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June 12, 2017

Mr. William Nemser
Town Planner
195 Main Street
Maynard, MA 01754

Subject: Response to Peer Review Comments
Off-Site Mitigation Roadway Plans
Maynard Crossing – 129 Parker Street

Dear Mr. Nemser:

Green International Affiliates, Inc. (Green) has reviewed the comments prepared by Vanasse Hangen Brustlin, Inc. (VHB), dated May 2, 2017, regarding their review of the Draft Final Plans and Specifications for off-site mitigation of the Maynard Crossing project at 129 Parker Street. This letter provides a response to those comments. For ease of reference, each comment has been repeated followed by Green's response.

Parker Street (Route 27) Plans

Typical Sections

Comment 1 Do not extend the baseline through the crown - show courses as continuous.

Response Baseline has been trimmed on typicals.

Comment 2 Consider a half section to show the retaining wall. Will a CLF be necessary?

Response A half section depicting the retaining wall with a CLF has been added to the plans.

Comment 3 Verify Parker Street STA 4+35-5+32 has a varying cross slope.

Responses Cross-slope is constant, typical has been updated to read 2%

Comment 4 Parker Street STA 12+14-14+47 shows quite a bit of mill depth. Verify there is adequate existing pavement. Should the shoulder break in this superelevated section?

Response The typical has been updated as milling was not as deep as shown. A decision to not break the shoulder was made to in order prevent additional stormwater runoff being directed to the abutters along the east side of Parker Street.

Construction Plans

Comment 1 Consider eliminating the gap in mill/ overlay from STA 3+00 to STA 4+35.

Response Roadway has been repaved in last couple of years, and is in good condition, therefore mill and overlay is not necessary in this area.

Comment 2 Thaw and label historic baseline.

Response There is no historic baseline available for this roadway, the existing centerline was mislabeled as Historic Baseline on the Typical Sections and has been corrected on the Final Plans.

Comment 3 Show limit of HMA drive/ Full Depth pavement.

Response Lines have been added to the plans to clearly delineate between driveway and roadway.

Comment 4 Identify limits of guard rail and end treatments.

Response Stations limits, callouts for terminal ends and radius labels for curved sections have been added to the plans to facilitate layout the guardrail.

Comment 5 Better define limits of curb

Response Begin and end stations for edge treatments have been added to the plans

Comment 6 Label side streets.

Response Missing side street labels have been added to the plans.

Comment 7 Fix the view at the northerly project limit.

Response Viewport has been adjusted to show limit.

Comment 8 Add sidewalk from STA 9+50 continuing to the north to South Street.

Response Proposed sidewalk on the east side of Park Street in that area has been incorporated into the plan set.

Comment 9 Both the westerly portion of the reconstructed Parker Street and the westerly frontage sidewalk are located within the 129 Parker Street property and outside of the town-controlled roadway layout. A no-harm land donation will be required from the applicant so that both the roadway and sidewalk are located entirely within the Town of Maynard Parker Street public street layout. The 129 Parker Street project's compliance with zoning setbacks and other zoning criteria should be reviewed and discussed relative to this modified property line.

Response The applicant will discuss with the Town to determine the specific nature of the agreement to allow the Town of Maynard full access for maintenance and other activities required for the proposed Parker Street roadway. Compliance with all zoning criteria is being reviewed as part of the site plan approval and peer review process for the project site.

Profiles

Comment 1 Label all grade breaks.

Response Missing PVIs have been added to the profiles.

Curb Tie & Grading Plan

Comment 1	Go to the tenth when providing ties to match existing.
Response	Precision of offset labels where proposed meets existing has been adjusted to 0.1 ft.
Comment 2	Consider labelling the pcs, pts, etc.
Response	Curve data and ties have been provided, labeling of pcs and pts along edge of road would clutter the plans and are not necessary to layout the geometry.
Comment 3	No grading has been provided on these sheets. Consider adding some spot elevations, cross slopes.
Response	Cross-slopes at critical stations have been added to the grading plans.
Comment 4	Label baselines.
Response	Construction baseline has been labeled.
Comment 5	L109 has a bearing parallel to the baseline, yet the two offsets are not the same.
Response	Offset dimension has been fixed to show 12.50' distance from baseline to PT of curve along north edge of Northern Site Drive. Line label has been removed as intent is to match into existing, making bearing unnecessary.

