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TO:	Emily Wentworth, Town of Hingham	DATE:	March 30, 2016
FROM:	Joe SanClemente, P.E., AICP	HSH PROJECT NO.:	2015151.01
SUBJECT:	Avalon Hingham Shipyard II – 319 Lincoln Street Vanasse Traffic Peer Review – Response to Comments		

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Howard Stein Hudson (HSH) has prepared this memorandum in response to the comments received on the Avalon Hingham Shipyard II Project from the Town's peer review consultant, Vanasse & Associates, Inc. (VAI) in a memorandum dated March 10, 2016. Since that time the Proponent has reduced the scope of the Project to include just 190 residential units (60 fewer units) and associated adjustments to the site plan. HSH has prepared a technical memorandum documenting the change to the Proposed Project, the reduced traffic impacts, and the proposed mitigation.

The peer review comments are based on review of the following submitted materials for the original proposal:

- *Traffic Impact and Access Study, Avalon Hingham Shipyard II, 319 Lincoln Street*, dated February 25, 2016; and
- *Comprehensive Permit Application, Avalon Hingham Shipyard II, 319 Lincoln Street*, dated February 25, 2016.

## February 25, 2016 Traffic Impact and Access Study

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**Comment 1:** This study area is generally sufficient to evaluate the potential impact of the Project on the transportation infrastructure based on the expected trip-distribution pattern for the Project, and encompasses all major intersections located proximate to the Project site where the Project is expected to result in an increase in peak-hour traffic volumes by: i) five (5) percent or more; or ii) by more than 100 vehicles per hour.

Response 1: No response necessary.

**Comment 2:** The data collection effort (traffic counts and vehicle travel speed measurements) and establishment of the seasonal adjustment were completed in accordance with standard Traffic Engineering and Transportation Planning practices, and we are in general agreement that the resulting data provides a reasonable basis from which to assess the potential impact to the project on the transportation infrastructure.



The Applicant's engineer should provide back-up data for the establishment of the composite peak-hour for the study area to include raw (unadjusted) traffic volume networks and the basis for the peak-hour selected for each time period (weekday morning, weekday evening, and Saturday midday).

**Response 2:** The raw data was adjusted to account for a network peak hour for the intersections along Route 3A between Lincoln Plaza Drive and Bradley Woods Drive, including both unsignalized site driveways of USS Amesbury Drive and HMS Essington Drive. These volumes were then balanced through the network. The intersection of Route 3A/Downer/Thaxter, Beak/Bradley Woods, and Beal/Fottler were not included in the network peak hour or the balancing due to the distance, and the number of significant driveway volume between intersections. Tables showing the adjustments to the volumes and peak hour selection are attached.

**Comment 3:** The description of existing pedestrian and bicycle facilities within the study area is generally consistent with field observations and indicates that the existing transportation system provides opportunities for pedestrian and bicycle access to the Project site.

We note that Sgt. William B. Terry Drive and Beal Street provide sufficient width to support on-road bicycle travel in a shared travelled-way condition. These accommodations link the Hingham Shipyard to the shared-use path within Bare Cove Park and also afford bicycle access to the West Hingham Commuter Rail Station.

**Response 3:** No response necessary.

**Comment 4:** The motor vehicle crash analysis was completed in accordance with MassDOT standards and following standard Traffic Engineering and Transportation Planning practices, and we are in agreement with the findings of the analysis.

**Response 4:** No response necessary.

**Comment 5:** We are in general agreement with the methodology that was used to develop the future No- Build condition traffic volume projections for the Project, including the background traffic growth rate used in the base calculations and the inclusion of the identified specific roadway and development projects by others.



Response 5: No response necessary.

**Comment 6:** We are in agreement with the methodology that was used to develop the anticipated traffic characteristics of the Project (ITE data and adjusted U.S. Census Data for mode share) and the trip distribution pattern (U.S. Census data and exiting traffic patterns), and we concur with the resulting traffic volume projections and trip assignments.

Response 6: No response necessary.

**Comment 7:** The traffic operations analysis was completed using the appropriate methodologies and we are in agreement with the reported results and the overall conclusion that the addition of Project-related traffic to the study area roadways and intersections will not result in a significant impact (increase) on motorist delays or vehicle queuing over existing or anticipated future conditions without the Project (i.e., the “No-Build” condition).

We note that vehicle queues on the Shipyard Drive East approach to Route 3A during the weekday evening peak-hour may exceed the distances predicted in the February 2016 TIAS during those distinct periods after the arrival of the commuter ferry; however, it is important to consider that during these periods, the majority of traffic associated with the Project will be entering Shipyard Drive East and will not be impacted by the surge in exiting traffic.

Response 7: No response necessary.

**Comment 8:** We are in agreement that sight lines looking to/from the east at the Route 3A/ USS Amesbury Drive and Beal Street/Fottler Road/Tuckers Lane intersections do not currently meet the required minimum distances for safe operation based on the measured prevailing speed of traffic approaching the intersections. The Applicant has provided specific recommendations to address the sight line deficiencies that will be implemented in conjunction with the Project and are discussed later in this review.

We recommend that any approvals that may be granted for the Project include a condition that that all signs and landscape features that are to be installed as a part of the Project within the sight triangle areas of the Project site driveways and at the Route 3A/USS Amesbury Drive intersection be designed and located so as not to



impede lines of sight. Such features should not exceed 2-feet in height as measured from the surface elevation of the Project site driveways or USS Amesbury Drive. In addition, the Applicant should be required to selectively trim/remove vegetation along the Project site frontage and Route 3A within the public right-of-way where necessary in order to enhance sight lines to and from the Project site driveways and USS Amesbury Drive.

Response 8: The Proponent agrees with these recommendations.

**Comment 9:** We are in agreement with the recommendations that have been provided by the Applicant's engineer and offer the following additional recommendations for consideration by the Applicant:

**Comment 9-1:** Internal to the Project site, roadways and circulating aisles should be a minimum of 22-feet in width for two-way travel and a minimum of 16-feet in width for one-way travel or where two-way traffic is separated by a raised island (16-foot travel lanes on either side of a raised median or island).

Response 9-1: As shown in the Signage and Pavement Markings Plan (C2.00), all two-way circulating aisle widths are 24-feet, which exceed the 22-foot wide minimum. There are no one-way road sections on the site.

**Comment 9-2:** Where perpendicular parking is proposed, the travel isle adjacent to the parking shall be a minimum of 23-feet in width in order to accommodate parking maneuvers.

Response 9-2: As shown on Sheet C2.00, all two-way aisles adjacent to the parking are 24-feet wide and exceed this minimum requirement.

**Comment 9-3:** Fire lanes and/or emergency vehicle access roads should be a minimum of 20-feet in width.

Response 9-3: As shown in Sheet C2.00, all fire and emergency access roads are 24-feet wide and exceed this requirement.

**Comment 9-4:** All Signs and pavement markings to be installed within the Project site shall conform to the applicable specifications of the Manual on



Uniform Traffic Control Devices (MUTCD). This note should be added to the Site Plans.

Response 9-4: This note has been added to Sheet C2.00.

**Comment 9-5:** Snow windrows within the sight triangle areas of the Project site driveways and at the intersection of Route 3A at USS Amesbury Drive shall be promptly removed where such accumulations would exceed 2-feet in height.

Response 9-5: The Proponent agrees to the snow removal within these areas subject to coordination with the abutting property owner and MassDOT as necessary.

**Comment 9-6:** Route 3A/Fottler Road/Bradley Woods Drive – replace crosswalk and stop-line pavement markings.

Response 9-6: The Proponent agrees to replace/refresh the crosswalk and stop-line pavement markings at this intersection, subject to MassDOT approval (see **Figure 3** in the technical memorandum).

**Comment 9-7:** Route 3A/Downer Avenue/Thaxter Street/Lincoln Street – Facilitate and fund the preparation of a Roadway Safety Audit (RSA) which will likely be required by MassDOT before considering the implementation of safety-related improvements at the intersection. The RSA should be completed prior to implementation of specific improvements at the intersection.

Response 9-7: The Proponent agrees with this approach. If deemed appropriate following the completion of the RSA, the Project will implement the safety enhancements previously committed to in the TIAS.

