EXHIBIT E
PROJECT SITE
NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT
NORTHEAST METROPOLITAN REGIONAL VOCATION HIGH SCHOOL

PROJECT SCOPE AND BUDGET AGREEMENT

Intrusion Alarm System

An IP-based addressable Intrusion Alarm system will be installed. The system shall have door contacts on all exterior doors and motion sensors in all spaces on grade with exterior doors and/or windows. Motion sensors will be installed in stairwells and corridors so that an intruder's travel through the building can be tracked in real-time.

The Intrusion Alarm system will include keypad locations for arming and disarming the system. The Intrusion Alarm system will include an automatic dialer for notification to an alarm monitoring service company,

The system will include interior sirens and strobes as well as beacon/strobes installed on the building exterior walls at locations affording line of sight from the street.

The Intrusion Alarm equipment and low voltage wiring will be included in the base bid.

CCTV Video Surveillance System

The existing Video Management System (VMS) shall be upgraded to its latest version and licenses shall be expanded for the number of CCTV cameras at the new building.

High Definition Multisensor IP cameras will be installed on-site lighting poles to provide coverage of parking lots, vehicle approaches, and driveway entrances and exits.

Approximately (50) High-Definition IP Video Surveillance cameras will be installed at key locations at building entrances, in corridors, and at strategic exterior wall locations to provide for monitoring of all entry/exit doors, bus drop off/loading area, interior corridors, and potential problem areas such as gymnasium, cafeteria, stairwells, and gang toilet entrances.

Live feed from all CCTV cameras will be viewable at large screen monitors installed in the main offices, the SRO office as well as at authorized computer stations.

Recorded images shall be assessable via the system console and through authorized staff computer stations.

The Video Surveillance system will be accessible by the police department.

The system's Network Video Recorder shall be sized to provide for a minimum of thirty days of image retention.

Site Development Requirements

The Site program has not changed since the original Preliminary Design Program (PDP).

The proposed school requires vehicular access and parking for students, staff, visitors, adjacent public open space users and service deliveries. The design incorporates a clear and safe separation of bus and car circulations, with separate drop-off for each. Service to the school is directed to the back of the building and various locations depending on the vocational programs.

There will be a total of 483 parking spaces provided in the design. This exceeds the zoning by-law calculations of 418 spaces which are 267 spaces for students and 151 staff spaces. The 483 total parking spaces are distributed as follows: 12 dedicated for users of the Breakheart Reservation, 10 dedicated for school visitors, 191 for school staff and 270 for students. There are also fenced vehicle storage areas dedicated for the respective vocational programs.

Accessible pathways to all building entries and amenity areas are incorporated into the design. A series of elevated boardwalk ramping sections are proposed in combination with a two-story elevator incorporated into the satellite locker room building, providing access from the lower parking lot to the main school building.

The main entry points for the building have been designed to incorporate plaza spaces that allow for gathering during the drop-off and pick-up times and can also be utilized for outdoor learning. Green (vegetated) roofs are proposed on the building. Two of these green roofs will be active use spaces for outdoor learning and gathering, one green roof is a passive area for visual aesthetics.

Recreation site improvements will include the development of a new irrigated natural grass multi-sport field with a softball skinned infield overlay. A 6-lane rubber running track with a synthetic turf football field on the inside edge. A 750-seat bleacher system with press box will be associated with the track and field. Athletic field sports lighting is proposed for the track and football field. A new bank of five tennis courts will be constructed behind the football/multi-sport fields. The existing irrigated natural grass baseball field will be renovated along with the lower natural grass practice fields and junior varsity softball field. These new fields will be located on the area of the current building and parking lots after they have been demolished.

Desired Visual / Aesthetic Focal Points

The proposed new school for Northeast Metro Tech will be a large-scale intervention in the wooded hillside adjacent to Breakheart Reservation. The site clearing and blasting necessary to create the buildable area makes it difficult to hide the size or scale of the new school. However, the design is composed to achieve a harmonious relationship and a sympathetic recall of the building's context. The massing is relatively straightforward with a few key focal points:

The **main entrance** is located on the prominent southeast corner of the building, clearly visible from the new entrance drive. It is framed by the tall stone wall of the cafeteria and the three-story volume of the library/media center "rotunda".

The upper floors of the **south elevation** step back to reflect the topography the existing hillside. This façade is composed of clean horizontal lines with generous roof overhangs for shading.

The key **entrance locations** are marked by vertical glass curtain walls. At the events entrance by the Gym and Auditorium this verticality carries indoors to a three-story high space capped with a clerestory to flood the interior with natural light.

The **north end of the building** steps down the hillside to follow the site's natural topography and to integrate the large volumes of the Gym and Auditorium into the site.

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DEMOLITION NOTES:

1. SITE PREPARATION AND DEMOLITION SHALL INCLUDE THOSE AREAS WITHIN THE LIMIT OF WORK LINE AS SHOWN ON THE CONTRACT DOCUMENTS.
2. ANY AREA OUTSIDE THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
3. CONSULT ALL OF THE DRAWINGS AND SPECIFICATIONS FOR COORDINATION REQUIREMENTS BEFORE COMMENCING DEMOLITION.
4. THE CONTRACTOR SHALL COORDINATE SITE DEMOLITION EFFORTS WITH ALL TRADES THAT MAY BE AFFECTED BY THE WORK.
5. ALL ITEMS REQUIRING REMOVAL SHALL BE REMOVED TO FULL DEPTH TO INCLUDE BASE MATERIAL AND FOOTINGS OR FOUNDATIONS AS REQUIRED TO FACILITATE CONSTRUCTION, AND LEGALLY DISPOSED OF OFFSITE BY CONTRACTOR.
6. UTILITY PIPES DESIGNATED TO BE ABANDONED IN PLACE SHALL BE PLUGGED AT THEIR ENDS WITH WATERTIGHT BRICK MASONRY OR CEMENT MORTAR WITH A MINIMUM THICKNESS OF 8 INCHES.
7. UTILITY PIPES DESIGNATED TO BE REMOVED SHALL CONSIST OF THE COMPLETE REMOVAL AND DISPOSAL OF THE ENTIRE LENGTH OF PIPE AND BACKFILL AND 95% COMPACTION OF THE VOID WITH ORDINARY BORROW. WHEN THE VOID IS WITHIN THE FOOTPRINT OF THE NEW BUILDING, GRAVEL BORROW SHALL BE USED TO BACKFILL THE VOID.
8. UTILITY STRUCTURES DESIGNATED TO BE ABANDONED IN PLACE SHALL HAVE THEIR CAST IRON CASTINGS REMOVED AND DISPOSED, INLET AND OUTLET PIPES PLUGGED, THE BOTTOM OF THE STRUCTURES SHALL BE BROKEN, THE VOID OF THE STRUCTURES SHALL BE BACKFILLED AND COMPACTED TO 95% WITH ORDINARY BORROW OR FLOWABLE FILL, AND THE TOP OF THE STRUCTURE SHALL BE REMOVED SO THAT IT IS AT LEAST 36 INCHES BELOW FINISH GRADE.
9. UTILITY STRUCTURES DESIGNATED TO BE REMOVED SHALL CONSIST OF THE REMOVAL AND DISPOSAL OF CAST IRON CASTINGS, PLUGGING OF INLET AND OUTLET PIPES, REMOVAL OF THE STRUCTURE, AND BACKFILL AND 95% COMPACTION OF THE VOID WITH ORDINARY BORROW. WHEN HE VOID IS WITHIN THE FOOTPRINT OF THE NEW BUILDING, GRAVEL BORROW SHALL BE USED TO BACKFILL THE VOID.
10. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFFSITE.
11. AT ALL LOCATIONS WHERE EXISTING CURBING, CONCRETE PAVEMENT OR BITUMINOUS CONCRETE ROADWAY ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE.
12. EXTEND DESIGNATED LIMIT OF WORK AS NECESSARY TO ACCOMPLISH ROUGH GRADING, EROSION CONTROL, TREE PROTECTION, AND SITE WORK AS REQUIRED BY THESE DRAWINGS AND SPECIFICATIONS.
13. THE CONTRACTOR SHALL REMOVE FROM THE SITE ALL RUBBISH AND DEBRIS FOUND THEREON. STORAGE OF SUCH MATERIALS ON THE PROJECT SITE WILL NOT BE PERMITTED. THE CONTRACTOR SHALL LEAVE THE SITE IN SAFE, CLEAN, AND LEVEL CONDITION UPON COMPLETION OF THE SITE DEMOLITION WORK.
14. REMOVE AND STOCKPILE ALL EXISTING SITE LIGHTS, BENCHES, TRASH RECEPTACLES, TRAFFIC SIGNS, GRANITE CURB, AND OTHER SITE IMPROVEMENTS WITHIN LIMIT OF WORK LINE UNLESS OTHERWISE NOTED.
15. ALL EXISTING TREES AND SHRUBS TO REMAIN SHALL BE PROTECTED AND MAINTAINED THROUGHOUT THE TIME OF CONSTRUCTION, AS SPECIFIED AND DIRECTED BY THE LANDSCAPE ARCHITECT.
16. BEFORE ANY TREES OR SHRUBS ARE REMOVED, THE CONTRACTOR SHALL ARRANGE A CONFERENCE ON THE SITE WITH THE OWNER OR OWNER'S REPRESENTATIVE TO IDENTIFY TREES AND SHRUBS THAT ARE TO BE REMOVED, AS WELL AS THOSE WHICH ARE TO BE PROTECTED. DO NOT COMMENCE CLEARING OPERATIONS WITHOUT A CLEAR UNDERSTANDING OF EXISTING CONDITIONS TO BE PRESERVED.
17. THE CONTRACTOR SHALL REMOVE FROM THE AREA OF CONSTRUCTION PAVEMENT, CONCRETE, CURBING, POLES AND FOUNDATIONS, ISLANDS, TREE BERMS AND OTHER FEATURES WITHIN THE LIMITS OF CONSTRUCTION AS REQUIRED TO ACCOMMODATE NEW CONSTRUCTION WHETHER SPECIFIED ON THE DRAWINGS OR NOT.

COST ESTIMATING NOTES:

1. ALL WATER LINES ARE DUCTILE IRON UNLESS OTHERWISE NOTED. ASSUME ALL WATER LINES INSTALLED WITH 5' OF COVER.
2. ASSUME ALL ROADWAY DRAINAGE LINES ARE 12" CORRUGATED PLASTIC PIPE UNLESS OTHERWISE NOTED. ASSUME ALL DRAIN LINES INSTALLED WITH 6' OF COVER.
3. ASSUME ALL ROOF DRAINAGE LINES ARE 6" CORRUGATED PLASTIC PIPE UNLESS OTHERWISE NOTED. ASSUME ALL DRAIN LINES INSTALLED WITH 4' OF COVER.
4. ASSUME THAT ALL SEWER LINES ARE 8" PVC. ASSUME ALL SEWER LINES INSTALLED WITH 6' OF COVER.
5. ASSUME ALL STRUCTURES ARE 4' INSIDE DIAMETER, EXCEPT FOR DOUBLE CATCH BASINS AND STRUCTURES THAT ARE DIRECTLY CONNECTED TO UNDERGROUND RECHARGE/DETENTION SYSTEMS. ASSUME THOSE STRUCTURES ARE 6' INSIDE DIAMETER.
6. SEE MEP PLANS FOR SIZING OF ELECTRIC, CABLE, TELEPHONE AND LIGHTING.

BUILDING LOCATION NOTES:

1. THE BUILDING LOCATION INFORMATION SHOWN ON THIS PLAN PROVIDES THE POSITION AND ORIENTATION OF THE BUILDING. REFER TO THE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR BUILDING AND FOUNDATION DIMENSIONS, INCLUDING BUILDING OVERHANGS AND AREAWAYS. THE CONTRACTOR SHALL VERIFY BUILDING AND FOUNDATION DIMENSIONS WITH THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO FOUNDATION CONSTRUCTION.
2. THE LOCATION OF THE CORNER AND OUTSIDE FACE OF THE PROPOSED BUILDING FOUNDATION WALL WAS TAKEN FROM AN AUTOCAD FILE RECEIVED FROM WARNER LARSON ON 5/12/2021.
3. THE SURVEYOR PERFORMING BUILDING LAYOUT SHALL BE A LICENSED PROFESSIONAL LAND SURVEYOR OR UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL LAND SURVEYOR IN THE STATE OF MASSACHUSETTS WITH EXPERIENCE PREPARING BUILDING LAYOUT CALCULATIONS. THOSE CALCULATIONS SHALL BE PREPARED TO THE STANDARD OF CARE CURRENTLY ESTABLISHED FOR THE SURVEYING PROFESSION IN THE STATE OF MASSACHUSETTS.
4. THE BUILDING LAYOUT SURVEYOR SHALL CONFIRM THE FOLLOWING ITEMS:
   A. THE BUILDING LOCATION CONFORMS TO ZONING SETBACKS;
   B. THE BUILDING LOCATION IS WITHIN THE PROPERTY LINE; AND
   C. THE BUILDING CLOSES ON ITSELF BASED ON THE DIMENSIONS PROVIDED ON THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
5. THE SURVEYOR PERFORMING BUILDING LAYOUT SHALL PROVIDE A SUBMITTAL TO THE DESIGN TEAM THAT INCLUDES THEIR CALCULATIONS CONFIRMING THE ITEMS LISTED UNDER NOTE #4 ABOVE. THIS SUBMITTAL SHALL BE STAMPED AND SIGNED BY THE LICENSED PROFESSIONAL LAND SURVEYOR WHO PREPARED THE CALCULATIONS.

EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE "MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS" PREPARED BY DEPARTMENT OF ENVIRONMENTAL PROTECTION, BUREAU OF RESOURCE PROTECTION, AND THE CURRENT NPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES.
2. MEANS OF EROSION AND SEDIMENT PROTECTION AS NOTED ON THE DRAWINGS INDICATE MINIMUM RECOMMENDED PROVISIONS. THE CONTRACTOR IS RESPONSIBLE FOR FINAL SELECTION AND PLACEMENT OF EROSION AND SEDIMENTATION CONTROLS BASED ON ACTUAL SITE CONDITIONS AND CONSTRUCTION CONDITIONS. ADDITIONAL MEANS OF PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR CONTINUED OR UNFORESEEN EROSION PROBLEMS, OR AS DIRECTED BY CONTROLLING MUNICIPAL AUTHORITIES, AT NO ADDITIONAL EXPENSE TO THE OWNER.
3. AN EROSION CONTROL BARRIER SHALL BE INSTALLED ALONG THE EDGE OF PROPOSED DEVELOPMENT AS INDICATED IN THE PLAN PRIOR TO COMMENCEMENT OF DEMOLITION OR CONSTRUCTION OPERATIONS.
4. SEDIMENT CONTROL MEASURES SHALL BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF AND DURING ALL PHASES OF CONSTRUCTION AND BE CONSTRUCTED PRIOR TO AND IMMEDIATELY AFTER ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON THE SITE.
5. AFTER ANY SIGNIFICANT RAINFALL (GREATER THAN 0.25 INCHES OF RAINFALL WITHIN 24 HOURS), SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGE SHALL BE CORRECTED IMMEDIATELY.
6. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO ENSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT LEAVING THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING SEDIMENT FROM ENTERING ANY STORM DRAINAGE SYSTEM AND FROM BEING CONVEYED TO ANY WETLAND RESOURCE AREA, PUBLIC WAYS, ABUTTING PROPERTY, OR OUTSIDE OF THE PROJECT LIMITS.
8. THE CONTRACTOR SHALL PROTECT ALL DRAINAGE SWALES AND GROUND SURFACES WITHIN THE LIMIT OF WORK FROM EROSIVE CONDITIONS. STRAW BALE, CRUSHED STONE OR EQUIVALENT CHECK DAMS ARE TO BE PROVIDED AT A MAXIMUM OF TWO HUNDRED (200) FOOT SPACING, OR LESS AS SITE-SPECIFIC CONDITIONS WARRANT, WITHIN ALL DRAINAGE SWALES AND DITCHES AND AT UPSTREAM SIDES OF ALL DRAINAGE INLETS.
9. ALL STOCK PILES SHALL BE PROTECTED AND LOCATED A MINIMUM OF 100' FROM EXISTING WETLAND RESOURCE AREAS & WITHIN THE LIMIT OF WORK.
10. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
11. ALL SEDIMENT RETAINED BY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE LEGALLY DISPOSED OF OFFSITE.
12. TEMPORARY DIVERSION DITCHES, PERMANENT DITCHES, CHANNELS, EMBANKMENTS, AND ANY DENUDED SURFACE THAT WILL BE EXPOSED FOR A PERIOD OF 14 CALENDAR DAYS OR MORE SHALL BE CONSIDERED CRITICAL VEGETATION AREAS. THESE AREAS SHALL BE STABILIZED/PROTECTED WITH APPROPRIATE EROSION CONTROL MATTING OR OTHER EROSION CONTROL METHODS.
13. DUST SHALL BE CONTROLLED BY WATERING OR OTHER APPROVED METHODS AS DIRECTED BY THE PERMITTING AUTHORITY OR OWNER.
14. THE CONTRACTOR SHALL USE TEMPORARY SEEDING, MULCHING, OR OTHER APPROVED STABILIZATION MEASURES TO PROTECT EXPOSED AREAS DURING PROLONGED CONSTRUCTION OR OTHER LAND DISTURBANCE. STOCKPILES THAT WILL BE EXPOSED FOR LONGER THAN 14 DAYS SHALL BE STABILIZED.
15. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL EROSION AND SEDIMENT CONTROLS AT THE COMPLETION OF SITE CONSTRUCTION, BUT ONLY WHEN DIRECTED BY THE CITY/TOWN OF XXXX CONSERVATION AGENT. STABILIZE OR SEED BARE AREAS LEFT AFTER EROSION CONTROL REMOVAL.

EARTH MOVING AND GRADING NOTES:

1. ALL TOPSOIL ENCOUNTERED WITHIN THE WORK AREA SHALL BE STRIPPED TO ITS FULL DEPTH AND STOCKPILED FOR REUSE. EXCESS TOPSOIL SHALL BE REMOVED FROM THE SITE UNLESS OTHERWISE DIRECTED BY THE OWNER. TOPSOIL PILES SHALL REMAIN SEGREGATED FROM EXCAVATED SUBSURFACE SOIL MATERIALS.
2. GRADES WITHIN HANDICAP PARKING SPACES AND ACCESS AISLES SHALL NOT EXCEED 1.5% IN ANY DIRECTION.
3. CROSS SLOPES OF ALL PEDESTRIAN WALKS SHALL NOT EXCEED 1.5%.
4. RUNNING SLOPE OF ALL PEDESTRIAN WALKS SHALL NOT EXCEED 4.5%, UNLESS OTHERWISE NOTED.
5. THE CONTRACTOR SHALL EXERCISE CAUTION IN ALL EXCAVATION ACTIVITY DUE TO POSSIBLE EXISTENCE OF UNRECORDED UTILITY LINES.
6. ALL PAVED AREAS MUST PITCH TO DRAIN AT A MINIMUM OF 1% UNLESS OTHERWISE NOTED.
7. PROVIDE POSITIVE DRAINAGE AWAY FROM FACE OF BUILDINGS AT ALL LOCATIONS.
8. PITCH EVENLY BETWEEN CONTOUR LINES AND BETWEEN SPOT GRADES. SPOT GRADE ELEVATIONS TAKE PRECEDENCE OVER CONTOUR LINES.
9. ALL PROPOSED TOP OF CURB ELEVATIONS ARE SIX INCHES (6") ABOVE BOTTOM OF CURB ELEVATIONS UNLESS OTHERWISE NOTED. ALL PROPOSED TOP OF CAPE COD BERM ELEVATIONS ARE FOUR INCHES (4") ABOVE BOTTOM OF CURB ELEVATION UNLESS OTHERWISE NOTED.
10. THE CONTRACTOR SHALL BLEND NEW GRADING SMOOTHLY INTO EXISTING GRADING AT LIMITS OF GRADING.
11. WHERE NEW PAVING MEETS EXISTING PAVING, MEET LINE AND GRADE OF EXISTING PAVING WITH SMOOTH TRANSITION BETWEEN EXISTING AND NEW SURFACES.
12. THE CONTRACTOR SHALL VERIFY EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO STARTING WORK.
13. PITCH TOPS OF ALL WALLS AT ONE-EIGHTH INCH (1/8") PER FOOT FROM BACK OF WALL TO FACE OF WALL.
14. SURPLUS MATERIALS SHALL BE REMOVED FROM THE SITE UNLESS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE. REFER TO EARTHWORK SPECIFICATIONS.
15. ANY AREAS OUTSIDE OF THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED BY THE CONTRACTOR TO THE PRE-CONSTRUCTION CONDITION/GRADE AT NO COST TO THE OWNER.
16. EXCAVATION REQUIRED WITHIN PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO ADDITIONAL COST TO OWNER.
17. GRADING SHOWN FOR INFORMATION ONLY – SEE LANDSCAPE ARCHITECT'S GRADING PLAN FOR GRADING.
18. GRADING FOR ATHLETIC FIELDS SHOWN FOR INFORMATION ONLY – SEE LANDSCAPE ARCHITECT'S GRADING PLAN.

GENERAL NOTES:

1. TOPOGRAPHIC DATA, PROPERTY LINE INFORMATION, AND EXISTING SITE FEATURES WERE OBTAINED FROM A PLAN ENTITLED "TOPOGRAPHIC SURVEY", PREPARED BY NITSCH, DATED 6/3/2020.
2. THE CONTRACTOR SHALL COMPLY WITH MASSACHUSETTS GENERAL LAWS CHAPTER 82, SECTION 40, AS AMENDED, WHICH STATES THAT NO ONE MAY EXCAVATE IN THE COMMONWEALTH OF MASSACHUSETTS EXCEPT IN AN EMERGENCY WITHOUT 72 HOURS NOTICE, EXCLUSIVE OF SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS, TO NATURAL GAS PIPELINE COMPANIES, AND MUNICIPAL UTILITY DEPARTMENTS THAT SUPPLY GAS, ELECTRICITY, TELEPHONE, OR CABLE TELEVISION SERVICE IN OR TO THE CITY OR TOWN WHERE THE EXCAVATION IS TO BE MADE. THE CONTRACTOR SHALL CALL "DIG SAFE" AT 1-888-DIG-SAFE.
3. THE CONTRACTOR SHALL COMPLY WITH MASSACHUSETTS GENERAL LAWS CHAPTER 82A, ALSO REFERRED TO AS JACKIE'S LAW, AS DETAILED IN SECTION 520 CMR 14.00 OF THE CODE OF MASSACHUSETTS REGULATIONS.
4. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, REGULATIONS AND SAFETY CODES IN THE CONSTRUCTION OF ALL IMPROVEMENTS.
5. THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRESENCE AND LOCATIONS OF ALL UTILITIES WITHIN THE LIMIT OF WORK MUST BE DETERMINED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND CONTACTING THE CONTROLLING AUTHORITIES AND/OR UTILITY COMPANIES RELATIVE TO THE LOCATIONS AND ELEVATIONS OF THEIR LINES. THE CONTRACTOR SHALL KEEP A RECORD OF ANY DISCREPANCIES OR CHANGES IN THE LOCATIONS OF ANY UTILITIES SHOWN OR ENCOUNTERED DURING CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE OWNER AND NITSCH ENGINEERING. ANY DAMAGE RESULTING FROM THE FAILURE OF THE CONTRACTOR TO MAKE THESE DETERMINATIONS AND CONTACTS SHALL BE BORNE BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL, THROUGHOUT CONSTRUCTION, TAKE ADEQUATE PRECAUTIONS TO PROTECT ALL WALKS, GRADING, SIDEWALKS AND SITE DETAILS OUTSIDE OF THE LIMIT OF WORK AS DEFINED ON THE DRAWINGS AND SHALL REPAIR AND REPLACE OR OTHERWISE MAKE GOOD AS DIRECTED BY THE ENGINEER OR OWNER'S DESIGNATED REPRESENTATIVE ANY SUCH OR OTHER DAMAGE SO CAUSED.
7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY AND ALL CONSTRUCTION MEANS AND METHODS.
8. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE SITE AND CONSTRUCTION DOCUMENTS TO DEVELOP A THOROUGH UNDERSTANDING OF THE PROJECT, INCLUDING ANY SPECIAL CONDITIONS AND CONSTRAINTS.
9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH THE PROJECT SITE AND TO VERIFY ALL CONDITIONS IN THE FIELD AND REPORT DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE OWNER OR OWNER'S REPRESENTATION IMMEDIATELY.
10. THE CONTRACTOR SHALL CONDUCT ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY CONSTRUCTION PERMITS.
11. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE ESTABLISHMENT AND USE OF ALL VERTICAL AND HORIZONTAL CONSTRUCTION CONTROLS.
12. ELEVATIONS REFER TO NAVD88 (REFER TO THE EXISTING CONDITIONS SURVEY FOR ADDITIONAL INFORMATION).
13. THE CONTRACTOR SHALL COMPLY WITH THE ORDER OF CONDITIONS DATED XXXX XX, XXXX AND ISSUED BY THE XXXX CONSERVATION COMMISSION (DEP #XXX-XXX).
14. FOR SOIL INFORMATION REFER TO GEOTECHNICAL REPORT.

UTILITY NOTES:

1. ALL UTILITY CONNECTIONS ARE SUBJECT TO THE APPROVAL OF, AND GRANTING OF PERMITS BY, THE LOCAL MUNICIPALITY. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL PERMITS AND APPROVALS RELATED TO UTILITY WORK PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR OBTAINING ALL PERMISSIONS FOR, AND FOR CONDUCTING ALL PREPARATIONS RELATED TO, WORK AFFECTING ANY UTILITIES WITHIN THE JURISDICTION OF ANY NON-MUNICIPAL UTILITY COMPANY, INCLUDING BUT NOT LIMITED TO ELECTRIC, TELEPHONE, AND/OR GAS. THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE AGENCIES, DEPARTMENTS, AND UTILITY COMPANIES, IN WRITING, AT LEAST 7 DAYS (OR PER UTILITY COMPANY REQUIREMENT) AND NOT MORE THAN 30 DAYS PRIOR TO ANY CONSTRUCTION.
3. THE CONTRACTOR SHALL MAINTAIN UTILITIES SERVICING BUILDINGS AND FACILITIES WITHIN OR OUTSIDE THE PROJECT LIMIT UNLESS THE INTERRUPTION OF SERVICE IS COORDINATED WITH THE OWNER.
4. ALL WATER, SEWER, AND DRAIN WORK SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS AND STANDARD SPECIFICATIONS OF THE LOCAL MUNICIPALITY.
5. GAS, TELECOMMUNICATIONS AND ELECTRIC SERVICES ARE TO BE DESIGNED BY EACH UTILITY COMPANY IN COORDINATION WITH THE MECHANICAL, ELECTRIC, AND PLUMBING CONSULTANTS.
6. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES OF NEW UTILITIES WITH GAS, TELECOMMUNICATION AND ELECTRICAL SERVICES.
7. INSTALL WATER LINES WITH A MINIMUM OF FIVE FEET OF COVER AND A MAXIMUM OF SEVEN FEET COVER FROM THE FINAL DESIGN GRADES.
8. MAINTAIN 10 FEET HORIZONTAL SEPARATION AND 18 INCHES VERTICAL SEPARATION (WATER OVER SEWER) BETWEEN SEWER AND WATER LINES. WHEREVER THERE IS LESS THAN 10 FEET OF HORIZONTAL SEPARATION AND 18 INCHES OF VERTICAL SEPARATION BETWEEN A PROPOSED OR EXISTING SEWER LINE TO REMAIN AND A PROPOSED OR EXISTING WATER LINE TO REMAIN BOTH WATER MAIN AND SEWER MAIN SHALL BE CONSTRUCTED OF MECHANICAL JOINT CEMENT LINED DUCTILE IRON PIPE FOR A DISTANCE OF 10-FEET ON EITHER SIDE OF THE CROSSING. ONE (1) FULL LENGTH OF WATER PIPE SHALL BE CENTERED OVER THE SEWER AT THE CROSSING.
9. THE CONTRACTOR SHALL MAINTAIN ALL EXISTING UTILITIES EXCEPT THOSE NOTED TO BE ABANDONED AND/OR REMOVED & DISPOSED.
10. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR TRENCHING, BACKFILLING, AND SURFACE RESTORATION FOR GAS UTILITY SYSTEMS.
11. ALL ONSITE UTILITIES SHALL BE INSTALLED UNDERGROUND UNLESS OTHERWISE NOTED.
12. ALL EXISTING AND PROPOSED MANHOLE FRAMES, COVERS, VALVES, CLEANOUTS, CASTINGS, ETC. SHALL BE RAISED TO FINISHED GRADE PRIOR TO FINAL GRADING AND PAVING CONSTRUCTION.
13. ALL GRATES IN WALKWAYS SHALL BE ADA COMPLIANT.

PROPOSED LEGEND

- LIMIT OF WORK
- EXISTING UTILITY TO BE ABANDONED, REMOVED AND DISPOSED IF IN CONFLICT WITH NEW SITE IMPROVEMENTS, OR AS INDICATED ON DRAWINGS
- EROSION CONTROL BARRIER
- CONSTRUCTION FENCE
- W — DOMESTIC WATER PIPE
- FP — FIRE PROTECTION PIPE
- S — SANITARY SEWER PIPE
- D — STORM DRAIN PIPE
- G — GAS PIPE
- E — ELECTRIC DUCTBANK
- T/C — TELECOM DUCTBANK
- CW — CHILLED WATER PIPE
- STM — STEAM PIPE
- CR — CONDENSATE RETURN PIPE
- HW — HOT WATER PIPE/RETURN
- HHW — HEATING HOT WATER
- RW — REUSE WATER PIPE
- GW — GREY WATER PIPE
- FUTURE UTILITY, SHOWN FOR INFORMATION ONLY
- INLET PROTECTION
- ELEVATION CONTOURS
- MATCH LINE
- CENTERLINE
- CO — CLEANOUT
- AREA DRAIN
- ACCESS BASIN
- DRAIN MANHOLE
- WATER QUALITY STRUCTURE
- CATCH BASIN
- DOUBLE CATCH BASIN
- WATER QUALITY INLET
- SEWER MANHOLE
- STMH — STEAM MANHOLE
- TMH — TELECOM MANHOLE
- EMH — ELECTRIC MANHOLE
- CWV — CHILLED WATER VALVE
- WV — WATER VALVE
- HYD — FIRE HYDRANT

ABBREVIATIONS

AB	ACCESS BASIN
AD	AREA DRAIN
BC	BOTTOM OF CURB ELEVATION
BW	BOTTOM OF WALL ELEVATION
CB	CATCH BASIN
CCB	CAPE COD BERM
CI	CAST IRON
CJ	CONTROL JOINT
CL	CENTER LINE
CO	CLEANOUT
COP	CENTER OF PIPE
CP	CARRIER PIPE
CPP	CORRUGATED POLYETHYLENE PIPE
DCB	DOUBLE CATCH BASIN
DI	DUCTILE IRON PIPE CEMENT LINED
DMH	DRAIN MANHOLE
EHH	ELECTRIC HANDHOLE
EJ	EXPANSION JOINT
EMH	ELECTRIC MANHOLE
FD	FOUNDATION DRAIN
FFE	FINISHED FLOOR ELEVATION
HP	HIGH POINT
HYD	FIRE HYDRANT
INV	INVERT ELEVATION
LF	LINEAR FEET
LOW	LIMIT OF WORK
LP	LOW POINT
LW	LAB WASTE
M&P	MAINTAIN AND PROTECT
NIC	NOT IN CONTRACT
OC	ON CENTER
OCS	OUTLET CONTROL STRUCTURE
PD	PERIMETER DRAIN
PERF	PERFORATED
PVC	POLYVINYL CHLORIDE PIPE
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND STOCKPILE
RD	ROOF DRAIN
RIM	RIM ELEVATION
SMH	SEWER MANHOLE
SS	SEWER SERVICE
TC	TOP OF CURB ELEVATION
TW	TOP OF WALL ELEVATION
THH	TELECOM HANDHOLE
TMH	TELECOM MANHOLE
TOP	TOP OF PIPE
TOD	TOP OF DUCT BANK
TYP	TYPICAL
UD	UNDERDRAIN
USD	UNDERSLAB DRAIN
VCC	VERTICAL GRANITE CURB
WQI	WATER QUALITY INLET
WQS	WATER QUALITY STRUCTURE
WV	WATER VALVE

G:\13872 rent study\civil\cad\13872_c00.dwg

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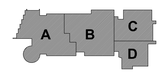
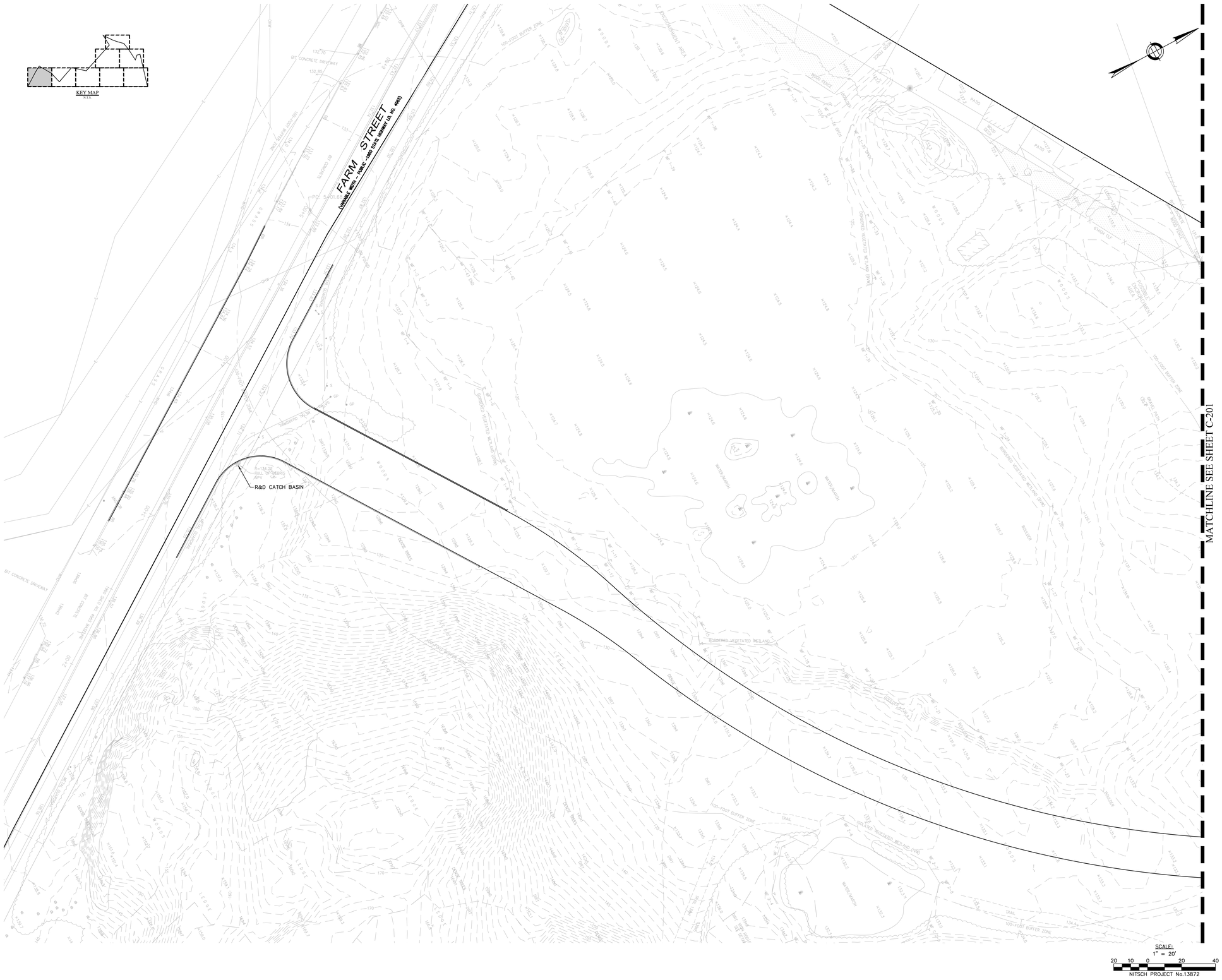


KEY PLAN

CIVIL NOTES, LEGENDS, AND ABBREVIATIONS

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-100



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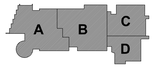
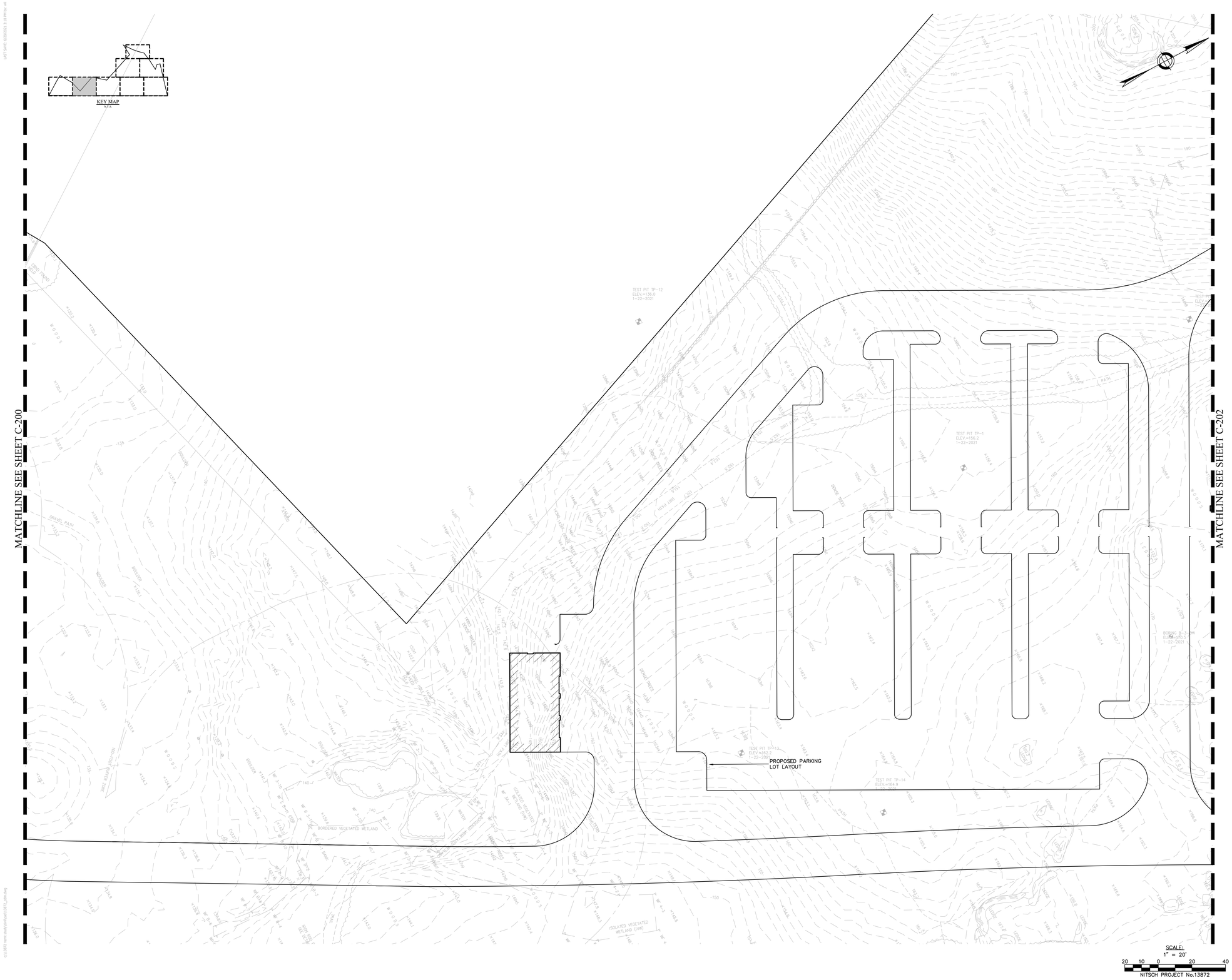


KEY PLAN

UTILITY DEMO PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-200



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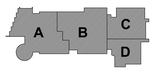
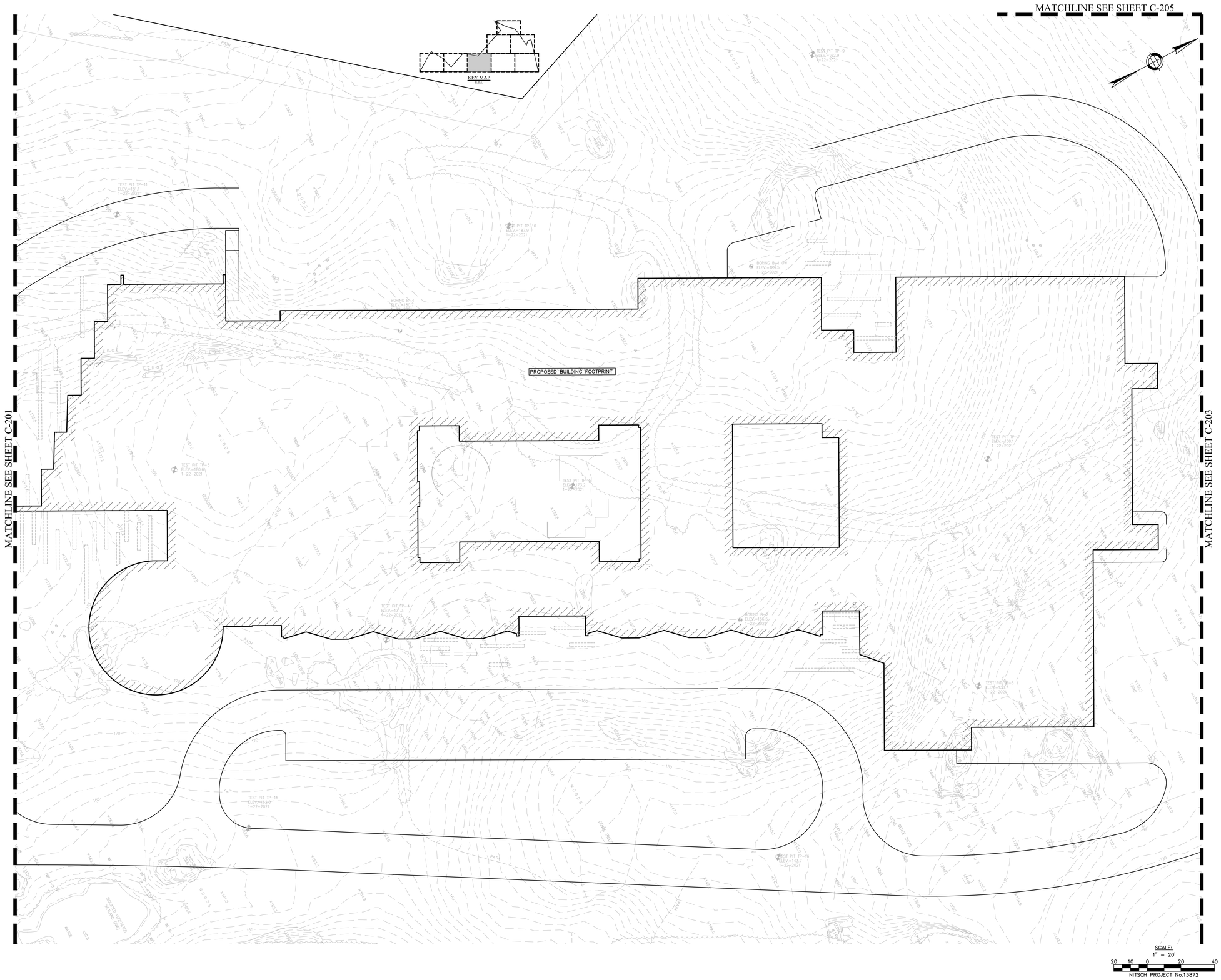


KEY PLAN

UTILITY DEMO PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-201



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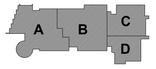

KEY PLAN

UTILITY DEMO PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-202

MATCHLINE SEE SHEET C-205

MATCHLINE SEE SHEET C-206

MATCHLINE SEE SHEET C-202

MATCHLINE SEE SHEET C-204

R&D CATCH BASIN

R&D MANHOLE

PROPOSED BUILDING FOOTPRINT

PROPOSED DRIVE AISLE LAYOUT

PROPOSED FIELD LAYOUT

100-FOOT BUFFER ZONE

KEY MAP

SCALE:
1" = 20'

20 10 0 20 40

NITSCH PROJECT No.13872

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KEY PLAN

UTILITY DEMO PLAN

Scale: AS NOTED
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Drawn By: WL
Date: June 17, 2021

C-203

MATCHLINE SEE SHEET C-206

MATCHLINE SEE SHEET C-203

R&D CATCH BASIN

R&D MANHOLE

R&D CATCH BASIN

R&D CATCH BASIN

M&P SEWER MANHOLE

R&D MANHOLE

R&D CATCH BASIN

R&D MANHOLE

M&P SEWER MANHOLE

R&D MANHOLE

R&D CATCH BASIN

R&R FIRE HYDRANT

R&D MANHOLE

R&D CATCH BASIN

R&D MANHOLE

R&D MANHOLE

M&P SEWER MANHOLE

M&P SEWER MANHOLE

KEY MAP
N.T.S.

SCALE:
1" = 20'
20 10 0 20 40
NITSCH PROJECT No.13872

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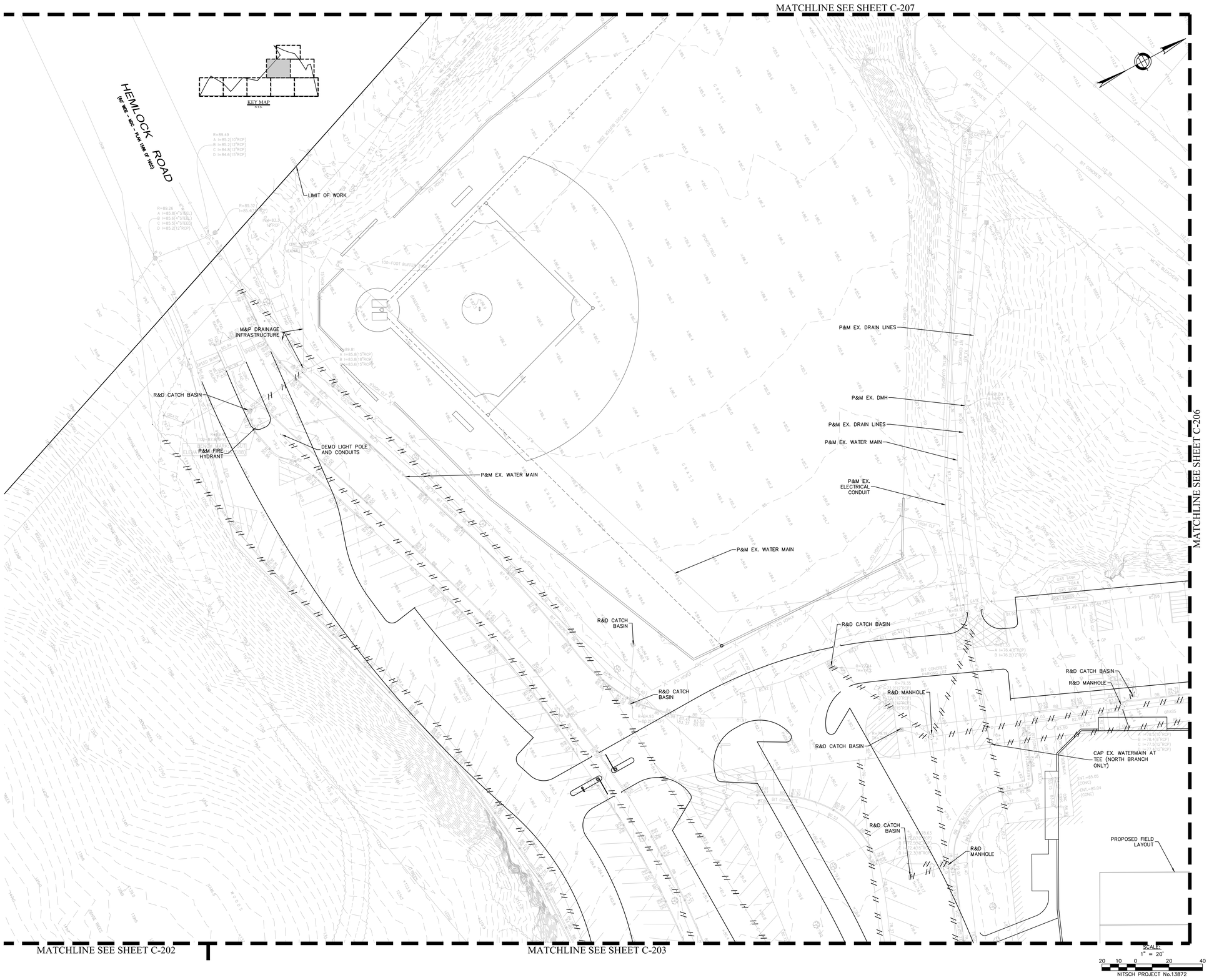
KEY PLAN

UTILITY DEMO PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-204



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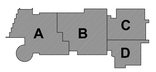


KEY PLAN

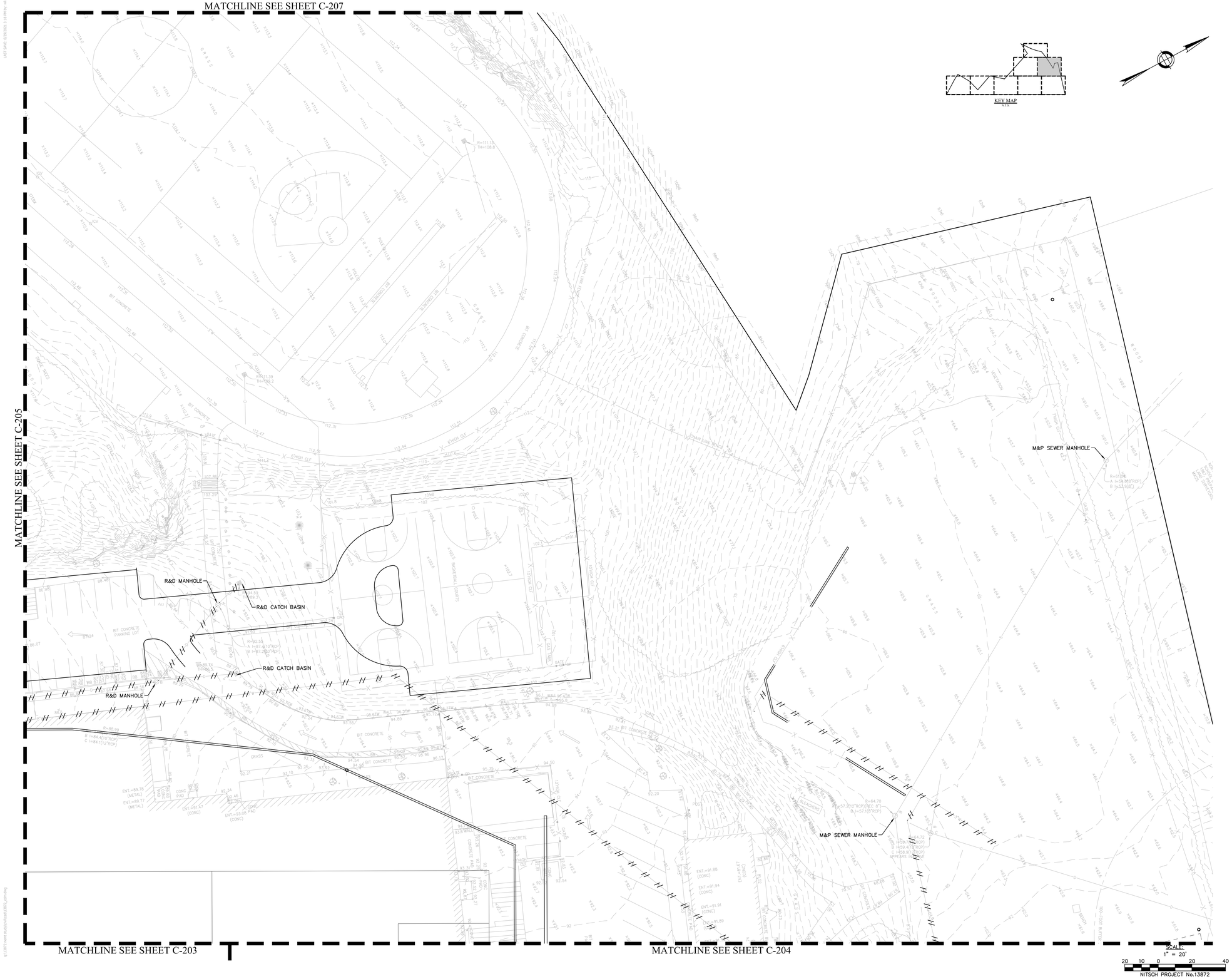
UTILITY DEMO PLAN

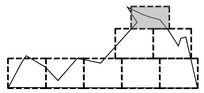
Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-205

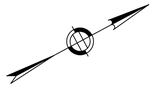
MATCHLINE SEE SHEET C-207

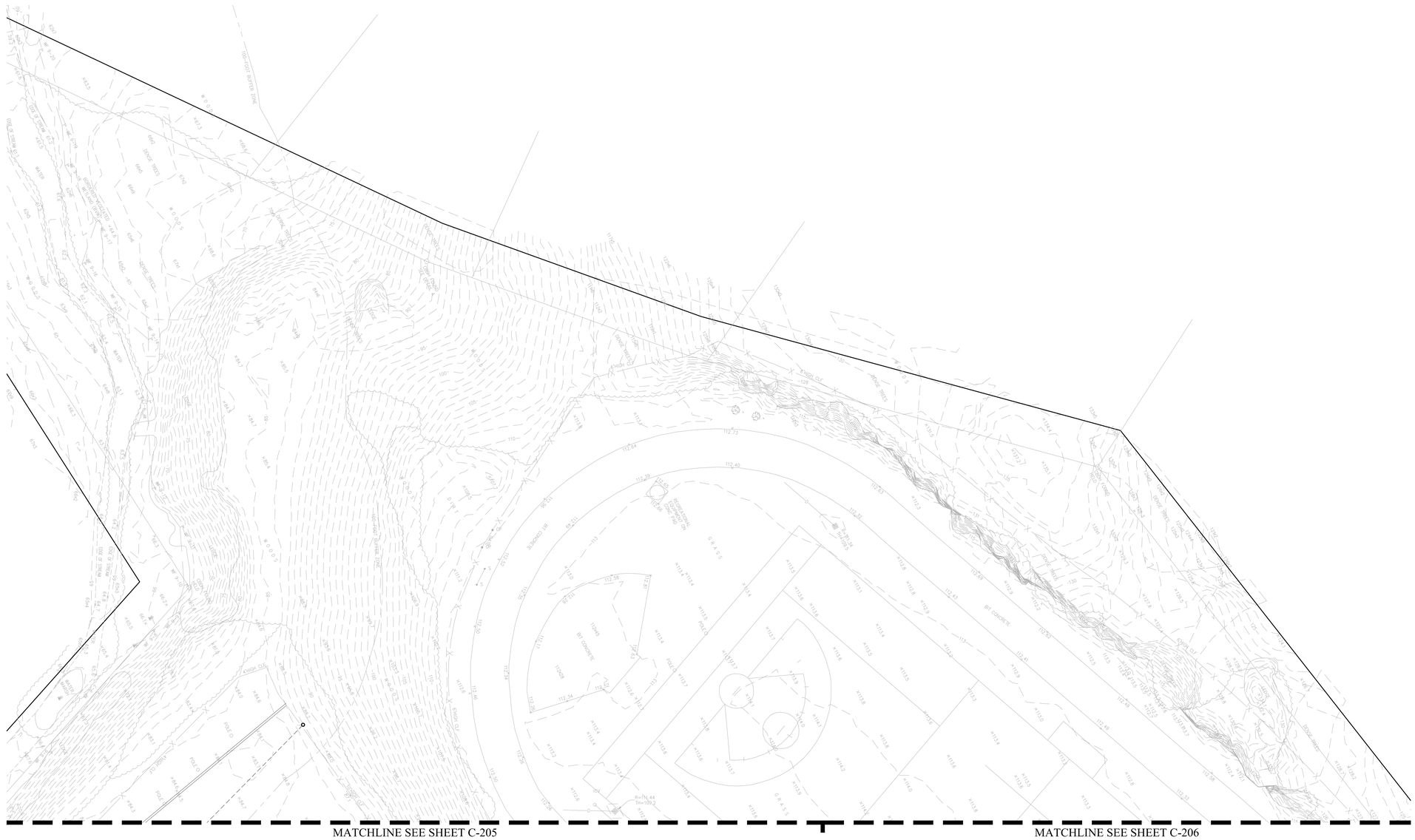
MATCHLINE SEE SHEET C-205


R&D MANHOLE
R&D CATCH BASIN
R&D CATCH BASIN
R&D MANHOLE
M&P SEWER MANHOLE
M&P SEWER MANHOLE
BIT CONCRETE PARKING LOT
BIT CONCRETE
BIT CONCRETE
BIT CONCRETE
BIT CONCRETE
BIT CONCRETE
GRASS
CONC PAD
CONC PAD
BASKETBALL COURTS
TRACK OVAL
R=111.13'
TH=108.8
R=111.39'
TH=100.2
R=92.55'
A=87.41'(10°8'0")
B=87.26'(10°8'0")
R=89.99'
B l=84.4'(107°60")
C l=84.1'(122°60")
R=64.70'
A=57.21'(50°9'0")
B=57.01'(50°9'0")
R=61.05'
A l=54.96'(51°6'0")
B l=54.96'(51°6'0")
R=64.70'
A=59.41'(52°6'0")
C l=58.9'(52°6'0")
APPEARS RADIAL
ENT.=89.78 (METAL)
ENT.=89.77 (METAL)
ENT.=91.47 (CONC)
ENT.=93.05 PAD (CONC)
ENT.=91.88 (CONC)
ENT.=91.94 (CONC)
ENT.=91.91 (CONC)
ENT.=91.89 (CONC)
ENT.=91.87 (CONC)
6"HIGH CLF
CHAIN LINK FENCE
WOOD FENCE
STONE WALL
GUARD RAIL
BUSHES
TREES
WOODS
WETLAND VEGETATION
BRUSH
BRUSH
BRUSH



KEY MAP
N.T.S.





MATCHLINE SEE SHEET C-205

MATCHLINE SEE SHEET C-206

SCALE:
1" = 20'
20 10 0 20 40
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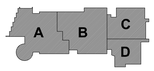
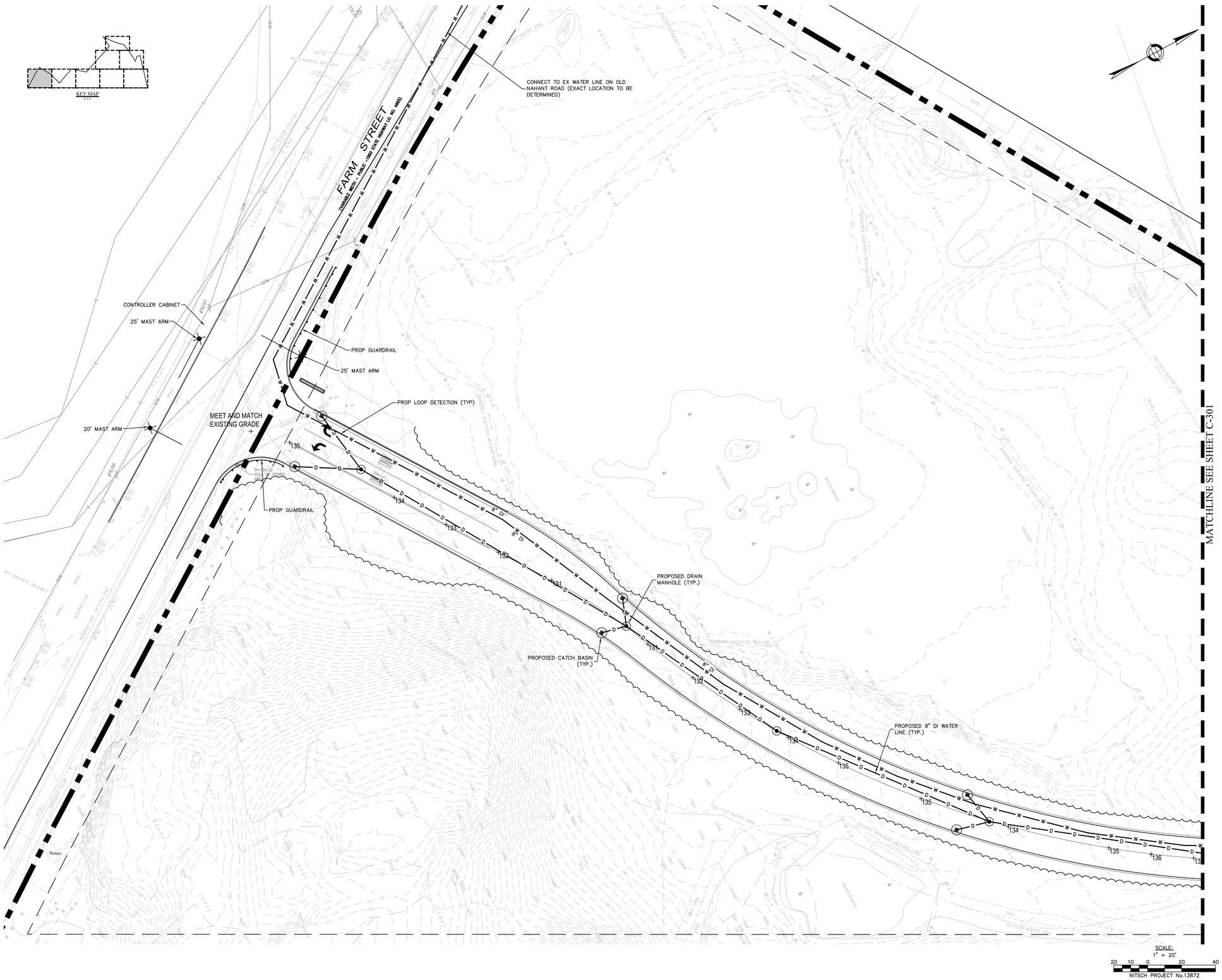


KEY PLAN

UTILITY DEMO PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-207



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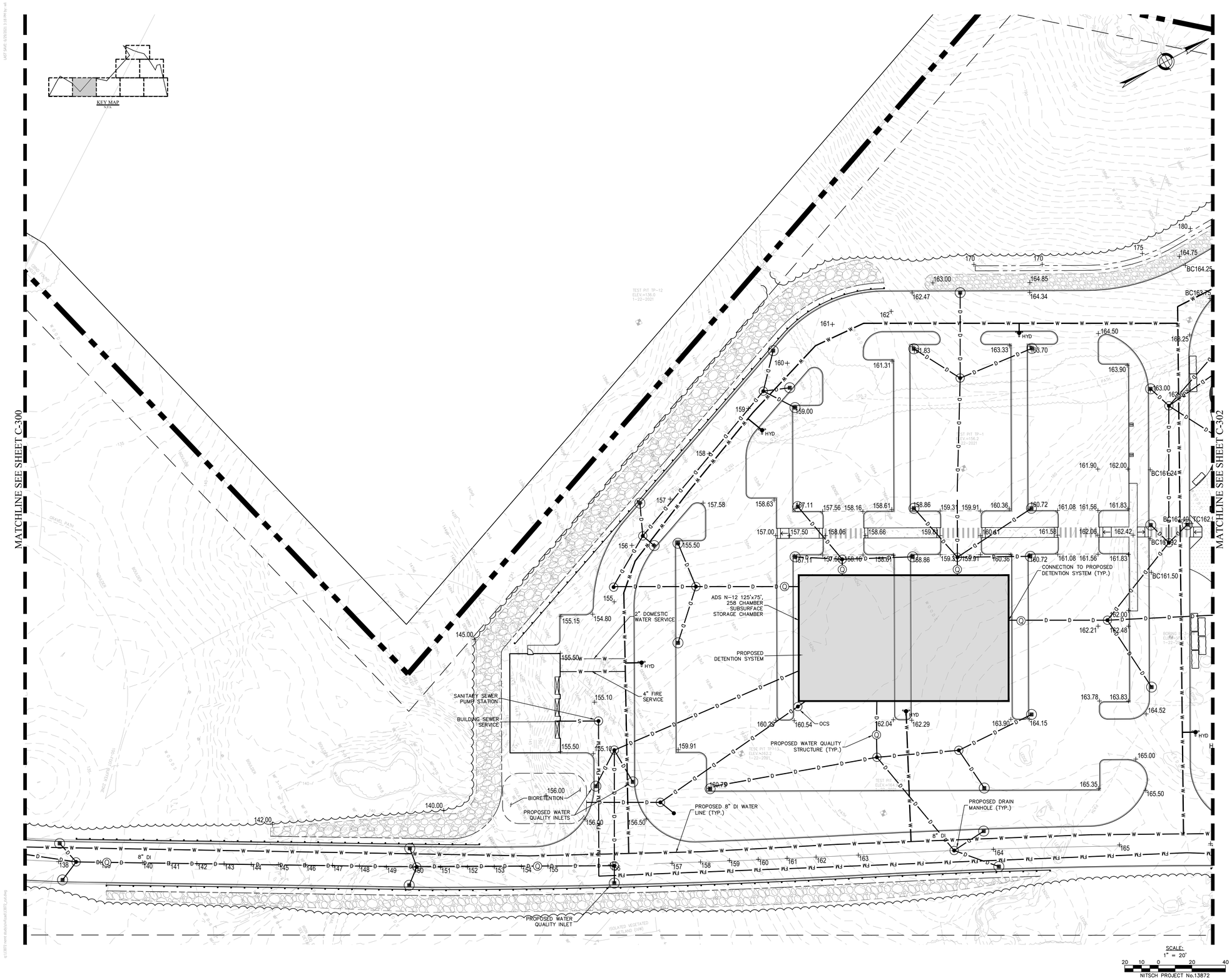
A B C D

KEY PLAN

UTILITY SITE PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-300



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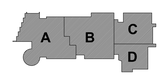

KEY PLAN

UTILITY SITE PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-301

MATCHLINE SEE SHEET C-305

MATCHLINE SEE SHEET C-301

MATCHLINE SEE SHEET C-303

KEY MAP

PRECAST FLARED END SECTION (TYP.)

SWALE

8" DI

OCS

18" CPEP

HYD

ROOF DRAIN (TYP.)

PROPOSED AREA DRAIN (TYP.)

PROPOSED BUILDING OVERHANG (TYP.)

BUILDING SEWER SERVICE

4,000 GALLON PRECAST GREASE TRAP

AREA DRAIN (TYP.)

PROPOSED GAS METER

ROOF DECK, REFER TO ARCH DWGS FOR ELEV.

PROPOSED DRAIN MANHOLE (TYP.)

PROPOSED 8" DI WATER LINE (TYP.)

PROPOSED SEWER MANHOLE (TYP.)

PROPOSED CATCH BASIN (TYP.)

BIORETENTION

PROPOSED WATER QUALITY STRUCTURE (TYP.)

SCALE:
1" = 20'

NITSCH PROJECT No.13872

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KEY PLAN

UTILITY SITE PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-302

MATCHLINE SEE SHEET C-305

MATCHLINE SEE SHEET C-306

MATCHLINE SEE SHEET C-302

MATCHLINE SEE SHEET C-304

GEN

ADS N-12 145'x140', 574 CHAMBER SUBSURFACE STORAGE CHAMBER

CONNECT TO PROPOSED DETENTION SYSTEM

ROOF DRAIN (TYP.)

SWALE

30" CPEP

FLARED END SECTION AND OPEN CHANNEL SWALE

PROPOSED 8" DI WATER LINE (TYP.)

SEE TYPICAL UTILITY AT ROADWAY ON DETAIL SHEET C-505

PROPOSED SEWER MANHOLE (TYP.)

PROPOSED CATCH BASIN (TYP.)

PROPOSED DRAIN MANHOLE (TYP.)

CONNECT TO EXISTING CATCH BASIN AND CONVERT EXISTING CATCH BASIN TO DRAIN MANHOLE

PROPOSED WATER QUALITY STRUCTURE (TYP.)

MEET AND MATCH

OCS

KEY MAP

SCALE:
1" = 20'
20 10 0 20 40

NITSCH PROJECT No.13872

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KEY PLAN

UTILITY SITE PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-303

MATCHLINE SEE SHEET C-306

MATCHLINE SEE SHEET C-303

BLEACHER PLATFORM: 87.50

PROPOSED SEWER MANHOLE (TYP.)

REPLACE EX SEWER MANHOLE WITH PROP SEWER MANHOLE; CONNECT TO EX SEWER LINE

CLEAN AND LINE EXISTING 1550± LF SEWER MAIN TO REMAIN (TYP.)

KEY MAP
N.T.S.

SCALE:
1" = 20'
20 10 0 20 40
NITSCH PROJECT No.13872

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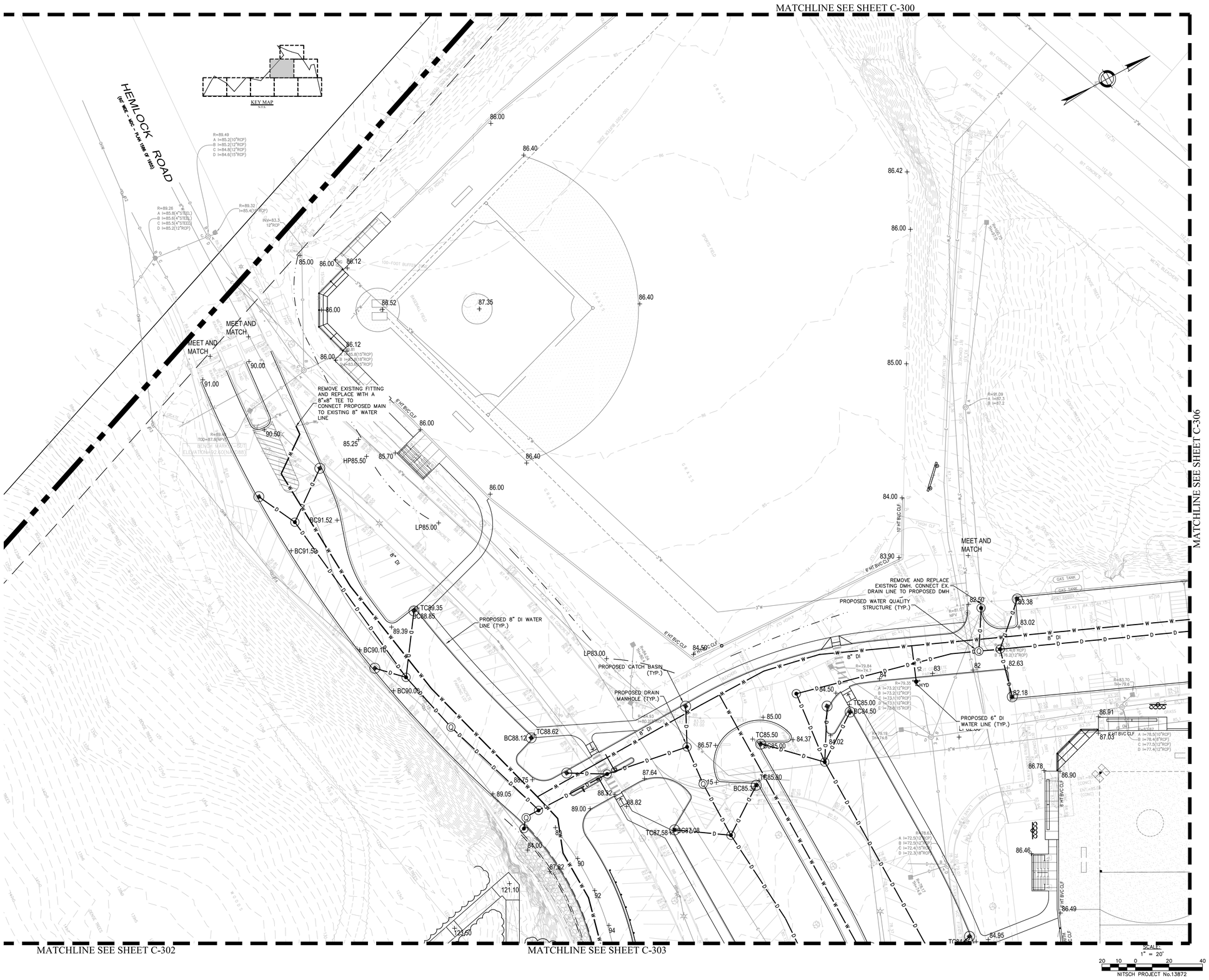
A B C D

KEY PLAN

UTILITY SITE PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-304



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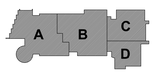

KEY PLAN

UTILITY SITE PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-305

MATCHLINE SEE SHEET C-307

MATCHLINE SEE SHEET C-305

MATCHLINE SEE SHEET C-303

MATCHLINE SEE SHEET C-304

KEY MAP
N.T.S.

CONNECT PROPOSED WATERMAIN TO EXISTING 8" WATER LINE

PROPOSED DRAIN MANHOLE (TYP.)

SCALE:
1" = 20'
20 10 0 20 40

NITSCH PROJECT No.13872

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KEY PLAN

UTILITY SITE PLAN

Scale: AS NOTED
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Date: June 17, 2021

C-306

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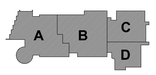
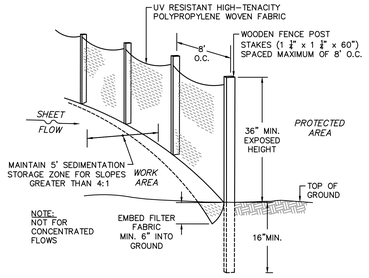


KEY PLAN

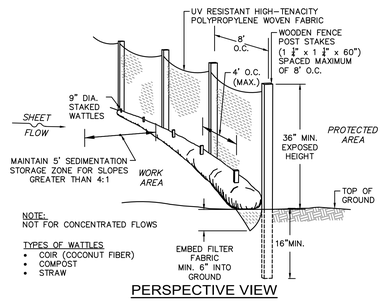
UTILITY SITE PLAN

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

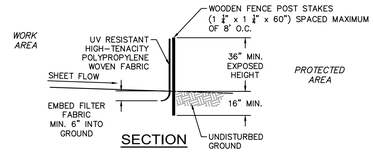
C-307



PERSPECTIVE VIEW

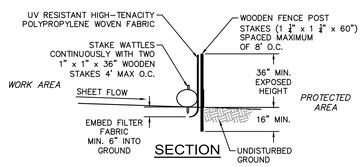


PERSPECTIVE VIEW



SECTION

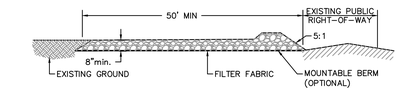
PERIMETER PROTECTION BARRIER (A)



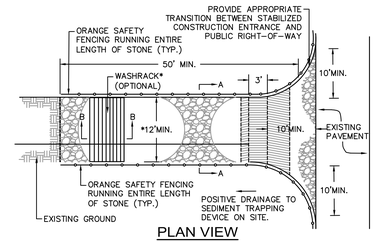
SECTION

PERIMETER PROTECTION BARRIER (B)
SILT FENCE DETAIL WITH WATTLES

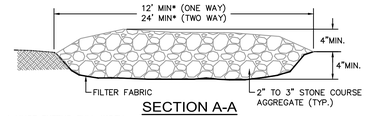
NOT TO SCALE



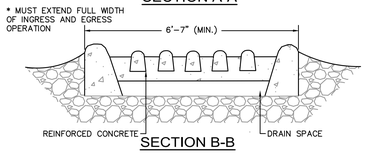
SIDE ELEVATION



PLAN VIEW



SECTION A-A



SECTION B-B

CONSTRUCTION SPECIFICATIONS

CONSTRUCTION SPECIFICATIONS

LENGTH – GREATER THAN OR EQUAL TO 50 FEET

WIDTH – TWELVE FOOT MINIMUM (ONE WAY), TWENTY FOUR FOOT MINIMUM (TWO WAY), BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.

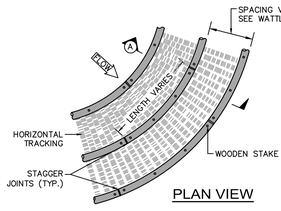
SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM SHALL BE PERMITTED.

THICKNESS – 8"

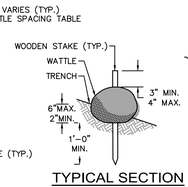
MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.

PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED.

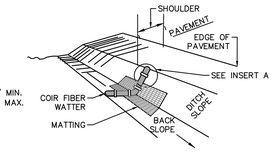
STABILIZED CONSTRUCTION ENTRANCE



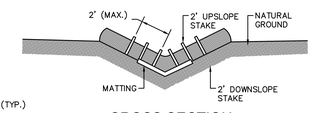
PLAN VIEW



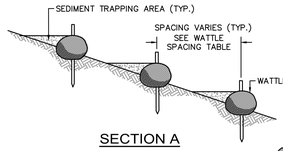
TYPICAL SECTION
WATTLE DETAIL



ISOMETRIC
VIEW

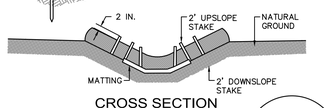


CROSS SECTION
VEE DITCH



SECTION A

WATTLE SPACING TABLE	
SLOPE	MAX. SPACING
1:1	10'-0"
2:1	20'-0"
3:1	30'-0"
4:1	40'-0"

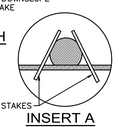


CROSS SECTION
TRAPEZOIDAL DITCH

WATTLE SLOPE PROTECTION NOTES:

1. SECURELY KNOT EACH END OF WATTLE. ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
2. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLES AND INTO THE SOIL WHEN SOIL CONDITIONS REQUIRE
3. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RAINFALL PRODUCES RUNOFF, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
4. ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

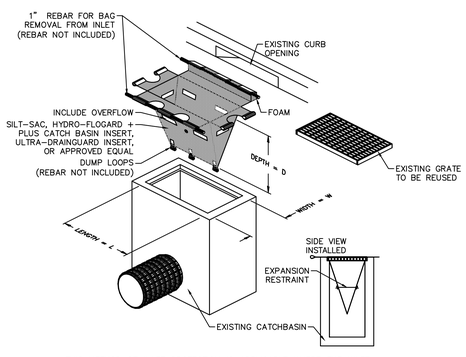
TYPES OF WATTLES
• COIR (COCONUT FIBER)
• COMPOST
• STRAW



INSERT A

EROSION CONTROL BARRIER (E)
WATTLES - STEEP SLOPE PROTECTION

NOT TO SCALE



THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS SHEET, OVERLAND OR CONCENTRATED FLOWS (NOT GREATER THAN 1 CFS). THE METHOD CAN DRAIN FLAT AREA TO STEEP SLOPES. INLET CAPACITY WILL BE DECREASED WITH THIS METHOD AND THE CONTRACTOR SHALL EXPECT PONDING DURING HIGH FLOW EVENTS.

INLET PROTECTION (2)
CATCH BASIN W/ SILTATION SACK

NOT TO SCALE

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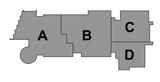
June 17, 2021



KEY PLAN

CIVIL SITE DETAILS

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Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-501

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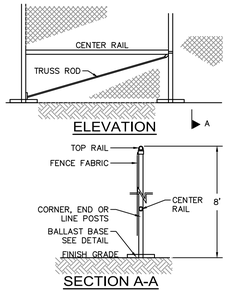
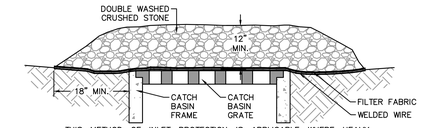


NOTES

1. END, GATE AND CORNER POSTS SHALL BE BRACED TO ADJACENT LINE POSTS. (MORE THAN 30° CHANGE IN DIRECTION CONSTITUTES A CORNER)
2. FABRIC SHALL BE 0.148" GAUGE MIN. WIRE, WOVEN INTO APPROXIMATELY 2" DIAMOND MESH.
3. ZINC-COATED STEEL FABRIC BASE METAL SHALL BE COATED WITH PRIME WESTERN SPELTER OR EQUAL.
4. ALUMINUM COATED STEEL FABRIC BASE METAL SHALL BE COATED WITH ALUMINUM ALLOY.
5. LINE POSTS SHALL BE 2½" O.D. END OR CORNER POSTS SHALL BE 3" O.D.
6. THE CONTRACTOR IS RESPONSIBLE FOR SURFACE RESTORATION ONCE THE FENCE IS REMOVED.
7. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF THE TEMPORARY CONSTRUCTION FENCE AT THE CONCLUSION OF THE PROJECT.

TEMPORARY CONSTRUCTION CHAIN LINK FENCE WITH BALLAST BASE

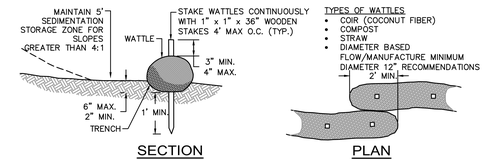
NOT TO SCALE



THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS. THIS METHOD NOT ACCEPTABLE IN ACTIVE TRAFFIC AREAS.

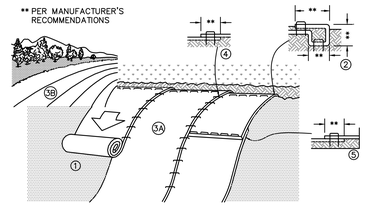
INLET PROTECTION ① CATCH BASIN W/ GRAVEL

NOT TO SCALE



WATTLES - SLOPE PROTECTION FOR SLOPES LESS THAN 10:1

NOT TO SCALE



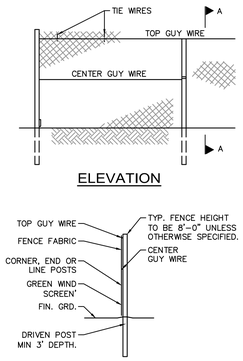
SLOPE INSTALLATION

NOTES:

1. PREPARE SOIL BEFORE INSTALLING EROSION CONTROL BLANKETS (ECB's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE ECB's IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING PORTION OF ECB's BACK OVER SEED AND COMPACTED SOIL. SECURE ECB's OVER COMPACTED SOIL WITH A ROW OF STAKES/STAPLES SPACED ACCORDANCE TO THE MANUFACTURER'S RECOMMENDATIONS ACROSS THE WIDTH OF THE ECB's.
3. ROLL THE ECB's DOWN (A) OR HORIZONTALLY (B) ACROSS THE SLOPE. ECB's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL ECB's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAKES/STAPLES IN APPROPRIATE LOCATIONS AS SHOWN ON THE STAKE/STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL ECB's MUST BE STAKED/STAPLED WITH OVERLAP DEPENDING ON ECB's TYPE. SEE THE MANUFACTURER'S RECOMMENDATIONS.
5. CONSECUTIVE ECB's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN OVERLAP (SEE THE MANUFACTURER'S RECOMMENDATIONS). STAKE/STAPLE THROUGH OVERLAPPED AREA, ACROSS ENTIRE ECB's WIDTH PER MANUFACTURER'S RECOMMENDATIONS.
6. IN LOOSE SOIL CONDITIONS, THE USE OF STAKE OR STAPLE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE ECB's.
7. THE CONTRACTOR SHALL FOLLOW ALL INSTALLATION INSTRUCTIONS AS RECOMMENDED BY THE MANUFACTURER.

TEMPORARY EROSION CONTROL BLANKET FOR STEEP SLOPES DETAIL

NOT TO SCALE

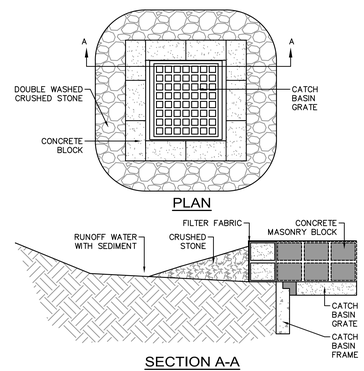


CONSTRUCTION FENCE AND GATE NOTES

1. FABRIC SHALL BE 0.148" WIRE, WOVEN INTO APPROXIMATELY 2" DIAMOND MESH.
2. THE FENCE FABRIC SHALL BE ZINC COATED STEEL OR ALUMINUM COATED STEEL.
3. FENCE POSTS SHALL RECEIVE THE SAME COATING AND TREATMENT AS THE FENCE FABRIC (DESCRIBED ABOVE).
4. THE CONTRACTOR SHALL ADD A GREEN WIND SCREEN
5. LINE POSTS SHALL BE 2½" O.D. END OR CORNER POSTS SHALL BE 3" O.D.
6. THE CONTRACTOR IS RESPONSIBLE FOR SURFACE RESTORATION ONCE THE FENCE IS REMOVED.
7. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF THE TEMPORARY CONSTRUCTION FENCE AT THE CONCLUSION OF THE PROJECT.

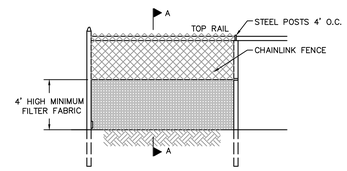
CHAIN LINK CONSTRUCTION FENCE

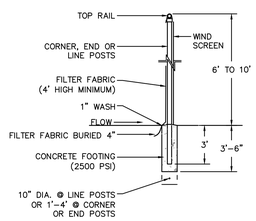
NOT TO SCALE



THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND STRUCTURE.

INLET PROTECTION ③ CATCH BASIN W/ BLOCK AND GRAVEL

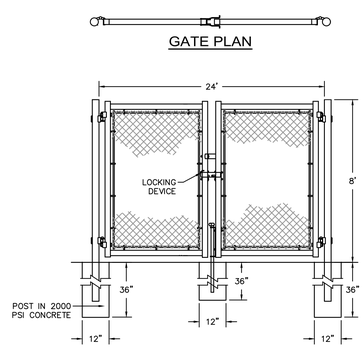




1. CHAINLINK FENCE SHALL BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES.
2. FILTER FABRIC SHALL BE FASTENED SECURELY TO CHAINLINK FENCE WITH TIES SPACED HORIZONTALLY 24" AS THE TOP AND MIDSECTION.
3. WHEN TWO SECTIONS OF FILTER FABIRC ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6"
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL SHALL BE REMOVED WHEN SEDIMENT BUILD-UP REACHES 50% OF THE HEIGHT OF THE FILTER FABRIC.
5. MAINTENANCE OF SILT FENCE SHALL BE RECORDED TO IN THE SWPPP

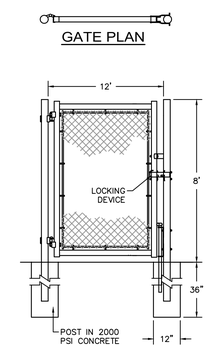
EROSION CONTROL BARRIER Ⓓ SUPER SILT FENCE

NOT TO SCALE



24' WIDE DOUBLE GATE

NOT TO SCALE



12' WIDE EMERGENCY GATE

NOT TO SCALE

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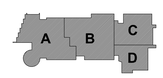

KEY PLAN

CIVIL SITE DETAILS

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-502

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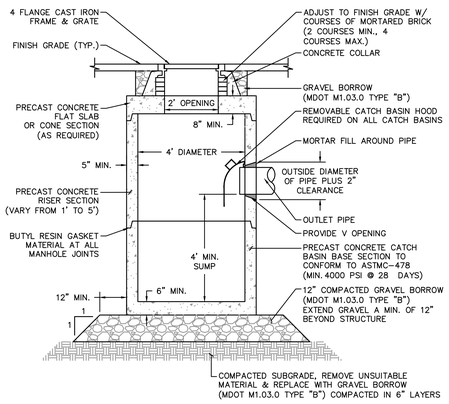
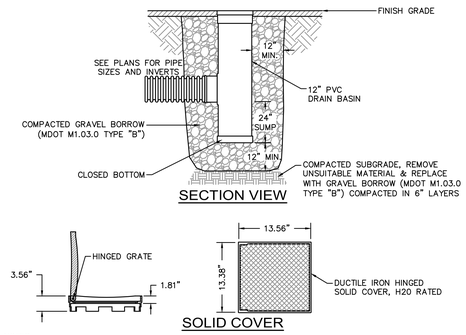


TYPICAL CATCH BASIN DETAIL

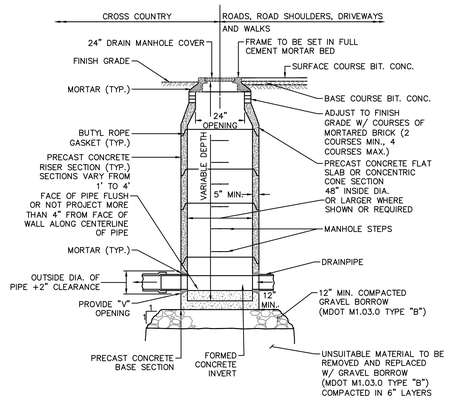
NOT TO SCALE



NOTES:
1. FRAME AND COVER SHALL BE DUCTILE IRON CONFORMING TO ASTM A536 GRADE 70-50-05.
2. 12" ACCESS BASINS SHALL BE NYLOPLAST MODEL 2812 AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC., OR APPROVED EQUAL.
3. ACCESS BASINS SHALL BE CUSTOM MANUFACTURED ACCORDING TO THE PLANS AND DETAIL.
4. CASTINGS SHALL BE FURNISHED WITH A BLACK PAINT.
5. SEE PLANS FOR LAYOUT AND ELEVATIONS OF DRAIN PIPES TO ACCESS BASINS.

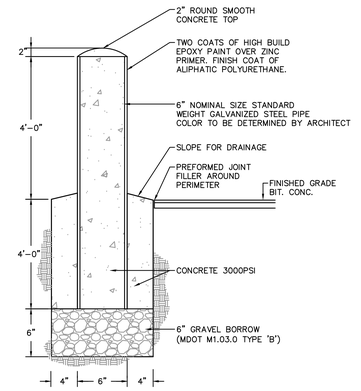
12" ACCESS BASIN DETAIL

NOT TO SCALE



TYPICAL DRAIN MANHOLE DETAIL

NOT TO SCALE



6" BOLLARD DETAIL

NOT TO SCALE

TYPICAL DOUBLE CATCH BASIN DETAIL

NOT TO SCALE

TYPICAL CATCH BASIN DETAIL (W/ GRANITE CURB INLET)

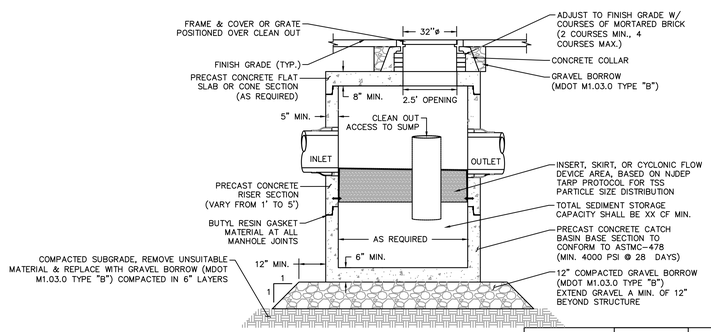
NOT TO SCALE

AREA DRAIN IN PAVEMENT

NOT TO SCALE

DROP MANHOLE DETAIL

NOT TO SCALE



NOTE :

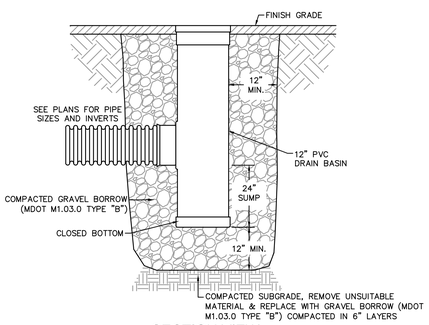
1. THE USE OF FLEXIBLE CONNECTIONS IS RECOMMENDED AT THE INLET AND OUTLET WHERE APPLICABLE.
2. THE COVER SHOULD BE POSITIONED OVER THE OUTLET DROP PIPE AND THE OIL CLEANOUT PIPE.
3. STRUCTURE DESIGNED FOR H20 LOADING

STRUCTURE NAME	MINIMUM WQF	PEAK FLOW RATE*	MINIMUM SEDIMENT STORAGE CAPACITY
WQS@XXX	X.XX CFS	X.XX CFS	XX CF
WQS@XXX	X.XX CFS	X.XX CFS	XX CF

* PEAK FLOW RATE BASED ON RATIONAL ANALYSIS FOR A 25-YEAR STORM EVENT. STRUCTURE SHALL BE ABLE TO PASS PEAK FLOW RATE WITHOUT CAUSING A BACKWATER CONDITION.

WATER QUALITY STRUCTURE DETAIL

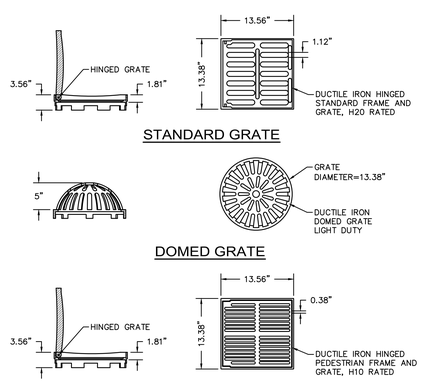
NOT TO SCALE



NOTES:
1. FRAME AND GRATE SHALL BE DUCTILE IRON CONFORMING TO ASTM A536 GRADE 70-50-05.
2. 12" AREA DRAINS SHALL BE NYLOPLAST MODEL 2812 AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC., OR APPROVED EQUAL.
3. AREA DRAINS SHALL BE CUSTOM MANUFACTURED ACCORDING TO THE PLANS AND DETAIL.
4. CASTINGS SHALL BE FURNISHED WITH A BLACK PAINT.
5. SEE PLANS FOR LAYOUT AND ELEVATIONS OF DRAIN PIPES TO AREA DRAINS.

12" AREA DRAIN DETAIL

NOT TO SCALE



PEDESTRIAN GRATE (ADA COMPLIANT)

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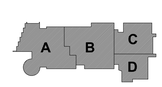

KEY PLAN

CIVIL SITE DETAILS

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Drawn By: WL
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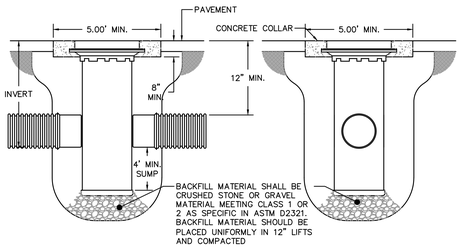
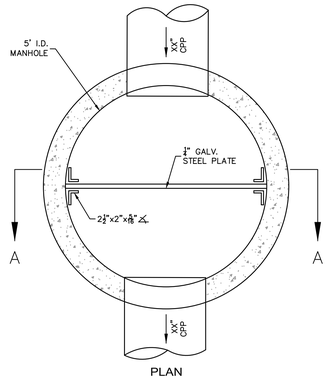
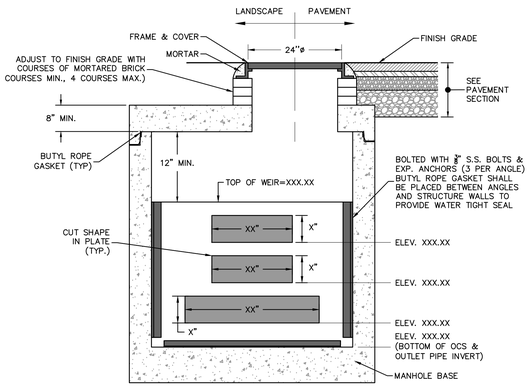


AREA DRAIN DETAIL

NOT TO SCALE



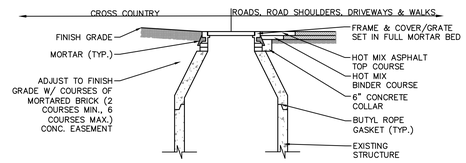
PLAN



SECTION A-A

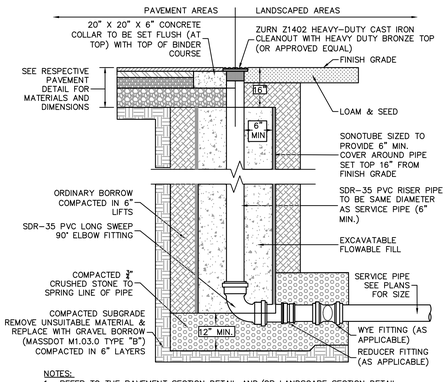
OUTLET CONTROL STRUCTURE

NOT TO SCALE



RIM SETTING DETAIL

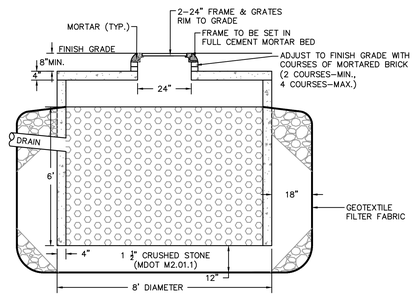
NOT TO SCALE



NOTES:
1. REFER TO THE PAVEMENT SECTION DETAIL AND/OR LANDSCAPE SECTION DETAIL FOR SURFACE MATERIALS AND DIMENSIONS

CLEANOUT DETAIL

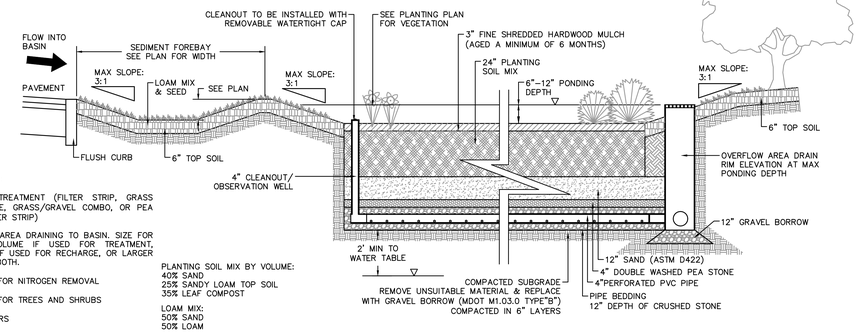
NOT TO SCALE



NOTES:
1. NO BOTTOM
2. CONCRETE MINIMUM STRENGTH: 5,000 P.S.I. AFTER 28 DAYS
3. STEEL REINFORCEMENT: ASTM A-615, A-185, OR A-497, 1" MIN. COVER
4. DESIGN LOADING: AASHTO HS20-44

8 FOOT DIAMETER DRY WELL DETAIL

NOT TO SCALE



NOTES TO DESIGNER:

90% TSS W/ PRETREATMENT (FILTER STRIP, GRASS CHANNEL, WQ SWALE, GRASS/GRAVEL COMBO, OR PEA DIAPHRAGM W/ FILTER STRIP)

SIZE FOR 5-7% OF AREA DRAINING TO BASIN. SIZE FOR WATER QUALITY VOLUME IF USED FOR TREATMENT, RECHARGE VOLUME IF USED FOR RECHARGE, OR LARGER OF 2 IF USED FOR BOTH.

30" PLANTING SOIL FOR NITROGEN REMOVAL

36" PLANTING SOIL FOR TREES AND SHRUBS

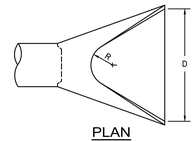
DRAIN W/IN 72 HOURS

PLANTING SOIL MIX BY VOLUME:
40% SAND
25% SANDY LOAM TOP SOIL
35% LEAF COMPOST

LOAM MIX:
50% SAND
50% LOAM

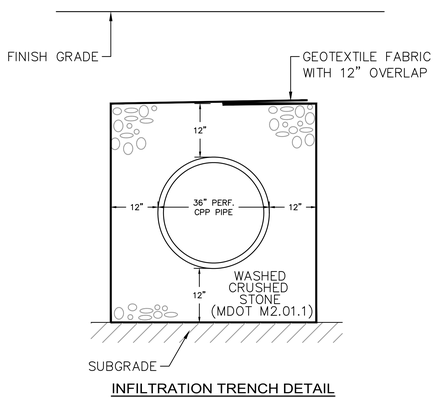
BIORETENTION BASIN W/ FOREBAY

NOT TO SCALE



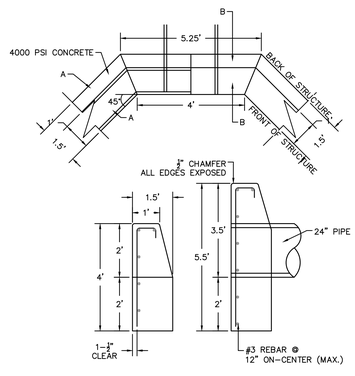
PLAN

DIA.	A	B	C	D	E	R
12"	4"	2'-0"	4'-0 ⅝"	2'-0"	2"	9"
18"	6"	2'-3"	3'-10"	2'-6"	2 ½"	11"
18"	9"	2'-3"	3'-10"	3'-0"	2 ½"	12"
24"	9"	3'-7 ½"	6'-2"	4'-0"	3"	14"
30"	12"	4'-6"	7'-7 ½"	5'-0"	3 ½"	15"
36"	15"	5'-3"	9'-10 ½"	6'-0"	4"	20"
42"	21"	5'-3"	9'-11"	6'-6"	4 ½"	22"
48"	24"	5'-3"	9'-11"	7'-0"	5"	22"
54"	27"	5'-3"	9'-11"	7'-6"	5 ½"	24"
60"	30"	5'-0"	9'-11"	8'-0"	6"	24"



INFILTRATION TRENCH DETAIL

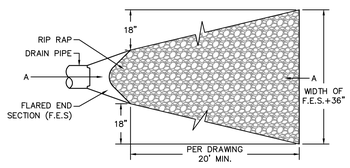
NOT TO SCALE

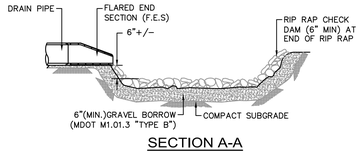


SECTION A-A SECTION B-B

HEADWALL DETAIL

NOT TO SCALE



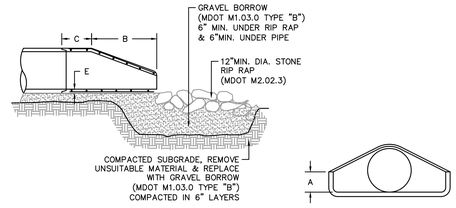


SECTION A-A

NOTE:
RIP RAP SHALL BE DUMPED AND MACHINE GRADED (HAND GRADE AS NEEDED)

RIP RAP DETAIL

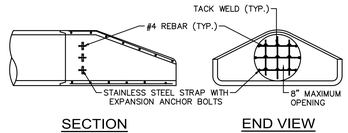
NOT TO SCALE



SECTION END VIEW

PRECAST CONCRETE FLARED END SECTION

NOT TO SCALE



SECTION END VIEW

CONCRETE FLARED END SECTION WITH SAFETY GRATE

NOT TO SCALE

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June 17, 2021

KEY PLAN

A B C D

CIVIL SITE DETAILS

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-504

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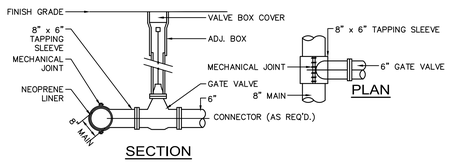
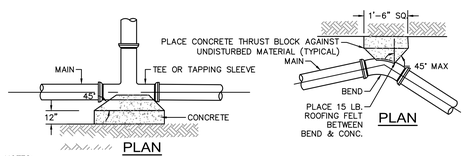


TAPPING SLEEVE, VALVE & BOX DETAIL

NOT TO SCALE



NOTES:

1. THRUST BLOCKS TO BE USED ON ALL PRESSURE PIPES AT HORIZONTAL AND VERTICAL BENDS GREATER OR EQUAL TO 45°, TEES AND DEAD ENDS.
2. FOR FITTINGS WITH LESS THAN 45° DEFLECTION USE BEARING AREAS FOR 45° BEND.
3. BEARING AREAS BASED ON HORIZONTAL PASSIVE SOIL PRESSURE OF 2000 PSF AND A MINIMUM INTERNAL WATER PRESSURE OF 175 PSIG. JOINTS SHALL NOT BE ENCASED IN CONCRETE, BEARING AREAS MAY BE DISREGARDED FOR TRENCHES IN ROCK WHERE THE TOP OF THE ROCK FACE IS AT OR ABOVE THE CROWN OF THE PIPE. HOWEVER, CONCRETE BACKING SHALL BE PLACED BETWEEN THE PIPE AND ROCK FACE.

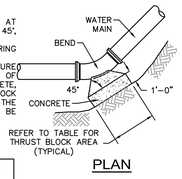
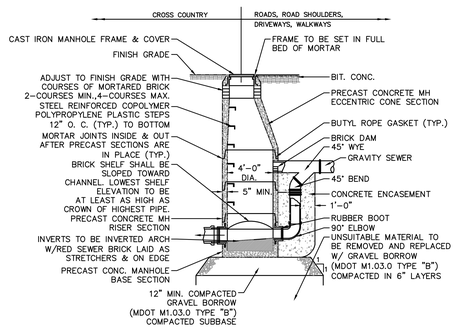


TABLE OF BEARING AREAS IN SQUARE FEET AGAINST UNDISTURBED MATERIAL FOR FITTING. *

SIZE OF MAIN (INCHES)	90° BEND (S.F.)	45° BEND (S.F.)	DEAD END (S.F.)
4	2.3	1.3	1.6
6	4.7	2.5	3.3
8	8.0	4.5	6.0
12	17.0	9.5	12.0

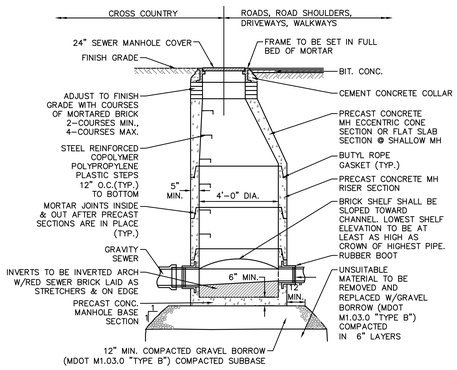
THRUST BLOCK DETAILS

NOT TO SCALE



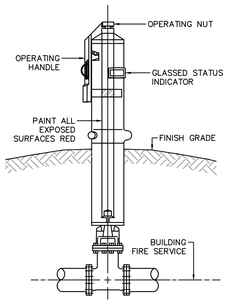
DROP SEWER MANHOLE DETAIL

NOT TO SCALE



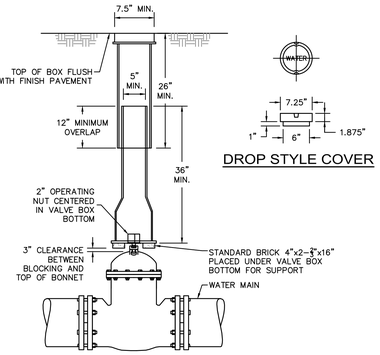
TYPICAL SEWER MANHOLE DETAIL

NOT TO SCALE



POST INDICATOR VALVE DETAIL

NOT TO SCALE

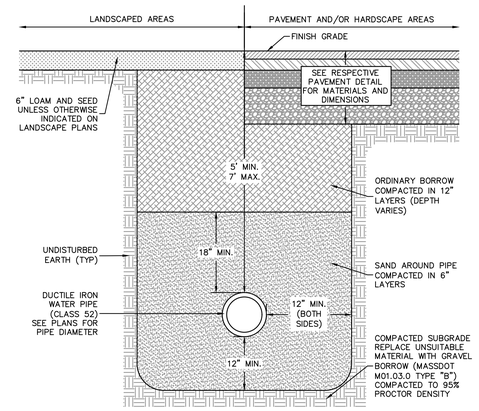


NOTES:

1. ALL WATER MAINS SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
2. COVER MUST BE MARKED "WATER".

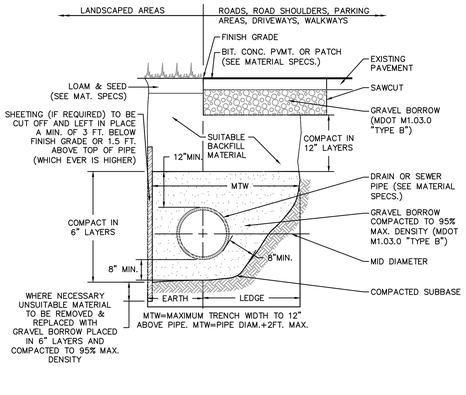
GATE VALVE BOX DETAIL

NOT TO SCALE



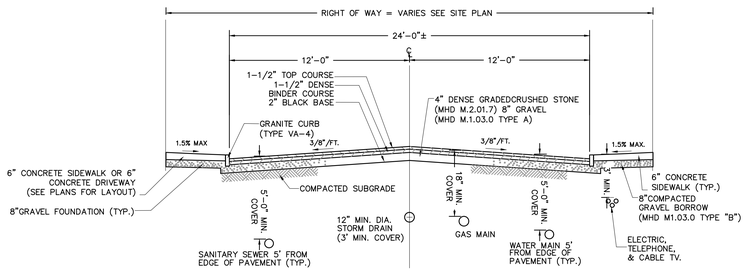
WATER TRENCH DETAIL

NOT TO SCALE



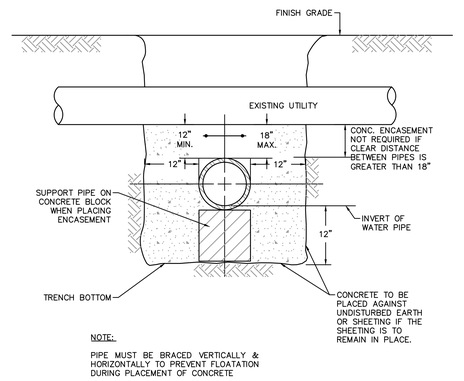
STANDARD TRENCH DETAIL FOR UTILITY PIPE

NOT TO SCALE



TYPICAL UTILITY SECTION AT ROADWAY

NOT TO SCALE



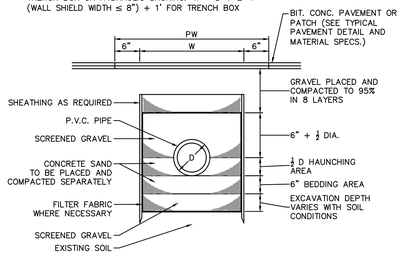
NOTE:

PIPE MUST BE BRACED VERTICALLY & HORIZONTALLY TO PREVENT FLOATATION DURING PLACEMENT OF CONCRETE

CONCRETE ENCASEMENT DETAIL AT UTILITY CROSSINGS

NOT TO SCALE

W=MAXIMUM TRENCH WIDTH PW = MAXIMUM PAVING WIDTH = W + 1'-0" D=OUTSIDE DIAMETER
UNSHEATHED TRENCH: W = D + 2'; 3'-0" MIN.
SHEATHED TRENCH: W = D + 2' + SHEATHING WIDTH: 4'-2" MIN. WITHOUT WALERS 5'-0" MIN. WITH WALERS
TRENCH BOX OR HYDRAULIC SHORING: W = D + 2' + (WALL SHIELD WIDTH ≤ 8") + 1' FOR TRENCH BOX



PVC PIPE TRENCH DETAIL

NOT TO SCALE

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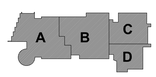
June 17, 2021



KEY PLAN

CIVIL SITE DETAILS

Scale: AS NOTED
Job No.: 13872
Drawn By: WL
Date: June 17, 2021

C-505

LAST SAVE: 6/7/2021 3:38 PM by: wli
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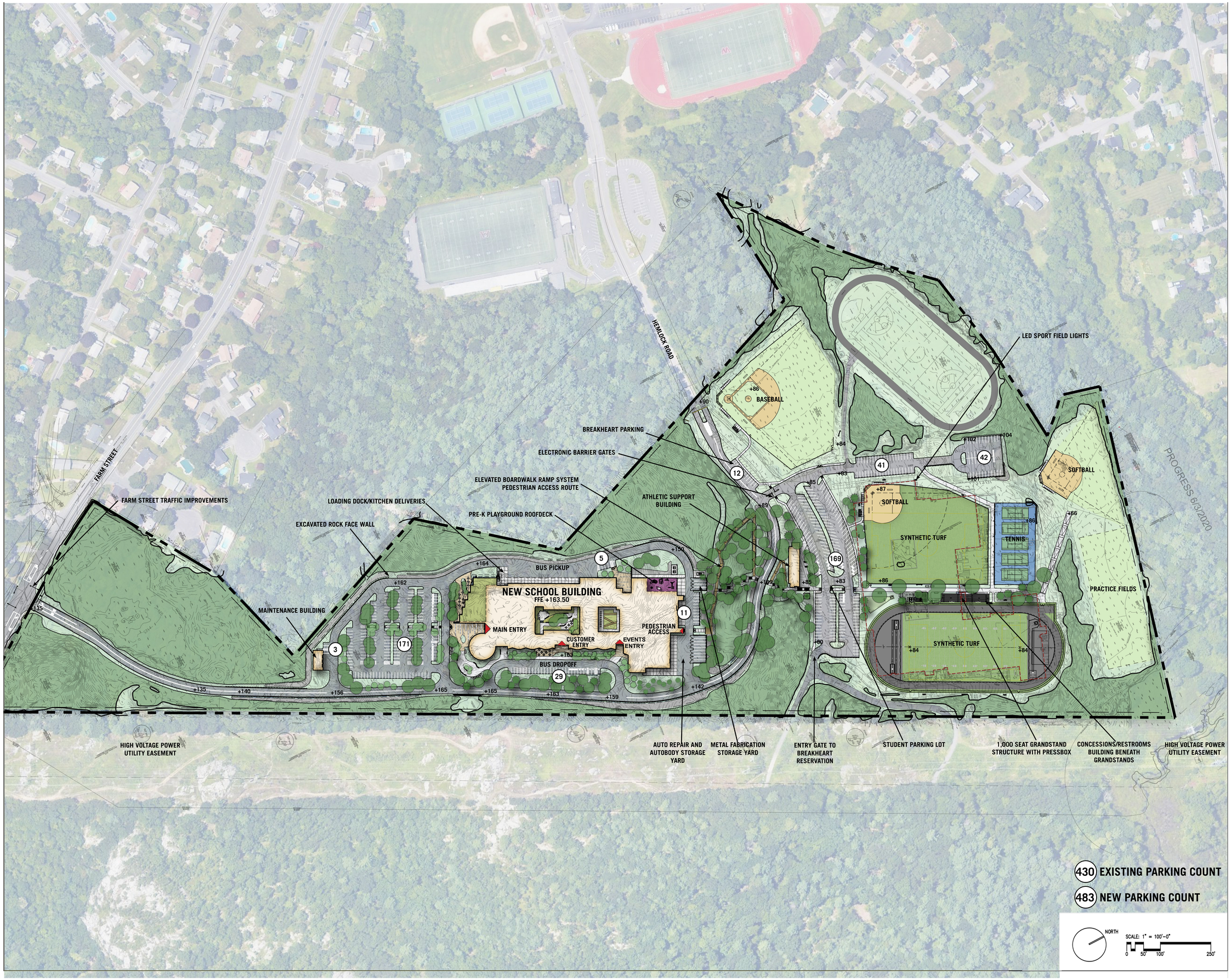

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NORTHEAST METRO TECHNICAL HIGH SCHOOL

Wakefield, Massachusetts

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SCHEMATIC DESIGN COST ESTIMATE SET

SITE PLAN RENDERING

Scale: 1" = 100'-0"
Job No.:
Drawn By: JM/EH
Date: 05/19/2021

R-100

SITE PREPARATION NOTES:

1. EXISTING CONDITIONS INFORMATION IS FROM A SURVEY PERFORMED BY NITSCH ENGINEERING 120 FRONT STREET, SUITE 820 WORCESTER, MA 01608, DATED JUNE 3, 2020.
2. CONTRACTOR SHALL REMOVE ALL EXISTING STRUCTURES, FOOTINGS, PAVEMENT, WALKS, WALLS, STAIRS, TREES AND SHRUBS NECESSARY TO COMPLETE THE WORK UNDER THIS CONTRACT. ALL ITEMS, INCLUDING BUT NOT LIMITED TO; STRUCTURES AND RELATED FOOTINGS, SITE AMENITIES, FENCES AND FENCE FOOTINGS, HAND RAILS, SIGNS, LIGHT POSTS AND LIGHT POST FOOTINGS LOCATED WITHIN THE LIMIT OF WORK LINE SHALL BE REMOVED AND LEGALLY DISPOSED OF UNLESS NOTED OTHERWISE. REFER TO CIVIL, ARCHITECTURAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION REGARDING REMOVAL AND DEMOLITION REQUIREMENTS.
3. ITEMS TO BE SALVAGED SHALL BE STORED ON-SITE WITHIN CONSTRUCTION FENCING AND SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION.
4. SALVAGE ALL SITE SIGNAGE REQUIRED TO BE REMOVED BY THE WORK OF THIS PROJECT, AND PROVIDE TO OWNER'S REPRESENTATIVE. DISPOSE OF FOOTINGS AND DAMAGED POSTS.,
5. REFER TO CIVIL DRAWINGS FOR TREATMENT OF EXISTING SITE UTILITIES AND DRAINAGE SYSTEMS. REFER TO ELECTRICAL SITE PLANS FOR TREATMENT OF EXISTING SITE ELECTRICAL.
6. REFER TO CIVIL DRAWINGS AND STORMWATER POLLUTION PREVENTION PLAN FOR EROSION AND SEDIMENTATION CONTROL.
7. REFER TO GEOTECHNICAL INFORMATION FOR SUBSURFACE EXPLORATION LOCATIONS AND INFORMATION.
8. EXISTING FOUNDATIONS AND BELOW GRADE REMAINS OF THE FORMER BUILDING(S) SHALL BE REMOVED AND DISPOSED IN THEIR ENTIRETY.
9. CONTRACTOR SHALL NOTIFY DIGSAFE (1-888-DIG-SAFE) AND VERIFY UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
10. CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED TO ROADS, WALKS, UTILITIES, SITE IMPROVEMENTS, EXISTING OR PROPOSED, DAMAGED BY THIS PROJECT.
11. CONTRACTOR SHALL VERIFY ALL CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO STARTING WORK.
12. ALL WORK SHALL COMPLY WITH ALL LOCAL AND STATE REGULATORY AGENCIES' REQUIREMENTS.
13. CONTRACTOR SHALL PROTECT ALL TREES TO REMAIN WITHIN THE LIMIT OF WORK.
14. REMOVE AND DISPOSE OF ALL GRANITE CURB ON SITE, REFER TO SPECIFICATIONS.
15. EXISTING IRRIGATION SYSTEM SHALL REMAIN IN WORKING CONDITION AT ALL TIMES OF THE GROWING SEASON DURING ALL CONSTRUCTION PHASES. CONTRACTOR IS RESPONSIBLE FOR ANY REPAIRS TO THE IRRIGATION SYSTEM CAUSED BY CONSTRUCTION ACTIVITIES AND REPLACEMENT OF ANY PLANT MATERIAL LOST DUE TO THE IRRIGATION SYSTEM BEING OFF-LINE.
16. REMOVE AND DISPOSE OF ALL STRIPPED TOPSOIL ON SITE. REFER TO GEOTECH SPECIFICATIONS.

