AROMA JOES

SITE PLAN APPLICATION #08-21

STAFF REPORT

August 25, 2021

SITE: 56 Derry Street; Map 173 Lot 029-000

ZONING: Business (B)

PURPOSE OF PLANS: Propose an Aroma Joe's drive-thru coffee shop at 56 Derry Street with associated parking and drives.

PLANS UNDER REVIEW:

Non-Residential Site Plan, Aroma Joe's; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3B, Bedford, NH 03110; prepared for owner: Steve S. & Hsiang Hwa W. Pan, 13 King Henry Drive, Londonderry, NH 03053 and owner/applicant: Scott Ziefelder, 169 Cannan Back Road, Barrington, NH 03825; consisting of 16 sheets including a cover sheet, with general notes 1-32 on Sheet 1; dated June 22, 2021, last revised August 12, 2021. [Plan set attached hereto]

ATTACHMENTS:

A. Second Round of Peer Review by Fuss & O'Neill, dated August 16, 2021
B. Traffic Impact and Access Study, prepared by TEPP, received July 20, 2021
C. Adjusted CAP Fee Worksheet

APPLICATION TRACKING:

- June 23, 2021 – Application received.
- July 20, 2021 - Traffic Impact and Access Study received.
- July 28, 2021 – Application accepted, public hearing held, waiver granted for relief from residential buffer, continued to 8/25/21.
- August 17, 2021 – Revised Plans received.
- August 25, 2021 – Continuance scheduled.

COMMENTS & RECOMMENDATIONS:

STATUS UPDATE

Please note that since the revised plan set was received on August 17, 2021, and this report was authored on August 18, 2021, a full review by town staff and the peer reviewer remains pending.

Since the last iteration of the plan set the applicant has made the following modifications:

1. Hours of operation (Sheet 1, note 15) have been revised to 5:15 AM to 9:00 PM, Monday through Sunday.

2. The proposed freestanding sign shows on Sheet 1 and the detail of the sign is on Sheet 10.
3. A crosswalk has been added per request at previous meeting.
4. The proposed sidewalk easement shows on Sheet E1.
5. The loading space and dumpster location are clearly identified on the plan

PEER REVIEW

Attachment A is the second round of peer review comments, distributed on Monday, August 16, 2021. For that reason, the applicant has not had time to provide a response. Peer review of the Traffic Study (**Attachment B**) is ongoing but expected soon.

1. The outstanding comments primarily focus on the stormwater/drainage design. These comments are under review by the applicant as well as the Town Engineer.
2. Some comments related to items being reviewed in the Traffic Study
3. Other items were administrative in nature and have been addressed by the applicant.

TRAFFIC STUDY

Attachment B is the Traffic Impact and Access Study prepared by Kim Hazarvartian of TEPP LLC, currently under peer review. The study concludes that no significant traffic impact results from this application.

The study reports:

2022 total vehicle trips:

- weekday daily, 629 (total of in and out)
- weekday AM-street-peak hour*, 106 (53 in and 53 out)
- weekday PM-street-peak hour, 40 (20 in and 20 out)

2032 total vehicle-trips are:

- weekday daily, 694 (total of in and out)
- weekday AM-street-peak hour, 117 (58 in and 539 out) *[Staff assumes 539 is a typo]*
- weekday PM-street-peak hour, 44 (22 in and 22 out)

Primary trips** are added to Derry Road near the site. 2022 primary vehicle-trips are:

- weekday daily, 69 (total of in and out)
- weekday AM-street-peak hour, 12 (6 in and 6 out)
- weekday PM-street-peak hour, 4 (2 in and 2 out)

2032 primary vehicle-trips are:

- weekday daily, 78 (total of in and out)
- weekday AM-street-peak hour, 13 (6 in and 7 out)
- weekday PM-street-peak hour, 6 (3 in and 3 out)

*Peak hours are reported to be 7:00 A.M. to 8:00 P.M., and 4:00 P.M to 5:00 P.M.

**Primary trips are vehicles drawn to the site by the coffee shop rather vehicles that are already travelling by the site. Peer review has indicated this is an acceptable approach with one caveat described in the CAP fee discussion below.

Staff has asked the Town's peer review consultant to examine how the traffic study lines up with the excepted operations of Aroma Joe's. For example, the study reports 53 vehicles in 2022 and 58 vehicles in 2032 during the morning peak hour. This requires customer turnover to be about 1 minute per vehicle. The operator of Aroma Joe's indicated a typical turnover time ranging from a minute to a few. This matters in determining the adequacy of the queue length to avoid the familiar problem of drive-thru customers spilling out onto public roads.

CAP Fee Adjustment

While Fuss & O'Neill serves as the Town's peer review consultant, including the traffic study in this application, VHB establishes the rates and methodology used in the Town's impact fee system, or Cost Allocation Procedure (CAP). Staff consulted VHB on the appropriate calculation of the CAP fee for this application, suspecting that using the square footage of the building was not an appropriate representation of its impact to traffic. In agreement with Staff's query, VHB recommended using the alternate method for unique categories, which is to multiply the number of new daily trips (or, Primary Trips) by $199. VHB noted that the Traffic Study appears to allocate 10% of total trips as Primary Trips (69 of 692), whereas their standard is 15%, or 104 Primary Trips. See **Attachment C** for the updated CAP Fee worksheet.

As it relates to the overall traffic impact, the total number of vehicles remains the same. Please note that the Traffic Study remains under peer review where the discrepancy between the two methodologies will be addressed.

Plan Notes

Suggested Changes to Plan/Notes:

1. Note #29: Staff suggests amending the note to state "All signs are subject to approval by the Zoning Administrator prior to installation." The note provided is consistent with §276.11.1.B (13), however, this regulation is inconsistent with actual sign permit practices.
2. Note #19 & #27: Staff suggests amending instances of "Community Development Department" to "Planning Department"
3. A plan note should address the hours of refuse removal / garbage pick-up. The typical hours are 7:00 A.M. and 7:00 P.M., Monday through Friday only.
4. References to Derry Road should be revised to Derry Street,

DRAFT MOTIONS

CONTINUE the public hearing to a date certain:

I move to continue the public hearing for the site plan application for Aroma Joes at 56 Derry Street; Map 173 Lot 029-000 to date certain, _____, 2021.

Motion by: _____Second: _____Carried/Failed: _____

APPROVE the site plan application:

I move to approve the Site Plan: Non-Residential Site Plan, Aroma Joe's; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3B, Bedford, NH 03110; prepared for owner: Steve S. & Hsiang Hwa W. Pan, 13 King Henry Drive, Londonderry, NH 03053 and owner/applicant: Scott Ziefelder, 169 Cannan Back Road, Barrington, NH 03825; consisting of 16 sheets including a cover sheet, with general notes 1-32 on Sheet 1; dated June 22, 2021, last revised August 12, 2021; subject to, and revised per, the following stipulations:

1. All stipulations of approval shall be incorporated into the Development Agreement, which shall be recorded at the HCRD, together with the Plan.

2. All improvements shown on the Plan shall be completed in their entirety and at the expense of the applicant or the applicant's assigns.

3. Prior to the issuance of a Certificate of Occupancy, an L.L.S. Certified "as-built" site plan shall be provided to the Town of Hudson Land Use Development, confirming that the site conforms to the Plan approved by the Planning Board.

4. A cost allocation procedure (CAP) amount of $20,696.00 shall be paid prior to the issuance of a Certificate of Occupancy

5. The onsite drainage system shall be constructed and maintained in compliance with NHDES requirements for such systems.

6. Prior to the Planning Board endorsement of the Plan, it shall be subject to final administrative review by Town Planner and Town Engineer.

7. The applicant shall schedule a pre-construction meeting with the Town Engineer prior to beginning work on the site.

8. Hours of refuse removal shall be exclusive to the hours between 7:00 A.M. and 7:00 P.M., Monday through Friday only.

Motion by: _____Second: _____Carried/Failed: _____

FUSS & O'NEILL

August 16, 2021

Mr. Brian Groth
Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Re: Town of Hudson Planning Board Review
Aroma Joe's Site Plan, 56 Derry Street
Tax Map 173 Lot 29; Acct. #1350-970
Reference No. 20030249.2040

Dear Mr. Groth:

Fuss & O'Neill (F&O) has reviewed the second submission of the materials received on June 23, 2021, related to the above-referenced project. Authorization to proceed was received on August 10, 2021. A list of items reviewed is enclosed. The scope of our review is based on the Site Plan Review Codes, Stormwater Codes, Driveway Review Codes, Sewer Use Ordinance 77, Zoning Regulations, and criteria outlined in the CLD Consulting Engineers Proposal approved September 16, 2003, revised September 20, 2004, June 4, 2007, September 3, 2008, and October 2015.

The project appears to consist of the development of a drive-thru coffee shop on a previously undeveloped site. Proposed improvements to the site also include the construction of a driveway, parking areas, drainage improvements, landscaping, lighting and other associated site improvements. The proposed buildings will be serviced by public water and sewer.

The following items have outstanding issues:

1. Site Plan Review Codes (HR 275)

g. *Former Fuss & O'Neill Comment: HR 275-8.C.(6). The applicant has not provided any off-street loading spaces on the plan set.*

Current Fuss & O'Neill Comment: The applicant has added a loading space to the plan set. We note that the space shown is 40 feet long instead of the standard 60 feet. The applicant should confirm that the size of anticipated delivery vehicles will fit in this location.

h. *Former Fuss & O'Neill Comment: HR 275-9.C.(11). The applicant has provided one handicap space for the site which meets the one space required. We recommend that the applicant add spot grades to the parking lot and sidewalk area to ensure that it is constructed as intended. This is especially important in the area of the handicap space and ramp.*

Current Fuss & O'Neill Comment: The applicant has provided spot grades for the parking lot ramp locations. We continue to recommend spot grades be provided for the sidewalk ramps as well.

50 Commercial Street
Manchester, NH
03101
t 603.668.8223
800.286.2469

www.fando.com

California
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i. *Former Fuss & O'Neill Comment: HR 275-9.F. The applicant did not provide copies of any easements or deeds as part of the package received for review, and has not shown any existing or proposed easements on the plans.*

Current Fuss & O'Neill Comment: The applicant has stated that no easements or deeds are required. We continue to recommend a sidewalk easement be provided to the Town for the relocated sidewalk.

3. Driveway Review Codes (HR 275-8.B. (34)/Chapter 193)

d. **New Fuss & O'Neill Comment:** We understand that the Town has requested a crosswalk be installed from the Derry Street sidewalk to the sidewalk at the proposed building. We recommend that the applicant provide appropriate pedestrian signage both internally for this crosswalk and for vehicles approaching Derry Street at the right turn lane.

6. Drainage Design/Stormwater Management (HR 275-9.A./Chapter 290)

a. *Former Fuss & O'Neill Comment: HR 275-9.A.(3). The applicant should provide test pits within the footprint of the infiltration basin area, as required by NHDES and common engineering practice.*

Current Fuss & O'Neill Comment: The applicant has noted that test pits are consistent within the site and within close proximity to the infiltration basin areas. We note test pit #2 has an existing elevation of 160.0, with 66" depth to ESHWT as noted within the Test Pit data and BMP worksheet for Infiltration Pond 2. Applying this test pit data to the entire Infiltration Pond#2: Bottom of basin is 159.0, existing elevation at bottom of basin is 164.0. Calculating ESHWT to be 66" below 164.0, computes to 158.5 and not 156.0 as noted within the BMP worksheet. This does not meet the 3.0' required separation from ESHWT. The applicant should provide additional test pit information to support the use of an infiltration basin situated upon the site in respect to existing elevations.

b. *Former Fuss & O'Neill Comment: HR 290-5.A.9. & 290-5.A.11. The applicant should provide NHDES BMP worksheets and an Infiltration Feasibility Report to illustrate the ESHWT is accounted for within the BMP design, as well as overall Stormwater Design meets NHDES standards.*

Current Fuss & O'Neill Comment: The applicant has provided BMP worksheets. We continue to recommend the applicant provide the required Infiltration Feasibility Report.

c. *Former Fuss & O'Neill Comment: HR 290-7.B.14. Although the property has been partially developed in the past, the contours illustrate a low point near the existing CBs to be removed, as well as the close proximity of the abutting wetland discharge point. The applicant should provide a letter from a wetland scientist stating wetlands do not exist upon the site.*

Current Fuss & O'Neill Comment: The applicant has stated that a letter was provided under separate cover. We note that a letter was not provided as part of the package received for review.

d. Former Fuss & O'Neill Comment: HR 290-7.B.16. The applicant should label snow storage areas upon the plan set. Due to the close proximity of wetlands and proposed infiltration systems, we suggest reviewing the need for onsite signage or fencing to ensure proper snow storage/removal occurs.

Current Fuss & O'Neill Comment: The applicant has illustrated two snow storage areas upon the landscaping plan. The applicant should review the need for fencing or signage to

ensure snow storage does not occur within the footprint of the infiltration basins.

e. *Former Fuss & O'Neill Comment: Engineering Technical Guideline & Typical Details (ETGTD) ETGTD 910.8. The HydroCAD analysis illustrates that the proposed conditions utilize an infiltration rate of 6.00in/hr. The applicant should provide additional information and/or conversion calculations to support the use of the infiltration rate. Does this rate utilize a factor of safety, does it follow typical current engineering practice as outlined within Env-Wq 1504.14(c), does the soil need to be amended, etc.*

Current Fuss & O'Neill Comment: The applicant has updated the infiltration rate to be 3.0 in/hr, from the previously utilized 6.0 in/hr. The Test Pit information provided within the Stormwater Management and Erosion Control Plan illustrates a perc rate of 2.0 min/inch, which is equivalent to the utilized 3.0 in/hr. The applicant should provide additional information as to why this rate was utilized and a factor of safety is not being accounted for within the calculations.

g. *Former Fuss & O'Neill Comment: ETGTD 920.6. The applicant should provide rip rap outlet calculations within the Stormwater Management Report.*

Current Fuss & O'Neill Comment: The applicant has provided rip rap calculations. The applicant should also provide all outlet protection apron calculations, as illustrated upon Plan Sheet 10 of the Plan Set.

h. *Former Fuss & O'Neill Comment: ETGTD 930.4. We note that the majority of the stormwater design utilizes pipe slopes of less than the required 2.0%. The applicant should review these pipe slopes and provide calculations showing that the drain line velocities are self-cleaning.*

Current Fuss & O'Neill Comment: The applicant has provided information demonstrating that the pipes are self-cleaning within the HydroCAD 2-year report. The applicant should review this with the Town to ensure this is an acceptable variation from the Regulations.

9. Landscaping (HR 275-8.C.(7) & 276-11.1.B.(20)) and Lighting (HR 276-11.1.B.(14))

d. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(14). The applicant has noted that the hours of operation for the facility are 6:00 am to 6:00 pm. The applicant should provide additional information regarding whether the lights are intended to be in operation during non-working hours.*

Current Fuss & O'Neill Comment: The applicant has stated that the lights will be on a timer and scheduled around the operating hours of the business. We note that applicant should update the business hours on the plan set per the Planning Board meeting on July 28, 2021.

11. Other

d. **New Fuss & O'Neill Comment:** The applicant should update Derry Road plan references to Derry Street.

The following items require Town evaluation or input:

1. Site Plan Review Codes (HR 275)

a. **Former/Current Fuss & O'Neill Comment:** Hudson Regulation (HR) 275-6.C. The applicant has proposed to realign the existing sidewalk along Derry Street to accommodate

a turning lane and the site entrance. The Town should review a need for an easement for the new sidewalk areas that are out of the Right-of-Way.

The following items are resolved or have no further Fuss & O'Neill input:

1. Site Plan Review Codes (HR 275)

b. *Former Fuss & O'Neill Comment: HR 275-6.I. The scope of this review does not include the adequacy of any fire protection provisions for the proposed building. No fire service connections to the buildings are shown.*

Current Fuss & O'Neill Comment: The applicant has added a fire service to the plan set. No further Fuss & O'Neill comment.

c. *Former Fuss & O'Neill Comment: HR 275-6.T. The applicant is proposing the construction of a 10 foot wide right turn lane on Derry Street southbound to access the site. We note that no grading was provided for this right turn lane area. The applicant should review and provide spot grades on the plans to ensure positive drainage will exist in this area.*

Current Fuss & O'Neill Comment: The applicant has added spot grades to the turn lane. No further Fuss & O'Neill comment.

d. *Former Fuss & O'Neill Comment: HR 275-6.T. The applicant has shown a 50 foot long right turn lane with a 50' long 10:1 taper. The applicant should confirm that these turn lane dimensions meet Town standards and the turn lane is long enough to accommodate expected traffic entering the site.*

Current Fuss & O'Neill Comment: The applicant has increased the lane to an 11 foot width and will be reviewed as part of the traffic review. No further Fuss & O'Neill comment.

e. *Former Fuss & O'Neill Comment: HR 275-8.C.(2) and Zoning Ordinance (ZO) 334-15.A. The applicant has provided parking calculations on the plan set. The applicant has noted that 9 parking are required for the 900 square foot facility and that 9 spaces are provided.*

f. *Former Fuss & O'Neill Comment: HR 275-8.C.(2).(c).[5]. The applicant should show the required stacking spaces in the drive thru area. We note that the Regulation requires a minimum of 12 stacking spaces in the drive thru, or a number of stacking spaces determined appropriate by the Planning Board for the use served.*

Current Fuss & O'Neill Comment: The applicant has noted that the 12 stacking spaces required have been added to the plan set. The plan shows a 240 feet of stacking length for the drive thru location. No further Fuss & O'Neill comment.

2. Administrative Review Codes (HR 276)

a. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(12).(c). The applicant should review and confirm that a 100 foot buffer exists between the residential use to the west of the site and the proposed development of this commercial site.*

Current Fuss & O'Neill Comment: The applicant has included a waiver application as part of the package received for review. We also note that waiver was approved by the Planning Board on June 28, 2021. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(13). The applicant has not included details for any proposed site signage other than traffic signs. The applicant has included a note stating that, "All signs are subject to approval by the Hudson Planning Board prior to installation."*

c. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(16).The applicant has not provided the locations of all driveways and travel ways within 200 feet of the site.*

   Current Fuss & O'Neill Comment: The applicant has provided the required information. No further Fuss & O'Neill comment.

d. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(23). The applicant has not noted any pertinent highway projects on the plan set.*

3. Driveway Review Codes (HR 275-8.B. (34)/Chapter 193)

a. *Former Fuss & O'Neill Comment: HR 193.10.C. The applicant has not provided grading at the driveway connection to Derry Street so we are unable to confirm that the proposed driveway grading conforms to the Regulation and Town standards.*

   Current Fuss & O'Neill Comment: The applicant has added grading to the driveway. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: HR 193.10.E. The applicant has not provided any sight distances for the proposed driveway location on the plan set.*

   Current Fuss & O'Neill Comment: The applicant has added sight distance information to the plan set. No further Fuss & O'Neill comment.

c. *Former Fuss & O'Neill Comment: The driveway layout at the entrance and the parking lot doesn't appear to allow for larger trucks to access the site. The applicant should confirm that these are not anticipated, and review the need for signage to prevent such trucks from attempting to access the site. The applicant should also provide information as to the types of delivery trucks expected to access the site.*

   Current Fuss & O'Neill Comment: The applicant has stated that Aroma Joe's sixes trucks according to site constraints. They do not anticipate larger trucks will try to access the site. No further Fuss & O'Neill comment.

d. *Former Fuss & O'Neill Comment: The applicant has called for vertical granite curb on the plan set and provided a detail for bituminous curb only. The applicant should coordinate the plans and details.*

   Current Fuss & O'Neill Comment: The applicant has added the vertical granite curb detail to the plan set. No further Fuss & O'Neill comment.

4. Traffic

a. *Former Fuss & O'Neill Comment: HR 275-9.B. The applicant has not provided any traffic information as part of their review package.*

   Current Fuss & O'Neill Comment: The applicant has submitted a Traffic Impact and Access Study which Fuss & O'Neill will review and provide comments for separately. No further Fuss & O'Neill comment.

5. Utility Design/Conflicts

a. *Former Fuss & O'Neill Comment: Engineering Technical Guideline & Typical Details (ETGTD)*

Section 720.8.3.The applicant has not provided a cleanout for the proposed sewer service. This should be located at the property line.

Current Fuss & O'Neill Comment: The applicant has added a sewer manhole to the site next to the property line per the request of the Town Engineer. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: The applicant should provide a water/sewer crossing detail for the sewer service crossing the water main in Derry Street, and crossing details for the service piping at the drain line in the driveway.*

Current Fuss & O'Neill Comment: The applicant has provided the recommended detail on the plan set. No further Fuss & O'Neill comment.

6. Drainage Design/Stormwater Management (HR 275-9.A./Chapter 290)

f. *Former Fuss & O'Neill Comment: ETGTD 920.4.18. & 920.4.11. The applicant should state on the plan that the responsibility of maintaining the stormwater features are solely the owner's.*

Current Fuss & O'Neill Comment: The applicant has added a note to the plan set. No further Fuss & O'Neill comment.

i. *Former Fuss & O'Neill Comment: ETGTD 930.12. The applicant should review the use of curb cuts on this private site. Snow storage and snow melt could reduce the effectiveness of this drainage design, leading to unwanted flooding.*

Current Fuss & O'Neill Comment: The applicant has revised the curb cuts to curb inlets. No further Fuss & O'Neill comment.

j. *Former Fuss & O'Neill Comment: The applicant will be required to comply with all provisions of the Town of Hudson's MS4 permit, including but not limited to annual reporting requirements, construction site stormwater runoff control, and record keeping requirements.*

k. *Former Fuss & O'Neill Comment: Please note that this review was carried out in accordance with applicable regulations and standards in place in New Hampshire at this time. Note that conditions at the site, including average weather conditions, patterns and trends, and design storm characteristics, may change in the future. In addition, future changes in federal, state or local laws, rules or regulations, or in generally accepted scientific or industry information concerning environmental, atmospheric and geotechnical conditions and developments may affect the information and conclusions set forth in this review. In no way shall Fuss & O'Neill be liable for any of these changed conditions that may impact the review, regardless of the source of or reason for such changed conditions. Other than as described herein, no other investigation or analysis has been requested by the Client or performed by Fuss & O'Neill in preparing this review.*

7. Zoning (ZO 334)

a. *Former Fuss & O'Neill Comment: ZO 334-14.A. The applicant has not provided the proposed building height on the plan set.*

Current Fuss & O'Neill Comment: The applicant has added the proposed building height on the plan set. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: ZO 334-17 & 334-21. The applicant has noted that the subject parcel is located within the Business (B) zoning district. The proposed use is permitted by the Ordinance within the Business district.*

c. *Former Fuss & O'Neill Comment: ZO 334-33. The applicant has not shown any wetlands on the plan set.*

d. *Former Fuss & O'Neill Comment: ZO 334-60. The applicant has not provided any information for any proposed signs on site, except traffic and parking signage. The applicant has noted that signs are subject to Planning Board approval prior to installation.*

e. *Former Fuss & O'Neill Comment: ZO 334-83 and HR 218-4.E. The applicant has noted that the site is not located within a designated flood hazard area.*

8. Erosion Control/Wetland Impacts

a. *Former Fuss & O'Neill Comment: The Town of Hudson should reserve the right to require any additional erosion control measures as needed. The applicant has noted this on the plans.*

9. Landscaping (HR 275-8.C.(7) & 276-11.1.B.(20)) and Lighting (HR 276-11.1.B.(14))

a. *Former Fuss & O'Neill Comment: HR 275-8.C.(7). The applicant has met the parking lot landscaping requirements.*

b. *Former Fuss & O'Neill Comment: HR 275-8.C.(8). The applicant has provided screening for the residential use to the west by using the existing tree line.*

c. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(14). The applicant has shown lighting fixture locations on the plans with details and photometric information.*

10. State and Local Permits (HR 275-9.G.)

a. *Former Fuss & O'Neill Comment: HR 275-9.G. The applicant has listed required permits and statuses on the plan set.*

b. *Former Fuss & O'Neill Comment: HR 275-9.G. The applicant did not provide copies of any applicable Town, State or Federal approvals or permits in the review package.*

c. *Former Fuss & O'Neill Comment: Additional local and state permitting may be required.*

11. Other

a. *Former Fuss & O'Neill Comment: The applicant should review the circles shown on sheets 8 and 9. They appear to be a drafting error.*

Current Fuss & O'Neill Comment: The applicant has corrected the plan. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: The applicant has proposed retaining walls adjacent to the parking lot. The applicant has provided a typical detail for the walls but individual designs were not provided. We note that a portion of this wall appears to be nearly 10 feet tall but specific wall grades are not provided. The applicant should provide detailed design drawings for the proposed wall, stamped by an Engineer licensed in the State of New Hampshire, for Town review prior to construction.*

Current Fuss & O'Neill Comment: The applicant has stated that a detailed design will be provided prior to construction. No further Fuss & O'Neill comment.

c. *Former Fuss & O'Neill Comment: ETGTD Section 565.1.1. The applicant is reminded of Town of Hudson requirements for the importing of off-site fill materials for use in constructing this project. It is recommended that these requirements be stated on the plans for the Contractors attention.*

Current Fuss & O'Neill Comment: The applicant has noted this on the plan set. No further Fuss & O'Neill comment.

FUSS & O'NEILL

Please feel free to call if you have any questions.

Very truly yours,

Steven W. Reichert, PE

Digitally signed by Steven W. Reichert, PE
DN: cn=Steven W. Reichert, PE, c=US, o=Fuss & O'Neill, Inc., ou=Fuss & O'Neill, Inc., email=sreichert@fando.com
Date: 2021.08.16 16:31:01 -04'00'

Steven W. Reichert, P.E.

SWR:
Enclosure

cc: Town of Hudson Engineering Division – File
Keach- Nordstrom Associates, Inc. - alewis@keachnordstrom.com

TRAFFIC IMPACT AND ACCESS STUDY

56 DERRY ROAD
Hudson, New Hampshire

July 1, 2021

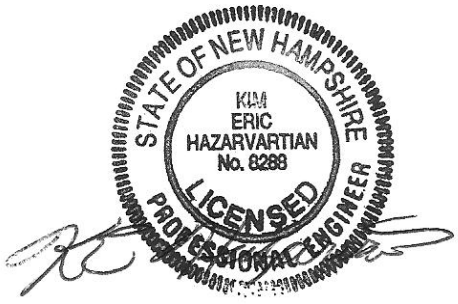
Prepared for Keach-Nordstrom Associates, Inc.

TEPP LLC TRANSPORTATION ENGINEERING, PLANNING AND POLICY

TRAFFIC-IMPACT AND ACCESS STUDY

56 DERRY ROAD
Hudson, New Hampshire

July 1, 2021



Prepared for Keach-Nordstrom Associates, Inc.

TEPP LLC **TRANSPORTATION ENGINEERING, PLANNING AND POLICY**

93 Stiles Road, Suite 201, Salem, New Hampshire 03079 USA
800 Turnpike Street, Suite 300, North Andover, Massachusetts 01845 USA
Phone (603) 212-9133 and Fax (603) 226-4108
Email tepp@teppllc.com and Web www.teppllc.com

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TABLES

FIGURES

SUMMARY

PROJECT DESCRIPTION

Keach-Nordstrom Associates, Inc. (KNA) has retained TEPP LLC to prepare this traffic impact and access study (TIAS) for a proposed commercial redevelopment in the Town of Hudson, New Hampshire.

The proposed redevelopment will:

- be at 56 Derry Road
- provide one drive-through coffee shop
- have one driveway to the west side of Derry Road, with a one-lane entrance and a two-lane exit

STUDY SCOPE

The TIAS study area includes the following unsignalized intersections:

- Derry Road/Ledge Road
- Derry Road/driveway

This TIAS analyzes the following conditions as applicable:

- 2021 existing
- 2022 and 2032 no-build, with background-traffic growth
- 2022 and 2032 build, with background-traffic growth and the proposed redevelopment

This TIAS analyzes traffic operations for the following hours as applicable:

- weekday AM street-peak hour
- weekday PM street-peak hour

TRIP GENERATION

Total trips appear on the site driveway but not all are added to Derry Road near the site. 2022 total vehicle-trips are:

- weekday daily, 629 (total of in and out)
- weekday AM-street-peak hour, 106 (53 in and 53 out)
- weekday PM-street-peak hour, 40 (20 in and 20 out)

2032 total vehicle-trips are:

- weekday daily, 694 (total of in and out)
- weekday AM-street-peak hour, 117 (58 in and 539 out)
- weekday PM-street-peak hour, 44 (22 in and 22 out)

Primary trips are added to Derry Road near the site. 2022 primary vehicle-trips are:

- weekday daily, 69 (total of in and out)
- weekday AM-street-peak hour, 12 (6 in and 6 out)
- weekday PM-street-peak hour, 4 (2 in and 2 out)

2032 primary vehicle-trips are:

- weekday daily, 78 (total of in and out)
- weekday AM-street-peak hour, 13 (6 in and 7 out)
- weekday PM-street-peak hour, 6 (3 in and 3 out)

CAPACITY ANALYSIS

Capacity analysis shows, for the Derry Road/Ledge Road intersection

- low delays for left turns from Derry Road
- moderate delays or delayed operations for movements from Ledge Road
- insignificant project impacts

Capacity analysis shows, for the Derry Road/driveway intersection:

- low delays for left turns from Derry Road
- moderate delays or delayed operations for movements from the driveway

Delayed operations on minor-street approaches to high-volume arterials are typical and acceptable.

TRAFFIC IMPACTS

Analysis indicates no significant area impact due to the proposed redevelopment.

INTRODUCTION

PROJECT DESCRIPTION

KNA has retained TEPP LLC to prepare this TIAS for a proposed commercial redevelopment in the Town of Hudson, New Hampshire.

The proposed redevelopment will:

- be at 56 Derry Road
- provide one drive-through coffee shop
- have one driveway to the west side of Derry Road, with a one-lane entrance and a two-lane exit

Figure 1 shows site location. The project plan is in Appendix A.

STUDY APPROACH

This TIAS assesses traffic impacts and access for the proposed redevelopment.

The TIAS study area includes the following unsignalized intersections:

- Derry Road/Ledge Road
- Derry Road/driveway

This TIAS analyzes the following conditions as applicable:

- 2021 existing
- 2022 and 2032 no-build, with background-traffic growth
- 2022 and 2032 build, with background-traffic growth and the proposed redevelopment

This TIAS analyzes traffic operations for the following hours as applicable:

- weekday AM street-peak hour
- weekday PM street-peak hour

Differences in traffic operations between the no-build and build conditions approximate traffic impacts of the proposed redevelopment.

Figure 1. Site location.

EXISTING CONDITIONS

INTRODUCTION

Existing conditions include:

- physical conditions of the transportation network, roads, and intersections
- traffic volumes
- other relevant information

PHYSICAL CONDITIONS

INTRODUCTION

Figure 1 shows the transportation network.

The TIAS study area includes the following existing unsignalized intersection: Derry Road/Ledge Road.

Description of the TIAS study area follows.

DERRY ROAD

Derry Road:

- is oriented approximately north-south
- functions as an arterial street
- is also known as New Hampshire Routes (NH) 3A and 102
- to the south, connects with the Town Center and New Hampshire Route 111 (NH 111), an arterial highway that leads to the City of Nashua and Towns of Windham and Salem
- to the north, connects with NH 102, an arterial highway that leads to the Towns of Londonderry and Derry, and NH 3A, an arterial highway that leads to the Town of Litchfield and the City of Manchester
- has a horizontal alignment includes minor to moderate horizontal curvature, but is essentially tangent at the proposed driveway location
- has a near-level vertical alignment

- has a three-lane cross-section with one travel lane per direction, a center-two-way-left-turn lane (TWLTL), and paved shoulders
- has asphaltic-cement concrete (ACC) pavement in overall good condition
- has curb and sidewalk along both sides
- includes utility poles along the west side, some with luminaires
- has a posted speed limit of 30 miles per hour (mph)
- has nearby commercial and residential development
- is under the jurisdiction of the Town

DERRY ROAD/LEDGE ROAD INTERSECTION

The intersection:

- is three legged
- has Derry Road as the major north-south street
- has Ledge Road as the minor east leg
- on Derry Road, has one travel lane per direction and one center TWLTL
- on the Ledge Road approach, has one lane
- has a STOP sign on the Ledge Road approach
- is illuminated
- has commercial and residential development nearby

TRAFFIC VOLUMES

TRAFFIC COUNTS

TEPP LLC obtained an automatic traffic counter (ATR) count:

- on Derry Road along the site frontage
- from Wednesday, June 2, to Thursday, June 3, 2021

The ATR data are in Appendix B.

ADJUSTMENTS

The June 2021 traffic counts were adjusted to reflect peak-month and non-pandemic conditions.

The increase to peak month was 2.0 percent, based on based on NHDOT 2019 monthly volumes for Group 4 (Urban Highways) averages in Appendix C,

The increase to pre-pandemic was 5.6 percent. NHDOT continuous count station 82229031, on Daniel Webster Highway north of Hilton Drive, in the Town of Merrimack showed May 2021 two-way average-daily traffic (ADT) of 15,404 vehicles. The station showed May 2019 pre-pandemic two-way ADT of 16,260 vehicles, which is 5.6 percent greater.

The combined increase was 7.7 percent.

RESULTS

Table 1 and Figure 2 show 2021 existing traffic volumes.

Table 1. 2021 existing traffic volumes.

Location and Time Period	Vehicles[a]	K-factor[b]	Percent Direction
Derry Road near Site Frontage			
Weekday Daily	28,667	---	---
Weekday AM-Street-Peak Hour	2,157	7.5	58 Southbound
Weekday PM-Street-Peak Hour	2,290	8.0	54 Northbound

[a] Two-way-total volumes.
[b] K = hour volume as a percent of daily volume.

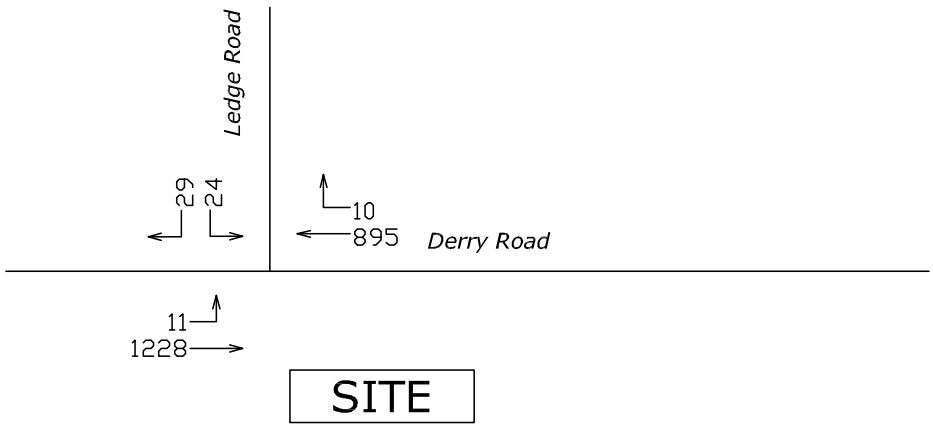
Derry Road near the site frontage showed about:

- 28,667 weekday-daily vehicles
- 2,157 vehicles during the weekday AM street-peak hour, predominantly southbound
- 2,290 vehicles during the weekday PM street-peak hour, predominantly northbound

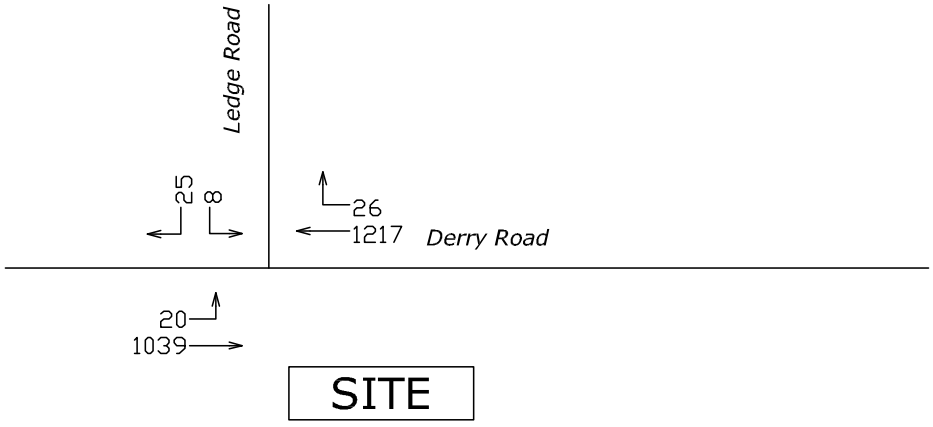
VEHICLE SPEEDS

The ATR collected vehicle speeds:

- on Derry Road along the site frontage
- from Wednesday, June 2, to Thursday, June 3, 2021



Weekday AM-Street-Peak Hour



N

Not to Scale

Weekday PM-Street-Peak Hour

Figure 2. 2021 existing traffic volumes.

The data are in Appendix D and are summarized in Table 2.

Table 2 indicates that on Derry Road:

Table 2. Vehicle speeds.

	Speeds (mph)		
Location and Direction	Speed Limit	Mean[a]	85th Percentile[a]
Derry Road along Site Frontage			
Northbound	30	35.3	39.0
Southbound	30	33.6	37.2

[a] From ATR conducted from Wednesday, June 2, to Thursday, June 3, 2021.

- the posted speed limit was 30 mph
- the northbound the mean speed was 35.3 mph and the 85th percentile speed was 39.0 mph
- for southbound the mean speed was 33.6 mph and the 85th percentile speed was 37.2 mph

SIGHT DISTANCES

The American Association of State Highway and Transportation Officials (AASHTO) has established authoritative policy for sight distances at unsignalized intersections[1] in terms of:

- stopping sight distance (SSD)
- optional intersection sight distance (ISD)

SSD: [2]

- provides for safety
- enables a driver, on the major road, to perceive and react accordingly to a vehicle entering the major road from a minor road
- is conservative because it encompasses a wide range of brake-reaction times and deceleration rates

[1] AASHTO, *A Policy on Geometric Design of Highways and Streets*, 6th Edition (Washington, DC, 2011), pages 9-28 to 9-29.

[2] AASHTO, pages 3-2 to 3-6.

Optional ISD:[3]

- is ordinarily greater than SSD and may enhance traffic operations
- is not required for safety

Table 3 shows relevant available sight distances that are at least 400 ft, per NHDOT practice, and are adequate.

Table 3. Sight distances.

Intersection, Movements, and View	Available Sight Distance (ft)[a]	Speeds (miles per hour)		
		Limit	SSD Provides For	ISD Provides For
Portland Street/Proposed Road for Proposed Road Movements				
Portland Street to/from South	400	30	45+	36+
Portland Street to/from North	400	30	45+	36+

[a] With appropriate roadside and vegetation maintenance.

[3] AASHTO, pages 9-22 to 9-55.

FUTURE CONDITIONS

INTRODUCTION

Future conditions include:

- planned road improvements independent of the proposed redevelopment
- future no-build traffic volumes, with background-traffic growth and without the proposed redevelopment
- future build traffic volumes, with background-traffic growth and with the proposed redevelopment

PLANNED ROAD IMPROVEMENTS

TEPP LLC identified no significant planned road improvement in the study area independent of the project.