**Comment 9-8:** Route 3A/USS Amesbury Drive – Expand the channelizing island through a combination of increasing the width (area) of the curbed island where not precluded by truck maneuvering and serrated concrete where truck off-tracking will occur. The combination of these features and the associated edgeline pavement markings should reduce the width of the entering and exiting travel lane to no



more than 16-feet and provide for improved channelization to reinforce the left-turn restriction. In addition, a “Right Turn Only” sign should be installed on USS Amesbury Drive approaching Route 3A.

**Response 9-8:** The Proponent agrees to these improvements subject to coordination and approval by MassDOT. See revised conceptual plan in Figure 4 of the technical memorandum.

**Comment 9-9:** Beal Street/Fottler Road – Install intersection ahead warning signs (graphic symbol) on Beal Street approaching the intersection and selectively trim trees and vegetation along the north side of Beal Street east of Fottler Road.

**Response 9-9:** The Proponent agrees to these additional enhancements as reflected in the revised conceptual plan. See Figure 5 of the technical memorandum.

**Comment 9-10:** Shipyard Drive East/HMS Essington Drive –  
Reconstruct/replace/install wheelchair ramps as necessary.

**Response 9-10:** The Proponent agrees to reconstruct/replace/install wheelchair ramps at this location as necessary to meet current accessibility standards (see Figure 6 of the technical memorandum).  
Improvements at this intersection location will be subject to Town of Hingham and MBTA coordination and approval.

**Comment 9-11:** TDM Program – consider adding the following:

- Information regarding public transportation services, maps, schedules and fare information will be posted in a central location
- Residents will be encouraged to participate in MassRIDES’ NuRide program, which rewards individuals that choose to walk, bicycle, carpool, vanpool or that use public transportation to travel to and from work.
- Residents will be made aware of the Emergency Ride Home (ERH) program available through MassRIDES, which reimburses employees of a participating MassRIDES



employer partner worksite that is registered for ERH and that carpool, take transit, bicycle, walk or vanpool to work.

Response 9-11: The Proponent agrees to the above TDM measures.

## Site Plan

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**Comment 1:** The Applicant's engineer provided a truck turning analysis for the Town of Hingham Fire Department design vehicle (tower truck) and an intermediate size tractor semi-trailer combination (WB-50). The turning analysis demonstrated that the subject vehicles can access and circulate within the Project site in an unimpeded manner; however, we note that the fire truck would need to back-up to exit the visitor parking area. The Applicant's engineer should also provide a turning analysis for an SU-30/40 (small delivery/moving vehicle and trash/recycling vehicle) that demonstrates that the subject vehicle can access and stage in the loading areas without blocking the garage access points. In addition, the analysis should also demonstrate the location and maneuvering required to serve the trash/recycling area.

Response 1: See attached truck turning analysis.

**Comment 2:** "No Parking Any Time" signs with a supplemental "Tow Away Zone" should be added along both sides of the fire lane. "No Parking Loading Zone" signs should be installed within the designated loading areas.

Response 2: These signs have been added as shown on Sheet C2.00.

**Comment 3:** The proposed sidewalk should be extended along the north side of the building to the stair/lobby area and should include ADA compliant wheelchair ramps at the pedestrian crossings of the driveways to the parking garage.

Response 3: The Project proposes to provide a continuous connection between the building's elevator lobby area, USS Amesbury Way, and Shipyard Drive East. Crosswalks and accessible curb ramps will be provided at all pedestrian crossings.

**Comment 4:** A school bus waiting area should be provided within the Project site or at an appropriate location defined in consultation with the Town of Hingham School Department.



Response 4: The Project team will coordinate with the Town's School Department to determine the most appropriate location for a bus waiting area.

**Comment 5:** An exterior bicycle rack(s) should be provided proximate to the entrance to the fitness center/management office.

Response 5: The Proponent agrees to install additional bicycle rack(s) outside of the fitness center/management office. Bicycle storage locations have been identified on Sheet C2.00.

**Comment 6:** A sign and pavement marking plan should be provided as a part of the Site Plans in order to verify that the proposed traffic control devices are appropriately designed and located within the Project site.

Response 6: A Signage and Pavement Marking Plan has been developed as part of the revised site design (see Sheet C2.00).

**Comment 7:** The sight triangle areas for the Project site driveway intersections with USS Amesbury Drive and at the intersection of Route 3A at USS Amesbury Drive should be added to the Site Plans along with a note to indicate: "Signs, landscaping and other features located within the sight triangle areas shall be designed, installed and maintained so as not to exceed 2-feet in height. Snow windrows located within the sight triangle areas that exceed 2-feet in height or that would otherwise inhibit sight lines shall be promptly removed."

Response 7: The sight triangles and associated note have been incorporated into Sheet C2.00.

The Proponent agrees to the snow removal within these areas subject to coordination with the abutting property owner and MassDOT as necessary.

**Comment 8:** A tenant move in/out management plan (narrative) should be provided and reflected in the truck turning analysis for the Project.

Response 8: The move-in/move-out activity will take place in the designated loading area along the north side of the building. The loading area can accommodate a vehicle as large as a WB-50 tractor trailer. The activity will be scheduled with the building manager to not conflict with other loading activities or needs of the building. Dedicated truck storage areas have been identified on the Site Plan to facilitate, and expedite, the



staging and loading of moving trucks. The furniture will then be taken to/from the elevator/lobby area and the appropriate unit.

**Comment 9:** A narrative should be provided describing how trash and recycling will be collected within the building and then picked-up by the contracted hauler.

Response 9: All trash and recyclables will be collected and stored within the dedicated, and enclosed, trash/recycle room. On trash/recycle collection days, the building manager will be responsible for wheeling the individual bins the trash/recycle areas, adjacent to the loading/service area on the north side of the building, for pick-up. The building manager will then be responsible for returning all trash and recycling bins to the designated trash/recycling room.

**Comment 10:** The Applicant should consider incorporating electric vehicle charging stations into the Project and coordinating with ZipCar to locate vehicles at the Project site.

Response 10: The Proponent agrees to install electric vehicle charging stations within the garage accommodating up to 14 spaces or 5% of the total parking garage supply.

The Proponent has considered the operational complexities to having a shared car service, such as ZipCar, that serves the public at large within a private residential community. However, a ZipCar will not be provided on site due to the increased liability of non-residents accessing the building to pick-up the vehicle.

## Parking

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**Comment 1:** The Applicant's engineer should provide the parking demand observations from the adjacent Avalon Hingham Shipyard residential community. The observations should be provided for both a weekday and a Saturday between 6 AM and 9 PM. We note that the parking ratio that is proposed is within the range of values documented by the Institute of Transportation Engineers (ITE) for an apartment community with a similar level of access to public transportation services.

Response 1: Based on data provided by Avalon Bay Communities, there are currently 310 outstanding parking permits issued for the existing 235 residential units, which are approximately 95% occupied. This corresponds to a residential parking demand ratio of approximately 1.29 spaces per residential unit. According to the Urban Land Institute's (ULI) publication *Shared Parking*, visitor parking demand (including



## RESPONSE TO COMMENTS

Avalon Hingham Shipyard II

March 30, 2016

other uses such as deliveries, etc.) for residential uses is 0.15 spaces per unit on weekdays and weekends; which corresponds to an additional 36 spaces for visitors and other users. Therefore, the overall peak parking demand for the existing Avalon Hingham Shipyard residential community is estimated at approximately 338 spaces or about 1.44 spaces per unit.

The Proposed parking supply of 298 spaces for the 190 residential units (or 1.57 spaces per unit) is expected to adequately accommodate the Project based on the current demand at Shipyard I.