LEGEND:

LOW	APPROXIMATE LIMIT OF WORK
P & P	PRESERVE AND PROTECT
R & D	REMOVE AND DISPOSE
R & S	REMOVE AND SALVAGE
ETR	EXISTING TO REMAIN
X	R & D TREE (AND GRUB), SIGN POST, BOLLARD, LIGHT POLE, ECT.
	PAVEMENT REMOVAL, REFER TO SURVEY FOR MATERIAL TYPE
	PAVER REMOVAL
	CLEAR AND GRUB VEGETATION
	REMOVE LEDGE

PRELIMINARY DEMOLITION INFORMATION NOTED, REFER TO EXISTING CONDITIONS SURVEY FOR DETAILED INFORMATION

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June 17, 2021

KEY PLAN

PROJECT NORTH

MAGNETIC NORTH

DEMO AND SITE PREPARATION PLAN

Scale: 1" = 30'-0"
Job No.: 20202.00
Drawn By: JM/MB
Date: June 17, 2021

L101

PRELIMINARY DEMOLITION INFORMATION NOTED, REFER TO EXISTING CONDITIONS SURVEY FOR DETAILED INFORMATION

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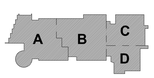
June 17, 2021



KEY PLAN

PROJECT NORTH	MAGNETIC NORTH

DEMO AND SITE PREPARATION PLAN

Scale: 1" = 30'-0"
Job No.: 20202.00
Drawn By: JM/MB
Date: June 17, 2021

L102

PRELIMINARY DEMOLITION INFORMATION NOTED, REFER TO EXISTING CONDITIONS SURVEY FOR DETAILED INFORMATION

R&D PAVEMENT

R&D LIGHT FIXTURES, POLES AND FOOTINGS, TYP.

P&P CLF

R&D CLF

R&D SIGN

R & D SHED

R & D BLEACHERS

S&S LOAM

R & D PLAY EQUIPMENT AND SAFETY SURFACING

R & D GATE

APPROX. LIMIT OF TREE CLEARING, TYP.

APPROX. LIMIT OF LEDGE REMOVAL, TYP.

R&D TREES, TYP.

R&D BENCHES, TYP.

R&D FLAGPOLES

R&D HANDRAIL

R&D CONCRETE RETAINING WALL

P&P STONE COLUMNS

P&P GATE

P&P BIT CONC.

100-FOOT BUFFER ZONE

INE

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June 17, 2021

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KEY PLAN

PROJECT NORTH | MAGNETIC NORTH

DEMO AND SITE PREPARATION PLAN

Scale: 1" = 30'-0"
Job No.: 20202.00
Drawn By: JM/MB
Date: June 17, 2021

L103

PRELIMINARY DEMOLITION INFORMATION NOTED, REFER TO EXISTING CONDITIONS SURVEY FOR DETAILED INFORMATION

PROGRESS 6/3/2021

P&P PAVEMENT AND STAIRS
P&P CLF AND GATES
P&P CLF
R&D CLF
R&D CLF
R & D PLAY EQUIPMENT AND SAFETY SURFACING
R & D GATE
S&S LOAM
R & D GAS TANKS
R & D JERSEY BARRIER
P&P PAVEMENT AND STAIRS
R&D SIGN
R & D SHED
R & D BLEACHERS
S&S LOAM
R & D BASKETBALL COURTS & HOOPS
R&D PAVEMENT
R&D GAS TANK
R&D CLF
R & D EXISTING BUILDINGS AND APPURTENANCES
R&D INFIELD
R&D BACKSTOP
R&D TRAILER
R&D SHED
R&D TREES, TYP.
S&S LOAM, TYP.
R&D TREES, TYP.
S&S LOAM, TYP.
R&D PAVEMENT
S&S LOAM, TYP.
R & D EXISTING BUILDINGS AND APPURTENANCES
R&D SHED
R&D GRAVEL
R&D TREES, TYP.
R&D BENCHES, TYP.
R & D EXISTING BUILDINGS AND APPURTENANCES
R&D TREES, TYP.
R&D BENCHES AND PORTABLE TABLES
S&S LOAM, TYP.
R&D WALL
R&D PAVEMENT
R&D PAVERS
R&D WALL AND STAIRS
R&D FLAGPOLES
R&D HANDRAIL
R&D TRAILER
P&P PRACTICE FIELD
R&D TRAILER
S&S LOAM
R&D CONC. WALL
R&D FUEL MANHOLES & CONCRETE PADS
R&D CONCRETE STAIRS
R & D AC UNIT
R & D RECREATIONAL EQUIPMENT
R & D TRAILER
R & D JERSEY BARRIER
R & D SHED
R & D GAS TANKS
R & D METAL GUARDRAIL
R & D CLF
P&P BIT CONC.
100-FOOT BUFFER ZONE
MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NAD 83

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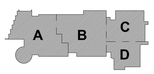

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MAGNETIC NORTH

DEMO AND SITE PREPARATION PLAN

Scale: 1" = 30'-0"
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L104

PRELIMINARY DEMOLITION INFORMATION NOTED, REFER TO EXISTING CONDITIONS SURVEY FOR DETAILED INFORMATION

HEMLOCK ROAD

R&D CLF
P&P CLF

P&P WOOD BUILDING

P&P TRACK AND FIELD

P&P SHED
P&P SPEED BUMPS
P&P GUARD BOOTH
P&P CONCRETE COLUMNS
R&D PAVEMENT
R&D LIGHT FIXTURES, POLES AND FOOTINGS, TYP.
R&D GATE
100-FOOT BUFFER ZONE
P&P CONC WALL
R&D BACKSTOP
R&D BASEBALL INFIELD MATERIAL
S&S LOAM, TYP.
P&P METAL BLEACHERS AND PRESSBOX
P&P SHED
P&P PAVEMENT AND STAIRS
P&P CLF AND GATES
P&P CLF
R&D CLF
R&D GATE
R & D PLAY EQUIPMENT AND SAFETY SURFACING
S&S LOAM
R & D GAS TANKS
R & D JERSEY BARRIER
R&D SIGN
R & D SHED
R & D BLEACHERS
S&S LOAM
P&P PAVEMENT AND STAIRS
R & D BASKETBALL COURTS & HOOPS
R&D PAVEMENT
R&D GAS TANK
R&D CLF
R & D EXISTING BUILDINGS AND APPURTENANCES
R&D INFIELD
R&D BACKSTOP
R&D TRAILER
R&D SHED
R&D TRENCHES, TYP.
S&S LOAM, TYP.

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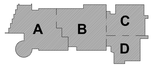

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L105

LEGEND:

- VEHICULAR ASPHALT PAVING
- ASPHALT WALKWAY PAVING
- VEHICULAR CONCRETE PAVING
- CONCRETE WALKWAY PAVING
- EXPOSED AGGREGATE CONCRETE WALKWAY PAVING
- STABILIZED STONEDUST
- P.I.P. SAFETY SURFACING
- TENNIS COURT SURFACING
- SYNTHETIC TURF
- SKINNED INFIELD

VGC	VERTICAL GRANITE CURB
CCB	FORMED ASPHALT CURB: CAPE COD BERM
CLF	CHAINLINK FENCE

MATERIAL NOTES:

1. EXISTING CONDITIONS INFORMATION IS FROM A SURVEY PERFORMED BY NITSCH ENGINEERING 2 CENTER STREET, SUITE 430 BOSTON, MA 02108, DATED JUNE 3, 2020.
2. CONTRACTOR SHALL VERIFY ALL CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO STARTING WORK.
3. CONTRACTOR SHALL NOTIFY DIGSAFE 1-888-DIG-SAFE AND VERIFY UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
4. CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED TO ROADS, WALKS, UTILITIES, SITE IMPROVEMENTS, EXISTING OR PROPOSED, DAMAGED BY THIS PROJECT.
5. ITEMS INDICATED AS "RELOCATED" ARE SALVAGED AND STORED FROM EXISTING SITE AND ARE TO BE INSTALLED BY THE GENERAL CONTRACTOR.
6. ALL CONCRETE PADS AT EXTERIOR DOORS SHALL BE PINNED TO BUILDING FOUNDATION, REFER TO STRUCTURAL DRAWINGS.
7. CONTRACTOR SHALL COORDINATE LOCATION OF ALL UTILITIES (LINES, DUCTS, CONDUITS, SLEEVES, FOOTINGS) WITH LOCATIONS OF PROPOSED LANDSCAPE ELEMENTS (WALLS, TREE ROOTBALLS, PROPOSED LIGHTING FOOTINGS). CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO CONTINUING WORK.
8. REFER TO L900 FOR PAVEMENT MARKINGS AND TRAFFIC SIGNAGE
9. PLANTING AREAS (PA), BIORETENTION AREAS (BA) LOAM AND SEED AREAS (L&S) ARE SHOWN ON THIS PLAN FOR REFERENCE ONLY, PLEASE SEE PLANTING PLANS L500, L501 AND L502 FOR FINAL SURFACE TREATMENT AND ASSOCIATED SOIL DEPTHS AND CROSS SECTIONS
10. REFER TO CIVIL PLANS FOR DETAILS ON DRAINAGE SYSTEM
11. REFER TO ELECTRICAL SITE PLAN FOR SITE LIGHTING AND SITE ELECTRICAL SCOPE

LAYOUT NOTES:

1. EXISTING CONDITIONS INFORMATION IS FROM A SURVEY PERFORMED BY NITSCH ENGINEERING 2 CENTER STREET, SUITE 430 BOSTON, MA 02108, DATED JUNE 3, 2020.
2. CONTRACTOR SHALL STAKE OUT ALL SITE IMPROVEMENTS BOTH HORIZONTALLY AND VERTICALLY IN THE FIELD, AND SUCH STAKEOUT TO BE APPROVED BY THE ARCHITECT PRIOR TO CONSTRUCTION.
3. DIMENSIONS TO CURB LINES ARE TO THE FACE OF THE CURB. DIMENSIONS TO SITE OR BUILDING WALLS ARE TO THE OUTSIDE (OR EXPOSED) FACE OF WALL, UNLESS OTHERWISE NOTED.
4. ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE NOTED.
5. THE DIMENSIONS SHOWN ON THE DRAWINGS SHOW DESIGN INTENT AND MUST BE FIELD VERIFIED PRIOR TO PREPARATION OF SHOP DRAWINGS.
6. ALL DIMENSIONS FOR LIGHTS AND SIGNS ARE TO THE CENTERLINE OF THE OBJECT UNLESS OTHERWISE NOTED.
7. PROVIDE EXPANSION JOINTS IN CONCRETE WALKS AT 30' O.C. AND CONTROL JOINTS AT 10' O.C. AS PER SPECIFICATIONS, UNLESS OTHERWISE INDICATED ON DRAWINGS.
8. ALL CURVES SHALL BE SMOOTH, CONTINUOUS RADII. NO STRAIGHT SECTIONS OR ABRUPT TRANSITIONS.

NORTH

SCALE: 1" = 30'-0"

0 15' 30' 75'

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June 17, 2021

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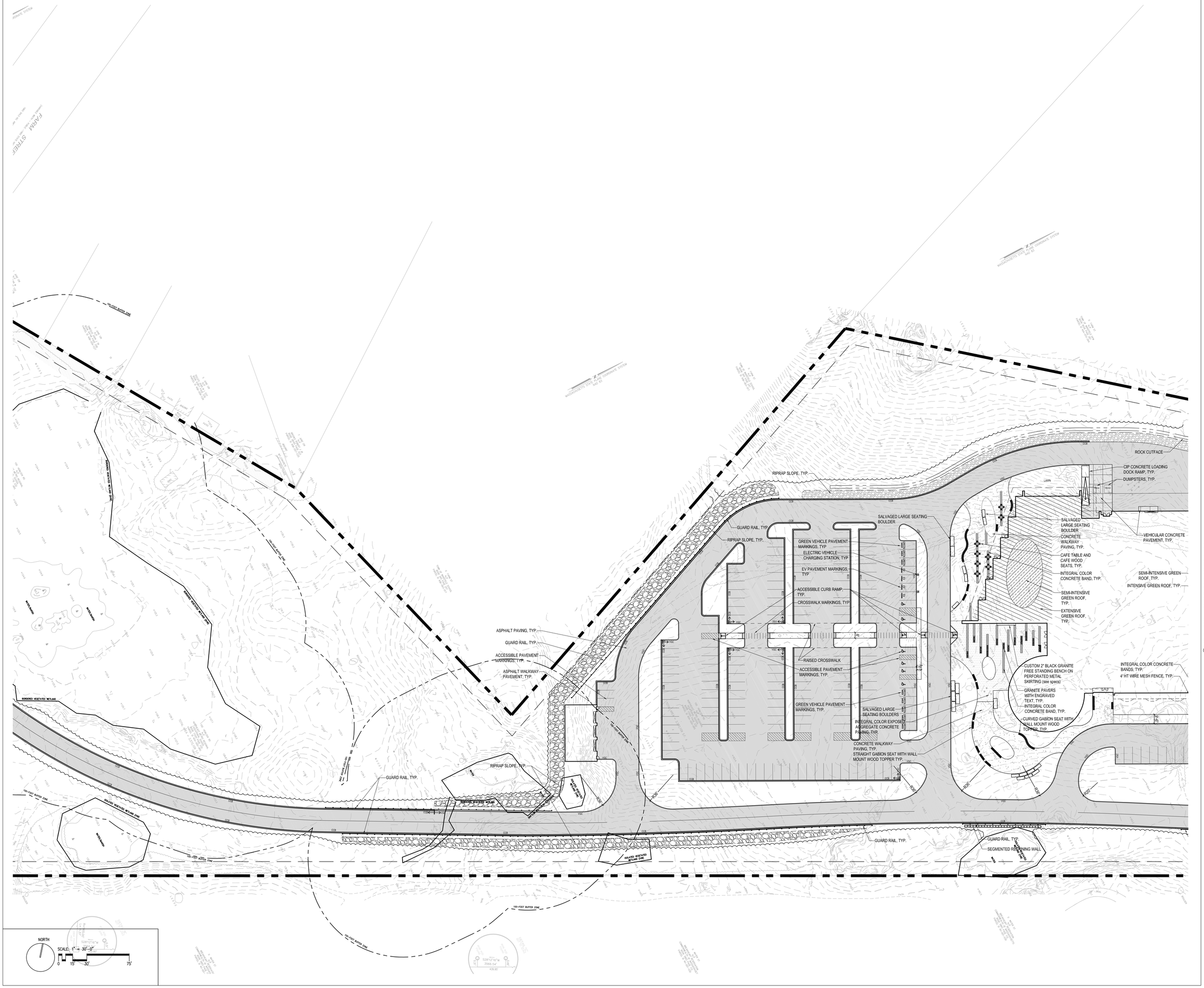
MAGNETIC NORTH

LAYOUT AND MATERIAL PLAN

Scale: 1" = 30'-0"
Job No.: 20202.00
Drawn By: JM/MB
Date: June 17, 2021

L301



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LAYOUT AND MATERIAL PLAN

Scale: 1" = 30'-0"
Job No.: 20202.00
Drawn By: JM/MB
Date: June 17, 2021

L302

NORTH

SCALE: 1" = 30'-0"

0 15' 30' 75'

NORTH

SCALE: 1" = 30'-0"

0 15' 30' 75'

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Drawn By: JM/MB
Date: June 17, 2021

L303

IX, TYP.

'E PAD, TYP.

M BLEACHER INCLUDING 2
ILE SPACES, PERIMETER
IL, TYP. ATTACHED AND
ED TO REINFORCED
'E PAD

ELECTRONIC SCOREBOARD 10' MOUNTING HEIGHT, STEEL POSTS WITH CONCRETE FOOTINGS, TYP.

GATE

ACCESSIBLE CURB RAMP, TYP.

CROSSWALK MARKINGS, TYP.

ASPHALT WALKWAY PAVING, TYP.

GUARD RAIL, TYP.

ACCESSIBLE CURB RAMP, TYP.

CLF BACKSTOP

8'X32' OVERHEAD SHADE STRUCTURE WITH TEAM BENCH ON REINFORCED CONCRETE PAD/FOUNDATION, TYP.

ENGINEERED INFIELD MIX, TYP.

ALUMINUM BLEACHER INCLUDING 2 ACCESSIBLE SPACES, PERIMETER GUARDRAIL, TYP. ATTACHED AND SUPPORTED TO REINFORCED CONCRETE PAD

CONCRETE PAD, TYP.

FOUL POLE, TYP.

RIPRAP SLOPE, TYP.

ASPHALT WALKWAY PAVING, TYP.

6' HT. BVC CLF

ATHLETIC FIELD

BACKSTOP

TEAM BENCH ON REINFORCED CONCRETE PAD, TYP.

ENGINEERED INFIELD MIX, TYP.

6' HT. BVC CLF

CONCRETE WALKWAY PAVING, TYP.

100-FOOT BUFFER ZONE

ASPHALT WALKWAY PAVING, TYP.

SALVAGED LARGE SEATING BOULDER

CONCESSION TABLE AND BENCH, TYP.

CONCRETE WALKWAY PAVING, TYP.

ELECTRIC VEHICLE CHARGING STATION, TYP.

60.68°

330'

20'HT. SPORTS NETTING

IRRIGATED NATURAL GRASS ATHLETIC FIELD

ELECTRONIC SCOREBOARD 10' MOUNTING HEIGHT, STEEL POSTS WITH CONCRETE FOOTINGS, TYP.

20' HT. SPORTS NETTING

STABILIZED STONEDUST, TYP.

CONCESSION TABLE AND BENCH, TYP.

METAL SHADE ROOF PERGOLA, TYP.

CONCRETE WALKWAY PAVING,TYP.

SALVAGED LARGE SEATING BOULDER

PRESSBOX

4' HT. BVC CLF

ACCESSIBLE WHEELCHAIR LIFT

OUTDOOR FITNESS EQUIPMENT (5)

POURED IN PLACE SAFETY SURFACING, 1" THICKNESS, TYP.

ALUMINUM BLEACHERS (750 PERSON CAPACITY) WITH CONCESSION BUILDING BELOW, SEE ARCH DWGS.

SEGMENTED RETAINING WALL

10' HT. BVC CLF PERIMETER FENCING, TYP.

TENNIS COURT: 3" ASPHALT PAVING WITH ACRYLIC SAND COLOR SEAL COAT, 2 COLORS

TENNIS POST AND NETS, TYP.

WINDSCREEN WITH PRINTED GRAPHICS, 4 SIDES

10' HT. BVC CLF PERIMETER FENCING, TYP.

TENNIS COURT: 3" ASPHALT PAVING WITH ACRYLIC SAND COLOR SEAL COAT, 2 COLORS

FOUL POLE, TYP.

VEHICULAR CONCRETE WALKWAY WITH GALVANIZED STEEL METAL HANDRAILS

ASPHALT WALKWAY PAVING, TYP.

GREEN VEHICLE PARKING, TYP.

EV PARKING, TYP.

ASPHALT WALKWAY PAVING, TYP.

SHOTPUT THROWING PAD AND LANDING SECTOR

ACCESSIBLE METAL RAMP SYSTEM ON CONCRETE PAD

CONCRETE DISCUSS PAD AND CAGE, TYP.

6-LANE URETHANE RESILIENT TRACK SURFACING ON ASPHALT, TYP.

URETHANE RESILIENT TRACK SURFACING AT D-ZONE, TYP.

20' HT. SPORTS NETTING

TRENCH DRAIN AT INNER TRACK PERIMETER, TYP.

FOOTBALL GOAL POST AND FOOTING

ASPHALT WALKWAY PAVING, TYP.

POLE VAULT RUNWAY AND BOX

ASPHALT PAINTED PAD AREA (COLOR TO MATCH RESILIENT SURFACE)

20' HT. SPORTS NETTING

FOOTBALL GOAL POST AND FOOTING

INFILLED SYNTHETIC TURF

GUARD RAIL, TYP.

URETHANE RESILIENT TRACK SURFACING AT D-ZONE, TYP.

LONG JUMP/TRIPLE JUMP RUNWAYS, TYP.

LONG JUMP PIT, TYP.

TRENCH DRAIN AT INNER TRACK PERIMETER, TYP.

ELECTRONIC SCOREBOARD 10' MOUNTING HEIGHT, STEEL POSTS WITH CONCRETE FOOTINGS, TYP.

LED SPORTLIGHTING, 50 FC AVERAGE ILLUMINATION, TYP.

ASPHALT WALKWAY PAVING, TYP.

ACCESSIBLE CURB RAMP, TYP.

ASPHALT WALKWAY, TYP.

3FORMER ON RETE PAD WITH RETE FILLED STEEL RDS

PROGRESS 6/3/2021

NORTH

SCALE: 1" = 30'-0"

0 15' 30' 75'

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L304

HEMLOCK ROAD

FOUL POLE, TYP.

6' BVC CLF WITH CAP, TYP.

8'X32' OVERHEAD SHADE STRUCTURE WITH TEAM BENCH ON REINFORCED CONCRETE PAD/FOUNDATION, TYP.

IRRIGATED ATHLETIC FIELD

CLF BACKSTOP

CONCRETE WALKWAY PAVING, TYP.

BASEBALL ENGINEERED INFIELD MIX, TYP.

CONCRETE PAD, TYP.

ALUMINUM BLEACHER INCLUDING 2 ACCESSIBLE SPACES, PERIMETER GUARDRAIL TYP. ATTACHED AND SUPPORTED TO REINFORCED CONCRETE PAD

ELECTRONIC SCOREBOARD 10' MOUNTING HEIGHT, STEEL POSTS WITH CONCRETE FOOTINGS, TYP.

GATE

VEHICULAR ASPHALT PAVING, TYP.

ASPHALT WALKWAY PAVING, TYP.

ACCESSIBLE CURB RAMP, TYP.

CROSSWALK MARKINGS, TYP.

GUARD RAIL, TYP.

ELECTRONIC VEHICLE ACCESS GATE WITH ACCESS CODE/CARD MOUNTED ON BOLLARD

6' HT. BVC CLF

BACKSTOP

RIPRAP SLOPE, TYP.

8'X32' OVERHEAD SHADE STRUCTURE WITH TEAM BENCH ON REINFORCED CONCRETE PAD/FOUNDATION, TYP.

ENGINEERED INFIELD MIX, TYP.

ALUMINUM BLEACHER INCLUDING 2 ACCESSIBLE SPACES, PERIMETER GUARDRAIL, TYP. ATTACHED AND SUPPORTED TO REINFORCED CONCRETE PAD

CONCRETE PAD, TYP.

SEGMENTED RETAINING WALL

10' HT. BVC CLF PERIMETER FENCING, TYP.

TENNIS COURT: 3" ASPHALT PAVING WITH ACRYLIC SAND

NORTH

SCALE: 1" = 30'-0"

0 15' 30' 75'

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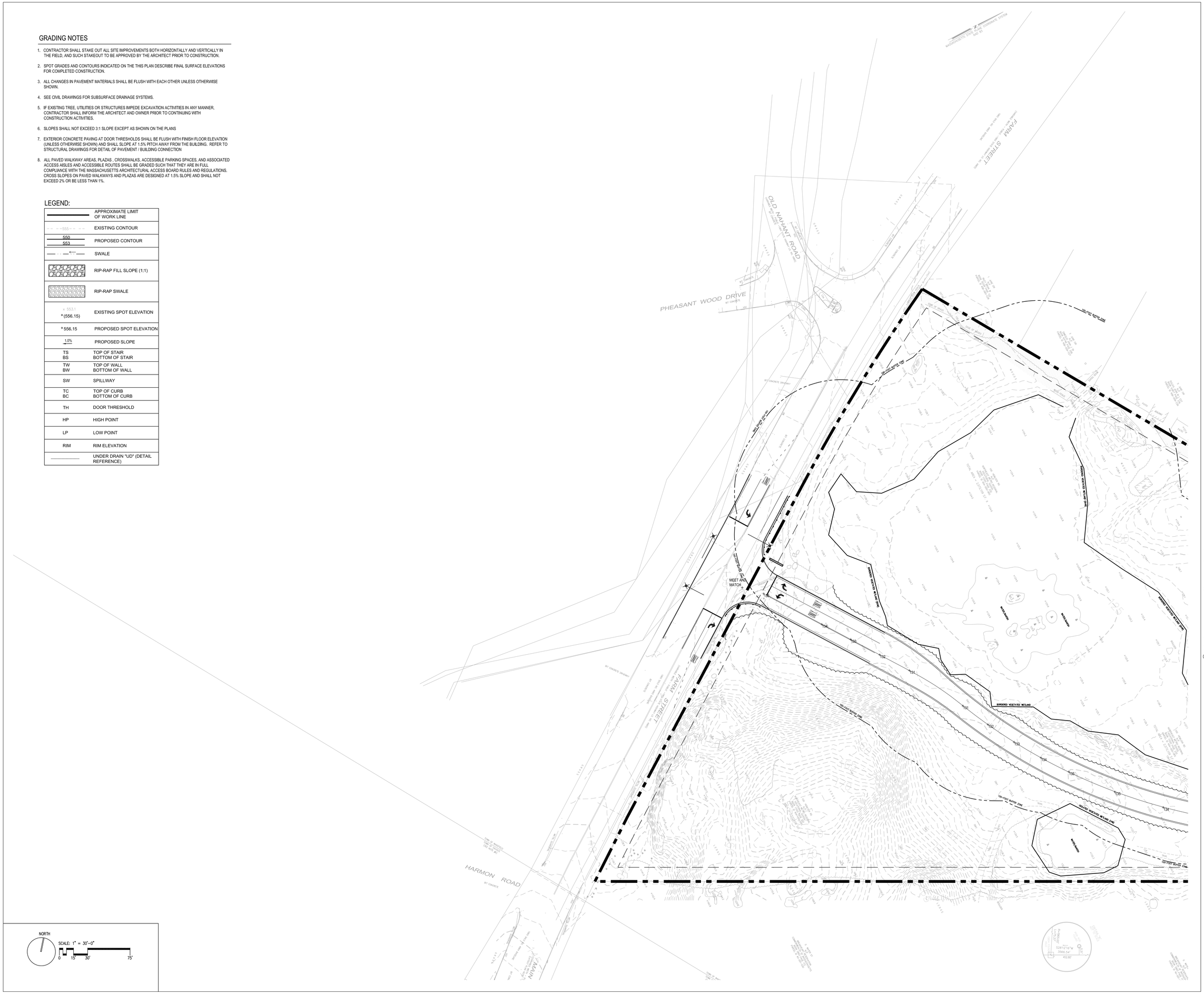
L305

GRADING NOTES

1. CONTRACTOR SHALL STAKE OUT ALL SITE IMPROVEMENTS BOTH HORIZONTALLY AND VERTICALLY IN THE FIELD, AND SUCH STAKEOUT TO BE APPROVED BY THE ARCHITECT PRIOR TO CONSTRUCTION.
2. SPOT GRADES AND CONTOURS INDICATED ON THE THIS PLAN DESCRIBE FINAL SURFACE ELEVATIONS FOR COMPLETED CONSTRUCTION.
3. ALL CHANGES IN PAVEMENT MATERIALS SHALL BE FLUSH WITH EACH OTHER UNLESS OTHERWISE SHOWN.
4. SEE CIVIL DRAWINGS FOR SUBSURFACE DRAINAGE SYSTEMS.
5. IF EXISTING TREE, UTILITIES OR STRUCTURES IMPEDE EXCAVATION ACTIVITIES IN ANY MANNER, CONTRACTOR SHALL INFORM THE ARCHITECT AND OWNER PRIOR TO CONTINUING WITH CONSTRUCTION ACTIVITIES.
6. SLOPES SHALL NOT EXCEED 3:1 SLOPE EXCEPT AS SHOWN ON THE PLANS
7. EXTERIOR CONCRETE PAVING AT DOOR THRESHOLDS SHALL BE FLUSH WITH FINISH FLOOR ELEVATION (UNLESS OTHERWISE SHOWN) AND SHALL SLOPE AT 1.5% PITCH AWAY FROM THE BUILDING. REFER TO STRUCTURAL DRAWINGS FOR DETAIL OF PAVEMENT / BUILDING CONNECTION
8. ALL PAVED WALKWAY AREAS, PLAZAS , CROSSWALKS, ACCESSIBLE PARKING SPACES, AND ASSOCIATED ACCESS AISLES AND ACCESSIBLE ROUTES SHALL BE GRADED SUCH THAT THEY ARE IN FULL COMPLIANCE WITH THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD RULES AND REGULATIONS. CROSS SLOPES ON PAVED WALKWAYS AND PLAZAS ARE DESIGNED AT 1.5% SLOPE AND SHALL NOT EXCEED 2% OR BE LESS THAN 1%.

LEGEND:

	APPROXIMATE LIMIT OF WORK LINE
555	EXISTING CONTOUR
550 / 553	PROPOSED CONTOUR
	SWALE
	RIP-RAP FILL SLOPE (1:1)
	RIP-RAP SWALE
+ 555.1 *(556.15)	EXISTING SPOT ELEVATION
+556.15	PROPOSED SPOT ELEVATION
1.0%	PROPOSED SLOPE
TS / BS	TOP OF STAIR / BOTTOM OF STAIR
TW / BW	TOP OF WALL / BOTTOM OF WALL
SW	SPILLWAY
TC / BC	TOP OF CURB / BOTTOM OF CURB
TH	DOOR THRESHOLD
HP	HIGH POINT
LP	LOW POINT
RIM	RIM ELEVATION
UD	UNDER DRAIN "UD" (DETAIL REFERENCE)



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June 17, 2021

KEY PLAN

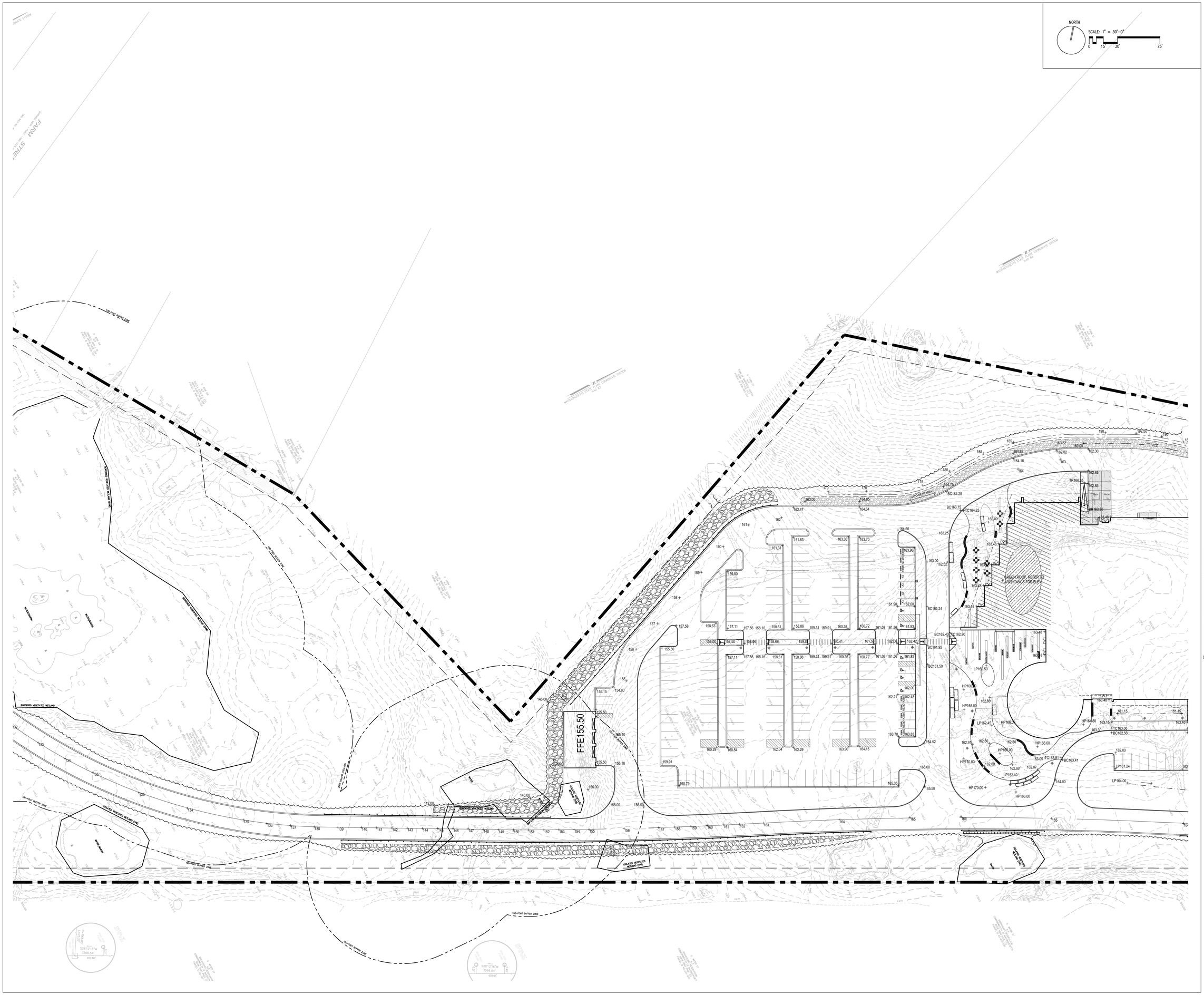
PROJECT NORTH

MAGNETIC NORTH

GRADING PLAN

Scale: 1" = 30'-0"
Job No.: 20202.00
Drawn By: JM/MB
Date: June 17, 2021

L401



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GRADING PLAN

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Job No.: 20202.00
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Date: June 17, 2021

L402

NORTH

SCALE: 1" = 30'-0"

0 15' 30' 75'

MEET AND MATCH

ROOF DECK, REFER TO ARCH DWGS FOR ELEV.

GREEN ROOF, REFER TO ARCH DWGS FOR ELEV.

GEN

100-FOOT BUFFER ZONE

50-FOOT BUFFER ZONE

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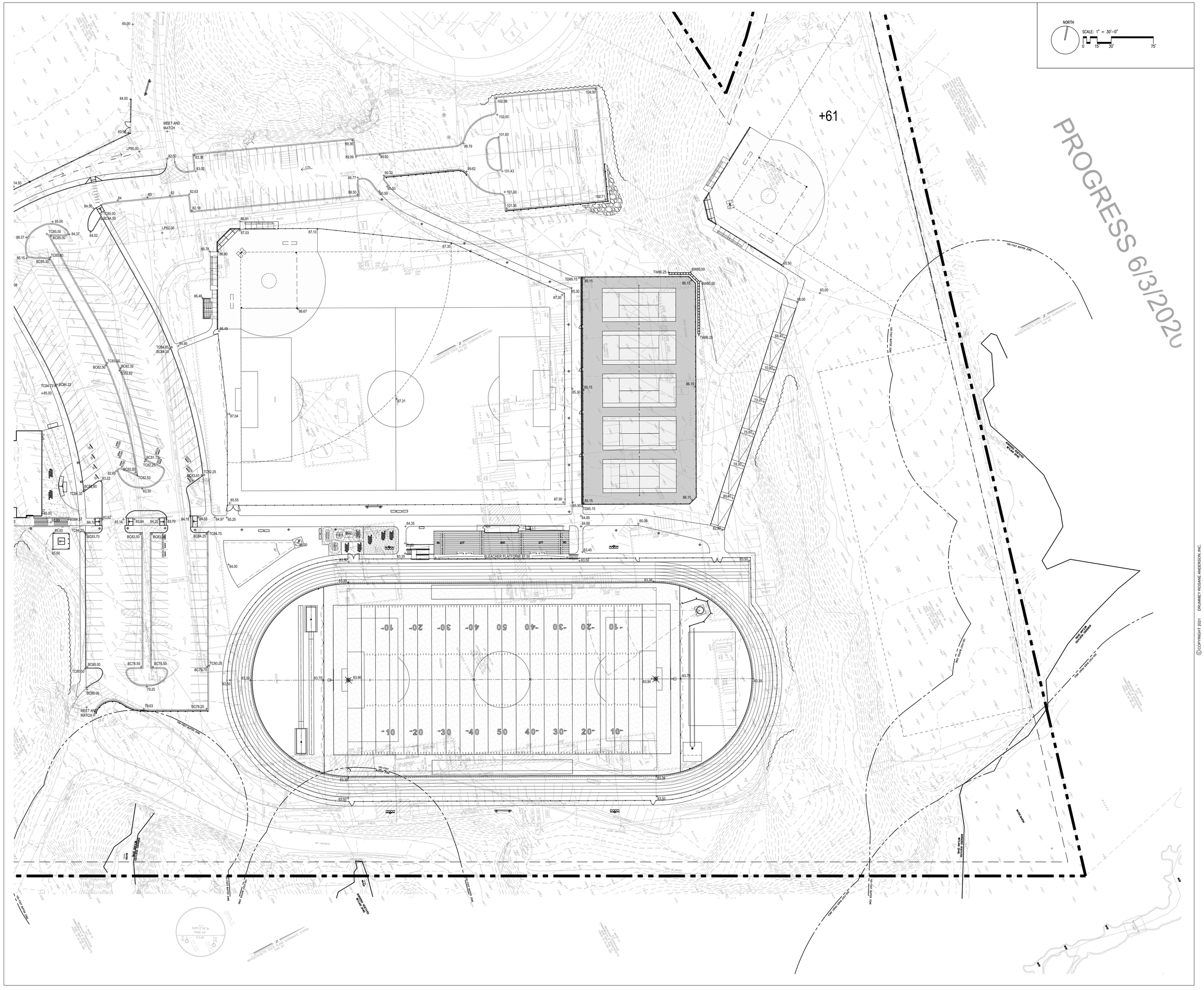

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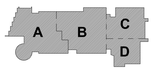

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NORTH

SCALE: 1" = 30'-0"

0 15' 30' 75'

HEMLOCK ROAD

100-FOOT BUFFER ZONE

MEET AND MATCH

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GRADING PLAN

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Date: June 17, 2021

L405

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	
AO	4	Acer rubrum 'October Glory'	October Glory Red Maple	4" cal. B&B		
AR2	10	Acer rubrum	Red Maple	1.5" Cal.		
MG2	8	Metasequoia glyptostroboides	Dawn Redwood	3" Cal.		
QA	18	Quercus alba	White Oak	1.5" Cal.		
QM	8	Quercus macrocarpa	Burr Oak	3.5" cal. B&B		
DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	
AR	29	Acer rubrum `Redpointe`	Redpointe Maple	3" Cal.	Native	
AS	5	Acer saccharum	Sugar Maple	2.5" Cal.	Green Mountain or Fall Fiesta Cultivars	
BC	22	Betula papyrifera 'Clump'	Clump Paper Birch	7-8` Ht. B&B		
BN	3	Betula nigra `Cully` TM	Heritage Birch	7-8` Ht. B&B	Clump	
BP	6	Betula populifolia `Whitespire`	Whitespire Birch	15` Ht.	Clump, Native	
BU	9	Betula papyrifera `Uenci` TM	Renaissance Upright Paper Birch	12-14` Ht. B&B	Multi-Clump	
FG	10	Fagus grandifolia	American Beech	2.5" Cal.		
NS	8	Nyssa sylvatica `Wildfire`	Black Gum	2.5" Cal.		
QB	9	Quercus bicolor	Swamp White Oak	3" Cal.		
QR	23	Quercus rubra	Red Oak	3.5" cal. B&B	Native	
UA	13	Ulmus americana `Jefferson`	American Elm	4.5-5.0" cal. B&B	Valley Forge acceptable cultivar	
EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	
JV	12	Juniperus virginiana	Eastern Red Cedar	8-10` Ht		
PR	14	Pinus rigida	Pitch Pine	8-10` Ht		
PS	27	Pinus strobus	White Pine	10-12` Ht. B&B	Native Evergreen	
PS2	11	Pinus strobus	White Pine	7-8` Ht. B&B		
ORNAMENTAL TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	
AX	17	Amelanchier x grandiflora `Autumn Brilliance`	`Autumn Brilliance` Serviceberry	7-8` Ht. B&B	Native Clump	
MD	12	Malus x 'Donald Wyman'	Donald Wyman Crabapple	2.5" Cal.		
GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	DETAIL	REMARKS
CP	451	Carex pensylvanica	Pennsylvania Sedge	Plugs		
ORNAMENTAL GRASSES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	DETAIL	REMARKS
DT	2,592	Deschampsia cespitosa	Tufted Hair Grass	Plugs		
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	DETAIL	REMARKS
RA	202	Rhus aromatica `Gro-Low`	Gro-Low Fragrant Sumac	1 gal.		3` O.C.

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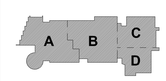

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PROJECT NORTH

MAGNETIC NORTH

PLANTING PLAN

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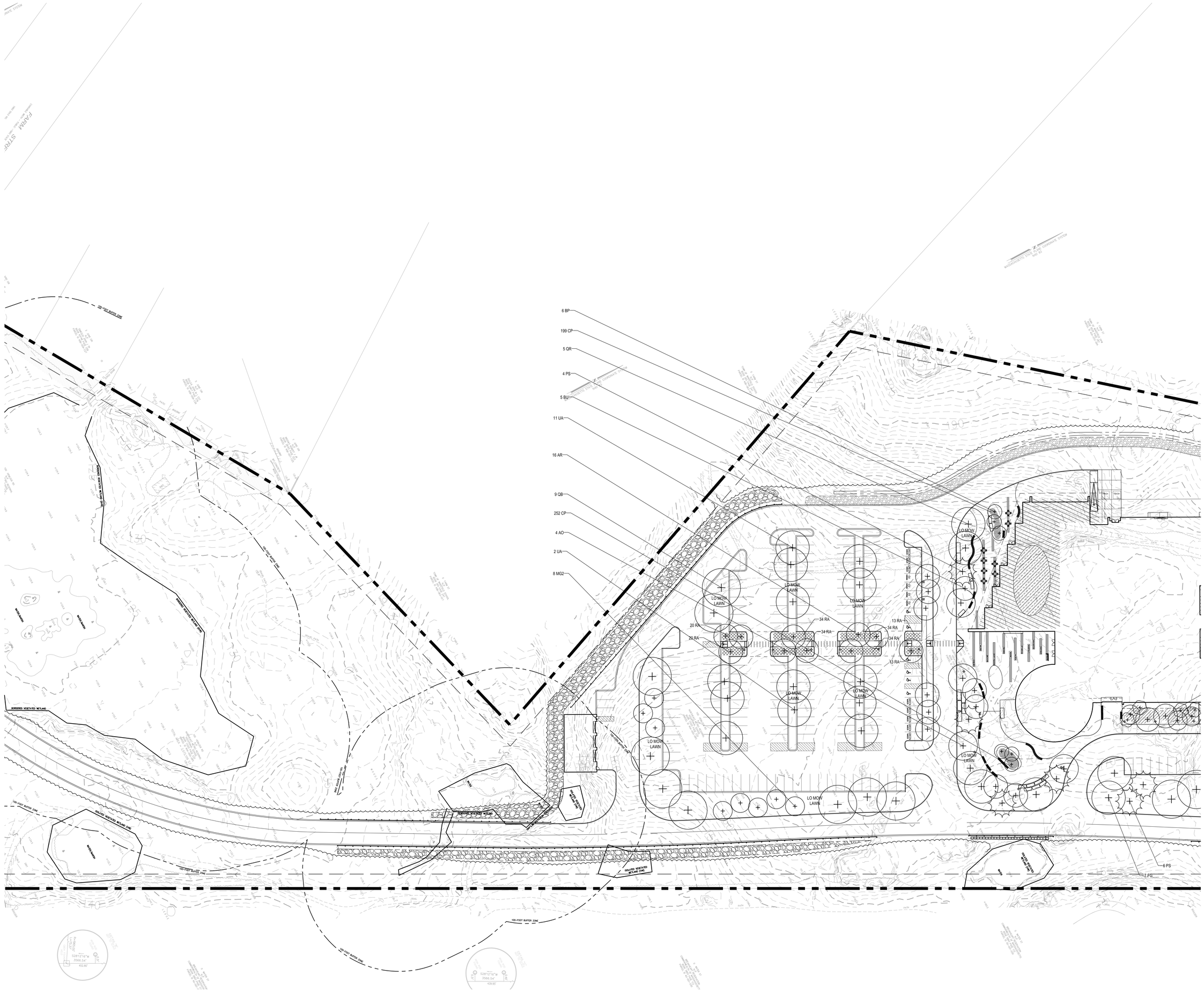
L501



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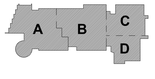

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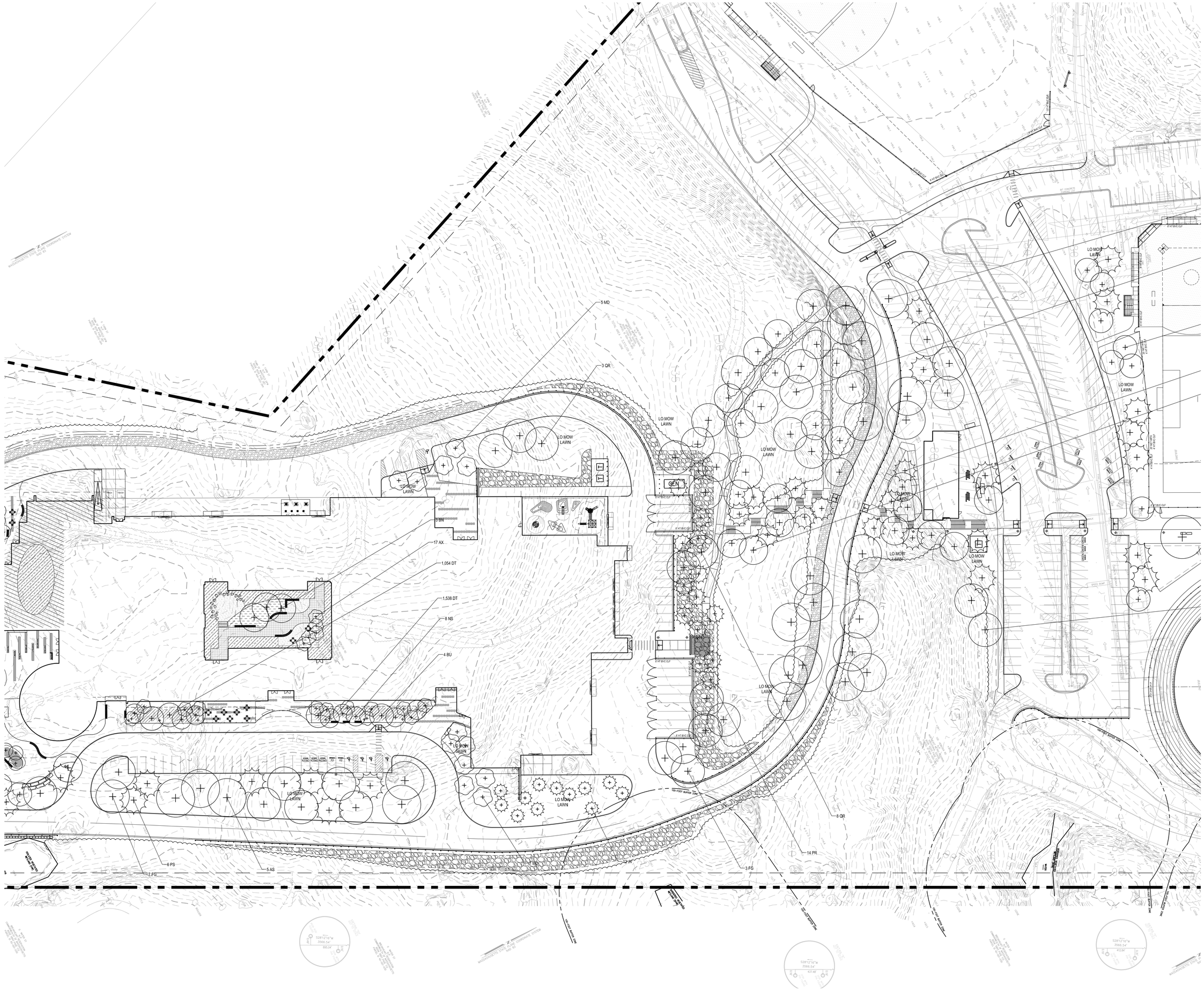

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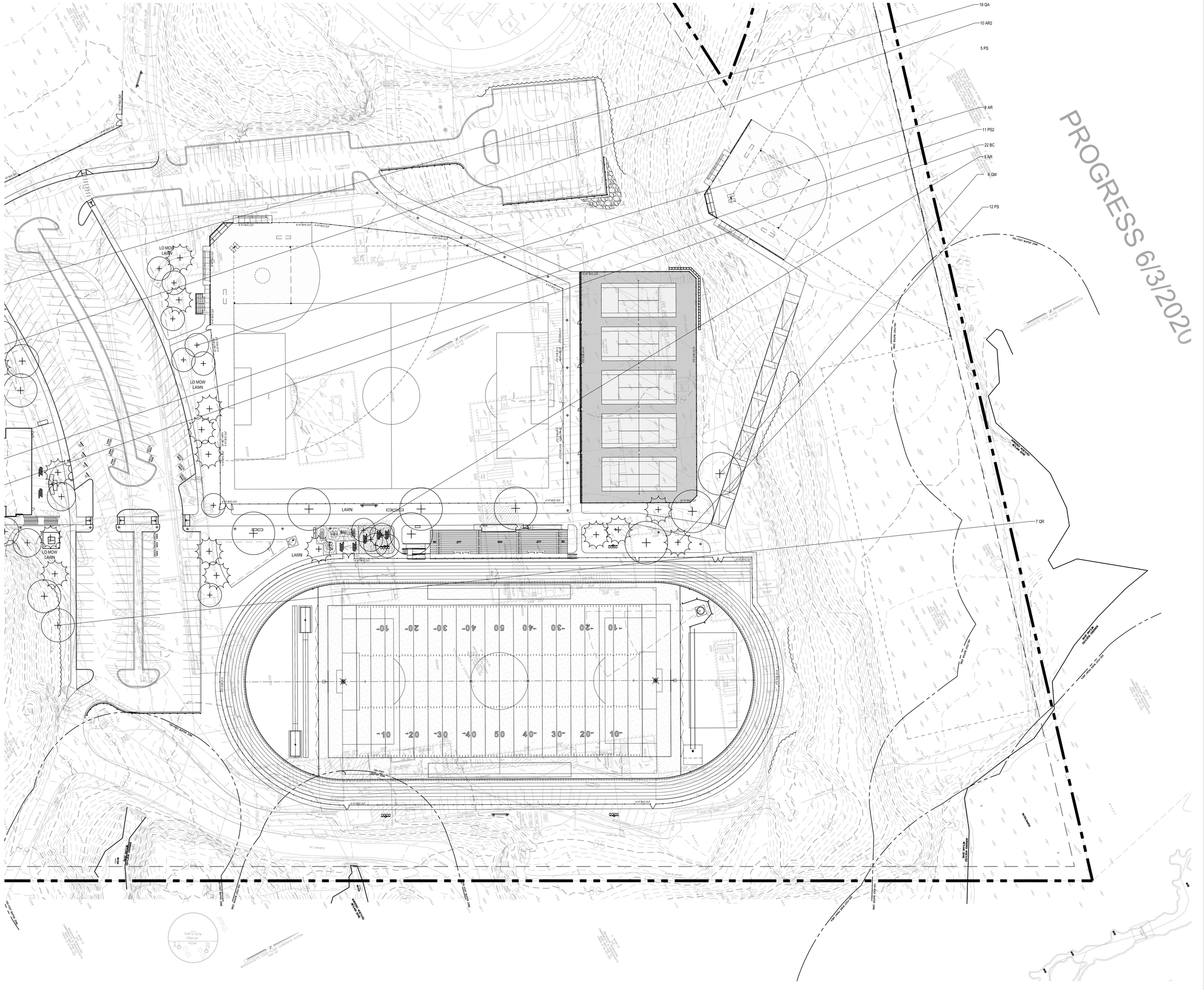

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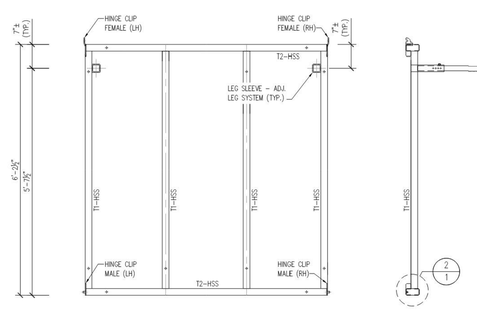
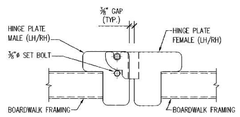
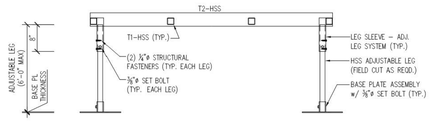




2/1 FRAME CONNECTION DETAIL
SCALE: N.T.S.



1/1 FRAME DETAIL
SCALE: N.T.S.

TYPICAL FRAMING NOTES:
1. LONGITUDINAL AND LATERAL DIAGONAL LEG BRACING IS REQUIRED WHEN ELEVATION AT THE TOP OF THE BOARDWALK DECKING EXCEED 3'-0" (36") ABOVE FINISHED GRADE.
2. FINAL BOARDWALK FRAMING SIZES (HSS / PLATE) & WELD SIZES ARE TO BE DETERMINED BY WICKCRAFT.
3. BOARDWALK HAS BEEN DESIGNED TO SUPPORT A LIVE LOAD OF 100 PSF. NO ADDITIONAL/SEPARATE LOADING HAS BEEN INCLUDED FOR SNOW.
4. MAXIMUM LIVE LOAD DEFLECTION CRITERIA: L/360.

#	DATE	DESCRIPTION	BY:
1	–	–	–
2	–	–	–

#	DATE	DESCRIPTION	BY:
1	–	–	–
2	–	–	–

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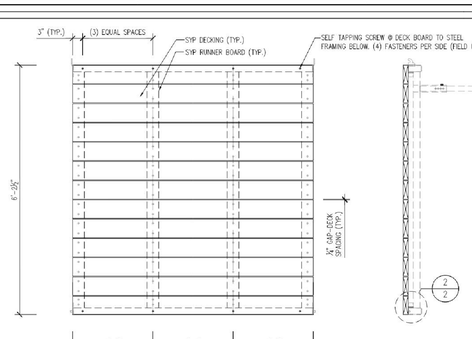
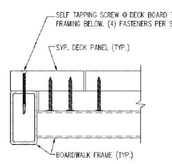


1/2 SYP DECK DETAIL
SCALE: N.T.S.



2/2 SYP. DECK PANEL ATTACHMENT
SCALE: N.T.S.

TYPICAL FRAMING NOTES:
1. LONGITUDINAL AND LATERAL DIAGONAL LEG BRACING IS REQUIRED WHEN ELEVATION AT THE TOP OF THE BOARDWALK DECKING EXCEED 3'-0" (36") ABOVE FINISHED GRADE.
2. FINAL BOARDWALK FRAMING SIZES (HSS / PLATE) & WELD SIZES ARE TO BE DETERMINED BY WICKCRAFT.
3. BOARDWALK HAS BEEN DESIGNED TO SUPPORT A LIVE LOAD OF 100 PSF. NO ADDITIONAL/SEPARATE LOADING HAS BEEN INCLUDED FOR SNOW.
4. MAXIMUM LIVE LOAD DEFLECTION CRITERIA: L/360.

#	DATE	DESCRIPTION	BY:
1	–	–	–
2	–	–	–

#	DATE	DESCRIPTION	BY:
1	–	–	–
2	–	–	–

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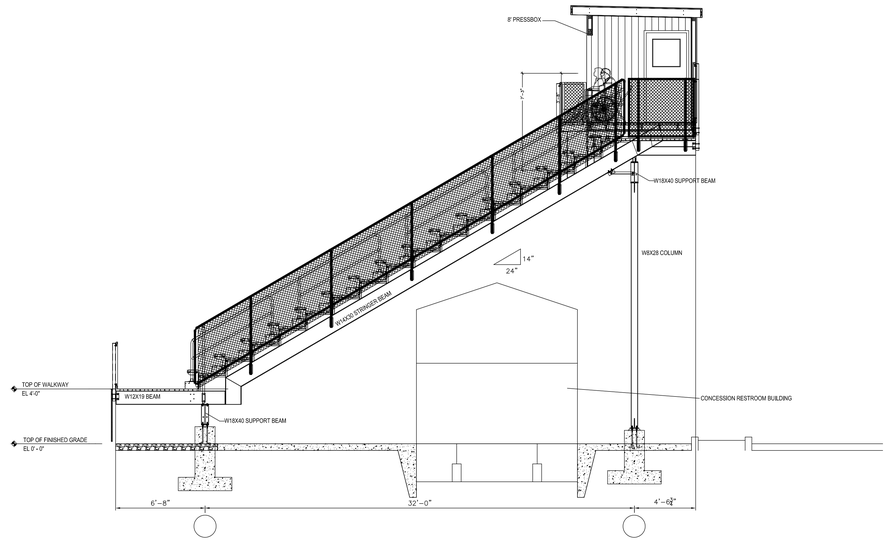
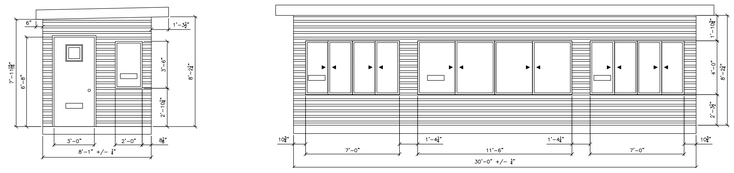
3 PRE- ENGINEERED ELEVATED BOARDWALK RAMPING SYSTEM
SCALE: NTS



NOTES:
1. BASIS OF DESIGN DANT CLAYTON
2. PLEASE CONTACT MATT DOUGHERTY FOR ACCURATE QUOTE-800.467.3655 EXT. 230

1 BLEACHER
SCALE: 3"=1'



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2 PRESSBOX
SCALE: 3"=1'

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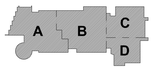

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MAGNETIC NORTH

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Date: June 17, 2021

L601

4.1.2 - 05

GEOTECHNICAL ANALYSIS

LGCI
Lahlaf Geotechnical Consulting, Inc.

June 10, 2021

Mr. Vladimir Lyubetsky
Principal
Drummey Rosane Anderson, Inc.
Howard Clock Building
260 Charles Street, Studio 300
Waltham, MA 02453
Phone: (617) 964-1700 x121
E-mail: vlyubetsky@draws.com

Re: **Geotechnical Report**
Proposed Northeast Metropolitan Regional Vocational Technical High School
Wakefield, Massachusetts
LGCI Project No. 2025

Dear Mr. Lyubetsky:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed additional explorations at the site of the Proposed Northeast Metropolitan Regional Vocational Technical High School in Wakefield, Massachusetts. This report contains the results of all our subsurface explorations to date and our foundation and construction recommendations. We are submitting this report electronically, please notify us if you need a hard copy.

The soil and rock samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples after three (3) months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

LGCI
Lahlaf Geotechnical Consulting, Inc.

GEOTECHNICAL REPORT
PROPOSED NORTHEAST METROPOLITAN REGIONAL VOCATIONAL TECHNICAL HIGH SCHOOL
WAKEFIELD, MASSACHUSETTS

LGCI Project No. 2025
June 10, 2021

Prepared for:

DRUMMEY ROSANE ANDERSON, INC.
Howard Clock Building
260 Charles Street, Studio 300
Waltham, MA 02453
Phone: (617) 964-1700

GEOTECHNICAL REPORT
PROPOSED NORTHEAST METROPOLITAN
REGIONAL VOCATIONAL TECHNICAL HIGH SCHOOL
WAKEFIELD, MASSACHUSETTS
LGCI Project No. 2025
June 10, 2021

Prepared for:

DRUMMEY ROSANE ANDERSON, INC.
Howard Clock Building
260 Charles Street, Studio 300
Waltham, MA 02453
Phone: (617) 964-1700

Prepared by:

LAHLAF GEOTECHNICAL CONSULTING, INC.
100 Chelmsford Road, Suite 2
Billerica, Massachusetts 01862
Phone: (978) 330-5912
Fax: (978) 330-5056

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

This geotechnical report presents the results of the subsurface explorations and a geotechnical evaluation performed by Lahlaf Geotechnical Consulting, Inc. (LGCI) for the proposed Northeast Metropolitan Regional Vocational Technical High School in Wakefield, Massachusetts. To date, we have performed services in three phases as follows:

- We performed a desk review in general accordance with the scope described in our proposal No. 20061 dated July 30, 2020. Mr. Vladimir Lyubetsky of Drummey Rosane Anderson, Inc. (DRA) authorized our desk review services by signing our proposal on July 30, 2020.

- We performed our Preferred Schematic Report (PSR) phase services in general accordance with the scope described in our proposal No. 20079 dated October 23, 2020. Mr. Vladimir Lyubetsky of DRA authorized our PSR phase services by signing our proposal on December 14, 2020.

- We performed our Schematic Design (SD) phase services in general accordance with the scope described in our proposal No. 21003-Rev. 2 dated January 29, 2021, and revised on February 19, 2021. Mr. Vladimir Lyubetsky of DRA authorized our SD phase services by signing our proposal on June 9, 2021.

1.2 Purpose and Scope of Services

The purpose of our geotechnical services was to perform subsurface explorations at the site and to provide foundation design and construction recommendations. LGCI performed the following services:

- Performed a desk review that included reviewing available information about the site, including the geologic data available from the U.S. Geological Survey and our field observations from the site visit.

- Coordinated our test pit and boring locations for the PSR and SD phases with DRA and with the school staff.

- Marked the test pit and boring locations for the PSR and SD phases at the site and notified Dig Safe Systems Inc. (Dig Safe) and the Town of Wakefield for utility clearance.

- Engaged a drilling subcontractor to advance ten (10) soil borings at the site, including four (4) borings as part of the PSR phase in 2020, and six (6) borings as part of the SD phase in 2021. Our drilling subcontractor installed four (4) groundwater observation wells at the site,

including two (2) groundwater observation wells as part of the PSR phase in 2020, and two (2) groundwater observation wells as part of the SD phase in 2021.

- Engaged an excavation subcontractor to excavate thirty-one (31) test pits at the site, including eighteen (18) test pits as part of the PSR phase in 2020, and thirteen (13) test pits as part of the SD phase in 2021.

- Provided an LGCI geotechnical engineer at the site to coordinate and observe the test pits and borings, describe the soil samples, and prepare field logs.

- Submitted eight (8) soil samples for laboratory testing, including four (4) soil samples as part of the PSR phase in 2020, and four (4) soil samples as part of the SD phase in 2021. Submitted four (4) rock core samples for compressive strength of rock.

- Prepared this geotechnical report containing the results of our subsurface explorations and our recommendations for foundation design and construction.

Following our 2020 desk review, LGCI submitted a preliminary geotechnical review services report dated August 7, 2020. Also, following our 2020 test pits and borings, LGCI submitted a preliminary geotechnical report dated December 14, 2020. The present report includes the results of our desk review, our 2020 explorations, and our 2021 explorations, and supersedes the two (2) aforementioned reports.

LGCI's scope of services does not include an environmental assessment for the presence or absence of wetlands or analytical testing for hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site, or mold in the soil or in any structure at the site. Any statements regarding odors, colors, or unusual or suspicious items or conditions are strictly for the information of the client.

Our SD phase scope includes preparing Earth Moving Specifications and Reviewing the geotechnical aspect of the SD Foundation and Civil Drawings. These services will be performed separately and are not included in this report. Our scope does not include performing field services. We will be pleased to perform these services for an additional fee. Recommendations for unsupported slopes, stormwater management, erosion control, pavement design, site specific liquefaction analysis, slope stability analyses, and detailed cost or quantity estimates are not included in our scope of work. Our scope does not include environmental services.

1.3 References

LGCI's understanding of the site is based on our observations at the site and on the following drawings and reports:

- Drawing S1 titled: "Typical Details and General Notes, Northeast Metropolitan Regional Vocational Technical School," (1969 Structural Details) prepared by Korslund, LeNormand & Quann, Inc., dated June 2, 1969, and provided to us by DRA on July 30, 2020.

- Drawing S3 titled: "Foundation and First Floor Plan – Unit A, Northeast Metropolitan Regional Vocational Technical School," (First Floor Plan – Unit A) prepared by Korslund, LeNormand & Quann, Inc., dated June 2, 1969, and provided to us by DRA on July 30, 2020.

- Drawing S5 titled: "Foundation and First Floor Plan – Unit B, Northeast Metropolitan Regional Vocational Technical School," (First Floor Plan – Unit B) prepared by Korslund, LeNormand & Quann, Inc., dated June 2, 1969, and provided to us by DRA on July 30, 2020.

- Drawing S7 titled: "Foundation and First Floor Plan – Unit C, Northeast Metropolitan Regional Vocational Technical School," (First Floor Plan – Unit C) prepared by Korslund, LeNormand & Quann, Inc., dated June 2, 1969, and provided to us by Drummey Rosane Anderson, Inc. (DRA) on July 30, 2020.

- Drawing S9 titled: "Foundation and First Floor Plan – Unit D, Northeast Metropolitan Regional Vocational Technical School," (First Floor Plan – Unit D) prepared by Korslund, LeNormand & Quann, Inc., dated June 2, 1969, and provided to us by DRA on July 30, 2020.

- Drawing S12 titled: "Foundation and First Floor Plan – Unit E, Northeast Metropolitan Regional Vocational Technical School," (First Floor Plan – Unit E) prepared by Korslund, LeNormand & Quann, Inc., dated June 2, 1969, and provided to us by DRA on July 30, 2020.

- Drawing S14 titled: "Foundation and First Floor Plan – Unit F, Northeast Metropolitan Regional Vocational Technical School," (First Floor Plan – Unit F) prepared by Korslund, LeNormand & Quann, Inc., dated June 2, 1969, and provided to us by DRA on July 30, 2020.

- "Custom Soil Resource Report for Essex County, Massachusetts, Southern Part; and Middlesex County, Massachusetts," (Soil Survey Report) National Cooperative Soil Survey/National Resources Conservation Services, USDA (Map and soil description) printed November 15, 2019 https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx).

- "Surficial Materials Map of the Boston North, Massachusetts," prepared by Stone, B.D. and DiGiacomo-Cohen, M.L. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 125 – Boston North.

- Drawings L-401 to L-405 titled: "Grading Plan, Northeast Metro Technical High School, Wakefield, Massachusetts," (Grading Plan) prepared by Warner Larson Landscape Architects, dated May 19, 2021, and provided to LGCI by Warner Larson Landscape Architects via e-mail on June 4, 2021.

- Drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," (Topographic Survey) prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

1.4 Site Description

The site consists of the existing Northeast Metropolitan Regional Vocational Technical High School and the vacant land located south of it. The existing Northeast Metropolitan Regional Vocational Technical High School is located at 100 Hemlock Road, Wakefield, Massachusetts, as shown in Figure 1.

The site is bordered by the existing Wakefield High School on the western side, by Saugus River on the northern side, by a utility easement on the eastern side, and by Farm Street on the southern side.

We have broken down our description into two parts: 1) the existing Northeast Metropolitan Regional Vocational Technical High School where the proposed athletic fields will be constructed as described in Section 1.5, and 2) the vacant land located south of the Northeast Metropolitan Regional Vocational Technical High School where the proposed school will be constructed as described in Section 1.5.

Northeast Metropolitan Regional Vocational Technical High School – The existing Northeast Metropolitan Regional Vocational Technical High School consists of several interconnected buildings and includes an athletic practice field and a small, paved parking lot on the northern side; a small, paved parking lot, a football field, and a baseball field on the western side; and a parking lot and a drop off loop on the southern side.

Based on the First Floor Plan (Unit A to F), the existing building is founded on conventional, shallow, spread, and continuous footings. Based on the 1969 Structural Details, the existing building footings were designed for allowable bearing capacities of 2 tons per square foot (tsf) for footings bearing on the natural soil or Structural Fill, and 15 tsf for footings bearing on bedrock.

Based on the historical topo maps included in Appendix A, the grades appear to have been cut on the western side of the site in what is currently the football field.

Based on the Topographic Survey, the existing grades vary at the site as described below.

- The grade drops from about El. 91 feet near at western end of the main access driveway (near the guard booth) to about El. 78 feet near the main entrance to the existing building. The grade continues dropping toward the southeastern corner of the existing building to about El. 75 feet then rises to about El. 90 feet near the northeastern corner of the building.

- The grade rises slightly to about El. 93 feet near the northwestern corner of the northern parking lot before it drops steeply to between about El. 58 feet and El. 62 feet at the northern practice field. The grade across the practice field continues dropping to about El. 58 feet near the northeastern corner of the field and gently rises to about El. 65 feet near the northwestern corner of the field.

- The driveway that loops around the building drops in elevation from about El. 93 feet near the northwestern corner of the site to about El. 80 feet on the southern side before it rises again to El. 85 feet where it joins the main driveway.

- On the western side, the site is terraced with tennis courts at about El. 102 feet, the football field is at about El. 114 feet, and the baseball field is between El. 84 feet and El. 86 feet.

Vacant Land located south of the existing Northeast Metropolitan Regional Vocational Technical High School – The vacant land located south of the existing Northeast Metropolitan Regional Vocational Technical High School is wooded and is accessible through dirt paths. It extends from the southern side of the existing parking lot to Farm Street. The grades in the wooded area at the southern side of Hemlock Road are characterized by rolling terrain. The grade rises steeply from about El. 82 feet near the eastern side of Hemlock Road to over El. 110 feet over what appears to be a former rock cut. The grade rises to about El. 207 feet near the western side of the wooded area, with frequent local highs and lows within the area. Rock outcrops and surficial boulders are present throughout the entire extent of the wooded area.

1.5 Project Description

Our understanding of the proposed construction is based on our discussions with DRA, the Grading Plan referenced in Section 1.3, and on the following drawing:

- Drawing L-301 titled: “Northeast Metro Technical High School, Site Plan,” (Building Layout Plan) prepared by Warner Larson Landscape Architects, Inc., undated, and provided to LGCI by DRA, via e-mail on May 3, 2021.

We understand that the Town of Wakefield is proposing the wooded area located south of the existing Northeast Metropolitan Regional Vocational Technical High School as the site for the proposed high school.

The proposed construction will include a new high school building, paved driveways and parking lots, concrete walkways, and athletic fields. The proposed building will be constructed in the wooded area south of Hemlock Road. Based on the Building Layout Plan, the proposed building will be somewhat rectangular in shape with a footprint of about 135,000 square feet. The proposed building will be accessible from Hemlock Road. We understand that the proposed building will consist of several underground levels. Based on the Grading Plan, the proposed building will be stepped with a lower ground floor on the northern side that will have a finished floor elevation (FFE) at El. 143.50 feet and higher ground floor elevation on the southern side

with an FFE at El. 163.50 feet. Based on our conversations with the Structural Engineer, we understand that the perimeter walls for the proposed building will be designed as retaining walls with concrete buttresses. Based on the Grading Plan, cuts of up to 34 feet will be required to achieve the proposed FFE grade of the proposed building and the proposed paved areas around the proposed building.

The proposed main parking lot will be in the general area of the current southern parking lot. We understand that infiltration basins will be installed beneath the main parking lot to manage stormwater runoff and that the water will be discharged into the adjacent stream. Additional parking and a driveway loop will be provided around the proposed building. Based on the Grading Plans, the proposed grades along the proposed driveway loop will range between about El. 88 feet near Hemlock Road and El. 165 feet along the northern side of the proposed parking lot on the southern side (southern parking lot) of the proposed building. Cuts of up to 30 feet will be required to achieve the proposed grades on the western portion of the proposed driveway loop and fill of up to 20 feet will be required to achieve the proposed grades for the eastern portion of the proposed driveway loop. The grades within the proposed southern parking lot drop gently in a southerly direction to elevations ranging between El. 160 feet and El. 155 feet; thus, requiring up to 12-foot cuts on the northern side and fill of up to 13 feet on the southern side. The grade will drop from the southern side of the southern parking lot to meet the existing grades via a rip-rap slope currently designed as a 1H:1V slope. Other riprap slopes are proposed in the fill areas along the eastern portion of the proposed driveway loop.

Based on the Grading Plan, the driveway connecting to Farm Street drops in elevation from El. 166 feet to about El. 135 feet where it connects to Farm Street. Based on the Grading Plan, the concrete walkways leading from the main parking lot to the northern edge of the proposed building will range in grade between El. 84 feet and El. 135 feet.

A nearly vertical rock cut is proposed on the western side of the western portion of the proposed driveway loop. The cut will range up to 33 feet in height. A storm management swale is proposed along the bottom of the near-vertical rock cut, i.e., on the western side of the driveway loop. The proposed swale will be about 10 feet wide.

Based on the Grading Plan, athletic fields will also be provided, including one (1) combined soccer/baseball field, five (5) tennis courts, and one (1) combined football/soccer field with a track and stands. The proposed athletic fields will be constructed within the area of the existing building after the latter has been demolished. The proposed grades within the proposed combined soccer/baseball field range between El. 85.55 feet and El. 87.31 feet, requiring minor cuts and fills to achieve the proposed grades. The proposed grades within the proposed tennis courts will range between El. 85.15 feet and El. 86.15 feet; thus, requiring cuts of up to 9 feet to achieve the proposed grades. The proposed grades within the proposed combined football/soccer field with a track and stands range between El. 83.50 feet and El. 84 feet; thus, requiring cuts of up to 6 feet along the northern portion of the field, and fills of up to 7 feet along the southern portion of the field to achieve the proposed grades.

1.6 Elevation Datum

We understand that the elevations shown in the Site Plans, Grading Plans, and Building Layout Plan are referenced to the National American Datum of 1983 (NAD 83).

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

Based on the Surficial Geologic Map listed in Section 1.3, the natural soils in the general vicinity of the site mostly consist of the following:

- Thin Till – The thin till is described as non-sorted, non-stratified matrix of sand, some silt, and little clay that contains scattered pebbles, cobbles and boulders. The thin till is generally less than 10 to 15 feet thick.

- Coarse Deposits – The coarse deposits consist of sand, sand and gravel, and gravel deposits as described below.

  Sand Deposits – The sand deposits are comprised mostly of fine to coarse sand. Coarser layers may contain up to 25 percent gravel. Finer layers may contain very fine sand, silt, and clay.

  Sand and Gravel Deposits –The sand and gravel deposits occur as a mixture of gravel and sand within individual layers and as alternating layers of sand and gravel. The sand and gravel layers range between 25 and 50 percent gravel and 50 to 75 percent sand.

  Gravel Deposits – The gravel deposits are comprised of at least 50 percent gravel, cobbles, and boulders. Sand occurs within gravel beds and as separate layers within the gravel.

- Bedrock Outcrops – The Surficial Geologic Map indicates the presence of abundant rock outcrops on the western and southern sides of the site.

The Surficial Geologic Map of the site is shown in Figure 2.

2.2 Soil Survey Report

Based on the Soil Survey Report listed in Section 1.3, the soils at the site are classified primarily as follows:

- Charlton-Urban Land-Hollis Complex – Charlton soils are defined as well drained drumlin and ground moraines, and Hollis soils are defined as well drained ridges and hillslopes. Based on the Soil Survey Report, the Charlton soils are generally comprised of up to 5 inches of fine sandy loam, overlying up to 17 inches of sandy loam, overlying up to 43 inches of gravelly sandy loam. The groundwater table is typically deeper than 80 inches. The Hollis soils are generally comprised of up to 14 inches of fine sandy loam, overlying unweathered bedrock. The groundwater table is typically deeper than 80 inches.

- Urban Land – Urban Land is defined as excavated and filled land.

- Rock Outcrop-Hollis Complex – Rock outcrops are defined as granite and gneiss. Hollis soils are defined as well drained, friable, shallow loamy basal till over granite and gneiss. Based on the Soil Survey Report, the Hollis soils are generally comprised of up to 14 inches of fine sandy loam, overlying unweathered bedrock. The groundwater table is typically deeper than 80 inches.

- Charlton-Hollis-Rock Outcrop Complex – Charlton soils are defined as well drained, friable loamy eolian deposits over friable loamy basal till derived from granite and gneiss. Based on the Soil Survey Report, the Charlton soils are generally comprised of up to 5 inches of fine sandy loam, overlying up to 17 inches of sandy loam, overlying up to 43 inches of gravelly sandy loam. The groundwater table is typically deeper than 80 inches. Hollis soils are defined as well drained, friable, shallow loamy basal till over granite and gneiss. Based on the Soil Survey Report, the Hollis soils are generally comprised of up to 14 inches of fine sandy loam, overlying unweathered bedrock. The groundwater table is typically deeper than 80 inches. Rock outcrops are defined as granite and gneiss.

- Swansea Muck – Swansea Muck is defined in the Soil Survey Report as "highly decomposed organic material over loose sandy and gravelly glaciofluvial deposits." Based on the Soil Survey Report, the Swansea Muck is generally comprised of up to 34 inches of muck, overlying up to 45 inches of coarse sand. The groundwater table typically ranges between 0 and 6 inches.

- Ridgebury Fine Sandy Loam – Ridgebury soils are defined as poorly drained depressions, drumlins, drainageways, hills, and ground moraines. Based on the Soil Survey Report, the Ridgebury soils are generally comprised of up to 1 inch of moderately decomposed plant material, overlying up to 5 inches of fine sandy loam, overlying up to 4 inches of sandy loam, overlying up to 56 inches of gravelly sandy loam. The groundwater table typically ranges between 0 and 6 inches.

A copy of the Soil Survey Report and Map are included in Appendix B.

2.3 LGCI's Test Pits and Borings

2.3.1 General

LGCI coordinated our exploration locations with DRA and marked the exploration locations in the field by taping distances from the proposed building corners staked by Nitsch Engineering, Inc. (Nitsch), the project surveyor. LGCI notified Dig Safe for utility clearance prior to starting our explorations at the site.

Unless notified otherwise, we will dispose of the soil and rock samples obtained during our explorations after three months.

2.3.2 LGCI Explorations

2.3.2.1 Test Pits

During the PSR phase, LGCI engaged Northern Drill Service, Inc. (NDS) of Northborough, Massachusetts to excavate eighteen (18) test pits (TP-1 to TP-18) at the site on December 3 and 4, 2020. The test pits were excavated with a Komatsu PC-120 excavator. The test pits extended to depths ranging between 0.7 and 10.5 feet beneath the ground surface. Upon completion, the test pit excavations were backfilled with the excavated material and tamped with the excavator bucket.

During the SD phase, LGCI engaged NDS to excavate thirteen (13) test pits (TP-101 to TP-111, TP-113 and TP-114) at the site between April 19 and 20, 2021. The test pits were excavated with a Kubota KX-080-4 excavator. The test pits extended to depths ranging between 1.8 and 5.5 feet beneath the ground surface. Upon completion, the test pit excavations were backfilled with the excavated material and tamped with the excavator bucket. Test pit TP-112 was skipped due to proximity to wetlands.

An LGCI engineer observed and logged the test pits in the field.

To explore the subsurface conditions at greater depths, soil borings were also advanced at the site as described in Section 2.3.2.2.

2.3.2.2 Soil Borings

During the PSR phase, LGCI engaged NDS to advance four (4) borings (B-1-OW to B-4) at the site on December 10 and 11, 2020. The borings were advanced with a Mobile B-48 track-mounted drill rig using drive and wash techniques with a 4-inch casing. The borings extended to depths ranging between 0.5 feet and 18 feet beneath the ground surface. Upon completion, the boreholes were backfilled with the soil cuttings. Two (2) groundwater observation wells were installed in borings B-1-OW and B-3-OW.

During the SD phase, LGCI engaged NDS to advance six (6) borings (B-101-OW to B-106) at the site between April 26 and May 14, 2021. The borings were advanced with a Mobile B-48 track-mounted drill rig and a Diedrich D-25 track-mounted drill rig using drive and wash techniques with 3-inch and 4-inch casings. The borings extended to depths ranging between 11.5 and 36 feet beneath the ground surface. Upon completion, the boreholes were backfilled with the soil cuttings. Two (2) groundwater observation wells were installed in borings B-101-OW and B-104-OW.

NDS performed Standard Penetration Tests (SPT) during drilling and obtained split spoon samples in the borings with an automatic hammer at typical depth intervals of 2

feet or 5 feet as noted on the boring logs in general accordance with ASTM D-1586. Rock was cored in borings B-1-OW, B-3-OW, and B-101-OW to B-106.

An LGCI engineer observed and logged the borings in the field.

2.3.2.3 Test Pit and Soil Boring Logs and Locations

The test pit and boring locations are shown in Figure 3. Appendix C contains LGCI's test pits logs. Appendix D contains LGCI's boring logs, the groundwater observation well installation reports, and photographs of the rock cores. Tables 1 and 2 include summaries of LGCI's test pits and borings, respectively.

The ground surface elevations shown in the test pit and boring logs were obtained from drawings EX-1 to EX-14 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch Engineering (Nitsch), and provided to LGCI by Nitsch via e-mail on June 4, 2021.

2.4 Subsurface Conditions

The subsurface description in this report is based on a limited number of test pits and borings and is intended to highlight the major soil strata encountered during our test pits and borings. The subsurface conditions are known only at the actual test pit and boring locations. Variations may occur and should be expected between test pit and boring locations. The test pit and boring logs represent conditions that we observed at the time of our test pits and borings and were edited, as appropriate, based on the results of the laboratory test data and inspection of the soil samples in the laboratory. The strata boundaries shown in our test pit and boring logs are based on our interpretations and the actual transitions may be gradual. Graphic soil symbols are for illustration only.

The soil strata encountered in the test pits and borings were as follows, starting at the ground surface.

Topsoil/Forest Mat – A layer of surficial topsoil/forest mat was encountered at the ground surface in all test pits and borings. The topsoil/forest mat extended to depths ranging between 0.1 and 2.3 feet beneath the ground surface. Refusal was encountered in this layer on apparent rock in test pits TP-7, TP-14, and TP-108; and in boring B-2 at depths of 2.0, 0.7, 2.3 and 0.5 feet beneath the ground surface, respectively. Rock outcrops were observed at the ground surface near the location of the test pits and borings.

Subsoil – A layer of subsoil was encountered beneath the surficial topsoil/forest mat in all the test pits and borings except in test pits TP-7, TP-14, TP-108, TP-113, and TP-114; and in borings B-2, B-101-OW, B-103, B-104-OW, and B-106. The subsoil extended to depths ranging between 1.5 and 5.0 feet beneath the ground surface. Refusal was encountered in this layer on apparent

rock in test pits TP-3, TP-4, TP-101, TP-105, TP-106, TP-110; and in borings B-1-OW, B-3-OW, and B-102 at depths of 2.0, 1.5, 3.5, 1.8, 3.2, 2.7, 2.5, 2.2, and 2.7 feet, respectively.

The samples in this layer were mostly described as silty sand. Six (6) samples were described as silt with sand or sandy silt, one (1) sample was described as silty gravel, and one (1) sample was described as well graded gravel. The fines content in the subsoil ranged between 20 and 45 percent, and the gravel content ranged up to 30 percent. The fines in the subsoil were occasionally described as slightly plastic. When described as silt, the sand content ranged between 5 and 40 percent. This layer contained traces of organic soil, roots, and wood. The subsoil also contained between 5 and 30 percent cobbles and boulders.

The standard penetration test (SPT) N-values in the subsoil ranged between 1 blow per foot (bpf) and refusal, with most values lower than 10 bpf, indicating very loose to loose soil.

Sand and Gravel – A layer of sand and gravel was encountered beneath the subsoil, or surficial topsoil/forest mat in test pits TP-1, TP-5, TP-6, TP-8 to TP-10, TP-12, TP-13, TP-15 to TP-18, TP-102 to TP-104, TP-107, TP-109, TP-111, TP-113, and TP-114; and in borings B-4, and B-105. Refusal was encountered in this layer on apparent rock at depths ranging between 1.9 and 10.5 feet beneath the ground surface.

The samples in this layer were mostly described as silty sand. Four (4) samples were described as well graded sand, one (1) sample was described as poorly graded sand, and one (1) sample was described as well graded gravel. The fines content in the sand ranged between 5 and 45 percent, and the gravel content ranged up to 35 percent. When described as gravel, the sand content ranged between 25 and 30 percent. A few samples in this layer contained traces of organic soil and roots. The sand and gravel also contained between 5 and 50 percent cobbles and boulders up to 2 feet in diameter.

The SPT N-values in the sand and gravel ranged between 11 bpf and refusal, with most values ranging between 11 and 34 bpf indicating mostly medium dense to dense sand.

Weathered Rock – Weathered rock was encountered beneath the subsoil in test pits TP-2 and TP-11 at depths of 3.5 and 2 feet beneath the ground surface, respectively. The weathered rock broke into a well graded gravel and silty gravel soil matrix.

Rock – Excavation refusal was encountered in all the test pits and borings at depths ranging between 0.7 and 10.5 feet beneath the ground surface. Split spoon refusal was also encountered in all borings at depths ranging between 0.1 and 6 feet beneath the ground surface.

To confirm and characterize the rock, rock was cored in borings B-1-OW, B-3-OW, and B-101-OW to B-106. The rock generally consisted of hard to very hard, slightly weathered to fresh, extremely fractured to sound, fine-grained to medium-grained, gray to blue, Rhyolite. The rock core recoveries ranged between 81 and 100 percent and the Rock Quality Designation (RQD) ranged between 46 and 100 percent. The coring rate was generally less than 20 minutes per foot

(min./ft.). However, in borings B-103 and B-106, coring rates up to 145 min./ft. were recorded, indicating very hard rock.

2.5 Groundwater

Groundwater was encountered in test pits TP-1, TP-2, TP-8, TP-9, TP-15 to TP-17, TP-101, TP-103, TP-107, TP-108, TP-110, TP-111, TP-114, and in borings B-1-OW, B-4, and B-101-OW to B-106 at depths ranging between 0 feet (at the ground surface) and 10 feet beneath the ground surface as shown in Tables 1 and 2 and in the test pit and boring logs.

Six (6) groundwater level readings were obtained in groundwater observation wells B-1-OW and B-3-OW, and two (2) groundwater level readings were obtained in groundwater observation wells B-101-OW and B-104-OW between the dates of December 11, 2020, and June 3, 2021. The groundwater level readings ranged between 4.9 and 23.9 feet beneath ground surface as shown in the table below.

	B-1-OW G.S. El. = 184.5 ft.	B-3-OW G.S. El. = 170.5 ft.	B-101-OW G.S. El. = 172.6 ft.	B-104-OW G.S. El. = 180.9 ft.
Date	**Depth / Elevation (ft.)**	**Depth / Elevation (ft.)**	**Depth / Elevation (ft.)**	**Depth / Elevation (ft.)**
12/11/2020	10.0 / 174.5	4.9 / 165.6	- / -	- / -
2/1/2021	10.0 / 174.5	8.7 / 161.8	- / -	- / -
3/3/2021	9.4 / 175.1	5.3 / 165.2	- / -	- / -
3/24/2021	9.5 / 175.0	7.8 / 162.7	- / -	- / -
5/13/2021	7.6 / 176.9	8.0 / 162.5	12.5 / 160.1	6.1 / 174.8
6/3/2021	7.9 / 176.6	8.1 / 162.4	23.9 / 148.7	17.1 / 163.8

Groundwater flowed out of the borehole at boring B-102 upon completion of drilling for 24 hours before the borehole was sealed, possibly indicating an artesian condition. Boring B-102 extended to El. 135.2 feet, i.e., the deepest elevation of all borings. This condition was not observed in other borings.

The groundwater information reported herein is based on observations made during or shortly after the completion of drilling and excavation and may not represent the actual groundwater conditions. Furthermore, the drilling procedure introduced water into the boreholes; therefore, additional time may be required for the groundwater levels to stabilize. The groundwater information presented in this report only represents the conditions encountered at the time and location of the explorations. Seasonal fluctuation should be anticipated.

2.6 Laboratory Test Data

LGCI submitted eight (8) soil samples collected from the test pits for grain-size analysis. The results of the grain-size analyses are provided in the test data sheets included in Appendix E and are summarized in the table below.

Grain-Size Analysis Test Results

Test Pit No.	Sample No.	Stratum	Sample depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
TP-1	Grab	Subsoil	0.7 – 3.5	10.3	38.1	51.6
TP-5	Grab	Subsoil	0.5 – 3.5	18.9	45.2	35.9
TP-6	Grab	Subsoil	0.5 – 3.0	2.6	39.4	58.0
TP-9	Grab	Natural Sand	1.9 – 6.2	23.2	54.3	22.5
TP-104	Grab	Subsoil	0.5 – 2.5	56.2	22.0	21.8
TP-106	Grab	Subsoil	0.5 – 3.2	8.3	54.4	37.3
TP-107	Grab	Natural Sand	2.1 – 3.1	7.4	51.1	41.5
TP-113	Grab	Natural Sand	0.5 – 3.0	31.6	55.9	12.5

LGCI submitted four (4) rock specimen to a laboratory for compressive strength tests. The results if the tests will be submitted separately

3. EVALUATION AND RECOMMENDATIONS

3.1 General

Based on our understanding of the proposed construction, our observation of the test pits and borings, and the results of our laboratory testing, there are a few issues that we would like to highlight for consideration and discussion.

We anticipate that the major considerations during design and construction will be the removal of the subsoil, the blasting of rock, the onsite processing of blasted rock to produce riprap and other fill materials, and under-slab drainage as described below.

3.1.1 Surficial Topsoil

The surficial topsoil and subsoil are not suitable to support the proposed building and paved areas and should be removed as described below.

- The surficial topsoil and subsoil should be entirely removed from within the proposed building footprint.

- In the proposed paved areas, we recommend entirely removing the surficial topsoil and forest mat. We recommend removing the subsoil to the top of the natural sand, or to a minimum depth of 18 inches beneath the bottom of the proposed pavement, whichever occurs first. Where subsoil is encountered and extends to depths greater than 18 inches beneath the bottom of the proposed pavement, the subsoil deeper than 18 inches beneath the bottom of the proposed pavement may remain in place provided that it is improved in accordance with the recommendations in Section 4.1. The removal of the topsoil and subsoil should extend laterally 5 feet outside the limits of improvement areas.

3.1.2 Rock Blasting

- Significant cuts are anticipated in order to achieve the proposed grades. Based on the test pits and borings, the majority of cuts will be in rock and will require rock blasting.

- To facilitate rock removal and the preparation of the subgrade of footings and slabs, we recommend that blasting extend at least 12 inches below the bottom of the footings over the entire building footprint.

- Care should be exercised by the blasting contractor not to overblast. Overblasted and heaved rock should be removed and replaced with Structural Fill.

- Where a near-vertical rock face is desired for esthetics, pre-splitting may be considered.

- On the western side of the western portion of the proposed driveway loop, an almost 33-foot high near-vertical rock cut is proposed. We recommend that the cut be performed with a taper of 1H:8V or flatter.

- For safety reasons, we recommend providing a catchment area at least 15 feet wide separating the bottom of the near-vertical rock cut and the nearest walkway or driveway. The drainage swale proposed on the western side of the western portion of the proposed driveway loop may be considered part of the catchment area.

- Based on our discussions with the project Civil Engineer, we understand that utilities will come into the building on all sides. Accordingly, rock blasting should be performed beyond the limits of the proposed building to allow for a safe space to install the utilities.

- Due to construction sequencing, rock blasting may not be feasible everywhere, especially for shallow utilities. Therefore, we recommend that the project include a contingency for hoe-ramming.

Additional recommendations for rock blasting are provided in Section 4.5.

3.1.3 Shallow Foundations and Slabs-on-Grade

- After the surficial topsoil and subsoil are entirely removed from within the proposed building footprint and from under the proposed retaining walls, if any, the proposed building and retaining walls, if any, may be supported on shallow footings bearing in Structural Fill placed directly on the natural sand and gravel or on top of rock. Due to the susceptibility of the natural sand to disturbance, we recommend placing footings on a minimum of 6 inches of Structural Fill.

- The proposed slab may be designed as a slab-on-grade supported on Structural Fill placed directly on top of the natural sand.

3.1.4 Under-Slab Drainage System

Based on the preliminary groundwater levels observed in the groundwater observation wells, we believe that an under-sab drainage system is required beneath the proposed slab-on-grade. We anticipate that the under-slab drainage system will generate a considerable volume of water. We recommend that the system be designed to flow by gravity. Based on our discussions with the project Civil Engineer, we understand that the water from the under-slab drainage system may be channeled to one of the infiltration systems under the proposed main parking lot and from there the overflow will be discharged into the Saugus River on the northern side of the site. Our recommendations for the under-slab drainage system are presented in Section 3.4.

3.1.5 Silt Content

The natural soil is silty. Silty soils are very susceptible to disturbance when exposed to moisture. Care should be exercised during construction to maintain a dry working subgrade and to provide working mats, e.g., crushed stone or concrete mud mats, to reduce the potential for disturbance of the foundation subgrade and to improve working conditions.

3.1.6 Reuse of Onsite Materials

The onsite materials are not suitable for reuse as Structural Fill.

The contractor may consider mobilizing a rock crusher to the site. Existing cobble and boulders and blasted rock can be processed by blending them with the natural soil and crushing them to produce a well graded material. Processed material obtained by crushing blasted rock, boulders, and soil should meet the gradation requirements of Ordinary Fill and Structural Fill. Material produced by the crushing operation should be well graded so as to reduce the potential for formation of honeycombs during its placement and compaction.

Additional recommendations for fill materials and reuse of onsite materials are presented in Sections 4.3 and 4.4, respectively.

3.1.7 Additional Explorations

To further explore the thickness of the subsoil and characterize the rock, we recommend performing additional explorations, including soil borings and test pits during the next phase of the project. We recommend advancing at least six (6) additional borings. The borings should extend at least 20 feet into bedrock. We recommend installing at least two (2) additional groundwater observation wells in two (2) borings (one each).

Our recommendations for footing design are presented in Section 3.2.1. Our estimates for settlement are presented in Section 3.2.2. Our concrete slab considerations are presented in Section 3.3 and the lateral earth pressure recommendations are presented in Section 3.6. Section 4.1 provides recommendations for preparation of subgrades.

3.2 Foundation Recommendations

3.2.1 Footing Design

- For footings supported on a minimum of 6 inches of Structural Fill placed directly over the natural sand and gravel or on rock after removing the surficial topsoil and the subsoil, we recommend a net allowable bearing pressure of 4 kips per square foot (ksf) for footings bearing in the natural sand or in deep Structural Fill thicker than 4 feet, and 10 ksf for footings bearing on a leveling layer of crushed stone or Structural Fill placed on rock.

- Footing subgrades should be prepared in accordance with the recommendations in Section 4.1.

- All foundations should be designed in accordance with *The Commonwealth of Massachusetts State Building Code 780 CMR, ninth Edition* (MSBC 9th Edition).

- Exterior footings and footings in unheated areas should be placed at a minimum depth of 4 feet below the final exterior grade to provide adequate frost protection. Interior footings in heated areas may be designed and constructed at a minimum depth of 2 feet below finished floor grades.

- Wall footings should be designed and constructed with continuous, longitudinal steel reinforcement for greater bending strength to span across small areas of loose or soft soils that may go undetected during construction.

- A representative of LGCI should be engaged to observe that the subgrade has been prepared in accordance with our recommendations.

3.2.2 Settlement Estimate

For footings designed using the net allowable bearing pressure recommended above, we anticipate that the settlement will be about 1 inch and that the differential settlement of the footings will be 3/4 inch or less, over 25 feet. Total and differential settlements of these magnitudes are usually considered tolerable for the anticipated construction. As the design progresses and the settlement estimates are refined, the tolerance of the proposed structure to the predicted total and differential settlements should be assessed by the structural engineer.

3.3 Concrete Slab Considerations

- Floor slabs can be constructed as slabs-on-grade bearing on a minimum of 12 inches of Structural Fill placed directly on top of the natural sand. The subgrade of the slabs should be prepared as described in Section 4.1.

- To reduce the potential for dampness in the proposed floor slabs, the project architect may consider placing a vapor barrier beneath the floor slabs. The vapor barrier should be protected from puncture during construction of the slabs.

- For the design of the floor slabs bearing on the materials described above, we recommend using a modulus of subgrade reaction, k_{s1}, of 100 tons per cubic foot (tcf). Please note that the values of k_{s1} are for a 1 x 1 square foot area. These values should be adjusted for larger areas using the following expression:

$$Modulus\ of\ Subgrade\ \mathrm{Re}action\ (k_s) = k_{s1} * \left(\frac{B+1}{2B}\right)^2$$

where:

k_s = Coefficient of vertical subgrade reaction for loaded area,
k_{s1} = Coefficient of vertical subgrade reaction for 1 x 1 square foot area, and
B = Width of area loaded, in feet.

Please note that cracking of slabs-on-grade can occur as a result of heaving or compression of the underlying soil, but also as a result of concrete curing stresses. To reduce the potential for cracking, the precautions listed below should be closely followed for construction of all slabs-on-grade:

- Construction joints should be provided between the floor slab and the walls and columns in accordance with the American Concrete Institute (ACI) requirements, or other applicable code.

- Backfill in interior utility trenches should be properly compacted.

- In order for the movement of exterior slabs not to be transmitted to the building foundation or superstructure, exterior slabs should be isolated from the building superstructure.

3.4 Under-Slab Drains

Based on the current groundwater levels observed in the explorations, we anticipate that an under-slab drainage system will be required under the proposed building.

We anticipate that the under-slab drainage system will generate considerable quantities of water. Accordingly, we recommend that the under-slab drainage system consist of 1) a minimum of 12 inches of ¾-inch crushed stone placed below the slab, and 2) 6-inch-diameter slotted PVC pipes installed with their inverts at least 18 inches below the bottom of the slab. The pipes should be installed in trenches placed at 10 to 15 feet apart. The trenches should be at least 18 inches wide and 12 inches deep (below the bottom of the 12 inches of crushed stone) to allow placing crushed stone around the PVC pipe. The slotted PVC pipes should connect to a 6-inch solid PVC header pipe that collects and channels the collected water out of the building.

A non-woven geotextile fabric should be installed between the crushed stone and the underlying soil or rock for separation. The slots on the PVC pipes should be placed facing downward to allow for entry of water at the bottom of the pipe. Clean-outs should be included at the end of the perforated pipes.

We recommend channeling the water from the under-slab drainage system to flow by gravity to a discharge area or to an infiltration system. The owner should apply for a discharge permit and should perform analytical tests as required by the permits.

3.5 Seismic Design

In accordance with Section 1613 of MSBC 9th Edition and International Building Code (2015 IBC) and based on the boring data, the seismic criteria for the site are as follows:

- Site Class: C
- Spectral Response Acceleration at short period (Ss): 0.232g
- Spectral Response Acceleration at 1 sec. (S_1): 0.072g
- Site Coefficient Fa (Table 1613.5.3(1)): 1.2
- Site Coefficient Fv (Table 1613.5.3(2): 1.7
- Adjusted spectral response S_{MS}: 0.278 g
- Adjusted spectral responses S_{M1}: 0.122 g

Based on the boring information, we believe the site soils are not susceptible to liquefaction.

3.6 Lateral Pressures for Wall Design

3.6.1 Lateral Earth Pressures

Lateral earth pressures recommended for design of below-ground building walls such as the wall separating the ground floor (FFE of El. 140 feet) and the main floor (FFE of El. 155 feet), and site retaining walls, if any, are provided below.

Coefficient of Active Earth Pressure, K_A:	0.33 (see note below)
Coefficient of At-Rest Earth Pressure, K_o:	0.50
Coefficient of Passive Earth Pressure, K_p:	3.0
Total Unit Weight γ:	125 pcf

Note: The values in the table are based on a friction angle for the backfill of 30 degrees and neglecting friction between the backfill and the wall. The design active and passive coefficients are based on horizontal surfaces (non-sloping backfill) on both the active and passive sides, and a vertical wall face.

- Exterior walls of below-ground spaces, and retaining walls braced at the top to restrain movement/rotation such as the perimeter walls of the proposed building and the wall separating the two levels, should be designed using the “at-rest” pressure coefficient.

- We recommend placing free-draining material within the 3 feet immediately behind the retaining wall. We recommend providing weep holes in site walls to promote drainage where possible, or a pipe should be placed at the base of the walls to collect the groundwater. Groundwater collected by the wall drains should be discharged in a lower area if gravity flow is possible.

- Passive earth pressures should only be used at the toe of the wall where special measures or provisions are taken to prevent disturbance or future removal of the soil on the passive side of the wall, or in areas where the wall design includes a key. In any case, the passive pressures should be neglected in the top 2 feet.

- Where a permanent vertical uniform load will be applied on the active side immediately adjacent to the wall, a horizontal surcharge load equal to half of the uniform vertical load should be applied over the height of the wall. At a minimum, a temporary construction surcharge of 100 psf should be applied uniformly over the height of the wall.

- We recommend using an ultimate friction factor of 0.50 between the natural sand and the bottom of the wall. Below-ground walls should be designed for minimum factors of safety of 1.5 for sliding and 2.0 for overturning.

3.6.2 Seismic Pressures

In accordance with MSBC 9th Edition, Section 1610, a lateral earthquake force equal to $0.100*(S_s)*(F_a)*\gamma*H^2$ should be included in the design of walls (for horizontal backfill), where S_s is the maximum considered earthquake spectral response acceleration (defined in Section 3.5), F_a is the site coefficient (defined in Section 3.5), γ is the total unit weight of the soil backfill, and H is the height of the wall.

The earthquake force should be distributed as an inverted triangle over the height of the wall. In accordance with MSBC 9th Edition, Section 1610.2, a load factor of 1.43 shall be applied to the earthquake force for wall strength design.

Temporary surcharges should not be included when designing for earthquake loads. Surcharge loads applied for extended periods of time shall be included in the total static lateral soil pressure and their earthquake lateral force shall be computed and added to the force determined above.

3.6.3 Wall Drains

- We recommend that free-draining material be placed within 3 feet of the below-ground spaces such the perimeter walls of the proposed building and the wall separating the ground floor and the main floor. To reduce the potential for dampness in below-ground spaces, perimeter walls of the proposed below-ground spaces, if any, should be damp-proofed.

- We recommend that drains be provided behind walls of below-ground spaces and behind site retaining walls. The drains should consist of 6-inch perforated PVC pipes installed with the slots facing down. Perimeter drains should be installed at the bottom of the wall in 18 inches of crushed stone wrapped in a geotextile fabric for separation and filtration.

Site retaining walls may be designed with weep holes discharging near the bottom of the face of the walls.

- Groundwater collected by the wall drains could be discharged in a lower area if gravity flow is possible. Alternatively, it should be discharged into the street drains. A permit would be required for discharge into street drains.

- Perimeter walls and the wall separating the two ground floors should be waterproofed.

3.7 Slope Stability

Riprap slopes are proposed at the site with inclinations of 1H:1V. To reduce the potential for landslide type of failures, we recommend removing the forest may and the subsoil under the slopes.

LGCI will perform slope stability analyses on the proposed slopes after the proposed grading is finalized.

3.8 Radon Mitigation System

We understand that a radon mitigation system will be installed at the site. The radon mitigation system should consist of 6-inch solid PVC pipes connected to the crushed stone installed under the proposed slab as part of the under-slab drainage system. The pipes should be installed vertically will one open end in the crushed stone and the other end daylighting on the roof of the proposed building. The system could be installed to operate passively. However, the pipes should be outfitted to be ready to install extraction fans.

We recommend at least one (1) stack per 10,000 square feet of building.

3.9 Pavement Considerations

3.9.1 General

The subsurface conditions encountered at the site are generally suitable to support the proposed driveway after preparation of the subgrade as described in Section 4.1.

- We recommend entirely removing the topsoil from within the footprint of the proposed paved areas.

- The subsoil should be removed in accordance with the recommendations in Sections 3.1.1 and 4.1.

- Cobbles and boulders should be removed to at least 18 inches below the bottom of the pavement.

3.9.2 Exterior Slabs

- Exterior slabs such as sidewalks/walkways and surface pads should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

- To reduce the potential for heave caused by surface water penetrating under the concrete panels of the proposed sidewalks/walkways, the joints between the concrete sections should be sealed with a waterproof compound. The exterior slabs should be sloped away from the building or other vertical surfaces to promote flow of water. To the extent possible, roof leaders should not discharge onto exterior slab surfaces.

- Based on the groundwater levels measured during our explorations, we do not believe that sidewalk drains are needed. LGCI will update this recommendation after additional explorations are performed and more groundwater observation wells are installed at the site.

3.9.3 Pavement Sections

The proposed driveways and parking areas should be constructed with minimum asphalt and subbase thicknesses in accordance with the recommendations and details prepared by the project Civil Engineer. At a minimum, the following typical pavement sections should be used.

A typical, minimum, standard-duty pavement section that could be used for parking areas is as follows:

1.5"	Asphalt "Top Course"
2.0"	Asphalt "Base Course"
8"	Processed Gravel for Sub-Base (MassDOT M1.03.1)

A typical, minimum, heavy-duty pavement section that could be used for driveways and areas of heavy truck traffic is as follows:

2.0"	Asphalt "Top Course"
2.5"	Asphalt "Base Course"
12"	Processed Gravel for Sub-Base (MassDOT M1.03.1)

Other than in parking spaces, the heavy-duty section should be used in all paved areas.

The pavement sections shown above represent minimum thicknesses representative of typical local construction practices for similar use. Periodic maintenance should be anticipated.

Pavement material types and construction procedures should conform to specifications of the "Standard Specifications for Highways and Bridges," prepared by the Commonwealth of Massachusetts Department of Public Works and dated 1988 (with the latest Supplemental Specifications).

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- The topsoil, subsoil, organic materials, abandoned utilities, if any, and other below-ground structures, if any, should be entirely removed from within the footprint of the proposed building and site structures, including site retaining walls and exterior stairs, if any, before the start of foundation work.

- Tree stumps, root balls, and roots larger than ½ inch in diameter should be removed and the cavities filled with suitable material and compacted per Section 4.3 of this report.

- Topsoil, root balls, organic material, and other deleterious material should be entirely removed from within the proposed paved areas.

- The site contractor should note that the surficial materials at the site may contain large boulders.

- Cobbles and boulders should be removed at least 6 inches from beneath footings, and 24 inches beneath the bottom of proposed slabs, 24 inches beneath the bottom of the asphalt in paved areas, and 24 inches beneath the base material of the turf in the proposed athletic fields. The resulting excavations should be backfilled with compacted Structural Fill within the proposed building and with Ordinary Fill under the subbase of paved areas and under the base material in athletic fields.

- The base material of athletic fields should conform to the gradation and placement requirements of the Landscape Architect or the manufacturer/installer of synthetic turf.

- Due to the high susceptibility of the natural sand and gravel for disturbance under foot and vehicular traffic, we recommend placing a minimum of 6 inches of Structural Fill at the bottom of the excavation or 4 inches of lean concrete to serve as a working mat.

- The bottom of the excavation resulting from the removal of the topsoil and subsoil in areas where the excavation terminates in the natural sand and gravel should be compacted with a dynamic vibratory compactor imparting a minimum of 40 kips of force to the subgrade.

- The base of the footing excavations terminating in granular soil should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade before placing the required 6 inches of Structural Fill.

- The subgrade of the slabs should be compacted using a vibratory roller compactor imparting a minimum of 10 kips of force to the subgrade before placing Structural Fill.

- Where soft zones are revealed during the preparation of the subgrade, the soft materials or buried organic soil should be removed and replaced with Structural Fill within the building footprint and with Ordinary Fill beneath the subbase of paved areas.

- The subgrade in rock should be prepared in accordance with the recommendations is Section 4.5.

- To reduce the potential of increasing lateral pressures on the retaining walls, fill placed within 3 feet of the walls, if any, should be compacted using a small plate compactor imparting a maximum dynamic effort of 4 kips. The fill within 3 feet of the walls should be placed in maximum 8-inch loose lifts.

- After the surficial topsoil is entirely removed and after the subsoil is removed from within the proposed paved areas in accordance with the recommendations in Section 3.1.1, the existing subsoil deeper than 18 inches beneath the bottom of the proposed pavement should be improved by compacting the exposed surface with at least eight (8) passes (4 passes in each direction) of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft zones of soil are observed, the soft soil should be removed, and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer. If pumping of the subsoil deeper than 18 inches beneath the bottom of the proposed grade is observed, the compactor should be switched to static mode and the soft material should be removed and replaced with Ordinary Fill.

- After the topsoil is removed from within the proposed athletic fields, the exposed subsoil or natural soil should be proofrolled with a loaded rubber tire truck or with a large vibratory roller compactor imparting a minimum dynamic effort of 40 kips. Where soft zones are indicated by the proofrolling, the soft zones should be removed and the grades should be restored using Ordinary Fill to the bottom of the base material of the proposed turf designed by the Landscape Architect or the manufacturer/installer of synthetic turf, if any. The preparation of the subgrade before the placement of the turf subbase should follow the recommendations of the Landscape Architect.

- Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill shown in Section 4.3.

- Fill placed under the subbase of paved areas, should meet the gradation and compaction requirements of Ordinary Fill shown in Section 4.3.

- Fill placed in the top 12 inches beneath exterior slabs should consist of Structural Fill with less than 5 percent fines.

- When crushed stone is required in the drawings or it is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation. The geotextile fabric

should not be used under retaining walls as it promotes a plane of sliding such as under retaining wall footings.

- An LGCI geotechnical representative should observe the subgrades of footings and slabs prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure. If soft or loose pockets are encountered in the footing excavations, the soft or loose materials should be removed, and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Structural Fill or crushed stone wrapped in geotextile for separation. The LGCI representative should also observe the improvement of the existing subsoil if any, and/or fill within the proposed paved areas.

4.2 Subgrade Protection

The site soils are frost susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final six inches of soil just before pouring concrete. Footings should be backfilled as soon as possible after footing construction. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Filling operations should be halted during freezing weather.

Materials with high fines contents are typically difficult to handle when wet as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel, free from organic matter, clay, surface coatings and deleterious materials, and should conform to the gradation requirements shown below.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size Percent	Passing by Weight
3 inches	100
1 ½ inch	80-100
½ inch	50-100
No. 4	30-85
No. 20	15-60
No. 60	5-35
No. 200*	0-10

* 0 – 5 Under sidewalks, unheated slabs, exterior stairs, ramps, and pads, and walkways

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size Percent	Passing by Weight
6 inches	100
1 inch	50-100
No. 4	20-100
No. 20	10-70
No. 60	5-45
No. 200	0-20

4.4 Reuse and Processing of Onsite Materials

Based on our field observations and the results of the grain-size analyses, we anticipate that the natural soils at the site may not be used as Structural Fill.

The contractor should avoid mixing the existing soils with suitable imported material. Should reusable materials be encountered during excavation, they should be excavated and stockpiled separately for compliance testing.

Soils with 20 percent or greater fines content are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during compaction of onsite soils with fines contents of 20 percent or greater. The contractor should be prepared to remove and replace such soils if pumping occurs.

The contractor may consider mobilizing a rock crusher to the site. Boulders and blasted rock can be processed with the natural soil and crushed to produce granular fill that is lower in fines if blended with a sufficient proportion of rock. Processed material obtained by crushing blasted rock, boulders, and soil should meet the gradation requirements of Ordinary Fill and Structural Fill. Material produced by the crushing operation should be well graded so as to reduce the potential for formation of honeycombs during its placement and compaction. The site contractor should be prepared to produce batches of material processed using different blending ratios at the start of the earthwork operations. LGCI will review the results of grain-size analyses performed on the processed material and provide an opinion about the blending ratio to maintain throughout construction.

All materials to be used as fill, including blended materials, should first be tested for compliance with the applicable gradation specifications.

4.5 Rock Blasting Considerations

4.5.1 Rock Removal

Deep rock cuts will be required to achieve the proposed FFE of the proposed building and the proposed grades of the paved areas.

Minor rock cuts (less than one foot) over short distances may be achieved using hoe-rams or using other non-blasting techniques. For the majority of the cuts, we anticipate that rock blasting will be required.

- Rock should be cut to at least 12 inches beneath footings and at a minimum of 24 inches beneath the bottom of the proposed slabs. To facilitate rock excavation and backfilling, we recommend that the blasting extend to the 12 inches beneath the bottom of footings under the entire building footprint.

- The rock should be cut laterally at least one foot beyond each side of the footing. For retaining wall footings, the rock should be cut laterally at least 3 feet from the outside face of the wall to allow for placement of the formwork. Where utilities are installed around the perimeter of the proposed building, the rock should be cut at least 3 feet from the nearest utility.

- The rock surface should be cut as level as possible. The surface of rock should not be steeper than 12H:1V.

- Structural Fill should not be placed directly on rock surfaces that are fractured. The fractures should be covered with a geotextile fabric for separation before placing Structural Fill on the fractured rock.

- Rock should be cut at least 18 inches beneath the bottom of paved areas and the ground surface of athletic fields.

- Under utility pipes, manholes, and catch basins, rock should be cut a minimum of 12 inches beneath the pipe or structure.

- Laterally, rock should be cut a minimum of 12 inches outside utility structures and a minimum of 18 inches on each side of utility pipes.

- To reduce overblasting and the potential for heaved rock, drill holes for blasting should not extend more than 2 feet beneath the minimum depths shown above.

- Rock blasting should be controlled to reduce vibrations and airblast overpressure to below thresholds established in the Earth Moving Specifications.

- Pre-splitting or controlled blasting may be desirable to reduce the amount of over-blast.

- To reduce the potential for blasted rock intended for crushing mixing with organic soil, we recommend that the topsoil, roots, tree stumps, and vegetation be removed before blasting. The remainder of the overburden soils and excavatable weathered rock should not be removed before blasting.

- To help obtain information about the top of the rock for rock quantity estimating purposes, we recommend that the Earth Moving Specifications include a requirement for the contractor to perform rock probes at the site in a grid pattern before the start of blasting. The results of the probes should include at a minimum the ground surface elevation and the elevation of the top of the rock. The probes should extend at least 10 feet beyond the perceived top of rock to make sure that the perceived top of rock is not a boulder.

4.5.2 Ground Vibration Monitoring

Rock blasting operations will generate ground vibrations that may result in minor cracks and cosmetic damage to nearby structures. To protect the adjacent structures from potential damage, construction blasting should be carefully controlled and monitored. We recommend monitoring vibrations at the ground surface and at nearby structures before and during the rock blasting operations. We recommend a peak particle velocity (PPV) of 2 inches per second (ips) for concrete foundations and 1 ips for masonry foundations.

4.5.3 Public Notification

The human perception threshold to vibration is very low, i.e., people are far more sensitive to vibrations than are the structures they occupy. Various studies have indicated that the sound effects are noticeable at PPV values of 0.02 ips and complaints and claims of damage are

likely at PPV values of 0.2 to 0.3 ips. These vibration intensities are well below the intensities that would cause structural damage to buildings. For these reasons, we recommend that the owner implement a proactive program of public notification and education of neighbors on the physical characteristics of blasting effects before the start of blasting.

4.5.4 Pre-Construction Condition Survey

We recommend that the Owner perform a pre-construction condition survey of structures located within 250 feet of the nearest blasting operation to document the existing conditions of the structures. The Owner may also consider using crack monitoring gauges to monitor large cracks identified during the pre-construction surveys.

4.6 Groundwater Control Procedures

Based on the groundwater levels encountered in our explorations, we anticipate that groundwater control procedures will be needed during removal of the subsoil and after rock blasting. We anticipate that significant quantities of water will be generated at the bottom of the rock excavation. Accordingly, we recommend that a groundwater control plan be designed and implemented that disposes of the groundwater by gravity. We anticipate that filtered sump pumps installed in pits located at least three feet below the bottom of the excavation may be sufficient to handle surface runoff that may enter shallow excavation. The contractor should be prepared to install multiple deep sump pumps to maintain a dry subgrade. Also, where deep trenches are required for utilities, multiple sump pumps would be required to maintain a dry excavation subgrade.

The contractor should be permitted to employ whatever commonly accepted means and practices as necessary to maintain the groundwater level below the bottom of the excavation and to maintain a dry excavation during wet weather. Groundwater levels should be maintained at a minimum of 1-foot below the bottom of excavations during construction. Placement of reinforcing steel or concrete in standing water should not be permitted.

Proper permits should be obtained from authorities having jurisdiction over the work. At a minimum, the water collected from excavations should be filtered for fines in sedimentation basins before being discharged. The sedimentation basins could be constructed of hay bales wrapped in a geotextile fabric.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile for separation. Alternatively, the crushed stone should be entirely removed after the sump pump is no longer in use and the sump pump pit should be restored with suitable backfill.

