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ASSOCIATES INC.

TECHNICAL MEMORANDUM

DATE: December 4, 2023 – REVISED

TO: John Jerkovich, Heartland Properties

FROM: John Jorgensen, PE, HGM Associates

PROJECT: **Sight Distance Study to widen driveway at 2140 Greenview Road**
Council Bluffs, Iowa
HGM Project Number 109723

A sight-distance study was completed for the proposed widening of the driveway at 2140 Greenview Road. There is currently a 24-foot widen shared driveway approach for 2144 and 2140 Greenview Road. 2140 Greenview Road is currently under construction and the property owners would like to increase the existing driveway approach an additional 12-feet to the west as shown in Attachment A. The property owners contend a wider driveway will improve site ingress/egress, especially for longer vehicles towing trailers.

The City of Council Bluffs indicated that an engineering analysis is needed to determine that a larger driveway approach at this location will not create a safety issue. The two traffic related issues reviewed as part of this engineering analysis are driveway spacing and intersection sight distance.

There are no other driveways on Greenview Road adjacent to this driveway and Eagle Ridge Circle is the closest adjacent intersection, located approximately 300-feet to the east. Based on this information there is no driveway interaction creating visibility or sight distance issues.

The sight distance was reviewed for vehicles turning left or right from this driveway onto Greenview Road. *The 2023 Iowa Statewide Urban Design and Specifications (SUDAS) notes that The AASHTO "Green Book" contains the required procedures, equations, and tables for determining the required sight distance under various intersection and traffic control configurations.* A Policy on Geometric Design of Highways and Streets, 2018 edition, or "AASHTO Greenbook" establishes departure sight triangles for intersections based on design speeds. Greenview Road has a posted speed limit of 35 mph, with a design speed of 40 mph.

*The AASHTO Greenbook states: The determination of whether an object constitutes a sight distance obstruction should consider both the horizontal and vertical alignment of both intersecting roadways, as well as the height and position of the object. In making this determination, it should be assumed that the driver's eye is **3.5 feet** above the roadway surface and that the object to be seen is **3.5 feet** above the surface of the intersecting roadway surface.*

Exhibit "B"

*In addition, the Greenbook states that the vertex (decision point) of the departure sight triangle on the minor road should be **14.5 feet** from the end of the major-road traveled way. This represents the typical position of the minor-road driver's eye when a vehicle is stopped relatively close to the major road.*

Case B1 – Left Turn from the Minor Street and Case B2 – Right Turn from the Minor Street were both reviewed. Adequate sight distance needs to be provided so vehicles from the driveway can enter Greenview Road without impeding through traffic.

Case B1 – Left Turn: A minimum 445-feet of sight distance is required from the study driveway to the west based on a 40-mph design speed. Exhibit B shows graphically that there is over 445-feet of sight distance for left turning vehicles from the driveway.

Case B2 – Right Turn: A minimum 385-feet of sight distance is required from the study driveway to the east based on a 40-mph design speed. Exhibit B also shows that there is over 385-feet of sight distance for right turning vehicles from the driveway. Note that the sight distance is less for right turning vehicles because they don't need to cross over the opposing lane of traffic.

The grade on Greenview Road is approximately 8% going from west to east near the study driveway. The AASHTO Design Manual states that "no adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicles will be on the same grade when departing the intersection."

In addition, driveway ingress, especially for vehicles with trailers, will be improved with a wider driveway approach. It will take drivers less time to exit the through traffic lane on Greenview Drive and they will be less likely to slow up expecting to run over the curb.