### Attachments:

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- A. Technical Memorandum
- B. Volume balancing Tables
- C. Peak Hour Selection Table
- D. Truck Turning Analysis

**2015151 - Avalon Hingham**

A.M. Peak (7:15 - 8:15 AM) / P.M. Peak (4:30 - 5:30 PM) / Saturday Peak (11:45-12:45)

Yearly Growth Rate: 1.0%  
 Current Year: 2016  
 Build Analysis Year: 2023  
 Seasonal Adjustment Factor: 3%

Howard Stein Hudson

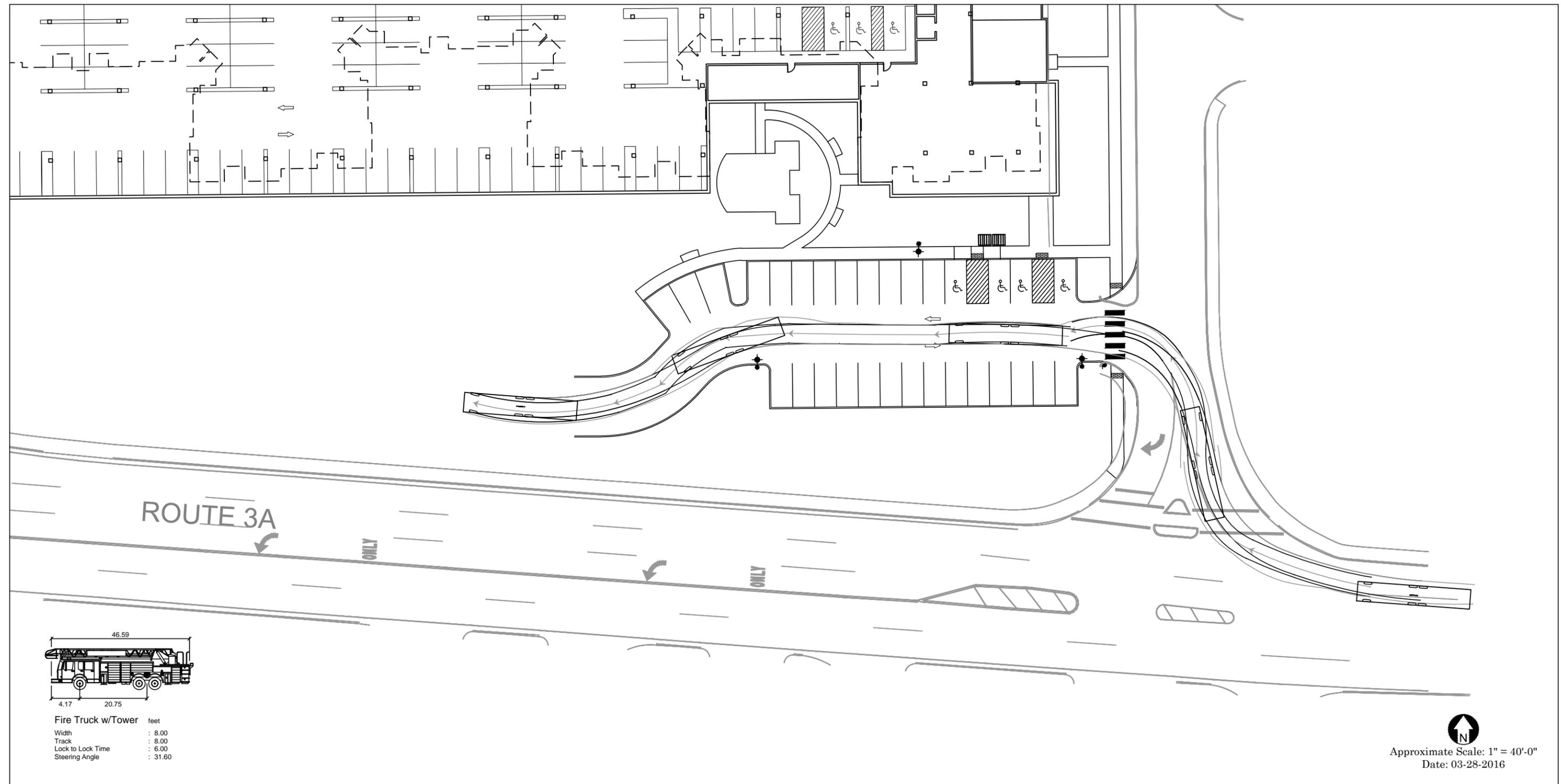
2/23/2016

	EXISTING (2016) CONDITION											
	AM				PM				SAT			
	Counts 2016	Seasonal Adjustment	Balance Adjustment	Existing 2016	Counts 2016	Seasonal Adjustment	Balance Adjustment	Existing 2016	Counts 2016	Seasonal Adjustment	Balance Adjustment	Existing 2016
<b>1. Route 3A (Lincoln Street)/H.M.S. Essington Drive/Lincoln Plaza Drive</b>												
Route 3A (Lincoln Street) EB left	35	1		36	103	3		106	147	4		151
Route 3A (Lincoln Street) EB thru	560	17	-26	551	945	28	-10	963	703	21		724
Route 3A (Lincoln Street) EB right	11	0		11	54	2		56	54	2		56
Route 3A (Lincoln Street) WB left	11	0		11	69	2		71	116	3		119
Route 3A (Lincoln Street) WB thru	1190	36	1	1227	705	21	-12	714	862	26	11	899
Route 3A (Lincoln Street) WB right	8	0		8	15	0		15	36	1		37
Lincoln Plaza Drive NB left	77	2		79	155	5		160	185	6		191
Lincoln Plaza Drive NB thru	7	0		7	24	1		25	29	1		30
Lincoln Plaza Drive NB right	17	1		18	99	3		102	135	4		139
H.M.S. Essington Drive SB left	2	0		2	14	0		14	22	1		23
H.M.S. Essington Drive SB thru	2	0		2	33	1		34	34	1		35
H.M.S. Essington Drive SB right	24	1		25	111	3		114	108	3		111
<b>2. Route 3A (Lincoln Street)/Sgt. William B. Terry Drive/Shipyards Drive West</b>												
Route 3A (Lincoln Street) EB left	56	2		58	97	3		100	196	6		202
Route 3A (Lincoln Street) EB thru	497	15	-22	490	937	28	-5	960	639	19	3	661
Route 3A (Lincoln Street) EB right	22	1		23	18	1		19	22	1		23
Route 3A (Lincoln Street) WB left	25	1		26	26	1		27	52	2		54
Route 3A (Lincoln Street) WB thru	1116	33	-12	1137	577	17	-2	592	778	23	-8	793
Route 3A (Lincoln Street) WB right	11	0		11	54	2		56	95	3		98
Sgt. William B. Terry Drive NB left	82	2		84	115	3		118	118	4		122
Sgt. William B. Terry Drive NB thru	118	4		122	75	2		77	99	3		102
Sgt. William B. Terry Drive NB right	26	1		27	49	1		50	54	2		56
Shipyards Drive West SB left	21	1		22	105	3		108	69	2		71
Shipyards Drive West SB thru	18	1		19	180	5		185	80	2		82
Shipyards Drive West SB right	24	1		25	87	3		90	138	4		142
<b>3. Route 3A (Lincoln Street)/Talbots Drive/Shipyards Drive East</b>												
Route 3A (Lincoln Street) EB left	21	1		22	22	1		23	27	1		28
Route 3A (Lincoln Street) EB thru	443	13	20	476	1045	31	18	1094	730	22	7	759
Route 3A (Lincoln Street) EB right	40	1		41	1	0		1	1	0		1
Route 3A (Lincoln Street) WB left	16	0		16	2	0		2	0	0		0
Route 3A (Lincoln Street) WB thru	1106	33	-7	1132	564	17	-18	563	865	26	21	912
Route 3A (Lincoln Street) WB right	498	15	-2	511	139	4	-2	141	178	5	2	185
Talbots Drive NB left	0	0		0	88	3		91	1	0		1
Talbots Drive NB thru	3	0		3	9	0		9	1	0		1
Talbots Drive NB right	2	0		2	21	1		22	0	0		0
Shipyards Drive East SB left	86	3		89	336	10	-8	338	137	4		141
Shipyards Drive East SB thru	7	0		7	7	0		7	1	0		1
Shipyards Drive East SB right	41	1		42	20	1		21	29	1		30
<b>4. Route 3A (Lincoln Street)/Fottler Road/Bradley Woods Drive</b>												
Route 3A (Lincoln Street) EB left	5	0		5	14	0		14	5	0		5
Route 3A (Lincoln Street) EB thru	482	14	39	535	1365	41	-7	1399	835	25	5	865
Route 3A (Lincoln Street) EB right	27	1		28	44	1		45	30	1		31
Route 3A (Lincoln Street) WB left	50	2		52	53	2		55	39	1		40
Route 3A (Lincoln Street) WB thru	1552	47	-6	1593	663	20	10	693	1,058	32	-10	1080
Route 3A (Lincoln Street) WB right	12	0		12	31	1		32	19	1		20
Fottler Road NB left	61	2		63	29	1		30	33	1		34
Fottler Road NB thru	5	0		5	15	0		15	10	0		10
Fottler Road NB right	41	1		42	65	2		67	39	1		40
Bradley Woods Drive SB left	31	1		32	22	1		23	18	1		19
Bradley Woods Drive SB thru	9	0		9	11	0		11	3	0		3
Bradley Woods Drive SB right	21	1		22	13	0		13	11	0		11
<b>5. Route 3A/Downer Avenue/Thaxter Street/Lincoln Street</b>												
Route 3A (Lincoln Street) EB left	15	0		15	18	1		19	21	1		22
Route 3A (Lincoln Street) EB thru	356	11		367	1092	33		1125	615	18		633
Route 3A (Lincoln Street) EB bear right	116	3		119	171	5		176	148	4		152
Route 3A (Lincoln Street) EB right	27	1		28	58	2		60	43	1		44
Route 3A WB hard left	2	0		2	0	0		0	3	0		3
Route 3A WB left	30	1		31	4	0		4	21	1		22
Route 3A WB thru	1276	38		1314	540	16		556	791	24		815