4.7 Temporary Excavations

All excavations to receive human traffic should be constructed in accordance with the OSHA guidelines.

The site soils should generally be considered Type "C" and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of the excavation sides and bottom and to protect existing structures.

The contractor should engage a design professional to inspect the rock cuts where workers will be working near the bottom of the cuts. Where the rock is deemed unstable, it should be cut to render the slope stable.

5. RECOMMENDATIONS FOR FUTURE WORK

As part of our current scope, LGCI will prepare Earth Moving specifications and will review the geotechnical aspect of the SD Foundation and Civil Drawing.

We recommend engaging LGCI to perform the following services:

- Perform additional explorations during the next phase of the project and update our geotechnical report accordingly.
- Review the geotechnical aspects of contractor submittals and requests for information (RFIs).
- Provide a field representative during construction to observe the subgrade of foundations and slabs.

6. REPORT LIMITATIONS

Our analysis and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Drummey Rosane Anderson, Inc. for the specific application to the Proposed Northeast Metropolitan Regional Technical Vocational High School in Wakefield, Massachusetts as conceived at this time.

7. REFERENCES

In addition to the references included in the text of the report, we used the following references:

The Commonwealth of Massachusetts (2015), "The Massachusetts State Building Code, Ninth Edition," comprised of the International Building Code (IBC-2015) and 780 CMR: Massachusetts Amendments to IBC-2015.

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

USGS Wakefield, MA topographic map from http://mapserver.mytopo.com.

Table 1 - Summary of LGCI's Test Pits
Proposed Northeast Metro Regional Vocational Technical High School
Wakefield, Massachusetts
LGCI Project No. 2025

Test Pit No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / El. (ft.)	Bottom of Forest Mat / **Topsoil** Depth / El. (ft.)	Bottom of Subsoil Depth / El. (ft.)	Bottom of Sand and Gravel Depth / El. (ft.)	Top of Possible Weathered Rock/Rock Depth / El. (ft.)	Bottom of Test Pit Depth / El. (ft.)
2020 Test Pits							
TP-1	156.2	2.0 / **154.2**	**0.7** / **155.5**	3.5 / **152.7**	9.0 / **147.2**	- / **-**	9.0 / **147.2**
TP-2	165.0	4.0 / **161.0**	**0.8** / **164.2**	3.5 / **161.5**	- / **-**	3.5 / **161.5**	4.3 / **160.7**
TP-3	180.6	- / **-**	**1.0** / **179.6**	2.0 / **178.6**	- / **-**	2.0 / **178.6**	2.0 / **178.6**
TP-4	171.3	- / **-**	**0.5** / **170.8**	1.5 / **169.8**	- / **-**	1.5 / **169.8**	1.5 / **169.8**
TP-5	173.2	- / **-**	**0.5** / **172.7**	3.5 / **169.7**	5.0 / **168.2**	5.0 / **168.2**	5.0 / **168.2**
TP-6	138.7	- / **-**	**0.5** / **138.2**	3.0 / **135.7**	4.5 / **134.2**	4.5 / **134.2**	4.5 / **134.2**
TP-7	158.1	- / **-**	**2.0** / **156.1**	- / **-**	- / **-**	2.0 / **156.1**	2.0 / **156.1**
TP-8	130.0	2.0 / **128.0**	**1.0** / **129.0**	3.0 / **127.0**	9.0 / **121.0**	9.0 [5]/ **121.0**	9.0 / **121.0**
TP-9	162.9	3.6 / **159.3**	**0.4** / **162.5**	1.9 / **161.0**	6.2 / **156.7**	6.2 [5]/ **156.7**	6.2 / **156.7**
TP-10	187.9	- / **-**	**0.3** / **187.6**	2.1 / **185.8**	2.7 / **185.2**	2.7 / **185.2**	2.7 / **185.2**
TP-11	181.1	- / **-**	**0.5** / **180.6**	2.0 / **179.1**	- / **-**	2.0 / **179.1**	3.2 / **177.9**
TP-12	136.0	- / **-**	**1.0** / **135.0**	4.0 / **132.0**	7.0 / **129.0**	7.0 / **129.0**	7.0 / **129.0**
TP-13	162.2	- / **-**	**0.4** / **161.8**	2.3 / **159.9**	4.8 / **157.4**	4.8 / **157.4**	4.8 / **157.4**
TP-14	164.9	- / **-**	**0.7** / **164.2**	- / **-**	- / **-**	0.7 / **164.2**	0.7 / **164.2**
TP-15	162.0	2.5 / **159.5**	**0.5** / **161.5**	4.0 / **158.0**	5.0 / **157.0**	5.0 / **157.0**	5.0 / **157.0**
TP-16	143.7	3.5 / **140.2**	**1.0** / **142.7**	5.0 / **138.7**	10.5 / **133.2**	10.5 / **133.2**	10.5 / **133.2**
TP-17	139.5	1.5 / **138.0**	**0.2** / **139.3**	1.9 / **137.6**	3.1 / **136.4**	3.1 [5]/ **136.4**	3.1 / **136.4**
TP-18	132.0	- / **-**	**0.3** / **131.7**	2.8 / **129.2**	3.9 / **128.1**	3.9 / **128.1**	3.9 / **128.1**
2021 Test Pits							
TP-101	126.5	3.5 / **123.0**	1.0 / **125.5**	3.5 / **123.0**	- / **-**	3.5 / **123.0**	3.5 / **123.0**
TP-102	126.4	- / **-**	0.7 / **125.7**	2.9 / **123.5**	3.7 / **122.7**	3.7 / **122.7**	3.7 / **122.7**
TP-103	135.0	1.3 / **133.7**	0.8 / **134.2**	2.4 / **132.6**	5.5 / **129.5**	5.5 / **129.5**	5.5 / **129.5**
TP-104	180.0	- / **-**	0.5 / **179.5**	2.5 / **177.5**	3.0 / **177.0**	3.0 / **177.0**	3.0 / **177.0**
TP-105	180.1	- / **-**	0.5 / **179.6**	1.8 / **178.3**	- / **-**	1.8 / **178.3**	1.8 / **178.3**
TP-106	161.0	- / **-**	0.5 / **160.5**	3.2 / **157.8**	- / **-**	3.2 / **157.8**	3.2 / **157.8**
TP-107	168.1	3.0 / **165.1**	0.3 / **167.8**	2.1 / **166.0**	3.1 / **165.0**	3.1 / **165.0**	3.1 / **165.0**
TP-108	180.4	2.3 / **178.1**	2.3 / **178.1**	- / **-**	- / **-**	2.3 / **178.1**	2.3 / **178.1**
TP-109	171.2	- / **-**	0.5 / **170.7**	3.0 / **168.2**	4.6 / **166.6**	4.6 / **166.6**	4.6 / **166.6**
TP-110	168.1	2.5 / **165.6**	0.5 / **167.6**	2.7 / **165.4**	- / **-**	2.7 / **165.4**	2.7 / **165.4**
TP-111	156.3	5.0 / **151.3**	0.5 / **155.8**	3.5 / **152.8**	5.0 / **151.3**	5.0 / **151.3**	5.0 / **151.3**
TP-113	143.6	- / **-**	0.5 / **143.1**	- / **-**	3.0 / **140.6**	3.0 / **140.6**	3.0 / **140.6**
TP-114	147.4	1.9 / **145.5**	0.3 / **147.1**	- / **-**	1.9 / **145.5**	1.9 / **145.5**	1.9 / **145.5**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: “Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA,” prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.
2. Groundwater depths based on level observed during excavation.
3. "-" means groundwater or layer was not encountered.
4. TP-112 was not performed.
5. Refusal was on cobbles and boulders.

Table 2 - Summary of LGCI's Borings
Proposed Northeast Metro Regional Vocational Technical High School
Wakefield, Massachusetts
LGCI Project No. 2025

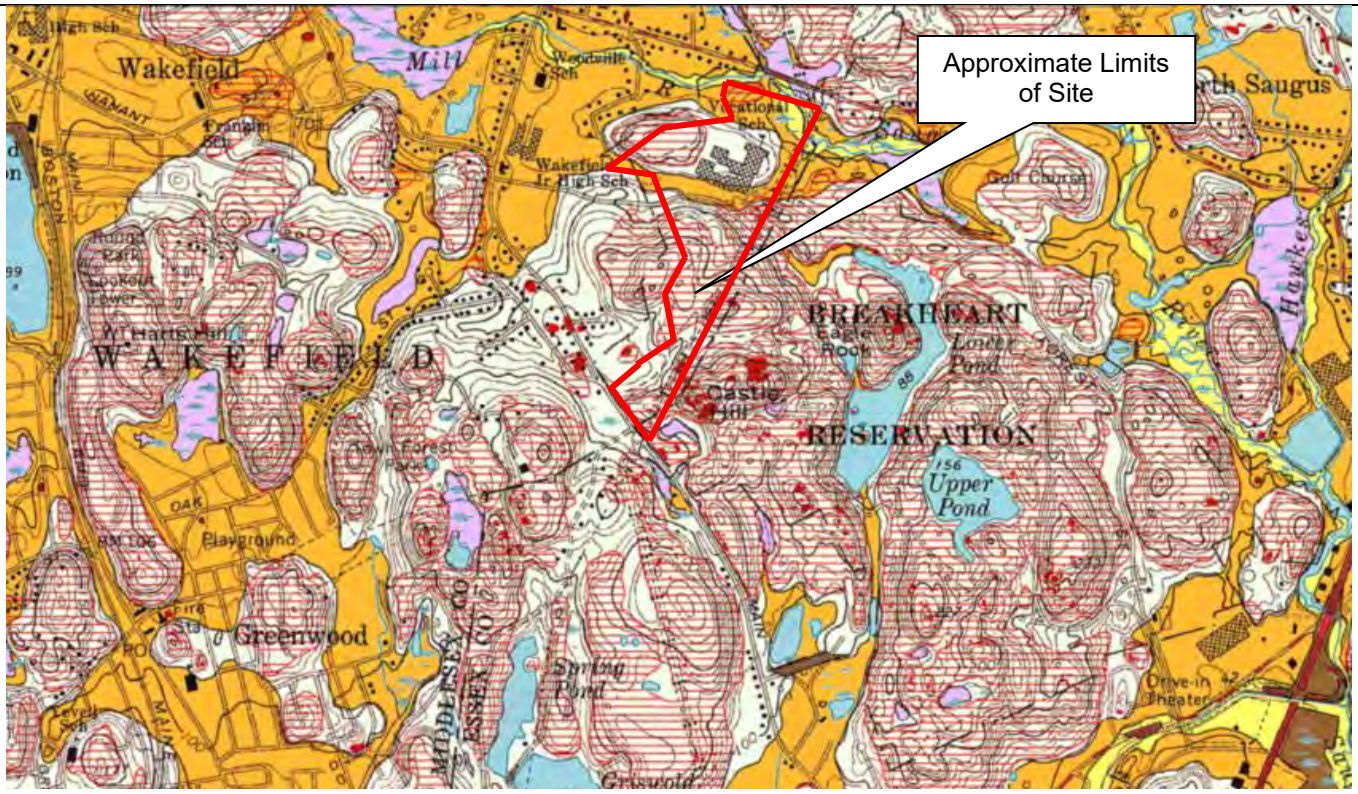
Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / El. (ft.)	Bottom of Forest Mat **Topsoil** Depth / El. (ft.)	Bottom of Subsoil Depth / El. (ft.)	Bottom of Sand and Gravel Depth / El. (ft.)	Top of Rock Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
2020 Boring Logs							
B-1-OW	184.5	10.0 / **174.5**	**0.3** / **184.2**	2.5 / **182.0**	- / **-**	2.5 / **182.0**	14.0 / **170.5**
B-2	166.5	- / **-**	**0.5** / **166.0**	- / **-**	- / **-**	0.5 / **166.0**	0.5 / **166.0**
B-3-OW	170.5	- / **-**	**0.3** / **170.2**	2.2 / **168.3**	- / **-**	2.2 / **168.3**	18.0 / **152.5**
B-4	180.7	0.8 / **179.9**	**0.3** / **180.4**	2.6 / **178.1**	6.0 / **174.7**	6.0 / **174.7**	8.0 / **172.7**
2021 Boring Logs							
B-101-OW	172.6	5.2 / **167.4**	0.1 / **172.5**	- / **-**	- / **-**	0.1 / **172.5**	36.0 / **136.6**
B-102	158.7	2.5 / **156.2**	0.5 / **158.2**	2.7 / **156.0**	- / **-**	2.7 / **156.0**	23.5 / **135.2**
B-103	174.6	0.1 / **174.5**	1.8 / **172.8**	- / **-**	- / **-**	1.8 / **172.8**	23.5 / **151.1**
B-104-OW	180.9	0.0 / **180.9**	0.7 / **180.2**	- / **-**	- / **-**	0.7 / **180.2**	27.0 / **153.9**
B-105	161.5	2.0 / **159.5**	0.3 / **161.2**	2.0 / **159.5**	3.5 / **158.0**	3.5 / **158.0**	17.0 / **144.5**
B-106	161.9	1.0 / **160.9**	1.4 / **160.5**	- / **-**	- / **-**	1.4 / **160.5**	11.5 / **150.4**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: “Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA,” prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.
2. Groundwater depths based on sample moisture or level at the end of drilling, whichever is shallower.
3. "-" means groundwater or layer was not encountered.

Contour Intervals: 10 feet

Figure based on USGS topographic map of Wakefield, MA obtained from www.mytopo.com

Client:	Project:		
Drummey Rosane Anderson, Inc.	Prop. Northeast Metro Regional Vocational Technical H.S.	Figure 1 – Site Location Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wakefield, MA	LGCI Project No.: 2025	Date: June 2021



Thin till—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts; large surface boulders are common; unit was mapped where till is generally less than 10 to 15 ft thick including areas of shallow bedrock. Predominantly consists of upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places: a looser, coarser grained ablation facies, melted out from supraglacial position; and an underlying more compact, finer grained lodgement facies deposited subglacially. In general, both ablation and lodgement facies of upper till derived from fine-grained bedrock are finer grained, more compact, less stony and have fewer surface boulders than upper till derived from coarse-grained crystalline rocks. Across Massachusetts, fine-grained bedrock sources include the red Mesozoic sedimentary rocks of the Connecticut Valley lowland, marble in the western river valleys, and fine-grained schists in upland areas

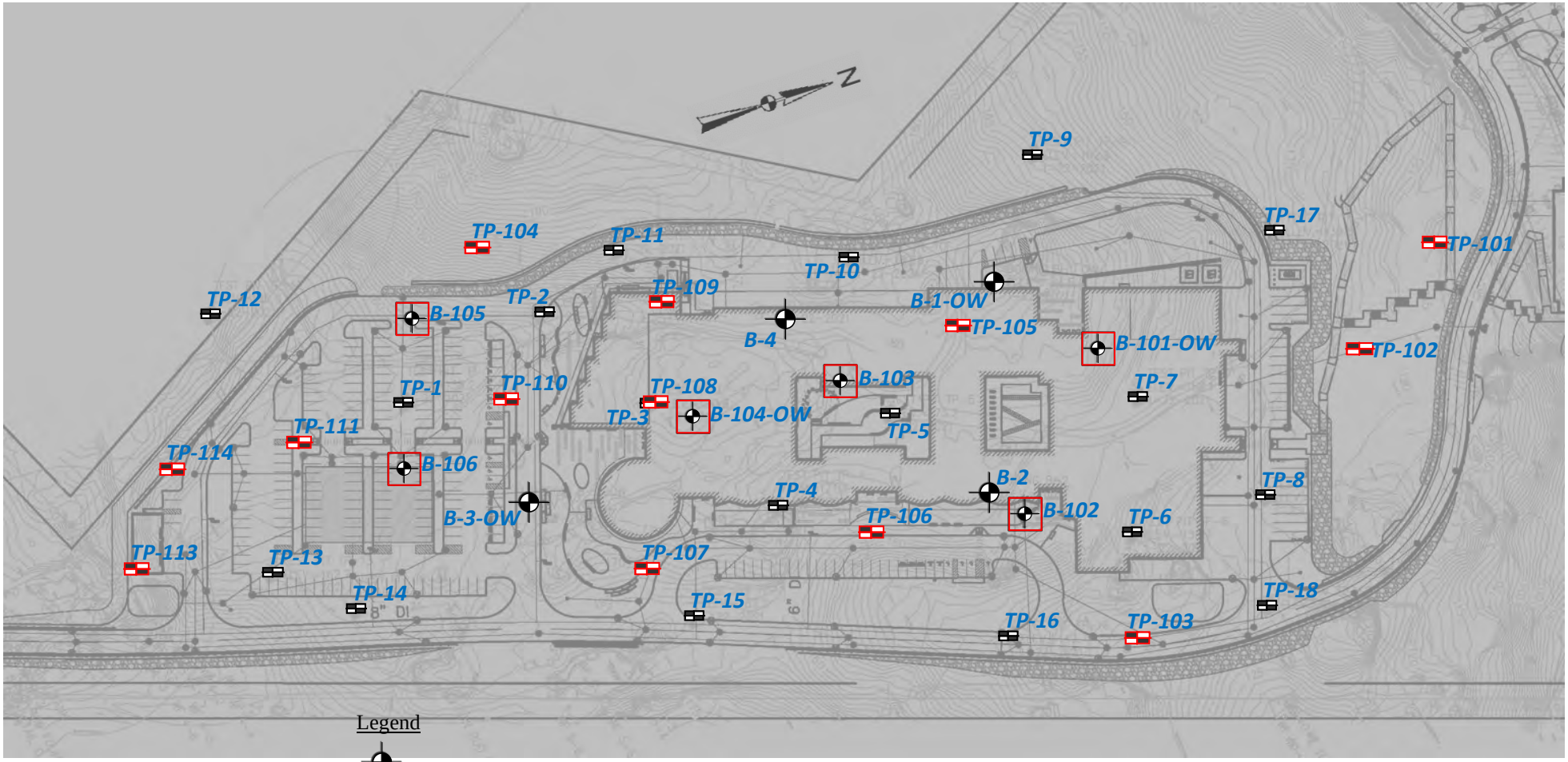
Coarse deposits consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

Bedrock outcrops and areas of abundant outcrop or shallow bedrock—Solid color shows extent of individual bedrock outcrops; horizontal-line pattern indicates areas of shallow bedrock or areas where small outcrops are too numerous to map individually; in areas of shallow bedrock, surficial materials are less than 5 to 10 ft thick. These units were not mapped consistently among all quadrangles; see note at beginning of appendix 1 for information on bedrock outcrop mapping by quadrangle

Figure based on map titled: "Surficial Materials Map of the Boston North, Massachusetts," prepared by Stone, B.D. and DiGiacomo-Cohen, M.L. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 125 – Boston North.

Client:	Project:	
Drummey Rosane Anderson, Inc.	Prop. Northeast Metro Regional Vocational Technical H.S.	Figure 2 – Surficial Geologic Map

LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wakefield, MA	LGCI Project No.: 2025	Date: June 2021



Legend

Approximate location of boring advanced by Northern Drill Service, Inc. (NDS) of Northborough, MA on December 10 and 11, 2020, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).

Approximate location of test pit excavated by NDS on December 3 and 4, 2020, and observed by LGCI.

Approximate location of boring advanced by NDS between April 26, 2021 and May 14, 202, and observed by LGCI.

Approximate location of test pit excavated by NDS on April 19 and 20, 2021, and observed by LGCI.

Approximate Scale (ft.)

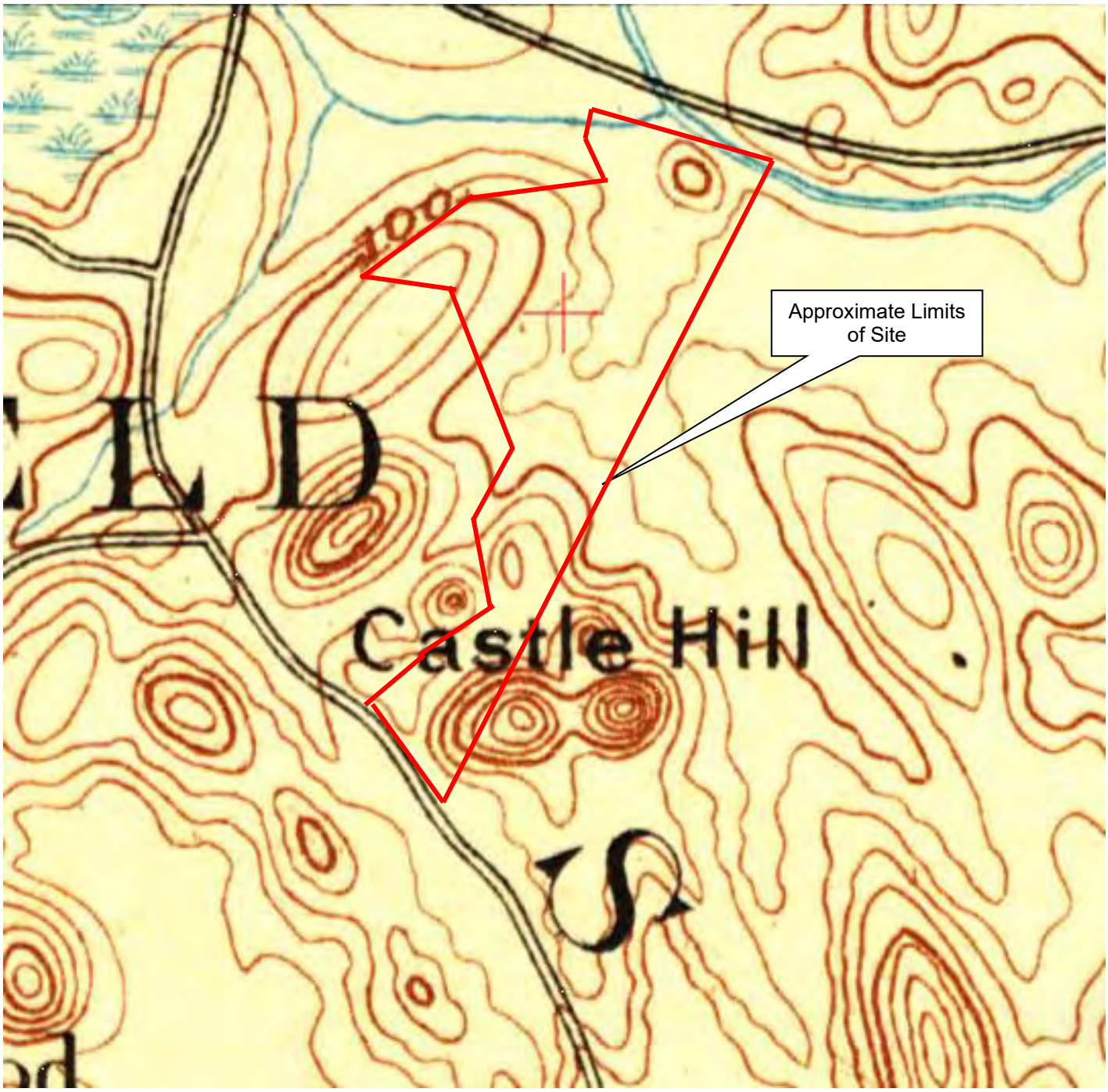
100 50 0 100 200

Note

Figure based on untitled prepared by Nitsch Engineering, Inc. (Nitsch) and provided to yia by Nitsch via e-mail on June 2, 2021.

Client: Drummey Rosane Anderson, Inc.	Project: Proposed Northeast Metro Regional Vocational Technical High School	Figure 3 –Test Pit and Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wakefield, MA	LGCI Project No.: 2025	Date: June 2021

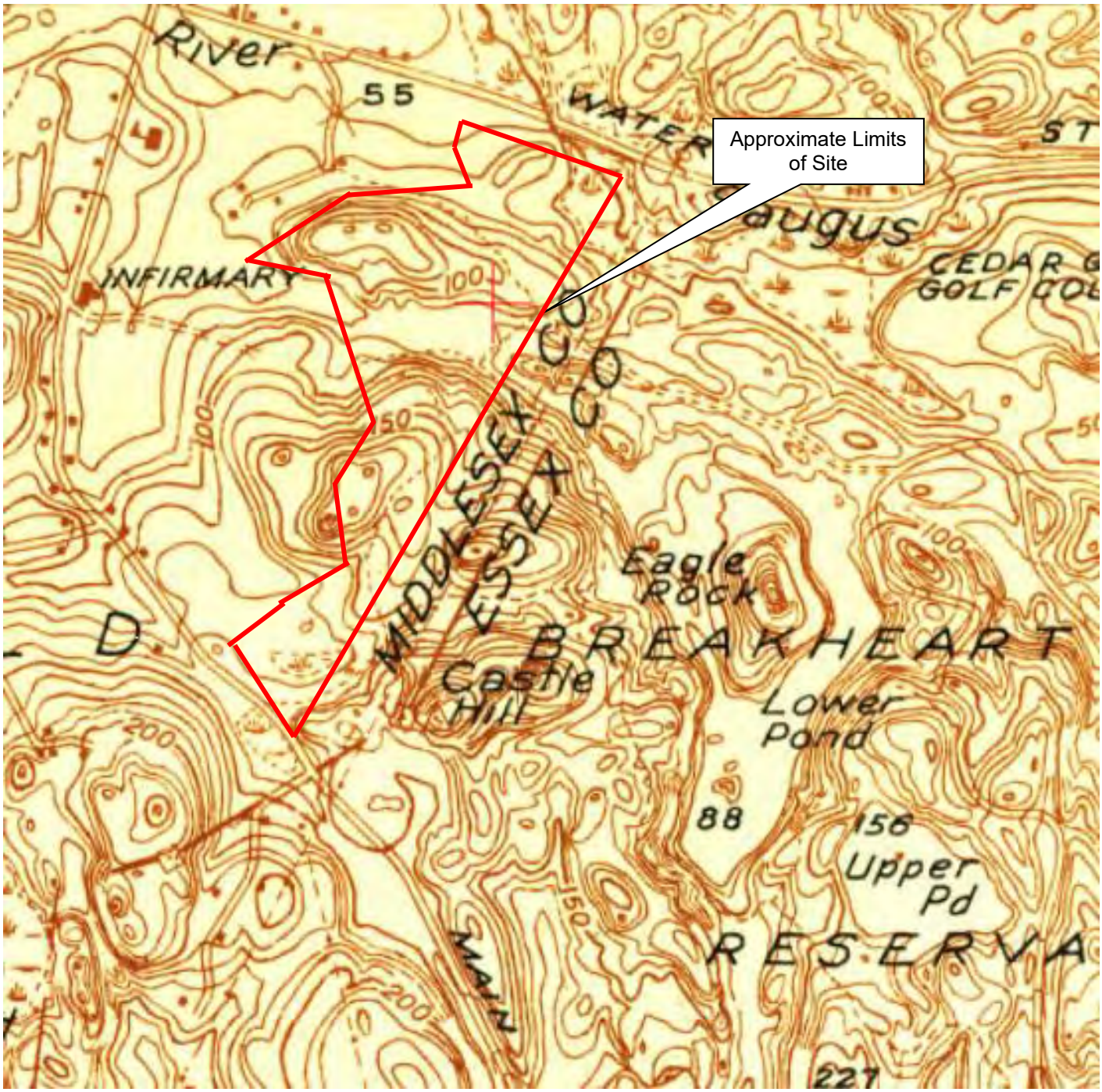
APPENDIX A – Historical Topo Maps



Contour Intervals: 20 feet

Figure based on USGS topographic map of Wakefield, MA obtained from https://livingatlas.arcgis.com/topoexplorer/index.html

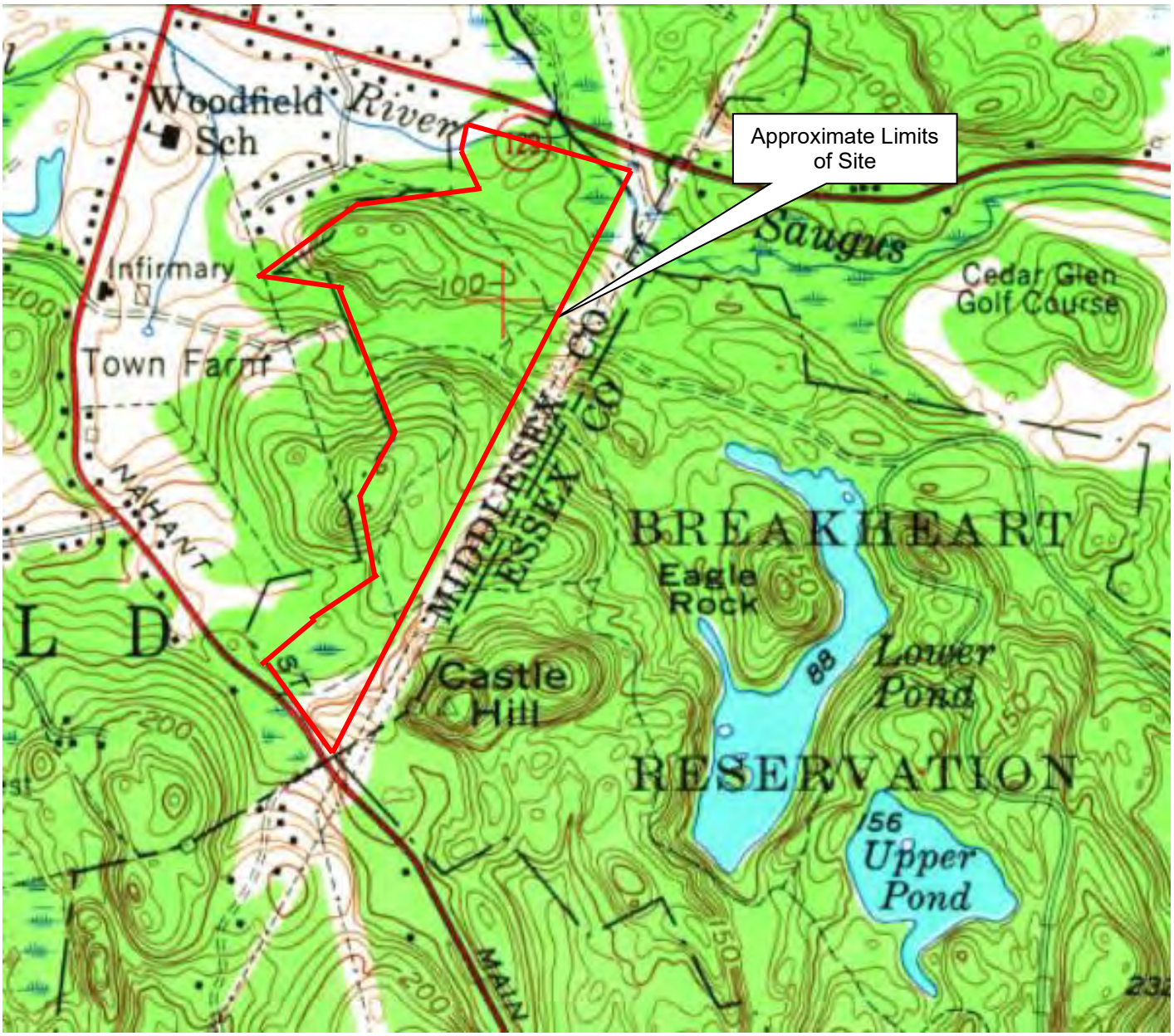
Client:	Project:	
Drummey Rosane Anderson, Inc.	Proposed Northeast Metropolitan Regional Vocational High School	Figure A1 – 1893 Historical Topo Map
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wakefield, MA	LGCI Project No.: 2025 / Date: June 2021



Contour Intervals: 10 feet

Figure based on USGS topographic map of Wakefield, MA obtained from https://livingatlas.arcgis.com/topoexplorer/index.html

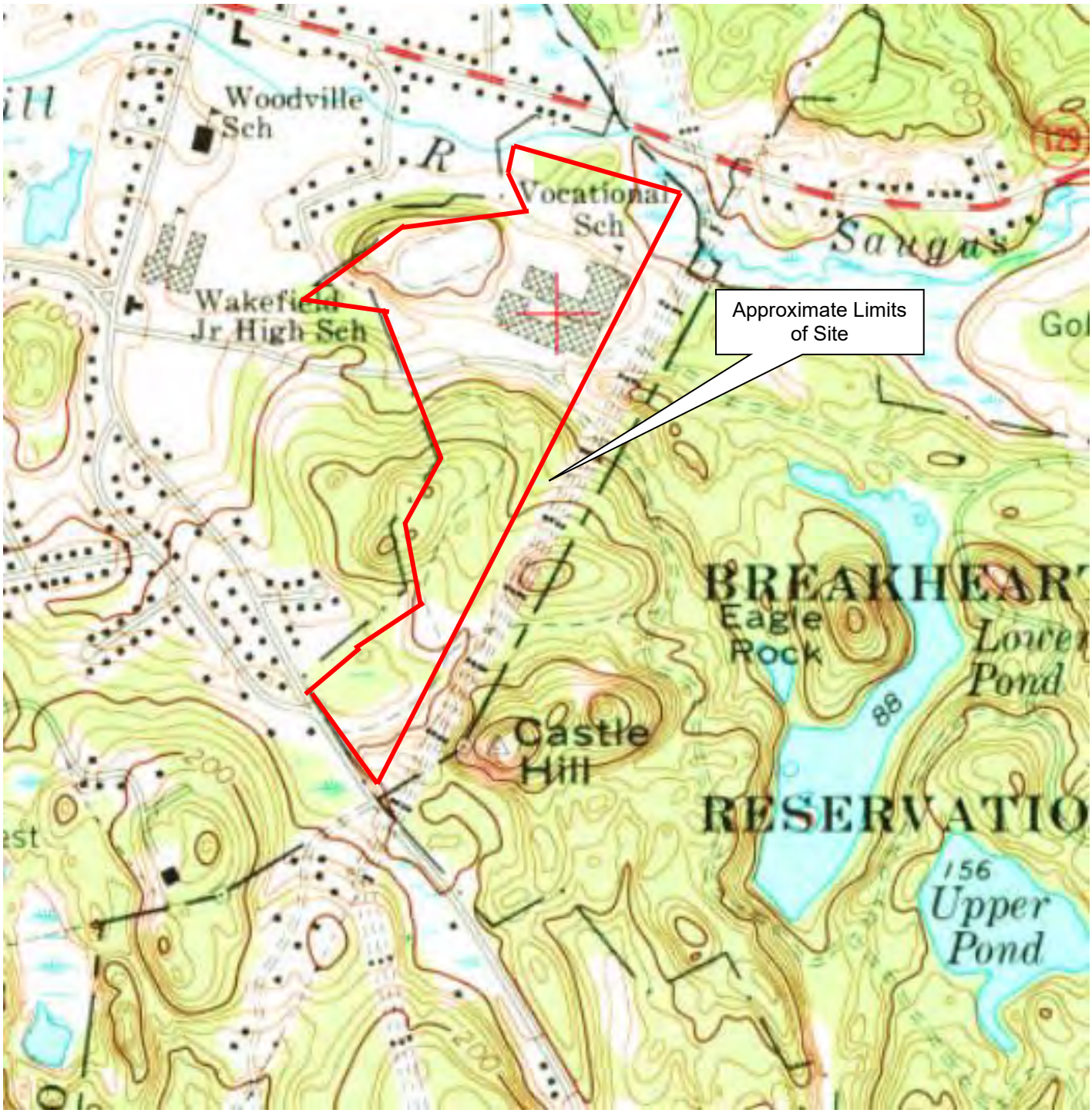
Client:	Project:		
Drummey Rosane Anderson, Inc.	Proposed Northeast Metropolitan Regional Vocational High School	Figure A2 – 1943 Historical Topo Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wakefield, MA	LGCI Project No.: 2025	Date: June 2021



Contour Intervals: 10 feet

Figure based on USGS topographic map of Wakefield, MA obtained from https://livingatlas.arcgis.com/topoexplorer/index.html

Client:	Project:		
Drummey Rosane Anderson, Inc.	Proposed Northeast Metropolitan Regional Vocational High School	Figure A3 – 1956 Historical Topo Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wakefield, MA	LGCI Project No.: 2025	Date: June 2021



Contour Intervals: 10 feet

Figure based on USGS topographic map of Wakefield, MA obtained from https://livingatlas.arcgis.com/topoexplorer/index.html

Client:	Project:		
Drummey Rosane Anderson, Inc.	Proposed Northeast Metropolitan Regional Vocational High School	Figure A4 – 1971 Historical Topo Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Wakefield, MA	LGCI Project No.: 2025	Date: June 2021

Contour Intervals: 3 meters

Figure based on USGS topographic map of Wakefield, MA obtained from https://livingatlas.arcgis.com/topoexplorer/index.html

Client:	Project:	
Drummey Rosane Anderson, Inc.	Proposed Northeast Metropolitan Regional Vocational High School	Figure A5 – 1985 Historical Topo Map

	Project Location:	LGCI Project No.:	Date:
LGCI Lahlaf Geotechnical Consulting, Inc.	Wakefield, MA	2025	June 2021

APPENDIX B – Soil Survey Report and Map

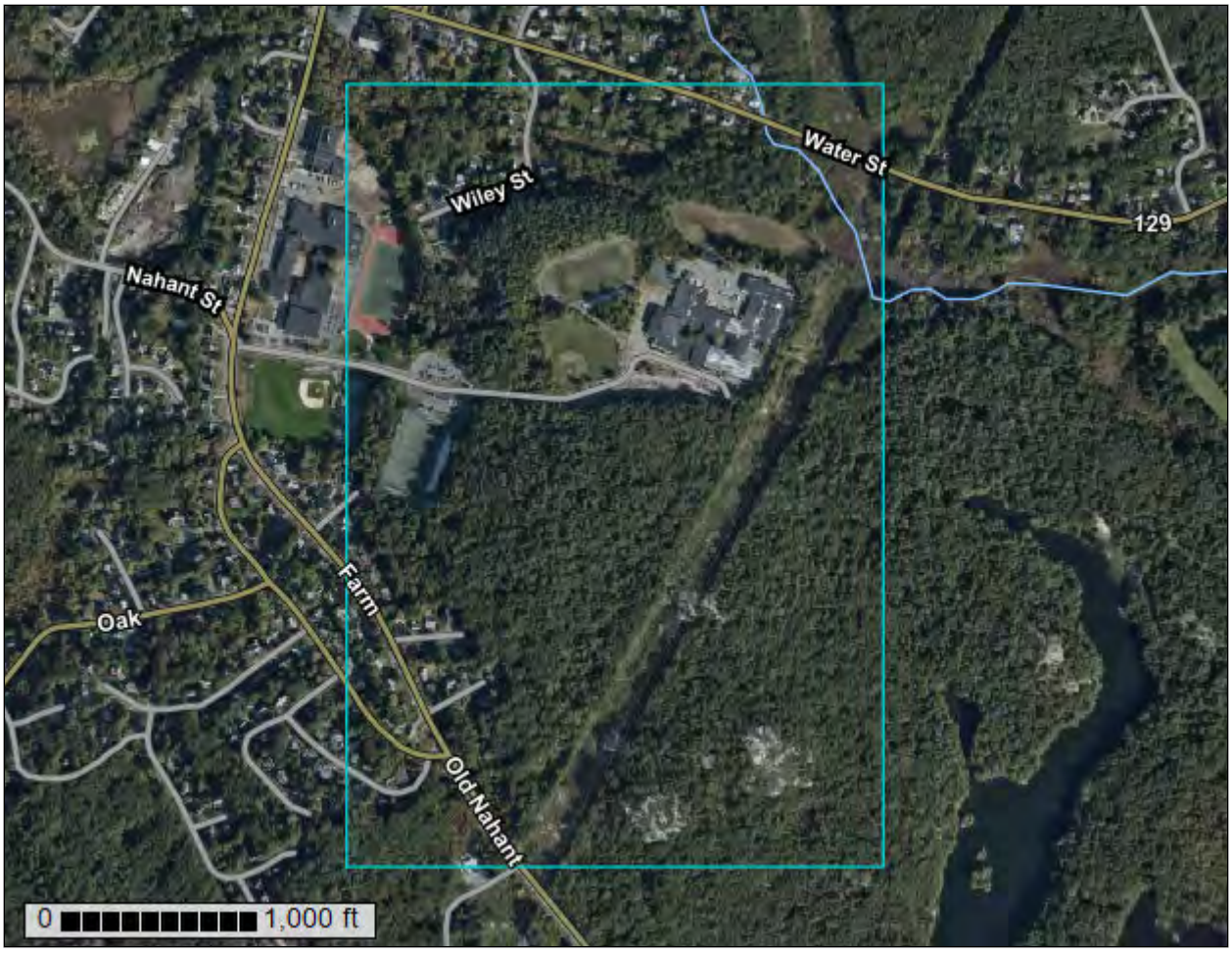
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Essex County, Massachusetts, Southern Part; and Middlesex County, Massachusetts



August 3, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, Massachusetts, Southern Part
Survey Area Data: Version 17, Jun 9, 2020

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 20, Jun 9, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 13, 2019—Oct 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	13.4	5.3%
102E	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	1.2	0.5%
105D	Rock outcrop-Hollis complex, 3 to 25 percent slopes	39.7	15.7%
242B	Hinckley gravelly fine sandy loam, 3 to 8 percent slopes	1.7	0.7%
616A	Fluvaquents, frequently flooded, 0 to 3 percent slopes	4.7	1.8%
Subtotals for Soil Survey Area		**60.6**	**24.0%**
Totals for Area of Interest		**252.2**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
51A	Swansea muck, 0 to 1 percent slopes	4.6	1.8%
52A	Freetown muck, 0 to 1 percent slopes	10.0	4.0%
53A	Freetown muck, ponded, 0 to 1 percent slopes	3.8	1.5%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	6.8	2.7%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	8.3	3.3%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	3.0	1.2%
104C	Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes	4.6	1.8%
104D	Hollis-Rock outcrop-Charlton complex, 15 to 25 percent slopes	6.4	2.6%
105E	Rock outcrop-Hollis complex, 3 to 35 percent slopes	58.2	23.1%
253B	Hinckley loamy sand, 3 to 8 percent slopes	2.9	1.2%
602	Urban land	11.7	4.6%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	39.8	15.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
655	Udorthents, wet substratum	15.7	6.2%
656	Udorthents-Urban land complex	15.7	6.2%
Subtotals for Soil Survey Area		**191.6**	**76.0%**
Totals for Area of Interest		**252.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Essex County, Massachusetts, Southern Part

102C—Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w69g
Elevation: 0 to 1,540 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, extremely stony, and similar soils: 39 percent
Hollis, extremely stony, and similar soils: 26 percent
Rock outcrop: 17 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Extremely Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

Description of Hollis, Extremely Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Nose slope, crest, side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Parent material: Igneous and metamorphic rock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Charlton, extremely stony
Percent of map unit: 12 percent
Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Sutton, extremely stony
Percent of map unit: 3 percent
Landform: Ground moraines, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Paxton, extremely stony
Percent of map unit: 2 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester, extremely stony
Percent of map unit: 1 percent
Landform: Depressions, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

102E—Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting
National map unit symbol: 2w69h
Elevation: 0 to 1,540 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, extremely stony, and similar soils: 35 percent
Hollis, extremely stony, and similar soils: 30 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Extremely Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Extremely Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, nose slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills, ridges
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 79 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Charlton, extremely stony

Percent of map unit: 7 percent
Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope

Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Leicester, extremely stony

Percent of map unit: 4 percent
Landform: Depressions, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sutton, extremely stony

Percent of map unit: 2 percent
Landform: Hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Paxton, extremely stony

Percent of map unit: 2 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Hydric soil rating: No

105D—Rock outcrop-Hollis complex, 3 to 25 percent slopes

Map Unit Setting

National map unit symbol: vkcq
Elevation: 0 to 280 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 65 percent
Hollis and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Parent material: Granite

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Description of Hollis

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till derived from granite and gneiss over granite

Typical profile

O - 0 to 2 inches: muck
H2 - 2 to 4 inches: fine sandy loam
H3 - 4 to 17 inches: gravelly fine sandy loam
H4 - 17 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 35 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Chatfield

Percent of map unit: 15 percent
Hydric soil rating: No

242B—Hinckley gravelly fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vk5l
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Flood plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 17 inches: gravelly loamy sand
H3 - 17 to 60 inches: stratified cobbly coarse sand to very gravelly loamy fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor
Percent of map unit: 10 percent
Hydric soil rating: No

Sudbury
Percent of map unit: 3 percent
Hydric soil rating: No

Wareham
Percent of map unit: 1 percent
Landform: Terraces
Hydric soil rating: Yes

Swansea
Percent of map unit: 1 percent
Landform: Bogs
Hydric soil rating: Yes

616A—Fluvaquents, frequently flooded, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: vk56
Elevation: 0 to 100 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Fluvaquents and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquents

Setting
Landform: Alluvial flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable loamy alluvium over friable sandy eolian deposits

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Depth to water table: About 0 to 12 inches
Frequency of flooding: NoneFrequent

Frequency of ponding: None

Minor Components

Swansea

Percent of map unit: 10 percent
Landform: Bogs
Hydric soil rating: Yes

Unnamed soils

Percent of map unit: 5 percent
Hydric soil rating: No

Middlesex County, Massachusetts

51A—Swansea muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2trl2
Elevation: 0 to 1,140 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Swansea and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swansea

Setting

Landform: Swamps, bogs
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material over loose sandy and gravelly glaciofluvial deposits

Typical profile

Oa1 - 0 to 24 inches: muck
Oa2 - 24 to 34 inches: muck
Cg - 34 to 79 inches: coarse sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water capacity: Very high (about 16.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Freetown

Percent of map unit: 10 percent
Landform: Bogs, swamps

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

52A—Freetown muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2q9
Elevation: 0 to 1,110 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Freetown and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown

Setting

Landform: Depressions, depressions, bogs, marshes, kettles, swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water capacity: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 5 percent
Landform: Kettles, depressions, depressions, marshes, swamps, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

53A—Freetown muck, ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2qc
Elevation: 0 to 1,140 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Freetown, ponded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown, Ponded

Setting

Landform: Marshes, kettles, swamps, bogs, depressions, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water capacity: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Whitman, ponded

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Swansea, ponded

Percent of map unit: 5 percent
Landform: Kettles, depressions, depressions, marshes, swamps, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

71B—Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w69c
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury, Extremely Stony

Setting

Landform: Depressions, drumlins, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope

Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Woodbridge, extremely stony

Percent of map unit: 10 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Footslope, summit, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Whitman, extremely stony

Percent of map unit: 8 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Paxton, extremely stony

Percent of map unit: 2 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Linear, convex

Across-slope shape: Convex, linear
Hydric soil rating: No

103B—Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 98yc
Elevation: 0 to 1,490 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton and similar soils: 50 percent
Hollis and similar soils: 25 percent
Rock outcrop: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Ground moraines, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over friable loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 22 inches: sandy loam
H3 - 22 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 14 inches: fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Granite and gneiss

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Canton

Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, toeslope, summit
Landform position (three-dimensional): Head slope, base slope, nose slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Scituate

Percent of map unit: 2 percent
Landform: Hillslopes, depressions
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Narragansett

Percent of map unit: 2 percent
Landform: Ridges, hills
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Montauk

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Head slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

103C—Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wzp1
Elevation: 0 to 1,390 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton, extremely stony, and similar soils: 50 percent
Hollis, extremely stony, and similar soils: 20 percent
Rock outcrop: 10 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton, Extremely Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: fine sandy loam
Bw - 4 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Extremely Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills, ridges
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 79 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Woodbridge, extremely stony

Percent of map unit: 8 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Canton, extremely stony

Percent of map unit: 5 percent
Landform: Moraines, ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Chatfield, extremely stony

Percent of map unit: 5 percent
Landform: Hills, ridges
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Ridgebury, extremely stony

Percent of map unit: 2 percent
Landform: Hills, ground moraines, depressions, drumlins, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

104C—Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w69p
Elevation: 0 to 1,270 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hollis, extremely stony, and similar soils: 35 percent
Charlton, extremely stony, and similar soils: 25 percent
Rock outcrop: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis, Extremely Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Charlton, Extremely Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: fine sandy loam
Bw - 4 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills, ridges
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 79 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Canton, extremely stony

Percent of map unit: 7 percent
Landform: Hills, moraines, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Chatfield, extremely stony

Percent of map unit: 6 percent
Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Montauk, extremely stony

Percent of map unit: 1 percent
Landform: Recessionial moraines, hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Scituate, extremely stony

Percent of map unit: 1 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Footslope, backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

104D—Hollis-Rock outcrop-Charlton complex, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 98yh
Elevation: 0 to 1,530 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hollis and similar soils: 35 percent
Rock outcrop: 30 percent
Charlton and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Crest, head slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 14 inches: fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Parent material: Granite and gneiss

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Description of Charlton

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over friable loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 22 inches: sandy loam
H3 - 22 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Canton

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, summit

Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Montauk

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Nose slope, head slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Unnamed

Percent of map unit: 2 percent

105E—Rock outcrop-Hollis complex, 3 to 35 percent slopes

Map Unit Setting

National map unit symbol: 98yj
Elevation: 0 to 2,100 feet
Mean annual precipitation: 32 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 50 percent
Hollis and similar soils: 45 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Granite and gneiss

Properties and qualities

Slope: 5 to 20 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Description of Hollis

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 14 inches: fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 35 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Whitman

Percent of map unit: 3 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Swansea

Percent of map unit: 1 percent
Landform: Bogs, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Unnamed

Percent of map unit: 1 percent

253B—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash terraces, outwash deltas, outwash plains, eskers, moraines, kame terraces, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 8 percent
Landform: Moraines, outwash terraces, outwash deltas, kame terraces, outwash plains, kames, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Kame terraces, outwash plains, moraines, outwash terraces, outwash deltas
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, base slope, head slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash deltas, kame terraces, outwash plains, kames, eskers, moraines, outwash terraces
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

602—Urban land

Map Unit Setting

National map unit symbol: 9950
Elevation: 0 to 3,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Excavated and filled land

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave

Udorthents, wet substratum

Percent of map unit: 5 percent
Hydric soil rating: No

Udorthents, loamy

Percent of map unit: 5 percent
Hydric soil rating: No

631C—Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky

Map Unit Setting

National map unit symbol: vr1g
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton and similar soils: 45 percent
Urban land: 35 percent
Hollis and similar soils: 10 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Drumlins, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over friable loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 22 inches: sandy loam
H3 - 22 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Excavated and filled land

Description of Hollis

Setting

Landform: Ridges, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 14 inches: fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Canton

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Udorthents, loamy

Percent of map unit: 2 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave

Scituate

Percent of map unit: 1 percent
Landform: Depressions, hillslopes
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Montauk

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Nose slope, head slope
Down-slope shape: Convex

Across-slope shape: Convex
Hydric soil rating: No

655—Udorthents, wet substratum

Map Unit Setting

National map unit symbol: vr1n
Elevation: 0 to 3,000 feet
Mean annual precipitation: 32 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, wet substratum, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Wet Substratum

Setting

Parent material: Loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Urban land

Percent of map unit: 8 percent
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear

Freetown

Percent of map unit: 4 percent
Landform: Depressions, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

Swansea

Percent of map unit: 3 percent
Landform: Bogs, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

656—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 995k
Elevation: 0 to 3,000 feet
Mean annual precipitation: 32 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 45 percent
Urban land: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Parent material: Loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Excavated and filled land

Minor Components

Canton

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Plains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Paxton

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

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APPENDIX C – LGCI's Test Pit Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd Suite 2
Billerica, MA 01862
Telephone: 9783305912
Fax: 9783305056

TEST PIT LOG

TP-1

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: Near SW side of prop. building
COORDINATES: NA
SURFACE EL.: 156.2 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 2.0 ft. / El. 154.2 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 13.0' x 4.5'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.7 / 155.5	0 ft. - 0.7 ft.: Topsoil
	155.0	E		Subsoil	3.5 / 152.7	0.7 ft. - 3.5 ft.: Sandy SILT (ML), slightly plastic, 35-40% fine sand, 10-15% fine subrounded gravel, trace of organic soil, trace of roots, trace of wood, 5-10% boulders, brown, wet
2.5						
	152.5	E		Sand and Gravel		3.5 ft. - 9 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 30-35% fine to coarse subrounded gravel, 15-20% cobbles, light brown, wet (natural)
5.0						
	150.0					
7.5						
	147.5	D	1		9.0	REMARK 1: Excavator refusal encountered on possible rock at depth of 9.0'.
						Bottom of test pit at 9.0 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd Suite 2
Billerica, MA 01862
Telephone: 9783305912
Fax: 9783305056

TEST PIT LOG

TP-2

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/4/20 **DATE COMPLETED:** 12/4/20
TEST PIT LOCATION: Along western side of prop. building
COORDINATES: NA
SURFACE EL.: 165.0 ft. (see note 1) **TOTAL DEPTH:** 4.3 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 4.0 ft. / El. 161.0 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 50's / Sunny
TEST PIT DIMENSIONS: 10.0' x 5.0'
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.8	0 ft. - 0.8 ft.: Topsoil
2.5	162.5	E		Subsoil	164.2 3.5	0.8 ft. - 3.5 ft.: SILT (ML), slightly plastic, 5-10% fine sand, trace of organic soil, trace of roots, 15-20% cobbles and boulders, brown, moist
		M D	1	Weathered Rock	4.3	3.5 ft. - 4.3 ft.: Well Graded GRAVEL with Silt (GW-GM), fine to coarse, subangular, 5-10% fines, 10-15% fine to coarse sand, wet (weathered rock) REMARK 1: Excavator refusal encountered on possible rock at depth of 4.3'. Bottom of test pit at 4.3 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-3

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: Within footprint of prop. building
COORDINATES: NA
SURFACE EL.: 180.6 ft. (see note 1) **TOTAL DEPTH:** 2 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 13.0' x 3.5'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	180.0	E		Topsoil	1.0	0 ft. - 1 ft.: Topsoil
		D	1	Subsoil	2.0	1 ft. - 2 ft.: Silty SAND (SM), fine to medium, trace coarse, 30-35% fines, 10-15% coarse subrounded gravel, trace of organic soil, trace of roots, trace of wood, brown, wet REMARK 1: Excavator refusal encountered on possible rock at depth of 2.0'. Bottom of test pit at 2.0 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-4

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: Along SE side of prop. building
COORDINATES: NA
SURFACE EL.: 171.3 ft. (see note 1) **TOTAL DEPTH:** 1.5 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 12.0' x 4.0'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
	170.0	D	1	Subsoil	1.5	0.5 ft. - 1.5 ft.: Silty SAND (SM), fine to medium, trace coarse, 30-35% fines, ~10% fine to coarse subrounded gravel, trace of organic soil, trace of roots, 15-20% cobbles, brown, moist REMARK 1: Excavator refusal encountered on possible rock at depth of 1.5'. Bottom of test pit at 1.5 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-5

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: Within footprint of prop. building
COORDINATES: NA
SURFACE EL.: 173.2 ft. (see note 1) **TOTAL DEPTH:** 5 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 11.0' x 6.0'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
	172.5				172.7	
		E		Subsoil		0.5 ft. - 3.5 ft.: Silty SAND with Gravel (SM), fine to coarse, 35-40% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, trace of roots, 25-30% cobbles and boulders, light brown, wet
2.5						
	170.0				3.5	
		D		Sand and Gravel	169.7	3.5 ft. - 5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse subrounded gravel, 45-50% cobbles and boulders, gray, wet
5.0			1		5.0	REMARK 1: Excavator refusal encoutered on possible rock at depth of 5.0'.
						Bottom of test pit at 5.0 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-6

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: Along NE side of prop. building
COORDINATES: NA
SURFACE EL.: 138.7 ft. (see note 1) **TOTAL DEPTH:** 4.5 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 7.5' x 5.0'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5 / 138.2	0 ft. - 0.5 ft.: Topsoil
	137.5	E		Subsoil	3.0 / 135.7	0.5 ft. - 3 ft.: Sandy SILT (ML), 35-40% fine sand, 0-5% fine subrounded gravel, trace of organic soil, trace of roots, 0-5% cobbles, brown, wet
2.5						
	135.0	D	1	Sand and Gravel	4.5	3 ft. - 4.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subrounded gravel, gray, wet
						REMARK 1: Excavator refusal encountered on possible rock at depth of 4.5'. Bottom of test pit at 4.5 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-7

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: Along northern side of prop. building
COORDINATES: NA
SURFACE EL.: 158.1 ft. (see note 1) **TOTAL DEPTH:** 2 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 11.0' x 5.0'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	157.5	E		Topsoil		0 ft. - 2 ft.: Topsoil
		D	1		2.0	REMARK 1: Excavator refusal encountered on possible rock at depth of 2.0'. Bottom of test pit at 2.0 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-8

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: Within prop. parking lot north of prop. building
COORDINATES: NA
SURFACE EL.: 130.0 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 2.0 ft. / El. 128.0 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 8.5' x 4.5'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	1.0 / 129.0	0 ft. - 1 ft.: Topsoil
2.5	127.5	E		Subsoil	3.0 / 127.0	1 ft. - 3 ft.: Silty SAND with Gravel (SM), fine to medium, trace coarse, ~30% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, trace of roots, light brown, wet
5.0	125.0	E		Sand and Gravel		3 ft. - 9 ft.: Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subrounded gravel, gray, wet
		M				
7.5	122.5	D				
			1		9.0	REMARK 1: Excavator refusal encountered on cobbles and boulders at depth of 9.0' (possible weathered rock).
						Bottom of test pit at 9.0 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-9

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/4/20 **DATE COMPLETED:** 12/4/20
TEST PIT LOCATION: Near NW corner of prop. building
COORDINATES: NA
SURFACE EL.: 162.9 ft. (see note 1) **TOTAL DEPTH:** 6.2 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** 3.6 ft. / El. 159.3 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 50's / Sunny
TEST PIT DIMENSIONS: 13.0' x 4.0'
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	162.5	E		Topsoil	0.4	0 ft. - 0.4 ft.: Topsoil
		E		Subsoil	162.5 1.9	0.4 ft. - 1.9 ft.: Silty SAND (SM), fine to medium, 35-40% fines, 5-10% fine to coarse subrounded gravel, trace of organic soil, trace of roots, brown, moist
2.5	160.0	E		Sand and Gravel	161.0	1.9 ft. - 6.2 ft.: Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 20-25% fine to coarse subrounded gravel, 5-10% cobbles and boulders, gray, moist
5.0	157.5	M				
		D	1		6.2	REMARK 1: Excavator refusal encountered on cobbles and boulders at depths ranging between 4.0' and 6.2' (possible weathered rock). Bottom of test pit at 6.2 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.1.

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TEST PIT LOG

TP-10

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/4/20 **DATE COMPLETED:** 12/4/20
TEST PIT LOCATION: West of prop. building
COORDINATES: NA
SURFACE EL.: 187.9 ft. (see note 1) **TOTAL DEPTH:** 2.7 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 50's / Sunny
TEST PIT DIMENSIONS: 14.0' x 4.0'
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	187.5	E		Topsoil	0.3 187.6	0 ft. - 0.3 ft.: Topsoil
		E		Subsoil	2.1	0.3 ft. - 2.1 ft.: Silty SAND (SM), fine to medium, 35-40% fines, trace of organic soil, trace of roots, brown, moist
2.5		D	1	Sand and Gravel	2.7	2.1 ft. - 2.7 ft.: Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 20-25% fine to coarse subrounded to subangular gravel, trace of roots, gray, moist REMARK 1: Excavator refusal encountered on possible rock at depth of 2.7'.
						Bottom of test pit at 2.7 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-11

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/4/20 **DATE COMPLETED:** 12/4/20
TEST PIT LOCATION: West of prop. building
COORDINATES: NA
SURFACE EL.: 181.1 ft. (see note 1) **TOTAL DEPTH:** 3.2 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 50's / Sunny
TEST PIT DIMENSIONS: 9.0' x 5.0'
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
	180.0	E		Subsoil	180.6 2.0	0.5 ft. - 2 ft.: Silty SAND (SM), fine to medium, 35-40% fines, trace of organic soil, trace of roots, 20-25% cobbles and boulders, brown, moist
2.5		M	1	Weathered Rock	179.1	2 ft. - 3.2 ft.: Silty GRAVEL with Sand (GM), fine to coarse, subangular to angular, 15-20% fines, 15-20% fine to coarse sand, trace of roots, moist (weathered rock) REMARK 1: Encountered two boulders about 2.0' x 1.0'.
		D	2		3.2	REMARK 2: Excavator refusal encountered on possible rock at depth of 3.2'. Bottom of test pit at 3.2 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-12

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: South of prop. building
COORDINATES: NA
SURFACE EL.: 136.0 ft. (see note 1) **TOTAL DEPTH:** 7 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 13.5' x 5.0'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	135.0	E		Topsoil	1.0	0 ft. - 1 ft.: Topsoil
2.5	132.5	E		Subsoil	135.0 4.0	1 ft. - 4 ft.: Silty SAND with Gravel (SM), fine to medium, trace coarse, 30-35% fines, 15-20% fine subrounded gravel, trace of organic soil, trace of roots, 10-15% boulders, light brown, moist
5.0	130.0	E		Sand and Gravel	132.0	4 ft. - 7 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), medium to coarse, trace fine, 10-15% fines, 30-35% fine to coarse subrounded to subangular gravel, 15-20% cobbles, dark brown, moist
		D	1		7.0	REMARK 1: Excavator refusal encountered on possible rock at depth of 7.0'.
						Bottom of test pit at 7.0 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-13

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/4/20 **DATE COMPLETED:** 12/4/20
TEST PIT LOCATION: South of prop. building
COORDINATES: NA
SURFACE EL.: 162.2 ft. (see note 1) **TOTAL DEPTH:** 4.8 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 50's / Sunny
TEST PIT DIMENSIONS: 11.0' x 4.5'
LOGGED BY: TG / SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.4	0 ft. - 0.4 ft.: Topsoil
		E		Subsoil	161.8 2.3	0.4 ft. - 2.3 ft.: Silty SAND with Gravel (SM), fine to medium, trace coarse, 30-35% fines, 15-20% fine to coarse subrounded to subangular gravel, trace of organic soil, trace of roots, 15-20% cobbles and boulders, light brown, moist
	160.0					
2.5		D		Sand and Gravel	159.9	2.3 ft. - 4.8 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 25-30% fine to coarse subrounded to subangular gravel, 15-20% cobbles, brown, moist
	157.5		1		4.8	REMARK 1: Excavator refusal encountered on possible rock at depth of 4.8'.
						Bottom of test pit at 4.8 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-14

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/4/20 **DATE COMPLETED:** 12/4/20
TEST PIT LOCATION: East of prop. building
COORDINATES: NA
SURFACE EL.: 164.9 ft. (see note 1) **TOTAL DEPTH:** 0.7 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 50's / Sunny
TEST PIT DIMENSIONS: 11.0' x 4.0'
LOGGED BY: SD / TG **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D	1	Topsoil	0.7	0 ft. - 0.7 ft.: Topsoil REMARK 1: Excavator refusal encountered on possible rock at depth of 0.7'. Bottom of test pit at 0.7 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-15

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: East of prop. building
COORDINATES: NA
SURFACE EL.: 162.0 ft. (see note 1) **TOTAL DEPTH:** 5 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 2.5 ft. / El. 159.5 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 13.5' x 4.5'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5 / 161.5	0 ft. - 0.5 ft.: Topsoil
	160.0	E		Subsoil		0.5 ft. - 4 ft.: Silty SAND (SM), fine to medium, trace coarse, 25-30% fines, 10-15% fine to coarse subangular gravel, trace of organic soil, trace of roots, 15-20% cobbles, brown, wet
2.5						▼
		M			4.0	
	157.5	D		Sand and Gravel		4 ft. - 5 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 25-30% fine to coarse subrounded to subangular gravel, 25-30% cobbles, gray, wet
5.0			1		5.0	REMARK 1: Excavator refusal encountered on possible rock at depth of 5.0'.
						Bottom of test pit at 5.0 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-16

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/3/20 **DATE COMPLETED:** 12/3/20
TEST PIT LOCATION: East of prop. building
COORDINATES: NA
SURFACE EL.: 143.7 ft. (see note 1) **TOTAL DEPTH:** 10.5 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 3.5 ft. / El. 140.2 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 12.5' x 4.5'
LOGGED BY: SD **CHECKED BY:** TG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	1.0	0 ft. - 1 ft.: Topsoil
	142.5				142.7	
2.5		E		Subsoil		1 ft. - 5 ft.: Silty SAND (SM), fine to medium, trace coarse, 25-30% fines, 10-15% fine subrounded gravel, trace of organic soil, trace of roots, ~15% cobbles and boulders, light brown, wet
	140.0					
5.0					5.0	
					138.7	
	137.5	E		Sand and Gravel		5 ft. - 10.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subrounded to subangular gravel, 25-30% cobbles and boulders, gray, moist
7.5						
	135.0					
10.0		D				
			1		10.5	REMARK 1: Excavator refusal encountered on possible rock at depth of 10.5'.
						Bottom of test pit at 10.5 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-17

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/4/20 **DATE COMPLETED:** 12/4/20
TEST PIT LOCATION: Prop. parking lot north of prop. building
COORDINATES: NA
SURFACE EL.: 139.5 ft. (see note 1) **TOTAL DEPTH:** 3.1 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 1.5 ft. / El. 138.0 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 50's / Sunny
TEST PIT DIMENSIONS: 22.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.2 139.3	0 ft. - 0.2 ft.: Topsoil
		E		Subsoil	1.9 137.6	0.2 ft. - 1.9 ft.: Silty SAND (SM), fine to medium, 35-40% fines, 0-5% fine subrounded gravel, trace of organic soil, trace of roots, brown, moist
2.5	137.5	M	1	Sand and Gravel	3.1	1.9 ft. - 3.1 ft.: Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 15-20% fine to coarse subrounded gravel, trace of roots, gray, wet REMARK 1: Excavator refusal encountered on cobbles and boulders at depths ranging between 0.2' and 3.1'. Bottom of test pit at 3.1 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-18

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/4/20 **DATE COMPLETED:** 12/4/20
TEST PIT LOCATION: Near driveway NE of prop. building
COORDINATES: NA
SURFACE EL.: 132.0 ft. (see note 1) **TOTAL DEPTH:** 3.9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Dave Edilberti
EXCAVATOR TYPE/MODEL: Komatsu PC 120
WEATHER: 50's / Sunny
TEST PIT DIMENSIONS: 14.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.3 / 131.7	0 ft. - 0.3 ft.: Topsoil
		E		Subsoil	2.8 / 129.2	0.3 ft. - 2.8 ft.: Silty SAND (SM), fine to medium, 30-35% fines, trace fine subangular gravel, trace of organic soil, trace of roots, brown, moist
2.5	130.0					
		D	1	Sand and Gravel	3.9	2.8 ft. - 3.9 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 15-20% fine to coarse subrounded gravel, trace of roots, light brown, moist REMARK 1: Excavator refusal encountered on possible rock at depth of 3.9'. Bottom of test pit at 3.9 feet. Backfilled excavation with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-101

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/19/21 **DATE COMPLETED:** 4/19/21
TEST PIT LOCATION: Wooded area north of prop. building
COORDINATES: NA
SURFACE EL.: 126.5 ft. (see note 1) **TOTAL DEPTH:** 3.5 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 3.5 ft. / El. 123.0 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 60's / Sunny
TEST PIT DIMENSIONS: 13.0' x 7.0'
LOGGED BY: NP **CHECKED BY:** AML

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M/D	1	Forest Mat	1.0 / 125.5	0 ft. - 1 ft.: Forest Mat REMARK 1: Several rock outcrops observed at the ground surface.
	125.0	D/V		Subsoil		1 ft. - 3.5 ft.: Silty SAND (SM), fine, 25-30% fines, 0-5% cobbles up to 8" in diameter, trace of organic soil, trace of roots, brown, moist to wet
2.5		V				
		V	2		3.5	REMARK 2: Excavator refusal encountered on possible rock at depth of 3.5'. Bottom of test pit at 3.5 feet. Backfilled excavation with excavated material and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-102

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/20/21 **DATE COMPLETED:** 4/20/21
TEST PIT LOCATION: Near prop. driveway north of prop. building
COORDINATES: NA
SURFACE EL.: 126.4 ft. (see note 1) **TOTAL DEPTH:** 3.7 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 11.0' x 6.5'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Forest Mat	0.7	0 ft. - 0.7 ft.: Forest Mat
	125.0	E	1	Subsoil	125.7	0.7 ft. - 2.9 ft.: Silty SAND (SM), fine, 40-45% slightly plastic fines, trace of organic soil, trace of roots, brown, moist to wet REMARK 1: Excavator refusal encountered on possible rock at depths ranging between 1' and 3.7'.
2.5		M				
		V		Sand and Gravel	2.9 3.7	2.9 ft. - 3.7 ft.: Silty SAND (SM), fine to coarse, 30-35% fines, 5-10% fine to coarse subangular gravel, gray, moist
						Bottom of test pit at 3.7 feet. Backfilled excavation with excavated material and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-103

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/20/21 **DATE COMPLETED:** 4/20/21
TEST PIT LOCATION: Near prop. driveway NW of prop. building
COORDINATES: NA
SURFACE EL.: 135.0 ft. (see note 1) **TOTAL DEPTH:** 5.5 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 1.3 ft. / El. 133.7 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 9.0' x 4.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M		Forest Mat	0.8	0 ft. - 0.8 ft.: Forest Mat
		M		Subsoil	134.2	0.8 ft. - 2.4 ft.: Sandy SILT (ML), slightly plastic, ~40% fine sand, trace of organic soil, trace of roots, brown, wet
2.5	132.5	D			2.4	
		D		Sand and Gravel	132.6	2.4 ft. - 5.5 ft.: Silty SAND (SM), fine to medium, 25-30% fines, 0-5% fine gravel, gray, wet
5.0	130.0	V				
			1		5.5	REMARK 1: Excavator refusal encountered on possible rock at depth of 5.5'.
						Bottom of test pit at 5.5 feet. Backfilled excavation with excavated material and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-104

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/19/21 **DATE COMPLETED:** 4/19/21
TEST PIT LOCATION: Near prop. parking lot west of prop. building
COORDINATES: NA
SURFACE EL.: 180.0 ft. (see note 1) **TOTAL DEPTH:** 3 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 60's / Sunny
TEST PIT DIMENSIONS: 11.0' x 6.0'
LOGGED BY: NP **CHECKED BY:** AML

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D	1	Forest Mat	0.5 / 179.5	0 ft. - 0.5 ft.: Forest Mat REMARK 1: Several rock outcrops observed at the ground surface.
		D/V		Subsoil	2.5	0.5 ft. - 2.5 ft.: Silty GRAVEL with Sand (GM), fine to coarse, 20-25% fines, 20-25% fine to coarse sand, 10-15% cobbles and boulders up to 2' in diamater, trace of organic soil, trace of roots, brown, moist
2.5	177.5	V	2	Sand and Gravel	3.0	2.5 ft. - 3 ft.: Silty SAND with Gravel (SM), fine to medium, ~20% fines, 25-30% fine subangular to subrounded gravel, trace of organic soil, trace of weathered rock, light brown, moist REMARK 2: Excavator refusal encountered on possible rock at depth of 3'.
						Bottom of test pit at 3.0 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-105

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/19/21 **DATE COMPLETED:** 4/19/21
TEST PIT LOCATION: Near NW portion of prop. building
COORDINATES: NA
SURFACE EL.: 180.1 ft. (see note 1) **TOTAL DEPTH:** 1.8 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 60's / Sunny
TEST PIT DIMENSIONS: 13.0' x 12.0'
LOGGED BY: NP **CHECKED BY:** AML

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D/V	1	Forest Mat	0.5 179.6	0 ft. - 0.5 ft.: Forest Mat REMARK 1: Several rock outcrops observed at the ground surface.
		V		Subsoil	1.8	0.5 ft. - 1.8 ft.: Silty SAND (SM), fine, 35-40% slightly plastic fines, trace of organic soil, trace of roots, brown, moist
			2			REMARK 2: Excavator refusal encountered on possible rock at depth of 1.8'. Bottom of test pit at 1.8 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-106

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/20/21 **DATE COMPLETED:** 4/20/21
TEST PIT LOCATION: Near prop. parking lot west of prop. building
COORDINATES: NA
SURFACE EL.: 161.0 ft. (see note 1) **TOTAL DEPTH:** 3.2 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 12.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M		Forest Mat	0.5	0 ft. - 0.5 ft.: Forest Mat
	160.0	D	1	Subsoil	160.5	0.5 ft. - 3.2 ft.: Silty SAND (SM), fine to coarse, 35-40% fines, 5-10% fine gravel, trace of organic soil, trace of roots, brown, moist
2.5		V			3.2	REMARK 1: Excavator refusal encountered on possible rock at depths ranging between 2.0' and 3.2'.
						Bottom of test pit at 3.2 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-107

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/20/21 **DATE COMPLETED:** 4/20/21
TEST PIT LOCATION: Near prop. parking lot west of prop. building
COORDINATES: NA
SURFACE EL.: 168.1 ft. (see note 1) **TOTAL DEPTH:** 3.1 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 3.0 ft. / El. 165.1 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 10.0' x 3.5'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Forest Mat	0.3 / 167.8	0 ft. - 0.3 ft.: Forest Mat
	167.5	M		Subsoil	2.1	0.3 ft. - 2.1 ft.: Silty SAND (SM), fine, 40-45% slightly plastic fines, trace of organic soil, trace of roots, brown, moist
2.5	165.0	V	1	Sand and Gravel	3.1	2.1 ft. - 3.1 ft.: Silty SAND (SM), fine to coarse, 40-45% fines, 5-10% fine subrounded to subangular gravel, gray, moist to wet REMARK 1: Excavator refusal encountered on possible rock at depth of 3.1'. Bottom of test pit at 3.1 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-108

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/20/21 **DATE COMPLETED:** 4/20/21
TEST PIT LOCATION: Near eastern side of prop. building
COORDINATES: NA
SURFACE EL.: 180.4 ft. (see note 1) **TOTAL DEPTH:** 2.3 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 2.3 ft. / El. 178.1 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 70's / Sunny
TEST PIT DIMENSIONS: 13.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	180.0	E / D / V	1	Forest Mat	2.3	0 ft. - 2.3 ft.: Forest Mat, 0-5% cobbles and boulders up to 1' in diameter REMARK 1: Excavator refusal encountered on possible rock at depths ranging between 0.5' and 2.3'. Bottom of test pit at 2.3 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-109

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/19/21 **DATE COMPLETED:** 4/20/21
TEST PIT LOCATION: Near western side of prop. building
COORDINATES: NA
SURFACE EL.: 171.2 ft. (see note 1) **TOTAL DEPTH:** 4.6 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 60's / Sunny
TEST PIT DIMENSIONS: 10.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M	1	Forest Mat	0.5 / 170.7	0 ft. - 0.5 ft.: Forest Mat REMARK 1: Several rock outcrops observed at the ground surface.
	170.0	M/D		Subsoil		0.5 ft. - 3 ft.: Silty SAND (SM), fine, ~40% slightly plastic fines, trace of organic soil, trace of roots, brown, moist
2.5		D			3.0 / 168.2	
	167.5	D		Sand and Gravel		3 ft. - 4.6 ft.: Silty SAND with Gravel (SM), fine to coarse, ~20% fines, ~30% fine to coarse subangular to angular gravel, 5-10% cobbles and boulders up to 2' in diameter, light brown, moist
		V	2 3		4.6	REMARK 2: Excavator blew hydraulic line at depth of 4' on 4/19/2021. The excavator bucket was left at the bottom of the excavation and the excavation was taped off with caution tape. Test pit continued on 4/20/2021. REMARK 3: Excavator refusal encountered on possible rock at depth of 4.6'. Bottom of test pit at 4.6 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-110

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/19/21 **DATE COMPLETED:** 4/19/21
TEST PIT LOCATION: South of prop. building
COORDINATES: NA
SURFACE EL.: 168.1 ft. (see note 1) **TOTAL DEPTH:** 2.7 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 2.5 ft. / El. 165.6 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 60's / Sunny
TEST PIT DIMENSIONS: 14.0' x 6.0'
LOGGED BY: NP **CHECKED BY:** AML

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	167.5	M	1	Forest Mat	0.5 / 167.6	0 ft. - 0.5 ft.: Forest Mat REMARK 1: Several rock outcrops observed at the ground surface.
		D		Subsoil		0.5 ft. - 2.7 ft.: Silty SAND (SM), fine, 35-40% slightly plastic fines, trace fine gravel, trace of organic soil, trace of roots, brown, moist to wet
2.5		V	2		2.7	REMARK 2: Excavator refusal encountered on possible rock at depth of 2.7'. Bottom of test pit at 2.7 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-111

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/19/21 **DATE COMPLETED:** 4/19/21
TEST PIT LOCATION: Prop. parking lot south of prop. building
COORDINATES: NA
SURFACE EL.: 156.3 ft. (see note 1) **TOTAL DEPTH:** 5 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** 5.0 ft. / El. 151.3 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 60's / Sunny
TEST PIT DIMENSIONS: 13.0' x 7.0'
LOGGED BY: NP **CHECKED BY:** AML

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M	1	Forest Mat	0.5 / 155.8	0 ft. - 0.5 ft.: Forest Mat REMARK 1: Several rock outcrops observed at the ground surface.
	155.0	D		Subsoil		0.5 ft. - 3.5 ft.: Silty SAND (SM), fine, 35-40% fines, trace fine gravel, trace of organic soil, trace of roots, brown, moist
2.5		D/V				
		V			3.5 / 152.8	
	152.5	V		Sand and Gravel		3.5 ft. - 5 ft.: Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, 15-20% fine subrounded gravel, trace of roots, light brown, moist to wet
5.0			2		5.0	REMARK 2: Excavator refusal encountered on possible rock at depth of 5'. Bottom of test pit at 5.0 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-113

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/19/21 **DATE COMPLETED:** 4/19/21
TEST PIT LOCATION: Wooded area SW of prop. building
COORDINATES: NA
SURFACE EL.: 143.6 ft. (see note 1) **TOTAL DEPTH:** 3 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 60's / Sunny
TEST PIT DIMENSIONS: 12.0' x 6.0'
LOGGED BY: NP **CHECKED BY:** AML

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D	1	Forest Mat	0.5 / 143.1	0 ft. - 0.5 ft.: Forest mat REMARK 1: Several rock outcrops observed at the ground surface.
	142.5	V		Sand and Gravel		0.5 ft. - 3 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse subrounded gravel, trace of roots, light brown
2.5		V	2		3.0	REMARK 2: Excavator refusal encountered on possible rock at depth of 3'. Bottom of test pit at 3.0 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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TEST PIT LOG

TP-114

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/19/21 **DATE COMPLETED:** 4/19/21
TEST PIT LOCATION: Prop. parking lot south of the prop. building
COORDINATES: NA
SURFACE EL.: 147.4 ft. (see note 1) **TOTAL DEPTH:** 1.9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 1.9 ft. / El. 145.5 ft.

EXCAVATION SUBCONTRACTOR: Northern Drill Service, Inc.
EXCAVATION FOREMAN: Justin Stevens
EXCAVATOR TYPE/MODEL: Kubota KX 080-4
WEATHER: 60's / Sunny
TEST PIT DIMENSIONS: 12.0' x 5.0'
LOGGED BY: NP **CHECKED BY:** AML

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D/V	1	Forest Mat	0.3 / 147.1	0 ft. - 0.3 ft.: Forest Mat REMARK 1: Several rock outcrops observed at the ground surface.
		V		Sand and Gravel		0.3 ft. - 1.9 ft.: Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded, 10-15% fines, 25-30% fine to coarse sand, trace of roots, light brown, moist to wet
			2		1.9	REMARK 2: Excavator refusal encountered on possible rock at depth of 1.9'. Bottom of test pit at 1.9 feet. Backfilled with excavation with excavated material and tamped with excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

APPENDIX D – LGCI's Boring Logs, Groundwater Observation Well Installation Reports, and Photographs of the Rock Cores

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BORING LOG

B-1-OW
PAGE 1 OF 1

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/10/20 **DATE COMPLETED:** 12/10/20
BORING LOCATION: Near NW corner of prop. building
COORDINATES: NA
SURFACE El.: 184.5 ft. (see note 1) **TOTAL DEPTH:** 14 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 10.0 ft. / El. 174.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile Drill B-48
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-1-8 (2)	24/11		Topsoil	0.5 184.3	S1 - Top 3": Topsoil
							Subsoil		Bot. 8": Silty SAND with Gravel (SM), fine to medium, 30-35% fines, 15-20% fine to coarse subrounded to angular gravel, trace of organic soil, trace of roots, brown, moist
		2	S2	43	6/5	1			S2 - Similar to S1 Bot. 8", 25-30% fine to coarse subangular to angular gravel, gray
		2.5						2.5 182.0	REMARK 1: Split spoon refusal encountered on rock at depth of 2.5'. Advanced button bit about 1.5' to depth of 4'.
	180.0	4	C1		60/57	2	Rock		C1 - min/ft: 12.6, 5.7, 3.5, 6.3, 7.5 REC=95%, RQD= 66% Very hard, slightly weathered to fresh, moderately fractured to sound, gray, medium-grained, RHYOLITE
5									REMARK 2: Rock core sampler jammed at depth of 5'.
	175.0	9	C2		60/59				C2 - min/ft: 6.6, 3.3, 2.0, 3.1, 4.0 REC=98%, RQD=92% Very hard, fresh, moderately fractured to sound, gray, medium-grained, RHYOLITE
10									
	170.0	14						14.0	Bottom of borehole at 14.0 feet. Installed groundwater observation well in borehole.
15									
	165.0								
20									
	160.0								
25									

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

B-2

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/11/20 **DATE COMPLETED:** 12/11/20
BORING LOCATION: Near NE corner of prop. building
COORDINATES: NA
SURFACE El.: 166.5 ft. (see note 1) **TOTAL DEPTH:** 0.5 ft.
WEATHER: 50's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: Not encountered
AT END OF DRILLING: Not encountered
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-48 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 - 0.5	S1	42	6/4	1 2	Topsoil	0.5	S1 - Topsoil REMARK 1: Split spoon sampler refusal encountered on possible rock at depth of 0.5'. REMARK 2: Moved borehole 18' south and encountered refusal at 0.5'. Exposed a 1' x 2' area of rock with a shovel. Bottom of borehole at 0.5 feet. Backfilled borehole with drill cuttings.
	165.0								
5	160.0								
10	155.0								
15	150.0								
20	145.0								
25									

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

B-3-OW
PAGE 1 OF 1

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/10/20 **DATE COMPLETED:** 12/11/20
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 170.5 ft. (see note 1) **TOTAL DEPTH:** 18 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not encountered
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile Drill B-48
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	170.0	0	S1	0-0-1-11 (1)	24/6		Topsoil	0.3	S1 - Top 4": Topsoil
							Subsoil	170.2	Bot. 2": SILT with Sand (ML), slightly plastic, ~15% fine sand, trace of organic soil, trace of roots, brownish orange, moist
		2	S2	38/2"	2/1	1		2.2	S2 - Similar to S1 Bot. 2", 10-15% fine subangular to angular gravel
		2.2						168.3	REMARK 1: Split spoon sampler refusal encountered on rock at depth of 2.2'. Advanced button bit about 0.8' to depth of 3'.
		3							C1 - min/ft: 3.4, 3.4, 2.7, 5.3, 3.8
5									REC=97%, RQD=69%
	165.0		C1		60/58				Very hard, slightly weathered to fresh, moderately fractured to sound, gray, medium-grained, RHYOLITE
		8							C2 - min/ft: 4.6, 3.5, 5.1, 4.3, 5.6
10									REC=100%, RQD=51%
	160.0		C2		60/60		Rock		Hard to very hard, slightly weathered to fresh, moderately fractured to sound, gray, medium-grained, RHYOLITE
		13							C3 - min/ft: 5.9, 5.6, 7.7, 11.7, 16.9
15									REC=97%, RQD=88%
	155.0		C3		60/58				Very hard, fresh, moderately fractured to sound, gray, medium-grained, RHYOLITE
						2			REMARK 2: Broke a button bit clearing out the borehole after coring.
		18						18.0	
20									Bottom of borehole at 18.0 feet. Installed groundwater observation well in borehole
	150.0								
25									

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 12/10/20 **DATE COMPLETED:** 12/10/20
BORING LOCATION: Along western side of prop. building
COORDINATES: NA
SURFACE El.: 180.7 ft. (see note 1) **TOTAL DEPTH:** 8 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 0.8 ft. / El. 179.9 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile Drill B-48
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: TG **CHECKED BY:** SD

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
0	180.0	0	S1	2-1-2-1 (3)	24/7		Topsoil	0.5 180.5	S1 - Top 3": Topsoil
							Subsoil		Bot. 4":Silty SAND (SM), fine to medium, 35-40% fines, 0-5% fine subrounded to angular gravel, trace of organic soil, trace of roots, brownish orange, moist
2		2	S2	2-2-9-12 (11)	24/13			2.6 178.1	S2 - Top 7": Similar to S1 Bot. 4", 10-15% fine to coarse subrounded to angular gravel
							Sand and Gravel		Bot. 6": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~20% fine to coarse subrounded to subangular gravel, light brown, moist (natural)
4		4	S3	15-16-18-27 (34)	24/13				S3 - Similar to S2 Bot. 6", 20-25% fine to coarse subrounded to subangular gravel
5	175.0	6				1		6.0 174.7	REMARK 1: Split spoon sampler refusal encountered on rock at depth of 6'.
						2	Rock		REMARK 2: Advanced button bit for 10 minutes. Advanced button bit from depth of 6' to 8' into rock.
								8.0	Bottom of borehole at 8.0 feet. Backfilled borehole with drill cuttings and 1.5 bags of gravel.
10	170.0								
15	165.0								
20	160.0								
25									

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

B-101-OW

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 5/10/21 **DATE COMPLETED:** 5/11/21
BORING LOCATION: Near NW corner of prop. bulding
COORDINATES: NA
SURFACE El.: 172.6 ft. (see note 1) **TOTAL DEPTH:** 36 ft.
WEATHER: 50's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 5.2 ft. / El. 167.4 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 3-inch casing
DRILL RIG TYPE/MODEL: Mobile Drill B-48
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		0	S1		0.1/0.1	1	Forest Mat	Depth (ft.) / El. (ft.) 0.0 / 172.5 — S1 - Forest Mat
		0						REMARK 1: Spun casing to a depth of 1'.
		1						C1 - min/ft: 7.3, 8.1, 12.2, 11.2, 14.7
	170.0		C1		60/58			REC = 97%, RQD = 73%
								Very hard, slightly weathered to fresh, slightly fractured to sound, gray with white and green mottles, fine-grained to medium-grained, RHYOLITE
5								▼
		6						C2 - min/ft: 19.5, 12.3, 12.8, 16.1, 15.1
	165.0		C2		60/60	2		REC = 100%, RQD = 46%
								Very hard, slightly weathered to fresh, extremely fractured to slightly fractured, gray, fine-grained, RHYOLITE
10								REMARK 2: Rock core sampler jammed at depth of 7.8'.
		11						C3 - min/ft: 11.1, 10.0, 11.1, 6.1, 5.5
	160.0		C3		60/60		Rock	REC = 100%, RQD = 63%
						3		Very hard, fresh, extremely fractured to sound, gray with white mottles, fine-grained to medium-grained, RHYOLITE
15								REMARK 3: Lost water at depth of 14' through end of boring.
		16						C4 - min/ft: 3.5, 3.0, 4.6, 4.6, 3.3
	155.0		C4		60/60			REC = 100%, RQD = 80%
								Hard to very hard, slightly weathered to fresh, extremely fractured to sound, gray with white mottles and green banding, medium-grained, RHYOLITE
20								
		21						C5 - min/ft: 7.3, 8.1, 12.2,11.2, 14.7
	150.0		C5		60/60			REC = 97%, RQD = 73%
								Very hard, slightly weathered to fresh, slightly fractured to sound, gray with white mottles and green banding, medium-grained, RHYOLITE
25								

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

B-101-OW

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		21						172.5	
		26	C6		60/60		Rock		C6 - min/ft: 9.0, 8.8, 14.6, 19.1, 2.7 REC = 100%, RQD = 91% Very hard, slightly weathered to fresh, moderately fractured to sound, gray with white mottles and green banding, medium-grained, RHYOLITE
	145.0								
30									
		31	C7		60/60				C7 - min/ft: 2.3, 4.7, 5.2, 6.3, 6.5 REC = 100%, RQD = 100% Very hard, slightly weathered to fresh, moderately fractured to sound, gray with white mottles and green banding, fine-grained to medium-grained, RHYOLITE
	140.0								
35									
		36						136.0	Bottom of borehole at 36.0 feet. Backfilled borehole with drill cuttings. Installed groundwater observation well.
	135.0								
40									
	130.0								
45									
	125.0								
50									
	120.0								
55									
	115.0								
60									

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BORING LOG

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PAGE 1 OF 1

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 5/10/21 **DATE COMPLETED:** 5/10/21
BORING LOCATION: Near NE corner of prop. building
COORDINATES: NA
SURFACE El.: 158.7 ft. (see note 1) **TOTAL DEPTH:** 23.5 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 2.5 ft. / El. 156.2 ft. Based on sample moisture.
AT END OF DRILLING: -
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile Drill B-48
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: QV **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-1-1-12 (2)	24/12		Forest Mat	0.5	S1 - Top 5": Forest Mat
		2	S2	22-100/2"	8/4		Subsoil	2.7 ▽	Bot 7": Silty SAND (SM), fine, trace medium, 35-40% fines, trace of organic soil, trace of roots, brown, moist S2 - Well Graded GRAVEL (GW), subangular to angular, ~5% fines, 5-10% medium to coarse sand, light brown, wet
		2.7							
	155.0	3.5	C1		60/59.5				C1 - min/ft: 8.9,7.3, 8.0, 8.8, 8.2 REC = 99%, RQD = 95% Very hard, slightly weathered to fresh, moderately fractured to sound, gray, medium-grained, RHYOLITE
5									
	150.0	8.5	C2		60/55				C2 - min/ft: 10.1, 10.5, 10.7, 18.8, 2.8 REC = 91.7%, RQD = 71.7% Very hard, slightly weathered to fresh, moderately fractured to sound, gray, medium-grained, RHYOLITE
10							Rock		
	145.0	13.5	C3		60/60				C3 - min/ft: 5.7, 6.7, 2.8, 3.7, 6.1 REC = 100%, RQD = 90% Hard, slightly weathered to fresh, moderately fractured to sound, gray with green mottles, medium-grained to coarse-grained, RHYOLITE
15									
	140.0	18.5	C4		60/60				C4 - min/ft: 3.9, 3.8, 6.8, 6.6, 7.3 REC = 100%, RQD = 96.7% Hard, slightly weathered to fresh, moderately fractured to sound, gray with green and white mottles, medium-grained, RHYOLITE
20									
	135.0	23.5						23.5	Bottom of borehole at 23.5 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

B-103
PAGE 1 OF 1

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 5/7/21 **DATE COMPLETED:** 5/14/21
BORING LOCATION: Near NW portion of prop. building
COORDINATES: NA
SURFACE El.: 174.6 ft. (see note 1) **TOTAL DEPTH:** 23.5 ft.
WEATHER: 50's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 0.1 ft. / El. 174.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 3-inch casing
DRILL RIG TYPE/MODEL: Mobile Drill B-48
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: NP / FR **CHECKED BY:** AML

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		0	S1	1-1-2-100/4" (3)	22/7		Forest Mat	S1 - Top 4": Forest Mat, trace of organic soil, trace of roots Bottom 3": Silty SAND (SM), fine to coarse, 20-25% fines, trace of roots, trace of organic soil, trace of pine needles, brown, moist
		1.8				1		Depth El.(ft.) 1.8 / 172.8 REMARK 1: Split spoon sampler refusal encountered on rock at depth of 1.8'. Advanced to 3.5' to seat casing and started coring. Drilled used series 10 bit to make coring faster.
		3.5	C1		60/55			C1 - min/ft: 19.0, 55.0, 33.0, 7.0, 44.0 REC = 85%, RQD = 40% Hard, slightly weathered to fresh, extremely fractured to slightly fractured, gray, medium-grained, RHYOLITE
5	170.0							
		8.5	C2		60/54	2		C2 - min/ft: 25.0, 34.5, 14.5, 42.1, 145.0 REC = 90%, RQD = 63.3% Very hard, slightly weathered to fresh, extremely fractured to slightly fractured, gray, medium-grained, RHYOLITE REMARK 2: Rock core sampler jammed at depth of 10'.
10	165.0							
		13.5	C3		60/60	3 4	Rock	REMARK 3: Rock core sampler jammed at depth of 12.7' C3 - min/ft: 130.0, 8.0, 6.0, 8.5, 22.0 REC = 100%, RQD = 83.3% Very hard, fresh, moderately fractured to sound, gray, medium-grained, RHYOLITE REMARK 4: Rock became softer and faster to core at depth of 15.5'.
15	160.0							
		18.5	C4		60/57			C4 - min/ft: 18.0, 15.0, 25.0, 8.0, 11.0 REC = 95%, RQD = 88.3% Very hard, slightly weathered to fresh, extremely fractured to sound, gray, medium-grained, RHYOLITE
20	155.0							
		23.5						23.5 Bottom of borehole at 23.5 feet. Backfilled borehole with drill cuttings.
25	150.0							

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

B-104-OW

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 5/12/21 **DATE COMPLETED:** 5/12/21
BORING LOCATION: Near southern portion of prop. building
COORDINATES: NA
SURFACE El.: 180.9 ft. (see note 1) **TOTAL DEPTH:** 27 ft.
WEATHER: 50's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 0.0 ft. / El. 180.9 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 3-inch casing
DRILL RIG TYPE/MODEL: Mobile Drill B-48
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: NP / FR **CHECKED BY:** AML

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
	180.0	0	S1	1-100/2"	8/1	1	Forest Mat	S1 - Forest Mat REMARK 1: Split spoon sampler refusal encountered at depth of 8" on rock.
		0.7						Depth El.(ft.) 0.7 180.2
		2	C1		60/60			C1 - min/ft: 5.2, 5.1, 4.1, 3.1, 3.1 REC = 100%, RQD = 76.7% Hard to very hard, slightly weathered to fresh, moderately fractured to sound, gray, fine-grained to medium-grained, RHYOLITE
5	175.0	7	C2		60/59			C2 - min/ft: 2.6, 2.5, 2.5, 2.9, 3.1 REC = 98.3, RQD = 67.5% Hard to very hard, moderately weathered to fresh, moderately fractured to sound, gray, fine-grained to medium-grained, RHYOLITE
10	170.0	12	C3		60/60		Rock	C3 - min/ft: 2.7, 2.5, 2.3, 2.7, 3.2 REC = 100%, RQD = 81.7% Hard to very hard, slightly weathered to fresh, moderately fractured to sound, gray, fine-grained to medium-grained, RHYOLITE
15	165.0	17	C4		60/60			C4 - min/ft: 5.2, 5.7, 3.5, 6.0, 7.1 REC = 100%, RQD = 93.3% Hard to very hard, fresh, moderately fractured to sound, gray, fine-grained to medium-grained, RHYOLITE
20	160.0	22	C5		60/60			C5 - min/ft: 5.5, 4.5, 5.3, 4.2, 4.5 REC = 100%, RQD = 84.2% Hard to very hard, fresh, moderately fractured to sound, gray, fine-grained to medium-grained, RHYOLITE
25								

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

B-104-OW

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	155.0	22					Rock	180.2	
		27						27.0	Bottom of borehole at 27.0 feet. Backfilled borehole with drill cuttings. Installed groundwater observation well.
30	150.0								
35	145.0								
40	140.0								
45	135.0								
50	130.0								
55	125.0								
60									

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BORING LOG

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PAGE 1 OF 1

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/26/21 **DATE COMPLETED:** 4/26/21
BORING LOCATION: Near SW corner of prop. building
COORDINATES: NA
SURFACE El.: 161.5 ft. (see note 1) **TOTAL DEPTH:** 17 ft.
WEATHER: 50's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 2.0 ft. / El. 159.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-25 Track Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: NP **CHECKED BY:** AML

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Forest Mat	0.3	S1 - Top 4": Forest Mat
	160.0		S1	1-3-2-3 (5)	24/12		Subsoil		Bot 8": Silty SAND (SM), fine to medium, 30-35% fines, 5-10% fine subrounded gravel, trace of organic soil, trace of roots, brown, moist
		2						2.0 ▼	
			S2	4-33-67	18/11		Sand		S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, ~10% fines, ~25% fine to coarse subrounded gravel, light brown, moist (natural)
		3.5						3.5	
5	155.0								
		7	C1		60/57		Rock		C1 - min/ft: 3.5, 5.1, 10.5, 31.2, 32.1 REC = 95%, RQD = 95% Hard to very hard, slightly weathered to fresh, slightly fractured to sound, gray with brown mottles, fine-grained to medium-grained, RHYOLITE
10	150.0								
		12				1			REMARK 1: Switched to series 6 turbo rock core bit from a series 4 rock core bit at depth of 12'.
			C2		60/54				C2 - min/ft: 8.1, 8.5, 15.2, 18.1, 19.2 REC = 90%, RQD = 86.7% Hard to very hard, fresh, moderately fractured to sound, gray, fine-grained to medium-grained, RHYOLITE
15	145.0								
		17						17.0	
									Bottom of borehole at 17.0 feet. Backfilled borehole with drill cuttings.
20	140.0								
25									

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Drummey Rosane Anderson, Inc.
PROJECT NAME: Prop. Northeast Metro Reg. Vocational Tech. H.S.
LGCI PROJECT NUMBER: 2025
PROJECT LOCATION: Wakefield, MA

DATE STARTED: 4/27/21 **DATE COMPLETED:** 5/14/21
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 161.9 ft. (see note 1) **TOTAL DEPTH:** 11.5 ft.
WEATHER: 50's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 1.0 ft. / El. 160.9 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Deidrich D-25 Track Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: NP / FR **CHECKED BY:** AML

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-3-100/3"	15/4		Forest Mat	1.4 160.5	S1 - Forest Mat
	160.0	1.3				1			REMARK 1: Split spoon sampler refusal encountered on rock at depth of 1.4'.
		3.5	C1		36/29.5		Rock		C1 - min/ft: 32.9, 65.1, 42.0 REC = 82%, RQD = 75% Hard to very hard, fresh, moderately fractured to sound, gray, fine-grained to medium-grained, RHYOLITE
5	155.0	6.5	C2		60/56				C2 - min/ft: 5.5, 5.0, 6.0, 2.5, 6.5 REC = 93%, RQD = 75% Hard to very hard, fresh, extremely fractured to sound, blue, fine-grained to medium-grained, RHYOLITE
10	150.0	11.5						11.5	Bottom of borehole at 11.5 feet. Backfilled borehole with drill cuttings.
15	145.0								
20	140.0								
25									

GENERAL NOTES:

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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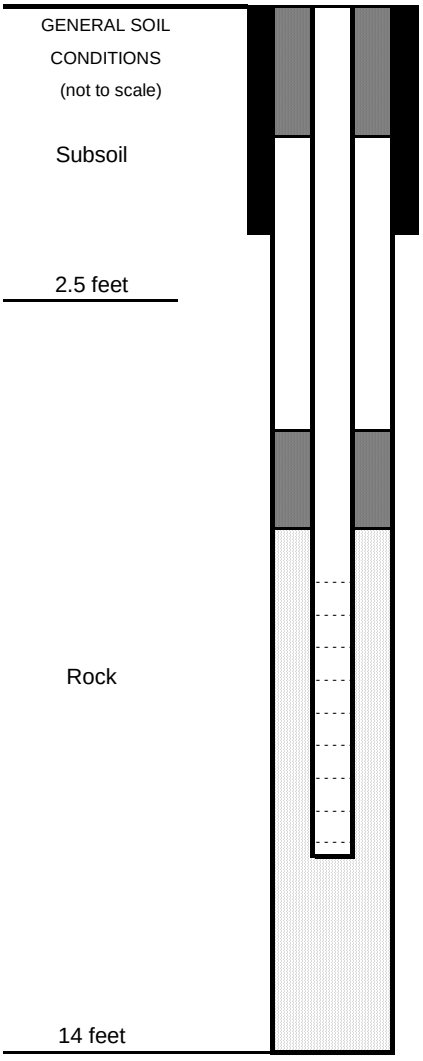
GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-1-OW**

Project Name: **Proposed Northeast Metro Regional Vocational Technical High School, Wakefield, MA**	
LGCI Project Number: **2025**	
Client: **Drummey Rosane Anderson, Inc.**	
Drilling Subcontractor: Northern Drill Services, Inc.	Date Started: 12/10/20
Drilling Foreman: Jon Beirholm	Date Completed: 12/10/20
LGCI Engineer: Tom Greenwood	Location: Near NW corner of proposed building
Ground Surface Elevation: 184.5 feet	Total Depth of Boring: 14 feet
Groundwater Depth: 10 feet below ground surface	Drill Rig Type: Mobile Drill B-48
	Drilling Method: Drive and wash with 4-inch casing



Riser Stickup 3.1 feet above ground surface

THICKNESS OF SURFACE SEAL	1 foot
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Riser pipe
ID OF SURFACE CASING	4 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Filter sand
DEPTH TO TOP OF SEAL	2 feet
TYPE OF SEAL	Bentonite
DEPTH TO BOTTOM OF SEAL	3 feet
DEPTH TO TOP OF PERVIOUS SECTION	4 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Filter sand (Holliston sand)
DEPTH TO BOTTOM OF PERVIOUS SECTION	14 feet
DEPTH TO BOTTOM OF SAND COLUMN	14 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Filter sand (Holliston sand)
DIAMETER OF BOREHOLE	4 inch
DEPTH TO BOTTOM OF BOREHOLE	14 feet

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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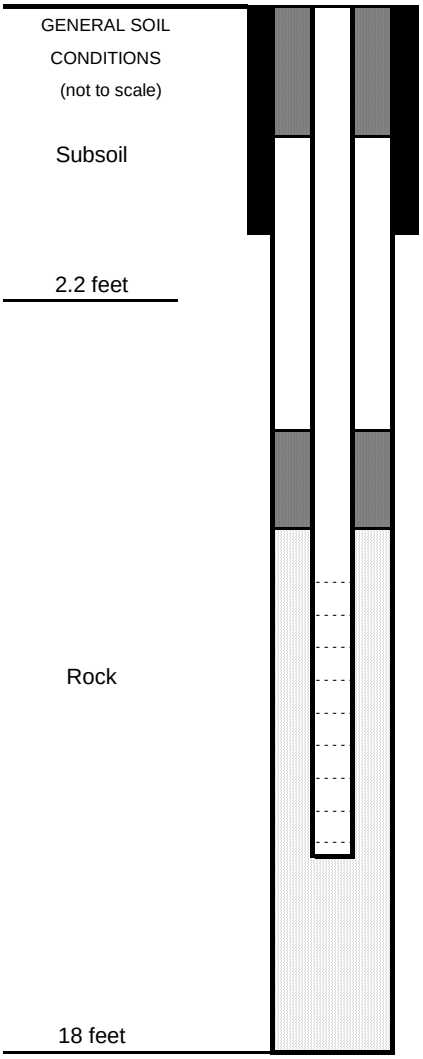
Lahlaf Geotechnical Consulting, Inc.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-3-OW**

Project Name: **Proposed Northeast Metro Regional Vocational Technical High School, Wakefield, MA**	
LGCI Project Number: **2025**	
Client: **Drummey Rosane Anderson, Inc.**	
Drilling Subcontractor: Northern Drill Services, Inc.	Date Started: 12/10/20
Drilling Foreman: Jon Beirholm	Date Completed: 12/11/20
LGCI Engineer: Tom Greenwood	Location: Near SE corner of proposed building
Ground Surface Elevation: 170.5 feet	Total Depth of Boring: 18 feet
Groundwater Depth: 4.9 feet below ground surface	Drill Rig Type: Mobile Drill B-48
	Drilling Method: Drive and wash with 4-inch casing



Riser Stickup 3.1 feet above ground surface

THICKNESS OF SURFACE SEAL	1 foot
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Riser pipe
ID OF SURFACE CASING	4 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Filter sand
DEPTH TO TOP OF SEAL	4 feet
TYPE OF SEAL	Bentonite
DEPTH TO BOTTOM OF SEAL	6 feet
DEPTH TO TOP OF PERVIOUS SECTION	8 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Filter sand (Holliston sand)
DEPTH TO BOTTOM OF PERVIOUS SECTION	18 feet
DEPTH TO BOTTOM OF SAND COLUMN	18 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Filter sand (Holliston sand)
DIAMETER OF BOREHOLE	4 inch
DEPTH TO BOTTOM OF BOREHOLE	18 feet

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

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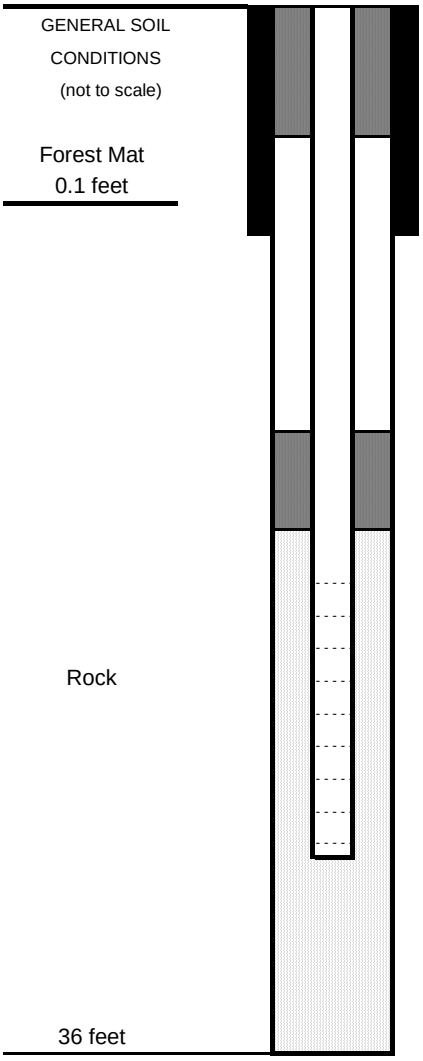
GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-101-OW**

Project Name: **Proposed Northeast Metro Regional Vocational Technical High School, Wakefield, MA**	
LGCI Project Number: **2025**	
Client: **Drummey Rosane Anderson, Inc.**	
Drilling Subcontractor: Northern Drill Services, Inc.	Date Started: 5/10/21
Drilling Foreman: Jon Beirholm	Date Completed: 5/11/21
LGCI Engineer: Tom Greenwood	Location: Near NW corner of proposed building
Ground Surface Elevation: 172.6 feet	Total Depth of Boring: 36 feet
Groundwater Depth: 5.2 feet below ground surface	Drill Rig Type: Mobile Drill B-48
	Drilling Method: Drive and wash with 3-inch casing



Riser Stickup 3.8 feet above ground surface

THICKNESS OF SURFACE SEAL	1 foot
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Riser pipe
ID OF SURFACE CASING	4 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Filter sand
DEPTH TO TOP OF SEAL	1 foot
TYPE OF SEAL	Bentonite
DEPTH TO BOTTOM OF SEAL	2 feet
DEPTH TO TOP OF PERVIOUS SECTION	16 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Filter sand (Holliston sand)
DEPTH TO BOTTOM OF PERVIOUS SECTION	36 feet
DEPTH TO BOTTOM OF SAND COLUMN	36 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Filter sand (Holliston sand)
DIAMETER OF BOREHOLE	3 inch
DEPTH TO BOTTOM OF BOREHOLE	36 feet

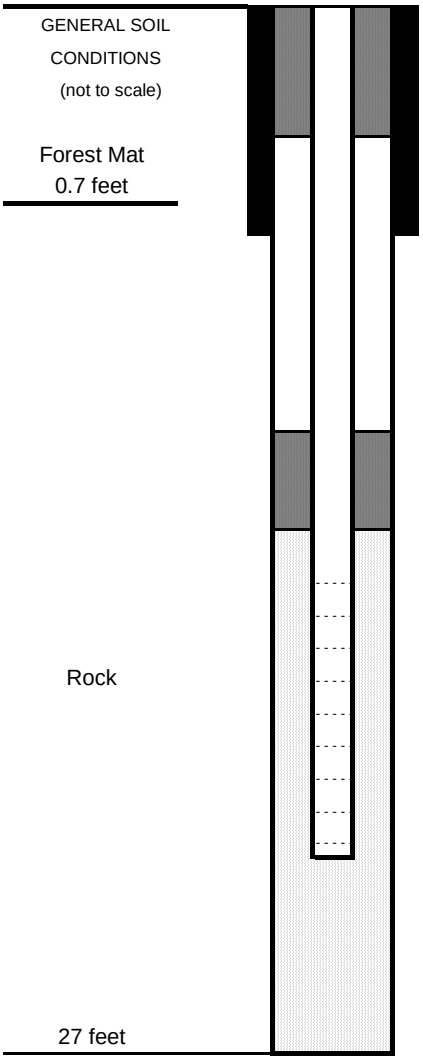
1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

LGCI
Lahlaf Geotechnical Consulting, Inc.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-104-OW**

Project Name: **Proposed Northeast Metro Regional Vocational Technical High School, Wakefield, MA**	
LGCI Project Number: **2025**	
Client: **Drummey Rosane Anderson, Inc.**	
Drilling Subcontractor: Northern Drill Services, Inc.	Date Started: 5/12/21
Drilling Foreman: Jon Beirholm	Date Completed: 5/12/21
LGCI Engineer: Nicholas Proulx	Location: Southern portion of proposed building
Ground Surface Elevation: 180.9 feet	Total Depth of Boring: 27 feet
Groundwater Depth: 0.0 feet below ground surface	Drill Rig Type: Mobile Drill B-48
	Drilling Method: Drive and wash with 3-inch casing



Riser Stickup 4.2 feet above ground surface

THICKNESS OF SURFACE SEAL	1 foot
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Riser pipe
ID OF SURFACE CASING	4 inch
DEPTH TO BOTTOM OF CASING	1 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Filter sand
DEPTH TO TOP OF SEAL	1 foot
TYPE OF SEAL	Bentonite
DEPTH TO BOTTOM OF SEAL	2 feet
DEPTH TO TOP OF PERVIOUS SECTION	7 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Filter sand (Holliston sand)
DEPTH TO BOTTOM OF PERVIOUS SECTION	27 feet
DEPTH TO BOTTOM OF SAND COLUMN	27 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Filter sand (Holliston sand)
DIAMETER OF BOREHOLE	3 inch
DEPTH TO BOTTOM OF BOREHOLE	27 feet

1. The ground surface elevation was surveyed by Nitsch Engineering, Inc. (Nitsch) and was obtained by LGCI from drawings EX-1 to EX-13 titled: "Topographic Survey, Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, MA," prepared by Nitsch and provided to us by Nitsch via e-mail on June 4, 2021.

Core Photos (from top): B-1-C1, B-1-C2, B-3-C1, B-3-C2

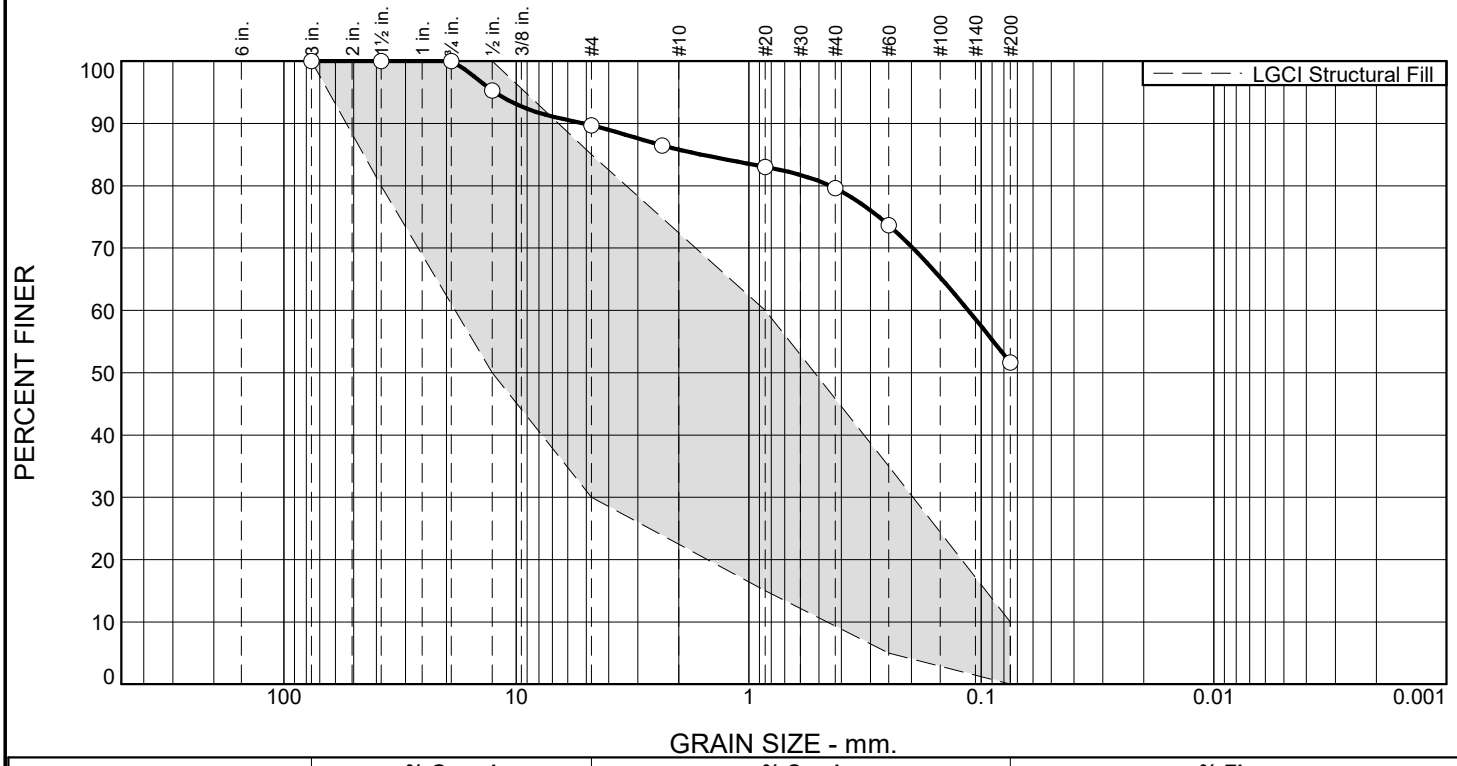
Core Photos (from top): B-1-C1, B-1-C2, B-3-C1, B-3-C2

Core Photos (from top): B-104-OW-C1, B-104-OW-C2, B-4-OW-C3, B14-OW-C4

Core Photos (from top): B-105-C1, B-105-C2, B-105-C1

APPENDIX E – Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	10.3	3.9	6.2	28.0	51.6	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	95.3	50.0 - 100.0	
#4	89.7	30.0 - 85.0	X
#8	86.5		
#20	83.0	15.0 - 60.0	X
#40	79.6		
#60	73.7	5.0 - 35.0	X
#200	51.6	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Sandy SILT (ML), 35-40% fine sand, 10-15% fine subrounded gravel, trace of organic soil, trace of roots, trace of wood, brown, wet

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 5.1253 D_{85}= 1.5952 D_{60}= 0.1137
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Subsoil

Date Received: 12/3/2020 **Date Tested:** 12/9/2020

Tested By: TG

Checked By: AML

Location: Test Pit TP-1
Depth: 0.7' - 3.5'

Date Sampled: 12/3/2020

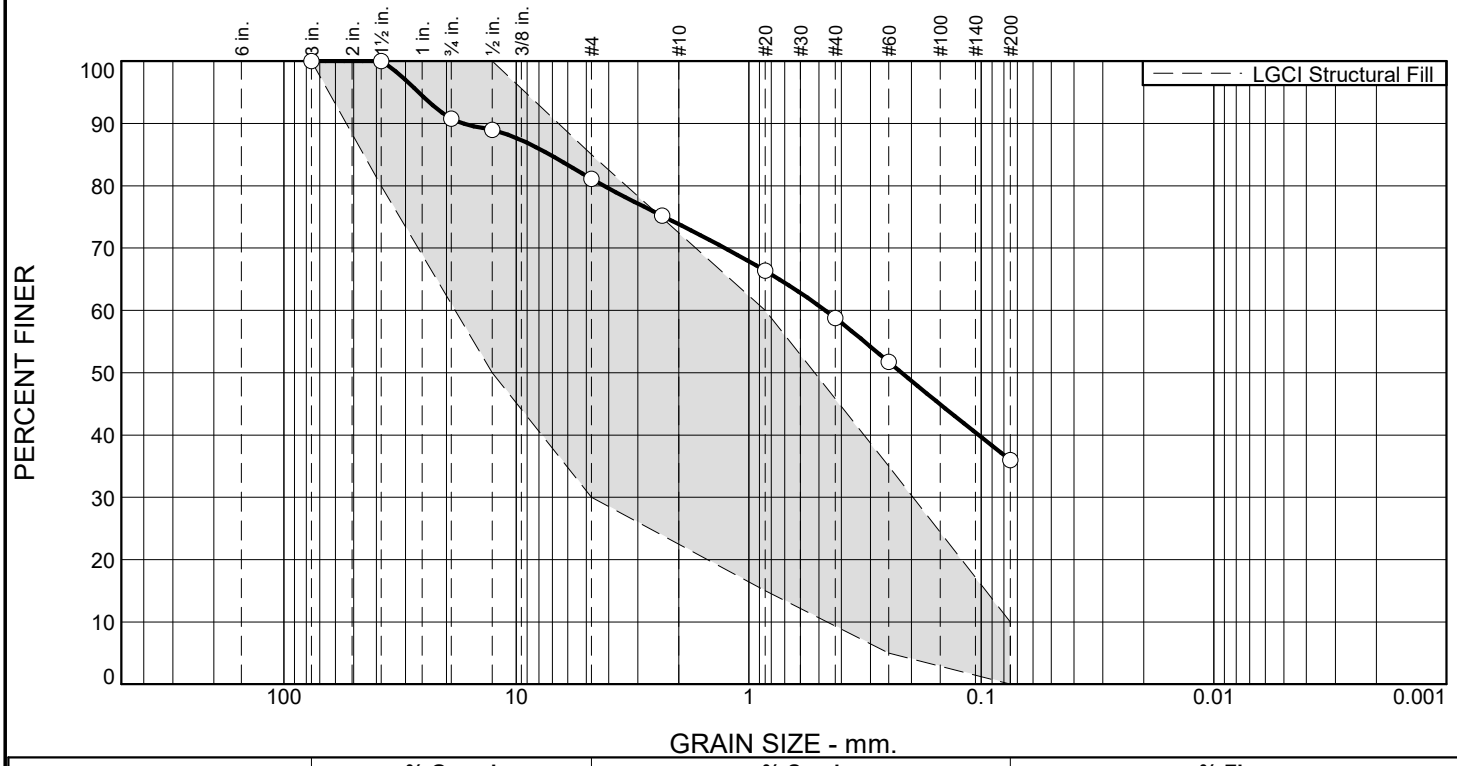
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Drummey Rosane Anderson, Inc.

