



TOWN OF HUDSON

Planning Board

Timothy Malley, Chairman

Marilyn McGrath, Selectmen Liaison



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

PUBLIC MEETING – SEPTEMBER 8, 2021

The Town of Hudson Planning Board will hold a regularly scheduled meeting on Wednesday, September 8, 2021 at 7:00 p.m. in the “Buxton Community Development Conference Room” at Town Hall. The following items will be on the agenda:

- I. CALL TO ORDER BY CHAIRPERSON AT 7:00 P.M.
- II. PLEDGE OF ALLEGIANCE
- III. ROLL CALL
- IV. SEATING OF ALTERNATES
- V. MINUTES OF PREVIOUS MEETING(S)
 - 25 August 2021 Meeting Minutes – Decisions
- VI. OLD BUSINESS
 - A. S.L. Chasse Steel Site Plan 201 Robinson Road
 SP# 03-21 Map 105/Lot 017-002
 Purpose of Plan: to show a proposed industrial building totaling 22,500 SF and associated parking.
 - B. S.L. Chasse Steel Site Plan 199 Robinson Road
 SP# 04-21 Map 105/Lot 017-003
 Purpose of plan: to show three (3) proposed industrial buildings totaling 50,400 SF and associated parking.
 - C. S.L. Chasse Steel Conditional Use Permit 201 & 199 Robinson Road
 CUP# 07-21 Map 105/Lots 17-2 & 17-3
 Purpose of Plan: to show public water connection from the existing stub approximately 900 feet north of the site to lots 17-2 & 17-3. Application acceptance & hearing.
 - D. Aroma Joe’s Site Plan 56 Derry Street
 SP# 08-21 Map 173/Lot 29
 Purpose of Plan: to propose a drive-thru coffee shop with associated parking and drives.
 Application acceptance & hearing.
- VII. OTHER BUSINESS
 - A. Discussion on zoning amendment workshops for Fall 2021.
- VIII. ADJOURNMENT

Comments may be submitted in writing until 10:00 a.m. on the Tuesday prior to the day of the meeting.

Brian Groth
Town Planner

POSTED: Town Hall, Library, Post Office & Web – 8/27/21



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

MINUTES/DECISIONS OF THE PLANNING BOARD MEETING DATE: AUGUST 25, 2021

In attendance = X	Alternate Seated = S	Partial Attendance = P	Excused Absence = E
Tim Malley Chair <input checked="" type="checkbox"/>	Ed Van der Veen Vice-Chair <input checked="" type="checkbox"/>	Elliott Veloso Secretary <input checked="" type="checkbox"/>	Jordan Ulery Member <input type="checkbox"/>
Dillon Dumont Member <input checked="" type="checkbox"/>	William Collins Member <input checked="" type="checkbox"/>	Victor Oates Alternate <input type="checkbox"/>	Leo Fauvel Alternate <input checked="" type="checkbox"/>
David Morin Select. Rep. <input checked="" type="checkbox"/>	Marilyn McGrath Alt. Select Rep. <input type="checkbox"/>	Brian Groth Town Rep. <input checked="" type="checkbox"/>	

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- I. CALL TO ORDER BY CHAIRPERSON AT 7:00 P.M.
 - II. PLEDGE OF ALLEGIANCE
 - III. ROLL CALL
 - IV. SEATING OF ALTERNATES

Mr. Fauvel seated for Mr. Ulery.

V. MINUTES OF PREVIOUS MEETING(S)

- 28 July 21 Meeting Minutes – Decisions

Mr. Dumont moved to accept 28 July 21 Meeting Minutes (as written/amended).

Motion seconded by Mr. Collins. All in favor – motion carried 6/0/0.

VI. NEW BUSINESS

- A. Plante Driveway Conditional Use Permit
CUP# 09-21

Wason Road
Map 206/Lot 001-002

Purpose of Plan: to show a proposed driveway crossing in support of a state wetland permit where a conditional use permit is also required from the town due to impacting the 50-foot wetlands buffer.

Mr. Dumont recused himself from this application.

Mr. Van der Veen moved to accept the conditional use permit application for the Plante Driveway Application, CUP# 09-21, on an unnumbered lot on Wason Road, Map 206/Lot 001-002.

Motion seconded by Mr. Collins. All in favor – motion carried 6/0/0.

Public input opened @ 7:06 p.m.

Caitlin Hamm, 8 Pasture Drive – Concerns about the vernal stream that runs through her yard onto the Plante parcel that since the construction of the driveway, no longer flows and is backing up into her yard causing an increase in mosquitos and a wet/muddy yard.

Tracy Bloom, 18 Pasture Drive – Not opposed to the new home being built, but concerned about the right-of-way (paper street) being utilized next to her property line as the access.

Susan Proulx, 20 Pasture Drive – Does not support any driveway being placed in the right-of-way. Feels it would be disruptive with construction and effect their quality of life.

Doug Gagnon, 19 Pasture Drive – Opposed to the road going in on the right-of-way. Lights from the cars would shine right on his house. The road is already in despair.

Andrew Bernard, 131 Wason Road – Is there going to be a “fan” at the end of the driveway? Concerned about the driveway being at the bottom of the hill and people go down that hill at 40 – 50 MPH. Concerned for the owner pulling out onto Wason.

Bob St. Cyr, 8 Wende Drive – Concerned about the driveway going through the wetland buffer. Looking for mitigation on his daughters property @ 8 Pasture Drive.

Mark & Susan Chase, 6 Pasture Drive (Not in attendance – written letter to the board) – Wants to ensure pipes are situated at current elevation to not disrupt the current natural flow of water to ensure there is no backup of water flow to abutting properties. Close proximity to property line and removal of nature buffer (tree line). To help ease the disturbance of construction activity, we would suggest preserving existing trees or planting trees along stone wall near abutter property line.

Public input closed @ 7:21 p.m.

Mr. Collins moved to approve the conditional use permit for the Plante Driveway Application on an unnumbered lot on Wason Road, Map 206/Lot 001-002 consisting of the plan entitled: Tax Map 206 Lot 1-2 Wetland Permit Plan; prepared by S&H Land Services, LLC, 141 Londonderry Tpke., Hooksett, NH; prepared for Marco Plante, Wason Road, Hudson, New Hampshire; consisting of a single sheet with general notes 1-6 dated July 8, 2021, last revised August 5, 2021; subject to, and revised per, the following stipulations:

1. All stipulations of approval shall be incorporated into the Notice of Decision, which shall be recorded at the HCRD, together with the Plan.
2. A cost allocation procedure (CAP) amount of \$5,880 per single-family residential unit, or \$5,133 per residential unit within a duplex (or two-family structure) shall be paid prior to the issuance of a Certificate of Occupancy for the new house lot.
3. 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 Land Use Development, confirming that the driveway conforms to the Plan approved by the Planning Board.
4. Prior to the Planning Board endorsement of the Plan, it shall be subject to final administrative review by Town Planner and Town Engineer.
5. Construction activities involving the subject lot shall be limited to the hours between 7:00 A.M. and 7:00 P.M. No exterior construction activities shall be allowed on Sundays.

Stipulations proposed by Conservation Commission:

6. Construction and restoration shall comply with Best Management Practices set forth in New Hampshire Storm Water Manual Volume 3: Erosion and Sediment Control
7. During construction and restoration erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer.
8. The Town Engineer or his representative shall be allowed to inspect the boundaries of the wetland and wetland buffer areas during construction and report any finding to the applicant and the Conservation Commission for remediation.
9. The applicant will file a Dredge and Fill permit application with the NHDES per Title L, Water Management and Protection Chapter 482-A.
10. The wetland buffer boundary shall be identified and marked prior to the start of construction per Hudson Zoning Ordinance, Article IX §334-35 (E.).
11. “No Cut/No Disturb” signage shall be installed along the wetland buffer boundary prior to issuing Certificates of Occupancy per Hudson Zoning Ordinance, Article IX §334-35 (E.).
12. Stockpiling of construction materials is not allowed in the wetland buffer areas during construction.
13. Shoulder reduction along impact area shall be reduced to one-foot on either side of the driveway along the wetlands, wetland buffer area, and wetland crossing.

Motion seconded by Mr. Veloso. All in favor – motion carried 6/0/0.

VII. OLD BUSINESS

- A. S.L. Chasse Steel Conditional Use Permit 201 & 199 Robinson Road
CUP# 07-21 Map 105/Lots 17-2 & 17-3

Purpose of Plan: to show public water connection from the existing stub approximately 900 feet north of the site to lots 17-2 & 17-3. Application acceptance & hearing.

Mr. Collins moved to continue the public hearing for the Conditional Use Permit for S.L. Chasse Steel at 199 & 201 Robinson Road, Map 105/Lots 017-002 & 017-003 to date certain, September 8, 2021.

Motion seconded by Mr. Dumont. All in favor – motion carried 6/0/0.

- B. S.L. Chasse Steel Site Plan 201 Robinson Road
SP# 03-21 Map 105/Lot 017-002

Purpose of Plan: to show a proposed industrial building totaling 22,500 SF and associated parking.

Mr. Collins moved to continue the public hearing for the Site Plan Applications for S.L. Chasse Steel at 199 & 201 Robinson Road, Map 105/Lots 017-002 & 017-003 to date certain, September 8, 2021. All in favor – motion carried 6/0/0.

Motion seconded by Mr. Dumont. All in favor – motion carried 6/0/0.

- C. S.L. Chasse Steel Site Plan 199 Robinson Road
SP# 04-21 Map 105/Lot 017-003

Purpose of plan: to show three (3) proposed industrial buildings totaling 50,400 SF and associated parking.

Mr. Collins moved to continue the public hearing for Site Plan Applications for S.L. Chasse Steel at 199 & 201 Robinson Road, Map 105/Lots 017-002 & 017-003 to date certain, September 8, 2021. All in favor – motion carried 6/0/0.

Motion seconded by Mr. Dumont. All in favor – motion carried 6/0/0.

- D. Aroma Joe's Site Plan 56 Derry Street
SP# 08-21 Map 173/Lot 29

Purpose of Plan: to propose a drive-thru coffee shop with associated parking and drives. Application acceptance & hearing.

Mr. Veloso moved to continue the public hearing for the site plan application for Aroma Joe's at 56 Derry Street; Map 173/Lot 029-000, to date certain, September 8, 2021.

Motion seconded by Mr. Dumont. All in favor – motion carried 6/0/0.

VIII. OTHER BUSINESS

A. Master Plan – Historic Resources and Community Facilities Chapters.

Mr. Groth introduced the draft chapters for Community Facilities and Historic Resources and requested that Board members email him their feedback and suggestions over the coming weeks. Once Board members feels they have had adequate time to review these drafts, they will be reviewed and potentially adopted at a future meeting.

B. Request to establish a bond for Granite Heights Subdivision by Elvis Dhima, Town Engineer.

Mr. Dumont moved to establish a performance surety in the amount of \$463,086.60 for the Granite Heights Subdivision, Map 161/Lot 029, in its entirety, and in accordance with the written recommendation of the Town Engineer, Elvis Dhima’s Interoffice Memo on file, dated August 20, 2021, together with the Road Guarantee Estimate Form. Note: said surety shall be established in the form of a Hampton-style letter of credit or cash deposit held by the Town.

Motion seconded by Mr. Van der Veen. All in favor – motion carried 6/0/0.

C. Planning Board Applications -Proposed language change to revision submission deadline.

The following information is required to be filed with the Planning Department ***no later than 10:00 A.M., Tuesday ONE WEEK prior to the scheduled Planning meeting. The purpose of these materials is hardcopy distribution to Planning Board members, not review. Any plan revisions that require staff review must be submitted no later than 10:00A.M., Tuesday TWO WEEKS prior to the scheduled Planning meeting. Depending on the complexity of changes, more time may be required for review. Please contact the Town Planner if you have any questions on this matter.***

Mr. Dumont moved to approve the revised application language as presented concerning submittal deadlines.

Motion seconded by Mr. Van der Veen. All in favor – motion carried 6/0/0.

IX. ADJOURNMENT

Motion to adjourn by Mr. Dumont. Seconded by Mr. Veloso. All in favor – motion carried 6/0/0.

Meeting adjourned at 8:23 p.m.

Elliott Veloso
Secretary

These minutes are in draft form and have not yet been approved by the Planning Board.

Note: Planning Board minutes are not a transcript. For full details on public input comments, please view the meeting on HCTV (Hudson Community Television).

S.L. CHASSE STEEL – 201 ROBINSON ROAD

SITE PLAN APPLICATION #03-21

STAFF REPORT #4

September 8, 2021

SITE: 201 Robinson Road; Map 105 Lot 17-2

ZONING: General-One (G-1)

PURPOSE OF PLANS: To show one proposed industrial building totaling 22,500 SF (including 300 SF office space) and associated parking on Robinson Road.

PLANS UNDER REVIEW: Non-residential Site Plan, S.L. Chasse Steel, Map 105 Lot 17-2, Robinson Road, Hudson, New Hampshire; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3, Bedford, New Hampshire 03110; prepared for Steel Properties, LLC, 8 Christine Drive, Hudson, New Hampshire 03051; consisting of 13 sheets plus a cover page, with general notes 1-38 on Sheet 1; dated April 6, 2021, last revised August 30, 2021.