Route 3A WB right	20	1		21	14	0		14	14	0		14
Thaxter Street NB left	95	3		98	98	3		101	89	3		92
Thaxter Street NB thru	86	3		89	49	1		50	53	2		55
Thaxter Street NB right	15	0		15	21	1		22	24	1		25
Thaxter Street NB hard right	8	0		8	10	0		10	6	0		6
Downer Avenue SB left	29	1		30	60	2		62	32	1		33
Downer Avenue SB bear left	61	2		63	35	1		36	42	1		43
Downer Avenue SB thru	74	2		76	97	3		100	67	2		69
Downer Avenue SB right	10	0		10	9	0		9	13	0		13
Lincoln Street NWB hard left	20	1		21	7	0		7	7	0		7
Lincoln Street NWB bear left	252	8		260	157	5		162	165	5		170
Lincoln Street NWB bear right	56	2		58	62	2		64	33	1		34
Lincoln Street NWB hard right	1	0		1	0	0		0	0	0		0
<b>6. Beal Street/Sgt. William B. Terry Drive/Lynch Field Drive</b>												
Beal Street EB left	42	1		43	18	1		19	14	0		14
Beal Street EB thru	161	5		166	386	12		398	300	9		309
Beal Street EB right	1	0		1	0	0		0	4	0		4
Beal Street WB left	3	0		3	3	0		3	6	0		6
Beal Street WB thru	114	3		117	141	4		145	170	5		175
Beal Street WB right	270	8		278	158	5		163	230	7		237
Sgt. William B. Terry Drive SB left	37	1		38	248	7		255	100	3		103
Sgt. William B. Terry Drive SB thru	1	0		1	1	0		1	1	0		1
Sgt. William B. Terry Drive SB right	4	0		4	14	0		14	10	0		10
<b>7. Route 3A (Lincoln Street)/U.S.S. Amesbury Drive</b>												
Route 3A (Lincoln Street) EB left	0	0		0	0			0	4	0		4
Route 3A (Lincoln Street) EB thru	538	16	11	565	1412	42	-3	1451	874	26	-8	892
Route 3A (Lincoln Street) EB right	2	0		2	3	0		3	4	0		4
Route 3A (Lincoln Street) WB left	1	0		1	7	0		7	10	0		10
Route 3A (Lincoln Street) WB thru	1594	48	14	1656	662	20	21	703	1,055	32	-5	1082
Route 3A (Lincoln Street) WB right	20	1		21	25	1		26	32	1		33
Private Drive NB left	0	0		0	2	0		2	5	0		5
Private Drive NB right	1	0		1	4	0		4	7	0		7
U.S.S. Amesbury Drive SB left	2	0		2	3	0		3	2	0		2
U.S.S. Amesbury Drive SB right	3	0		3	1	0		1	10	0		10
<b>8. Shipyards Drive East/H.M.S. Essington Drive/Private Drive</b>												
H.M.S. Essington Drive EB left	14	0		14	23	1		24	25	1		26
H.M.S. Essington Drive EB thru	4	0		4	26	1		27	0	0		0
H.M.S. Essington Drive EB right	23	1		24	202	6		208	102	3		105
Private Drive WB left	12	0		12	52	2		54	0	0		0
Private Drive WB thru	17	1		18	10	0		10	1	0		1
Private Drive WB right	4	0		4	1	0		1	1	0		1
Shipyards Drive East NB left	349	10		359	80	2		82	152	5		157
Shipyards Drive East NB thru	136	4		140	68	2		70	54	2		56
Shipyards Drive East NB right	36	1		37	20	1		21	1	0		1
Shipyards Drive East SB left	3	0		3	5	0		5	0	0		0
Shipyards Drive East SB thru	99	3		102	101	3		104	65	2		67
Shipyards Drive East SB right	15	0		15	6	0		6	15	0		15
<b>9. Beal Street/Fottler Road/Tuckers Lane</b>												
Beal Street EB left	12	0		12	32	1		33	28	1		29
Beal Street EB thru	182	5		187	615	18		633	365	11		376
Beal Street EB right	2	0		2	24	1		25	20	1		21
Beal Street WB left	3	0		3	15	0		15	9	0		9
Beal Street WB thru	477	14		491	279	8		287	373	11		384
Beal Street WB right	47	1		48	66	2		68	57	2		59
Tuckers Lane NB left	8	0		8	9	0		9	19	1		20
Tuckers Lane NB thru	3	0		3	7	0		7	4	0		4
Tuckers Lane NB right	20	1		21	8	0		8	9	0		9
Fottler Road SB left	48	1		49	85	3		88	62	2		64
Fottler Road SB thru	4	0		4	13	0		13	4	0		4
Fottler Road SB right	17	1		18	25	1		26	15	0		15

	#1	#2	#3	#4	#5	#6	#7	#8	#9	Total Network Peak
7:00 AM - 8:00 AM	1900	1935	2269	2310	2461	560	2231	741	691	10645
7:15 AM - 8:15 AM	1884	1933	2205	2276	2491	571	2171	695	744	10469
7:30 AM - 8:30 AM	1944	2016	2263	2296	2549	588	2161	712	775	10680
7:45 AM - 8:45 AM	1933	1995	2190	2181	2389	633	2047	613	823	10346
8:00 AM - 9:00 AM	1896	1933	2034	2034	2255	630	1877	513	806	9774
4:00 PM - 5:00 PM	2332	2167	2014	2152	2387	845	2024	411	1054	10689
4:15 PM - 5:15 PM	2346	2233	2130	2231	2447	884	2082	469	1135	11022
4:30 PM - 5:30 PM	2373	2282	2179	2290	2502	917	2098	496	1179	11222
4:45 PM - 5:45 PM	2342	2238	2236	2331	2496	909	2097	575	1075	11244
5:00 PM - 6:00 PM	2331	2320	2255	2325	2471	969	2119	594	1156	11350
11:00 AM - 12:00 PM	2272	2091	1786	1864	2062	766	1763	372	907	9776
11:15 AM - 12:15 PM	2376	2224	1861	1985	2147	799	1874	394	928	10320
11:30 AM - 12:30 PM	2426	2280	1927	2056	2187	835	1947	404	965	10636
11:45 AM - 12:45 PM	2441	2341	1970	2100	2157	831	2003	416	956	10855
12:00 PM - 1:00 PM	2422	2324	1971	2094	2185	810	1996	456	922	10807
12:15 PM - 1:15 PM	2420	2250	1939	2033	2128	816	1910	440	934	10552
12:30 PM - 1:30 PM	2396	2266	1898	1990	2111	778	1877	431	898	10427
12:45 PM - 1:45 PM	2445	2274	1876	1968	2146	805	1847	411	862	10410
1:00 PM - 2:00 PM	2448	2255	1819	1957	2098	815	1816	370	860	10295