Project: Proposed Northeast Metro Reg. Vocational Tech. H.S., Wakefield, MA

Project No: 2025 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.2	9.7	7.3	15.0	22.9	35.9	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	90.8		
0.5"	89.0	50.0 - 100.0	
#4	81.1	30.0 - 85.0	
#8	75.2		
#20	66.4	15.0 - 60.0	X
#40	58.8		
#60	51.7	5.0 - 35.0	X
#200	35.9	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel, fine to coarse, 35-40% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, trace of roots, light brown, moist

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 16.9724 D_{85}= 7.1728 D_{60}= 0.4689
D_{50}= 0.2202 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Subsoil

Date Received: 12/3/2020 **Date Tested:** 12/9/2020

Tested By: TG

Checked By: AML

Location: Test Pit TP-5
Depth: 0.5'- 3.5'

Date Sampled: 12/3/2020

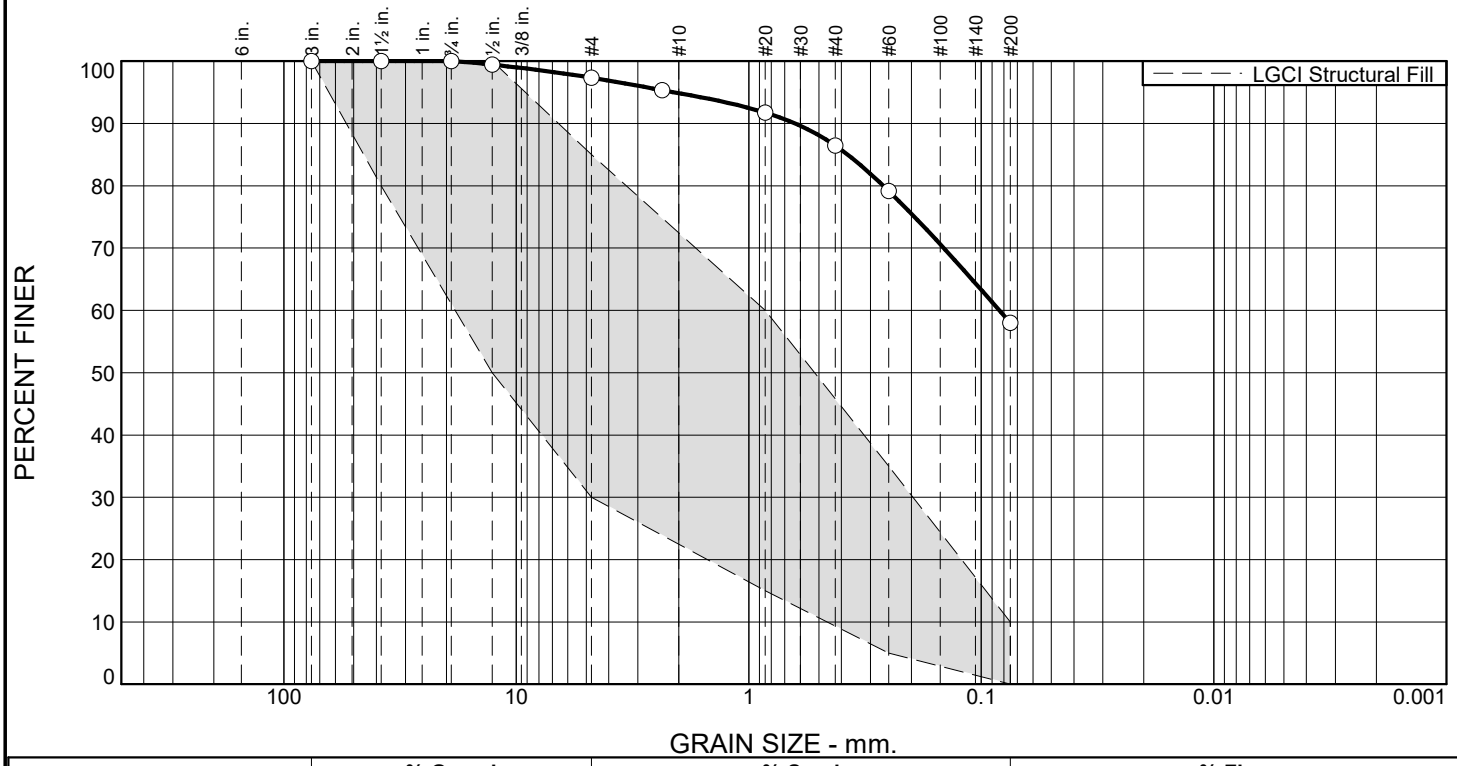
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Drummey Rosane Anderson, Inc.

Project: Proposed Northeast Metro Reg. Vocational Tech. H.S., Wakefield, MA

Project No: 2025 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.6	2.5	8.4	28.5	58.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	99.4	50.0 - 100.0	
#4	97.4	30.0 - 85.0	X
#8	95.4		
#20	91.7	15.0 - 60.0	X
#40	86.5		
#60	79.2	5.0 - 35.0	X
#200	58.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Sandy SILT (ML), 35-40% fine sand, 0-5% fine subrounded gravel, trace of organic soil, trace of roots, 0-5% cobbles, brown

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.6334 D_{85}= 0.3753 D_{60}= 0.0836
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Subsoil

Date Received: 12/3/2020 **Date Tested:** 12/9/2020

Tested By: TG

Checked By: AML

Location: Test Pit TP-6
Depth: 0.5' - 3'

Date Sampled: 12/3/2020

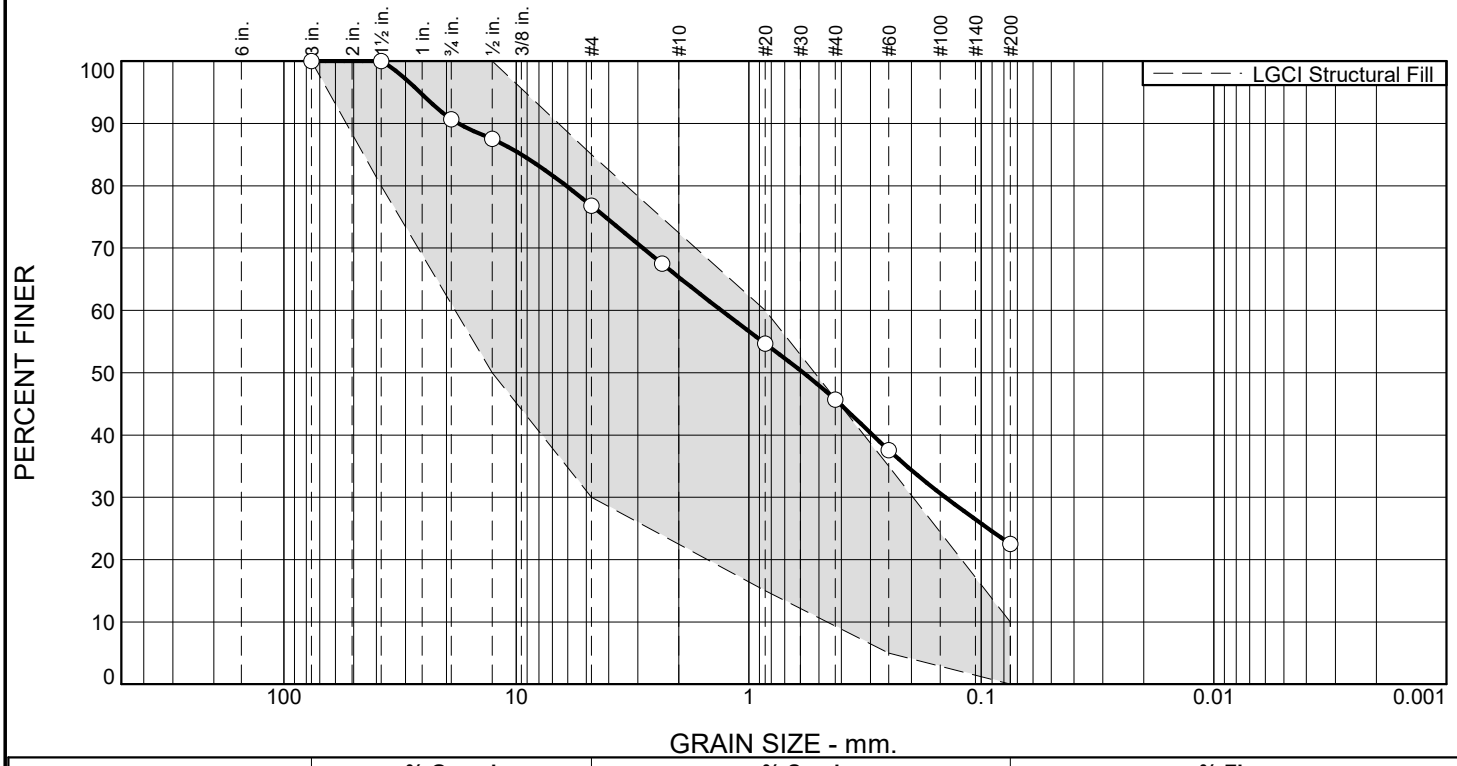
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Drummey Rosane Anderson, Inc.

Project: Proposed Northeast Metro Reg. Vocational Tech. H.S., Wakefield, MA

Project No: 2025 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.3	13.9	11.5	19.6	23.2	22.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	90.7		
0.5"	87.5	50.0 - 100.0	
#4	76.8	30.0 - 85.0	
#8	67.5		
#20	54.7	15.0 - 60.0	
#40	45.7		
#60	37.6	5.0 - 35.0	X
#200	22.5	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 20-25% fine to coarse subrounded gravel, gray, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 17.7802 D_{85}= 9.4700 D_{60}= 1.3106
D_{50}= 0.5834 D_{30}= 0.1424 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sand

Date Received: 12/4/2020 **Date Tested:** 12/9/2020

Tested By: TG

Checked By: AML

Location: Test Pit TP-9
Depth: 1.9' - 6.2'

Date Sampled: 12/4/2020

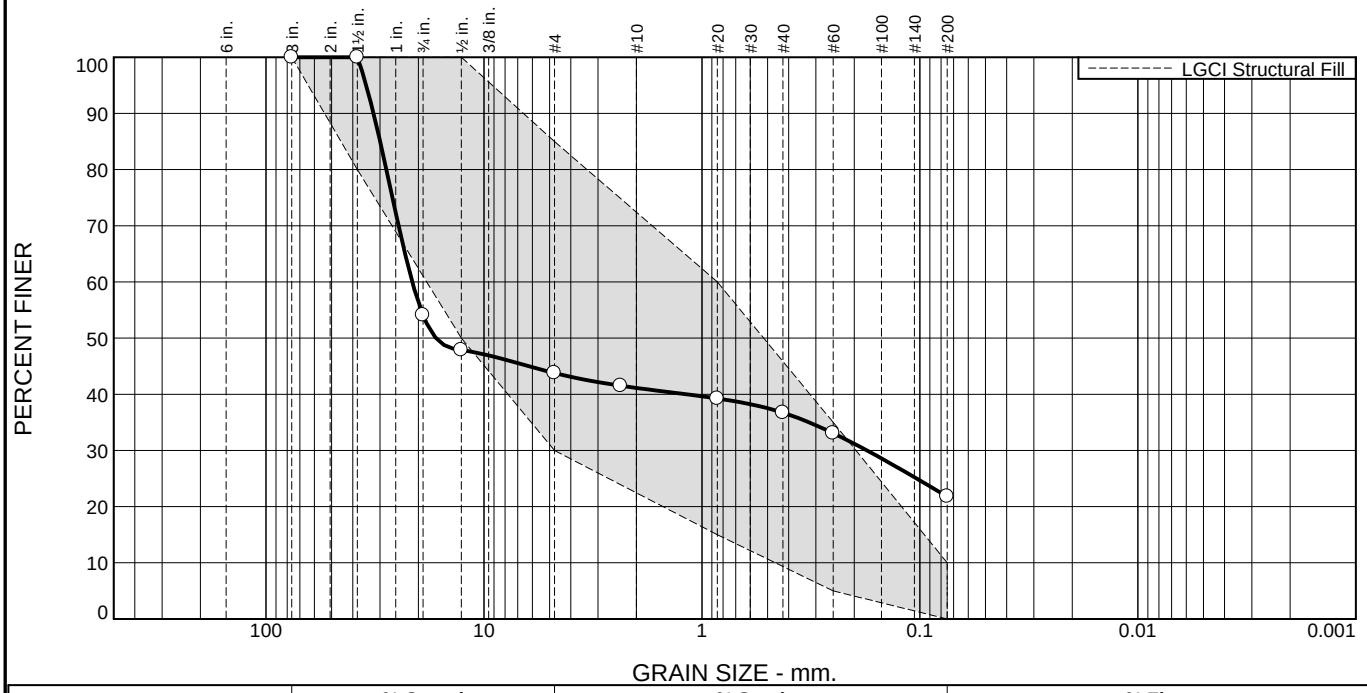
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Drummey Rosane Anderson, Inc.

Project: Proposed Northeast Metro Reg. Vocational Tech. H.S., Wakefield, MA

Project No: 2025 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	45.9	10.3	2.7	4.4	14.9	21.8	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	54.1		
0.5"	47.9	50.0 - 100.0	X
#4	43.8	30.0 - 85.0	
#8	41.5		
#20	39.2	15.0 - 60.0	
#40	36.7		
#60	33.1	5.0 - 35.0	
#200	21.8	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty GRAVEL with Sand (GM), fine to coarse, 20-25% fines, 20-25% fine to coarse sand, trace of organic soil, trace of roots, brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 32.1157 D_{85}= 29.9725 D_{60}= 21.3315
D_{50}= 16.6162 D_{30}= 0.1750 D_{15}=
D_{10}= C_u= C_c=

Remarks

Subsoil

Date Received: 4/19/21 **Date Tested:** 5/17/21

Tested By: KK

Checked By: IM

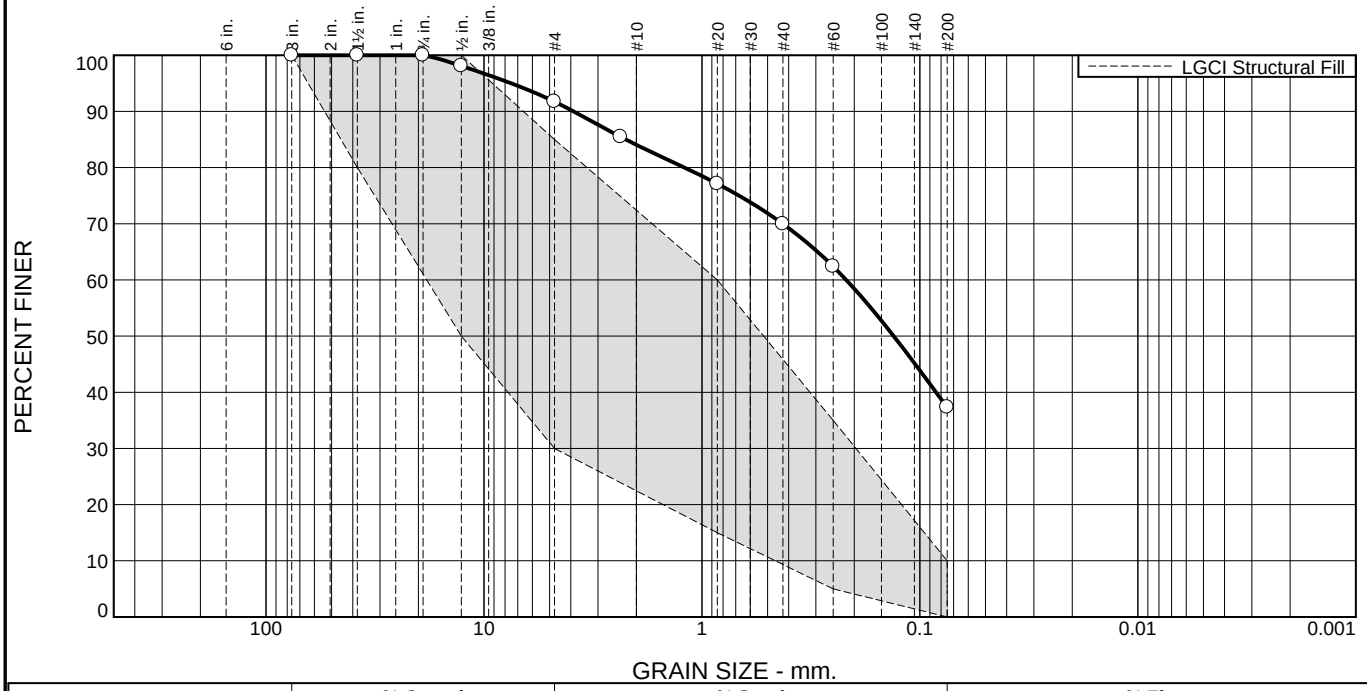
Location: TP-104
Depth: 0.5'-2.5'

Date Sampled: 4/19/21

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Drummey Rosane Anderson, Inc.
Project: Prop. Northeast Metropolitan Regional Vocational Technical High School, Wakefield MA
Project No: 2025 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.3	7.6	14.1	32.7	37.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	98.1	50.0 - 100.0	
#4	91.7	30.0 - 85.0	X
#8	85.5		
#20	77.1	15.0 - 60.0	X
#40	70.0		
#60	62.4	5.0 - 35.0	X
#200	37.3	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to coarse, 35-40% fines, 5-10% fine gravel, trace of organic soil, trace of roots, brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 3.8810 D_{85}= 2.2358 D_{60}= 0.2178
D_{50}= 0.1319 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Subsoil

Date Received: 4/20/2021 **Date Tested:** 5/17/2021

Tested By: KK

Checked By: IM

Location: TP-106
Depth: 0.5'-3.2'

Date Sampled: 4/20/2021

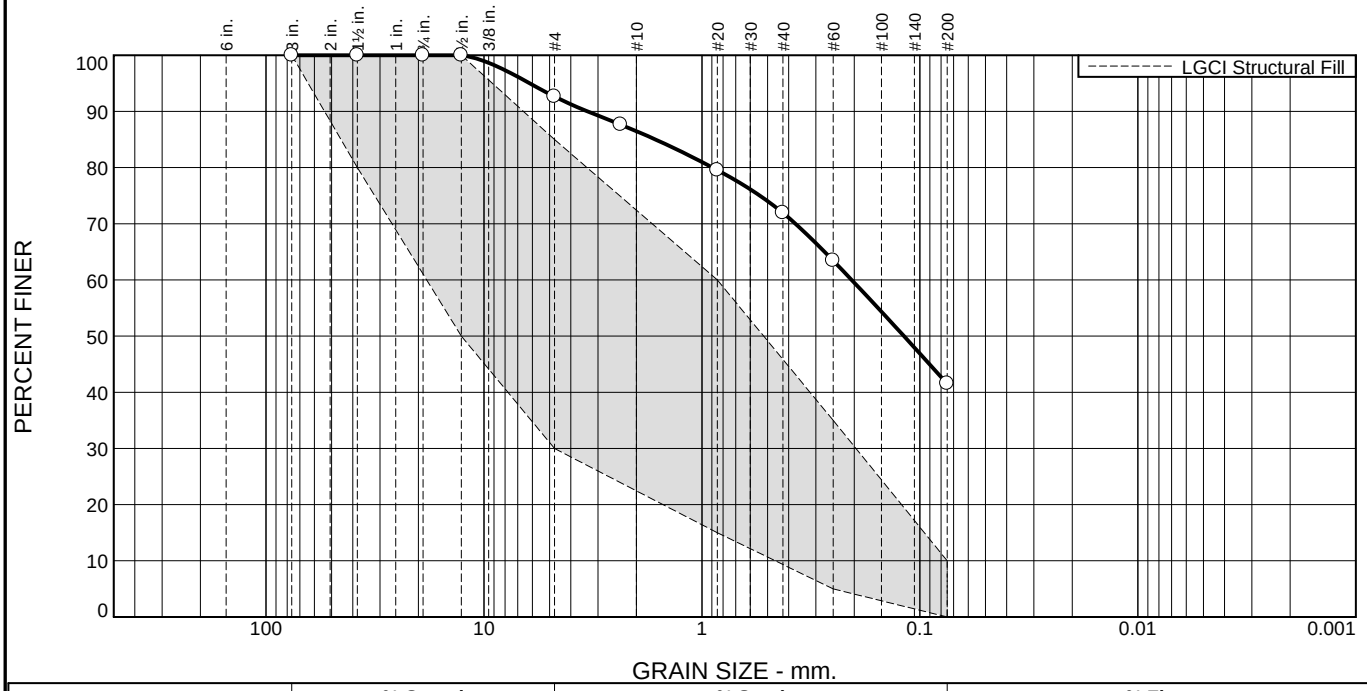
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Drummey Rosane Anderson, Inc.

Project: Prop. Northeast Metropolitan Regional Vocational Technical High School, Wakefield MA

Project No: 2025 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	7.4	6.1	14.6	30.4	41.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	92.6	30.0 - 85.0	X
#8	87.6		
#20	79.6	15.0 - 60.0	X
#40	71.9		
#60	63.4	5.0 - 35.0	X
#200	41.5	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to coarse, 40-45% fines, 5-10% fine subrounded to subangular gravel, gray, moist to wet

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 3.3466 D_{85}= 1.6352 D_{60}= 0.2056
D_{50}= 0.1184 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Sand

Date Received: 4/20/2021 **Date Tested:** 5/17/2021

Tested By: KK

Checked By: IM

Location: TP-107
Depth: 2.1'-3.1'

Date Sampled: 4/20/2021

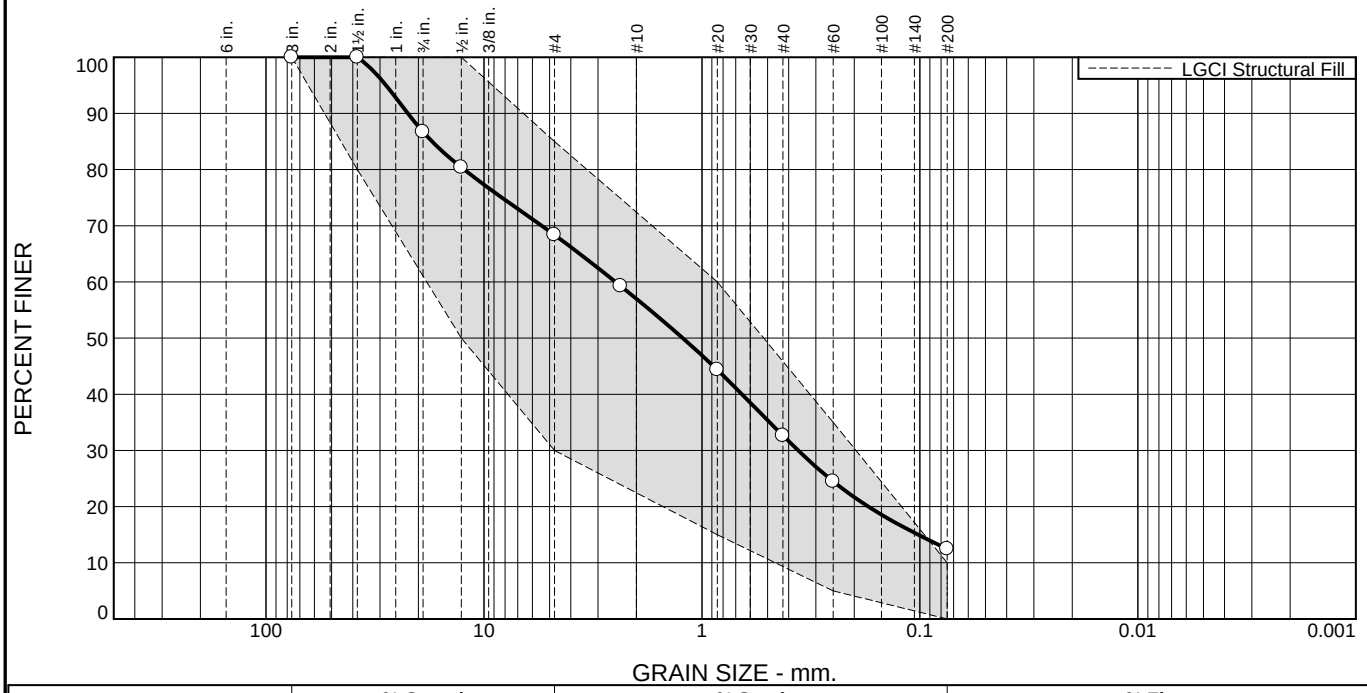
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Drummey Rosane Anderson, Inc.

Project: Prop. Northeast Metropolitan Regional Vocational Technical High School, Wakefield MA

Project No: 2025 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.3	18.3	11.4	24.4	20.1	12.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	86.7		
0.5"	80.4	50.0 - 100.0	
#4	68.4	30.0 - 85.0	
#8	59.3		
#20	44.3	15.0 - 60.0	
#40	32.6		
#60	24.5	5.0 - 35.0	
#200	12.5	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt and Gravel (SW-SM), fine to corse, 10-15% fines, 30-35% fine to coarse subrounded gravel, trace of roots, light brown, moist

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 22.3370 D_{85}= 17.3210 D_{60}= 2.4930
D_{50}= 1.2241 D_{30}= 0.3617 D_{15}= 0.1018
D_{10}= C_u= C_c=

Remarks

Natural Sand

Date Received: 4/19/2021 **Date Tested:** 5/17/2021

Tested By: KK

Checked By: IM

Location: TP-113
Depth: 0.5'-3.0'

Date Sampled: 4/19/2021

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Drummey Rosane Anderson, Inc.
Project: Prop. Northeast Metropolitan Regional Vocational Technical High School, Wakefield MA
Project No: 2025 **Figure**

Nitsch Engineering

Traffic Impact Study

Northeast Metropolitan Regional Vocational High School Wakefield, MA

June 29, 2021

Prepared for:

Drumney Rosane Anderson, Inc.
235 Bear Hill Road, 4th
Waltham, MA 02451

Submitted by:

Nitsch Engineering
2 Center Plaza, Suite 430
Boston, MA 02108

Nitsch Project #13872.2

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1 Executive Summary

Nitsch Engineering has completed a detailed Traffic Impact Study (TIS) to evaluate the potential impacts of constructing a new Northeast Metropolitan Regional Vocational High School (NEMT) building and grounds on the existing NEMT site to accommodate 1,600 students.

The proposed school option will provide many enhancements to traffic circulations and controls such as providing a new access road from Farm Street south of Hemlock Road, an extended parent queue on site, dedicated bus loop to separate cars and buses, providing a dedicated delivery access and increased parking.

1.1 Trip Generation and Access

The new school is anticipated to generate 3,248 daily trips, 880 weekday morning peak school hour trips, 528 weekday afternoon peak school hour trips, and 160 Saturday midday peak hour trips. Per the traffic volume data collected at the intersection of Farm Street and Hemlock Road, this represents an increase in 686 daily trips, 220 trips during the weekday morning peak school hour, 132 trips during the weekday evening peak school hour, and 40 trips during the Saturday midday peak hour.

The Proposed School will be accessed from two driveways on Farm Street. All school traffic, including parental drop-off and pick-up, as well as the teachers and staff, will be encouraged to use the new driveway on Farm Street south of Hemlock Road. Parents dropping off and picking up their students will circulate around the new parking area in front of the main school entrance and then continue to exit the site via the new driveway. The bus pick-up/drop-off will occur at the designated bus circle located east of the school building. A dedicated loop road will be provided on-site for authorized vehicles only. The road will be used for either deliveries to the loading dock located at the west of the school building or for emergency vehicle access.

The addition of the new driveway will divert school traffic away from the Farm Street/Hemlock Road intersection. It is anticipated that 352 vehicles will be diverted during the weekday morning peak school hour, 211 vehicles will be diverted during the weekday afternoon peak school hour, and 64 vehicles during the Saturday midday peak hour.

1.2 Parental Drop-off/Pick-up

During the morning drop-off, 880 vehicles (parents and staff) will arrive via Hemlock Street and the new driveway on Farm Street between 7:00 AM and 7:45 AM to drop-off their students. The students will be dropped-off at the car loop, and the vehicles will exit to Farm Street.

During the afternoon pick-up, 528 vehicles will start arriving between 1:30 PM and 2:10 PM. Once the parents have picked up their students, they will proceed to exit the school lot via either Hemlock Street or the new driveway to Farm Street.

1.3 Parking

The school parking lot, when complete, will provide 484 striped parking spaces that include 11 accessible spaces, as well as 22 spaces designated for Green Vehicles and 10 spaces equipped with Electric Vehicle charging stations. This number exceeds the 416 parking spaces recommended by the Institute of Transportation Engineers (ITE) Parking Generation for land code 530 to facilitate parental parking during drop-off and pick-up times (see

Table 1). The curb at the car loop is approximately 360 linear feet, which can accommodate an additional 18 vehicles.

1.4 Mitigation and Recommendations

To determine the required infrastructure improvements associated with the new driveway, Nitsch Engineering conducted a Traffic Signal Warrant Analysis based on the regulations set forth in the *Manual of Uniform Traffic Control Devices* (MUTCD). Based on the analysis, a traffic signal is not warranted. However, to optimize traffic operations at the new intersection, a traffic signal with increased lane capacity is recommended.

2 Introduction

Nitsch Engineering has been retained by Drumney Rosane Anderson, Inc. ("DRA") to prepare a Traffic Impact Study (TIS) based on the schematic design for the planned on-site improvements at the Northeast Metropolitan Regional Vocational High School ("NEMT") in Wakefield, MA. As part of the Feasibility Study, the team was tasked to observe the existing traffic circulation and queue lengths on adjacent streets during drop-off and pick-up periods at the school and assess the site access alternatives. The access alternatives included:

- Existing access to remain off Hemlock Road only;
- An additional access road from Water Street; or
- An additional access road from Farm Street south of Hemlock Road.

It was determined and described in the Preferred Schematic Report (PSR), that the school will build the additional driveway from Farm Street approximately ½-mile south of Hemlock Road, near the intersection of Farm Street and Old Nahant Road.

This TIS will review the existing and proposed traffic volumes, operations, and safety of the adjacent surrounding roadways and intersections; as well as traffic patterns associated with the existing NEMT and Breakheart Reservation, including site access/egress, parent and bus pick-up/drop-off, traffic circulation, and parking supply/demand. This TIS will also analyze existing and future conditions at the intersections within the study area to establish the impact the proposed improvements would have on traffic operations.

2.1 Study Area

The study area includes five roadways and five intersections within and adjacent to the Project site that are affected by the development.

Roadways

- Water Street (Route 129);
- Farm Street;
- Nahant Street;
- Hemlock Road; and
- Old Nahant Road.

Intersections

- Water Street and Farm Street (signalized);
- Farm Street and Hemlock Road/Nahant Street (unsignalized);
- Hemlock Road and WMHS Back Parking Lot Drive (signalized);
- Farm Street and Old Nahant Road North (unsignalized); and
- Farm Street and Old Nahant Road South (unsignalized).

2.2 Methodology

The traffic analysis herein is summarized in the following sections:

1. An inventory of existing transportation conditions, including roadway capacities, parking, transit, pedestrian and bicycle circulation, and site conditions.
2. An evaluation of future transportation conditions and an assessment of potential traffic impacts associated with the Project and other neighboring projects. Long-term impacts are evaluated for the year 2028, based on a seven-year horizon from the 2021 base year. Expected roadway, parking, transit, and pedestrian conditions and deficiencies are identified. This section includes the following scenarios:
    a. The No-Build Scenario (2028) includes general background growth and additional vehicular traffic associated with specific proposed or planned developments and roadway changes in the vicinity of the Project site; and
    b. The Build Scenario (2028) includes specific travel demand forecasts for the Project.
3. An identification of appropriate measures to mitigate Project-related impacts.

The standards used for analysis conform to the 2009 edition of the Manual on Uniform Traffic Control Devices (MUTCD) and the 2010 edition of the Highway Capacity Manual.

The following conditions are analyzed in this report:

- Existing 2021 “Normal” Conditions;
- Future 2028 No-Build;
- Future 2028 Build; and

Figure 1 is the Locus Map showing the proximity of the Project Site and the surrounding roadway network. Figure 2 identifies the study intersections.

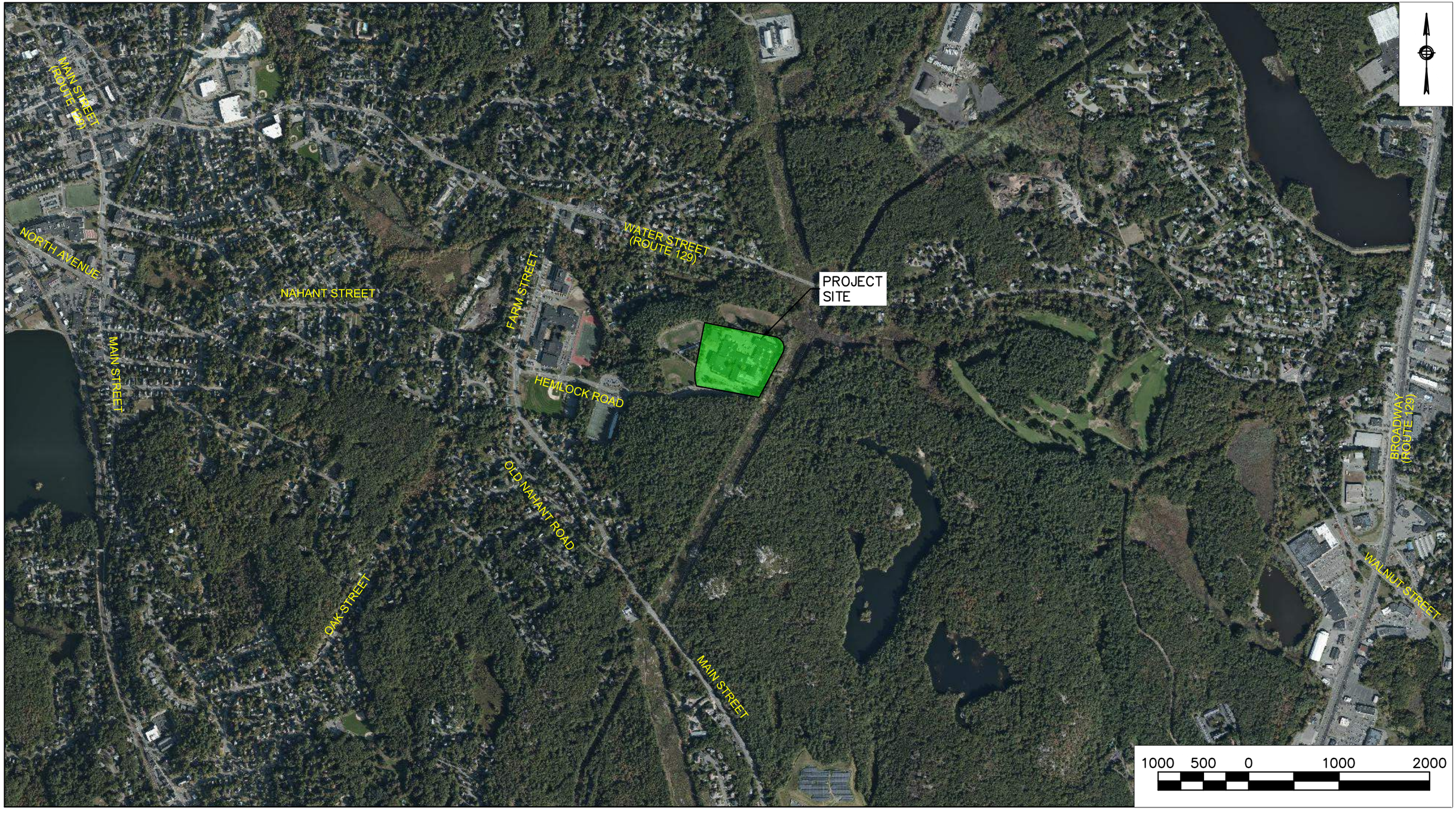

Figure 1: Locus Map
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

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STUDY INTERSECTIONS

1. WATER STREET AND FARM STREET
2. HEMLOCK ROAD AND DRIVEWAY
3. FARM STREET, NAHANT ROAD AND HEMLOCK ROAD
4. FARM STREET AND OLD NAHANT ROAD NORTH
5. FARM STREET AND OLD NAHANT ROAD SOUTH
6. FARM STREET AND NEW DRIVEWAY

Figure 2: Study Intersections
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

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3 Existing Conditions

3.1 Existing Site

The existing NEMT, located at 100 Hemlock Road in Wakefield, was formed in an agreement in 1964 by the twelve Massachusetts communities of Chelsea, Malden, Melrose, North Reading, Reading, Revere, Saugus, Stoneham, Wakefield, Winchester, Winthrop, and Woburn. The school serves Grades 9 through 12 with a total enrollment of about 1,250 students.

The site includes the school building, parking lot, baseball and football field, and basketball court. It is bound by Water Street and residential properties to the north, Breakheart Reservation to the east and south, and Wakefield Memorial High School (WMHS) to the west.

Site access is provided via Hemlock Road, which is a two-way roadway. Hemlock Road extends from Farm Lane, where it forms a three-legged unsignalized intersection, to the entrance to the NEMT. The road also serves as a main access point to the WMHS.

3.2 Breakheart Reservation

Breakheart Reservation is a public recreation area covering 652 acres in the towns of Saugus and Wakefield. The reservation features a hardwood forest, two freshwater lakes, a winding stretch of the Saugus River, and scenic views of Boston and rural New England from rocky hilltops. The park is managed by the Massachusetts Department of Conservation and Recreation.

3.3 Roadways

To examine the existing conditions, we studied and collected data at the following roadways:

Water Street (Route 129)

Water Street (Route 129) is classified by the MassDOT as an urban principal arterial that runs in a general east-west direction from its eastern terminus at Saugus Town Line to its western terminus at North Avenue. Water Street is 40 feet wide with one travel lane in each direction separated by a double yellow center line (DYCL). The roadway provides one 12-foot-wide lane and an eight-foot-wide shoulder in each direction. Bituminous concrete sidewalk is present on both sides of Water Street east of Farm Street and south side of Water Street west of Farm Street. The roadway is maintained by the Town of Wakefield. The posted speed limit along the roadway is 30 MPH. Bicycle accommodations are not present on Water Street. Land use along Water Street is primarily residential.

Farm Street

Farm Street is classified by the MassDOT as an urban minor arterial that runs in a general north-south direction, with its northern terminus at Water Street (Route 129) and its southern terminus at Saugus Town Line. South of Hemlock Road, Farm Street is 44 feet wide with one 18 -foot-wide travel lane and a four-foot-wide shoulder in each direction separated by a DYCL. Bituminous concrete sidewalk is present on the west side of Farm Street from Water Street to Old Nahant Road (south) and on the east side of Farm Street from Water Street to June Circle. The roadway is maintained by the Town of Wakefield. The posted speed limit along the roadway is 30 MPH. Land use along Farm Street is residential.

Hemlock Road

Hemlock Road is classified by the MassDOT as a local roadway and runs in a general west-east direction and provides access to the WMHS, NEMT, and the Breakheart Reservation. Hemlock Road is 32 feet wide with one travel lane in each direction separated by a DYCL. Bituminous concrete sidewalks are present on both sides of the roadway east of the WMHS Parking Lot Driveway. The roadway is maintained by the Department of Conservation and Recreation (DCR). The posted speed limit along the roadway is 15 MPH. A signalized midblock pedestrian crossing is present approximately 210 feet east of Farm Street that connects the High School parking lot and James M. Walsh Athletic Field.

Nahant Street

Nahant Street is classified by the MassDOT as an urban minor arterial and runs in a general west-east direction, with its western terminus at Main Street and its eastern terminus at Farm Street. Nahant Street is 28 feet wide with one 12-foot-wide travel lane and a two-foot-wide shoulder in each direction separated by a DYCL. Bituminous concrete sidewalk is present on the north side of the roadway. Nahant Street is maintained by the Town of Wakefield. The posted speed limit along the roadway is 20 MPH. Land use along Nahant Street is residential.

Old Nahant Road

Old Nahant Road is classified by the MassDOT as an urban collector and runs with a horseshoe pattern in a north-south direction with both its northern and southern terminuses at Farm Street. Old Nahant Road is 22 feet wide with one 11 travel lane in each direction separated by a DYCL. Bituminous concrete sidewalks are present on both sides of the roadway north of Oak Street and west side of the roadway south of Oak Street. The roadway is maintained by the Town of Wakefield. The posted speed limit along the roadway is 25 MPH. Land use along Old Nahant Road is residential.

3.4 Study Intersections

The study area includes four intersections (Figure 2). To examine the existing conditions, we designated the following intersections as the main intersections of the study.

Water Street (Route 129) and Farm Street

Water Street and Farm Street intersect to form a three-way signalized intersection, with Water Street approaching from the east and west, and Farm Street from the south.

The Farm Street northbound approach consists of a dedicated right-turn lane transitioning onto Water Street eastbound and an dedicated left-turn lane. The Water Street westbound approach consists of a through lane and an dedicated left-turn lane; and the Water Street eastbound approach consists of a through lane and an dedicated right-turn lane.

The intersection includes eight-foot-wide ADA accessible crosswalks across all the approaches. Bicycle accommodations are not present on any of the approaches.

The fully actuated traffic signal operates in four phases. The following movements are permitted or protected, as noted, during each of the phases.

First phase:

- Water Street westbound (protected left turn);
- Water Street westbound; and
- Farm Street northbound (right turn overlap)

Second phase:

- Water Street eastbound and westbound (permitted left turn).

Third phase (if actuated):

- Exclusive pedestrian phase for crossing Water Street eastbound, Water Street westbound, and Farm Street northbound.

Fourth phase:

- Farm Street northbound (protected left and right turn); and
- Water Street eastbound (right turn overlap).

Farm Street and Hemlock Road/Nahant Street

Farm Street and Hemlock Road/Nahant Street intersect to form a four-way off-set unsignalized intersection, with Farm Street approaching from the north and south, Nahant Street approaching from the west, and Hemlock Road approaching from the east. Farm Street operates freely with no stop control while Nahant Street and Hemlock Road operate with stop control.

All approaches provide one approach lane except for the Farm Street southbound approach to Hemlock Road which provides a through lane and an dedicated left-turn lane. The intersection includes eight-foot-wide ADA accessible crosswalks across the Farm Street southbound approach, the Nahant Street eastbound approach, and the Hemlock Street westbound approach.

Hemlock Road and WMHS Back Parking Lot Drive

Hemlock Road and WMHS Back Parking Lot Drive intersect to form a three-way intersection equipped with flashing beacon, with Hemlock Road approaching from the east and west, and WMHS Back Parking Lot Drive approaching from the north.

All approaches to the intersection provide one approach lane. The intersection includes an eight-foot-wide ADA accessible crosswalks across the Hemlock Road eastbound approach.

The traffic signal at this intersection operated on flash mode, with Hemlock Road eastbound and westbound having the yellow indication and WMHS having the red indication. Upon actuation the traffic signal switches to exclusive pedestrian phase for crossing Hemlock Road eastbound.

Farm Street and Old Nahant Road (North Intersection)

Farm Street and Old Nahant Road intersect to form a three-way unsignalized intersection with Farm Street approaching from the north and south, and Old Nahant Road approaching from the west. Farm Street operates freely with no control, and Old Nahant Road operates with stop control.

All approaches to the intersection provide one approach lane. The intersection includes an eight-foot-wide ADA accessible crosswalk across the Old Nahant Road approach.

Farm Street and Old Nahant Road (South Intersection)

Farm Street and Old Nahant Road intersect to form a three-way unsignalized intersection with Farm Street approaching from the north and south, and Old Nahant Road approaching from the west. Farm Street operates freely with no control, and Old Nahant Road operates with stop control.

All approaches to the intersection provide one approach lane. The intersection includes an eight-foot-wide ADA accessible crosswalk across the Old Nahant Road approach.

3.5 NEMT School Site Observations

Nitsch Engineering conducted a site visit on Tuesday, February 25, 2020 to observe the site circulation associated with the weekday morning drop-off period and the weekday afternoon pick-up period. The observations occurred during overcast conditions.

3.6 Off-site Traffic Observations

To understand the magnitude of traffic along the adjacent roadways, we conducted 15-minute spot counts on Water Street just northwest of Montrose Avenue and at the intersection of Farm Street and Old Nahant Road, shown in Tables 1 and 2.

Table 1 – Traffic Count at Water Street (Route 129) near Montrose Avenue

Direction	Count	Directional Split
Morning - 9:15-9:30 AM		
Westbound towards Farm Street	72	51%
Eastbound away from Farm Street	69	49%
Afternoon - 3:00-3:15 PM		
Westbound towards Farm Street	82	53%
Eastbound away from Farm Street	74	47%

Table 2 – Traffic Count at Farm Street near Old Nahant Road

Direction	Count	Directional Split
Morning - 9:40-9:55 AM		
Northbound towards Hemlock Road	69	59%
Southbound away from Hemlock Road	47	41%
Afternoon - 3:00-3:15 PM		
Northbound towards Hemlock Road	102	48%
Southbound away from Hemlock Road	109	52%

As shown, the volumes are slightly higher in the weekday afternoon period however an approximate 50-50 directional distribution is maintained on both roadways.

We also observed the existing traffic conditions at the intersections of Hemlock Road and Farm Street; and Hemlock Street and the Wakefield Memorial High School driveway to understand the effects the school traffic has during the peak arrival and dismissal periods. The following is a summary:

- The Wakefield Memorial High School dismissal is at 2:00 PM, and only a few cars remained on Hemlock Road as the Northeast Metropolitan Regional Vocational High School traffic was exiting school property.
- Approximately 70% of vehicles were turning right from Hemlock Road onto Farm Street
- Most of the vehicles were taking a left from Farm Street onto Hemlock Road for pick-up
- Queueing quickly cleared at the end of Hemlock Road

3.7 On-site Traffic Observations

3.7.1 Parking Supply and Demand

As shown in Table 3 the parking lot has approximately 418 spaces, 11 of which are accessible spaces. This meets the Massachusetts Architectural Access Board (MAAB) Regulations (521 CMR) for the required number of handicapped parking spaces. Student, Breakheart Reservation, visitor, reserved and some faculty parking are in front of the school, with faculty-only parking behind the building.

Table 3 – Parking Utilization

		Total Spaces	Unoccupied
Back of Building	Faculty (White Striping)	154	19
Front of Building	Faculty (White Striping)	61	0
	Student / Resident (Yellow Striping)	156	10
	Handicap and Van Access	11	9
	Reserved	20	9
	Visitor	10	6
	Breakheart Reserved	5	2
	Co-Op	1	1
Total		**418**	**56**

Each student is required to have a parking sticker, which is checked at the front gate by a security guard. To the best of the guard's ability, the parking stickers are quickly checked to keep drop-off traffic moving. As shown in the tables, there are equal amount of parking stickers as there are dedicated student spaces. There were also 26 vehicles without license plates observed in the parking lot behind the building which were assumed to be for the automotive classes. The limited parking capacity becomes an issue as the school year approaches summer when patrons looking to visit Breakheart Reservation occupy the student parking spaces and as newly licensed drivers begin to drive to school without parking stickers. This results in the excess student vehicles occupying faculty parking behind the building or park outside of school property.

It was observed that student cars and buses all enter the site via the single entrance off Hemlock Road. Student pick-up and drop-off operates via one-way circulation at the front entrance to the building and buses circulate around the building to drop off students at the back entrance. Traffic circulation is illustrated in Figure 3.

Buses and pick-up vehicles arrive between 1:45 PM and 2:45 PM, with the school dismissal at 2:30 PM. Queueing will then occur on all exit routes as shown in Figure 4. A flagger will stop pick-up and student vehicles to let buses exit from the back of the building. This exit point is also a conflict area as students and faculty will come from behind the building to try and merge with the pick-up vehicles from the front of the building.

Below are the detailed field notes of the on-site observations made during our site visit.

Morning Drop-Off (7:00 AM – 8:00 AM)

- Security guard's shift at the gate starts at 7:00 AM
- Student parking requires paid parking decal
- Few students were observed in the parking lot before 7:00 AM
- School buses park around the back
- First bus was observed at 7:06 AM
- Total of 20 buses in the morning
- Cars start queueing up at the gate by 7:15 AM
- 15+ cars observed in queue at 7:30 AM
- There was no queue observed at the front of the school after 7:25 AM
- First bell occurred at 7:45 AM and due to queue vehicles were still pulling into parking lot

- Gate to exit back parking lot closes at 7:55 AM
- There is also a preschool and restaurant at this school
- 8 Reserved parking spaces for preschool drop off, restaurant and Reading Cooperative Bank
- Preschool drop off does not happen until 8:15 – 8:20 AM, when queues and traffic has calmed down
- Restaurant does not open until 11:30 AM, with 8 parking spaces reserved
- Of the 286 Seniors, 115 have parking decals and of 304 Juniors, 41 have decals
- Separate parking for faculty and students
- Students compete with the local community for parking due to Breakheart Reservation, which has an entrance near the front entrance of the school
- There are also 5 spots reserved with signs for Breakheart Reservation, and when these are full residents will take student parking
- Once student parking is full, they will circulate to the back of the building where it is faculty only parking and take vacant spaces

Afternoon Pick-Up (1:45 PM – 3:15 PM)

- Parents start to show up around 1:45 PM
- School dismissal is at 2:30 PM
- Buses park in the back waiting for dismissal
- Total of 18 buses in the afternoon
- Buses started to show up as early as 1:55 PM
- Queue outside entrance grew to 49 and stretched down the entire side of building before students were released
- There were vehicles parked illegally and in handicap spaces waiting to pick-up students
- As vehicles started to exit, there was a dangerous point of conflict where pick-up and faculty/students from the rear of the school were forced to merge but had limited sight due to parked cars in between
- There is a flagger controlling exiting vehicles, directing traffic from the student parking lot, the entrance pick-up vehicles and buses/faculty and students coming from the rear of the school
- Buses receive priority when ready to exit from the back of the building
- Queueing in student parking lot circulated all the way to the security at the gate
- Students could not back out of parking spaces due to this queue
- Queue from student parking lot cleared at 2:45 PM
- Flagger left at 2:50 PM
- There were only 11 unoccupied faculty spaces at 2:50 PM Site Access and Egress

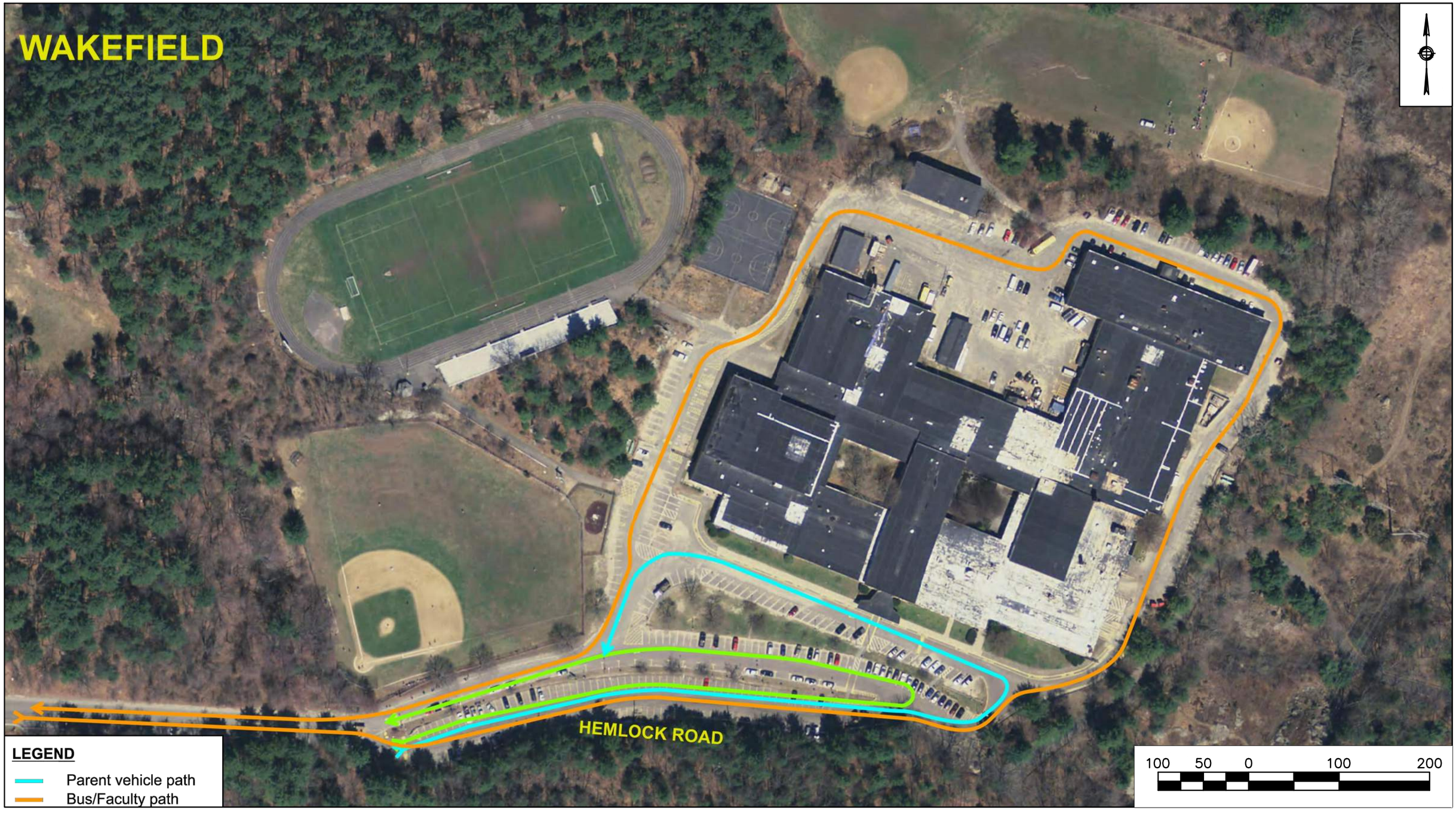

Figure 3: Travel Path
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

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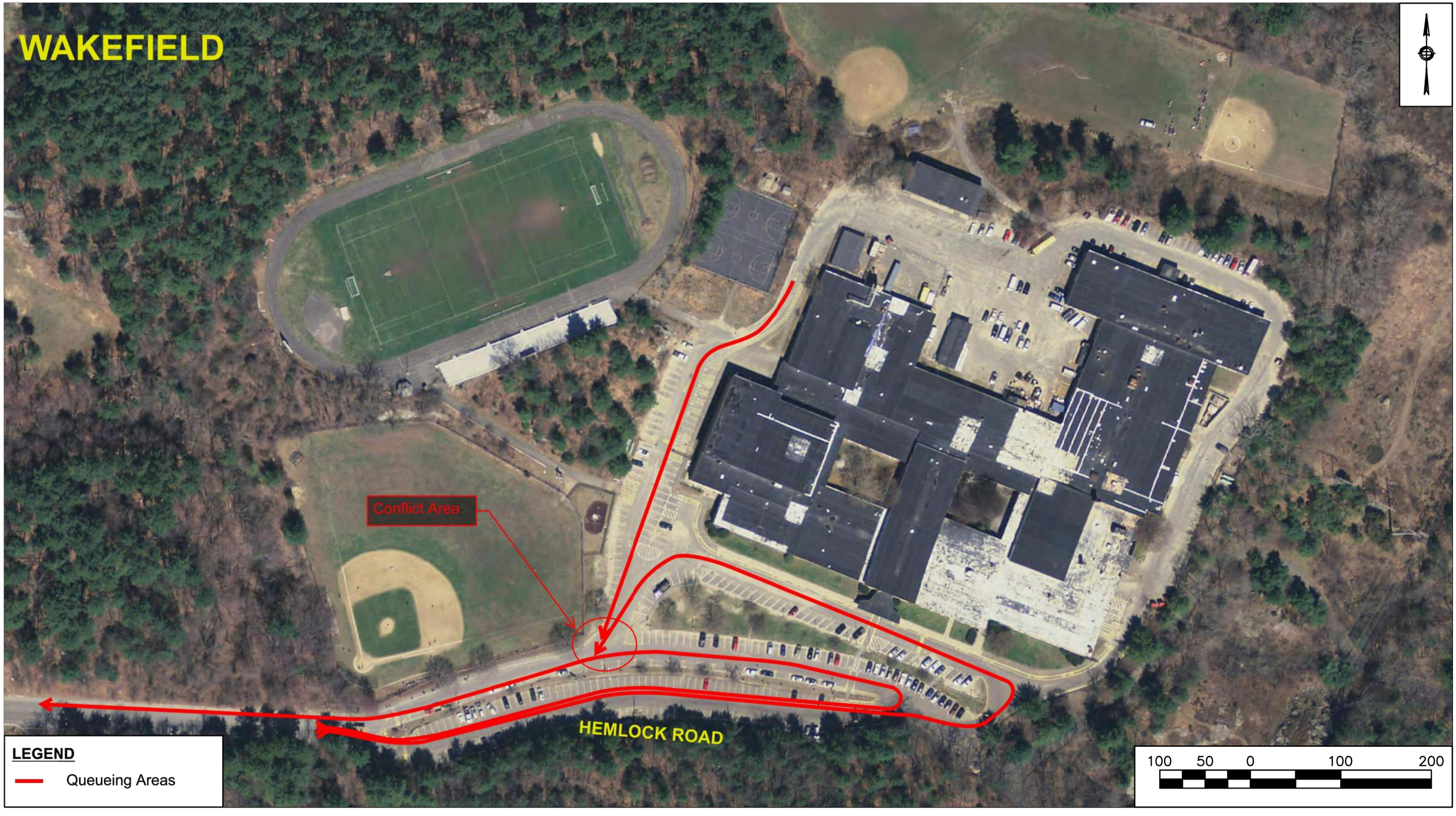

Figure 4: Queue Location
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

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4 Existing Traffic Conditions

4.1 Traffic Count Data

Automatic Traffic Recorder (ATR) Data

Nitsch Engineering retained Precision Data Industries, LLC (PDI) of Hudson, Massachusetts to conduct 48-hour Automatic Traffic Recorder (ATR) vehicle traffic counts throughout the study area from Tuesday, May 25, 2021 to Thursday, May 27, 2021. Table 4 summarizes the ATR data. A copy of the raw traffic count data is included in Appendix A-1.

Table 4 – Automatic Traffic Recorder (ATR) Summary

Location	Period	ADT[a]		Peak Hour Traffic			
		Volumes (VPD)[B]	Directional Distribution	Period	Volumes (VPH)[C]	Directional Distribution	K Factor[d]
Water St west of Farm St	Weekday	10,955	52.0% WB	Morning	897	57.9% WB	0.08
				Afternoon	883	54.7% WB	0.08
Farm St south of Hemlock Rd	Weekday	7,319	50.1% NB	Morning	488	53.1% NB	0.07
				Afternoon	1,035	56.3% NB	0.14

[a] Average Daily Traffic; [b] Vehicles per day; [c] Vehicles per hour; [d] Percent of daily traffic

Turning Movement Count (TMC) Data

PDI also conducted continuous Turning Movement Counts (TMC) data for the five main intersections of the study area on Saturday, May 22, 2021, from 11:00 AM to 1:00 PM to capture the Saturday midday peak period; and Thursday, May 27, 2021 from 7:00 AM to 9:00 AM and 2:00 PM to 4:00 PM to capture the weekday morning and afternoon peak school periods. The TMC data included bicycle and pedestrian counts. The peak hours within the study area were established as 7:15 AM to 8:15 AM during the morning period, and 2:30 PM to 3:30 PM during the afternoon period. Note, as part of this study, TMC data was only collected at the four main intersections along Farm Street. Since data was not collected at the Woodville Circle and Kennedy Circle intersections with Farm Street, Nitsch used the Institute of Transportation Engineers' (ITE) publication *Trip Generation, 10th Edition* (Land Use Code 210: Single-Family detached Housing) to estimate the vehicle trip rates for the approaches to the intersections.

4.2 Seasonal Adjustment

Nitsch Engineering used the MassDOT 2017 Weekday Seasonal Adjustment Factors to establish if the traffic counts needed to be seasonally adjusted. The composition of the study area falls within "Group U4-7 Urban Arterials." Counts within Group U4-7 collected during the month of May experience a value that is approximately 8% higher than an average month. Therefore, no seasonal adjustment factors were applied.

4.3 COVID-19 Adjustment

Since early 2020, the COVID-19 pandemic has caused the State of Massachusetts to close most businesses, schools, retail stores, and restaurants, therefore significantly altering daily traffic operations. Specific to this project, the operation at the school had been hybrid until Monday May 3, 2021, when full in-person classes resumed at the school. Since the data collection was conducted on May 25 through 27, 2021 it includes the school-related traffic volumes for both the Wakefield High School and NEMT; therefore, a COVID adjustment for the school-related volumes is not needed.

In April 2020, MassDOT published a new Engineering Directive E-20-005, to provide guidance on how to estimate existing and future traffic counts due to traffic counts taken after March 13, 2020, which may undercount the baseline for which future years are based. Because of this, it is widely accepted to use 2019 data for baseline. Since our TMC data was collected during the pandemic but with schools open, we assessed adjusting the commuter related traffic volumes to better represent the baseline.

To do so, Nitsch Engineering used the 2019 and 2021 volumes from MassDOT's Traffic Data Management System (TDMS) portal. The data from the nearest MassDOT continuous count station # 5099, located on Yankee Division Highway south of the Walnut Street to Route 95 Southbound ramp, was used to compare the 2019 hourly ATR data collected on Thursday May 30, 2019 with the 2021 hourly ATR data collected in Thursday May 27, 2021 to make the appropriate TMC volume adjustments and calculate the background traffic growth. Table 5 presents the daily traffic volume comparison.

Table 5 – Daily Traffic Volume Comparison

Time	2019	2021 COVID	Net Change
12:00 AM - 1:00 AM	1,084	742	-32%
1:00 AM - 2:00 AM	615	470	-24%
2:00 AM - 3:00 AM	455	381	-16%
3:00 AM - 4:00 AM	563	555	-1%
4:00 AM - 5:00 AM	1,409	1,225	-13%
5:00 AM - 6:00 AM	5,412	4,244	-22%
6:00 AM - 7:00 AM	8,895	8,520	-4%
7:00 AM - 8:00 AM	10,135	9,877	-3%
8:00 AM - 9:00 AM	9,185	9,299	1%
9:00 AM - 10:00 AM	8,848	9,185	4%
10:00 AM - 11:00 AM	8,785	9,094	4%
11:00 AM - 12:00 PM	8,789	9,476	8%
12:00 PM - 1:00 PM	8,965	9,525	6%
1:00 PM - 2:00 PM	9,682	9,345	-3%
2:00 PM - 3:00 PM	10,526	10,130	-4%
3:00 PM - 4:00 PM	10,676	9,414	-12%
4:00 PM - 5:00 PM	10,408	742	-9%
5:00 PM - 6:00 PM	10,246	470	-3%
6:00 PM - 7:00 PM	9,685	381	-4%
7:00 PM - 8:00 PM	7,758	555	-5%
8:00 PM - 9:00 PM	5,808	1,225	-4%
9:00 PM - 10:00 PM	4,611	4,244	-6%
10:00 PM - 11:00 PM	3,120	8,520	-3%
11:00 PM - 12:00 AM	2,051	1,915	-7%
Daily	157,711	152,439	-3%

School peak hour

Comparing the 2019 hourly ATR data with the 2021 hourly ATR data, the average daily traffic has decreased by approximately 3% during the weekday morning peak school hour and by approximately 4% during the weekday afternoon peak school hour. As a conservative measure for our analysis, we applied a 4% growth rate to non-school related commuter traffic volumes along the adjacent roadways to estimate the base morning and afternoon traffic volumes. The adjusted 2021 Existing Traffic Volumes are shown in Figure 5. The Existing Peak Hour Pedestrian Volumes are shown in Figure 6.

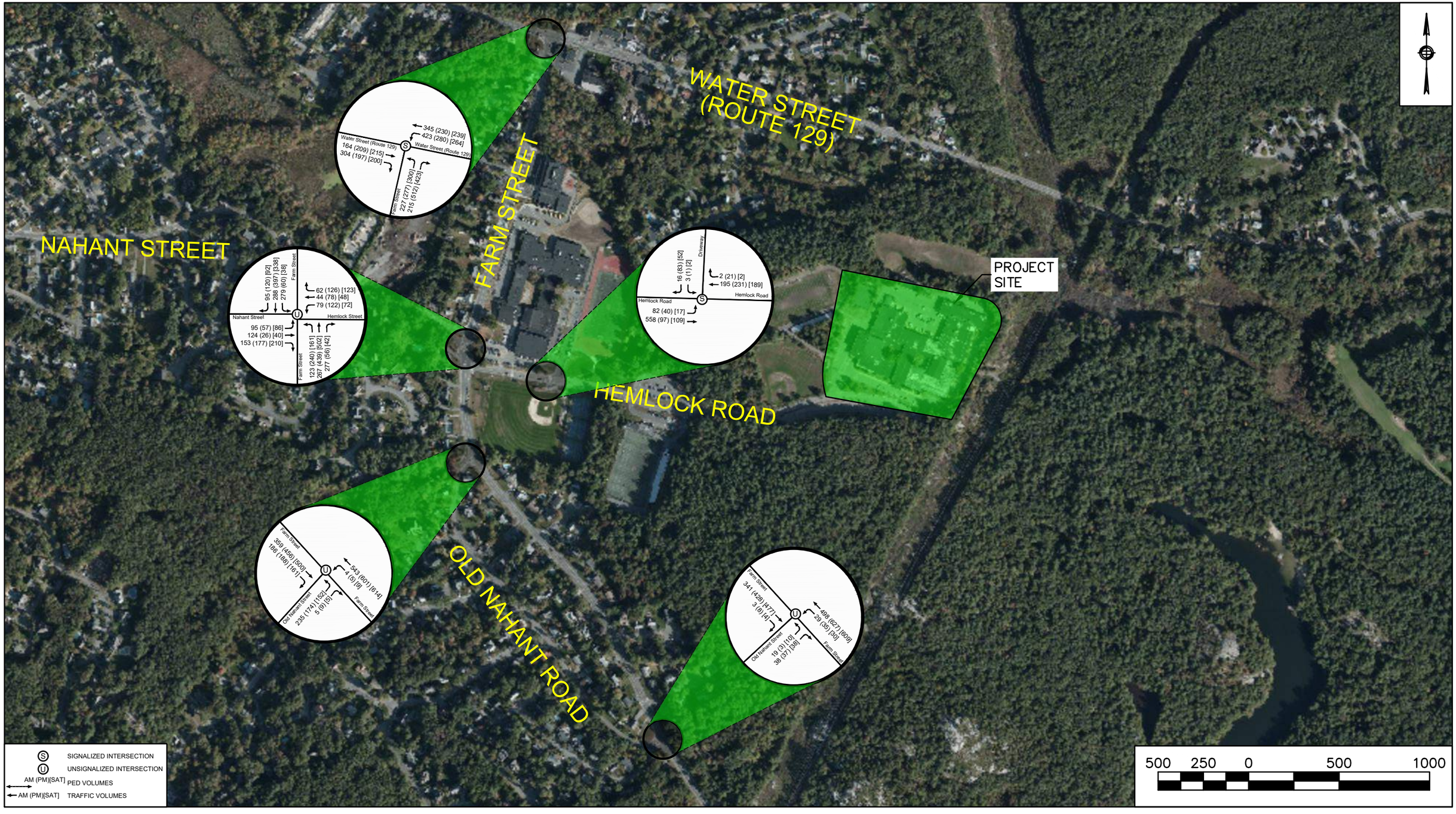

Figure 5: 2021 Existing Peak Hour Volumes
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

Nitsch Engineering

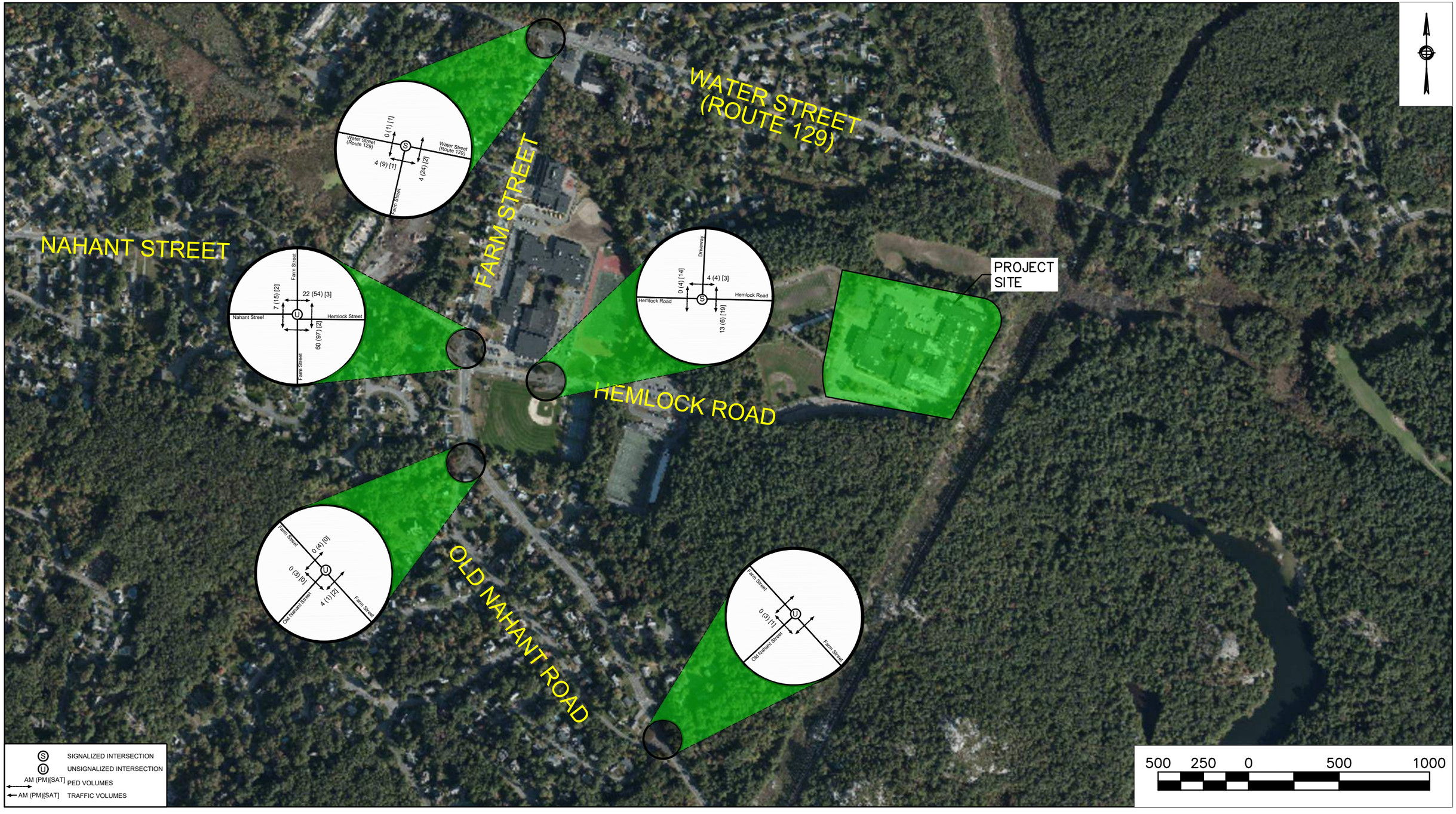

Figure 6: 2021 Existing Peak Hour Pedestrian Volumes
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

Nitsch Engineering

5 Safety Analysis

5.1 Crash Data

As part of the safety analysis, it is recommended to summarize the crash data for the five most recent "closed" years. To date, 2018 is the latest year for which the crash data is finalized (closed) therefore crash data from MassDOT from 2014 to 2018 was collected and reviewed for the study area intersections. The total crashes, severity, manner of collision, and percentage that occurred during peak hours and/or wet/icy weather conditions for each intersection are presented in Table 6. A copy of the crash data is included in the Appendix.

Table 6 – Crash Summary

Location	Number of Crashes			Severity				Manner of Collision					Percent During	
	Year	Total Crashes	Avg	PD[a]	PI[b]	NR[c]	F[d]	A[e]	RE[f]	HO[g]	Other[h]	Incl. Ped-Bike[j]	Peak Hours[k]	Wet/Icy Conditions
Water Street and Farm Street	2014	1	2.4	1	0	0	0	0	1	0	0	0	100%	100%
	2015	1		1	0	0	0	0	1	0	0	0	0%	100%
	2016	4		4	0	0	0	0	1	0	3	0	0%	100%
	2017	3		1	2	0	0	1	0	0	2	0	0%	0%
	2018	3		2	1	0	0	1	1	0	1	0	0%	100%
	Total	***12***		***9***	***3***	***0***	***0***	***2***	***4***	***0***	***6***	***0***	***0%***	***67%***
Hemlock Road and Driveway	2014	0	0.0	0	0	0	0	0	0	0	0	0	0%	0%
	2015	0		0	0	0	0	0	0	0	0	0	0%	0%
	2016	0		0	0	0	0	0	0	0	0	0	0%	0%
	2017	0		0	0	0	0	0	0	0	0	0	0%	0%
	2018	0		0	0	0	0	0	0	0	0	0	0%	0%
	Total	***0***		***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0%***	***0%***
Farm Street and Hemlock Road/Nahant Street	2014	2	3.6	2	0	0	0	1	0	0	1	0	50%	0%
	2015	4		3	1	0	0	3	1	0	0	0	50%	0%
	2016	4		3	1	0	0	3	1	0	0	0	75%	0%
	2017	2		2	0	0	0	0	2	0	0	0	0%	0%
	2018	6		5	1	0	0	5	1	0	0	0	67%	17%
	Total	***18***		***15***	***3***	***0***	***0***	***12***	***5***	***0***	***1***	***0***	***55%***	***6%***
Farm Street and Old Nahant Road North	2014	0	0.4	0	0	0	0	0	0	0	0	0	0%	0%
	2015	0		0	0	0	0	0	0	0	0	0	0%	0%
	2016	0		0	0	0	0	0	0	0	0	0	0%	0%
	2017	2		1	1	0	0	1	1	0	0	0	50%	0%
	2018	0		0	0	0	0	0	0	0	0	0	0%	0%
	Total	***2***		***1***	***1***	***0***	***0***	***1***	***1***	***0***	***0***	***0***	***50%***	***0%***
Farm Street and Old Nahant Road South	2014	1	0.6	1	0	0	0	0	1	0	0	0	100%	0%
	2015	1		0	1	0	0	0	0	0	1	0	0%	0%
	2016	0		0	0	0	0	0	0	0	0	0	0%	0%
	2017	0		0	0	0	0	0	0	0	0	0	0%	0%
	2018	1		0	1	0	0	0	1	0	0	0	0%	0%
	Total	***3***		***1***	***2***	***0***	***0***	***0***	***2***	***0***	***0***	***0***	***33%***	***0%***
Total	**ALL**	**35**		**26**	**9**	**0**	**0**	**15**	**12**	**0**	**8**	**0**	**46%**	**14%**

[a]Property Damage Only; [b]Personal Injury Only (non-Fatal Injury); [c]Not Reported; [d]Fatality; [e]Angle; [f]Rear end; [g]Head on; [h]Sideswipe, opposite direction; sideswipe, same direction, single vehicle crash, rear-to-rear, not reported, unknown, etc.; [j]Includes pedestrian or cyclist; [k]Occurred between 7-9am or 4-6pm

A total of 35 crashes were reported for the study area intersections. In terms of severity, 26 reported property damage and nine reported personal injury. In terms of the type of collision, 15 reported an angle collision, 12 were rear-end collisions, and another eight were reported as other (sideswipe and single vehicle). None of the reported crashes included a bicycle or a pedestrian. 14% of the collisions occurred during wet/icy conditions and 46% of the collisions occurred during peak traffic hours of 7:00 AM – 9:00 AM or 4:00 PM – 6:00 PM. Analyzing the crash data, as the crashes were of angle, rear-end or sideswipe type, the crashes were most likely caused by driver carelessness or inattentiveness.

5.2 Intersection Crash Rates

The intersection crash rate is recognized as an effective tool to measure the safety of intersections. For intersections, crash rates are expressed by the number of crashes per million entering vehicles (MEV). As of June 26, 2018, the average statewide crash rate for unsignalized intersections is 0.57 crashes per MEV and 0.78 crashes per MEV for signalized intersections. For District 4, which includes the Town of Wakefield, the rate for unsignalized intersections is 0.57 crashes per MEV and 0.73 crashes per MEV for signalized intersections. As shown in Table 7, the four study Intersections are below both Statewide and Districtwide averages. Crash rate worksheets can be found in Appendix A-3.

Table 7 – Crash Rate Summary

Location	Control	Total Crashes	Crash Rate[c]	Compared to Average[d]		Compared to Average[d]	
				Statewide	District 4	Statewide	District 3
Water Street and Farm Street	Signalized	12	0.32	0.78	0.73	Below	Below
Hemlock Road and Driveway	Signalized	0	0.00	0.78	0.73	Below	Below
Farm Street and Hemlock Road/Nahant Street	Unsignalized	18	0.43	0.57	0.57	Below	Below
Farm Street and Old Nahant Road North	Unsignalized	2	0.06	0.57	0.57	Below	Below
Farm Street and Old Nahant Road South	Unsignalized	3	0.12	0.57	0.57	Below	Below

6 Future No-Build Traffic Conditions

Nitsch Engineering used the 2021 existing traffic volumes as the baseline for projecting traffic volumes to future 2028 No-Build conditions. To determine future 2028 conditions, the following steps are included:

- Project existing 2021 traffic volumes seven years in the future to the horizon year (2028) using an annual background traffic growth factor to account for regional growth;
- Add traffic volumes associated with any planned developments that may impact the study area; and
- Analyze the study area location to determine future traffic operations.

6.1 Background Growth

Nitsch Engineering used the data from the MassDOT TDMS portal at the nearest MassDOT count station #4126, located on Main Street north of Water Street (Route 129), to calculate the background traffic growth. The data indicates that Average Annual Daily Traffic (AADT) was recorded at:

- 15,739 vehicles in 2009;
- 15,911 vehicles in 2010;
- 14,627 vehicles in 2011;
- 15,330 vehicles in 2012;
- 15,547 vehicles in 2013;
- 16,402 vehicles in 2014;
- 16,582 vehicles in 2015;
- 16,798 vehicles in 2016;
- 12,400 vehicles in 2017;
- 12,574 vehicles in 2018; and
- 12,624 vehicles in 2019.

As shown, the traffic has been decreasing in this area at an average rate of approximately 2% per year. However, to provide a conservative analysis, we used an annual background traffic growth rate of 0.5%, which is also consistent with recent MassDOT projects in eastern Massachusetts. We also believe that any potential additional traffic as a result of planned developments and area roadway improvements will be accounted for within the 0.5% per-year background growth along the adjacent roadways.

6.2 Planned Development

The Project team is aware that the Wakefield Memorial High School is expected to be redeveloped and there is potential for traffic increases as a result. However, currently there is no official program in-place, and it is expected that the full build-out of the NEMT will occur prior to the full build-out of the WMHS.

6.3 2028 No-Build Traffic Volumes

The 2028 No-Build Traffic Volumes are shown in Figure 7 and are derived by applying the traffic growth rate of 0.5% per year over the seven-year design horizon to project the 2021 existing traffic volumes.

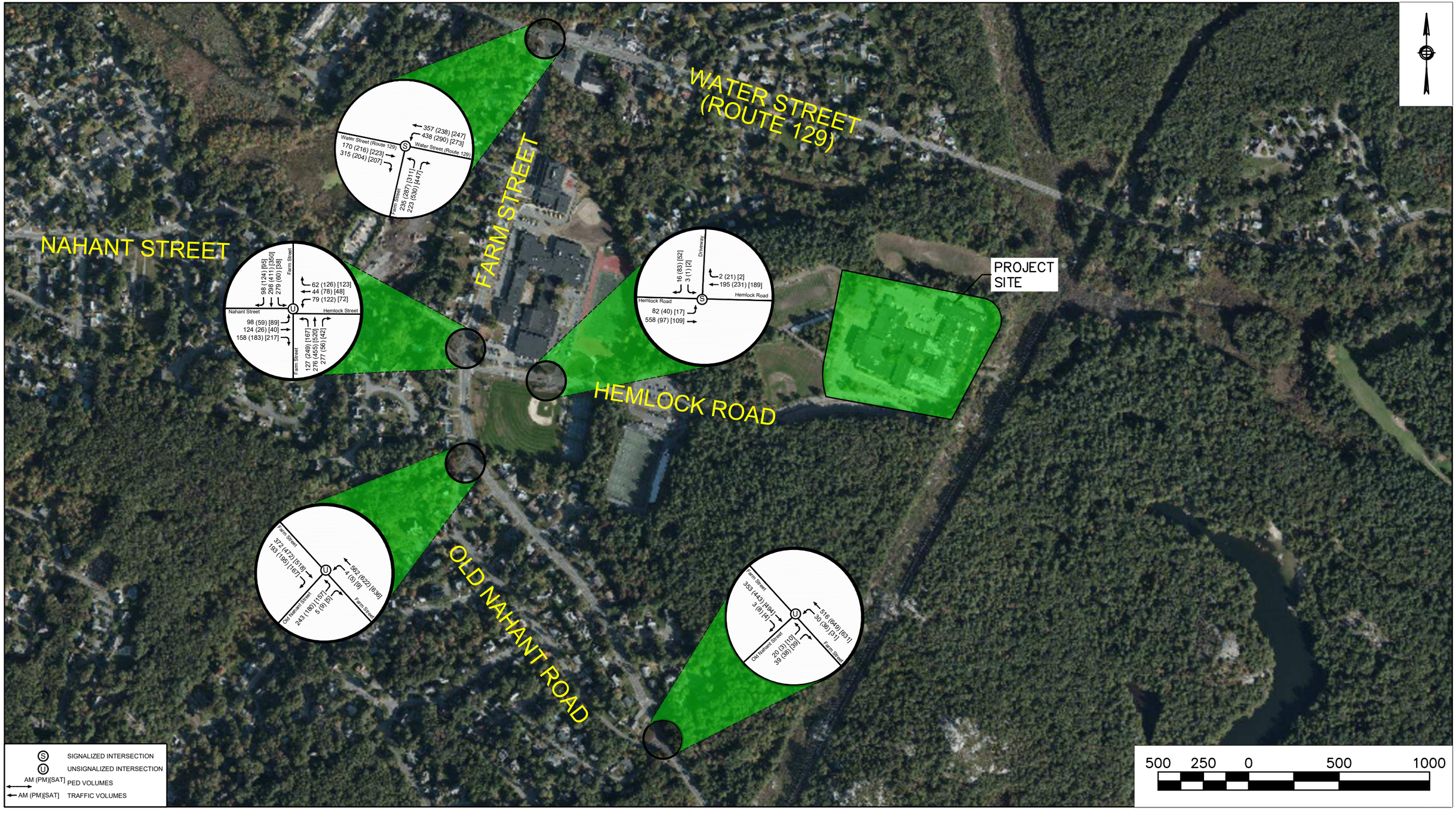

Figure 7: 2028 No-Build Peak Hour Volumes
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

Nitsch Engineering

7 Proposed Future Conditions

7.1 Proposed Development

The existing NEMT building will be demolished, and a new school will be constructed to accommodate 1,600 students. The site will be expanded to include a larger building, more parking and longer queuing lengths to accommodate the additional project-generated trips which include additional busses, additional parent drop-off/pick-up, and additional faculty.

Access to the site will be provided via two driveways; the existing Hemlock Road extension, and a new driveway connecting to Farm Street south of Hemlock Street. The new driveway at Farm Street will create a three-way intersection, with the new driveway approaching from the east, and Farm Street approaching from the north and the south.

The bus drop-off/pick-up will occur at the designated bus loop located at the south of the school. A total of 484 parking spaces will be provided on-site, including 11 accessible parking stalls, as well as 22 spaces designated for Green Vehicles and 10 spaces equipped with Electric Vehicle charging stations. Significant queuing capacity is proposed on-site so parents will be able to circulate through the site and park on the side of the drive aisles instead of utilizing the parking spaces temporarily.

7.2 Proposed Trip Generation

Nitsch Engineering used the Institute of Transportation Engineers' (ITE) publication *Trip Generation, 10th Edition* to estimate the vehicle trip rates for the existing NEMT and the proposed reconstructed school and establish the net trips. These trips include parents, faculty, and busses.

Trip generation rates for the High School were based on Land Use Code (LUC) 530 (High School). The weekday morning drop-off and weekday afternoon pick-up trips are outlined in Table 8.

Table 8 – Existing and Proposed Trip Generation

Time	High School (LUC 530)		
	NEMT School		
	Existing with 1,200 Students	Redeveloped with 1,600Students	Net Increase
Weekday Daily	2562	3248	686
Entering	1281	1624	343
Exiting	1281	1624	343
Weekday Morning Peak	660	880	220
Entering	449	598	149
Exiting	211	282	71
Weekday Afternoon Peak	396	528	132
Entering	127	169	42
Exiting	269	359	90
Saturday Peak	120	160	40
Entering	76	101	25
Exiting	44	59	15

As illustrated in Table 8, the proposed redeveloped School with 1,600 students would result in approximately 686 additional daily trips (343 trips in and 343 trips out), with 220 additional trips (149 trips in and 71 trips out) during the weekday morning drop-off time and 132 additional trips (42 trips in and 90 trips out) during the weekday afternoon pick-up time. The school building and its athletic fields will also generate 40 additional trips (25 trips in and 15 trips out) during the peak hour of community and recreational activities on Saturdays.

7.3 Trip Distribution and Assignment

The trips to/from the proposed school will be distributed and assigned based on the existing travel patterns and logical travel routes through the existing roadway network within the Town of Wakefield. The Trip Distribution percentages specific to the proposed school are shown in Figure 8.

The resultant net trip assignment volumes were calculated by multiplying the trip distribution by the additional school-related trips from Table 8. The existing school trips were also redistributed based on the future trip distribution resulting in a traffic volume decrease on Hemlock Road; 352 vehicles during the weekday morning peak school hour, 211 vehicles during the weekday afternoon peak school hour, and 64 vehicles during the Saturday midday peak hour. The net trip assignment volumes are shown in Figure 9 for the weekday morning and the weekday afternoon peak hours.

7.4 Proposed 2028 Build Volumes

For the proposed school, the corresponding trip assignment volumes were added to the 2028 No-Build Volumes to yield the 2028 Build Volumes. The 2028 Build Volumes are shown in Figure 10.

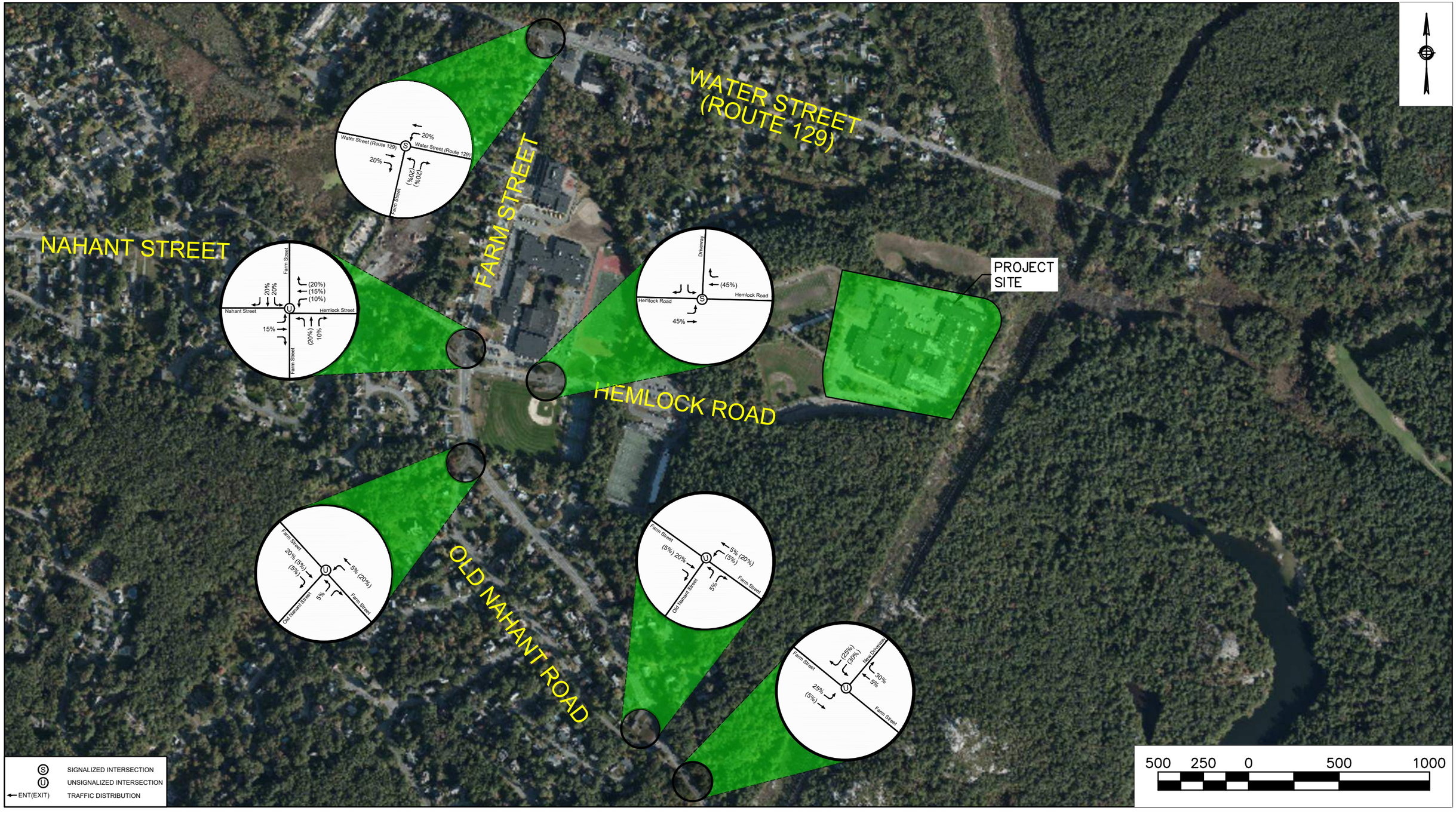

Figure 8: Trip Distribution
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

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Figure 9: Trip Assignment
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

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Figure 10: 2028 Build Peak Hour Volumes
Northeast Metropolitan Regional Vocational High School
Wakefield, MA

Data Source: BingMaps
Nitsch Project #: 13872.2

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7.5 Parking Generation and Adequacy

Nitsch Engineering used the Institute of Transportation Engineers' (ITE) publication *Parking Generation Manual, 5th Edition* to estimate the parking demand for the proposed development. Parking generation rates for the proposed school were based on Land Use Code (LUC) 530 (High School). The calculated parking demand for the combined school with projected student population of 1,600 students is 416 spaces.

Therefore, the 484 striped parking spaces in addition to the 18 live drop-off spaces exceeds the 416 parking spaces recommended by the Institute of Transportation Engineers (ITE) Parking Generation for LUC 530 to facilitate parental parking during drop-off and pick-up times (see Table 9).

Table 9 – Proposed Parking Summary

Parking Spaces Provided	Parking Spaces Required by ITE Parking Generation for LUC 530
484 Striped (11 Accessible)	416
18 Live Drop-Off	

8 Traffic Operations

8.1 Evaluation Criteria

Traffic operations at intersections are evaluated using the performance measures of average vehicular delay, level of service (LOS), volume-to-capacity (v/c) ratio, and average and 95th percentile queue lengths.

LOS is a qualitative measure that describes operating conditions through letter designations, from A to F. It is defined for intersections in terms of average control delay per vehicle. LOS A indicates the most favorable condition, with minimum traffic delay. LOS F represents the worst condition where there is significant traffic delay. LOS D or better is typically considered desirable for peak-hour operation in urban and suburban settings. The delay designations for each LOS level differ slightly between signalized and unsignalized intersections due to driver expectations and behavior. Table 10 summarizes the LOS criteria for intersections as used in this analysis.

Table 10 – Intersection Level of Service Criteria

Level of Service	Average Control Delay (sec/veh)	
	Signalized	Unsignalized
A	0-10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50
Source: HCM 2000		

For signalized intersections, LOS is reported by lane group, by approach, and for the entire intersection. For unsignalized intersections, the analysis assumes that the traffic on the mainline is not affected by traffic on the side street. As such, an unsignalized intersection's LOS is generally reported for left-turns on the mainline and all side street movements, and an overall intersection LOS is not determined.

The v/c ratio is a measure of congestion at an intersection approach. The capacity of a facility is the maximum hourly rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions. A v/c ratio below one indicates that the intersection approach has adequate capacity to serve the arriving traffic demand. A v/c ratio that approaches or exceeds 1.0 indicates traffic congestion or poor operating conditions. In that situation, vehicles arrive faster than they can be served, so queue lengths can theoretically grow indefinitely, which is the unstable condition.

Since arrival volumes fluctuate throughout the peak hour, queue lengths vary. The average (50th percentile) queue length represents the maximum back of queue on a typical cycle for a signalized intersection. Average queue lengths are not reported for unsignalized intersections. The 95th percentile queue, reported for both signalized and unsignalized intersections, occurs with 95th percentile traffic volumes, and its length commonly denotes the farthest extent of the vehicle queue.

8.2 Capacity Analyses

Nitsch Engineering performed traffic analyses to evaluate traffic operations for the 2021 Existing Conditions, 2028 No-Build Conditions, and 2028 Build Conditions during the weekday morning and weekday afternoon peak school hours, as well as Saturday midday peak hour at the study intersections using Trafficware's Synchro 10 software. Synchro uses, in part, the traffic operational analysis methodology of the Transportation Research Board's *Highway Capacity Manual* (HCM).[1] We generated the results of the capacity analyses using Synchro's Percentile Delay Method for delay, v/c ratio, and queue lengths, supported by HCM 2000 methodology for unsignalized intersection analysis. The Synchro output sheets for the capacity analyses are included in Appendix A-4.

8.3 2021 Existing Capacity Analysis

Nitsch Engineering analyzed the 2021 Existing Conditions traffic operations at the study intersections based on the existing traffic counts performed by PDI in May 2021. The Level of Service Summaries are shown in Tables 11a and 11b.

[1] *Highway Capacity Manual 2000 (HCM 2000)*, Transportation Research Board, Washington, D.C., 2000.

Table 11a – Capacity Analysis Summary: 2021 Existing Conditions

Location	Direction / Movement[a]	Weekday Morning Peak Hour					Weekday Afternoon Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th	v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Water St. at Farm Dr. *[signalized]*	Water St. EB - T	0.48	43.7	D	136	185	0.50	40.5	D	163	225
	Water St. EB - R	0.53	2.7	A	0	0	0.25	1.5	A	0	13
	Water St. WB - L	0.77	33.8	C	216	457	0.69	30.6	C	161	236
	Water St. WB - T	0.50	25.1	C	211	300	0.39	23.2	C	153	188
	Farm St. NB - L	0.83	57.4	E	248	212	0.84	57.9	E	253	270
	Farm St. NB - R	0.27	2.7	A	0	0	0.56	3.7	A	0	58
	Total	0.83	25.7	C			0.84	24.9	C	-	
Farm St. at Nahant St. *[unsignalized]*	Nahant St. EB - LR	1.43	237.1	F	-	661	4.65	Error	F	-	Error
	Farm St. NB - LT	0.24	5.7	A	-	23	0.56	14.0	B	-	87
	Farm St. SB - TR	0.46	0.0	A	-	0	0.46	0.0	A	-	0
Farm St. at Hemlock St. *[unsignalized]*	Hemlock St. WB - LR	12.47	Error	F	-	Error	3.14	Error	F	-	Error
	Farm St. NB - TR	0.50	0.0	A	-	0	0.54	0.0	A	-	0
	Farm St. SB - L	0.62	16.8	C	-	110	0.15	10.7	B	-	13
	Farm St. SB - T	0.30	0.0	A	-	0	0.41	0.0	A	-	0
Hemlock St. at WMHS Dr. *[unsignalized]*	Hemlock St. EB - LT	0.16	3.7	A	-	14	0.04	2.8	A	-	3
	Hemlock St. WB - TR	0..25	0.0	A	-	0	0.24	0.0	A	-	0
	WMHS Dr. SB - LR	0.12	17.5	C	-	10	0.23	12.0	B	-	22
Farm St. at Old Nahant Rd (North) *[unsignalized]*	Old Nahant EB - LR	1.14	142.2	F	-	312	1.02	110.3	F	-	245
	Farm St. NB - LT	0.02	0.4	A	-	0	0.41	0.0	A	-	0
	Farm St. SB - TR	0.37	0.0	A	-	1	0.01	0.4	A	-	1
Farm St. at Old Nahant Rd (South) *[unsignalized]*	Old Nahant EB - LR	0.25	18.5	C	-	24	0.10	12.9	B	-	8
	Farm St. NB - LT	0.04	1.1	A	-	3	0.05	1.3	A	-	4
	Farm St. SB - TR	0.24	0.0	A	-	0	0.27	0.0	A	-	0

[a] Direction: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound;
Movement: L = Left-turn, T = Through movement, R = Right-turn
[b] Overall v/c ratio is the maximum v/c ratio among lane groups
[c] Average vehicle delay (seconds)
[d] 50th and 95th percentile queue lengths (feet) based upon average vehicle length of 25 feet
~ Volume exceeds capacity, queue is theoretically infinite; queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer; queue shown is maximum after two cycles

Table 11b – Capacity Analysis Summary: 2021 Existing Conditions

Location	Direction / Movement[a]	Saturday Midday Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Water St. at Farm Dr. *[signalized]*	Water St. EB - T	0.44	38.6	D	149	240
	Water St. EB - R	0.23	1.6	A	0	17
	Water St. WB - L	0.64	27.2	C	153	216
	Water St. WB - T	0.31	21.3	C	124	199
	Farm St. NB - L	0.84	58.7	Error	250	304
	Farm St. NB - R	0.50	3.4	A	0	50
	Total	0.84	24.8	C		
Farm St. at Nahant St. *[unsignalized]*	Nahant St. EB - LR	1.63	336.5	F	-	623
	Farm St. NB - LT	0.25	5.6	A	-	24
	Farm St. SB - TR	0.32	0.0	A	-	0
Farm St. at Hemlock St. *[unsignalized]*	Hemlock St. WB - LR	1.59	328.2	F	-	540
	Farm St. NB - TR	0.47	0.0	A	-	0
	Farm St. SB – L	0.11	10.0	A	-	9
	Farm St. SB - T	0.37	0.0	A	-	0
Hemlock St. at WMHS Dr. *[signalized]*	Hemlock St. EB - LT	0.02	1.5	A	-	2
	Hemlock St. WB - TR	0.15	0.0	A	-	0
	WMHS Dr. SB - LR	0.14	10.4	B	-	12
Farm St. at Old Nahant Rd (North) *[unsignalized]*	Old Nahant EB - LR	0.96	101.9	F	-	202
	Farm St. NB - LT	0.45	0.0	A	-	0
	Farm St. SB - TR	0.02	0.5	A	-	1
Farm St. at Old Nahant Rd (South) *[unsignalized]*	Old Nahant EB - LR	0.33	23.9	C	-	35
	Farm St. NB - LT	0.04	1.1	A	-	3
	Farm St. SB - TR	0.31	0.0	A	-	0

Under 2021 Existing conditions, at the intersection of Water Street (Route 129) and Farm Street, the Farm Street northbound left-turn lane operates at LOS E in both the morning and afternoon peak school hours, as well as Saturday midday. The remaining lane groups at the intersection operate at LOS C or better in both the morning and afternoon peak school hours, as well as Saturday midday. Overall, the intersection operates at LOS C in both the morning and afternoon peak hours, as well as Saturday midday.

All approaches at the signalized intersection of Hemlock Street and Wakefield Memorial High School Driveway operate at LOS C or better in both the morning and afternoon peak school hours, as well as Saturday midday.

At the intersection of Nahant Street and Farm Street, the Nahant Street eastbound approach operates at LOS F in both the morning and afternoon peak school hours, as well as Saturday midday. The remaining lane groups at the intersection operate at LOS C or better in both the morning and afternoon peak hours, as well as Saturday midday.

At the intersection of Hemlock Street and Farm Street, the Hemlock Street westbound approach operates at LOS F in both the morning and afternoon peak school hours, as well as Saturday midday. The remaining lane groups

at the intersection operate at LOS C or better in both the morning and afternoon peak school hours, as well as Saturday midday.

At the northern intersection of Old Nahant Road and Farm Street, the Old Nahant Road eastbound approach operates at LOS F in both the morning and afternoon peak school hours, as well as Saturday midday. The remaining lane groups at the intersection operate at LOS C or better in both the morning and afternoon peak school hours, as well as Saturday midday.

Most of the approaches at the remaining unsignalized intersections operate at LOS C or better and the approaches at these intersections are experiencing minimal queueing.

8.4 2028 No-Build Capacity Analysis

Nitsch Engineering analyzed the 2028 No-Build Conditions traffic operations at the study intersections. The 2028 No-Build Condition represents the 2021 Existing Conditions and projects a traffic increase at the rate of 0.5% per year between 2021 and 2028. The Level of Service Summaries are shown in Tables 12a and 12b.

Table 12a – Capacity Analysis Summary: 2028 No-Build Conditions

Location	Direction / Movement[a]	Weekday Morning Peak Hour					Weekday Afternoon Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th	v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Water St. at Farm Dr. *[signalized]*	Water St. EB - T	0.53	45.7	D	148	187	0.53	41.8	D	175	231
	Water St. EB - R	0.55	2.7	A	0	0	0.25	1.5	A	0	13
	Water St. WB - L	0.47	38.3	D	231	567	0.75	34.6	C	172	292
	Water St. WB - T	0.46	26.2	C	225	314	0.41	24.3	C	163	198
	Farm St. NB - L	0.25	56.9	E	256	216	0.84	56.7	E	262	278
	Farm St. NB - R	0.49	2.7	A	0	40	0.57	3.8	A	0	59
	Total	0.55	27.0	C			0.84	25.7	C		
Farm St. at Nahant St. *[unsignalized]*	Nahant St. EB – LR	1.64	330.0	F	-	790	5.67	Error	F	-	Error
	Farm St. NB - LT	0.24	5.9	A	-	24	0.58	15.3	C	-	96
	Farm St. SB - TR	0.47	0.0	A	-	0	0.47	0.0	A	-	0
Farm St. at Hemlock St. *[unsignalized]*	Hemlock St. WB - LR	13.02	Error	F	-	Error	3.38	Error	F	-	Error
	Farm St. NB - TR	0.51	0.0	B	-	0	0.56	0.0	A	-	0
	Farm St. SB - L	0.63	17.2	C	-	114	0.15	10.8	B	-	13
	Farm St. SB - T	0.30	0.0	A	-	0	0.43	0.0	A	-	0
Hemlock St. at WMHS Dr. *[unsignalized]*	Hemlock St. EB - LT	0.16	3.7	A	-	14	0.04	2.8	A	-	3
	Hemlock St. WB - TR	0..25	0.0	A	-	0	0.24	0.0	A	-	0
	WMHS Dr. SB - LR	0.12	17.5	C	-	10	0.23	12.0	B	-	22
Farm St. at Old Nahant Rd (North) *[unsignalized]*	Old Nahant EB - LR	1.33	218.8	F	-	391	1.39	252.0	F	-	390
	Farm St. NB - LT	0.39	0.0	A	-	0	0.43	0.0	A	-	0
	Farm St. SB - TR	0.01	0.3	A	-	1	0.01	0.4	A	-	1
Farm St. at Old Nahant Rd (South) *[unsignalized]*	Old Nahant EB - LR	0.27	19.7	C	-	27	0.10	13.1	B	-	8
	Farm St. NB - LT	0.04	1.1	A	-	3	0.05	1.4	A	-	4
	Farm St. SB - TR	0.25	0.0	A	-	0	0.28	0.0	A	-	0

[a] Direction: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound;
Movement: L = Left-turn, T = Through movement, R = Right-turn
[b] Overall v/c ratio is the maximum v/c ratio among lane groups
[c] Average vehicle delay (seconds)
[d] 50th and 95th percentile queue lengths (feet) based upon average vehicle length of 25 feet
~ Volume exceeds capacity, queue is theoretically infinite; queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer; queue shown is maximum after two cycles

Table 12b – Capacity Analysis Summary: 2028 No-Build Conditions

Location	Direction / Movement[a]	Saturday Midday Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Water St. at Farm Dr. *[signalized]*	Water St. EB - T	0.48	40.5	D	160	245
	Water St. EB - R	0.24	1.5	A	0	17
	Water St. WB - L	0.68	30.0	C	163	227
	Water St. WB - T	0.33	22.1	C	131	208
	Farm St. NB - L	0.84	57.8	Error	258	313
	Farm St. NB - R	0.51	3.4	A	0	51
	Total	0.84	25.4	C		
Farm St. at Nahant St. *[unsignalized]*	Nahant St. EB - LR	1.93	472.8	F	-	740
	Farm St. NB - LT	0.26	5.8	A	-	26
	Farm St. SB - TR	0.33	0.0	A	-	0
Farm St.at Hemlock St. *[unsignalized]*	Hemlock St. WB - LR	1.69	373.5	F	-	571
	Farm St. NB - TR	0.49	0.0	A	-	0
	Farm St. SB - L	0.11	10.1	B	-	10
	Farm St. SB - T	0.39	0.0	A	-	0
Hemlock St. at WMHS Dr. *[unsignalized]*	Hemlock St. EB - LT	0.02	1.5	A	-	2
	Hemlock St. WB - TR	0.15	0.0	A	-	0
	WMHS Dr. SB - LR	0.14	10.4	B	-	12
Farm St. at Old Nahant Rd (North) *[unsignalized]*	Old Nahant EB - LR	1.22	196.1	F	-	281
	Farm St. NB - LT	0.46	0.0	A	-	0
	Farm St. SB - TR	0.02	0.5	A	-	1
Farm St. at Old Nahant Rd (South) *[unsignalized]*	Old Nahant EB - LR	0.23	19.5	C	-	22
	Farm St. NB - LT	0.05	1.2	A	-	4
	Farm St. SB - TR	0.32	0.0	A	-	0

Under 2028 No-Build conditions, at the intersection of Water Street (Route 129) and Farm Street, the Farm Street northbound left-turn lane will continue to operate at LOS E in both the morning and afternoon peak school hours, as well as Saturday midday. The remaining lane groups at the intersection will operate at LOS C or better in both the morning and afternoon peak school hours, as well as Saturday midday. Overall, the intersection will continue to operate at LOS C in both the morning and afternoon peak hours, as well as Saturday midday.

All approaches at the intersection of Hemlock Street and Wakefield High School Driveway will continue to operate at LOS C or better in both the morning and afternoon peak hours, as well as Saturday midday.

At the intersection of Nahant Street and Farm Street, the Nahant Street eastbound approach will continue to operate at LOS F in both the morning and afternoon peak school hours, as well as Saturday midday. The remaining lane groups at the intersection will operate at LOS C or better in both the morning and afternoon peak hours, as well as Saturday midday.

At the intersection of Hemlock Street and Farm Street, the Hemlock Street westbound approach will continue to operate at LOS F in both the morning and afternoon peak school hours, as well as Saturday midday. The remaining

lane groups at the intersection will operate at LOS C or better in both the morning and afternoon peak school hours, as well as Saturday midday.

At the northern intersection of Old Nahant Road and Farm Street, the Old Nahant Road eastbound approach will continue to operate at LOS F in both the morning and afternoon peak school hours, as well as Saturday midday. The remaining lane groups at the intersection will operate at LOS C or better in both the morning and afternoon peak school hours, as well as Saturday midday.

Most of the approaches at the remaining unsignalized intersections will operate at LOS C or better and the approaches at these intersections are experiencing minimal queueing.

8.5 2028 Build Capacity Analysis

Nitsch Engineering analyzed the 2028 Build Conditions traffic operations at the study intersections for the proposed schools. The 2028 Build Conditions represent the 2028 No-Build Conditions traffic volumes in addition to the proposed school net volumes. The Level of Service Summaries are shown in Tables 13a and 13b.

Table 13a – Capacity Analysis Summary: 2028 Build Conditions

Location	Direction / Movement[a]	Weekday Morning Peak Hour					Weekday Afternoon Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th	v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Water St. at Farm Dr. *[signalized]*	Water St. EB - T	0.62	50.7	D	149	184	0.57	44.2	D	183	231
	Water St. EB - R	0.59	3.1	A	0	0	0.26	1.4	A	0	13
	Water St. WB - L	0.89	48.4	D	263	658	0.80	40.4	D	186	346
	Water St. WB - T	0.54	27.7	C	235	320	0.43	25.7	C	169	202
	Farm St. NB - L	0.84	55.0	E	267	226	0.84	54.7	D	275	291
	Farm St. NB - R	0.28	2.7	A	0	42	0.57	3.7	A	0	60
	Total	0.89	29.2	C			0.84	26.8	C		
Farm St. at Nahant St. *[unsignalized]*	Nahant St. EB - LR	2.29	625.2	F	-	1092	7.21	E	F	-	E
	Farm St. NB - LT	0.28	6.6	A	-	28	0.62	16.1	C	-	110
	Farm St. SB - TR	0.51	0.0	A	-	0	0.49	0.0	A	-	0
Farm St.at Hemlock St. *[unsignalized]*	Hemlock St. WB - LR	1.89	498.5	F	-	425	1.65	364.9	F	-	496
	Farm St. NB - TR	0.44	0.0	A	-	0	0.59	0.0	A	-	0
	Farm St. SB - L	0.51	13.5	B	-	75	0.14	11.0	B	-	12
	Farm St. SB - T	0.39	0.0	A	-	0	0.45	0.0	A	-	0
Hemlock St.at WMHS Dr. *[unsignalized]*	Hemlock St. EB - LT	0.14	3.3	A	-	12	0.04	4.0	A	-	3
	Hemlock St. WB - TR	0.14	0.0	A	-	0	0.14	0.0	A	-	0
	WMHS Dr. SB - LR	0.08	12.7	B	-	6	0.19	10.4	B	-	17
Farm St. at Old Nahant Rd (North) *[unsignalized]*	Old Nahant EB - LR	1.13	141.2	F	-	303	0.99	98.6	F	-	233
	Farm St. NB - LT	0.42	0.0	A	-	0	0.39	0.0	A	-	0
	Farm St. SB - TR	0.01	0.4	A	-	1	0.01	0.4	A	-	1
Farm St. at Old Nahant Rd (South) *[unsignalized]*	Old Nahant EB - LR	0.37	21.6	C	-	41	0.13	13.4	B	-	11
	Farm St. NB - LT	0.07	1.8	A	-	5	0.08	2.0	A	-	6
	Farm St. SB - TR	0.29	0.0	A	-	0	0.26	0.0	A	-	0
Farm St. at New Dr. (un*signalized)*	New Dr. WB - L	0.46	37.3	E	-	55	0.57	43.5	E	-	78
	New Dr. WB - R	0.13	11.8	B	-	11	0.22	15.6	C	-	21
	Farm St. NB - T	0.27	0.0	A	-	0	0.41	0.0	A	-	0
	Farm St NB - R	0.11	0.0	A	-	0	0.03	0.0	A	-	0
	Farm St. SB - L	0.17	9.6	A	-	16	0.05	9.5	A	-	4
	Farm St. SB - T	0.17	0.0	A	-	0	0.21	0.0	A	-	0

[a] Direction: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound;
Movement: L = Left-turn, T = Through movement, R = Right-turn
[b] Overall v/c ratio is the maximum v/c ratio among lane groups
[c] Average vehicle delay (seconds)
[d] 50th and 95th percentile queue lengths (feet) based upon average vehicle length of 25 feet
~ Volume exceeds capacity, queue is theoretically infinite; queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer; queue shown is maximum after two cycles

Table 13b – Capacity Analysis Summary: 2028 Build Conditions

Location	Direction / Movement[a]	Saturday Midday Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Water St. at Farm Dr. *[signalized]*	Water St. EB - T	0.49	40.9	D	161	245
	Water St. EB - R	0.25	1.5	A	0	17
	Water St. WB - L	0.70	31.0	C	167	232
	Water St. WB - T	0.33	22.3	C	132	209
	Farm St. NB - L	0.84	57.5	E	260	316
	Farm St. NB - R	0.51	3.4	A	0	51
	Total	0.84	25.2	C		
Farm St. at Nahant St. *[unsignalized]*	Nahant St. EB - LR	2.05	529.3	F	-	782
	Farm St. NB - LT	0.26	6.0	A	-	27
	Farm St. SB - TR	0.34	0.0	A	-	0
Farm St.at Hemlock St. *[unsignalized]*	Hemlock St. WB - LR	1.47	277.2	F	-	470
	Farm St. NB - TR	0.48	0.0	A	-	0
	Farm St. SB - L	0.10	10.0	A	-	9
	Farm St. SB - T	0.40	0.0	A	-	0
Hemlock St.at WMHS Dr. *[unsignalized]*	Hemlock St. EB - LT	0.02	1.9	A	-	2
	Hemlock St. WB - TR	0.13	0.0	A	-	0
	WMHS Dr. SB - LR	0.14	10.2	B	-	12
Farm St. at Old Nahant Rd (North) *[unsignalized]*	Old Nahant EB - LR	1.03	123.0	F	-	223
	Farm St. NB - LT	0.47	0.0	A	-	0
	Farm St. SB - TR	0.02	0.5	A	-	1
Farm St. at Old Nahant Rd (South) *[unsignalized]*	Old Nahant EB - LR	0.29	23.4	C	-	30
	Farm St. NB - LT	0.05	1.3	A	-	4
	Farm St. SB - TR	0.32	0.0	A	-	0
Farm St. at New Dr. *(signalized)*	New Dr. WB - L	0.12	28.6	D	-	10
	New Dr. WB - R	0.04	13.4	B	-	3
	Farm St. NB - T	0.41	0.0	A	-	0
	Farm St NB - R	0.02	0.0	A	-	0
	Farm St. SB - L	0.03	9.2	A	-	2
	Farm St. SB - T	0.32	0.0	A	-	0

Under 2028 Build conditions, at the intersection of Water Street (Route 129) and Farm Street, the Farm Street northbound left-turn lane will continue to operate at LOS E in the morning and Saturday midday peak hours but will improve to LOS D in the afternoon peak hours. The remaining lane groups at the intersection will operate at LOS D or better in both the morning and afternoon peak hours, as well as Saturday midday. Overall, the intersection will continue to operate at LOC C in both the morning and afternoon peak hours, as well as Saturday midday.

All approached at the intersection of Hemlock Street and Wakefield High School Driveway will operate at LOC B or better in both the morning and afternoon peak hours, as well as Saturday midday.

At the new intersection of Farm Street and the New Driveway, the New Driveway westbound left-turn lane will operate at LOS E in the morning and afternoon peak hours, and at LOS D in the Saturday midday peak hours. The remaining lane groups at the intersection will operate at LOS B or better in both the morning and afternoon peak hours, as well as Saturday midday.

At the intersection of Nahant Street and Farm Street, the Nahant Street eastbound approach will continue to operate at LOS F in both the morning and afternoon peak hours, as well as Saturday midday. The remaining lane groups at the intersection will operate at LOS C or better in both the morning and afternoon peak hours, as well as Saturday midday.

At the intersection of Hemlock Street and Farm Street, the Hemlock Street westbound approach will continue to operate at LOS F in both the morning and afternoon peak hours, as well as Saturday midday. The remaining lane groups at the intersection will operate at LOS C or better in both the morning and afternoon peak hours, as well as Saturday midday.

At the northern intersection of Old Nahant Road and Farm Street, the Old Nahant Road eastbound approach will continue to operate at LOS F in both the morning and afternoon peak hours, as well as Saturday midday. The remaining lane groups at the intersection will operate at LOS C or better in both the morning and afternoon peak hours, as well as Saturday midday.

Most of the approaches at the remaining unsignalized intersections will operate at LOS C or better and the approaches at these intersections are experiencing minimal queueing.

9 Sight Distance

Stopping Sight Distance (SSD) is the length of the roadway ahead that is visible to the driver and should be sufficiently long to enable a vehicle traveling at or near the design speed to stop before reaching a stationary object in its path. Stopping sight distance is the sum of the distance traversed by the vehicle from the instant the driver sights an object necessitating a stop to the instant the brakes are applied, and the distance needed to stop the vehicle from the instant brake application begins.

Intersection Sight Distance (ISD) is the length of the leg of the departure sight triangle along the major road in both directions for a vehicle stopped on the minor road waiting to depart. The critical departure sight triangles for the new school driveway are for traffic approaching from either the left or right for left turns from the driveway onto Farm Street. The methods for determining the sight distances needed by drivers approaching intersections are based on the same principles as stopping sight distance, but incorporate modified assumptions based on observed driver behavior at intersections.