Note: Included in this packet is revised Sheet 5 showing fire suppression storage tanks.

ATTACHMENTS:

- A. Third Round of Peer Review of SP #03-21 by Fuss & O'Neill, dated August 30, 2021
- B. Third Round of Peer Review of Drainage for both SP #03-21 and #04-21, dated August 30, 2021.
- C. CAP Fee worksheet.
- D. Revised Traffic Study, prepared by TEPP, received August 30, 2021.

APPLICATION TRACKING:

- April 7, 2021 – Site Plan applications received.
- May 28, 2021 – Conditional Use Permit application received.
- June 1, 2021 – Revised plans received.
- June 9, 2021 – Public hearing scheduled, SP applications accepted, continued to June 23, 2021.
- June 23, 2021 – Public hearing scheduled, applicant requested continuance to July 28, 2021.
- July 28, 2021 – Public hearing scheduled, applicant requested continuance to August 25, 2021.
- August 17, 2021 – Revised plan sets received.
- August 25, 2021 – Public hearing scheduled.

WAIVER REQUESTS

The Applicant is seeking relief from two land use regulations:

- §276-11.1.B(12) – requires a 200-foot buffer between residential and industrial uses. The revised plan set shows a limited amount of parking area within approximately 50-feet of the buffer (~150 away from residential property line).
- §276-11.1.B(25) – This regulation permits the Planning Board to allow access ways across side lot lines. This enables the application to connect to the Owner’s neighboring Lot 17-3 which is the subject of SP #04-21.

COMMENTS:

FIRE SUPPRESSION SUPPLY

Upon conferring with the Fire Department and Engineering Department, we have found the following:

1. The total fire suppression need to cover both sites is 60,000 gallons/hour for 3 hours, or 180,000 gallons
2. Our consultant’s conservative estimate is that 500 gallons/minute are available, equating to 90,000 gallons over 3 hours.
3. This leaves a gap of 90,000 gallons.
4. 3x 30,000 gallon tanks would cover the supply gap for both sites.
5. Engineering requests an offsite improvement, a surge valve, in order to ensure the 500 gallons/minute is available from town supply. The Town would handle installation.

Additionally, during final design of the sprinkler systems for the respective buildings, if a “quick-response” system is designed and built; further forgiveness on the fire flow may become available. This has the potential to reduce the needs described above. Accordingly, this may mean starting the building permit review prior to recording the final Mylar in order to determine the final tank design.

A revised plan sheet has been provided showing proposed tank locations, if necessary.

(Draft Motions on the follow pages)

DRAFT MOTIONS

To GRANT a waiver:

I move to grant a waiver from §276-11.1.B(12), to reduce the residential buffer to 100-feet, based on the Board’s discussion, the testimony of the Applicant’s representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion by: _____ Second: _____ Carried/Failed: _____

To GRANT a waiver:

I move to grant a waiver from §276-11.1.B(25), to allow access across the side lot line between lot 17-2 and Lot 17-4, based on the Board’s discussion, the testimony of the Applicant’s representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion by: _____ Second: _____ Carried/Failed: _____

CONTINUE the public hearing to a date certain:

I move to continue the public hearing for the conditional use permit application and site plan applications for S.L. Chasse Steel at 199 and 201 Robinson Road; Map 105 Lot 17-3 and Lot 17-2 to date certain, _____, 2021.

Motion by: _____ Second: _____ Carried/Failed: _____

APPROVE the site plan application:

I move to approve the site plan for Non-residential Site Plan, S.L. Chasse Steel, Map 105 Lot 17-2, Robinson Road, Hudson, New Hampshire; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3, Bedford, New Hampshire 03110; prepared for Steel Properties, LLC, 8 Christine Drive, Hudson, New Hampshire 03051; consisting of 13 sheets plus a cover page, with general notes 1-38 on Sheet 1; dated April 6, 2021, last revised September 2, 2021.; subject to, and revised per, the following stipulations:

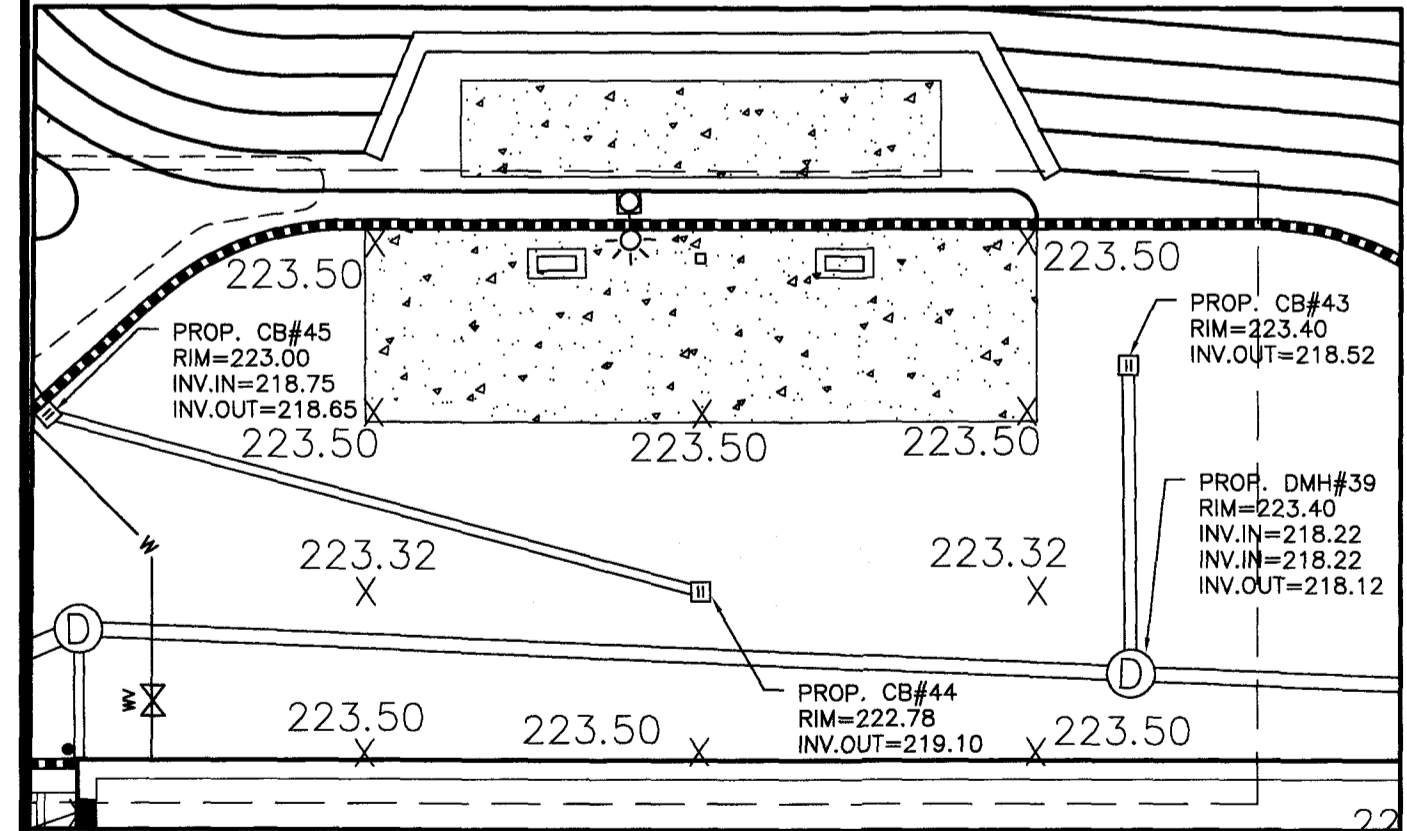
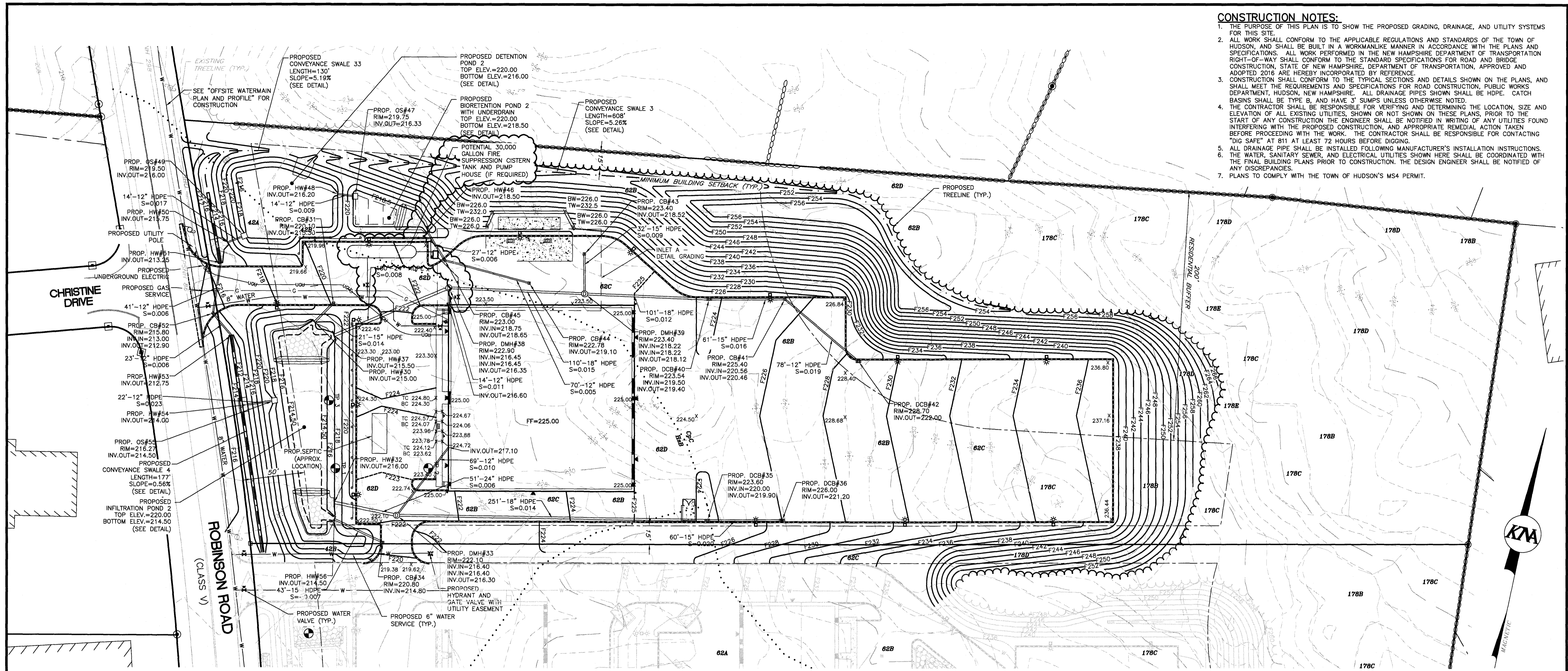
1. All stipulations of approval shall be incorporated into the Notice of Decision and the Development Agreement, which shall be recorded at the HCRD, together with the Plan.
2. All improvements shown on the Plan shall be completed in their entirety and at the expense of the applicant or the applicant’s assigns.
3. A cost allocation procedure (CAP) amount of \$31,050 shall be paid prior to the issuance of a Certificate of Occupancy.

4. An offsite improvement, a Surge Valve for the Route 102 Booster Station, is necessitated by this application in tandem with SP #04-21. This shall be coordinated with the Engineering Department.
5. Prior to the issuance of a Certificate of Occupancy, an L.L.S. Certified “as-built” site plan shall be provided to the Planning Department, confirming that the site conforms to the Plan approved by the Planning Board.
6. The final design and size of the fire suppression water supply tanks shall be subject to the Fire Department’s determination. The final Plan will reflect the needs identified during the building permit review process, which may begin prior to recording of the Plan. A building permit will not be issued until the Plan is recorded.
7. Prior to the Planning Board endorsement of the Plan, it shall be subject to final administrative review by Town Planner and Town Engineer.
8. The applicant shall schedule a pre-construction meeting with the Town Engineer prior to applying for a building permit.
9. Construction activities involving the subject lot shall be limited to the hours between 7:00 A.M. and 7:00 P.M. No exterior construction activities shall be allowed on Sundays.
10. Blasting or ramming activities shall be limited to the hours between 9:00 A.M and 5:00 P.M, Monday through Friday. Blasting activities are prohibited on Saturday and Sunday.

Motion by: _____ Second: _____ Carried/Failed: _____

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. CATCH BASINS SHALL BE TYPE B, AND HAVE 3' SUMPS UNLESS OTHERWISE NOTED.
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 M54 PERMIT.