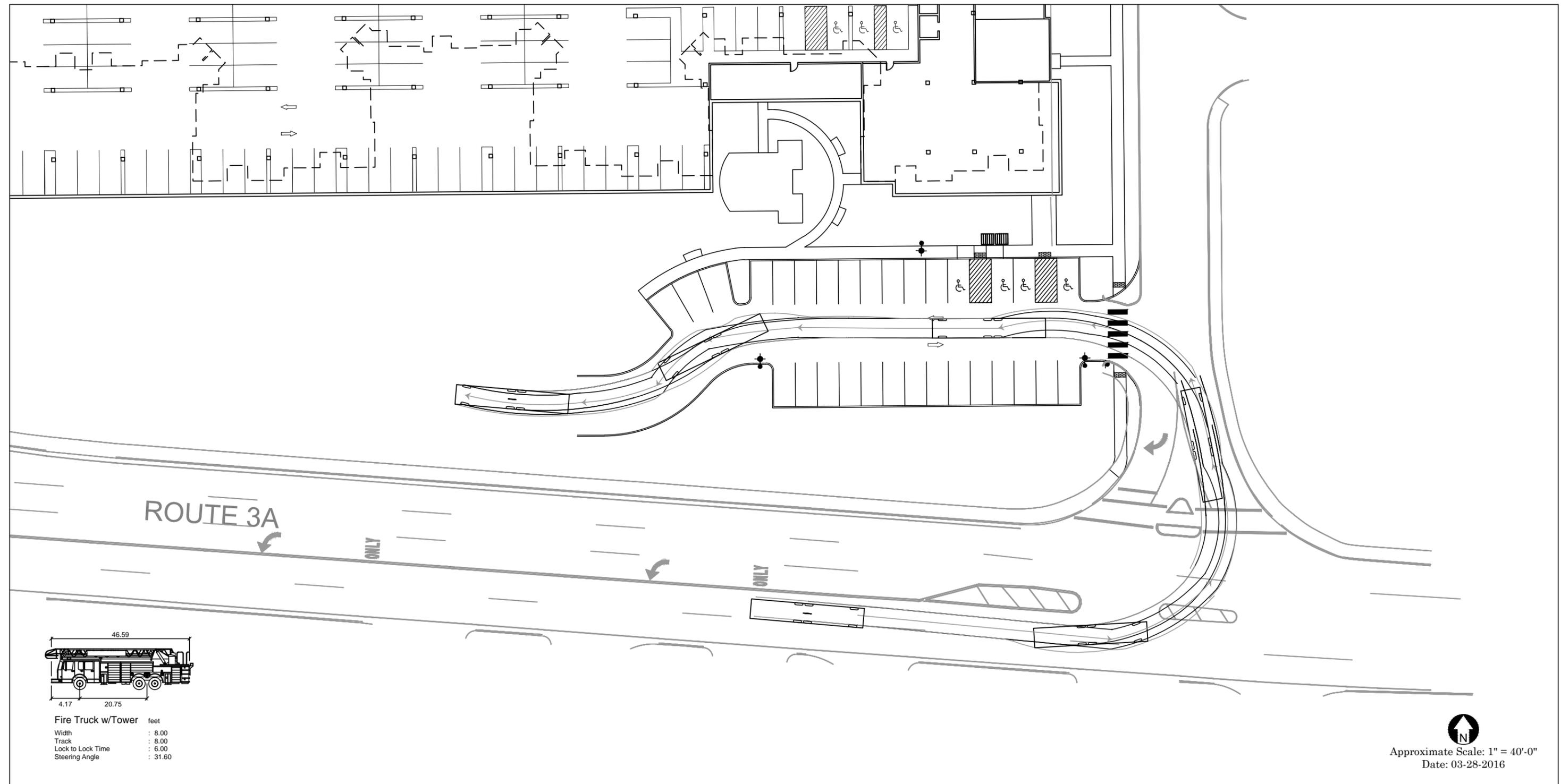
Network Peak  
 Intersection Peak

Figure D.1. Fire Truck Turning Movements from Route 3A WB to Visitor Parking Lot



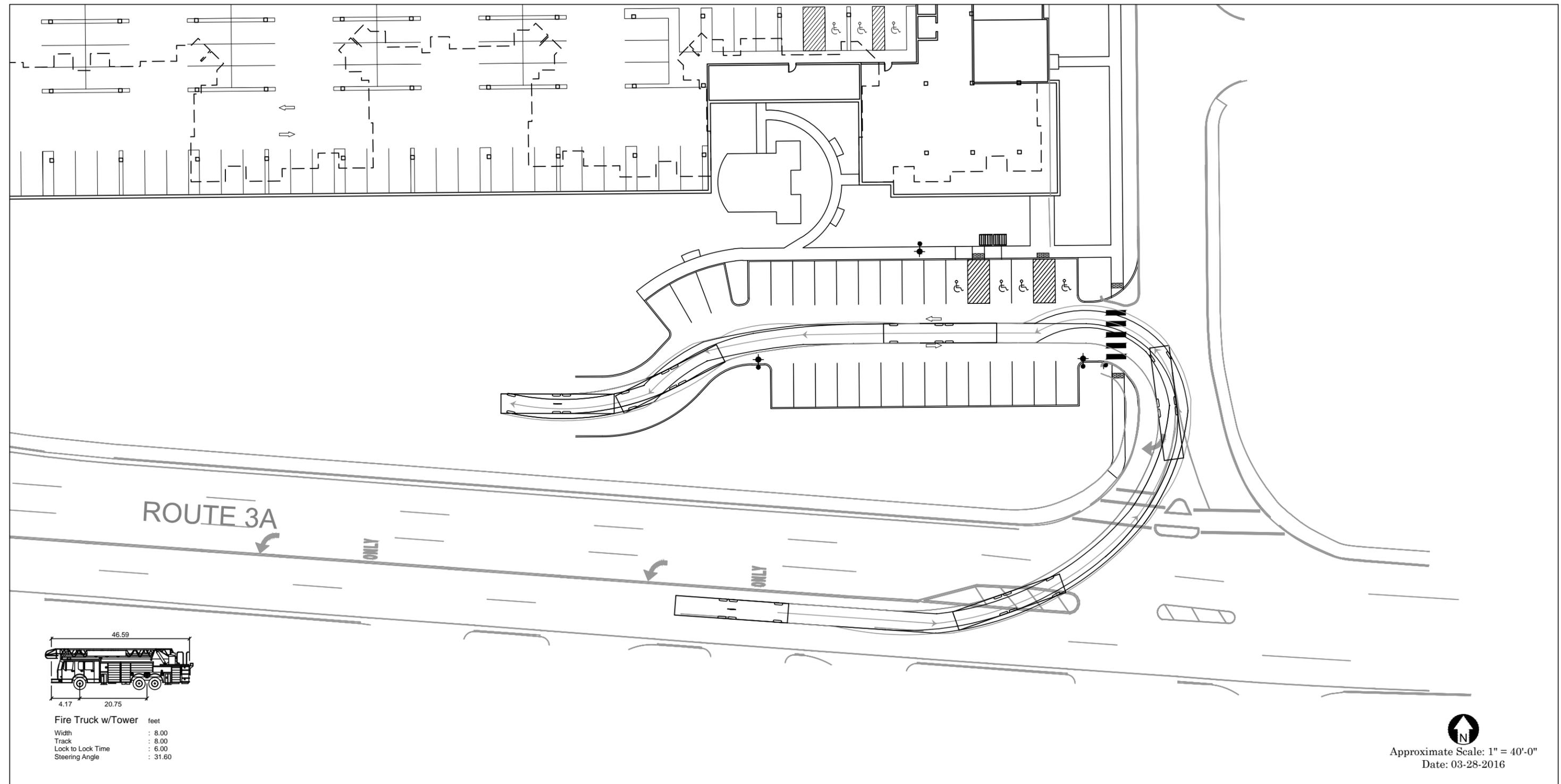
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Michael Littman