The SSD and ISD values associated with a given design speed are shown in Table 14. The sight distance evaluations for the intersection are shown in Table 15.

Table 14 – Sight Distance Criteria

Design Speed (MPH)	**Design Stopping Sight Distance Value[1] (SSD)** (FT)	**Recommended Intersection Sight Distance Value[2] (ISD)** (FT)
15	80	170
20	115	225
25	155	280
30	200	335
35	250	390
40	305	445
45	360	500
50	425	555
55	495	610
60	570	665
65	645	720
70	730	775
75	820	830
80	910	885
Source: *A Policy on Geometric Design of Highways and Streets, AASHTO, Washington DC (2011)*		
[1]Design value based on a grade of less than 3%, a brake reaction distance predicted on a time of 2.5 seconds and a deceleration rate of 11.2 ft/s^2		
[2]Recommended value based on Case B1 - a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less		

The posted speed limit for Farm Street at the project site is 30 MPH, with the 85th percentile speeds of 47 MPH at the southbound direction and 50 MPH at the northbound direction. To be conservative, we used the 85th percentile speed of 50 MPH for the sight distance analysis.

Table 15 – Proposed Sight Distance Evaluation

Intersection	Posted Speed (MPH)	85th Speed (MPH)	Minimum (FEET)[1,2]	Measured (FEET)	Obstruction
Farm Street at the School Driveway					
Stopping Sight Distance:					
Farm Street Northbound	30	50	425	380	Vertical curve
Farm Street Southbound	30	50	425	680	
Intersection Sight Distance:					
Looking to the right from Driveway	30	50	555	680	
Looking to the left from Driveway	30	50	555	380	Vertical curve

Source: A Policy on Geometric Design of Highways and Streets, AASHTO, Washington DC (2011)
[1] Table 3-1. Stopping Sight Distance on Level Roadways
[2] Table 9-6. Design Intersection Sight Distance - Case B1, Left Turn from Stop

As shown in Table 15 both SSD and ISD values at the new driveway for the southbound traffic on Farm Street exceed the minimum values. However, because of the vertical curve on Farm Street south of the new driveway, the SSD and ISD values to not meet the minimum required distances. The installation of the traffic signal system will improve conditions related to the sight distance.

10 Mitigation

10.1 Traffic Signal Warrant Analysis

We performed Traffic Signal Warrant Analyses for the new intersection of Farm Street at the New School Drive based on the procedures outlined in the *Manual on Uniform Traffic Control Devices*[2] (MUTCD), 2009 edition. The MUTCD indicates nine separate conditions under which a traffic signal warrant can be met, and they are shown below.

1. Warrant 1: Eight-Hour Vehicular Volume;
2. Warrant 2: Four-Hour Vehicular Volume;
3. Warrant 3: Peak Hour;
4. Warrant 4: Pedestrian Volume;
5. Warrant 5: School Crossing;
6. Warrant 6: Coordinated Signal System;
7. Warrant 7: Crash Experience;
8. Warrant 8: Roadway Network; and
9. Warrant 9: Intersection Near a Grade Crossing.

Given the criteria set forth in the MUTCD and the assumptions above, none of the warrants are met for the intersection of Farm Street at the new driveway. The Traffic Signal Warrant Analysis is included in Appendix A-5.

10.2 Recommended Mitigation

Although a traffic signal is not warranted per the MUTCD, Tables 13a and 13b indicate that the intersection of Farm Street and the new driveway has approaches that will operate at LOS E or worse and delays up to 43.5 seconds. In addition, the SSD and ISD values do not meet the minimum required distances due to the vertical curve on Farm Street south of the new driveway. Therefore, to mitigate the delays, improve conditions related to the sight distance and address the speeding on Farm Street we recommend implementing a traffic signal with additional lane capacity at the intersection.

Based on our analysis to optimize operations, the signalized intersection will be a semi-actuated traffic signal operating in three phases. The following movements are permitted or protected, as noted, during each of the phases.

<u>First phase:</u>
- Farm Street southbound (protected left turn); and
- Farm Street southbound through traffic.

<u>Second phase:</u>
- Farm Street northbound and southbound.

<u>Third phase:</u>
- New driveway westbound (protected left and right turn).

[2] Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 Edition, Federal Highway Administration

The new driveway approach will consist of two lanes; one dedicated right-turn lane and one dedicated left-turn lane. The Farm Street southbound approach will consist of two lanes; one dedicated left-turn lane and one through lane. The Farm Street northbound approach will consist of two lanes; one dedicated right-turn lane and one through lane.

The Level of Service Summary for this 2028 Build with Mitigation for the intersection of Farm Street and the new driveway is shown in Tables 16a and 16b.

Table 16a – Capacity Analysis Summary: 2028 Build with Mitigation Conditions

Location	Direction / Movement[a]	Weekday Morning Peak Hour					Weekday Afternoon Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th	v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Farm St. at New Dr. (*signalized*)	New Dr. WB - L	0.35	30.7	C	36	76	0.43	32.2	C	46	92
	New Dr. WB - R	0.12	4.0	A	0	21	0.17	4.7	A	0	27
	Farm St. NB - T	0.48	14.1	B	113	219	0.61	14.3	B	205	360
	Farm St NB - R	0.17	1.0	A	0	17	0.04	0.8	A	0	6
	Farm St. SB - L	0.55	33.7	C	65	115	0.18	28.7	C	17	47
	Farm St. SB - T	0.22	3.4	A	30	55	0.25	3.4	A	37	75
	Total	0.55	12.7	B			0.61	12.2	B		

[a] Direction: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound; Movement: L = Left-turn, T = Through movement, R = Right-turn
[b] Overall v/c ratio is the maximum v/c ratio among lane groups
[c] Average vehicle delay (seconds)
[d] 50th and 95th percentile queue lengths (feet) based upon average vehicle length of 25 feet
~ Volume exceeds capacity, queue is theoretically infinite; queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer; queue shown is maximum after two cycles

Table 16b – Capacity Analysis Summary: 2028 Build Conditions

Location	Direction / Movement[a]	Saturday Midday Peak Hour				
		v/c Ratio[b]	Delay[c]	LOS	Queue[d] 50th	Queue[d] 95th
Farm St. at New Dr. (*signalized*)	New Dr. WB - L	0.05	24.1	C	7	24
	New Dr. WB - R	0.05	12.3	B	0	15
	Farm St. NB - T	0.93	43.9	D	300	517
	Farm St NB - R	0.05	8.1	A	3	19
	Farm St. SB - L	0.07	23.4	C	10	29
	Farm St. SB - T	0.44	6.8	A	98	153
	Total	0.93	26.7	C		

All lane groups at the new signalized intersection of Farm Street and the new driveway will operate at LOS C or better in both the morning and afternoon peak school hours, and at LOS D or better in Saturday midday. Overall, the intersection will operate at LOS B in both the morning and afternoon peak hours, and at LOS C in Saturday midday.

11 Conclusions and Recommendations

11.1 Conclusions

Nitsch Engineering has been retained by Drumney Rosane Anderson, Inc. ("DRA") to prepare a Traffic Impact Study (TIS) based on the schematic design for the planned on-site improvements at the Northeast Metropolitan Regional Vocational High School ("NEMT") in Wakefield, including the construction of the new driveway off Farm Street south of Hemlock Road.

We studied five intersections, two signalized and three unsignalized, to establish the impacts the new school with additional enrollment would have on intersection traffic operations.

To be conservative in our analysis, we used the Institute of Transportation Engineers (ITE) publication *Trip Generation, 10th Edition* to estimate the vehicle trip rates for the existing NEMT School and the proposed school to establish the net trips. Assuming transportation proportions remain approximately the same for the design year of 2028, it will result in approximately 686 new daily trips (343 trips in and 343 trips out) with 220 new trips (149 trips in and 71 trips out) during weekday morning drop-off times, and 132 new trips (42 trips in and 90 trips out) during weekday afternoon pick-up times.

We examined the build condition with respect to the projected student enrollment at the proposed school. During the morning drop-off, 880 vehicles (parents and staff) will arrive via Hemlock Street and the new driveway on Farm Street between 7:00 AM and 7:45 AM to drop-off their students. The students will be dropped-off at the car loop, and the vehicles will exit to Farm Street. Our analysis indicates that during the morning drop-off, the 95th Percentile Queue length exiting the new driveway for the left turns onto Farm Street will be 76 (approximately 4 vehicles) and for the right turns onto Farm Street will be 21 feet (approximately 1 vehicle). The 95th Percentile Queue length entering the new driveway from the left turns onto Farm Street will be 115 (approximately 6 vehicles).

During the afternoon pick-up, 528 vehicles will start arriving between 1:30 and 2:10pm. Once the parents have picked up their students, they will proceed to exit the school lot via either Hemlock Street or the new driveway onto Farm Street. Our analysis indicates that during the afternoon pick-up, the 95th Percentile Queue length exiting the new driveway for the left turns onto Farm Street will be 92 (approximately 5 vehicles) and for the right turns onto Farm Street will be 27 feet (approximately 3 vehicles). The 95th Percentile Queue length entering the new driveway from the left turns onto Farm Street will be 47 (approximately 3 vehicles).

The bus pick-up/drop-off will occur at the designated bus loop located south of the school.

11.2 Recommendations

Based on the proposed school, Nitsch Engineering offers the following recommendations:

- Signalization of the intersection of the New School Driveway and Farm Street will help improve the sight distance at the intersection.
- Consider appropriate measures to discourage speeding on Farm Street, which experiences an 85th percentile speed of 50 MPH.

Nitsch Engineering

Appendices

Northeast Metropolitan Regional Vocational High School Wakefield, MA

June 29, 2021

Prepared for:

Drumney Rosane Anderson, Inc.
235 Bear Hill Road, 4th
Waltham, MA 02451

Submitted by:

Nitsch Engineering
2 Center Plaza, Suite 430
Boston, MA 02108

Nitsch Project #13872.2

CONTENTS

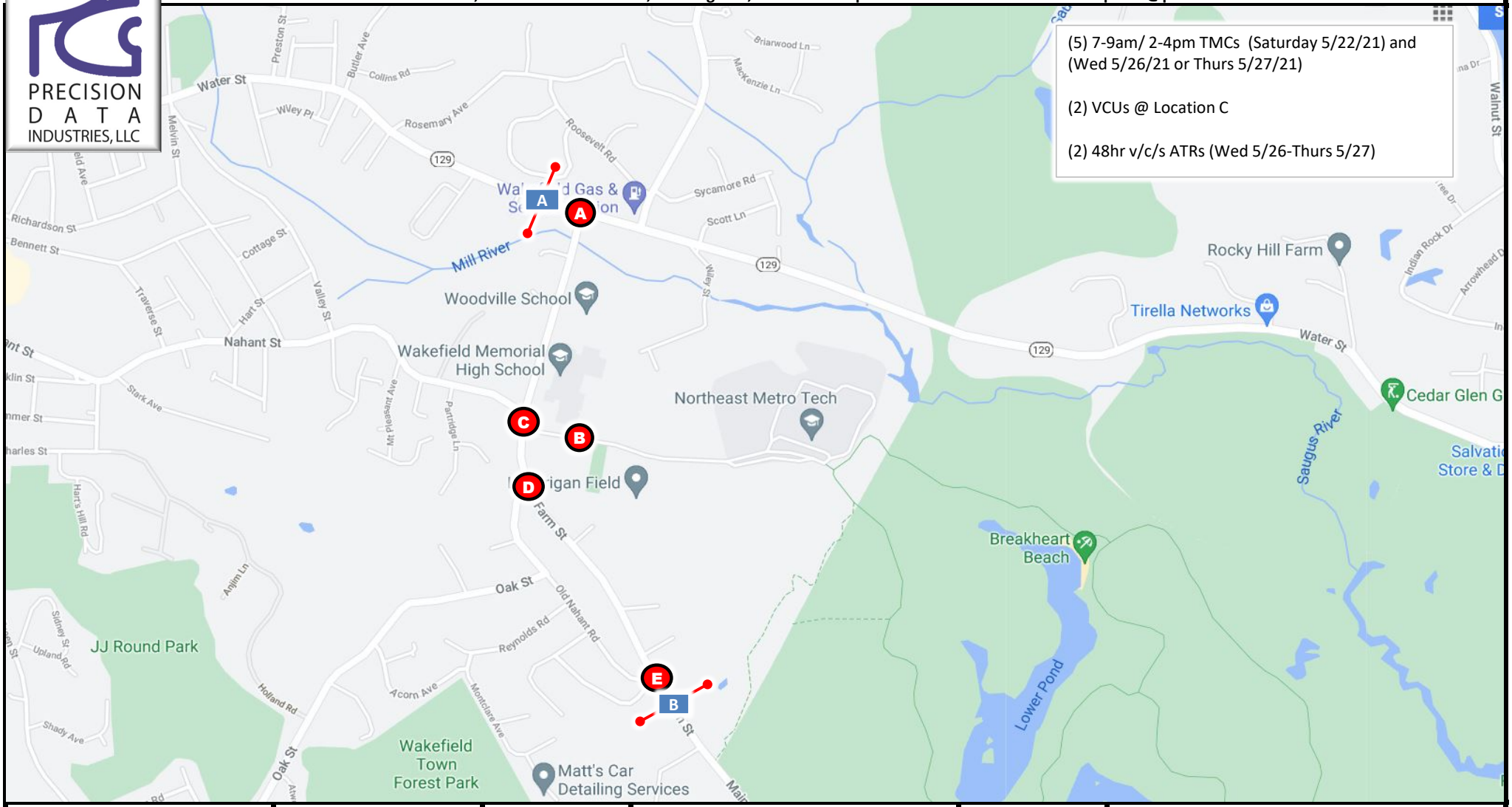
Section Number	DESCRIPTION
A-1	Traffic Count Data
A-2	Weekday Seasonal Adjustment Factors
A-3	Crash Data
A-4	Traffic Signal Warrant Analysis
A-5	Capacity Analysis

Section A-1

Traffic Count Data

Location Map: 217949 Wakefield, MA

Precision Data Industries, LLC 46 Morton Street, Framingham, MA 01702 ph: 508-875-0100 email: datarequests@pdillc.com



Client:	Engineer:	Site Code:	Date:	PDI Job #	City, State:
Nitsch Engineering	D. Birru	13872.2	Sat 5/22/21 thru Thurs 5/27/2021	217949	Wakefield, MA

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date:
Wednesday, May, 26, 2021

Volume

WB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	4		12:00 PM	63	
12:15 AM	5		12:15 PM	98	
12:30 AM	8		12:30 PM	97	
12:45 AM	3	20	12:45 PM	75	333
1:00 AM	2		1:00 PM	63	
1:15 AM	5		1:15 PM	103	
1:30 AM	3		1:30 PM	94	
1:45 AM	3	13	1:45 PM	79	339
2:00 AM	1		2:00 PM	111	
2:15 AM	1		2:15 PM	142	
2:30 AM	0		2:30 PM	96	
2:45 AM	1	3	2:45 PM	111	460
3:00 AM	1		3:00 PM	117	
3:15 AM	1		3:15 PM	115	
3:30 AM	0		3:30 PM	122	
3:45 AM	3	5	3:45 PM	103	457
4:00 AM	5		4:00 PM	119	
4:15 AM	4		4:15 PM	113	
4:30 AM	2		4:30 PM	104	
4:45 AM	7	18	4:45 PM	108	444
5:00 AM	4		5:00 PM	103	
5:15 AM	16		5:15 PM	106	
5:30 AM	20		5:30 PM	122	
5:45 AM	36	76	5:45 PM	86	417
6:00 AM	23		6:00 PM	98	
6:15 AM	49		6:15 PM	78	
6:30 AM	70		6:30 PM	82	
6:45 AM	79	221	6:45 PM	80	338
7:00 AM	68		7:00 PM	88	
7:15 AM	114		7:15 PM	79	
7:30 AM	128		7:30 PM	58	
7:45 AM	116	426	7:45 PM	79	304
8:00 AM	113		8:00 PM	57	
8:15 AM	156		8:15 PM	40	
8:30 AM	97		8:30 PM	36	
8:45 AM	94	460	8:45 PM	49	182
9:00 AM	75		9:00 PM	27	
9:15 AM	87		9:15 PM	27	
9:30 AM	70		9:30 PM	18	
9:45 AM	72	304	9:45 PM	23	95
10:00 AM	76		10:00 PM	17	
10:15 AM	61		10:15 PM	12	
10:30 AM	72		10:30 PM	13	
10:45 AM	107	316	10:45 PM	12	54
11:00 AM	71		11:00 PM	8	
11:15 AM	79		11:15 PM	8	
11:30 AM	75		11:30 PM	10	
11:45 AM	69	294	11:45 PM	5	31
Total	2156			3454	
Percent	38.43%			61.57%	
Day Total			5610		
Peak Hour	7:30 AM			2:15 PM	
Volume	513			466	
P.H.F.	0.822			0.820	

EB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	1		12:00 PM	68	
12:15 AM	3		12:15 PM	91	
12:30 AM	3		12:30 PM	70	
12:45 AM	2	9	12:45 PM	79	308
1:00 AM	0		1:00 PM	91	
1:15 AM	3		1:15 PM	80	
1:30 AM	0		1:30 PM	84	
1:45 AM	0	3	1:45 PM	112	367
2:00 AM	1		2:00 PM	112	
2:15 AM	1		2:15 PM	104	
2:30 AM	1		2:30 PM	90	
2:45 AM	1	4	2:45 PM	84	390
3:00 AM	1		3:00 PM	103	
3:15 AM	3		3:15 PM	79	
3:30 AM	1		3:30 PM	103	
3:45 AM	2	7	3:45 PM	102	387
4:00 AM	3		4:00 PM	124	
4:15 AM	4		4:15 PM	109	
4:30 AM	2		4:30 PM	117	
4:45 AM	3	12	4:45 PM	108	458
5:00 AM	10		5:00 PM	123	
5:15 AM	6		5:15 PM	126	
5:30 AM	15		5:30 PM	98	
5:45 AM	15	46	5:45 PM	112	459
6:00 AM	19		6:00 PM	87	
6:15 AM	29		6:15 PM	90	
6:30 AM	47		6:30 PM	69	
6:45 AM	72	167	6:45 PM	87	333
7:00 AM	106		7:00 PM	74	
7:15 AM	138		7:15 PM	71	
7:30 AM	99		7:30 PM	56	
7:45 AM	91	434	7:45 PM	48	249
8:00 AM	85		8:00 PM	46	
8:15 AM	103		8:15 PM	31	
8:30 AM	88		8:30 PM	46	
8:45 AM	80	356	8:45 PM	39	162
9:00 AM	62		9:00 PM	28	
9:15 AM	48		9:15 PM	33	
9:30 AM	65		9:30 PM	22	
9:45 AM	64	239	9:45 PM	21	104
10:00 AM	79		10:00 PM	23	
10:15 AM	83		10:15 PM	13	
10:30 AM	88		10:30 PM	15	
10:45 AM	71	321	10:45 PM	8	59
11:00 AM	66		11:00 PM	6	
11:15 AM	87		11:15 PM	7	
11:30 AM	76		11:30 PM	0	
11:45 AM	65	294	11:45 PM	4	17
Total	1892			3293	
Percent	36.49%			63.51%	
Day Total			5185		
Peak Hour	7:00 AM			4:30 PM	
Volume	434			474	
P.H.F.	0.786			0.940	

Combined

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	5		12:00 PM	131	
12:15 AM	8		12:15 PM	189	
12:30 AM	11		12:30 PM	167	
12:45 AM	5	29	12:45 PM	154	641
1:00 AM	2		1:00 PM	154	
1:15 AM	8		1:15 PM	183	
1:30 AM	3		1:30 PM	178	
1:45 AM	3	16	1:45 PM	191	706
2:00 AM	2		2:00 PM	223	
2:15 AM	2		2:15 PM	246	
2:30 AM	1		2:30 PM	186	
2:45 AM	2	7	2:45 PM	195	850
3:00 AM	2		3:00 PM	220	
3:15 AM	4		3:15 PM	194	
3:30 AM	1		3:30 PM	225	
3:45 AM	5	12	3:45 PM	205	844
4:00 AM	8		4:00 PM	243	
4:15 AM	8		4:15 PM	222	
4:30 AM	4		4:30 PM	221	
4:45 AM	10	30	4:45 PM	216	902
5:00 AM	14		5:00 PM	226	
5:15 AM	22		5:15 PM	232	
5:30 AM	35		5:30 PM	220	
5:45 AM	51	122	5:45 PM	198	876
6:00 AM	42		6:00 PM	185	
6:15 AM	78		6:15 PM	168	
6:30 AM	117		6:30 PM	151	
6:45 AM	151	388	6:45 PM	167	671
7:00 AM	174		7:00 PM	162	
7:15 AM	252		7:15 PM	150	
7:30 AM	227		7:30 PM	114	
7:45 AM	207	860	7:45 PM	127	553
8:00 AM	198		8:00 PM	103	
8:15 AM	259		8:15 PM	71	
8:30 AM	185		8:30 PM	82	
8:45 AM	174	816	8:45 PM	88	344
9:00 AM	137		9:00 PM	55	
9:15 AM	135		9:15 PM	60	
9:30 AM	135		9:30 PM	40	
9:45 AM	136	543	9:45 PM	44	199
10:00 AM	155		10:00 PM	40	
10:15 AM	144		10:15 PM	25	
10:30 AM	160		10:30 PM	28	
10:45 AM	178	637	10:45 PM	20	113
11:00 AM	137		11:00 PM	14	
11:15 AM	166		11:15 PM	15	
11:30 AM	151		11:30 PM	10	
11:45 AM	134	588	11:45 PM	9	48
Total	4048			6747	
Percent	37.50%			62.50%	
Day Total			10795		
Peak Hour	7:30 AM			4:00 PM	
Volume	891			902	
P.H.F.	0.860			0.928	

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date:
Thursday, May 27, 2021

Volume

WB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	8		12:00 PM	94	
12:15 AM	3		12:15 PM	80	
12:30 AM	2		12:30 PM	72	
12:45 AM	2	15	12:45 PM	74	320
1:00 AM	1		1:00 PM	77	
1:15 AM	4		1:15 PM	99	
1:30 AM	2		1:30 PM	108	
1:45 AM	2	9	1:45 PM	79	363
2:00 AM	0		2:00 PM	105	
2:15 AM	1		2:15 PM	130	
2:30 AM	2		2:30 PM	119	
2:45 AM	0	3	2:45 PM	129	483
3:00 AM	1		3:00 PM	105	
3:15 AM	0		3:15 PM	101	
3:30 AM	1		3:30 PM	80	
3:45 AM	4	6	3:45 PM	106	392
4:00 AM	5		4:00 PM	97	
4:15 AM	6		4:15 PM	105	
4:30 AM	4		4:30 PM	100	
4:45 AM	8	23	4:45 PM	104	406
5:00 AM	16		5:00 PM	116	
5:15 AM	11		5:15 PM	89	
5:30 AM	17		5:30 PM	125	
5:45 AM	35	79	5:45 PM	84	414
6:00 AM	22		6:00 PM	100	
6:15 AM	45		6:15 PM	88	
6:30 AM	61		6:30 PM	75	
6:45 AM	90	218	6:45 PM	62	325
7:00 AM	79		7:00 PM	91	
7:15 AM	111		7:15 PM	81	
7:30 AM	120		7:30 PM	68	
7:45 AM	140	450	7:45 PM	47	287
8:00 AM	120		8:00 PM	50	
8:15 AM	139		8:15 PM	42	
8:30 AM	108		8:30 PM	48	
8:45 AM	119	486	8:45 PM	44	184
9:00 AM	80		9:00 PM	36	
9:15 AM	82		9:15 PM	40	
9:30 AM	70		9:30 PM	48	
9:45 AM	85	317	9:45 PM	28	152
10:00 AM	69		10:00 PM	35	
10:15 AM	72		10:15 PM	18	
10:30 AM	62		10:30 PM	21	
10:45 AM	79	282	10:45 PM	15	89
11:00 AM	84		11:00 PM	15	
11:15 AM	88		11:15 PM	19	
11:30 AM	82		11:30 PM	11	
11:45 AM	89	343	11:45 PM	5	50
Total	2231			3465	
Percent	39.17%			60.83%	
Day Total			5696		
Peak Hour	7:30 AM			2:00 PM	
Volume	519			483	
P.H.F.	0.927			0.929	

EB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	5		12:00 PM	90	
12:15 AM	5		12:15 PM	89	
12:30 AM	1		12:30 PM	64	
12:45 AM	3	14	12:45 PM	75	318
1:00 AM	1		1:00 PM	76	
1:15 AM	0		1:15 PM	94	
1:30 AM	1		1:30 PM	93	
1:45 AM	1	3	1:45 PM	94	357
2:00 AM	1		2:00 PM	145	
2:15 AM	0		2:15 PM	95	
2:30 AM	1		2:30 PM	68	
2:45 AM	0	2	2:45 PM	92	400
3:00 AM	1		3:00 PM	94	
3:15 AM	1		3:15 PM	106	
3:30 AM	4		3:30 PM	101	
3:45 AM	4	10	3:45 PM	113	414
4:00 AM	3		4:00 PM	110	
4:15 AM	6		4:15 PM	104	
4:30 AM	7		4:30 PM	109	
4:45 AM	3	19	4:45 PM	114	437
5:00 AM	5		5:00 PM	103	
5:15 AM	8		5:15 PM	101	
5:30 AM	9		5:30 PM	99	
5:45 AM	28	50	5:45 PM	117	420
6:00 AM	23		6:00 PM	105	
6:15 AM	24		6:15 PM	114	
6:30 AM	35		6:30 PM	104	
6:45 AM	79	161	6:45 PM	100	423
7:00 AM	109		7:00 PM	67	
7:15 AM	148		7:15 PM	87	
7:30 AM	94		7:30 PM	59	
7:45 AM	75	426	7:45 PM	66	279
8:00 AM	89		8:00 PM	52	
8:15 AM	107		8:15 PM	43	
8:30 AM	68		8:30 PM	47	
8:45 AM	67	331	8:45 PM	47	189
9:00 AM	53		9:00 PM	33	
9:15 AM	62		9:15 PM	35	
9:30 AM	65		9:30 PM	30	
9:45 AM	63	243	9:45 PM	25	123
10:00 AM	47		10:00 PM	21	
10:15 AM	60		10:15 PM	27	
10:30 AM	57		10:30 PM	19	
10:45 AM	78	242	10:45 PM	12	79
11:00 AM	55		11:00 PM	9	
11:15 AM	75		11:15 PM	8	
11:30 AM	79		11:30 PM	2	
11:45 AM	88	297	11:45 PM	3	22
Total	1798			3461	
Percent	34.19%			65.81%	
Day Total			5259		
Peak Hour	6:45 AM			5:45 PM	
Volume	430			440	
P.H.F.	0.726			0.940	

Combined

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	13		12:00 PM	184	
12:15 AM	8		12:15 PM	169	
12:30 AM	3		12:30 PM	136	
12:45 AM	5	29	12:45 PM	149	638
1:00 AM	2		1:00 PM	153	
1:15 AM	4		1:15 PM	193	
1:30 AM	3		1:30 PM	201	
1:45 AM	3	12	1:45 PM	173	720
2:00 AM	1		2:00 PM	250	
2:15 AM	1		2:15 PM	225	
2:30 AM	3		2:30 PM	187	
2:45 AM	0	5	2:45 PM	221	883
3:00 AM	2		3:00 PM	199	
3:15 AM	1		3:15 PM	207	
3:30 AM	5		3:30 PM	181	
3:45 AM	8	16	3:45 PM	219	806
4:00 AM	8		4:00 PM	207	
4:15 AM	12		4:15 PM	209	
4:30 AM	11		4:30 PM	209	
4:45 AM	11	42	4:45 PM	218	843
5:00 AM	21		5:00 PM	219	
5:15 AM	19		5:15 PM	190	
5:30 AM	26		5:30 PM	224	
5:45 AM	63	129	5:45 PM	201	834
6:00 AM	45		6:00 PM	205	
6:15 AM	69		6:15 PM	202	
6:30 AM	96		6:30 PM	179	
6:45 AM	169	379	6:45 PM	162	748
7:00 AM	188		7:00 PM	158	
7:15 AM	259		7:15 PM	168	
7:30 AM	214		7:30 PM	127	
7:45 AM	215	876	7:45 PM	113	566
8:00 AM	209		8:00 PM	102	
8:15 AM	246		8:15 PM	85	
8:30 AM	176		8:30 PM	95	
8:45 AM	186	817	8:45 PM	91	373
9:00 AM	133		9:00 PM	69	
9:15 AM	144		9:15 PM	75	
9:30 AM	135		9:30 PM	78	
9:45 AM	148	560	9:45 PM	53	275
10:00 AM	116		10:00 PM	56	
10:15 AM	132		10:15 PM	45	
10:30 AM	119		10:30 PM	40	
10:45 AM	157	524	10:45 PM	27	168
11:00 AM	139		11:00 PM	24	
11:15 AM	163		11:15 PM	27	
11:30 AM	161		11:30 PM	13	
11:45 AM	177	640	11:45 PM	8	72
Total	4029			6926	
Percent	36.78%			63.22%	
Day Total			10955		
Peak Hour	7:15 AM			2:00 PM	
Volume	897			883	
P.H.F.	0.866			0.883	

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Wednesday, May, 26, 2021

Classification (60-minute)

WB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	8	8	0	4	0	0	0	0	0	0	0	0	20
1:00 AM	0	8	5	0	0	0	0	0	0	0	0	0	0	13
2:00 AM	0	2	1	0	0	0	0	0	0	0	0	0	0	3
3:00 AM	0	5	0	0	0	0	0	0	0	0	0	0	0	5
4:00 AM	0	10	4	0	3	1	0	0	0	0	0	0	0	18
5:00 AM	0	48	16	1	11	0	0	0	0	0	0	0	0	76
6:00 AM	1	112	55	1	47	3	1	1	0	0	0	0	0	221
7:00 AM	2	270	87	2	51	1	2	11	0	0	0	0	0	426
8:00 AM	3	289	108	2	38	2	5	11	1	0	1	0	0	460
9:00 AM	3	177	83	7	28	3	2	1	0	0	0	0	0	304
10:00 AM	0	193	74	2	42	2	0	2	1	0	0	0	0	316
11:00 AM	1	179	65	3	39	2	1	4	0	0	0	0	0	294
12:00 PM	1	207	67	5	38	5	6	4	0	0	0	0	0	333
1:00 PM	2	222	67	7	31	3	1	5	0	1	0	0	0	339
2:00 PM	2	297	109	10	35	1	0	5	0	1	0	0	0	460
3:00 PM	3	284	110	8	42	3	0	5	1	1	0	0	0	457
4:00 PM	4	285	111	5	36	0	0	3	0	0	0	0	0	444
5:00 PM	5	284	95	4	28	1	0	0	0	0	0	0	0	417
6:00 PM	6	234	79	0	18	0	0	1	0	0	0	0	0	338
7:00 PM	2	193	86	0	21	0	0	1	1	0	0	0	0	304
8:00 PM	1	126	37	0	16	0	0	1	1	0	0	0	0	182
9:00 PM	0	64	22	0	9	0	0	0	0	0	0	0	0	95
10:00 PM	0	39	12	0	3	0	0	0	0	0	0	0	0	54
11:00 PM	1	24	4	0	2	0	0	0	0	0	0	0	0	31
Total	37	3560	1305	57	542	27	18	55	5	3	1	0	0	5610
Percent	0.66%	63.46%	23.26%	1.02%	9.66%	0.48%	0.32%	0.98%	0.09%	0.05%	0.02%	0.00%	0.00%	
AM Peak	8:00 AM	8:00 AM	8:00 AM	9:00 AM	7:00 AM	6:00 AM	8:00 AM	7:00 AM	8:00 AM		8:00 AM			8:00 AM
Volume	3	289	108	7	51	3	5	11	1	0	1	0	0	460
PM Peak	6:00 PM	2:00 PM	4:00 PM	2:00 PM	3:00 PM	12:00 PM	12:00 PM	1:00 PM	3:00 PM	1:00 PM				2:00 PM
Volume	6	297	111	10	42	5	6	5	1	1	0	0	0	460

Cycles:	37	0.7%
Cars and Light Trucks:	4865	86.7%
Heavy Vehicles:	708	12.6%

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Wednesday, May, 26, 2021

Classification (60-minute)

EB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	7	1	0	1	0	0	0	0	0	0	0	0	9
1:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	3
2:00 AM	0	3	1	0	0	0	0	0	0	0	0	0	0	4
3:00 AM	0	5	0	0	1	1	0	0	0	0	0	0	0	7
4:00 AM	0	8	2	0	2	0	0	0	0	0	0	0	0	12
5:00 AM	1	23	12	2	8	0	0	0	0	0	0	0	0	46
6:00 AM	0	111	32	3	17	0	2	2	0	0	0	0	0	167
7:00 AM	3	306	79	6	30	4	0	6	0	0	0	0	0	434
8:00 AM	1	238	64	8	34	5	0	6	0	0	0	0	0	356
9:00 AM	0	161	51	3	15	6	0	2	1	0	0	0	0	239
10:00 AM	4	208	71	4	25	5	0	3	0	1	0	0	0	321
11:00 AM	2	199	49	2	33	3	1	5	0	0	0	0	0	294
12:00 PM	4	212	50	4	28	6	1	2	1	0	0	0	0	308
1:00 PM	3	260	61	5	31	4	0	3	0	0	0	0	0	367
2:00 PM	1	264	74	13	34	2	0	2	0	0	0	0	0	390
3:00 PM	4	282	63	7	27	2	0	2	0	0	0	0	0	387
4:00 PM	0	309	93	3	45	1	0	7	0	0	0	0	0	458
5:00 PM	6	322	83	2	38	0	0	6	1	0	0	1	0	459
6:00 PM	1	247	53	4	27	0	0	1	0	0	0	0	0	333
7:00 PM	0	181	51	0	17	0	0	0	0	0	0	0	0	249
8:00 PM	0	133	17	0	11	1	0	0	0	0	0	0	0	162
9:00 PM	0	76	20	1	6	0	0	0	1	0	0	0	0	104
10:00 PM	0	44	12	1	2	0	0	0	0	0	0	0	0	59
11:00 PM	0	15	1	0	1	0	0	0	0	0	0	0	0	17
PM Total	30	3617	940	68	433	40	4	47	4	1	0	1	0	5185
Percent	0.58%	69.76%	18.13%	1.31%	8.35%	0.77%	0.08%	0.91%	0.08%	0.02%	0.00%	0.02%	0.00%	
AM Peak	10:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	9:00 AM	6:00 AM	7:00 AM	9:00 AM	10:00 AM				7:00 AM
Volume	4	306	79	8	34	6	2	6	1	1	0	0	0	434
PM Peak	5:00 PM	5:00 PM	4:00 PM	2:00 PM	4:00 PM	12:00 PM	12:00 PM	4:00 PM	12:00 PM			5:00 PM		5:00 PM
Volume	6	322	93	13	45	6	1	7	1	0	0	1	0	459

Cycles:	30	0.6%
Cars and Light Trucks:	4557	87.9%
Heavy Vehicles:	598	11.5%

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Wednesday, May, 26, 2021

Classification (60-minute)

Combined

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	15	9	0	5	0	0	0	0	0	0	0	0	29
1:00 AM	0	11	5	0	0	0	0	0	0	0	0	0	0	16
2:00 AM	0	5	2	0	0	0	0	0	0	0	0	0	0	7
3:00 AM	0	10	0	0	1	1	0	0	0	0	0	0	0	12
4:00 AM	0	18	6	0	5	1	0	0	0	0	0	0	0	30
5:00 AM	1	71	28	3	19	0	0	0	0	0	0	0	0	122
6:00 AM	1	223	87	4	64	3	3	3	0	0	0	0	0	388
7:00 AM	5	576	166	8	81	5	2	17	0	0	0	0	0	860
8:00 AM	4	527	172	10	72	7	5	17	1	0	1	0	0	816
9:00 AM	3	338	134	10	43	9	2	3	1	0	0	0	0	543
10:00 AM	4	401	145	6	67	7	0	5	1	1	0	0	0	637
11:00 AM	3	378	114	5	72	5	2	9	0	0	0	0	0	588
12:00 PM	5	419	117	9	66	11	7	6	1	0	0	0	0	641
1:00 PM	5	482	128	12	62	7	1	8	0	1	0	0	0	706
2:00 PM	3	561	183	23	69	3	0	7	0	1	0	0	0	850
3:00 PM	7	566	173	15	69	5	0	7	1	1	0	0	0	844
4:00 PM	4	594	204	8	81	1	0	10	0	0	0	0	0	902
5:00 PM	11	606	178	6	66	1	0	6	1	0	0	1	0	876
6:00 PM	7	481	132	4	45	0	0	2	0	0	0	0	0	671
7:00 PM	2	374	137	0	38	0	0	1	1	0	0	0	0	553
8:00 PM	1	259	54	0	27	1	0	1	1	0	0	0	0	344
9:00 PM	0	140	42	1	15	0	0	0	1	0	0	0	0	199
10:00 PM	0	83	24	1	5	0	0	0	0	0	0	0	0	113
11:00 PM	1	39	5	0	3	0	0	0	0	0	0	0	0	48
PM Total	67	7177	2245	125	975	67	22	102	9	4	1	1	0	10795
Percent	0.62%	66.48%	20.80%	1.16%	9.03%	0.62%	0.20%	0.94%	0.08%	0.04%	0.01%	0.01%	0.00%	
AM Peak	7:00 AM	7:00 AM	8:00 AM	8:00 AM	7:00 AM	9:00 AM	8:00 AM	7:00 AM	8:00 AM	10:00 AM	8:00 AM			7:00 AM
Volume	5	576	172	10	81	9	5	17	1	1	1	0	0	860
PM Peak	5:00 PM	5:00 PM	4:00 PM	2:00 PM	4:00 PM	12:00 PM	12:00 PM	4:00 PM	12:00 PM	1:00 PM		5:00 PM		4:00 PM
Volume	11	606	204	23	81	11	7	10	1	1	0	1	0	902

Cycles:	67	0.6%
Cars and Light Trucks:	9422	87.3%
Heavy Vehicles:	1306	12.1%

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Thursday, May 27, 2021

Classification (60-minute)

WB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	10	4	0	1	0	0	0	0	0	0	0	0	15
1:00 AM	0	7	0	0	2	0	0	0	0	0	0	0	0	9
2:00 AM	0	2	0	0	1	0	0	0	0	0	0	0	0	3
3:00 AM	0	5	0	0	1	0	0	0	0	0	0	0	0	6
4:00 AM	0	16	5	0	2	0	0	0	0	0	0	0	0	23
5:00 AM	0	37	25	2	13	1	1	0	0	0	0	0	0	79
6:00 AM	2	127	38	1	49	0	0	1	0	0	0	0	0	218
7:00 AM	1	273	102	4	62	3	0	5	0	0	0	0	0	450
8:00 AM	1	292	125	6	54	3	1	3	1	0	0	0	0	486
9:00 AM	3	200	68	2	36	5	0	3	0	0	0	0	0	317
10:00 AM	2	184	57	3	28	2	1	5	0	0	0	0	0	282
11:00 AM	3	215	88	2	32	1	1	1	0	0	0	0	0	343
12:00 PM	1	213	64	4	33	4	0	0	0	1	0	0	0	320
1:00 PM	3	237	68	6	43	3	0	3	0	0	0	0	0	363
2:00 PM	5	334	94	7	34	2	0	6	1	0	0	0	0	483
3:00 PM	5	260	77	3	42	2	0	2	0	1	0	0	0	392
4:00 PM	3	278	80	1	37	1	0	6	0	0	0	0	0	406
5:00 PM	1	288	77	4	40	1	0	3	0	0	0	0	0	414
6:00 PM	4	206	79	1	32	1	0	2	0	0	0	0	0	325
7:00 PM	4	187	64	4	27	0	0	1	0	0	0	0	0	287
8:00 PM	1	131	39	0	12	0	0	1	0	0	0	0	0	184
9:00 PM	1	115	28	0	8	0	0	0	0	0	0	0	0	152
10:00 PM	0	74	11	1	3	0	0	0	0	0	0	0	0	89
11:00 PM	1	36	11	0	2	0	0	0	0	0	0	0	0	50
Total	41	3727	1204	51	594	29	4	42	2	2	0	0	0	5696
Percent	0.72%	65.43%	21.14%	0.90%	10.43%	0.51%	0.07%	0.74%	0.04%	0.04%	0.00%	0.00%	0.00%	
AM Peak	9:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	9:00 AM	5:00 AM	7:00 AM	8:00 AM					8:00 AM
Volume	3	292	125	6	62	5	1	5	1	0	0	0	0	486
PM Peak	2:00 PM	2:00 PM	2:00 PM	2:00 PM	1:00 PM	12:00 PM		2:00 PM	2:00 PM	12:00 PM				2:00 PM
Volume	5	334	94	7	43	4	0	6	1	1	0	0	0	483

Cycles:	41	0.7%
Cars and Light Trucks:	4931	86.6%
Heavy Vehicles:	724	12.7%

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Thursday, May 27, 2021

Classification (60-minute)

EB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	14	0	0	0	0	0	0	0	0	0	0	0	14
1:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	3
2:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	2
3:00 AM	0	8	1	0	0	1	0	0	0	0	0	0	0	10
4:00 AM	0	10	5	0	3	0	1	0	0	0	0	0	0	19
5:00 AM	0	31	9	2	8	0	0	0	0	0	0	0	0	50
6:00 AM	0	111	25	1	18	4	0	2	0	0	0	0	0	161
7:00 AM	4	305	65	9	34	1	3	5	0	0	0	0	0	426
8:00 AM	0	228	63	4	27	1	5	3	0	0	0	0	0	331
9:00 AM	0	179	37	3	22	1	1	0	0	0	0	0	0	243
10:00 AM	3	163	49	1	21	0	1	2	2	0	0	0	0	242
11:00 AM	0	203	61	5	22	2	3	1	0	0	0	0	0	297
12:00 PM	1	225	56	1	30	0	2	3	0	0	0	0	0	318
1:00 PM	1	259	60	1	30	3	0	3	0	0	0	0	0	357
2:00 PM	3	295	60	3	38	0	0	1	0	0	0	0	0	400
3:00 PM	2	312	59	4	34	0	0	2	0	0	0	1	0	414
4:00 PM	3	295	91	7	37	1	0	3	0	0	0	0	0	437
5:00 PM	3	283	82	6	38	1	0	7	0	0	0	0	0	420
6:00 PM	2	304	74	5	33	0	0	5	0	0	0	0	0	423
7:00 PM	2	204	52	0	21	0	0	0	0	0	0	0	0	279
8:00 PM	2	145	28	1	12	1	0	0	0	0	0	0	0	189
9:00 PM	1	103	12	0	6	1	0	0	0	0	0	0	0	123
10:00 PM	0	60	16	1	2	0	0	0	0	0	0	0	0	79
11:00 PM	0	19	3	0	0	0	0	0	0	0	0	0	0	22
PM Total	27	3761	908	54	436	17	16	37	2	0	0	1	0	5259
Percent	0.51%	71.52%	17.27%	1.03%	8.29%	0.32%	0.30%	0.70%	0.04%	0.00%	0.00%	0.02%	0.00%	
AM Peak	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	6:00 AM	8:00 AM	7:00 AM	10:00 AM					7:00 AM
Volume	4	305	65	9	34	4	5	5	2	0	0	0	0	426
PM Peak	2:00 PM	3:00 PM	4:00 PM	4:00 PM	2:00 PM	1:00 PM	12:00 PM	5:00 PM				3:00 PM		4:00 PM
Volume	3	312	91	7	38	3	2	7	0	0	0	1	0	437

Cycles:	27	0.5%
Cars and Light Trucks:	4669	88.8%
Heavy Vehicles:	563	10.7%

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Thursday, May 27, 2021

Classification (60-minute)

Combined

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	24	4	0	1	0	0	0	0	0	0	0	0	29
1:00 AM	0	10	0	0	2	0	0	0	0	0	0	0	0	12
2:00 AM	0	4	0	0	1	0	0	0	0	0	0	0	0	5
3:00 AM	0	13	1	0	1	1	0	0	0	0	0	0	0	16
4:00 AM	0	26	10	0	5	0	1	0	0	0	0	0	0	42
5:00 AM	0	68	34	4	21	1	1	0	0	0	0	0	0	129
6:00 AM	2	238	63	2	67	4	0	3	0	0	0	0	0	379
7:00 AM	5	578	167	13	96	4	3	10	0	0	0	0	0	876
8:00 AM	1	520	188	10	81	4	6	6	1	0	0	0	0	817
9:00 AM	3	379	105	5	58	6	1	3	0	0	0	0	0	560
10:00 AM	5	347	106	4	49	2	2	7	2	0	0	0	0	524
11:00 AM	3	418	149	7	54	3	4	2	0	0	0	0	0	640
12:00 PM	2	438	120	5	63	4	2	3	0	1	0	0	0	638
1:00 PM	4	496	128	7	73	6	0	6	0	0	0	0	0	720
2:00 PM	8	629	154	10	72	2	0	7	1	0	0	0	0	883
3:00 PM	7	572	136	7	76	2	0	4	0	1	0	1	0	806
4:00 PM	6	573	171	8	74	2	0	9	0	0	0	0	0	843
5:00 PM	4	571	159	10	78	2	0	10	0	0	0	0	0	834
6:00 PM	6	510	153	6	65	1	0	7	0	0	0	0	0	748
7:00 PM	6	391	116	4	48	0	0	1	0	0	0	0	0	566
8:00 PM	3	276	67	1	24	1	0	1	0	0	0	0	0	373
9:00 PM	2	218	40	0	14	1	0	0	0	0	0	0	0	275
10:00 PM	0	134	27	2	5	0	0	0	0	0	0	0	0	168
11:00 PM	1	55	14	0	2	0	0	0	0	0	0	0	0	72
PM Total	68	7488	2112	105	1030	46	20	79	4	2	0	1	0	10955
Percent	0.62%	68.35%	19.28%	0.96%	9.40%	0.42%	0.18%	0.72%	0.04%	0.02%	0.00%	0.01%	0.00%	
AM Peak	7:00 AM	7:00 AM	8:00 AM	7:00 AM	7:00 AM	9:00 AM	8:00 AM	7:00 AM	10:00 AM					7:00 AM
Volume	5	578	188	13	96	6	6	10	2	0	0	0	0	876
PM Peak	2:00 PM	2:00 PM	4:00 PM	2:00 PM	5:00 PM	1:00 PM	12:00 PM	5:00 PM	2:00 PM	12:00 PM		3:00 PM		2:00 PM
Volume	8	629	171	10	78	6	2	10	1	1	0	1	0	883

Cycles:	68	0.6%
Cars and Light Trucks:	9600	87.6%
Heavy Vehicles:	1287	11.7%

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Wednesday, May, 26, 2021

Speed (60-minute)

WB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	7	5	6	1	0	0	0	0	0	20	41.2	36.9
1:00 AM	0	0	0	0	4	5	2	0	2	0	0	0	0	13	44.8	39.3
2:00 AM	0	0	0	0	0	2	1	0	0	0	0	0	0	3	40.1	38.7
3:00 AM	0	0	0	0	1	1	3	0	0	0	0	0	0	5	43.0	39.0
4:00 AM	0	1	0	1	6	8	2	0	0	0	0	0	0	18	38.5	34.5
5:00 AM	0	0	0	1	26	26	22	1	0	0	0	0	0	76	42.0	36.6
6:00 AM	0	0	0	27	65	90	36	2	1	0	0	0	0	221	40.0	35.1
7:00 AM	3	3	14	28	163	178	29	6	1	1	0	0	0	426	38.0	34.2
8:00 AM	2	13	25	56	160	161	37	4	2	0	0	0	0	460	38.0	33.2
9:00 AM	2	0	3	20	95	139	36	6	3	0	0	0	0	304	39.0	35.4
10:00 AM	1	0	9	20	101	138	39	6	2	0	0	0	0	316	39.0	35.1
11:00 AM	1	0	1	21	94	130	40	6	1	0	0	0	0	294	40.0	35.6
12:00 PM	1	0	6	18	119	136	45	8	0	0	0	0	0	333	40.0	35.2
1:00 PM	6	0	1	16	97	154	59	6	0	0	0	0	0	339	40.0	35.4
2:00 PM	12	3	5	26	173	185	48	8	0	0	0	0	0	460	39.0	34.3
3:00 PM	5	1	3	23	151	207	58	9	0	0	0	0	0	457	39.0	35.1
4:00 PM	5	0	0	21	142	196	63	12	4	1	0	0	0	444	40.0	35.7
5:00 PM	6	0	0	5	121	211	63	10	1	0	0	0	0	417	40.0	35.9
6:00 PM	0	0	3	15	95	153	63	7	1	1	0	0	0	338	40.0	36.3
7:00 PM	0	0	0	16	107	135	35	10	0	0	1	0	0	304	39.6	35.6
8:00 PM	0	0	0	6	79	69	25	3	0	0	0	0	0	182	39.9	35.4
9:00 PM	0	0	0	0	33	45	15	2	0	0	0	0	0	95	40.0	36.3
10:00 PM	0	1	0	2	17	23	10	1	0	0	0	0	0	54	41.0	35.8
11:00 PM	0	0	0	1	13	11	6	0	0	0	0	0	0	31	40.5	35.7
Total	44	22	70	324	1869	2408	743	108	18	3	1	0	0	5610	40.0	35.2
Percent	0.78%	0.39%	1.25%	5.78%	33.32%	42.92%	13.24%	1.93%	0.32%	0.05%	0.02%	0.00%	0.00%			
AM Peak	7:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	7:00 AM	11:00 AM	7:00 AM	9:00 AM	7:00 AM				8:00 AM		
Volume	3	13	25	56	163	178	40	6	3	1	0	0	0	460		
PM Peak	2:00 PM	2:00 PM	12:00 PM	2:00 PM	2:00 PM	5:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	7:00 PM			2:00 PM		
Volume	12	3	6	26	173	211	63	12	4	1	1	0	0	460		

15th Percentile:	31.0 MPH	Average Speed:	35.2 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	35.0 MPH	10 MPH Pace:	31 to 40 MPH	Number of Vehicles > 30 MPH:	4960
85th Percentile:	40.0 MPH	Number in Pace:	4357	Percent of Vehicles > 30 MPH:	88.4%
95th Percentile:	43.0 MPH	Percent in Pace:	77.7%		

Water Street
west of Farm Street
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Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Wednesday, May, 26, 2021

Speed (60-minute)

EB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	3	5	1	0	0	0	0	0	0	9	36.8	35.6
1:00 AM	0	0	0	0	1	1	1	0	0	0	0	0	0	3	38.8	35.3
2:00 AM	0	0	0	0	1	3	0	0	0	0	0	0	0	4	37.7	35.3
3:00 AM	0	0	0	0	3	4	0	0	0	0	0	0	0	7	36.3	35.0
4:00 AM	0	0	1	0	4	2	3	2	0	0	0	0	0	12	42.8	36.8
5:00 AM	0	0	1	1	23	12	7	2	0	0	0	0	0	46	40.3	34.8
6:00 AM	1	0	1	16	71	54	21	3	0	0	0	0	0	167	39.0	34.6
7:00 AM	2	5	18	79	186	119	23	0	1	0	1	0	0	434	37.0	32.4
8:00 AM	6	6	27	68	153	83	11	1	1	0	0	0	0	356	36.8	31.2
9:00 AM	0	0	4	29	127	64	12	3	0	0	0	0	0	239	36.0	33.2
10:00 AM	0	4	15	56	147	88	9	2	0	0	0	0	0	321	36.0	32.2
11:00 AM	0	1	5	66	131	74	14	3	0	0	0	0	0	294	37.0	32.6
12:00 PM	5	3	20	52	132	75	17	4	0	0	0	0	0	308	37.0	32.1
1:00 PM	6	4	21	63	170	90	12	1	0	0	0	0	0	367	36.0	31.5
2:00 PM	31	23	53	76	128	61	17	1	0	0	0	0	0	390	36.0	28.2
3:00 PM	27	35	42	76	120	75	12	0	0	0	0	0	0	387	36.0	28.4
4:00 PM	31	36	59	113	137	72	9	1	0	0	0	0	0	458	35.0	27.9
5:00 PM	22	26	50	100	157	93	10	1	0	0	0	0	0	459	36.0	29.1
6:00 PM	4	2	4	47	159	102	15	0	0	0	0	0	0	333	37.0	32.8
7:00 PM	0	0	1	29	128	76	14	1	0	0	0	0	0	249	37.0	33.4
8:00 PM	0	0	2	16	70	58	14	1	1	0	0	0	0	162	38.0	34.2
9:00 PM	0	0	4	13	40	40	5	1	0	0	0	0	1	104	38.0	33.7
10:00 PM	0	0	3	14	19	19	4	0	0	0	0	0	0	59	37.0	32.3
11:00 PM	0	0	0	1	6	6	4	0	0	0	0	0	0	17	40.0	35.7
Total	135	145	331	915	2116	1276	235	27	3	0	1	0	1	5185	37.0	31.3
Percent	2.60%	2.80%	6.38%	17.65%	40.81%	24.61%	4.53%	0.52%	0.06%	0.00%	0.02%	0.00%	0.02%			
AM Peak	8:00 AM	8:00 AM	8:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	6:00 AM	7:00 AM		7:00 AM			7:00 AM		
Volume	6	6	27	79	186	119	23	3	1	0	1	0	0	434		
PM Peak	2:00 PM	4:00 PM	4:00 PM	4:00 PM	1:00 PM	6:00 PM	12:00 PM	12:00 PM	8:00 PM				9:00 PM	5:00 PM		
Volume	31	36	59	113	170	102	17	4	1	0	0	0	1	459		

15th Percentile:	26.0 MPH	Average Speed:	31.3 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	32.0 MPH	10 MPH Pace:	28 to 37 MPH	Number of Vehicles > 30 MPH:	3324
85th Percentile:	37.0 MPH	Number in Pace:	3612	Percent of Vehicles > 30 MPH:	64.1%
95th Percentile:	40.0 MPH	Percent in Pace:	69.7%		

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Wednesday, May, 26, 2021

Speed (60-minute)

Combined WB and EB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	10	10	7	1	0	0	0	0	0	29	41.0	36.5
1:00 AM	0	0	0	0	5	6	3	0	2	0	0	0	0	16	42.8	38.6
2:00 AM	0	0	0	0	1	5	1	0	0	0	0	0	0	7	39.2	36.7
3:00 AM	0	0	0	0	4	5	3	0	0	0	0	0	0	12	41.7	36.7
4:00 AM	0	1	1	1	10	10	5	2	0	0	0	0	0	30	40.7	35.4
5:00 AM	0	0	1	2	49	38	29	3	0	0	0	0	0	122	42.0	35.9
6:00 AM	1	0	1	43	136	144	57	5	1	0	0	0	0	388	40.0	34.9
7:00 AM	5	8	32	107	349	297	52	6	2	1	1	0	0	860	38.0	33.3
8:00 AM	8	19	52	124	313	244	48	5	3	0	0	0	0	816	38.0	32.3
9:00 AM	2	0	7	49	222	203	48	9	3	0	0	0	0	543	39.0	34.4
10:00 AM	1	4	24	76	248	226	48	8	2	0	0	0	0	637	38.0	33.6
11:00 AM	1	1	6	87	225	204	54	9	1	0	0	0	0	588	39.0	34.1
12:00 PM	6	3	26	70	251	211	62	12	0	0	0	0	0	641	39.0	33.7
1:00 PM	12	4	22	79	267	244	71	7	0	0	0	0	0	706	38.0	33.4
2:00 PM	43	26	58	102	301	246	65	9	0	0	0	0	0	850	38.0	31.5
3:00 PM	32	36	45	99	271	282	70	9	0	0	0	0	0	844	38.0	32.0
4:00 PM	36	36	59	134	279	268	72	13	4	1	0	0	0	902	38.0	31.8
5:00 PM	28	26	50	105	278	304	73	11	1	0	0	0	0	876	38.0	32.3
6:00 PM	4	2	7	62	254	255	78	7	1	1	0	0	0	671	39.0	34.6
7:00 PM	0	0	1	45	235	211	49	11	0	0	1	0	0	553	38.0	34.6
8:00 PM	0	0	2	22	149	127	39	4	1	0	0	0	0	344	39.0	34.8
9:00 PM	0	0	4	13	73	85	20	3	0	0	0	0	1	199	39.0	34.9
10:00 PM	0	1	3	16	36	42	14	1	0	0	0	0	0	113	39.0	34.0
11:00 PM	0	0	0	2	19	17	10	0	0	0	0	0	0	48	40.0	35.7
Total	179	167	401	1239	3985	3684	978	135	21	3	2	0	1	10795	38.0	33.3
Percent	1.66%	1.55%	3.71%	11.48%	36.92%	34.13%	9.06%	1.25%	0.19%	0.03%	0.02%	0.00%	0.01%			
AM Peak	8:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	7:00 AM	6:00 AM	9:00 AM	8:00 AM	7:00 AM	7:00 AM			7:00 AM		
Volume	8	19	52	124	349	297	57	9	3	1	1	0	0	860		
PM Peak	2:00 PM	3:00 PM	4:00 PM	4:00 PM	2:00 PM	5:00 PM	6:00 PM	4:00 PM	4:00 PM	4:00 PM	7:00 PM		9:00 PM	4:00 PM		
Volume	43	36	59	134	301	304	78	13	4	1	1	0	1	902		

15th Percentile:	29.0 MPH	Average Speed:	33.3 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	34.0 MPH	10 MPH Pace:	29 to 38 MPH	Number of Vehicles > 30 MPH:	8284
85th Percentile:	38.0 MPH	Number in Pace:	7699	Percent of Vehicles > 30 MPH:	76.7%
95th Percentile:	41.0 MPH	Percent in Pace:	71.3%		

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Thursday, May 27, 2021

Speed (60-minute)

WB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	6	4	4	1	0	0	0	0	0	15	42.9	37.0
1:00 AM	0	0	0	2	1	3	2	1	0	0	0	0	0	9	40.8	36.9
2:00 AM	0	0	0	0	0	2	1	0	0	0	0	0	0	3	42.5	40.0
3:00 AM	0	0	0	0	2	2	2	0	0	0	0	0	0	6	40.3	36.3
4:00 AM	0	0	0	0	8	9	6	0	0	0	0	0	0	23	41.7	36.5
5:00 AM	0	0	1	2	19	38	17	1	1	0	0	0	0	79	41.3	36.8
6:00 AM	1	0	1	9	83	97	23	3	1	0	0	0	0	218	39.0	35.4
7:00 AM	5	0	6	29	188	174	45	3	0	0	0	0	0	450	38.0	34.4
8:00 AM	4	1	5	46	186	185	53	6	0	0	0	0	0	486	39.0	34.3
9:00 AM	0	1	2	15	118	132	41	8	0	0	0	0	0	317	40.0	35.5
10:00 AM	0	0	2	20	98	122	34	5	1	0	0	0	0	282	39.0	35.1
11:00 AM	0	0	4	19	118	153	41	7	1	0	0	0	0	343	39.0	35.4
12:00 PM	0	0	1	21	97	154	43	4	0	0	0	0	0	320	39.0	35.6
1:00 PM	2	1	2	18	137	159	39	5	0	0	0	0	0	363	39.0	35.0
2:00 PM	2	0	9	52	207	167	44	2	0	0	0	0	0	483	38.0	33.9
3:00 PM	1	0	2	18	133	173	58	4	3	0	0	0	0	392	40.0	35.6
4:00 PM	2	1	0	10	135	182	70	4	1	0	0	0	1	406	40.0	35.8
5:00 PM	8	1	0	28	130	179	56	11	1	0	0	0	0	414	40.0	35.1
6:00 PM	5	0	1	11	111	138	52	4	1	1	0	1	0	325	40.0	35.4
7:00 PM	2	0	0	13	94	140	30	8	0	0	0	0	0	287	39.0	35.5
8:00 PM	0	0	1	4	63	89	23	4	0	0	0	0	0	184	39.0	35.9
9:00 PM	0	0	0	5	60	60	23	3	0	1	0	0	0	152	40.0	35.8
10:00 PM	0	0	0	2	26	39	18	3	1	0	0	0	0	89	41.0	36.6
11:00 PM	0	0	0	2	16	22	10	0	0	0	0	0	0	50	40.7	36.1
Total	32	5	37	326	2036	2423	735	87	11	2	0	1	1	5696	39.0	35.2
Percent	0.56%	0.09%	0.65%	5.72%	35.74%	42.54%	12.90%	1.53%	0.19%	0.04%	0.00%	0.02%	0.02%			
AM Peak	7:00 AM	8:00 AM	7:00 AM	8:00 AM	7:00 AM	8:00 AM	8:00 AM	9:00 AM	5:00 AM					8:00 AM		
Volume	5	1	6	46	188	185	53	8	1	0	0	0	0	486		
PM Peak	5:00 PM	1:00 PM	2:00 PM	2:00 PM	2:00 PM	4:00 PM	4:00 PM	5:00 PM	3:00 PM	6:00 PM		6:00 PM	4:00 PM	2:00 PM		
Volume	8	1	9	52	207	182	70	11	3	1	0	1	1	483		

15th Percentile:	31.0 MPH	Average Speed:	35.2 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	35.0 MPH	10 MPH Pace:	31 to 40 MPH	Number of Vehicles > 30 MPH:	5067
85th Percentile:	39.0 MPH	Number in Pace:	4488	Percent of Vehicles > 30 MPH:	89.0%
95th Percentile:	42.0 MPH	Percent in Pace:	78.8%		

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Thursday, May 27, 2021

Speed (60-minute)

EB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	2	6	4	2	0	0	0	0	0	0	14	38.2	33.8
1:00 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	3	37.5	35.0
2:00 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	2	34.0	31.5
3:00 AM	0	0	0	1	6	2	1	0	0	0	0	0	0	10	38.3	34.4
4:00 AM	0	0	0	1	9	3	4	1	1	0	0	0	0	19	42.3	36.3
5:00 AM	0	0	0	1	24	18	7	0	0	0	0	0	0	50	38.0	34.9
6:00 AM	1	0	2	22	67	52	14	3	0	0	0	0	0	161	38.0	33.8
7:00 AM	7	1	13	90	222	75	18	0	0	0	0	0	0	426	36.0	31.5
8:00 AM	0	10	21	53	154	79	14	0	0	0	0	0	0	331	36.5	31.8
9:00 AM	0	2	5	39	94	87	15	0	1	0	0	0	0	243	38.0	33.4
10:00 AM	0	0	11	40	100	78	12	1	0	0	0	0	0	242	38.0	33.0
11:00 AM	1	2	7	50	154	70	12	1	0	0	0	0	0	297	37.0	32.6
12:00 PM	0	3	7	60	145	88	15	0	0	0	0	0	0	318	36.0	32.5
1:00 PM	2	0	19	94	166	62	11	2	1	0	0	0	0	357	36.0	31.5
2:00 PM	3	7	26	83	185	86	9	1	0	0	0	0	0	400	36.0	31.2
3:00 PM	5	7	24	85	192	79	21	1	0	0	0	0	0	414	36.0	31.3
4:00 PM	18	23	48	99	170	74	5	0	0	0	0	0	0	437	35.0	29.1
5:00 PM	48	36	34	92	152	51	7	0	0	0	0	0	0	420	34.0	27.1
6:00 PM	24	10	43	101	168	70	6	0	1	0	0	0	0	423	35.0	29.2
7:00 PM	0	0	8	48	140	70	12	1	0	0	0	0	0	279	37.0	32.6
8:00 PM	1	0	2	28	87	60	10	1	0	0	0	0	0	189	37.0	33.0
9:00 PM	0	0	5	15	61	39	3	0	0	0	0	0	0	123	37.0	32.8
10:00 PM	0	0	3	8	34	25	7	1	1	0	0	0	0	79	38.0	34.0
11:00 PM	0	0	1	3	6	5	7	0	0	0	0	0	0	22	41.0	35.0
Total	110	101	279	1016	2344	1179	212	13	5	0	0	0	0	5259	36.0	31.3
Percent	2.09%	1.92%	5.31%	19.32%	44.57%	22.42%	4.03%	0.25%	0.10%	0.00%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	8:00 AM	8:00 AM	7:00 AM	7:00 AM	9:00 AM	7:00 AM	6:00 AM	4:00 AM					7:00 AM		
Volume	7	10	21	90	222	87	18	3	1	0	0	0	0	426		
PM Peak	5:00 PM	5:00 PM	4:00 PM	6:00 PM	3:00 PM	12:00 PM	3:00 PM	1:00 PM	1:00 PM					4:00 PM		
Volume	48	36	48	101	192	88	21	2	1	0	0	0	0	437		

15th Percentile:	27.0 MPH	Average Speed:	31.3 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	32.0 MPH	10 MPH Pace:	28 to 37 MPH	Number of Vehicles > 30 MPH:	3340
85th Percentile:	36.0 MPH	Number in Pace:	3811	Percent of Vehicles > 30 MPH:	63.5%
95th Percentile:	39.0 MPH	Percent in Pace:	72.5%		

Water Street
west of Farm Street
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-A

Count Date
Thursday, May 27, 2021

Speed (60-minute)

Combined WB and EB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	2	12	8	6	1	0	0	0	0	0	29	42.0	35.4
1:00 AM	0	0	0	2	3	4	2	1	0	0	0	0	0	12	40.4	36.4
2:00 AM	0	0	0	1	0	3	1	0	0	0	0	0	0	5	41.0	36.6
3:00 AM	0	0	0	1	8	4	3	0	0	0	0	0	0	16	39.8	35.1
4:00 AM	0	0	0	1	17	12	10	1	1	0	0	0	0	42	42.0	36.4
5:00 AM	0	0	1	3	43	56	24	1	1	0	0	0	0	129	40.0	36.0
6:00 AM	2	0	3	31	150	149	37	6	1	0	0	0	0	379	39.0	34.7
7:00 AM	12	1	19	119	410	249	63	3	0	0	0	0	0	876	37.0	33.0
8:00 AM	4	11	26	99	340	264	67	6	0	0	0	0	0	817	38.0	33.3
9:00 AM	0	3	7	54	212	219	56	8	1	0	0	0	0	560	39.0	34.6
10:00 AM	0	0	13	60	198	200	46	6	1	0	0	0	0	524	38.0	34.2
11:00 AM	1	2	11	69	272	223	53	8	1	0	0	0	0	640	38.0	34.1
12:00 PM	0	3	8	81	242	242	58	4	0	0	0	0	0	638	38.0	34.1
1:00 PM	4	1	21	112	303	221	50	7	1	0	0	0	0	720	38.0	33.3
2:00 PM	5	7	35	135	392	253	53	3	0	0	0	0	0	883	37.0	32.7
3:00 PM	6	7	26	103	325	252	79	5	3	0	0	0	0	806	38.3	33.4
4:00 PM	20	24	48	109	305	256	75	4	1	0	0	0	1	843	38.0	32.3
5:00 PM	56	37	34	120	282	230	63	11	1	0	0	0	0	834	38.0	31.1
6:00 PM	29	10	44	112	279	208	58	4	2	1	0	1	0	748	38.0	31.9
7:00 PM	2	0	8	61	234	210	42	9	0	0	0	0	0	566	38.0	34.1
8:00 PM	1	0	3	32	150	149	33	5	0	0	0	0	0	373	39.0	34.4
9:00 PM	0	0	5	20	121	99	26	3	0	1	0	0	0	275	39.0	34.5
10:00 PM	0	0	3	10	60	64	25	4	2	0	0	0	0	168	40.0	35.4
11:00 PM	0	0	1	5	22	27	17	0	0	0	0	0	0	72	41.0	35.7
Total	142	106	316	1342	4380	3602	947	100	16	2	0	1	1	10955	38.0	33.4
Percent	1.30%	0.97%	2.88%	12.25%	39.98%	32.88%	8.64%	0.91%	0.15%	0.02%	0.00%	0.01%	0.01%			
AM Peak	7:00 AM	8:00 AM	8:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	9:00 AM	4:00 AM					7:00 AM		
Volume	12	11	26	119	410	264	67	8	1	0	0	0	0	876		
PM Peak	5:00 PM	5:00 PM	4:00 PM	2:00 PM	2:00 PM	4:00 PM	3:00 PM	5:00 PM	3:00 PM	6:00 PM		6:00 PM	4:00 PM	2:00 PM		
Volume	56	37	48	135	392	256	79	11	3	1	0	1	1	883		

15th Percentile:	29.0 MPH	Average Speed:	33.4 MPH	Posted Speed Limit:	30 MPH
50th Percentile:	34.0 MPH	10 MPH Pace:	29 to 38 MPH	Number of Vehicles > 30 MPH:	8407
85th Percentile:	38.0 MPH	Number in Pace:	8018	Percent of Vehicles > 30 MPH:	76.7%
95th Percentile:	41.0 MPH	Percent in Pace:	73.2%		

Farm Street
south of Old Nahant Road
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: **217949 ATR-B**

Count Date:
Tuesday, May, 25, 2021

Volume

SB						NB						Combined					
Start Time:	15 min	60 min		15 min	60 min	Start Time:	15 min	60 min		15 min	60 min	Start Time:	15 min	60 min		15 min	60 min
12:00 AM	0		12:00 PM	74		12:00 AM	0		12:00 PM	73		12:00 AM	0		12:00 PM	147	
12:15 AM	0		12:15 PM	78		12:15 AM	0		12:15 PM	94		12:15 AM	0		12:15 PM	172	
12:30 AM	0		12:30 PM	77		12:30 AM	0		12:30 PM	92		12:30 AM	0		12:30 PM	169	
12:45 AM	0	0	12:45 PM	85	314	12:45 AM	0	0	12:45 PM	91	350	12:45 AM	0	0	12:45 PM	176	664
1:00 AM	0		1:00 PM	78		1:00 AM	0		1:00 PM	106		1:00 AM	0		1:00 PM	184	
1:15 AM	0		1:15 PM	155		1:15 AM	0		1:15 PM	75		1:15 AM	0		1:15 PM	230	
1:30 AM	0		1:30 PM	106		1:30 AM	0		1:30 PM	100		1:30 AM	0		1:30 PM	206	
1:45 AM	0	0	1:45 PM	84	423	1:45 AM	0	0	1:45 PM	97	378	1:45 AM	0	0	1:45 PM	181	801
2:00 AM	0		2:00 PM	83		2:00 AM	0		2:00 PM	102		2:00 AM	0		2:00 PM	185	
2:15 AM	0		2:15 PM	105		2:15 AM	0		2:15 PM	89		2:15 AM	0		2:15 PM	194	
2:30 AM	0		2:30 PM	101		2:30 AM	0		2:30 PM	87		2:30 AM	0		2:30 PM	188	
2:45 AM	0	0	2:45 PM	122	411	2:45 AM	0	0	2:45 PM	116	394	2:45 AM	0	0	2:45 PM	238	805
3:00 AM	0		3:00 PM	118		3:00 AM	0		3:00 PM	114		3:00 AM	0		3:00 PM	232	
3:15 AM	0		3:15 PM	107		3:15 AM	0		3:15 PM	159		3:15 AM	0		3:15 PM	266	
3:30 AM	0		3:30 PM	107		3:30 AM	0		3:30 PM	142		3:30 AM	0		3:30 PM	249	
3:45 AM	0	0	3:45 PM	124	456	3:45 AM	0	0	3:45 PM	149	564	3:45 AM	0	0	3:45 PM	273	1020
4:00 AM	0		4:00 PM	114		4:00 AM	0		4:00 PM	133		4:00 AM	0		4:00 PM	247	
4:15 AM	0		4:15 PM	129		4:15 AM	0		4:15 PM	130		4:15 AM	0		4:15 PM	259	
4:30 AM	0		4:30 PM	115		4:30 AM	0		4:30 PM	129		4:30 AM	0		4:30 PM	244	
4:45 AM	0	0	4:45 PM	110	468	4:45 AM	0	0	4:45 PM	141	533	4:45 AM	0	0	4:45 PM	251	1001
5:00 AM	0		5:00 PM	136		5:00 AM	0		5:00 PM	124		5:00 AM	0		5:00 PM	260	
5:15 AM	0		5:15 PM	132		5:15 AM	0		5:15 PM	138		5:15 AM	0		5:15 PM	270	
5:30 AM	0		5:30 PM	120		5:30 AM	0		5:30 PM	106		5:30 AM	0		5:30 PM	226	
5:45 AM	0	0	5:45 PM	119	507	5:45 AM	0	0	5:45 PM	104	472	5:45 AM	0	0	5:45 PM	223	979
6:00 AM	0		6:00 PM	92		6:00 AM	0		6:00 PM	85		6:00 AM	0		6:00 PM	177	
6:15 AM	0		6:15 PM	110		6:15 AM	0		6:15 PM	95		6:15 AM	0		6:15 PM	205	
6:30 AM	0		6:30 PM	97		6:30 AM	0		6:30 PM	93		6:30 AM	0		6:30 PM	190	
6:45 AM	0	0	6:45 PM	72	371	6:45 AM	0	0	6:45 PM	87	360	6:45 AM	0	0	6:45 PM	159	731
7:00 AM	0		7:00 PM	94		7:00 AM	0		7:00 PM	59		7:00 AM	0		7:00 PM	153	
7:15 AM	0		7:15 PM	89		7:15 AM	0		7:15 PM	71		7:15 AM	0		7:15 PM	160	
7:30 AM	0		7:30 PM	61		7:30 AM	0		7:30 PM	61		7:30 AM	0		7:30 PM	122	
7:45 AM	0	0	7:45 PM	87	331	7:45 AM	0	0	7:45 PM	67	258	7:45 AM	0	0	7:45 PM	154	589
8:00 AM	0		8:00 PM	59		8:00 AM	0		8:00 PM	59		8:00 AM	0		8:00 PM	118	
8:15 AM	0		8:15 PM	67		8:15 AM	0		8:15 PM	59		8:15 AM	0		8:15 PM	126	
8:30 AM	0		8:30 PM	55		8:30 AM	0		8:30 PM	47		8:30 AM	0		8:30 PM	102	
8:45 AM	0	0	8:45 PM	44	225	8:45 AM	0	0	8:45 PM	35	200	8:45 AM	0	0	8:45 PM	79	425
9:00 AM	0		9:00 PM	39		9:00 AM	0		9:00 PM	39		9:00 AM	0		9:00 PM	78	
9:15 AM	0		9:15 PM	36		9:15 AM	0		9:15 PM	38		9:15 AM	0		9:15 PM	74	
9:30 AM	0		9:30 PM	35		9:30 AM	0		9:30 PM	41		9:30 AM	0		9:30 PM	76	
9:45 AM	0	0	9:45 PM	28	138	9:45 AM	0	0	9:45 PM	35	153	9:45 AM	0	0	9:45 PM	63	291
10:00 AM	0		10:00 PM	8		10:00 AM	0		10:00 PM	5		10:00 AM	0		10:00 PM	13	
10:15 AM	0		10:15 PM	0		10:15 AM	0		10:15 PM	0		10:15 AM	0		10:15 PM	0	
10:30 AM	0		10:30 PM	0		10:30 AM	0		10:30 PM	0		10:30 AM	0		10:30 PM	0	
10:45 AM	0	0	10:45 PM	0	8	10:45 AM	0	0	10:45 PM	0	5	10:45 AM	0	0	10:45 PM	0	13
11:00 AM	0		11:00 PM	0		11:00 AM	0		11:00 PM	0		11:00 AM	0		11:00 PM	0	
11:15 AM	0		11:15 PM	0		11:15 AM	0		11:15 PM	0		11:15 AM	0		11:15 PM	0	
11:30 AM	0		11:30 PM	0		11:30 AM	0		11:30 PM	0		11:30 AM	0		11:30 PM	0	
11:45 AM	0	0	11:45 PM	0	0	11:45 AM	0	0	11:45 PM	0	0	11:45 AM	0	0	11:45 PM	0	0
Total	0			3652		Total	0			3667		Total	0			7319	
Percent	0.00%			100.00%		Percent	0.00%			100.00%		Percent	0.00%			100.00%	
Day Total			3652			Day Total			3667			Day Total			7319		
Peak Hour	11:45 AM			5:00 PM		Peak Hour	11:45 AM			3:15 PM		Peak Hour	11:45 AM			3:15 PM	
Volume	229			507		Volume	259			583		Volume	488			1035	
P.H.F.	0.734			0.932		P.H.F.	0.689			0.917		P.H.F.	0.709			0.948	

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-B

Count Date
Tuesday, May, 25, 2021

Classification (60-minute)

SB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	118	157	3	35	0	0	1	0	0	0	0	0	314
1:00 PM	1	148	210	11	47	0	2	4	0	0	0	0	0	423
2:00 PM	3	148	190	5	61	2	0	2	0	0	0	0	0	411
3:00 PM	2	148	226	11	67	0	0	1	1	0	0	0	0	456
4:00 PM	4	155	237	4	63	1	0	3	1	0	0	0	0	468
5:00 PM	4	179	242	5	71	1	0	5	0	0	0	0	0	507
6:00 PM	5	134	183	3	43	0	0	3	0	0	0	0	0	371
7:00 PM	4	128	162	3	33	0	0	1	0	0	0	0	0	331
8:00 PM	2	83	115	1	24	0	0	0	0	0	0	0	0	225
9:00 PM	1	38	84	2	13	0	0	0	0	0	0	0	0	138
10:00 PM	0	2	6	0	0	0	0	0	0	0	0	0	0	8
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	26	1281	1812	48	457	4	2	20	2	0	0	0	0	3652
Percent	0.71%	35.08%	49.62%	1.31%	12.51%	0.11%	0.05%	0.55%	0.05%	0.00%	0.00%	0.00%	0.00%	
AM Peak														
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Peak	6:00 PM	5:00 PM	5:00 PM	1:00 PM	5:00 PM	2:00 PM	1:00 PM	5:00 PM	3:00 PM					5:00 PM
Volume	5	179	242	11	71	2	2	5	1	0	0	0	0	507

Cycles:	26	0.7%
Cars and Light Trucks:	3093	84.7%
Heavy Vehicles:	533	14.6%

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-B

Count Date
Tuesday, May, 25, 2021

Classification (60-minute)

NB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	75	231	3	38	2	0	1	0	0	0	0	0	350
1:00 PM	0	87	235	5	47	0	0	4	0	0	0	0	0	378
2:00 PM	1	106	226	6	49	0	0	6	0	0	0	0	0	394
3:00 PM	2	108	365	5	73	2	0	8	0	0	0	0	1	564
4:00 PM	0	109	348	4	66	0	0	6	0	0	0	0	0	533
5:00 PM	0	121	290	4	50	0	0	7	0	0	0	0	0	472
6:00 PM	2	110	203	5	38	0	0	2	0	0	0	0	0	360
7:00 PM	1	93	142	0	22	0	0	0	0	0	0	0	0	258
8:00 PM	1	70	109	0	19	1	0	0	0	0	0	0	0	200
9:00 PM	0	57	82	0	14	0	0	0	0	0	0	0	0	153
10:00 PM	0	2	2	0	1	0	0	0	0	0	0	0	0	5
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Total	7	938	2233	32	417	5	0	34	0	0	0	0	1	3667
Percent	0.19%	25.58%	60.89%	0.87%	11.37%	0.14%	0.00%	0.93%	0.00%	0.00%	0.00%	0.00%	0.03%	
AM Peak														
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Peak	3:00 PM	5:00 PM	3:00 PM	2:00 PM	3:00 PM	12:00 PM		3:00 PM					3:00 PM	3:00 PM
Volume	2	121	365	6	73	2	0	8	0	0	0	0	1	564

Cycles:	7	0.2%
Cars and Light Trucks:	3171	86.5%
Heavy Vehicles:	489	13.3%

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-B

Count Date
Tuesday, May, 25, 2021

Classification (60-minute)

Combined

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	193	388	6	73	2	0	2	0	0	0	0	0	664
1:00 PM	1	235	445	16	94	0	2	8	0	0	0	0	0	801
2:00 PM	4	254	416	11	110	2	0	8	0	0	0	0	0	805
3:00 PM	4	256	591	16	140	2	0	9	1	0	0	0	1	1020
4:00 PM	4	264	585	8	129	1	0	9	1	0	0	0	0	1001
5:00 PM	4	300	532	9	121	1	0	12	0	0	0	0	0	979
6:00 PM	7	244	386	8	81	0	0	5	0	0	0	0	0	731
7:00 PM	5	221	304	3	55	0	0	1	0	0	0	0	0	589
8:00 PM	3	153	224	1	43	1	0	0	0	0	0	0	0	425
9:00 PM	1	95	166	2	27	0	0	0	0	0	0	0	0	291
10:00 PM	0	4	8	0	1	0	0	0	0	0	0	0	0	13
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Total	33	2219	4045	80	874	9	2	54	2	0	0	0	1	7319
Percent	0.45%	30.32%	55.27%	1.09%	11.94%	0.12%	0.03%	0.74%	0.03%	0.00%	0.00%	0.00%	0.01%	
AM Peak														
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Peak	6:00 PM	5:00 PM	3:00 PM	1:00 PM	3:00 PM	12:00 PM	1:00 PM	5:00 PM	3:00 PM				3:00 PM	3:00 PM
Volume	7	300	591	16	140	2	2	12	1	0	0	0	1	1020

Cycles:	33	0.5%
Cars and Light Trucks:	6264	85.6%
Heavy Vehicles:	1022	14.0%

Farm Street
south of Old Nahant Road
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157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-B

Count Date
Tuesday, May, 25, 2021

Speed (60-minute)

SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
12:00 PM	1	1	1	11	26	88	106	60	17	3	0	0	0	314	46.0	40.5
1:00 PM	1	0	0	1	11	86	161	114	38	9	1	1	0	423	49.0	43.4
2:00 PM	3	0	0	1	12	90	152	120	28	5	0	0	0	411	48.0	42.6
3:00 PM	7	0	0	0	19	118	186	101	19	6	0	0	0	456	47.0	41.6
4:00 PM	3	0	0	1	26	89	208	112	20	6	1	0	2	468	47.0	42.4
5:00 PM	6	1	1	0	24	90	207	142	31	4	1	0	0	507	47.0	42.3
6:00 PM	5	0	2	3	9	68	174	90	15	4	1	0	0	371	47.0	42.1
7:00 PM	1	0	0	1	27	73	122	83	18	4	2	0	0	331	48.0	42.0
8:00 PM	1	0	0	2	10	45	110	42	11	2	1	0	1	225	46.0	42.0
9:00 PM	0	0	0	3	5	35	52	32	9	1	1	0	0	138	46.0	41.9
10:00 PM	0	0	0	0	2	2	3	1	0	0	0	0	0	8	42.0	38.8
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
Total	28	2	4	23	171	784	1481	897	206	44	8	1	3	3652	47.0	42.1
Percent	0.77%	0.05%	0.11%	0.63%	4.68%	21.47%	40.55%	24.56%	5.64%	1.20%	0.22%	0.03%	0.08%			
AM Peak																
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
PM Peak	3:00 PM	12:00 PM	6:00 PM	12:00 PM	7:00 PM	3:00 PM	4:00 PM	5:00 PM	1:00 PM	1:00 PM	7:00 PM	1:00 PM	4:00 PM	5:00 PM		
Volume	7	1	2	11	27	118	208	142	38	9	2	1	2	507		

15th Percentile:	37.0 MPH	Average Speed:	42.1 MPH	Posted Speed Limit:	45 MPH
50th Percentile:	42.0 MPH	10 MPH Pace:	37 to 46 MPH	Number of Vehicles > 45 MPH:	880
85th Percentile:	47.0 MPH	Number in Pace:	2547	Percent of Vehicles > 45 MPH:	24.1%
95th Percentile:	51.0 MPH	Percent in Pace:	69.7%		

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PDI File #: 217949 ATR-B

Count Date
Tuesday, May, 25, 2021

Speed (60-minute)

NB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
12:00 PM	0	0	0	1	6	42	126	119	46	9	1	0	0	350	50.0	44.5
1:00 PM	1	0	0	0	7	34	108	149	69	9	0	1	0	378	51.0	45.3
2:00 PM	1	0	0	0	6	18	129	149	65	22	3	1	0	394	51.0	46.2
3:00 PM	6	0	0	0	6	25	167	237	104	15	2	1	1	564	51.0	45.8
4:00 PM	1	0	0	0	3	39	145	218	102	18	5	2	0	533	51.0	46.3
5:00 PM	6	0	0	1	11	40	141	181	76	15	1	0	0	472	50.0	44.9
6:00 PM	5	0	0	3	4	38	111	144	48	7	0	0	0	360	50.0	44.5
7:00 PM	0	0	0	1	3	23	73	109	41	7	1	0	0	258	50.0	45.6
8:00 PM	0	0	0	0	4	28	66	66	28	7	1	0	0	200	50.0	44.7
9:00 PM	0	0	0	0	3	16	54	59	19	2	0	0	0	153	49.0	44.6
10:00 PM	1	0	0	0	0	1	2	1	0	0	0	0	0	5	45.6	35.6
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
Total	21	0	0	6	53	304	1122	1432	598	111	14	5	1	3667	50.0	45.4
Percent	0.57%	0.00%	0.00%	0.16%	1.45%	8.29%	30.60%	39.05%	16.31%	3.03%	0.38%	0.14%	0.03%			
AM Peak																
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
PM Peak	3:00 PM			6:00 PM	5:00 PM	12:00 PM	3:00 PM	3:00 PM	3:00 PM	2:00 PM	4:00 PM	4:00 PM	3:00 PM	3:00 PM		
Volume	6	0	0	3	11	42	167	237	104	22	5	2	1	564		

15th Percentile:	41.0 MPH	Average Speed:	45.4 MPH	Posted Speed Limit:	45 MPH
50th Percentile:	46.0 MPH	10 MPH Pace:	41 to 50 MPH	Number of Vehicles > 45 MPH:	1863
85th Percentile:	50.0 MPH	Number in Pace:	2598	Percent of Vehicles > 45 MPH:	50.8%
95th Percentile:	53.0 MPH	Percent in Pace:	70.8%		

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-B

Count Date
Tuesday, May, 25, 2021

Speed (60-minute)

Combined SB and NB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
12:00 PM	1	1	1	12	32	130	232	179	63	12	1	0	0	664	48.0	42.6
1:00 PM	2	0	0	1	18	120	269	263	107	18	1	2	0	801	50.0	44.3
2:00 PM	4	0	0	1	18	108	281	269	93	27	3	1	0	805	50.0	44.4
3:00 PM	13	0	0	0	25	143	353	338	123	21	2	1	1	1020	49.0	44.0
4:00 PM	4	0	0	1	29	128	353	330	122	24	6	2	2	1001	50.0	44.5
5:00 PM	12	1	1	1	35	130	348	323	107	19	2	0	0	979	49.0	43.5
6:00 PM	10	0	2	6	13	106	285	234	63	11	1	0	0	731	48.0	43.3
7:00 PM	1	0	0	2	30	96	195	192	59	11	3	0	0	589	49.0	43.6
8:00 PM	1	0	0	2	14	73	176	108	39	9	2	0	1	425	49.0	43.3
9:00 PM	0	0	0	3	8	51	106	91	28	3	1	0	0	291	48.0	43.3
10:00 PM	1	0	0	0	2	3	5	2	0	0	0	0	0	13	44.4	37.5
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
Total	49	2	4	29	224	1088	2603	2329	804	155	22	6	4	7319	49.0	43.8
Percent	0.67%	0.03%	0.05%	0.40%	3.06%	14.87%	35.56%	31.82%	10.99%	2.12%	0.30%	0.08%	0.05%			
AM Peak																
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
PM Peak	3:00 PM	12:00 PM	6:00 PM	12:00 PM	5:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM	2:00 PM	4:00 PM	1:00 PM	4:00 PM	3:00 PM		
Volume	13	1	2	12	35	143	353	338	123	27	6	2	2	1020		

15th Percentile:	38.0 MPH	Average Speed:	43.8 MPH	Posted Speed Limit:	45 MPH
50th Percentile:	44.0 MPH	10 MPH Pace:	40 to 49 MPH	Number of Vehicles > 45 MPH:	2743
85th Percentile:	49.0 MPH	Number in Pace:	4932	Percent of Vehicles > 45 MPH:	37.5%
95th Percentile:	52.0 MPH	Percent in Pace:	67.4%		

Farm Street
south of Old Nahant Road
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: **217949 ATR-BB**

Count Date:
Wednesday, June, 02, 2021

Volume

NB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	10		12:00 PM	88	
12:15 AM	9		12:15 PM	102	
12:30 AM	5		12:30 PM	87	
12:45 AM	6	30	12:45 PM	87	364
1:00 AM	2		1:00 PM	96	
1:15 AM	2		1:15 PM	108	
1:30 AM	2		1:30 PM	109	
1:45 AM	4	10	1:45 PM	115	428
2:00 AM	0		2:00 PM	106	
2:15 AM	1		2:15 PM	87	
2:30 AM	1		2:30 PM	91	
2:45 AM	3	5	2:45 PM	125	409
3:00 AM	1		3:00 PM	139	
3:15 AM	4		3:15 PM	163	
3:30 AM	2		3:30 PM	166	
3:45 AM	3	10	3:45 PM	158	626
4:00 AM	1		4:00 PM	144	
4:15 AM	5		4:15 PM	139	
4:30 AM	5		4:30 PM	136	
4:45 AM	9	20	4:45 PM	150	569
5:00 AM	8		5:00 PM	141	
5:15 AM	10		5:15 PM	137	
5:30 AM	21		5:30 PM	119	
5:45 AM	33	72	5:45 PM	122	519
6:00 AM	32		6:00 PM	103	
6:15 AM	52		6:15 PM	87	
6:30 AM	67		6:30 PM	78	
6:45 AM	89	240	6:45 PM	84	352
7:00 AM	85		7:00 PM	81	
7:15 AM	107		7:15 PM	79	
7:30 AM	127		7:30 PM	62	
7:45 AM	119	438	7:45 PM	59	281
8:00 AM	94		8:00 PM	53	
8:15 AM	122		8:15 PM	54	
8:30 AM	91		8:30 PM	52	
8:45 AM	70	377	8:45 PM	71	230
9:00 AM	72		9:00 PM	49	
9:15 AM	85		9:15 PM	62	
9:30 AM	66		9:30 PM	44	
9:45 AM	86	309	9:45 PM	47	202
10:00 AM	59		10:00 PM	35	
10:15 AM	79		10:15 PM	35	
10:30 AM	88		10:30 PM	23	
10:45 AM	91	317	10:45 PM	27	120
11:00 AM	73		11:00 PM	31	
11:15 AM	87		11:15 PM	23	
11:30 AM	87		11:30 PM	16	
11:45 AM	75	322	11:45 PM	10	80
Total	2150			4180	
Percent	33.97%			66.03%	
Day Total			6330		
Peak Hour	7:30 AM			3:15 PM	
Volume	462			631	
P.H.F.	0.909			0.950	

SB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	6		12:00 PM	82	
12:15 AM	3		12:15 PM	87	
12:30 AM	2		12:30 PM	86	
12:45 AM	2	13	12:45 PM	87	342
1:00 AM	2		1:00 PM	82	
1:15 AM	2		1:15 PM	128	
1:30 AM	6		1:30 PM	103	
1:45 AM	2	12	1:45 PM	69	382
2:00 AM	4		2:00 PM	77	
2:15 AM	0		2:15 PM	117	
2:30 AM	2		2:30 PM	104	
2:45 AM	4	10	2:45 PM	93	391
3:00 AM	0		3:00 PM	119	
3:15 AM	1		3:15 PM	106	
3:30 AM	4		3:30 PM	104	
3:45 AM	2	7	3:45 PM	116	445
4:00 AM	5		4:00 PM	122	
4:15 AM	6		4:15 PM	109	
4:30 AM	9		4:30 PM	127	
4:45 AM	11	31	4:45 PM	104	462
5:00 AM	15		5:00 PM	128	
5:15 AM	15		5:15 PM	130	
5:30 AM	13		5:30 PM	117	
5:45 AM	31	74	5:45 PM	122	497
6:00 AM	32		6:00 PM	123	
6:15 AM	44		6:15 PM	91	
6:30 AM	73		6:30 PM	85	
6:45 AM	65	214	6:45 PM	79	378
7:00 AM	67		7:00 PM	73	
7:15 AM	87		7:15 PM	69	
7:30 AM	98		7:30 PM	86	
7:45 AM	103	355	7:45 PM	65	293
8:00 AM	77		8:00 PM	75	
8:15 AM	73		8:15 PM	54	
8:30 AM	86		8:30 PM	56	
8:45 AM	75	311	8:45 PM	51	236
9:00 AM	79		9:00 PM	49	
9:15 AM	57		9:15 PM	47	
9:30 AM	77		9:30 PM	42	
9:45 AM	85	298	9:45 PM	33	171
10:00 AM	92		10:00 PM	30	
10:15 AM	66		10:15 PM	27	
10:30 AM	76		10:30 PM	18	
10:45 AM	73	307	10:45 PM	10	85
11:00 AM	74		11:00 PM	13	
11:15 AM	79		11:15 PM	10	
11:30 AM	71		11:30 PM	8	
11:45 AM	89	313	11:45 PM	5	36
Total	1945			3718	
Percent	34.35%			65.65%	
Day Total			5663		
Peak Hour	7:15 AM			5:00 PM	
Volume	365			497	
P.H.F.	0.886			0.956	

Combined

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	16		12:00 PM	170	
12:15 AM	12		12:15 PM	189	
12:30 AM	7		12:30 PM	173	
12:45 AM	8	43	12:45 PM	174	706
1:00 AM	4		1:00 PM	178	
1:15 AM	4		1:15 PM	236	
1:30 AM	8		1:30 PM	212	
1:45 AM	6	22	1:45 PM	184	810
2:00 AM	4		2:00 PM	183	
2:15 AM	1		2:15 PM	204	
2:30 AM	3		2:30 PM	195	
2:45 AM	7	15	2:45 PM	218	800
3:00 AM	1		3:00 PM	258	
3:15 AM	5		3:15 PM	269	
3:30 AM	6		3:30 PM	270	
3:45 AM	5	17	3:45 PM	274	1071
4:00 AM	6		4:00 PM	266	
4:15 AM	11		4:15 PM	248	
4:30 AM	14		4:30 PM	263	
4:45 AM	20	51	4:45 PM	254	1031
5:00 AM	23		5:00 PM	269	
5:15 AM	25		5:15 PM	267	
5:30 AM	34		5:30 PM	236	
5:45 AM	64	146	5:45 PM	244	1016
6:00 AM	64		6:00 PM	226	
6:15 AM	96		6:15 PM	178	
6:30 AM	140		6:30 PM	163	
6:45 AM	154	454	6:45 PM	163	730
7:00 AM	152		7:00 PM	154	
7:15 AM	194		7:15 PM	148	
7:30 AM	225		7:30 PM	148	
7:45 AM	222	793	7:45 PM	124	574
8:00 AM	171		8:00 PM	128	
8:15 AM	195		8:15 PM	108	
8:30 AM	177		8:30 PM	108	
8:45 AM	145	688	8:45 PM	122	466
9:00 AM	151		9:00 PM	98	
9:15 AM	142		9:15 PM	109	
9:30 AM	143		9:30 PM	86	
9:45 AM	171	607	9:45 PM	80	373
10:00 AM	151		10:00 PM	65	
10:15 AM	145		10:15 PM	62	
10:30 AM	164		10:30 PM	41	
10:45 AM	164	624	10:45 PM	37	205
11:00 AM	147		11:00 PM	44	
11:15 AM	166		11:15 PM	33	
11:30 AM	158		11:30 PM	24	
11:45 AM	164	635	11:45 PM	15	116
Total	4095			7898	
Percent	34.14%			65.86%	
Day Total			11993		
Peak Hour	7:30 AM			3:15 PM	
Volume	813			1079	
P.H.F.	0.903			0.984	

Farm Street
south of Old Nahant Road
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: **217949 ATR-BB**

Count Date:
Thursday, June 3, 2021

Volume

NB						SB						Combined					
Start Time:	15 min	60 min		15 min	60 min	Start Time:	15 min	60 min		15 min	60 min	Start Time:	15 min	60 min		15 min	60 min
12:00 AM	8		12:00 PM	105		12:00 AM	10		12:00 PM	78		12:00 AM	18		12:00 PM	183	
12:15 AM	12		12:15 PM	118		12:15 AM	2		12:15 PM	90		12:15 AM	14		12:15 PM	208	
12:30 AM	10		12:30 PM	149		12:30 AM	4		12:30 PM	86		12:30 AM	14		12:30 PM	235	
12:45 AM	5	35	12:45 PM	134	506	12:45 AM	4	20	12:45 PM	122	376	12:45 AM	9	55	12:45 PM	256	882
1:00 AM	4		1:00 PM	123		1:00 AM	0		1:00 PM	95		1:00 AM	4		1:00 PM	218	
1:15 AM	5		1:15 PM	146		1:15 AM	3		1:15 PM	89		1:15 AM	8		1:15 PM	235	
1:30 AM	3		1:30 PM	141		1:30 AM	4		1:30 PM	104		1:30 AM	7		1:30 PM	245	
1:45 AM	3	15	1:45 PM	137	547	1:45 AM	1	8	1:45 PM	91	379	1:45 AM	4	23	1:45 PM	228	926
2:00 AM	2		2:00 PM	130		2:00 AM	4		2:00 PM	83		2:00 AM	6		2:00 PM	213	
2:15 AM	3		2:15 PM	99		2:15 AM	1		2:15 PM	84		2:15 AM	4		2:15 PM	183	
2:30 AM	1		2:30 PM	91		2:30 AM	3		2:30 PM	116		2:30 AM	4		2:30 PM	207	
2:45 AM	3	9	2:45 PM	122	442	2:45 AM	4	12	2:45 PM	124	407	2:45 AM	7	21	2:45 PM	246	849
3:00 AM	3		3:00 PM	149		3:00 AM	3		3:00 PM	134		3:00 AM	6		3:00 PM	283	
3:15 AM	3		3:15 PM	169		3:15 AM	5		3:15 PM	99		3:15 AM	8		3:15 PM	268	
3:30 AM	1		3:30 PM	169		3:30 AM	1		3:30 PM	108		3:30 AM	2		3:30 PM	277	
3:45 AM	2	9	3:45 PM	162	649	3:45 AM	4	13	3:45 PM	113	454	3:45 AM	6	22	3:45 PM	275	1103
4:00 AM	1		4:00 PM	161		4:00 AM	7		4:00 PM	121		4:00 AM	8		4:00 PM	282	
4:15 AM	3		4:15 PM	129		4:15 AM	4		4:15 PM	141		4:15 AM	7		4:15 PM	270	
4:30 AM	8		4:30 PM	151		4:30 AM	5		4:30 PM	114		4:30 AM	13		4:30 PM	265	
4:45 AM	8	20	4:45 PM	120	561	4:45 AM	13	29	4:45 PM	138	514	4:45 AM	21	49	4:45 PM	258	1075
5:00 AM	13		5:00 PM	131		5:00 AM	12		5:00 PM	165		5:00 AM	25		5:00 PM	296	
5:15 AM	12		5:15 PM	143		5:15 AM	17		5:15 PM	164		5:15 AM	29		5:15 PM	307	
5:30 AM	18		5:30 PM	135		5:30 AM	18		5:30 PM	111		5:30 AM	36		5:30 PM	246	
5:45 AM	39	82	5:45 PM	136	545	5:45 AM	30	77	5:45 PM	89	529	5:45 AM	69	159	5:45 PM	225	1074
6:00 AM	35		6:00 PM	129		6:00 AM	28		6:00 PM	92		6:00 AM	63		6:00 PM	221	
6:15 AM	37		6:15 PM	85		6:15 AM	47		6:15 PM	78		6:15 AM	84		6:15 PM	163	
6:30 AM	85		6:30 PM	80		6:30 AM	54		6:30 PM	87		6:30 AM	139		6:30 PM	167	
6:45 AM	90	247	6:45 PM	54	348	6:45 AM	70	199	6:45 PM	78	335	6:45 AM	160	446	6:45 PM	132	683
7:00 AM	93		7:00 PM	85		7:00 AM	69		7:00 PM	70		7:00 AM	162		7:00 PM	155	
7:15 AM	110		7:15 PM	61		7:15 AM	93		7:15 PM	88		7:15 AM	203		7:15 PM	149	
7:30 AM	125		7:30 PM	62		7:30 AM	97		7:30 PM	63		7:30 AM	222		7:30 PM	125	
7:45 AM	111	439	7:45 PM	49	257	7:45 AM	107	366	7:45 PM	65	286	7:45 AM	218	805	7:45 PM	114	543
8:00 AM	98		8:00 PM	56		8:00 AM	55		8:00 PM	59		8:00 AM	153		8:00 PM	115	
8:15 AM	108		8:15 PM	63		8:15 AM	66		8:15 PM	59		8:15 AM	174		8:15 PM	122	
8:30 AM	110		8:30 PM	56		8:30 AM	99		8:30 PM	43		8:30 AM	209		8:30 PM	99	
8:45 AM	99	415	8:45 PM	48	223	8:45 AM	78	298	8:45 PM	39	200	8:45 AM	177	713	8:45 PM	87	423
9:00 AM	110		9:00 PM	30		9:00 AM	74		9:00 PM	45		9:00 AM	184		9:00 PM	75	
9:15 AM	78		9:15 PM	43		9:15 AM	71		9:15 PM	38		9:15 AM	149		9:15 PM	81	
9:30 AM	84		9:30 PM	43		9:30 AM	75		9:30 PM	39		9:30 AM	159		9:30 PM	82	
9:45 AM	74	346	9:45 PM	31	147	9:45 AM	74	294	9:45 PM	36	158	9:45 AM	148	640	9:45 PM	67	305
10:00 AM	70		10:00 PM	27		10:00 AM	92		10:00 PM	37		10:00 AM	162		10:00 PM	64	
10:15 AM	80		10:15 PM	24		10:15 AM	74		10:15 PM	22		10:15 AM	154		10:15 PM	46	
10:30 AM	88		10:30 PM	43		10:30 AM	74		10:30 PM	20		10:30 AM	162		10:30 PM	63	
10:45 AM	89	327	10:45 PM	28	122	10:45 AM	92	332	10:45 PM	10	89	10:45 AM	181	659	10:45 PM	38	211
11:00 AM	85		11:00 PM	25		11:00 AM	80		11:00 PM	19		11:00 AM	165		11:00 PM	44	
11:15 AM	101		11:15 PM	22		11:15 AM	68		11:15 PM	11		11:15 AM	169		11:15 PM	33	
11:30 AM	95		11:30 PM	13		11:30 AM	80		11:30 PM	10		11:30 AM	175		11:30 PM	23	
11:45 AM	115	396	11:45 PM	10	70	11:45 AM	74	302	11:45 PM	9	49	11:45 AM	189	698	11:45 PM	19	119
Total	2340			4417		Total	1950			3776		Total	4290			8193	
Percent	34.63%			65.37%		Percent	34.06%			65.94%		Percent	34.37%			65.63%	
Day Total			6757			Day Total			5726			Day Total			12483		
Peak Hour	11:45 AM			3:15 PM		Peak Hour	7:00 AM			4:30 PM		Peak Hour	11:45 AM			4:30 PM	
Volume	487			661		Volume	366			581		Volume	815			1126	
P.H.F.	0.817			0.978		P.H.F.	0.855			0.880		P.H.F.	0.867			0.917	

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Wednesday, June, 02, 2021

Classification (60-minute)

NB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	26	3	0	1	0	0	0	0	0	0	0	0	30
1:00 AM	0	7	2	0	1	0	0	0	0	0	0	0	0	10
2:00 AM	0	5	0	0	0	0	0	0	0	0	0	0	0	5
3:00 AM	0	7	2	0	1	0	0	0	0	0	0	0	0	10
4:00 AM	0	17	1	0	0	1	0	1	0	0	0	0	0	20
5:00 AM	0	48	19	0	4	0	1	0	0	0	0	0	0	72
6:00 AM	1	156	64	1	16	0	0	1	1	0	0	0	0	240
7:00 AM	3	295	102	17	18	0	0	3	0	0	0	0	0	438
8:00 AM	1	305	48	3	15	3	0	1	1	0	0	0	0	377
9:00 AM	1	233	58	2	11	1	0	1	1	1	0	0	0	309
10:00 AM	5	228	66	2	11	3	0	1	1	0	0	0	0	317
11:00 AM	5	248	51	0	15	2	0	0	1	0	0	0	0	322
12:00 PM	1	278	69	3	11	1	0	0	1	0	0	0	0	364
1:00 PM	2	319	88	2	14	1	0	0	1	0	0	1	0	428
2:00 PM	5	300	73	4	23	3	0	1	0	0	0	0	0	409
3:00 PM	4	500	90	3	23	1	0	4	0	1	0	0	0	626
4:00 PM	5	450	87	3	20	0	0	4	0	0	0	0	0	569
5:00 PM	3	406	82	5	22	0	0	1	0	0	0	0	0	519
6:00 PM	4	289	47	3	9	0	0	0	0	0	0	0	0	352
7:00 PM	2	225	47	0	5	0	0	1	1	0	0	0	0	281
8:00 PM	1	185	35	0	8	0	0	0	0	1	0	0	0	230
9:00 PM	3	165	22	0	11	1	0	0	0	0	0	0	0	202
10:00 PM	3	100	14	0	2	0	0	1	0	0	0	0	0	120
11:00 PM	1	66	10	0	3	0	0	0	0	0	0	0	0	80
Total	50	4858	1080	48	244	17	1	20	8	3	0	1	0	6330
Percent	0.79%	76.75%	17.06%	0.76%	3.85%	0.27%	0.02%	0.32%	0.13%	0.05%	0.00%	0.02%	0.00%	
AM Peak	10:00 AM	8:00 AM	7:00 AM	7:00 AM	7:00 AM	8:00 AM	5:00 AM	7:00 AM	6:00 AM	9:00 AM				7:00 AM
Volume	5	305	102	17	18	3	1	3	1	1	0	0	0	438
PM Peak	2:00 PM	3:00 PM	3:00 PM	5:00 PM	2:00 PM	2:00 PM		3:00 PM	12:00 PM	3:00 PM		1:00 PM		3:00 PM
Volume	5	500	90	5	23	3	0	4	1	1	0	1	0	626

Cycles:	50	0.8%
Cars and Light Trucks:	5938	93.8%
Heavy Vehicles:	342	5.4%

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Wednesday, June, 02, 2021

Classification (60-minute)

SB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	9	2	0	2	0	0	0	0	0	0	0	0	13
1:00 AM	0	12	0	0	0	0	0	0	0	0	0	0	0	12
2:00 AM	0	9	1	0	0	0	0	0	0	0	0	0	0	10
3:00 AM	0	3	3	1	0	0	0	0	0	0	0	0	0	7
4:00 AM	0	20	11	0	0	0	0	0	0	0	0	0	0	31
5:00 AM	0	47	22	0	5	0	0	0	0	0	0	0	0	74
6:00 AM	1	152	55	0	6	0	0	0	0	0	0	0	0	214
7:00 AM	4	260	65	4	17	1	1	2	1	0	0	0	0	355
8:00 AM	0	223	67	3	13	3	0	1	1	0	0	0	0	311
9:00 AM	0	221	58	2	9	4	1	2	1	0	0	0	0	298
10:00 AM	1	236	61	0	8	0	0	1	0	0	0	0	0	307
11:00 AM	3	234	69	0	3	2	1	0	1	0	0	0	0	313
12:00 PM	5	259	62	1	11	0	2	1	1	0	0	0	0	342
1:00 PM	10	289	64	9	7	2	0	0	1	0	0	0	0	382
2:00 PM	3	321	51	4	11	0	0	1	0	0	0	0	0	391
3:00 PM	3	354	71	6	7	3	0	1	0	0	0	0	0	445
4:00 PM	6	354	78	4	19	0	0	0	1	0	0	0	0	462
5:00 PM	5	398	72	3	18	1	0	0	0	0	0	0	0	497
6:00 PM	3	314	47	6	7	0	0	0	1	0	0	0	0	378
7:00 PM	4	239	40	4	5	0	0	1	0	0	0	0	0	293
8:00 PM	5	200	24	1	5	0	0	0	1	0	0	0	0	236
9:00 PM	1	153	12	1	2	1	0	0	1	0	0	0	0	171
10:00 PM	1	75	7	0	2	0	0	0	0	0	0	0	0	85
11:00 PM	3	32	1	0	0	0	0	0	0	0	0	0	0	36
PM Total	58	4414	943	49	157	17	5	10	10	0	0	0	0	5663
Percent	1.02%	77.94%	16.65%	0.87%	2.77%	0.30%	0.09%	0.18%	0.18%	0.00%	0.00%	0.00%	0.00%	
AM Peak	7:00 AM	7:00 AM	11:00 AM	7:00 AM	7:00 AM	9:00 AM	7:00 AM	7:00 AM	7:00 AM					7:00 AM
Volume	4	260	69	4	17	4	1	2	1	0	0	0	0	355
PM Peak	1:00 PM	5:00 PM	4:00 PM	1:00 PM	4:00 PM	3:00 PM	12:00 PM	12:00 PM	12:00 PM					5:00 PM
Volume	10	398	78	9	19	3	2	1	1	0	0	0	0	497

Cycles:	58	1.0%
Cars and Light Trucks:	5357	94.6%
Heavy Vehicles:	248	4.4%

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Wednesday, June, 02, 2021

Classification (60-minute)

Combined

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	35	5	0	3	0	0	0	0	0	0	0	0	43
1:00 AM	0	19	2	0	1	0	0	0	0	0	0	0	0	22
2:00 AM	0	14	1	0	0	0	0	0	0	0	0	0	0	15
3:00 AM	0	10	5	1	1	0	0	0	0	0	0	0	0	17
4:00 AM	0	37	12	0	0	1	0	1	0	0	0	0	0	51
5:00 AM	0	95	41	0	9	0	1	0	0	0	0	0	0	146
6:00 AM	2	308	119	1	22	0	0	1	1	0	0	0	0	454
7:00 AM	7	555	167	21	35	1	1	5	1	0	0	0	0	793
8:00 AM	1	528	115	6	28	6	0	2	2	0	0	0	0	688
9:00 AM	1	454	116	4	20	5	1	3	2	1	0	0	0	607
10:00 AM	6	464	127	2	19	3	0	2	1	0	0	0	0	624
11:00 AM	8	482	120	0	18	4	1	0	2	0	0	0	0	635
12:00 PM	6	537	131	4	22	1	2	1	2	0	0	0	0	706
1:00 PM	12	608	152	11	21	3	0	0	2	0	0	1	0	810
2:00 PM	8	621	124	8	34	3	0	2	0	0	0	0	0	800
3:00 PM	7	854	161	9	30	4	0	5	0	1	0	0	0	1071
4:00 PM	11	804	165	7	39	0	0	4	1	0	0	0	0	1031
5:00 PM	8	804	154	8	40	1	0	1	0	0	0	0	0	1016
6:00 PM	7	603	94	9	16	0	0	0	1	0	0	0	0	730
7:00 PM	6	464	87	4	10	0	0	2	1	0	0	0	0	574
8:00 PM	6	385	59	1	13	0	0	0	1	1	0	0	0	466
9:00 PM	4	318	34	1	13	2	0	0	1	0	0	0	0	373
10:00 PM	4	175	21	0	4	0	0	1	0	0	0	0	0	205
11:00 PM	4	98	11	0	3	0	0	0	0	0	0	0	0	116
PM Total	108	9272	2023	97	401	34	6	30	18	3	0	1	0	11993
Percent	0.90%	77.31%	16.87%	0.81%	3.34%	0.28%	0.05%	0.25%	0.15%	0.03%	0.00%	0.01%	0.00%	
AM Peak	11:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	8:00 AM	5:00 AM	7:00 AM	8:00 AM	9:00 AM				7:00 AM
Volume	8	555	167	21	35	6	1	5	2	1	0	0	0	793
PM Peak	1:00 PM	3:00 PM	4:00 PM	1:00 PM	5:00 PM	3:00 PM	12:00 PM	3:00 PM	12:00 PM	3:00 PM		1:00 PM		3:00 PM
Volume	12	854	165	11	40	4	2	5	2	1	0	1	0	1071

Cycles:	108	0.9%
Cars and Light Trucks:	11295	94.2%
Heavy Vehicles:	590	4.9%

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Thursday, June 3, 2021

Classification (60-minute)

NB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	26	8	0	1	0	0	0	0	0	0	0	0	35
1:00 AM	0	14	1	0	0	0	0	0	0	0	0	0	0	15
2:00 AM	0	9	0	0	0	0	0	0	0	0	0	0	0	9
3:00 AM	0	9	0	0	0	0	0	0	0	0	0	0	0	9
4:00 AM	0	14	3	0	2	1	0	0	0	0	0	0	0	20
5:00 AM	0	60	17	1	4	0	0	0	0	0	0	0	0	82
6:00 AM	2	174	43	1	22	1	0	2	2	0	0	0	0	247
7:00 AM	2	319	77	18	19	1	0	3	0	0	0	0	0	439
8:00 AM	0	328	66	2	12	4	0	1	1	1	0	0	0	415
9:00 AM	0	256	70	1	13	4	0	0	2	0	0	0	0	346
10:00 AM	1	259	42	0	14	5	1	3	2	0	0	0	0	327
11:00 AM	3	311	52	6	16	5	1	0	1	1	0	0	0	396
12:00 PM	3	396	83	3	15	1	1	2	2	0	0	0	0	506
1:00 PM	2	429	98	7	8	1	0	1	1	0	0	0	0	547
2:00 PM	3	333	84	1	15	4	0	2	0	0	0	0	0	442
3:00 PM	1	527	85	3	25	2	0	4	1	1	0	0	0	649
4:00 PM	5	422	106	4	20	2	0	2	0	0	0	0	0	561
5:00 PM	1	430	88	7	16	0	0	2	0	1	0	0	0	545
6:00 PM	2	291	43	0	9	0	0	3	0	0	0	0	0	348
7:00 PM	0	198	52	0	7	0	0	0	0	0	0	0	0	257
8:00 PM	1	193	25	0	4	0	0	0	0	0	0	0	0	223
9:00 PM	2	116	22	1	5	0	0	1	0	0	0	0	0	147
10:00 PM	0	109	11	0	2	0	0	0	0	0	0	0	0	122
11:00 PM	0	60	9	0	1	0	0	0	0	0	0	0	0	70
Total	28	5283	1085	55	230	31	3	26	12	4	0	0	0	6757
Percent	0.41%	78.19%	16.06%	0.81%	3.40%	0.46%	0.04%	0.38%	0.18%	0.06%	0.00%	0.00%	0.00%	
AM Peak	11:00 AM	8:00 AM	7:00 AM	7:00 AM	6:00 AM	10:00 AM	10:00 AM	7:00 AM	6:00 AM	8:00 AM				7:00 AM
Volume	3	328	77	18	22	5	1	3	2	1	0	0	0	439
PM Peak	4:00 PM	3:00 PM	4:00 PM	1:00 PM	3:00 PM	2:00 PM	12:00 PM	3:00 PM	12:00 PM	3:00 PM				3:00 PM
Volume	5	527	106	7	25	4	1	4	2	1	0	0	0	649

Cycles:	28	0.4%
Cars and Light Trucks:	6368	94.2%
Heavy Vehicles:	361	5.3%

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
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Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Thursday, June 3, 2021

Classification (60-minute)

SB

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	17	3	0	0	0	0	0	0	0	0	0	0	20
1:00 AM	0	7	1	0	0	0	0	0	0	0	0	0	0	8
2:00 AM	0	8	3	0	0	1	0	0	0	0	0	0	0	12
3:00 AM	0	11	1	1	0	0	0	0	0	0	0	0	0	13
4:00 AM	0	22	7	0	0	0	0	0	0	0	0	0	0	29
5:00 AM	0	52	18	0	7	0	0	0	0	0	0	0	0	77
6:00 AM	1	133	54	0	10	0	1	0	0	0	0	0	0	199
7:00 AM	0	270	67	4	17	1	1	5	1	0	0	0	0	366
8:00 AM	1	228	56	2	8	2	0	0	1	0	0	0	0	298
9:00 AM	2	228	48	5	5	3	2	0	1	0	0	0	0	294
10:00 AM	0	261	53	2	13	1	1	0	1	0	0	0	0	332
11:00 AM	0	235	52	4	7	3	0	0	1	0	0	0	0	302
12:00 PM	2	301	57	6	7	1	1	0	1	0	0	0	0	376
1:00 PM	5	295	57	3	13	4	0	2	0	0	0	0	0	379
2:00 PM	3	327	64	3	7	2	0	1	0	0	0	0	0	407
3:00 PM	4	362	61	7	15	4	0	1	0	0	0	0	0	454
4:00 PM	5	403	81	7	16	0	0	2	0	0	0	0	0	514
5:00 PM	2	435	75	2	12	1	0	1	0	1	0	0	0	529
6:00 PM	0	283	48	0	3	0	0	1	0	0	0	0	0	335
7:00 PM	1	249	31	0	5	0	0	0	0	0	0	0	0	286
8:00 PM	1	175	21	0	3	0	0	0	0	0	0	0	0	200
9:00 PM	0	137	16	2	2	0	0	0	1	0	0	0	0	158
10:00 PM	0	77	12	0	0	0	0	0	0	0	0	0	0	89
11:00 PM	0	39	10	0	0	0	0	0	0	0	0	0	0	49
PM Total	27	4555	896	48	150	23	6	13	7	1	0	0	0	5726
Percent	0.47%	79.55%	15.65%	0.84%	2.62%	0.40%	0.10%	0.23%	0.12%	0.02%	0.00%	0.00%	0.00%	
AM Peak	9:00 AM	7:00 AM	7:00 AM	9:00 AM	7:00 AM	9:00 AM	9:00 AM	7:00 AM	7:00 AM					7:00 AM
Volume	2	270	67	5	17	3	2	5	1	0	0	0	0	366
PM Peak	1:00 PM	5:00 PM	4:00 PM	3:00 PM	4:00 PM	1:00 PM	12:00 PM	1:00 PM	12:00 PM	5:00 PM				5:00 PM
Volume	5	435	81	7	16	4	1	2	1	1	0	0	0	529

