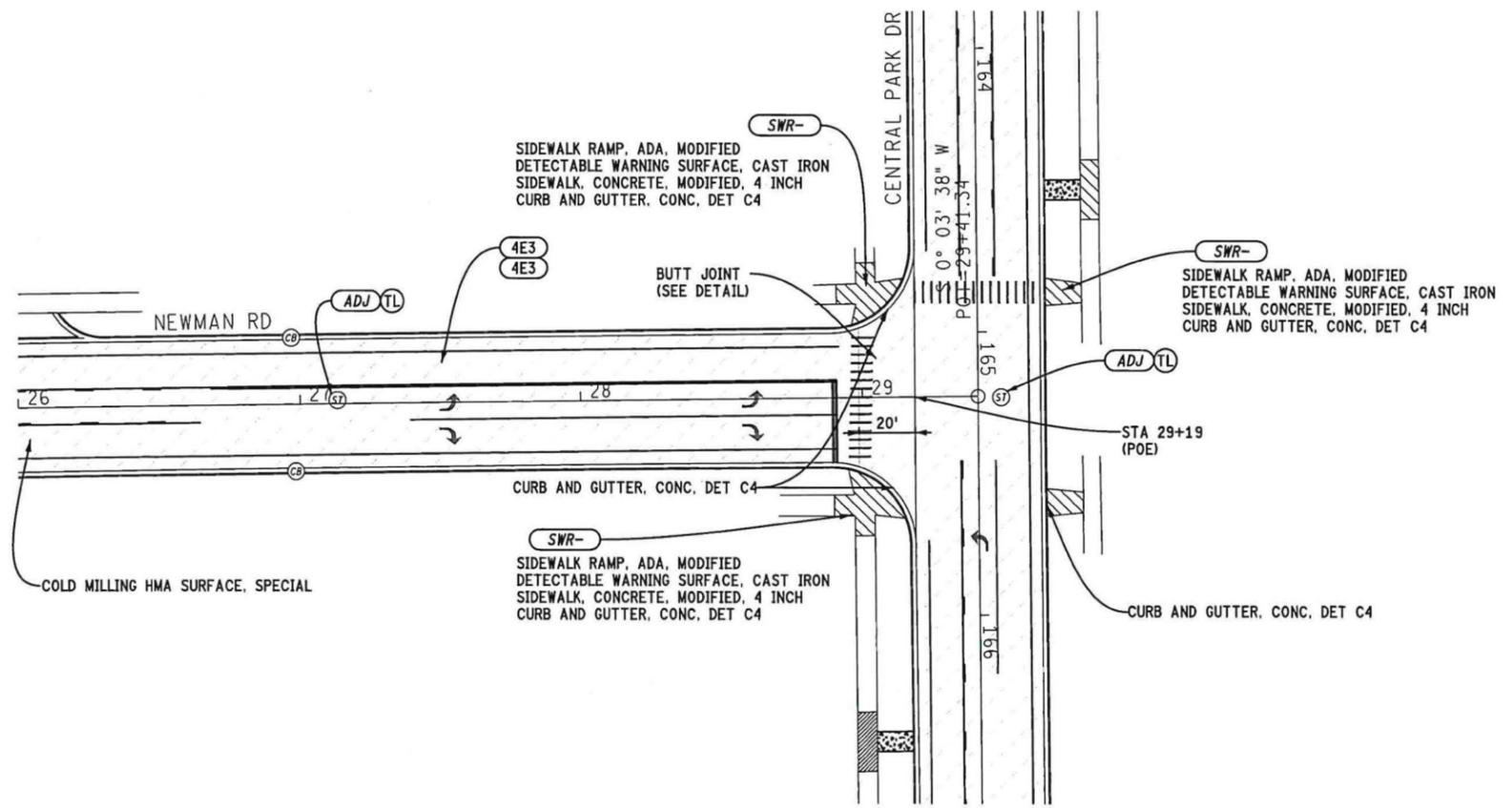
INGHAM COUNTY ROAD DEPARTMENT



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 JN: 500864

PLAN		DRAWING	SHEET
CENTRAL PARK DR		PLAN	22
STA 171+00 TO 184+29			

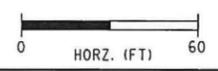


PLAN QUANTITIES	
1609 Syd	Cold Milling HMA Surface, Special
354 Ton	HMA, 4E3
22 Syd	HMA Surface, Rem
10 Ton	Hand Patching
112 Ft	Curb and Gutter, Rem
112 Ft	Curb and Gutter, Conc, Det C4
724 Ft	Pavt Mrkg, Waterborne, 4 inch, White
472 Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
1 Ea	Dr Structure, Temp Lowering
1 Ea	Dr Structure Cover, Adj, Case 1
2 Ea	Erosion Control, Inlet Protection, Fabric Bag
42 Sft	Detectable Warning Surface, Cast Iron
320 Sft	Sidewalk Ramp, ADA Modified

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
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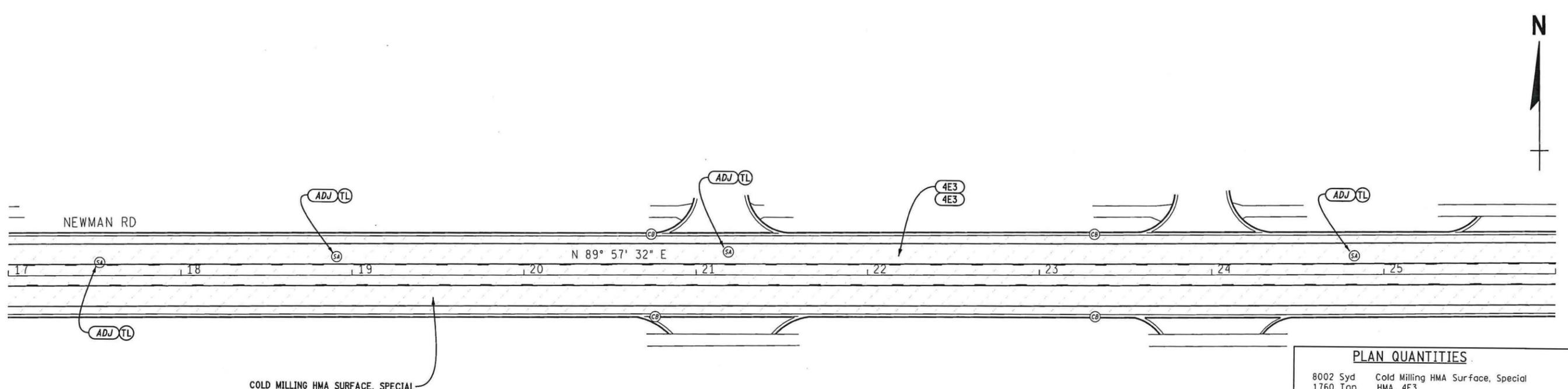
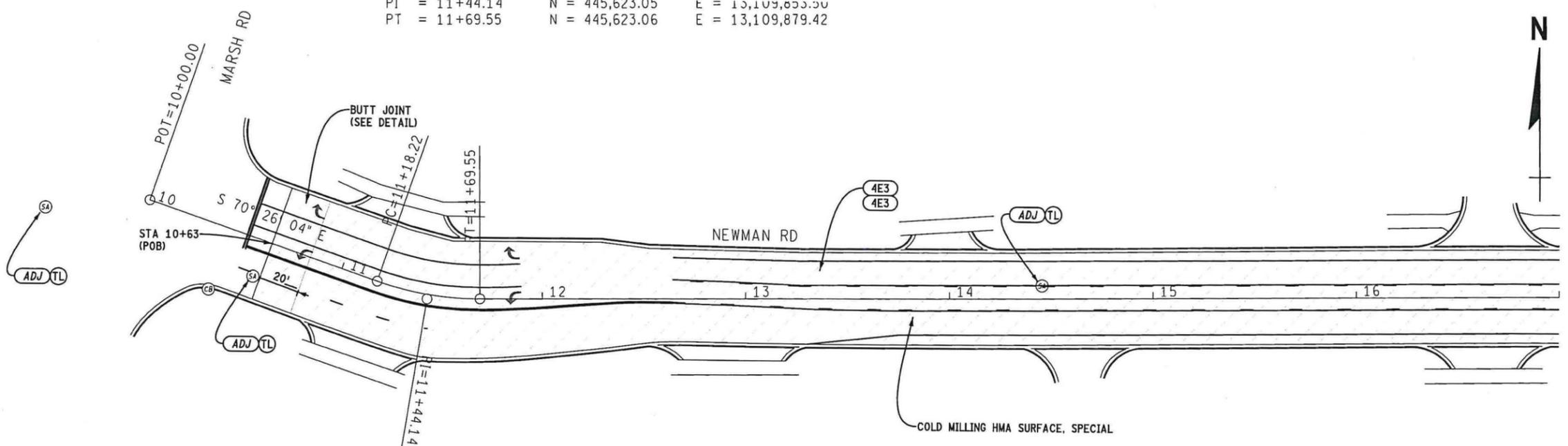
INGHAM COUNTY
ROAD DEPARTMENT