Figure D.2. Fire Truck Turning Movements from Route 3A EB to Visitor Parking Lot



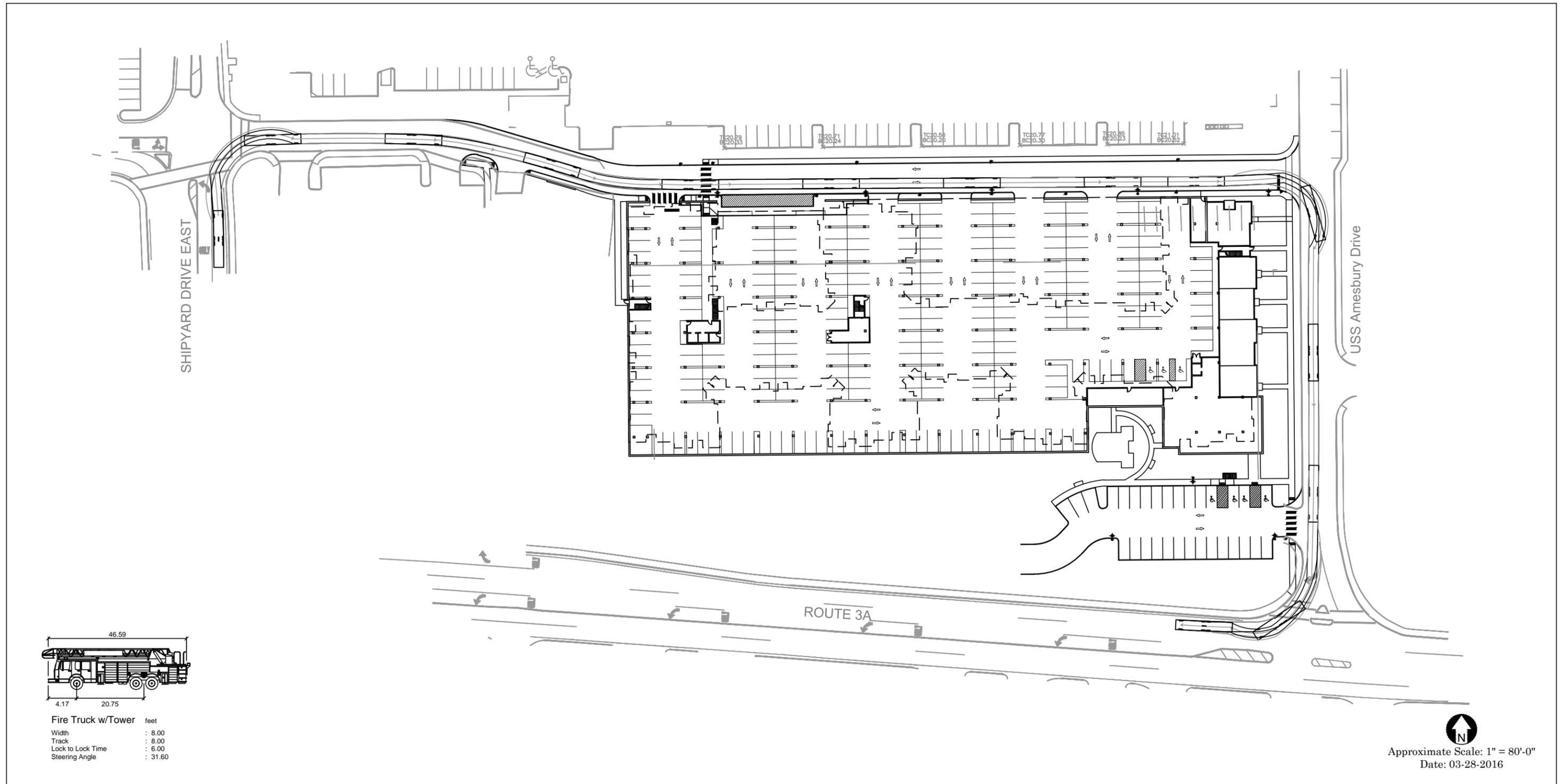
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Michael Littman

Figure D.3. Fire Truck Turning Movements from Route 3A EB to Visitor Parking Lot



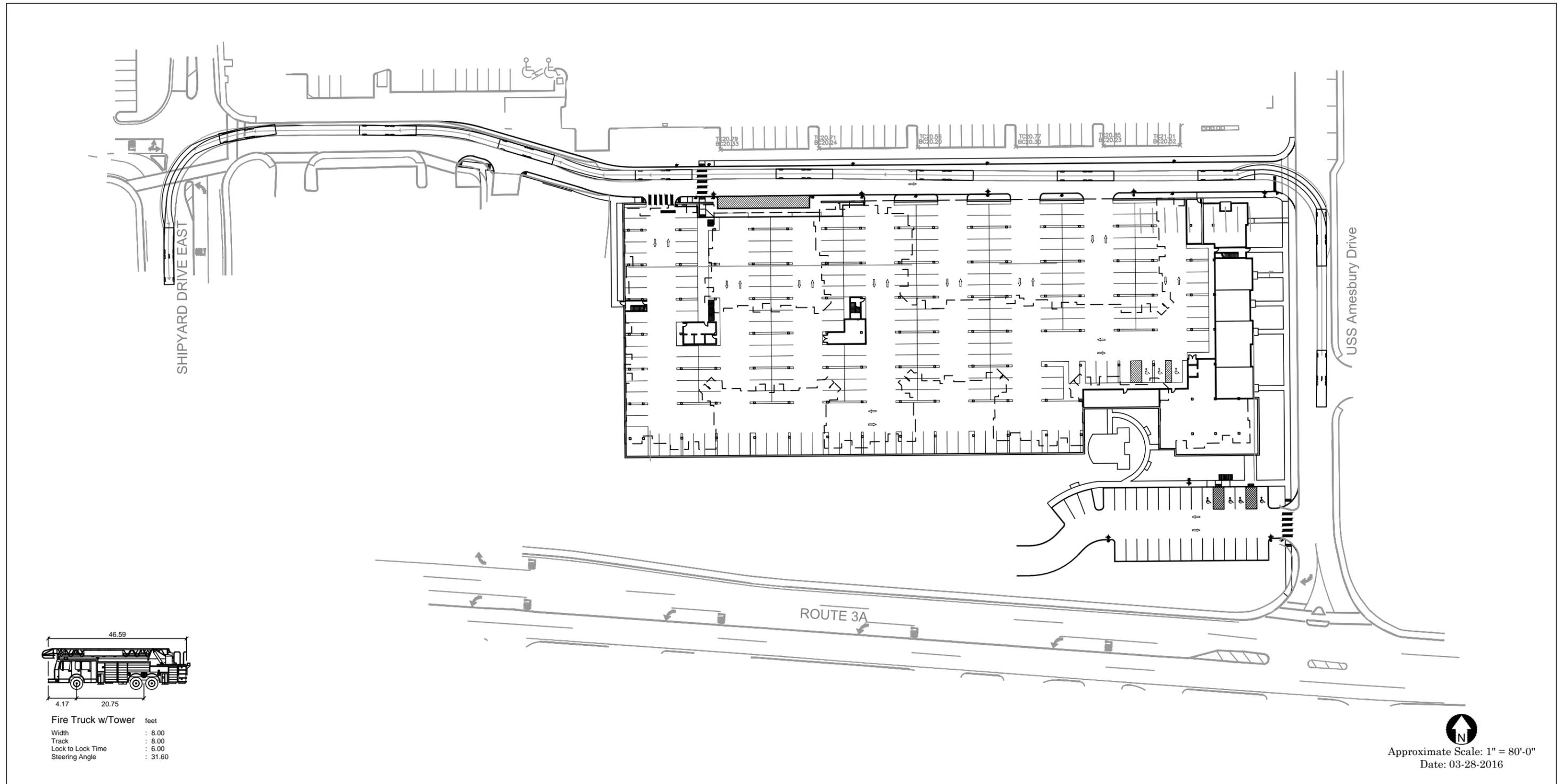
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Figure D.4. Fire Truck Turning Movements from Shipyard Drive East to Service Aisle/Fire Lane