Cycles:	27	0.5%
Cars and Light Trucks:	5451	95.2%
Heavy Vehicles:	248	4.3%

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
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Count Date
Thursday, June 3, 2021

Classification (60-minute)

Combined

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	43	11	0	1	0	0	0	0	0	0	0	0	55
1:00 AM	0	21	2	0	0	0	0	0	0	0	0	0	0	23
2:00 AM	0	17	3	0	0	1	0	0	0	0	0	0	0	21
3:00 AM	0	20	1	1	0	0	0	0	0	0	0	0	0	22
4:00 AM	0	36	10	0	2	1	0	0	0	0	0	0	0	49
5:00 AM	0	112	35	1	11	0	0	0	0	0	0	0	0	159
6:00 AM	3	307	97	1	32	1	1	2	2	0	0	0	0	446
7:00 AM	2	589	144	22	36	2	1	8	1	0	0	0	0	805
8:00 AM	1	556	122	4	20	6	0	1	2	1	0	0	0	713
9:00 AM	2	484	118	6	18	7	2	0	3	0	0	0	0	640
10:00 AM	1	520	95	2	27	6	2	3	3	0	0	0	0	659
11:00 AM	3	546	104	10	23	8	1	0	2	1	0	0	0	698
12:00 PM	5	697	140	9	22	2	2	2	3	0	0	0	0	882
1:00 PM	7	724	155	10	21	5	0	3	1	0	0	0	0	926
2:00 PM	6	660	148	4	22	6	0	3	0	0	0	0	0	849
3:00 PM	5	889	146	10	40	6	0	5	1	1	0	0	0	1103
4:00 PM	10	825	187	11	36	2	0	4	0	0	0	0	0	1075
5:00 PM	3	865	163	9	28	1	0	3	0	2	0	0	0	1074
6:00 PM	2	574	91	0	12	0	0	4	0	0	0	0	0	683
7:00 PM	1	447	83	0	12	0	0	0	0	0	0	0	0	543
8:00 PM	2	368	46	0	7	0	0	0	0	0	0	0	0	423
9:00 PM	2	253	38	3	7	0	0	1	1	0	0	0	0	305
10:00 PM	0	186	23	0	2	0	0	0	0	0	0	0	0	211
11:00 PM	0	99	19	0	1	0	0	0	0	0	0	0	0	119
PM Total	55	9838	1981	103	380	54	9	39	19	5	0	0	0	12483
Percent	0.44%	78.81%	15.87%	0.83%	3.04%	0.43%	0.07%	0.31%	0.15%	0.04%	0.00%	0.00%	0.00%	
AM Peak	6:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	11:00 AM	9:00 AM	7:00 AM	9:00 AM	8:00 AM				7:00 AM
Volume	3	589	144	22	36	8	2	8	3	1	0	0	0	805
PM Peak	4:00 PM	3:00 PM	4:00 PM	4:00 PM	3:00 PM	2:00 PM	12:00 PM	3:00 PM	12:00 PM	5:00 PM				3:00 PM
Volume	10	889	187	11	40	6	2	5	3	2	0	0	0	1103

Cycles:	55	0.4%
Cars and Light Trucks:	11819	94.7%
Heavy Vehicles:	609	4.9%

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Wednesday, June, 02, 2021

Speed (60-minute)

NB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	2	11	11	3	2	0	0	0	0	30	44.7	39.9
1:00 AM	0	0	0	1	0	3	4	2	0	0	0	0	0	10	46.6	40.4
2:00 AM	0	0	0	0	0	3	1	1	0	0	0	0	0	5	44.6	40.4
3:00 AM	0	0	0	0	2	1	3	3	0	1	0	0	0	10	48.0	42.4
4:00 AM	0	0	0	0	3	6	6	2	1	2	0	0	0	20	48.6	41.6
5:00 AM	0	0	0	1	2	17	31	17	3	1	0	0	0	72	47.0	42.1
6:00 AM	0	0	0	0	15	67	117	37	4	0	0	0	0	240	45.0	41.0
7:00 AM	2	1	1	7	40	123	191	63	10	0	0	0	0	438	45.0	40.1
8:00 AM	1	0	4	15	25	120	155	49	8	0	0	0	0	377	44.6	39.8
9:00 AM	1	0	0	0	19	90	133	61	5	0	0	0	0	309	45.0	41.0
10:00 AM	2	0	2	8	42	80	130	41	10	0	2	0	0	317	45.0	39.8
11:00 AM	1	0	0	1	25	92	126	63	12	2	0	0	0	322	46.0	41.1
12:00 PM	0	1	1	2	30	104	151	64	9	1	1	0	0	364	45.0	40.8
1:00 PM	1	0	0	5	36	135	175	67	7	2	0	0	0	428	45.0	40.4
2:00 PM	1	1	0	9	31	105	187	66	7	2	0	0	0	409	45.0	40.6
3:00 PM	1	0	1	5	44	191	278	96	9	1	0	0	0	626	45.0	40.6
4:00 PM	2	1	0	5	38	179	247	93	4	0	0	0	0	569	45.0	40.4
5:00 PM	2	1	1	10	55	159	215	71	5	0	0	0	0	519	44.0	39.7
6:00 PM	3	0	0	4	37	91	155	52	10	0	0	0	0	352	45.0	40.3
7:00 PM	1	0	0	0	14	97	131	34	3	1	0	0	0	281	44.0	40.5
8:00 PM	0	2	2	11	17	83	91	22	2	0	0	0	0	230	43.7	38.9
9:00 PM	0	0	3	2	9	67	84	27	9	1	0	0	0	202	45.9	40.5
10:00 PM	0	0	0	4	10	38	55	8	4	1	0	0	0	120	44.0	39.9
11:00 PM	0	0	0	0	16	18	28	14	4	0	0	0	0	80	46.0	40.3
Total	18	7	15	91	512	1880	2705	956	128	15	3	0	0	6330	45.0	40.4
Percent	0.28%	0.11%	0.24%	1.44%	8.09%	29.70%	42.73%	15.10%	2.02%	0.24%	0.05%	0.00%	0.00%			
AM Peak	7:00 AM	7:00 AM	8:00 AM	8:00 AM	10:00 AM	7:00 AM	7:00 AM	7:00 AM	11:00 AM	4:00 AM	10:00 AM			7:00 AM		
Volume	2	1	4	15	42	123	191	63	12	2	2	0	0	438		
PM Peak	6:00 PM	8:00 PM	9:00 PM	8:00 PM	5:00 PM	3:00 PM	3:00 PM	3:00 PM	6:00 PM	1:00 PM	12:00 PM			3:00 PM		
Volume	3	2	3	11	55	191	278	96	10	2	1	0	0	626		

15th Percentile:	36.0 MPH	Average Speed:	40.4 MPH	Posted Speed Limit:	40 MPH
50th Percentile:	41.0 MPH	10 MPH Pace:	36 to 45 MPH	Number of Vehicles > 40 MPH:	3218
85th Percentile:	45.0 MPH	Number in Pace:	4661	Percent of Vehicles > 40 MPH:	50.8%
95th Percentile:	48.0 MPH	Percent in Pace:	73.6%		

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
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Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Wednesday, June, 02, 2021

Speed (60-minute)

SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	2	4	4	1	1	1	0	0	0	0	13	42.0	36.1
1:00 AM	0	0	0	0	3	2	4	2	1	0	0	0	0	12	47.1	40.1
2:00 AM	0	0	0	0	2	1	4	1	2	0	0	0	0	10	48.3	41.0
3:00 AM	0	0	0	0	0	1	4	1	1	0	0	0	0	7	46.8	44.3
4:00 AM	0	0	1	0	4	7	12	4	3	0	0	0	0	31	46.0	40.6
5:00 AM	0	0	2	2	10	17	37	4	1	1	0	0	0	74	43.0	39.1
6:00 AM	0	0	0	11	33	73	68	27	2	0	0	0	0	214	44.0	38.7
7:00 AM	2	2	3	11	52	109	140	33	3	0	0	0	0	355	44.0	38.6
8:00 AM	0	0	1	10	43	107	116	29	4	1	0	0	0	311	44.0	39.1
9:00 AM	1	1	0	14	38	132	94	16	2	0	0	0	0	298	42.0	37.9
10:00 AM	0	0	0	15	49	123	89	29	2	0	0	0	0	307	43.0	38.3
11:00 AM	0	0	1	6	45	143	89	23	6	0	0	0	0	313	43.0	38.6
12:00 PM	0	0	4	15	47	149	92	34	1	0	0	0	0	342	43.0	38.2
1:00 PM	2	2	3	13	63	145	121	28	5	0	0	0	0	382	43.0	37.9
2:00 PM	1	0	0	23	68	139	136	20	4	0	0	0	0	391	42.0	37.8
3:00 PM	1	0	1	17	70	195	136	19	5	1	0	0	0	445	42.4	37.9
4:00 PM	3	2	1	14	76	203	149	11	0	3	0	0	0	462	42.0	37.5
5:00 PM	2	2	2	11	87	236	141	14	2	0	0	0	0	497	42.0	37.4
6:00 PM	3	1	2	20	91	155	85	20	1	0	0	0	0	378	41.0	36.6
7:00 PM	1	0	1	8	69	123	76	13	1	1	0	0	0	293	42.0	37.3
8:00 PM	1	0	0	10	48	106	59	9	1	1	0	0	1	236	42.0	37.6
9:00 PM	0	0	0	9	31	81	36	10	2	1	0	1	0	171	42.0	37.8
10:00 PM	0	1	0	2	18	36	22	4	2	0	0	0	0	85	42.0	37.4
11:00 PM	0	0	0	2	8	17	6	2	1	0	0	0	0	36	41.0	36.8
Total	17	11	22	215	959	2304	1717	354	53	9	0	1	1	5663	43.0	37.9
Percent	0.30%	0.19%	0.39%	3.80%	16.93%	40.69%	30.32%	6.25%	0.94%	0.16%	0.00%	0.02%	0.02%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	10:00 AM	7:00 AM	11:00 AM	7:00 AM	7:00 AM	11:00 AM	5:00 AM				7:00 AM		
Volume	2	2	3	15	52	143	140	33	6	1	0	0	0	355		
PM Peak	4:00 PM	1:00 PM	12:00 PM	2:00 PM	6:00 PM	5:00 PM	4:00 PM	12:00 PM	1:00 PM	4:00 PM		9:00 PM	8:00 PM	5:00 PM		
Volume	3	2	4	23	91	236	149	34	5	3	0	1	1	497		

15th Percentile:	33.0 MPH	Average Speed:	37.9 MPH	Posted Speed Limit:	40 MPH
50th Percentile:	38.0 MPH	10 MPH Pace:	34 to 43 MPH	Number of Vehicles > 40 MPH:	1636
85th Percentile:	43.0 MPH	Number in Pace:	4109	Percent of Vehicles > 40 MPH:	28.9%
95th Percentile:	46.0 MPH	Percent in Pace:	72.6%		

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Wednesday, June, 02, 2021

Speed (60-minute)

Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	3	6	15	12	4	3	0	0	0	0	43	44.7	38.7
1:00 AM	0	0	0	1	3	5	8	4	1	0	0	0	0	22	48.6	40.2
2:00 AM	0	0	0	0	2	4	5	2	2	0	0	0	0	15	46.8	40.8
3:00 AM	0	0	0	0	2	2	7	4	1	1	0	0	0	17	48.0	43.2
4:00 AM	0	0	1	0	7	13	18	6	4	2	0	0	0	51	47.0	41.0
5:00 AM	0	0	2	3	12	34	68	21	4	2	0	0	0	146	45.3	40.6
6:00 AM	0	0	0	11	48	140	185	64	6	0	0	0	0	454	45.0	39.9
7:00 AM	4	3	4	18	92	232	331	96	13	0	0	0	0	793	44.0	39.4
8:00 AM	1	0	5	25	68	227	271	78	12	1	0	0	0	688	44.0	39.5
9:00 AM	2	1	0	14	57	222	227	77	7	0	0	0	0	607	44.0	39.5
10:00 AM	2	0	2	23	91	203	219	70	12	0	2	0	0	624	44.0	39.1
11:00 AM	1	0	1	7	70	235	215	86	18	2	0	0	0	635	45.0	39.9
12:00 PM	0	1	5	17	77	253	243	98	10	1	1	0	0	706	45.0	39.5
1:00 PM	3	2	3	18	99	280	296	95	12	2	0	0	0	810	44.0	39.2
2:00 PM	2	1	0	32	99	244	323	86	11	2	0	0	0	800	44.0	39.2
3:00 PM	2	0	2	22	114	386	414	115	14	2	0	0	0	1071	44.0	39.4
4:00 PM	5	3	1	19	114	382	396	104	4	3	0	0	0	1031	44.0	39.1
5:00 PM	4	3	3	21	142	395	356	85	7	0	0	0	0	1016	43.0	38.6
6:00 PM	6	1	2	24	128	246	240	72	11	0	0	0	0	730	44.0	38.4
7:00 PM	2	0	1	8	83	220	207	47	4	2	0	0	0	574	43.0	38.9
8:00 PM	1	2	2	21	65	189	150	31	3	1	0	0	1	466	43.0	38.2
9:00 PM	0	0	3	11	40	148	120	37	11	2	0	1	0	373	44.0	39.3
10:00 PM	0	1	0	6	28	74	77	12	6	1	0	0	0	205	43.0	38.9
11:00 PM	0	0	0	2	24	35	34	16	5	0	0	0	0	116	45.0	39.2
Total	35	18	37	306	1471	4184	4422	1310	181	24	3	1	1	11993	44.0	39.2
Percent	0.29%	0.15%	0.31%	2.55%	12.27%	34.89%	36.87%	10.92%	1.51%	0.20%	0.03%	0.01%	0.01%			
AM Peak	7:00 AM	7:00 AM	8:00 AM	8:00 AM	7:00 AM	11:00 AM	7:00 AM	7:00 AM	11:00 AM	4:00 AM	10:00 AM			7:00 AM		
Volume	4	3	5	25	92	235	331	96	18	2	2	0	0	793		
PM Peak	6:00 PM	4:00 PM	12:00 PM	2:00 PM	5:00 PM	5:00 PM	3:00 PM	3:00 PM	3:00 PM	4:00 PM	12:00 PM	9:00 PM	8:00 PM	3:00 PM		
Volume	6	3	5	32	142	395	414	115	14	3	1	1	1	1071		

15th Percentile:	34.0 MPH	Average Speed:	39.2 MPH	Posted Speed Limit:	40 MPH
50th Percentile:	39.0 MPH	10 MPH Pace:	35 to 44 MPH	Number of Vehicles > 40 MPH:	4854
85th Percentile:	44.0 MPH	Number in Pace:	8606	Percent of Vehicles > 40 MPH:	40.5%
95th Percentile:	47.0 MPH	Percent in Pace:	71.8%		

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Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Thursday, June 3, 2021

Speed (60-minute)

NB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	1	12	11	10	0	0	0	0	0	35	46.0	40.9
1:00 AM	0	0	0	0	2	1	8	3	1	0	0	0	0	15	45.0	42.5
2:00 AM	0	0	0	1	1	0	3	1	1	1	0	0	1	9	54.2	45.3
3:00 AM	0	0	0	0	0	3	2	2	2	0	0	0	0	9	51.0	43.3
4:00 AM	0	0	0	0	1	7	7	4	1	0	0	0	0	20	46.3	41.6
5:00 AM	0	0	0	1	1	17	38	20	2	3	0	0	0	82	47.0	42.4
6:00 AM	0	0	0	0	9	80	112	39	5	1	1	0	0	247	45.0	41.1
7:00 AM	1	0	0	1	29	136	196	68	6	2	0	0	0	439	45.0	40.7
8:00 AM	1	0	0	7	56	154	135	59	3	0	0	0	0	415	44.0	39.2
9:00 AM	0	0	0	4	34	110	148	45	3	2	0	0	0	346	44.0	40.2
10:00 AM	0	0	1	1	24	107	145	41	7	1	0	0	0	327	44.1	40.5
11:00 AM	1	0	0	4	44	113	166	61	7	0	0	0	0	396	45.0	40.1
12:00 PM	0	1	1	3	48	192	180	75	6	0	0	0	0	506	45.0	39.8
1:00 PM	2	2	0	11	69	186	203	66	8	0	0	0	0	547	44.0	39.3
2:00 PM	0	0	1	3	72	114	183	61	8	0	0	0	0	442	45.0	39.9
3:00 PM	3	0	1	13	39	175	299	95	19	3	1	0	1	649	45.0	40.7
4:00 PM	3	1	3	4	69	180	229	62	9	1	0	0	0	561	44.0	39.6
5:00 PM	4	4	0	9	52	152	226	86	12	0	0	0	0	545	45.0	40.0
6:00 PM	1	0	0	11	36	125	105	60	10	0	0	0	0	348	45.0	39.6
7:00 PM	0	0	0	0	39	76	110	26	6	0	0	0	0	257	44.0	39.8
8:00 PM	0	0	1	4	35	77	79	22	3	2	0	0	0	223	44.0	39.1
9:00 PM	0	0	1	0	8	50	67	16	5	0	0	0	0	147	44.0	40.6
10:00 PM	0	0	1	3	8	46	44	15	4	1	0	0	0	122	45.0	39.8
11:00 PM	0	0	0	1	10	22	25	8	3	1	0	0	0	70	45.7	40.0
Total	16	8	10	82	687	2135	2721	945	131	18	2	0	2	6757	45.0	40.0
Percent	0.24%	0.12%	0.15%	1.21%	10.17%	31.60%	40.27%	13.99%	1.94%	0.27%	0.03%	0.00%	0.03%			
AM Peak	7:00 AM		10:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	7:00 AM	10:00 AM	5:00 AM	6:00 AM		2:00 AM	7:00 AM		
Volume	1	0	1	7	56	154	196	68	7	3	1	0	1	439		
PM Peak	5:00 PM	5:00 PM	4:00 PM	3:00 PM	2:00 PM	12:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM		3:00 PM	3:00 PM		
Volume	4	4	3	13	72	192	299	95	19	3	1	0	1	649		

15th Percentile:	35.0 MPH	Average Speed:	40.0 MPH	Posted Speed Limit:	40 MPH
50th Percentile:	40.0 MPH	10 MPH Pace:	36 to 45 MPH	Number of Vehicles > 40 MPH:	3198
85th Percentile:	45.0 MPH	Number in Pace:	4880	Percent of Vehicles > 40 MPH:	47.3%
95th Percentile:	48.0 MPH	Percent in Pace:	72.2%		

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Count Date
Thursday, June 3, 2021

Speed (60-minute)

SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	2	9	6	1	1	0	0	0	0	20	44.0	38.9
1:00 AM	0	0	0	1	0	3	2	0	2	0	0	0	0	8	49.7	40.9
2:00 AM	0	0	0	0	2	2	7	0	1	0	0	0	0	12	44.0	40.0
3:00 AM	0	0	0	0	1	3	4	4	1	0	0	0	0	13	46.2	42.3
4:00 AM	0	0	0	1	4	9	8	5	2	0	0	0	0	29	45.0	39.8
5:00 AM	0	0	0	4	11	19	25	15	3	0	0	0	0	77	46.0	39.5
6:00 AM	0	0	0	4	22	58	93	20	2	0	0	0	0	199	44.0	39.6
7:00 AM	1	1	2	23	68	140	103	24	4	0	0	0	0	366	43.0	37.5
8:00 AM	0	0	2	21	48	116	92	17	1	0	0	1	0	298	42.0	37.6
9:00 AM	2	2	1	17	74	113	66	17	1	0	1	0	0	294	42.0	36.5
10:00 AM	2	0	1	21	95	135	64	10	4	0	0	0	0	332	41.0	36.2
11:00 AM	1	0	5	30	41	140	73	9	2	1	0	0	0	302	42.0	36.6
12:00 PM	1	0	1	17	76	149	104	24	4	0	0	0	0	376	42.8	37.6
1:00 PM	1	4	1	17	72	153	103	26	2	0	0	0	0	379	42.0	37.3
2:00 PM	1	1	0	21	86	177	99	19	2	1	0	0	0	407	42.0	37.0
3:00 PM	2	2	1	21	85	188	131	21	3	0	0	0	0	454	42.0	37.3
4:00 PM	3	1	4	26	88	227	139	17	9	0	0	0	0	514	42.0	37.3
5:00 PM	2	1	4	23	135	207	142	11	3	1	0	0	0	529	41.0	36.8
6:00 PM	1	0	0	9	62	130	91	35	4	1	2	0	0	335	43.0	38.4
7:00 PM	0	0	0	14	56	125	76	14	1	0	0	0	0	286	42.0	37.4
8:00 PM	0	0	1	7	50	88	43	8	1	1	0	1	0	200	42.0	37.2
9:00 PM	0	0	0	1	42	81	27	7	0	0	0	0	0	158	41.0	37.1
10:00 PM	0	0	0	2	21	44	19	2	1	0	0	0	0	89	41.0	36.8
11:00 PM	0	1	3	3	6	16	13	6	1	0	0	0	0	49	44.0	37.4
Total	17	13	26	284	1147	2332	1530	312	55	5	3	2	0	5726	42.0	37.3
Percent	0.30%	0.23%	0.45%	4.96%	20.03%	40.73%	26.72%	5.45%	0.96%	0.09%	0.05%	0.03%	0.00%			
AM Peak	9:00 AM	9:00 AM	11:00 AM	11:00 AM	10:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	11:00 AM	9:00 AM	8:00 AM		7:00 AM		
Volume	2	2	5	30	95	140	103	24	4	1	1	1	0	366		
PM Peak	4:00 PM	1:00 PM	4:00 PM	4:00 PM	5:00 PM	4:00 PM	5:00 PM	6:00 PM	4:00 PM	2:00 PM	6:00 PM	8:00 PM		5:00 PM		
Volume	3	4	4	26	135	227	142	35	9	1	2	1	0	529		

15th Percentile:	33.0 MPH	Average Speed:	37.3 MPH	Posted Speed Limit:	40 MPH
50th Percentile:	38.0 MPH	10 MPH Pace:	33 to 42 MPH	Number of Vehicles > 40 MPH:	1441
85th Percentile:	42.0 MPH	Number in Pace:	4112	Percent of Vehicles > 40 MPH:	25.2%
95th Percentile:	45.0 MPH	Percent in Pace:	71.8%		

Farm Street
south of Old Nahant Road
City, State: Wakefield, MA
Client: Nitsch/ D. Birru
Site Code: 13872.2

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 217949 ATR-BB

Count Date
Thursday, June 3, 2021

Speed (60-minute)

Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	2	3	21	17	11	1	0	0	0	0	55	45.0	40.1
1:00 AM	0	0	0	1	2	4	10	3	3	0	0	0	0	23	46.4	41.9
2:00 AM	0	0	0	1	3	2	10	1	2	1	0	0	1	21	51.0	42.3
3:00 AM	0	0	0	0	1	6	6	6	3	0	0	0	0	22	47.0	42.7
4:00 AM	0	0	0	1	5	16	15	9	3	0	0	0	0	49	46.0	40.5
5:00 AM	0	0	0	5	12	36	63	35	5	3	0	0	0	159	46.0	41.0
6:00 AM	0	0	0	4	31	138	205	59	7	1	1	0	0	446	45.0	40.4
7:00 AM	2	1	2	24	97	276	299	92	10	2	0	0	0	805	44.0	39.2
8:00 AM	1	0	2	28	104	270	227	76	4	0	0	1	0	713	43.0	38.5
9:00 AM	2	2	1	21	108	223	214	62	4	2	1	0	0	640	44.0	38.5
10:00 AM	2	0	2	22	119	242	209	51	11	1	0	0	0	659	43.0	38.3
11:00 AM	2	0	5	34	85	253	239	70	9	1	0	0	0	698	44.0	38.6
12:00 PM	1	1	2	20	124	341	284	99	10	0	0	0	0	882	44.0	38.9
1:00 PM	3	6	1	28	141	339	306	92	10	0	0	0	0	926	44.0	38.5
2:00 PM	1	1	1	24	158	291	282	80	10	1	0	0	0	849	44.0	38.5
3:00 PM	5	2	2	34	124	363	430	116	22	3	1	0	1	1103	44.0	39.3
4:00 PM	6	2	7	30	157	407	368	79	18	1	0	0	0	1075	43.0	38.5
5:00 PM	6	5	4	32	187	359	368	97	15	1	0	0	0	1074	43.0	38.4
6:00 PM	2	0	0	20	98	255	196	95	14	1	2	0	0	683	45.0	39.0
7:00 PM	0	0	0	14	95	201	186	40	7	0	0	0	0	543	43.0	38.5
8:00 PM	0	0	2	11	85	165	122	30	4	3	0	1	0	423	43.0	38.2
9:00 PM	0	0	1	1	50	131	94	23	5	0	0	0	0	305	43.0	38.8
10:00 PM	0	0	1	5	29	90	63	17	5	1	0	0	0	211	43.0	38.5
11:00 PM	0	1	3	4	16	38	38	14	4	1	0	0	0	119	45.0	39.0
Total	33	21	36	366	1834	4467	4251	1257	186	23	5	2	2	12483	44.0	38.8
Percent	0.26%	0.17%	0.29%	2.93%	14.69%	35.78%	34.05%	10.07%	1.49%	0.18%	0.04%	0.02%	0.02%			
AM Peak	7:00 AM	9:00 AM	11:00 AM	11:00 AM	10:00 AM	7:00 AM	7:00 AM	7:00 AM	10:00 AM	5:00 AM	6:00 AM	8:00 AM	2:00 AM	7:00 AM		
Volume	2	2	5	34	119	276	299	92	11	3	1	1	1	805		
PM Peak	4:00 PM	1:00 PM	4:00 PM	3:00 PM	5:00 PM	4:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM	6:00 PM	8:00 PM	3:00 PM	3:00 PM		
Volume	6	6	7	34	187	407	430	116	22	3	2	1	1	1103		

15th Percentile:	34.0 MPH	Average Speed:	38.8 MPH	Posted Speed Limit:	40 MPH
50th Percentile:	39.0 MPH	10 MPH Pace:	34 to 43 MPH	Number of Vehicles > 40 MPH:	4639
85th Percentile:	44.0 MPH	Number in Pace:	8718	Percent of Vehicles > 40 MPH:	37.2%
95th Percentile:	47.0 MPH	Percent in Pace:	69.8%		

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	54	51	0	105	93	86	0	179	53	43	0	96	380
11:15 AM	57	60	0	117	111	64	0	175	45	54	0	99	391
11:30 AM	67	63	0	130	94	66	0	160	47	52	0	99	389
11:45 AM	52	80	0	132	117	72	0	189	47	58	0	105	426
Total	230	254	0	484	415	288	0	703	192	207	0	399	1586
12:00 PM	40	54	0	94	98	65	0	163	51	53	0	104	361
12:15 PM	39	64	0	103	94	45	0	139	70	65	0	135	377
12:30 PM	54	66	0	120	93	46	0	139	58	47	0	105	364
12:45 PM	51	76	0	127	103	55	0	158	51	44	0	95	380
Total	184	260	0	444	388	211	0	599	230	209	0	439	1482
Grand Total	414	514	0	928	803	499	0	1302	422	416	0	838	3068
Approach %	44.6	55.4	0.0		61.7	38.3	0.0		50.4	49.6	0.0		
Total %	13.5	16.8	0.0	30.2	26.2	16.3	0.0	42.4	13.8	13.6	0.0	27.3	
Exiting Leg Total				1219				936				913	3068
Cars	410	508	0	918	799	492	0	1291	417	409	0	826	3035
% Cars	99.0	98.8	0.0	98.9	99.5	98.6	0.0	99.2	98.8	98.3	0.0	98.6	98.9
Exiting Leg Total				1208				925				902	3035
Heavy Vehicles	4	6	0	10	4	7	0	11	5	7	0	12	33
% Heavy Vehicles	1.0	1.2	0.0	1.1	0.5	1.4	0.0	0.8	1.2	1.7	0.0	1.4	1.1
Exiting Leg Total				11				11				11	33

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	54	51	0	105	93	86	0	179	53	43	0	96	380
11:15 AM	57	60	0	117	111	64	0	175	45	54	0	99	391
11:30 AM	67	63	0	130	94	66	0	160	47	52	0	99	389
11:45 AM	52	80	0	132	117	72	0	189	47	58	0	105	426
Total Volume	230	254	0	484	415	288	0	703	192	207	0	399	1586
% Approach Total	47.5	52.5	0.0		59.0	41.0	0.0		48.1	51.9	0.0		
PHF	0.858	0.794	0.000	0.917	0.887	0.837	0.000	0.930	0.906	0.892	0.000	0.950	0.931
Cars	228	251	0	479	412	281	0	693	188	204	0	392	1564
Cars %	99.1	98.8	0.0	99.0	99.3	97.6	0.0	98.6	97.9	98.6	0.0	98.2	98.6
Heavy Vehicles	2	3	0	5	3	7	0	10	4	3	0	7	22
Heavy Vehicles %	0.9	1.2	0.0	1.0	0.7	2.4	0.0	1.4	2.1	1.4	0.0	1.8	1.4
Cars Enter Leg	228	251	0	479	412	281	0	693	188	204	0	392	1564
Heavy Enter Leg	2	3	0	5	3	7	0	10	4	3	0	7	22
Total Entering Leg	230	254	0	484	415	288	0	703	192	207	0	399	1586
Cars Exiting Leg				616				439				509	1564
Heavy Exiting Leg				6				7				9	22
Total Exiting Leg				622				446				518	1586

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	54	51	0	105	92	84	0	176	52	42	0	94	375
11:15 AM	56	60	0	116	111	61	0	172	45	53	0	98	386
11:30 AM	66	63	0	129	94	66	0	160	45	52	0	97	386
11:45 AM	52	77	0	129	115	70	0	185	46	57	0	103	417
Total	228	251	0	479	412	281	0	693	188	204	0	392	1564
12:00 PM	39	52	0	91	98	65	0	163	51	51	0	102	356
12:15 PM	38	64	0	102	94	45	0	139	69	64	0	133	374
12:30 PM	54	65	0	119	93	46	0	139	58	46	0	104	362
12:45 PM	51	76	0	127	102	55	0	157	51	44	0	95	379
Total	182	257	0	439	387	211	0	598	229	205	0	434	1471
Grand Total	410	508	0	918	799	492	0	1291	417	409	0	826	3035
Approach %	44.7	55.3	0.0		61.9	38.1	0.0		50.5	49.5	0.0		
Total %	13.5	16.7	0.0	30.2	26.3	16.2	0.0	42.5	13.7	13.5	0.0	27.2	
Exiting Leg Total				1208				925				902	3035

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	54	51	0	105	92	84	0	176	52	42	0	94	375
11:15 AM	56	60	0	116	111	61	0	172	45	53	0	98	386
11:30 AM	66	63	0	129	94	66	0	160	45	52	0	97	386
11:45 AM	52	77	0	129	115	70	0	185	46	57	0	103	417
Total Volume	228	251	0	479	412	281	0	693	188	204	0	392	1564
% Approach Total	47.6	52.4	0.0		59.5	40.5	0.0		48.0	52.0	0.0		
PHF	0.864	0.815	0.000	0.928	0.896	0.836	0.000	0.936	0.904	0.895	0.000	0.951	0.938
Entering Leg	228	251	0	479	412	281	0	693	188	204	0	392	1564
Exiting Leg				616				439				509	1564
Total				1095				1132				901	3128

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	0	0	0	0	1	2	0	3	1	1	0	2	5
11:15 AM	1	0	0	1	0	3	0	3	0	1	0	1	5
11:30 AM	1	0	0	1	0	0	0	0	2	0	0	2	3
11:45 AM	0	3	0	3	2	2	0	4	1	1	0	2	9
Total	2	3	0	5	3	7	0	10	4	3	0	7	22
12:00 PM	1	2	0	3	0	0	0	0	0	2	0	2	5
12:15 PM	1	0	0	1	0	0	0	0	1	1	0	2	3
12:30 PM	0	1	0	1	0	0	0	0	0	1	0	1	2
12:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	2	3	0	5	1	0	0	1	1	4	0	5	11
Grand Total	4	6	0	10	4	7	0	11	5	7	0	12	33
Approach %	40.0	60.0	0.0		36.4	63.6	0.0		41.7	58.3	0.0		
Total %	12.1	18.2	0.0	30.3	12.1	21.2	0.0	33.3	15.2	21.2	0.0	36.4	
Exiting Leg Total				11				11				11	33
Buses	0	1	0	1	1	0	0	1	0	0	0	0	2
% Buses	0.0	16.7	0.0	10.0	25.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	6.1
Exiting Leg Total				1				1				0	2
Single-Unit Trucks	4	4	0	8	3	7	0	10	5	6	0	11	29
% Single-Unit	100.0	66.7	0.0	80.0	75.0	100.0	0.0	90.9	100.0	85.7	0.0	91.7	87.9
Exiting Leg Total				9				9				11	29
Articulated Trucks	0	1	0	1	0	0	0	0	0	1	0	1	2
% Articulated	0.0	16.7	0.0	10.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	8.3	6.1
Exiting Leg Total				1				1				0	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	0	0	0	0	1	2	0	3	1	1	0	2	5
11:15 AM	1	0	0	1	0	3	0	3	0	1	0	1	5
11:30 AM	1	0	0	1	0	0	0	0	2	0	0	2	3
11:45 AM	0	3	0	3	2	2	0	4	1	1	0	2	9
Total Volume	2	3	0	5	3	7	0	10	4	3	0	7	22
% Approach Total	40.0	60.0	0.0		30.0	70.0	0.0		57.1	42.9	0.0		
PHF	0.500	0.250	0.000	0.417	0.375	0.583	0.000	0.625	0.500	0.750	0.000	0.875	0.611
Buses	0	0	0	0	1	0	0	1	0	0	0	0	1
Buses %	0.0	0.0	0.0	0.0	33.3	0.0	0.0	10.0	0.0	0.0	0.0	0.0	4.5
Single-Unit Trucks	2	3	0	5	2	7	0	9	4	2	0	6	20
Single-Unit %	100.0	100.0	0.0	100.0	66.7	100.0	0.0	90.0	100.0	66.7	0.0	85.7	90.9
Articulated Trucks	0	0	0	0	0	0	0	0	0	1	0	1	1
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	14.3	4.5
Buses	0	0	0	0	1	0	0	1	0	0	0	0	1
Single-Unit Trucks	2	3	0	5	2	7	0	9	4	2	0	6	20
Articulated Trucks	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Entering Leg	2	3	0	5	3	7	0	10	4	3	0	7	22
Buses				1				0				0	1
Single-Unit Trucks				4				7				9	20
Articulated Trucks				1				0				0	1
Total Exiting Leg				6				7				9	22

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	1	0	1	1	0	0	1	0	0	0	0	2
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	50.0	0.0	50.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				1				1				0	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	1	1	0	0	1	0	0	0	0	2
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	1	0	1	1	0	0	1	0	0	0	0	2
Exiting Leg				1				1				0	2
Total				2				2				0	4

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	0	0	0	0	1	2	0	3	1	0	0	1	4
11:15 AM	1	0	0	1	0	3	0	3	0	1	0	1	5
11:30 AM	1	0	0	1	0	0	0	0	2	0	0	2	3
11:45 AM	0	3	0	3	1	2	0	3	1	1	0	2	8
Total	2	3	0	5	2	7	0	9	4	2	0	6	20
12:00 PM	1	1	0	2	0	0	0	0	0	2	0	2	4
12:15 PM	1	0	0	1	0	0	0	0	1	1	0	2	3
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
12:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	2	1	0	3	1	0	0	1	1	4	0	5	9
Grand Total	4	4	0	8	3	7	0	10	5	6	0	11	29
Approach %	50.0	50.0	0.0		30.0	70.0	0.0		45.5	54.5	0.0		
Total %	13.8	13.8	0.0	27.6	10.3	24.1	0.0	34.5	17.2	20.7	0.0	37.9	
Exiting Leg Total				9				9				11	29

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	0	0	0	0	1	2	0	3	1	0	0	1	4
11:15 AM	1	0	0	1	0	3	0	3	0	1	0	1	5
11:30 AM	1	0	0	1	0	0	0	0	2	0	0	2	3
11:45 AM	0	3	0	3	1	2	0	3	1	1	0	2	8
Total Volume	2	3	0	5	2	7	0	9	4	2	0	6	20
% Approach Total	40.0	60.0	0.0		22.2	77.8	0.0		66.7	33.3	0.0		
PHF	0.500	0.250	0.000	0.417	0.500	0.583	0.000	0.750	0.500	0.500	0.000	0.750	0.625
Entering Leg	2	3	0	5	2	7	0	9	4	2	0	6	20
Exiting Leg				4				7				9	20
Total				9				16				15	40

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Articulated Trucks

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	1	0	1	0	0	0	0	0	1	0	1	2
Approach %	0.0	100.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	0.0	50.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	
Exiting Leg Total				1				1				0	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	1
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	1	0	1	1
Exiting Leg				1				0				0	1
Total				1				0				1	2

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
11:45 AM	0	1	0	2	0	3	1	0	0	0	0	1	0	0	0	0	0	0	4
Total	0	2	0	2	0	4	1	2	0	0	0	3	0	0	0	0	0	0	7
12:00 PM	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	2
12:15 PM	1	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	3	0	0	0	3	3	0	0	0	0	3	6
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	2	3	0	1	0	6	3	0	0	0	0	3	10
Grand Total	1	2	0	2	0	5	3	5	0	1	0	9	3	0	0	0	0	3	17
Approach %	20.0	40.0	0.0	40.0	0.0		33.3	55.6	0.0	11.1	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	5.9	11.8	0.0	11.8	0.0	29.4	17.6	29.4	0.0	5.9	0.0	52.9	17.6	0.0	0.0	0.0	0.0	17.6	
Exiting Leg Total						5						6						6	17

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
11:45 AM	0	1	0	2	0	3	1	0	0	0	0	1	0	0	0	0	0	0	4
12:00 PM	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	2
12:15 PM	1	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	3	0	0	0	3	3	0	0	0	0	3	6
Total Volume	1	1	0	2	0	4	3	3	0	1	0	7	3	0	0	0	0	3	14
% Approach Total	25.0	25.0	0.0	50.0	0.0		42.9	42.9	0.0	14.3	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.250	0.250	0.000	0.250	0.000	0.333	0.375	0.250	0.000	0.250	0.000	0.583	0.250	0.000	0.000	0.000	0.000	0.250	0.583
Entering Leg	1	1	0	2	0	4	3	3	0	1	0	7	3	0	0	0	0	3	14
Exiting Leg						5						5						4	14
Total						9						12						7	28

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	2
12:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	1	2	0	0	0	1	0	1	0	0	0	0	1	1	4
Grand Total	0	0	0	1	1	2	0	0	0	1	0	1	0	0	0	0	1	1	4
Approach %	0	0	0	50	50		0	0	0	100	0		0	0	0	0	100		
Total %	0	0	0	25	25	50	0	0	0	25	0	25	0	0	0	0	25	25	
Exiting Leg Total						2						1						1	4

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
12:00 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	2
12:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	1	1	2	0	0	0	1	0	1	0	0	0	0	1	1	4
% Approach Total	0.0	0.0	0.0	50.0	50.0		0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	100.0		
PHF	0.000	0.000	0.000	0.250	0.250	0.500	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.250	0.500
Entering Leg	0	0	0	1	1	2	0	0	0	1	0	1	0	0	0	0	1	1	4
Exiting Leg						2						1						1	4
Total						4						2						2	8

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	53	86	0	139	36	29	0	65	87	25	0	112	316
7:15 AM	62	104	0	166	53	85	0	138	131	32	0	163	467
7:30 AM	67	105	0	172	54	65	0	119	71	40	0	111	402
7:45 AM	102	95	0	197	58	39	0	97	41	37	0	78	372
Total	284	390	0	674	201	218	0	419	330	134	0	464	1557
8:00 AM	101	103	0	204	42	29	0	71	49	49	0	98	373
8:15 AM	79	72	0	151	96	69	0	165	62	57	0	119	435
8:30 AM	68	55	0	123	64	52	0	116	35	35	0	70	309
8:45 AM	75	57	0	132	39	41	0	80	33	45	0	78	290
Total	323	287	0	610	241	191	0	432	179	186	0	365	1407
Grand Total	607	677	0	1284	442	409	0	851	509	320	0	829	2964
Approach %	47.3	52.7	0.0		51.9	48.1	0.0		61.4	38.6	0.0		
Total %	20.5	22.8	0.0	43.3	14.9	13.8	0.0	28.7	17.2	10.8	0.0	28.0	
Exiting Leg Total				762				1186				1016	2964
Cars	577	660	0	1237	425	391	0	816	483	300	0	783	2836
% Cars	95.1	97.5	0.0	96.3	96.2	95.6	0.0	95.9	94.9	93.8	0.0	94.5	95.7
Exiting Leg Total				725				1143				968	2836
Heavy Vehicles	30	17	0	47	17	18	0	35	26	20	0	46	128
% Heavy Vehicles	4.9	2.5	0.0	3.7	3.8	4.4	0.0	4.1	5.1	6.3	0.0	5.5	4.3
Exiting Leg Total				37				43				48	128

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:15 AM	62	104	0	166	53	85	0	138	131	32	0	163	467
7:30 AM	67	105	0	172	54	65	0	119	71	40	0	111	402
7:45 AM	102	95	0	197	58	39	0	97	41	37	0	78	372
8:00 AM	101	103	0	204	42	29	0	71	49	49	0	98	373
Total Volume	332	407	0	739	207	218	0	425	292	158	0	450	1614
% Approach Total	44.9	55.1	0.0		48.7	51.3	0.0		64.9	35.1	0.0		
PHF	0.814	0.969	0.000	0.906	0.892	0.641	0.000	0.770	0.557	0.806	0.000	0.690	0.864
Cars	319	399	0	718	203	211	0	414	278	144	0	422	1554
Cars %	96.1	98.0	0.0	97.2	98.1	96.8	0.0	97.4	95.2	91.1	0.0	93.8	96.3
Heavy Vehicles	13	8	0	21	4	7	0	11	14	14	0	28	60
Heavy Vehicles %	3.9	2.0	0.0	2.8	1.9	3.2	0.0	2.6	4.8	8.9	0.0	6.2	3.7
Cars Enter Leg	319	399	0	718	203	211	0	414	278	144	0	422	1554
Heavy Enter Leg	13	8	0	21	4	7	0	11	14	14	0	28	60
Total Entering Leg	332	407	0	739	207	218	0	425	292	158	0	450	1614
Cars Exiting Leg				347				677				530	1554
Heavy Exiting Leg				18				22				20	60
Total Exiting Leg				365				699				550	1614

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	45	85	0	130	31	27	0	58	84	23	0	107	295
7:15 AM	54	102	0	156	52	84	0	136	128	28	0	156	448
7:30 AM	65	104	0	169	53	64	0	117	67	35	0	102	388
7:45 AM	100	92	0	192	57	36	0	93	37	33	0	70	355
Total	264	383	0	647	193	211	0	404	316	119	0	435	1486
8:00 AM	100	101	0	201	41	27	0	68	46	48	0	94	363
8:15 AM	76	69	0	145	93	68	0	161	57	56	0	113	419
8:30 AM	65	53	0	118	63	50	0	113	35	35	0	70	301
8:45 AM	72	54	0	126	35	35	0	70	29	42	0	71	267
Total	313	277	0	590	232	180	0	412	167	181	0	348	1350
Grand Total	577	660	0	1237	425	391	0	816	483	300	0	783	2836
Approach %	46.6	53.4	0.0		52.1	47.9	0.0		61.7	38.3	0.0		
Total %	20.3	23.3	0.0	43.6	15.0	13.8	0.0	28.8	17.0	10.6	0.0	27.6	
Exiting Leg Total				725				1143				968	2836

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:15 AM	54	102	0	156	52	84	0	136	128	28	0	156	448
7:30 AM	65	104	0	169	53	64	0	117	67	35	0	102	388
7:45 AM	100	92	0	192	57	36	0	93	37	33	0	70	355
8:00 AM	100	101	0	201	41	27	0	68	46	48	0	94	363
Total Volume	319	399	0	718	203	211	0	414	278	144	0	422	1554
% Approach Total	44.4	55.6	0.0		49.0	51.0	0.0		65.9	34.1	0.0		
PHF	0.798	0.959	0.000	0.893	0.890	0.628	0.000	0.761	0.543	0.750	0.000	0.676	0.867
Entering Leg	319	399	0	718	203	211	0	414	278	144	0	422	1554
Exiting Leg				347				677				530	1554
Total				1065				1091				952	3108

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	8	1	0	9	5	2	0	7	3	2	0	5	21
7:15 AM	8	2	0	10	1	1	0	2	3	4	0	7	19
7:30 AM	2	1	0	3	1	1	0	2	4	5	0	9	14
7:45 AM	2	3	0	5	1	3	0	4	4	4	0	8	17
Total	20	7	0	27	8	7	0	15	14	15	0	29	71
8:00 AM	1	2	0	3	1	2	0	3	3	1	0	4	10
8:15 AM	3	3	0	6	3	1	0	4	5	1	0	6	16
8:30 AM	3	2	0	5	1	2	0	3	0	0	0	0	8
8:45 AM	3	3	0	6	4	6	0	10	4	3	0	7	23
Total	10	10	0	20	9	11	0	20	12	5	0	17	57
Grand Total	30	17	0	47	17	18	0	35	26	20	0	46	128
Approach %	63.8	36.2	0.0		48.6	51.4	0.0		56.5	43.5	0.0		
Total %	23.4	13.3	0.0	36.7	13.3	14.1	0.0	27.3	20.3	15.6	0.0	35.9	
Exiting Leg Total				37				43				48	128
Buses	1	5	0	6	5	3	0	8	6	2	0	8	22
% Buses	3.3	29.4	0.0	12.8	29.4	16.7	0.0	22.9	23.1	10.0	0.0	17.4	17.2
Exiting Leg Total				7				11				4	22
Single-Unit Trucks	25	10	0	35	11	12	0	23	17	14	0	31	89
% Single-Unit	83.3	58.8	0.0	74.5	64.7	66.7	0.0	65.7	65.4	70.0	0.0	67.4	69.5
Exiting Leg Total				25				27				37	89
Articulated Trucks	4	2	0	6	1	3	0	4	3	4	0	7	17
% Articulated	13.3	11.8	0.0	12.8	5.9	16.7	0.0	11.4	11.5	20.0	0.0	15.2	13.3
Exiting Leg Total				5				5				7	17

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	8	1	0	9	5	2	0	7	3	2	0	5	21
7:15 AM	8	2	0	10	1	1	0	2	3	4	0	7	19
7:30 AM	2	1	0	3	1	1	0	2	4	5	0	9	14
7:45 AM	2	3	0	5	1	3	0	4	4	4	0	8	17
Total Volume	20	7	0	27	8	7	0	15	14	15	0	29	71
% Approach Total	74.1	25.9	0.0		53.3	46.7	0.0		48.3	51.7	0.0		
PHF	0.625	0.583	0.000	0.675	0.400	0.583	0.000	0.536	0.875	0.750	0.000	0.806	0.845
Buses	1	2	0	3	1	1	0	2	3	0	0	3	8
Buses %	5.0	28.6	0.0	11.1	12.5	14.3	0.0	13.3	21.4	0.0	0.0	10.3	11.3
Single-Unit Trucks	16	4	0	20	7	4	0	11	8	11	0	19	50
Single-Unit %	80.0	57.1	0.0	74.1	87.5	57.1	0.0	73.3	57.1	73.3	0.0	65.5	70.4
Articulated Trucks	3	1	0	4	0	2	0	2	3	4	0	7	13
Articulated %	15.0	14.3	0.0	14.8	0.0	28.6	0.0	13.3	21.4	26.7	0.0	24.1	18.3
Buses	1	2	0	3	1	1	0	2	3	0	0	3	8
Single-Unit Trucks	16	4	0	20	7	4	0	11	8	11	0	19	50
Articulated Trucks	3	1	0	4	0	2	0	2	3	4	0	7	13
Total Entering Leg	20	7	0	27	8	7	0	15	14	15	0	29	71
Buses				1				5				2	8
Single-Unit Trucks				18				12				20	50
Articulated Trucks				4				4				5	13
Total Exiting Leg				23				21				27	71

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Buses**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	1	0	0	1	1	1	0	2	0	0	0	0	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	1	0	0	0	0	2	0	0	2	3
7:45 AM	0	1	0	1	0	0	0	0	1	0	0	1	2
Total	1	2	0	3	1	1	0	2	3	0	0	3	8
8:00 AM	0	1	0	1	0	0	0	0	2	0	0	2	3
8:15 AM	0	2	0	2	3	0	0	3	1	0	0	1	6
8:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
8:45 AM	0	0	0	0	1	1	0	2	0	2	0	2	4
Total	0	3	0	3	4	2	0	6	3	2	0	5	14
Grand Total	1	5	0	6	5	3	0	8	6	2	0	8	22
Approach %	16.7	83.3	0.0		62.5	37.5	0.0		75.0	25.0	0.0		
Total %	4.5	22.7	0.0	27.3	22.7	13.6	0.0	36.4	27.3	9.1	0.0	36.4	
Exiting Leg Total				7				11				4	22

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:30 AM	0	1	0	1	0	0	0	0	2	0	0	2	3
7:45 AM	0	1	0	1	0	0	0	0	1	0	0	1	2
8:00 AM	0	1	0	1	0	0	0	0	2	0	0	2	3
8:15 AM	0	2	0	2	3	0	0	3	1	0	0	1	6
Total Volume	0	5	0	5	3	0	0	3	6	0	0	6	14
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.625	0.000	0.625	0.250	0.000	0.000	0.250	0.750	0.000	0.000	0.750	0.583
Entering Leg	0	5	0	5	3	0	0	3	6	0	0	6	14
Exiting Leg				3				11				0	14
Total				8				14				6	28

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	6	1	0	7	4	1	0	5	2	1	0	3	15
7:15 AM	6	1	0	7	1	0	0	1	3	3	0	6	14
7:30 AM	2	0	0	2	1	0	0	1	1	4	0	5	8
7:45 AM	2	2	0	4	1	3	0	4	2	3	0	5	13
Total	16	4	0	20	7	4	0	11	8	11	0	19	50
8:00 AM	1	0	0	1	0	2	0	2	1	1	0	2	5
8:15 AM	2	1	0	3	0	1	0	1	4	1	0	5	9
8:30 AM	3	2	0	5	1	1	0	2	0	0	0	0	7
8:45 AM	3	3	0	6	3	4	0	7	4	1	0	5	18
Total	9	6	0	15	4	8	0	12	9	3	0	12	39
Grand Total	25	10	0	35	11	12	0	23	17	14	0	31	89
Approach %	71.4	28.6	0.0		47.8	52.2	0.0		54.8	45.2	0.0		
Total %	28.1	11.2	0.0	39.3	12.4	13.5	0.0	25.8	19.1	15.7	0.0	34.8	
Exiting Leg Total				25				27				37	89

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	6	1	0	7	4	1	0	5	2	1	0	3	15
7:15 AM	6	1	0	7	1	0	0	1	3	3	0	6	14
7:30 AM	2	0	0	2	1	0	0	1	1	4	0	5	8
7:45 AM	2	2	0	4	1	3	0	4	2	3	0	5	13
Total Volume	16	4	0	20	7	4	0	11	8	11	0	19	50
% Approach Total	80.0	20.0	0.0		63.6	36.4	0.0		42.1	57.9	0.0		
PHF	0.667	0.500	0.000	0.714	0.438	0.333	0.000	0.550	0.667	0.688	0.000	0.792	0.833
Entering Leg	16	4	0	20	7	4	0	11	8	11	0	19	50
Exiting Leg				18				12				20	50
Total				38				23				39	100

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	1	0	0	1	0	0	0	0	1	1	0	2	3
7:15 AM	2	1	0	3	0	1	0	1	0	1	0	1	5
7:30 AM	0	0	0	0	0	1	0	1	1	1	0	2	3
7:45 AM	0	0	0	0	0	0	0	0	1	1	0	2	2
Total	3	1	0	4	0	2	0	2	3	4	0	7	13
8:00 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
8:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	1	1	0	2	1	1	0	2	0	0	0	0	4
Grand Total	4	2	0	6	1	3	0	4	3	4	0	7	17
Approach %	66.7	33.3	0.0		25.0	75.0	0.0		42.9	57.1	0.0		
Total %	23.5	11.8	0.0	35.3	5.9	17.6	0.0	23.5	17.6	23.5	0.0	41.2	
Exiting Leg Total				5				5				7	17

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	1	0	0	1	0	0	0	0	1	1	0	2	3
7:15 AM	2	1	0	3	0	1	0	1	0	1	0	1	5
7:30 AM	0	0	0	0	0	1	0	1	1	1	0	2	3
7:45 AM	0	0	0	0	0	0	0	0	1	1	0	2	2
Total Volume	3	1	0	4	0	2	0	2	3	4	0	7	13
% Approach Total	75.0	25.0	0.0		0.0	100.0	0.0		42.9	57.1	0.0		
PHF	0.375	0.250	0.000	0.333	0.000	0.500	0.000	0.500	0.750	1.000	0.000	0.875	0.650
Entering Leg	3	1	0	4	0	2	0	2	3	4	0	7	13
Exiting Leg				4				4				5	13
Total				8				6				12	26

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0	2
Grand Total	0	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0	2
Approach %	0.0	0.0	0.0	0.0	0.0		50.0	0.0	0.0	50.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						1						1						0	2

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		50.0	0.0	0.0	50.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0	2
Exiting Leg						1						1						0	2
Total						1						3						0	4

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	1	0	1	0	0	0	0	2	2	0	0	0	0	0	0	3
7:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2
7:45 AM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	4	0	4	0	0	0	2	2	4	0	0	0	0	0	0	8
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	4	1	5	0	0	0	2	2	4	0	0	0	0	0	0	9
Approach %	0	0	0	80	20		0	0	0	50	50		0	0	0	0	0		
Total %	0	0	0	44.444	11.111	55.556	0	0	0	22.222	22.222	44.444	0	0	0	0	0	0	
Exiting Leg Total						5						4						0	9

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	1	0	1	0	0	0	0	2	2	0	0	0	0	0	0	3
7:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2
7:45 AM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	4	0	4	0	0	0	2	2	4	0	0	0	0	0	0	8
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	50.0	50.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.250	0.250	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.667
Entering Leg	0	0	0	4	0	4	0	0	0	2	2	4	0	0	0	0	0	0	8
Exiting Leg						4						4						0	8
Total						8						8						0	16

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	56	64	0	120	55	55	0	110	88	67	0	155	385
2:15 PM	50	62	0	112	83	103	0	186	46	50	0	96	394
2:30 PM	40	51	0	91	135	88	0	223	39	42	0	81	395
2:45 PM	78	68	0	146	109	61	0	170	56	47	0	103	419
Total	224	245	0	469	382	307	0	689	229	206	0	435	1593
3:00 PM	55	68	0	123	112	54	0	166	44	51	0	95	384
3:15 PM	48	82	0	130	136	63	0	199	50	61	0	111	440
3:30 PM	52	73	0	125	106	30	0	136	47	54	0	101	362
3:45 PM	55	65	0	120	123	61	0	184	54	62	0	116	420
Total	210	288	0	498	477	208	0	685	195	228	0	423	1606
Grand Total	434	533	0	967	859	515	0	1374	424	434	0	858	3199
Approach %	44.9	55.1	0.0		62.5	37.5	0.0		49.4	50.6	0.0		
Total %	13.6	16.7	0.0	30.2	26.9	16.1	0.0	43.0	13.3	13.6	0.0	26.8	
Exiting Leg Total				1293				957				949	3199
Cars	415	525	0	940	842	502	0	1344	417	423	0	840	3124
% Cars	95.6	98.5	0.0	97.2	98.0	97.5	0.0	97.8	98.3	97.5	0.0	97.9	97.7
Exiting Leg Total				1265				942				917	3124
Heavy Vehicles	19	8	0	27	17	13	0	30	7	11	0	18	75
% Heavy Vehicles	4.4	1.5	0.0	2.8	2.0	2.5	0.0	2.2	1.7	2.5	0.0	2.1	2.3
Exiting Leg Total				28				15				32	75

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:30 PM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	40	51	0	91	135	88	0	223	39	42	0	81	395
2:45 PM	78	68	0	146	109	61	0	170	56	47	0	103	419
3:00 PM	55	68	0	123	112	54	0	166	44	51	0	95	384
3:15 PM	48	82	0	130	136	63	0	199	50	61	0	111	440
Total Volume	221	269	0	490	492	266	0	758	189	201	0	390	1638
% Approach Total	45.1	54.9	0.0		64.9	35.1	0.0		48.5	51.5	0.0		
PHF	0.708	0.820	0.000	0.839	0.904	0.756	0.000	0.850	0.844	0.824	0.000	0.878	0.931
Cars	210	264	0	474	479	255	0	734	187	195	0	382	1590
Cars %	95.0	98.1	0.0	96.7	97.4	95.9	0.0	96.8	98.9	97.0	0.0	97.9	97.1
Heavy Vehicles	11	5	0	16	13	11	0	24	2	6	0	8	48
Heavy Vehicles %	5.0	1.9	0.0	3.3	2.6	4.1	0.0	3.2	1.1	3.0	0.0	2.1	2.9
Cars Enter Leg	210	264	0	474	479	255	0	734	187	195	0	382	1590
Heavy Enter Leg	11	5	0	16	13	11	0	24	2	6	0	8	48
Total Entering Leg	221	269	0	490	492	266	0	758	189	201	0	390	1638
Cars Exiting Leg				674				451				465	1590
Heavy Exiting Leg				19				7				22	48
Total Exiting Leg				693				458				487	1638

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	54	63	0	117	53	55	0	108	87	64	0	151	376
2:15 PM	48	61	0	109	81	103	0	184	44	50	0	94	387
2:30 PM	39	51	0	90	131	83	0	214	38	41	0	79	383
2:45 PM	72	66	0	138	105	58	0	163	56	44	0	100	401
Total	213	241	0	454	370	299	0	669	225	199	0	424	1547
3:00 PM	55	65	0	120	109	54	0	163	43	51	0	94	377
3:15 PM	44	82	0	126	134	60	0	194	50	59	0	109	429
3:30 PM	49	72	0	121	106	30	0	136	45	53	0	98	355
3:45 PM	54	65	0	119	123	59	0	182	54	61	0	115	416
Total	202	284	0	486	472	203	0	675	192	224	0	416	1577
Grand Total	415	525	0	940	842	502	0	1344	417	423	0	840	3124
Approach %	44.1	55.9	0.0		62.6	37.4	0.0		49.6	50.4	0.0		
Total %	13.3	16.8	0.0	30.1	27.0	16.1	0.0	43.0	13.3	13.5	0.0	26.9	
Exiting Leg Total				1265				942				917	3124

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:30 PM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	39	51	0	90	131	83	0	214	38	41	0	79	383
2:45 PM	72	66	0	138	105	58	0	163	56	44	0	100	401
3:00 PM	55	65	0	120	109	54	0	163	43	51	0	94	377
3:15 PM	44	82	0	126	134	60	0	194	50	59	0	109	429
Total Volume	210	264	0	474	479	255	0	734	187	195	0	382	1590
% Approach Total	44.3	55.7	0.0		65.3	34.7	0.0		49.0	51.0	0.0		
PHF	0.729	0.805	0.000	0.859	0.894	0.768	0.000	0.857	0.835	0.826	0.000	0.876	0.927
Entering Leg	210	264	0	474	479	255	0	734	187	195	0	382	1590
Exiting Leg				674				451				465	1590
Total				1148				1185				847	3180

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	2	1	0	3	2	0	0	2	1	3	0	4	9
2:15 PM	2	1	0	3	2	0	0	2	2	0	0	2	7
2:30 PM	1	0	0	1	4	5	0	9	1	1	0	2	12
2:45 PM	6	2	0	8	4	3	0	7	0	3	0	3	18
Total	11	4	0	15	12	8	0	20	4	7	0	11	46
3:00 PM	0	3	0	3	3	0	0	3	1	0	0	1	7
3:15 PM	4	0	0	4	2	3	0	5	0	2	0	2	11
3:30 PM	3	1	0	4	0	0	0	0	2	1	0	3	7
3:45 PM	1	0	0	1	0	2	0	2	0	1	0	1	4
Total	8	4	0	12	5	5	0	10	3	4	0	7	29
Grand Total	19	8	0	27	17	13	0	30	7	11	0	18	75
Approach %	70.4	29.6	0.0		56.7	43.3	0.0		38.9	61.1	0.0		
Total %	25.3	10.7	0.0	36.0	22.7	17.3	0.0	40.0	9.3	14.7	0.0	24.0	
Exiting Leg Total				28				15				32	75
Buses	0	1	0	1	7	3	0	10	3	0	0	3	14
% Buses	0.0	12.5	0.0	3.7	41.2	23.1	0.0	33.3	42.9	0.0	0.0	16.7	18.7
Exiting Leg Total				7				4				3	14
Single-Unit Trucks	17	5	0	22	9	8	0	17	4	11	0	15	54
% Single-Unit	89.5	62.5	0.0	81.5	52.9	61.5	0.0	56.7	57.1	100.0	0.0	83.3	72.0
Exiting Leg Total				20				9				25	54
Articulated Trucks	2	2	0	4	1	2	0	3	0	0	0	0	7
% Articulated	10.5	25.0	0.0	14.8	5.9	15.4	0.0	10.0	0.0	0.0	0.0	0.0	9.3
Exiting Leg Total				1				2				4	7

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:30 PM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	1	0	0	1	4	5	0	9	1	1	0	2	12
2:45 PM	6	2	0	8	4	3	0	7	0	3	0	3	18
3:00 PM	0	3	0	3	3	0	0	3	1	0	0	1	7
3:15 PM	4	0	0	4	2	3	0	5	0	2	0	2	11
Total Volume	11	5	0	16	13	11	0	24	2	6	0	8	48
% Approach Total	68.8	31.3	0.0		54.2	45.8	0.0		25.0	75.0	0.0		
PHF	0.458	0.417	0.000	0.500	0.813	0.550	0.000	0.667	0.500	0.500	0.000	0.667	0.667
Buses	0	0	0	0	5	2	0	7	1	0	0	1	8
Buses %	0.0	0.0	0.0	0.0	38.5	18.2	0.0	29.2	50.0	0.0	0.0	12.5	16.7
Single-Unit Trucks	10	3	0	13	7	7	0	14	1	6	0	7	34
Single-Unit %	90.9	60.0	0.0	81.3	53.8	63.6	0.0	58.3	50.0	100.0	0.0	87.5	70.8
Articulated Trucks	1	2	0	3	1	2	0	3	0	0	0	0	6
Articulated %	9.1	40.0	0.0	18.8	7.7	18.2	0.0	12.5	0.0	0.0	0.0	0.0	12.5
Buses	0	0	0	0	5	2	0	7	1	0	0	1	8
Single-Unit Trucks	10	3	0	13	7	7	0	14	1	6	0	7	34
Articulated Trucks	1	2	0	3	1	2	0	3	0	0	0	0	6
Total Entering Leg	11	5	0	16	13	11	0	24	2	6	0	8	48
Buses				5				1				2	8
Single-Unit Trucks				13				4				17	34
Articulated Trucks				1				2				3	6
Total Exiting Leg				19				7				22	48

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Buses**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	2	0	0	2	2	0	0	2	4
2:30 PM	0	0	0	0	0	2	0	2	1	0	0	1	3
2:45 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
Total	0	1	0	1	5	2	0	7	3	0	0	3	11
3:00 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	0	0	0	2	1	0	3	0	0	0	0	3
Grand Total	0	1	0	1	7	3	0	10	3	0	0	3	14
Approach %	0.0	100.0	0.0		70.0	30.0	0.0		100.0	0.0	0.0		
Total %	0.0	7.1	0.0	7.1	50.0	21.4	0.0	71.4	21.4	0.0	0.0	21.4	
Exiting Leg Total				7				4				3	14

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:15 PM	0	0	0	0	2	0	0	2	2	0	0	2	4
2:30 PM	0	0	0	0	0	2	0	2	1	0	0	1	3
2:45 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
3:00 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
Total Volume	0	0	0	0	7	2	0	9	3	0	0	3	12
% Approach Total	0.0	0.0	0.0		77.8	22.2	0.0		100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.583	0.250	0.000	0.750	0.375	0.000	0.000	0.375	0.750
Entering Leg	0	0	0	0	7	2	0	9	3	0	0	3	12
Exiting Leg				7				3				2	12
Total				7				12				5	24

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	2	0	0	2	2	0	0	2	1	3	0	4	8
2:15 PM	2	1	0	3	0	0	0	0	0	0	0	0	3
2:30 PM	1	0	0	1	3	2	0	5	0	1	0	1	7
2:45 PM	5	1	0	6	1	2	0	3	0	3	0	3	12
Total	10	2	0	12	6	4	0	10	1	7	0	8	30
3:00 PM	0	2	0	2	1	0	0	1	1	0	0	1	4
3:15 PM	4	0	0	4	2	3	0	5	0	2	0	2	11
3:30 PM	2	1	0	3	0	0	0	0	2	1	0	3	6
3:45 PM	1	0	0	1	0	1	0	1	0	1	0	1	3
Total	7	3	0	10	3	4	0	7	3	4	0	7	24
Grand Total	17	5	0	22	9	8	0	17	4	11	0	15	54
Approach %	77.3	22.7	0.0		52.9	47.1	0.0		26.7	73.3	0.0		
Total %	31.5	9.3	0.0	40.7	16.7	14.8	0.0	31.5	7.4	20.4	0.0	27.8	
Exiting Leg Total				20				9				25	54

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:30 PM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:30 PM	1	0	0	1	3	2	0	5	0	1	0	1	7
2:45 PM	5	1	0	6	1	2	0	3	0	3	0	3	12
3:00 PM	0	2	0	2	1	0	0	1	1	0	0	1	4
3:15 PM	4	0	0	4	2	3	0	5	0	2	0	2	11
Total Volume	10	3	0	13	7	7	0	14	1	6	0	7	34
% Approach Total	76.9	23.1	0.0		50.0	50.0	0.0		14.3	85.7	0.0		
PHF	0.500	0.375	0.000	0.542	0.583	0.583	0.000	0.700	0.250	0.500	0.000	0.583	0.708
Entering Leg	10	3	0	13	7	7	0	14	1	6	0	7	34
Exiting Leg				13				4				17	34
Total				26				18				24	68

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	1	1	0	2	0	0	0	0	2
2:45 PM	1	1	0	2	0	1	0	1	0	0	0	0	3
Total	1	1	0	2	1	2	0	3	0	0	0	0	5
3:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1	0	2	0	0	0	0	0	0	0	0	2
Grand Total	2	2	0	4	1	2	0	3	0	0	0	0	7
Approach %	50.0	50.0	0.0		33.3	66.7	0.0		0.0	0.0	0.0		
Total %	28.6	28.6	0.0	57.1	14.3	28.6	0.0	42.9	0.0	0.0	0.0	0.0	
Exiting Leg Total				1				2				4	7

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Water Street (Route 129) from East				Farm Street from South				Water Street (Route 129) from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	1	1	0	2	0	0	0	0	2
2:45 PM	1	1	0	2	0	1	0	1	0	0	0	0	3
3:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	1	2	0	3	1	2	0	3	0	0	0	0	6
% Approach Total	33.3	66.7	0.0		33.3	66.7	0.0		0.0	0.0	0.0		
PHF	0.250	0.500	0.000	0.375	0.250	0.500	0.000	0.375	0.000	0.000	0.000	0.000	0.500
Entering Leg	1	2	0	3	1	2	0	3	0	0	0	0	6
Exiting Leg				1				2				3	6
Total				4				5				3	12

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
2:15 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Total	0	0	0	0	2	2	0	0	0	0	0	0	2	0	0	0	0	2	4
3:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	1	2	0	0	0	0	2	3
Grand Total	0	0	0	0	2	2	0	1	0	0	0	1	4	0	0	0	0	4	7
Approach %	0.0	0.0	0.0	0.0	100.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	28.6	28.6	0.0	14.3	0.0	0.0	0.0	14.3	57.1	0.0	0.0	0.0	0.0	57.1	
Exiting Leg Total						2						4						1	7

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
2:15 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Total Volume	0	0	0	0	2	2	0	0	0	0	0	0	2	0	0	0	0	2	4
% Approach Total	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	2	2	0	0	0	0	0	0	2	0	0	0	0	2	4
Exiting Leg						2						2						0	4
Total						4						2						2	8

PDI File #: **217949 A**
Location: **S: Farm Street**
Location: **E: Water Street (Route 129) W: Water Street (Route 129)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	3	9	12	0	0	0	2	0	2	0	0	0	0	0	0	14
2:15 PM	0	0	0	2	3	5	0	0	0	3	0	3	0	0	0	1	0	1	9
2:30 PM	0	0	0	1	6	7	0	0	0	3	1	4	0	0	0	0	0	0	11
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	6	18	24	0	0	0	8	1	9	0	0	0	1	0	1	34
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	6	18	24	0	0	0	8	1	9	0	0	0	1	0	1	34
Approach %	0	0	0	25	75		0	0	0	88.889	11.111		0	0	0	100	0		
Total %	0	0	0	17.647	52.941	70.588	0	0	0	23.529	2.9412	26.471	0	0	0	2.9412	0	2.9412	
Exiting Leg Total						24						9						1	34

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	Water Street (Route 129) from East						Farm Street from South						Water Street (Route 129) from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	3	9	12	0	0	0	2	0	2	0	0	0	0	0	0	14
2:15 PM	0	0	0	2	3	5	0	0	0	3	0	3	0	0	0	1	0	1	9
2:30 PM	0	0	0	1	6	7	0	0	0	3	1	4	0	0	0	0	0	0	11
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	6	18	24	0	0	0	8	1	9	0	0	0	1	0	1	34
% Approach Total	0.0	0.0	0.0	25.0	75.0		0.0	0.0	0.0	88.9	11.1		0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.500	0.500	0.500	0.000	0.000	0.000	0.667	0.250	0.563	0.000	0.000	0.000	0.250	0.000	0.250	0.607
Entering Leg	0	0	0	6	18	24	0	0	0	8	1	9	0	0	0	1	0	1	34
Exiting Leg						24						9						1	34
Total						48						18						2	68

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	25	0	0	25	0	62	0	62	24	7	0	31	118
11:15 AM	14	2	0	16	1	22	0	23	34	1	0	35	74
11:30 AM	5	0	0	5	1	48	0	49	27	4	0	31	85
11:45 AM	8	0	0	8	0	57	0	57	24	5	0	29	94
Total	52	2	0	54	2	189	0	191	109	17	0	126	371
12:00 PM	3	1	0	4	1	43	0	44	17	2	0	19	67
12:15 PM	5	0	0	5	0	31	0	31	26	1	1	28	64
12:30 PM	7	0	0	7	0	18	0	18	20	1	0	21	46
12:45 PM	1	0	0	1	0	17	0	17	17	1	0	18	36
Total	16	1	0	17	1	109	0	110	80	5	1	86	213
Grand Total	68	3	0	71	3	298	0	301	189	22	1	212	584
Approach %	95.8	4.2	0.0		1.0	99.0	0.0		89.2	10.4	0.5		
Total %	11.6	0.5	0.0	12.2	0.5	51.0	0.0	51.5	32.4	3.8	0.2	36.3	
Exiting Leg Total				25				192				367	584
Cars	68	3	0	71	3	292	0	295	186	22	1	209	575
% Cars	100.0	100.0	0.0	100.0	100.0	98.0	0.0	98.0	98.4	100.0	100.0	98.6	98.5
Exiting Leg Total				25				189				361	575
Heavy Vehicles	0	0	0	0	0	6	0	6	3	0	0	3	9
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	1.6	0.0	0.0	1.4	1.5
Exiting Leg Total				0				3				6	9

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	25	0	0	25	0	62	0	62	24	7	0	31	118
11:15 AM	14	2	0	16	1	22	0	23	34	1	0	35	74
11:30 AM	5	0	0	5	1	48	0	49	27	4	0	31	85
11:45 AM	8	0	0	8	0	57	0	57	24	5	0	29	94
Total Volume	52	2	0	54	2	189	0	191	109	17	0	126	371
% Approach Total	96.3	3.7	0.0		1.0	99.0	0.0		86.5	13.5	0.0		
PHF	0.520	0.250	0.000	0.540	0.500	0.762	0.000	0.770	0.801	0.607	0.000	0.900	0.786
Cars	52	2	0	54	2	185	0	187	106	17	0	123	364
Cars %	100.0	100.0	0.0	100.0	100.0	97.9	0.0	97.9	97.2	100.0	0.0	97.6	98.1
Heavy Vehicles	0	0	0	0	0	4	0	4	3	0	0	3	7
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	2.1	0.0	2.1	2.8	0.0	0.0	2.4	1.9
Cars Enter Leg	52	2	0	54	2	185	0	187	106	17	0	123	364
Heavy Enter Leg	0	0	0	0	0	4	0	4	3	0	0	3	7
Total Entering Leg	52	2	0	54	2	189	0	191	109	17	0	126	371
Cars Exiting Leg				19				108				237	364
Heavy Exiting Leg				0				3				4	7
Total Exiting Leg				19				111				241	371

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	25	0	0	25	0	62	0	62	24	7	0	31	118
11:15 AM	14	2	0	16	1	22	0	23	34	1	0	35	74
11:30 AM	5	0	0	5	1	48	0	49	24	4	0	28	82
11:45 AM	8	0	0	8	0	53	0	53	24	5	0	29	90
Total	52	2	0	54	2	185	0	187	106	17	0	123	364
12:00 PM	3	1	0	4	1	41	0	42	17	2	0	19	65
12:15 PM	5	0	0	5	0	31	0	31	26	1	1	28	64
12:30 PM	7	0	0	7	0	18	0	18	20	1	0	21	46
12:45 PM	1	0	0	1	0	17	0	17	17	1	0	18	36
Total	16	1	0	17	1	107	0	108	80	5	1	86	211
Grand Total	68	3	0	71	3	292	0	295	186	22	1	209	575
Approach %	95.8	4.2	0.0		1.0	99.0	0.0		89.0	10.5	0.5		
Total %	11.8	0.5	0.0	12.3	0.5	50.8	0.0	51.3	32.3	3.8	0.2	36.3	
Exiting Leg Total				25				189				361	575

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	25	0	0	25	0	62	0	62	24	7	0	31	118
11:15 AM	14	2	0	16	1	22	0	23	34	1	0	35	74
11:30 AM	5	0	0	5	1	48	0	49	24	4	0	28	82
11:45 AM	8	0	0	8	0	53	0	53	24	5	0	29	90
Total Volume	52	2	0	54	2	185	0	187	106	17	0	123	364
% Approach Total	96.3	3.7	0.0		1.1	98.9	0.0		86.2	13.8	0.0		
PHF	0.520	0.250	0.000	0.540	0.500	0.746	0.000	0.754	0.779	0.607	0.000	0.879	0.771
Entering Leg	52	2	0	54	2	185	0	187	106	17	0	123	364
Exiting Leg				19				108				237	364
Total				73				295				360	728

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	3	0	0	3	3
11:45 AM	0	0	0	0	0	4	0	4	0	0	0	0	4
Total	0	0	0	0	0	4	0	4	3	0	0	3	7
12:00 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	2	0	0	0	0	2
Grand Total	0	0	0	0	0	6	0	6	3	0	0	3	9
Approach %	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	66.7	0.0	66.7	33.3	0.0	0.0	33.3	
Exiting Leg Total				0				3				6	9
Buses	0	0	0	0	0	1	0	1	1	0	0	1	2
% Buses	0.0	0.0	0.0	0.0	0.0	16.7	0.0	16.7	33.3	0.0	0.0	33.3	22.2
Exiting Leg Total				0				1				1	2
Single-Unit Trucks	0	0	0	0	0	5	0	5	2	0	0	2	7
% Single-Unit	0.0	0.0	0.0	0.0	0.0	83.3	0.0	83.3	66.7	0.0	0.0	66.7	77.8
Exiting Leg Total				0				2				5	7
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	3	0	0	3	3
11:45 AM	0	0	0	0	0	4	0	4	0	0	0	0	4
12:00 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
Total Volume	0	0	0	0	0	6	0	6	3	0	0	3	9
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.375	0.250	0.000	0.000	0.250	0.563
Buses	0	0	0	0	0	1	0	1	1	0	0	1	2
Buses %	0.0	0.0	0.0	0.0	0.0	16.7	0.0	16.7	33.3	0.0	0.0	33.3	22.2
Single-Unit Trucks	0	0	0	0	0	5	0	5	2	0	0	2	7
Single-Unit %	0.0	0.0	0.0	0.0	0.0	83.3	0.0	83.3	66.7	0.0	0.0	66.7	77.8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buses	0	0	0	0	0	1	0	1	1	0	0	1	2
Single-Unit Trucks	0	0	0	0	0	5	0	5	2	0	0	2	7
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Entering Leg	0	0	0	0	0	6	0	6	3	0	0	3	9
Buses				0				1				1	2
Single-Unit Trucks				0				2				5	7
Articulated Trucks				0				0				0	0
Total Exiting Leg				0				3				6	9

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Buses**

	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
11:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	1	0	0	1	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	1	0	1	1	0	0	1	2
Approach %	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	50.0	0.0	0.0	50.0	
Exiting Leg Total				0				1				1	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
11:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	1	0	1	1	0	0	1	2
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250	0.000	0.000	0.250	0.500
Entering Leg	0	0	0	0	0	1	0	1	1	0	0	1	2
Exiting Leg				0				1				1	2
Total				0				2				2	4

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Single-Unit Trucks

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
11:45 AM	0	0	0	0	0	3	0	3	0	0	0	0	3
Total	0	0	0	0	0	3	0	3	2	0	0	2	5
12:00 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	2	0	0	0	0	2
Grand Total	0	0	0	0	0	5	0	5	2	0	0	2	7
Approach %	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	71.4	0.0	71.4	28.6	0.0	0.0	28.6	
Exiting Leg Total				0				2				5	7

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
11:45 AM	0	0	0	0	0	3	0	3	0	0	0	0	3
12:00 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
Total Volume	0	0	0	0	0	5	0	5	2	0	0	2	7
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.417	0.000	0.417	0.250	0.000	0.000	0.250	0.583
Entering Leg	0	0	0	0	0	5	0	5	2	0	0	2	7
Exiting Leg				0				2				5	7
Total				0				7				7	14

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Articulated Trucks

	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg				0				0				0	0
Total				0				0				0	0

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	0	1	3
12:00 PM	0	0	0	0	1	1	0	2	0	0	0	2	1	0	0	0	0	1	4
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	3
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Total	0	0	0	0	1	1	0	5	0	0	0	5	2	0	0	0	0	2	8
Grand Total	1	0	0	0	1	2	0	6	0	0	0	6	3	0	0	0	0	3	11
Approach %	50.0	0.0	0.0	0.0	50.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	9.1	0.0	0.0	0.0	9.1	18.2	0.0	54.5	0.0	0.0	0.0	54.5	27.3	0.0	0.0	0.0	0.0	27.3	
Exiting Leg Total						1						3						7	11

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	1	1	0	2	0	0	0	2	1	0	0	0	0	1	4
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	3
Total Volume	0	0	0	0	1	1	0	6	0	0	0	6	1	0	0	0	0	1	8
% Approach Total	0.0	0.0	0.0	0.0	100.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.500	0.000	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.250	0.500
Entering Leg	0	0	0	0	1	1	0	6	0	0	0	6	1	0	0	0	0	1	8
Exiting Leg						1						1						6	8
Total						2						7						7	16

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	6	6	9
11:15 AM	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	1	1	2	5
11:30 AM	0	0	0	0	0	0	0	0	0	1	4	5	0	0	0	0	0	0	5
11:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	3	3	0	0	0	4	5	9	0	0	0	1	7	8	20
12:00 PM	0	0	0	0	3	3	0	0	0	1	9	10	0	0	0	12	0	12	25
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	3	3	0	0	0	2	9	11	0	0	0	12	0	12	26
Grand Total	0	0	0	0	6	6	0	0	0	6	14	20	0	0	0	13	7	20	46
Approach %	0	0	0	0	100		0	0	0	30	70		0	0	0	65	35		
Total %	0	0	0	0	13.043	13.043	0	0	0	13.043	30.435	43.478	0	0	0	28.261	15.217	43.478	
Exiting Leg Total						6						20						20	46

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	1	1	2	5
11:30 AM	0	0	0	0	0	0	0	0	0	1	4	5	0	0	0	0	0	0	5
11:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	3	3	0	0	0	1	9	10	0	0	0	12	0	12	25
Total Volume	0	0	0	0	3	3	0	0	0	5	14	19	0	0	0	13	1	14	36
% Approach Total	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	26.3	73.7		0.0	0.0	0.0	92.9	7.1		
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.625	0.389	0.475	0.000	0.000	0.000	0.271	0.250	0.292	0.360
Entering Leg	0	0	0	0	3	3	0	0	0	5	14	19	0	0	0	13	1	14	36
Exiting Leg						3						19						14	36
Total						6						38						28	72

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	0	4	0	7	0	7	120	46	0	166	177
7:15 AM	3	0	0	3	1	10	0	11	125	17	0	142	156
7:30 AM	8	2	0	10	0	72	0	72	182	15	0	197	279
7:45 AM	1	1	0	2	1	106	0	107	131	4	0	135	244
Total	16	3	0	19	2	195	0	197	558	82	0	640	856
8:00 AM	2	3	0	5	2	31	1	34	41	4	0	45	84
8:15 AM	1	1	0	2	0	11	0	11	24	7	0	31	44
8:30 AM	2	2	0	4	2	13	1	16	21	2	0	23	43
8:45 AM	2	0	0	2	0	9	0	9	15	0	0	15	26
Total	7	6	0	13	4	64	2	70	101	13	0	114	197
Grand Total	23	9	0	32	6	259	2	267	659	95	0	754	1053
Approach %	71.9	28.1	0.0		2.2	97.0	0.7		87.4	12.6	0.0		
Total %	2.2	0.9	0.0	3.0	0.6	24.6	0.2	25.4	62.6	9.0	0.0	71.6	
Exiting Leg Total				101				670				282	1053
Cars	22	9	0	31	6	236	2	244	638	93	0	731	1006
% Cars	95.7	100.0	0.0	96.9	100.0	91.1	100.0	91.4	96.8	97.9	0.0	96.9	95.5
Exiting Leg Total				99				649				258	1006
Heavy Vehicles	1	0	0	1	0	23	0	23	21	2	0	23	47
% Heavy Vehicles	4.3	0.0	0.0	3.1	0.0	8.9	0.0	8.6	3.2	2.1	0.0	3.1	4.5
Exiting Leg Total				2				21				24	47

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	0	4	0	7	0	7	120	46	0	166	177
7:15 AM	3	0	0	3	1	10	0	11	125	17	0	142	156
7:30 AM	8	2	0	10	0	72	0	72	182	15	0	197	279
7:45 AM	1	1	0	2	1	106	0	107	131	4	0	135	244
Total Volume	16	3	0	19	2	195	0	197	558	82	0	640	856
% Approach Total	84.2	15.8	0.0		1.0	99.0	0.0		87.2	12.8	0.0		
PHF	0.500	0.375	0.000	0.475	0.500	0.460	0.000	0.460	0.766	0.446	0.000	0.812	0.767
Cars	16	3	0	19	2	174	0	176	537	81	0	618	813
Cars %	100.0	100.0	0.0	100.0	100.0	89.2	0.0	89.3	96.2	98.8	0.0	96.6	95.0
Heavy Vehicles	0	0	0	0	0	21	0	21	21	1	0	22	43
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	10.8	0.0	10.7	3.8	1.2	0.0	3.4	5.0
Cars Enter Leg	16	3	0	19	2	174	0	176	537	81	0	618	813
Heavy Enter Leg	0	0	0	0	0	21	0	21	21	1	0	22	43
Total Entering Leg	16	3	0	19	2	195	0	197	558	82	0	640	856
Cars Exiting Leg				83				540				190	813
Heavy Exiting Leg				1				21				21	43
Total Exiting Leg				84				561				211	856

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	0	4	0	7	0	7	120	46	0	166	177
7:15 AM	3	0	0	3	1	10	0	11	123	17	0	140	154
7:30 AM	8	2	0	10	0	65	0	65	170	15	0	185	260
7:45 AM	1	1	0	2	1	92	0	93	124	3	0	127	222
Total	16	3	0	19	2	174	0	176	537	81	0	618	813
8:00 AM	2	3	0	5	2	30	1	33	41	4	0	45	83
8:15 AM	1	1	0	2	0	11	0	11	24	6	0	30	43
8:30 AM	1	2	0	3	2	12	1	15	21	2	0	23	41
8:45 AM	2	0	0	2	0	9	0	9	15	0	0	15	26
Total	6	6	0	12	4	62	2	68	101	12	0	113	193
Grand Total	22	9	0	31	6	236	2	244	638	93	0	731	1006
Approach %	71.0	29.0	0.0		2.5	96.7	0.8		87.3	12.7	0.0		
Total %	2.2	0.9	0.0	3.1	0.6	23.5	0.2	24.3	63.4	9.2	0.0	72.7	
Exiting Leg Total				99				649				258	1006

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	0	4	0	7	0	7	120	46	0	166	177
7:15 AM	3	0	0	3	1	10	0	11	123	17	0	140	154
7:30 AM	8	2	0	10	0	65	0	65	170	15	0	185	260
7:45 AM	1	1	0	2	1	92	0	93	124	3	0	127	222
Total Volume	16	3	0	19	2	174	0	176	537	81	0	618	813
% Approach Total	84.2	15.8	0.0		1.1	98.9	0.0		86.9	13.1	0.0		
PHF	0.500	0.375	0.000	0.475	0.500	0.473	0.000	0.473	0.790	0.440	0.000	0.835	0.782
Entering Leg	16	3	0	19	2	174	0	176	537	81	0	618	813
Exiting Leg				83				540				190	813
Total				102				716				808	1626

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
7:30 AM	0	0	0	0	0	7	0	7	12	0	0	12	19
7:45 AM	0	0	0	0	0	14	0	14	7	1	0	8	22
Total	0	0	0	0	0	21	0	21	21	1	0	22	43
8:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:30 AM	1	0	0	1	0	1	0	1	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	2	0	2	0	1	0	1	4
Grand Total	1	0	0	1	0	23	0	23	21	2	0	23	47
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		91.3	8.7	0.0		
Total %	2.1	0.0	0.0	2.1	0.0	48.9	0.0	48.9	44.7	4.3	0.0	48.9	
Exiting Leg Total				2				21				24	47
Buses	0	0	0	0	0	22	0	22	20	0	0	20	42
% Buses	0.0	0.0	0.0	0.0	0.0	95.7	0.0	95.7	95.2	0.0	0.0	87.0	89.4
Exiting Leg Total				0				20				22	42
Single-Unit Trucks	1	0	0	1	0	1	0	1	1	1	0	2	4
% Single-Unit	100.0	0.0	0.0	100.0	0.0	4.3	0.0	4.3	4.8	50.0	0.0	8.7	8.5
Exiting Leg Total				1				1				2	4
Articulated Trucks	0	0	0	0	0	0	0	0	0	1	0	1	1
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	4.3	2.1
Exiting Leg Total				1				0				0	1

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
7:30 AM	0	0	0	0	0	7	0	7	12	0	0	12	19
7:45 AM	0	0	0	0	0	14	0	14	7	1	0	8	22
8:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	22	0	22	21	1	0	22	44
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		95.5	4.5	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.393	0.000	0.393	0.438	0.250	0.000	0.458	0.500
Buses	0	0	0	0	0	21	0	21	20	0	0	20	41
Buses %	0.0	0.0	0.0	0.0	0.0	95.5	0.0	95.5	95.2	0.0	0.0	90.9	93.2
Single-Unit Trucks	0	0	0	0	0	1	0	1	1	0	0	1	2
Single-Unit %	0.0	0.0	0.0	0.0	0.0	4.5	0.0	4.5	4.8	0.0	0.0	4.5	4.5
Articulated Trucks	0	0	0	0	0	0	0	0	0	1	0	1	1
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	4.5	2.3
Buses	0	0	0	0	0	21	0	21	20	0	0	20	41
Single-Unit Trucks	0	0	0	0	0	1	0	1	1	0	0	1	2
Articulated Trucks	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Entering Leg	0	0	0	0	0	22	0	22	21	1	0	22	44
Buses				0				20				21	41
Single-Unit Trucks				0				1				1	2
Articulated Trucks				1				0				0	1
Total Exiting Leg				1				21				22	44

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Buses**

	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	0	0	0	0	0	6	0	6	12	0	0	12	18
7:45 AM	0	0	0	0	0	14	0	14	7	0	0	7	21
Total	0	0	0	0	0	20	0	20	20	0	0	20	40
8:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	2	0	0	0	0	2
Grand Total	0	0	0	0	0	22	0	22	20	0	0	20	42
Approach %	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	52.4	0.0	52.4	47.6	0.0	0.0	47.6	
Exiting Leg Total				0				20				22	42

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	0	0	0	0	0	6	0	6	12	0	0	12	18
7:45 AM	0	0	0	0	0	14	0	14	7	0	0	7	21
8:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	21	0	21	20	0	0	20	41
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.375	0.417	0.000	0.000	0.417	0.488
Entering Leg	0	0	0	0	0	21	0	21	20	0	0	20	41
Exiting Leg				0				20				21	41
Total				0				41				41	82

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	1	0	0	1	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	0	0	0	1	0	1	2
Grand Total	1	0	0	1	0	1	0	1	1	1	0	2	4
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		50.0	50.0	0.0		
Total %	25.0	0.0	0.0	25.0	0.0	25.0	0.0	25.0	25.0	25.0	0.0	50.0	
Exiting Leg Total				1				1				2	4

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	1	0	0	1	2
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250	0.000	0.000	0.250	0.500
Entering Leg	0	0	0	0	0	1	0	1	1	0	0	1	2
Exiting Leg				0				1				1	2
Total				0				2				2	4

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	1	0	1	1
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	
Exiting Leg Total				1				0				0	1

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	1
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	1	0	1	1
Exiting Leg				1				0				0	1
Total				1				0				1	2

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0	
Exiting Leg Total						0						1						0	1

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Exiting Leg						0						1						0	1
Total						0						1						1	2

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Pedestrians

	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	3
7:30 AM	0	0	0	3	2	5	0	0	0	0	2	2	0	0	0	0	0	0	7
7:45 AM	0	0	0	1	2	3	0	0	0	1	0	1	0	0	0	0	0	0	4
Total	0	0	0	4	4	8	0	0	0	2	4	6	0	0	0	0	0	0	14
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
8:15 AM	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3
8:30 AM	0	0	0	0	1	1	0	0	0	6	0	6	0	0	0	0	0	0	7
8:45 AM	0	0	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	6
Total	0	0	0	1	3	4	0	0	0	7	6	13	0	0	0	0	0	0	17
Grand Total	0	0	0	5	7	12	0	0	0	9	10	19	0	0	0	0	0	0	31
Approach %	0	0	0	41.667	58.333		0	0	0	47.368	52.632		0	0	0	0	0		
Total %	0	0	0	16.129	22.581	38.71	0	0	0	29.032	32.258	61.29	0	0	0	0	0	0	
Exiting Leg Total						12						19						0	31

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
8:15 AM	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3
8:30 AM	0	0	0	0	1	1	0	0	0	6	0	6	0	0	0	0	0	0	7
8:45 AM	0	0	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	6
Total Volume	0	0	0	1	3	4	0	0	0	7	6	13	0	0	0	0	0	0	17
% Approach Total	0.0	0.0	0.0	25.0	75.0		0.0	0.0	0.0	53.8	46.2		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.375	0.333	0.000	0.000	0.000	0.292	0.250	0.542	0.000	0.000	0.000	0.000	0.000	0.000	0.607
Entering Leg	0	0	0	1	3	4	0	0	0	7	6	13	0	0	0	0	0	0	17
Exiting Leg						4						13						0	17
Total						8						26						0	34

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	38	0	0	38	3	49	0	52	20	6	0	26	116
2:15 PM	28	0	0	28	16	48	0	64	27	9	0	36	128
2:30 PM	10	1	0	11	1	49	0	50	29	13	0	42	103
2:45 PM	7	0	0	7	1	85	0	86	21	12	0	33	126
Total	83	1	0	84	21	231	0	252	97	40	0	137	473
3:00 PM	6	0	0	6	0	48	0	48	19	4	0	23	77
3:15 PM	10	0	0	10	0	35	0	35	25	6	0	31	76
3:30 PM	4	0	0	4	0	20	0	20	19	10	0	29	53
3:45 PM	13	0	0	13	1	17	0	18	17	9	0	26	57
Total	33	0	0	33	1	120	0	121	80	29	0	109	263
Grand Total	116	1	0	117	22	351	0	373	177	69	0	246	736
Approach %	99.1	0.9	0.0		5.9	94.1	0.0		72.0	28.0	0.0		
Total %	15.8	0.1	0.0	15.9	3.0	47.7	0.0	50.7	24.0	9.4	0.0	33.4	
Exiting Leg Total				91				178				467	736
Cars	115	1	0	116	22	340	0	362	169	69	0	238	716
% Cars	99.1	100.0	0.0	99.1	100.0	96.9	0.0	97.1	95.5	100.0	0.0	96.7	97.3
Exiting Leg Total				91				170				455	716
Heavy Vehicles	1	0	0	1	0	11	0	11	8	0	0	8	20
% Heavy Vehicles	0.9	0.0	0.0	0.9	0.0	3.1	0.0	2.9	4.5	0.0	0.0	3.3	2.7
Exiting Leg Total				0				8				12	20

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	School Driveway				Hemlock Road				Hemlock Road				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	38	0	0	38	3	49	0	52	20	6	0	26	116
2:15 PM	28	0	0	28	16	48	0	64	27	9	0	36	128
2:30 PM	10	1	0	11	1	49	0	50	29	13	0	42	103
2:45 PM	7	0	0	7	1	85	0	86	21	12	0	33	126
Total Volume	83	1	0	84	21	231	0	252	97	40	0	137	473
% Approach Total	98.8	1.2	0.0		8.3	91.7	0.0		70.8	29.2	0.0		
PHF	0.546	0.250	0.000	0.553	0.328	0.679	0.000	0.733	0.836	0.769	0.000	0.815	0.924
Cars	83	1	0	84	21	223	0	244	90	40	0	130	458
Cars %	100.0	100.0	0.0	100.0	100.0	96.5	0.0	96.8	92.8	100.0	0.0	94.9	96.8
Heavy Vehicles	0	0	0	0	0	8	0	8	7	0	0	7	15
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	3.5	0.0	3.2	7.2	0.0	0.0	5.1	3.2
Cars Enter Leg	83	1	0	84	21	223	0	244	90	40	0	130	458
Heavy Enter Leg	0	0	0	0	0	8	0	8	7	0	0	7	15
Total Entering Leg	83	1	0	84	21	231	0	252	97	40	0	137	473
Cars Exiting Leg				61				91				306	458
Heavy Exiting Leg				0				7				8	15
Total Exiting Leg				61				98				314	473

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	38	0	0	38	3	49	0	52	19	6	0	25	115
2:15 PM	28	0	0	28	16	47	0	63	25	9	0	34	125
2:30 PM	10	1	0	11	1	49	0	50	26	13	0	39	100
2:45 PM	7	0	0	7	1	78	0	79	20	12	0	32	118
Total	83	1	0	84	21	223	0	244	90	40	0	130	458
3:00 PM	5	0	0	5	0	47	0	47	18	4	0	22	74
3:15 PM	10	0	0	10	0	33	0	33	25	6	0	31	74
3:30 PM	4	0	0	4	0	20	0	20	19	10	0	29	53
3:45 PM	13	0	0	13	1	17	0	18	17	9	0	26	57
Total	32	0	0	32	1	117	0	118	79	29	0	108	258
Grand Total	115	1	0	116	22	340	0	362	169	69	0	238	716
Approach %	99.1	0.9	0.0		6.1	93.9	0.0		71.0	29.0	0.0		
Total %	16.1	0.1	0.0	16.2	3.1	47.5	0.0	50.6	23.6	9.6	0.0	33.2	
Exiting Leg Total				91				170				455	716

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	38	0	0	38	3	49	0	52	19	6	0	25	115
2:15 PM	28	0	0	28	16	47	0	63	25	9	0	34	125
2:30 PM	10	1	0	11	1	49	0	50	26	13	0	39	100
2:45 PM	7	0	0	7	1	78	0	79	20	12	0	32	118
Total Volume	83	1	0	84	21	223	0	244	90	40	0	130	458
% Approach Total	98.8	1.2	0.0		8.6	91.4	0.0		69.2	30.8	0.0		
PHF	0.546	0.250	0.000	0.553	0.328	0.715	0.000	0.772	0.865	0.769	0.000	0.833	0.916
Entering Leg	83	1	0	84	21	223	0	244	90	40	0	130	458
Exiting Leg				61				91				306	458
Total				145				335				436	916

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
2:15 PM	0	0	0	0	0	1	0	1	2	0	0	2	3
2:30 PM	0	0	0	0	0	0	0	0	3	0	0	3	3
2:45 PM	0	0	0	0	0	7	0	7	1	0	0	1	8
Total	0	0	0	0	0	8	0	8	7	0	0	7	15
3:00 PM	1	0	0	1	0	1	0	1	1	0	0	1	3
3:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	3	0	3	1	0	0	1	5
Grand Total	1	0	0	1	0	11	0	11	8	0	0	8	20
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	5.0	0.0	0.0	5.0	0.0	55.0	0.0	55.0	40.0	0.0	0.0	40.0	
Exiting Leg Total				0				8				12	20
Buses	1	0	0	1	0	6	0	6	5	0	0	5	12
% Buses	100.0	0.0	0.0	100.0	0.0	54.5	0.0	54.5	62.5	0.0	0.0	62.5	60.0
Exiting Leg Total				0				5				7	12
Single-Unit Trucks	0	0	0	0	0	5	0	5	3	0	0	3	8
% Single-Unit	0.0	0.0	0.0	0.0	0.0	45.5	0.0	45.5	37.5	0.0	0.0	37.5	40.0
Exiting Leg Total				0				3				5	8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:15 PM	0	0	0	0	0	1	0	1	2	0	0	2	3
2:30 PM	0	0	0	0	0	0	0	0	3	0	0	3	3
2:45 PM	0	0	0	0	0	7	0	7	1	0	0	1	8
3:00 PM	1	0	0	1	0	1	0	1	1	0	0	1	3
Total Volume	1	0	0	1	0	9	0	9	7	0	0	7	17
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.321	0.000	0.321	0.583	0.000	0.000	0.583	0.531
Buses	1	0	0	1	0	6	0	6	5	0	0	5	12
Buses %	100.0	0.0	0.0	100.0	0.0	66.7	0.0	66.7	71.4	0.0	0.0	71.4	70.6
Single-Unit Trucks	0	0	0	0	0	3	0	3	2	0	0	2	5
Single-Unit %	0.0	0.0	0.0	0.0	0.0	33.3	0.0	33.3	28.6	0.0	0.0	28.6	29.4
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buses	1	0	0	1	0	6	0	6	5	0	0	5	12
Single-Unit Trucks	0	0	0	0	0	3	0	3	2	0	0	2	5
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Entering Leg	1	0	0	1	0	9	0	9	7	0	0	7	17
Buses				0				5				7	12
Single-Unit Trucks				0				2				3	5
Articulated Trucks				0				0				0	0
Total Exiting Leg				0				7				10	17

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
2:30 PM	0	0	0	0	0	0	0	0	3	0	0	3	3
2:45 PM	0	0	0	0	0	5	0	5	0	0	0	0	5
Total	0	0	0	0	0	5	0	5	5	0	0	5	10
3:00 PM	1	0	0	1	0	1	0	1	0	0	0	0	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	1	0	1	0	0	0	0	2
Grand Total	1	0	0	1	0	6	0	6	5	0	0	5	12
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	8.3	0.0	0.0	8.3	0.0	50.0	0.0	50.0	41.7	0.0	0.0	41.7	
Exiting Leg Total				0				5				7	12

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:15 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
2:30 PM	0	0	0	0	0	0	0	0	3	0	0	3	3
2:45 PM	0	0	0	0	0	5	0	5	0	0	0	0	5
3:00 PM	1	0	0	1	0	1	0	1	0	0	0	0	2
Total Volume	1	0	0	1	0	6	0	6	5	0	0	5	12
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.300	0.000	0.300	0.417	0.000	0.000	0.417	0.600
Entering Leg	1	0	0	1	0	6	0	6	5	0	0	5	12
Exiting Leg				0				5				7	12
Total				1				11				12	24

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
2:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	2	0	2	1	0	0	1	3
Total	0	0	0	0	0	3	0	3	2	0	0	2	5
3:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
3:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	2	1	0	0	1	3
Grand Total	0	0	0	0	0	5	0	5	3	0	0	3	8
Approach %	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	62.5	0.0	62.5	37.5	0.0	0.0	37.5	
Exiting Leg Total				0				3				5	8

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:30 PM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	2	0	2	1	0	0	1	3
3:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
3:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
Total Volume	0	0	0	0	0	4	0	4	2	0	0	2	6
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.500	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	0	4	0	4	2	0	0	2	6
Exiting Leg				0				2				4	6
Total				0				6				6	12

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	School Driveway from North				Hemlock Road from East				Hemlock Road from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg				0				0				0	0
Total				0				0				0	0

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0	0	1	3
Total	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0	0	1	3
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0	0	1	3
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	50.0	0.0	50.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	33.3	0.0	66.7	33.3	0.0	0.0	0.0	0.0	33.3	
Exiting Leg Total						0						2						1	3

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0	0	1	3
Total Volume	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0	0	1	3
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	50.0	0.0	50.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0	0	1	3
Exiting Leg						0						2						1	3
Total						0						4						2	6

PDI File #: **217949 B**
Location: **N: School Driveway**
Location: **E: Hemlock Road W: Hemlock Road**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Pedestrians

	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	2	0	2	0	0	0	3	0	3	0	0	0	0	4	4	9
2:15 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	2
Total	0	0	0	4	0	4	0	0	0	5	1	6	0	0	0	0	4	4	14
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2
3:30 PM	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	0	1	1	0	0	0	2	1	3	0	0	0	0	1	1	5
Grand Total	0	0	0	4	1	5	0	0	0	7	2	9	0	0	0	0	5	5	19
Approach %	0	0	0	80	20		0	0	0	77.778	22.222		0	0	0	0	100		
Total %	0	0	0	21.053	5.2632	26.316	0	0	0	36.842	10.526	47.368	0	0	0	0	26.316	26.316	
Exiting Leg Total						5						9						5	19

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	School Driveway						Hemlock Road						Hemlock Road						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	2	0	2	0	0	0	3	0	3	0	0	0	0	4	4	9
2:15 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	2
Total Volume	0	0	0	4	0	4	0	0	0	5	1	6	0	0	0	0	4	4	14
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	83.3	16.7		0.0	0.0	0.0	0.0	100.0		
PHF	0.000	0.000	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.417	0.250	0.500	0.000	0.000	0.000	0.000	0.250	0.250	0.389
Entering Leg	0	0	0	4	0	4	0	0	0	5	1	6	0	0	0	0	4	4	14
Exiting Leg						4						6						4	14
Total						8						12						8	28

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	27	83	10	0	120	42	21	26	0	89	12	106	40	0	158	46	7	16	0	69	436
11:15 AM	22	74	11	0	107	19	10	8	0	37	11	126	37	0	174	52	13	29	0	94	412
11:30 AM	22	73	9	0	104	25	6	18	0	49	11	114	31	0	156	48	12	21	0	81	390
11:45 AM	17	95	8	0	120	37	11	20	0	68	8	137	47	0	192	56	8	17	1	82	462
Total	88	325	38	0	451	123	48	72	0	243	42	483	155	0	680	202	40	83	1	326	1700
12:00 PM	20	79	10	0	109	22	9	19	1	51	3	126	51	0	180	43	6	14	0	63	403
12:15 PM	20	93	15	0	128	18	17	22	0	57	11	113	55	0	179	45	5	14	0	64	428
12:30 PM	20	97	8	0	125	10	7	10	0	27	13	109	65	0	187	45	2	17	0	64	403
12:45 PM	33	83	9	0	125	6	6	6	0	18	5	126	61	0	192	43	4	18	0	65	400
Total	93	352	42	0	487	56	39	57	1	153	32	474	232	0	738	176	17	63	0	256	1634
Grand Total	181	677	80	0	938	179	87	129	1	396	74	957	387	0	1418	378	57	146	1	582	3334
Approach %	19.3	72.2	8.5	0.0		45.2	22.0	32.6	0.3		5.2	67.5	27.3	0.0		64.9	9.8	25.1	0.2		
Total %	5.4	20.3	2.4	0.0	28.1	5.4	2.6	3.9	0.0	11.9	2.2	28.7	11.6	0.0	42.5	11.3	1.7	4.4	0.0	17.5	
Exiting Leg Total					1282					212					1184					656	3334
Cars	180	669	79	0	928	177	87	126	1	391	74	947	385	0	1406	374	55	145	1	575	3300
% Cars	99.4	98.8	98.8	0.0	98.9	98.9	100.0	97.7	100.0	98.7	100.0	99.0	99.5	0.0	99.2	98.9	96.5	99.3	100.0	98.8	99.0
Exiting Leg Total					1269					209					1169					653	3300
Heavy Vehicles	1	8	1	0	10	2	0	3	0	5	0	10	2	0	12	4	2	1	0	7	34
% Heavy Vehicles	0.6	1.2	1.3	0.0	1.1	1.1	0.0	2.3	0.0	1.3	0.0	1.0	0.5	0.0	0.8	1.1	3.5	0.7	0.0	1.2	1.0
Exiting Leg Total					13					3					15					3	34

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	27	83	10	0	120	42	21	26	0	89	12	106	40	0	158	46	7	16	0	69	436
11:15 AM	22	74	11	0	107	19	10	8	0	37	11	126	37	0	174	52	13	29	0	94	412
11:30 AM	22	73	9	0	104	25	6	18	0	49	11	114	31	0	156	48	12	21	0	81	390
11:45 AM	17	95	8	0	120	37	11	20	0	68	8	137	47	0	192	56	8	17	1	82	462
Total Volume	88	325	38	0	451	123	48	72	0	243	42	483	155	0	680	202	40	83	1	326	1700
% Approach Total	19.5	72.1	8.4	0.0		50.6	19.8	29.6	0.0		6.2	71.0	22.8	0.0		62.0	12.3	25.5	0.3		
PHF	0.815	0.855	0.864	0.000	0.940	0.732	0.571	0.692	0.000	0.683	0.875	0.881	0.824	0.000	0.885	0.902	0.769	0.716	0.250	0.867	0.920
Cars	87	322	37	0	446	121	48	70	0	239	42	474	155	0	671	198	38	83	1	320	1676
Cars %	98.9	99.1	97.4	0.0	98.9	98.4	100.0	97.2	0.0	98.4	100.0	98.1	100.0	0.0	98.7	98.0	95.0	100.0	100.0	98.2	98.6
Heavy Vehicles	1	3	1	0	5	2	0	2	0	4	0	9	0	0	9	4	2	0	0	6	24
Heavy Vehicles %	1.1	0.9	2.6	0.0	1.1	1.6	0.0	2.8	0.0	1.6	0.0	1.9	0.0	0.0	1.3	2.0	5.0	0.0	0.0	1.8	1.4
Cars Enter Leg	87	322	37	0	446	121	48	70	0	239	42	474	155	0	671	198	38	83	1	320	1676
Heavy Enter Leg	1	3	1	0	5	2	0	2	0	4	0	9	0	0	9	4	2	0	0	6	24
Total Entering Leg	88	325	38	0	451	123	48	72	0	243	42	483	155	0	680	202	40	83	1	326	1700
Cars Exiting Leg					678					117					590					291	1676
Heavy Exiting Leg					11					3					9					1	24
Total Exiting Leg					689					120					599					292	1700

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	27	82	10	0	119	42	21	26	0	89	12	103	40	0	155	46	7	16	0	69	432
11:15 AM	22	74	11	0	107	19	10	8	0	37	11	123	37	0	171	51	13	29	0	93	408
11:30 AM	22	72	8	0	102	25	6	18	0	49	11	113	31	0	155	47	10	21	0	78	384
11:45 AM	16	94	8	0	118	35	11	18	0	64	8	135	47	0	190	54	8	17	1	80	452
Total	87	322	37	0	446	121	48	70	0	239	42	474	155	0	671	198	38	83	1	320	1676
12:00 PM	20	76	10	0	106	22	9	18	1	50	3	126	49	0	178	43	6	14	0	63	397
12:15 PM	20	92	15	0	127	18	17	22	0	57	11	112	55	0	178	45	5	14	0	64	426
12:30 PM	20	96	8	0	124	10	7	10	0	27	13	109	65	0	187	45	2	17	0	64	402
12:45 PM	33	83	9	0	125	6	6	6	0	18	5	126	61	0	192	43	4	17	0	64	399
Total	93	347	42	0	482	56	39	56	1	152	32	473	230	0	735	176	17	62	0	255	1624
Grand Total	180	669	79	0	928	177	87	126	1	391	74	947	385	0	1406	374	55	145	1	575	3300
Approach %	19.4	72.1	8.5	0.0		45.3	22.3	32.2	0.3		5.3	67.4	27.4	0.0		65.0	9.6	25.2	0.2		
Total %	5.5	20.3	2.4	0.0	28.1	5.4	2.6	3.8	0.0	11.8	2.2	28.7	11.7	0.0	42.6	11.3	1.7	4.4	0.0	17.4	
Exiting Leg Total					1269					209					1169					653	3300

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:45 AM	16	94	8	0	118	35	11	18	0	64	8	135	47	0	190	54	8	17	1	80	452
12:00 PM	20	76	10	0	106	22	9	18	1	50	3	126	49	0	178	43	6	14	0	63	397
12:15 PM	20	92	15	0	127	18	17	22	0	57	11	112	55	0	178	45	5	14	0	64	426
12:30 PM	20	96	8	0	124	10	7	10	0	27	13	109	65	0	187	45	2	17	0	64	402
Total Volume	76	358	41	0	475	85	44	68	1	198	35	482	216	0	733	187	21	62	1	271	1677
% Approach Total	16.0	75.4	8.6	0.0		42.9	22.2	34.3	0.5		4.8	65.8	29.5	0.0		69.0	7.7	22.9	0.4		
PHF	0.950	0.932	0.683	0.000	0.935	0.607	0.647	0.773	0.250	0.773	0.673	0.893	0.831	0.000	0.964	0.866	0.656	0.912	0.250	0.847	0.928
Entering Leg	76	358	41	0	475	85	44	68	1	198	35	482	216	0	733	187	21	62	1	271	1677
Exiting Leg					629					98					613					337	1677
Total					1104					296					1346					608	3354

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	4
11:30 AM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	1	2	0	0	3	6
11:45 AM	1	1	0	0	2	2	0	2	0	4	0	2	0	0	2	2	0	0	0	2	10
Total	1	3	1	0	5	2	0	2	0	4	0	9	0	0	9	4	2	0	0	6	24
12:00 PM	0	3	0	0	3	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	6
12:15 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	5	0	0	5	0	0	1	0	1	0	1	2	0	3	0	0	1	0	1	10
Grand Total	1	8	1	0	10	2	0	3	0	5	0	10	2	0	12	4	2	1	0	7	34
Approach %	10.0	80.0	10.0	0.0		40.0	0.0	60.0	0.0		0.0	83.3	16.7	0.0		57.1	28.6	14.3	0.0		
Total %	2.9	23.5	2.9	0.0	29.4	5.9	0.0	8.8	0.0	14.7	0.0	29.4	5.9	0.0	35.3	11.8	5.9	2.9	0.0	20.6	
Exiting Leg Total					13					3					15					3	34
Buses	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1	1	0	0	2	4
% Buses	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	20.0	0.0	0.0	50.0	0.0	8.3	25.0	50.0	0.0	0.0	28.6	11.8
Exiting Leg Total					1					1					1					1	4
Single-Unit Trucks	1	8	1	0	10	1	0	3	0	4	0	9	1	0	10	2	1	1	0	4	28
% Single-Unit	100.0	100.0	100.0	0.0	100.0	50.0	0.0	100.0	0.0	80.0	0.0	90.0	50.0	0.0	83.3	50.0	50.0	100.0	0.0	57.1	82.4
Exiting Leg Total					11					2					13					2	28
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	8.3	25.0	0.0	0.0	0.0	14.3	5.9
Exiting Leg Total					1					0					1					0	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	4
11:30 AM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	1	2	0	0	3	6
11:45 AM	1	1	0	0	2	2	0	2	0	4	0	2	0	0	2	2	0	0	0	2	10
12:00 PM	0	3	0	0	3	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	6
Total Volume	1	5	1	0	7	2	0	3	0	5	0	6	2	0	8	4	2	0	0	6	26
% Approach Total	14.3	71.4	14.3	0.0		40.0	0.0	60.0	0.0		0.0	75.0	25.0	0.0		66.7	33.3	0.0	0.0		
PHF	0.250	0.417	0.250	0.000	0.583	0.250	0.000	0.375	0.000	0.313	0.000	0.500	0.250	0.000	0.667	0.500	0.250	0.000	0.000	0.500	0.650
Buses	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1	1	0	0	2	4
Buses %	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	20.0	0.0	0.0	50.0	0.0	12.5	25.0	50.0	0.0	0.0	33.3	15.4
Single-Unit Trucks	1	5	1	0	7	1	0	3	0	4	0	6	1	0	7	2	1	0	0	3	21
Single-Unit %	100.0	100.0	100.0	0.0	100.0	50.0	0.0	100.0	0.0	80.0	0.0	100.0	50.0	0.0	87.5	50.0	50.0	0.0	0.0	50.0	80.8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	16.7	3.8
Buses	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1	1	0	0	2	4
Single-Unit Trucks	1	5	1	0	7	1	0	3	0	4	0	6	1	0	7	2	1	0	0	3	21
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total Entering Leg	1	5	1	0	7	2	0	3	0	5	0	6	2	0	8	4	2	0	0	6	26
Buses					1					1					1					1	4
Single-Unit Trucks					7					2					10					2	21
Articulated Trucks					0					0					1					0	1
Total Exiting Leg					8					3					12					3	26

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:45 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0	2	3
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1	1	0	0	2	4
Approach %	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		50.0	50.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	25.0	0.0	0.0	25.0	0.0	25.0	25.0	25.0	0.0	0.0	50.0	
Exiting Leg Total					1					1					1					1	4

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:45 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Total Volume	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1	1	0	0	2	4
% Approach Total	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		50.0	50.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.250	0.250	0.250	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1	1	0	0	2	4
Exiting Leg					1					1					1					1	4
Total					1					2					2					3	8

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	4
11:30 AM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	1	1	0	0	2	5
11:45 AM	1	1	0	0	2	1	0	2	0	3	0	2	0	0	2	0	0	0	0	0	7
Total	1	3	1	0	5	1	0	2	0	3	0	9	0	0	9	2	1	0	0	3	20
12:00 PM	0	3	0	0	3	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	5
12:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	5	0	0	5	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	8
Grand Total	1	8	1	0	10	1	0	3	0	4	0	9	1	0	10	2	1	1	0	4	28
Approach %	10.0	80.0	10.0	0.0		25.0	0.0	75.0	0.0		0.0	90.0	10.0	0.0		50.0	25.0	25.0	0.0		
Total %	3.6	28.6	3.6	0.0	35.7	3.6	0.0	10.7	0.0	14.3	0.0	32.1	3.6	0.0	35.7	7.1	3.6	3.6	0.0	14.3	
Exiting Leg Total					11					2					13					2	28

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	4
11:30 AM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	1	1	0	0	2	5
11:45 AM	1	1	0	0	2	1	0	2	0	3	0	2	0	0	2	0	0	0	0	0	7
12:00 PM	0	3	0	0	3	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	5
Total Volume	1	5	1	0	7	1	0	3	0	4	0	6	1	0	7	2	1	0	0	3	21
% Approach Total	14.3	71.4	14.3	0.0		25.0	0.0	75.0	0.0		0.0	85.7	14.3	0.0		66.7	33.3	0.0	0.0		
PHF	0.250	0.417	0.250	0.000	0.583	0.250	0.000	0.375	0.000	0.333	0.000	0.500	0.250	0.000	0.583	0.500	0.250	0.000	0.000	0.375	0.750
Entering Leg	1	5	1	0	7	1	0	3	0	4	0	6	1	0	7	2	1	0	0	3	21
Exiting Leg					7					2					10					2	21
Total					14					6					17					5	42

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	50.0	
Exiting Leg Total					1					0					1					0	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.250	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2
Exiting Leg					1					0					1					0	2
Total					1					0					2					1	4

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North							Hemlock Roads from East							Farm Street from South							Nahant Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	2
11:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	2	0	2	0	0	0	0	2	0	0	1	0	1	0	2	6
12:00 PM	0	0	0	0	0	2	2	0	0	1	0	0	0	1	0	2	0	0	0	0	2	0	1	0	0	0	0	1	6
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	4	0	0	0	0	4	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	4	0	0	0	2	6	3	0	1	0	0	0	4	1	2	0	0	0	0	3	0	1	0	0	0	0	1	14
Grand Total	0	4	0	0	0	2	6	3	1	2	0	0	0	6	1	4	0	0	0	0	5	0	1	1	0	1	0	3	20
Approach %	0.0	66.7	0.0	0.0	0.0	33.3		50.0	16.7	33.3	0.0	0.0	0.0		20.0	80.0	0.0	0.0	0.0	0.0		0.0	33.3	33.3	0.0	33.3	0.0		
Total %	0.0	20.0	0.0	0.0	0.0	10.0	30.0	15.0	5.0	10.0	0.0	0.0	0.0	30.0	5.0	20.0	0.0	0.0	0.0	0.0	25.0	0.0	5.0	5.0	0.0	5.0	0.0	15.0	
Exiting Leg Total							10							2							6							2	20