DATE: 02/05/2019	CS:
DESIGN UNIT: JONES	JN: 500864
FILE:	50064
TSC: ICRD	

PLAN	DRAWING	SHEET
NEWMAN RD	PLAN	24
STA 26+00 TO 29+19		

PI = 11+44.14 N = 445,623.05 E = 13,109,855.50
 PT = 11+69.55 N = 445,623.06 E = 13,109,879.42



PLAN QUANTITIES

8002 Syd	Cold Milling HMA Surface, Special
1760 Ton	HMA, 4E3
2871 Ft	Pavt Mrkg, Waterborne, 4 inch, White
1096 Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
36 Ft	Pavt Mrkg, Ovlly Cold Plastic, 24 inch, Stop Bar
2 Ea	Pavt Mrkg, Ovlly Cold Plastic, Rt Turn Arrow Sym
2 Ea	Pavt Mrkg, Ovlly Cold Plastic, Lt Turn Arrow Sym
6 Ea	Dr Structure, Temp Lowering
6 Ea	Sanitary Structure Cover, Adj, Case 1
8 Ea	Erosion Control, Inlet Protection, Fabric Bag

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)

NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



INGHAM COUNTY
ROAD DEPARTMENT



DATE: 02/05/2019
 DESIGN UNIT: JONES
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CS:
 JN: 500864
 50064

PLAN
 NEWMAN RD
 STA 10+63 TO 26+00

DRAWING SHEET
 PLAN 23

1.0 – PURPOSE AND NEED

1.2 Project Purpose

The primary purpose of the proposed project is to replace the functionally obsolete and structurally deficient bridges over the Red Cedar River to maintain safe and efficient traffic flow of vehicles, bicycles, and pedestrians along the Okemos Road corridor between West Grand River Avenue and I-96. A secondary purpose is to address the existing undesirable hydraulic conditions relating to bridges' geometry and skew in relation to the river channel.

1.3 Project Need

This section provides information about the existing bridge and hydraulic deficiencies and evaluates potential safety and hydraulic enhancements. Information supporting the need for the project is discussed in detail below.

1.3.1 Northbound Bridge

The need to replace the existing northbound bridge is driven by deteriorating condition and its functional deficiencies. Additionally, the clear travel way is only 20 feet wide and no shoulders are present on the bridge. The current width is below current design standards for this type of roadway per the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*. This width does not adequately accommodate wide vehicles, such as trucks, busses, and recreational vehicles, passing side by side. The northbound bridge cannot be rehabilitated to increase the width due to the nature of camelback bridges. The two camelback shaped stringers support the entire load of the bridge with traffic driving between the two stringers. The stringers were designed to support a 20-foot-wide roadway. Widening the bridge would increase the dead load and further restrict the allowable vehicle weights.

The reinforced concrete structure has been deteriorated by almost 100 years of weather and wear. As a result, the bridge is currently posted for vehicle weight restrictions. If structural deterioration is not corrected, further restrictions or bridge closure may be necessary. The structural concrete is heavily delaminated including the girders, deck, and sidewalks. Delamination is a failure that develops inside of the concrete without being obvious on the surface. Numerous delaminations have spalled (i.e., chipped) allowing steel reinforcement to be exposed and potentially deteriorated. Many concrete surfaces also have significant cracking. Cracks on the bottom surface of the deck have leachate and stalactites, particularly along the centerline joint. This is evidence of moisture leaking through the deck.

The most recent bridge inspection found heavy deterioration in the tension zones of the camelback stringers. Both stringers have deep spalls and exposed steel reinforcement along the bottoms. The bottom row of steel reinforcement is exposed in two critical areas: midspan of the bridge and at the steel reinforcement overlap locations. This steel reinforcement provides a majority of the bridge's ability to support vehicle loads and is critical to the bridge's strength. Because of the location and depth to which a concrete repair would be required on both stringers, it would be unrealistic to expect the stringers to withstand the necessary amount of material removal to allow for a sound structural repair. Patching new material to inferior 100-year-old concrete would be required and may not result in a structurally sound repair. The lifespan of such repairs would be difficult to predict and would do nothing to slow the continuing decline of the remaining original concrete. The stringers have previous patches that have started to crack and delaminate.

The concrete deck also has heavy deterioration both in the roadway and on the sidewalks. The top surface has longitudinal and transverse cracking throughout. The bottom surface also has longitudinal and transverse cracking throughout. The transverse cracks have leachate and stalactites. Delaminations are scattered throughout. Many delaminations have spalled and steel reinforcement is exposed. Exposed steel is susceptible corrosion and section loss. According to the original plans, the deck has only one layer of steel reinforcement, located in the lower portion of the deck. This steel reinforcement is responsible for transferring the vehicle loads from the deck to the stringers. Section loss will decrease the deck's ability to transfer the vehicle loads resulting in further restrictions to vehicles. The deck has previous patches that have started to crack and delaminate.

Scour is not currently an issue and the bridge footings are considered stable based on the July 2018 bridge inspection. Scour is the removal of sediment (sand, topsoil, etc.) by moving water, such as a stream. Bridge abutments are ideally located outside of the stream's influence and parallel to the stream. When that is not feasible, scour protection measures, such as cofferdams, rock (riprap), or other materials are installed to keep the bridge safe. The northbound bridge has a total length of 90 feet compared to the 180-foot southbound bridge with the same amount of water passing beneath. Both abutments are within the stream. The south abutment footing has exposed areas making it susceptible to future scour. No scour protection is in place.