INSET A - DETAIL GRADING
SCALE: 1" = 20'

LEGEND

GB-F	GRANITE BOUND FOUND	OHU	PROPOSED OVERHEAD UTILITIES
IPIN-F	IRON PIN FOUND	UGU	PROPOSED UNDERGROUND UTILITIES
DH-F	DRILL HOLE FOUND	G	PROPOSED GAS LINE
	UTILITY POLE	W	PROPOSED WATER LINE
	PROPOSED SIGN	S	PROPOSED SEWER LINE
	PROPOSED LIGHT		PROPOSED DRAINAGE LINE
	PROPOSED HYDRANT		PROPOSED TREELINE
	PROPOSED WELL		PROPOSED EDGE OF PAVEMENT
	PROPOSED SEWER MANHOLE		PROPOSED VERTICAL GRANITE CURB
	PROPOSED DRAINAGE MANHOLE		PROPOSED SLOPED GRANITE CURB
	PROPOSED CATCH BASIN		PROPOSED BITUMINOUS CURB
	PROPOSED OUTLET STRUCTURE		PROPOSED 2' CONTOUR
	ABUTTER LINE		PROPOSED SWALE
	PROPERTY LINE		PROPOSED RETAINING WALL
	WETLAND		PROPOSED STONEWALL
	GUARDRAIL		EASEMENT
	OVERHEAD UTILITIES		SITE LIGHTING
	DRAINAGE LINE		BUILDING WALL PACK LIGHTING
	TREELINE		TEST PIT
	EDGE OF PAVEMENT		
	STONEWALL		
	BUILDING SETBACK		
	ZONE LINE		
	10' CONTOUR		
	2' CONTOUR		

SITE SPECIFIC SOIL MAP UNIT KEY

SYMBOL	MAP UNIT	SLOPE CLASS	DRAINAGE CLASS	HSG
42A	CANTON SANDY LOAM	0-3%	WELL DRAINED	B
42B	CANTON SANDY LOAM	3-8%	WELL DRAINED	B
42C	CANTON SANDY LOAM	8-15%	WELL DRAINED	B
42D	CANTON SANDY LOAM	15-25%	WELL DRAINED	B
62A	CHARLTON FINE SANDY LOAM	0-3%	WELL DRAINED	B
62B	CHARLTON FINE SANDY LOAM	3-8%	WELL DRAINED	B
62C	CHARLTON FINE SANDY LOAM	8-15%	WELL DRAINED	B
62D	CHARLTON FINE SANDY LOAM	15-25%	WELL DRAINED	B
178B	CHARLTON-CHATFIELD COMPLEX (60-40)	3-8%	WELL DRAINED	B
178C	CHARLTON-CHATFIELD COMPLEX (60-40)	8-15%	WELL DRAINED	B
178D	CHARLTON-CHATFIELD COMPLEX (60-40)	15-25%	WELL DRAINED	B
178E	CHARLTON-CHATFIELD COMPLEX (60-40)	25-50%	WELL DRAINED	B
444A	NEWFIELDS FINE SANDY LOAM	0-3%	MODERATELY WELL DRAINED	B
444B	NEWFIELDS FINE SANDY LOAM	3-8%	MODERATELY WELL DRAINED	B
444C	NEWFIELDS FINE SANDY LOAM	8-15%	MODERATELY WELL DRAINED	B
444D	NEWFIELDS FINE SANDY LOAM	15-25%	MODERATELY WELL DRAINED	B

THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOILS SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, PRODUCED BY A CERTIFIED SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCE CONSERVATION SERVICE. THERE IS A NARRATIVE REPORT THAT ACCOMPANIES THIS MAP AND MAP KEY.

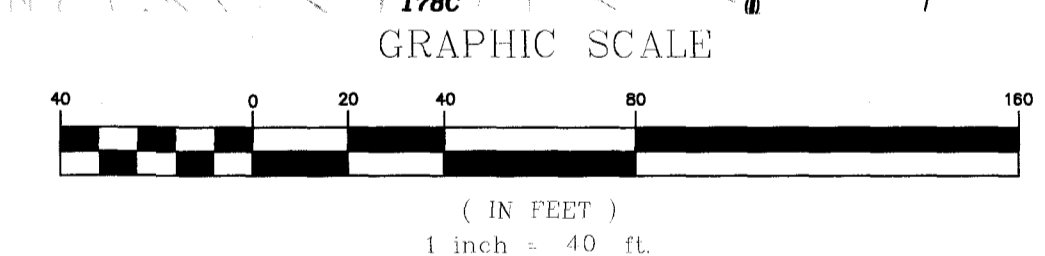
SCS SOIL MAP UNIT KEY

SYMBOL	MAP UNIT	SLOPE CLASS
CpB	CHATFIELD-HOLLIS-CANTON	3-8%
CpC	CHATFIELD-HOLLIS-CANTON	8-15%
HsB	HINCKLEY LOAMY SAND	3-8%
PIA	PIPESTONE LOAMY SAND	0-3%

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



LOAM & SEED ALL DISTURBED AREAS (TYP.)

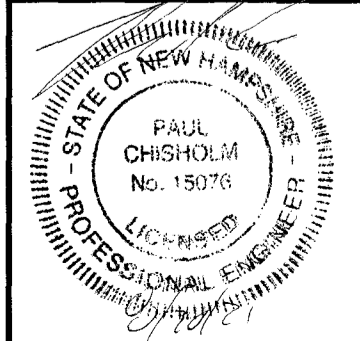


GRADING, DRAINAGE & UTILITY PLAN

S.L. CHASSE STEEL
MAP 105 LOT 17-2
ROBINSON ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD/APPLICANT:
STEEL PROPERTIES, LLC
8 CHRISTINE DRIVE
HUDSON, N.H. 03051
H.C.R.D. BK. 9327 PG. 197

KMA 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	05/12/21	TOWN COMMENTS	SCV
2	08/17/21	TOWN AND AOT COMMENTS	SCV
3	08/30/21	ADD FIRE CISTERN	SCV

DATE: APRIL 6, 2021 SCALE: 1" = 40'
PROJECT NO: 20-0921-2 SHEET 5 OF 16

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.



August 30, 2021

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

Re: Town of Hudson Planning Board Review
SL Chasse Steel Site Plan, Robinson Road
Tax Map 105 Lot 17-2; Acct. #1350-532
Reference No. 20030249.2020

Dear Mr. Groth:

Fuss & O'Neill (F&O) has reviewed the third submission of the materials received on August 17, 2021, related to the above-referenced project. 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.

Please note that comments related to the proposed development at lot 17-3 will be forwarded with a separate letter. Also, the stormwater design documents provided as part of the review package incorporate both lots, so our drainage related comments have been provided separately.

Previous review comments that did not require further action or input have been removed from this letter for brevity/clarity.

The following items have outstanding issues:

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

- a. **Former/Current Fuss & O'Neill Comment:** HR 193.10.E. The applicant has shown sight distances of 400 feet for the proposed driveway on the plan set. We note that the site line is very close to the existing grade at Station 1+00 and that it does not take into account snow or vegetation. The applicant should review the need to modify this area to better account for seasonal obstructions.

5. Utility Design/Conflicts

- b. *Former Fuss & O'Neill Comment:* HR 275-9.E. *The applicant has not shown the existing well or septic system on the plans. / The applicant has stated that they have not been located and will be decommissioned. The applicant should provide the information or review the need for a waiver.*

Current Fuss & O'Neill Comment: The applicant has shown the existing well on the plan and noted it is to be decommissioned. The applicant should review the need for a waiver from showing the existing septic on the plan.

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Massachusetts
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Mr. Brian Groth
August 30, 2021
Page 2 of 4

- c. *Former Fuss & O'Neill Comment: The applicant did not provide any information about the fuel pumping area or the underground tanks typically associated with the pumps. / The applicant has stated that they are in the process of design for the tanks.*

Current Fuss & O'Neill Comment: The applicant has stated that the fuel pump area has been revised and is in the process of being designed and permitted by others.

- e. *Former Fuss & O'Neill Comment: The applicant should review with the Hudson Fire Department whether hydrants should be installed along the proposed water main on Robinson Road. If required, hydrants shall meet the requirements of Hudson Engineering Technical Guidelines section 825.4.10.*

Current Fuss & O'Neill Comment: The applicant has stated they are working with the Town on fire protection. We note that a hydrant detail has been provided on the plan set.

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

- b. *Former Fuss & O'Neill Comment: HR 275-9.G. The applicant has not provided any information or details related to sizing or containment design for the fuel pumps, nor provided any information about state and local permitting for these structures.*

Current Fuss & O'Neill Comment: The applicant has noted that the fuel pumps are in the process of being designed.

The following items require Town evaluation or input:

1. Site Plan Review Codes (HR 275)

- a. *Former Fuss & O'Neill Comment: Hudson Regulation (HR) 275-6.I. The scope of this review does not include the adequacy of any fire protection provisions for the proposed buildings. Fuss & O'Neill defers to the Hudson Fire Department for review of proposed fire protection for this facility. We note that the site is proposed to be serviced by a private well. The Town should review the need for an onsite cistern depending on the well capacity.*

Current Fuss & O'Neill Comment: The applicant has stated that they are coordinating with the Town and the Fire Department.

2. Administrative Review Codes (HR 276)

- b. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(6) The owner's signature is not shown on the plan set.*

Current Fuss & O'Neill Comment: The applicant noted that the owner will sign the final plan.

- c. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(12).(a). The applicant has shown a 100 foot residential buffer setback from adjacent residential lots, but based on the proposed industrial use for the site a 200 foot setback would be required for all buildings, parking or display areas.*

Current Fuss & O'Neill Comment: The applicant has requested a waiver to reduce the buffer to 100 feet.

7. Zoning (ZO 334)

- f. *Former Fuss & O'Neill Comment: ZO 334-36.C.(2). The applicant is proposing installation of a water main along Robinson Road that impacts a wetlands buffer. The applicant should review with the Town to*

Mr. Brian Groth
August 30, 2021
Page 3 of 4

determine if the proposed water main requires a Conditional Use Permit in accordance with the Ordinance.

Current Fuss & O'Neill Comment: The applicant has stated that a Conditional Use Permit had been submitted. No further Fuss & O'Neill comment.

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

1. Site Plan Review Codes (HR 275)

- g. *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. / The applicant has provided a copy of the deed. We note no easements were provided, however, the deed references a State of New Hampshire easement.*

Current Fuss & O'Neill Comment: The applicant has stated that the easement noted affected the lot before the 2020 subdivision and does not affect this parcel. No further Fuss & O'Neill comment.

2. Administrative Review Codes (HR 276)

- f. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(17). We were unable to locate any benchmarks within the Site plan.*

Current Fuss & O'Neill Comment: The applicant has added a benchmark 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 the review package. / The applicant has indicated that the Town has not requested any traffic information, and their understanding is that it is not required to this point. We note that between lots 2 and 3 there are over 130 parking spaces proposed, which may provide traffic impacts that warrant further review.*

Current Fuss & O'Neill Comment: The applicant has submitted a traffic study and our review comments were provided to the Town on August 6, 2021 for the report dated July 23, 2021. Further traffic reviews will be responded to separately.

5. Utility Design/Conflicts

- a. *Former Fuss & O'Neill Comment: HR 275-9.E and 276-13. The applicant has provided a typical septic system detail and shown the approximate septic location. We note that no water or well details were provided. / The applicant has stated that they are currently working on a water connection to the site, and an off-site water main extension plan was provided. We note that water lines are now shown on the site but details, size and materials are not provided.*

Current Fuss & O'Neill Comment:

- d. *Former Fuss & O'Neill Comment: The applicant has provided a water main profile that shows a minimum of 4 feet of cover in some sections. The minimum cover required by the Town of Hudson is 5 feet.*

Current Fuss & O'Neill Comment: The applicant has revised the plan to provide the minimum 5 feet of cover. No further Fuss & O'Neill comment.

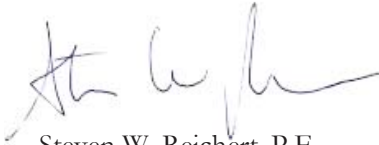
Mr. Brian Groth
August 30, 2021
Page 4 of 4

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

The review of the drainage design and Alteration of Terrain report was provided under separate letters from Fuss & O'Neill dated April 30, 2021, June 14, 2021, and August 30, 2021.

Please feel free to call if you have any questions.

Very truly yours,



Steven W. Reichert, P.E.

**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: 2021.08.30 14:10:50 -0400

SWR:

Enclosure

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



August 30, 2021

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

Re: Town of Hudson Planning Board Review - Stormwater Design Review
SL Chasse Steel Site Plan, Robinson Road
Tax Map 105 Lot 17-2 & 17-3; Acct. #1350-532
Reference No. 20030249.2020

Dear Mr. Groth:

Fuss & O'Neill (F&O) has reviewed the third submission of the materials received on August 17, 2021, related to the above-referenced project. The scope of this review letter is related to stormwater aspects of the project design only. Site plan, subdivision, and other review elements are provided under separate cover.

This review is based on the recently adopted Stormwater Regulations (Chapter 290), Subdivision Regulations (Chapter 289), Site Plan Review Regulations (Chapter 275), Hudson's Engineering Technical Guidelines and Typical Details, and general engineering practices. Due to the combined Alteration of Terrain Application for both lots 17-2 and 17-3, we have included comments for both of those lots as part of the overall stormwater design, and issued these separately from our Site Plan review comments.

Previous review comments that did not require further action or input have been removed from this letter for brevity/clarity.