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Farm Street from North							Hemlock Roads from East							Farm Street from South							Nahant Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
12:00 PM	0	0	0	0	0	2	2	0	0	1	0	0	0	1	0	2	0	0	0	0	2	0	1	0	0	0	0	1	6
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	4	0	0	0	0	4	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Total Volume	0	4	0	0	0	2	6	3	1	1	0	0	0	5	0	2	0	0	0	0	2	0	1	0	0	1	0	2	15
% Approach Total	0.0	66.7	0.0	0.0	0.0	33.3		60.0	20.0	20.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		0.0	50.0	0.0	0.0	50.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.000	0.250	0.375	0.250	0.250	0.250	0.000	0.000	0.000	0.417	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.250	0.000	0.500	0.536
Entering Leg	0	4	0	0	0	2	6	3	1	1	0	0	0	5	0	2	0	0	0	0	2	0	1	0	0	1	0	2	15
Exiting Leg							7							1							5							2	15
Total							13							6							7							4	30

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street							Hemlock Roads							Farm Street							Nahant Street							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11:15 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2
Total	0	0	0	0	0	3	3	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	1	2		7
12:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2		2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0		2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0		1
Total	0	0	0	0	0	1	1	0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	2	2		6
Grand Total	0	0	0	0	0	4	4	0	0	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0	1	3	4		13
Approach %	0	0	0	0	0	100		0	0	0	0	20	80		0	0	0	0	0	0		0	0	0	0	25	75		
Total %	0	0	0	0	0	30.8	30.8	0	0	0	0	7.69	30.8	38.5	0	0	0	0	0	0	0	0	0	0	0	7.69	23.1	30.8	
Exiting Leg Total							4							5							0							4	13

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Farm Street							Hemlock Roads							Farm Street							Nahant Street							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11:15 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1		2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1		2
Total Volume	0	0	0	0	0	3	3	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	1	2		7
% Approach Total	0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	50.0	50.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.375	0.375	0.000	0.000	0.000	0.000	0.000	0.500	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.500	0.875
Entering Leg	0	0	0	0	0	3	3	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	1	2		7
Exiting Leg							3							2							0							2	7
Total							6							4							0							4	14

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	14	61	85	0	160	4	2	0	0	6	56	53	30	0	139	38	37	15	0	90	395
7:15 AM	24	69	83	0	176	5	0	2	0	7	62	78	22	0	162	49	27	34	1	111	456
7:30 AM	30	81	65	0	176	22	14	23	0	59	95	67	32	0	194	35	38	22	1	96	525
7:45 AM	23	66	46	0	135	31	28	54	0	113	64	59	34	0	157	25	22	20	0	67	472
Total	91	277	279	0	647	62	44	79	0	185	277	257	118	0	652	147	124	91	2	364	1848
8:00 AM	18	52	28	0	98	14	8	21	0	43	20	97	40	0	157	31	7	24	0	62	360
8:15 AM	62	101	16	0	179	7	2	4	0	13	9	89	65	0	163	29	13	55	0	97	452
8:30 AM	27	79	11	0	117	6	3	8	0	17	7	69	56	0	132	34	6	19	0	59	325
8:45 AM	20	60	10	0	90	5	4	1	0	10	3	64	41	1	109	35	3	12	0	50	259
Total	127	292	65	0	484	32	17	34	0	83	39	319	202	1	561	129	29	110	0	268	1396
Grand Total	218	569	344	0	1131	94	61	113	0	268	316	576	320	1	1213	276	153	201	2	632	3244
Approach %	19.3	50.3	30.4	0.0		35.1	22.8	42.2	0.0		26.1	47.5	26.4	0.1		43.7	24.2	31.8	0.3		
Total %	6.7	17.5	10.6	0.0	34.9	2.9	1.9	3.5	0.0	8.3	9.7	17.8	9.9	0.0	37.4	8.5	4.7	6.2	0.1	19.5	
Exiting Leg Total					871					813					959					601	3244
Cars	208	536	339	0	1083	93	52	99	0	244	303	547	309	1	1160	266	148	196	2	612	3099
% Cars	95.4	94.2	98.5	0.0	95.8	98.9	85.2	87.6	0.0	91.0	95.9	95.0	96.6	100.0	95.6	96.4	96.7	97.5	100.0	96.8	95.5
Exiting Leg Total					836					790					902					571	3099
Heavy Vehicles	10	33	5	0	48	1	9	14	0	24	13	29	11	0	53	10	5	5	0	20	145
% Heavy Vehicles	4.6	5.8	1.5	0.0	4.2	1.1	14.8	12.4	0.0	9.0	4.1	5.0	3.4	0.0	4.4	3.6	3.3	2.5	0.0	3.2	4.5
Exiting Leg Total					35					23					57					30	145

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	14	61	85	0	160	4	2	0	0	6	56	53	30	0	139	38	37	15	0	90	395
7:15 AM	24	69	83	0	176	5	0	2	0	7	62	78	22	0	162	49	27	34	1	111	456
7:30 AM	30	81	65	0	176	22	14	23	0	59	95	67	32	0	194	35	38	22	1	96	525
7:45 AM	23	66	46	0	135	31	28	54	0	113	64	59	34	0	157	25	22	20	0	67	472
Total Volume	91	277	279	0	647	62	44	79	0	185	277	257	118	0	652	147	124	91	2	364	1848
% Approach Total	14.1	42.8	43.1	0.0		33.5	23.8	42.7	0.0		42.5	39.4	18.1	0.0		40.4	34.1	25.0	0.5		
PHF	0.758	0.855	0.821	0.000	0.919	0.500	0.393	0.366	0.000	0.409	0.729	0.824	0.868	0.000	0.840	0.750	0.816	0.669	0.500	0.820	0.880
Cars	86	259	275	0	620	62	38	66	0	166	264	243	111	0	618	145	119	90	2	356	1760
Cars %	94.5	93.5	98.6	0.0	95.8	100.0	86.4	83.5	0.0	89.7	95.3	94.6	94.1	0.0	94.8	98.6	96.0	98.9	100.0	97.8	95.2
Heavy Vehicles	5	18	4	0	27	0	6	13	0	19	13	14	7	0	34	2	5	1	0	8	88
Heavy Vehicles %	5.5	6.5	1.4	0.0	4.2	0.0	13.6	16.5	0.0	10.3	4.7	5.4	5.9	0.0	5.2	1.4	4.0	1.1	0.0	2.2	4.8
Cars Enter Leg	86	259	275	0	620	62	38	66	0	166	264	243	111	0	618	145	119	90	2	356	1760
Heavy Enter Leg	5	18	4	0	27	0	6	13	0	19	13	14	7	0	34	2	5	1	0	8	88
Total Entering Leg	91	277	279	0	647	62	44	79	0	185	277	257	118	0	652	147	124	91	2	364	1848
Cars Exiting Leg					395					658					470					237	1760
Heavy Exiting Leg					15					22					33					18	88
Total Exiting Leg					410					680					503					255	1848

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	13	57	85	0	155	4	2	0	0	6	56	48	30	0	134	38	37	14	0	89	384
7:15 AM	24	64	83	0	171	5	0	2	0	7	60	75	22	0	157	48	27	34	1	110	445
7:30 AM	28	77	64	0	169	22	13	19	0	54	87	64	29	0	180	35	35	22	1	93	496
7:45 AM	21	61	43	0	125	31	23	45	0	99	61	56	30	0	147	24	20	20	0	64	435
Total	86	259	275	0	620	62	38	66	0	166	264	243	111	0	618	145	119	90	2	356	1760
8:00 AM	17	50	28	0	95	14	8	20	0	42	20	94	39	0	153	30	7	24	0	61	351
8:15 AM	61	94	15	0	170	7	2	4	0	13	9	87	64	0	160	27	13	55	0	95	438
8:30 AM	26	78	11	0	115	5	1	8	0	14	7	67	54	0	128	32	6	17	0	55	312
8:45 AM	18	55	10	0	83	5	3	1	0	9	3	56	41	1	101	32	3	10	0	45	238
Total	122	277	64	0	463	31	14	33	0	78	39	304	198	1	542	121	29	106	0	256	1339
Grand Total	208	536	339	0	1083	93	52	99	0	244	303	547	309	1	1160	266	148	196	2	612	3099
Approach %	19.2	49.5	31.3	0.0		38.1	21.3	40.6	0.0		26.1	47.2	26.6	0.1		43.5	24.2	32.0	0.3		
Total %	6.7	17.3	10.9	0.0	34.9	3.0	1.7	3.2	0.0	7.9	9.8	17.7	10.0	0.0	37.4	8.6	4.8	6.3	0.1	19.7	
Exiting Leg Total					836					790					902					571	3099

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	13	57	85	0	155	4	2	0	0	6	56	48	30	0	134	38	37	14	0	89	384
7:15 AM	24	64	83	0	171	5	0	2	0	7	60	75	22	0	157	48	27	34	1	110	445
7:30 AM	28	77	64	0	169	22	13	19	0	54	87	64	29	0	180	35	35	22	1	93	496
7:45 AM	21	61	43	0	125	31	23	45	0	99	61	56	30	0	147	24	20	20	0	64	435
Total Volume	86	259	275	0	620	62	38	66	0	166	264	243	111	0	618	145	119	90	2	356	1760
% Approach Total	13.9	41.8	44.4	0.0		37.3	22.9	39.8	0.0		42.7	39.3	18.0	0.0		40.7	33.4	25.3	0.6		
PHF	0.768	0.841	0.809	0.000	0.906	0.500	0.413	0.367	0.000	0.419	0.759	0.810	0.925	0.000	0.858	0.755	0.804	0.662	0.500	0.809	0.887
Entering Leg	86	259	275	0	620	62	38	66	0	166	264	243	111	0	618	145	119	90	2	356	1760
Exiting Leg					395					658					470					237	1760
Total					1015					824					1088					593	3520

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	4	0	0	5	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	11
7:15 AM	0	5	0	0	5	0	0	0	0	0	2	3	0	0	5	1	0	0	0	1	11
7:30 AM	2	4	1	0	7	0	1	4	0	5	8	3	3	0	14	0	3	0	0	3	29
7:45 AM	2	5	3	0	10	0	5	9	0	14	3	3	4	0	10	1	2	0	0	3	37
Total	5	18	4	0	27	0	6	13	0	19	13	14	7	0	34	2	5	1	0	8	88
8:00 AM	1	2	0	0	3	0	0	1	0	1	0	3	1	0	4	1	0	0	0	1	9
8:15 AM	1	7	1	0	9	0	0	0	0	0	0	2	1	0	3	2	0	0	0	2	14
8:30 AM	1	1	0	0	2	1	2	0	0	3	0	2	2	0	4	2	0	2	0	4	13
8:45 AM	2	5	0	0	7	0	1	0	0	1	0	8	0	0	8	3	0	2	0	5	21
Total	5	15	1	0	21	1	3	1	0	5	0	15	4	0	19	8	0	4	0	12	57
Grand Total	10	33	5	0	48	1	9	14	0	24	13	29	11	0	53	10	5	5	0	20	145
Approach %	20.8	68.8	10.4	0.0		4.2	37.5	58.3	0.0		24.5	54.7	20.8	0.0		50.0	25.0	25.0	0.0		
Total %	6.9	22.8	3.4	0.0	33.1	0.7	6.2	9.7	0.0	16.6	9.0	20.0	7.6	0.0	36.6	6.9	3.4	3.4	0.0	13.8	
Exiting Leg Total					35					23					57					30	145
Buses	4	4	4	0	12	0	7	14	0	21	12	4	4	0	20	2	4	3	0	9	62
% Buses	40.0	12.1	80.0	0.0	25.0	0.0	77.8	100.0	0.0	87.5	92.3	13.8	36.4	0.0	37.7	20.0	80.0	60.0	0.0	45.0	42.8
Exiting Leg Total					7					20					20					15	62
Single-Unit Trucks	4	23	1	0	28	0	1	0	0	1	1	21	6	0	28	7	1	2	0	10	67
% Single-Unit	40.0	69.7	20.0	0.0	58.3	0.0	11.1	0.0	0.0	4.2	7.7	72.4	54.5	0.0	52.8	70.0	20.0	40.0	0.0	50.0	46.2
Exiting Leg Total					23					3					30					11	67
Articulated Trucks	2	6	0	0	8	1	1	0	0	2	0	4	1	0	5	1	0	0	0	1	16
% Articulated	20.0	18.2	0.0	0.0	16.7	100.0	11.1	0.0	0.0	8.3	0.0	13.8	9.1	0.0	9.4	10.0	0.0	0.0	0.0	5.0	11.0
Exiting Leg Total					5					0					7					4	16

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:30 AM	2	4	1	0	7	0	1	4	0	5	8	3	3	0	14	0	3	0	0	3	29
7:45 AM	2	5	3	0	10	0	5	9	0	14	3	3	4	0	10	1	2	0	0	3	37
8:00 AM	1	2	0	0	3	0	0	1	0	1	0	3	1	0	4	1	0	0	0	1	9
8:15 AM	1	7	1	0	9	0	0	0	0	0	0	2	1	0	3	2	0	0	0	2	14
Total Volume	6	18	5	0	29	0	6	14	0	20	11	11	9	0	31	4	5	0	0	9	89
% Approach Total	20.7	62.1	17.2	0.0		0.0	30.0	70.0	0.0		35.5	35.5	29.0	0.0		44.4	55.6	0.0	0.0		
PHF	0.750	0.643	0.417	0.000	0.725	0.000	0.300	0.389	0.000	0.357	0.344	0.917	0.563	0.000	0.554	0.500	0.417	0.000	0.000	0.750	0.601
Buses	2	3	4	0	9	0	5	14	0	19	11	1	2	0	14	0	4	0	0	4	46
Buses %	33.3	16.7	80.0	0.0	31.0	0.0	83.3	100.0	0.0	95.0	100.0	9.1	22.2	0.0	45.2	0.0	80.0	0.0	0.0	44.4	51.7
Single-Unit Trucks	2	12	1	0	15	0	1	0	0	1	0	8	6	0	14	4	1	0	0	5	35
Single-Unit %	33.3	66.7	20.0	0.0	51.7	0.0	16.7	0.0	0.0	5.0	0.0	72.7	66.7	0.0	45.2	100.0	20.0	0.0	0.0	55.6	39.3
Articulated Trucks	2	3	0	0	5	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	8
Articulated %	33.3	16.7	0.0	0.0	17.2	0.0	0.0	0.0	0.0	0.0	0.0	18.2	11.1	0.0	9.7	0.0	0.0	0.0	0.0	0.0	9.0
Buses	2	3	4	0	9	0	5	14	0	19	11	1	2	0	14	0	4	0	0	4	46
Single-Unit Trucks	2	12	1	0	15	0	1	0	0	1	0	8	6	0	14	4	1	0	0	5	35
Articulated Trucks	2	3	0	0	5	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	8
Total Entering Leg	6	18	5	0	29	0	6	14	0	20	11	11	9	0	31	4	5	0	0	9	89
Buses					1					19					17					9	46
Single-Unit Trucks					8					2					16					9	35
Articulated Trucks					2					0					3					3	8
Total Exiting Leg					11					21					36					21	89

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	3
7:30 AM	1	0	1	0	2	0	0	4	0	4	8	0	0	0	8	0	3	0	0	3	17
7:45 AM	0	1	3	0	4	0	5	9	0	14	3	0	2	0	5	0	1	0	0	1	24
Total	2	2	4	0	8	0	5	13	0	18	12	1	2	0	15	0	4	0	0	4	45
8:00 AM	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
8:30 AM	1	0	0	0	1	0	2	0	0	2	0	0	2	0	2	1	0	2	0	3	8
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	0	1	0	2	4
Total	2	2	0	0	4	0	2	1	0	3	0	3	2	0	5	2	0	3	0	5	17
Grand Total	4	4	4	0	12	0	7	14	0	21	12	4	4	0	20	2	4	3	0	9	62
Approach %	33.3	33.3	33.3	0.0		0.0	33.3	66.7	0.0		60.0	20.0	20.0	0.0		22.2	44.4	33.3	0.0		
Total %	6.5	6.5	6.5	0.0	19.4	0.0	11.3	22.6	0.0	33.9	19.4	6.5	6.5	0.0	32.3	3.2	6.5	4.8	0.0	14.5	
Exiting Leg Total					7					20					20					15	62

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	3
7:30 AM	1	0	1	0	2	0	0	4	0	4	8	0	0	0	8	0	3	0	0	3	17
7:45 AM	0	1	3	0	4	0	5	9	0	14	3	0	2	0	5	0	1	0	0	1	24
8:00 AM	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
Total Volume	1	3	4	0	8	0	5	14	0	19	12	1	2	0	15	0	4	0	0	4	46
% Approach Total	12.5	37.5	50.0	0.0		0.0	26.3	73.7	0.0		80.0	6.7	13.3	0.0		0.0	100.0	0.0	0.0		
PHF	0.250	0.750	0.333	0.000	0.500	0.000	0.250	0.389	0.000	0.339	0.375	0.250	0.250	0.000	0.469	0.000	0.333	0.000	0.000	0.333	0.479
Entering Leg	1	3	4	0	8	0	5	14	0	19	12	1	2	0	15	0	4	0	0	4	46
Exiting Leg					1					20					17					8	46
Total					9					39					32					12	92

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	8
7:15 AM	0	2	0	0	2	0	0	0	0	0	1	1	0	0	2	1	0	0	0	1	5
7:30 AM	0	3	0	0	3	0	1	0	0	1	0	2	2	0	4	0	0	0	0	0	8
7:45 AM	2	2	0	0	4	0	0	0	0	0	0	3	2	0	5	1	1	0	0	2	11
Total	2	10	0	0	12	0	1	0	0	1	1	10	4	0	15	2	1	1	0	4	32
8:00 AM	0	1	0	0	1	0	0	0	0	0	0	2	1	0	3	1	0	0	0	1	5
8:15 AM	0	6	1	0	7	0	0	0	0	0	0	1	1	0	2	2	0	0	0	2	11
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	4
8:45 AM	2	5	0	0	7	0	0	0	0	0	0	6	0	0	6	1	0	1	0	2	15
Total	2	13	1	0	16	0	0	0	0	0	0	11	2	0	13	5	0	1	0	6	35
Grand Total	4	23	1	0	28	0	1	0	0	1	1	21	6	0	28	7	1	2	0	10	67
Approach %	14.3	82.1	3.6	0.0		0.0	100.0	0.0	0.0		3.6	75.0	21.4	0.0		70.0	10.0	20.0	0.0		
Total %	6.0	34.3	1.5	0.0	41.8	0.0	1.5	0.0	0.0	1.5	1.5	31.3	9.0	0.0	41.8	10.4	1.5	3.0	0.0	14.9	
Exiting Leg Total					23					3					30					11	67

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:30 AM	0	3	0	0	3	0	1	0	0	1	0	2	2	0	4	0	0	0	0	0	8
7:45 AM	2	2	0	0	4	0	0	0	0	0	0	3	2	0	5	1	1	0	0	2	11
8:00 AM	0	1	0	0	1	0	0	0	0	0	0	2	1	0	3	1	0	0	0	1	5
8:15 AM	0	6	1	0	7	0	0	0	0	0	0	1	1	0	2	2	0	0	0	2	11
Total Volume	2	12	1	0	15	0	1	0	0	1	0	8	6	0	14	4	1	0	0	5	35
% Approach Total	13.3	80.0	6.7	0.0		0.0	100.0	0.0	0.0		0.0	57.1	42.9	0.0		80.0	20.0	0.0	0.0		
PHF	0.250	0.500	0.250	0.000	0.536	0.000	0.250	0.000	0.000	0.250	0.000	0.667	0.750	0.000	0.700	0.500	0.250	0.000	0.000	0.625	0.795
Entering Leg	2	12	1	0	15	0	1	0	0	1	0	8	6	0	14	4	1	0	0	5	35
Exiting Leg					8					2					16					9	35
Total					23					3					30					14	70

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
7:15 AM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
7:30 AM	1	1	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4
7:45 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	1	6	0	0	7	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	11
8:00 AM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	2
Total	1	0	0	0	1	1	1	0	0	2	0	1	0	0	1	1	0	0	0	1	5
Grand Total	2	6	0	0	8	1	1	0	0	2	0	4	1	0	5	1	0	0	0	1	16
Approach %	25.0	75.0	0.0	0.0		50.0	50.0	0.0	0.0		0.0	80.0	20.0	0.0		100.0	0.0	0.0	0.0		
Total %	12.5	37.5	0.0	0.0	50.0	6.3	6.3	0.0	0.0	12.5	0.0	25.0	6.3	0.0	31.3	6.3	0.0	0.0	0.0	6.3	
Exiting Leg Total					5					0					7					4	16

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
7:15 AM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
7:30 AM	1	1	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4
7:45 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	1	6	0	0	7	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	11
% Approach Total	14.3	85.7	0.0	0.0		0.0	0.0	0.0	0.0		0.0	75.0	25.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.250	0.750	0.000	0.000	0.875	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.688
Entering Leg	1	6	0	0	7	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	11
Exiting Leg					3					0					6					2	11
Total					10					0					10					2	22

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North							Hemlock Roads from East							Farm Street from South							Nahant Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	5	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	6
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	5	0	5	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	0	0	0	0	0	7
Approach %	0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	71.4	0.0	71.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	14.3	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							6							1							0							0	7

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North							Hemlock Roads from East							Farm Street from South							Nahant Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	5	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	6
% Approach Total	0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.417	0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	5	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	6
Exiting Leg							5							1							0							0	6
Total							10							1							1							0	12

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street							Hemlock Roads							Farm Street							Nahant Street							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	1	0	1	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
7:15 AM	0	0	0	0	12	0	12	0	0	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0	0	2	1	3	46
7:30 AM	0	0	0	0	6	0	6	0	0	0	0	0	21	21	0	0	0	0	0	0	0	0	0	0	0	1	0	1	28
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	19	0	19	0	0	0	0	0	63	63	0	0	0	0	0	0	0	0	0	0	0	3	1	4	86
8:00 AM	0	0	0	0	4	0	4	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	3	0	3	12
8:15 AM	0	0	0	0	0	3	3	0	0	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0	0	2	1	3	11
8:30 AM	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
8:45 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	4	5	9	0	0	0	0	1	10	11	0	0	0	0	0	0	0	0	0	0	0	5	2	7	27
Grand Total	0	0	0	0	23	5	28	0	0	0	0	1	73	74	0	0	0	0	0	0	0	0	0	0	0	8	3	11	113
Approach %	0	0	0	0	82.1	17.9		0	0	0	0	1.35	98.6		0	0	0	0	0	0		0	0	0	0	72.7	27.3		
Total %	0	0	0	0	20.4	4.42	24.8	0	0	0	0	0.88	64.6	65.5	0	0	0	0	0	0	0	0	0	0	0	7.08	2.65	9.73	
Exiting Leg Total							28							74							0							11	113

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Farm Street							Hemlock Roads							Farm Street							Nahant Street							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:15 AM	0	0	0	0	12	0	12	0	0	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0	0	2	1	3	46
7:30 AM	0	0	0	0	6	0	6	0	0	0	0	0	21	21	0	0	0	0	0	0	0	0	0	0	0	1	0	1	28
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:00 AM	0	0	0	0	4	0	4	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	3	0	3	12
Total Volume	0	0	0	0	22	0	22	0	0	0	0	0	60	60	0	0	0	0	0	0	0	0	0	0	0	6	1	7	89
% Approach Total	0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	85.7	14.3		
PHF	0.000	0.000	0.000	0.000	0.458	0.000	0.458	0.000	0.000	0.000	0.000	0.000	0.484	0.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.250	0.583	0.484
Entering Leg	0	0	0	0	22	0	22	0	0	0	0	0	60	60	0	0	0	0	0	0	0	0	0	0	0	6	1	7	89
Exiting Leg							22							60							0							7	89
Total							44							120							0							14	178

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:00 PM	35	67	17	0	119	13	15	27	0	55	11	73	41	0	125	32	10	35	2	79	378
2:15 PM	53	117	19	0	189	23	27	45	0	95	15	62	85	0	162	50	3	11	0	64	510
2:30 PM	25	83	14	0	122	33	16	24	0	73	19	113	50	0	182	39	8	11	0	58	435
2:45 PM	14	96	15	0	125	41	25	35	0	101	16	117	47	0	180	38	6	19	0	63	469
Total	127	363	65	0	555	110	83	131	0	324	61	365	223	0	649	159	27	76	2	264	1792
3:00 PM	23	86	12	0	121	29	10	18	0	57	6	130	49	0	185	43	9	14	0	66	429
3:15 PM	24	102	10	0	136	30	8	14	0	52	15	129	48	0	192	39	8	20	0	67	447
3:30 PM	21	100	8	0	129	6	9	9	0	24	12	120	54	0	186	50	11	17	0	78	417
3:45 PM	31	87	9	0	127	9	11	12	0	32	11	140	56	0	207	39	6	27	0	72	438
Total	99	375	39	0	513	74	38	53	0	165	44	519	207	0	770	171	34	78	0	283	1731
Grand Total	226	738	104	0	1068	184	121	184	0	489	105	884	430	0	1419	330	61	154	2	547	3523
Approach %	21.2	69.1	9.7	0.0		37.6	24.7	37.6	0.0		7.4	62.3	30.3	0.0		60.3	11.2	28.2	0.4		
Total %	6.4	20.9	3.0	0.0	30.3	5.2	3.4	5.2	0.0	13.9	3.0	25.1	12.2	0.0	40.3	9.4	1.7	4.4	0.1	15.5	
Exiting Leg Total					1222					270					1252					779	3523
Cars	224	730	102	0	1056	181	118	181	0	480	101	863	426	0	1390	325	60	147	2	534	3460
% Cars	99.1	98.9	98.1	0.0	98.9	98.4	97.5	98.4	0.0	98.2	96.2	97.6	99.1	0.0	98.0	98.5	98.4	95.5	100.0	97.6	98.2
Exiting Leg Total					1191					263					1236					770	3460
Heavy Vehicles	2	8	2	0	12	3	3	3	0	9	4	21	4	0	29	5	1	7	0	13	63
% Heavy Vehicles	0.9	1.1	1.9	0.0	1.1	1.6	2.5	1.6	0.0	1.8	3.8	2.4	0.9	0.0	2.0	1.5	1.6	4.5	0.0	2.4	1.8
Exiting Leg Total					31					7					16					9	63

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:15 PM	53	117	19	0	189	23	27	45	0	95	15	62	85	0	162	50	3	11	0	64	510
2:30 PM	25	83	14	0	122	33	16	24	0	73	19	113	50	0	182	39	8	11	0	58	435
2:45 PM	14	96	15	0	125	41	25	35	0	101	16	117	47	0	180	38	6	19	0	63	469
3:00 PM	23	86	12	0	121	29	10	18	0	57	6	130	49	0	185	43	9	14	0	66	429
Total Volume	115	382	60	0	557	126	78	122	0	326	56	422	231	0	709	170	26	55	0	251	1843
% Approach Total	20.6	68.6	10.8	0.0		38.7	23.9	37.4	0.0		7.9	59.5	32.6	0.0		67.7	10.4	21.9	0.0		
PHF	0.542	0.816	0.789	0.000	0.737	0.768	0.722	0.678	0.000	0.807	0.737	0.812	0.679	0.000	0.958	0.850	0.722	0.724	0.000	0.951	0.903
Cars	114	377	59	0	550	123	75	119	0	317	52	411	229	0	692	167	25	50	0	242	1801
Cars %	99.1	98.7	98.3	0.0	98.7	97.6	96.2	97.5	0.0	97.2	92.9	97.4	99.1	0.0	97.6	98.2	96.2	90.9	0.0	96.4	97.7
Heavy Vehicles	1	5	1	0	7	3	3	3	0	9	4	11	2	0	17	3	1	5	0	9	42
Heavy Vehicles %	0.9	1.3	1.7	0.0	1.3	2.4	3.8	2.5	0.0	2.8	7.1	2.6	0.9	0.0	2.4	1.8	3.8	9.1	0.0	3.6	2.3
Cars Enter Leg	114	377	59	0	550	123	75	119	0	317	52	411	229	0	692	167	25	50	0	242	1801
Heavy Enter Leg	1	5	1	0	7	3	3	3	0	9	4	11	2	0	17	3	1	5	0	9	42
Total Entering Leg	115	382	60	0	557	126	78	122	0	326	56	422	231	0	709	170	26	55	0	251	1843
Cars Exiting Leg					584					136					663					418	1801
Heavy Exiting Leg					19					6					11					6	42
Total Exiting Leg					603					142					674					424	1843

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:00 PM	35	67	16	0	118	13	15	27	0	55	11	72	41	0	124	32	10	34	2	78	375
2:15 PM	52	117	19	0	188	23	27	44	0	94	14	60	84	0	158	49	2	9	0	60	500
2:30 PM	25	82	13	0	120	33	16	24	0	73	17	108	50	0	175	38	8	11	0	57	425
2:45 PM	14	95	15	0	124	39	23	33	0	95	15	114	47	0	176	37	6	18	0	61	456
Total	126	361	63	0	550	108	81	128	0	317	57	354	222	0	633	156	26	72	2	256	1756
3:00 PM	23	83	12	0	118	28	9	18	0	55	6	129	48	0	183	43	9	12	0	64	420
3:15 PM	24	101	10	0	135	30	8	14	0	52	15	125	47	0	187	38	8	19	0	65	439
3:30 PM	20	99	8	0	127	6	9	9	0	24	12	119	54	0	185	49	11	17	0	77	413
3:45 PM	31	86	9	0	126	9	11	12	0	32	11	136	55	0	202	39	6	27	0	72	432
Total	98	369	39	0	506	73	37	53	0	163	44	509	204	0	757	169	34	75	0	278	1704
Grand Total	224	730	102	0	1056	181	118	181	0	480	101	863	426	0	1390	325	60	147	2	534	3460
Approach %	21.2	69.1	9.7	0.0		37.7	24.6	37.7	0.0		7.3	62.1	30.6	0.0		60.9	11.2	27.5	0.4		
Total %	6.5	21.1	2.9	0.0	30.5	5.2	3.4	5.2	0.0	13.9	2.9	24.9	12.3	0.0	40.2	9.4	1.7	4.2	0.1	15.4	
Exiting Leg Total					1191					263					1236					770	3460

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:15 PM	52	117	19	0	188	23	27	44	0	94	14	60	84	0	158	49	2	9	0	60	500
2:30 PM	25	82	13	0	120	33	16	24	0	73	17	108	50	0	175	38	8	11	0	57	425
2:45 PM	14	95	15	0	124	39	23	33	0	95	15	114	47	0	176	37	6	18	0	61	456
3:00 PM	23	83	12	0	118	28	9	18	0	55	6	129	48	0	183	43	9	12	0	64	420
Total Volume	114	377	59	0	550	123	75	119	0	317	52	411	229	0	692	167	25	50	0	242	1801
% Approach Total	20.7	68.5	10.7	0.0		38.8	23.7	37.5	0.0		7.5	59.4	33.1	0.0		69.0	10.3	20.7	0.0		
PHF	0.548	0.806	0.776	0.000	0.731	0.788	0.694	0.676	0.000	0.834	0.765	0.797	0.682	0.000	0.945	0.852	0.694	0.694	0.000	0.945	0.901
Entering Leg	114	377	59	0	550	123	75	119	0	317	52	411	229	0	692	167	25	50	0	242	1801
Exiting Leg					584					136					663					418	1801
Total					1134					453					1355					660	3602

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	3
2:15 PM	1	0	0	0	1	0	0	1	0	1	1	2	1	0	4	1	1	2	0	4	10
2:30 PM	0	1	1	0	2	0	0	0	0	0	2	5	0	0	7	1	0	0	0	1	10
2:45 PM	0	1	0	0	1	2	2	2	0	6	1	3	0	0	4	1	0	1	0	2	13
Total	1	2	2	0	5	2	2	3	0	7	4	11	1	0	16	3	1	4	0	8	36
3:00 PM	0	3	0	0	3	1	1	0	0	2	0	1	1	0	2	0	0	2	0	2	9
3:15 PM	0	1	0	0	1	0	0	0	0	0	0	4	1	0	5	1	0	1	0	2	8
3:30 PM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	4
3:45 PM	0	1	0	0	1	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	6
Total	1	6	0	0	7	1	1	0	0	2	0	10	3	0	13	2	0	3	0	5	27
Grand Total	2	8	2	0	12	3	3	3	0	9	4	21	4	0	29	5	1	7	0	13	63
Approach %	16.7	66.7	16.7	0.0		33.3	33.3	33.3	0.0		13.8	72.4	13.8	0.0		38.5	7.7	53.8	0.0		
Total %	3.2	12.7	3.2	0.0	19.0	4.8	4.8	4.8	0.0	14.3	6.3	33.3	6.3	0.0	46.0	7.9	1.6	11.1	0.0	20.6	
Exiting Leg Total					31					7					16					9	63
Buses	1	1	1	0	3	3	2	1	0	6	3	3	0	0	6	1	1	3	0	5	20
% Buses	50.0	12.5	50.0	0.0	25.0	100.0	66.7	33.3	0.0	66.7	75.0	14.3	0.0	0.0	20.7	20.0	100.0	42.9	0.0	38.5	31.7
Exiting Leg Total					9					5					3					3	20
Single-Unit Trucks	1	6	1	0	8	0	1	2	0	3	1	14	4	0	19	4	0	4	0	8	38
% Single-Unit	50.0	75.0	50.0	0.0	66.7	0.0	33.3	66.7	0.0	33.3	25.0	66.7	100.0	0.0	65.5	80.0	0.0	57.1	0.0	61.5	60.3
Exiting Leg Total					18					2					12					6	38
Articulated Trucks	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	5
% Articulated	0.0	12.5	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	19.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	7.9
Exiting Leg Total					4					0					1					0	5

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:15 PM	1	0	0	0	1	0	0	1	0	1	1	2	1	0	4	1	1	2	0	4	10
2:30 PM	0	1	1	0	2	0	0	0	0	0	2	5	0	0	7	1	0	0	0	1	10
2:45 PM	0	1	0	0	1	2	2	2	0	6	1	3	0	0	4	1	0	1	0	2	13
3:00 PM	0	3	0	0	3	1	1	0	0	2	0	1	1	0	2	0	0	2	0	2	9
Total Volume	1	5	1	0	7	3	3	3	0	9	4	11	2	0	17	3	1	5	0	9	42
% Approach Total	14.3	71.4	14.3	0.0		33.3	33.3	33.3	0.0		23.5	64.7	11.8	0.0		33.3	11.1	55.6	0.0		
PHF	0.250	0.417	0.250	0.000	0.583	0.375	0.375	0.375	0.000	0.375	0.500	0.550	0.500	0.000	0.607	0.750	0.250	0.625	0.000	0.563	0.808
Buses	1	1	1	0	3	3	2	1	0	6	3	2	0	0	5	1	1	3	0	5	19
Buses %	100.0	20.0	100.0	0.0	42.9	100.0	66.7	33.3	0.0	66.7	75.0	18.2	0.0	0.0	29.4	33.3	100.0	60.0	0.0	55.6	45.2
Single-Unit Trucks	0	3	0	0	3	0	1	2	0	3	1	6	2	0	9	2	0	2	0	4	19
Single-Unit %	0.0	60.0	0.0	0.0	42.9	0.0	33.3	66.7	0.0	33.3	25.0	54.5	100.0	0.0	52.9	66.7	0.0	40.0	0.0	44.4	45.2
Articulated Trucks	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
Articulated %	0.0	20.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	27.3	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0	9.5
Buses	1	1	1	0	3	3	2	1	0	6	3	2	0	0	5	1	1	3	0	5	19
Single-Unit Trucks	0	3	0	0	3	0	1	2	0	3	1	6	2	0	9	2	0	2	0	4	19
Articulated Trucks	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
Total Entering Leg	1	5	1	0	7	3	3	3	0	9	4	11	2	0	17	3	1	5	0	9	42
Buses					8					5					3					3	19
Single-Unit Trucks					8					1					7					3	19
Articulated Trucks					3					0					1					0	4
Total Exiting Leg					19					6					11					6	42

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	1	0	0	0	1	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	4
2:30 PM	0	1	1	0	2	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	5
2:45 PM	0	0	0	0	0	2	1	1	0	4	0	0	0	0	0	1	0	1	0	2	6
Total	1	1	1	0	3	2	1	1	0	4	3	2	0	0	5	1	1	1	0	3	15
3:00 PM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	2	0	2	4
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	0	0	2	0	2	5
Grand Total	1	1	1	0	3	3	2	1	0	6	3	3	0	0	6	1	1	3	0	5	20
Approach %	33.3	33.3	33.3	0.0		50.0	33.3	16.7	0.0		50.0	50.0	0.0	0.0		20.0	20.0	60.0	0.0		
Total %	5.0	5.0	5.0	0.0	15.0	15.0	10.0	5.0	0.0	30.0	15.0	15.0	0.0	0.0	30.0	5.0	5.0	15.0	0.0	25.0	
Exiting Leg Total					9					5					3					3	20

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:15 PM	1	0	0	0	1	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	4
2:30 PM	0	1	1	0	2	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	5
2:45 PM	0	0	0	0	0	2	1	1	0	4	0	0	0	0	0	1	0	1	0	2	6
3:00 PM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	2	0	2	4
Total Volume	1	1	1	0	3	3	2	1	0	6	3	2	0	0	5	1	1	3	0	5	19
% Approach Total	33.3	33.3	33.3	0.0		50.0	33.3	16.7	0.0		60.0	40.0	0.0	0.0		20.0	20.0	60.0	0.0		
PHF	0.250	0.250	0.250	0.000	0.375	0.375	0.500	0.250	0.000	0.375	0.375	0.500	0.000	0.000	0.417	0.250	0.250	0.375	0.000	0.625	0.792
Entering Leg	1	1	1	0	3	3	2	1	0	6	3	2	0	0	5	1	1	3	0	5	19
Exiting Leg					8					5					3					3	19
Total					11					11					8					8	38

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	3
2:15 PM	0	0	0	0	0	0	0	1	0	1	0	1	1	0	2	1	0	2	0	3	6
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	3
2:45 PM	0	1	0	0	1	0	1	1	0	2	1	2	0	0	3	0	0	0	0	0	6
Total	0	1	1	0	2	0	1	2	0	3	1	6	1	0	8	2	0	3	0	5	18
3:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4
3:15 PM	0	1	0	0	1	0	0	0	0	0	0	4	1	0	5	1	0	1	0	2	8
3:30 PM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	4
3:45 PM	0	1	0	0	1	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	4
Total	1	5	0	0	6	0	0	0	0	0	0	8	3	0	11	2	0	1	0	3	20
Grand Total	1	6	1	0	8	0	1	2	0	3	1	14	4	0	19	4	0	4	0	8	38
Approach %	12.5	75.0	12.5	0.0		0.0	33.3	66.7	0.0		5.3	73.7	21.1	0.0		50.0	0.0	50.0	0.0		
Total %	2.6	15.8	2.6	0.0	21.1	0.0	2.6	5.3	0.0	7.9	2.6	36.8	10.5	0.0	50.0	10.5	0.0	10.5	0.0	21.1	
Exiting Leg Total					18					2					12					6	38

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:45 PM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:45 PM	0	1	0	0	1	0	1	1	0	2	1	2	0	0	3	0	0	0	0	0	6
3:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4
3:15 PM	0	1	0	0	1	0	0	0	0	0	0	4	1	0	5	1	0	1	0	2	8
3:30 PM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	4
Total Volume	1	5	0	0	6	0	1	1	0	2	1	8	2	0	11	2	0	1	0	3	22
% Approach Total	16.7	83.3	0.0	0.0		0.0	50.0	50.0	0.0		9.1	72.7	18.2	0.0		66.7	0.0	33.3	0.0		
PHF	0.250	0.625	0.000	0.000	0.750	0.000	0.250	0.250	0.000	0.250	0.250	0.500	0.500	0.000	0.550	0.500	0.000	0.250	0.000	0.375	0.688
Entering Leg	1	5	0	0	6	0	1	1	0	2	1	8	2	0	11	2	0	1	0	3	22
Exiting Leg					9					1					8					4	22
Total					15					3					19					7	44

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
3:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Grand Total	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	5
Approach %	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	80.0	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					4					0					1					0	5

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North					Hemlock Roads from East					Farm Street from South					Nahant Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
3:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
% Approach Total	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
Exiting Leg					3					0					1					0	4
Total					4					0					4					0	8

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North							Hemlock Roads from East							Farm Street from South							Nahant Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	5	5	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
Total	0	0	1	0	2	7	10	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	13
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1
3:15 PM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	2
Total	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	3	4	6
Grand Total	1	0	1	0	2	7	11	0	0	0	0	2	0	2	0	1	0	0	0	0	1	1	0	0	0	1	3	5	19
Approach %	9.1	0.0	9.1	0.0	18.2	63.6		0.0	0.0	0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		20.0	0.0	0.0	0.0	20.0	60.0		
Total %	5.3	0.0	5.3	0.0	10.5	36.8	57.9	0.0	0.0	0.0	0.0	10.5	0.0	10.5	0.0	5.3	0.0	0.0	0.0	0.0	5.3	5.3	0.0	0.0	0.0	5.3	15.8	26.3	
Exiting Leg Total							10							3							1							5	19

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	Farm Street from North							Hemlock Roads from East							Farm Street from South							Nahant Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	5	5	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
Total Volume	0	0	1	0	2	7	10	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	13
% Approach Total	0.0	0.0	10.0	0.0	20.0	70.0		0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.250	0.000	0.250	0.350	0.500	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.464
Entering Leg	0	0	1	0	2	7	10	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	13
Exiting Leg							9							3							0							1	13
Total							19							5							0							2	26

PDI File #: **217949 C**
Location: **N: Farm Street S: Farm Street**
Location: **E: Hemlock Roads W: Nahant Street**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street from North							Hemlock Roads from East							Farm Street from South							Nahant Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	3	42	45	0	0	0	0	66	9	75	0	0	0	0	0	0	0	0	0	0	0	3	4	7	127
2:15 PM	0	0	0	0	3	2	5	0	0	0	0	13	0	13	0	0	0	0	0	0	0	0	0	0	0	1	5	6	24
2:30 PM	0	0	0	0	1	2	3	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	2	2	11
2:45 PM	0	0	0	0	0	1	1	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	0	7	47	54	0	0	0	0	88	9	97	0	0	0	0	0	0	0	0	0	0	0	4	11	15	166
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	7	48	55	0	0	0	0	88	9	97	0	0	0	0	0	0	0	0	0	0	0	4	11	15	167
Approach %	0	0	0	0	12.7	87.3		0	0	0	0	90.7	9.28		0	0	0	0	0	0		0	0	0	0	26.7	73.3		
Total %	0	0	0	0	4.19	28.7	32.9	0	0	0	0	52.7	5.39	58.1	0	0	0	0	0	0	0	0	0	0	0	2.4	6.59	8.98	
Exiting Leg Total							55							97							0							15	167

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	Farm Street from North							Hemlock Roads from East							Farm Street from South							Nahant Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	3	42	45	0	0	0	0	66	9	75	0	0	0	0	0	0	0	0	0	0	0	3	4	7	127
2:15 PM	0	0	0	0	3	2	5	0	0	0	0	13	0	13	0	0	0	0	0	0	0	0	0	0	0	1	5	6	24
2:30 PM	0	0	0	0	1	2	3	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	2	2	11
2:45 PM	0	0	0	0	0	1	1	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	0	0	0	7	47	54	0	0	0	0	88	9	97	0	0	0	0	0	0	0	0	0	0	0	4	11	15	166
% Approach Total	0.0	0.0	0.0	0.0	13.0	87.0		0.0	0.0	0.0	0.0	90.7	9.3		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	26.7	73.3		
PHF	0.000	0.000	0.000	0.000	0.583	0.280	0.300	0.000	0.000	0.000	0.000	0.333	0.250	0.323	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.550	0.536	0.327
Entering Leg	0	0	0	0	7	47	54	0	0	0	0	88	9	97	0	0	0	0	0	0	0	0	0	0	0	4	11	15	166
Exiting Leg							54							97							0							15	166
Total							108							194							0							30	332

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	46	110	0	156	113	2	0	115	0	44	0	44	315
11:15 AM	31	102	0	133	134	0	0	134	2	40	0	42	309
11:30 AM	41	103	0	144	118	2	0	120	1	42	0	43	307
11:45 AM	49	133	0	182	148	4	0	152	0	40	0	40	374
Total	167	448	0	615	513	8	0	521	3	166	0	169	1305
12:00 PM	36	102	0	138	141	1	0	142	1	43	0	44	324
12:15 PM	38	130	0	168	145	1	0	146	4	31	0	35	349
12:30 PM	32	116	0	148	156	3	0	159	0	32	0	32	339
12:45 PM	32	102	0	134	149	2	0	151	1	45	0	46	331
Total	138	450	0	588	591	7	0	598	6	151	0	157	1343
Grand Total	305	898	0	1203	1104	15	0	1119	9	317	0	326	2648
Approach %	25.4	74.6	0.0		98.7	1.3	0.0		2.8	97.2	0.0		
Total %	11.5	33.9	0.0	45.4	41.7	0.6	0.0	42.3	0.3	12.0	0.0	12.3	
Exiting Leg Total				1421				907				320	2648
Cars	301	887	0	1188	1096	15	0	1111	9	314	0	323	2622
% Cars	98.7	98.8	0.0	98.8	99.3	100.0	0.0	99.3	100.0	99.1	0.0	99.1	99.0
Exiting Leg Total				1410				896				316	2622
Heavy Vehicles	4	11	0	15	8	0	0	8	0	3	0	3	26
% Heavy Vehicles	1.3	1.2	0.0	1.2	0.7	0.0	0.0	0.7	0.0	0.9	0.0	0.9	1.0
Exiting Leg Total				11				11				4	26

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:45 AM	49	133	0	182	148	4	0	152	0	40	0	40	374
12:00 PM	36	102	0	138	141	1	0	142	1	43	0	44	324
12:15 PM	38	130	0	168	145	1	0	146	4	31	0	35	349
12:30 PM	32	116	0	148	156	3	0	159	0	32	0	32	339
Total Volume	155	481	0	636	590	9	0	599	5	146	0	151	1386
% Approach Total	24.4	75.6	0.0		98.5	1.5	0.0		3.3	96.7	0.0		
PHF	0.791	0.904	0.000	0.874	0.946	0.563	0.000	0.942	0.313	0.849	0.000	0.858	0.926
Cars	152	473	0	625	588	9	0	597	5	144	0	149	1371
Cars %	98.1	98.3	0.0	98.3	99.7	100.0	0.0	99.7	100.0	98.6	0.0	98.7	98.9
Heavy Vehicles	3	8	0	11	2	0	0	2	0	2	0	2	15
Heavy Vehicles %	1.9	1.7	0.0	1.7	0.3	0.0	0.0	0.3	0.0	1.4	0.0	1.3	1.1
Cars Enter Leg	152	473	0	625	588	9	0	597	5	144	0	149	1371
Heavy Enter Leg	3	8	0	11	2	0	0	2	0	2	0	2	15
Total Entering Leg	155	481	0	636	590	9	0	599	5	146	0	151	1386
Cars Exiting Leg				732				478				161	1371
Heavy Exiting Leg				4				8				3	15
Total Exiting Leg				736				486				164	1386

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	46	110	0	156	111	2	0	113	0	44	0	44	313
11:15 AM	31	100	0	131	131	0	0	131	2	40	0	42	304
11:30 AM	40	102	0	142	117	2	0	119	1	41	0	42	303
11:45 AM	48	129	0	177	148	4	0	152	0	39	0	39	368
Total	165	441	0	606	507	8	0	515	3	164	0	167	1288
12:00 PM	34	100	0	134	139	1	0	140	1	43	0	44	318
12:15 PM	38	129	0	167	145	1	0	146	4	30	0	34	347
12:30 PM	32	115	0	147	156	3	0	159	0	32	0	32	338
12:45 PM	32	102	0	134	149	2	0	151	1	45	0	46	331
Total	136	446	0	582	589	7	0	596	6	150	0	156	1334
Grand Total	301	887	0	1188	1096	15	0	1111	9	314	0	323	2622
Approach %	25.3	74.7	0.0		98.6	1.4	0.0		2.8	97.2	0.0		
Total %	11.5	33.8	0.0	45.3	41.8	0.6	0.0	42.4	0.3	12.0	0.0	12.3	
Exiting Leg Total				1410				896				316	2622

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:45 AM	48	129	0	177	148	4	0	152	0	39	0	39	368
12:00 PM	34	100	0	134	139	1	0	140	1	43	0	44	318
12:15 PM	38	129	0	167	145	1	0	146	4	30	0	34	347
12:30 PM	32	115	0	147	156	3	0	159	0	32	0	32	338
Total Volume	152	473	0	625	588	9	0	597	5	144	0	149	1371
% Approach Total	24.3	75.7	0.0		98.5	1.5	0.0		3.4	96.6	0.0		
PHF	0.792	0.917	0.000	0.883	0.942	0.563	0.000	0.939	0.313	0.837	0.000	0.847	0.931
Entering Leg	152	473	0	625	588	9	0	597	5	144	0	149	1371
Exiting Leg				732				478				161	1371
Total				1357				1075				310	2742

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
11:15 AM	0	2	0	2	3	0	0	3	0	0	0	0	5
11:30 AM	1	1	0	2	1	0	0	1	0	1	0	1	4
11:45 AM	1	4	0	5	0	0	0	0	0	1	0	1	6
Total	2	7	0	9	6	0	0	6	0	2	0	2	17
12:00 PM	2	2	0	4	2	0	0	2	0	0	0	0	6
12:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	2
12:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	4	0	6	2	0	0	2	0	1	0	1	9
Grand Total	4	11	0	15	8	0	0	8	0	3	0	3	26
Approach %	26.7	73.3	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	15.4	42.3	0.0	57.7	30.8	0.0	0.0	30.8	0.0	11.5	0.0	11.5	
Exiting Leg Total				11				11				4	26
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total				0				0				0	0
Single-Unit Trucks	3	11	0	14	8	0	0	8	0	2	0	2	24
% Single-Unit	75.0	100.0	0.0	93.3	100.0	0.0	0.0	100.0	0.0	66.7	0.0	66.7	92.3
Exiting Leg Total				10				11				3	24
Articulated Trucks	1	0	0	1	0	0	0	0	0	1	0	1	2
% Articulated	25.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	33.3	0.0	33.3	7.7
Exiting Leg Total				1				0				1	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:15 AM	0	2	0	2	3	0	0	3	0	0	0	0	5
11:30 AM	1	1	0	2	1	0	0	1	0	1	0	1	4
11:45 AM	1	4	0	5	0	0	0	0	0	1	0	1	6
12:00 PM	2	2	0	4	2	0	0	2	0	0	0	0	6
Total Volume	4	9	0	13	6	0	0	6	0	2	0	2	21
% Approach Total	30.8	69.2	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.500	0.563	0.000	0.650	0.500	0.000	0.000	0.500	0.000	0.500	0.000	0.500	0.875
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	3	9	0	12	6	0	0	6	0	2	0	2	20
Single-Unit %	75.0	100.0	0.0	92.3	100.0	0.0	0.0	100.0	0.0	100.0	0.0	100.0	95.2
Articulated Trucks	1	0	0	1	0	0	0	0	0	0	0	0	1
Articulated %	25.0	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	3	9	0	12	6	0	0	6	0	2	0	2	20
Articulated Trucks	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Entering Leg	4	9	0	13	6	0	0	6	0	2	0	2	21
Buses				0				0				0	0
Single-Unit Trucks				8				9				3	20
Articulated Trucks				0				0				1	1
Total Exiting Leg				8				9				4	21

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:45 PM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	1
% Approach Total	0.0	0.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	1	0	0	1	0	0	0	0	1
Exiting Leg				1				0				0	1
Total				1				1				0	2

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
11:15 AM	0	2	0	2	3	0	0	3	0	0	0	0	5
11:30 AM	1	1	0	2	1	0	0	1	0	1	0	1	4
11:45 AM	0	4	0	4	0	0	0	0	0	1	0	1	5
Total	1	7	0	8	6	0	0	6	0	2	0	2	16
12:00 PM	2	2	0	4	2	0	0	2	0	0	0	0	6
12:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	4	0	6	2	0	0	2	0	0	0	0	8
Grand Total	3	11	0	14	8	0	0	8	0	2	0	2	24
Approach %	21.4	78.6	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	12.5	45.8	0.0	58.3	33.3	0.0	0.0	33.3	0.0	8.3	0.0	8.3	
Exiting Leg Total				10				11				3	24

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:15 AM	0	2	0	2	3	0	0	3	0	0	0	0	5
11:30 AM	1	1	0	2	1	0	0	1	0	1	0	1	4
11:45 AM	0	4	0	4	0	0	0	0	0	1	0	1	5
12:00 PM	2	2	0	4	2	0	0	2	0	0	0	0	6
Total Volume	3	9	0	12	6	0	0	6	0	2	0	2	20
% Approach Total	25.0	75.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.375	0.563	0.000	0.750	0.500	0.000	0.000	0.500	0.000	0.500	0.000	0.500	0.833
Entering Leg	3	9	0	12	6	0	0	6	0	2	0	2	20
Exiting Leg				8				9				3	20
Total				20				15				5	40

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	1	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	1	0	0	1	0	0	0	0	0	1	0	1	2
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	
Exiting Leg Total				1				0				1	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	1	0	0	1	0	0	0	0	0	1	0	1	2
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.500
Entering Leg	1	0	0	1	0	0	0	0	0	1	0	1	2
Exiting Leg				1				0				1	2
Total				2				0				2	4

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	2	1	0	0	0	3	1	0	0	0	0	1	0	0	0	0	0	0	4
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
11:45 AM	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
Total	3	1	0	0	0	4	3	0	0	0	0	3	0	0	0	0	0	0	7
12:00 PM	0	3	0	0	0	3	1	0	0	0	0	1	1	1	0	0	0	2	6
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
12:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	2	3
Total	0	7	0	0	0	7	1	0	0	0	1	2	2	2	0	0	0	4	13
Grand Total	3	8	0	0	0	11	4	0	0	0	1	5	2	2	0	0	0	4	20
Approach %	27.3	72.7	0.0	0.0	0.0		80.0	0.0	0.0	0.0	20.0		50.0	50.0	0.0	0.0	0.0		
Total %	15.0	40.0	0.0	0.0	0.0	55.0	20.0	0.0	0.0	0.0	5.0	25.0	10.0	10.0	0.0	0.0	0.0	20.0	
Exiting Leg Total						6						11						3	20

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
12:00 PM	0	3	0	0	0	3	1	0	0	0	0	1	1	1	0	0	0	2	6
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
12:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	2	3
Total Volume	0	7	0	0	0	7	1	0	0	0	1	2	2	2	0	0	0	4	13
% Approach Total	0.0	100.0	0.0	0.0	0.0		50.0	0.0	0.0	0.0	50.0		50.0	50.0	0.0	0.0	0.0		
PHF	0.000	0.438	0.000	0.000	0.000	0.438	0.250	0.000	0.000	0.000	0.250	0.500	0.500	0.500	0.000	0.000	0.000	0.500	0.542
Entering Leg	0	7	0	0	0	7	1	0	0	0	1	2	2	2	0	0	0	4	13
Exiting Leg						3						10						0	13
Total						10						12						4	26

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	2
Grand Total	0	0	0	0	1	1	0	0	0	1	1	2	0	0	0	1	0	1	4
Approach %	0	0	0	0	100		0	0	0	50	50		0	0	0	100	0		
Total %	0	0	0	0	25	25	0	0	0	25	25	50	0	0	0	25	0	25	
Exiting Leg Total						1						2						1	4

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	50.0	50.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	2
Exiting Leg						0						2						0	2
Total						0						4						0	4

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	28	73	0	101	106	0	0	106	0	63	0	63	270
7:15 AM	36	87	0	123	136	0	0	136	1	62	0	63	322
7:30 AM	58	91	0	149	146	1	0	147	4	58	0	62	358
7:45 AM	57	94	0	151	134	3	0	137	0	43	0	43	331
Total	179	345	0	524	522	4	0	526	5	226	0	231	1281
8:00 AM	30	74	0	104	88	1	0	89	0	55	0	55	248
8:15 AM	48	84	0	132	106	2	0	108	0	55	0	55	295
8:30 AM	49	73	0	122	102	1	0	103	0	34	0	34	259
8:45 AM	29	64	0	93	78	0	0	78	0	23	0	23	194
Total	156	295	0	451	374	4	0	378	0	167	0	167	996
Grand Total	335	640	0	975	896	8	0	904	5	393	0	398	2277
Approach %	34.4	65.6	0.0		99.1	0.9	0.0		1.3	98.7	0.0		
Total %	14.7	28.1	0.0	42.8	39.4	0.4	0.0	39.7	0.2	17.3	0.0	17.5	
Exiting Leg Total				1289				645				343	2277
Cars	313	605	0	918	849	8	0	857	5	389	0	394	2169
% Cars	93.4	94.5	0.0	94.2	94.8	100.0	0.0	94.8	100.0	99.0	0.0	99.0	95.3
Exiting Leg Total				1238				610				321	2169
Heavy Vehicles	22	35	0	57	47	0	0	47	0	4	0	4	108
% Heavy Vehicles	6.6	5.5	0.0	5.8	5.2	0.0	0.0	5.2	0.0	1.0	0.0	1.0	4.7
Exiting Leg Total				51				35				22	108

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	28	73	0	101	106	0	0	106	0	63	0	63	270
7:15 AM	36	87	0	123	136	0	0	136	1	62	0	63	322
7:30 AM	58	91	0	149	146	1	0	147	4	58	0	62	358
7:45 AM	57	94	0	151	134	3	0	137	0	43	0	43	331
Total Volume	179	345	0	524	522	4	0	526	5	226	0	231	1281
% Approach Total	34.2	65.8	0.0		99.2	0.8	0.0		2.2	97.8	0.0		
PHF	0.772	0.918	0.000	0.868	0.894	0.333	0.000	0.895	0.313	0.897	0.000	0.917	0.895
Cars	163	331	0	494	488	4	0	492	5	225	0	230	1216
Cars %	91.1	95.9	0.0	94.3	93.5	100.0	0.0	93.5	100.0	99.6	0.0	99.6	94.9
Heavy Vehicles	16	14	0	30	34	0	0	34	0	1	0	1	65
Heavy Vehicles %	8.9	4.1	0.0	5.7	6.5	0.0	0.0	6.5	0.0	0.4	0.0	0.4	5.1
Cars Enter Leg	163	331	0	494	488	4	0	492	5	225	0	230	1216
Heavy Enter Leg	16	14	0	30	34	0	0	34	0	1	0	1	65
Total Entering Leg	179	345	0	524	522	4	0	526	5	226	0	231	1281
Cars Exiting Leg				713				336				167	1216
Heavy Exiting Leg				35				14				16	65
Total Exiting Leg				748				350				183	1281

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	28	70	0	98	101	0	0	101	0	62	0	62	261
7:15 AM	32	85	0	117	130	0	0	130	1	62	0	63	310
7:30 AM	55	86	0	141	132	1	0	133	4	58	0	62	336
7:45 AM	48	90	0	138	125	3	0	128	0	43	0	43	309
Total	163	331	0	494	488	4	0	492	5	225	0	230	1216
8:00 AM	29	70	0	99	85	1	0	86	0	54	0	54	239
8:15 AM	46	76	0	122	105	2	0	107	0	55	0	55	284
8:30 AM	47	71	0	118	100	1	0	101	0	33	0	33	252
8:45 AM	28	57	0	85	71	0	0	71	0	22	0	22	178
Total	150	274	0	424	361	4	0	365	0	164	0	164	953
Grand Total	313	605	0	918	849	8	0	857	5	389	0	394	2169
Approach %	34.1	65.9	0.0		99.1	0.9	0.0		1.3	98.7	0.0		
Total %	14.4	27.9	0.0	42.3	39.1	0.4	0.0	39.5	0.2	17.9	0.0	18.2	
Exiting Leg Total				1238				610				321	2169

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	28	70	0	98	101	0	0	101	0	62	0	62	261
7:15 AM	32	85	0	117	130	0	0	130	1	62	0	63	310
7:30 AM	55	86	0	141	132	1	0	133	4	58	0	62	336
7:45 AM	48	90	0	138	125	3	0	128	0	43	0	43	309
Total Volume	163	331	0	494	488	4	0	492	5	225	0	230	1216
% Approach Total	33.0	67.0	0.0		99.2	0.8	0.0		2.2	97.8	0.0		
PHF	0.741	0.919	0.000	0.876	0.924	0.333	0.000	0.925	0.313	0.907	0.000	0.913	0.905
Entering Leg	163	331	0	494	488	4	0	492	5	225	0	230	1216
Exiting Leg				713				336				167	1216
Total				1207				828				397	2432

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	3	0	3	5	0	0	5	0	1	0	1	9
7:15 AM	4	2	0	6	6	0	0	6	0	0	0	0	12
7:30 AM	3	5	0	8	14	0	0	14	0	0	0	0	22
7:45 AM	9	4	0	13	9	0	0	9	0	0	0	0	22
Total	16	14	0	30	34	0	0	34	0	1	0	1	65
8:00 AM	1	4	0	5	3	0	0	3	0	1	0	1	9
8:15 AM	2	8	0	10	1	0	0	1	0	0	0	0	11
8:30 AM	2	2	0	4	2	0	0	2	0	1	0	1	7
8:45 AM	1	7	0	8	7	0	0	7	0	1	0	1	16
Total	6	21	0	27	13	0	0	13	0	3	0	3	43
Grand Total	22	35	0	57	47	0	0	47	0	4	0	4	108
Approach %	38.6	61.4	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	20.4	32.4	0.0	52.8	43.5	0.0	0.0	43.5	0.0	3.7	0.0	3.7	
Exiting Leg Total				51				35				22	108
Buses	13	7	0	20	16	0	0	16	0	2	0	2	38
% Buses	59.1	20.0	0.0	35.1	34.0	0.0	0.0	34.0	0.0	50.0	0.0	50.0	35.2
Exiting Leg Total				18				7				13	38
Single-Unit Trucks	9	23	0	32	29	0	0	29	0	1	0	1	62
% Single-Unit	40.9	65.7	0.0	56.1	61.7	0.0	0.0	61.7	0.0	25.0	0.0	25.0	57.4
Exiting Leg Total				30				23				9	62
Articulated Trucks	0	5	0	5	2	0	0	2	0	1	0	1	8
% Articulated	0.0	14.3	0.0	8.8	4.3	0.0	0.0	4.3	0.0	25.0	0.0	25.0	7.4
Exiting Leg Total				3				5				0	8

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	3	0	3	5	0	0	5	0	1	0	1	9
7:15 AM	4	2	0	6	6	0	0	6	0	0	0	0	12
7:30 AM	3	5	0	8	14	0	0	14	0	0	0	0	22
7:45 AM	9	4	0	13	9	0	0	9	0	0	0	0	22
Total Volume	16	14	0	30	34	0	0	34	0	1	0	1	65
% Approach Total	53.3	46.7	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.444	0.700	0.000	0.577	0.607	0.000	0.000	0.607	0.000	0.250	0.000	0.250	0.739
Buses	11	4	0	15	15	0	0	15	0	0	0	0	30
Buses %	68.8	28.6	0.0	50.0	44.1	0.0	0.0	44.1	0.0	0.0	0.0	0.0	46.2
Single-Unit Trucks	5	7	0	12	17	0	0	17	0	0	0	0	29
Single-Unit %	31.3	50.0	0.0	40.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	44.6
Articulated Trucks	0	3	0	3	2	0	0	2	0	1	0	1	6
Articulated %	0.0	21.4	0.0	10.0	5.9	0.0	0.0	5.9	0.0	100.0	0.0	100.0	9.2
Buses	11	4	0	15	15	0	0	15	0	0	0	0	30
Single-Unit Trucks	5	7	0	12	17	0	0	17	0	0	0	0	29
Articulated Trucks	0	3	0	3	2	0	0	2	0	1	0	1	6
Total Entering Leg	16	14	0	30	34	0	0	34	0	1	0	1	65
Buses				15				4				11	30
Single-Unit Trucks				17				7				5	29
Articulated Trucks				3				3				0	6
Total Exiting Leg				35				14				16	65

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Buses**

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:15 AM	1	0	0	1	3	0	0	3	0	0	0	0	4
7:30 AM	3	1	0	4	8	0	0	8	0	0	0	0	12
7:45 AM	7	3	0	10	3	0	0	3	0	0	0	0	13
Total	11	4	0	15	15	0	0	15	0	0	0	0	30
8:00 AM	1	1	0	2	0	0	0	0	0	1	0	1	3
8:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
8:45 AM	0	1	0	1	1	0	0	1	0	1	0	1	3
Total	2	3	0	5	1	0	0	1	0	2	0	2	8
Grand Total	13	7	0	20	16	0	0	16	0	2	0	2	38
Approach %	65.0	35.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	34.2	18.4	0.0	52.6	42.1	0.0	0.0	42.1	0.0	5.3	0.0	5.3	
Exiting Leg Total				18				7				13	38

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	1	0	0	1	3	0	0	3	0	0	0	0	4
7:30 AM	3	1	0	4	8	0	0	8	0	0	0	0	12
7:45 AM	7	3	0	10	3	0	0	3	0	0	0	0	13
8:00 AM	1	1	0	2	0	0	0	0	0	1	0	1	3
Total Volume	12	5	0	17	14	0	0	14	0	1	0	1	32
% Approach Total	70.6	29.4	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.429	0.417	0.000	0.425	0.438	0.000	0.000	0.438	0.000	0.250	0.000	0.250	0.615
Entering Leg	12	5	0	17	14	0	0	14	0	1	0	1	32
Exiting Leg				15				5				12	32
Total				32				19				13	64

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	2	0	2	4	0	0	4	0	0	0	0	6
7:15 AM	3	2	0	5	2	0	0	2	0	0	0	0	7
7:30 AM	0	2	0	2	5	0	0	5	0	0	0	0	7
7:45 AM	2	1	0	3	6	0	0	6	0	0	0	0	9
Total	5	7	0	12	17	0	0	17	0	0	0	0	29
8:00 AM	0	2	0	2	3	0	0	3	0	0	0	0	5
8:15 AM	1	8	0	9	1	0	0	1	0	0	0	0	10
8:30 AM	2	1	0	3	2	0	0	2	0	1	0	1	6
8:45 AM	1	5	0	6	6	0	0	6	0	0	0	0	12
Total	4	16	0	20	12	0	0	12	0	1	0	1	33
Grand Total	9	23	0	32	29	0	0	29	0	1	0	1	62
Approach %	28.1	71.9	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	14.5	37.1	0.0	51.6	46.8	0.0	0.0	46.8	0.0	1.6	0.0	1.6	
Exiting Leg Total				30				23				9	62

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	0	2	0	2	3	0	0	3	0	0	0	0	5
8:15 AM	1	8	0	9	1	0	0	1	0	0	0	0	10
8:30 AM	2	1	0	3	2	0	0	2	0	1	0	1	6
8:45 AM	1	5	0	6	6	0	0	6	0	0	0	0	12
Total Volume	4	16	0	20	12	0	0	12	0	1	0	1	33
% Approach Total	20.0	80.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.500	0.500	0.000	0.556	0.500	0.000	0.000	0.500	0.000	0.250	0.000	0.250	0.688
Entering Leg	4	16	0	20	12	0	0	12	0	1	0	1	33
Exiting Leg				13				16				4	33
Total				33				28				5	66

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	1	0	1	0	0	0	0	0	1	0	1	2
7:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:30 AM	0	2	0	2	1	0	0	1	0	0	0	0	3
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	3	2	0	0	2	0	1	0	1	6
8:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	2	0	2	0	0	0	0	0	0	0	0	2
Grand Total	0	5	0	5	2	0	0	2	0	1	0	1	8
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	0.0	62.5	0.0	62.5	25.0	0.0	0.0	25.0	0.0	12.5	0.0	12.5	
Exiting Leg Total				3				5				0	8

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	1	0	1	0	0	0	0	0	1	0	1	2
7:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:30 AM	0	2	0	2	1	0	0	1	0	0	0	0	3
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	3	0	3	2	0	0	2	0	1	0	1	6
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.375	0.000	0.375	0.500	0.000	0.000	0.500	0.000	0.250	0.000	0.250	0.500
Entering Leg	0	3	0	3	2	0	0	2	0	1	0	1	6
Exiting Leg				3				3				0	6
Total				6				5				1	12

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	2
Grand Total	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	2
Approach %	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	0.0	0.0	0.0	50.0	
Exiting Leg Total						2						0						0	2

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	2
Total Volume	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	2
Exiting Leg						2						0						0	2
Total						2						1						1	4

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4
Grand Total	0	0	0	1	0	1	0	0	0	0	5	5	0	0	0	0	0	0	6
Approach %	0	0	0	100	0		0	0	0	0	100		0	0	0	0	0		
Total %	0	0	0	16.667	0	16.667	0	0	0	0	83.333	83.333	0	0	0	0	0	0	
Exiting Leg Total						1						5						0	6

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4
Total Volume	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4
Exiting Leg						0						4						0	4
Total						0						8						0	8

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	52	76	0	128	85	7	0	92	2	41	1	44	264
2:15 PM	82	131	0	213	95	7	0	102	6	32	0	38	353
2:30 PM	45	105	0	150	117	2	0	119	1	46	0	47	316
2:45 PM	46	120	0	166	144	1	0	145	5	32	0	37	348
Total	225	432	0	657	441	17	0	458	14	151	1	166	1281
3:00 PM	41	103	0	144	147	1	0	148	2	36	0	38	330
3:15 PM	46	106	0	152	146	0	0	146	0	52	0	52	350
3:30 PM	48	109	0	157	141	3	0	144	2	47	0	49	350
3:45 PM	32	107	0	139	162	2	0	164	2	42	0	44	347
Total	167	425	0	592	596	6	0	602	6	177	0	183	1377
Grand Total	392	857	0	1249	1037	23	0	1060	20	328	1	349	2658
Approach %	31.4	68.6	0.0		97.8	2.2	0.0		5.7	94.0	0.3		
Total %	14.7	32.2	0.0	47.0	39.0	0.9	0.0	39.9	0.8	12.3	0.0	13.1	
Exiting Leg Total				1365				877				416	2658
Cars	387	840	0	1227	1019	21	0	1040	19	317	1	337	2604
% Cars	98.7	98.0	0.0	98.2	98.3	91.3	0.0	98.1	95.0	96.6	100.0	96.6	98.0
Exiting Leg Total				1336				859				409	2604
Heavy Vehicles	5	17	0	22	18	2	0	20	1	11	0	12	54
% Heavy Vehicles	1.3	2.0	0.0	1.8	1.7	8.7	0.0	1.9	5.0	3.4	0.0	3.4	2.0
Exiting Leg Total				29				18				7	54

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:45 PM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:45 PM	46	120	0	166	144	1	0	145	5	32	0	37	348
3:00 PM	41	103	0	144	147	1	0	148	2	36	0	38	330
3:15 PM	46	106	0	152	146	0	0	146	0	52	0	52	350
3:30 PM	48	109	0	157	141	3	0	144	2	47	0	49	350
Total Volume	181	438	0	619	578	5	0	583	9	167	0	176	1378
% Approach Total	29.2	70.8	0.0		99.1	0.9	0.0		5.1	94.9	0.0		
PHF	0.943	0.913	0.000	0.932	0.983	0.417	0.000	0.985	0.450	0.803	0.000	0.846	0.984
Cars	179	428	0	607	569	4	0	573	9	166	0	175	1355
Cars %	98.9	97.7	0.0	98.1	98.4	80.0	0.0	98.3	100.0	99.4	0.0	99.4	98.3
Heavy Vehicles	2	10	0	12	9	1	0	10	0	1	0	1	23
Heavy Vehicles %	1.1	2.3	0.0	1.9	1.6	20.0	0.0	1.7	0.0	0.6	0.0	0.6	1.7
Cars Enter Leg	179	428	0	607	569	4	0	573	9	166	0	175	1355
Heavy Enter Leg	2	10	0	12	9	1	0	10	0	1	0	1	23
Total Entering Leg	181	438	0	619	578	5	0	583	9	167	0	176	1378
Cars Exiting Leg				735				437				183	1355
Heavy Exiting Leg				10				10				3	23
Total Exiting Leg				745				447				186	1378

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	52	75	0	127	84	7	0	91	2	41	1	44	262
2:15 PM	80	128	0	208	92	7	0	99	6	27	0	33	340
2:30 PM	44	104	0	148	114	2	0	116	1	43	0	44	308
2:45 PM	46	115	0	161	139	1	0	140	5	32	0	37	338
Total	222	422	0	644	429	17	0	446	14	143	1	158	1248
3:00 PM	41	100	0	141	147	1	0	148	2	35	0	37	326
3:15 PM	44	106	0	150	142	0	0	142	0	52	0	52	344
3:30 PM	48	107	0	155	141	2	0	143	2	47	0	49	347
3:45 PM	32	105	0	137	160	1	0	161	1	40	0	41	339
Total	165	418	0	583	590	4	0	594	5	174	0	179	1356
Grand Total	387	840	0	1227	1019	21	0	1040	19	317	1	337	2604
Approach %	31.5	68.5	0.0		98.0	2.0	0.0		5.6	94.1	0.3		
Total %	14.9	32.3	0.0	47.1	39.1	0.8	0.0	39.9	0.7	12.2	0.0	12.9	
Exiting Leg Total				1336				859				409	2604

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

3:00 PM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
3:00 PM	41	100	0	141	147	1	0	148	2	35	0	37	326
3:15 PM	44	106	0	150	142	0	0	142	0	52	0	52	344
3:30 PM	48	107	0	155	141	2	0	143	2	47	0	49	347
3:45 PM	32	105	0	137	160	1	0	161	1	40	0	41	339
Total Volume	165	418	0	583	590	4	0	594	5	174	0	179	1356
% Approach Total	28.3	71.7	0.0		99.3	0.7	0.0		2.8	97.2	0.0		
PHF	0.859	0.977	0.000	0.940	0.922	0.500	0.000	0.922	0.625	0.837	0.000	0.861	0.977
Entering Leg	165	418	0	583	590	4	0	594	5	174	0	179	1356
Exiting Leg				764				423				169	1356
Total				1347				1017				348	2712

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
2:15 PM	2	3	0	5	3	0	0	3	0	5	0	5	13
2:30 PM	1	1	0	2	3	0	0	3	0	3	0	3	8
2:45 PM	0	5	0	5	5	0	0	5	0	0	0	0	10
Total	3	10	0	13	12	0	0	12	0	8	0	8	33
3:00 PM	0	3	0	3	0	0	0	0	0	1	0	1	4
3:15 PM	2	0	0	2	4	0	0	4	0	0	0	0	6
3:30 PM	0	2	0	2	0	1	0	1	0	0	0	0	3
3:45 PM	0	2	0	2	2	1	0	3	1	2	0	3	8
Total	2	7	0	9	6	2	0	8	1	3	0	4	21
Grand Total	5	17	0	22	18	2	0	20	1	11	0	12	54
Approach %	22.7	77.3	0.0		90.0	10.0	0.0		8.3	91.7	0.0		
Total %	9.3	31.5	0.0	40.7	33.3	3.7	0.0	37.0	1.9	20.4	0.0	22.2	
Exiting Leg Total				29				18				7	54
Buses	1	3	0	4	4	0	0	4	0	2	0	2	10
% Buses	20.0	17.6	0.0	18.2	22.2	0.0	0.0	20.0	0.0	18.2	0.0	16.7	18.5
Exiting Leg Total				6				3				1	10
Single-Unit Trucks	4	12	0	16	12	1	0	13	1	6	0	7	36
% Single-Unit	80.0	70.6	0.0	72.7	66.7	50.0	0.0	65.0	100.0	54.5	0.0	58.3	66.7
Exiting Leg Total				18				13				5	36
Articulated Trucks	0	2	0	2	2	1	0	3	0	3	0	3	8
% Articulated	0.0	11.8	0.0	9.1	11.1	50.0	0.0	15.0	0.0	27.3	0.0	25.0	14.8
Exiting Leg Total				5				2				1	8

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:15 PM	2	3	0	5	3	0	0	3	0	5	0	5	13
2:30 PM	1	1	0	2	3	0	0	3	0	3	0	3	8
2:45 PM	0	5	0	5	5	0	0	5	0	0	0	0	10
3:00 PM	0	3	0	3	0	0	0	0	0	1	0	1	4
Total Volume	3	12	0	15	11	0	0	11	0	9	0	9	35
% Approach Total	20.0	80.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.375	0.600	0.000	0.750	0.550	0.000	0.000	0.550	0.000	0.450	0.000	0.450	0.673
Buses	1	3	0	4	3	0	0	3	0	2	0	2	9
Buses %	33.3	25.0	0.0	26.7	27.3	0.0	0.0	27.3	0.0	22.2	0.0	22.2	25.7
Single-Unit Trucks	2	7	0	9	6	0	0	6	0	5	0	5	20
Single-Unit %	66.7	58.3	0.0	60.0	54.5	0.0	0.0	54.5	0.0	55.6	0.0	55.6	57.1
Articulated Trucks	0	2	0	2	2	0	0	2	0	2	0	2	6
Articulated %	0.0	16.7	0.0	13.3	18.2	0.0	0.0	18.2	0.0	22.2	0.0	22.2	17.1
Buses	1	3	0	4	3	0	0	3	0	2	0	2	9
Single-Unit Trucks	2	7	0	9	6	0	0	6	0	5	0	5	20
Articulated Trucks	0	2	0	2	2	0	0	2	0	2	0	2	6
Total Entering Leg	3	12	0	15	11	0	0	11	0	9	0	9	35
Buses				5				3				1	9
Single-Unit Trucks				11				7				2	20
Articulated Trucks				4				2				0	6
Total Exiting Leg				20				12				3	35

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	1	0	1	2	0	0	2	0	1	0	1	4
2:30 PM	1	0	0	1	1	0	0	1	0	1	0	1	3
2:45 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total	1	3	0	4	3	0	0	3	0	2	0	2	9
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
Grand Total	1	3	0	4	4	0	0	4	0	2	0	2	10
Approach %	25.0	75.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	10.0	30.0	0.0	40.0	40.0	0.0	0.0	40.0	0.0	20.0	0.0	20.0	
Exiting Leg Total				6				3				1	10

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	1	0	1	2	0	0	2	0	1	0	1	4
2:30 PM	1	0	0	1	1	0	0	1	0	1	0	1	3
2:45 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total Volume	1	3	0	4	3	0	0	3	0	2	0	2	9
% Approach Total	25.0	75.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.250	0.375	0.000	0.500	0.375	0.000	0.000	0.375	0.000	0.500	0.000	0.500	0.563
Entering Leg	1	3	0	4	3	0	0	3	0	2	0	2	9
Exiting Leg				5				3				1	9
Total				9				6				3	18

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
2:15 PM	2	1	0	3	1	0	0	1	0	3	0	3	7
2:30 PM	0	1	0	1	1	0	0	1	0	1	0	1	3
2:45 PM	0	3	0	3	4	0	0	4	0	0	0	0	7
Total	2	6	0	8	7	0	0	7	0	4	0	4	19
3:00 PM	0	2	0	2	0	0	0	0	0	1	0	1	3
3:15 PM	2	0	0	2	4	0	0	4	0	0	0	0	6
3:30 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
3:45 PM	0	2	0	2	1	1	0	2	1	1	0	2	6
Total	2	6	0	8	5	1	0	6	1	2	0	3	17
Grand Total	4	12	0	16	12	1	0	13	1	6	0	7	36
Approach %	25.0	75.0	0.0		92.3	7.7	0.0		14.3	85.7	0.0		
Total %	11.1	33.3	0.0	44.4	33.3	2.8	0.0	36.1	2.8	16.7	0.0	19.4	
Exiting Leg Total				18				13				5	36

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:15 PM	2	1	0	3	1	0	0	1	0	3	0	3	7
2:30 PM	0	1	0	1	1	0	0	1	0	1	0	1	3
2:45 PM	0	3	0	3	4	0	0	4	0	0	0	0	7
3:00 PM	0	2	0	2	0	0	0	0	0	1	0	1	3
Total Volume	2	7	0	9	6	0	0	6	0	5	0	5	20
% Approach Total	22.2	77.8	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.250	0.583	0.000	0.750	0.375	0.000	0.000	0.375	0.000	0.417	0.000	0.417	0.714
Entering Leg	2	7	0	9	6	0	0	6	0	5	0	5	20
Exiting Leg				11				7				2	20
Total				20				13				7	40

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	2
2:30 PM	0	0	0	0	1	0	0	1	0	1	0	1	2
2:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	1	0	1	2	0	0	2	0	2	0	2	5
3:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	1	0	1	0	1	0	1	0	1	0	1	3
Grand Total	0	2	0	2	2	1	0	3	0	3	0	3	8
Approach %	0.0	100.0	0.0		66.7	33.3	0.0		0.0	100.0	0.0		
Total %	0.0	25.0	0.0	25.0	25.0	12.5	0.0	37.5	0.0	37.5	0.0	37.5	
Exiting Leg Total				5				2				1	8

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North				Farm Street from South				Old Nahant Road (North) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	2
2:30 PM	0	0	0	0	1	0	0	1	0	1	0	1	2
2:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
3:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	2	0	2	2	0	0	2	0	2	0	2	6
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.500	0.000	0.500	0.500	0.000	0.000	0.500	0.000	0.500	0.000	0.500	0.750
Entering Leg	0	2	0	2	2	0	0	2	0	2	0	2	6
Exiting Leg				4				2				0	6
Total				6				4				2	12

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	1	1	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	2	4
Total	1	1	0	0	0	2	0	0	0	0	0	0	1	1	0	0	1	3	5
Grand Total	1	2	0	0	0	3	0	0	0	0	0	0	1	1	0	0	1	3	6
Approach %	33.3	66.7	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		33.3	33.3	0.0	0.0	33.3		
Total %	16.7	33.3	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	16.7	0.0	0.0	16.7	50.0	
Exiting Leg Total						1						3						2	6

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

3:00 PM	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	1	1	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	2	4
Total Volume	1	1	0	0	0	2	0	0	0	0	0	0	1	1	0	0	1	3	5
% Approach Total	50.0	50.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		33.3	33.3	0.0	0.0	33.3		
PHF	0.250	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.250	0.375	0.313
Entering Leg	1	1	0	0	0	2	0	0	0	0	0	0	1	1	0	0	1	3	5
Exiting Leg						1						2						2	5
Total						3						2						5	10

PDI File #: **217949 D**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (North)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	3	4
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	3	4
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	3	4
Approach %	0	0	0	0	0		0	0	0	100	0		0	0	0	0	100		
Total %	0	0	0	0	0	0	0	0	0	25	0	25	0	0	0	0	75	75	
Exiting Leg Total						0						1						3	4

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	Farm Street from North						Farm Street from South						Old Nahant Road (North) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	3	4
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	3	4
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	100.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	3	4
Exiting Leg						0						1						3	4
Total						0						2						6	8

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	1	103	0	104	115	10	0	125	11	3	0	14	243
11:15 AM	3	100	0	103	129	8	0	137	7	0	0	7	247
11:30 AM	1	105	0	106	122	7	0	129	6	0	0	6	241
11:45 AM	0	123	0	123	154	11	0	165	6	6	0	12	300
Total	5	431	0	436	520	36	0	556	30	9	0	39	1031
12:00 PM	1	100	0	101	129	8	0	137	12	1	0	13	251
12:15 PM	3	123	0	126	148	6	0	154	9	2	0	11	291
12:30 PM	0	113	0	113	155	4	0	159	10	1	0	11	283
12:45 PM	1	101	0	102	150	13	0	163	3	3	0	6	271
Total	5	437	0	442	582	31	0	613	34	7	0	41	1096
Grand Total	10	868	0	878	1102	67	0	1169	64	16	0	80	2127
Approach %	1.1	98.9	0.0		94.3	5.7	0.0		80.0	20.0	0.0		
Total %	0.5	40.8	0.0	41.3	51.8	3.1	0.0	55.0	3.0	0.8	0.0	3.8	
Exiting Leg Total				1118				932				77	2127
Cars	10	857	0	867	1094	66	0	1160	64	16	0	80	2107
% Cars	100.0	98.7	0.0	98.7	99.3	98.5	0.0	99.2	100.0	100.0	0.0	100.0	99.1
Exiting Leg Total				1110				921				76	2107
Heavy Vehicles	0	11	0	11	8	1	0	9	0	0	0	0	20
% Heavy Vehicles	0.0	1.3	0.0	1.3	0.7	1.5	0.0	0.8	0.0	0.0	0.0	0.0	0.9
Exiting Leg Total				8				11				1	20

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:45 AM	0	123	0	123	154	11	0	165	6	6	0	12	300
12:00 PM	1	100	0	101	129	8	0	137	12	1	0	13	251
12:15 PM	3	123	0	126	148	6	0	154	9	2	0	11	291
12:30 PM	0	113	0	113	155	4	0	159	10	1	0	11	283
Total Volume	4	459	0	463	586	29	0	615	37	10	0	47	1125
% Approach Total	0.9	99.1	0.0		95.3	4.7	0.0		78.7	21.3	0.0		
PHF	0.333	0.933	0.000	0.919	0.945	0.659	0.000	0.932	0.771	0.417	0.000	0.904	0.938
Cars	4	452	0	456	585	28	0	613	37	10	0	47	1116
Cars %	100.0	98.5	0.0	98.5	99.8	96.6	0.0	99.7	100.0	100.0	0.0	100.0	99.2
Heavy Vehicles	0	7	0	7	1	1	0	2	0	0	0	0	9
Heavy Vehicles %	0.0	1.5	0.0	1.5	0.2	3.4	0.0	0.3	0.0	0.0	0.0	0.0	0.8
Cars Enter Leg	4	452	0	456	585	28	0	613	37	10	0	47	1116
Heavy Enter Leg	0	7	0	7	1	1	0	2	0	0	0	0	9
Total Entering Leg	4	459	0	463	586	29	0	615	37	10	0	47	1125
Cars Exiting Leg				595				489				32	1116
Heavy Exiting Leg				1				7				1	9
Total Exiting Leg				596				496				33	1125

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	1	102	0	103	113	10	0	123	11	3	0	14	240
11:15 AM	3	98	0	101	125	8	0	133	7	0	0	7	241
11:30 AM	1	104	0	105	121	7	0	128	6	0	0	6	239
11:45 AM	0	119	0	119	153	11	0	164	6	6	0	12	295
Total	5	423	0	428	512	36	0	548	30	9	0	39	1015
12:00 PM	1	99	0	100	129	8	0	137	12	1	0	13	250
12:15 PM	3	122	0	125	148	6	0	154	9	2	0	11	290
12:30 PM	0	112	0	112	155	3	0	158	10	1	0	11	281
12:45 PM	1	101	0	102	150	13	0	163	3	3	0	6	271
Total	5	434	0	439	582	30	0	612	34	7	0	41	1092
Grand Total	10	857	0	867	1094	66	0	1160	64	16	0	80	2107
Approach %	1.2	98.8	0.0		94.3	5.7	0.0		80.0	20.0	0.0		
Total %	0.5	40.7	0.0	41.1	51.9	3.1	0.0	55.1	3.0	0.8	0.0	3.8	
Exiting Leg Total				1110				921				76	2107

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:45 AM	0	119	0	119	153	11	0	164	6	6	0	12	295
12:00 PM	1	99	0	100	129	8	0	137	12	1	0	13	250
12:15 PM	3	122	0	125	148	6	0	154	9	2	0	11	290
12:30 PM	0	112	0	112	155	3	0	158	10	1	0	11	281
Total Volume	4	452	0	456	585	28	0	613	37	10	0	47	1116
% Approach Total	0.9	99.1	0.0		95.4	4.6	0.0		78.7	21.3	0.0		
PHF	0.333	0.926	0.000	0.912	0.944	0.636	0.000	0.934	0.771	0.417	0.000	0.904	0.946
Entering Leg	4	452	0	456	585	28	0	613	37	10	0	47	1116
Exiting Leg				595				489				32	1116
Total				1051				1102				79	2232

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
11:15 AM	0	2	0	2	4	0	0	4	0	0	0	0	6
11:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
11:45 AM	0	4	0	4	1	0	0	1	0	0	0	0	5
Total	0	8	0	8	8	0	0	8	0	0	0	0	16
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	3	0	1	0	1	0	0	0	0	4
Grand Total	0	11	0	11	8	1	0	9	0	0	0	0	20
Approach %	0.0	100.0	0.0		88.9	11.1	0.0		0.0	0.0	0.0		
Total %	0.0	55.0	0.0	55.0	40.0	5.0	0.0	45.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				8				11				1	20
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total				0				0				0	0
Single-Unit Trucks	0	11	0	11	7	1	0	8	0	0	0	0	19
% Single-Unit	0.0	100.0	0.0	100.0	87.5	100.0	0.0	88.9	0.0	0.0	0.0	0.0	95.0
Exiting Leg Total				7				11				1	19
Articulated Trucks	0	0	0	0	1	0	0	1	0	0	0	0	1
% Articulated	0.0	0.0	0.0	0.0	12.5	0.0	0.0	11.1	0.0	0.0	0.0	0.0	5.0
Exiting Leg Total				1				0				0	1

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
11:15 AM	0	2	0	2	4	0	0	4	0	0	0	0	6
11:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
11:45 AM	0	4	0	4	1	0	0	1	0	0	0	0	5
Total Volume	0	8	0	8	8	0	0	8	0	0	0	0	16
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.500	0.000	0.500	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.667
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	0	8	0	8	7	0	0	7	0	0	0	0	15
Single-Unit %	0.0	100.0	0.0	100.0	87.5	0.0	0.0	87.5	0.0	0.0	0.0	0.0	93.8
Articulated Trucks	0	0	0	0	1	0	0	1	0	0	0	0	1
Articulated %	0.0	0.0	0.0	0.0	12.5	0.0	0.0	12.5	0.0	0.0	0.0	0.0	6.3
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	0	8	0	8	7	0	0	7	0	0	0	0	15
Articulated Trucks	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Entering Leg	0	8	0	8	8	0	0	8	0	0	0	0	16
Buses				0				0				0	0
Single-Unit Trucks				7				8				0	15
Articulated Trucks				1				0				0	1
Total Exiting Leg				8				8				0	16

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg				0				0				0	0
Total				0				0				0	0

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
11:15 AM	0	2	0	2	3	0	0	3	0	0	0	0	5
11:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
11:45 AM	0	4	0	4	1	0	0	1	0	0	0	0	5
Total	0	8	0	8	7	0	0	7	0	0	0	0	15
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	3	0	1	0	1	0	0	0	0	4
Grand Total	0	11	0	11	7	1	0	8	0	0	0	0	19
Approach %	0.0	100.0	0.0		87.5	12.5	0.0		0.0	0.0	0.0		
Total %	0.0	57.9	0.0	57.9	36.8	5.3	0.0	42.1	0.0	0.0	0.0	0.0	
Exiting Leg Total				7				11				1	19

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
11:15 AM	0	2	0	2	3	0	0	3	0	0	0	0	5
11:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
11:45 AM	0	4	0	4	1	0	0	1	0	0	0	0	5
Total Volume	0	8	0	8	7	0	0	7	0	0	0	0	15
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.500	0.000	0.500	0.583	0.000	0.000	0.583	0.000	0.000	0.000	0.000	0.750
Entering Leg	0	8	0	8	7	0	0	7	0	0	0	0	15
Exiting Leg				7				8				0	15
Total				15				15				0	30

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	0	0	1	0	0	0	0	1
Approach %	0.0	0.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				1				0				0	1

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	1
% Approach Total	0.0	0.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	1	0	0	1	0	0	0	0	1
Exiting Leg				1				0				0	1
Total				1				1				0	2

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	2
Total	0	1	0	0	0	1	4	0	0	0	0	4	0	0	0	0	0	0	5
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	4	0	0	0	4	0	0	0	0	0	0	2	0	0	0	0	2	6
Grand Total	0	5	0	0	0	5	4	0	0	0	0	4	2	0	0	0	0	2	11
Approach %	0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	45.5	0.0	0.0	0.0	45.5	36.4	0.0	0.0	0.0	0.0	36.4	18.2	0.0	0.0	0.0	0.0	18.2	
Exiting Leg Total						4						7						0	11

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	4	0	0	0	4	0	0	0	0	0	0	2	0	0	0	0	2	6
% Approach Total	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.375
Entering Leg	0	4	0	0	0	4	0	0	0	0	0	0	2	0	0	0	0	2	6
Exiting Leg						0						6						0	6
Total						4						6						2	12

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Saturday, May 22, 2021**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	
Exiting Leg Total						0						0						1	1

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Exiting Leg						0						0						1	1
Total						0						0						2	2

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	66	0	66	96	6	0	102	8	3	0	11	179
7:15 AM	0	77	0	77	129	8	0	137	11	10	0	21	235
7:30 AM	1	82	0	83	140	3	0	143	11	4	0	15	241
7:45 AM	1	97	0	98	124	6	0	130	7	0	0	7	235
Total	2	322	0	324	489	23	0	512	37	17	0	54	890
8:00 AM	1	72	0	73	86	11	0	97	8	4	0	12	182
8:15 AM	2	84	0	86	101	6	0	107	3	4	0	7	200
8:30 AM	0	70	0	70	95	6	0	101	15	0	0	15	186
8:45 AM	0	63	0	63	78	6	0	84	4	0	0	4	151
Total	3	289	0	292	360	29	0	389	30	8	0	38	719
Grand Total	5	611	0	616	849	52	0	901	67	25	0	92	1609
Approach %	0.8	99.2	0.0		94.2	5.8	0.0		72.8	27.2	0.0		
Total %	0.3	38.0	0.0	38.3	52.8	3.2	0.0	56.0	4.2	1.6	0.0	5.7	
Exiting Leg Total				874				678				57	1609
Cars	3	578	0	581	805	47	0	852	67	25	0	92	1525
% Cars	60.0	94.6	0.0	94.3	94.8	90.4	0.0	94.6	100.0	100.0	0.0	100.0	94.8
Exiting Leg Total				830				645				50	1525
Heavy Vehicles	2	33	0	35	44	5	0	49	0	0	0	0	84
% Heavy Vehicles	40.0	5.4	0.0	5.7	5.2	9.6	0.0	5.4	0.0	0.0	0.0	0.0	5.2
Exiting Leg Total				44				33				7	84

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	0	77	0	77	129	8	0	137	11	10	0	21	235
7:30 AM	1	82	0	83	140	3	0	143	11	4	0	15	241
7:45 AM	1	97	0	98	124	6	0	130	7	0	0	7	235
8:00 AM	1	72	0	73	86	11	0	97	8	4	0	12	182
Total Volume	3	328	0	331	479	28	0	507	37	18	0	55	893
% Approach Total	0.9	99.1	0.0		94.5	5.5	0.0		67.3	32.7	0.0		
PHF	0.750	0.845	0.000	0.844	0.855	0.636	0.000	0.886	0.841	0.450	0.000	0.655	0.926
Cars	1	313	0	314	452	25	0	477	37	18	0	55	846
Cars %	33.3	95.4	0.0	94.9	94.4	89.3	0.0	94.1	100.0	100.0	0.0	100.0	94.7
Heavy Vehicles	2	15	0	17	27	3	0	30	0	0	0	0	47
Heavy Vehicles %	66.7	4.6	0.0	5.1	5.6	10.7	0.0	5.9	0.0	0.0	0.0	0.0	5.3
Cars Enter Leg	1	313	0	314	452	25	0	477	37	18	0	55	846
Heavy Enter Leg	2	15	0	17	27	3	0	30	0	0	0	0	47
Total Entering Leg	3	328	0	331	479	28	0	507	37	18	0	55	893
Cars Exiting Leg				470				350				26	846
Heavy Exiting Leg				27				15				5	47
Total Exiting Leg				497				365				31	893

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Cars**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	63	0	63	90	5	0	95	8	3	0	11	169
7:15 AM	0	74	0	74	124	7	0	131	11	10	0	21	226
7:30 AM	1	76	0	77	128	3	0	131	11	4	0	15	223
7:45 AM	0	93	0	93	117	5	0	122	7	0	0	7	222
Total	1	306	0	307	459	20	0	479	37	17	0	54	840
8:00 AM	0	70	0	70	83	10	0	93	8	4	0	12	175
8:15 AM	2	77	0	79	99	6	0	105	3	4	0	7	191
8:30 AM	0	67	0	67	93	5	0	98	15	0	0	15	180
8:45 AM	0	58	0	58	71	6	0	77	4	0	0	4	139
Total	2	272	0	274	346	27	0	373	30	8	0	38	685
Grand Total	3	578	0	581	805	47	0	852	67	25	0	92	1525
Approach %	0.5	99.5	0.0		94.5	5.5	0.0		72.8	27.2	0.0		
Total %	0.2	37.9	0.0	38.1	52.8	3.1	0.0	55.9	4.4	1.6	0.0	6.0	
Exiting Leg Total				830				645				50	1525

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	0	74	0	74	124	7	0	131	11	10	0	21	226
7:30 AM	1	76	0	77	128	3	0	131	11	4	0	15	223
7:45 AM	0	93	0	93	117	5	0	122	7	0	0	7	222
8:00 AM	0	70	0	70	83	10	0	93	8	4	0	12	175
Total Volume	1	313	0	314	452	25	0	477	37	18	0	55	846
% Approach Total	0.3	99.7	0.0		94.8	5.2	0.0		67.3	32.7	0.0		
PHF	0.250	0.841	0.000	0.844	0.883	0.625	0.000	0.910	0.841	0.450	0.000	0.655	0.936
Entering Leg	1	313	0	314	452	25	0	477	37	18	0	55	846
Exiting Leg				470				350				26	846
Total				784				827				81	1692

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	3	0	3	6	1	0	7	0	0	0	0	10
7:15 AM	0	3	0	3	5	1	0	6	0	0	0	0	9
7:30 AM	0	6	0	6	12	0	0	12	0	0	0	0	18
7:45 AM	1	4	0	5	7	1	0	8	0	0	0	0	13
Total	1	16	0	17	30	3	0	33	0	0	0	0	50
8:00 AM	1	2	0	3	3	1	0	4	0	0	0	0	7
8:15 AM	0	7	0	7	2	0	0	2	0	0	0	0	9
8:30 AM	0	3	0	3	2	1	0	3	0	0	0	0	6
8:45 AM	0	5	0	5	7	0	0	7	0	0	0	0	12
Total	1	17	0	18	14	2	0	16	0	0	0	0	34
Grand Total	2	33	0	35	44	5	0	49	0	0	0	0	84
Approach %	5.7	94.3	0.0		89.8	10.2	0.0		0.0	0.0	0.0		
Total %	2.4	39.3	0.0	41.7	52.4	6.0	0.0	58.3	0.0	0.0	0.0	0.0	
Exiting Leg Total				44				33				7	84
Buses	1	6	0	7	15	2	0	17	0	0	0	0	24
% Buses	50.0	18.2	0.0	20.0	34.1	40.0	0.0	34.7	0.0	0.0	0.0	0.0	28.6
Exiting Leg Total				15				6				3	24
Single-Unit Trucks	1	23	0	24	26	3	0	29	0	0	0	0	53
% Single-Unit	50.0	69.7	0.0	68.6	59.1	60.0	0.0	59.2	0.0	0.0	0.0	0.0	63.1
Exiting Leg Total				26				23				4	53
Articulated Trucks	0	4	0	4	3	0	0	3	0	0	0	0	7
% Articulated	0.0	12.1	0.0	11.4	6.8	0.0	0.0	6.1	0.0	0.0	0.0	0.0	8.3
Exiting Leg Total				3				4				0	7

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	3	0	3	6	1	0	7	0	0	0	0	10
7:15 AM	0	3	0	3	5	1	0	6	0	0	0	0	9
7:30 AM	0	6	0	6	12	0	0	12	0	0	0	0	18
7:45 AM	1	4	0	5	7	1	0	8	0	0	0	0	13
Total Volume	1	16	0	17	30	3	0	33	0	0	0	0	50
% Approach Total	5.9	94.1	0.0		90.9	9.1	0.0		0.0	0.0	0.0		
PHF	0.250	0.667	0.000	0.708	0.625	0.750	0.000	0.688	0.000	0.000	0.000	0.000	0.694
Buses	1	3	0	4	14	1	0	15	0	0	0	0	19
Buses %	100.0	18.8	0.0	23.5	46.7	33.3	0.0	45.5	0.0	0.0	0.0	0.0	38.0
Single-Unit Trucks	0	9	0	9	14	2	0	16	0	0	0	0	25
Single-Unit %	0.0	56.3	0.0	52.9	46.7	66.7	0.0	48.5	0.0	0.0	0.0	0.0	50.0
Articulated Trucks	0	4	0	4	2	0	0	2	0	0	0	0	6
Articulated %	0.0	25.0	0.0	23.5	6.7	0.0	0.0	6.1	0.0	0.0	0.0	0.0	12.0
Buses	1	3	0	4	14	1	0	15	0	0	0	0	19
Single-Unit Trucks	0	9	0	9	14	2	0	16	0	0	0	0	25
Articulated Trucks	0	4	0	4	2	0	0	2	0	0	0	0	6
Total Entering Leg	1	16	0	17	30	3	0	33	0	0	0	0	50
Buses				14				3				2	19
Single-Unit Trucks				14				9				2	25
Articulated Trucks				2				4				0	6
Total Exiting Leg				30				16				4	50

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Buses**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	3	0	0	3	0	0	0	0	3
7:30 AM	0	1	0	1	7	0	0	7	0	0	0	0	8
7:45 AM	1	2	0	3	3	1	0	4	0	0	0	0	7
Total	1	3	0	4	14	1	0	15	0	0	0	0	19
8:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	0	1	0	1	0	1	0	0	0	0	2
8:45 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
Total	0	3	0	3	1	1	0	2	0	0	0	0	5
Grand Total	1	6	0	7	15	2	0	17	0	0	0	0	24
Approach %	14.3	85.7	0.0		88.2	11.8	0.0		0.0	0.0	0.0		
Total %	4.2	25.0	0.0	29.2	62.5	8.3	0.0	70.8	0.0	0.0	0.0	0.0	
Exiting Leg Total				15				6				3	24

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	3	0	0	3	0	0	0	0	3
7:30 AM	0	1	0	1	7	0	0	7	0	0	0	0	8
7:45 AM	1	2	0	3	3	1	0	4	0	0	0	0	7
Total Volume	1	3	0	4	14	1	0	15	0	0	0	0	19
% Approach Total	25.0	75.0	0.0		93.3	6.7	0.0		0.0	0.0	0.0		
PHF	0.250	0.375	0.000	0.333	0.500	0.250	0.000	0.536	0.000	0.000	0.000	0.000	0.594
Entering Leg	1	3	0	4	14	1	0	15	0	0	0	0	19
Exiting Leg				14				3				2	19
Total				18				18				2	38

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	2	0	2	4	1	0	5	0	0	0	0	7
7:15 AM	0	2	0	2	2	1	0	3	0	0	0	0	5
7:30 AM	0	4	0	4	4	0	0	4	0	0	0	0	8
7:45 AM	0	1	0	1	4	0	0	4	0	0	0	0	5
Total	0	9	0	9	14	2	0	16	0	0	0	0	25
8:00 AM	1	1	0	2	2	1	0	3	0	0	0	0	5
8:15 AM	0	7	0	7	2	0	0	2	0	0	0	0	9
8:30 AM	0	2	0	2	2	0	0	2	0	0	0	0	4
8:45 AM	0	4	0	4	6	0	0	6	0	0	0	0	10
Total	1	14	0	15	12	1	0	13	0	0	0	0	28
Grand Total	1	23	0	24	26	3	0	29	0	0	0	0	53
Approach %	4.2	95.8	0.0		89.7	10.3	0.0		0.0	0.0	0.0		
Total %	1.9	43.4	0.0	45.3	49.1	5.7	0.0	54.7	0.0	0.0	0.0	0.0	
Exiting Leg Total				26				23				4	53

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
8:00 AM	1	1	0	2	2	1	0	3	0	0	0	0	5
8:15 AM	0	7	0	7	2	0	0	2	0	0	0	0	9
8:30 AM	0	2	0	2	2	0	0	2	0	0	0	0	4
8:45 AM	0	4	0	4	6	0	0	6	0	0	0	0	10
Total Volume	1	14	0	15	12	1	0	13	0	0	0	0	28
% Approach Total	6.7	93.3	0.0		92.3	7.7	0.0		0.0	0.0	0.0		
PHF	0.250	0.500	0.000	0.536	0.500	0.250	0.000	0.542	0.000	0.000	0.000	0.000	0.700
Entering Leg	1	14	0	15	12	1	0	13	0	0	0	0	28
Exiting Leg				12				14				2	28
Total				27				27				2	56

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
7:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
7:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	4	0	4	2	0	0	2	0	0	0	0	6
8:00 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
Grand Total	0	4	0	4	3	0	0	3	0	0	0	0	7
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	57.1	0.0	57.1	42.9	0.0	0.0	42.9	0.0	0.0	0.0	0.0	
Exiting Leg Total				3				4				0	7

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
7:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
7:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	4	0	4	2	0	0	2	0	0	0	0	6
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	1.000	0.000	1.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.750
Entering Leg	0	4	0	4	2	0	0	2	0	0	0	0	6
Exiting Leg				2				4				0	6
Total				6				6				0	12

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	3	77	0	80	102	10	0	112	15	1	0	16	208
2:15 PM	13	130	0	143	88	12	0	100	9	3	0	12	255
2:30 PM	4	102	0	106	110	5	0	115	11	4	1	16	237
2:45 PM	2	119	0	121	130	17	0	147	4	6	0	10	278
Total	22	428	0	450	430	44	0	474	39	14	1	54	978
3:00 PM	4	95	0	99	153	10	0	163	11	1	0	12	274
3:15 PM	4	104	0	108	138	6	0	144	7	1	0	8	260
3:30 PM	0	110	0	110	143	13	0	156	10	0	0	10	276
3:45 PM	0	103	0	103	169	5	0	174	8	1	0	9	286
Total	8	412	0	420	603	34	0	637	36	3	0	39	1096
Grand Total	30	840	0	870	1033	78	0	1111	75	17	1	93	2074
Approach %	3.4	96.6	0.0		93.0	7.0	0.0		80.6	18.3	1.1		
Total %	1.4	40.5	0.0	41.9	49.8	3.8	0.0	53.6	3.6	0.8	0.0	4.5	
Exiting Leg Total				1050				915				109	2074
Cars	30	825	0	855	1009	74	0	1083	70	17	0	87	2025
% Cars	100.0	98.2	0.0	98.3	97.7	94.9	0.0	97.5	93.3	100.0	0.0	93.5	97.6
Exiting Leg Total				1026				895				104	2025
Heavy Vehicles	0	15	0	15	24	4	0	28	5	0	1	6	49
% Heavy Vehicles	0.0	1.8	0.0	1.7	2.3	5.1	0.0	2.5	6.7	0.0	100.0	6.5	2.4
Exiting Leg Total				24				20				5	49

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

3:00 PM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
3:00 PM	4	95	0	99	153	10	0	163	11	1	0	12	274
3:15 PM	4	104	0	108	138	6	0	144	7	1	0	8	260
3:30 PM	0	110	0	110	143	13	0	156	10	0	0	10	276
3:45 PM	0	103	0	103	169	5	0	174	8	1	0	9	286
Total Volume	8	412	0	420	603	34	0	637	36	3	0	39	1096
% Approach Total	1.9	98.1	0.0		94.7	5.3	0.0		92.3	7.7	0.0		
PHF	0.500	0.936	0.000	0.955	0.892	0.654	0.000	0.915	0.818	0.750	0.000	0.813	0.958
Cars	8	405	0	413	592	30	0	622	32	3	0	35	1070
Cars %	100.0	98.3	0.0	98.3	98.2	88.2	0.0	97.6	88.9	100.0	0.0	89.7	97.6
Heavy Vehicles	0	7	0	7	11	4	0	15	4	0	0	4	26
Heavy Vehicles %	0.0	1.7	0.0	1.7	1.8	11.8	0.0	2.4	11.1	0.0	0.0	10.3	2.4
Cars Enter Leg	8	405	0	413	592	30	0	622	32	3	0	35	1070
Heavy Enter Leg	0	7	0	7	11	4	0	15	4	0	0	4	26
Total Entering Leg	8	412	0	420	603	34	0	637	36	3	0	39	1096
Cars Exiting Leg				595				437				38	1070
Heavy Exiting Leg				11				11				4	26
Total Exiting Leg				606				448				42	1096

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	3	76	0	79	99	10	0	109	15	1	0	16	204
2:15 PM	13	128	0	141	86	12	0	98	9	3	0	12	251
2:30 PM	4	101	0	105	107	5	0	112	10	4	0	14	231
2:45 PM	2	115	0	117	125	17	0	142	4	6	0	10	269
Total	22	420	0	442	417	44	0	461	38	14	0	52	955
3:00 PM	4	93	0	97	153	9	0	162	9	1	0	10	269
3:15 PM	4	103	0	107	133	5	0	138	6	1	0	7	252
3:30 PM	0	108	0	108	140	11	0	151	9	0	0	9	268
3:45 PM	0	101	0	101	166	5	0	171	8	1	0	9	281
Total	8	405	0	413	592	30	0	622	32	3	0	35	1070
Grand Total	30	825	0	855	1009	74	0	1083	70	17	0	87	2025
Approach %	3.5	96.5	0.0		93.2	6.8	0.0		80.5	19.5	0.0		
Total %	1.5	40.7	0.0	42.2	49.8	3.7	0.0	53.5	3.5	0.8	0.0	4.3	
Exiting Leg Total				1026				895				104	2025

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

3:00 PM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
3:00 PM	4	93	0	97	153	9	0	162	9	1	0	10	269
3:15 PM	4	103	0	107	133	5	0	138	6	1	0	7	252
3:30 PM	0	108	0	108	140	11	0	151	9	0	0	9	268
3:45 PM	0	101	0	101	166	5	0	171	8	1	0	9	281
Total Volume	8	405	0	413	592	30	0	622	32	3	0	35	1070
% Approach Total	1.9	98.1	0.0		95.2	4.8	0.0		91.4	8.6	0.0		
PHF	0.500	0.938	0.000	0.956	0.892	0.682	0.000	0.909	0.889	0.750	0.000	0.875	0.952
Entering Leg	8	405	0	413	592	30	0	622	32	3	0	35	1070
Exiting Leg				595				437				38	1070
Total				1008				1059				73	2140

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	1	0	1	3	0	0	3	0	0	0	0	4
2:15 PM	0	2	0	2	2	0	0	2	0	0	0	0	4
2:30 PM	0	1	0	1	3	0	0	3	1	0	1	2	6
2:45 PM	0	4	0	4	5	0	0	5	0	0	0	0	9
Total	0	8	0	8	13	0	0	13	1	0	1	2	23
3:00 PM	0	2	0	2	0	1	0	1	2	0	0	2	5
3:15 PM	0	1	0	1	5	1	0	6	1	0	0	1	8
3:30 PM	0	2	0	2	3	2	0	5	1	0	0	1	8
3:45 PM	0	2	0	2	3	0	0	3	0	0	0	0	5
Total	0	7	0	7	11	4	0	15	4	0	0	4	26
Grand Total	0	15	0	15	24	4	0	28	5	0	1	6	49
Approach %	0.0	100.0	0.0		85.7	14.3	0.0		83.3	0.0	16.7		
Total %	0.0	30.6	0.0	30.6	49.0	8.2	0.0	57.1	10.2	0.0	2.0	12.2	
Exiting Leg Total				24				20				5	49
Buses	0	3	0	3	3	2	0	5	2	0	0	2	10
% Buses	0.0	20.0	0.0	20.0	12.5	50.0	0.0	17.9	40.0	0.0	0.0	33.3	20.4
Exiting Leg Total				3				5				2	10
Single-Unit Trucks	0	11	0	11	17	2	0	19	3	0	1	4	34
% Single-Unit	0.0	73.3	0.0	73.3	70.8	50.0	0.0	67.9	60.0	0.0	100.0	66.7	69.4
Exiting Leg Total				17				14				3	34
Articulated Trucks	0	1	0	1	4	0	0	4	0	0	0	0	5
% Articulated	0.0	6.7	0.0	6.7	16.7	0.0	0.0	14.3	0.0	0.0	0.0	0.0	10.2
Exiting Leg Total				4				1				0	5

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:45 PM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:45 PM	0	4	0	4	5	0	0	5	0	0	0	0	9
3:00 PM	0	2	0	2	0	1	0	1	2	0	0	2	5
3:15 PM	0	1	0	1	5	1	0	6	1	0	0	1	8
3:30 PM	0	2	0	2	3	2	0	5	1	0	0	1	8
Total Volume	0	9	0	9	13	4	0	17	4	0	0	4	30
% Approach Total	0.0	100.0	0.0		76.5	23.5	0.0		100.0	0.0	0.0		
PHF	0.000	0.563	0.000	0.563	0.650	0.500	0.000	0.708	0.500	0.000	0.000	0.500	0.833
Buses	0	2	0	2	0	2	0	2	2	0	0	2	6
Buses %	0.0	22.2	0.0	22.2	0.0	50.0	0.0	11.8	50.0	0.0	0.0	50.0	20.0
Single-Unit Trucks	0	6	0	6	10	2	0	12	2	0	0	2	20
Single-Unit %	0.0	66.7	0.0	66.7	76.9	50.0	0.0	70.6	50.0	0.0	0.0	50.0	66.7
Articulated Trucks	0	1	0	1	3	0	0	3	0	0	0	0	4
Articulated %	0.0	11.1	0.0	11.1	23.1	0.0	0.0	17.6	0.0	0.0	0.0	0.0	13.3
Buses	0	2	0	2	0	2	0	2	2	0	0	2	6
Single-Unit Trucks	0	6	0	6	10	2	0	12	2	0	0	2	20
Articulated Trucks	0	1	0	1	3	0	0	3	0	0	0	0	4
Total Entering Leg	0	9	0	9	13	4	0	17	4	0	0	4	30
Buses				0				4				2	6
Single-Unit Trucks				10				8				2	20
Articulated Trucks				3				1				0	4
Total Exiting Leg				13				13				4	30

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
2:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
2:45 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total	0	3	0	3	2	0	0	2	0	0	0	0	5
3:00 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
3:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
3:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
3:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	0	0	1	2	0	3	2	0	0	2	5
Grand Total	0	3	0	3	3	2	0	5	2	0	0	2	10
Approach %	0.0	100.0	0.0		60.0	40.0	0.0		100.0	0.0	0.0		
Total %	0.0	30.0	0.0	30.0	30.0	20.0	0.0	50.0	20.0	0.0	0.0	20.0	
Exiting Leg Total				3				5				2	10

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:15 PM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
2:45 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
3:00 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
Total Volume	0	3	0	3	1	0	0	1	2	0	0	2	6
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.375	0.000	0.375	0.250	0.000	0.000	0.250	0.250	0.000	0.000	0.250	0.750
Entering Leg	0	3	0	3	1	0	0	1	2	0	0	2	6
Exiting Leg				1				5				0	6
Total				4				6				2	12

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	1	0	1	2	0	0	2	0	0	0	0	3
2:15 PM	0	1	0	1	2	0	0	2	0	0	0	0	3
2:30 PM	0	1	0	1	1	0	0	1	1	0	1	2	4
2:45 PM	0	2	0	2	4	0	0	4	0	0	0	0	6
Total	0	5	0	5	9	0	0	9	1	0	1	2	16
3:00 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
3:15 PM	0	1	0	1	5	0	0	5	1	0	0	1	7
3:30 PM	0	2	0	2	1	1	0	2	1	0	0	1	5
3:45 PM	0	2	0	2	2	0	0	2	0	0	0	0	4
Total	0	6	0	6	8	2	0	10	2	0	0	2	18
Grand Total	0	11	0	11	17	2	0	19	3	0	1	4	34
Approach %	0.0	100.0	0.0		89.5	10.5	0.0		75.0	0.0	25.0		
Total %	0.0	32.4	0.0	32.4	50.0	5.9	0.0	55.9	8.8	0.0	2.9	11.8	
Exiting Leg Total				17				14				3	34

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:45 PM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:45 PM	0	2	0	2	4	0	0	4	0	0	0	0	6
3:00 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
3:15 PM	0	1	0	1	5	0	0	5	1	0	0	1	7
3:30 PM	0	2	0	2	1	1	0	2	1	0	0	1	5
Total Volume	0	6	0	6	10	2	0	12	2	0	0	2	20
% Approach Total	0.0	100.0	0.0		83.3	16.7	0.0		100.0	0.0	0.0		
PHF	0.000	0.750	0.000	0.750	0.500	0.500	0.000	0.600	0.500	0.000	0.000	0.500	0.714
Entering Leg	0	6	0	6	10	2	0	12	2	0	0	2	20
Exiting Leg				10				8				2	20
Total				16				20				4	40

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
2:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	0	0	2	0	0	2	0	0	0	0	2
3:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	2	0	0	2	0	0	0	0	3
Grand Total	0	1	0	1	4	0	0	4	0	0	0	0	5
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	20.0	0.0	20.0	80.0	0.0	0.0	80.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				4				1				0	5

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:45 PM	Farm Street from North				Farm Street from South				Old Nahant Road (South) from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
2:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
3:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
Total Volume	0	1	0	1	3	0	0	3	0	0	0	0	4
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	1	0	1	3	0	0	3	0	0	0	0	4
Exiting Leg				3				1				0	4
Total				4				4				0	8

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Approach %	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						2						0	2

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg						0						1						0	1
Total						1						1						0	2

PDI File #: **217949 E**
Location: **N: Farm Street S: Farm Street**
Location: **W: Old Nahant Road (South)**
City, State: **Wakefield, MA**
Client: **Nitsch/ D. Birru**
Site Code: **13872.2**
Count Date: **Thursday, May 27, 2021**
Start Time: **2:00 PM**
End Time: **4:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	3
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	3
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	33.333	66.667		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33.333	66.667	100	
Exiting Leg Total						0						0						3	3

Peak Hour Analysis from 02:00 PM to 04:00 PM begins at:

2:00 PM	Farm Street from North						Farm Street from South						Old Nahant Road (South) from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	3
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	33.3	66.7		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.500	0.750	0.750
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	3
Exiting Leg						0						0						3	3
Total						0						0						6	6

Section A-2

Weekday Seasonal Adjustment Factors

Massachusetts Highway Department
Statewide Traffic Data Collection
2017 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.30	1.23	1.21	1.04	0.98	0.92	0.86	0.81	0.95	0.99	1.03	1.10	0.80
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.05	1.01	1.04	0.99	0.94	0.93	0.91	0.92	0.96	0.94	1.01	1.03	0.97
R4-R7	1.10	1.07	1.09	1.00	0.95	0.89	0.88	0.87	0.92	0.95	1.04	1.09	0.93
U1-Boston	1.01	1.04	0.99	0.94	0.93	0.92	0.96	0.93	0.94	0.93	0.95	0.98	0.95
U1-Essex	1.04	1.05	1.00	0.96	0.93	0.89	0.90	0.90	0.93	0.93	0.98	1.03	0.90
U1-Southeast	1.07	1.05	1.02	0.97	0.95	0.90	0.89	0.88	0.92	0.94	0.98	1.01	0.97
U1-West	1.00	0.96	0.94	0.92	0.93	0.92	0.95	0.93	0.92	0.92	0.97	0.97	0.89
U1-Worcester	1.10	1.10	1.04	0.97	0.95	0.94	0.93	0.91	0.95	0.96	0.98	1.04	0.89
U2	1.01	1.03	0.98	0.95	0.93	0.91	0.94	0.92	0.95	0.95	0.95	0.97	0.98
U3	1.03	1.05	1.01	0.95	0.92	0.90	0.94	0.93	0.93	0.92	0.96	0.99	0.96
U4-U7	1.06	1.05	1.02	0.96	0.92	0.89	0.95	0.95	0.92	0.92	0.98	1.03	0.98
Rec - East	1.18	1.17	1.08	1.03	0.95	0.87	0.83	0.83	0.97	0.98	1.19	1.19	0.98
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.95

Round off:
0-999 = 10
>1000 = 100

U = Urban
R = Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114, 1116,2196,2197 and 2198.

