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MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

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EXHIBIT #12

RECEIVED
DEC 8 2017
PLANNING BOARD
GRAFTON, MA

December 8, 2017

Grafton Planning Board
Grafton Memorial Municipal Center
30 Providence Road
Grafton, MA 01519

Attn: Mr. Joseph Laydon, Town Planner

Subject: Transportation Peer Review Comments
Retail Motor Fuel Outlet, 88 Worcester Street
Grafton, MA

Dear Joe:

MDM Transportation Consultants, Inc. (MDM) is pleased to provide you with the following transportation review comments for the above-referenced project. These comments have been prepared based on a site visit in December 2017, discussions with you and review of the documents identified below. To facilitate response by Applicant, review items requiring response are noted in ***Bold Italic***.

In summary, MDM finds that the Transportation Impact and Access Study (TIAS) has been prepared in general conformance with industry standards and reasonably quantifies existing/baseline traffic conditions for area roadways, traffic generation characteristics for the Site, and traffic impacts/operations at study intersections. The proposed Site driveway modifications are subject to approval by MassDOT and we note specific comments that Applicant should address under that approval process.

Documents Reviewed

MDM has reviewed the following documents to gain an understanding of the project and determine if industry standards have been applied in determining the potential impacts of the project. The following relevant documents were reviewed:

- *Transportation Impact and Access Study, Retail Motor Fuel Outlet, 88 Worcester Street Grafton, Massachusetts*, prepared by GPI, dated November, 2017.

- *Proposed Site Improvement Plans, 88 Worcester Street, Grafton MA* prepared by MHF Design Consultants, Inc. dated November 7, 2017 as updated through November 13, 2017.

Proposed Development

The proposed site development consists of redeveloping the vacant 2,080 sf BP service station to a convenience store, reconfiguring eight (8) fueling positions within the Site and modifying existing curb cuts along Worcester Street to current MassDOT standards to provide two (2) standard full-access driveways. A total of 18 on-site parking spaces are noted on the submitted Site Plans.

Traffic Impact and Access Study Comments

Existing Conditions

1. *Study Area*: The study area includes the intersecting roadways at Hitchings Road, the Site driveways and driveways serving the Shell station opposite the property. MDM concurs that these study locations are appropriate and in context with the likely traffic impacts for the Project.

2. *Traffic Volumes*: Traffic volumes for study locations were conducted in July 2017 during mid-week AM and PM peak hours. MDM concurs that traffic volumes presented in the TIAS are a reasonable representation of typical/average traffic volume conditions for weekday peak AM and PM peak hours along area roadways, noting that July data is slightly above-average volume month based on nearby permanent count station data published by MassDOT.

The TIAS Appendices includes Saturday count data which indicates that weekday daily and peak hour volumes represent the highest design hour conditions (Saturday daily volumes are 20 percent lower than weekdays; Saturday midday volumes are approximately equal to weekday AM peak hours and are 15 percent lower than weekday PM peak hours). Accordingly, weekday AM/PM operational analysis presented in the TIAS reasonably represent peak travel conditions at study intersections.

3. *Accidents/Crash Data*: The TIAS presents relevant crash data for the study intersections for the period 2010-2014 confirming that crash rates are below statewide and district-level average rates. Likewise, the study locations are not listed as high crash locations on the MassDOT HSIP

crash clusters. MDM concurs with the crash analysis methodology and conclusions as presented in the TIAS.

4. *Vehicle Speeds*: Vehicle speeds presented in the TIAS are derived from automatic traffic recorder (ATR) counts conducted by an independent third-party vendor. MDM concurs with the methodology used to calculate average and 85th percentile travel speeds along Worcester Street, and which serve as the basis for calculating intersection sight line criteria. The reported travel speed data are also generally consistent with field observations conducted by MDM in December 2017 under non-peak travel conditions.

5. *Sight Distances*: Measured minimum sight distance requirements for the proposed driveways exceed minimum values required for measured 85th percentile travel speeds following AASHTO guidance. MDM concurs with these calculated minimum distances.