The following items have outstanding issues:

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

- i. **New Fuss & O'Neill Comment:** The applicant provided revised drainage calculations that only contained the NHDES required 10-year storm calculations. The applicant should provide a copy of (at a minimum) the HydroCAD node listing of the 25-Year and 50-Year revised drainage calculations for Town records.

The following items require Town evaluation or input:

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

- c. *Former Fuss & O'Neill Comment: HR 290-5.A.(5). The applicant has proposed a decrease in stormwater rates from the pre to post conditions in all storms analyzed, however, we do note an increase in stormwater volume in all storms analyzed at Analysis Point A. The applicant should provide additional information and*

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Mr. Brian Groth
 August 30, 2021
 Page 2 of 2

review this volumetric increase with the Town. / As previously noted, the design proposes a decrease in runoff rate, but the design does not meet the Regulation for runoff volumes at all storms analyzed for Analysis Point A. The most recent drainage calculations provided for review (during the first submittal-stamped April 6, 2021), illustrate the following increases in volume at Analysis Point A:

<i>Year Storm Analyzed</i>	<i>Pre-Development Volume (cfs)</i>	<i>Post Development Volume (cfs)</i>
<i>10 year</i>	<i>75,737</i>	<i>94,931</i>
<i>25 year</i>	<i>135,577</i>	<i>161,520</i>
<i>50 year</i>	<i>201,728</i>	<i>230,049</i>

The applicant shall provide additional information and review this volumetric increase with the Town.

Current Fuss & O'Neill Comment: The applicant has offered reasoning for the increased volume from Pre to Post Development at Analysis Point A, and states this meets NHDES AoT regulations. We note the volume of the latest round of drainage calculations provided with this review is slightly greater in volume than the last round of calculations provided. The data provided does not currently meet Town of Hudson Regulations, the applicant shall review this volumetric increase with the Town, to ensure this increase is allowed and whether a waiver is necessary.

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

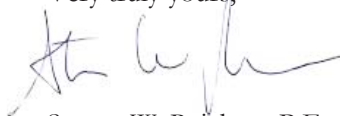
6. Drainage Design/Stormwater Management (HR 275-9.A./Chapter 290)

- f. *Former Fuss & O'Neill Comment: HR 290-7.B.(13). The applicant should provide the certified soil scientist's stamp on the Existing Conditions Plan for each plan set with the final plan submissions. / The applicant has stated that the final plan will be stamped. We recommend the Town make this a Condition of Approval.*

Current Fuss & O'Neill Comment: The applicant has provided the certified soil scientist's stamp on the plan set. No further Fuss & O'Neill comment.

Please feel free to call if you have any questions.

Very truly yours,



Steven W. Reichert, P.E.

Steven W. Reichert, PE

Digitally signed by Steven W. Reichert, PE
 DNI: cn=Steven W. Reichert, PE, c=US, o=Fuss & O'Neill, Inc., ou=Fuss & O'Neill, Inc., email=sreichert@fando.com
 Date: 2021.08.30 14:14:09 -0400

SWR:

Enclosure

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



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: 09-01-21 Zone # 1 Map/Lot: 105/017-002

201 Robinson Rd.

Project Name: S.L. Chasse Steel

Proposed ITE Use #1: Industrial

Proposed Building Area (square footage): 22,500 S.F.

CAP FEES: (ONE CHECK NEEDED)

1.	(Bank 09) 2070-701	Light Industrial (22,500 s.f @ \$1.38 per s.f)	\$ <u>31,050.00</u>
		Total CAP Fee	\$ <u>31,050.00</u>

Check should be made payable to the Town of Hudson.

Thank you,

Brooke Dabowik

Planning Administrative Aide

TRAFFIC IMPACT AND ACCESS STUDY

**ROBINSON ROAD
Hudson, New Hampshire**

Revised August 25, 2021

Prepared for Keach-Nordstrom Associates, Inc.

TRAFFIC-IMPACT AND ACCESS STUDY

**ROBINSON ROAD
Hudson, New Hampshire**

Revised August 25, 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
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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 on Robinson Road opposite Christine Drive
- provide about 72,900 square feet (sf) of light-industrial floor area
- have two driveways along the east side of Robinson Road, with the north driveway opposite Christine Drive and with the south driveway about 250 feet (ft) to the south

STUDY SCOPE

The TIAS study area includes the following unsignalized intersections:

- Robinson Road/Christine Drive/north driveway
- Robinson Road/south 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

Calculated changes in weekday vehicle-trips for the redeveloped site are:

- daily, 329 (total of in and out)
- AM-street-peak hour, 35 (31 in and 4 out)
- PM-street-peak hour, 25 (2 in and 23 out)

CAPACITY ANALYSIS

Capacity analysis shows low delays throughout the study area.

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 on Robinson Road opposite Christine Drive
- provide about 72,900 sf of light-industrial floor area
- have two driveways along the east side of Robinson Road, with the north driveway opposite Christine Drive and with the south driveway about 250 ft to the south

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:

- Robinson Road/Christine Drive/north driveway
- Robinson Road/south 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: Robinson Road/Christine Drive.

Description of the TIAS study area follows.

ROBINSON ROAD

Robinson Road:

- is oriented approximately north-south
- functions as a collector street
- to the north, connects with NH 102 (Derry Road), an arterial highway that leads to the Towns of Londonderry and Derry
- near the site, has a horizontal alignment that includes minor curvature
- near the site, has a vertical alignment that includes minor grades
- has a two-lane cross-section, with one travel lane per direction and paved shoulders
- has asphaltic-cement concrete pavement in overall good condition
- near the site, includes utility poles along the east side
- has nearby commercial development

- is under the jurisdiction of the Town

ROBINSON ROAD/CHRISTINE DRIVE INTERSECTION

The intersection:

- is four legged
- has Robinson Road as the major north-south street
- has Christine Drive as the minor west leg
- has the north driveway as the minor east leg
- has one-lane approaches
- operates as unposted STOP control on the minor-leg approaches
- has commercial development nearby

TRAFFIC VOLUMES

TRAFFIC COUNTS

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

- on Robinson Road south of Christine Drive
- from Tuesday, June 29, to Wednesday, June 30, 2021

The ATR data are in Appendix B.

TEPP LLC obtained turning-movement counts:

- including vehicle classifications, bicycles, and pedestrians
- at the Robinson Road/Christine Drive/north driveway intersection
- on Tuesday, June 29, 2021, from 7:00 to 9:00 AM and from 4:00 to 6:00 PM

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
Robinson Road South of Christine Drive			
Weekday Daily	4,133	---	---
Weekday AM-Street-Peak Hour	303	7.3	61 Northbound
Weekday PM-Street-Peak Hour	375	9.1	51 Southbound

^a Two-way-total volumes.

^b K = hour volume as a percent of daily volume.

Robinson Road near the site frontage showed about:

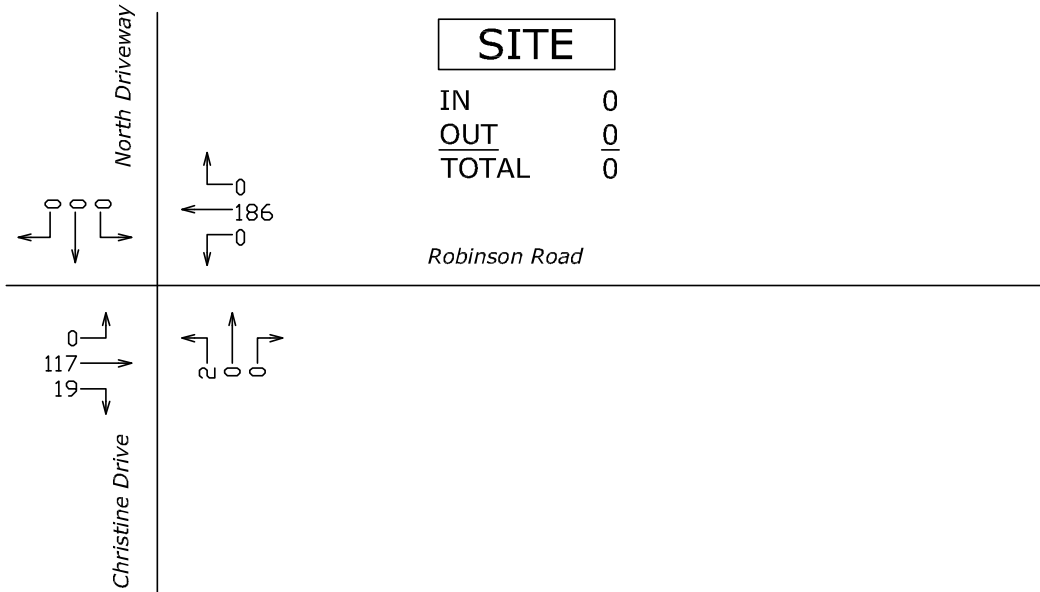
- 4,133 weekday-daily vehicles
- 303 vehicles during the weekday AM street-peak hour, predominantly northbound
- 375 vehicles during the weekday PM street-peak hour, slightly southbound

VEHICLE SPEEDS

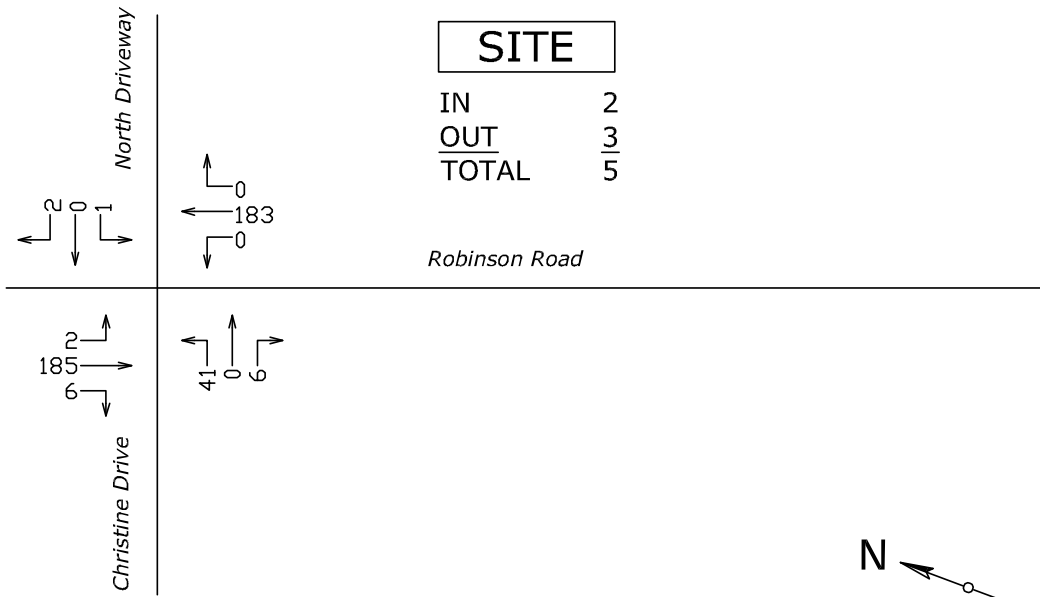
The ATR collected vehicle speeds:

- on Robinson Road south of Christine Drive
- from Tuesday, June 29, to Wednesday, June 30, 2021

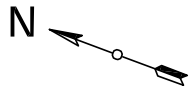
The data are in Appendix D and are summarized in Table 2.



Weekday AM-Street-Peak Hour



Weekday PM-Street-Peak Hour



Not to Scale

Figure 2. 2021 existing traffic volumes.

Table 2. Vehicle speeds.

Location and Direction	Speeds (mph)		
	Speed Limit	Mean ^a	85 th Percentile ^a
Robinson Road South of Christine Drive			
Northbound	---	39.7	44.0
Southbound	---	38.6	42.8

^a From ATR conducted from Tuesday, June 29, to Wednesday, June 30, 2021.

Table 2 indicates that on Robinson Road:

- speed limit was not posted
- the northbound the mean speed was 39.7 mph and the 85th percentile speed was 44.0 mph
- for southbound the mean speed was 38.6 mph and the 85th percentile speed was 42.8 mph

SIGHT DISTANCES

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

- stopping sight distance (SSD)
- optional intersection sight distance (ISD)¹

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

Optional ISD:³

¹ AASHTO, *A Policy on Geometric Design of Highways and Streets*, 7th Edition (Washington, DC, 2018), pages 9-35 to 9-36.

² AASHTO, pages 3-2 to 3-6.

³ AASHTO, pages 9-35 to 9-59.

- 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. Appendix A includes sight-distance plans and profiles.

Table 3. Sight distances.

Intersection, Movements, and View	Available Sight Distance (ft) ^a	Speeds (miles per hour)		
		Limit	SSD Provides For	ISD Provides For
Robinson Road/Christine Drive/North Driveway, for North Driveway Movements				
Robinson Road to/from North	400	30	45+	36+
Robinson Road to/from South	400	30	45+	36+
Robinson Road/Christine Drive/South Driveway, for South Driveway Movements				
Robinson Road to/from North	400	30	45+	36+
Robinson Road to/from South	400	30	45+	36+

^a With appropriate roadside and vegetation maintenance.