1.3.2 Southbound Bridge

The need to replace the existing southbound bridge is driven by deteriorating condition and its functional deficiencies. Additionally, no shoulders are present on the bridge. Per AASHTO's *A Policy on Geometric Design of Highways and Streets*, shoulders are required. The southbound bridge underwent emergency superstructure repairs in 2016 to keep the bridge open. The 2016 rehabilitation included expansion joint replacement, pin and hanger replacement, diaphragm replacement, and steel beam repairs totaling approximately \$400,000. Not all structural issues were addressed by this emergency project. Even after the repairs, the bridge is still in poor condition and nearing the end of its service life.

The bridge is currently posted for vehicle weight restrictions. If structural deterioration is not corrected, further restrictions or closure may be necessary. Numerous holes were found in the structural steel beams in 2015. In 2016, new flange and web plates were bolted to the existing beams where holes in the beams were found. The north expansion joint is leaking, leaving the beam ends below the bridge deck susceptible to future deterioration. Approximately half of the paint system (three layers of paint: primer, intermediate coat, and top coat) on the steel beams is failing. Only the steel immediately adjacent to the repairs was repainted. Other local areas of paint system failure were not repainted leaving the steel beams susceptible to further deterioration. The concrete deck has mild delamination and spalling. The deck has been previously patched, particularly along the centerline and transverse joints. The transverse cracks on the bottom surface of the deck are leaching. The deck fascia also has leaching cracks.

1.3.3 Hydraulics

The northbound bridge crosses the Red Cedar River at a skew, resulting in the bridge abutments protruding from the natural stream bank into the river channel, disrupting and restricting the natural flow of the river and leaving the abutments susceptible to scour. This restriction has a lesser hydraulic area than the natural stream, resulting in higher backwater surface elevations, which increase the potential of upstream flooding. The Red Cedar River is prone to flooding and would benefit from a greater hydraulic area at the Okemos Road crossing. Scour is the removal of stream material (soil) by moving water. Scour generally occurs during flood events when a larger amount of water is flowing faster than normal. Abutments and piers obstruct the flow of the stream causing the water to flow even faster around them. The south abutment of the northbound bridge has already been exposed by scour. Most bridge failures in the United States are related to scour/hydraulics.

2.0 – ALTERNATIVES

Alternative 1: Reconstruct and Rehabilitate Bridges on Existing Alignment

Alternative 1 included reconstruction of a new two-lane southbound bridge and rehabilitation of the existing two-lane northbound bridge. See Figures 1 and 4. Both bridges would continue to be used for vehicles and the Okemos Road alignment would not change. The existing pedestrian bridge on the west side of Okemos Road would remain in place.

Under this alternative, the structural and aesthetics deficiencies of the northbound bridge would be rehabilitated and restored. Rehabilitation and restoration would include: concrete chipping and patching of delaminated or spalled concrete areas; clean and inject cracks in concrete members; replacement of roadway approach slabs; place riprap (large stone) at the south abutment; place healer/sealer or epoxy overlay on the top surface of the bridge deck and sidewalk; remove brush along approaches near the bridge; and, seal or replace all roadway/deck joints.

The proposed southbound bridge would carry two 11-foot lanes of traffic with two-foot shoulders. The total width of the proposed southbound bridge would be 29 feet. New abutments would be placed behind the existing abutments increasing the length to approximately 186 feet long. The existing steel beams are approximately 36 inches deep. To minimize the grade impacts on the approaches, proposed beams would be of similar depth. A two-span bridge with 42-inch prestressed concrete bulb-tee beams or a three-span bridge with 36-inch prestressed concrete bulb-tee beams would be sufficient.

It is estimated that this alternative would cost approximately \$3,635,000.

This alternative was eliminated from consideration as it would not address the functional obsolescence of the existing northbound bridge (i.e., the bridge cannot be widened to meet the minimum required widths without affecting the historic integrity of the bridge). Additionally, the bridge is so structurally deficient that it cannot be rehabilitated to meet minimum acceptable load requirements without affecting the historic integrity of the bridge. Finally, this alternative would perpetuate the undesirable hydraulic conditions caused by the existing substructure's geometry.

2.2.3 Alternative 2: Build New Bridge on New Alignment - Maintain Historical Bridge

Alternative 2 included construction of a single five-lane bridge to carry both northbound and southbound traffic. Under this alternative, the southbound bridge would be demolished, and the northbound bridge would be converted for pedestrian use. The new bridge would consist of two travel lanes in each direction and a center left turn lane to provide left turns in either directions (i.e., two-way left-turn lane (TWLTL)). See Figures 2 and 4. The existing pedestrian bridge on the west side of Okemos Road would remain in place. Under this alternative, Meridian Township (or another entity) would be required to take ownership of the northbound (historic camelback bridge) and would be responsible for future maintenance.

The bridge would carry five 11-foot lanes of traffic with two-foot shoulders. The total width of the bridge would be 62 feet. New abutments would be placed behind the existing abutments of the southbound bridge for a total length to approximately 186 feet. The existing steel beams are approximately 36 inches deep. To minimize the grade impacts on the approaches, proposed beams should be of similar depth. A two-span bridge with 42-inch prestressed concrete bulb-tee beams or a three-span bridge with 36-inch prestressed concrete bulb-tee beams would be sufficient. The bridge abutments outside of the river channel greatly improving the hydraulics and less susceptible to scour.

Under this alternative, the location of the camelback bridge would restrict the new bridge width and prevent the addition of an attached non-motorized facility on the east side of the new bridge (Figure 4). Therefore, pedestrian and bicycle traffic would use the camelback bridge as a non-motorized path.

This alternative would require realignment of Okemos Road and the Okemos Road/Mt. Hope intersection and removal of the grass median to account for the new single bridge location. The northbound roadway would be shifted to the west of the existing northbound bridge, while the southbound roadway would be shifted slightly to the east of the existing southbound bridge. The existing laneage at the intersection would remain unchanged except for the TWLTL, which would run from Mt. Hope Road to the Wonch Park entrance. The entrances to both Wonch Park and Ferguson Park may require minor grading depending on the magnitude of grade changes.

It is estimated that this alternative would cost approximately \$5,995,000.