Applicant should identify the sight line triangles on updated Site Plans with notes that no plantings, snow storage or other features exceed a height of 2 feet above grade within these sight line areas.

Future Conditions

6. *Traffic Growth*: Future traffic volumes are projected to a 7-year horizon using 1 percent annualized growth. Re-occupancy of the service station is also assumed under this scenario. MDM concurs that this growth factor and Site rec-occupancy is consistent with protocols customary to the industry and present a reasonable basis for estimating "No Build" traffic volume conditions for purposes of the Project TIAS.

7. *Trip Generation*: Trip estimates for the Project are appropriately based on characteristics published by the Institute of Transportation Engineers (ITE) in *Trip Generation* 9th Edition for Gasoline/Service Station with Convenience Market, Land Use Code (LUC) 945. Application of "pass-by" trips in accordance with ITE standards results in a total net new traffic activity level of approximately 81 to 108 total vehicle-trips during weekday peak hours. MDM finds that this represents a reasonable estimate of traffic activity for the Site and is generally in line with observed trips activity for the Shell station and convenience mart opposite the Site.

As an additional point of reference, MDM also reviewed the recently published 10th edition of ITE *Trip Generation*, which categorizes the proposed use as more in line with LUC 853 – Convenience Market with Gasoline Pumps. Application of trip rates based on building size

(2,080 sf) results in similar trip activity (84 to 103 vehicle-trips total during weekday peak hours).

8. *Trip Distribution:* Regional trip patterns for Site traffic presented in the TIAS are reasonably consistent with existing travel patterns on area roadways. The overall assignment of trips to area roadways presents similar trip activity to "No Build" conditions and presents a reasonable estimate for analysis purposes.

9. *Operations Analysis:* Operational analyses are presented in the TIAS follow generally accepted traffic engineering practices and protocols, indicating ample capacity at study intersections to accommodate Project trip increases. Trip increases due to the Project are not expected to materially change operations or delays relative to "No Build" conditions with nominal delays and level-of-service (LOS) B or better operations on Worcester Street during peak hours. However, longer delays are expected for vehicles exiting the Site (LOS E/F operation during weekday peak hours). Associated vehicle queuing will occur on-site will be up to several vehicles at the easterly driveway during peak hours; however ample storage area is available within the Site to accommodate queues without unduly impacting circulation.

Access/Circulation Comments

11. *Access/Site Circulation:*

(a) The Truck Turn Plan dated November 7, 2017 confirms that the largest vehicle type (tanker trucks) are accommodated within the Site; Applicant should confirm that canopy height is sufficient to accommodate these vehicles.

(b) Driveway layout appears to generally conform to MassDOT commercial driveway standards and MDM concurs with the location and alignment of the curbed openings relative to the fuel pump apron; however, design modifications are recommended to facilitate pedestrian access at the curb cuts. Applicant should consider a consistent sidewalk grade across the curb cuts which would eliminate the need for ramps (see attached detail). This design would also better define the roadway gutter line and would promote better drainage patterns.

(c) Field observation (see attached photos) indicates that puddling occurs along the Site frontage on Worcester Street; adjustment of roadway grades and catch basins is necessary to address this puddling issue. The Site Plan (Grading, Drainage and Utilities Plan) should show

appropriate adjustments for drainage structures including conversion of the existing catch basin within the proposed sidewalk alignment to a manhole that connects to a gutter inlet/catch basin along the driveway gutter line.

(d) Pavement markings to MassDOT standards should be identified on the Site Plan.

MDM appreciates the opportunity to provide Transportation Planning & Engineering Services to the Town of Grafton. If you have any questions or concerns, please feel free to contact this office.