Drainage & Utility Plans

Comment 1	Label DMH (1) on sheet 15.
Response	Label has been added to plans.
Comment 2	Check for utility conflicts (for example DMH 4).
Response	The drainage design has been modified to avoid conflicting underground utilities.
Comment 3	The size of the existing outlet pipe (where DMH (1) is proposed) should be labelled on the existing conditions plans.
Response	Size label has been added to the basemap.
Comment 4	Wetland resource areas and buffer lines should be shown on the drainage & utility plans.
Response	Resource area and buffer lines have been thawed, and are now visible on plans.
Comment 5	There is a significant amount of impervious area (on the order of 10,000 sf) being added as part of the proposed roadway improvements. Drainage appears to be collected in standard catch basins and conveyed in an existing trunk line system prior to discharge to a wetland resource area, which is classified as a Zone II, with no water quality treatment besides deep sump catch basins. Documentation should be provided to prove the proposed project's stormwater management system is designed in compliance with the Massachusetts Stormwater Handbook standards. This information should be included in the Notice of Intent filing with the DEP and the Town. Copies of this NOI filing shall be filed with the Planning Board as well, consistent with the intent of the projects MOA.
Response	As it stands today a portion of Parker Street adjacent to the development drains into an existing trunk line and discharges to said wetland system with little to no treatment.

This wetland system acts as a swale and conveys runoff to the existing basin on site. The project improvements will add additional impervious surface to Parker Street due to the roadway widening and turn lane addition. This area will drain into deep sump catch basins and discharge to the same location under existing conditions and be conveyed to the basin at the center of the site. This basin will be modified to function as a wet basin and include the installation of a forebay for pretreatment. Stormwater from this basin will discharge through a Vortechs treatment unit for additional TSS removal prior to discharge into the wetlands at the rear of the site. It should also be noted that the treatment train will be providing enhanced treatment for all of Parker Street that drains onto the site and not just the increased impervious area. This will provide a substantial improvement over existing conditions.

The revised Site Development Plans and Drainage Report prepared by Bohler Engineering have been submitted to the Commission for review. These documents contain information about the project's compliance with the Stormwater Handbook Standards.

Comment 6 Is outlet protection required at the new drainage outlet? Calculations documenting the outlet protection analysis should be included.

Response Stone for pipe ends has been added to the design at this location to provide energy dissipation at the outlet. This is consistent with MassDOT standard practices for pipes of 24 inch diameter or less.

Comment 7 A hydraulic analysis of the closed piping system should be completed to confirm that the existing trunkline to remain and the proposed closed piping infrastructure conveys the required design storm event without potential issues. Inlet capacity and spread calculations should also be included.

Response The hydraulic calculations are attached.

Comment 8 It appears that the project will result in the filling of a wetland resource area. It should be noted that permitting with the Army Corps of Engineers, in addition to the Maynard Conservation Commission and Mass DEP, may be required. Copies of these permit submissions and approval should be provided to the Town.

Response The proposed wetland alteration constitutes the filling of a "Water of the United States," and therefore the activity is subject to Clean Water Act permitting with MA DEP and ACOE. The necessary permits/applications/certifications from DEP and ACOE as follows:

1) Pursuant to 314 CMR 9.03, the project proposes the filling of less than 5,000 s.f. of resource areas, therefore a valid Order of Conditions would serve as the required 401 Water Quality Certification (WQC) from DEP.

2) Pursuant to the Army Corps MA General Permit (effective 2/4/15), the project is eligible for "Self-Verification" notification. Prior to the start of construction, Maynard Crossings JV, LLC will complete the "SVNF" form, then the project may proceed without further verification/action necessary from the Corps.

Comment 9 An oil separating hood should be incorporated into the double grate catch basin detail.

Response The detail has been revised to specify hoods for all new catch basins.