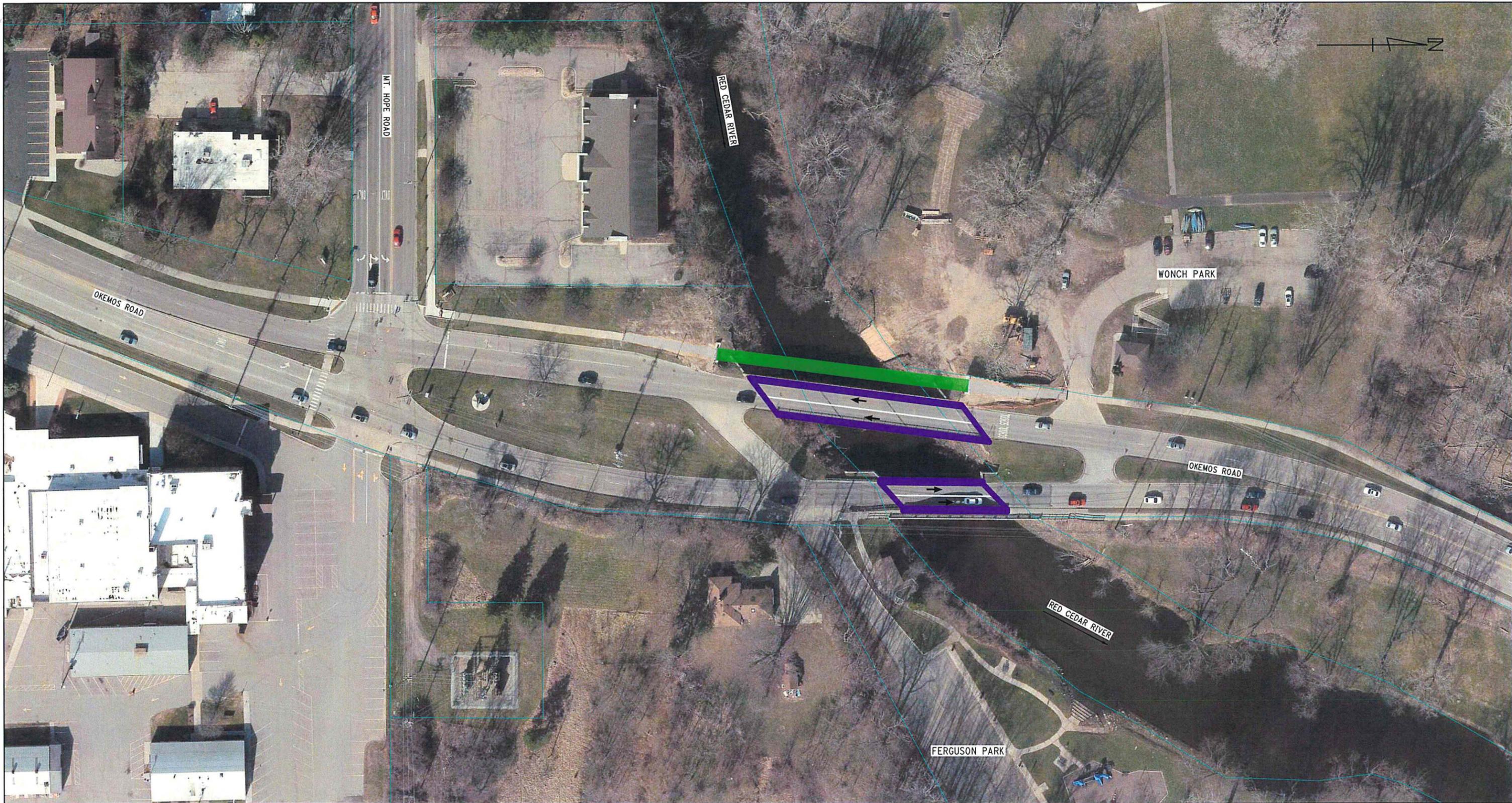
2.2.4 Alternative 3: Build New Bridge on New Alignment – Remove Historical Bridge

Alternative 3 is the same as Alternative 2 except both existing bridges would be demolished, and five-foot bike lanes with three-foot buffers would be added to both sides of the new bridge. Additionally, a non-motorized facility would be incorporated on the east side of the new bridge for a total width of 82 feet. See Figures 3 and 4.

It is estimated that this alternative would cost approximately \$6,700,000.

2.2.1 Alternative 4: No Build

The "No Build" alternative assumes no work beyond standard repair and maintenance. The existing deteriorated conditions documented in the bridge inspection report would not be addressed and the existing structure would provide an estimated remaining life of only 10-20 years. This alternative does not meet the Purpose and Need for the proposed project as it does not address the functional obsolescence or structural deficiencies or improve the hydraulic conditions of the river. Per NEPA guidance, the No Build Alternative is carried through the environmental study to provide a baseline comparison against the Preferred Alternative.



OKEMOS ROAD BRIDGE
IMPROVEMENT PROJECT
ENVIRONMENTAL ASSESSMENT

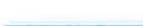


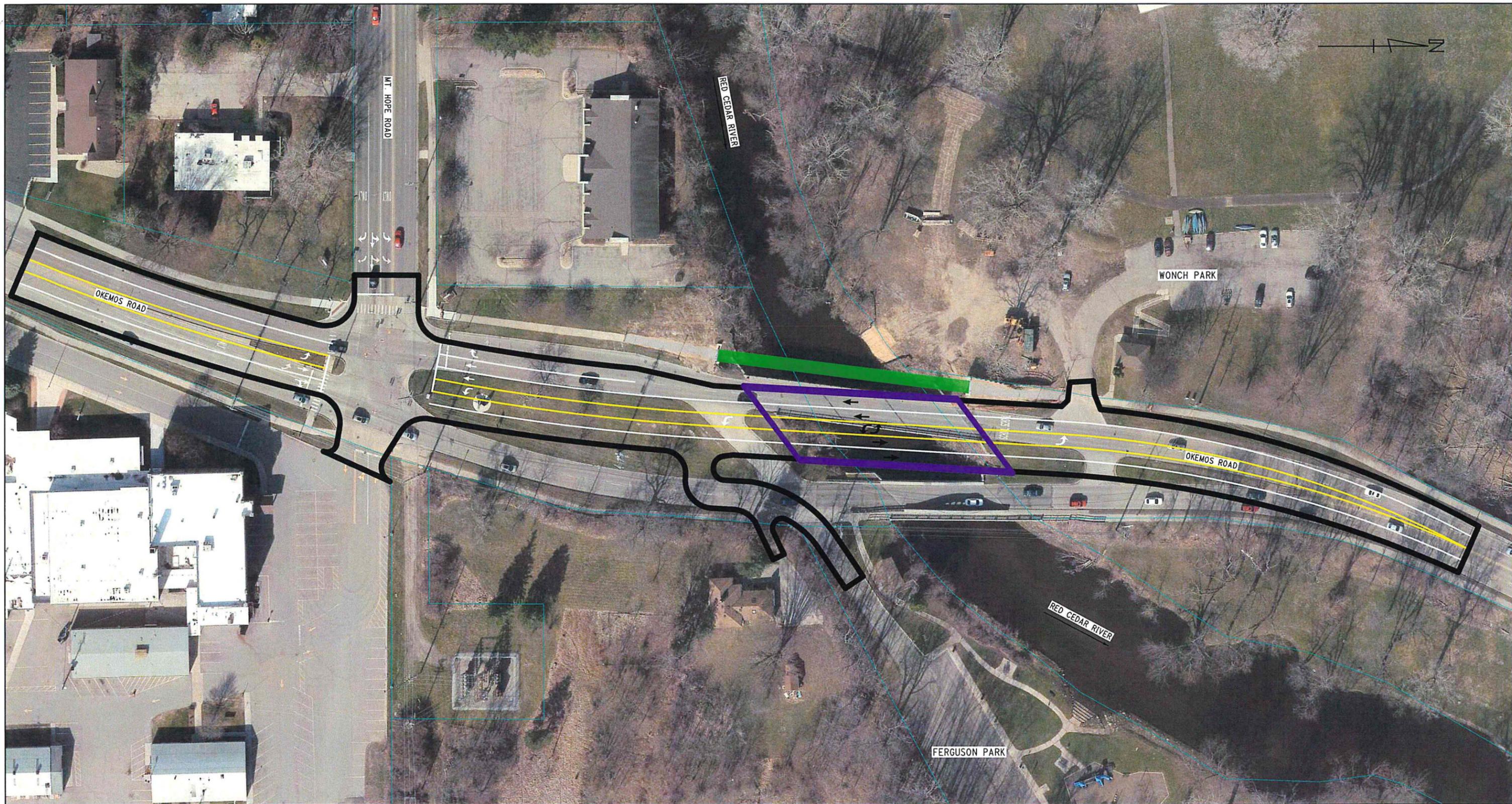
FIGURE 1
ALTERNATIVE 1
RECONSTRUCT AND REHABILITATE BRIDGES
ON EXISTING ALIGNMENT