6/19/2019

Section A-3

Crash Data

INTERSECTION CRASH RATE WORKSHEET, 2014-2018

CITY/TOWN : WAKEFIELD COUNT DATE : 5/25/2021

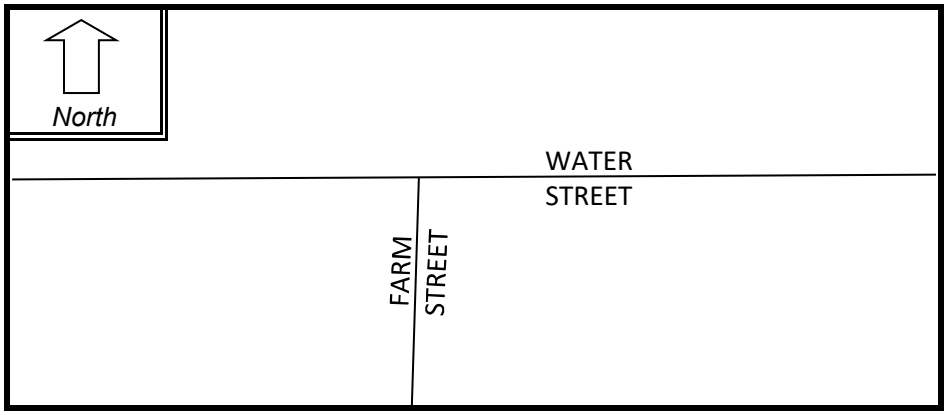
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : Water Street (Route 129)

MINOR STREET(S) : Farm Street

INTERSECTION DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	390	490	758			**1,638**

" K " FACTOR : **0.08** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **20,475**

TOTAL # OF CRASHES : 12 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **2.40**

CRASH RATE CALCULATION : **0.32** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : PM Peak used

Project Title & Date: NEMT Traffic Study 05/30/2021

INTERSECTION CRASH RATE WORKSHEET, 2014-2018

CITY/TOWN : WAKEFIELD COUNT DATE : 5/25/2021

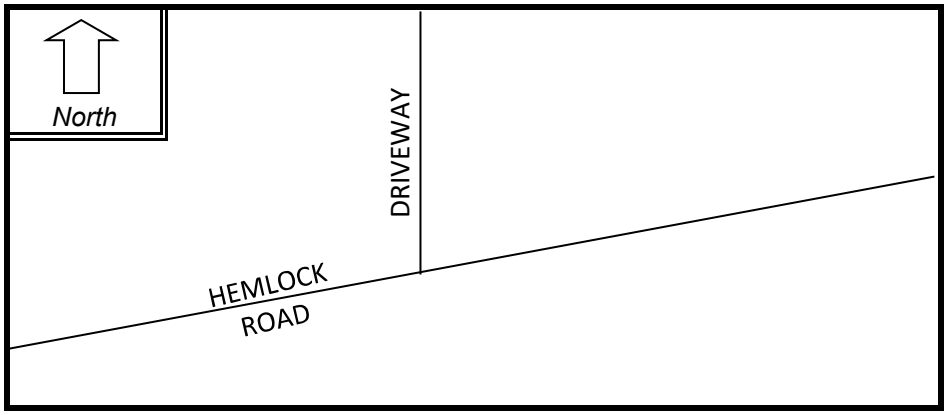
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : Hemlock Road

MINOR STREET(S) : Driveway

INTERSECTION DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	640	197	19			**856**

" K " FACTOR : **0.08** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **10,700**

TOTAL # OF CRASHES : 0 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.00**

CRASH RATE CALCULATION : **0.00** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : AM Peak used

Project Title & Date: NEMT Traffic Study 05/30/2021

INTERSECTION CRASH RATE WORKSHEET, 2014-2018

CITY/TOWN : WAKEFIELD COUNT DATE : 5/25/2021

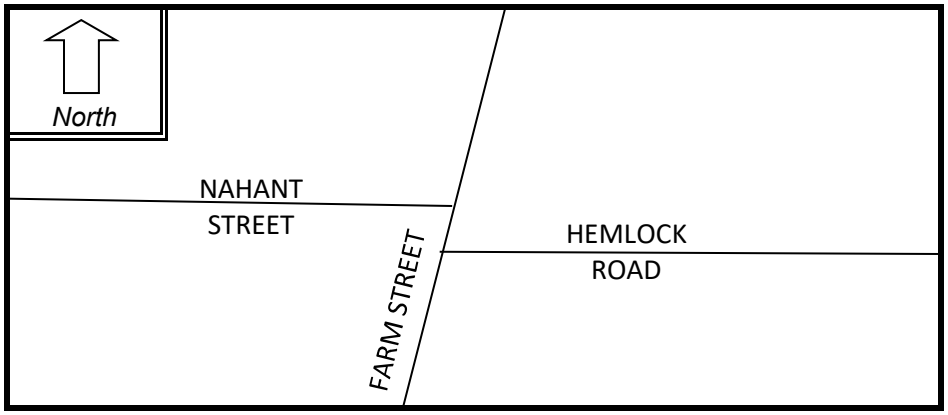
DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Nahant Street and Hemlock Road

INTERSECTION DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	364	185	652	647		1,848

" K " FACTOR : **0.08**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **23,100**

TOTAL # OF CRASHES : 18

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **3.60**

CRASH RATE CALCULATION : **0.43**

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : AM Peak used

Project Title & Date: NEMT Traffic Study 05/30/2021

INTERSECTION CRASH RATE WORKSHEET, 2014-2018

CITY/TOWN : WAKEFIELD COUNT DATE : 5/25/2021

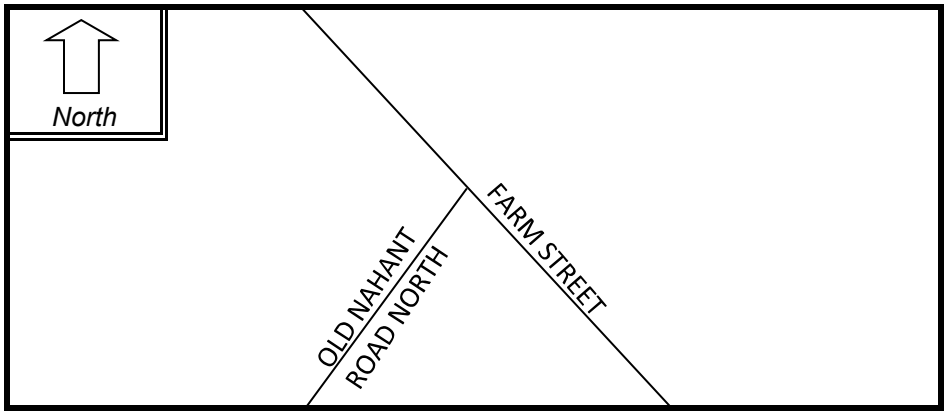
DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Old Nahant Road North

INTERSECTION DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	NB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	151	599	636			**1,386**

" K " FACTOR : **0.08** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **17,325**

TOTAL # OF CRASHES : 2 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.40**

CRASH RATE CALCULATION : **0.06** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Saturday Peak used

Project Title & Date: NEMT Traffic Study 05/30/2021

INTERSECTION CRASH RATE WORKSHEET, 2014-2018

CITY/TOWN : WAKEFIELD COUNT DATE : 5/25/2021

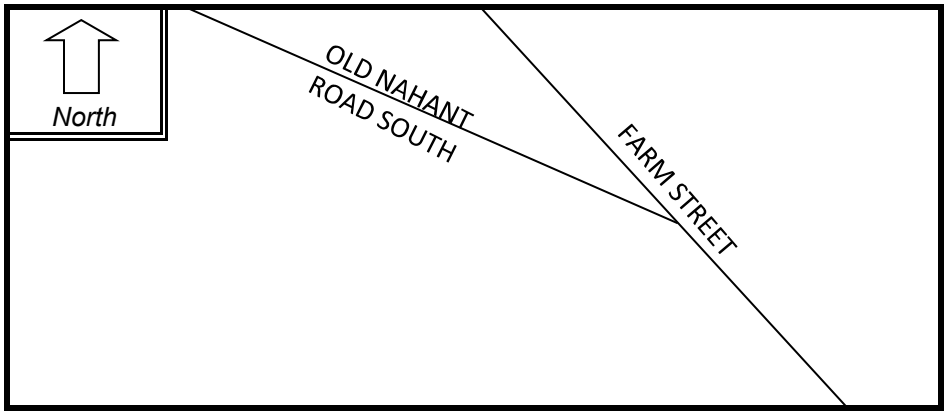
DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Old Nahant Road South

INTERSECTION DIAGRAM



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	NB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	47	615	463			**1,125**

" K " FACTOR : **0.08**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **14,063**

TOTAL # OF CRASHES : 3

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **0.60**

CRASH RATE CALCULATION : **0.12**

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Saturday Peak used

Project Title & Date: NEMT Traffic Study 05/30/2021

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CRASH DIAGRAM

SYMBOLS
- Moving Vehicle
- Backing Vehicle
- Non–Involved Vehicle

Involved / Non–Involved
- Pedestrian
- Bicycle
- Animal
- Direction of Motion
- Parked Vehicle
- Fixed Object

TYPE OF CRASH
- Head on
- Rear End
- Angle
- Turning Movement
- Sideswipe
- Out of Control
- Night Time Crash

SEVERITY
- (#) Injury
- (#) Fatal
- # Property Damage Only

WAKEFIELD, MA

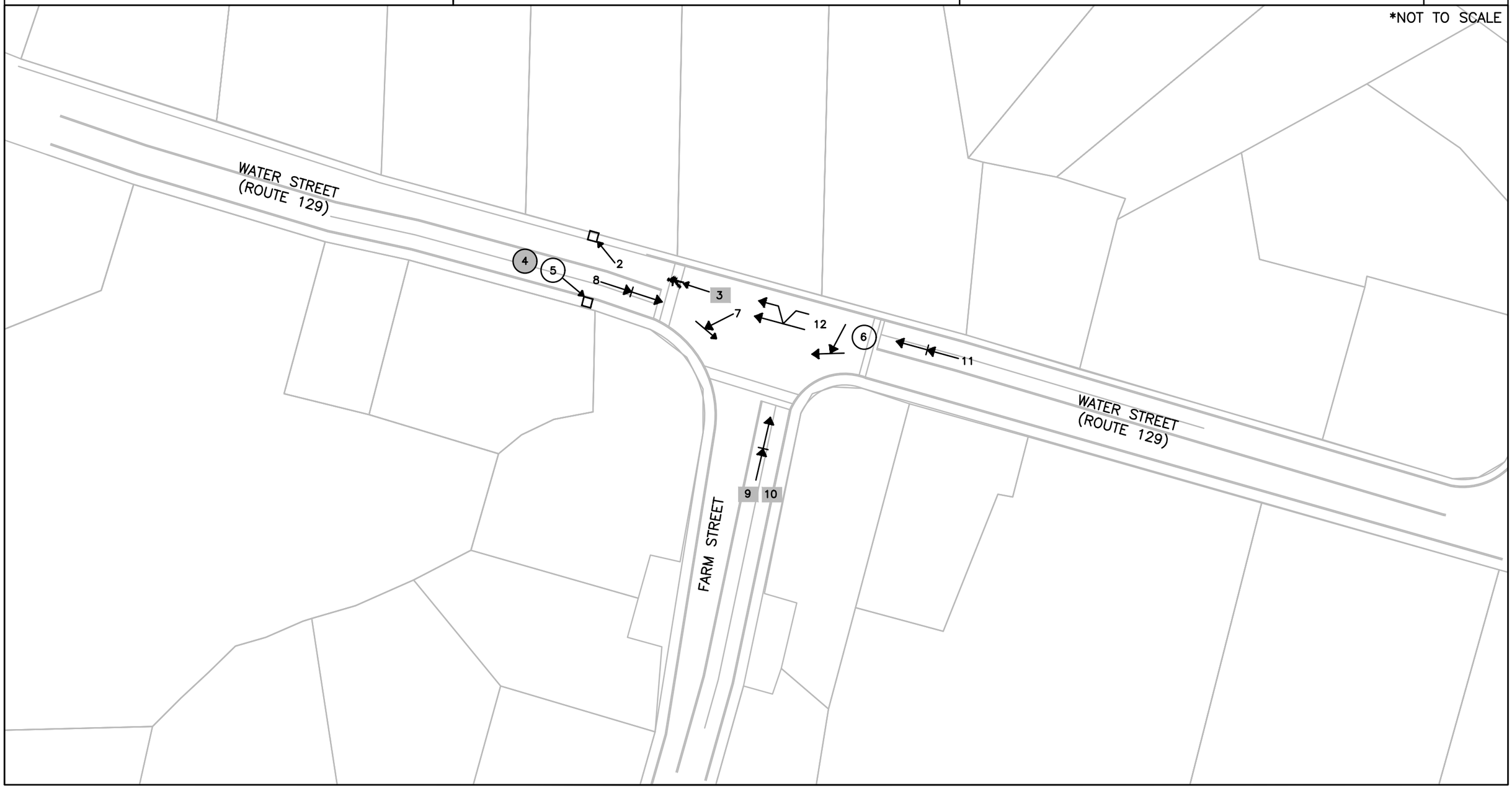
NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL: WATER STREET (ROUTE 129) AND FARM STREET

REGION: WAKEFIELD

TIME PERIOD ANALYZED: 2014–2018
SOURCE OF CRASH REPORTS: MASSDOT CRASH PORTAL
DATE PREPARED: JUNE 2021
PREPARED BY: DAWIT BIRRU

N

*NOT TO SCALE



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CRASH DIAGRAM

SYMBOLS

Involved / Non-Involved

- Moving Vehicle
- Backing Vehicle
- Non-Involved Vehicle
- Pedestrian
- Bicycle
- Animal
- Direction of Motion
- Parked Vehicle
- Fixed Object

TYPE OF CRASH

- Head on
- Rear End
- Angle
- Turning Movement
- Sideswipe
- Out of Control
- Night Time Crash

SEVERITY

- (#) Injury
- (#) Fatal
- # Property Damage Only

WAKEFIELD, MA

NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL: WATER STREET (ROUTE 129) AND FARM STREET

REGION: WAKEFIELD

TIME PERIOD ANALYZED: 2014–2018
SOURCE OF CRASH REPORTS: MASSDOT CRASH PORTAL
DATE PREPARED: JUNE 2021
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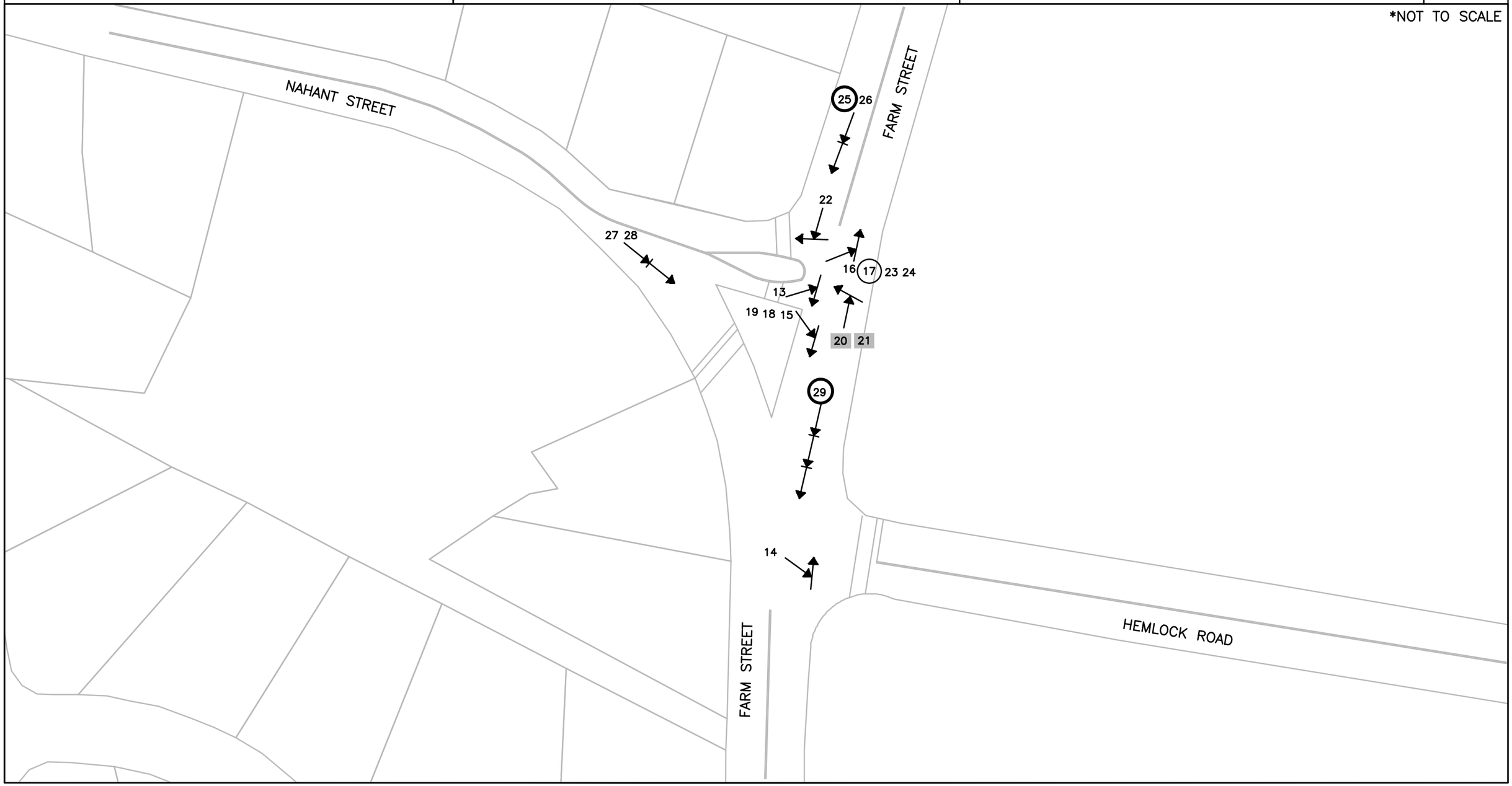

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CRASH DIAGRAM

SYMBOLS

Involved / Non-Involved

- Moving Vehicle
- Backing Vehicle
- Non-Involved Vehicle
- Pedestrian
- Bicycle
- Animal
- Direction of Motion
- Parked Vehicle
- Fixed Object

TYPE OF CRASH

- Head on
- Rear End
- Angle
- Turning Movement
- Sideswipe
- Out of Control
- Night Time Crash

SEVERITY

- (#) Injury
- (#) Fatal
- # Property Damage Only

WAKEFIELD, MA

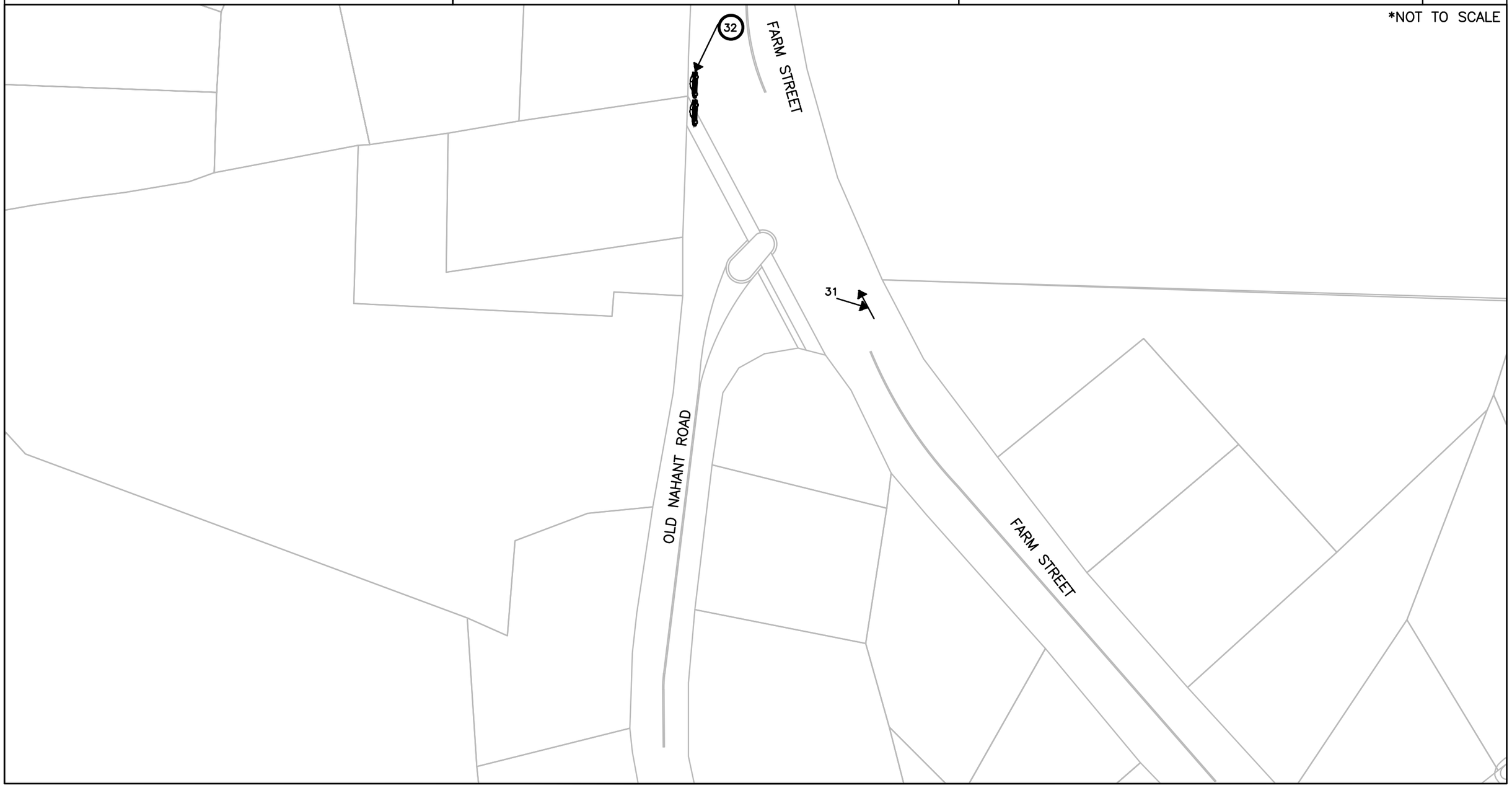
NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL: WATER STREET (ROUTE 129) AND FARM STREET

REGION: WAKEFIELD

TIME PERIOD ANALYZED: 2014–2018
SOURCE OF CRASH REPORTS: MASSDOT CRASH PORTAL
DATE PREPARED: JUNE 2021
PREPARED BY: DAWIT BIRRU

N

*NOT TO SCALE



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CRASH DIAGRAM

SYMBOLS

Involved / Non-Involved

- Moving Vehicle
- Backing Vehicle
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- Pedestrian
- Bicycle
- Animal
- Direction of Motion
- Parked Vehicle
- Fixed Object

TYPE OF CRASH

- Head on
- Rear End
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- Sideswipe
- Out of Control
- Night Time Crash

SEVERITY

- (#) Injury
- (#) Fatal
- # Property Damage Only

WAKEFIELD, MA

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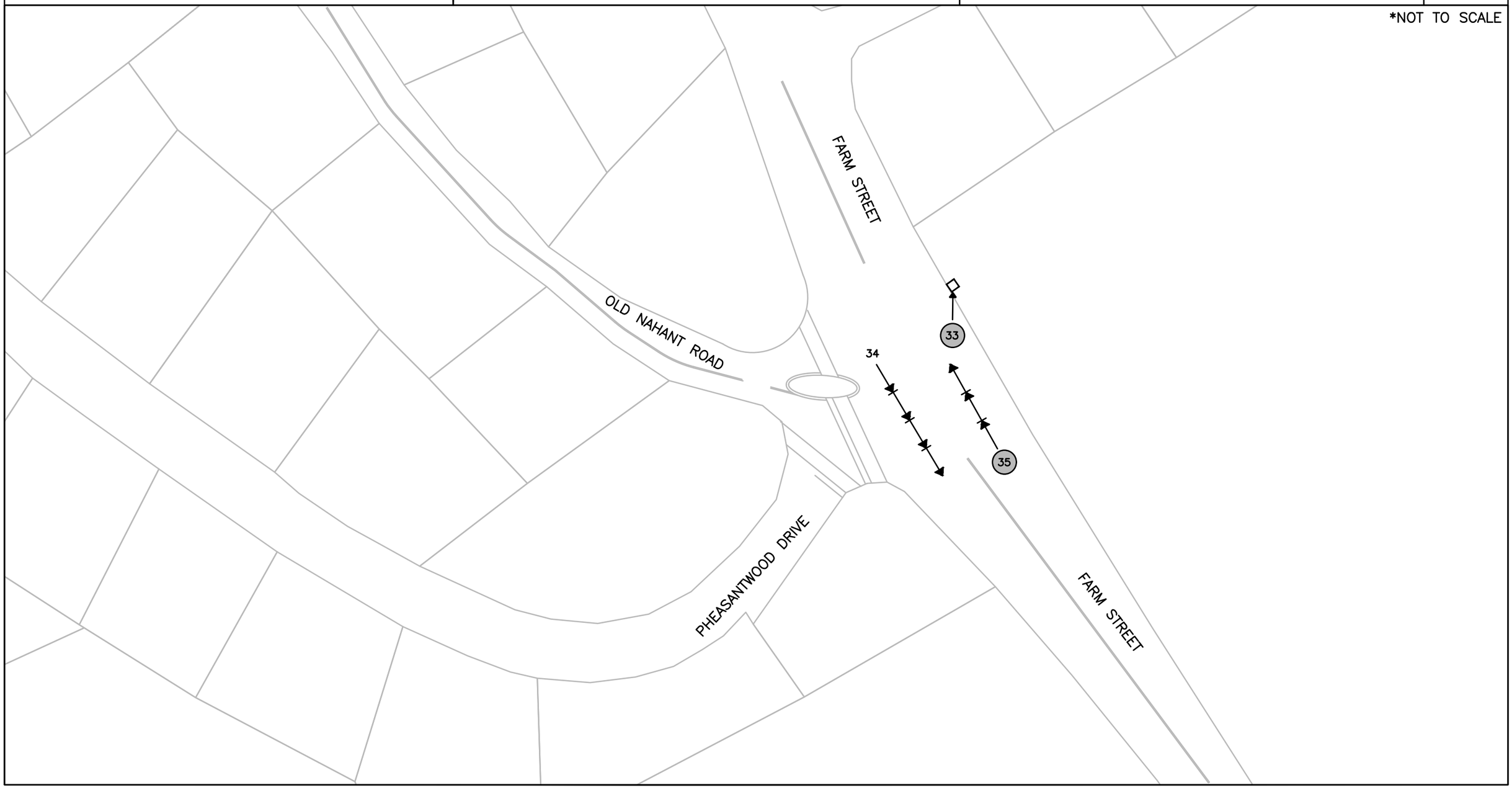
SOURCE OF CRASH REPORTS: MASSDOT CRASH PORTAL
DATE PREPARED: JUNE 2021
PREPARED BY: DAWIT BIRRU

N

*NOT TO SCALE



Section A-4

Traffic Signal Warrant Analysis

MUTCD Traffic Signal Warrant
Summary Worksheet

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: Farm Street at New School Drive
Town: Wakefield, MA

100%
Volume Level

Major Street: Farm Street
Critical Approach Speed: 30 mph
Lanes: 2 or more lanes

Minor Street: New School Drive
Critical Approach Speed: 15 mph
Lanes: 2 or more lanes

% Right Turns Included
From North (SB) 0%
From East (WB) 0%
From South (NB) 0%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 3
We request that the Applicant Manually set volume level? No

Analysis based on PROJECTED volume data.

Forecast Year	Within 5 Years of Construction?	Time (HH:MM)			
		From	AM / PM	To	AM / PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	**No**
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	**No**
Warrant 3: Peak Hour Volume	**No**
Warrant 4: Pedestrian Volume	**N/A**
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	**No**
Warrant 6: Coordinated Signal System	**N/A**
Warrant 7: Crash Experience	**N/A**
Warrant 8: Roadway Network	**No**
Warrant 9: Intersection Near a Grade Crossing	**N/A**

Warrant Analysis Conducted By:

Name: Nick Havan, PE, PTOE, ENV SP
Date: 6/27/2021
Nitsch Engineering

Warrant 1: Eight - Hour Vehicular Volume 100%

Warrant Evaluated? Yes **Warrant Satisfied? No** **Manually Set To:**

Condition A : Min. Veh. Volume		
Volume Level	100%	80%
Major Rd. Req	600	480
Minor Rd. Req	200	160
Number of Hours	0	0

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	100%	80%
Major Rd. Req	900	720
Minor Rd. Req	100	80
Number of Hours	1	2

Satisfied? No

Condition C: Combination of A & B at 80%

Satisfied? No

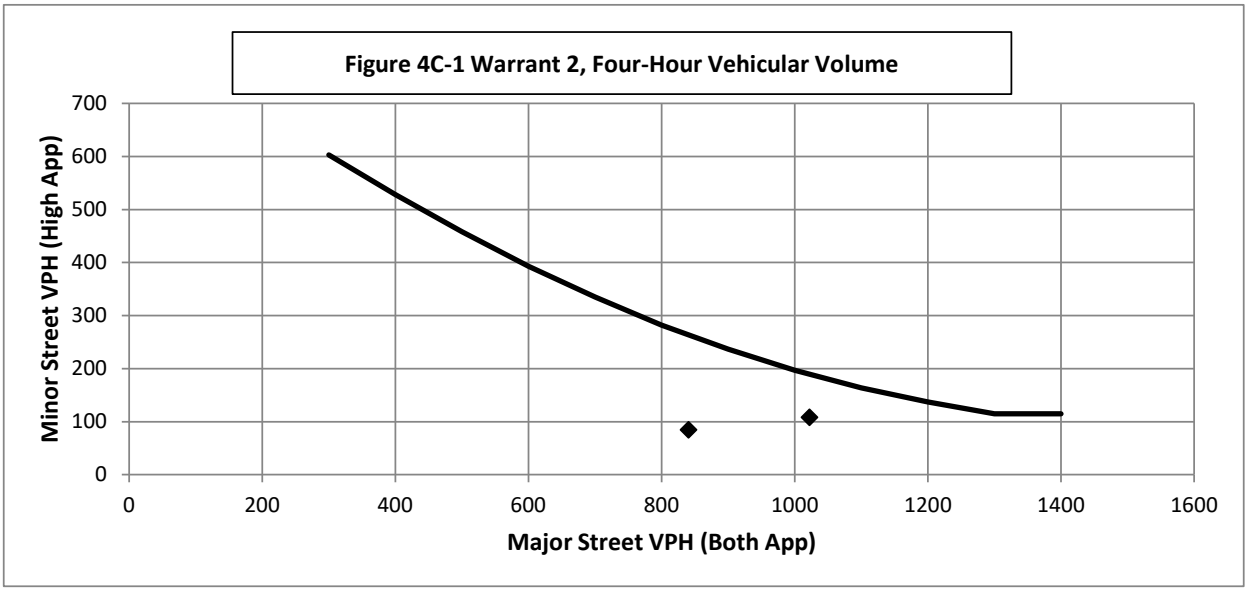
6:00 AM		Enter Start Time (Military Time) (HH:MM)			
Time Period	**From**	**To**	**Major Road: Both App. (VPH)**	**Minor Road: High App. (VPH)**	**Total**
1	6:00	7:00	0	0	0
2	7:00	8:00	0	0	0
3	8:00	9:00	840	85	925
4	9:00	10:00	0	0	0
5	10:00	11:00	0	0	0
6	11:00	12:00	0	0	0
7	12:00	13:00	0	0	0
8	13:00	14:00	0	0	0
9	14:00	15:00	1022	108	1130
10	15:00	16:00	0	0	0
11	16:00	17:00	0	0	0
12	17:00	18:00	0	0	0
13	18:00	19:00	0	0	0
14	19:00	20:00	0	0	0
15	20:00	21:00	0	0	0
16	21:00	22:00	0	0	0

Warrant 2: Four-Hour Volume 100%

Four hours with highest total volume meeting warrant criteria:

Hour Start	14:00	8:00	#N/A	#N/A
Major Road Vol.	1022	840	#N/A	#N/A
Minor Road Vol.	108	85	#N/A	#N/A

Warrant Evaluated? Yes
Number of Hours 0
Warrant Satisfied? No
Manually Set To:



Warrant 3: Peak Hour Volume 100%

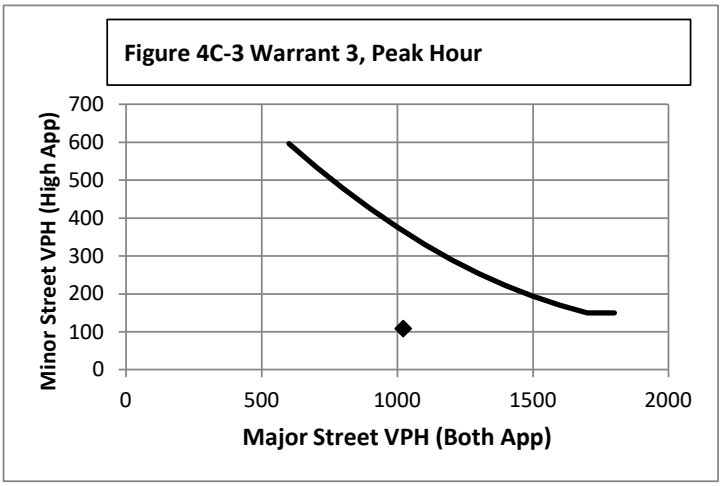
Warrant Evaluated? Yes **Warrant Satisfied? No** **Manually Set To:**

Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	5	No
Volume on Minor Approach	150	No
Total Entering Volume (veh/h)	650	

Manually Set Peak Hour?

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
14:00	1022	108



Warrant 4: Pedestrian Volume 100%

Warrant Evaluated? No **Warrant Satisfied? N/A** **Manually Set To:**

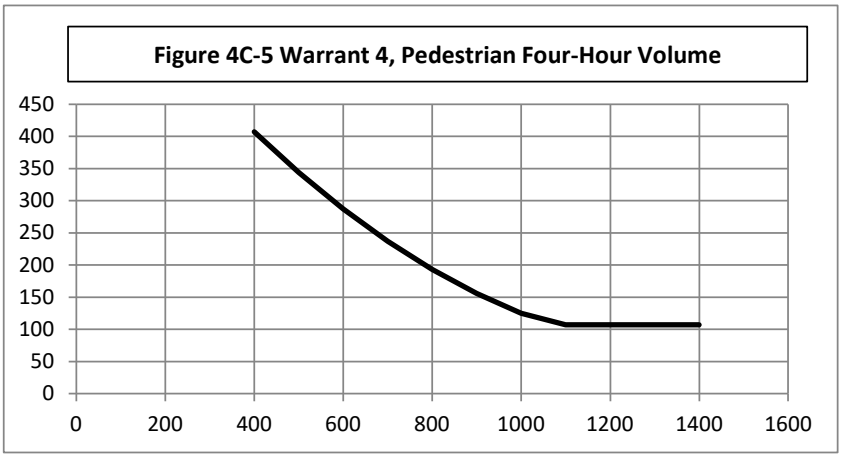
Criterion A: Four Hour

Hour (Start)	Pedestrian Volume	Major Road Vol.
		0
		0
		0
		0

Manually Set Major Rd Vol?

15th % walk speed < 3.5 ft/s?

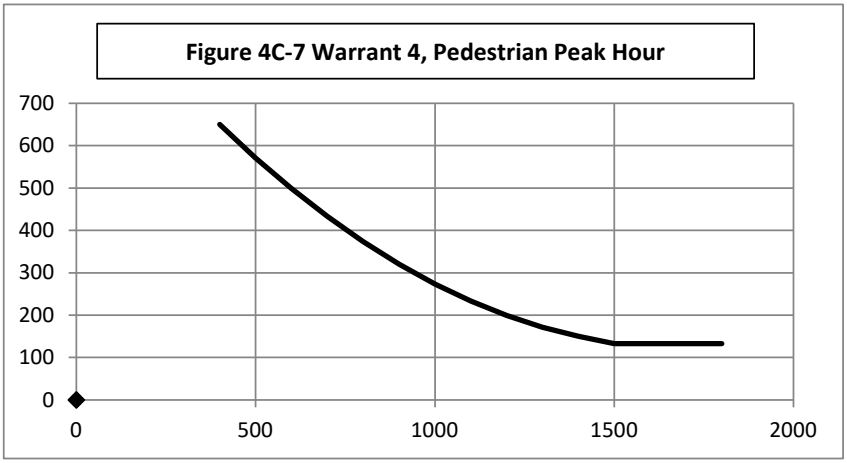
Criterion A Satisfied?



Criterion B: Peak Hour

Peak Hour	Pedestrian Vol.	Major Road Vol.
0:00	0	0

Criterion B Satisfied?



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Warrant 5: School Crossing

Warrant Evaluated? Yes **Warrant Satisfied? No** **Manually Set To:**

	Criteria	Fulfilled?
1	There are a MINIMUM of 20 school children during the highest crossing hour.	Yes
2	There are fewer adequate gaps in the major road traffic stream during the period when the school children are using the crossing than the number of minutes in the same period.	No
3	The nearest traffic signal along the major road is located more than 300 ft away. Or, the nearest traffic signal is within 300 ft but the proposed traffic signal will not restrict the progressive movement of traffic.	Yes

Warrant 6: Coordinated Signal System

Warrant Evaluated? No **Warrant Satisfied? N/A** **Manually Set To:**

	Criteria	Fulfilled?
1	Signal spacing > 1000 ft	
2	On a one-way road or a road that has traffic predominantly in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.	
3	On a two-way road, adjacent signals do not provide the necessary degree of platooning and the proposed and the adjacent signals will collectively provide a progressive operation.	

Warrant 7: Crash Experience 100%

Warrant Evaluated? No **Warrant Satisfied? N/A** **Manually Set To:**

	Criteria		Met?	Fulfilled?
1	Adequate trial of other remedial measures has failed to reduce crash frequency.			
	Measures Tried:			
2	Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12 month period.	# of crashes per 12 months		
3	Warrant 1, Condition A (80%)			
	Warrant 1, Condition B (80%)			
	Warrant 4, Criterion A (80%)			
	Warrant 4, Criterion B (80%)			

Warrant 8: Roadway Network

Warrant Evaluated? Yes **Warrant Satisfied? No** **Manually Set To:**

	Criteria					Met?	Fulfilled?
1	Total entering volume of at least 1,000 veh/h during typical weekday peak hour				1130	Yes	No
	Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.					No	
2	Total entering vol. of at least 1,000 veh/h for each of any 5 hrs of non-normal business day (Sat. or Sun.)						
	Hour						
	Volume						

	Characteristics of Major Routes - Select yes if all intersecting routes have characteristic	Fulfilled?
1	Part of the road or highway system that serves as the principal roadway network for through traffic flow	
2	Rural or suburban highway outside of, entering, or traversing a city	
3	Appears as a major route on an official plan	

Warrant 9: Intersection Near a Grade Crossing

Warrant Evaluated? No **Warrant Satisfied? N/A** **Manually Set To:**

Adjustment Factors				Manually Set Peak Hour?			
Rail Traffic per Day	% High Occupancy Buses on Minor Road	% Tractor-Trailer Trucks on Minor Road	D	Peak Hour	Major Road Vol.	Minor Road Vol.	Adjusted Minor Vol.
					0	0	0

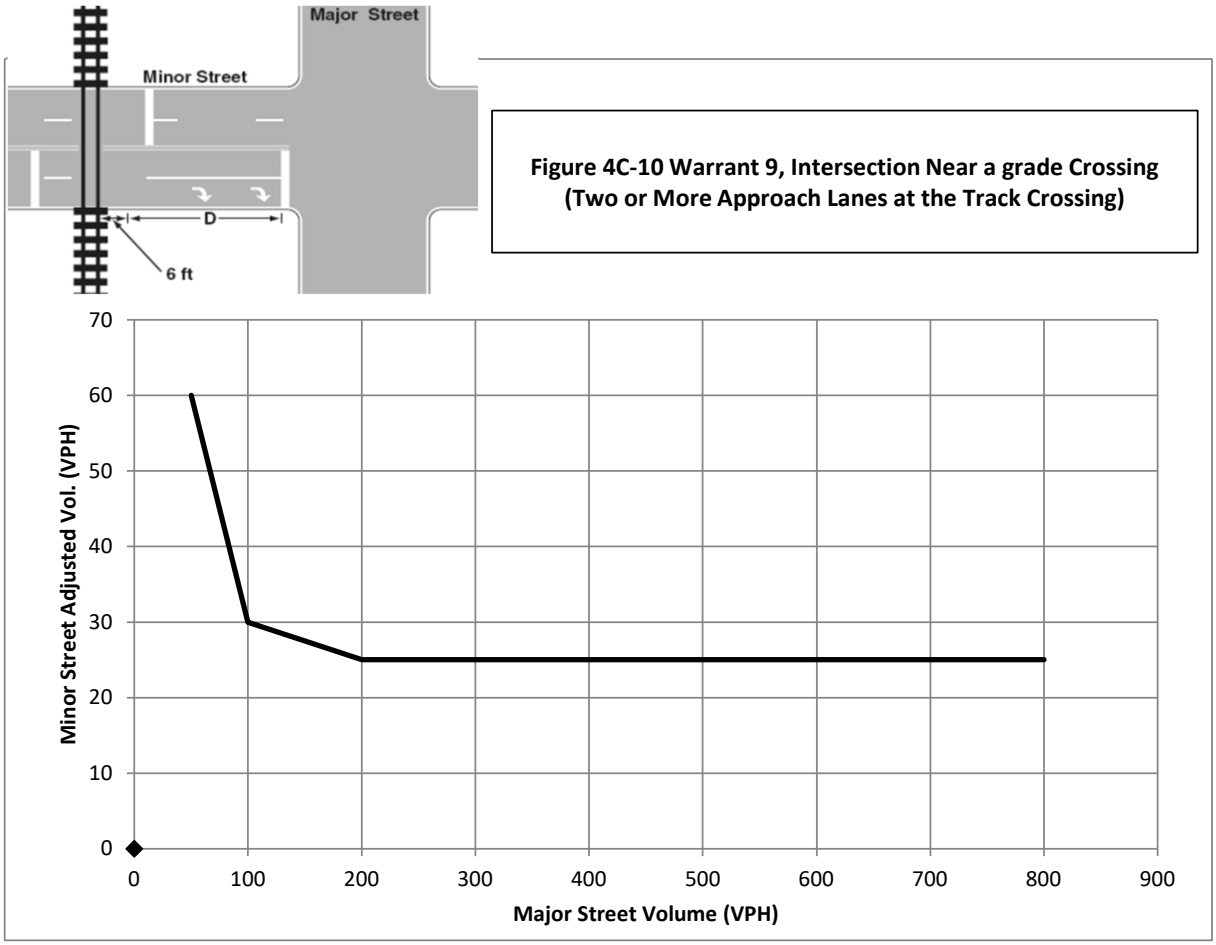


Figure 4C-10 Warrant 9, Intersection Near a grade Crossing (Two or More Approach Lanes at the Track Crossing)

Conclusions/Comments:

Section A-5

Capacity Analysis

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	164	304	423	345	227	215	
Future Volume (vph)	164	304	423	345	227	215	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1743	1538	1770	1827	1752	1583	
Flt Permitted			0.433		0.950		
Satd. Flow (perm)	1743	1538	807	1827	1752	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		543				242	
Link Speed (mph)	30			31	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			80.3	39.0		
Peak Hour Factor	0.81	0.56	0.97	0.81	0.64	0.89	
Heavy Vehicles (%)	9%	5%	2%	4%	3%	2%	
Adj. Flow (vph)	202	543	436	426	355	242	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	202	543	436	426	355	242	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

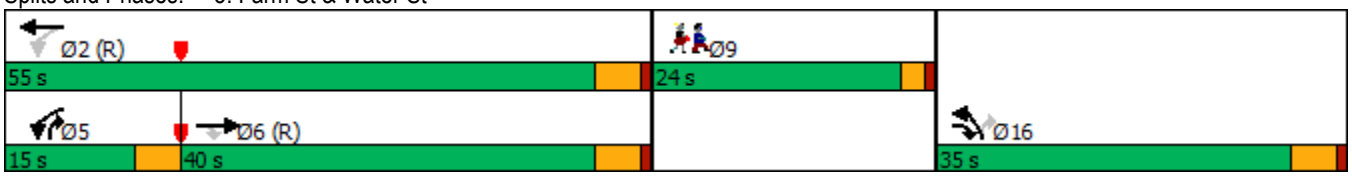
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	27.6	55.3	54.3	53.3	27.7	54.4	
Actuated g/C Ratio	0.24	0.49	0.48	0.47	0.24	0.48	
v/c Ratio	0.48	0.53	0.77	0.50	0.83	0.27	
Control Delay	43.7	2.7	33.8	25.1	57.4	2.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	43.7	2.7	33.8	25.1	57.4	2.7	
LOS	D	A	C	C	E	A	
Approach Delay	13.8			29.5	35.2		
Approach LOS	B			C	D		
90th %ile Green (s)	24.5	35.6	16.9	45.4	35.6	16.9	20.0
90th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
70th %ile Green (s)	20.3	31.8	24.9	49.2	31.8	24.9	20.0
70th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
50th %ile Green (s)	22.1	27.8	27.1	53.2	27.8	27.1	20.0
50th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
30th %ile Green (s)	30.2	24.3	22.5	56.7	24.3	22.5	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	40.7	19.2	17.1	61.8	19.2	17.1	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	142	15	272	241	209	14	
Fuel Used(gal)	4	4	16	13	7	3	
CO Emissions (g/hr)	309	300	1144	898	478	215	
NOx Emissions (g/hr)	60	58	223	175	93	42	
VOC Emissions (g/hr)	72	70	265	208	111	50	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	136	0	216	211	248	0	
Queue Length 95th (ft)	185	0	#457	300	212	38	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	552	1058	567	870	484	882	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

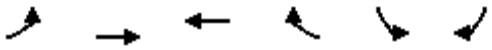
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.37	0.51	0.77	0.49	0.73	0.27	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 25.7		Intersection LOS: C	
Intersection Capacity Utilization 56.3%		ICU Level of Service B	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Farm St & Water St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	82	558	195	2	3	16
Future Volume (Veh/h)	82	558	195	2	3	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.45	0.77	0.46	0.50	0.38	0.50
Hourly flow rate (vph)	182	725	424	4	8	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	428				1515	426
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	428				1515	426
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				93	95
cM capacity (veh/h)	1137				112	633

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	907	428	40
Volume Left	182	0	8
Volume Right	0	4	32
cSH	1137	1700	327
Volume to Capacity	0.16	0.25	0.12
Queue Length 95th (ft)	14	0	10
Control Delay (s)	3.7	0.0	17.5
Lane LOS	A		C
Approach Delay (s)	3.7	0.0	17.5
Approach LOS			C

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	95	277	167	329	567	95
Future Volume (Veh/h)	95	277	167	329	567	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.75	0.87	0.82	0.86	0.76
Hourly flow rate (vph)	142	369	192	401	659	125
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1506	722	784			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1506	722	784			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	0	14	76			
cM capacity (veh/h)	102	429	817			

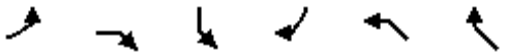
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	511	593	784
Volume Left	142	192	0
Volume Right	369	0	125
cSH	358	817	1700
Volume to Capacity	1.43	0.24	0.46
Queue Length 95th (ft)	661	23	0
Control Delay (s)	237.1	5.7	0.0
Lane LOS	F	A	
Approach Delay (s)	237.1	5.7	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	66.0		
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	79	106	390	277	403	441
Future Volume (Veh/h)	79	106	390	277	403	441
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.37	0.50	0.82	0.73	0.82	0.86
Hourly flow rate (vph)	214	212	476	379	491	513
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2160	666			855	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2160	666			855	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	0	54			38	
cM capacity (veh/h)	18	463			789	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	426	855	491	513
Volume Left	214	0	491	0
Volume Right	212	379	0	0
cSH	34	1700	789	1700
Volume to Capacity	12.47	0.50	0.62	0.30
Queue Length 95th (ft)	Err	0	110	0
Control Delay (s)	Err	0.0	16.8	0.0
Lane LOS	F		C	
Approach Delay (s)	Err	0.0	8.2	
Approach LOS	F			

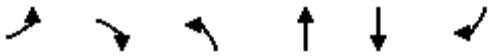
Intersection Summary			
Average Delay	1867.7		
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	235	5	359	186	5	601
Future Volume (Veh/h)	235	5	359	186	5	601
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.31	0.92	0.77	0.33	0.89
Hourly flow rate (vph)	261	16	390	242	15	675
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1095	390			632	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1095	390			632	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	98			98	
cM capacity (veh/h)	235	663			960	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	277	632	690
Volume Left	261	0	15
Volume Right	16	242	0
cSH	244	1700	960
Volume to Capacity	1.14	0.37	0.02
Queue Length 95th (ft)	312	0	1
Control Delay (s)	142.2	0.0	0.4
Lane LOS	F		A
Approach Delay (s)	142.2	0.0	0.4
Approach LOS	F		

Intersection Summary			
Average Delay	24.8		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	38	29	498	341	3
Future Volume (Veh/h)	19	38	29	498	341	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.45	0.84	0.64	0.86	0.85	0.75
Hourly flow rate (vph)	42	45	45	579	401	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1072	403	405			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1072	403	405			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	82	93	96			
cM capacity (veh/h)	236	652	1107			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	87	624	405
Volume Left	42	45	0
Volume Right	45	0	4
cSH	352	1107	1700
Volume to Capacity	0.25	0.04	0.24
Queue Length 95th (ft)	24	3	0
Control Delay (s)	18.5	1.1	0.0
Lane LOS	C	A	
Approach Delay (s)	18.5	1.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

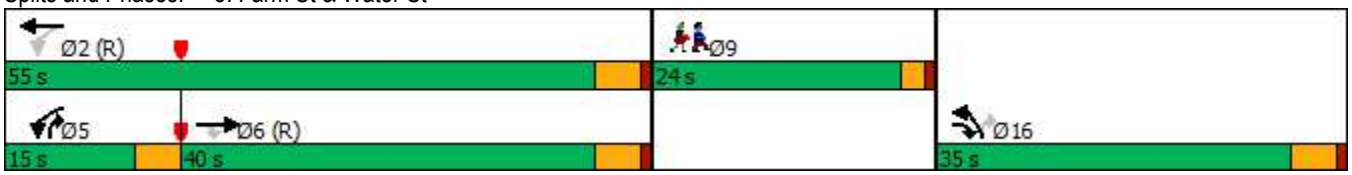
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	209	197	280	230	277	512	
Future Volume (vph)	209	197	280	230	277	512	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1845	1599	1770	1810	1736	1568	
Flt Permitted			0.390		0.950		
Satd. Flow (perm)	1845	1599	726	1810	1736	1568	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		235				563	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			83.0	39.0		
Peak Hour Factor	0.82	0.84	0.82	0.71	0.76	0.91	
Heavy Vehicles (%)	3%	1%	2%	5%	4%	3%	
Adj. Flow (vph)	255	235	341	324	364	563	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	255	235	341	324	364	563	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

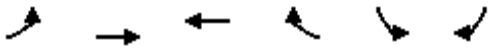
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	31.8	60.2	53.6	52.6	28.4	50.2	
Actuated g/C Ratio	0.28	0.53	0.47	0.46	0.25	0.44	
v/c Ratio	0.50	0.25	0.69	0.39	0.84	0.56	
Control Delay	40.5	1.5	30.6	23.2	57.9	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.5	1.5	30.6	23.2	57.9	3.7	
LOS	D	A	C	C	E	A	
Approach Delay	21.8			27.0	25.0		
Approach LOS	C			C	C		
90th %ile Green (s)	27.4	35.7	13.9	45.3	35.7	13.9	20.0
90th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
70th %ile Green (s)	22.7	32.1	22.2	48.9	32.1	22.2	20.0
70th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
50th %ile Green (s)	28.6	28.8	19.6	52.2	28.8	19.6	20.0
50th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
30th %ile Green (s)	35.5	25.3	16.2	55.7	25.3	16.2	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	44.9	20.1	12.0	60.9	20.1	12.0	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	177	12	177	151	257	33	
Fuel Used(gal)	5	3	11	8	8	7	
CO Emissions (g/hr)	383	192	748	592	586	519	
NOx Emissions (g/hr)	75	37	145	115	114	101	
VOC Emissions (g/hr)	89	44	173	137	136	120	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	163	0	161	153	253	0	
Queue Length 95th (ft)	225	13	236	188	270	58	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	600	993	495	853	480	1005	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.42	0.24	0.69	0.38	0.76	0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 24.9		Intersection LOS: C	
Intersection Capacity Utilization 53.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Farm St & Water St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	97	231	21	1	83
Future Volume (Veh/h)	40	97	231	21	1	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.84	0.68	0.33	0.25	0.55
Hourly flow rate (vph)	52	115	340	64	4	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	404				591	372
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	404				591	372
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				99	78
cM capacity (veh/h)	1166				452	678

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	167	404	155
Volume Left	52	0	4
Volume Right	0	64	151
cSH	1166	1700	670
Volume to Capacity	0.04	0.24	0.23
Queue Length 95th (ft)	3	0	22
Control Delay (s)	2.8	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	2.8	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay		3.2	
Intersection Capacity Utilization		35.9%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	203	318	565	457	120
Future Volume (Veh/h)	57	203	318	565	457	120
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.85	0.68	0.81	0.82	0.54
Hourly flow rate (vph)	77	239	468	698	557	222
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2302	668	779			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2302	668	779			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	48	44			
cM capacity (veh/h)	18	458	842			

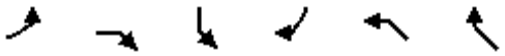
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	316	1166	779
Volume Left	77	468	0
Volume Right	239	0	222
cSH	68	842	1700
Volume to Capacity	4.65	0.56	0.46
Queue Length 95th (ft)	Err	87	0
Control Delay (s)	Err	14.0	0.0
Lane LOS	F	B	
Approach Delay (s)	Err	14.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	1404.7		
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	122	204	679	56	86	574
Future Volume (Veh/h)	122	204	679	56	86	574
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.68	0.77	0.81	0.74	0.79	0.82
Hourly flow rate (vph)	179	265	838	76	109	700
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1794	876			914	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1794	876			914	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	24			85	
cM capacity (veh/h)	75	348			746	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	444	914	109	700
Volume Left	179	0	109	0
Volume Right	265	76	0	0
cSH	141	1700	746	1700
Volume to Capacity	3.14	0.54	0.15	0.41
Queue Length 95th (ft)	Err	0	13	0
Control Delay (s)	Err	0.0	10.7	0.0
Lane LOS	F		B	
Approach Delay (s)	Err	0.0	1.4	
Approach LOS	F			

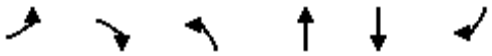
Intersection Summary			
Average Delay	2049.2		
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	174	9	456	188	5	601
Future Volume (Veh/h)	174	9	456	188	5	601
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.80	0.45	0.91	0.94	0.42	0.98
Hourly flow rate (vph)	218	20	501	200	12	613
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1138	501			701	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1138	501			701	
tC, single (s)	6.4	6.2			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.4	
p0 queue free %	1	97			99	
cM capacity (veh/h)	221	574			818	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	238	701	625
Volume Left	218	0	12
Volume Right	20	200	0
cSH	233	1700	818
Volume to Capacity	1.02	0.41	0.01
Queue Length 95th (ft)	245	0	1
Control Delay (s)	110.3	0.0	0.4
Lane LOS	F		A
Approach Delay (s)	110.3	0.0	0.4
Approach LOS	F		

Intersection Summary			
Average Delay	16.9		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	37	35	627	428	8
Future Volume (Veh/h)	3	37	35	627	428	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.82	0.64	0.89	0.94	0.92
Hourly flow rate (vph)	4	45	55	704	455	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1274	460	464			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1274	460	464			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	98	93	95			
cM capacity (veh/h)	177	606	1047			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	49	759	464
Volume Left	4	55	0
Volume Right	45	0	9
cSH	506	1047	1700
Volume to Capacity	0.10	0.05	0.27
Queue Length 95th (ft)	8	4	0
Control Delay (s)	12.9	1.3	0.0
Lane LOS	B	A	
Approach Delay (s)	12.9	1.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	250	209	625	376	92
Future Volume (Veh/h)	86	250	209	625	376	92
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.91	0.82	0.88	0.86	0.82
Hourly flow rate (vph)	119	275	255	710	437	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1713	493	549			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1713	493	549			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	52	75			
cM capacity (veh/h)	76	576	1031			

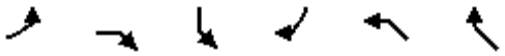
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	394	965	549
Volume Left	119	255	0
Volume Right	275	0	112
cSH	242	1031	1700
Volume to Capacity	1.63	0.25	0.32
Queue Length 95th (ft)	623	24	0
Control Delay (s)	336.5	5.6	0.0
Lane LOS	F	A	
Approach Delay (s)	336.5	5.6	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	72.3		
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	72	171	663	42	78	548
Future Volume (Veh/h)	72	171	663	42	78	548
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.69	0.73	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	104	234	753	48	91	637
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1596	777			801	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1596	777			801	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	41			89	
cM capacity (veh/h)	104	397			818	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	338	801	91	637
Volume Left	104	0	91	0
Volume Right	234	48	0	0
cSH	212	1700	818	1700
Volume to Capacity	1.59	0.47	0.11	0.37
Queue Length 95th (ft)	540	0	9	0
Control Delay (s)	328.2	0.0	10.0	0.0
Lane LOS	F		A	
Approach Delay (s)	328.2	0.0	1.2	
Approach LOS	F			

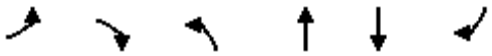
Intersection Summary			
Average Delay	59.9		
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	152	5	500	161	9	614
Future Volume (Veh/h)	152	5	500	161	9	614
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.31	0.90	0.79	0.56	0.95
Hourly flow rate (vph)	179	16	556	204	16	646
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1234	556			760	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1234	556			760	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	7	97			98	
cM capacity (veh/h)	192	534			861	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	195	760	662
Volume Left	179	0	16
Volume Right	16	204	0
cSH	203	1700	861
Volume to Capacity	0.96	0.45	0.02
Queue Length 95th (ft)	202	0	1
Control Delay (s)	101.9	0.0	0.5
Lane LOS	F		A
Approach Delay (s)	101.9	0.0	0.5
Approach LOS	F		

Intersection Summary			
Average Delay	12.5		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	38	30	609	477	4
Future Volume (Veh/h)	19	38	30	609	477	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.77	0.66	0.95	0.93	0.33
Hourly flow rate (vph)	45	49	45	641	513	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1250	519	525			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1250	519	525			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	91	96			
cM capacity (veh/h)	184	561	1037			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	94	686	525
Volume Left	45	45	0
Volume Right	49	0	12
cSH	283	1037	1700
Volume to Capacity	0.33	0.04	0.31
Queue Length 95th (ft)	35	3	0
Control Delay (s)	23.9	1.1	0.0
Lane LOS	C	A	
Approach Delay (s)	23.9	1.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

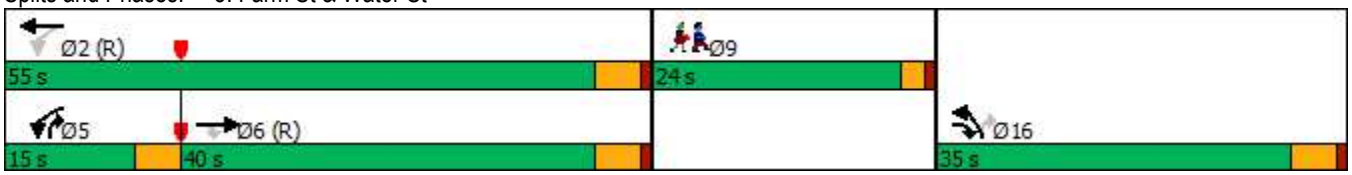
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	215	200	264	239	300	423	
Future Volume (vph)	215	200	264	239	300	423	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1881	1583	1787	1881	1770	1599	
Flt Permitted			0.420		0.950		
Satd. Flow (perm)	1881	1583	790	1881	1770	1599	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		220				475	
Link Speed (mph)	30			31	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			80.3	39.0		
Peak Hour Factor	0.89	0.91	0.79	0.86	0.84	0.89	
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	
Adj. Flow (vph)	242	220	334	278	357	475	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	242	220	334	278	357	475	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

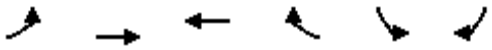
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	33.1	60.5	54.7	53.7	27.3	48.9	
Actuated g/C Ratio	0.29	0.53	0.48	0.47	0.24	0.43	
v/c Ratio	0.44	0.23	0.64	0.31	0.84	0.50	
Control Delay	38.6	1.6	27.2	21.3	58.7	3.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.6	1.6	27.2	21.3	58.7	3.4	
LOS	D	A	C	C	E	A	
Approach Delay	21.0			24.5	27.1		
Approach LOS	C			C	C		
90th %ile Green (s)	26.1	34.8	16.1	46.2	34.8	16.1	20.0
90th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
70th %ile Green (s)	24.0	30.9	22.1	50.1	30.9	22.1	20.0
70th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
50th %ile Green (s)	31.0	27.7	18.3	53.3	27.7	18.3	20.0
50th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
30th %ile Green (s)	37.8	24.2	15.0	56.8	24.2	15.0	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	46.8	19.1	11.1	61.9	19.1	11.1	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	178	13	170	148	278	25	
Fuel Used(gal)	6	3	10	9	9	6	
CO Emissions (g/hr)	387	195	689	602	638	426	
NOx Emissions (g/hr)	75	38	134	117	124	83	
VOC Emissions (g/hr)	90	45	160	139	148	99	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	149	0	153	124	250	0	
Queue Length 95th (ft)	240	17	216	199	304	50	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	625	988	523	898	483	956	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.39	0.22	0.64	0.31	0.74	0.50	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 24.8		Intersection LOS: C	
Intersection Capacity Utilization 54.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Farm St & Water St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	109	189	2	2	52
Future Volume (Veh/h)	17	109	189	2	2	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.61	0.81	0.76	0.50	0.25	0.52
Hourly flow rate (vph)	28	135	249	4	8	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	253				442	251
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	253				442	251
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	87
cM capacity (veh/h)	1324				565	793

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	163	253	108
Volume Left	28	0	8
Volume Right	0	4	100
cSH	1324	1700	770
Volume to Capacity	0.02	0.15	0.14
Queue Length 95th (ft)	2	0	12
Control Delay (s)	1.5	0.0	10.4
Lane LOS	A		B
Approach Delay (s)	1.5	0.0	10.4
Approach LOS			B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

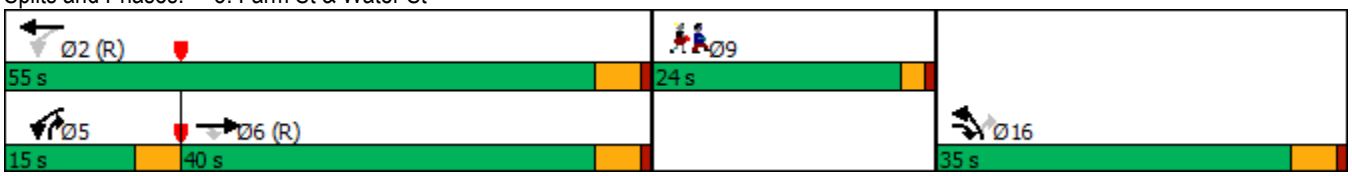
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	170	315	438	357	235	223	
Future Volume (vph)	170	315	438	357	235	223	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1743	1538	1770	1827	1752	1583	
Flt Permitted			0.403		0.950		
Satd. Flow (perm)	1743	1538	751	1827	1752	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		563				251	
Link Speed (mph)	30			31	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			80.3	39.0		
Peak Hour Factor	0.81	0.56	0.97	0.81	0.64	0.89	
Heavy Vehicles (%)	9%	5%	2%	4%	3%	2%	
Adj. Flow (vph)	210	563	452	441	367	251	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	210	563	452	441	367	251	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

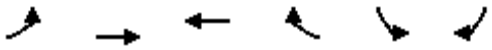
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	25.9	54.4	53.4	52.4	28.6	56.1	
Actuated g/C Ratio	0.23	0.48	0.47	0.46	0.25	0.49	
v/c Ratio	0.53	0.55	0.82	0.53	0.84	0.28	
Control Delay	45.7	2.7	38.3	26.2	56.9	2.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	45.7	2.7	38.3	26.2	56.9	2.7	
LOS	D	A	D	C	E	A	
Approach Delay	14.4			32.3	34.9		
Approach LOS	B			C	C		
90th %ile Green (s)	26.9	36.2	13.9	44.8	36.2	13.9	20.0
90th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
70th %ile Green (s)	21.1	32.7	23.2	48.3	32.7	23.2	20.0
70th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
50th %ile Green (s)	18.5	28.7	29.8	52.3	28.7	29.8	20.0
50th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
30th %ile Green (s)	25.9	25.2	25.9	55.8	25.2	25.9	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	37.0	20.0	20.0	61.0	20.0	20.0	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	151	15	276	254	216	15	
Fuel Used(gal)	5	4	17	13	7	3	
CO Emissions (g/hr)	327	311	1210	937	493	223	
NOx Emissions (g/hr)	64	60	236	182	96	43	
VOC Emissions (g/hr)	76	72	281	217	114	52	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	148	0	231	225	256	0	
Queue Length 95th (ft)	187	0	#567	314	216	40	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	541	1056	553	862	488	906	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.39	0.53	0.82	0.51	0.75	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 27.0		Intersection LOS: C	
Intersection Capacity Utilization 57.9%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Farm St & Water St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	82	558	195	2	3	16
Future Volume (Veh/h)	82	558	195	2	3	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.45	0.77	0.46	0.50	0.38	0.50
Hourly flow rate (vph)	182	725	424	4	8	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	428				1515	426
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	428				1515	426
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				93	95
cM capacity (veh/h)	1137				112	633

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	907	428	40
Volume Left	182	0	8
Volume Right	0	4	32
cSH	1137	1700	327
Volume to Capacity	0.16	0.25	0.12
Queue Length 95th (ft)	14	0	10
Control Delay (s)	3.7	0.0	17.5
Lane LOS	A		C
Approach Delay (s)	3.7	0.0	17.5
Approach LOS			C

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	98	282	171	338	577	98
Future Volume (Veh/h)	98	282	171	338	577	98
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.75	0.87	0.82	0.86	0.76
Hourly flow rate (vph)	146	376	197	412	671	129
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1542	736	800			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1542	736	800			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	0	11	76			
cM capacity (veh/h)	96	421	806			

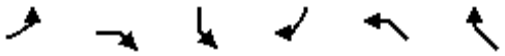
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	522	609	800
Volume Left	146	197	0
Volume Right	376	0	129
cSH	319	806	1700
Volume to Capacity	1.64	0.24	0.47
Queue Length 95th (ft)	790	24	0
Control Delay (s)	330.0	5.9	0.0
Lane LOS	F	A	
Approach Delay (s)	330.0	5.9	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	91.1		
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	79	106	403	277	403	441
Future Volume (Veh/h)	79	106	403	277	403	441
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.37	0.50	0.82	0.73	0.82	0.86
Hourly flow rate (vph)	214	212	491	379	491	513
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2176	680			870	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2176	680			870	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	0	53			37	
cM capacity (veh/h)	17	454			779	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	426	870	491	513
Volume Left	214	0	491	0
Volume Right	212	379	0	0
cSH	33	1700	779	1700
Volume to Capacity	13.02	0.51	0.63	0.30
Queue Length 95th (ft)	Err	0	114	0
Control Delay (s)	Err	0.0	17.2	0.0
Lane LOS	F		C	
Approach Delay (s)	Err	0.0	8.4	
Approach LOS	F			

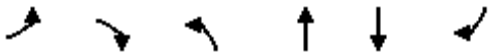
Intersection Summary			
Average Delay	1855.7		
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	243	5	372	193	4	562
Future Volume (Veh/h)	243	5	372	193	4	562
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.31	0.92	0.77	0.33	0.89
Hourly flow rate (vph)	270	16	404	251	12	631
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1184	530			655	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1184	530			655	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	97			99	
cM capacity (veh/h)	208	553			942	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	286	655	643
Volume Left	270	0	12
Volume Right	16	251	0
cSH	216	1700	942
Volume to Capacity	1.33	0.39	0.01
Queue Length 95th (ft)	391	0	1
Control Delay (s)	218.8	0.0	0.3
Lane LOS	F		A
Approach Delay (s)	218.8	0.0	0.3
Approach LOS	F		

Intersection Summary			
Average Delay	39.6		
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	39	30	516	353	3
Future Volume (Veh/h)	20	39	30	516	353	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.45	0.84	0.64	0.86	0.85	0.75
Hourly flow rate (vph)	44	46	47	600	415	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1111	417	419			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1111	417	419			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	80	93	96			
cM capacity (veh/h)	223	640	1093			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	90	647	419
Volume Left	44	47	0
Volume Right	46	0	4
cSH	335	1093	1700
Volume to Capacity	0.27	0.04	0.25
Queue Length 95th (ft)	27	3	0
Control Delay (s)	19.7	1.1	0.0
Lane LOS	C	A	
Approach Delay (s)	19.7	1.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

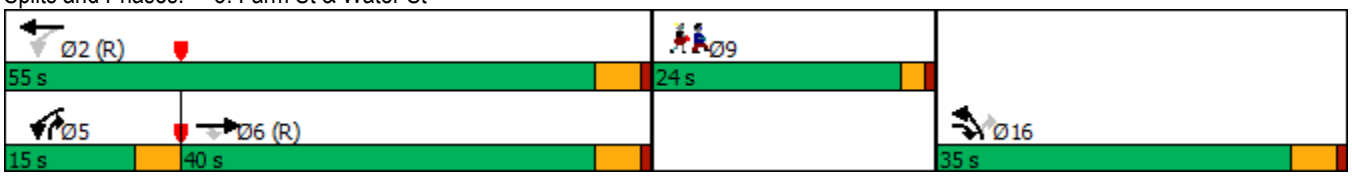
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	216	204	290	238	287	530	
Future Volume (vph)	216	204	290	238	287	530	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1845	1599	1770	1810	1736	1568	
Flt Permitted			0.370		0.950		
Satd. Flow (perm)	1845	1599	689	1810	1736	1568	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		243				582	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			83.0	39.0		
Peak Hour Factor	0.82	0.84	0.82	0.71	0.76	0.91	
Heavy Vehicles (%)	3%	1%	2%	5%	4%	3%	
Adj. Flow (vph)	263	243	354	335	378	582	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	263	243	354	335	378	582	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

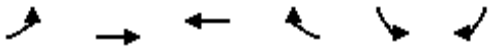
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	30.8	60.3	52.5	51.5	29.5	51.2	
Actuated g/C Ratio	0.27	0.53	0.46	0.45	0.26	0.45	
v/c Ratio	0.53	0.25	0.75	0.41	0.84	0.57	
Control Delay	41.8	1.5	34.6	24.3	56.7	3.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.8	1.5	34.6	24.3	56.7	3.8	
LOS	D	A	C	C	E	A	
Approach Delay	22.4			29.6	24.6		
Approach LOS	C			C	C		
90th %ile Green (s)	28.0	36.8	12.2	44.2	36.8	12.2	20.0
90th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
70th %ile Green (s)	23.8	33.2	20.0	47.8	33.2	20.0	20.0
70th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
50th %ile Green (s)	26.1	29.9	21.0	51.1	29.9	21.0	20.0
50th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
30th %ile Green (s)	33.3	26.4	17.3	54.6	26.4	17.3	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	43.0	21.1	12.9	59.9	21.1	12.9	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	185	11	180	161	265	34	
Fuel Used(gal)	6	3	11	9	9	8	
CO Emissions (g/hr)	401	198	790	618	602	537	
NOx Emissions (g/hr)	78	39	154	120	117	105	
VOC Emissions (g/hr)	93	46	183	143	140	125	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	175	0	172	163	262	0	
Queue Length 95th (ft)	231	13	#292	198	278	59	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	592	990	475	843	487	1024	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.44	0.25	0.75	0.40	0.78	0.57	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 25.7		Intersection LOS: C	
Intersection Capacity Utilization 55.0%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Farm St & Water St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	97	231	21	1	83
Future Volume (Veh/h)	40	97	231	21	1	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.84	0.68	0.33	0.25	0.55
Hourly flow rate (vph)	52	115	340	64	4	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	404				591	372
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	404				591	372
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				99	78
cM capacity (veh/h)	1166				452	678

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	167	404	155
Volume Left	52	0	4
Volume Right	0	64	151
cSH	1166	1700	670
Volume to Capacity	0.04	0.24	0.23
Queue Length 95th (ft)	3	0	22
Control Delay (s)	2.8	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	2.8	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay		3.2	
Intersection Capacity Utilization		35.9%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	209	327	581	471	124
Future Volume (Veh/h)	59	209	327	581	471	124
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.85	0.68	0.81	0.82	0.54
Hourly flow rate (vph)	80	246	481	717	574	230
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2368	689	804			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2368	689	804			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	45	42			
cM capacity (veh/h)	15	446	825			

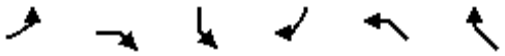
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	326	1198	804
Volume Left	80	481	0
Volume Right	246	0	230
cSH	58	825	1700
Volume to Capacity	5.67	0.58	0.47
Queue Length 95th (ft)	Err	96	0
Control Delay (s)	Err	15.3	0.0
Lane LOS	F	C	
Approach Delay (s)	Err	15.3	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	1408.1		
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	122	204	704	56	86	594
Future Volume (Veh/h)	122	204	704	56	86	594
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.68	0.77	0.81	0.74	0.79	0.82
Hourly flow rate (vph)	179	265	869	76	109	724
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1849	907			945	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1849	907			945	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	21			85	
cM capacity (veh/h)	69	334			726	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	444	945	109	724
Volume Left	179	0	109	0
Volume Right	265	76	0	0
cSH	131	1700	726	1700
Volume to Capacity	3.38	0.56	0.15	0.43
Queue Length 95th (ft)	Err	0	13	0
Control Delay (s)	Err	0.0	10.8	0.0
Lane LOS	F		B	
Approach Delay (s)	Err	0.0	1.4	
Approach LOS	F			

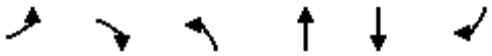
Intersection Summary			
Average Delay	1998.5		
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	195	9	472	195	5	622
Future Volume (Veh/h)	195	9	472	195	5	622
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.80	0.45	0.91	0.94	0.42	0.98
Hourly flow rate (vph)	244	20	519	207	12	635
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1282	622			726	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1282	622			726	
tC, single (s)	6.4	6.2			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.4	
p0 queue free %	0	96			99	
cM capacity (veh/h)	181	490			800	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	264	726	647
Volume Left	244	0	12
Volume Right	20	207	0
cSH	190	1700	800
Volume to Capacity	1.39	0.43	0.01
Queue Length 95th (ft)	390	0	1
Control Delay (s)	252.0	0.0	0.4
Lane LOS	F		A
Approach Delay (s)	252.0	0.0	0.4
Approach LOS	F		

Intersection Summary			
Average Delay	40.8		
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	38	36	649	443	8
Future Volume (Veh/h)	3	38	36	649	443	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.82	0.64	0.89	0.94	0.92
Hourly flow rate (vph)	4	46	56	729	471	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1316	476	480			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1316	476	480			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	98	92	95			
cM capacity (veh/h)	166	593	1032			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	50	785	480
Volume Left	4	56	0
Volume Right	46	0	9
cSH	492	1032	1700
Volume to Capacity	0.10	0.05	0.28
Queue Length 95th (ft)	8	4	0
Control Delay (s)	13.1	1.4	0.0
Lane LOS	B	A	
Approach Delay (s)	13.1	1.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

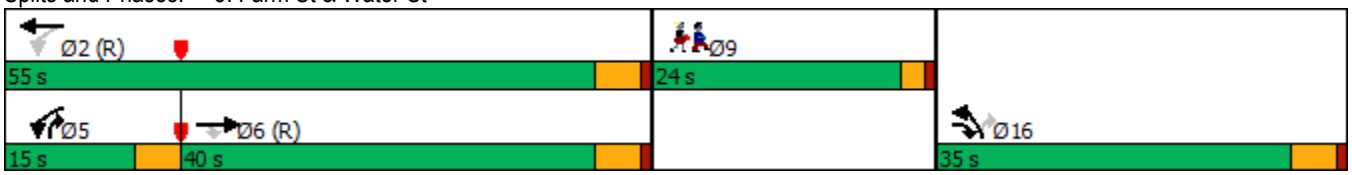
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	223	207	273	247	311	447	
Future Volume (vph)	223	207	273	247	311	447	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1881	1583	1787	1881	1770	1599	
Flt Permitted			0.394		0.950		
Satd. Flow (perm)	1881	1583	741	1881	1770	1599	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		227				502	
Link Speed (mph)	30			31	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			80.3	39.0		
Peak Hour Factor	0.89	0.91	0.79	0.86	0.84	0.89	
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	
Adj. Flow (vph)	251	227	346	287	370	502	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	251	227	346	287	370	502	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

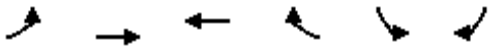
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	31.6	59.9	53.7	52.7	28.3	50.4	
Actuated g/C Ratio	0.28	0.53	0.47	0.46	0.25	0.44	
v/c Ratio	0.48	0.24	0.68	0.33	0.84	0.51	
Control Delay	40.5	1.5	30.0	22.1	57.8	3.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.5	1.5	30.0	22.1	57.8	3.4	
LOS	D	A	C	C	E	A	
Approach Delay	22.0			26.4	26.4		
Approach LOS	C			C	C		
90th %ile Green (s)	26.7	35.6	14.7	45.4	35.6	14.7	20.0
90th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
70th %ile Green (s)	21.7	32.0	23.3	49.0	32.0	23.3	20.0
70th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
50th %ile Green (s)	28.7	28.7	19.6	52.3	28.7	19.6	20.0
50th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
30th %ile Green (s)	35.7	25.2	16.1	55.8	25.2	16.1	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	45.0	20.0	12.0	61.0	20.0	12.0	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	188	13	173	157	288	27	
Fuel Used(gal)	6	3	10	9	9	6	
CO Emissions (g/hr)	408	202	723	626	658	450	
NOx Emissions (g/hr)	79	39	141	122	128	88	
VOC Emissions (g/hr)	95	47	167	145	152	104	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	160	0	163	131	258	0	
Queue Length 95th (ft)	245	17	227	208	313	51	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	612	977	506	888	489	987	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.41	0.23	0.68	0.32	0.76	0.51	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 25.4		Intersection LOS: C	
Intersection Capacity Utilization 55.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Farm St & Water St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	109	189	2	2	52
Future Volume (Veh/h)	17	109	189	2	2	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.61	0.81	0.76	0.50	0.25	0.52
Hourly flow rate (vph)	28	135	249	4	8	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	253				442	251
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	253				442	251
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	87
cM capacity (veh/h)	1324				565	793

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	163	253	108
Volume Left	28	0	8
Volume Right	0	4	100
cSH	1324	1700	770
Volume to Capacity	0.02	0.15	0.14
Queue Length 95th (ft)	2	0	12
Control Delay (s)	1.5	0.0	10.4
Lane LOS	A		B
Approach Delay (s)	1.5	0.0	10.4
Approach LOS			B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	89	257	215	643	388	95
Future Volume (Veh/h)	89	257	215	643	388	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.91	0.82	0.88	0.86	0.82
Hourly flow rate (vph)	124	282	262	731	451	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1764	509	567			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1764	509	567			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	50	74			
cM capacity (veh/h)	69	564	1015			

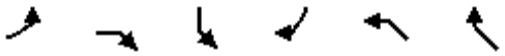
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	406	993	567
Volume Left	124	262	0
Volume Right	282	0	116
cSH	211	1015	1700
Volume to Capacity	1.93	0.26	0.33
Queue Length 95th (ft)	740	26	0
Control Delay (s)	472.8	5.8	0.0
Lane LOS	F	A	
Approach Delay (s)	472.8	5.8	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	100.6		
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	72	171	687	42	78	567
Future Volume (Veh/h)	72	171	687	42	78	567
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.69	0.73	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	104	234	781	48	91	659
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1646	805			829	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1646	805			829	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	39			89	
cM capacity (veh/h)	96	382			798	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	338	829	91	659
Volume Left	104	0	91	0
Volume Right	234	48	0	0
cSH	200	1700	798	1700
Volume to Capacity	1.69	0.49	0.11	0.39
Queue Length 95th (ft)	571	0	10	0
Control Delay (s)	373.5	0.0	10.1	0.0
Lane LOS	F		B	
Approach Delay (s)	373.5	0.0	1.2	
Approach LOS	F			

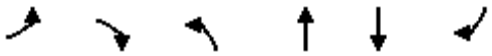
Intersection Summary			
Average Delay	66.3		
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	157	5	518	167	9	636
Future Volume (Veh/h)	157	5	518	167	9	636
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.31	0.90	0.79	0.56	0.95
Hourly flow rate (vph)	185	16	576	211	16	669
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1382	682			787	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1382	682			787	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	96			98	
cM capacity (veh/h)	156	454			841	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	201	787	685
Volume Left	185	0	16
Volume Right	16	211	0
cSH	165	1700	841
Volume to Capacity	1.22	0.46	0.02
Queue Length 95th (ft)	281	0	1
Control Delay (s)	196.1	0.0	0.5
Lane LOS	F		A
Approach Delay (s)	196.1	0.0	0.5
Approach LOS	F		

Intersection Summary			
Average Delay	23.8		
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	39	31	631	494	4
Future Volume (Veh/h)	10	39	31	631	494	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.77	0.66	0.95	0.93	0.33
Hourly flow rate (vph)	24	51	47	664	531	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1295	537	543			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1295	537	543			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	91	95			
cM capacity (veh/h)	173	548	1021			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	75	711	543
Volume Left	24	47	0
Volume Right	51	0	12
cSH	323	1021	1700
Volume to Capacity	0.23	0.05	0.32
Queue Length 95th (ft)	22	4	0
Control Delay (s)	19.5	1.2	0.0
Lane LOS	C	A	
Approach Delay (s)	19.5	1.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

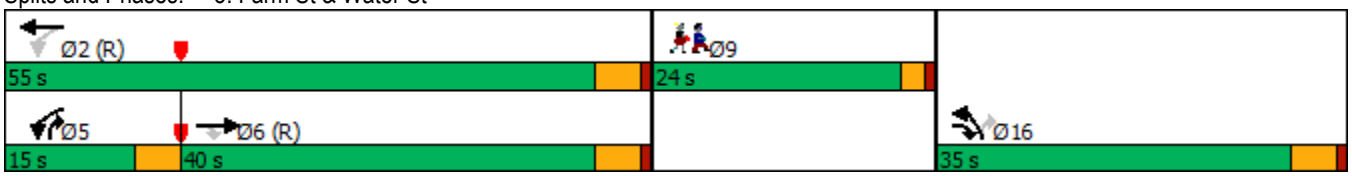
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	170	345	468	357	249	237	
Future Volume (vph)	170	345	468	357	249	237	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1743	1538	1770	1827	1752	1583	
Flt Permitted			0.360		0.950		
Satd. Flow (perm)	1743	1538	671	1827	1752	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		616				266	
Link Speed (mph)	30			31	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			80.3	39.0		
Peak Hour Factor	0.81	0.56	0.97	0.81	0.64	0.89	
Heavy Vehicles (%)	9%	5%	2%	4%	3%	2%	
Adj. Flow (vph)	210	616	482	441	389	266	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	210	616	482	441	389	266	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

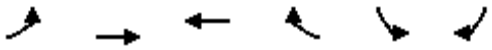
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	22.2	52.5	51.7	50.7	30.3	59.8	
Actuated g/C Ratio	0.19	0.46	0.45	0.44	0.27	0.52	
v/c Ratio	0.62	0.59	0.89	0.54	0.84	0.28	
Control Delay	50.7	3.1	48.4	27.7	55.0	2.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	50.7	3.1	48.4	27.7	55.0	2.7	
LOS	D	A	D	C	E	A	
Approach Delay	15.2			38.5	33.8		
Approach LOS	B			D	C		
90th %ile Green (s)	28.1	37.4	11.5	43.6	37.4	11.5	20.0
90th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
70th %ile Green (s)	21.1	34.3	21.6	46.7	34.3	21.6	20.0
70th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
50th %ile Green (s)	18.0	31.2	27.8	49.8	31.2	27.8	20.0
50th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
30th %ile Green (s)	17.8	27.0	32.2	54.0	27.0	32.2	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	26.0	21.7	29.3	59.3	21.7	29.3	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	154	16	285	262	229	17	
Fuel Used(gal)	5	5	19	14	7	3	
CO Emissions (g/hr)	340	342	1356	948	516	237	
NOx Emissions (g/hr)	66	67	264	184	100	46	
VOC Emissions (g/hr)	79	79	314	220	120	55	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	149	0	263	235	267	0	
Queue Length 95th (ft)	184	0	#658	320	226	42	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	535	1058	540	844	500	956	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.39	0.58	0.89	0.52	0.78	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 29.2		Intersection LOS: C	
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Farm St & Water St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	82	378	111	2	3	16
Future Volume (Veh/h)	82	378	111	2	3	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.45	0.77	0.46	0.50	0.38	0.50
Hourly flow rate (vph)	182	491	241	4	8	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	245				1098	243
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	245				1098	243
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				96	96
cM capacity (veh/h)	1327				205	801

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	673	245	40
Volume Left	182	0	8
Volume Right	0	4	32
cSH	1327	1700	506
Volume to Capacity	0.14	0.14	0.08
Queue Length 95th (ft)	12	0	6
Control Delay (s)	3.3	0.0	12.7
Lane LOS	A		B
Approach Delay (s)	3.3	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	85	71	418	179	150	272
Future Volume (Veh/h)	85	71	418	179	150	272
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	77	454	195	163	296
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1076	454			649	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1076	454			649	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	54	87			83	
cM capacity (veh/h)	201	606			937	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	92	77	454	195	163	296
Volume Left	92	0	0	0	163	0
Volume Right	0	77	0	195	0	0
cSH	201	606	1700	1700	937	1700
Volume to Capacity	0.46	0.13	0.27	0.11	0.17	0.17
Queue Length 95th (ft)	55	11	0	0	16	0
Control Delay (s)	37.3	11.8	0.0	0.0	9.6	0.0
Lane LOS	E	B			A	
Approach Delay (s)	25.7		0.0		3.4	
Approach LOS	D					

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	98	305	182	366	637	98
Future Volume (Veh/h)	98	305	182	366	637	98
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.75	0.87	0.82	0.86	0.76
Hourly flow rate (vph)	146	407	209	446	741	129
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1670	806	870			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1670	806	870			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	0	0	72			
cM capacity (veh/h)	77	384	758			

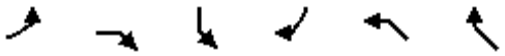
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	553	655	870
Volume Left	146	209	0
Volume Right	407	0	129
cSH	242	758	1700
Volume to Capacity	2.29	0.28	0.51
Queue Length 95th (ft)	1092	28	0
Control Delay (s)	625.2	6.6	0.0
Lane LOS	F	A	
Approach Delay (s)	625.2	6.6	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	168.5		
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	89	459	135	366	576
Future Volume (Veh/h)	12	89	459	135	366	576
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.37	0.50	0.82	0.73	0.82	0.86
Hourly flow rate (vph)	32	178	560	185	446	670
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2214	652			745	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2214	652			745	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	0	62			49	
cM capacity (veh/h)	21	471			867	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	210	745	446	670
Volume Left	32	0	446	0
Volume Right	178	185	0	0
cSH	111	1700	867	1700
Volume to Capacity	1.89	0.44	0.51	0.39
Queue Length 95th (ft)	425	0	75	0
Control Delay (s)	498.5	0.0	13.5	0.0
Lane LOS	F		B	
Approach Delay (s)	498.5	0.0	5.4	
Approach LOS	F			

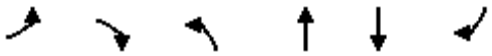
Intersection Summary			
Average Delay	53.4		
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	228	5	432	186	4	551
Future Volume (Veh/h)	228	5	432	186	4	551
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.31	0.92	0.77	0.33	0.89
Hourly flow rate (vph)	253	16	470	242	12	619
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1113	470			712	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1113	470			712	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	97			99	
cM capacity (veh/h)	230	598			897	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	269	712	631
Volume Left	253	0	12
Volume Right	16	242	0
cSH	238	1700	897
Volume to Capacity	1.13	0.42	0.01
Queue Length 95th (ft)	303	0	1
Control Delay (s)	141.2	0.0	0.4
Lane LOS	F		A
Approach Delay (s)	141.2	0.0	0.4
Approach LOS	F		

Intersection Summary			
Average Delay	23.7		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	69	44	445	413	3
Future Volume (Veh/h)	20	69	44	445	413	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.45	0.84	0.64	0.86	0.85	0.75
Hourly flow rate (vph)	44	82	69	517	486	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				533		
pX, platoon unblocked	0.83					
vC, conflicting volume	1143	488	490			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1072	488	490			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	77	86	93			
cM capacity (veh/h)	192	584	1028			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	126	586	490
Volume Left	44	69	0
Volume Right	82	0	4
cSH	341	1028	1700
Volume to Capacity	0.37	0.07	0.29
Queue Length 95th (ft)	41	5	0
Control Delay (s)	21.6	1.8	0.0
Lane LOS	C	A	
Approach Delay (s)	21.6	1.8	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

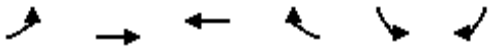
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	216	213	299	238	305	548	
Future Volume (vph)	216	213	299	238	305	548	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1845	1599	1770	1810	1736	1568	
Flt Permitted			0.349		0.950		
Satd. Flow (perm)	1845	1599	650	1810	1736	1568	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		254				602	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			83.0	39.0		
Peak Hour Factor	0.82	0.84	0.82	0.71	0.76	0.91	
Heavy Vehicles (%)	3%	1%	2%	5%	4%	3%	
Adj. Flow (vph)	263	254	365	335	401	602	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	263	254	365	335	401	602	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	28.7	60.1	50.6	49.6	31.4	53.3	
Actuated g/C Ratio	0.25	0.53	0.44	0.44	0.28	0.47	
v/c Ratio	0.57	0.26	0.80	0.43	0.84	0.57	
Control Delay	44.2	1.4	40.4	25.7	54.7	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.2	1.4	40.4	25.7	54.7	3.7	
LOS	D	A	D	C	D	A	
Approach Delay	23.2			33.4	24.1		
Approach LOS	C			C	C		
90th %ile Green (s)	28.0	38.0	11.0	43.0	38.0	11.0	20.0
90th %ile Term Code	Coord	Max	Max	Coord	Max	Max	Ped
70th %ile Green (s)	23.8	34.9	18.3	46.1	34.9	18.3	20.0
70th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
50th %ile Green (s)	22.3	32.1	22.6	48.9	32.1	22.6	20.0
50th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
30th %ile Green (s)	29.7	28.6	18.7	52.4	28.6	18.7	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	39.8	23.3	13.9	57.7	23.3	13.9	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	190	12	187	164	281	35	
Fuel Used(gal)	6	3	12	9	9	8	
CO Emissions (g/hr)	410	207	840	624	631	555	
NOx Emissions (g/hr)	80	40	163	121	123	108	
VOC Emissions (g/hr)	95	48	195	145	146	129	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	183	0	186	169	275	0	
Queue Length 95th (ft)	231	13	#346	202	291	60	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	582	982	454	825	502	1053	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.45	0.26	0.80	0.41	0.80	0.57	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 26.8		Intersection LOS: C	
Intersection Capacity Utilization 56.5%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Farm St & Water St



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	46	123	21	1	83
Future Volume (Veh/h)	40	46	123	21	1	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.84	0.68	0.33	0.25	0.55
Hourly flow rate (vph)	52	55	181	64	4	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	245				372	213
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	245				372	213
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				99	82
cM capacity (veh/h)	1333				608	832

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	107	245	155
Volume Left	52	0	4
Volume Right	0	64	151
cSH	1333	1700	824
Volume to Capacity	0.04	0.14	0.19
Queue Length 95th (ft)	3	0	17
Control Delay (s)	4.0	0.0	10.4
Lane LOS	A		B
Approach Delay (s)	4.0	0.0	10.4
Approach LOS			B

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	108	90	649	51	42	331
Future Volume (Veh/h)	108	90	649	51	42	331
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	98	705	55	46	360
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1157	705			760	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1157	705			760	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	43	78			95	
cM capacity (veh/h)	205	436			852	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	98	705	55	46	360
Volume Left	117	0	0	0	46	0
Volume Right	0	98	0	55	0	0
cSH	205	436	1700	1700	852	1700
Volume to Capacity	0.57	0.22	0.41	0.03	0.05	0.21
Queue Length 95th (ft)	78	21	0	0	4	0
Control Delay (s)	43.5	15.6	0.0	0.0	9.5	0.0
Lane LOS	E	C			A	
Approach Delay (s)	30.8		0.0		1.1	
Approach LOS	D					

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	215	341	617	489	124
Future Volume (Veh/h)	59	215	341	617	489	124
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.85	0.68	0.81	0.82	0.54
Hourly flow rate (vph)	80	253	501	762	596	230
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2475	711	826			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2475	711	826			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	42	38			
cM capacity (veh/h)	12	433	809			

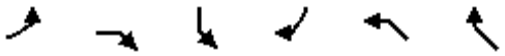
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	333	1263	826
Volume Left	80	501	0
Volume Right	253	0	230
cSH	46	809	1700
Volume to Capacity	7.21	0.62	0.49
Queue Length 95th (ft)	Err	110	0
Control Delay (s)	Err	16.4	0.0
Lane LOS	F	C	
Approach Delay (s)	Err	16.4	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	1383.3		
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	182	776	32	76	628
Future Volume (Veh/h)	37	182	776	32	76	628
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.68	0.77	0.81	0.74	0.79	0.82
Hourly flow rate (vph)	54	236	958	43	96	766
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1938	980			1001	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1938	980			1001	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	12	22			86	
cM capacity (veh/h)	62	303			692	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	290	1001	96	766
Volume Left	54	0	96	0
Volume Right	236	43	0	0
cSH	175	1700	692	1700
Volume to Capacity	1.65	0.59	0.14	0.45
Queue Length 95th (ft)	496	0	12	0
Control Delay (s)	364.9	0.0	11.0	0.0
Lane LOS	F		B	
Approach Delay (s)	364.9	0.0	1.2	
Approach LOS	F			

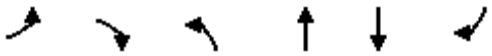
Intersection Summary			
Average Delay	49.6		
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	176	9	430	186	5	598
Future Volume (Veh/h)	176	9	430	186	5	598
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.80	0.45	0.91	0.94	0.42	0.98
Hourly flow rate (vph)	220	20	473	198	12	610
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1107	473			671	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1107	473			671	
tC, single (s)	6.4	6.2			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.4	
p0 queue free %	4	97			99	
cM capacity (veh/h)	230	595			840	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	240	671	622
Volume Left	220	0	12
Volume Right	20	198	0
cSH	243	1700	840
Volume to Capacity	0.99	0.39	0.01
Queue Length 95th (ft)	233	0	1
Control Delay (s)	98.6	0.0	0.4
Lane LOS	F		A
Approach Delay (s)	98.6	0.0	0.4
Approach LOS	F		

Intersection Summary			
Average Delay	15.6		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	47	54	685	401	8
Future Volume (Veh/h)	3	47	54	685	401	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.82	0.64	0.89	0.94	0.92
Hourly flow rate (vph)	4	57	84	770	427	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				533		
pX, platoon unblocked	0.72					
vC, conflicting volume	1370	432	436			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1320	432	436			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	97	91	92			
cM capacity (veh/h)	117	628	1072			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	61	854	436
Volume Left	4	84	0
Volume Right	57	0	9
cSH	488	1072	1700
Volume to Capacity	0.13	0.08	0.26
Queue Length 95th (ft)	11	6	0
Control Delay (s)	13.4	2.0	0.0
Lane LOS	B	A	
Approach Delay (s)	13.4	2.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

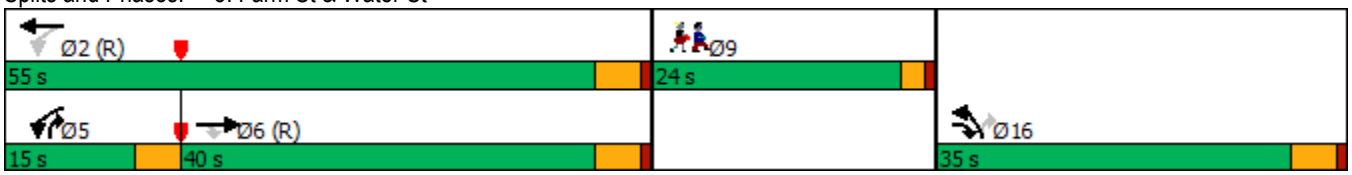
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	223	212	278	247	314	450	
Future Volume (vph)	223	212	278	247	314	450	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1881	1583	1787	1881	1770	1599	
Flt Permitted			0.390		0.950		
Satd. Flow (perm)	1881	1583	734	1881	1770	1599	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		233				506	
Link Speed (mph)	30			31	30		
Link Distance (ft)	1706			3653	1716		
Travel Time (s)	38.8			80.3	39.0		
Peak Hour Factor	0.89	0.91	0.79	0.86	0.84	0.89	
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	
Adj. Flow (vph)	251	233	352	287	374	506	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	251	233	352	287	374	506	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (ft)	100	20	20	100	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov	
Protected Phases	6	16	5	2	16	5	9
Permitted Phases		6	2			16	
Detector Phase	6	16	5	2	16	5	
Switch Phase							

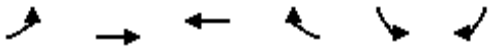
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0	1.0
Minimum Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (s)	40.0	35.0	15.0	55.0	35.0	15.0	24.0
Total Split (%)	35.1%	30.7%	13.2%	48.2%	30.7%	13.2%	21%
Maximum Green (s)	35.0	30.0	11.0	50.0	30.0	11.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag		Lead			Lead	
Lead-Lag Optimize?	Yes		Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None	Ped
Walk Time (s)							7.0
Flash Dont Walk (s)							13.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	31.1	59.7	53.4	52.4	28.6	50.9	
Actuated g/C Ratio	0.27	0.52	0.47	0.46	0.25	0.45	
v/c Ratio	0.49	0.25	0.70	0.33	0.84	0.51	
Control Delay	40.9	1.5	31.0	22.3	57.5	3.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.9	1.5	31.0	22.3	57.5	3.4	
LOS	D	A	C	C	E	A	
Approach Delay	21.9			27.1	26.4		
Approach LOS	C			C	C		
90th %ile Green (s)	26.7	35.8	14.5	45.2	35.8	14.5	20.0
90th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
70th %ile Green (s)	21.9	32.3	22.8	48.7	32.3	22.8	20.0
70th %ile Term Code	Coord	Gap	Max	Coord	Gap	Max	Ped
50th %ile Green (s)	27.9	29.0	20.1	52.0	29.0	20.1	20.0
50th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
30th %ile Green (s)	34.9	25.5	16.6	55.5	25.5	16.6	20.0
30th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
10th %ile Green (s)	44.3	20.3	12.4	60.7	20.3	12.4	20.0
10th %ile Term Code	Coord	Gap	Gap	Coord	Gap	Gap	Ped
Stops (vph)	188	13	176	157	290	27	
Fuel Used(gal)	6	3	11	9	9	6	
CO Emissions (g/hr)	410	207	740	627	663	453	
NOx Emissions (g/hr)	80	40	144	122	129	88	
VOC Emissions (g/hr)	95	48	171	145	154	105	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	161	0	167	132	260	0	
Queue Length 95th (ft)	245	17	232	209	316	51	
Internal Link Dist (ft)	1626			3573	1636		
Turn Bay Length (ft)							
Base Capacity (vph)	608	976	503	885	490	993	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Reduced v/c Ratio	0.41	0.24	0.70	0.32	0.76	0.51	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 114			
Offset: 22.5 (20%), Referenced to phase 2:WBTL and 6:EBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 25.5		Intersection LOS: C	
Intersection Capacity Utilization 56.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Farm St & Water St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	78	171	2	2	52
Future Volume (Veh/h)	17	78	171	2	2	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.61	0.81	0.76	0.50	0.25	0.52
Hourly flow rate (vph)	28	96	225	4	8	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229				379	227
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229				379	227
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	88
cM capacity (veh/h)	1351				614	817

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	124	229	108
Volume Left	28	0	8
Volume Right	0	4	100
cSH	1351	1700	798
Volume to Capacity	0.02	0.13	0.14
Queue Length 95th (ft)	2	0	12
Control Delay (s)	1.9	0.0	10.2
Lane LOS	A		B
Approach Delay (s)	1.9	0.0	10.2
Approach LOS			B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	15	639	30	25	507
Future Volume (Veh/h)	18	15	639	30	25	507
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	16	695	33	27	551
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1300	695			728	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1300	695			728	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	96			97	
cM capacity (veh/h)	172	442			876	

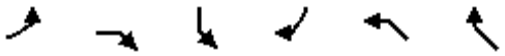
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	20	16	695	33	27	551
Volume Left	20	0	0	0	27	0
Volume Right	0	16	0	33	0	0
cSH	172	442	1700	1700	876	1700
Volume to Capacity	0.12	0.04	0.41	0.02	0.03	0.32
Queue Length 95th (ft)	10	3	0	0	2	0
Control Delay (s)	28.6	13.4	0.0	0.0	9.2	0.0
Lane LOS	D	B			A	
Approach Delay (s)	21.9		0.0		0.4	
Approach LOS	C					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	58	168	699	18	71	587
Future Volume (Veh/h)	58	168	699	18	71	587
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.69	0.73	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	84	230	794	20	83	683
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1653	804			814	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1653	804			814	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	13	40			90	
cM capacity (veh/h)	97	383			809	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	314	814	83	683
Volume Left	84	0	83	0
Volume Right	230	20	0	0
cSH	214	1700	809	1700
Volume to Capacity	1.47	0.48	0.10	0.40
Queue Length 95th (ft)	470	0	9	0
Control Delay (s)	277.2	0.0	10.0	0.0
Lane LOS	F		A	
Approach Delay (s)	277.2	0.0	1.1	
Approach LOS	F			

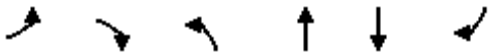
Intersection Summary			
Average Delay	46.4		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	154	5	525	166	9	626
Future Volume (Veh/h)	154	5	525	166	9	626
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.31	0.90	0.79	0.56	0.95
Hourly flow rate (vph)	181	16	583	210	16	659
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1274	583			793	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1274	583			793	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	97			98	
cM capacity (veh/h)	182	516			837	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	197	793	675
Volume Left	181	0	16
Volume Right	16	210	0
cSH	192	1700	837
Volume to Capacity	1.03	0.47	0.02
Queue Length 95th (ft)	223	0	1
Control Delay (s)	123.0	0.0	0.5
Lane LOS	F		A
Approach Delay (s)	123.0	0.0	0.5
Approach LOS	F		

Intersection Summary			
Average Delay	14.8		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	44	33	621	501	4
Future Volume (Veh/h)	10	44	33	621	501	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.77	0.66	0.95	0.93	0.33
Hourly flow rate (vph)	24	57	50	654	539	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				533		
pX, platoon unblocked	0.63					
vC, conflicting volume	1299	545	551			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1182	545	551			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	89	95			
cM capacity (veh/h)	127	542	1014			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	81	704	551
Volume Left	24	50	0
Volume Right	57	0	12
cSH	276	1014	1700
Volume to Capacity	0.29	0.05	0.32
Queue Length 95th (ft)	30	4	0
Control Delay (s)	23.4	1.3	0.0
Lane LOS	C	A	
Approach Delay (s)	23.4	1.3	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	89	261	218	649	398	95
Future Volume (Veh/h)	89	261	218	649	398	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.91	0.82	0.88	0.86	0.82
Hourly flow rate (vph)	124	287	266	738	463	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		12				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1791	521	579			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1791	521	579			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	48	74			
cM capacity (veh/h)	66	555	1005			

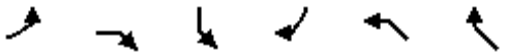
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	411	1004	579
Volume Left	124	266	0
Volume Right	287	0	116
cSH	200	1005	1700
Volume to Capacity	2.05	0.26	0.34
Queue Length 95th (ft)	782	27	0
Control Delay (s)	529.3	6.0	0.0
Lane LOS	F	A	
Approach Delay (s)	529.3	6.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	112.1		
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	58	168	699	18	71	587
Future Volume (Veh/h)	58	168	699	18	71	587
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.69	0.73	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	84	230	794	20	83	683
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1653	804			814	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1653	804			814	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	13	40			90	
cM capacity (veh/h)	97	383			809	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	314	814	83	683
Volume Left	84	0	83	0
Volume Right	230	20	0	0
cSH	214	1700	809	1700
Volume to Capacity	1.47	0.48	0.10	0.40
Queue Length 95th (ft)	470	0	9	0
Control Delay (s)	277.2	0.0	10.0	0.0
Lane LOS	F		A	
Approach Delay (s)	277.2	0.0	1.1	
Approach LOS	F			

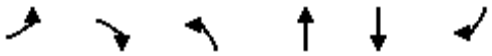
Intersection Summary			
Average Delay	46.4		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	154	5	525	166	9	626
Future Volume (Veh/h)	154	5	525	166	9	626
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.31	0.90	0.79	0.56	0.95
Hourly flow rate (vph)	181	16	583	210	16	659
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1274	583			793	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1274	583			793	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	97			98	
cM capacity (veh/h)	182	516			837	

Direction, Lane #	EB 1	SB 1	NW 1
Volume Total	197	793	675
Volume Left	181	0	16
Volume Right	16	210	0
cSH	192	1700	837
Volume to Capacity	1.03	0.47	0.02
Queue Length 95th (ft)	223	0	1
Control Delay (s)	123.0	0.0	0.5
Lane LOS	F		A
Approach Delay (s)	123.0	0.0	0.5
Approach LOS	F		

Intersection Summary			
Average Delay	14.8		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	44	33	621	501	4
Future Volume (Veh/h)	10	44	33	621	501	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.77	0.66	0.95	0.93	0.33
Hourly flow rate (vph)	24	57	50	654	539	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				533		
pX, platoon unblocked	0.63					
vC, conflicting volume	1299	545	551			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1182	545	551			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	89	95			
cM capacity (veh/h)	127	542	1014			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	81	704	551
Volume Left	24	50	0
Volume Right	57	0	12
cSH	276	1014	1700
Volume to Capacity	0.29	0.05	0.32
Queue Length 95th (ft)	30	4	0
Control Delay (s)	23.4	1.3	0.0
Lane LOS	C	A	
Approach Delay (s)	23.4	1.3	0.0
Approach LOS	C		

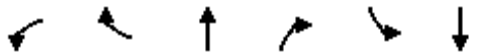
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	85	71	418	179	150	272
Future Volume (vph)	85	71	418	179	150	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		120	120	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		77		195		
Link Speed (mph)	30		30			30
Link Distance (ft)	407		962			533
Travel Time (s)	9.3		21.9			12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	77	454	195	163	296
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	77	454	195	163	296
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	6	20	20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	pm+ov	NA	pt+ov	Prot	NA
Protected Phases	8	1	2	2 8	1	6
Permitted Phases		8				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	1	2	2 8	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0
Minimum Split (s)	20.0	14.5	20.0		14.5	20.0
Total Split (s)	20.0	22.0	33.0		22.0	55.0
Total Split (%)	26.7%	29.3%	44.0%		29.3%	73.3%
Maximum Green (s)	16.0	17.5	29.0		17.5	51.0
Yellow Time (s)	3.0	3.5	3.0		3.5	3.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0		4.5	4.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	10.3	25.8	35.0	49.2	11.6	51.0
Actuated g/C Ratio	0.15	0.37	0.51	0.71	0.17	0.74
v/c Ratio	0.35	0.12	0.48	0.17	0.55	0.22
Control Delay	30.7	4.0	14.1	1.0	33.7	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	4.0	14.1	1.0	33.7	3.4
LOS	C	A	B	A	C	A
Approach Delay	18.6		10.1			14.1
Approach LOS	B		B			B
90th %ile Green (s)	11.3	15.0	31.5		15.0	51.0
90th %ile Term Code	Gap	Gap	Hold		Gap	MaxR
70th %ile Green (s)	10.0	12.3	34.2		12.3	51.0
70th %ile Term Code	Min	Gap	Hold		Gap	MaxR
50th %ile Green (s)	10.0	10.6	35.9		10.6	51.0
50th %ile Term Code	Min	Gap	Hold		Gap	MaxR
30th %ile Green (s)	10.0	10.0	36.5		10.0	51.0
30th %ile Term Code	Min	Min	Hold		Min	MaxR
10th %ile Green (s)	10.0	10.0	36.8		10.0	51.3
10th %ile Term Code	Min	Min	Dwell		Min	Dwell
Stops (vph)	73	12	266	10	133	74
Fuel Used(gal)	1	0	6	1	2	2
CO Emissions (g/hr)	84	24	405	100	167	121
NOx Emissions (g/hr)	16	5	79	20	32	23
VOC Emissions (g/hr)	20	6	94	23	39	28
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	36	0	113	0	65	30
Queue Length 95th (ft)	76	21	219	17	115	55
Internal Link Dist (ft)	327		882			453
Turn Bay Length (ft)	200			120	120	
Base Capacity (vph)	408	766	940	1296	446	1372
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.10	0.48	0.15	0.37	0.22

Intersection Summary		
Area Type:	Other	
Cycle Length: 75		
Actuated Cycle Length: 69.3		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.55		
Intersection Signal Delay: 12.7		Intersection LOS: B
Intersection Capacity Utilization 49.1%		ICU Level of Service A
Analysis Period (min) 15		
90th %ile Actuated Cycle: 70.3		
70th %ile Actuated Cycle: 69		
50th %ile Actuated Cycle: 69		
30th %ile Actuated Cycle: 69		
10th %ile Actuated Cycle: 69.3		

Splits and Phases: 16: Farm St

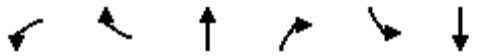


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	108	90	649	51	42	331
Future Volume (vph)	108	90	649	51	42	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		120	120	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		97		55		
Link Speed (mph)	15		30			30
Link Distance (ft)	407		962			533
Travel Time (s)	18.5		21.9			12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	98	705	55	46	360
Shared Lane Traffic (%)						
Lane Group Flow (vph)	117	98	705	55	46	360
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60		60	60	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	6	20	20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	1	2	8	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	14.5	20.0	20.0	14.5	20.0
Total Split (s)	20.0	22.0	33.0	20.0	22.0	55.0
Total Split (%)	26.7%	29.3%	44.0%	26.7%	29.3%	73.3%
Maximum Green (s)	16.0	18.0	29.0	16.0	18.0	51.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None	Max	None	None	Max
Act Effct Green (s)	10.7	21.9	43.6	55.5	10.0	54.8
Actuated g/C Ratio	0.15	0.31	0.62	0.79	0.14	0.78
v/c Ratio	0.43	0.17	0.61	0.04	0.18	0.25
Control Delay	32.2	4.7	14.3	0.8	28.7	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	4.7	14.3	0.8	28.7	3.4
LOS	C	A	B	A	C	A
Approach Delay	19.7		13.3			6.3
Approach LOS	B		B			A
90th %ile Green (s)	12.9	10.0	37.0	12.9	10.0	51.0
90th %ile Term Code	Gap	Min	Hold	Gap	Min	MaxR
70th %ile Green (s)	10.4	10.0	37.0	10.4	10.0	51.0
70th %ile Term Code	Gap	Min	Hold	Gap	Min	MaxR
50th %ile Green (s)	10.0	10.0	37.0	10.0	10.0	51.0
50th %ile Term Code	Min	Min	Hold	Min	Min	MaxR
30th %ile Green (s)	10.0	10.0	37.0	10.0	10.0	51.0
30th %ile Term Code	Min	Min	Hold	Min	Min	MaxR
10th %ile Green (s)	0.0	0.0	66.0	0.0	0.0	66.0
10th %ile Term Code	Skip	Skip	Dwell	Skip	Skip	Dwell
Stops (vph)	94	16	426	4	38	89
Fuel Used(gal)	1	0	9	0	1	2
CO Emissions (g/hr)	91	34	637	29	44	147
NOx Emissions (g/hr)	18	7	124	6	9	29
VOC Emissions (g/hr)	21	8	148	7	10	34
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	46	0	205	0	17	37
Queue Length 95th (ft)	92	27	360	6	47	75
Internal Link Dist (ft)	327		882			453
Turn Bay Length (ft)	200			120	120	
Base Capacity (vph)	405	732	1162	1358	456	1461
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.13	0.61	0.04	0.10	0.25

Intersection Summary		
Area Type:	Other	
Cycle Length: 75		
Actuated Cycle Length: 69.9		
Natural Cycle: 65		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.61		
Intersection Signal Delay: 12.2		Intersection LOS: B
Intersection Capacity Utilization 49.9%		ICU Level of Service A
Analysis Period (min) 15		
90th %ile Actuated Cycle: 71.9		
70th %ile Actuated Cycle: 69.4		
50th %ile Actuated Cycle: 69		
30th %ile Actuated Cycle: 69		
10th %ile Actuated Cycle: 70		

Splits and Phases: 16: Farm St



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	15	639	30	25	507
Future Volume (vph)	18	15	639	30	25	507
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		120	120	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		16		22		
Link Speed (mph)	30		30			30
Link Distance (ft)	407		962			533
Travel Time (s)	9.3		21.9			12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	16	695	33	27	551
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	16	695	33	27	551
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60		60	60	
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Minimum Split (s)	20.0	20.0	20.0	20.0	14.5	20.0
Total Split (s)	20.0	20.0	34.0	34.0	21.0	55.0
Total Split (%)	26.7%	26.7%	45.3%	45.3%	28.0%	73.3%
Maximum Green (s)	16.0	16.0	30.0	30.0	17.0	51.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Act Effct Green (s)	16.0	16.0	30.0	30.0	17.0	51.0
Actuated g/C Ratio	0.21	0.21	0.40	0.40	0.23	0.68
v/c Ratio	0.05	0.05	0.93	0.05	0.07	0.44
Control Delay	24.1	12.3	43.9	8.1	23.4	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	12.3	43.9	8.1	23.4	6.8

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	C	B	D	A	C	A
Approach Delay	18.8		42.2			7.5
Approach LOS	B		D			A
Stops (vph)	16	8	532	11	21	211
Fuel Used(gal)	0	0	13	0	0	4
CO Emissions (g/hr)	16	9	939	23	24	278
NOx Emissions (g/hr)	3	2	183	5	5	54
VOC Emissions (g/hr)	4	2	218	5	5	64
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	7	0	300	3	10	98
Queue Length 95th (ft)	24	15	#517	19	29	153
Internal Link Dist (ft)	327		882			453
Turn Bay Length (ft)	200			120	120	
Base Capacity (vph)	377	350	745	646	401	1266
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.05	0.93	0.05	0.07	0.44

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Pretimed
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 26.7 Intersection LOS: C
Intersection Capacity Utilization 48.6% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Farm St