BACKGROUND-TRAFFIC GROWTH

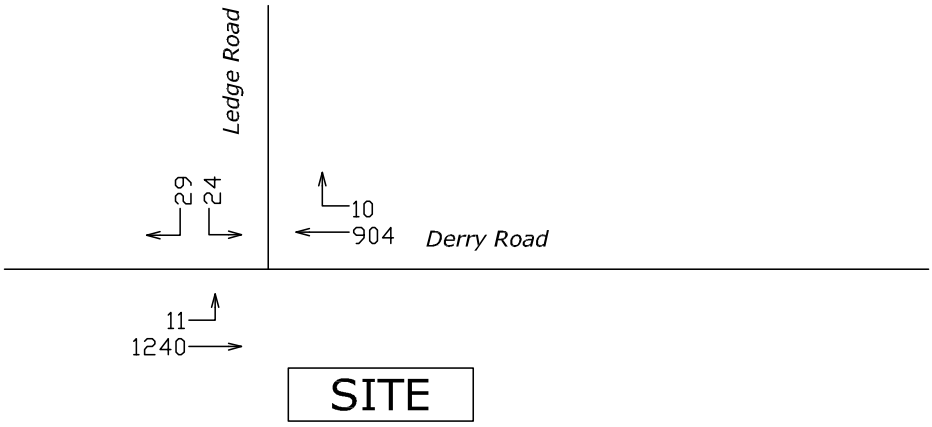
Background-traffic growth:

- is independent of the proposed redevelopment
- is related to land development in the immediate area, population and economic development in the region, and changes in travel patterns in the region
- typically considers two factors: a general traffic-growth rate and specific planned land developments in the immediate area

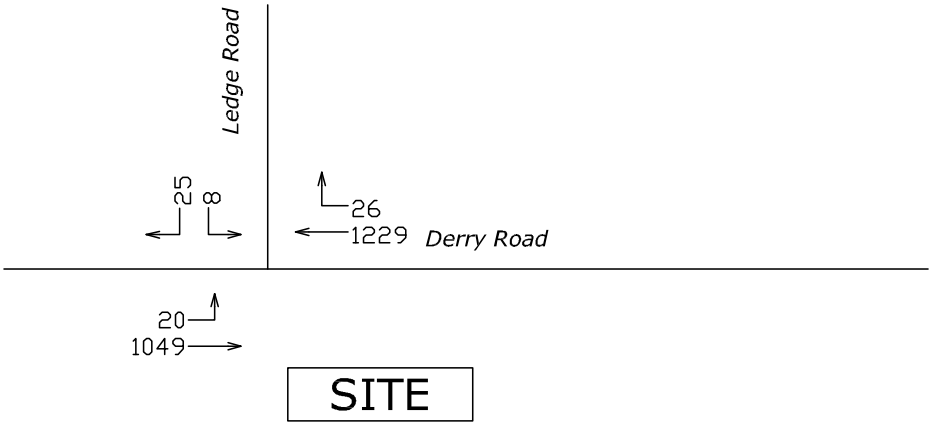
This TIAS uses a 1.0-percent annual growth rate. This yields about 11.6-percent growth between 2021 and 2032.

NO-BUILD TRAFFIC VOLUMES

The background-traffic growth described above was applied to 2021 existing traffic volumes. Figures 3 and 4 show 2022 and 2032 no-build traffic volumes.



Weekday AM-Street-Peak Hour



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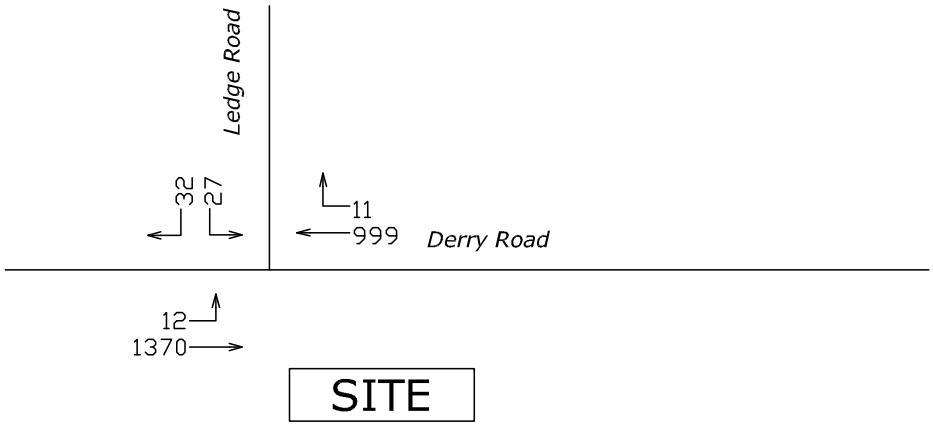
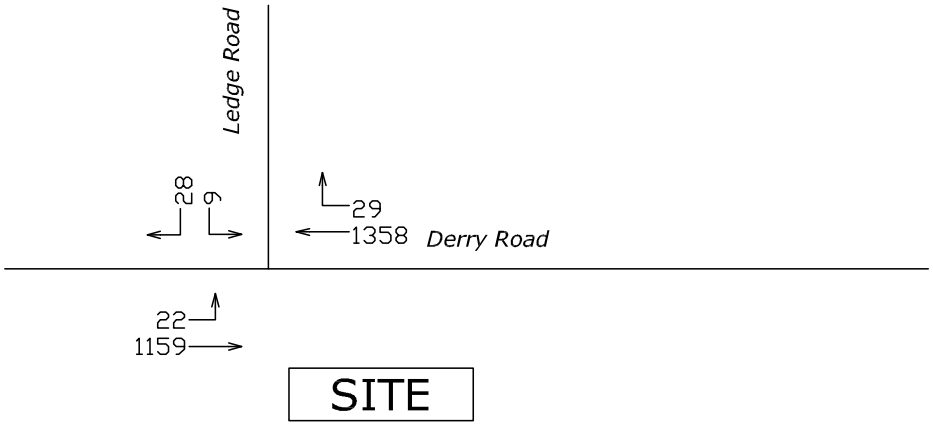
Weekday PM-Street-Peak Hour

Figure 3. 2022 no-build traffic volumes.



Weekday AM-Street-Peak Hour



N

Not to Scale

Weekday PM-Street-Peak Hour

Figure 4. 2032 no-build traffic volumes.

TRIP GENERATION

BASIC TRIP GENERATION

The Institute of Transportation Engineers (ITE) compiles and publishes trip-generation information for a variety of land uses in *Trip Generation Manual*.[4] This guide for estimating site traffic includes coffee/donut shop with drive-through window and no indoor seating, land use 938, based on floor area.[5] However, this information is based on sites with floor areas of 90 square feet (sf) and is not applicable to the proposed land use, with a floor area of about 900 sf.

Stephen G. Pernaw & Company, Inc. has published appropriate and applicable trip-generation information specific to this land use, which estimates trip generation based on traffic volumes passing the site.[6] Basic trip generation is based on this information.

TRIP TYPES

Total trips appear on site driveways but not all are added to roads near the site. Accordingly, ITE compiles information on three trip types, based on empirical data for many land uses, in the authoritative Hooper, *Trip Generation Handbook*.[7] These three trip types are:

- primary trips that are added to the area and are primarily for visiting the site
- diverted trips that not added to the general area; these trips are from existing traffic on roads near the site
- pass-by trips that are not added to the general area; these trips are from existing traffic passing the site[8]

RESULTS

Table 4 shows calculated weekday vehicle-trip generation for the site.

---

[4] ITE, *Trip Generation Manual,* 10th edition (Washington DC, September 2017).

[5] ITE, *Trip Generation Manual,* V Volume 2, Data, Services (Land Uses 900-999), pages 250 and 251, pages 249 to 254.

[6] Stephen G. Pernaw & Company, Inc., *Traffic Impact Assessment, Proposed Drive-Thru Coffee Shop, Northwood, New Hampshire* (Concord, New Hampshire, October 2019), page 10 and Appendix E.

[7] Kevin G. Hooper, P.E., Principal Editor, *Trip Generation Handbook,* 3rd edition (Washington DC: Institute of Transportation Engineers, September 2017).

[8] Definitions of primary trips, diverted trips, and pass-by trips are in Hooper, page 93. Relevant data on primary trips, diverted trips and pass-by trips are in Hooper, 3rd edition, page 216.

Table 4. Calculated weekday vehicle-trip generation

		AM-Street-Peak Hour			PM-Street-Peak Hour		
	Daily[a]	Total[b]	In	Out	Total[c]	In	Out
2022 Vehicle-Trips							
Primary	69	12	6	6	4	2	2
Pass-By[d]	560	94	47	47	36	18	18
Total	629	106	53	53	40	20	20
2032 Vehicle-Trips							
Primary	78	13	6	7	6	3	3
Pass-By[d]	616	104	52	52	38	19	19
Total	694	117	58	59	44	22	22

[a] Estimated total weekday daily trips are 5.93 times weekday AM-street-peak hour trips, based on ITE, *Trip Generation Manual*, Volume 2, Data, Services (Land Uses 900-999), pages 250 and 251.

[b] Total weekday AM-street-peak hour trips are 0.0488 times 2021 no-build weekday AM-street-peak hour volume on Derry Road along the site frontage. Stephen G. Pernaw & Company, Inc., Appendix E.

[c] Total weekday PM-street-peak hour trips are 0.0172 times 2021 no-build weekday PM-street-peak hour volume on Derry Road along the site frontage. Stephen G. Pernaw & Company, Inc., Appendix E.

[d] Pass-by trip percentage is 89. Based on Hooper, *Trip Generation Handbook*, 3rd edition, page 216, coffee/donut shop with drive-through window and no indoor seating, land use 938.

Total trips appear on the site driveway but not all are added to Derry Road near the site. 2022 total vehicle-trips are:

- weekday daily, 629 (total of in and out)
- weekday AM-street-peak hour, 106 (53 in and 53 out)
- weekday PM-street-peak hour, 40 (20 in and 20 out)

2032 total vehicle-trips are:

- weekday daily, 694 (total of in and out)
- weekday AM-street-peak hour, 117 (58 in and 539 out)
- weekday PM-street-peak hour, 44 (22 in and 22 out)

Primary trips are added to Derry Road near the site. 2022 primary vehicle-trips are:

- weekday daily, 69 (total of in and out)
- weekday AM-street-peak hour, 12 (6 in and 6 out)

- weekday PM-street-peak hour, 4 (2 in and 2 out)

2032 primary vehicle-trips are:

- weekday daily, 78 (total of in and out)
- weekday AM-street-peak hour, 13 (6 in and 7 out)
- weekday PM-street-peak hour, 6 (3 in and 3 out)

TRIP DISTRIBUTION AND NETWORK ASSIGNMENT

Trip distribution and network assignment of vehicle-trips to and from the site may consider such factors as existing site distribution, travel patterns, population, regional land development, and site access. Trip distribution and network assignment for this TIAS considered the 2021 existing volumes.

Table 5 shows trip distribution and network assignment for primary trips. Pass-by trips were assigned reflecting peak-hour directional distributions on Derry Road: 58-percent southbound for the weekday AM-street-peak hour and 54-percent northbound for the weekday PM-street-peak hour. Figures 5 and 6 show site traffic volumes.

Table 5. Trip distribution and network assignment.

Road and Direction (To/From)	Approximate Percent
Derry Road to/from South	45
Derry Road to/from South	55
Total	100

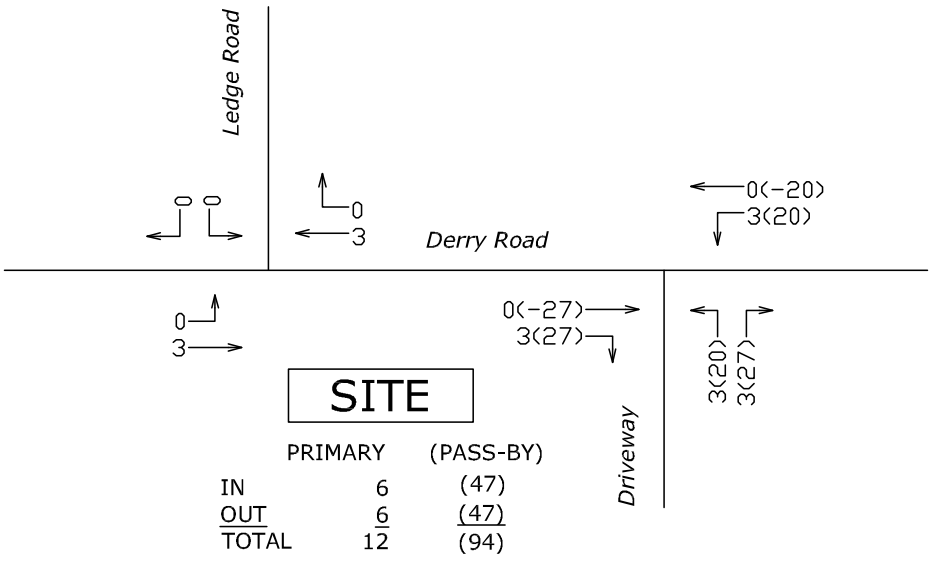
BUILD TRAFFIC VOLUMES

Site traffic volumes were superimposed on the no-build traffic volumes to estimate build traffic volumes. Figures 7 and 8 show the resulting 2022 and 2032 build traffic volumes.

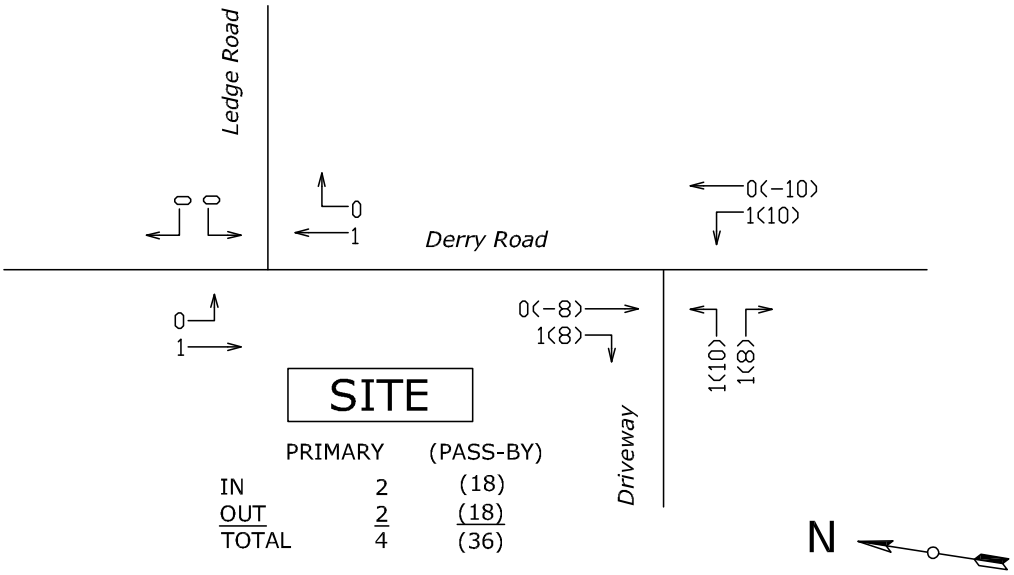
TRAFFIC-VOLUME CHANGES

Table 6 presents calculated traffic-volume changes due to the proposed redevelopment for the:

- weekday AM-street-peak hour
- weekday PM-street-peak hour



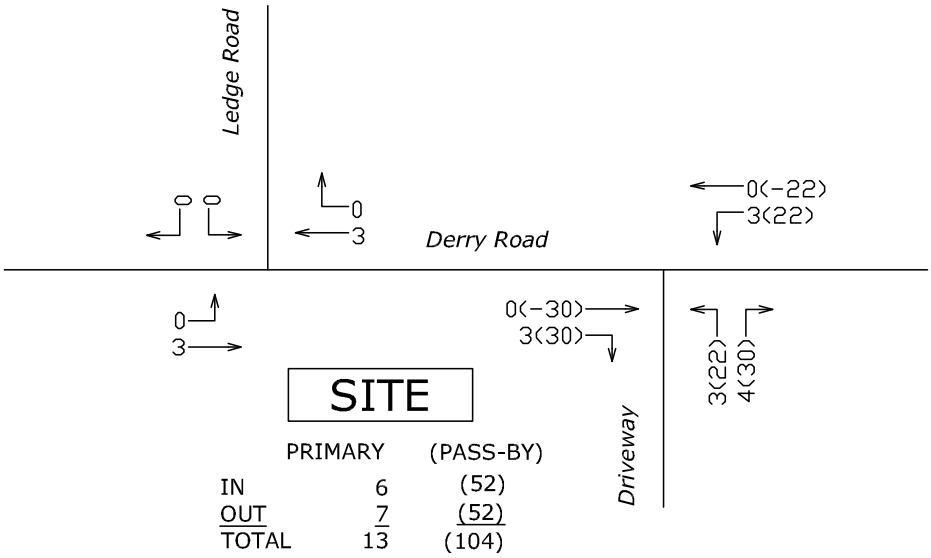
Weekday AM-Street-Peak Hour



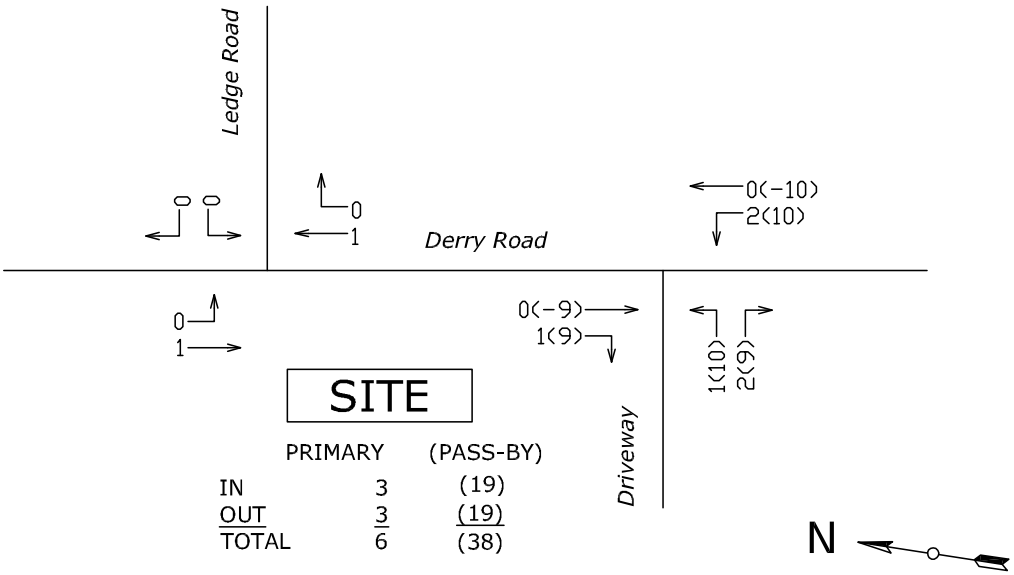
Not to Scale

Weekday PM-Street-Peak Hour

Figure 5. 2022 site traffic volumes.



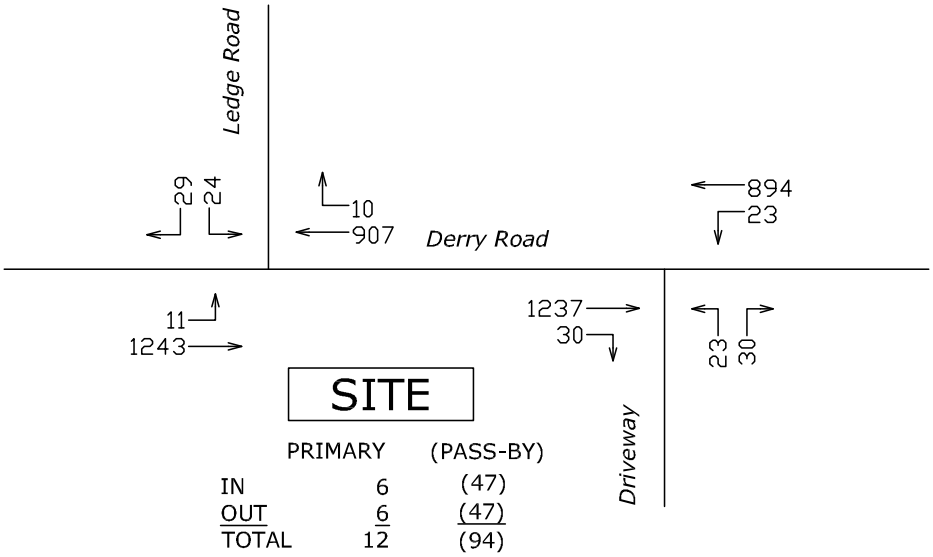
Weekday AM-Street-Peak Hour



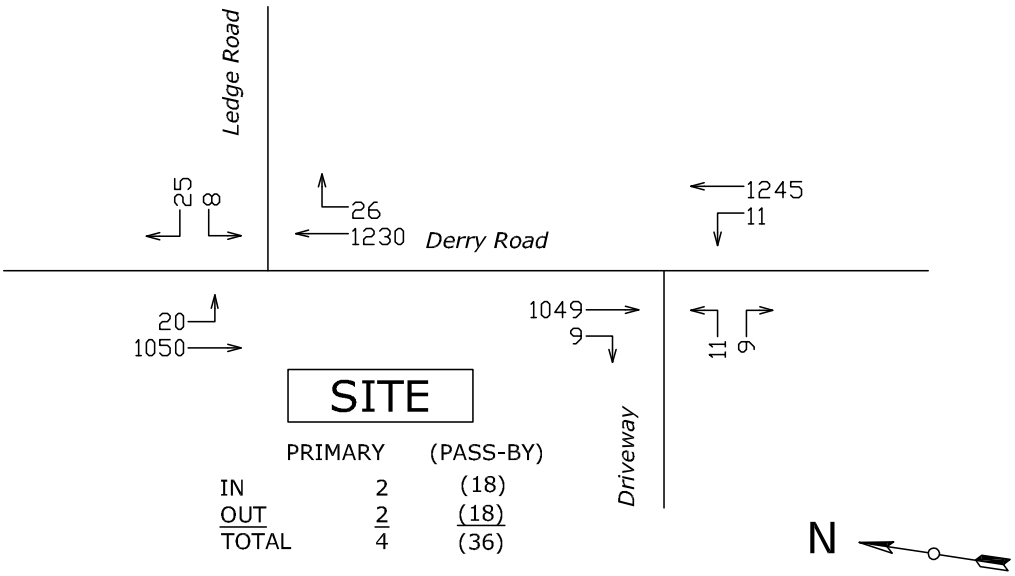
Not to Scale

Weekday PM-Street-Peak Hour

Figure 6. 2032 site traffic volumes.

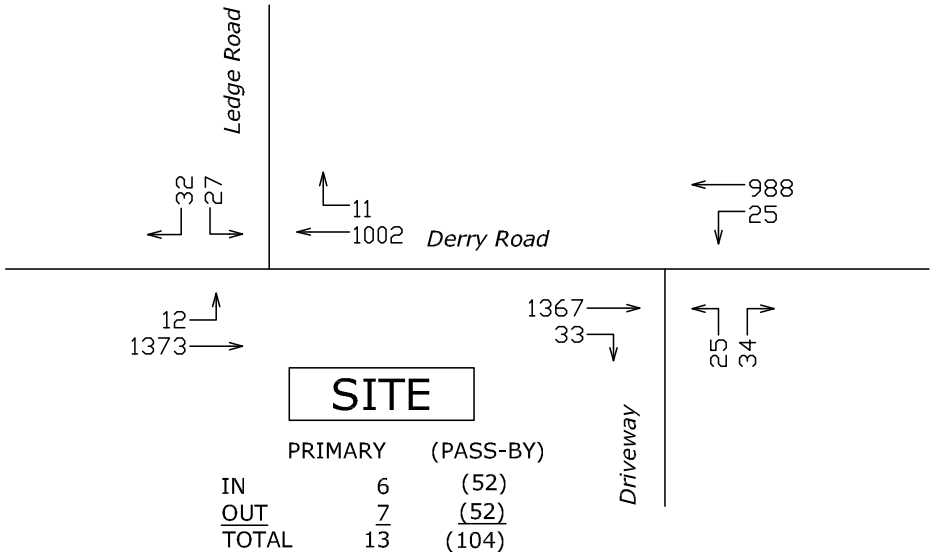


Weekday AM-Street-Peak Hour

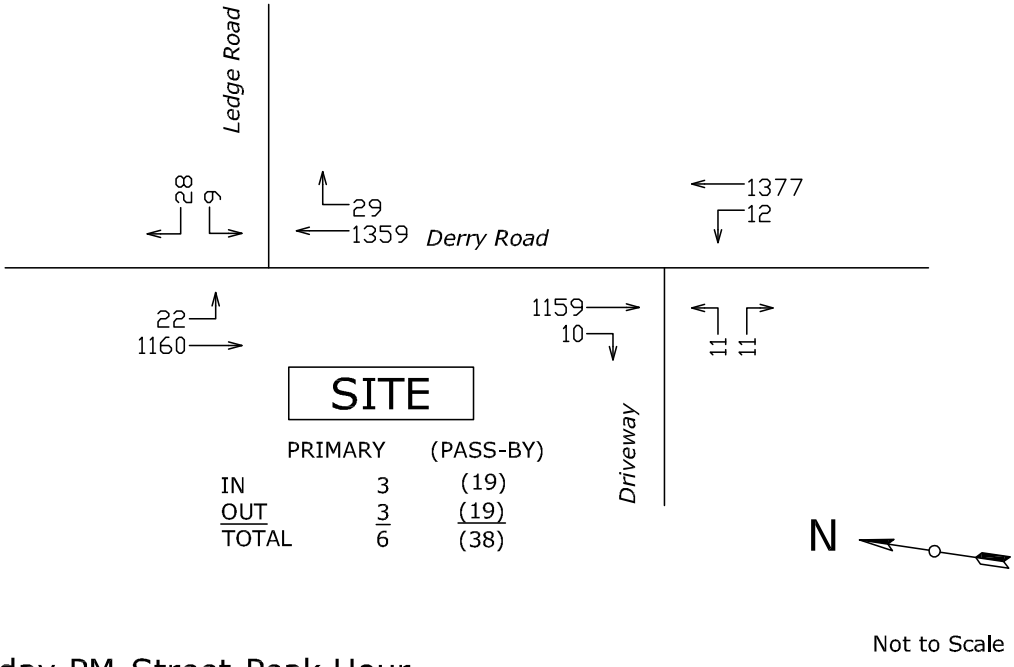


Weekday PM-Street-Peak Hour

Figure 7. 2022 build traffic volumes.



Weekday AM-Street-Peak Hour



Weekday PM-Street-Peak Hour

Figure 8. 2032 build traffic volumes.

Table 6. Traffic-volume changes.

Location and Time Period	2022 Traffic Volumes (vph)[a]			2032 Traffic Volumes (vph)		
	No-Build	Build	Change	No-Build	Build	Change
Derry Road North of Driveway						
Weekday AM-Street-Peak Hour	2,178	2,184	6	2,407	2.413	6
Weekday PM-Street-Peak Hour	2,312	2,314	2	2,555	2,557	2
Derry Road South of Driveway						
Weekday AM-Street-Peak Hour	2,178	2,184	6	2,407	2,414	7
Weekday PM-Street-Peak Hour	2,312	2,314	2	2,555	2,559	4

[a] Two-way total volumes.

Table 6 shows peak-hour-traffic-volume increases:

- of 2 to 7 vehicle-trips
- constituting averages about one vehicle-trip per 8 to 30 minutes
- that are further split by northbound and southbound direction on Derry Road

CAPACITY ANALYSIS

INTRODUCTION

This TIAS has quantified existing, future-no-build and future-build traffic volumes. Capacity analysis models the quality of traffic operations. Comparing build conditions to the no-build conditions indicates impacts of the proposed redevelopment on quality of traffic operations.

METHODS

Capacity analysis calculates LOS for transportation facilities. LOS indicates the quality of traffic operations based on delay and other measures. The six LOS are designated A to F. LOS A represents the best or highest operating conditions. LOS F is the lowest, but does not necessarily connote failure.

LOS is a function of traffic volumes and traffic control. Because these volumes can vary, LOS of a transportation facility can differ by time of day, day of the week, or month. For example, a transportation facility with a low LOS during peak hours may have a high LOS during other hours. The operational analysis methods of the Transportation Research Board (TRB)[9] models LOS for intersections based on calculated delay per vehicle, as shown in Table 7. Synchro analysis software was used.

Method inputs include:

- intersection geometry
- traffic control, such as YIELD sign, two-way STOP sign, all-way STOP sign, roundabout, or signal (including phasing, timing, and progression)
- traffic volumes
- vehicle composition, such as passenger cars and trucks

The methods are all approximate. In particular, the method for two-way STOP-sign control can be conservative, with observed delays and queuing shorter than those modeled.

[9] TRB, *Highway Capacity Manual 2000* (Washington DC 2000) and *Highway Capacity Manual 2010* (Washington DC, 2010).

Table 7. Level-of-service criteria for intersections.

	Control Delay (seconds/vehicle)	
Level of Service	Unsignalized Intersections[a]	Signalized Intersections
A	≤10.0	≤10.0
B	>10.0 and ≤15.0	>10.0 and ≤20.0
C	>15.0 and ≤25.0	>20.0 and ≤35.0
D	>25.0 and ≤35.0	>35.0 and ≤55.0
E	>35.0 and ≤50.0	>55.0 and ≤80.0
F	>50	>80

From Transportation Research Board, *Highway Capacity Manual 2010* (Washington D.C., 2010).

[a] For YIELD sign, two-way STOP sign or all-way STOP sign, control delay defines LOS. For roundabout approaches and overall intersection, control delay defines LOS. For roundabout lanes with volume/capacity ratio ≤1.0, control delay defines LOS. For roundabout lanes with volume/capacity ratio > 1.0, LOS is F regardless of control delay.

RESULTS

Table 8 shows computed LOS, delays, and queues at study-area intersections for the:

- weekday AM-street-peak hour
- weekday PM-street-peak hour

The analysis is under the following conditions, as applicable:

- 2021 existing
- 2022 and 2032 no build
- 2022 and 2032 build

Capacity-analysis worksheets that give detail and explanation are in Appendix E.

Table 8 shows, for the Derry Road/Ledge Road intersection

- low delays for left turns from Derry Road
- moderate delays or delayed operations for movements from Ledge Road
- insignificant project impacts

Table 8 shows, for the Derry Road/driveway intersection:

- low delays for left turns from Derry Road
- moderate delays or delayed operations for movements from the driveway

Delayed operations on minor-street approaches to high-volume arterials are typical and acceptable.

Table 8. Capacity-analysis summary.

Intersection, Control, Hour and Movement	2021 Existing				2022 No Build				2032 No Build				2022 Build				2032 No Build			
	LOS[a]	Delay[b]	V/C[c]	Queue[d]	LOS	Delay	V/C	Queue	LOS	Delay	V/C	Queue	LOS	Delay	V/C	Queue	LOS	Delay	V/C	Queue
Derry Road/Ledge Road Intersection, Unsignalized, Weekday AM-Street-Peak Hour																				
Derry Road SB L	B	10.7	0.019	0.1	B	10.9	0.020	0.1	B	11.6	0.024	0.1	B	11.0	0.020	0.1	B	11.6	0.024	0.1
Ledge Road WB LR	D	33.3	0.370	1.6	D	31.8	0.307	1.2	E	41.2	0.402	1.8	E	35.2	0.333	1.4	E	41.6	0.405	1.8
Derry Road/Ledge Road Intersection, Unsignalized, Weekday PM-Street-Peak Hour																				
Derry Road SB L	B	11.7	0.037	0.1	B	12.6	0.045	0.1	B	13.7	0.056	0.2	B	12.6	0.045	0.1	B	13.7	0.056	0.2
Ledge Road WB LR	D	29.6	0.250	1.0	D	33.4	0.225	0.8	E	42.9	0.305	1.2	D	33.6	0.226	0.8	E	43.3	0.307	1.2
Derry Road/Driveway Intersection, Unsignalized, Weekday AM-Street-Peak Hour																				
Derry Road NB L	---	---	---	---	---	---	---	---	---	---	---	---	B	12.9	0.053	0.2	B	14.1	0.2	0.066
Driveway EB L	---	---	---	---	---	---	---	---	---	---	---	---	E	37.5	0.188	0.7	E	46.9	0.246	0.9
Driveway EB R	---	---	---	---	---	---	---	---	---	---	---	---	D	30.5	0.192	0.7	E	39.3	0.266	1.0
Derry Road/Driveway Intersection, Unsignalized, Weekday PM-Street-Peak Hour																				
Derry Road NB L	---	---	---	---	---	---	---	---	---	---	---	---	B	11.2	0.021	0.1	B	11.9	0.025	0.1
Driveway EB L	---	---	---	---	---	---	---	---	---	---	---	---	E	36.1	0.095	0.3	E	42.5	0.113	0.4
Driveway EB R	---	---	---	---	---	---	---	---	---	---	---	---	C	21.0	0.043	0.1	C	24.3	0.061	0.2

[a] LOS = level of service.

[b] Delay = average delay in seconds per vehicle.

[c] V/C = volume/capacity ratio.

[d] 95th percentile queue in vehicles.

EB = eastbound, WB = westbound, SB = southbound, NB = northbound, L = left, T = through, R = right.

CONCLUSION

PROJECT DESCRIPTION

The proposed redevelopment will:

- be at 56 Derry Road
- provide one drive-through coffee shop
- have one driveway to the west side of Derry Road, with a one-lane entrance and a two-lane exit

TRIP GENERATION

Total trips appear on the site driveway but not all are added to Derry Road near the site. 2022 total vehicle-trips are:

- weekday daily, 629 (total of in and out)
- weekday AM-street-peak hour, 106 (53 in and 53 out)
- weekday PM-street-peak hour, 40 (20 in and 20 out)

2032 total vehicle-trips are:

- weekday daily, 694 (total of in and out)
- weekday AM-street-peak hour, 117 (58 in and 539 out)
- weekday PM-street-peak hour, 44 (22 in and 22 out)

Primary trips are added to Derry Road near the site. 2022 primary vehicle-trips are:

- weekday daily, 69 (total of in and out)
- weekday AM-street-peak hour, 12 (6 in and 6 out)
- weekday PM-street-peak hour, 4 (2 in and 2 out)

2032 primary vehicle-trips are:

- weekday daily, 78 (total of in and out)
- weekday AM-street-peak hour, 13 (6 in and 7 out)

- weekday PM-street-peak hour, 6 (3 in and 3 out)

CAPACITY ANALYSIS

Capacity analysis shows, for the Derry Road/Ledge Road intersection

- low delays for left turns from Derry Road
- moderate delays or delayed operations for movements from Ledge Road
- insignificant project impacts

Capacity analysis shows, for the Derry Road/driveway intersection:

- low delays for left turns from Derry Road
- moderate delays or delayed operations for movements from the driveway

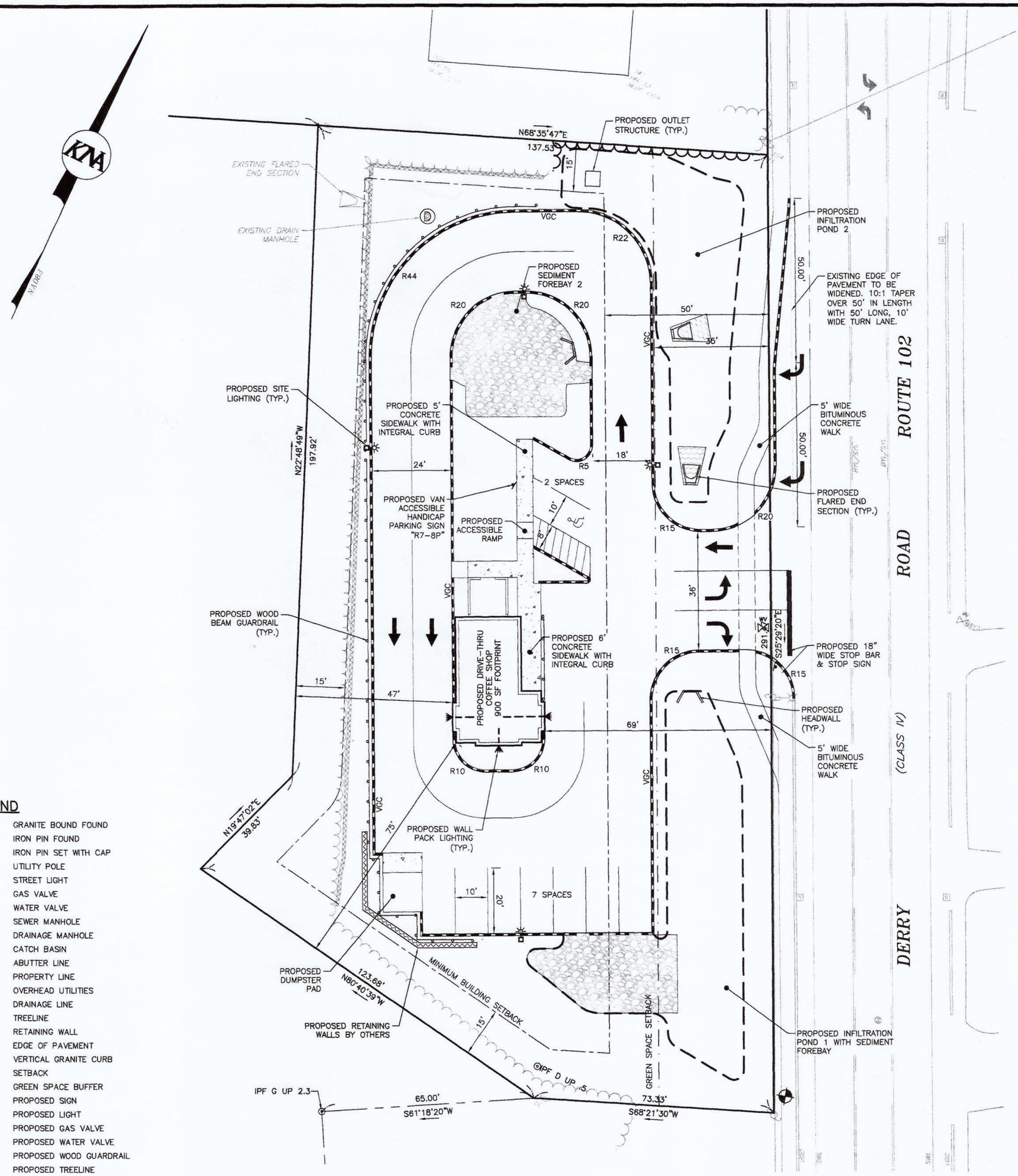
Delayed operations on minor-street approaches to high-volume arterials are typical and acceptable.

TRAFFIC IMPACTS

Analysis indicates no significant area impact due to the proposed redevelopment.

APPENDIX

Appendix A: Project Plan



LEGEND

GB-F	GRANITE BOUND FOUND
IP-F	IRON PIN FOUND
IP-S W/CAP	IRON PIN SET WITH CAP
	UTILITY POLE
	STREET LIGHT
	GAS VALVE
	WATER VALVE
	SEWER MANHOLE
	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
OHU	OVERHEAD UTILITIES
	DRAINAGE LINE
	TREELINE
	RETAINING WALL
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
	SETBACK
	GREEN SPACE BUFFER
	PROPOSED SIGN
	PROPOSED LIGHT
	PROPOSED GAS VALVE
	PROPOSED WATER VALVE
	PROPOSED WOOD GUARDRAIL
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED RETAINING WALL
	PROPOSED VERTICAL GRANITE CURB
	PROPOSED OUTLET STRUCTURE

REFERENCE PLANS:

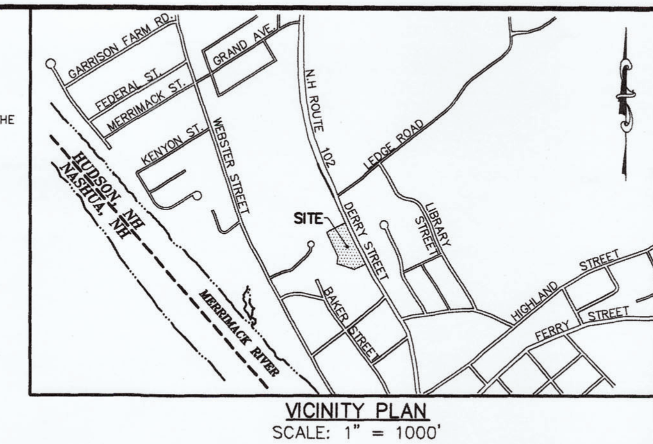
1. "EXISTING CONDITIONS PLAN, AROMA JOE'S, MAP 173 LOT 29, 56 DERRY STREET, HUDSON, NEW HAMPSHIRE, DATED MAY 7, 2021," PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC.