NOVEMBER 2018

LEGEND

- | | | | |
|---|---------------------------|---|----------------------------|
|  | PROPOSED BRIDGE WORK |  | PROPOSED SIDEWALK |
|  | PROPOSED ROADWAY |  | EXISTING SIDEWALK |
|  | PROPOSED PAVEMENT MARKING |  | EXISTING PEDESTRIAN BRIDGE |
|  | PROPOSED PAVEMENT MARKING |  | PARCEL BOUNDARY |



OKEMOS ROAD BRIDGE
IMPROVEMENT PROJECT
ENVIRONMENTAL ASSESSMENT



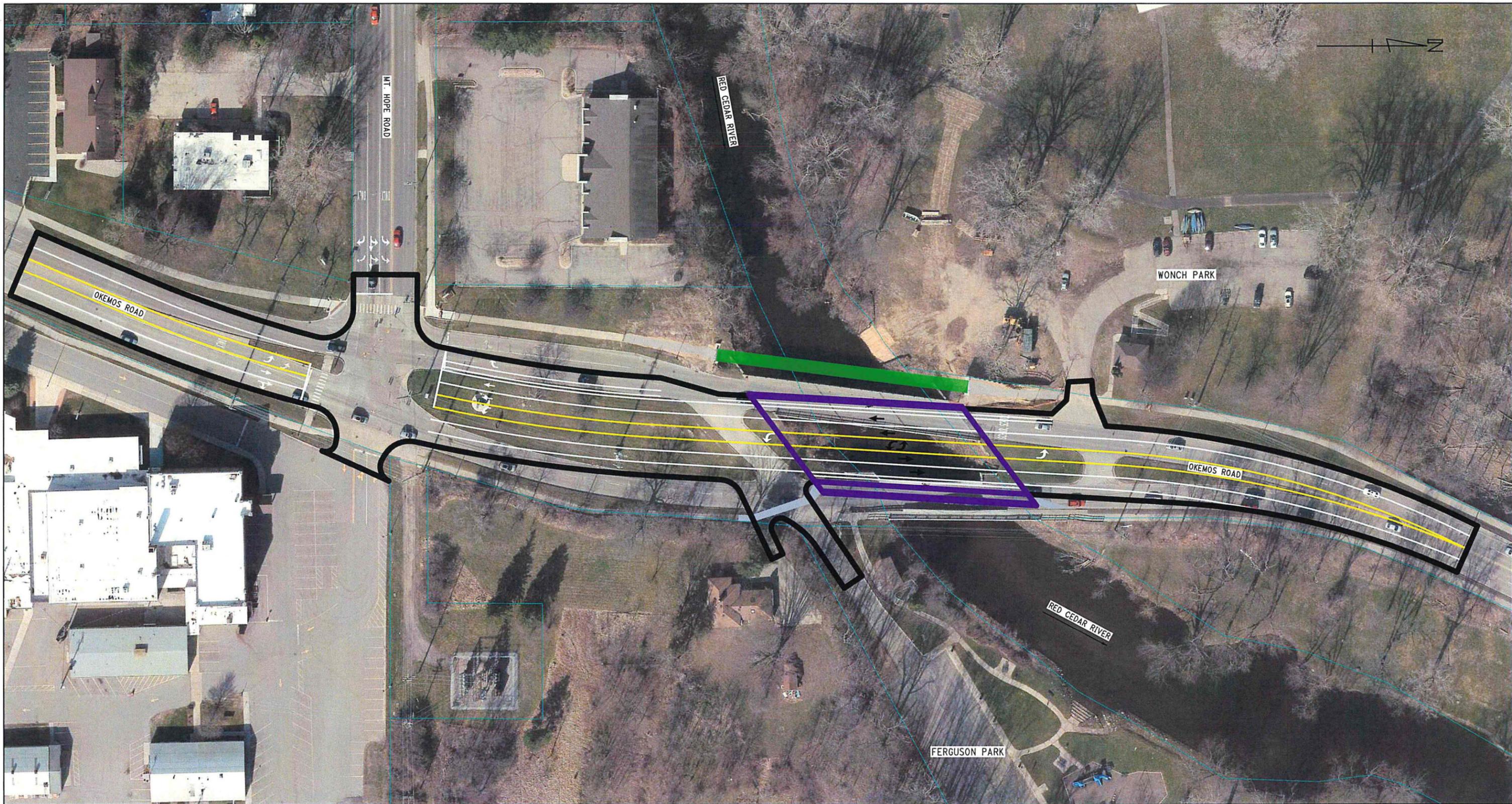
FIGURE 2
ALTERNATIVE 2
BUILD NEW BRIDGE ON NEW ALIGNMENT
(MAINTAIN HISTORICAL BRIDGE)



NOVEMBER 2018

LEGEND

- | | | | |
|---|---------------------------|---|----------------------------|
|  | PROPOSED BRIDGE WORK |  | PROPOSED SIDEWALK |
|  | PROPOSED ROADWAY |  | EXISTING SIDEWALK |
|  | PROPOSED PAVEMENT MARKING |  | EXISTING PEDESTRIAN BRIDGE |
|  | PROPOSED PAVEMENT MARKING |  | PARCEL BOUNDARY |



OKEMOS ROAD BRIDGE
IMPROVEMENT PROJECT
ENVIRONMENTAL ASSESSMENT



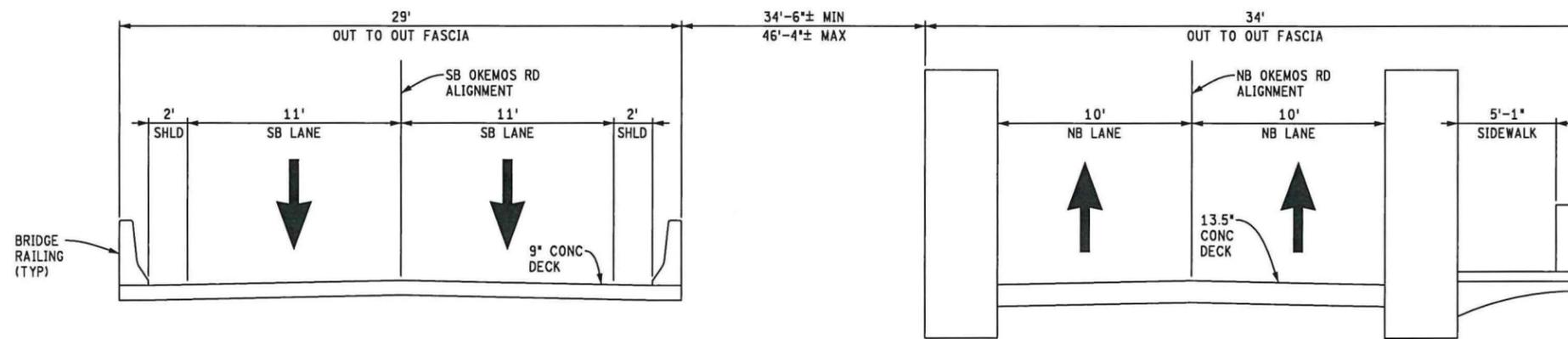
FIGURE 3
ALTERNATIVE 3
BUILD NEW BRIDGE ON NEW ALIGNMENT
(REMOVE HISTORICAL BRIDGE)