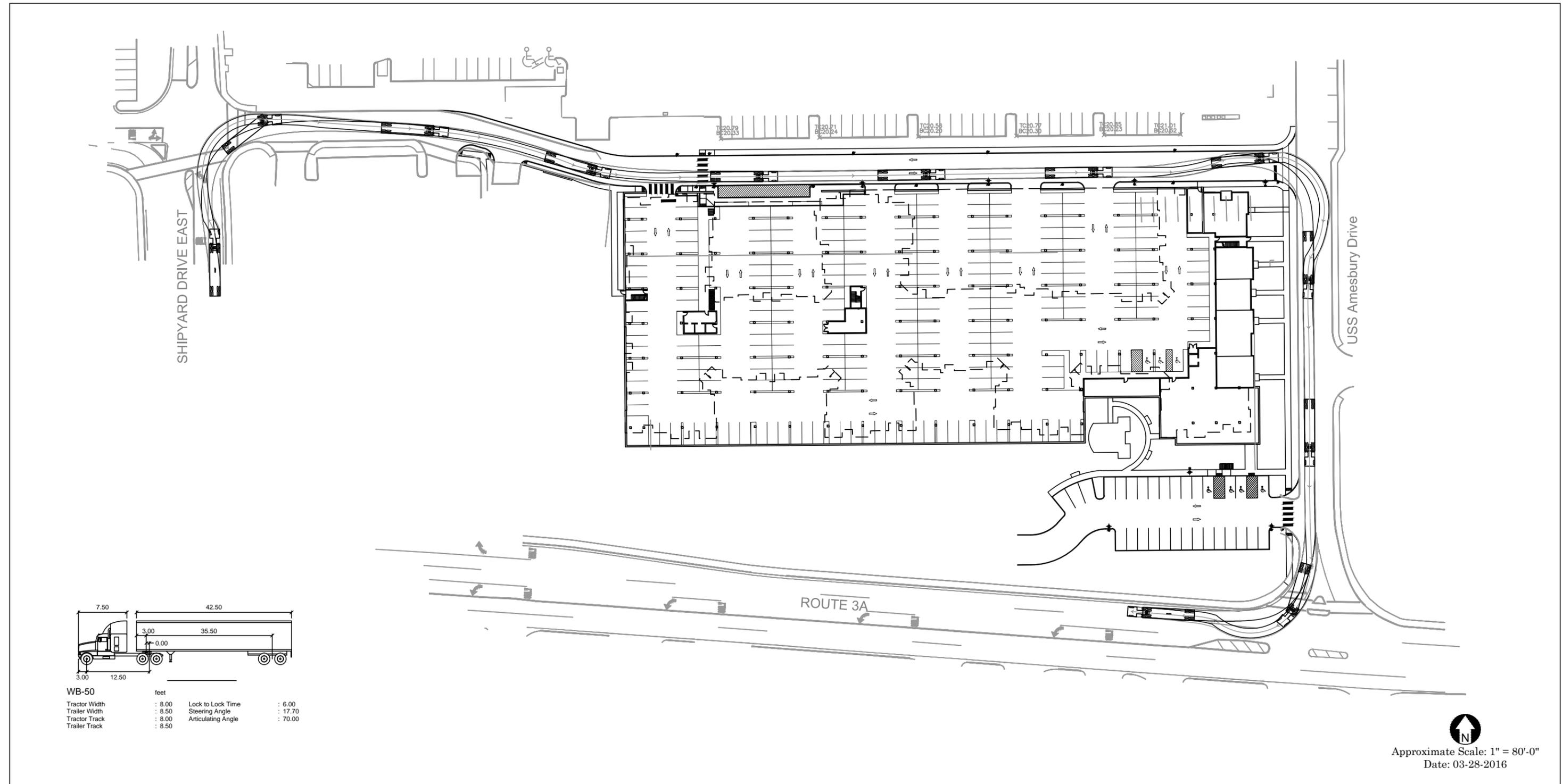
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Figure D.5. Fire Truck Turning Movements from U.S.S. Amesbury Drive to Service Aisle/Fire Lane



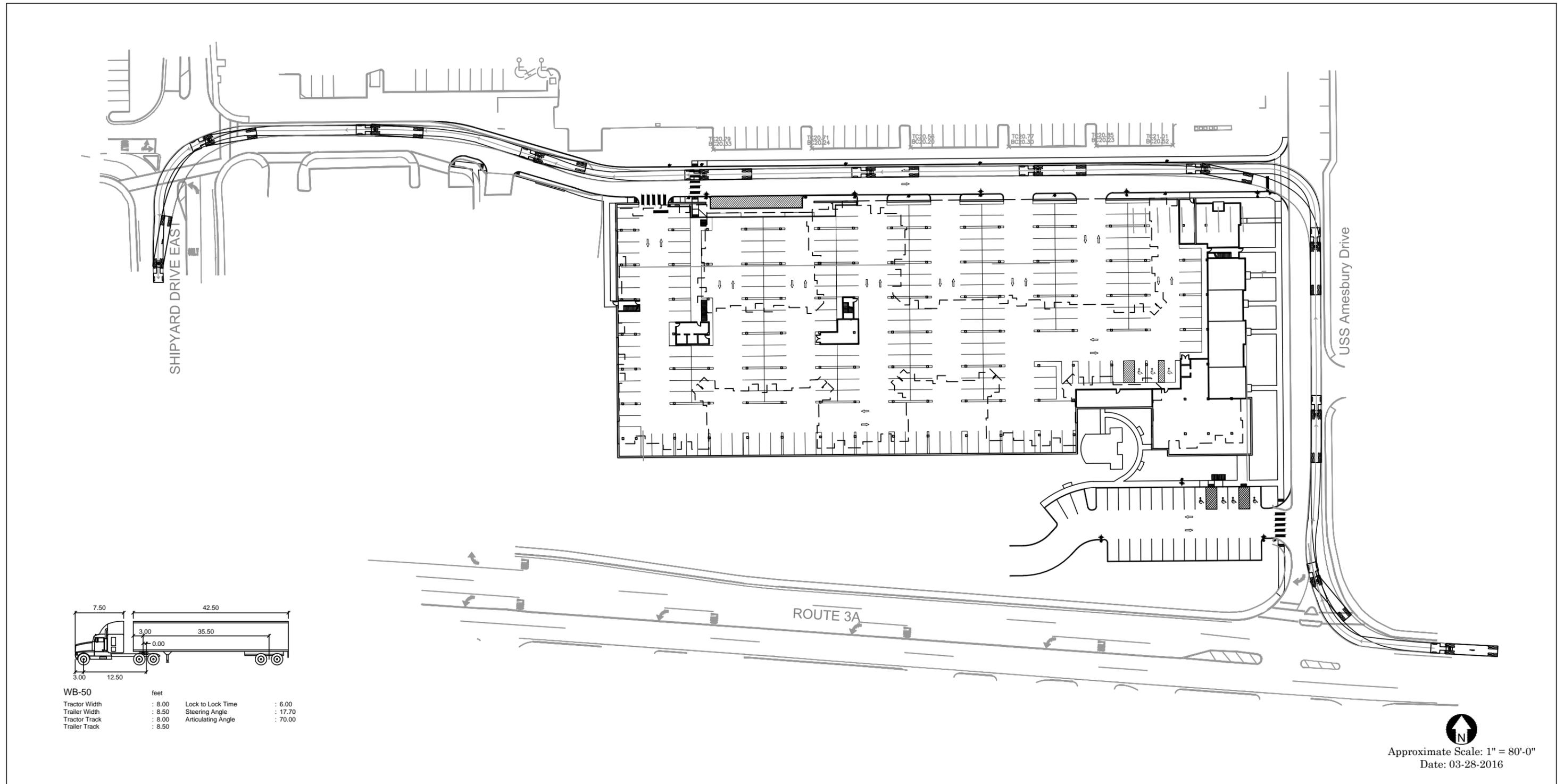
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Figure D.6. WB-50 Turning Movements from Shipyard Drive East NB to Service Aisle/Fire Lane