Pavement Marking and Signing Plans (Sheets 20 through 22 of 43)

Comment 1	Provide an additional crosswalk with RRFB assemblies on Parker Street at Old Marlboro Road near STA 3+00. Add curb cuts. For this and the RRFB assembly proposed near STA 17+00 passive actuation should be considered as opposed to the current push-button actuation (which could result in pedestrians expecting Parker Street traffic to be facing a red signal indication).
Response	A Crosswalk and RRFB at this location have been incorporated into the plans. Pushbutton activation was chosen to avoid false pedestrian detection (by pedestrians walking along Parker Street but not crossing) and to be consistent with the pushbutton-activated RRFBs installed along the Assabet River Rail Trail, also in Maynard.
Comment 2	Provide pavement marking dimensions and stations.
Response	Stations and dimensions for pavement markings have been added to the plans.
Comment 3	Define length and spacing of DWLEx.
Response	Length and spacing of DWLEx has been shown on the Legend Sheet.
Comment 4	Consider a painted island on driveway if raised island is being removed.
Response	A mountable island is proposed in this area. This was previously shown on the Site Plans prepared by Bohler Engineering, and has now been added to the Parker Street plans for consistency.
Comment 5	Define SYGL.
Response	Solid Yellow Gore Line has been added to the Legend Sheet.
Comment 6	Consider MA-R10-12A sign (Left Turn Yield on Flashing Arrow) on mast arm next to signal head A.
Response	The MA-R10-12a sign has been added to the plans.
Comment 7	Consider additional ARROW and ONLY in exclusive right-turn lane near STA 10+00 LT.
Response	Additional ARROW and ONLY pavement markings have been added to the right-turn lane.
Comment 8	Add a crosswalk, ped heads, and curb cuts on the north side of the site drive (STA 9+50).
Response	These items were made necessary with the addition of proposed sidewalk along east side of Parker Street in this area, and have been added to plans.
Comment 9	Break DBYL at B Street.
Response	A break has been added to DBYL pavement markings at B Street.
Comment 10	Provide crosswalk signs at proposed crosswalk at STA 14.
Response	The signage near STA 14+00 has been corrected to show the existing pedestrian crossing signage for the crosswalk at STA 14+00.
Comment 11	Rectify bicycle signage near STA 14+00 on both sides of Parker Street
Response	The signage near STA 14+00 has been corrected to show the existing pedestrian crossing signage for the crosswalk at STA 14+00.

Comment 12 Suggest a detail and items list for RRFB assemblies.

Response Specifications have been written for the RRFB assemblies. A list of items is included in the specifications.

Comment 13 Fix overlapping "B Street" label.

Response Extra street label has been removed.

Traffic Sign Summary (Sheet 23 of 43)

Comment 1 Check size of R3-7R sign.

Response The size of the R3-7R sign has been corrected in the plan.

Comment 2 Check size of R10-11 sign.

Response The size of the R10-11 sign has been corrected in the plan.

Comment 3 Suggest adding Yellow or Fluorescent yellow-green to pedestrian and bike signs for clarification.

Response Bicycle and pedestrian warning signage has been specified to have fluorescent yellow-green backgrounds.

Comment 4 Consider using MassDOT MA-W16-19p sign in lieu of W16-10.

Response A W16-10P sign is a symbolic "photo enforced" sign, and was never being proposed. We believe that the comment included typo and was suggesting the use of a MA-W16-19p ("ON ROADWAY") plaque in place of the proposed W16-1P ("SHARE THE ROAD") plaque. The latest design plans continue to propose a W16-1P plaque in conjunction with the W11-1 (bicycle warning signs) at the location where the NB and SB bicycle lanes end. This is consistent with MUTCD Section 2C.60.

Comment 5 Verify size of street name sign and consider using larger size. SOUTH ST should read South St to follow the latest MUTCD standards.

Response A 12-inch street name sign is now proposed for the South St sign.

Traffic Signal Plan (Sheets 24 and 25 of 43)

Comment 1 Symbols do not match those shown on the Legend on Sheet 2.

Response The Legend has been revised to reflect the symbols used in the Traffic Signal Plan.

Comment 2 Suggest rotating the traffic control cabinet such that the technician is facing traffic.

Response Cabinet has been rotated on plans to allow technician to face traffic while accessing cabinet.

Comment 3 Backplates should be non-louvered to be in accordance with current MassDOT standards.

Response Signal heads have been specified to have non-louvered backplates in the traffic signal plan.

Comment 4 Verify yellow and red clearance intervals are in accordance with MassDOT standards.

Response Clearance timings have been verified. Calculations are attached to this letter.

Comment 5 The private residence at #130 Parker Street needs to be included in the signal operation. Vehicle detection and signal heads facing this driveway need to be added.