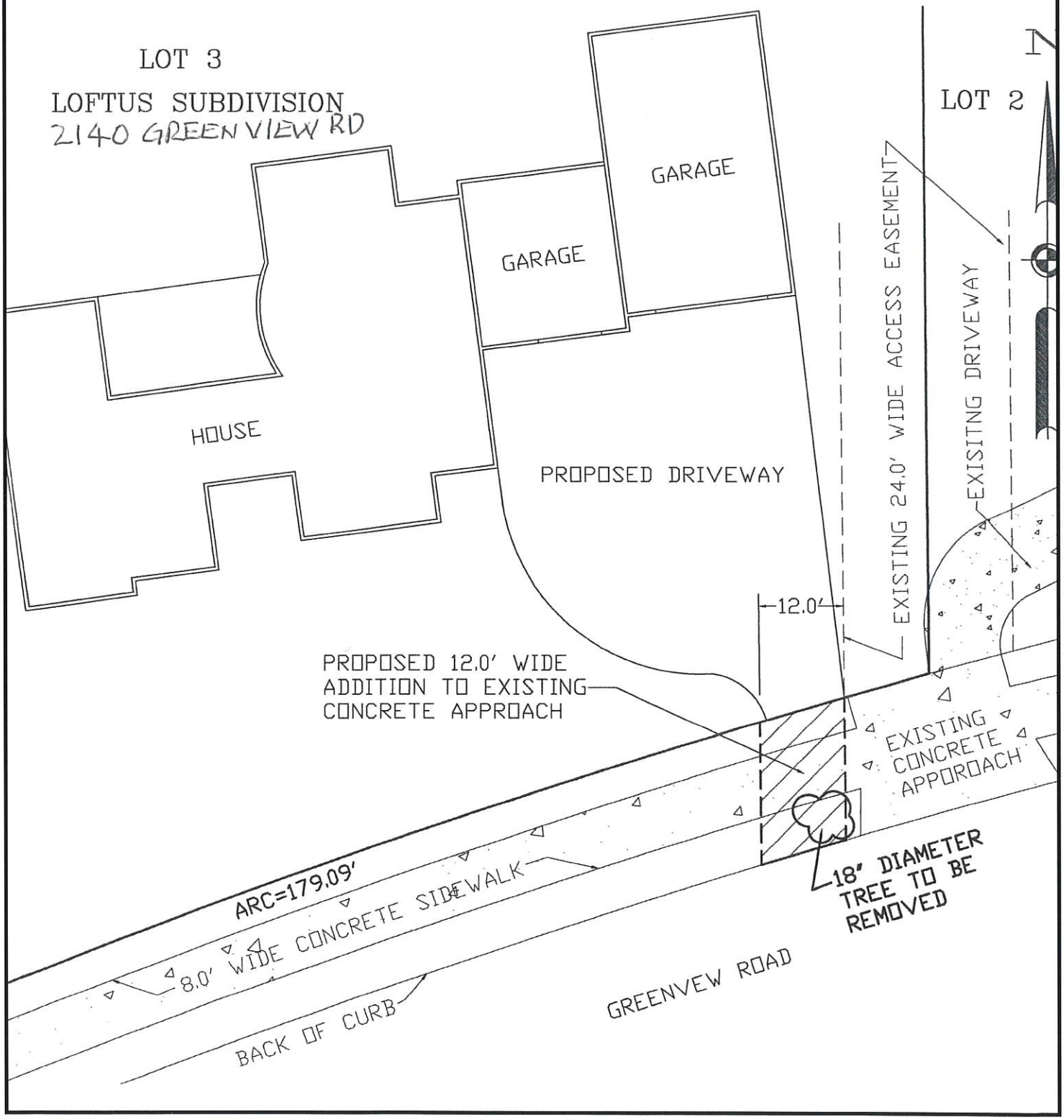
Based on this study, there will be no negative impact from a traffic perspective if this driveway approach is widened 12-feet to the west from 24-feet to 36-feet. The proposed driveway widen will require the removal of a tree in City right-of-way. The property owner will include replacing this tree as part of the driveway work.