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

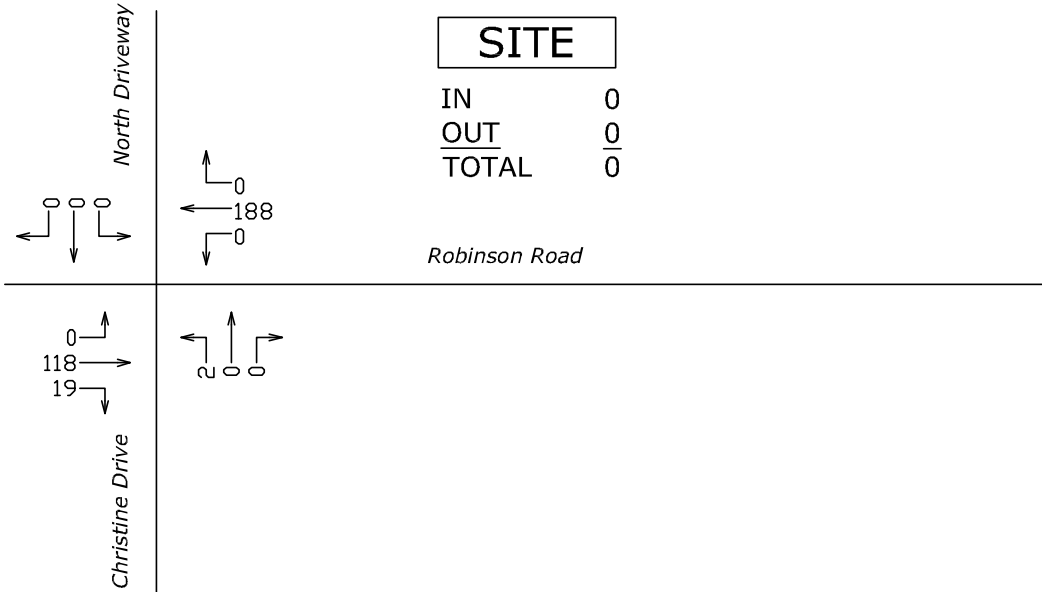
Background-traffic growth:

- 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

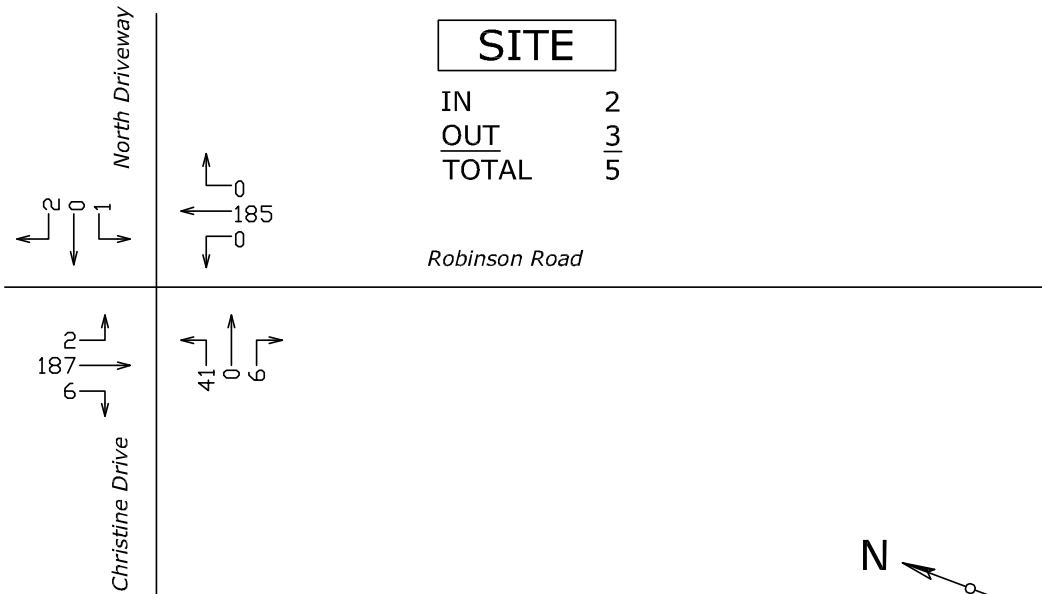
This TIAS uses a 1.0-percent annual growth rate. This yields about 11.6-percent growth between 2021 and 2032.

NO-BUILD TRAFFIC VOLUMES

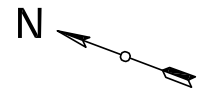
The background-traffic growth described above was applied to 2021 existing traffic volumes. Figures 3 and 4 show 2022 and 2032 no-build traffic volumes.



Weekday AM-Street-Peak Hour

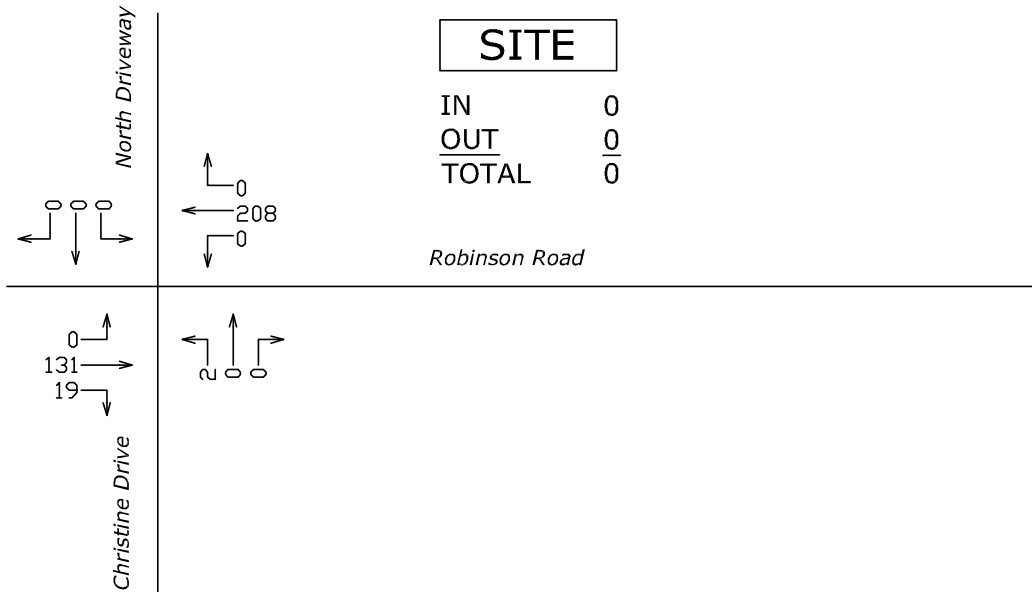


Weekday PM-Street-Peak Hour

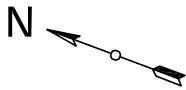
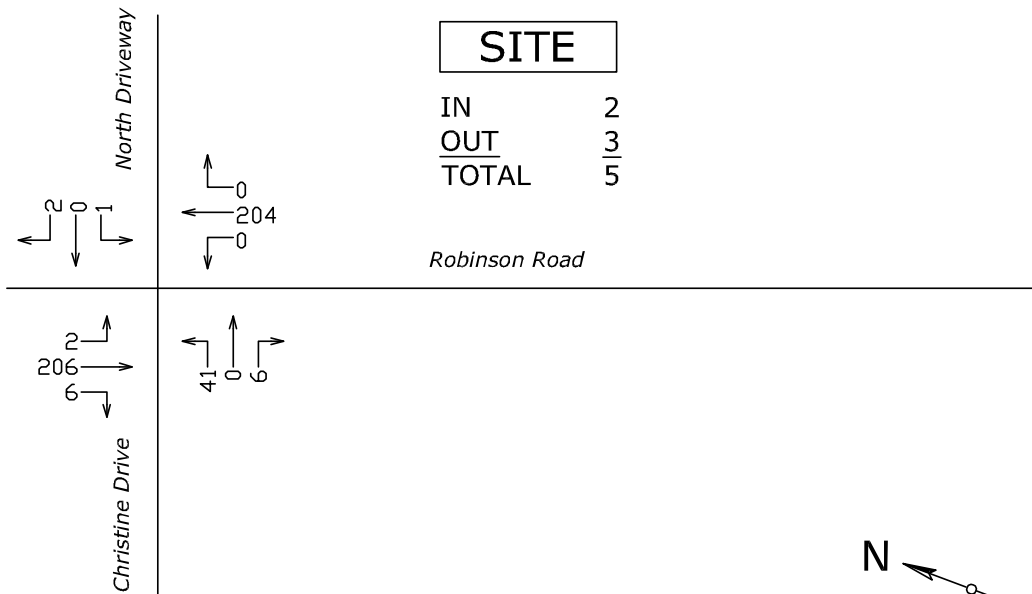


Not to Scale

Figure 3. 2022 no-build traffic volumes.



Weekday AM-Street-Peak Hour



Not to Scale

Weekday PM-Street-Peak Hour

Figure 4. 2032 no-build traffic volumes.

TRIP GENERATION

The Institute of Transportation Engineers (ITE) publishes trip-generation information in the authoritative *Trip Generation Manual*.⁴ This information is based on empirical data for a variety of land uses including general light industrial, land use 110, based on floor area.⁵

Table 4 shows calculated changes in weekday vehicle-trips for the redeveloped site as:

Table 4. Calculated weekday trip generation.

Time Period and Direction	Vehicle-Trips		
	Existing ^a	Future ^b	Difference
Daily	5	334	329
AM-Street-Peak Hour			
In	0	31	31
Out	0	4	4
Total	0	35	35
PM-Street-Peak Hour			
In	2	4	2
Out	3	26	23
Total	5	30	25

^a Based on 2021 existing traffic volumes.

^b Based on ITE, general light industrial, land use 110, 72,900-sf floor area.

- daily, 329 (total of in and out)
- AM-street-peak hour, 35 (31 in and 4 out)
- PM-street-peak hour, 25 (2 in and 23 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

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

⁵ ITE, *Trip Generation Manual*, Volume 2, Data, Industrial (Land Uses 100-199), pages 1 to 19.

site access. Trip distribution and network assignment for this TIAS considered the 2021 existing volumes entering and exiting Christine Drive.

Table 5 and Figure 5 shows trip distribution and network assignment for site trips.

Table 5. Trip distribution and network assignment.	
Road and Direction (To/From)	Approximate Percent
Robinson Road to/from North	87
<u>Robinson Road to/from South</u>	<u>13</u>
Total	100

BUILD TRAFFIC VOLUMES

Site traffic volumes were superimposed on the no-build traffic volumes to estimate build traffic volumes. Figures 6 and 7 show the resulting 2022 and 2032 build traffic volumes.

TRAFFIC-VOLUME CHANGES

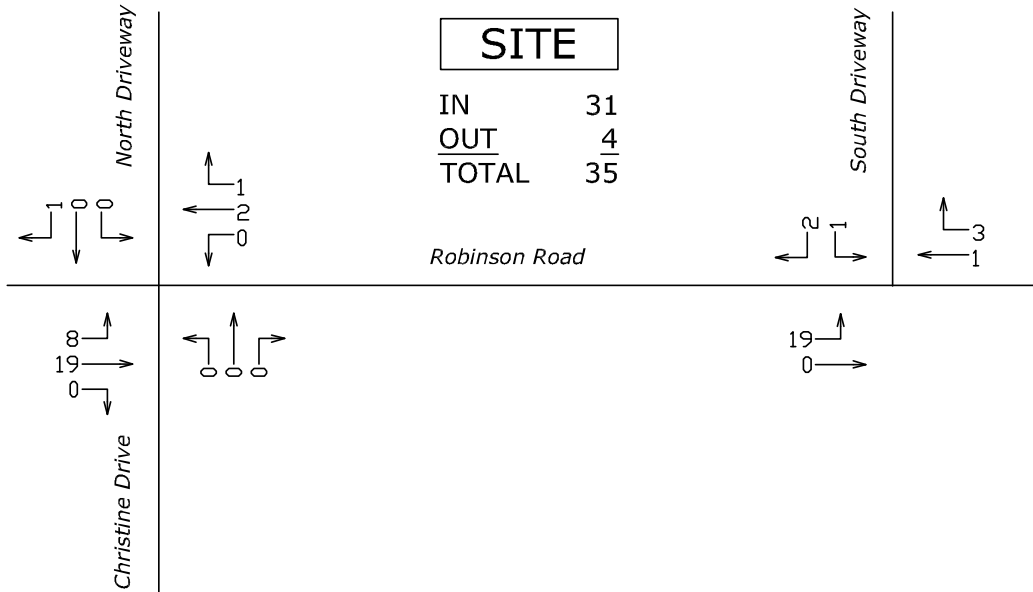
Table 6 presents calculated traffic-volume changes due to the proposed redevelopment for the:

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

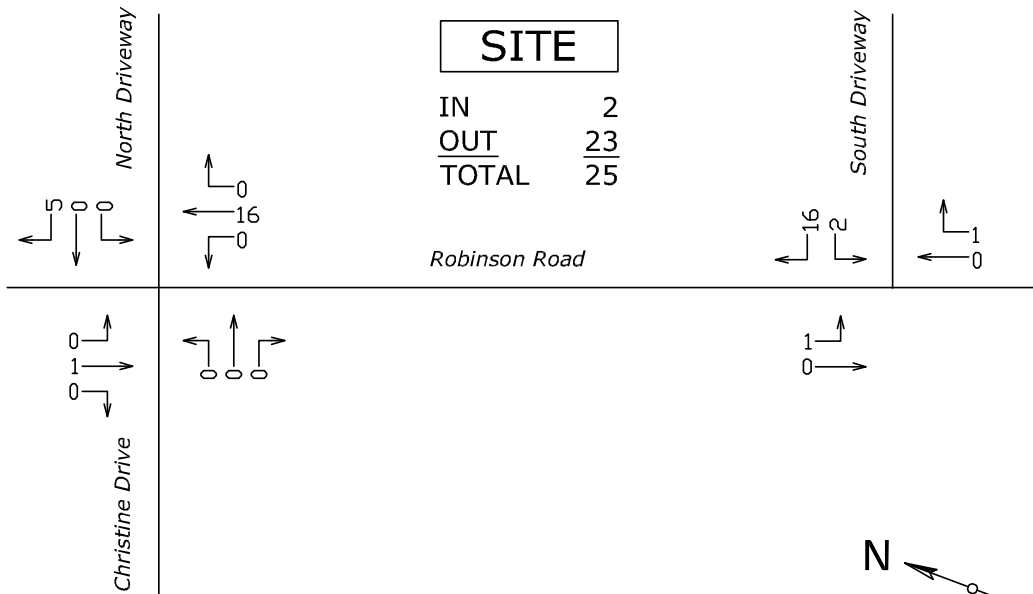
Table 6 shows peak-hour-traffic-volume increases:

- of 3 to 30 vehicle-trips
- constituting averages about one vehicle-trip per 2 to 20 minutes
- that are further split by northbound and southbound direction on Robinson Road

The Derry Road/Robinson Road/West Road signalized intersection is about 1,200 ft north of the Robinson Road/Christine Drive intersection. Traffic-volume increases at the former intersection due to the proposed redevelopment are up to:



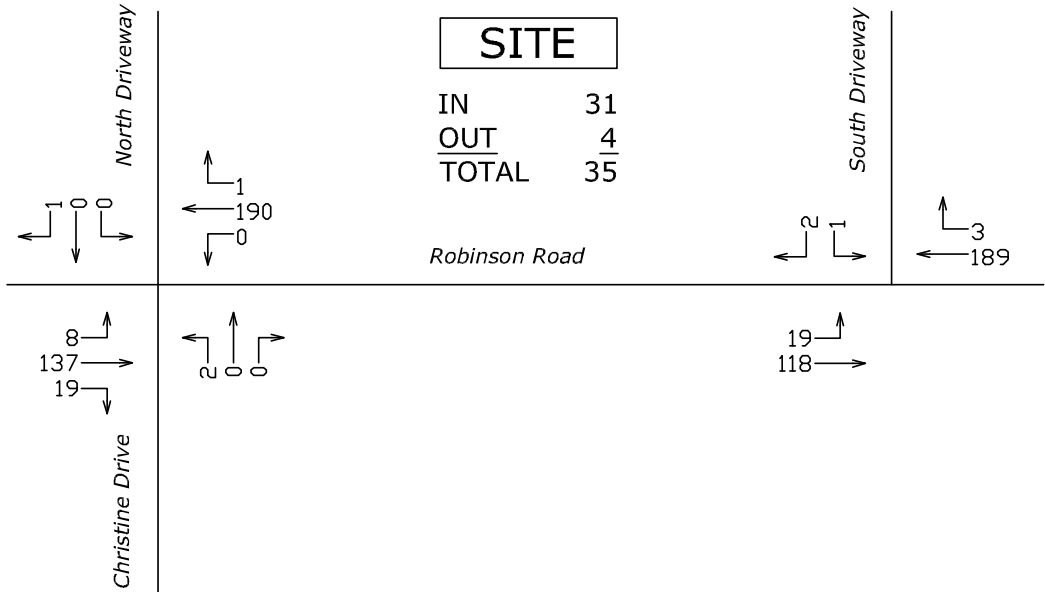
Weekday AM-Street-Peak Hour



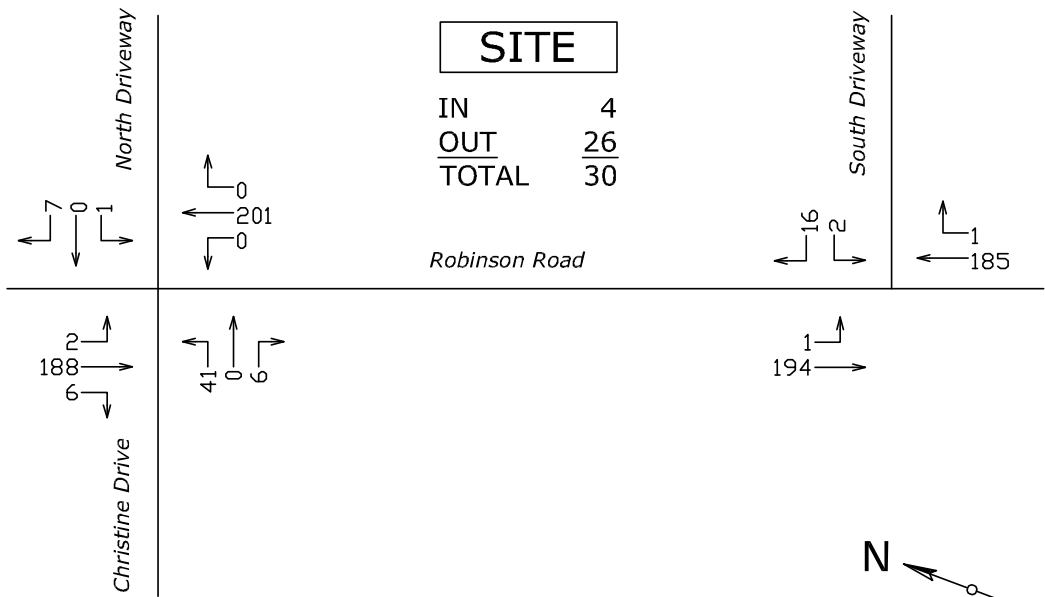
Not to Scale

Weekday PM-Street-Peak Hour

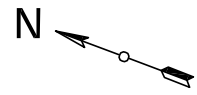
Figure 5. Site traffic volumes added by redevelopment.



Weekday AM-Street-Peak Hour

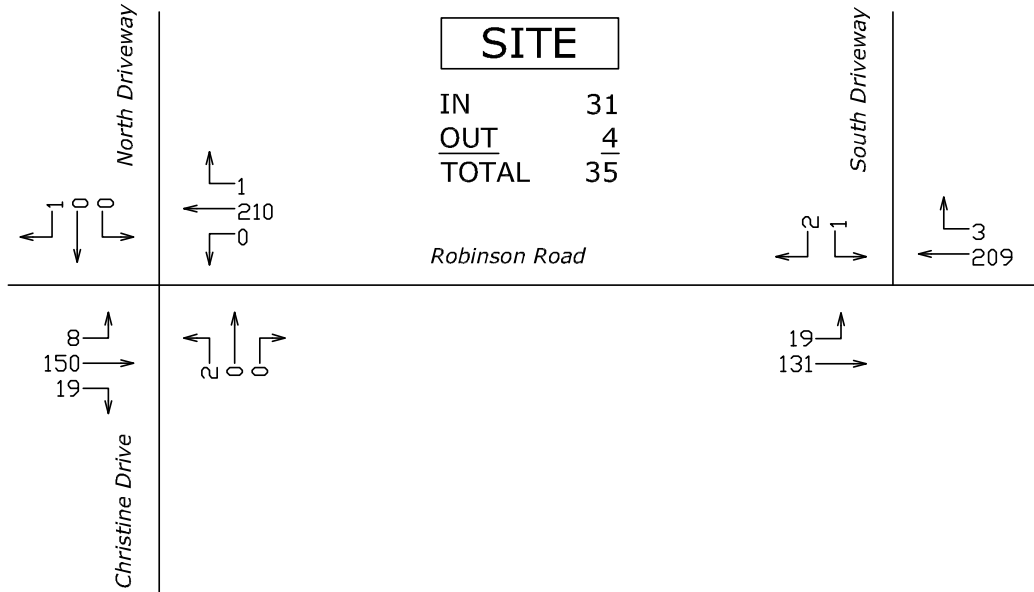


Weekday PM-Street-Peak Hour

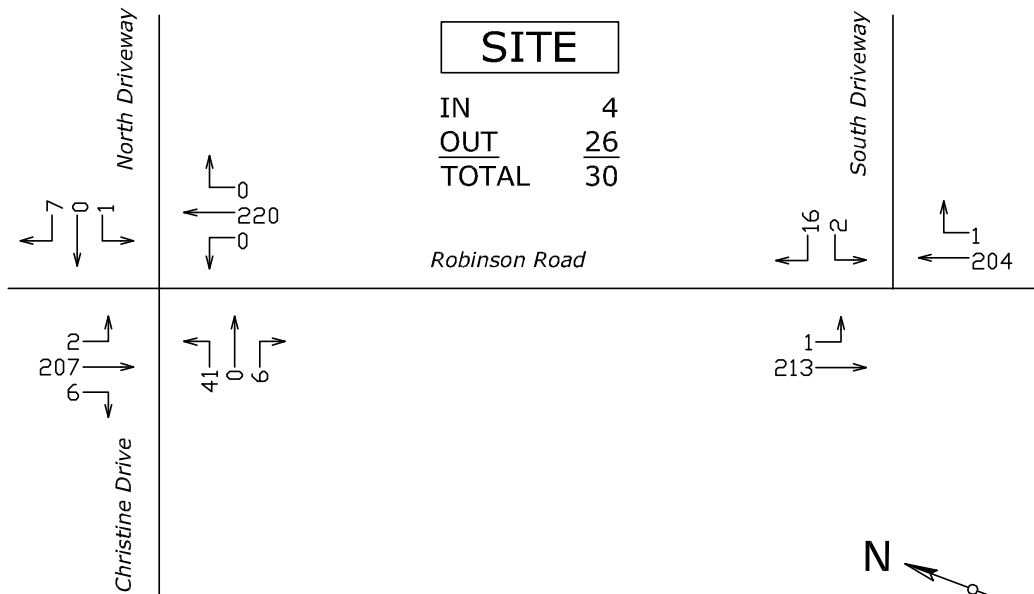


Not to Scale

Figure 6. 2022 build traffic volumes.



Weekday AM-Street-Peak Hour



Not to Scale

Weekday PM-Street-Peak Hour

Figure 7. 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
Robinson Road North of Site						
Weekday AM-Street-Peak Hour	327	357	30	360	390	30
Weekday PM-Street-Peak Hour	423	445	22	461	483	22
Robinson Road South of Site						
Weekday AM-Street-Peak Hour	306	311	5	339	344	5
Weekday PM-Street-Peak Hour	379	382	3	417	420	3

^a Two-way total volumes.

- for the weekday AM-street-peak hour, up to 27 vehicle-trips entering for the site
- for the weekday PM-street-peak hour, up to 21 vehicle-trips leaving the site

This approximates less than one vehicle-trip per signal cycle and constitutes no significant impact. Therefore, no further analysis of the Derry Road/Robinson Road/West Road intersection is warranted.

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)⁶ 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.

⁶ TRB, *Highway Capacity Manual 2000* (Washington DC 2000) and *Highway Capacity Manual 2010* (Washington DC, 2010).

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

Level of Service	Control Delay (seconds/vehicle)	
	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 low delays throughout the study area.

Table 8. Capacity-analysis summary.