NOVEMBER 2018

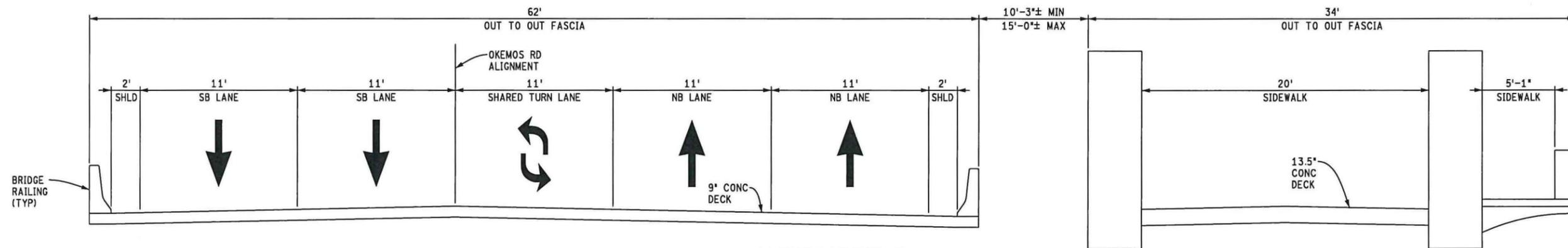
LEGEND

- | | | | |
|---|---------------------------|---|----------------------------|
|  | PROPOSED BRIDGE WORK |  | PROPOSED SIDEWALK |
|  | PROPOSED ROADWAY |  | EXISTING SIDEWALK |
|  | PROPOSED PAVEMENT MARKING |  | EXISTING PEDESTRIAN BRIDGE |
|  | PROPOSED PAVEMENT MARKING |  | PARCEL BOUNDARY |