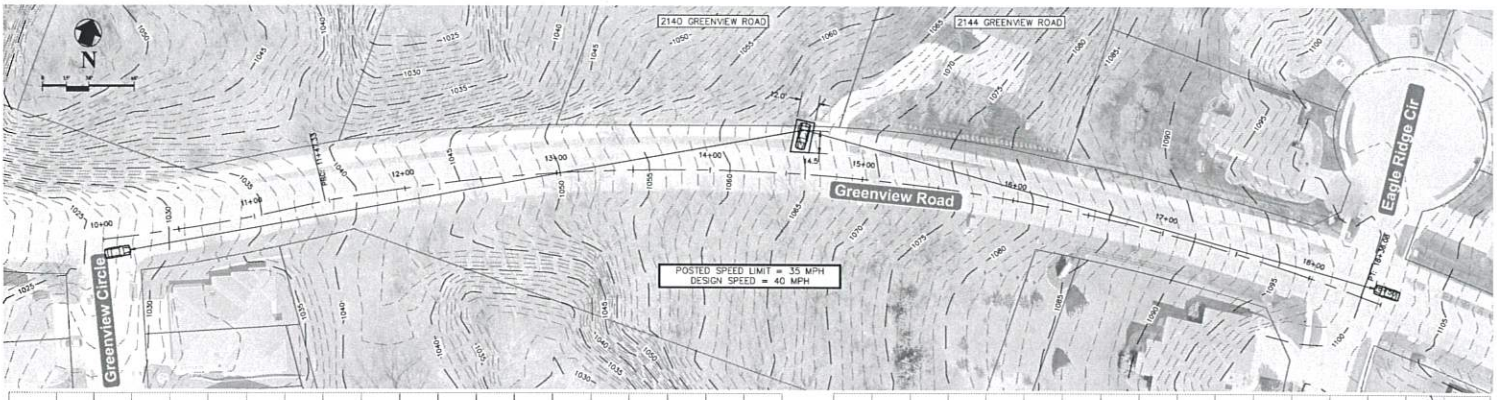
ATTACHMENTS:

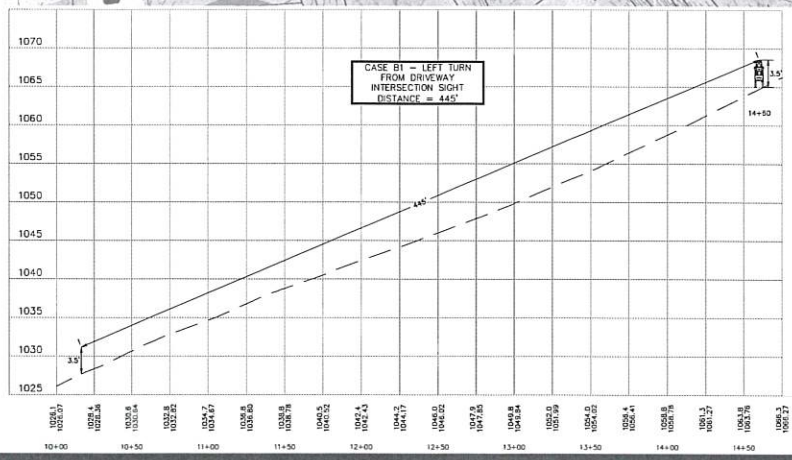
Exhibit A – Proposed 12-foot-wide addition to existing driveway approach.
Exhibit B – Driveway Sight Distance Diagram

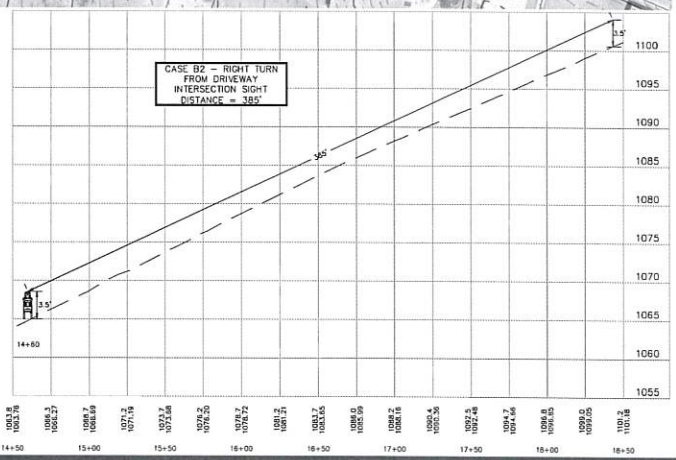
Exhibit A

Proposed 12-foot-wide addition to existing driveway approach









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DEC. 4, 2023 HGM PROJECT #109723

Plan and Profile

2140 Greenview Drive
Exhibit B - Driveway Sight Distance Diagram