Intersection, Control, Hour and Movement	2021 Existing				2022 No Build				2032 No Build				2022 Build				2032 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
Robinson Road/Christine Drive/North Driveway Intersection, Unsignalized, Weekday AM-Street-Peak Hour																				
Robinson Road NB L	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	0.0	0.000	0.0
Robinson Road SB L	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	7.7	0.007	0.0	A	7.7	0.007	0.0
Christine Road EB LTR	B	13.1	0.009	0.0	B	13.1	0.009	0.0	B	13.6	0.010	0.0	B	13.7	0.010	0.0	B	14.3	0.010	0.0
North Driveway WB LTR	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	0.0	0.000	0.0	B	11.5	0.002	0.0	B	11.9	0.002	0.0
Robinson Road/Christine Drive/North Driveway Intersection, Unsignalized, Weekday PM-Street-Peak Hour																				
Robinson Road NB L	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	0.0	0.000	0.0	A	0.0	0.000	0.0
Robinson Road SB L	A	7.6	0.002	0.0	A	7.6	0.002	0.0	A	7.6	0.002	0.0	A	7.7	0.002	0.0	A	7.7	0.002	0.0
Christine Road EB LTR	B	12.9	0.144	0.5	B	12.9	0.145	0.5	B	13.6	0.155	0.5	B	13.4	0.153	0.5	B	14.1	0.163	0.6
North Driveway WB LTR	B	10.3	0.012	0.0	B	10.3	0.012	0.0	B	10.6	0.012	0.0	A	9.9	0.028	0.1	B	10.1	0.029	0.1
Robinson Road/South Driveway, Unsignalized, Weekday AM-Street-Peak Hour																				
Robinson Road SB L	---	---	---	---	---	---	---	---	---	---	---	---	A	7.7	0.016	0.0	A	7.8	0.016	0.0
North Driveway WB LR	---	---	---	---	---	---	---	---	---	---	---	---	A	9.9	0.005	0.0	B	10.1	0.005	0.0
Robinson Road/South Driveway, Unsignalized, Weekday PM-Street-Peak Hour																				
Robinson Road SB L	---	---	---	---	---	---	---	---	---	---	---	---	A	7.6	0.001	0.0	A	7.7	0.001	0.0
North Driveway WB LR	---	---	---	---	---	---	---	---	---	---	---	---	A	9.6	0.025	0.1	A	9.8	0.026	0.1

^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 on Robinson Road opposite Christine Drive
- provide about 72,900 sf of light-industrial floor area
- have two driveways along the east side of Robinson Road, with the north driveway opposite Christine Drive and with the south driveway about 250 ft to the south

TRIP GENERATION

Calculated changes in weekday vehicle-trips for the redeveloped site are:

- daily, 329 (total of in and out)
- AM-street-peak hour, 35 (31 in and 4 out)
- PM-street-peak hour, 25 (2 in and 23 out)

CAPACITY ANALYSIS

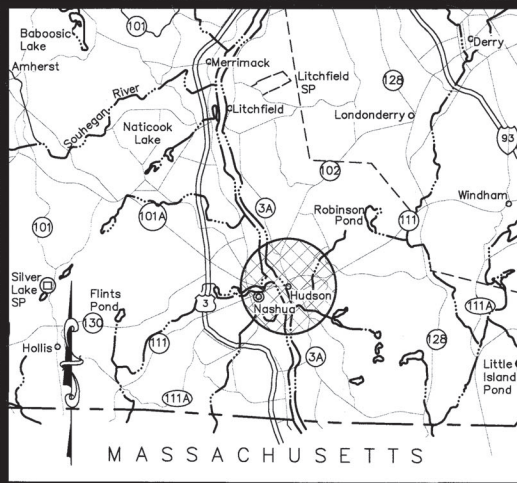
Capacity analysis shows low delays throughout the study area.

TRAFFIC IMPACTS

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

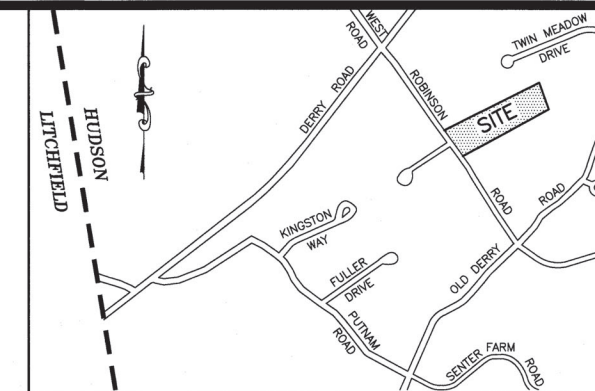
APPENDIX

Appendix A: Project Plan

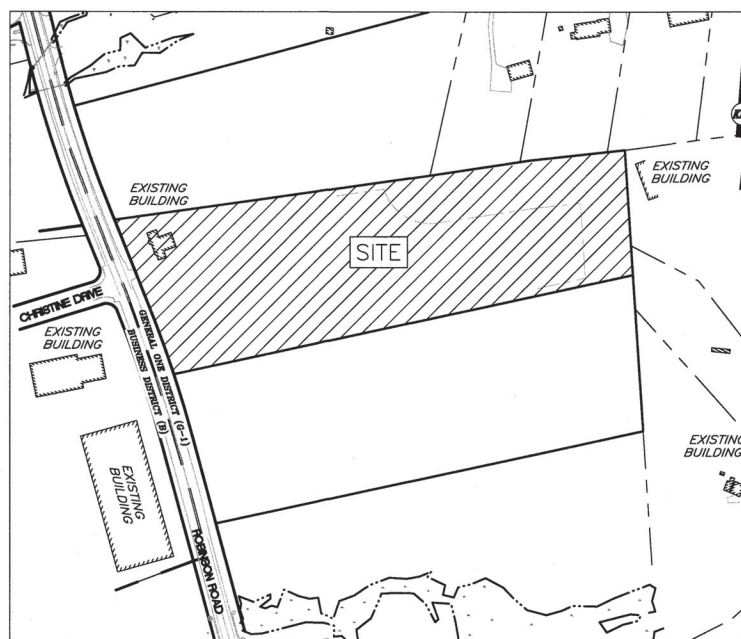


VICINITY PLAN
NOT TO SCALE

NON-RESIDENTIAL SITE PLAN S.L. CHASSE STEEL MAP 105 LOT 17-2 ROBINSON ROAD HUDSON, NEW HAMPSHIRE



LOCUS PLAN
SCALE: 1" = 1,000'



EXISTING FEATURES WITHIN 200 FEET
SCALE: 1" = 200'

LEGEND

	WETLAND
	EDGE OF PAVEMENT
	ZONE BOUNDARY
	PROPERTY LINE
	PROPERTY LINE

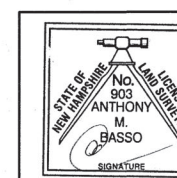
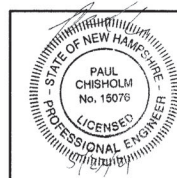
OWNER OF RECORD/APPLICANT:
STEEL PROPERTIES, LLC
8 CHRISTINE DRIVE
HUDSON, NEW HAMPSHIRE 03051

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

SHEET TITLE

SHEET No.

MASTER SITE PLAN	1
EXISTING CONDITIONS PLAN	2
REMOVALS PLAN	3
NON-RESIDENTIAL SITE LAYOUT PLAN	4
GRADING, DRAINAGE & UTILITY PLAN	5
EROSION CONTROL PLAN	6
LANDSCAPE PLAN	7
LIGHTING PLAN	8
SIGHT DISTANCE PLAN & PROFILE	9
CONSTRUCTION DETAILS	10-13



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

APRIL 6, 2021
REVISED MAY 12, 2021
PROJECT NO. 20-0921-2

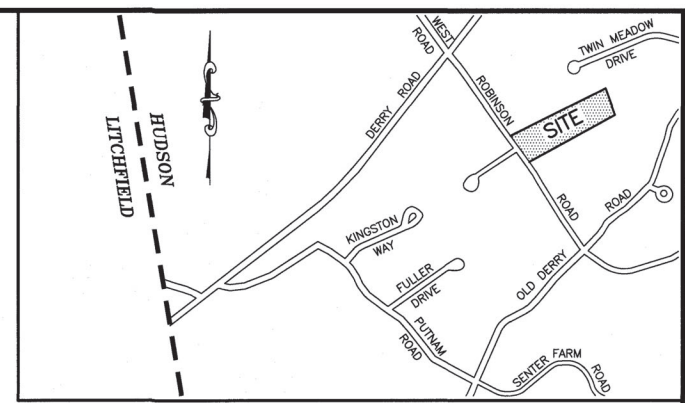
PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL.

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.



LOCUS PLAN
SCALE: 1" = 1,000'

REFERENCE PLANS:

- "SUBDIVISION PLAN, NOURY INVESTMENT, LLC, MAP 105 LOTS 16 & 17, ROBINSON ROAD & OLD DERRY ROAD, HUDSON, NEW HAMPSHIRE, DATED NOVEMBER 20, 2019, WITH REVISIONS THROUGH 05/13/20, PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC. (14 SHEETS). H.C.R.D. PLAN NUMBER: 40605

NOTES:

- THE PURPOSE OF THIS PLAN IS TO SHOW A PROPOSED 22,500 SF INDUSTRIAL BUILDING AND ASSOCIATED PARKING ON ROBINSON ROAD ON MAP 105 LOT 17-2 IN THE TOWN OF HUDSON, NEW HAMPSHIRE, AND NO OTHER PURPOSE.
- MAP 105 LOT 17-2 INDICATES TOWN OF HUDSON TAX ASSESSOR'S MAP AND LOT NUMBER.
- OWNER OF RECORD: STEEL PROPERTIES, LLC. 8 CHRISTINE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 9327 PG. 197
- AREA OF SUBJECT PARCEL = 309,586 SF, OR 7.107 ACRES
- BOUNDARY INFORMATION SHOWN HEREON IS BASED UPON AN ACTUAL FIELD SURVEY PERFORMED BY THIS OFFICE DURING DECEMBER 2009 AND AUGUST 2015.
- HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NGVD29 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA-OPUS.
- THE SUBJECT PARCEL IS LOCATED WITHIN THE GENERAL-ONE (G-1) ZONING DISTRICT. DIMENSIONAL REQUIREMENTS ARE AS FOLLOWS FOR LOTS SERVICED WITHOUT MUNICIPAL SEWER AND WATER:

	REQUIRED	PROPOSED
MINIMUM LOT AREA	97,120 SF	309,586 SF
MINIMUM LOT FRONTAGE	200 FT	345.05 (ROBINSON),
MINIMUM BUILDING SETBACKS:		
FRONT	50 FT	164 FT
SIDE	15 FT	43 FT
REAR	15 FT	679 FT
- PARCEL WILL BE SERVICED BY INDIVIDUAL SEPTIC AND MUNICIPAL WATER.
- THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. KEACH-NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 811.
- THE SUBJECT PREMISES IS NOT LOCATED WITHIN A DESIGNATED FLOOD ZONE AS SHOWN ON FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 330110050B, PANEL 508 OF 701, AND MAP NUMBER 330110050B, PANEL 509 OF 701, EFFECTIVE DATE SEPTEMBER 25, 2009. THE SUBJECT PARCEL IS LOCATED IN ZONES 'A' & 'X'.
- 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.
- OPEN SPACE: REQUIRED = 40%, PROPOSED = 62%
- PARKING CALCULATIONS:**
REQUIRED:
22,200 SF INDUSTRIAL BUILDING = 1 SPACE/600 SF = 37 SPACES
300 SF OFFICE = 1 SPACE/300 SF = 1 SPACE
TOTAL REQUIRED = 38 PARKING SPACES
PROPOSED:
TOTAL PROPOSED = 38 PARKING SPACES (INCLUDING 2 ACCESSIBLE PARKING SPACES)
- LOADING:**
REQUIRED:
1 SPACE/FIRST 5,000 SF + 1 SPACE/10,000 SF x 17,500 SF = 1 + 2 = 3 SPACES
PROVIDED = 3 SPACES

NOTES (CONTINUED):

- SITE LIGHTING SHALL BE AS SHOWN ON THE PLAN, DIRECTED ONTO SITE, AND SHALL CONFORM WITH ALL APPLICABLE TOWN OF HUDSON ZONING REGULATIONS.
- 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.
- HOURS OF REFUSE REMOVAL SHALL BE EXCLUSIVE TO THE HOURS OF 7:00 AM AND 7:00 PM, MONDAY THROUGH SATURDAY ONLY.
- HOURS OF OPERATION: 8:00 AM TO 6:00 PM, MONDAY THROUGH SATURDAY.
- APPROVAL OF THIS PLAN SHALL BE SUBJECT TO FINAL ENGINEERING REVIEW.
- IF LOT DEVELOPMENT INVOLVES BLASTING AND/OR RAMMING OF BEDROCK MATERIALS, SAID ACTIVITIES SHALL BE LIMITED TO THE HOURS BETWEEN 7:00AM AND 5:00PM MONDAY THROUGH FRIDAY ONLY. SAID BLASTING/RAMMING ACTIVITIES SHALL BE PROHIBITED ON WEEKENDS.
- SITE IMPROVEMENTS DEPICTED ON THE PLAN SHALL CONFORM WITH TITLE III OF THE AMERICANS WITH DISABILITIES ACT WITH REGARD TO DIMENSION AND GRADE.
- 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.
- 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.
- IDENTIFICATION SIGNAGE SHALL NOT BE ERRECTED UNTIL APPROVED BY THE BUILDING INSPECTOR AND ZONING ADMINISTRATOR.
- PERMITS REQUIRED:**
-NHDES ALTERATION OF TERRAIN STATUS: PENDING
-NHDES NOTICE OF INTENT PENDING PRIOR TO CONSTRUCTION
-NHDES SUBSURFACE DISPOSAL PENDING
- FLOWED 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 ADJUTING 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.
- ONSITE DRAINAGE SYSTEM SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH NHDES REQUIREMENTS FOR SUCH SYSTEMS.
- 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.
- 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.
- ALL IMPROVEMENTS SHOWN ON THE SITE PLAN-OF-RECORD, INCLUDING NOTES 1-40, SHALL BE COMPLETED IN THEIR ENTIRETY AND AT THE EXPENSE OF THE APPLICANT OR HIS ASSIGNS.
- THE TOWN OF HUDSON SHALL RESERVE THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION.
- IT SHALL BE UNLAWFUL TO MODIFY, CHANGE, 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.
- 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.
- 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.
- ALL PROPOSED BUILDING HEIGHTS ARE UNDER 38'.
- TOTAL AREA OF DISTURBANCE = 223,358 SF.
- THE PROPOSED PROJECT HAS BEEN DESIGNED TO MEET 2018 MS4 REQUIREMENTS.
- WETLAND MAPPING FOR THIS SITE AND SURROUNDING SITES WAS DONE BY WETLAND SCIENTIST JOSHUA BRIEN, NO. 256, IN APRIL OF 2020, REFER TO REFERENCE PLAN NUMBER ONE FOR MORE INFORMATION.
- ALL SIGNS ARE SUBJECT TO APPROVAL BY THE HUDSON PLANNING BOARD PRIOR TO INSTALLATION.
- HR 276-11.1.B(12) A WAIVER IS REQUESTED TO ALLOW PAVEMENT WITHIN THE 200' RESIDENTIAL BUFFER.