Response Video detection zones, signal heads, and a separate signal phase have been added to the plans for the driveway for #130 Parker Street.

Comment 6 The proposed location of the mast arm at STA 9+49.58 should be reviewed relative to the adjacent utility pole and potential sidewalk clearance constraints. The mast arm may need to be shifted slightly north or south from its currently proposed location.

Response The mast arm has been relocated, to also account for the addition of the sidewalk along the east side of Parker Street.

Traffic Management Plans (Sheets 29 and 31 of 43)

Comment 1 Verify taper lengths are appropriate for speed of roadways.

Response Taper lengths have been checked and updated based on design speed and width of shoulders and lanes.

Comment 2 Consider additional information on advisory speed plaques.

Response Specific speed values have been added to the advisory speed plaques depicted.

Construction Details

Comment 1 Box widening details show two courses of pavement in the mill & overlay.

Response Detail has been modified to show one course for mill and overlay.

Comment 2 Verify gutter slopes/ transition lengths on the curb cut details.

Response Gutter slopes and transition lengths have been verified and updated as needed.

Comment 3 Clarify location/ size of level landing on the Perp CC Ramp from Level Landing Tangent Section details. Note max slope on the ramp to the gutter, Define length of curb transitions. Set detectable warning panel (DWP) back 6” from gutter.

Response DWP has been moved back 6” from edge of road, and transition lengths adjacent to sidewalk have been removed since there is sufficient length for full transition to occur between roadway edge and level turning area. This is similar to MassDOT Std. detail E107.3.0 “Wheelchair Ramps Greater than 12’-4” Sidewalk”.

Comment 4 Transition length on the Straight-Approach Perp CC Ramp detail can include the DWP. Set DWP 6” back from gutter. Why is a level landing required at top of the ramp? Define length of curb transitions.

Response DWP has been move back 6” from edge of road, and level landing at top of ramp has been removed since no turning is required to access ramp from walk.

Comment 5 The driveway detail can include the DWP as part of the transition lengths. Verify curb to be placed across the Pedestrian Access Route.

Response "The Continuous Direction of Pedestrian Travel WCR" has been modified to remove granite curb across pedestrian access route and to show 3 ft min. opening occurring closer to edge of roadway which in turn shows DWP falling within transition length.

Comment 6 Add wall profiles. Confirm the adequacy of the wall to support the adjacent roadway.

Response Wall elevation has been added to the typical sections. To provide construction flexibility and cost savings, the wall will be designed by the contractor. Contractor will provide shop drawings with supporting soil conditions analysis and design calculations.

Parker Street Specifications

Comment 1 Item 767.12 references a wedge of compost on top of the filter tube that is not shown on the detail.

Response Detail has been modified to show wedge of compost with callout.

Comment 2a Item 815 – Should pad in front of control cabinet connect to sidewalk for accessibility?

Response This is not necessary. It is noted that a clear area for cabinet accessibility will be coordinated with the landscape architect.

Comment 2b Item 815 – Consider painting mast arms and cabinet in addition to posts

Response Painting the mast arms and cabinet black has been added to the specifications.

Comment 3a Item 815.11- Suggest providing initial timing for flash duration

Response An initial flash cycle and timing sequence has been added to the specifications.

Comment 3b Item 815.11 - Should posts be painted black?

Response The posts have been specified to be painted black.

Comment 4 Item 866.112 – Reference is made to Imprinted Crosswalks but there's nothing shown on the plans

Response Reference to imprinted crosswalks has been removed from specifications.

Old Marlborough Road and Parker Street Plans

Construction Plans

Comment 1 Some of the pavement appears to be in poor shape. Verify that it can be milled and overlaid. The Town has a Pavement Management Program in place and can share the Streets, Pavement Condition Index if requested.

Response Full depth reconstruction or reclamation over these small areas would not be cost effective. Item 482.17 Hot Applied Asphaltic Crack Filler (CMCR) has been added to the contract for use on the milled course, prior to resurfacing, to prevent reflection of cracks through the overlay. These areas should undergo full depth reconstruction at the same time as the remainder of the roadway as part of the town's overall pavement management program.

Comment 2 Verify that no edge treatments are required.

The decision to provide no edge treatments was based on the following: The proposed geometry maintains or narrows the existing pavement in these areas, existing drainage patterns are retained, no existing drainage issues have been identified.