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE PROPOSED SITE LAYOUT ON MAP 173 LOT 29 IN THE TOWN OF HUDSON, NEW HAMPSHIRE AS SHOWN HEREON.
2. OWNER OF RECORD:
   STEVE S. & HSIANG HWA W. PAN
   13 KING HENRY DRIVE
   LONDONDERRY, N.H. 03053
   BK. 6281 PG. 776
3. AREA OF SUBJECT PARCEL = 40,793 SF, OR 0.935 ACRES
4. TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HEREON ARE BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE IN APRIL OF 2021.
5. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NGVD29 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA-OPUS.
6. THE SUBJECT PARCEL IS LOCATED WITHIN THE BUSINESS (B) ZONING DISTRICT. DIMENSIONAL REQUIREMENTS ARE AS FOLLOWS FOR LOTS SERVICED WITH MUNICIPAL SEWER AND WATER:

	REQUIRED	PROPOSED
MINIMUM LOT AREA	30,000 SF	40,793 SF
MINIMUM LOT FRONTAGE	150 FT	291.47 FT
MINIMUM BUILDING SETBACKS:		
FRONT	50 FT	69 FT
SIDE	15 FT	75 FT
REAR	15 FT	47 FT

7. PARCEL WILL BE SERVICED BY MUNICIPAL WATER & SEWER.
8. EXAMINATION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF MERRIMACK N.H., HILLSBOROUGH COUNTY, MAP NUMBER 33011C0514E, PANEL 501 OF 701, EFFECTIVE DATE: APRIL 18, 2011 INDICATES THAT NO PORTION OF THE SUBJECT PARCEL IS LOCATED WITHIN A DESIGNATED FLOOD HAZARD AREA.
9. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS APPROXIMATE. KEACH-NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF THE UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR OR OWNER SHALL CONTACT DIG-SAFE AT 811.
10. EASEMENTS, RIGHTS AND RESTRICTIONS SHOWN OR IDENTIFIED HEREON ARE THOSE FOUND DURING RESEARCH AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS. OTHER EASEMENTS, RIGHTS AND RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF THE SUBJECT PREMISES MAY DETERMINE.
11. OPEN SPACE REQUIRED = 40%
    OPEN SPACE PROPOSED = 58.6%
12. PARKING CALCULATIONS:
    PARKING REQUIRED = 1 SPACE/100 SF X 900 SF = 9 SPACES
    TOTAL PARKING REQUIRED = 9 SPACES
    TOTAL PARKING PROVIDED = 9 SPACES
13. SITE LIGHTING SHALL BE AS SHOWN ON THE PLAN, DIRECTED ONTO SITE, AND SHALL CONFORM WITH ALL APPLICABLE TOWN OF HUDSON ZONING REGULATIONS.
14. CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO THE HOURS OF 7:00 AM & 7:00 PM, MONDAY THROUGH SATURDAY. NO EXTERIOR CONSTRUCTION ACTIVITIES SHALL OCCUR ON SUNDAY.
15. HOURS OF OPERATION: 6:00 AM TO 6:00 PM, MONDAY THROUGH SATURDAY.
16. APPROVAL OF THIS PLAN SHALL BE SUBJECT TO FINAL ENGINEERING REVIEW.
17. SITE IMPROVEMENTS DEPICTED ON THE PLAN SHALL CONFORM WITH TITLE III OF THE AMERICANS WITH DISABILITIES ACT WITH REGARD TO DIMENSION AND GRADE.
18. IT SHALL BE UNLAWFUL TO MODIFY, CHANGE, OR ALTER ANY STRUCTURE OR USE SHOWN ON THIS SITE PLAN IN ANYWAY WHATSOEVER, OR CONVERT OR ALTER ANY STRUCTURE OR USE SHOWN ON THIS SITE PLAN, OR CHANGE THE ABOVE USE INDICATED ON THE PLAN WITHOUT RECEIVING APPROVAL FROM THE TOWN OF HUDSON PLANNING BOARD.
19. PRIOR TO THE ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY, AN L.L.S. CERTIFIED "AS-BUILT" SITE PLAN SHALL BE PROVIDED TO THE TOWN OF HUDSON COMMUNITY DEVELOPMENT DEPARTMENT CONFIRMING THAT THE SITE CONFORMS WITH THE PLANNING BOARD APPROVED SITE PLAN.
20. IDENTIFICATION SIGNAGE SHALL NOT BE ERECTED UNTIL APPROVED BY THE BUILDING INSPECTOR AND ZONING ADMINISTRATOR.
21. PLOWED SNOW FROM THE FACILITIES, DRIVEWAY, PARKING LOTS AND SIDEWALK SHALL BE STORED IN THE DESIGNATED AREAS SHOWN IN THIS PLAN SET. NO SNOW MAY BE PLOWED OR STORED ON THE ABUTTING PARCELS. WHEN THE SNOW STORAGE AREAS ARE AT CAPACITY, SUBSEQUENT SNOW SHALL BE HAULED OFF-SITE AND DISPOSED OF IN AN ENVIRONMENTALLY SOUND FASHION AND IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
22. ONSITE DRAINAGE SYSTEM SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH NHDES REQUIREMENTS FOR SUCH SYSTEMS.
23. THE APPLICANT'S ENGINEER AND/OR CONTRACTOR SHALL CONTACT THE TOWN OF HUDSON TO SCHEDULE A PRE-CONSTRUCTION MEETING, WHICH WILL BE HELD WITH STAFF PRIOR TO STARTING CONSTRUCTION.
24. ALL STIPULATIONS OF APPROVAL SHALL BE INCORPORATED INTO THE DEVELOPMENT AGREEMENT, WHICH SHALL BE RECORDED AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS, TOGETHER WITH THE SITE PLAN-OF-RECORD AND ALL AGREED UPON EASEMENT DEEDS, WHICH SHALL BE FAVORABLY REVIEWED BY TOWN COUNSEL PRIOR TO PLANNING BOARD ENDORSEMENT OF PLAN.
25. ALL IMPROVEMENTS SHOWN ON THE SITE PLAN-OF-RECORD, INCLUDING NOTES 1-29, SHALL BE COMPLETED IN THEIR ENTIRETY AND AT THE EXPENSE OF THE APPLICANT OR HIS ASSIGNS.
26. THE TOWN OF HUDSON SHALL RESERVE THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION.
27. AFTER ISSUANCE OF THE FOUNDATION PERMIT FOR THE PROPOSED BUILDING, AND PRIOR TO THE ISSUANCE OF THE FRAMING PERMIT THEREOF, THE APPLICANT SHALL SUBMIT TO THE HUDSON COMMUNITY DEVELOPMENT DEPARTMENT A FOUNDATION "AS-BUILT" PLAN ON A TRANSPARENCY AND TO THE SAME SCALE AS THE APPROVED SITE PLAN. THE FOUNDATION "AS-BUILT" PLAN SHALL INCLUDE ALL STRUCTURAL DIMENSIONS AND LOT LINE SETBACK MEASUREMENTS TO THE FOUNDATION AND BE STAMPED BY A LICENSED LAND SURVEYOR. ANY DISCREPANCY BETWEEN THE APPROVED SITE PLAN AND FOUNDATION "AS-BUILT" PLANS SHALL BE DOCUMENTED BY THE APPLICANT AND BE PART OF THE FOUNDATION "AS-BUILT" SUBMISSION.
28. THE PROPOSED PROJECT HAS BEEN DESIGNED TO MEET 2018 MS4 REQUIREMENTS.
29. ALL SIGNS ARE SUBJECT TO APPROVAL BY THE HUDSON PLANNING BOARD PRIOR TO INSTALLATION.



VICINITY PLAN
SCALE: 1" = 1000'

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

DIG SAFE
811 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

NON RESIDENTIAL SITE PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:	APPLICANT:
STEVE S. & HSIANG HWA W. PAN 13 KING HENRY DRIVE LONDONDERRY, N.H. 03053 BK. 6281 PG. 776	SCOTT ZIEFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825

KNA KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: ____________

____________ SIGNATURE DATE: ____________

____________ SIGNATURE DATE: ____________

SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

OWNER OF MAP 173 LOT 29
SIGNATURE: [signature]
DATE: 6-16-2021

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 903 ANTHONY M. BASSO SIGNATURE

SURVEYOR'S CERTIFICATION:
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. FURTHER, THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE DURING APRIL OF 2021. SAID SURVEY HAS A RELATIVE ERROR OF CLOSURE OF ONE PART IN TEN THOUSAND (1:10,000) OR BETTER.

[signature] 6/21/21
LICENSED LAND SURVEYOR DATE

STATE OF NEW HAMPSHIRE PAUL CHISHOLM No. 15076 LICENSED PROFESSIONAL ENGINEER

REVISIONS

No.	DATE	DESCRIPTION	BY

DATE: JUNE 22, 2021	SCALE: 1"=20'
PROJECT NO: 21-0311-1	SHEET 2 OF 12

Appendix B: Traffic Counts

Accurate Counts

978-664-2565

Location : Derry Road 15530001
Location : South of Ledge Road
City/State: Hudson, NH

5/31/2021	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,
12:00 AM	*	*	*	*	33	41	44	51	*	*	*	*	*	*	38	46
1:00	*	*	*	*	27	22	28	27	*	*	*	*	*	*	28	24
2:00	*	*	*	*	18	19	36	23	*	*	*	*	*	*	27	21
3:00	*	*	*	*	46	40	49	23	*	*	*	*	*	*	48	32
4:00	*	*	*	*	155	75	138	91	*	*	*	*	*	*	146	83
5:00	*	*	*	*	428	241	421	264	*	*	*	*	*	*	424	252
6:00	*	*	*	*	759	544	744	490	*	*	*	*	*	*	752	517
7:00	*	*	*	*	1048	842	1026	871	*	*	*	*	*	*	1037	856
8:00	*	*	*	*	956	735	945	774	*	*	*	*	*	*	950	754
9:00	*	*	*	*	767	654	721	664	*	*	*	*	*	*	744	659
10:00	*	*	*	*	813	640	748	673	*	*	*	*	*	*	780	656
11:00	*	*	*	*	738	755	810	690	*	*	*	*	*	*	774	722
12:00 PM	*	*	*	*	840	799	819	814	*	*	*	*	*	*	830	806
1:00	*	*	*	*	798	808	825	877	*	*	*	*	*	*	812	842
2:00	*	*	*	*	1013	921	1008	986	*	*	*	*	*	*	1010	954
3:00	*	*	*	*	981	1065	979	1072	*	*	*	*	*	*	980	1068
4:00	*	*	*	*	927	1163	1009	1120	*	*	*	*	*	*	968	1142
5:00	*	*	*	*	943	1106	950	1098	*	*	*	*	*	*	946	1102
6:00	*	*	*	*	783	883	700	841	*	*	*	*	*	*	742	862
7:00	*	*	*	*	605	642	528	638	*	*	*	*	*	*	566	640
8:00	*	*	*	*	448	507	396	447	*	*	*	*	*	*	422	477
9:00	*	*	*	*	267	329	264	304	*	*	*	*	*	*	266	316
10:00	*	*	*	*	154	165	164	171	*	*	*	*	*	*	159	168
11:00	*	*	*	*	72	99	78	104	*	*	*	*	*	*	75	102
Total	0	0	0	0	13619	13095	13430	13113	0	0	0	0	0	0	13524	13101
Day	0		0		26714		26543		0		0		0		26625	
AM Peak					7:00	7:00	7:00	7:00							7:00	7:00
Volume					1048	842	1026	871							1037	856
PM Peak					2:00	4:00	4:00	4:00							2:00	4:00
Volume					1013	1163	1009	1120							1010	1142
Comb Total	0		0		26714		26543		0		0		0		26625	
ADT	ADT: 26,628		AADT: 26,628													

Accurate Counts

978-664-2565

N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

File Name : 15530001
Site Code : 15530001
Start Date : 6/2/2021
Page No : 1

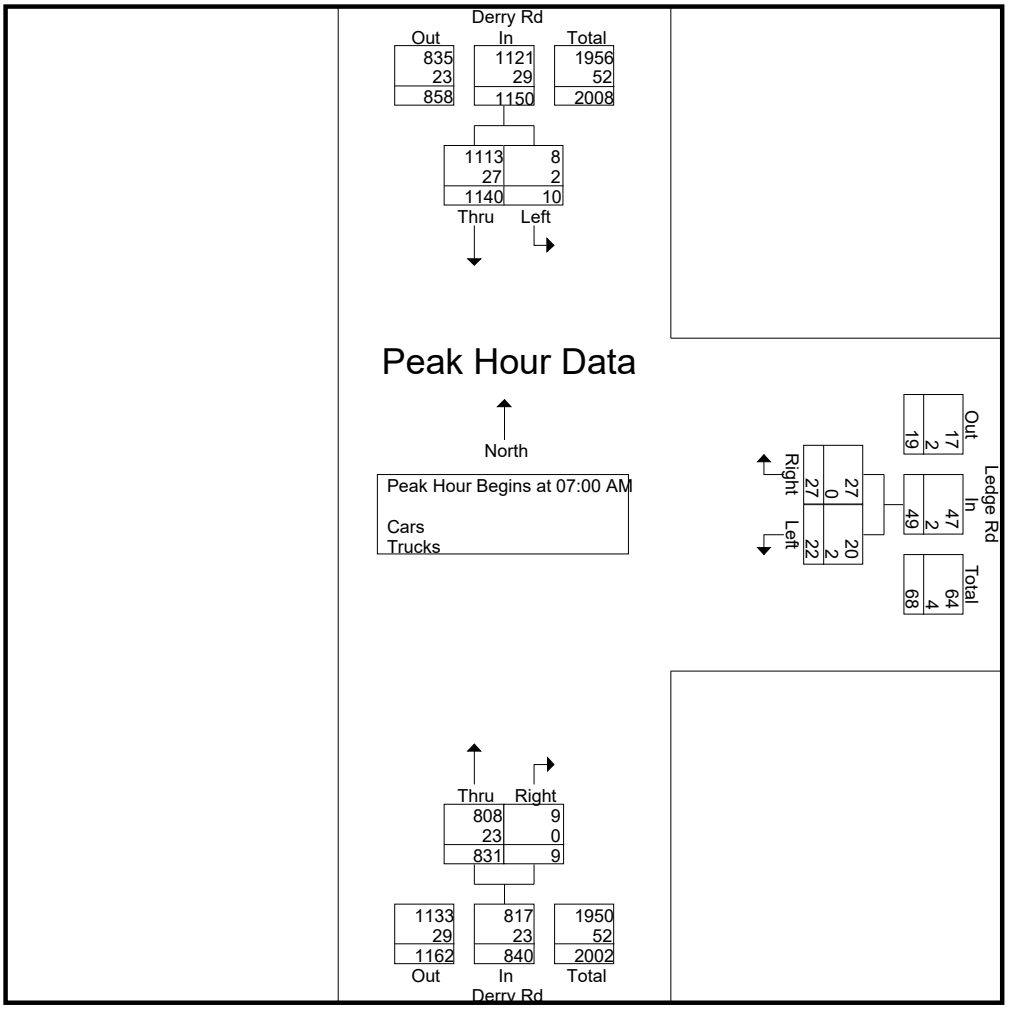
Groups Printed- Cars - Trucks

	Derry Rd From North		Ledge Rd From East		Derry Rd From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	3	246	7	10	211	3	480
07:15 AM	3	297	7	5	225	0	537
07:30 AM	1	319	5	4	191	3	523
07:45 AM	3	278	3	8	204	3	499
Total	10	1140	22	27	831	9	2039
08:00 AM	2	251	3	3	162	4	425
08:15 AM	2	250	2	4	153	3	414
08:30 AM	2	288	7	2	175	2	476
08:45 AM	2	240	3	5	212	6	468
Total	8	1029	15	14	702	15	1783
Grand Total	18	2169	37	41	1533	24	3822
Apprch %	0.8	99.2	47.4	52.6	98.5	1.5	
Total %	0.5	56.8	1	1.1	40.1	0.6	
Cars	16	2092	34	40	1492	23	3697
% Cars	88.9	96.4	91.9	97.6	97.3	95.8	96.7
Trucks	2	77	3	1	41	1	125
% Trucks	11.1	3.6	8.1	2.4	2.7	4.2	3.3

	Derry Rd From North			Ledge Rd From East			Derry Rd From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**3**	246	249	**7**	**10**	**17**	211	**3**	214	480
07:15 AM	3	297	300	7	5	12	**225**	0	**225**	**537**
07:30 AM	1	**319**	**320**	5	4	9	191	3	194	523
07:45 AM	3	278	281	3	8	11	204	3	207	499
Total Volume	10	1140	1150	22	27	49	831	9	840	2039
% App. Total	0.9	99.1		44.9	55.1		98.9	1.1		
PHF	.833	.893	.898	.786	.675	.721	.923	.750	.933	.949
Cars	8	1113	1121	20	27	47	808	9	817	1985
% Cars	80.0	97.6	97.5	90.9	100	95.9	97.2	100	97.3	97.4
Trucks	2	27	29	2	0	2	23	0	23	54
% Trucks	20.0	2.4	2.5	9.1	0	4.1	2.8	0	2.7	2.6

N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

File Name : 15530001
Site Code : 15530001
Start Date : 6/2/2021
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:00 AM		
+0 mins.	**3**	297	300	**7**	**10**	**17**	211	**3**	214
+15 mins.	1	**319**	**320**	7	5	12	**225**	0	**225**
+30 mins.	3	278	281	5	4	9	191	3	194
+45 mins.	2	251	253	3	8	11	204	3	207
Total Volume	9	1145	1154	22	27	49	831	9	840
% App. Total	0.8	99.2		44.9	55.1		98.9	1.1	
PHF	.750	.897	.902	.786	.675	.721	.923	.750	.933
Cars	8	1120	1128	20	27	47	808	9	817
% Cars	88.9	97.8	97.7	90.9	100	95.9	97.2	100	97.3
Trucks	1	25	26	2	0	2	23	0	23
% Trucks	11.1	2.2	2.3	9.1	0	4.1	2.8	0	2.7

Accurate Counts

978-664-2565

N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

File Name : 15530001
Site Code : 15530001
Start Date : 6/2/2021
Page No : 10

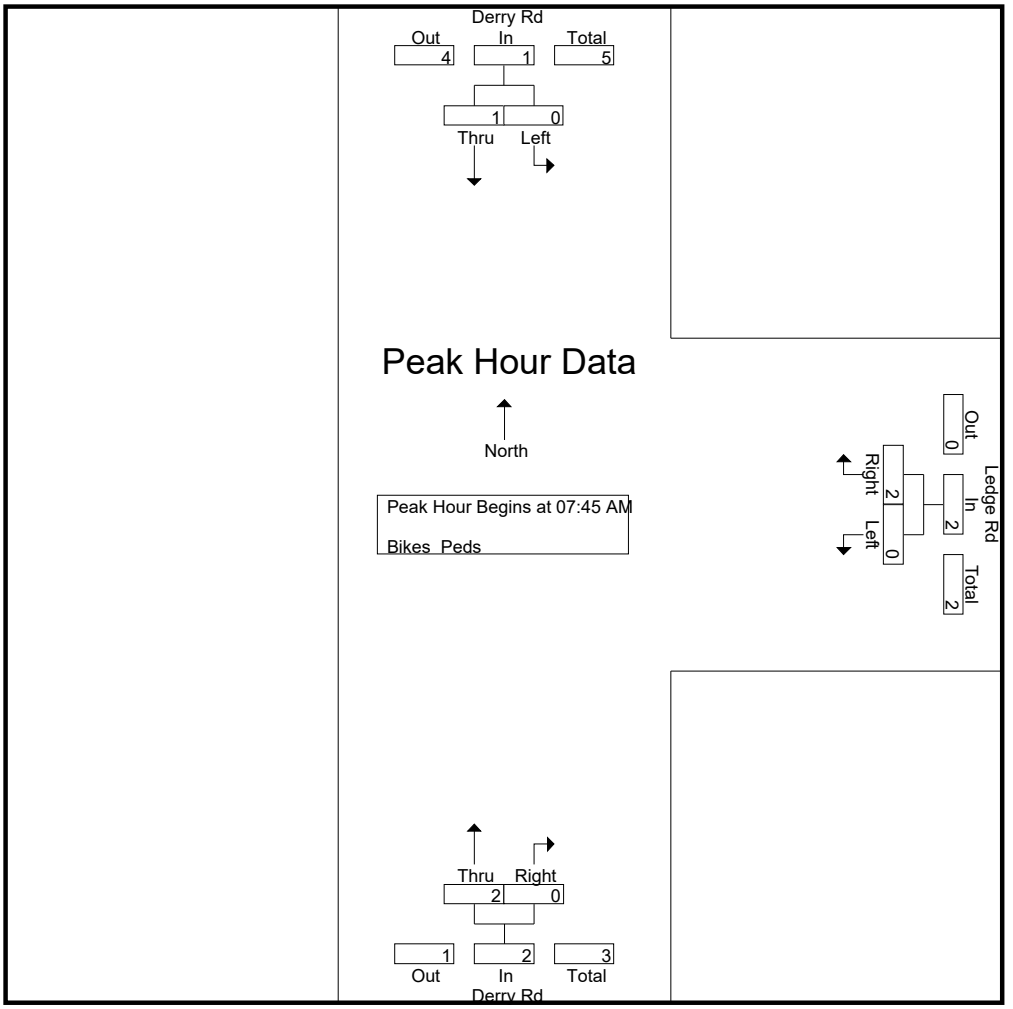
Groups Printed- Bikes Peds

	Derry Rd From North			Ledge Rd From East			Derry Rd From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	2	0	0	0	2	2
Total	0	0	0	0	0	0	2	0	0	0	2	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	1	0	0	2	1	0	0	0	1	3	4
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	2	1	0	0	0	1	3	4
Grand Total	0	1	0	0	2	1	2	0	0	1	5	6
Apprch %	0	100		0	100		100	0				
Total %	0	20		0	40		40	0		16.7	83.3	

	Derry Rd From North			Ledge Rd From East			Derry Rd From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	0	0	0	0	0	**2**	0	**2**	2
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	**1**	**1**	0	**2**	**2**	0	0	0	**3**
Total Volume	0	1	1	0	2	2	2	0	2	5
% App. Total	0	100		0	100		100	0		
PHF	.000	.250	.250	.000	.250	.250	.250	.000	.250	.417

N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

File Name : 15530001
Site Code : 15530001
Start Date : 6/2/2021
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM			07:45 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	**1**	**1**	0	**2**	**2**	**2**	0	**2**
Total Volume	0	1	1	0	2	2	2	0	2
% App. Total	0	100		0	100		100	0	
PHF	.000	.250	.250	.000	.250	.250	.250	.000	.250

Accurate Counts

978-664-2565

N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

File Name : 15530001
Site Code : 15530001
Start Date : 6/2/2021
Page No : 1

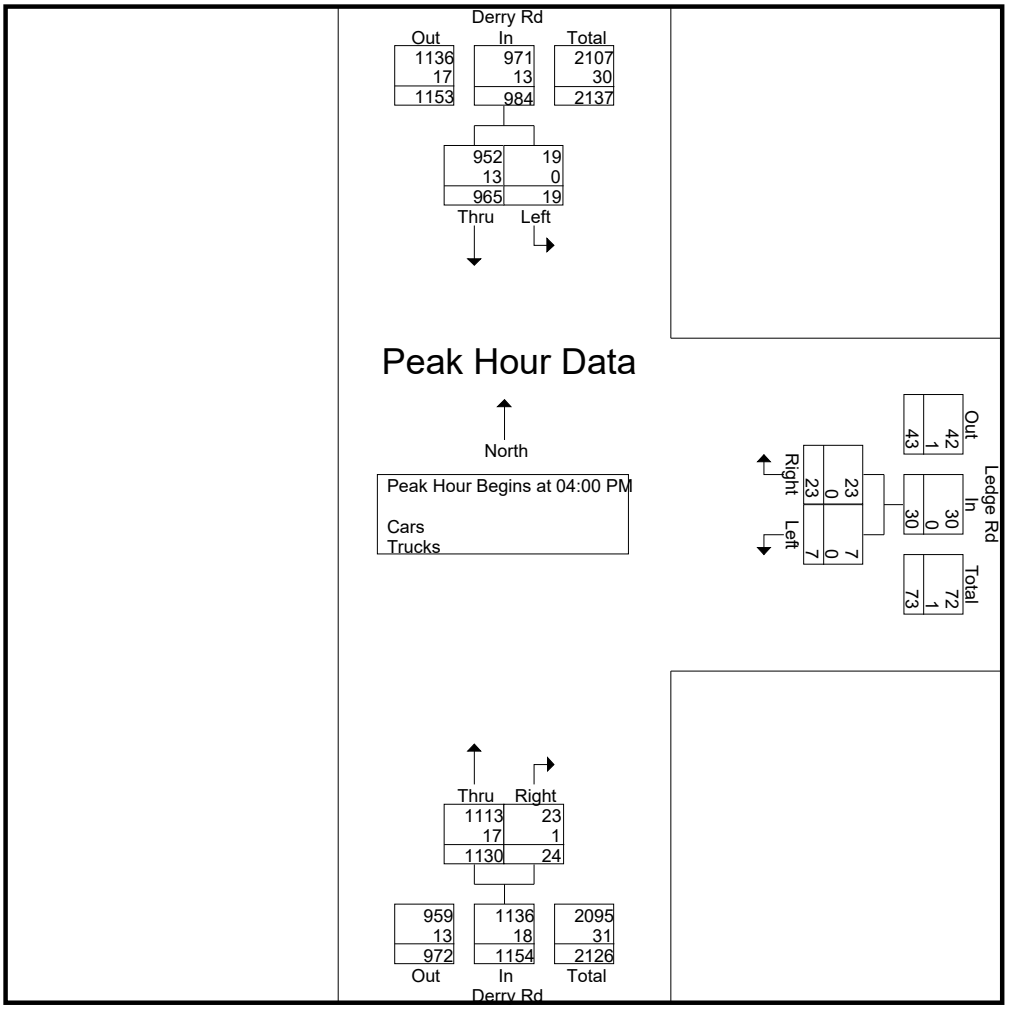
Groups Printed- Cars - Trucks

	Derry Rd From North		Ledge Rd From East		Derry Rd From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	2	251	2	6	284	8	553
04:15 PM	2	239	1	6	277	6	531
04:30 PM	6	227	1	3	287	5	529
04:45 PM	9	248	3	8	282	5	555
Total	19	965	7	23	1130	24	2168
05:00 PM	3	237	1	6	258	6	511
05:15 PM	6	269	4	5	282	6	572
05:30 PM	8	220	2	8	261	6	505
05:45 PM	3	244	1	5	277	4	534
Total	20	970	8	24	1078	22	2122
Grand Total	39	1935	15	47	2208	46	4290
Apprch %	2	98	24.2	75.8	98	2	
Total %	0.9	45.1	0.3	1.1	51.5	1.1	
Cars	39	1913	15	47	2188	45	4247
% Cars	100	98.9	100	100	99.1	97.8	99
Trucks	0	22	0	0	20	1	43
% Trucks	0	1.1	0	0	0.9	2.2	1

	Derry Rd From North			Ledge Rd From East			Derry Rd From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	2	**251**	253	2	6	8	284	**8**	**292**	553
04:15 PM	2	239	241	1	6	7	277	6	283	531
04:30 PM	6	227	233	1	3	4	**287**	5	292	529
04:45 PM	**9**	248	**257**	**3**	**8**	**11**	282	5	287	**555**
Total Volume	19	965	984	7	23	30	1130	24	1154	2168
% App. Total	1.9	98.1		23.3	76.7		97.9	2.1		
PHF	.528	.961	.957	.583	.719	.682	.984	.750	.988	.977
Cars	19	952	971	7	23	30	1113	23	1136	2137
% Cars	100	98.7	98.7	100	100	100	98.5	95.8	98.4	98.6
Trucks	0	13	13	0	0	0	17	1	18	31
% Trucks	0	1.3	1.3	0	0	0	1.5	4.2	1.6	1.4

N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

File Name : 15530001
Site Code : 15530001
Start Date : 6/2/2021
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:45 PM			04:00 PM		
+0 mins.	6	227	233	3	**8**	**11**	284	**8**	**292**
+15 mins.	**9**	248	257	1	6	7	277	6	283
+30 mins.	3	237	240	**4**	5	9	**287**	5	292
+45 mins.	6	**269**	**275**	2	8	10	282	5	287
Total Volume	24	981	1005	10	27	37	1130	24	1154
% App. Total	2.4	97.6		27	73		97.9	2.1	
PHF	.667	.912	.914	.625	.844	.841	.984	.750	.988
Cars	24	975	999	10	27	37	1113	23	1136
% Cars	100	99.4	99.4	100	100	100	98.5	95.8	98.4
Trucks	0	6	6	0	0	0	17	1	18
% Trucks	0	0.6	0.6	0	0	0	1.5	4.2	1.6

Accurate Counts

978-664-2565

N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

File Name : 15530001
Site Code : 15530001
Start Date : 6/2/2021
Page No : 10

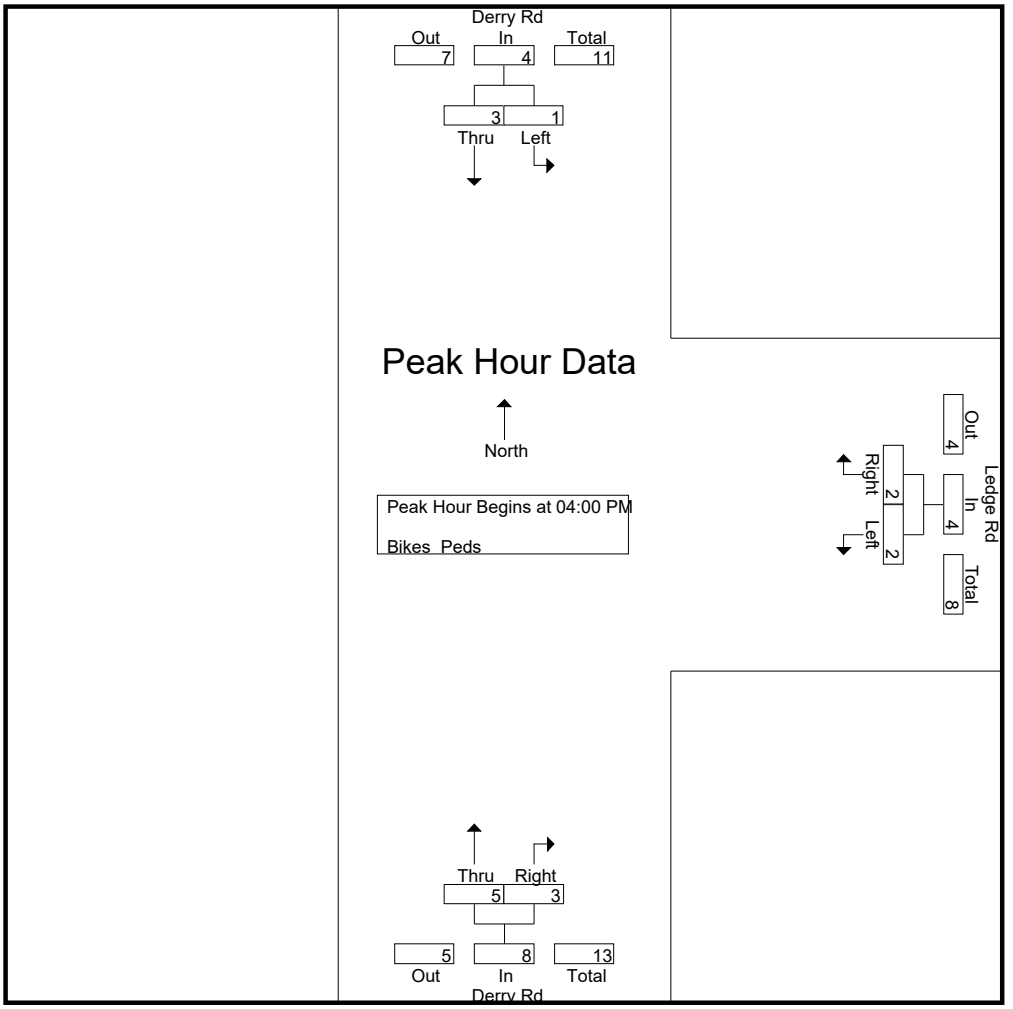
Groups Printed- Bikes Peds

	Derry Rd From North			Ledge Rd From East			Derry Rd From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	1	0	1	1	1	2
04:15 PM	0	2	1	0	1	0	1	1	0	1	5	6
04:30 PM	1	1	0	0	0	0	3	2	0	0	7	7
04:45 PM	0	0	0	2	1	0	0	0	0	0	3	3
Total	1	3	1	2	2	0	5	3	1	2	16	18
05:00 PM	0	0	0	0	0	0	0	1	0	0	1	1
05:15 PM	0	1	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	1	0	0	0	0	0	0	0	0	1	1
05:45 PM	0	0	0	4	0	2	0	0	0	2	4	6
Total	0	2	0	4	0	2	0	1	0	2	7	9
Grand Total	1	5	1	6	2	2	5	4	1	4	23	27
Apprch %	16.7	83.3		75	25		55.6	44.4				
Total %	4.3	21.7		26.1	8.7		21.7	17.4		14.8	85.2	

	Derry Rd From North			Ledge Rd From East			Derry Rd From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	**2**	**2**	0	**1**	1	1	1	2	5
04:30 PM	**1**	1	2	0	0	0	**3**	**2**	**5**	**7**
04:45 PM	0	0	0	**2**	1	**3**	0	0	0	3
Total Volume	1	3	4	2	2	4	5	3	8	16
% App. Total	25	75		50	50		62.5	37.5		
PHF	.250	.375	.500	.250	.500	.333	.417	.375	.400	.571

N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

File Name : 15530001
Site Code : 15530001
Start Date : 6/2/2021
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	1	0	1
+15 mins.	0	**2**	**2**	0	**1**	1	1	1	2
+30 mins.	**1**	1	2	0	0	0	**3**	**2**	**5**
+45 mins.	0	0	0	**2**	1	**3**	0	0	0
Total Volume	1	3	4	2	2	4	5	3	8
% App. Total	25	75		50	50		62.5	37.5	
PHF	.250	.375	.500	.250	.500	.333	.417	.375	.400

Appendix C: Monthly Traffic Volumes

Year 2019 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22

Average ADT: 12,838
Peak ADT: 14,016

Appendix D: Vehicle Speeds

Accurate Counts

978-664-2565

Location : Derry Road 15530001
Location : South of Ledge Road
City/State: Hudson, NH
Direction: SB,

6/2/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	3	16	9	3	1	1	0	0	0	0	33
1:00	0	0	0	2	13	8	4	0	0	0	0	0	0	27
2:00	0	0	0	4	8	6	0	0	0	0	0	0	0	18
3:00	0	0	0	4	17	15	8	1	0	1	0	0	0	46
4:00	0	1	2	8	37	73	31	3	0	0	0	0	0	155
5:00	0	2	1	9	108	237	59	12	0	0	0	0	0	428
6:00	0	0	17	69	257	350	63	3	0	0	0	0	0	759
7:00	0	2	3	154	618	244	25	2	0	0	0	0	0	1048
8:00	0	8	24	255	435	206	26	2	0	0	0	0	0	956
9:00	2	7	8	133	363	227	27	0	0	0	0	0	0	767
10:00	0	8	5	101	400	264	33	1	1	0	0	0	0	813
11:00	0	6	10	104	364	219	33	2	0	0	0	0	0	738
12:00 PM	0	5	15	134	397	255	31	3	0	0	0	0	0	840
1:00	1	9	14	121	427	197	25	4	0	0	0	0	0	798
2:00	0	10	27	182	566	215	12	1	0	0	0	0	0	1013
3:00	1	3	29	222	475	228	20	3	0	0	0	0	0	981
4:00	2	4	11	119	498	253	37	3	0	0	0	0	0	927
5:00	1	4	38	102	438	313	45	2	0	0	0	0	0	943
6:00	0	5	8	77	334	298	59	2	0	0	0	0	0	783
7:00	0	3	2	38	298	221	39	3	1	0	0	0	0	605
8:00	0	2	1	27	206	180	30	2	0	0	0	0	0	448
9:00	0	2	1	21	129	89	21	3	1	0	0	0	0	267
10:00	0	0	0	15	69	54	14	2	0	0	0	0	0	154
11:00	0	2	0	7	26	30	7	0	0	0	0	0	0	72
Total	7	83	216	1911	6499	4191	652	55	4	1	0	0	0	13619

Percentile	15th	50th	85th	95th
Speed	29.7	33.5	37.8	40.3

Mean Speed (Average)	33.7
10 MPH Pace Speed	30-39
Number in Pace	10644
Percent in Pace	78.2%
Number > 30 MPH	11402
Percent > 30 MPH	83.7%

Accurate Counts

978-664-2565

Location : Derry Road 15530001
Location : South of Ledge Road
City/State: Hudson, NH
Direction: SB,

6/3/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	8	10	21	4	1	0	0	0	0	0	44
1:00	0	1	0	8	10	4	3	1	1	0	0	0	0	28
2:00	0	0	2	5	13	13	2	1	0	0	0	0	0	36
3:00	0	0	0	1	19	19	8	1	1	0	0	0	0	49
4:00	0	0	2	4	38	71	22	1	0	0	0	0	0	138
5:00	0	1	1	15	154	193	50	7	0	0	0	0	0	421
6:00	0	2	0	61	308	335	36	2	0	0	0	0	0	744
7:00	1	12	20	195	534	248	10	5	1	0	0	0	0	1026
8:00	0	3	23	252	463	180	23	1	0	0	0	0	0	945
9:00	0	3	8	87	352	241	28	2	0	0	0	0	0	721
10:00	0	7	11	107	401	204	16	1	0	0	1	0	0	748
11:00	0	8	22	163	428	169	15	5	0	0	0	0	0	810
12:00 PM	0	6	20	91	438	235	29	0	0	0	0	0	0	819
1:00	0	6	11	132	434	216	26	0	0	0	0	0	0	825
2:00	0	8	42	233	498	194	32	1	0	0	0	0	0	1008
3:00	1	6	18	251	476	200	25	1	1	0	0	0	0	979
4:00	10	17	56	222	400	265	37	1	0	1	0	0	0	1009
5:00	0	3	9	97	480	327	32	2	0	0	0	0	0	950
6:00	0	1	2	30	297	306	58	5	1	0	0	0	0	700
7:00	0	0	1	44	226	210	42	5	0	0	0	0	0	528
8:00	1	3	5	37	141	166	39	2	0	2	0	0	0	396
9:00	1	1	0	13	85	129	30	5	0	0	0	0	0	264
10:00	1	2	0	10	62	58	25	6	0	0	0	0	0	164
11:00	0	1	0	10	28	30	7	2	0	0	0	0	0	78
Total	15	91	253	2076	6295	4034	599	58	5	3	1	0	0	13430
			Percentile	15th	50th	85th	95th							
			Speed	29.7	33.5	37.2	39.7							
		Mean Speed (Average)		33.5										
		10 MPH Pace Speed		30-39										
		Number in Pace		10290										
		Percent in Pace		76.6%										
		Number > 30 MPH		10995										
		Percent > 30 MPH		81.9%										
Grand Total	22	174	469	3987	12794	8225	1251	113	9	4	1	0	0	27049
Stats			Percentile	15th	50th	85th	95th							
			Speed	29.7	33.5	37.2	39.7							
		Mean Speed (Average)		33.6										
		10 MPH Pace Speed		30-39										
		Number in Pace		20934										
		Percent in Pace		77.4%										
		Number > 30 MPH		22397										
		Percent > 30 MPH		82.8%										

Accurate Counts

978-664-2565

Location : Derry Road 15530001
Location : South of Ledge Road
City/State: Hudson, NH
Direction: NB,