Sincerely,

Robert J. Michaud, P.E.
Managing Principal

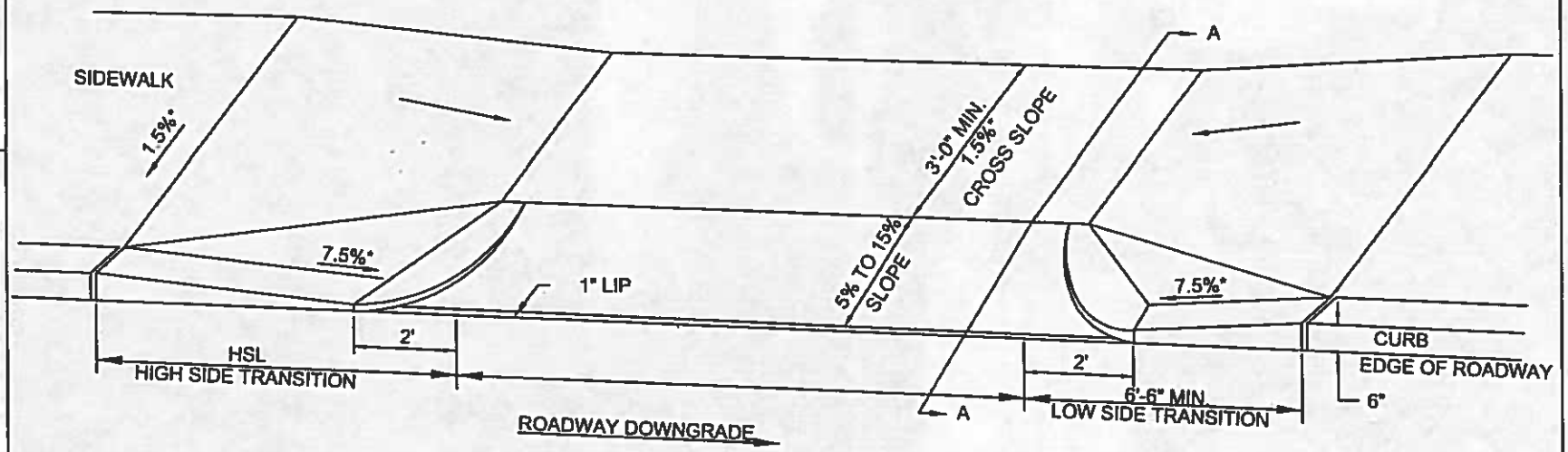
Attachments

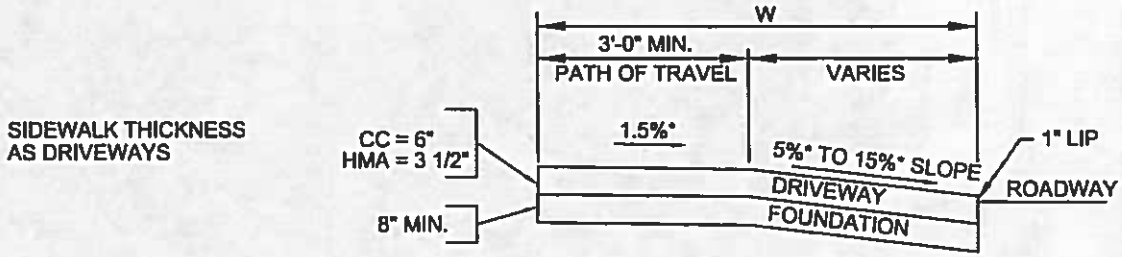
- MassDOT Detail: Sidewalk Through Driveway with Curb Return
- Photos: Drainage puddling at Site Driveways