Comment 3 The Old Marlboro Road/Marlboro Street intersection should be reconfigured so that the existing general straight alignment of Marlboro Road with the southerly leg of Old Marlboro Road is maintained. With this condition the south/westbound approach of Old Marlboro Road should intersect this roadway at a right-angle, with that approach only being under STOP-sign control. The current paved area at the easterly edge of this intersection should be replaced with loam and seed.

Response The intersection has been modified as requested so Old Marlboro Road east of Marlboro Street approaches intersection at a right angle and traffic is continuous along Marlboro Street to Old Marlboro Road. However, all 3 approaches are still proposed to be under stop control. Loam and seed has been added to replace existing pavement to be removed.

Comment 4 The eastbound Rte. 117 alignment has a reverse curve.

Response Reverse curve only occurs in easterly direction, and meets a 35MPH design speed. It is also noted that both curve falls entirely within 20 MPH posted speed limit, and posted speed limit just to the east of curve limit is 35 MPH.

Comment 5 All existing crosswalks at the intersection should be brought into AAB/ADA compliance.

Response All existing ramps and crosswalks fall outside limits of proposed roadway work, per further conversation with the Town. Therefore, existing ramps and crosswalks do not need to be brought into compliance as part of this project.

Curb Tie Plan

Comment 1 It appears there are many unnecessary ties to the existing edge of road (see sheet 8).

Response All ties are placed at changes in geometry, however where proposed geometry meets existing conditions the precision of ties has been adjusted to 0.1 ft.

Sign and Striping Plans (Sheets 10 through 12 of 21)

Comment 1 Remove period from abbreviations to match Legend.

Response Periods have been removed.

Comment 2 Provide additional dimensions and stations.

Response Additional dimensions and stations have been added to facilitate layout of markings.

Comment 3 A second R1-2 “YIELD” sign should be posted near STA 13+50 on the raised island on the left-side of the channelized right-turn lane from Great Road westbound to help improve visibility of the YIELD condition.

Response We have added a second R1-2 YIELD sign at approx. Sta 13+50 on the raised island on the left-side of the channelized right-turn lane from Great Road *eastbound*. The existing YIELD sign is being removed from the Great Road *westbound* channelized right-turn lane, and therefore we are not proposing a new YIELD sign for that turn, as requested in Comment 7 and 8 (below).

Comment 4 The existing signal heads J and K facing the Great Road eastbound right-turn lane should be replaced with bimodal signal heads (similar to "M" in the signal identification chart but with a right-turn arrow) with new posts.

Response New signal heads and posts have been specified for J and K.

Comment 5 YIELD pavement markings should be provided at the point where the Great Road eastbound right-turn lane intersects Parker Street.

Response YIELD pavement markings have been added.

Comment 6 A R10-17a "RIGHT TURN ON RED AFTER STOP" sign should be posted on the Great Road eastbound approach.

Response A R10-17a sign has been added to the eastbound approach.

Comment 7 The existing R1-2 "YIELD" sign mounted on the signal post at the northeast corner of the intersection should be removed.

Response The existing R1-2 sign has been called out for removal in the plans.

Comment 8 A R10-17a "RIGHT TURN ON RED AFTER STOP" sign should be posted on the Great Road westbound approach.

Response A R10-17a sign has been added to the westbound approach.

Traffic Signal Plan (Sheets 14 and 15 of 21)

Comment 1 Proposed camera symbol does not match Legend.

Response The camera symbol has been added to the Legend Sheet.

Comment 2 Add detection zones to Legend.

Response Detection zones have been added to the Legend Sheet.

Comment 3 The Parker Street southbound right-turn movement should be signalized with an accompanying signalized pedestrian crossing also being added with required associated accommodations.

Response New vehicle and pedestrian signal heads are proposed to signalize the this existing crosswalk.

Traffic Management Plans (Sheets 18 and 20 of 21)

Comment 1 Verify taper lengths are appropriate for speed of roadways.

Response Taper lengths have been checked and updated based on design speed and width of shoulders and lanes.

Comment 2 Consider additional information on advisory speed plaques.

Response Specific speed values have been recommended to the advisory speed plaques depicted.

Construction Details

Comment 1 Mill and resurfacing notes reference "proposed grading" yet none is provided.

Response Note regarding variable milling depth has been adjusted to refer to crown line shift as opposed to proposed grading.