6/2/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	1	1	7	23	7	2	0	0	0	0	0	41
1:00	0	0	0	0	10	10	2	0	0	0	0	0	0	22
2:00	0	0	0	2	4	6	5	2	0	0	0	0	0	19
3:00	0	0	0	0	7	18	7	7	0	0	0	0	1	40
4:00	0	0	2	0	11	29	27	4	0	0	0	0	2	75
5:00	0	0	2	3	38	102	77	17	0	1	0	0	1	241
6:00	0	5	21	61	133	217	94	11	2	0	0	0	0	544
7:00	3	1	17	87	235	404	86	7	1	0	0	0	1	842
8:00	3	1	24	63	221	352	68	1	0	0	0	0	2	735
9:00	1	2	12	34	204	323	70	5	0	0	0	1	2	654
10:00	3	6	8	30	238	274	72	7	0	0	0	0	2	640
11:00	2	6	8	63	275	312	80	6	0	0	0	1	2	755
12:00 PM	2	7	16	39	296	362	72	5	0	0	0	0	0	799
1:00	6	2	17	90	312	317	60	3	1	0	0	0	0	808
2:00	3	2	4	75	349	411	70	5	0	0	0	1	1	921
3:00	4	4	20	86	423	431	94	3	0	0	0	0	0	1065
4:00	6	8	24	204	498	389	32	1	0	0	0	0	1	1163
5:00	0	3	6	105	408	493	86	5	0	0	0	0	0	1106
6:00	3	5	3	45	293	418	104	11	0	0	0	0	1	883
7:00	0	3	3	28	179	348	70	9	2	0	0	0	0	642
8:00	0	1	5	41	189	222	42	7	0	0	0	0	0	507
9:00	1	0	0	13	103	159	50	3	0	0	0	0	0	329
10:00	0	0	2	10	44	81	25	2	0	1	0	0	0	165
11:00	0	0	3	3	23	51	15	4	0	0	0	0	0	99
Total	37	56	198	1083	4500	5752	1315	127	6	2	0	3	16	13095

Percentile	15th	50th	85th	95th
Speed	31	35.3	39	41.5

Mean Speed (Average)	35.4
10 MPH Pace Speed	30-39
Number in Pace	10159
Percent in Pace	77.6%
Number > 30 MPH	11721
Percent > 30 MPH	89.5%

Accurate Counts

978-664-2565

Location : Derry Road 15530001
Location : South of Ledge Road
City/State: Hudson, NH
Direction: NB,

6/3/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	1	0	5	9	27	7	0	0	0	1	1	0	51
1:00	0	0	0	2	7	8	8	1	1	0	0	0	0	27
2:00	0	0	1	1	4	7	7	3	0	0	0	0	0	23
3:00	0	0	0	1	5	9	7	0	1	0	0	0	0	23
4:00	0	0	0	4	11	45	25	6	0	0	0	0	0	91
5:00	0	0	5	9	52	108	68	21	0	0	0	0	1	264
6:00	1	2	18	66	104	199	85	11	1	1	0	0	2	490
7:00	4	2	16	103	315	359	62	6	1	0	0	2	1	871
8:00	7	2	20	56	261	326	85	7	1	0	0	0	9	774
9:00	1	1	3	48	218	316	65	9	1	0	0	0	2	664
10:00	1	4	3	51	199	318	90	7	0	0	0	0	0	673
11:00	2	5	9	71	232	270	95	1	0	0	0	3	2	690
12:00 PM	3	3	7	50	310	358	75	8	0	0	0	0	0	814
1:00	2	4	16	74	373	349	56	3	0	0	0	0	0	877
2:00	5	7	15	129	431	347	47	2	0	0	1	2	0	986
3:00	5	2	17	180	447	366	53	1	1	0	0	0	0	1072
4:00	15	16	39	121	396	460	73	0	0	0	0	0	0	1120
5:00	0	5	12	68	433	471	104	5	0	0	0	0	0	1098
6:00	0	0	2	46	317	359	103	13	1	0	0	0	0	841
7:00	3	0	6	38	195	301	89	6	0	0	0	0	0	638
8:00	0	0	1	24	160	215	44	2	1	0	0	0	0	447
9:00	0	3	4	16	99	119	62	1	0	0	0	0	0	304
10:00	0	0	1	13	38	81	30	7	1	0	0	0	0	171
11:00	0	0	1	2	22	53	25	1	0	0	0	0	0	104
Total	49	57	196	1178	4638	5471	1365	121	10	1	2	8	17	13113
			Percentile	15th	50th	85th	95th							
			Speed	31	35.3	39	41.5							
		Mean Speed (Average)		35.3										
		10 MPH Pace Speed		30-39										
		Number in Pace		10023										
		Percent in Pace		76.4%										
		Number > 30 MPH		11633										
		Percent > 30 MPH		88.7%										
Grand Total	86	113	394	2261	9138	11223	2680	248	16	3	2	11	33	26208
Stats			Percentile	15th	50th	85th	95th							
			Speed	31	35.3	39	41.5							
		Mean Speed (Average)		35.3										
		10 MPH Pace Speed		30-39										
		Number in Pace		20182										
		Percent in Pace		77.0%										
		Number > 30 MPH		23354										
		Percent > 30 MPH		89.1%										

Appendix E: Capacity-Analysis Worksheets

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	29	895	10	11	1228
Future Vol, veh/h	24	29	895	10	11	1228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	72	72	93	93	90	90
Heavy Vehicles, %	9	0	3	0	20	2
Mvmt Flow	33	40	962	11	12	1364

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2356	968	0	0	973	0
Stage 1	968	-	-	-	-	-
Stage 2	1388	-	-	-	-	-
Critical Hdwy	6.49	6.2	-	-	4.3	-
Critical Hdwy Stg 1	5.49	-	-	-	-	-
Critical Hdwy Stg 2	5.49	-	-	-	-	-
Follow-up Hdwy	3.581	3.3	-	-	2.38	-
Pot Cap-1 Maneuver	37	311	-	-	642	-
Stage 1	358	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	36	311	-	-	642	-
Mov Cap-2 Maneuver	139	-	-	-	-	-
Stage 1	358	-	-	-	-	-
Stage 2	219	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.3	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	199	642	-
HCM Lane V/C Ratio	-	-	0.37	0.019	-
HCM Control Delay (s)	-	-	33.3	10.7	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	1.6	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	25	1217	26	20	1039
Future Vol, veh/h	8	25	1217	26	20	1039
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	68	68	99	99	96	96
Heavy Vehicles, %	0	0	2	4	0	1
Mvmt Flow	12	37	1229	26	21	1082

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2366	1242	0	0	1255	0
Stage 1	1242	-	-	-	-	-
Stage 2	1124	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	39	215	-	-	561	-
Stage 1	275	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	38	215	-	-	561	-
Mov Cap-2 Maneuver	148	-	-	-	-	-
Stage 1	275	-	-	-	-	-
Stage 2	301	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29.6	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	194	561	-
HCM Lane V/C Ratio	-	-	0.25	0.037	-
HCM Control Delay (s)	-	-	29.6	11.7	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	1	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	29	904	10	11	1240
Future Vol, veh/h	24	29	904	10	11	1240
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	0	3	0	20	2
Mvmt Flow	27	32	1004	11	12	1378

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2412	1010	0	0	1015	0
Stage 1	1010	-	-	-	-	-
Stage 2	1402	-	-	-	-	-
Critical Hdwy	6.49	6.2	-	-	4.3	-
Critical Hdwy Stg 1	5.49	-	-	-	-	-
Critical Hdwy Stg 2	5.49	-	-	-	-	-
Follow-up Hdwy	3.581	3.3	-	-	2.38	-
Pot Cap-1 Maneuver	34	294	-	-	618	-
Stage 1	342	-	-	-	-	-
Stage 2	220	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	33	294	-	-	618	-
Mov Cap-2 Maneuver	135	-	-	-	-	-
Stage 1	342	-	-	-	-	-
Stage 2	216	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.8	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	192	618	-
HCM Lane V/C Ratio	-	-	0.307	0.02	-
HCM Control Delay (s)	-	-	31.8	10.9	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	25	1229	26	20	1049
Future Vol, veh/h	8	25	1229	26	20	1049
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	2	4	0	1
Mvmt Flow	9	28	1366	29	22	1166

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2591	1381	0	0	1395	0
Stage 1	1381	-	-	-	-	-
Stage 2	1210	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	28	178	-	-	497	-
Stage 1	236	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	27	178	-	-	497	-
Mov Cap-2 Maneuver	128	-	-	-	-	-
Stage 1	236	-	-	-	-	-
Stage 2	272	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.4	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	163	497	-
HCM Lane V/C Ratio	-	-	0.225	0.045	-
HCM Control Delay (s)	-	-	33.4	12.6	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	27	32	999	11	12	1370
Future Vol, veh/h	27	32	999	11	12	1370
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	0	3	0	20	2
Mvmt Flow	30	36	1110	12	13	1522

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2664	1116	0	0	1122	0
Stage 1	1116	-	-	-	-	-
Stage 2	1548	-	-	-	-	-
Critical Hdwy	6.49	6.2	-	-	4.3	-
Critical Hdwy Stg 1	5.49	-	-	-	-	-
Critical Hdwy Stg 2	5.49	-	-	-	-	-
Follow-up Hdwy	3.581	3.3	-	-	2.38	-
Pot Cap-1 Maneuver	~ 24	255	-	-	561	-
Stage 1	303	-	-	-	-	-
Stage 2	186	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 23	255	-	-	561	-
Mov Cap-2 Maneuver	114	-	-	-	-	-
Stage 1	303	-	-	-	-	-
Stage 2	182	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.2	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	163	561	-
HCM Lane V/C Ratio	-	-	0.402	0.024	-
HCM Control Delay (s)	-	-	41.2	11.6	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	1.8	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	28	1358	29	22	1159
Future Vol, veh/h	9	28	1358	29	22	1159
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	2	4	0	1
Mvmt Flow	10	31	1509	32	24	1288

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2861	1525	0	0	1541	0
Stage 1	1525	-	-	-	-	-
Stage 2	1336	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	19	147	-	-	437	-
Stage 1	200	-	-	-	-	-
Stage 2	248	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	18	147	-	-	437	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	200	-	-	-	-	-
Stage 2	234	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	42.9	0	0.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	135	437	-
HCM Lane V/C Ratio	-	-	0.305	0.056	-
HCM Control Delay (s)	-	-	42.9	13.7	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0.2	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	29	24	907	10	11	1243
Future Vol, veh/h	29	24	907	10	11	1243
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	0	3	0	20	2
Mvmt Flow	32	27	1008	11	12	1381

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2419	1014	0	0	1019	0
Stage 1	1014	-	-	-	-	-
Stage 2	1405	-	-	-	-	-
Critical Hdwy	6.49	6.2	-	-	4.3	-
Critical Hdwy Stg 1	5.49	-	-	-	-	-
Critical Hdwy Stg 2	5.49	-	-	-	-	-
Follow-up Hdwy	3.581	3.3	-	-	2.38	-
Pot Cap-1 Maneuver	34	292	-	-	616	-
Stage 1	340	-	-	-	-	-
Stage 2	219	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	33	292	-	-	616	-
Mov Cap-2 Maneuver	134	-	-	-	-	-
Stage 1	340	-	-	-	-	-
Stage 2	215	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35.2	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	177	616	-
HCM Lane V/C Ratio	-	-	0.333	0.02	-
HCM Control Delay (s)	-	-	35.2	11	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	1.4	0.1	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	30	23	894	1237	30
Future Vol, veh/h	23	30	23	894	1237	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	3	3	3	3
Mvmt Flow	26	33	26	993	1374	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2436	1391	1407	0	-	0
Stage 1	1391	-	-	-	-	-
Stage 2	1045	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.227	-	-	-
Pot Cap-1 Maneuver	35	174	482	-	-	-
Stage 1	231	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	33	174	482	-	-	-
Mov Cap-2 Maneuver	136	-	-	-	-	-
Stage 1	219	-	-	-	-	-
Stage 2	339	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.5	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	482	-	136	174	-	-
HCM Lane V/C Ratio	0.053	-	0.188	0.192	-	-
HCM Control Delay (s)	12.9	-	37.5	30.5	-	-
HCM Lane LOS	B	-	E	D	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	0.7	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	25	1230	26	20	1050
Future Vol, veh/h	8	25	1230	26	20	1050
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	2	4	0	1
Mvmt Flow	9	28	1367	29	22	1167

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2593	1382	0	0	1396	0
Stage 1	1382	-	-	-	-	-
Stage 2	1211	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	28	178	-	-	496	-
Stage 1	235	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	27	178	-	-	496	-
Mov Cap-2 Maneuver	127	-	-	-	-	-
Stage 1	235	-	-	-	-	-
Stage 2	272	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.6	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	162	496	-
HCM Lane V/C Ratio	-	-	0.226	0.045	-
HCM Control Delay (s)	-	-	33.6	12.6	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	9	11	1245	1049	9
Future Vol, veh/h	11	9	11	1245	1049	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	10	12	1383	1166	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2578	1171	1176	0	-	0
Stage 1	1171	-	-	-	-	-
Stage 2	1407	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	28	235	594	-	-	-
Stage 1	295	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	235	594	-	-	-
Mov Cap-2 Maneuver	128	-	-	-	-	-
Stage 1	289	-	-	-	-	-
Stage 2	226	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.3	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	594	-	128	235	-	-
HCM Lane V/C Ratio	0.021	-	0.095	0.043	-	-
HCM Control Delay (s)	11.2	-	36.1	21	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	27	32	1002	11	12	1373
Future Vol, veh/h	27	32	1002	11	12	1373
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	0	3	0	20	2
Mvmt Flow	30	36	1113	12	13	1526

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2671	1119	0	0	1125	0
Stage 1	1119	-	-	-	-	-
Stage 2	1552	-	-	-	-	-
Critical Hdwy	6.49	6.2	-	-	4.3	-
Critical Hdwy Stg 1	5.49	-	-	-	-	-
Critical Hdwy Stg 2	5.49	-	-	-	-	-
Follow-up Hdwy	3.581	3.3	-	-	2.38	-
Pot Cap-1 Maneuver	~ 23	254	-	-	559	-
Stage 1	302	-	-	-	-	-
Stage 2	185	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 22	254	-	-	559	-
Mov Cap-2 Maneuver	113	-	-	-	-	-
Stage 1	302	-	-	-	-	-
Stage 2	181	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.6	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	162	559	-
HCM Lane V/C Ratio	-	-	0.405	0.024	-
HCM Control Delay (s)	-	-	41.6	11.6	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	1.8	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	34	25	988	1367	33
Future Vol, veh/h	25	34	25	988	1367	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	3	3	3	3
Mvmt Flow	28	38	28	1098	1519	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2692	1538	1556	0	-	0
Stage 1	1538	-	-	-	-	-
Stage 2	1154	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.227	-	-	-
Pot Cap-1 Maneuver	~ 24	142	422	-	-	-
Stage 1	195	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 22	142	422	-	-	-
Mov Cap-2 Maneuver	113	-	-	-	-	-
Stage 1	182	-	-	-	-	-
Stage 2	300	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.5	0.3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	422	-	113	142	-	-
HCM Lane V/C Ratio	0.066	-	0.246	0.266	-	-
HCM Control Delay (s)	14.1	-	46.9	39.3	-	-
HCM Lane LOS	B	-	E	E	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	28	1359	29	22	1160
Future Vol, veh/h	9	28	1359	29	22	1160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	2	4	0	1
Mvmt Flow	10	31	1510	32	24	1289

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2863	1526	0	0	1542	0
Stage 1	1526	-	-	-	-	-
Stage 2	1337	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	19	146	-	-	436	-
Stage 1	200	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	18	146	-	-	436	-
Mov Cap-2 Maneuver	106	-	-	-	-	-
Stage 1	200	-	-	-	-	-
Stage 2	233	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	43.3	0	0.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	134	436	-
HCM Lane V/C Ratio	-	-	0.307	0.056	-
HCM Control Delay (s)	-	-	43.3	13.7	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0.2	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	11	12	1377	1159	10
Future Vol, veh/h	11	11	12	1377	1159	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	12	13	1530	1288	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2850	1294	1299	0	-	0
Stage 1	1294	-	-	-	-	-
Stage 2	1556	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	19	199	533	-	-	-
Stage 1	257	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	19	199	533	-	-	-
Mov Cap-2 Maneuver	108	-	-	-	-	-
Stage 1	251	-	-	-	-	-
Stage 2	191	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.4	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	533	-	108	199	-	-
HCM Lane V/C Ratio	0.025	-	0.113	0.061	-	-
HCM Control Delay (s)	11.9	-	42.5	24.3	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0.2	-	-

TOWN OF HUDSON

Planning Board

Timothy Malley, Chairman

12 School Street • Hudson, New Hampshire 03051 • Tel: 603-886-6008 • Fax: 603-594-1142

CAP FEE WORKSHEET - 2021

Date: 07-21-21 Zone # 1 Map/Lot: 173/029-000
56 Derry Street

Project Name: Aroma Joe's

Proposed ITE Use #1: Commercial – Coffee Shop

New Daily Trips (15% of Total): 104 trips.

CAP FEES: (ONE CHECK NEEDED)

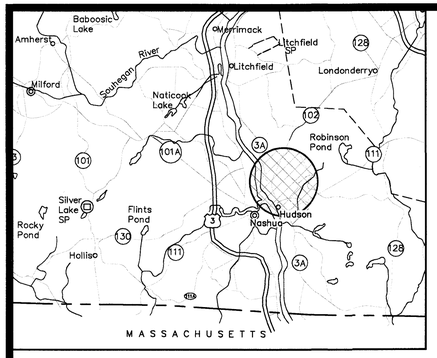
1.	**(Bank 09)**		
	2070-701	**Coffee/Donut Shop (104 trips @ $199 per trip)**	**$ 20,696.00**
		Total CAP Fee	**$ 20,696.00**

Check should be made payable to the Town of Hudson.

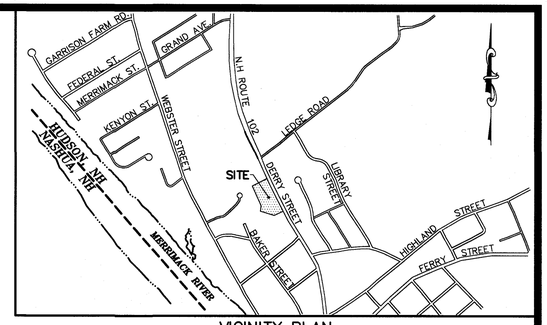
Thank you,

Brian Groth

Town Planner



VICINITY PLAN
NOT TO SCALE



VICINITY PLAN
SCALE: 1" = 1000'

NON RESIDENTIAL SITE PLAN
AROMA JOE'S
MAP 173; LOTS 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE

OWNER:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, NH 03053

OWNER/APPLICANT:
SCOTT ZIEFELDER
169 CANAAN BACK ROAD
BARINGTON, NH 03825

PREPARED BY:
KEACH-NORDSTROM ASSOCIATES, INC.
10 COMMERCE PARK NORTH, SUITE 3B
BEDFORD, NEW HAMPSHIRE 03110
(603) 627-2881

DIG SAFE
811 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

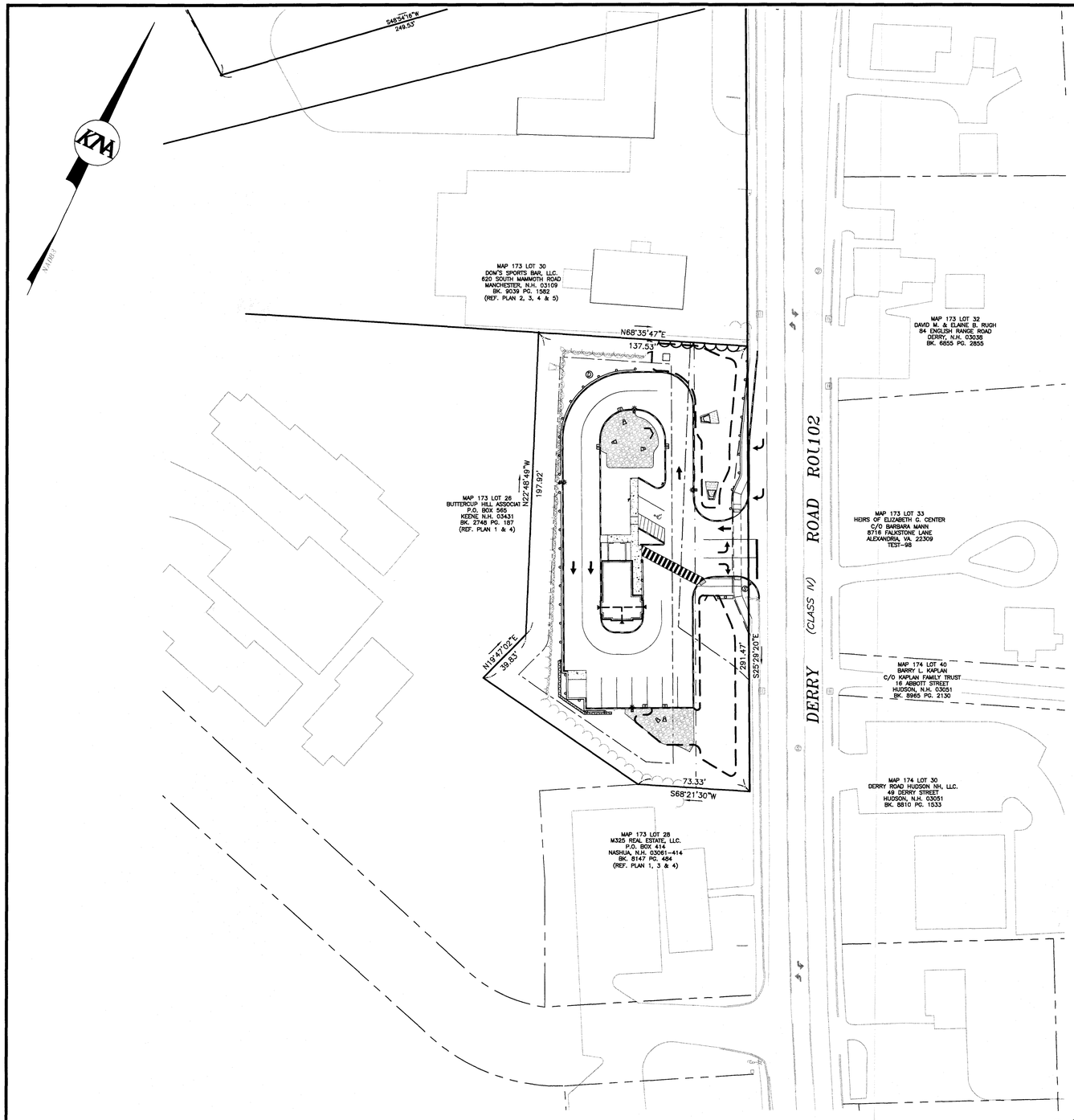
STATE OF New HAMPSHIRE
No. 903
ANTHONY M. BASSO
LICENSED LAND SURVEYOR
SIGNATURE

STATE OF NEW HAMPSHIRE
PAUL CHISHOLM
No. 15076
LICENSED PROFESSIONAL ENGINEER

9/13/21

KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

JUNE 22, 2021
LAST REVISED: AUGUST 12, 2021
PROJECT NO. 21-0311-1



REFERENCE PLANS:

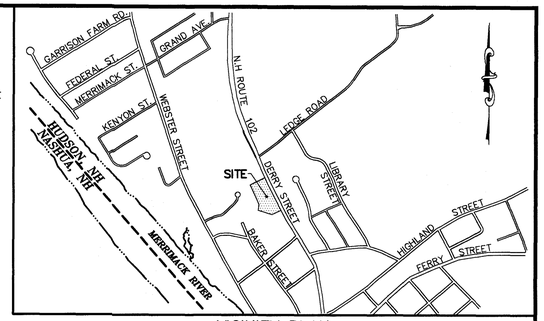
1. "EXISTING CONDITIONS PLAN, AROMA JOE'S, MAP 173 LOT 29, 56 DERRY STREET, HUDSON, NEW HAMPSHIRE, DATED MAY 7, 2021," PREPARED BY KEACH–NORDSTROM ASSOCIATES, INC.

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE PROPOSED SITE LAYOUT ON MAP 173 LOT 29 IN THE TOWN OF HUDSON, NEW HAMPSHIRE AS SHOWN HEREON.
2. OWNER OF RECORD:
   STEVE S. & HSIANG HWA W. PAN
   13 KING HENRY DRIVE
   LONDONDERRY, N.H. 03053
   BK. 6281 PG. 776
3. AREA OF SUBJECT PARCEL = 40,793 SF, OR 0.935 ACRES
4. TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HEREON ARE BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE IN APRIL OF 2021.
5. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NGVD29 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA–OPUS.
6. THE SUBJECT PARCEL IS LOCATED WITHIN THE BUSINESS (B) ZONING DISTRICT. DIMENSIONAL REQUIREMENTS ARE AS FOLLOWS FOR LOTS SERVICED WITH MUNICIPAL SEWER AND WATER:

	REQUIRED	PROPOSED
MINIMUM LOT AREA	30,000 SF	40,793 SF
MINIMUM LOT FRONTAGE	150 FT	291.47 FT
MINIMUM BUILDING SETBACKS:		
FRONT	50 FT	69 FT
SIDE	15 FT	75 FT
REAR	15 FT	47 FT

7. PARCEL WILL BE SERVICED BY MUNICIPAL WATER & SEWER.
8. EXAMINATION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF MERRIMACK N.H., HILLSBOROUGH COUNTY, MAP NUMBER 33011C0514E, PANEL 501 OF 701, EFFECTIVE DATE: APRIL 18, 2011 INDICATES THAT NO PORTION OF THE SUBJECT PARCEL IS LOCATED WITHIN A DESIGNATED FLOOD HAZARD AREA.
9. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS APPROXIMATE. KEACH–NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF THE UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR OR OWNER SHALL CONTACT DIG–SAFE AT 811.
10. EASEMENTS, RIGHTS AND RESTRICTIONS SHOWN OR IDENTIFIED HEREON ARE THOSE FOUND DURING RESEARCH AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS. OTHER EASEMENTS, RIGHTS AND RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF THE SUBJECT PREMISES MAY DETERMINE.
11. OPEN SPACE REQUIRED = 40%
    OPEN SPACE PROPOSED = 58.6%
12. PARKING CALCULATIONS:
    PARKING REQUIRED = 1 SPACE/100 SF X 900 SF = 9 SPACES
    TOTAL PARKING REQUIRED = 9 SPACES
    TOTAL PARKING PROVIDED = 9 SPACES
13. SITE LIGHTING SHALL BE AS SHOWN ON THE PLAN, DIRECTED ONTO SITE, AND SHALL CONFORM WITH ALL APPLICABLE TOWN OF HUDSON ZONING REGULATIONS.
14. CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO THE HOURS OF 7:00 AM & 7:00 PM, MONDAY THROUGH SATURDAY. NO EXTERIOR CONSTRUCTION ACTIVITIES SHALL OCCUR ON SUNDAY.
15. HOURS OF OPERATION: 5:15 AM TO 9:00 PM, MONDAY THROUGH SUNDAY.
16. APPROVAL OF THIS PLAN SHALL BE SUBJECT TO FINAL ENGINEERING REVIEW.
17. SITE IMPROVEMENTS DEPICTED ON THE PLAN SHALL CONFORM WITH TITLE III OF THE AMERICANS WITH DISABILITIES ACT WITH REGARD TO DIMENSION AND GRADE.
18. IT SHALL BE UNLAWFUL TO MODIFY, CHANGE, OR ALTER ANY STRUCTURE OR USE SHOWN ON THIS SITE PLAN IN ANYWAY WHATSOEVER, OR CONVERT OR ALTER ANY STRUCTURE OR USE SHOWN ON THIS SITE PLAN, OR CHANGE THE ABOVE USE INDICATED ON THE PLAN WITHOUT RECEIVING APPROVAL FROM THE TOWN OF HUDSON PLANNING BOARD.
19. PRIOR TO THE ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY, AN L.L.S. CERTIFIED "AS–BUILT" SITE PLAN SHALL BE PROVIDED TO THE TOWN OF HUDSON COMMUNITY DEVELOPMENT DEPARTMENT CONFIRMING THAT THE SITE CONFORMS WITH THE PLANNING BOARD APPROVED SITE PLAN.
20. IDENTIFICATION SIGNAGE SHALL NOT BE ERECTED UNTIL APPROVED BY THE BUILDING INSPECTOR AND ZONING ADMINISTRATOR.
21. PLOWED SNOW FROM THE FACILITIES, DRIVEWAY, PARKING LOTS AND SIDEWALK SHALL BE STORED IN THE DESIGNATED AREAS SHOWN IN THIS PLAN SET. NO SNOW MAY BE PLOWED OR STORED ON THE ABUTTING PARCELS. WHEN THE SNOW STORAGE AREAS ARE AT CAPACITY, SUBSEQUENT SNOW SHALL BE HAULED OFF–SITE AND DISPOSED OF IN AN ENVIRONMENTALLY SOUND FASHION AND IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
22. ONSITE DRAINAGE SYSTEM SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH NHDES REQUIREMENTS FOR SUCH SYSTEMS.
23. THE APPLICANT'S ENGINEER AND/OR CONTRACTOR SHALL CONTACT THE TOWN OF HUDSON TO SCHEDULE A PRE–CONSTRUCTION MEETING, WHICH WILL BE HELD WITH STAFF PRIOR TO STARTING CONSTRUCTION.
24. ALL STIPULATIONS OF APPROVAL SHALL BE INCORPORATED INTO THE DEVELOPMENT AGREEMENT, WHICH SHALL BE RECORDED AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS, TOGETHER WITH THE SITE PLAN–OF–RECORD AND ALL AGREED UPON EASEMENT DEEDS, WHICH SHALL BE FAVORABLY REVIEWED BY TOWN COUNSEL PRIOR TO PLANNING BOARD ENDORSEMENT OF PLAN.
25. ALL IMPROVEMENTS SHOWN ON THE SITE PLAN–OF–RECORD, INCLUDING NOTES 1–32, SHALL BE COMPLETED IN THEIR ENTIRETY AND AT THE EXPENSE OF THE APPLICANT OR HIS ASSIGNS.
26. THE TOWN OF HUDSON SHALL RESERVE THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION.
27. AFTER ISSUANCE OF THE FOUNDATION PERMIT FOR THE PROPOSED BUILDING, AND PRIOR TO THE ISSUANCE OF THE FRAMING PERMIT THEREOF, THE APPLICANT SHALL SUBMIT TO THE HUDSON COMMUNITY DEVELOPMENT DEPARTMENT A FOUNDATION "AS–BUILT" PLAN ON A TRANSPARENCY AND TO THE SAME SCALE AS THE APPROVED SITE PLAN. THE FOUNDATION "AS–BUILT" PLAN SHALL INCLUDE ALL STRUCTURAL DIMENSIONS AND LOT LINE SETBACK MEASUREMENTS TO THE FOUNDATION AND BE STAMPED BY A LICENSED LAND SURVEYOR. ANY DISCREPANCY BETWEEN THE APPROVED SITE PLAN AND FOUNDATION "AS–BUILT" PLANS SHALL BE DOCUMENTED BY THE APPLICANT AND BE PART OF THE FOUNDATION "AS–BUILT" SUBMISSION.
28. THE PROPOSED PROJECT HAS BEEN DESIGNED TO MEET 2018 MS4 REQUIREMENTS.
29. ALL SIGNS ARE SUBJECT TO APPROVAL BY THE HUDSON PLANNING BOARD PRIOR TO INSTALLATION.
30. PROPOSED BUILDING HEIGHT: 12 FT.
31. CONTRACTOR SHALL FOLLOW THE TOWN OF HUDSON'S REQUIREMENTS FOR THE IMPORTING OF OFFSITE FILL MATERIALS.
32. A WAIVER WAS GRANTED FROM SECTION 276–11.11B(12)(c): TO ALLOW CONSTRUCTION WITHIN THE 100' BUFFER FROM A RESIDENTIAL USE BY THE PLANNING BOARD ON JULY 28, 2021



VICINITY PLAN
SCALE: 1" = 1000'

LEGEND

GB–F	GRANITE BOUND FOUND
IP–F	IRON PIN FOUND
IP–S W/CAP	IRON PIN SET WITH CAP
	UTILITY POLE
	STREET LIGHT
	GAS VALVE
	WATER VALVE
S	SEWER MANHOLE
D	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
OHU	OVERHEAD UTILITIES
	DRAINAGE LINE
	TREELINE
	RETAINING WALL
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
	SETBACK
	100' RESIDENTIAL BUFFER
	GREEN SPACE BUFFER
	PROPOSED SIGN
	PROPOSED LIGHT
	PROPOSED GAS VALVE
	PROPOSED WATER VALVE
	PROPOSED WOOD GUARDRAIL
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED RETAINING WALL
	PROPOSED VERTICAL GRANITE CURB
	PROPOSED OUTLET STRUCTURE

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

MASTER SITE PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776

APPLICANT:
SCOTT ZIELFELDER
169 CANAAN BACK ROAD
BARRINGTON, NH 03825

KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627–2881

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

OWNER OF MAP 173 LOT 29
SIGNATURE: _____
DATE: 6-16-2021

DIG SAFE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
811 CALL TOLL FREE
RI · MA · NH · VT · ME

STATE OF NEW HAMPSHIRE
PAUL CHISHOLM
No. 15076
LICENSED
PROFESSIONAL ENGINEER

SURVEYOR'S CERTIFICATION:

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. FURTHER, THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE DURING APRIL OF 2021. SAID SURVEY HAS A RELATIVE ERROR OF CLOSURE OF ONE PART IN TEN THOUSAND (1:10,000) OR BETTER.

LICENSED LAND SURVEYOR _____ DATE 5/13/21

STATE OF NEW HAMPSHIRE
NO. 9613
ANTHONY J. BASSO
LICENSED LAND SURVEYOR
SIGNATURE

REVISIONS

No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL

DATE: JUNE 22, 2021 | SCALE: 1"=40'
PROJECT NO: 21–0311–1 | SHEET 1 OF 14

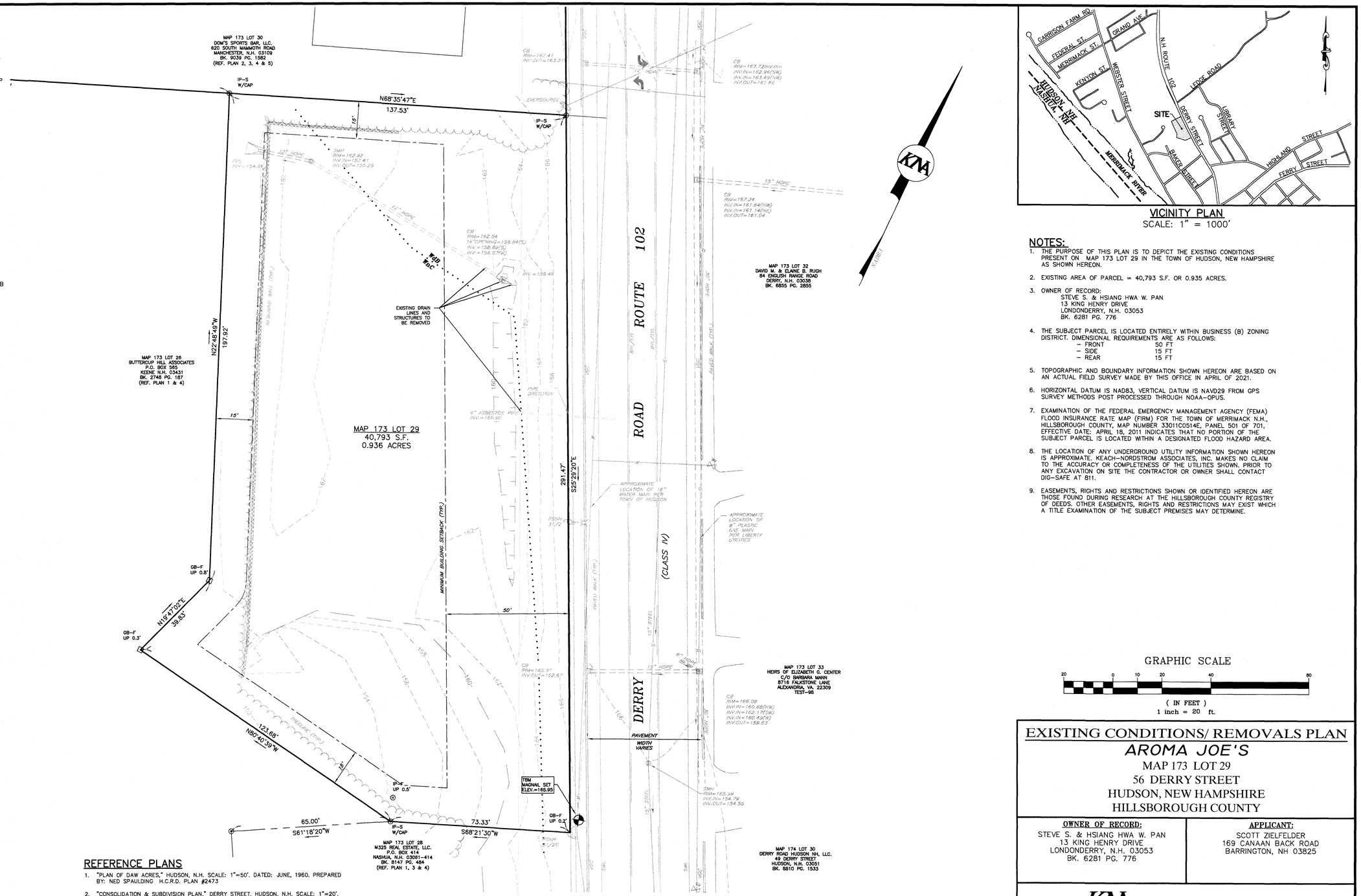
LEGEND

⊡ GB–F	GRANITE BOUND FOUND
⊙ IP–F	IRON PIN FOUND
⊙ IP–S W/CAP	IRON PIN SET WITH CAP
	UTILITY POLE
	STREET LIGHT
	GAS VALVE
	WATER VALVE
	SEWER MANHOLE
	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
OHU	OVERHEAD UTILITIES
G	GAS LINE
W	WATER LINE
S	SEWER LINE
	DRAINAGE LINE
	TREELINE
	RETAINING WALL
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
	10' CONTOUR
	2' CONTOUR
	SOIL LINE
	SETBACK

SCS SOILS LEGEND

WdB	WINDSOR LOAMY SAND 3 TO 8% SLOPES
WnC	WINDSOR–URBAN LAND COMPLEX 3 TO 15% SLOPES

SOURCE: USDA–SCS WEB SOIL SURVEY
HILLSBOROUGH COUNTY



VICINITY PLAN
SCALE: 1" = 1000'

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE EXISTING CONDITIONS PRESENT ON MAP 173 LOT 29 IN THE TOWN OF HUDSON, NEW HAMPSHIRE AS SHOWN HEREON.
2. EXISTING AREA OF PARCEL = 40,793 S.F. OR 0.935 ACRES.
3. OWNER OF RECORD:
   STEVE S. & HSIANG HWA W. PAN
   13 KING HENRY DRIVE
   LONDONDERRY, N.H. 03053
   BK. 6281 PG. 776
4. THE SUBJECT PARCEL IS LOCATED ENTIRELY WITHIN BUSINESS (B) ZONING DISTRICT. DIMENSIONAL REQUIREMENTS ARE AS FOLLOWS:

– FRONT	50 FT
– SIDE	15 FT
– REAR	15 FT

5. TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HEREON ARE BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE IN APRIL OF 2021.
6. HORIZONTAL DATUM IS NAD83, VERTICAL DATUM IS NAVD29 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA–OPUS.
7. EXAMINATION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF MERRIMACK N.H., HILLSBOROUGH COUNTY, MAP NUMBER 33011C0514E, PANEL 501 OF 701, EFFECTIVE DATE: APRIL 18, 2011 INDICATES THAT NO PORTION OF THE SUBJECT PARCEL IS LOCATED WITHIN A DESIGNATED FLOOD HAZARD AREA.
8. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS APPROXIMATE. KEACH–NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF THE UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR OR OWNER SHALL CONTACT DIG–SAFE AT 811.
9. EASEMENTS, RIGHTS AND RESTRICTIONS SHOWN OR IDENTIFIED HEREON ARE THOSE FOUND DURING RESEARCH AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS. OTHER EASEMENTS, RIGHTS AND RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF THE SUBJECT PREMISES MAY DETERMINE.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

DIG SAFE
IN ME–NH–VT–MA 811 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

UTILITY NOTE

THE UNDERGROUND UTILITIES DEPICTED HEREON HAVE BEEN DRAWN FROM FIELD SURVEY INFORMATION AND OR PLOTTED FROM EXISTING DRAWINGS. KEACH–NORDSTROM ASSOCIATES, INC. MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES DEPICTED COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. FURTHER, KEACH–NORDSTROM ASSOCIATES, INC. DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. KEACH–NORDSTROM ASSOCIATES, INC. HAS NOT PHYSICALLY LOCATED THE UNDERGROUND PORTIONS OF THE UTILITIES.