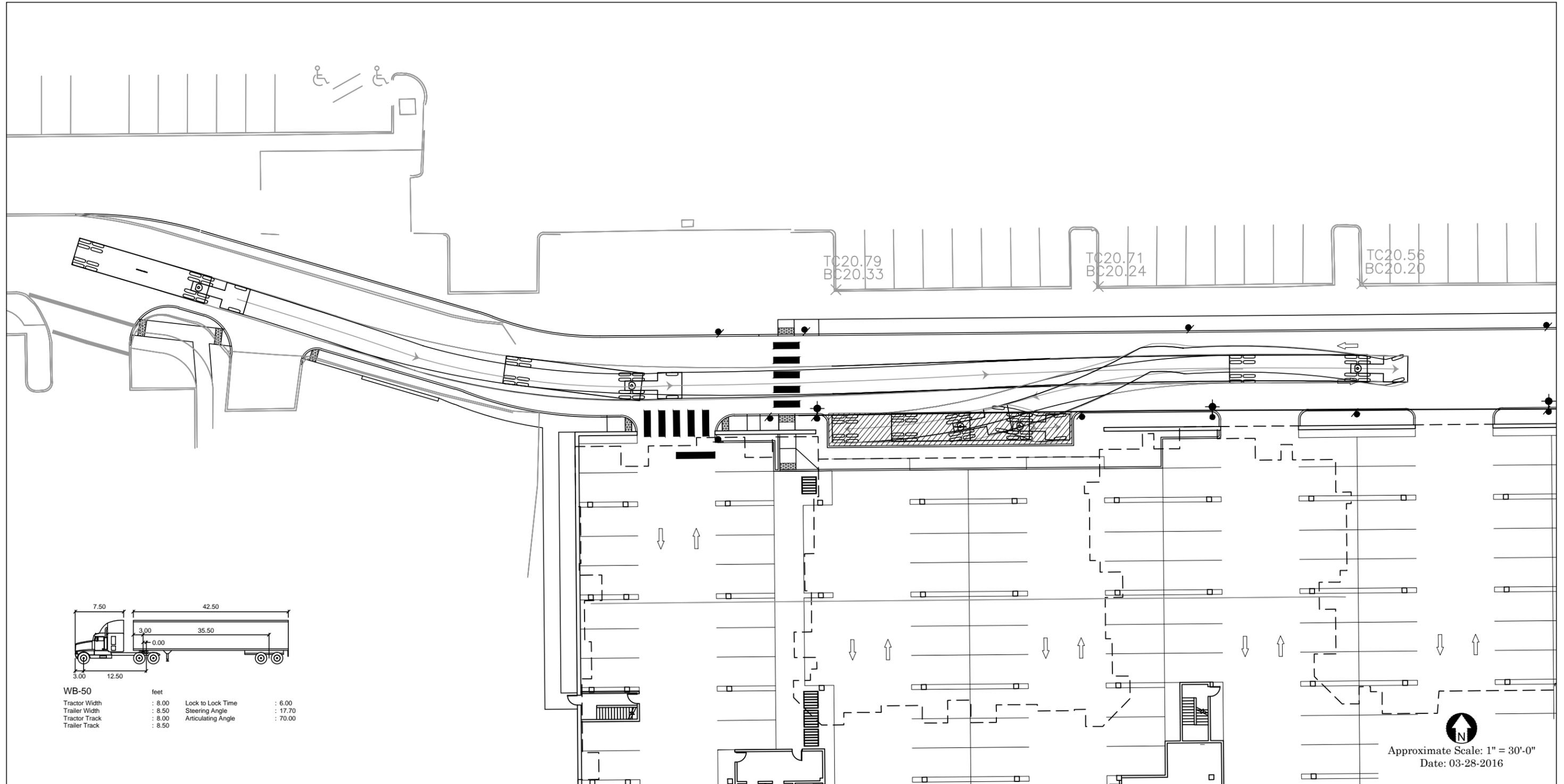
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Figure D.7. WB-50 Turning Movements from Route 3A WB to Service Aisle/Fire Lane



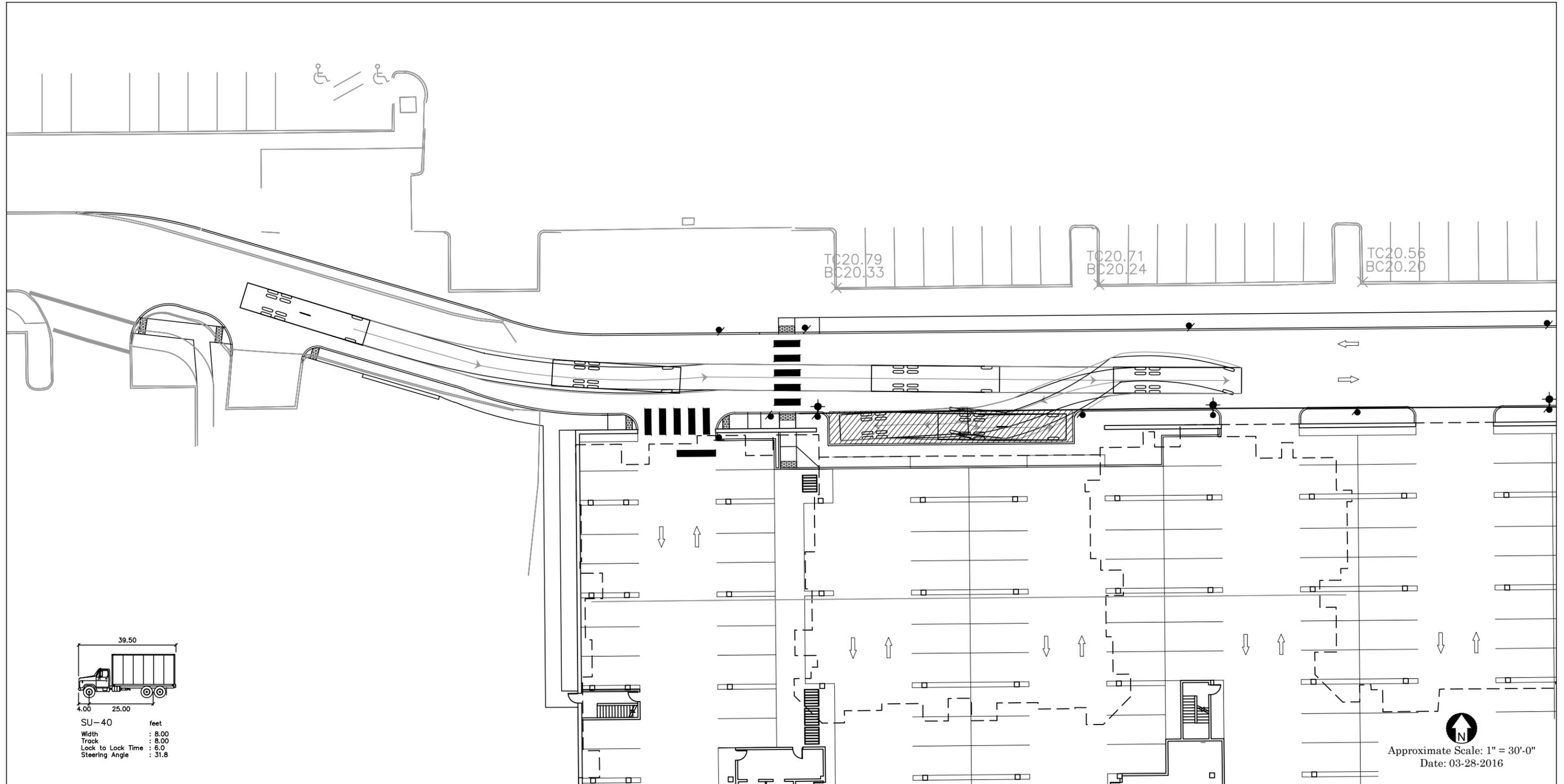
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Figure D.8. WB-50 Turning Movements Backing-in from Service Aisle/Fire Lane



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Figure D.9. SU-40 Turning Movements Pulling in from Service Aisle/Fire Lane



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