Comment 2 Verify there is proposed HMA and cem conc walk.

Response Cement concrete walk is needed to extend existing residential walkway to realigned roadway. HMA walk is no longer needed due to reconfiguration of intersection at Old Marlboro Road, Marlboro Street and B Street.

Comment 3 Box widening detail shows two courses in the mill and overlay.

Response Box widening detail has been modified to show only one top course layer.

Haynes Square: Brown Street/Haynes Street (Route 27) at Concord Street

Comment 1 A sheet should be added to the plan set showing existing conditions at this location using either aerial photography or available record plans. The plans should depict the addition of MUTCD-compliant "radar speed feedback signs" posted facing Brown Street/Haynes Street (Route 27) traffic in both directions. Additionally, add a standard intersection (W2-1) sign to each approach. The sign should feature the posted 25-miles-per-hour speed limit, with the variable message portion of the sign providing the measured speed of approaching traffic. In keeping with MUTCD standards the sign should not include any rapid flashing or other dynamic elements. Details and specifications should be provided for the signs proposed.

Response A sheet depicting the addition of radar speed feedback signs and W2-1 signage for Haynes Square area has been added to the plans. A special provision has been added for radar speed feedback signs.

Great Road (Route 117) at Main Street

Comment 1 A sheet should be added to the plan set showing existing condition at this location using either aerial photography or available record plans. The plans should depict the conversion of the existing signal heads facing approaching Main Street traffic to provide a green-arrow signal face replacing the existing green ball treatment.

Response A sheet depicting signal face changes at the Great Road (Route 117) / Parker Street intersection has been added to the plans.

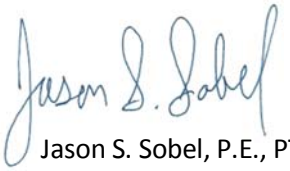
Old Marlborough Road and Parker Street Specifications

Comment 1 Item 866.112 – Project does not contain crosswalks yet they are mentioned in the spec.

Response Specification has been updated to refer only to stop bars on project, crosswalk language has been removed.

If there are further questions or a need to discuss the traffic related items in more detail, please do not hesitate to contact me.

Sincerely,
Green International Affiliates, Inc.



Jason S. Sobel, P.E., PTOE
Project Manager

cc: Wayne Amico, P.E., Town Engineer
Patrick Dunford, P.E., VHB
Daniel Ruiz, Capital Group Properties
Bob Depietri, Capital Group Properties
Bill Depietri, Capital Group Properties
W. Scully, P.E., Green