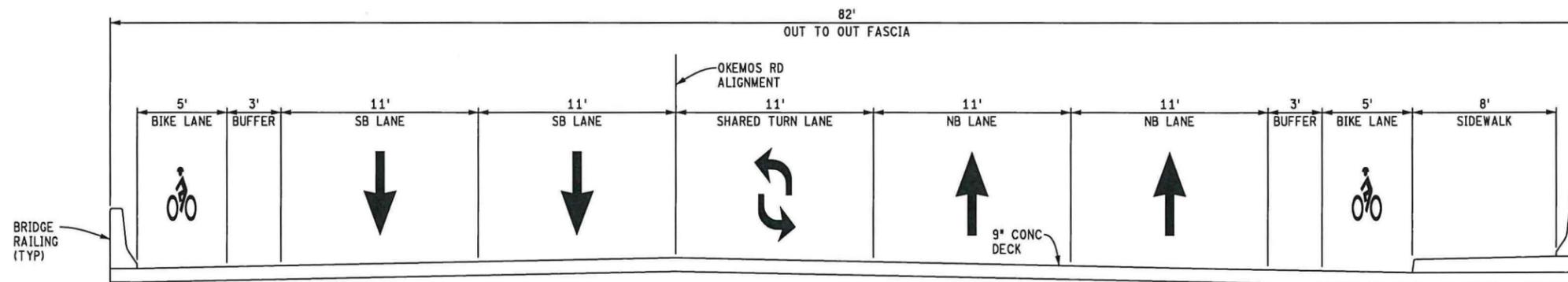
ALTERNATIVE 1

LOOKING NORTH



ALTERNATIVE 2

LOOKING NORTH



ALTERNATIVE 3

LOOKING NORTH

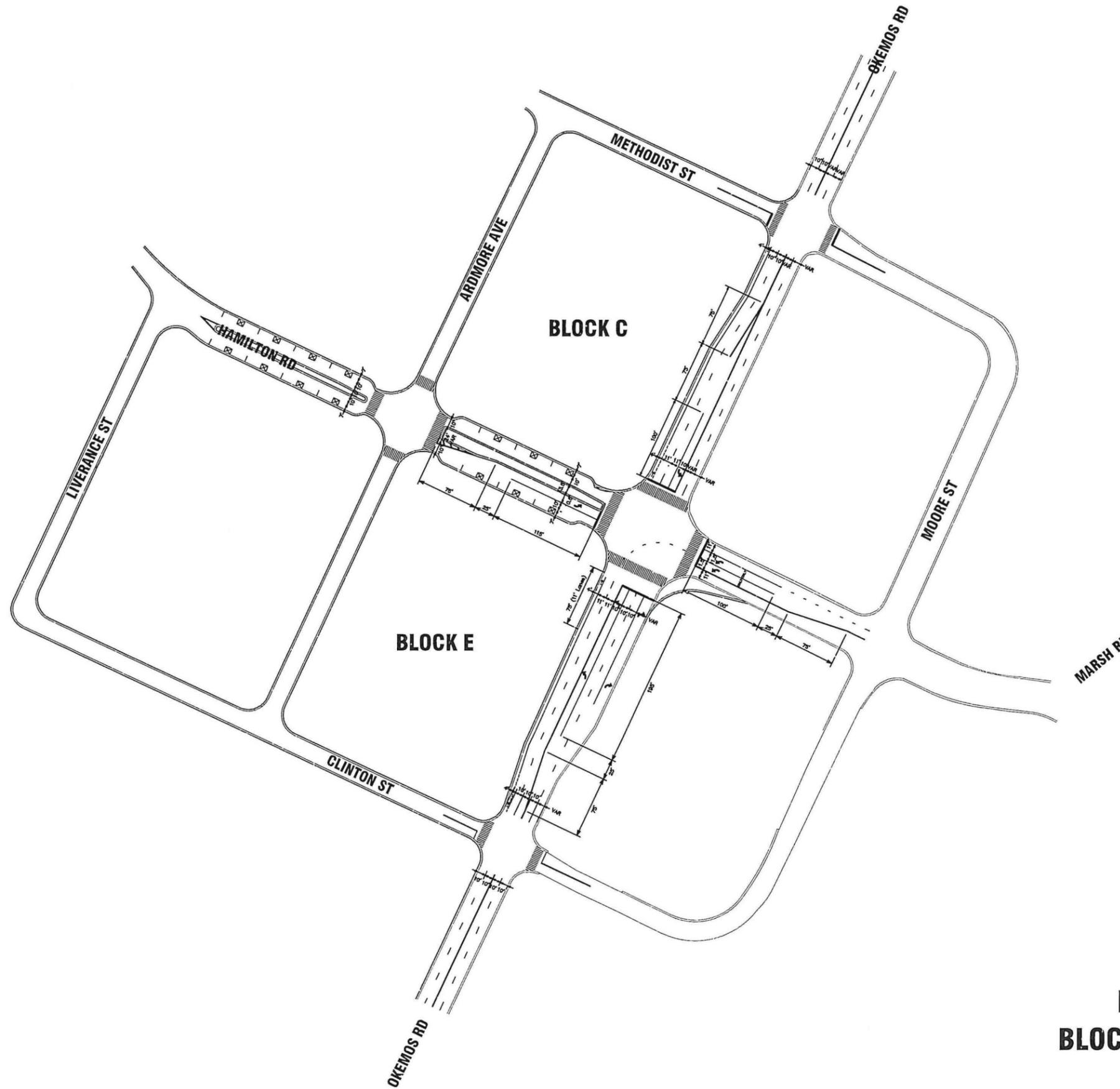
OKEMOS ROAD BRIDGE
IMPROVEMENT PROJECT
ENVIRONMENTAL ASSESSMENT



FIGURE 4
PROPOSED ALTERNATIVE CROSS SECTIONS



NOVEMBER 2018



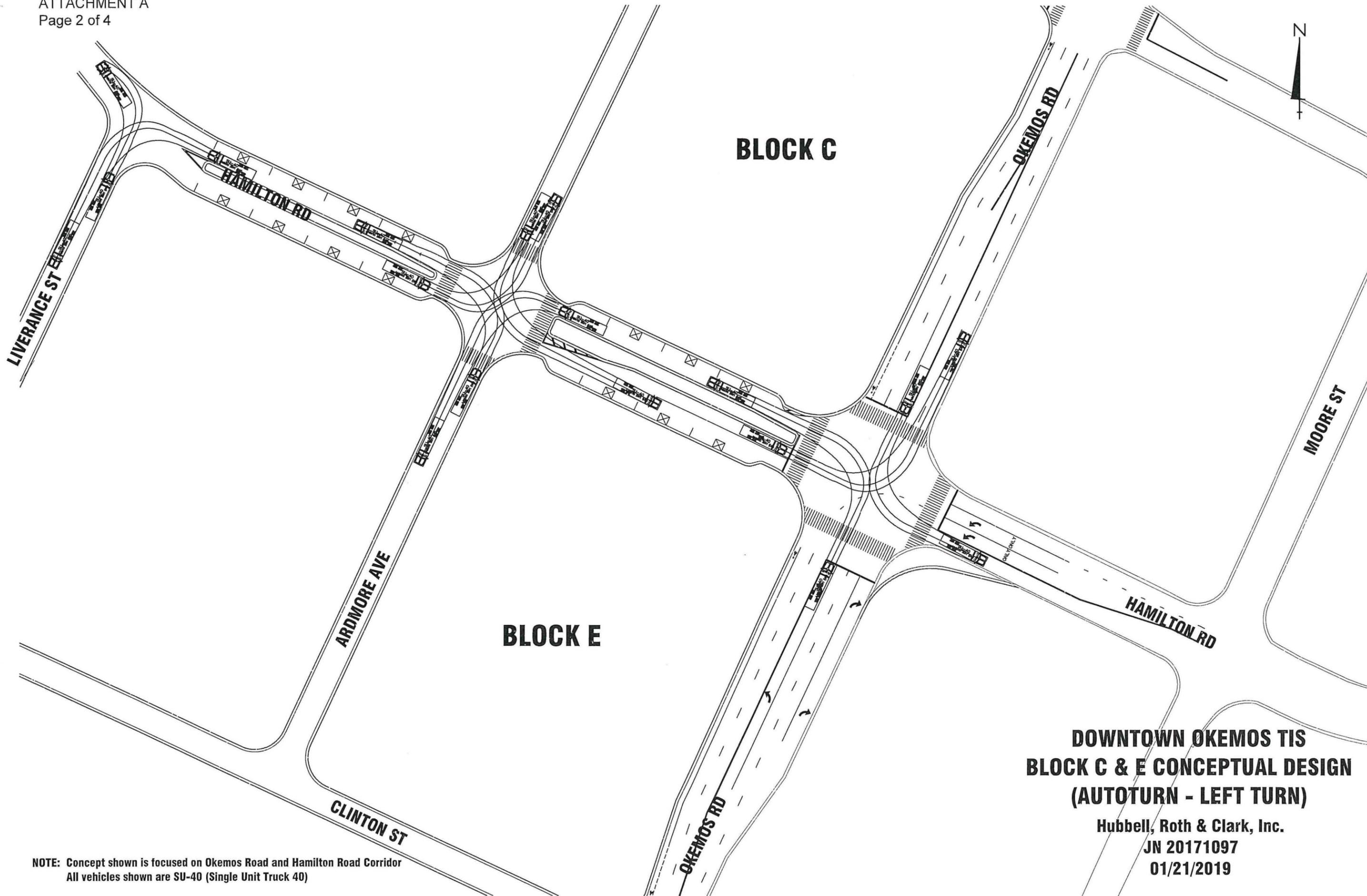
NOTE: Concept shown is focused on
Okemos Road and Hamilton Road Corridor

**DOWNTOWN OKEMOS TIS
BLOCK C & E CONCEPTUAL DESIGN**

Hubbell, Roth & Clark, Inc.