REFERENCE PLANS

1. "PLAN OF DAW ACRES," HUDSON, N.H. SCALE: 1"=50'. DATED: JUNE, 1960. PREPARED BY: NED SPAULDING H.C.R.D. PLAN #2473
2. "CONSOLIDATION & SUBDIVISION PLAN," DERRY STREET, HUDSON, N.H. SCALE: 1"=20'. DATED: JUNE, 1978. PREPARED BY: A.E. MAYNARD CIVIL ENGINEER. H.C.R.D. PLAN #11484
3. "THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT–OF–WAY PLANS FEDERAL AID PROJECT STP–X–0005(216) N.H. PROJECT NO. 12460. N.H. ROUTE 102" REVISED ROW PURCHASE PLANS DATE:D SEPT . 09, 2005, REVISION No. 7 ON FILE WITH NHDOT, NOT RECORDED.
4. "BOUNDARY & CONSOLIDATION PLAN, HUDSON ELDERLY HOUSING," SCALE: 1"=50'. DATED: SEPTEMBER 12, 1979. PREPARED BY: ALLAN H. SWANSON, INC. H.C.R.D. PLAN #12828
5. "SITE PLAN, PROPOSED RESTAURANT," PIZZA HUT INC. 62 DERRY ROAD HUDSON, N.H. SCALE: 1"=20'. DATED: JUNE, 1978. PREPARED BY: MAYNARD & PAQUETTE, INC. H.C.R.D. PLAN #15190
6. "SITE PLAN, GREEN TEA, 56 DERRY STREET, HUDSON, NEW HAMPSHIRE." SCALE: 1"=20'. DATED: JUNE 7, 2002. PREPARED BY: MAYNARD & PAQUETTE ENGINEERING ASSOCIATES, LLC. H.C.R.D. PLAN #32223

SURVEYOR'S CERTIFICATION:

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. FURTHER, THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE DURING APRIL OF 2021. SAID SURVEY HAS A RELATIVE ERROR OF CLOSURE OF ONE PART IN TEN THOUSAND (1:10,000) OR BETTER.

LICENSED LAND SURVEYOR

9/13/21
DATE

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — No. 902 — ANTHONY M BASSO — SIGNATURE

EXISTING CONDITIONS/ REMOVALS PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776

APPLICANT:
SCOTT ZIELFELDER
169 CANAAN BACK ROAD
BARRINGTON, NH 03825

KNA KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627–2881

REVISIONS

No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
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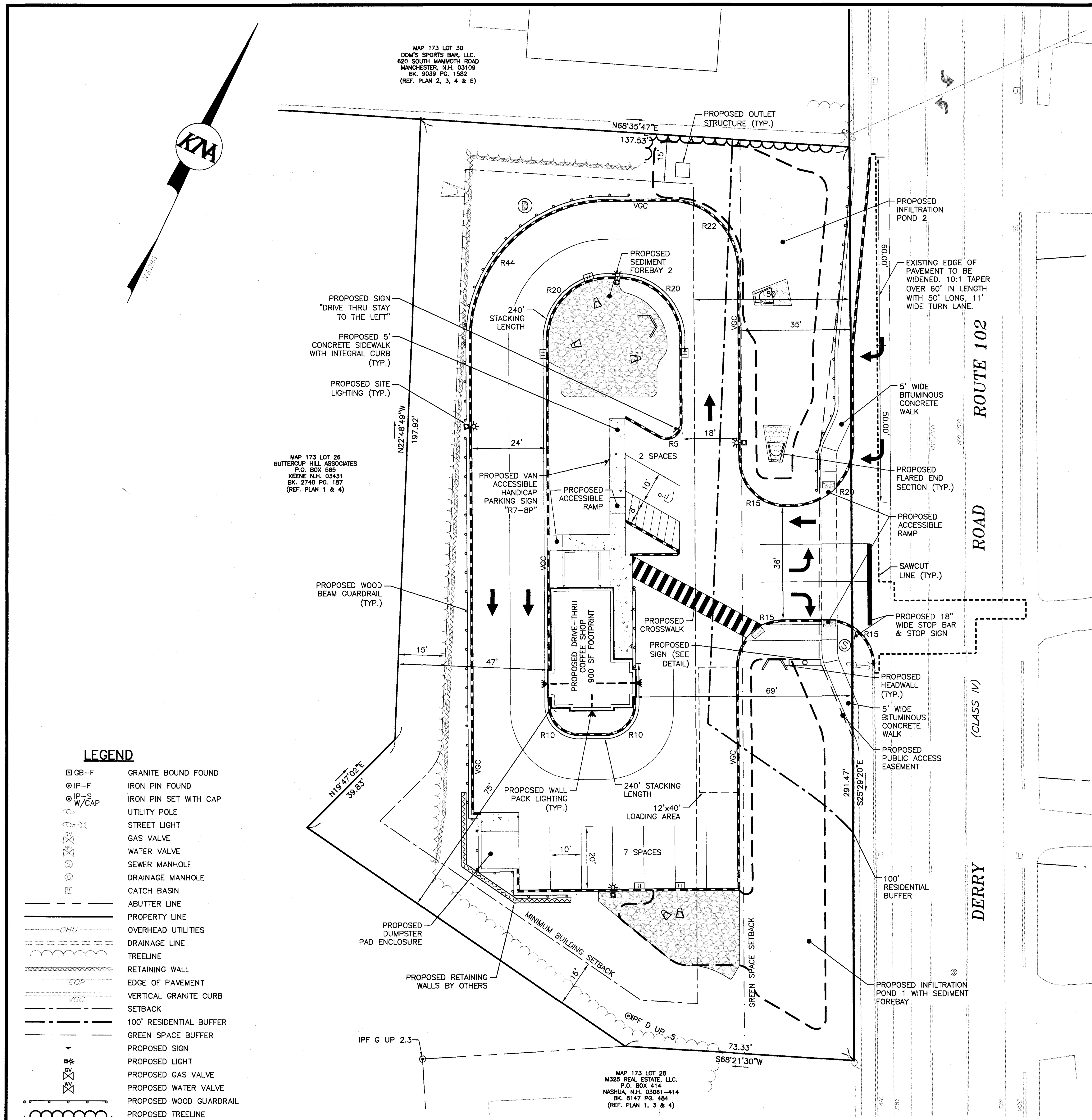
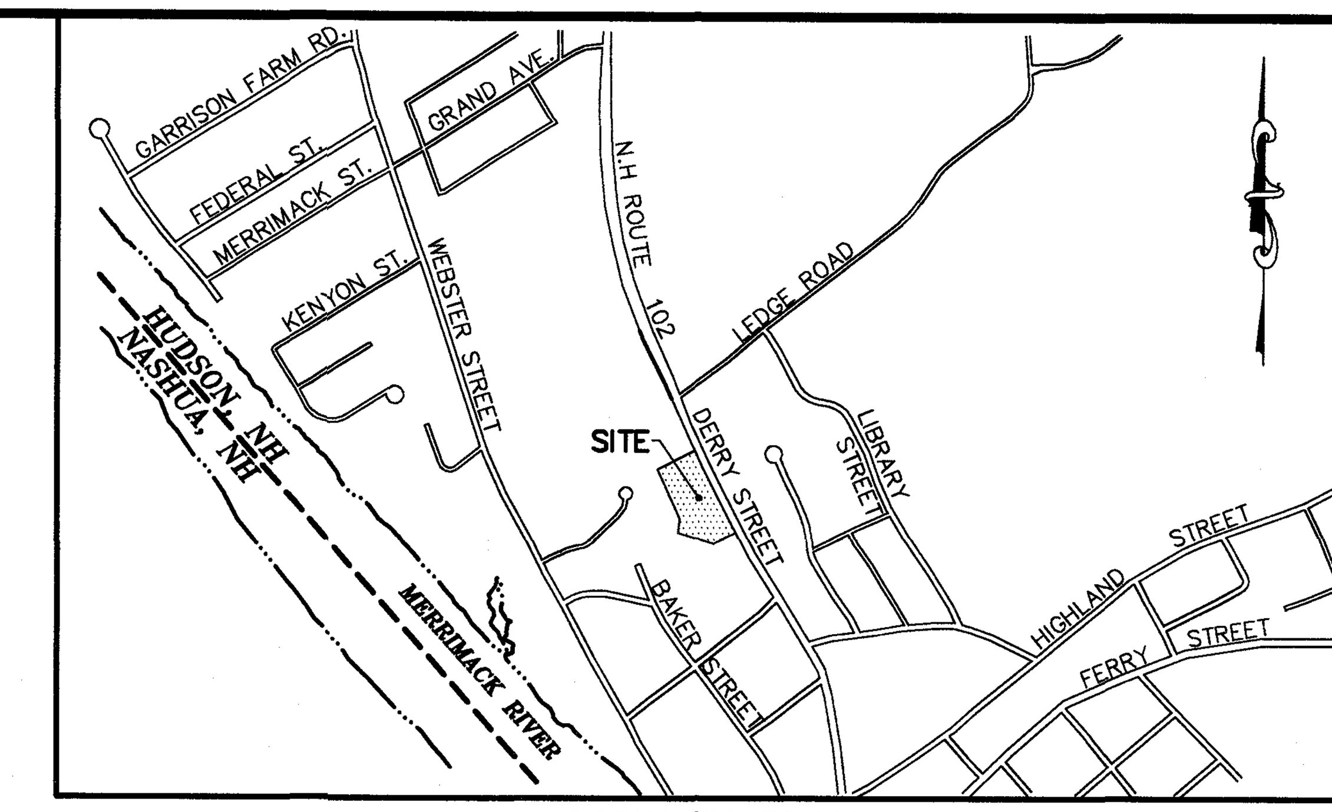
DATE: JUNE 22, 2021 — SCALE: 1"=20'
PROJECT NO: 21–0311–1 — SHEET 2 OF 14





VICINITY PLAN
SCALE: 1" = 1000'

LEGEND

GB-F	GRANITE BOUND FOUND
IP-F	IRON PIN FOUND
IP-S W/CAP	IRON PIN SET WITH CAP
	UTILITY POLE
	STREET LIGHT
	GAS VALVE
	WATER VALVE
	SEWER MANHOLE
	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
OHU	OVERHEAD UTILITIES
	DRAINAGE LINE
	TREELINE
	RETAINING WALL
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
	SETBACK
	100' RESIDENTIAL BUFFER
	GREEN SPACE BUFFER
	PROPOSED SIGN
	PROPOSED LIGHT
	PROPOSED GAS VALVE
	PROPOSED WATER VALVE
	PROPOSED WOOD GUARDRAIL
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED RETAINING WALL
	PROPOSED VERTICAL GRANITE CURB
	PROPOSED OUTLET STRUCTURE

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL	APPROVED BY THE HUDSON, NH PLANNING BOARD DATE OF MEETING: ______ ______ SIGNATURE DATE: ______ ______ SIGNATURE DATE: ______ SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

OWNER OF MAP 173 LOT 29
SIGNATURE: [signature]
DATE: 6-16-2021

SEE SHEET 1 FOR NOTES & REFERENCE PLANS

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

DIG SAFE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CALL TOLL FREE 811
RI-ME-NH-VT-MA

NON RESIDENTIAL SITE PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:	APPLICANT:
STEVE S. & HSIANG HWA W. PAN 13 KING HENRY DRIVE LONDONDERRY, N.H. 03053 BK. 6281 PG. 776	SCOTT ZIELFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825

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STATE OF NEW HAMPSHIRE
PAUL CHISHOLM
No. 15076
LICENSED PROFESSIONAL ENGINEER

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PROJECT NO: 21-0311-1	SHEET 3 OF 14

LEGEND

- GB–F — GRANITE BOUND FOUND
- IP–F — IRON PIN FOUND
- IP–S W/CAP — IRON PIN SET WITH CAP
- UTILITY POLE
- STREET LIGHT
- GAS VALVE
- WATER VALVE
- SEWER MANHOLE
- DRAINAGE MANHOLE
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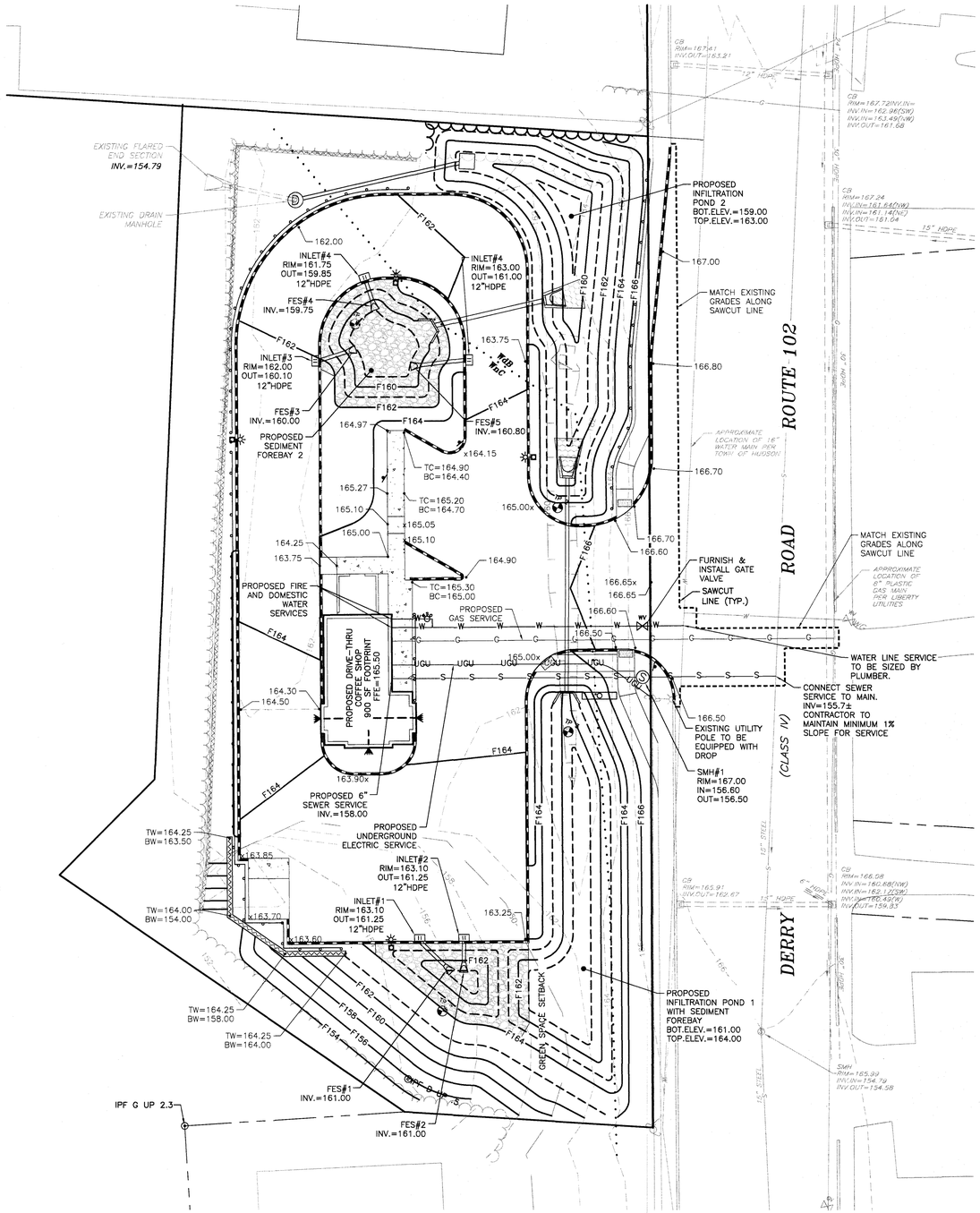
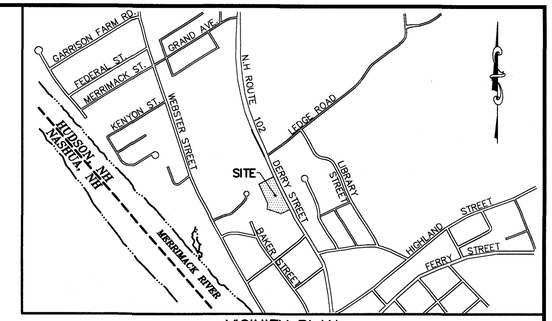
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED GAS VALVE
- PROPOSED WATER VALVE
- PROPOSED WOOD GUARDRAIL
- PROPOSED TREELINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED RETAINING WALL
- PROPOSED VERTICAL GRANITE CURB
- PROPOSED OUTLET STRUCTURE
- UGU — PROPOSED UNDERGROUND UTILITIES
- G — PROPOSED GAS LINE
- W — PROPOSED WATER LINE
- S — PROPOSED SEWER LINE
- PROPOSED DRAINAGE LINE
- 10' CONTOUR
- 2' CONTOUR
- SOIL LINE





VICINITY PLAN
SCALE: 1" = 1000'

CONSTRUCTION NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED GRADING, DRAINAGE, AND UTILITY SYSTEMS FOR THIS SITE.
2. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF HUDSON, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK PERFORMED IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, APPROVED AND ADOPTED 2016 ARE HEREBY INCORPORATED BY REFERENCE.
3. CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS, AND SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS FOR ROAD CONSTRUCTION, PUBLIC WORKS DEPARTMENT, HUDSON, NEW HAMPSHIRE. ALL DRAINAGE PIPES SHOWN SHALL BE HDPE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION, AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG SAFE" AT 811 AT LEAST 72 HOURS BEFORE DIGGING.
5. ALL DRAINAGE PIPE SHALL BE INSTALLED FOLLOWING MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. THE WATER, SANITARY SEWER, AND ELECTRICAL UTILITIES SHOWN HERE SHALL BE COORDINATED WITH THE FINAL BUILDING PLANS PRIOR TO CONSTRUCTION. THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES.
7. PLANS TO COMPLY WITH THE TOWN OF HUDSON'S MS4 PERMIT.
8. OWNER IS SOLELY RESPONSIBLE FOR MAINTAINING THE STORMWATER MANAGEMENT SYSTEM AS OUTLINED IN THE OPERATION & MAINTENANCE PLAN.

SCS SOIL MAP UNIT KEY

SYMBOL	MAP UNIT	SLOPE CLASS
WdB	WINDSOR–LOAMY–SAND	3–8%
WnC	WINDSOR–URBAN	3–15%

SOURCE: WEB SOIL SURVEY, WWW.WEBSOILSURVEY.SC.EGOV.USDA.GOV

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

DIG SAFE
811 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

UTILITY NOTE

THE UNDERGROUND UTILITIES DEPICTED HEREON HAVE BEEN DRAWN FROM FIELD SURVEY INFORMATION AND OR PLOTTED FROM EXISTING DRAWINGS. KEACH–NORDSTROM ASSOCIATES, INC. MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES DEPICTED COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. FURTHER, KEACH–NORDSTROM ASSOCIATES, INC. DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. KEACH–NORDSTROM ASSOCIATES, INC. HAS NOT PHYSICALLY LOCATED THE UNDERGROUND PORTIONS OF THE UTILITIES.

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GRADING, DRAINAGE & UTILITY PLAN

AROMA JOE'S

MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776

APPLICANT:
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169 CANAAN BACK ROAD
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STATE OF NEW HAMPSHIRE — PAUL CHISHOLM No. 15076 — LICENSED PROFESSIONAL ENGINEER

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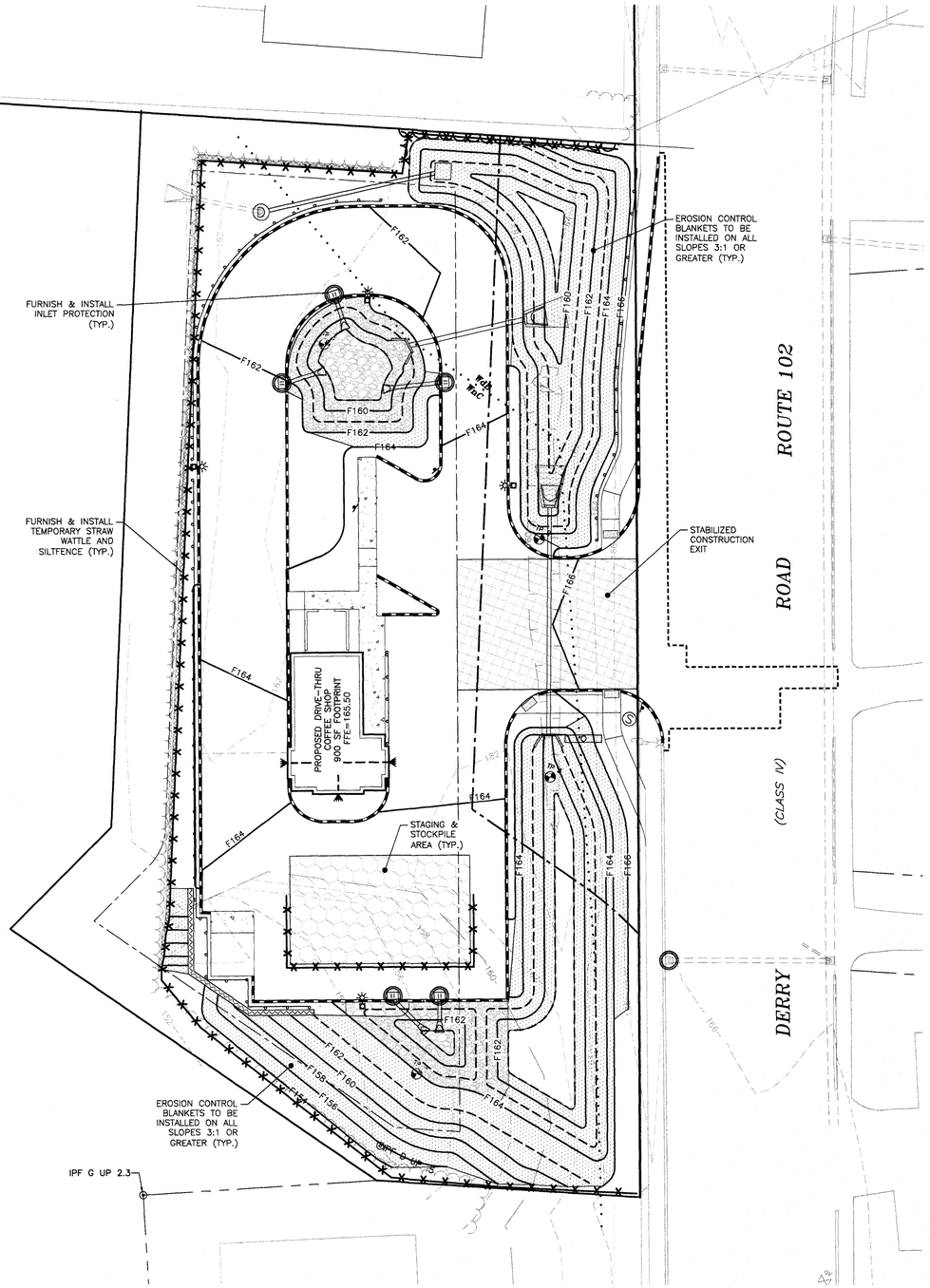
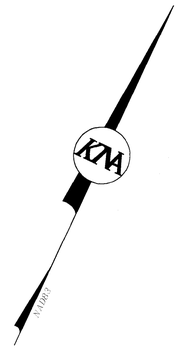
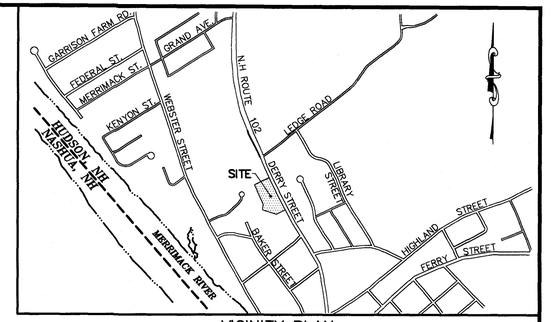
EROSION & SEDIMENT CONTROL LEGEND

- PERMANENT OUTLET PROTECTION APRON (RIP RAP)
- INLET PROTECTION
- SILT FENCE
- ORANGE CONSTRUCTION FENCING
- TEMPORARY STONE CHECK DAM
- STABILIZED CONSTRUCTION EXIT
- STAGING AND STOCKPILE AREA
- EROSION CONTROL BLANKETS
- NON DISTURBANCE AREA







VICINITY PLAN
SCALE: 1" = 1000'

EROSION CONTROL NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE REQUIRED ONSITE TEMPORARY CONSTRUCTION EROSION CONTROL MEASURES AS WELL AS THE PERMANENT EROSION CONTROL MEASURES.
2. ALL MEASURES IN THE PLAN SHALL MEET AS A MINIMUM THE BEST MANAGEMENT PRACTICES SET FORTH IN VOLUME 3 OF THE NEW HAMPSHIRE STORMWATER MANUEL TITLED "EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION," DATED DECEMBER 2010, AS AMENDED FROM TIME TO TIME.
3. WHENEVER PRACTICAL, NATURAL VEGETATION SHALL BE RETAINED, PROTECTED OR SUPPLEMENTED. THE STRIPPING OF VEGETATION SHALL BE DONE IN A MANNER THAT MINIMIZES SOIL EROSION.
4. APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO LAND DISTURBANCE.
5. THE AREA OF DISTURBANCE SHALL BE KEPT TO A MINIMUM. DISTURBED AREAS REMAINING IDLE FOR MORE THAN 30 DAYS SHALL BE STABILIZED.
6. MEASURES SHALL BE TAKEN TO CONTROL EROSION WITHIN THE PROJECT AREA. SEDIMENT IN RUNOFF WATER SHALL BE TRAPPED AND RETAINED WITHIN THE PROJECT AREA USING APPROVED MEASURES. WETLAND AREAS AND SURFACE WATERS SHALL BE PROTECTED FROM SEDIMENT.
7. OFFSITE SURFACE WATER AND RUNOFF FROM UNDISTURBED AREAS SHALL BE DIVERTED AWAY FROM DISTURBED AREAS WHERE FEASIBLE OR CARRIED NON-EROSIVELY THROUGH THE PROJECT AREA. INTEGRITY OF DOWNSTREAM DRAINAGE SYSTEMS SHALL BE MAINTAINED.
8. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN FUNCTIONING CONDITION UNTIL FINAL SITE STABILIZATION IS ACCOMPLISHED.
9. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. TRAPPED SEDIMENT AND OTHER DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS UNLESS CONDITIONS DICTATE OTHERWISE.
10. THE TOWN OF HUDSON SHALL RESERVE THE RIGHT TO REQUIRE FURTHER EROSION CONTROL PRACTICES DURING CONSTRUCTION SHOULD THEY FIND IT NECESSARY.
11. INFILTRATION AREAS ARE TO BE PROTECTED FROM OVER-COMPACTION DURING CONSTRUCTION.

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

DIG SAFE
RI-SAFE-NH-VT-MA 811 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

UTILITY NOTE

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EROSION CONTROL PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
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BK. 6281 PG. 776

APPLICANT:
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PAUL CHISHOLM No. 15076 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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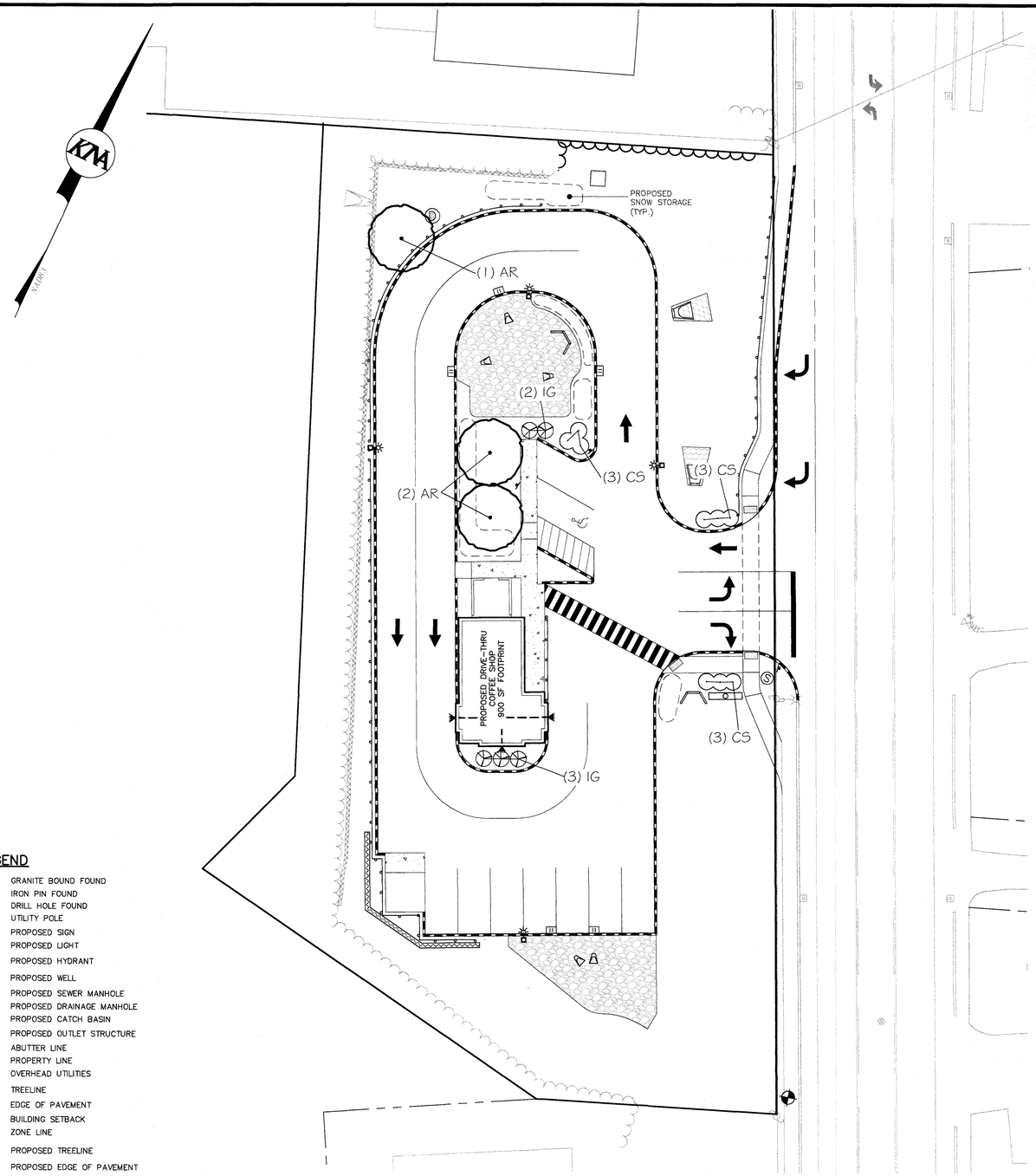
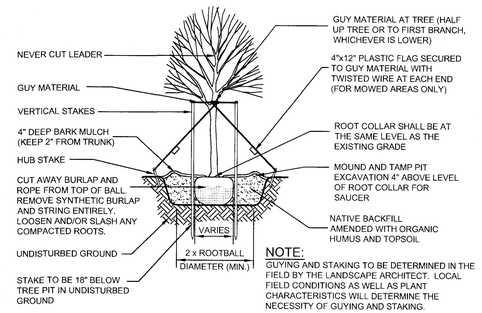


LEGEND

GB-F	GRANITE BOUND FOUND
IPIN-F	IRON PIN FOUND
DH-F	DRILL HOLE FOUND
	UTILITY POLE
	PROPOSED SIGN
	PROPOSED LIGHT
	PROPOSED HYDRANT
W	PROPOSED WELL
S	PROPOSED SEWER MANHOLE
D	PROPOSED DRAINAGE MANHOLE
	PROPOSED CATCH BASIN
	PROPOSED OUTLET STRUCTURE
	ABUTTER LINE
	PROPERTY LINE
OHU	OVERHEAD UTILITIES
	TREELINE
	EDGE OF PAVEMENT
	BUILDING SETBACK
	ZONE LINE
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED BITUMINOUS CURB
	PROPOSED SWALE
	EASEMENT

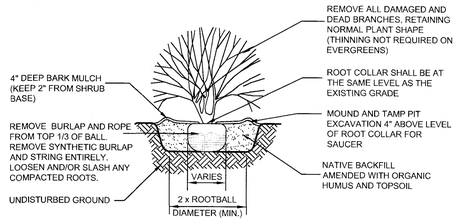
PLANTING SCHEDULE

Botanical Name/ Common Name	Size	Label	Quantity	Mature Height
Trees				
Acer rubrum 'Redpointe' / Redpointe Red Maple	3-3.5" CAL.	AR	3	40-60'
Shrubs				
Cornus sericea 'Arctic Fire' / Arctic Fire Red-Osier Dogwood	#3	CS	9	5-6'
Ilex glabra 'Compacta' / Compact Inkberry	#3	IG	5	5-6'



NOTE:
GUYING AND STAKING TO BE DETERMINED IN THE FIELD BY THE LANDSCAPE ARCHITECT. LOCAL FIELD CONDITIONS AS WELL AS PLANT CHARACTERISTICS WILL DETERMINE THE NECESSITY OF GUYING AND STAKING.

DECIDUOUS TREE PLANTING DETAIL
NOT TO SCALE
(JANUARY 2012)



BALLED & BURLAP SHRUB PLANTING DETAIL
NOT TO SCALE
(JANUARY 2012)

LANDSCAPE NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED SITE LANDSCAPE WHICH PROVIDES CLIMATIC RELIEF AND AESTHETIC APPEAL.
2. ALL PLANT MATERIALS USED SHALL BE NURSERY STOCK AND SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF INSTALLATION. ANY MATERIAL WHICH DIES OR DOES NOT SHOWN HEALTHY APPEARANCE WITHIN THIS TIME SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE; WITH SAME WARRANTY REQUIREMENTS AS THE ORIGINAL. WARRANTIES TYPICALLY DO NOT COVER LOSS DUE TO INSECT INFESTATION OR MECHANICAL DAMAGE (I.E. SNOW STORAGE).
3. IF THE SOIL CONDITIONS ARE EXTREMELY SANDY, ALL TREES SHALL HAVE A 6" LAYER OF COMPACTED TOPSOIL PLACED IN THE BASE OF THE PLANT PIT AS A MOISTURE RETENTION LAYER. THE PLANT PIT SIDEWALLS SHALL BE OVER EXCAVATED BY AN ADDITIONAL 12" BEYOND THE NORMAL OUTSIDE RADIUS OF THE HOLE. A TOPSOIL MIXTURE SHALL BE USED TO BACKFILL THE HOLE AS FOLLOWED; ORGANIC TOPSOIL, AMENDED WITH 10% WOOD ASH, 10% MANURE, 30% PEATMOSS AND A GRANULAR HYDROGEL TO ABSORB AND RETAIN WATER.
4. PLANTING BEDS AND SAUCERS SHALL RECEIVE A 4" MINIMUM THICKNESS OF PINE/HEMLOCK BARK MULCH OVER A 5oz. POLYPROPYLENE WEED CONTROL FABRIC.
5. PAVEMENT AND ROAD BASE MATERIAL ENCOUNTERED IN ANY LAWN OR PLANTING BED SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AND SUITABLE AMENDED SOIL INSTALLED AS SPECIFIED IN THE TURF ESTABLISHMENT SCHEDULE.
6. PLANT TYPES SHOWN ARE SUBJECT TO AVAILABILITY. SUBSTITUTE MATERIALS CAN BE IMPLEMENTED WITH APPROVAL FROM KEACH NORDSTROM ASSOCIATES PRIOR TO CONSTRUCTION.