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Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	9.000	0.00	1.65	0.00	0.00	1.31	0.0	8.5	4.9	9.73	63.08	4.25	24	7.78	193.40	194.10	195.40	195.21	196.40	201.01	
2	1	15.000	0.00	1.06	0.00	0.00	0.82	0.0	8.4	4.9	7.39	62.63	4.52	24	7.67	194.10	195.25	195.21	196.22	201.01	201.47	5' - 24 Inch
3	2	270.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.52	1.53	3.10	10	0.49	195.84	197.16	196.59	197.82	201.47	202.38	Exist. 10 Inch
4	2	52.000	0.00	1.06	0.00	0.00	0.82	0.0	8.2	4.9	5.90	2.83	4.81	15	0.19	196.04	196.14	197.29	197.72	201.47	201.54	4' - 15 Inch
5	4	149.000	0.00	1.04	0.00	0.00	0.80	5.0	7.7	5.0	5.90	2.18	4.81	15	0.11	196.14	196.31	198.08	199.33	201.54	202.15	4' - 15 Inch
6	5	188.860	0.00	0.79	0.00	0.00	0.65	0.0	6.9	5.2	5.21	2.57	4.24	15	0.16	196.28	196.58	199.68	200.91	202.15	202.93	4' - 15 Inch(2)
7	6	7.000	0.00	0.09	0.00	0.00	0.08	0.0	5.8	5.5	0.44	9.13	0.56	12	6.57	197.16	197.62	201.17	201.17	202.93	202.82	Exist. 12 Inch
8	7	29.000	0.09	0.09	0.90	0.08	0.08	5.0	5.0	5.7	0.46	3.03	0.59	12	0.72	197.72	197.93	201.17	201.18	202.82	202.68	Class IV
9	6	18.000	0.30	0.30	0.72	0.22	0.22	5.0	5.0	5.7	1.23	2.91	1.57	12	0.67	197.54	197.66	201.17	201.19	202.93	202.53	Exist. 12 Inch
10	6	119.000	0.00	0.40	0.00	0.00	0.35	0.0	6.3	5.4	3.72	5.52	3.03	15	0.73	197.03	197.90	201.17	201.56	202.93	203.67	4' - 15 Inch
11	10	70.000	0.00	0.29	0.00	0.00	0.26	0.0	5.8	5.5	3.27	5.57	2.66	15	0.74	197.92	198.44	201.71	201.89	203.67	204.00	8' - 15 Inch
12	11	97.000	0.00	0.20	0.00	0.00	0.18	0.0	5.2	5.7	2.87	5.56	2.34	15	0.74	198.46	199.18	201.99	202.18	204.00	204.55	4' - 15 Inch
13	12	12.000	0.20	0.20	0.90	0.18	0.18	5.0	5.0	5.7	1.03	3.41	1.31	12	0.92	199.28	199.39	202.27	202.28	204.55	204.59	
14	12	205.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.85	1.86	2.36	12	0.27	199.48	200.04	202.27	202.82	204.55	205.26	Exist. 12 Inch
15	1	12.000	0.28	0.28	0.73	0.20	0.20	5.0	5.0	5.7	1.16	3.56	3.70	12	1.00	196.10	196.22	196.49	196.67	201.01	201.07	
16	1	16.000	0.00	0.31	0.00	0.00	0.28	0.0	6.2	5.4	1.50	3.56	3.99	12	1.00	196.50	196.66	196.95	197.18	201.01	201.08	
17	16	101.000	0.21	0.21	0.90	0.19	0.19	5.0	5.0	5.7	1.08	2.92	3.35	12	0.67	196.76	197.44	197.18	197.88	201.08	201.32	Class V
18	16	6.000	0.10	0.10	0.90	0.09	0.09	5.0	5.0	5.7	0.51	4.60	2.14	12	1.67	196.76	196.86	197.18	197.16	201.08	201.03	Class IV
19	4	16.000	0.02	0.02	0.90	0.02	0.02	5.0	5.0	5.7	0.10	2.82	0.13	12	0.62	196.60	196.70	198.08	198.08	201.54	201.23	
20	11	16.000	0.09	0.09	0.88	0.08	0.08	5.0	5.0	5.7	0.45	4.36	0.57	12	1.50	198.54	198.78	201.99	202.00	204.00	204.14	
21	10	26.000	0.11	0.11	0.81	0.09	0.09	5.0	5.0	5.7	0.51	3.63	0.65	12	1.04	198.00	198.27	201.71	201.71	203.67	203.08	
22	5	24.713	0.11	0.25	0.81	0.09	0.16	5.0	5.1	5.7	0.90	3.20	1.15	12	0.81	197.70	197.90	199.68	199.70	202.15	202.16	