massDOT Highway Division

CONSTRUCTION STANDARDS

SIDEWALK THROUGH DRIVEWAYS WITH CURB RETURNS 2' CURB CORNERS





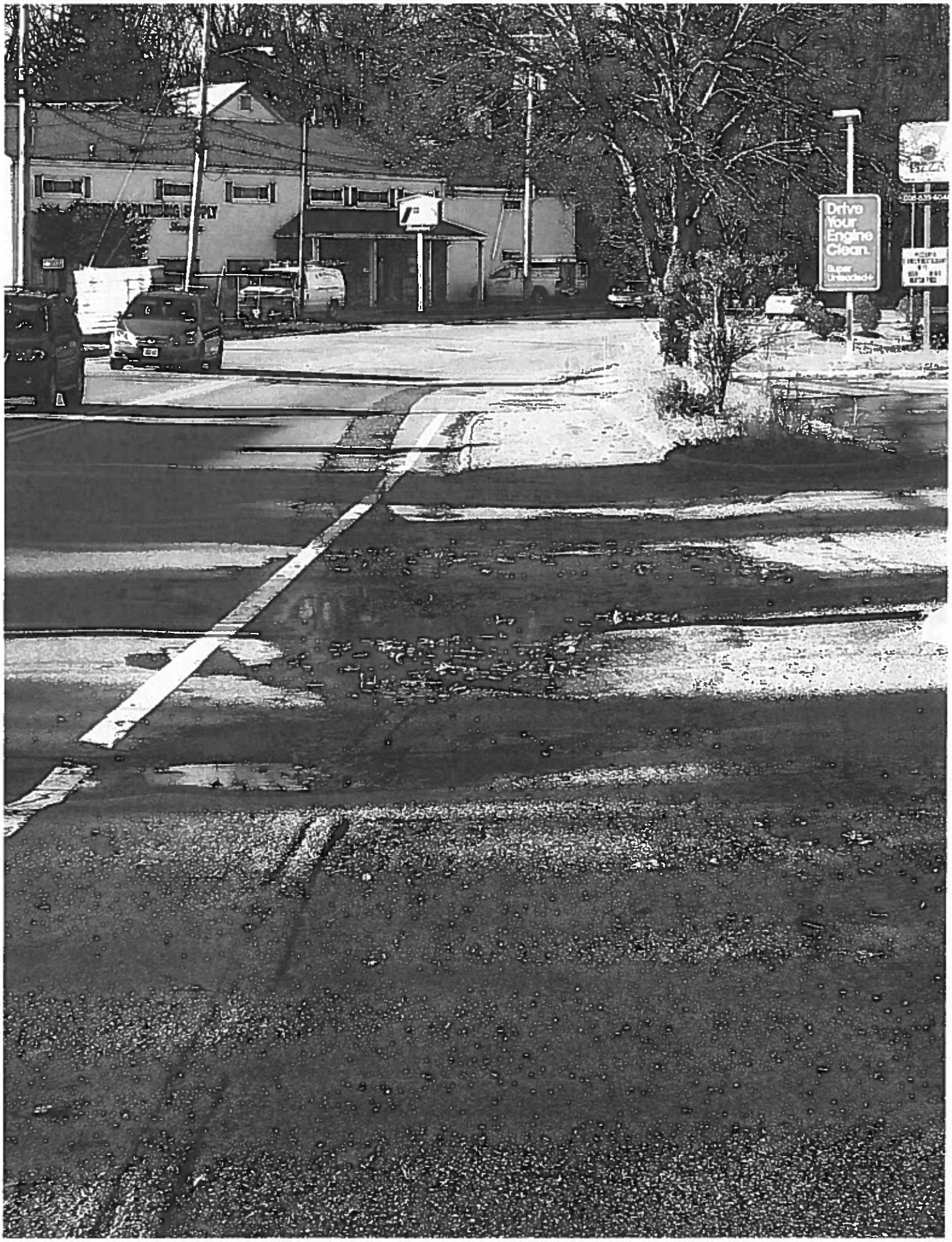
SECTION A-A

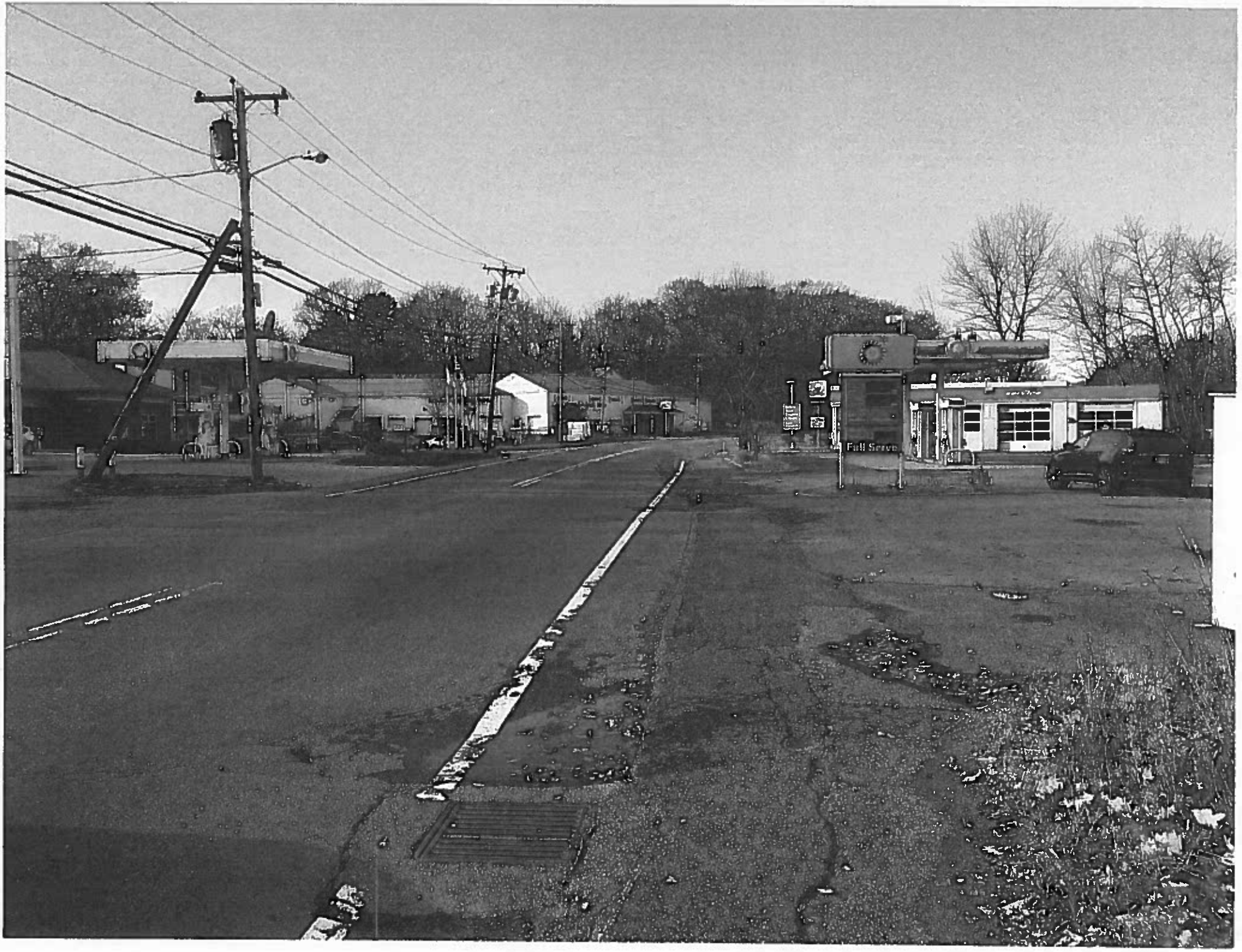
LEGEND

HSL = HIGH SIDE TRANSITION LENGTH. SEE E 107.9.0
W = SIDEWALK WIDTH
* = TOLERANCE FOR CONSTRUCTION ±0.5%
CC = CEMENT CONCRETE
HMA = HOT MIX ASPHALT

DATE OF ISSUE
OCTOBER 2017

DRAWING NUMBER
E 107.8.0


Drive
Your
Engine
Clean.


Full Serve