LANDSCAPE CALCULATIONS

REQUIRED PARKING LOT INTERIOR LANDSCAPE AREA

PROPOSED PARKING AREA PAVED:	5,151 SF
10% REQUIRED LANDSCAPE AREA:	515 SF
PROVIDED LANDSCAPE AREA:	1,496 SF

REQUIRED PARKING LOT SHADE TREES AND SHRUBS

PROPOSED PAVED AREA:	5,151 SF
SHADE TREES REQUIRED (5,151/1,600):	3 TREES REQUIRED
(OR 1 TREE/5 PROP. PARKING SPACES)	2 TREES REQUIRED
SHADE TREES PROVIDED:	3 TREES PROPOSED
SHRUBS REQUIRED (5,151/200):	26 SHRUBS, OR
(OR 1.6 x 9 PROP. PARKING SPACES)	14 SHRUBS REQUIRED
SHRUBS PROVIDED:	14 SHRUBS PROPOSED

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LANDSCAPE PLAN
AROMA JOE'S
MAP 173 LOT 29
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UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

STATE OF NEW HAMPSHIRE
PAUL CHISHOLM No. 15076 LICENSED
PROFESSIONAL ENGINEER

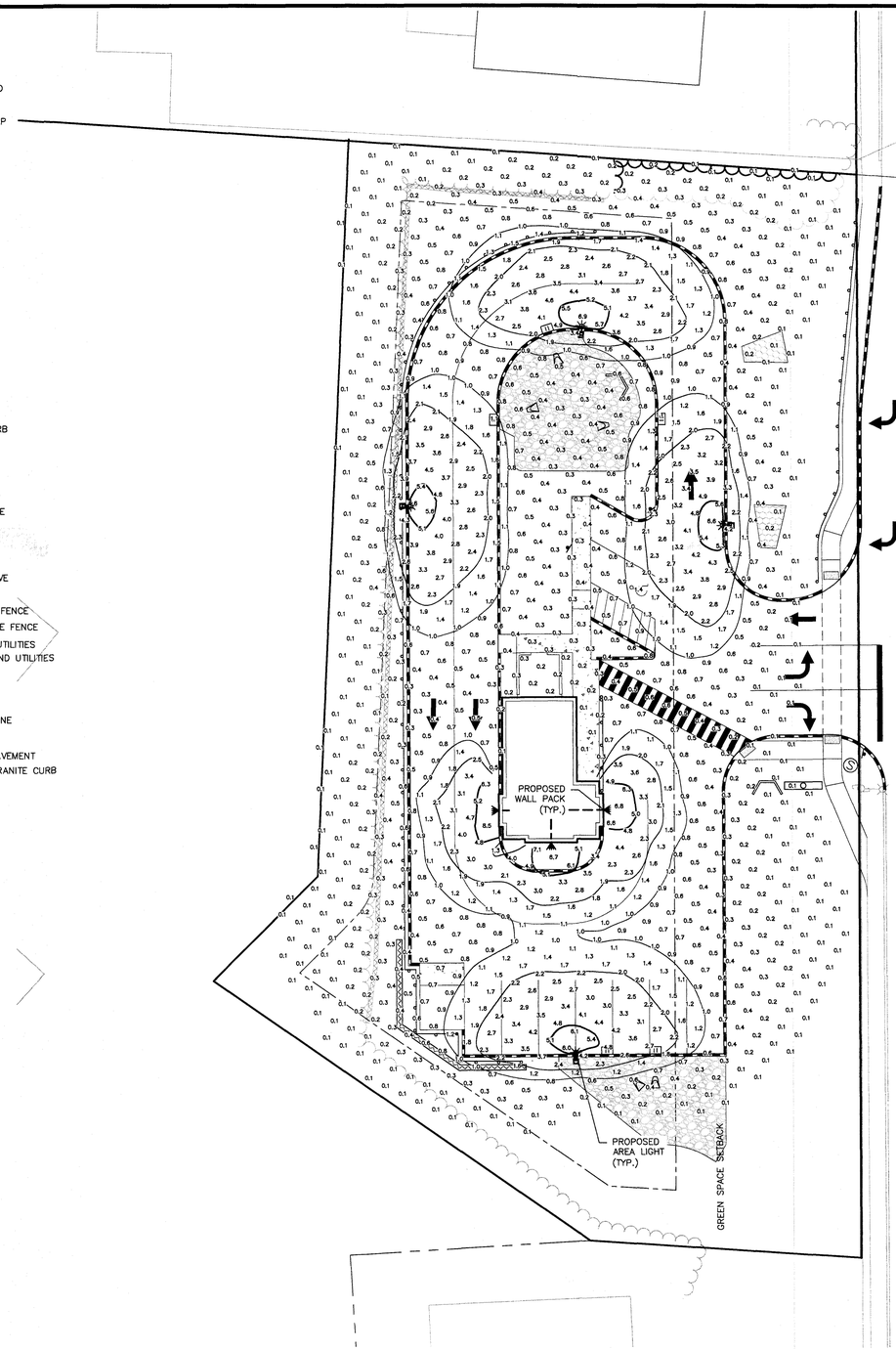
REVISIONS

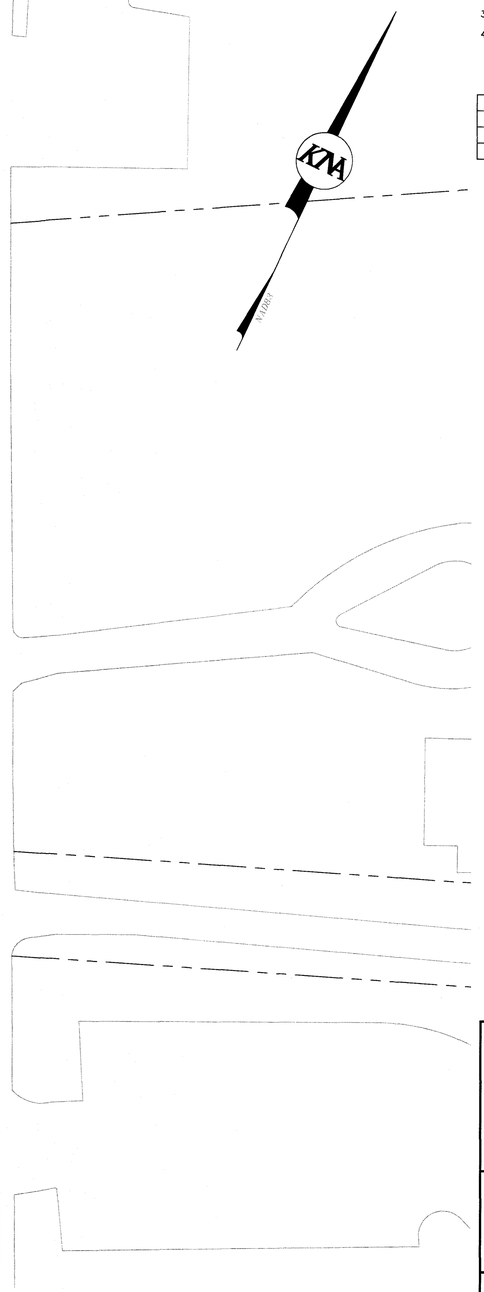
No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL

DATE: JUNE 22, 2021 | SCALE: 1"=20'
PROJECT NO: 21-0311-1 | SHEET 6 OF 14

LEGEND

GB-F	GRANITE BOUND FOUND
IP-F	IRON PIN FOUND
IP-S W/CAP	IRON PIN SET WITH CAP
	UTILITY POLE
	STREET LIGHT
GV	GAS VALVE
WV	WATER VALVE
S	SEWER MANHOLE
D	DRAINAGE MANHOLE
CB	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
OHU	OVERHEAD UTILITIES
G	GAS LINE
W	WATER LINE
S	SEWER LINE
	DRAINAGE LINE
	TREELINE
	RETAINING WALL
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
	10' CONTOUR
	2' CONTOUR
	SOIL LINE
	SETBACK
	PROPOSED UTILITY POLE
	PROPOSED SIGN
	PROPOSED LIGHT
GV	PROPOSED GAS VALVE
WV	PROPOSED WATER VALVE
	PROPOSED HYDRANT
	PROPOSED CHAIN LINK FENCE
	PROPOSED BARBED WIRE FENCE
OHU	PROPOSED OVERHEAD UTILITIES
UGU	PROPOSED UNDERGROUND UTILITIES
G	PROPOSED GAS LINE
W	PROPOSED WATER LINE
S	PROPOSED SEWER LINE
	PROPOSED DRAINAGE LINE
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED VERTICAL GRANITE CURB





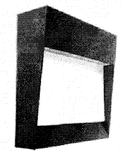
LIGHTING NOTES:

1. ALL LIGHTS/FIXTURES SHALL BE AS SPECIFIED BY CHARRON LIGHTING.
2. ALL PROPOSED LIGHTS/FIXTURES ARE TO BE FULL CUTOFF.
3. FIXTURES SHALL BE MOUNTED AT HEIGHTS AS SPECIFIED IN TABLE.
4. PRIOR TO CONSTRUCTION, THE SITE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ELECTRICIAN FOR THE EXACT LOCATION, LAYOUT, CONDUIT SIZE AND CIRCUITS ASSOCIATED WITH THE SITE LIGHTING.

LUMINAIRE SCHEDULE

SYMBOL	QTY	LABEL	ARRANGEMENT	DESCRIPTION
	4	P1	SINGLE	RAB ALED3T50NK AREA LIGHT (15' AFG)
	3	W1	SINGLE	RAB W17-30L WALL PACK (15' AFG)

RAB AREA LIGHT



RAB WALL PACK

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LIGHTING PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776

APPLICANT:
SCOTT ZIELFELDER
169 CANAAN BACK ROAD
BARRINGTON, NH 03825

KNA KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

DIG SAFE
811 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

STATE OF NEW HAMPSHIRE
PAUL CHISHOLM No. 15076
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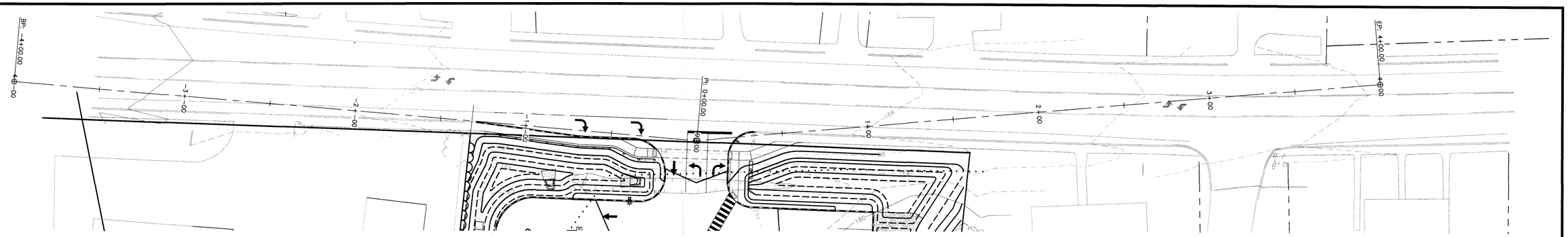
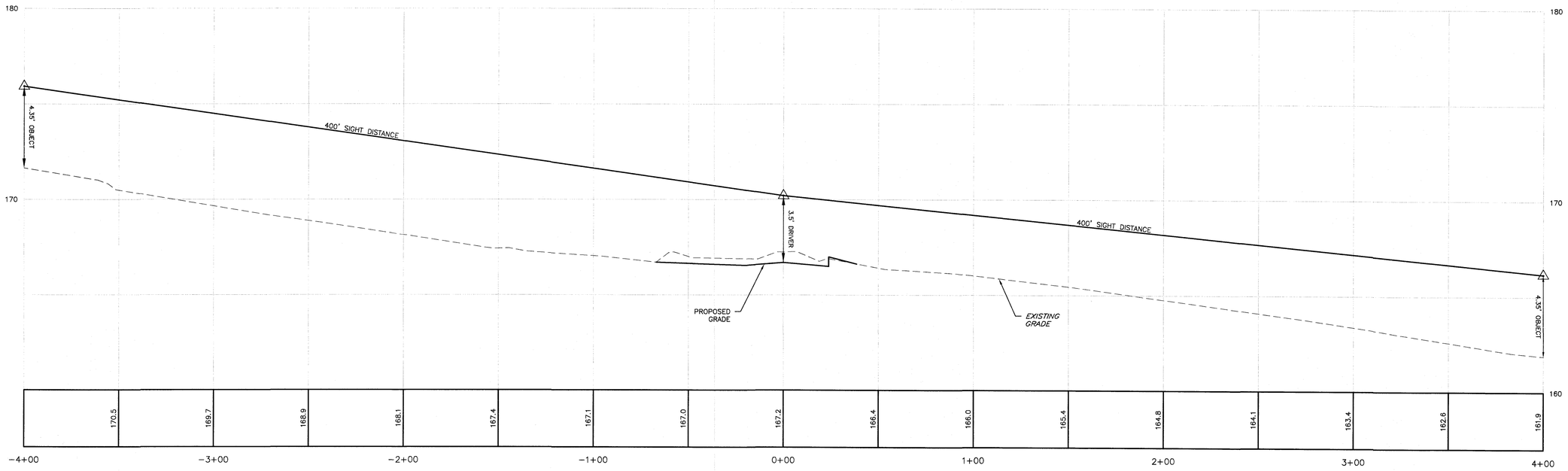
PROJECT NO: 21-0311-1 SHEET 7 OF 14



SIGHT DISTANCE PLAN
SCALE: 1" = 30'



SIGHT DISTANCE PROFILE
SCALE: 1" = 30'(HORIZ.)
1" = 3'(VERT.)

DIG SAFE
811
CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL	APPROVED BY THE HUDSON, NH PLANNING BOARD DATE OF MEETING: _____ _____ SIGNATURE DATE: _____ _____ SIGNATURE DATE: _____ SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

GENERAL NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE SIGHT DISTANCE FOR THE INTERSECTION BETWEEN THE PROPOSED DRIVEWAY AND DERRY STREET.
2. THE SPEED LIMIT ON DERRY STREET IS 30 MPH.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

SIGHT DISTANCE PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
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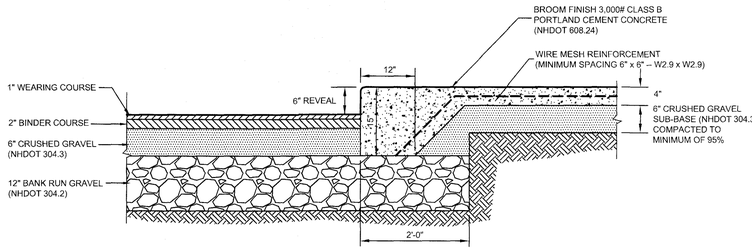
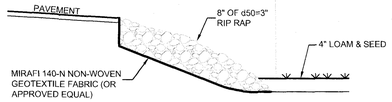
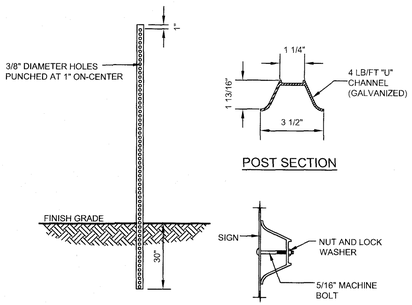
PROJECT NO: 21-0311-1	SHEET 8 OF 14



INTEGRAL CURB AND WALK DETAIL
NOT TO SCALE
(MARCH 2008)



CURB BREAK DETAIL
NOT TO SCALE
(SEPTEMBER 2010)



POST SECTION

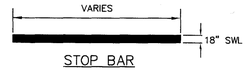
POST MOUNTING

NOTE:
POST SHALL CONFORM TO NHDOT 615.2.5.3

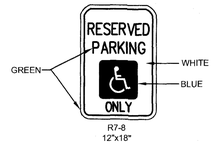
STEEL SIGN POST DETAIL
NOT TO SCALE
(MARCH 2008)

R1-1
30" x 30"

STOP SIGN DETAIL
NOT TO SCALE

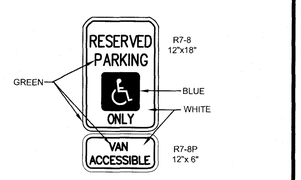


STOP BAR
STOP BAR DETAIL
NOT TO SCALE

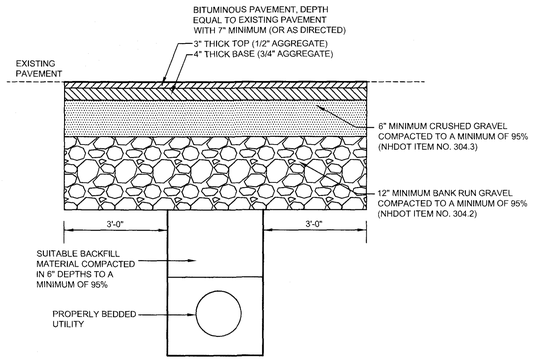


R7-8
12"x18"

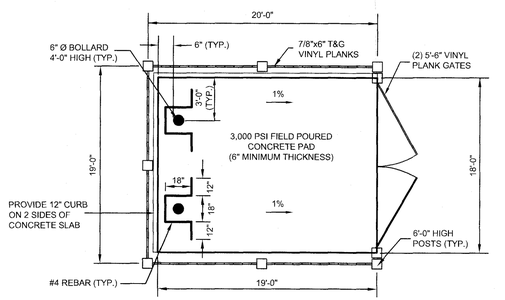
HANDICAP PARKING SIGN DETAIL
NOT TO SCALE
(MARCH 2008)

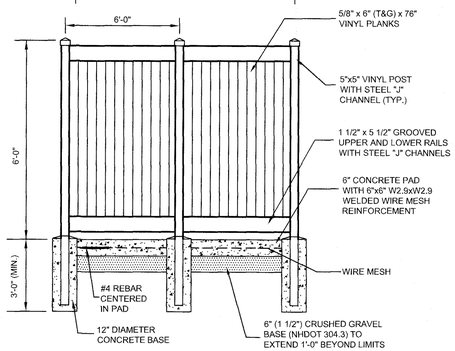


VAN ACCESSIBLE HANDICAP PARKING SIGN DETAIL
NOT TO SCALE
(NOVEMBER 2016)



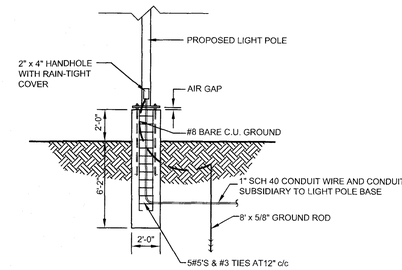
PERMANENT PAVEMENT REPAIR IN PUBLIC RIGHT OF WAY
NOT TO SCALE



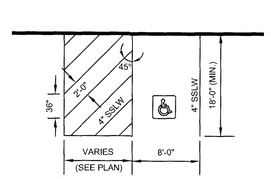


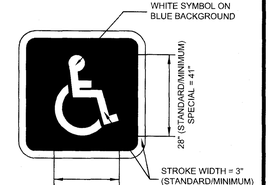
NOTE:
THIS DUMPSTER ENCLOSURE WILL ACCOMMODATE MOST 2, 4, 6 AND 8 CY DUMPSTERS.

VINYL STOCKADE TRASH ENCLOSURE DETAIL

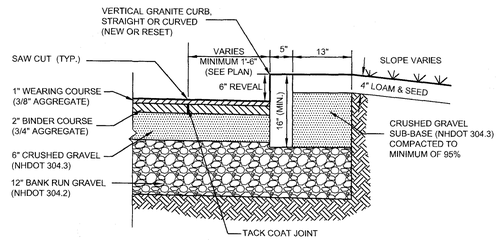


CONCRETE LIGHT POLE BASE DETAIL
NOT TO SCALE
(MARCH 2008)

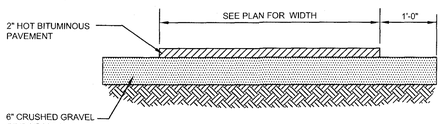




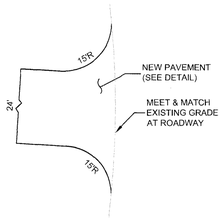
HANDICAP STRIPING DETAIL
NOT TO SCALE
(MARCH 2012)



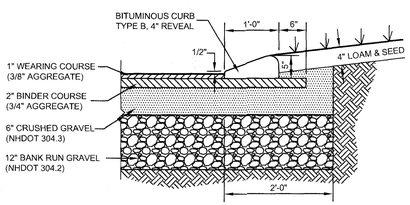
VERTICAL GRANITE CURB DETAIL
NOT TO SCALE
(MARCH 2008)



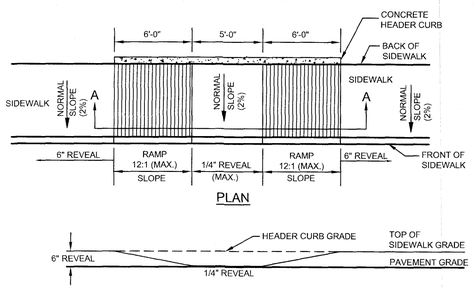
BITUMINOUS WALK DETAIL
NOT TO SCALE
(MARCH 2008)



DRIVEWAY DETAIL
NOT TO SCALE



BITUMINOUS CURB TYPE B DETAIL
NOT TO SCALE
(MARCH 2008)

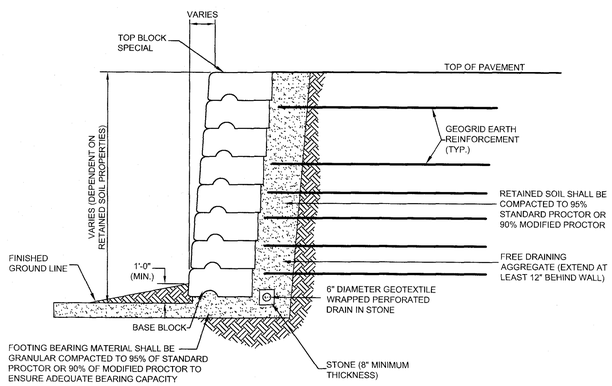


PLAN

SECTION A-A

NOTES:
1. A BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP SHALL BE USED ON PORTLAND CEMENT CONCRETE RAMPS.
2. MAINTAIN THE NORMAL PAVEMENT PROFILE THROUGHOUT THE RAMP AREA.
3. MAINTAIN A MAXIMUM 1/4" OF CURB REVEAL AT THE RAMP, SEE SECTION A-A

SIDEWALK RAMP
NOT TO SCALE
(JUNE 2012)



NOTES:
1. AS PERMISSIBLE, THE STRUCTURAL ENGINEER CHARGED WITH RETAINING WALL DESIGN SHALL SPECIFY SALT RESISTANT BLOCK CONSTRUCTION WHERE WALLS ARE TO BE CONSTRUCTED NEAR ROADWAYS OR PARKING AREAS.
2. RETAINING WALL DRAIN TO "DAYLIGHT" AT LOW POINT OR TIE TO DRAIN STRUCTURE AS SHOWN IN PLAN VIEW.

REDI-ROCK RETAINING WALL WITH GUARDRAIL
(TO BE DESIGNED BY OTHERS)
NOT TO SCALE
(SEPTEMBER 2010)

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

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CONSTRUCTION DETAILS
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
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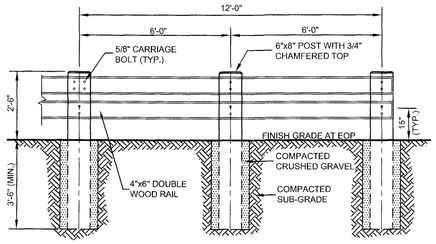
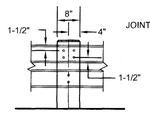
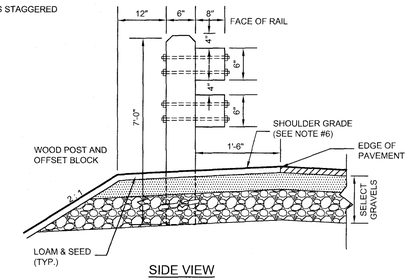
PROJECT NO: 21-0311-1 **SHEET** 9 **OF** 14



ELEVATION



BOLT DETAIL



SIDE VIEW

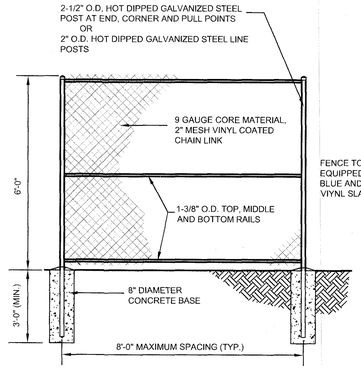
NOTES:

1. ALL TIMBERS SHALL BE PRESSURE TREATED.
2. PAY LIMIT = PER LINEAR FOOT INCLUDING END SECTION.
3. ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED.

WOOD BEAM GUARDRAIL

NOT TO SCALE

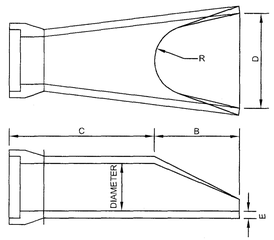
(AUGUST 2011)



CHAIN LINK FENCE DETAIL

NOT TO SCALE

(MARCH 2008)



NOTES:

1. CONCRETE STRENGTH SHALL BE 4000 PSI AT 28 DAYS.
2. REINFORCING IN ACCORDANCE WITH ASTM C-76, CLASS III.
3. INLET END SECTIONS AND OUTLET END SECTIONS AVAILABLE (OUTLET SHOWN).
4. OTHER DIAMETERS AVAILABLE UPON REQUEST.

DIAMETER	A	B	C	D	E	R
12"	4"	2'-0"	4'-0 7/8"	2'-0"	2"	9"
15"	6"	2'-3"	3'-10"	2'-6"	2 1/4"	11"
18"	9"	2'-3"	3'-10"	3'-0"	2 1/2"	12"
21"	9"	2'-11"	3'-2"	3'-6"	2 3/4"	13"
24"	9 1/2"	3'-7 1/2"	2'-6"	4'-0"	3"	14"
30"	12"	4'-6"	1'-7 3/4"	5'-0"	3 1/2"	15"
36"	15"	5'-3"	2'-10 3/4"	6'-0"	4"	20"

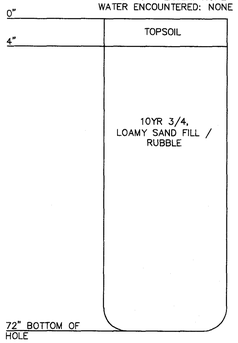
RCP FLARED END SECTION DETAIL

NOT TO SCALE

(MARCH 2008)

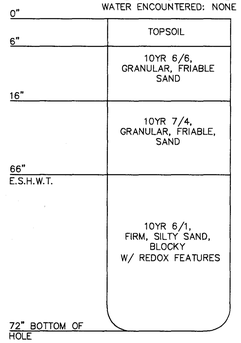
TP #1

LOGGED BY GPC
PERC TEST @ 20"
DATE: 6-17-2021
PERC RATE: 2 MIN./INCH
IMPERVIOUS LAYER: NONE
WATER ENCOUNTERED: NONE



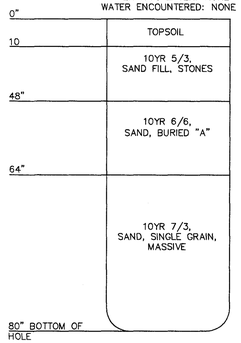
TP #2

LOGGED BY GPC
PERC TEST @ 20"
DATE: 6-17-2021
PERC RATE: 2 MIN./INCH
IMPERVIOUS LAYER: NONE
WATER ENCOUNTERED: NONE



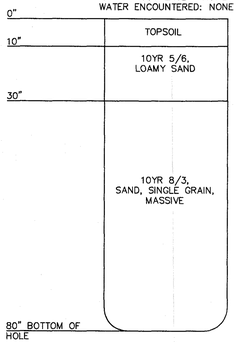
TP #3

LOGGED BY GPC
PERC TEST @ 20"
DATE: 6-17-2021
PERC RATE: 2 MIN./INCH
IMPERVIOUS LAYER: NONE
WATER ENCOUNTERED: NONE

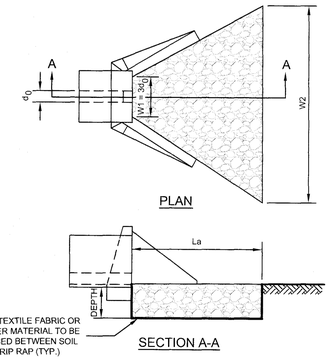


TP #4

LOGGED BY GPC
PERC TEST @ 20"
DATE: 6-17-2021
PERC RATE: 2 MIN./INCH
IMPERVIOUS LAYER: NONE
WATER ENCOUNTERED: NONE



PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL	APPROVED BY THE HUDSON, NH PLANNING BOARD DATE OF MEETING: _____ _____ SIGNATURE DATE: _____ _____ SIGNATURE DATE: _____ SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.



PLAN

SECTION A-A

TABLE 7-24 -- RECOMMENDED RIP RAP GRADATION RANGES	
PERCENT OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE
100%	1.5 TO 2.0 d50
85%	1.3 TO 1.8 d50
50%	1.0 TO 1.5 d50
15%	0.3 TO 0.5 d50

CONSTRUCTION SPECIFICATIONS:

1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

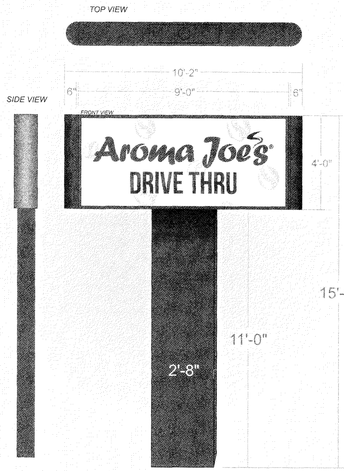
MAINTENANCE:

THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR RAIN EVENT. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED, OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL

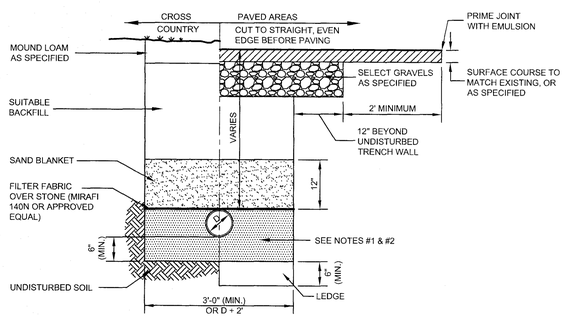
NOT TO SCALE

LOCATION	La	W1	W2	d50	DEPTH
N. PIPE	30'	9'	21'	4"	10"
S. PIPE	35'	9'	23'	4"	10"
HW#31	15'	10'	10'	4"	10"
HW#14	30'	10'	10'	4"	10"
HW#16	31'	4'	4'	4"	10"



FREESTANDING SIGN DETAIL

NOT TO SCALE



NOTES

1. THOROUGHLY COMPACTED SCREENED GRAVEL FOR RCP PIPE. SCREENED GRAVEL TO EXTEND TO SELECT FILL LINE.
2. FOR HDPE OR PVC PIPE, BEDDING SHALL BE 3/4" STONE TO THE TOP OF THE PIPE.

STORM DRAINAGE TRENCH DETAIL

NOT TO SCALE

(MARCH 2008)

CONSTRUCTION DETAILS

AROMA JOE'S

MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776

APPLICANT:
SCOTT ZIELFELDER
169 CANAAN BACK ROAD
BARRINGTON, NH 03825

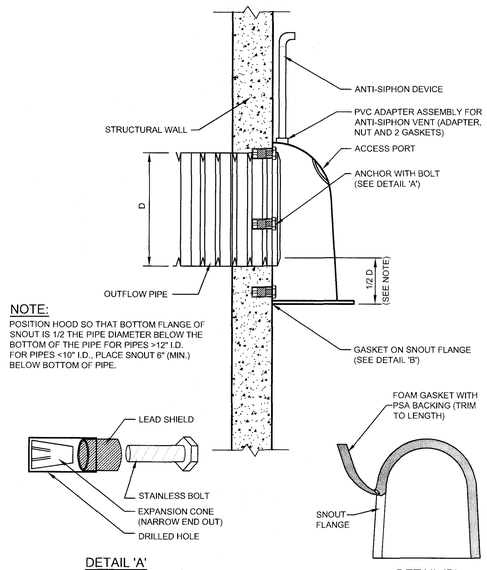
KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

STATE OF NEW HAMPSHIRE — PAUL CHISHOLM No. 15076 LICENSED PROFESSIONAL ENGINEER

REVISIONS

No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL

DATE: JUNE 22, 2021 **SCALE:** AS SHOWN
PROJECT NO: 21-0311-1 **SHEET** 10 **OF** 14



NOTE:
POSITION HOOD SO THAT BOTTOM FLANGE OF SNOUT IS 1/2 THE PIPE DIAMETER BELOW THE BOTTOM OF THE PIPE FOR PIPES >12" I.D. FOR PIPES <10" I.D., PLACE SNOUT 6" (MIN.) BELOW BOTTOM OF PIPE.

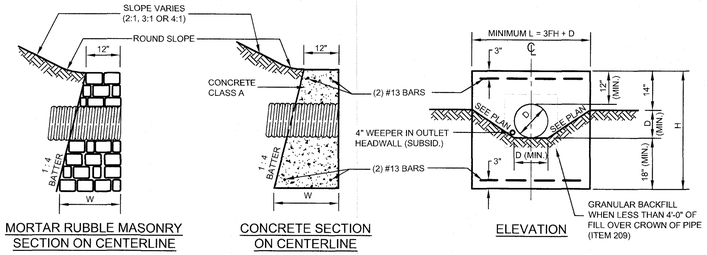
DETAIL 'A'

DETAIL 'B'

SNOUT OIL AND DEBRIS STOP DETAIL (OR EQUAL)

NOT TO SCALE

(MARCH 2008)



MORTAR RUBBLE MASONRY SECTION ON CENTERLINE

CONCRETE SECTION ON CENTERLINE

ELEVATION

NOTE:
DIMENSIONS SHOWN ARE TO PAYMENT LINES. MORTAR RUBBLE MASONRY TO BE STEPPED OUTSIDE PAYMENT LINES ON SLOPING FACES.

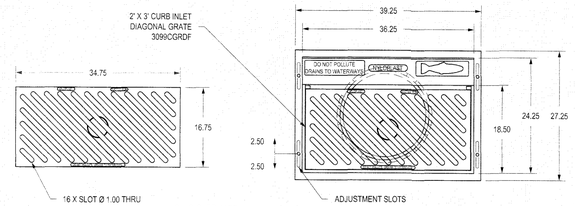
DIAMETER D (INCH)	AREA OF PIPE (SF)	MASONRY PER FOOT OF WALL (CU. YD.)	MASONRY PER HOLE (CU. FT.)	MASONRY PER STANDARD HEADER (CU. YD.)	STEEL PER STANDARD HEADER (LB)	LENGTH OF BARS	PIPE EXC. 1' DEPTH 1' LENGTH (CU. YD.)	HEADER EXC. PER HEADER 1' DEPTH (CU. YD.)	ITEM 209 PER LINEAR FOOT	HEADER LENGTH L	HEADER HEIGHT H	FILL HEIGHT FH	WIDTH AT BOTTOM OF HEADER W	"L" HEADWALL MASONRY IN CORNER FRUSTRUM (CU. YD)	"L" HEADWALL HEADER EXC. PER HEADER 1' DEPTH (CU. YD.)
15"	1.23	0.202	1.73	0.85	11	3'-10"	0.120	0.947	0.35	4'-6"	3'-9"	1'-1"	1'-11 1/4"	0.31	1.232
18"	1.77	0.222	2.52	1.13	14	5'-2"	0.130	1.111	0.39	5'-6"	4'-0"	1'-4"	2'-0"	0.35	1.406
30"	4.91	0.301	7.67	2.58	25	9'-2"	0.185	1.810	0.65	9'-6"	5'-0"	2'-4"	2'-3"	0.51	2.164

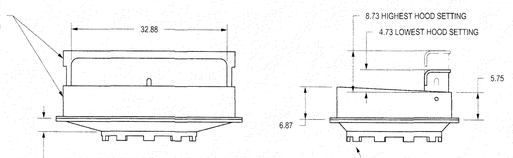
NOTE: STEEL QUANTITIES ARE FOR CONCRETE HEADWALLS ONLY.

CONCRETE HEADWALLS

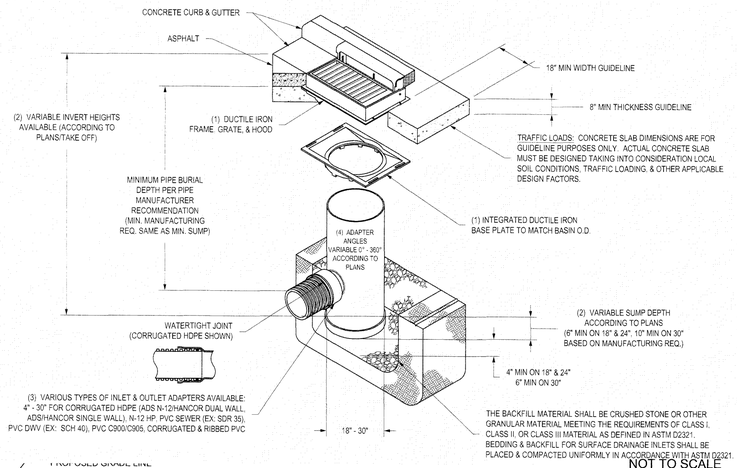
3099CGRDF & 3099CGRFH

APPROX. GRATE DRAIN AREA = 232.87 SQ IN
*APPROX. WEIGHT WITH FRAME & HOOD = 344.00 LBS



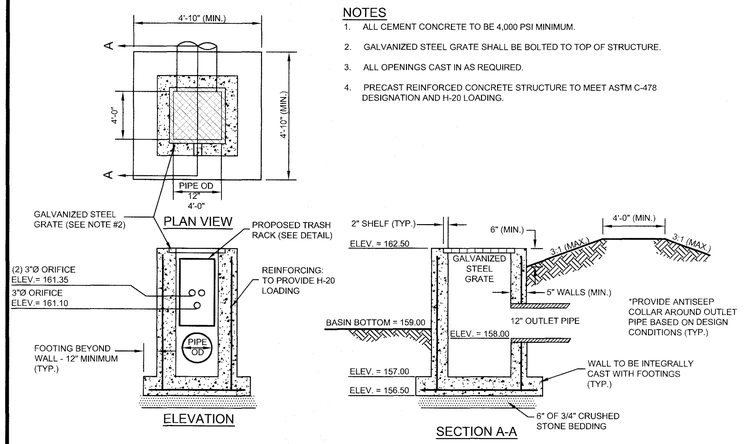


NYLOPLAST



NOT TO SCALE

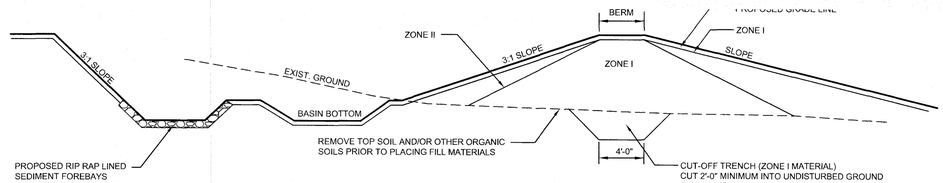
NYLOPLAST TYPICAL DETAILS



OUTLET STRUCTURE #1

NOT TO SCALE

NOTES
1. ALL CEMENT CONCRETE TO BE 4,000 PSI MINIMUM.
2. GALVANIZED STEEL GRATE SHALL BE BOLTED TO TOP OF STRUCTURE.
3. ALL OPENINGS CAST IN AS REQUIRED.
4. PRECAST REINFORCED CONCRETE STRUCTURE TO MEET ASTM C-478 DESIGNATION AND H-20 LOADING.



STORMWATER PONDS CONSTRUCTION SEQUENCE

1. CONTRACTOR TO NOTIFY DIG-SAFE 72 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. CUT AND CLEAR TREES AND BRUSH FROM CONSTRUCTION AREAS TO THE EXTENT NECESSARY. ALL BRANCHES, TOPS AND BRUSH TO BE PROPERLY DISPOSED OF BY CONTRACTOR.
3. PRIOR TO GRUBBING OF CLEARED AREAS, ALL SILTATION BARRIERS DESIGNED FOR USE AS TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED AS CALLED FOR ON PROJECT PLANS.
4. COMPLETE GRUBBING OPERATIONS. ALL STUMPS AND SIMILAR DEBRIS SHALL BE PROPERLY DISPOSED OF BY CONTRACTOR. ORGANIC MATERIAL SUITABLE FOR USE AS TOPSOIL SHALL BE STOCKPILED IN UPLAND AREAS. ALL STOCKPILES SHALL BE SEEDED WITH WINTER RYE AND, IF NECESSARY, SURROUNDED WITH HAY BALES IN ORDER TO PREVENT LOSS DUE TO EROSION.
5. CONSTRUCT TEMPORARY CULVERTS AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. ALL SUCH CROSSINGS SHALL BE PROTECTED WITH HAY BALE BARRIERS TO LIMIT EROSION.
6. CONSTRUCT CUT-OFF TRENCH (PART OF ZONE I).
7. CONSTRUCT BROAD CRESTED WEIR, ANTI SEEP COLLARS, HEADWALL, AND RIP RAP OUTLET PROTECTION AS SHOWN ON PLANS.
8. CONSTRUCT ZONE I PORTION OF EARTH EMBANKMENT.
9. CONSTRUCT ZONE II PORTION OF EARTH EMBANKMENT.
10. APPLY TOPSOIL TO SLOPES AND OTHER AREAS DISTURBED BY CONSTRUCTION. TOPSOIL USED MAY BE NATIVE ORGANIC MATERIAL SCREENED SO AS TO BE FREE OF ROOTS, BRANCHES, STONES, AND OTHER DELETERIOUS MATERIALS. TOPSOIL SHALL BE APPLIED SO AS TO PROVIDE A MINIMUM OF A 4-INCH COMPACTED THICKNESS. UPON COMPLETION OF TOPSOILING, FINISHED SECTIONS ARE TO BE LIMED, SEEDED AND MULCHED. CONSTRUCTION PERSONNEL SHALL INSPECT COMPLETED SECTIONS OF WORK ON A REGULAR BASIS AND REMEDY ANY PROBLEM AREAS UNTIL A HEALTHY STAND OF GRASS HAS BECOME ESTABLISHED.
11. MAINTAIN, REPAIR, AND REPLACE AS NECESSARY TEMPORARY EROSION CONTROL MEASURES UNTIL SUCH TIME AS THE ENTIRE CONSTRUCTION AREA HAS BEEN STABILIZED (A MINIMUM OF ONE WINTER SHALL HAVE PASSED).
12. AFTER STABILIZATION, REMOVE AND SUITABLY DISPOSE OF TEMPORARY EROSION CONTROL MEASURES.
13. MONITOR CONSTRUCTION ACTIVITIES TO INSURE CONSTRUCTION ACTIVITIES ARE BEING PERFORMED IN SUCH A WAY AS NOT TO ENDANGER THE INTEGRITY OF EARTH EMBANKMENTS, STORMWATER CONTROL STRUCTURE, CULVERT AND RIP RAP OUTLET PROTECTION.
14. THE CONTRACTOR SHALL STAKE OUT AND PROTECT THE PROPOSED INFILTRATION AREA DURING ALL CONSTRUCTION ACTIVITIES. NO SOIL COMPACTION OF ANY KIND SHALL TAKE PLACE WITHIN THE INFILTRATION AREA IN ORDER TO MAINTAIN CURRENT SOIL INFILTRATION QUALITIES.

INFILTRATION POND DETAIL

NOT TO SCALE

MATERIAL TYPE/SPECIFICATIONS

ZONE I

WELL GRADED MIXTURE OF GRAVEL, SAND, SILT OR CLAY WITH MAX. 6-INCH
SIZE STONE AND GEADATION AS INDICATED BELOW. PLACE IN MAX. 12-INCH
THICK LIFTS TO 95% OF MAX. DRY DENSITY IN ACCORDANCE WITH ASTM D1557.
SCARIFY SURFACE PRIOR TO PLACING SUBSEQUENT LIFT. IN ADDITION, REMOVE ORGANIC SOILS.