JN 20171097

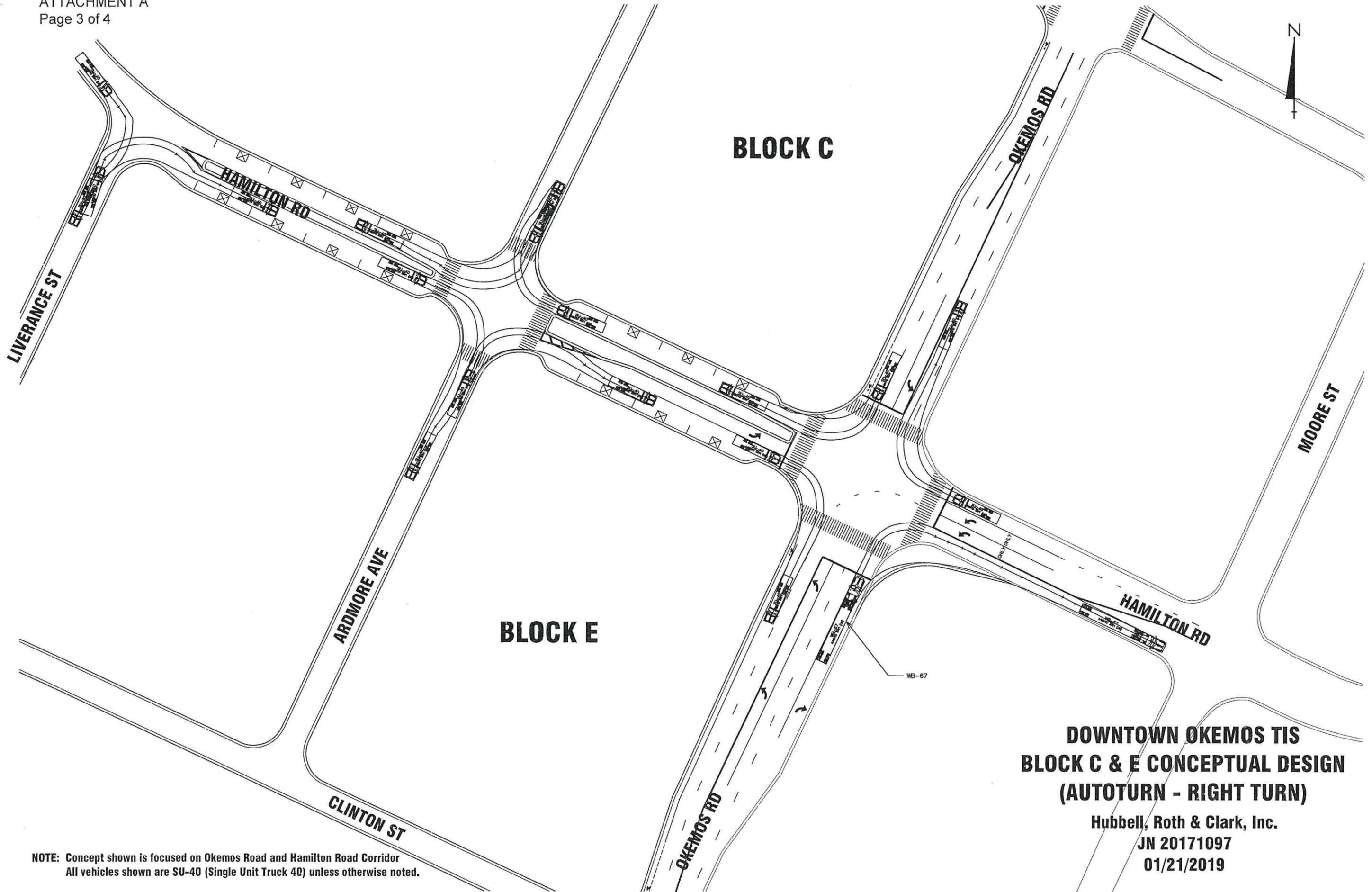
01/21/2019



NOTE: Concept shown is focused on Okemos Road and Hamilton Road Corridor
All vehicles shown are SU-40 (Single Unit Truck 40)

**DOWNTOWN OKEMOS TIS
BLOCK C & E CONCEPTUAL DESIGN
(AUTOTURN - LEFT TURN)**

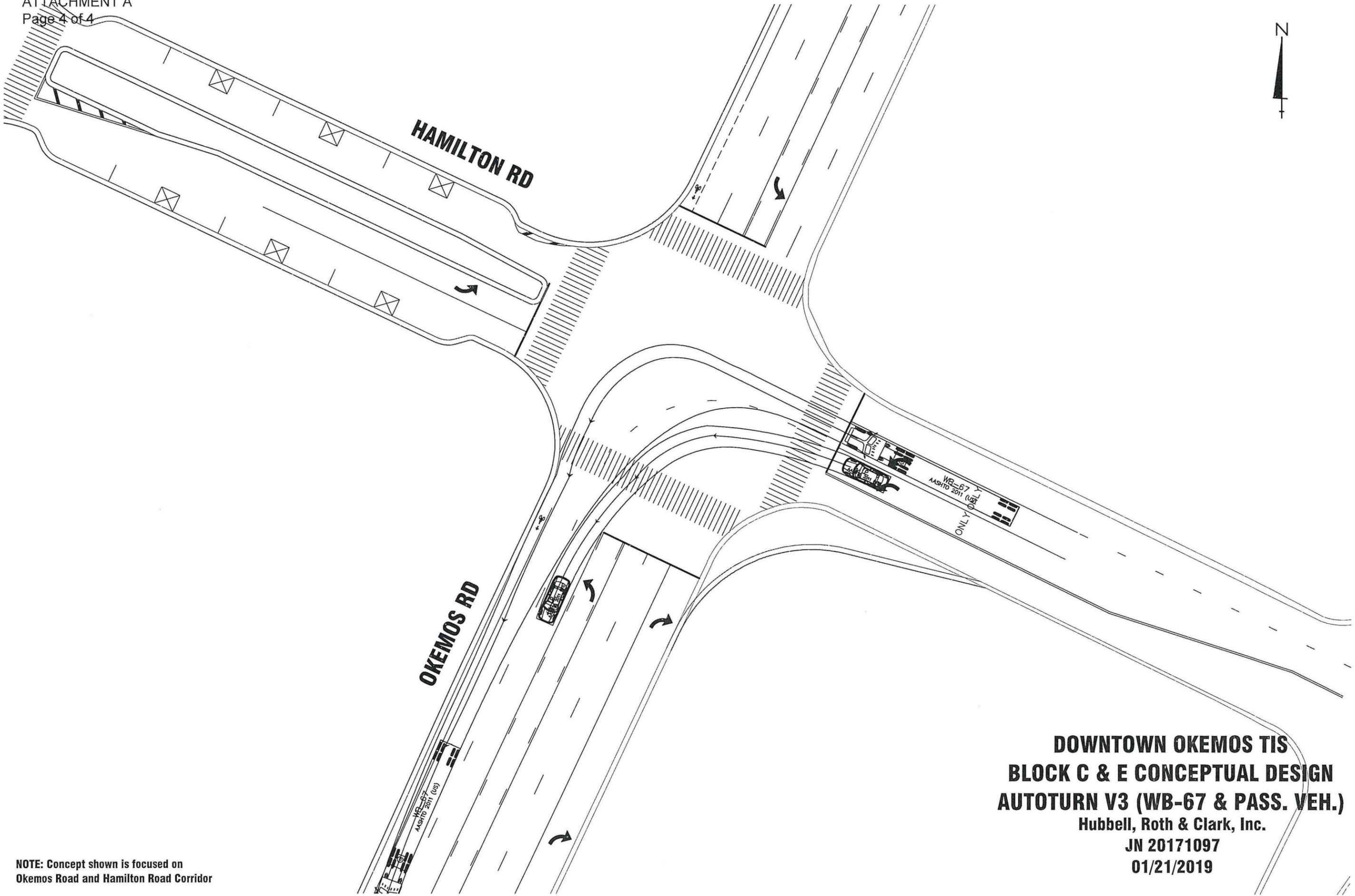
Hubbell, Roth & Clark, Inc.
JN 20171097
01/21/2019



**DOWNTOWN OKEMOS TIS
BLOCK C & E CONCEPTUAL DESIGN
(AUTOTURN - RIGHT TURN)**

Hubbell, Roth & Clark, Inc.
JN 20171097
01/21/2019

NOTE: Concept shown is focused on Okemos Road and Hamilton Road Corridor
All vehicles shown are SU-40 (Single Unit Truck 40) unless otherwise noted.



NOTE: Concept shown is focused on
Okemos Road and Hamilton Road Corridor

**DOWNTOWN OKEMOS TIS
BLOCK C & E CONCEPTUAL DESIGN
AUTOTURN V3 (WB-67 & PASS. VEH.)**
Hubbell, Roth & Clark, Inc.
JN 20171097
01/21/2019