Maynard Proposed Drainage | Number of lines: 22 | Run Date: 6/12/2017

NOTES:Intensity = 49.95 / (Inlet time + 10.80) ^ 0.79; Return period =Yrs. 10 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	DMH 6+06 LT	0.00	3.88	0.00	3.88	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.030	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	EXIST. DMH 6+04	0.00	3.88	0.00	3.88	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.030	0.020	0.013	0.00	0.00	0.00	0.00	0.0	1
3	Exist. DMH 3+31 L	1.52*	0.00	0.00	1.52	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	2
4	DMH 6+60 LT	0.00	2.36	0.00	2.36	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	2
5	DMH 7+93 LT	0.00	2.36	0.00	2.36	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	4
6	Exist. DMH 9+31	0.00	1.85	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
7	CIT 9+38 LT	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.016	0.016	0.013	0.00	0.00	0.00	0.00	0.0	Off
8	DG CB 9+50 LT	0.46	0.09	0.46	0.09	Comb	5.0	4.00	0.00	4.00	2.00	0.005	2.00	0.016	0.016	0.013	0.11	6.94	0.11	6.94	0.0	17
9	Exist. CB 9+44 RT	1.23	0.00	0.69	0.54	Comb	5.0	2.00	0.00	2.00	2.00	0.005	5.70	0.020	0.020	0.013	0.16	8.16	0.16	8.16	0.0	23
10	DMH 10+54 LT	0.00	1.85	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	6
11	DMH 11+28 LT	0.00	1.85	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	10
12	Exist. DMH 12+29	0.00	1.85	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	11
13	DG CB 12+30 LT	1.03	0.00	0.90	0.13	Comb	5.0	4.00	0.00	4.00	2.00	0.004	5.00	0.039	0.039	0.013	0.21	5.28	0.21	5.28	0.0	20
14	Exist. DMH 14+38	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	12
15	PROP. DG CB 5+9	1.16	0.00	0.89	0.27	Comb	5.0	4.00	0.00	4.00	2.00	0.004	5.00	0.020	0.020	0.013	0.17	8.41	0.17	8.41	0.0	18
16	PROP. DMH 6+25	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.030	0.020	0.013	0.00	0.00	0.00	0.00	0.0	1
17	PROP. DG CB 7+2	1.08	0.09	0.87	0.30	Comb	5.0	4.00	0.00	4.00	2.00	0.006	5.00	0.020	0.020	0.013	0.16	7.81	0.16	7.81	0.0	18
18	PROP DG CB 6+26	0.51	0.58	1.09	0.00	Comb	5.0	4.00	3.32	4.00	2.00	Sag	5.00	0.020	0.020	0.013	0.15	7.40	0.15	7.40	0.0	16
19	CB 6+59 RT	0.10	0.07	0.14	0.03	Comb	5.0	2.00	0.00	2.00	2.00	0.002	5.50	0.020	0.020	0.013	0.09	4.61	0.09	4.61	0.0	Off
20	DG CB 11+32 LT	0.45	0.13	0.49	0.09	Comb	5.0	4.00	0.00	4.00	2.00	0.008	2.00	0.019	0.019	0.013	0.11	5.90	0.11	5.90	0.0	21
21	DG CB 10+56 LT	0.51	0.09	0.51	0.09	Comb	5.0	4.00	0.00	4.00	2.00	0.007	2.00	0.020	0.020	0.013	0.12	5.91	0.12	5.91	0.0	8
22	DMH 7+97 RT	0.51	0.00	0.00	0.51	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5

Maynard Proposed Drainage | Number of lines: 22 | Run Date: 6/12/2017

NOTES: Inlet N-Values = 0.016; Intensity = 49.95 / (Inlet time + 10.80) ^ 0.79; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Yellow Clearance Interval

$$Y = t + \frac{1.47V}{2a + 64.4g}$$

Where:

- Y = yellow interval (s). Y shall be a minimum of 3.0 s in all scenarios;
- t = perception-reaction time (1 s);
- V = 85th percentile approach speed (mph);
- a = deceleration rate (10 ft/s^2); and
- g = grade of approach (percent / 100, downhill is negative grade).

All-Red Clearance Interval

$$R = \frac{W + L}{1.47V} - 1$$

Where:

- R = red interval (s). R shall be a minimum of 1.0 s in all scenarios;
- V = 85th percentile approach speed (mph);
- W = intersection width measured from the back/upstream edge of the approaching movement stop line to the far side of the intersection as defined by the extension of the curb line or outside edge of the farthest travel lane (ft); and
- L = length of vehicle, typically 20 ft.

Parker Street/Primary Site Drive

Parker Street NB/SB Through

V =	35	mph
g =	0.00	
Y =	3.6	sec
use Y =	**3.5**	**sec**
W =	65	ft
R =	0.7	sec
use R =	**1**	**sec**

Parker Street NB Left Turn

V =	20	mph
g =	0.00	
Y =	2.5	sec
use Y =	**3.0**	**sec**
W =	65	ft
R =	1.9	sec
use R =	**2**	**sec**

Primary Site Site Driveway EB Left Turn

V =	15	mph
g =	0.00	
Y =	2.1	sec
use Y =	**3.0**	**sec**
W =	70	ft
R =	3.1	sec
use R =	**3.0**	**sec**

Parker Street

V =	15	mph
g =	0.00	
Y =	2.1	sec
use Y =	**3.0**	**sec**
W =	95	ft
R =	4.2	sec
use R =	**4.5**	**sec**

Pedestrian crossing distance =	72	ft	(N-S direction)
V =	3.5	ft/sec	
Pedestrian clearance time =	20.6	sec	
Use pedestrian clearance time =	**21.0**	**sec**	