SIEVE SIZE	PERCENT BY WEIGHT PASSING
6-INCH	100
NO. 4	50 TO 100
NO. 40	30 TO 70
NO. 200	20 TO 40

ZONE II

DRAINAGE LAYER: PLACE IN MAX. 12-INCH THICK LIFTS TO 95% OF MAX. DRY
DENSITY IN ACCORDANCE WITH ASTM D1557.

SIEVE SIZE	PERCENT BY WEIGHT PASSING
1-INCH	100
NO. 4	70-100
NO. 200	0-12 (IN SAND PORTION ONLY)

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

CONSTRUCTION DETAILS

AROMA JOE'S

MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776

APPLICANT:
SCOTT ZIELFELDER
169 CANAAN BACK ROAD
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Civil Engineering Land Surveying Landscape Architecture
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PAUL CHISHOLM No. 15076 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

REVISIONS

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1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
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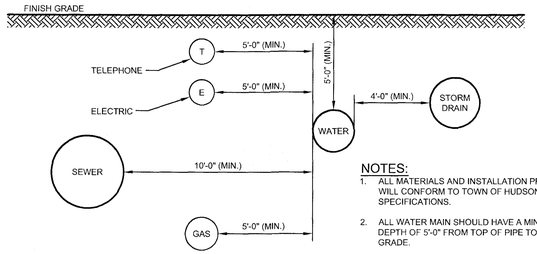
DATE: JUNE 22, 2021 **SCALE:** AS SHOWN
PROJECT NO: 21-0311-1 **SHEET** 11 **OF** 14



NOTES:

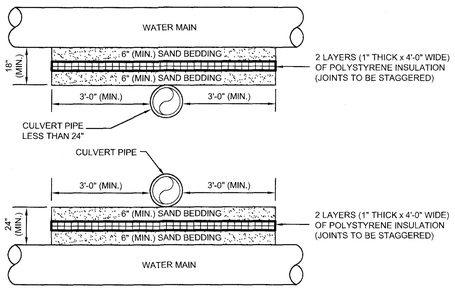
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL FOR TRENCH SPECIFICATIONS.
4. SEE DETAIL FOR OUTSIDE SERVICE ENTRANCE SPECIFICATIONS.

UTILITY SEPARATION (MAIN) DETAIL

(A-01)

NOT TO SCALE

(MARCH 2008)



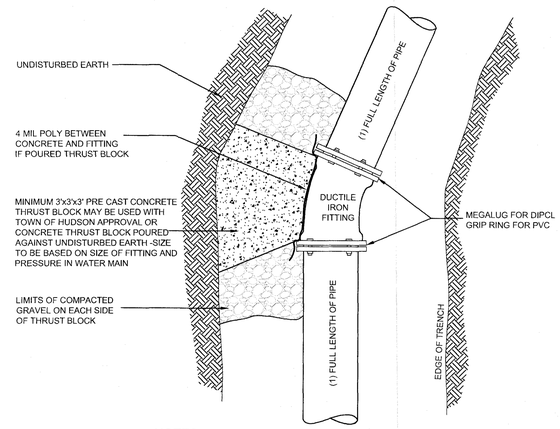
NOTES:

1. INSULATION TO BE USED WHERE PIPE SEPARATION IS 24" OR LESS.

WATER PIPE CROSSING INSULATION DETAIL

NOT TO SCALE

(JUNE 2012)



NOTES:

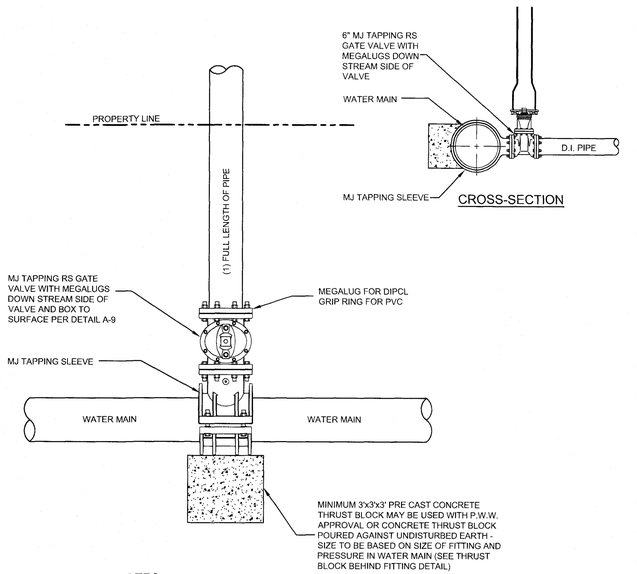
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
3. 3/4"Ø S.S. RODS SHALL BE USED IN CONJUNCTION WITH REQUIRED S.S. NUTS. RODS ARE TO BE ATTACHED TO FITTINGS WITH EITHER STAR BOLTS OR DUC LUGS.
   10" FITTING OR SMALLER = (2) 3/4"Ø S.S. RODS & ASSOCIATED HARDWARE.
   12" FITTING OR LARGER = (4) 3/4"Ø S.S. RODS & ASSOCIATED HARDWARE.
4. MIN 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH TOWN OF HUDSON APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN.

THRUST BLOCK BEHIND FITTINGS INSTALLATION

(A-07)

NOT TO SCALE

(MARCH 2008)



NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.

LARGE SERVICE AND/OR TAPPING SLEEVE DETAIL

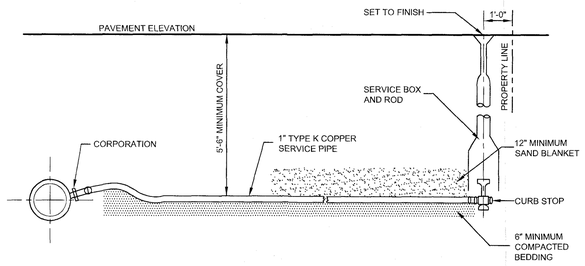
(A-21)

NOT TO SCALE

(MARCH 2008)

CONSTRUCTION NOTES:

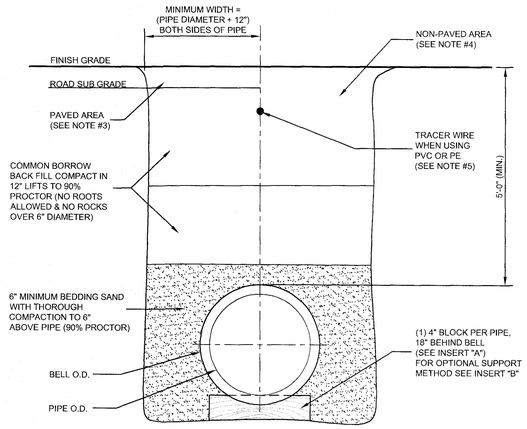
1. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. IN THE EVENT THAT A DISCREPANCY FROM THE INFORMATION SHOWN ON THESE PLANS IS FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO RESOLVE THE SITUATION.
2. PRIOR TO CONSTRUCTION, CONTACT DIG SAFE CENTER, TOLL FREE 811. NEW HAMPSHIRE STATE LAW REQUIRES NOTIFICATION AT LEAST THREE BUSINESS DAYS BEFORE DIGGING OPERATIONS START. IF AN EMERGENCY, CALL IMMEDIATELY.
3. ALL WORKMANSHIP AND MATERIALS INCORPORATED INTO THE CONSTRUCTION OF ROADS AND DRAINAGE SHOWN HEREON SHALL CONFORM WITH THE STANDARDS OF THE TOWN OF HUDSON ENGINEERING DEPARTMENT AND THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AS PUBLISHED AND AMENDED BY THE N.H.D.O.T.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES, AS SHOWN IN THESE PLANS, THROUGHOUT THE DURATION OF THE PROJECT IN ACCORDANCE WITH APPLICABLE NHDES STANDARDS. THE EROSION CONTROL MEASURES PROVIDED SERVE AS A GUIDE ONLY AND SHALL BE CONSIDERED A MINIMUM STANDARD. CONTRACTOR SHALL IMPLEMENT ANY AND ALL ADDITIONAL MEASURES AS FIELD CONDITIONS DICTATE OR AS REQUIRED BY LOCAL OR STATE GUIDELINES. ALL EROSION CONTROL SHALL BE MAINTAINED AND/OR REPLACED IF DAMAGED.
5. THE CONTRACTOR SHALL STABILIZE ALL DITCHES, SWALES AND PONDS PRIOR TO DIRECTING STORM WATER RUN-OFF TO THEM.
6. SILT SOXX TO BE CONSTRUCTED AS IDENTIFIED ON THIS PLAN. SILT SOXX BARRIERS TO BE CHECKED WEEKLY AND/OR AFTER LARGE STORM EVENTS. ALL SILT MATERIAL TO BE REMOVED. ANY DAMAGED SILT SOXX SHALL BE REINSTALLED IMMEDIATELY.
7. SLOPE STABILIZATION METHODS SHALL BE PROVIDED IN ACCORDANCE WITH THE NHDES SITE SPECIFIC PERMIT OR AS FIELD CONDITIONS DICTATE. SLOPE STABILIZATION SHALL BE PROVIDED ON ALL SLOPES 3:1 AND GREATER AS A MINIMUM STANDARD. PROVIDE SLOPE STABILIZATION ON SLOPES LESS THAN 3:1 IF WARRANTED, AS FIELD CONDITIONS DICTATE.
8. THE DRAINAGE DESIGN AND EROSION CONTROL MEASURES AS PROPOSED MEET ALL TOWN AND STATE REQUIREMENTS AND BEST MANAGEMENT PRACTICES AS PROMULGATED BY THE NHDES.
9. ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRICTION OPERATIONS IN THE IMMEDIATE AREA.
10. TOPSOIL SHALL BE REMOVED FOR ITS TOTAL DEPTH WITHIN THE LIMITS OF GRADING, UNLESS OTHERWISE DIRECTED. THE TOPSOIL SHALL BE STOCKPILED AND USED IN ITS ENTIRETY. STOCKPILE SOIL IN ACCORDANCE WITH NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (CURRENT EDITION).
11. UNSUITABLE MATERIAL, ROOTS, AND STUMPS WITHIN THE LIMITS OF WORK SHALL BE REMOVED FROM THE SITE AS ORDERED. DISPOSAL OF SUCH MATERIALS SHALL BE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS AND GUIDELINES AS APPLICABLE OR AS DIRECTED.
12. THE SUBGRADE SHALL BE SCARIFIED TO ASSURE THAT ALL BOULDERS AND COBBLES OVER 6" ARE REMOVED PRIOR TO SHAPE, GRADE, AND COMPACTION ACTIVITIES.
13. ALL WORKMANSHIP AND MATERIALS INCORPORATED INTO THE CONSTRUCTION OF ELECTRIC LINES SHALL CONFORM WITH THE STANDARDS OF THE OWNING UTILITY COMPANY.
14. ALL WORKMANSHIP AND MATERIALS INCORPORATED INTO THE CONSTRUCTION OF TELEPHONE LINES SHALL CONFORM WITH THE STANDARDS OF THE OWNING TELEPHONE COMPANY.
15. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND WITHIN THE CONSTRUCTION AREA. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
16. THE CONTRACTOR SHALL COORDINATE MATERIALS AND INSTALLATION SPECIFICATIONS WITH THE INDIVIDUAL UTILITY AGENCIES/COMPANIES AND ARRANGE FOR ALL INSPECTIONS.
17. UTILITY STUB CONNECTIONS SHOWN TO PROPOSED LOTS ARE APPROXIMATE AND INTENDED TO ILLUSTRATE FEASIBILITY OF CONSTRUCTING CONNECTIONS. THE CONTRACTOR SHALL PROVIDE SERVICE STUBS AS DIRECTED BY THE OWNING UTILITY COMPANY AND LOCAL AUTHORITY.
18. CONTRACTOR SHALL COORDINATE WITH PHONE, CABLE, AND ELECTRIC COMPANIES FOR POTENTIAL NEED OF INDIVIDUAL SECTORS AT EACH LOT SERVICE CONNECTION.
19. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY HIS WORK AT ALL TIMES.
20. THE CONTRACTOR SHALL VERIFY TBM ELEVATIONS PRIOR TO CONSTRUCTION.

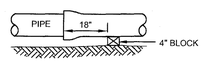


WATER SERVICE CONNECTION

NOT TO SCALE

(MARCH 2008)





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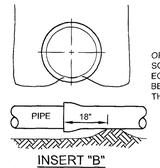

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NOTES:

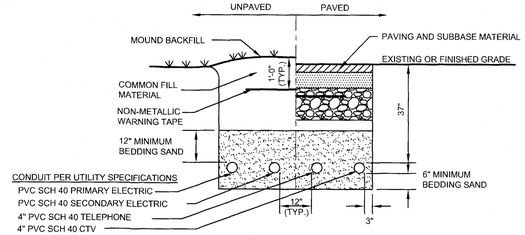
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
3. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
4. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
5. 10 GAUGE TRACER WIRE AS MANUFACTURED BY BMS, DIVISION OF ALBESTAR CORP., AVON, MA OR EQUIVALENT.

TRENCH DETAIL

(A-02)

NOT TO SCALE

(MARCH 2008)



NOTE:
INSTALLATION AND MATERIALS OF UNDERGROUND UTILITIES SHALL CONFORM TO LOCAL UTILITY COMPANY SPECIFICATIONS.

UTILITY TRENCH DETAIL

NOT TO SCALE

(MARCH 2008)

CONSTRUCTION DETAILS

AROMA JOE'S

MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776

APPLICANT:
SCOTT ZIELFELDER
169 CANAAN BACK ROAD
BARRINGTON, NH 03825

KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

PAUL CHISHOLM No. 15076 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

REVISIONS

No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL

DATE: JUNE 22, 2021 **SCALE:** AS SHOWN
PROJECT NO: 21-0311-1 **SHEET** 12 **OF** 14

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

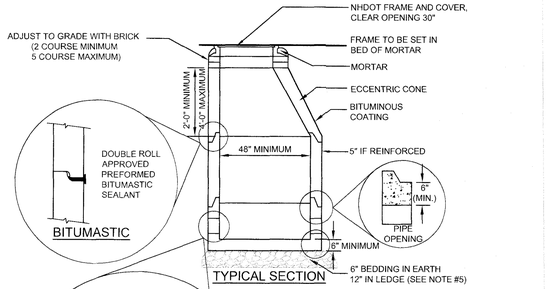
_____ SIGNATURE DATE: _____

SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

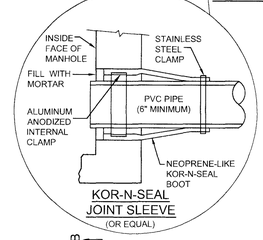
NOTES: (NHDES ENV WQ700 - 2015)

1. ALL COMPONENT PARTS OF MANHOLE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE AND SPACE NECESSARY FOR THE INTENDED SERVICE.
2. MANHOLE STRUCTURES SHALL HAVE A LIFE EXPECTANCY IN EXCESS OF 25 YEARS.
3. MANHOLE STRUCTURES SHALL BE DESIGNED TO WITHSTAND H-20 LOADING AND SHALL NOT LEAK IN EXCESS OF ONE GPD PER VERTICAL FOOT OF MANHOLE FOR THE LIFE OF THE STRUCTURE.
4. BARRELS, CONCRETE GRADE RINGS AND CONE SECTIONS SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE AND SHALL CONFORM TO ASTM C478.
5. BEDDING: CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33
   - 100% PASSING 1 INCH SCREEN
   - 90% PASSING 3/4 INCH SCREEN
   - 20-55% PASSING 3/8 INCH SCREEN
   - 0-10% PASSING #4 SIEVE
   - 0-5% PASSING #8 SIEVE

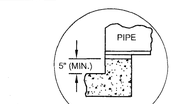
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, CRUSHED STONE 1/2 INCH TO 1-1/2 INCH SHALL BE USED.
6. BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 6 INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
7. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER-TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT.
8. PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
   - A. ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
   - B. CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;
   - C. ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING; AND
   - D. NON-SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
9. MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
10. ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL.
11. ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP-PROOFING COATING.
12. MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. INVERTS AND SHELVES SHALL BE PLACED AFTER TESTING.
13. MATERIALS OF CONSTRUCTION FOR MANHOLES SHALL BE AS FOLLOWS:
   - A. CONCRETE FOR PRECAST BASES OR GRADE RINGS SHALL CONFORM TO THE REQUIREMENTS FOR CLASS AA CONCRETE IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION".
   - B. REINFORCING FOR PRECAST CONCRETE SHALL BE STEEL OR STRUCTURAL FIBERS THAT CONFORM TO THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
   - C. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL BE CERTIFIED BY THEIR MANUFACTURER(S) AS CONFORM TO ASTM C478;
   - D. THE MANHOLE FRAME AND COVER SHALL PROVIDE A 30-INCH DIAMETER CLEAR OPENING;
   - E. THE MANHOLE COVER SHALL HAVE THE WORD "SEWER" IN 3-INCH LETTERS CAST INTO THE TOP SURFACE;
   - F. THE CASTINGS SHALL BE OF EVEN-GRAINED CAST IRON, SMOOTH AND FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES AND DEFECTS;
   - G. CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION;
   - H. CASTINGS SHALL BE EQUAL TO CLASS 30, BE CERTIFIED BY THEIR MANUFACTURE(S) AS CONFORMING TO ASTM A48/48M;
   - I. BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL BE CERTIFIED BY THEIR MANUFACTURE(S) AS CONFORMING TO ASTM C32, CLAY OR SHALE, FOR GRADE SS HARD BRICK;
   - J. MORTAR SHALL BE COMPOSED OF TYPE II PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
   - K. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
     1. 4.5 PARTS SAND AND 1.5 PARTS CEMENT, OR
     2. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PARTS HYDRATED LIME;
   - L. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150/C150M;
   - M. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES";
   - N. SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES";
   - O. CONCRETE FOR DROP SUPPORTS SHALL CONFORM TO THE REQUIREMENT FOR CLASS AAA CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
   - P. SUBJECT TO (Q) BELOW, A FLEXIBLE PIPE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION:
     1. WITHIN 48-INCHES FOR REINFORCED CONCRETE (RC) PIPE; AND
     2. WITHIN 60-INCHES FOR PVC PIPE LARGER THAN 15-INCH DIAMETER;
   - Q. NO FLEXIBLE JOINT SHALL BE REQUIRED FOR D.I. PIPE OR FOR PVC PIPE UP THROUGH 15-INCH DIAMETER; AND
   - R. WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED IN LIEU OF A CONE SECION, PROVIDED THE SLAB HAS AN ECCENTRIC ENTRANCE OPENING AND IS CAPABLE OF SUPPORTING H-20 LOADS.
14. MANHOLE TESTING:
   15. MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST.
   16. THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
   17. 1. THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES Hg: AND
   18. 2. THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR A 1-INCH Hg PRESSURE DROP TO 9 INCH Hg SHALL BE:
   19. a. NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP IN DEPTH;
   20. b. NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP; AND
   21. c. NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP.
   22. THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (B) ABOVE.
   23. FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON THE TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN OR ANIMALS UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENTS TO GRADE.

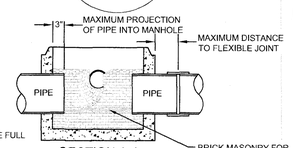


TYPICAL SECTION



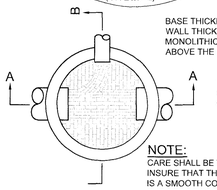
KOR-N-SEAL JOINT SLEEVE (OR EQUAL)



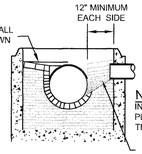


SECTION A-A

BASE THICKNESS TO BE FULL WALL THICKNESS AND MONOLITHIC TO A POINT 6" ABOVE THE PIPE CROWN.

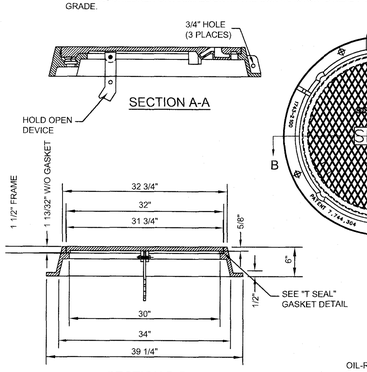


NOTE: CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.



NOTE: INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.

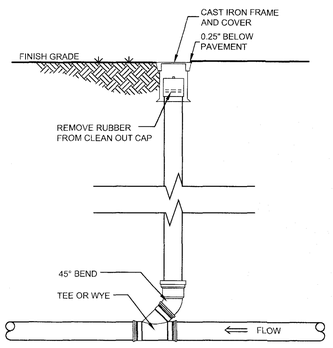
SANITARY SEWER MANHOLE
NOT TO SCALE



NOTES:

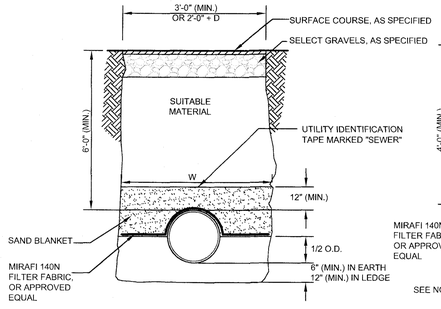
SPECIFICATIONS:
- MEETS H-20 LOADING REQUIREMENTS
- COMPONENT #: FRAME 1743-2100, LID 1743-5317
- MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
- FINISH: NO PAINT
- WEIGHT: FRAME 149#, LID 162#

SEWER MANHOLE FRAME AND LID DETAIL



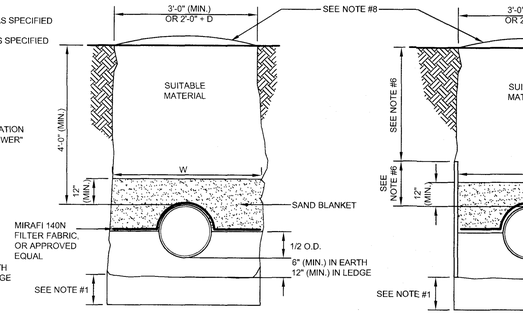
CLEANOUTS ON SERVICE LATERALS (4" OR 6")
NOT TO SCALE
(MARCH 2008)

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL	APPROVED BY THE HUDSON, NH PLANNING BOARD DATE OF MEETING: _____ _____ SIGNATURE DATE: _____ _____ SIGNATURE DATE: _____ SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

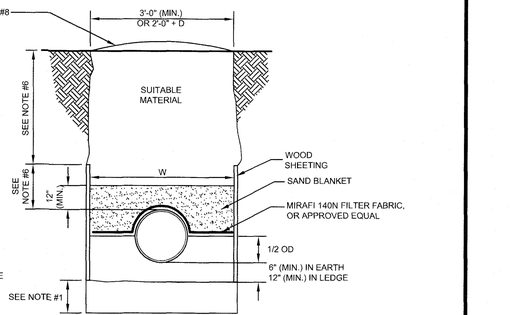


FOR CONSTRUCTION IN ROADS, ROAD SHOULDER AND WALKWAYS

NOTE: MINIMUM BEDDING DEPTH AND MAXIMUM PAYMENT DEPTH FOR LEDGE EXCAVATION: 1/4 O.D. (6" MIN.)



CROSS COUNTRY EARTH CONSTRUCTION



CROSS COUNTRY EARTH CONSTRUCTION WITH SHEETING

SANITARY SEWER TRENCH DETAIL
NOT TO SCALE
(MARCH 2008)

NOTES:

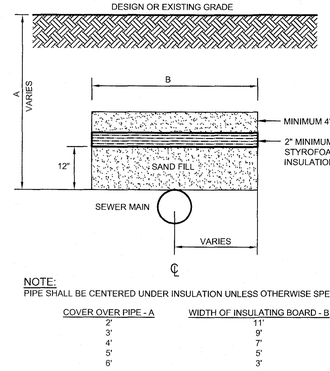
1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE. REFILL WITH BEDDING MATERIAL, ALSO SEE NOTE #7.

   BEDDING: CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33-03 STONE SIZE NO. 67.

   100% PASSING 1 INCH SCREEN
   90 - 100% PASSING 3/4 INCH SCREEN
   20 - 55% PASSING 3/8 INCH SCREEN
   0 - 10% PASSING # 4 SIEVE
   0 - 5% PASSING # 8 SIEVE

   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, GRADED CRUSHED STONE 1/2 INCH TO 1-1/2 INCHES SHALL BE USED.
2. SAND BLANKET: GRADED CLEAN SAND FREE FROM ORGANIC MATTER, SO THAT 100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A # 200 SIEVE. BLANKET MAY BE OMITTED FOR CAST IRON, DUCTILE IRON AND REINFORCED CONCRETE PIPE PROVIDED, HOWEVER, THAT NO STONE LARGER THAN 2 INCHES IS IN CONTACT WITH THE PIPE.
3. MIRAFI 140 N FILTER FABRIC, OR APPROVED EQUAL, SHALL BE INSTALLED ABOVE PIPE.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL AND ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, OR ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

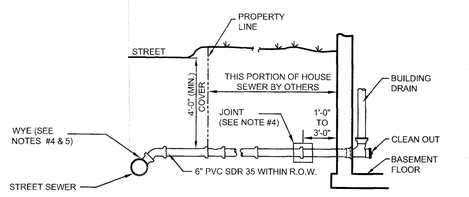
   IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT IF HE/SHE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER WILL BE PRESERVED FOR MAINTENANCE AND POSSIBLY RECONSTRUCTION, WHEN NECESSARY.
5. BASE COURSE, IF ORDERED BY THE ENGINEER, SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE LATEST EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS."
6. WOOD SHEETING, IF REQUIRED, WHERE PLACED ALONGSIDE THE PIPE AND EXTENDING BELOW MID-DIAMETER, SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.
7. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE 10 FEET OF SEPARATION BETWEEN WATER AND SEWER. HOWEVER, SHOULD CONSTRUCTION REVEAL OR EXPOSE A WATERLINE (MAIN OR SERVICE) RUNNING APPROXIMATELY PARALLEL AND LESS THAN 10 FEET HORIZONTALLY FROM THE PROPOSED SEWER INSTALLATION AND WHERE IT IS NOT PRACTICAL TO RELOCATE THE SEWER, A DEVIATION MAY BE GRANTED PROVIDED THAT THE SEWER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE MAIN CONSTRUCTION REQUIREMENT SPECIFIED BELOW:
   - A. FORCEMAINS SHALL BE CONSTRUCTED FROM DUCTILE IRON, HIGH DENSITY POLYETHYLENE, OR PVC PER ENV-WQ 704.06(a)
     PVC SHALL CONFORM TO ASTM D2241-05 OR ASTM D1785-05
     HDPE SHALL CONFORM TO ASTM D3035-03a
     DI SHALL BE CORROSION PROTECTED IN CORROSIVE ENVIRONMENTS
10. WHERE WATER LINES AND SEWER LINES CROSS, THEY SHOULD CROSS AS PERPENDICULAR AS POSSIBLE AND THE WATER MAIN SHALL CROSS AT LEAST 18" INCHES ABOVE THE SEWER. FURTHER, THE SEWER JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.
11. ALL SEWERS AT 8 PERCENT SLOPE, OR GREATER, SHALL HAVE IMPERVIOUS TRENCH DAMS CONSTRUCTED EVERY 300 FEET.
12. UNLESS OTHERWISE NOTED, ALL GRANULAR MATERIAL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO 95% OF THE MODIFIED PROCTOR TEST.
13. WHERE WATER MAINS CROSS UNDER SEWER MAINS, BOTH THE SEWER AND WATER MAINS SHALL BE PRESSURE RATED PIPE PER ENV-WQ 704.06 AND TESTED PER AWWA C600-05 AT 1.5 TIMES DESIGN PRESSURE OR 100 PSI, WHICHEVER IS GREATER, WITH NO JOINTS WITHIN 9 FEET OF THE CROSSING POINT AND 18" MINIMUM VERTICAL SEPARATION.
14. GRAVITY PIPE SEWER TESTING:
   - A. ALL NEW GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW-PRESSURE AIR TESTS.
   - B. LOW-PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:
     1. ASTM F1417-92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW-PRESSURE AIR;" OR
     2. UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, "LOW-PRESSURE AIR TESTING OF INSTALLED SEWER PIPE" (1998).
   - C. ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED AND SHALL BE TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE.
   - D. ALL PLASTIC SEWER PIPE SHALL BE DEFLECTION TESTED NOT LESS THAN 30 DAYS FOLLOWING INSTALLATION.
   - E. THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 7-1/2 PERCENT OF AVERAGE INSIDE DIAMETER.



NOTE: PIPE SHALL BE CENTERED UNDER INSULATION UNLESS OTHERWISE SPECIFIED.

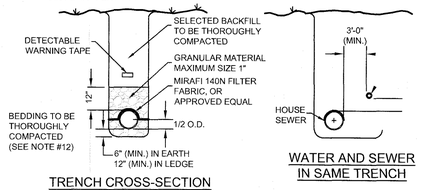
COVER OVER PIPE - A	WIDTH OF INSULATING BOARD - B
2'	11'
3'	9'
4'	7'
5'	5'
6'	3'

SEWER MAIN INSULATION DETAIL
NOT TO SCALE



APPROVED BACKFLOW PREVENTER TO BE INSTALLED WHERE DIRECTED.
HOUSE SEWER: 6" PVC SDR 35, MINIMUM SLOPE 1/8" PER FOOT

NOTE: HOUSE SEWER MAY ALSO BE LOCATED BELOW BASEMENT FLOOR WHEN REQUIRED.



TRENCH CROSS-SECTION

WATER AND SEWER IN SAME TRENCH

SANITARY SEWER SERVICE DETAIL
NOT TO SCALE

1. MINIMUM SIZE PIPE FOR HOUSE SERVICE SHALL BE 6 INCHES. MINIMUM SIZE FOR STREET SEWER LINES SHALL BE 8 INCHES.
2. PIPE AND JOINT MATERIALS:
   - A. DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION (AWWA):
     1. AWWA C151/A21.51-02 - FOR DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL OR SAND-LINED MOLDS, FOR WATER OR OTHER LIQUIDS;
     2. AWWA C150/A21.50-02 - FOR THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A536-84 (2004) DUCTILE IRON CASTINGS;
     3. JOINTS SHALL BE MECHANICAL, PUSH-ON OR BALL-AND-SOCKET TYPE.
   - B. PLASTIC GRAVITY SEWER PIPE AND FITTINGS SHALL COMPLY WITH THE FOLLOWING STANDARDS:
     1. ASTM D3034-04A - PVC, SOLID WALL;
     2. AT LEAST 46 PSI AT 5% PIPE DIAMETER DEFLECTION, AS MEASURED IN ACCORDANCE WITH ASTM D2414-02 DURING MANUFACTURING; AND
     3. JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D3212-96A(2003)E1 AND SHALL BE PUSH-ON OR BELL-AND-SPIGOT TYPE.
3. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.
4. JOINTS SHALL BE DEPENDENT UPON PROPER MATERIALS (SEE NOTE #2) FOR WATER TIGHTNESS, AND ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.
5. SERVICE CONNECTIONS SHALL USE SANITARY FITTINGS FOR ALL NEW CONSTRUCTION. THE CENTERLINE OF ALL BUILDING CONNECTIONS SHALL ENTER THE TOP HALF OF THE SEWER. IF A CHECK VALVE IS USED AT THE PROPERTY LINE, THE VALVE SHALL BE INSTALLED WITHIN A VAULT TO FACILITATE MAINTENANCE. ROOF DOWNSPOUTS, EXTERIOR OR INTERIOR FOUNDATION DRAINS, SUMP PUMPS OR OTHER SOURCE OF SURFACE WATER RUN-OFF OR GROUND WATER SHALL NOT BE DIRECTLY OR INDIRECTLY CONNECTED TO A PUBLIC SEWER.
6. PIPE INSTALLATION:
   - A. THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER.
   - B. PIPES SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL.
   - C. BEDDING AND RE-FILL, FOR A DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE, SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH THE APPROPRIATE MECHANICAL DEVICES.
   - D. THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE HOUSE FOUNDATION AT A GRADE OF NOT LESS THAN 1/8 INCH PER FOOT.
   - E. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.
7. TESTING: THE COMPLETED HOUSE SEWER SHALL BE SUBJECTED TO VACUUM TESTING.
8. ILLEGAL CONNECTIONS: NOTHING BUT SANITARY WASTE FLOW FROM TOILETS, SINKS, LAUNDRY, ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR ANY OTHER SIMILAR CONNECTION CARRYING RAIN WATER, DRAINAGE OR GROUND WATER, SHALL NOT BE PERMITTED.
9. WATER SERVICE SHALL NOT BE LAID IN THE SAME TRENCH AS THE SEWER SERVICE. WHEN NECESSARY, THE WATER SERVICE SHALL BE PLACED ABOVE AND TO ONE SIDE OF THE SEWER SERVICE, AS SHOWN.
10. LOCATION: THE LOCATION OF THE WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS MATERIAL, ROD OR PIPE SHALL BE PLACED OVER THE WYE TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPE FINDER.
11. UNLESS OTHERWISE NOTED, ALL GRANULAR MATERIAL SHALL BE PLACED IN 12" MAXIMUM LIFTS AND COMPACTED TO 95% OF THE MODIFIED PROCTOR TEST DENSITY.

CONSTRUCTION DETAILS
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:	APPLICANT:
STEVE S. & HSIANG HWA W. PAN 13 KING HENRY DRIVE LONDONDERRY, N.H. 03053 BK. 6281 PG. 776	SCOTT ZIELFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825

KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

STATE OF NEW HAMPSHIRE · PAUL CHISHOLM No. 15076 · LICENSED PROFESSIONAL ENGINEER

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL

DATE: JUNE 22, 2021	SCALE: AS SHOWN
PROJECT NO: 21-0311-1	SHEET 13 OF 14

TURF ESTABLISHMENT SCHEDULE

PURPOSE:

TO ESTABLISH AND MAINTAIN PERMANENT AND TEMPORARY TURF AREAS, RESTORE GROWTH TO EXISTING TURF AREAS DISTURBED DURING CONSTRUCTION AND CONTROL SOIL EROSION.

PREPARATION AND EXECUTION:

1. RAKE THE SUBGRADE OF ALL AREAS TO BE LOAMED AND SEEDED TO REMOVE RUBBISH, STICKS, ROOTS AND STONES LARGER THAN 1 INCH.
2. PLACE LOAM OVER AREAS TO BE SEEDED AND SPREAD.
3. FINE GRADE SURFACE AND SUPPLEMENT WITH SUITABLE LOAM WHERE NEEDED TO CREATE A UNIFORM SURFACE ACCORDING TO THE FINISH GRADES INDICATED; TOP AND BOTTOM OF SLOPES SHALL BE ROUNDED. NO LOAM SHALL BE SPREAD IF THE SUBGRADE IS EXCESSIVELY WET OR FROZEN.
4. IF THE pH OF THE SOIL NEEDS TO BE RAISED, APPLY LIME EVENLY OVER LOAM SURFACE AND THOROUGHLY INCORPORATE LIME INTO THE LOAM BY HEAVY RAKING TO AT LEAST ONE-HALF THE DEPTH OF THE LOAM.
5. APPLY FERTILIZER AND MIX WITH THE UPPER 2 INCHES OF LOAM.
6. DETERMINE APPROPRIATE MIXTURE FOR AREA TO BE SEEDED BASED ON EXAMINATION OF PROJECT PLANS. UNIFORMLY SPREAD THE SEED BY BROADCASTING OR HYDROSEEDING. IF BROADCASTING, LIGHTLY RAKE INTO THE PREPARED SURFACE AND ROLL. IF, HYDROSEEDING, USE 4 TIMES THE RECOMMENDED RATE OF INOCULANT. AFTER SEED IS SPREAD, WATER THOROUGHLY WITH A FINE SPRAY.
7. SEEDING AND INITIAL FERTILIZING SHALL BE DONE BETWEEN APRIL 1 AND JUNE 1 OR BETWEEN AUGUST 15 AND OCTOBER 14, OR AS PERMITTED. SEEDING SHALL NOT BE DONE DURING WINDY WEATHER OR WHEN THE GROUND IS FROZEN, EXCESSIVELY WET OR OTHERWISE UNTILLABLE.
8. WITHIN 24 HOURS AFTER SEEDING OPERATION, UNIFORMLY MULCH THE AREA WITH STRAW. ANCHOR MULCH ON ALL SLOPES EXCEEDING 3 : 1 USING MULCH NETTING INSTALLED IN ACCORDANCE WITH THE MANUFACTURER.
9. PROTECT AND PREVENT AGAINST WASHOUTS, ANY WASHOUTS WHICH OCCUR SHALL BE PROMPTLY REGRADED AND RESEEDED.
10. WHEN IT IS IMPRACTICAL TO ESTABLISH PERMANENT GROWTH ON DISTURBED EARTH BY OCTOBER 14, A TEMPORARY SEED MIXTURE SHALL BE USED. WHEN TEMPORARY SEEDING CANNOT ESTABLISH VISIBLE GROWTH, THE DISTURBED AREA SHALL BE COVERED WITH SIX INCHES OF MULCH FOR THE WINTER.

MAINTENANCE:

ALL SEEDED AREAS SHALL BE KEPT WATERED AND IN GOOD CONDITION. RESEED AS NECESSARY TO ESTABLISH HEALTHY UNIFORM GROWTH OVER THE ENTIRE SEEDED AREA. MAINTAIN SEEDED AREAS IN AN APPROVED CONDITION UNTIL FINAL ACCEPTANCE. MAINTENANCE SHALL INCLUDE REPAIRS FOR DAMAGE CAUSED BY EROSION.

APPLICATION RATES:

1. LOAM SHALL BE APPLIED AT A MINIMUM COMPACTED THICKNESS OF 4 INCHES.
2. LIME SHALL BE USED WHEN NECESSARY TO RAISE THE pH OF THE SOIL AND APPLIED AT ONE OF THE FOLLOWING RATES:

EXISTING SOIL Ph	TONS/ACRE	POUNDS/CUBIC YARD
4.0 - 4.4	3	1.2
4.5 - 4.9	2	0.8
5.0 - 5.4	1	0.4

3. FERTILIZER SHALL BE APPLIED AT THE FOLLOWING RATE:

INITIAL APPLICATION	POUNDS/1,000 SF	MEASUREMENT FACTOR
10-10-10	20.0	1.0
15-15-15	13.4	1.5
19-19-19	10.5	1.9

REFERTILIZATION	POUNDS/1,000 SF	MEASUREMENT FACTOR
10-3-6	20.0	1.0
12-2-8	16.7	1.2
12-4-8	16.7	1.2

4. MULCH SHALL BE APPLIED AT A RATE OF 13 CUBIC YARDS PER 1,000 S.F. OF LANDSCAPE BED.

MATERIALS:

1. LOAM SHALL CONSIST OF LOOSE, FRIABLE TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH. LOAM SHALL BE FREE OF VIABLE PARTS OF PROHIBITED INVASIVE PLANTS AND BE GENERALLY FREE OF STONES, LUMPS, STUMPS AND SIMILAR OBJECTS LARGER THAN 2 INCHES IN GREATEST DIAMETER, SUBSOIL, ROOTS AND WEEDS. THE MINIMUM AND MAXIMUM pH VALUE SHALL BE FROM 5.5 TO 7.6.
2. LIME SHALL BE A CALCIC OR DOLOMITIC GROUND AGRICULTURAL LIMESTONE CONTAINING NOT LESS THAN 95% OF EITHER CALCIUM OR MAGNESIUM CARBONATE, OR BOTH. IT SHALL CONFORM TO THE STANDARDS OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS AND SHALL COMPLY WITH ALL STATE AND FEDERAL RULES AND REGULATIONS.
3. FERTILIZER SHALL BE STANDARD COMMERCIAL GRADE FERTILIZER CONFORMING TO ALL STATE AND FEDERAL RULES AND REGULATIONS AND TO THE STANDARDS OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS. EXCEPT AS PERMITTED, THE ANALYSIS RATIO SHALL BE 1:1:1 FOR INITIAL APPLICATION AND 3:1:2 FOR REFERTILIZATION APPLICATION.
4. GRASS SEED SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE AGRICULTURAL AND VEGETABLE SEED LAWS AND SHALL INCLUDE NO "PRIMARY NOXIOUS WEED SEEDS."
5. SEED MIXTURE FOR LAWN AREAS SHALL CONSIST OF THE FOLLOWING:

KIND OF SEED	MINIMUM PURITY (%)	MINIMUM GERMANATION (%)	POUNDS/ACRE (TOTAL 120 POUNDS)
CREEPING RED FESCUE	96	85	40
PERENNIAL RYEGRASS	98	90	50
KENTUCKY BLUEGRASS	97	85	25
REDTOP	95	80	5

6. SEED MIXTURE FOR SLOPE AREAS SHALL CONSIST OF THE FOLLOWING:

KIND OF SEED	MINIMUM PURITY (%)	MINIMUM GERMANATION (%)	POUNDS/ACRE (TOTAL 95 POUNDS)
CREEPING RED FESCUE	96	85	35
PERENNIAL RYEGRASS	98	90	30
REDTOP	95	80	5
ALSIKE CLOVER	97	90	5
BIRDSFOOT TREFOIL	98	80	5
LANCE-LEAVED COREOPSIS	95	80	4
OXEYE DAISY	95	80	3
BLACKEYED SUSAN	95	80	4
WILD LUPINE	95	80	4

7. TEMPORARY SEEDING MIXTURE SHALL BE APPLIED AT A RATE OF 2 POUNDS PER 1,000 SF AND SHALL BE AN APPROVED CONSERVATION MIX OR CONSIST OF THE FOLLOWING:
   - 15% BLACKWELL OR SHELTER SWITCHGRASS
   - 30% NIAGRA OR KAW BIG BLUESTEM
   - 30% CAMPER OR BLAZE LITTLESTEM
   - 15% NE-27 OR BLAZE SAND LOVEGRASS
   - 10% VIKING BIRDSFOOT TREFOIL

   INOCULUM SPECIFIC TO BIRDSFOOT TREFOIL MUST BE USED WITH THIS MIXTURE. IF SEEDING BY HAND, A STICKING AGENT SHALL BE USED. IF SEEDING WITH A HYDROSEEDER, USE FOUR TIMES THE RECOMMENDED AMOUNT OF INOCULUM.
8. SEED MIXTURE FOR STORMWATER MANAGEMENT AREAS, INCLUDING DETENTION BASINS AND VEGETATED TREATMENT SWALES, SHALL BE APPLIED AT A RATE OF 70 POUNDS PER ACRE OR 1.6 POUNDS PER 1,000 SF, AND SHALL CONSIST OF THE FOLLOWING:
   - 25% CREEPING RED FESCUE
   - 15% SWITCH GRASS
   - 15% FOX SEDGE
   - 15% CREEPING BENTGRASS
   - 10% FLATPEA
   - 20% WILDFLOWER VARIETY
9. STRAW USED FOR MULCH SHALL CONSIST OF MOWED AND PROPERLY CURED GRASS OR LEGUME MOWINGS, FREE FROM WEEDS, TWIGS, DEBRIS, INVASIVE SPECIES OR OTHER DELETERIOUS MATERIAL AND ROT OR MOLD.

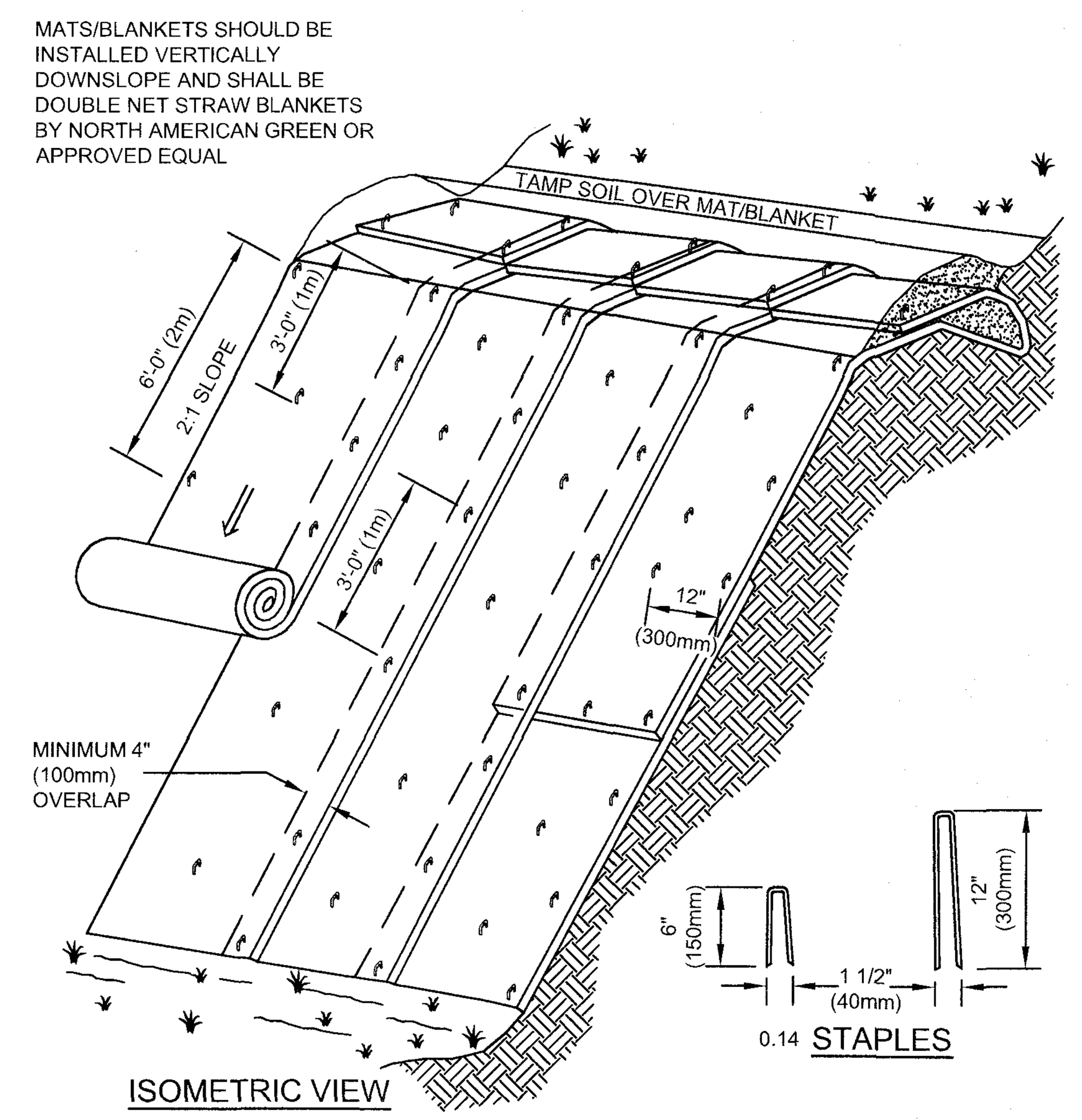
SOD SPECIFICATIONS:

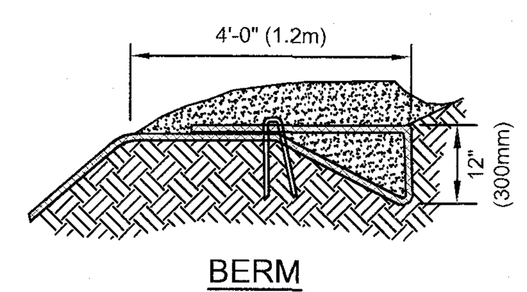
1. SOD SHALL BE PROVIDED WITH A STRONG ROOT SYSTEM, NOT LESS THAN TWO YEARS OLD AND SHALL BE FREE OF ANY UNDESIRABLE NATIVE GRASSES OR WEEDS.
2. SOD SHALL BE MACHINE CUT TO A THICKNESS NOT LESS THAN 3/4", EXCLUDING THATCH, AND SHALL BE CAPABLE OF VIGOROUS GROWTH WHEN PLANTED.
3. SOD PADS SHALL BE OF UNIFORM SIZE AND COMPOSED OF AT LEAST TWO LOCAL GRASS VARIETIES.
4. LAY SOD TO FORM A SOLID MASS WITH TIGHTLY FITTED JOINTS, DO NOT OVERLAP. STAGGER STRIPS TO OFFSET JOINTS IN ADJACENT COURSES. TAMP SOD TO ENSURE CONTACT WITH WITH SOIL.
5. WATER WITHIN ONE HOUR OF PLANTING WITH A FINE SPRAY.

WINTER CONSTRUCTION NOTES:

1. ALL PROPOSED POST-DEVELOPMENT VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 4:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER OCTOBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3 OR, IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON, BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT.
4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
   - A. BASE COURSE GRAVELS ARE INSTALLED IN AREAS TO BE PAVED;
   - B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   - C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED; OR
   - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL	APPROVED BY THE HUDSON, NH PLANNING BOARD DATE OF MEETING: ______ ______ SIGNATURE DATE: ______ ______ SIGNATURE DATE: ______ SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.





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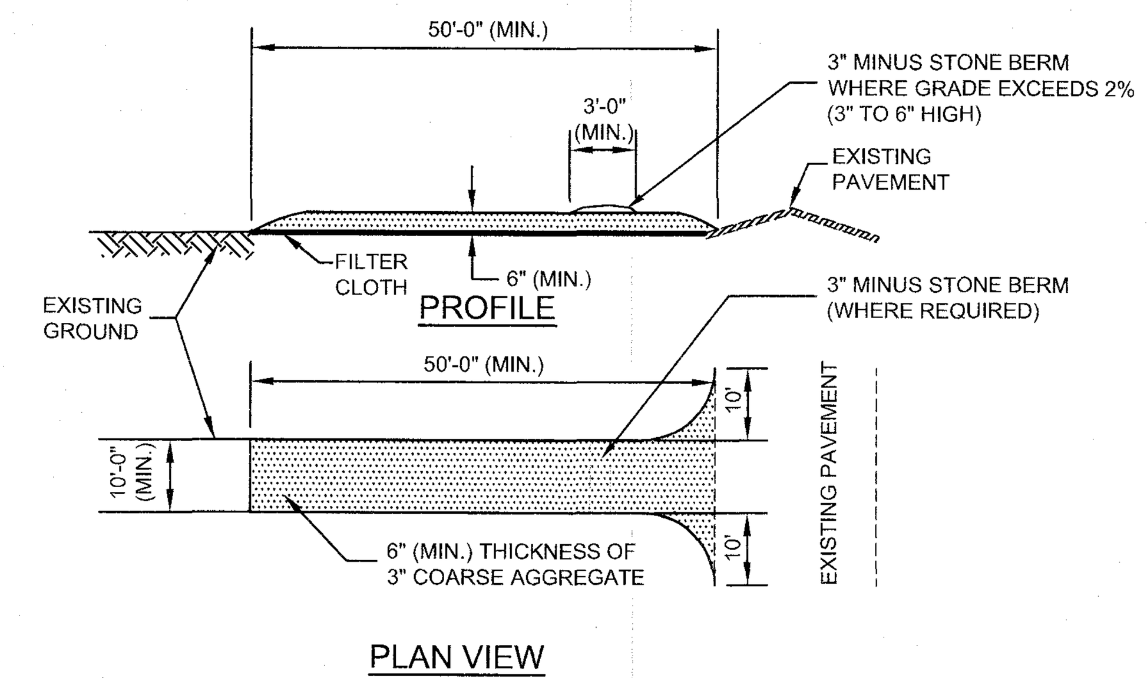
NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

EROSION CONTROL BLANKETS - SLOPE INSTALLATION
NOT TO SCALE
(AUGUST 2011)



STABILIZED CONSTRUCTION EXIT DETAIL
NOT TO SCALE
(APRIL 2018)

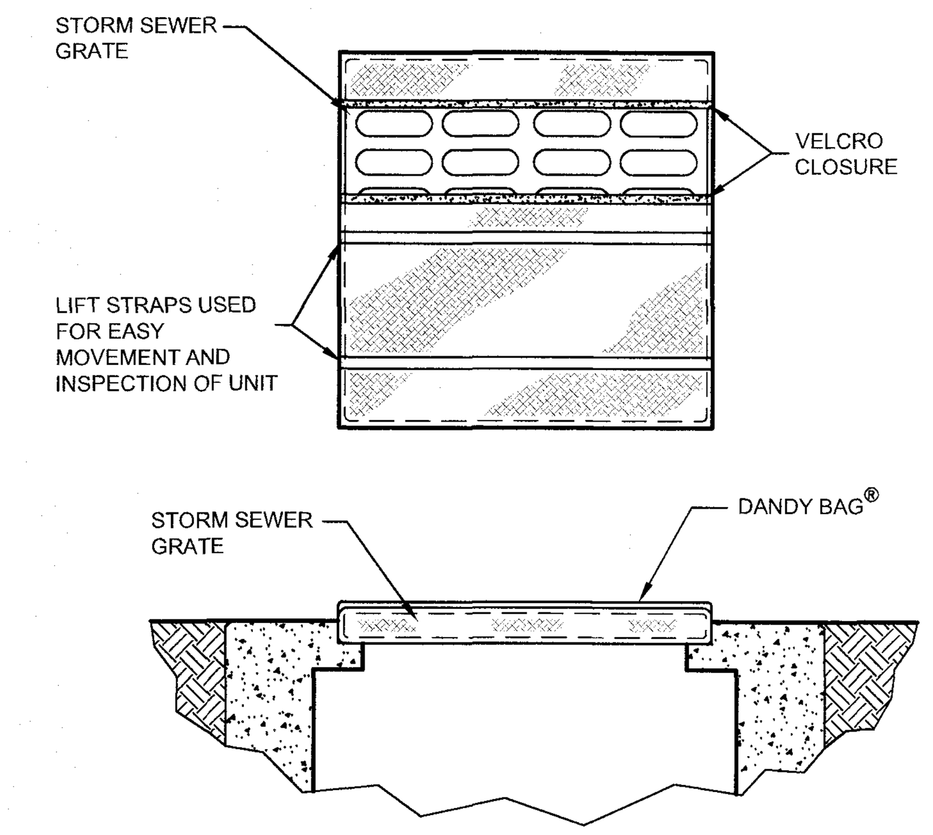
MAINTENANCE:

MUD AND SOIL PARTICLES WILL EVENTUALLY CLOG THE VOIDS IN THE CRUSHED STONE AND THE EFFECTIVENESS OF THE CRUSHED STONE PAD WILL NOT BE SATISFACTORY. WHEN THIS OCCURS, THE PAD SHOULD BE TOPDRESSED WITH NEW CRUSHED STONE OR COMPLETE REPLACEMENT OF THE PAD MAY BE NECESSARY WHEN THE PAD BECOMES COMPLETELY CLOGGED.

IF WASHING FACILITIES ARE USED, THE SEDIMENT TRAPS SHOULD BE CLEANED OUT AS OFTEN AS NECESSARY TO ASSURE THAT ADEQUATE TRAPPING EFFICIENCY AND STORAGE VOLUME IS AVAILABLE. VEGETATIVE FILTER STRIPS SHOULD BE MAINTAINED TO INSURE A VIGOROUS STAND OF VEGETATION AT ALL TIMES.

CONSTRUCTION SPECIFICATIONS:

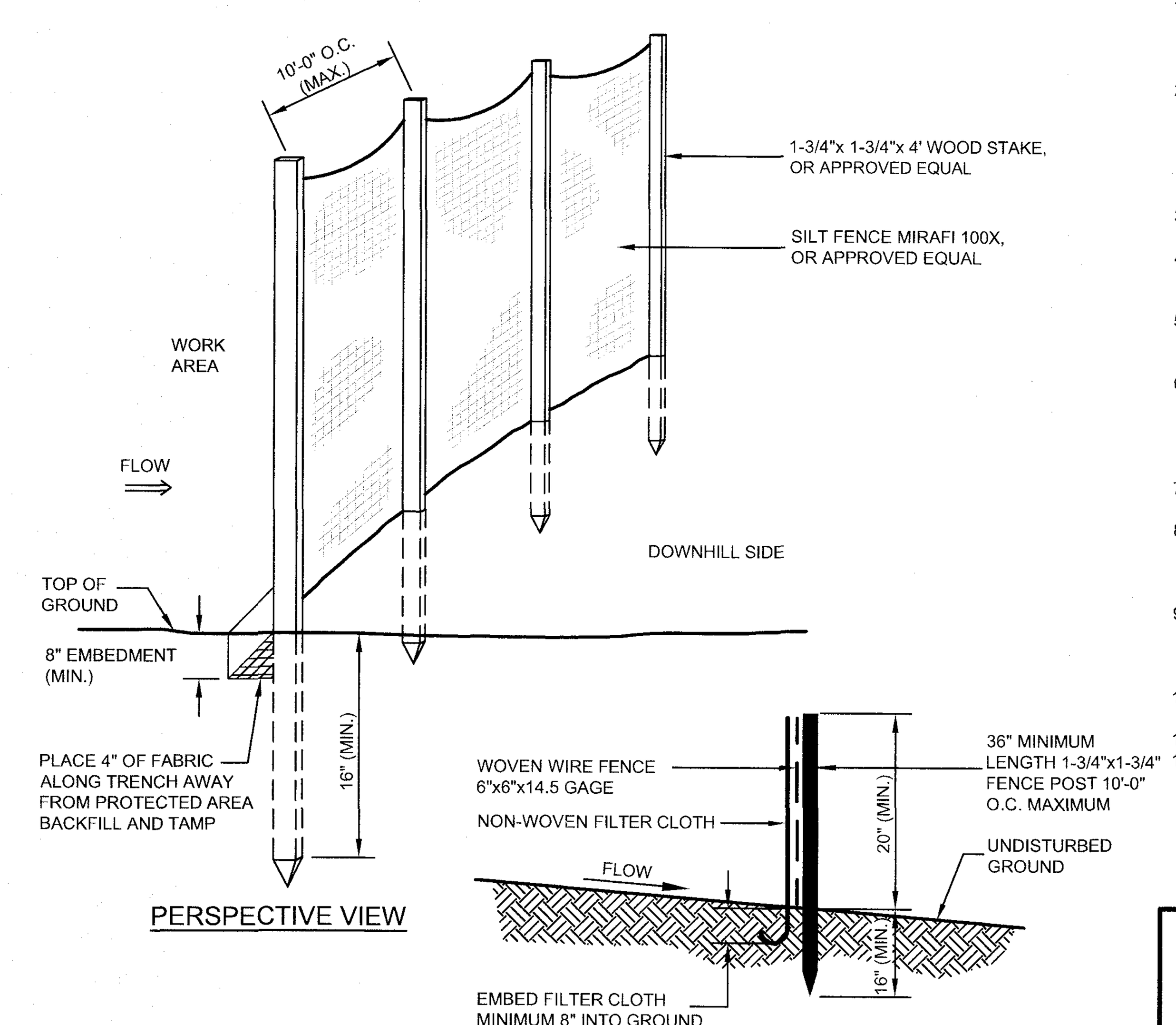
1. STONE FOR A STABILIZED CONSTRUCTION EXIT SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED EXIT SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED EXIT SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE EXIT SHALL NOT BE LESS THAN THE FULL WIDTH OF THE AREA WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY LOT OR DUPLEX.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION EXIT SHALL BE PIPED BENEATH THE EXIT. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE EXIT SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOPDRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY . WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.



HI-FLOW DANDY BAG® (SAFETY ORANGE)

MECHANICAL PROPERTIES	TEST METHOD	UNITS	MARV
GRAB TENSILE STRENGTH	ASTM D 4632	kN (lbs)	1.62 (365) x 0.89 (200)
GRAB TENSILE ELONGATION	ASTM D 4632	%	24 x 10
PUNCTURE STRENGTH	ASTM D 4833	kN (lbs)	0.40 (90)
MULLEN BURST STRENGTH	ASTM D 3786	kPa (psi)	3097 (450)
TRAPEZOID TEAR STRENGTH	ASTM D 4533	kN (lbs)	0.51 (115) x 0.33 (75)
UV RESISTANCE	ASTM D 4355	%	90
APPARENT OPENING SIZE	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
FLOW RATE	ASTM D 4491	1/min/m^2 (gal/min/ft^2)	5907 (145)
PERMITTIVITY	ASTM D 4491	Sec^{-1}	2.1

DANDY BAG®
NOT TO SCALE
(APRIL 2010)



SILT FENCE DETAIL
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS:

1. THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.
2. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.
3. WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIE OR STAPLES WHERE NOTED OR AS DIRECTED BY DESIGN ENGINEER.
4. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MIDSECTION AND BOTTOM.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED.
6. FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG AND DRIVEN A MINIMUM OF 16 INCHES INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

MAINTENANCE:

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

CONSTRUCTION SEQUENCE

1. CONTRACTOR TO NOTIFY DIG-SAFE 72-HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. PRIOR TO GRUBBING OF CLEARED AREAS, ALL SILTATION BARRIERS DESIGNED FOR USE AS TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED AS CALLED FOR ON PROJECT PLANS. INSTALL STABILIZED CONSTRUCTION EXIT AT LOCATION OF CONSTRUCTION ACCESS AT LOCATION OF INTERSECTION WITH EXISTING PAVEMENT.
3. CUT AND CLEAR TREES AND BRUSH FROM CONSTRUCTION AREAS TO THE EXTENT NECESSARY. ALL BRANCHES, TOPS AND BRUSH TO BE PROPERLY DISPOSED OF BY CONTRACTOR. THIS PROJECT IS MANAGED TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.
4. COMPLETE GRUBBING OPERATIONS UNDER THE ROADWAY AND SLOPE SECTIONS . ALL STUMPS AND SIMILAR DEBRIS SHALL BE PROPERLY DISPOSED OF BY CONTRACTOR. ORGANIC MATERIAL SUITABLE FOR USE AS TOPSOIL SHALL BE STOCKPILED IN UPLAND AREAS. ALL STOCKPILES SHALL BE SEEDED WITH WINTER RYE AND, IF NECESSARY, SURROUNDED WITH HAY BALES IN ORDER TO PREVENT LOSS DUE TO EROSION.
5. CONSTRUCT TEMPORARY CULVERTS AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. ALL SUCH CROSSINGS SHALL BE PROTECTED WITH HAY BALE BARRIERS TO LIMIT EROSION. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BEST MANAGEMENT PRACTICES ARE STABILIZED.
6. DO NOT DIRECT RUNOFF TO TREATMENT SWALES UNTIL THE SWALES AND ALL CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
7. STABILIZE ALL DITCHLINES PRIOR TO DIRECTING FLOW INTO THEM, CONSTRUCT DRAINAGE SYSTEM, SEWER AND OTHER SUBSURFACE UTILITIES.
8. PONDS/SWALES MUST BE INSTALLED BEFORE ROUGH GRADING OF THE SITE.
9. COMMENCE CONSTRUCTION OF ROADWAY, PERFORM EXCAVATION ACTIVITIES REQUIRED TO ACHIEVE SUBGRADE ELEVATION. ALL EXCAVATED EMBANKMENTS, DITCHES, SWALES AND ROADWAY CROSS CULVERTS SHALL BE INSTALLED AND STABILIZED. ALL SWALES AND DITCHLINES SHALL BE PROTECTED FROM EROSION BY IMPLEMENTATION OF HAY BALE SILTATION FENCES AS SHOWN ON PROJECT PLANS. DIVERT STORMWATER RUNOFF THROUGH THE USE OF TEMPORARY CULVERTS, OR OTHER MEANS NECESSARY PRIOR TO THE COMPLETIONS OF A FUNCTIONAL STORM DRAINAGE SYSTEM. SLOPES AND EMBANKMENTS SHALL BE STABILIZED BY TRACKING AND TEMPORARY SEEDING WITH WINTER RYE PRIOR TO TURF ESTABLISHMENT. ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO HAVING RUNOFF DIRECTED TO THEM.
10. COMPLETE CONSTRUCTION OF ROADWAY EMBANKMENTS BY ADDING APPROPRIATE BASE MATERIALS GRADED TO PROPER ELEVATION.
11. APPLY TOPSOIL TO ROADWAY SLOPES AND OTHER AREAS DISTURBED BY CONSTRUCTION. TOPSOIL USED MAY BE NATIVE ORGANIC MATERIAL SCREENED SO AS TO BE FREE OF ROOTS, BRANCHES, STONES AND OTHER DELETERIOUS MATERIALS. TOPSOIL SHALL BE APPLIED SO AS TO PROVIDE A MINIMUM OF A 4-INCH COMPACTED THICKNESS. UPON COMPLETION OF TOPSOILING, FINISHED SECTIONS ARE TO BE LIMED, SEEDED AND MULCHED. CONSTRUCTION PERSONNEL SHALL INSPECT COMPLETED SECTIONS OF WORK ON A REGULAR BASIS AND REMEDY ANY PROBLEM AREAS UNTIL A HEALTHY STAND OF GRASS HAS BECOME ESTABLISHED.
12. PERFORM FINE GRADING OF ROADWAY BASE MATERIALS.
13. MAINTAIN, REPAIR AND REPLACE AS NECESSARY TEMPORARY EROSION CONTROL MEASURES UNTIL SUCH TIME AS THE ENTIRE CONSTRUCTION AREA HAS BEEN STABILIZED (A MINIMUM OF ONE WINTER SHALL HAVE PASSED).
14. AFTER STABILIZATION ,REMOVE AND SUITABLY DISPOSE OF TEMPORARY EROSION CONTROL MEASURES.
15. MONITOR CONSTRUCTION ACTIVITIES ON INDIVIDUAL LOTS TO INSURE CONSTRUCTION ACTIVITIES ARE BEING PERFORMED IN SUCH A WAY AS NOT TO ENDANGER THE INTEGRITY OF ROADWAY EMBANKMENTS, STORMWATER SYSTEMS AND UTILITIES. ALL DRIVEWAYS ACROSS DITCHLINES SHALL HAVE CULVERTS INSTALLED IN ACCORDANCE WITH LOCAL REQUIREMENTS.
16. LOT DISTURBANCE , OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.
17. PRIOR TO CONSTRUCTION A STORMWATER PROTECTION PLAN SHALL BE PREPARED PER FEDERAL REGULATRIONS.
18. SINCE THIS SITE WILL DISTURB MORE THAN 5 ACRES AT ONE TIME WEEKLY INSPECTION SHALL OCCUR, AS WELL AS DURING ANY RAIN EVENT IN WHICH 0.5 INCH OF PRECIPITATION OR MORE FALLS WITHIN A 24 HOUR PERIOD, PROVIDED THAT IF THE MONITOR IS UNABLE TO BE PRESENT DURING SUCH A STORM, THE MONITOR SHALL INSPECT THE SITE WITHIN 24 HOURS OF THE RAIN EVENT.
19. A REPORT FOR EACH INSPECTION SHALL BE STAMPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST AND SUBMITTED WITHIN 24 HOURS OF EACH INSPECTION.

EROSION CONTROL NOTES:

1. EXPOSED EARTHWORK SHALL BE CONFINED TO AS LIMITED AN AREA AS IS PRACTICAL AT ANY GIVEN TIME THROUGHOUT THE CONSTRUCTION SEQUENCE. AT NO TIME SHALL MORE THAN FIVE (5) ACRES OF SITE AREA BE IN AN UNSTABLE CONDITION. NO GIVEN AREA OF THE SITE SHALL BE LEFT IN AN UNSTABILIZED CONDITION FOR A PERIOD OF TIME EXCEEDING THIRTY (30) CALENDAR DAYS.
2. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH PROJECT PLANS. IN ADDITION, SIMILAR MEASURES SHALL BE INSTALLED WHERE AND WHEN THE FIELD CONDITION, OR FIELD OPERATION OF THE INDIVIDUAL SITE CONTRACTOR, MAY WARRANT. ALL TEMPORARY EROSION CONTROL MEASURES USED SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER 0.25" OF RAINFALL OR MORE. THEY SHALL BE CLEANED AND MAINTAINED AND OTHERWISE KEPT IN AN EFFECTIVE OPERATING MANNER THROUGHOUT THE CONSTRUCTION PERIOD.
3. ALL DISTURBED AREAS DESIGNATED TO BE TURF, SHALL RECEIVE A MINIMUM APPLICATION OF 4 INCHES OF LOAM (COMPACTED THICKNESS), PRIOR TO FINAL SEEDING AND MULCHING.
4. ALL SWALES AND DITCHLINES SHALL BE PERIODICALLY CLEANED OF DEPOSITED SEDIMENT SO AS TO MAINTAIN AN EFFECTIVE GRADE AND CROSS SECTION. ALL SWALES AND DITCHLINES SHALL BE FULLY STABILIZED PRIOR TO HAVING STORMWATER DIRECTED TOWARDS THEM.
5. IN THE EVENT THAT, DURING CONSTRUCTION OF ANY PORTION OF THIS PROJECT, A WINTER SHUTDOWN IS NECESSARY, THE CONTRACTOR SHALL STABILIZE ALL INCOMPLETE WORK AND PROVIDE FOR SUITABLE METHODS OF DIVERTING RUNOFF IN ORDER TO ELIMINATE SHEET FLOW ACROSS FROZEN SURFACES.
6. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
   - A. BASE COURSE GRAVELS ARE INSTALLED IN AREAS TO BE PAVED;
   - B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   - C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED; OR
   - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
7. DUST SHALL BE CONTROLLED BY THE USE OF WATER AS NECESSARY THROUGHOUT THE CONSTRUCTION PERIOD, IN ACCORDANCE WITH ENV-A 1000.
8. IN NO WAY ARE THOSE TEMPORARY EROSION CONTROL MEASURES INDICATED ON THESE PLANS TO BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR SHALL USE JUDGEMENT IN INSTALLING SUPPLEMENTARY EROSION CONTROL MEASURES WHERE AND WHEN SPECIFIC SITE CONDITIONS AND/OR CONSTRUCTION METHODOLOGIES MAY WARRANT.
9. AREAS HAVING FINISH GRADE SLOPES OF 3 : 1 OR STEEPER, SHALL BE STABILIZED WITH JUTE MATTING WHEN AND IF FIELD CONDITIONS WARRANT, OR IF SO ORDERED. JUTE MATTING INSTALLED TO CONFORM WITH THE RECOMMENDED BEST MANAGEMENT PRACTICE OUTLINED IN VOLUME 3 OF THE NEW HAMPSHIRE STORMWATER MANUAL "EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION."
10. ALL DETENTION PONDS AND TREATMENT SWALES SHALL BE CONSTRUCTED PRIOR TO ANY EARTH MOVING ACTIVITIES THAT WILL INFLUENCE STORMWATER RUNOFF.
11. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
12. ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

CONSTRUCTION DETAILS

AROMA JOE'S

MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:	APPLICANT:
STEVE S. & HSIANG HWA W. PAN 13 KING HENRY DRIVE LONDONDERRY, N.H. 03053 BK. 6281 PG. 776	SCOTT ZIELFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825

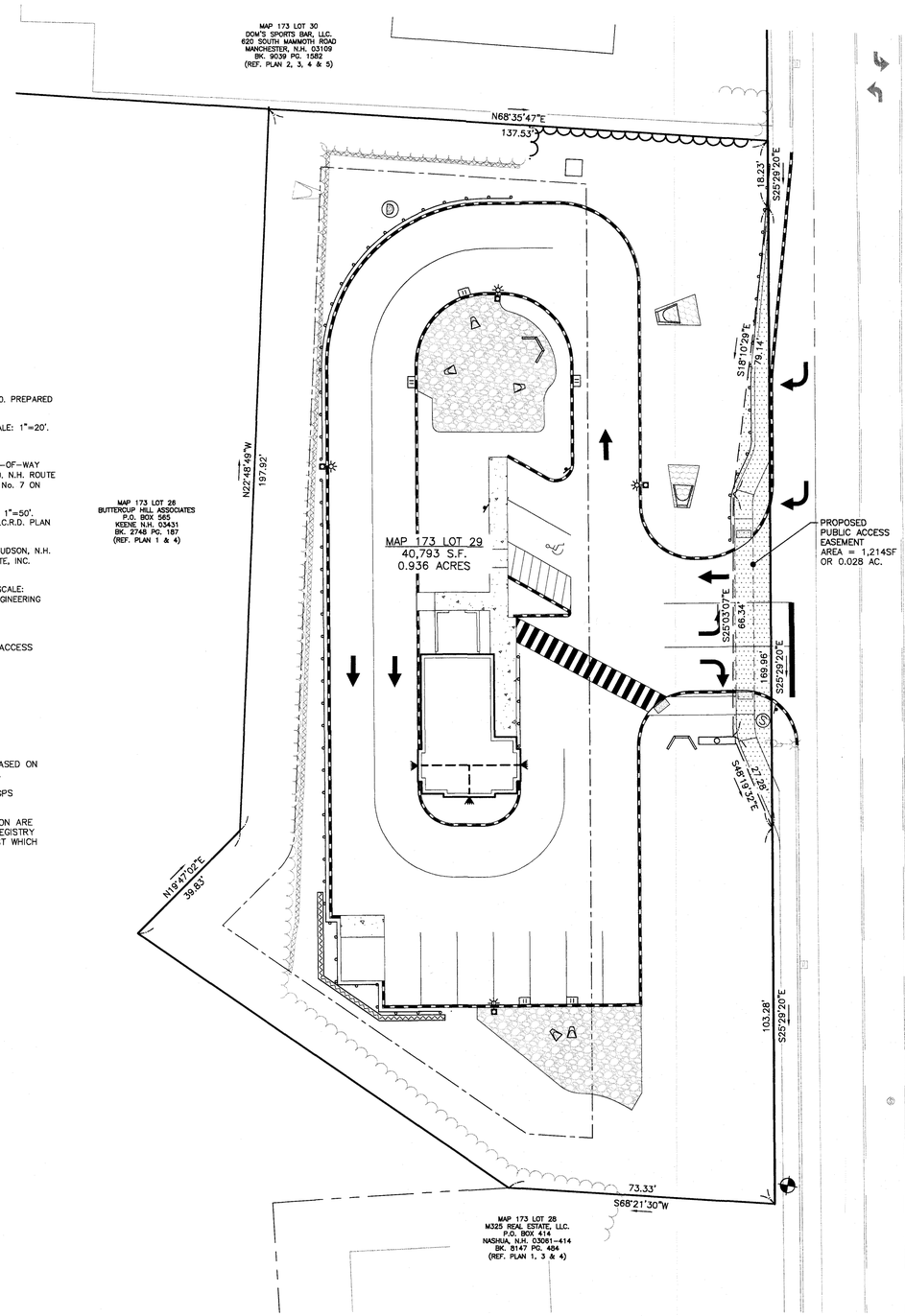
KNA KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627–2881

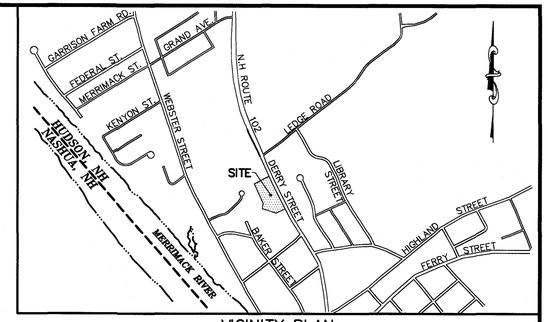
STATE OF NEW HAMPSHIRE – PAUL CHISHOLM No. 15076 LICENSED – PROFESSIONAL ENGINEER

REVISIONS

No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL

DATE: JUNE 22, 2021 SCALE: AS SHOWN
PROJECT NO: 21–0311–1 SHEET 14 OF 14





VICINITY PLAN
SCALE: 1" = 1000'

REFERENCE PLANS

1. "PLAN OF DAW ACRES," HUDSON, N.H. SCALE: 1"=50'. DATED: JUNE, 1960. PREPARED BY: NED SPAULDING H.C.R.D. PLAN #2473
2. "CONSOLIDATION & SUBDIVISION PLAN," DERRY STREET, HUDSON, N.H. SCALE: 1"=20'. DATED: JUNE, 1978. PREPARED BY: A.E. MAYNARD CIVIL ENGINEER. H.C.R.D. PLAN #11484
3. "THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY PLANS FEDERAL AID PROJECT STP-X-0005(216) N.H. PROJECT NO. 12460. N.H. ROUTE 102" REVISED ROW PURCHASE PLANS DATED SEPT . 09, 2005, REVISION No. 7 ON FILE WITH NHDOT, NOT RECORDED.
4. "BOUNDARY & CONSOLIDATION PLAN, HUDSON ELDERLY HOUSING." SCALE: 1"=50'. DATED: SEPTEMBER 12, 1979. PREPARED BY: ALLAN H. SWANSON, INC. H.C.R.D. PLAN #12828
5. "SITE PLAN, PROPOSED RESTAURANT," PIZZA HUT INC. 62 DERRY ROAD HUDSON, N.H. SCALE: 1"=20'. DATED: JUNE, 1978. PREPARED BY: MAYNARD & PAQUETTE, INC. H.C.R.D. PLAN #15190
6. "SITE PLAN, GREEN TEA, 56 DERRY STREET, HUDSON, NEW HAMPSHIRE." SCALE: 1"=20'. DATED: JUNE 7, 2002. PREPARED BY: MAYNARD & PAQUETTE ENGINEERING ASSOCIATES, LLC. H.C.R.D. PLAN #32223

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE PROPOSED PUBLIC ACCESS EASEMENT ON MAP 173 LOT 29 IN THE TOWN OF HUDSON, NEW HAMPSHIRE AS SHOWN HEREON.
2. EXISTING AREA OF PARCEL = 40,793 S.F. OR 0.935 ACRES.
3. OWNER OF RECORD:
   STEVE S. & HSIANG HWA W. PAN
   13 KING HENRY DRIVE
   LONDONDERRY, N.H. 03053
   BK. 6281 PG. 776
4. TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HEREON ARE BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE IN APRIL OF 2021.
5. HORIZONTAL DATUM IS NAD83, VERTICAL DATUM IS NAVD29 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA-OPUS.
6. EASEMENTS, RIGHTS AND RESTRICTIONS SHOWN OR IDENTIFIED HEREON ARE THOSE FOUND DURING RESEARCH AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS. OTHER EASEMENTS, RIGHTS AND RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF THE SUBJECT PREMISES MAY DETERMINE.

LEGEND

⊡ CB-F	GRANITE BOUND FOUND
⊙ IP-F	IRON PIN FOUND
⊙ IP-S W/CAP	IRON PIN SET WITH CAP
	UTILITY POLE
	STREET LIGHT
GV	GAS VALVE
WV	WATER VALVE
S	SEWER MANHOLE
D	DRAINAGE MANHOLE
CB	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
OHU	OVERHEAD UTILITIES
	DRAINAGE LINE
	TREELINE
	RETAINING WALL
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
	SETBACK
	100' RESIDENTIAL BUFFER
	GREEN SPACE BUFFER
	PROPOSED SIGN
	PROPOSED LIGHT
PGV	PROPOSED GAS VALVE
PWV	PROPOSED WATER VALVE
	PROPOSED WOOD GUARDRAIL
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED RETAINING WALL
	PROPOSED VERTICAL GRANITE CURB
	PROPOSED OUTLET STRUCTURE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

EASEMENT PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776

APPLICANT:
SCOTT ZIELFELDER
169 CANAAN BACK ROAD
BARRINGTON, NH 03825

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

DIG SAFE
811 CALL TOLL FREE
811 IT'S THE LAW UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

CERTIFICATION:

Pursuant to RSA 676:18,III and RSA 672:14:
I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

THIS PLAN AND THE SURVEY UPON WHICH IT IS BASED WAS MADE ON THE GROUND UNDER MY DIRECTION AND SUPERVISION BETWEEN APRIL 2021 IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE STATE OF NEW HAMPSHIRE AND THE CITY/TOWN WITHIN WHICH IT IS LOCATED WITH A TRAVERSE ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000. THE SURVEY PERFORMED IS CLASSIFIED AS AN URBAN STANDARD SURVEY, AS CODIFIED IN THE NEW HAMPSHIRE LAND SURVEYORS ASSOCIATION ETHICS AND STANDARDS.

LICENSED LAND SURVEYOR — DATE 8/13/21

KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — No. 903 — ANTHONY M. BASSO — SIGNATURE — DATE

REVISIONS

No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL

DATE: JUNE 22, 2021 — **SCALE:** 1"=20'
PROJECT NO: 21-0311-1 — **SHEET** E1 **OF** E1