LEGEND

	ABUTTER LINE		GRANITE BOUND TO BE SET
	PROPERTY LINE		IRON PIN TO BE SET
	WETLAND		DRILL HOLE TO BE SET
	EDGE OF PAVEMENT		PROPOSED UTILITY POLE
	10' CONTOUR		PROPOSED SIGN
	2' CONTOUR		PROPOSED LIGHT
	BUILDING SETBACK		PROPOSED GAS VALVE
	GREEN SPACE BUFFER		PROPOSED WATER VALVE
	EASEMENT		PROPOSED HYDRANT
	ZONE LINE		PROPOSED CHAIN LINK FENCE
	IRON PIN		PROPOSED BARBED WIRE FENCE
	STONE BOUND		PROPOSED OVERHEAD UTILITIES
	UTILITY POLE		PROPOSED UNDERGROUND UTILITIES
	GAS VALVE		PROPOSED GAS LINE
	WATER VALVE		PROPOSED WATER LINE
	HYDRANT		PROPOSED SEWER LINE
	WATER SHUT OFF		PROPOSED DRAINAGE LINE
	SEWER MANHOLE		PROPOSED TREELINE
	TREELINE		PROPOSED EDGE OF PAVEMENT
			PROPOSED VERTICAL GRANITE CURB
			PROPOSED 2' CONTOUR
			PROPOSED RETAINING WALL
			PROPOSED BITUMINOUS CURB

MAP 105 LOT 27
MARK R. KLEINER &
CHELSEA M. GALLANT
18 TWIN MEADOW DRIVE
H.C.R.D. BK. 9291 PG.
2095

MAP 105 LOT 17-1
NOURY INVESTMENTS, LLC
17 ELMATHANS WAY
HOLLIS, NH 03049
H.C.R.D. BK. 7251, PG. 797

MAP 105 LOT 17-2
309,586 SF
7.107 ACRES

MAP 105 LOT 17-3
STEEL PROPERTIES, LLC
8 CHRISTINE DRIVE
HUDSON, NH 03051
H.C.R.D. BK. 9327 PG. 197

MAP 105 LOT 13
STEEL PROPERTIES, LLC
8 CHRISTINE DRIVE
HUDSON, NH 03051
H.C.R.D. BK. 9177 PG. 305

MAP 105 LOT 12
GNM CORPORATION
172 KINSLEY STREET
NASHUA, N.H. 03060
H.C.R.D. BK. 8137 PG. 1409

OWNER OF MAP 105 LOT 17-2

SIGNATURE: _____
DATE: _____

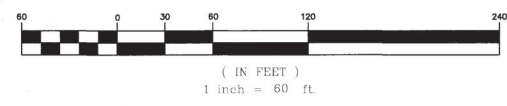
PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL.

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.

GRAPHIC SCALE



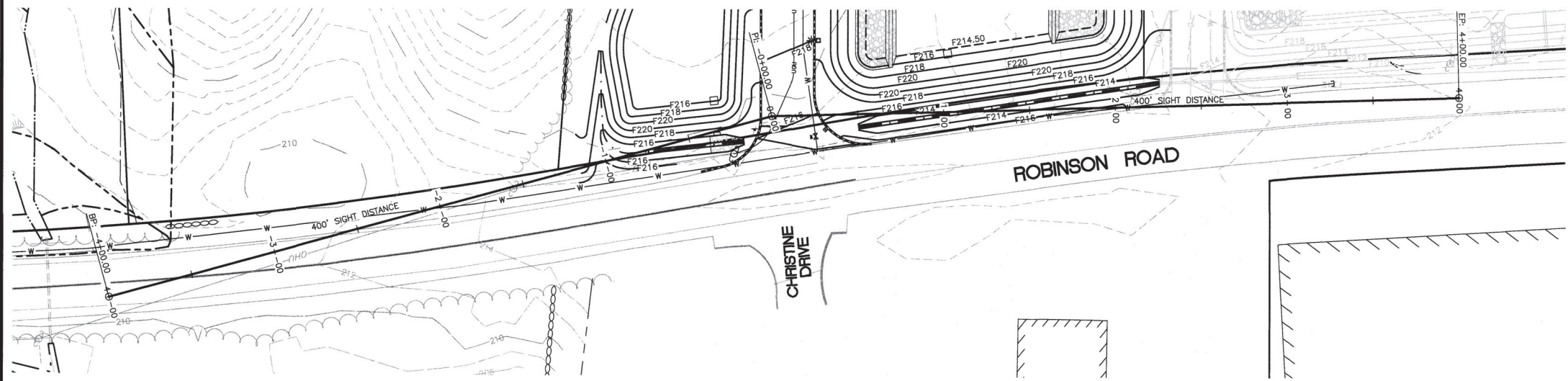
CERTIFICATION:

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. FURTHER, THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY MADE ON THE GROUND BY THIS OFFICE DURING DECEMBER 2009 AND AUGUST OF 2015. SAID SURVEY HAS AN ERROR OF CLOSURE BETTER THAN ONE PART IN TEN THOUSAND (1:10,000).

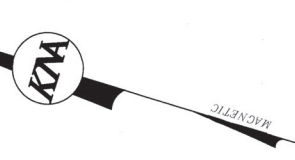
LICENSED LAND SURVEYOR _____ DATE _____



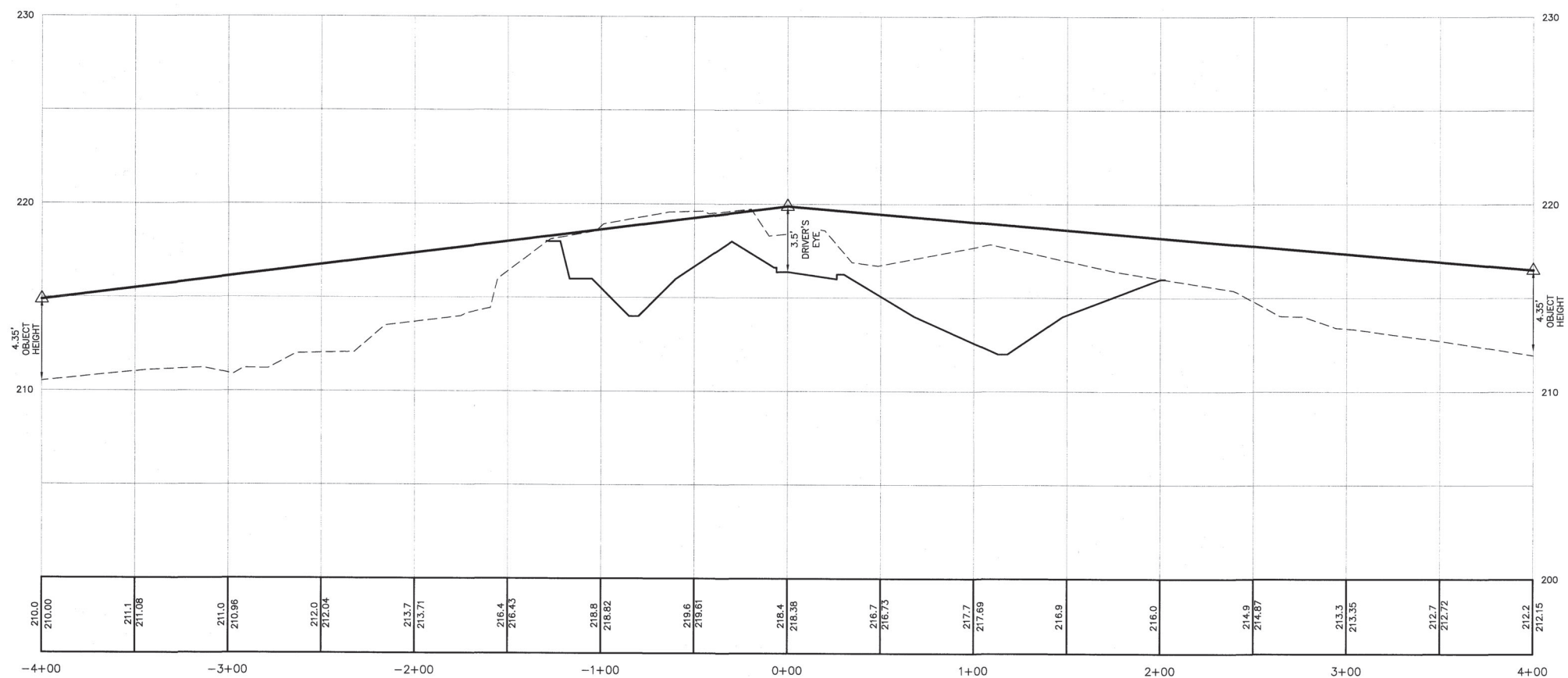
REVISIONS			
No.	DATE	DESCRIPTION	BY
1	05/12/21	TOWN COMMENTS	SCV
DATE: APRIL 6, 2021 SCALE: 1" = 60' PROJECT NO: 20-0921-2 SHEET 1 OF 13			



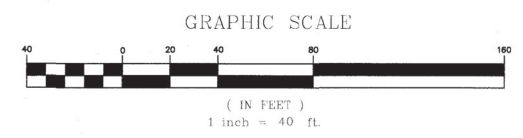
SIGHT DISTANCE PLAN
SCALE: 1" = 40'



- UTILITY POLE
- ABUTTER LINE
- PROPERTY LINE
- OVERHEAD UTILITIES
- TREELINE
- EDGE OF PAVEMENT
- VERTICAL GRANITE CURB
- BITUMINOUS CURB
- 10' CONTOUR
- 2' CONTOUR
- BUILDING SETBACK
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED DRAINAGE MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED TREELINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED BITUMINOUS CURB
- PROPOSED 2' CONTOUR
- PROPOSED SWALE
- SITE LIGHTING
- BUILDING WALL PACK LIGHTING



SIGHT DISTANCE PROFILE
SCALE: 1" = 40' (HORIZ.)
1" = 4' (VERT.)



SIGHT DISTANCE PLAN & PROFILE
S.L. CHASSE STEEL
 MAP 105 LOT 17-2
 ROBINSON ROAD
 HUDSON, NEW HAMPSHIRE
 HILLSBOROUGH COUNTY

OWNER OF RECORD/APPLICANT:
 STEEL PROPERTIES, LLC
 8 CHRISTINE DRIVE
 HUDSON, N.H. 03051
 H.C.R.D. BK. 9327 PG. 197

KMA 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

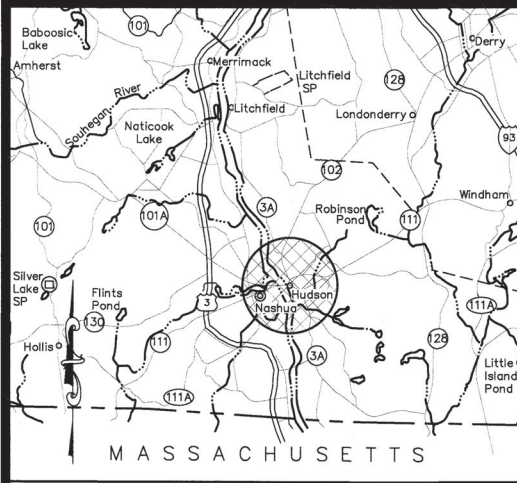
APPROVED BY THE HUDSON, NH PLANNING BOARD
 DATE OF MEETING: _____
 _____ SIGNATURE DATE: _____
 _____ SIGNATURE DATE: _____

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.

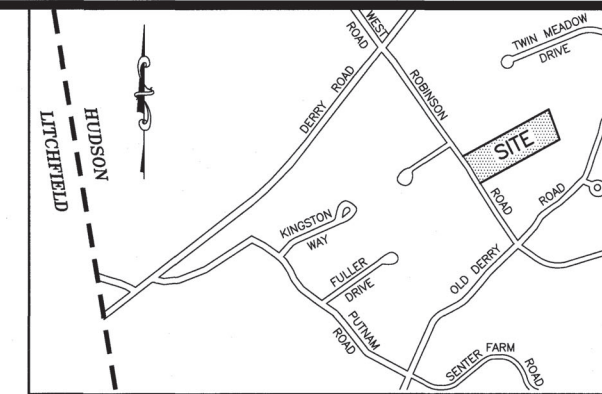
REVISIONS			
No.	DATE	DESCRIPTION	BY
1	05/12/21	TOWN COMMENTS	SCV

DATE: APRIL 6, 2021 SCALE: 1" = 40'
 PROJECT NO: 20-0921-2 SHEET 9 OF 13

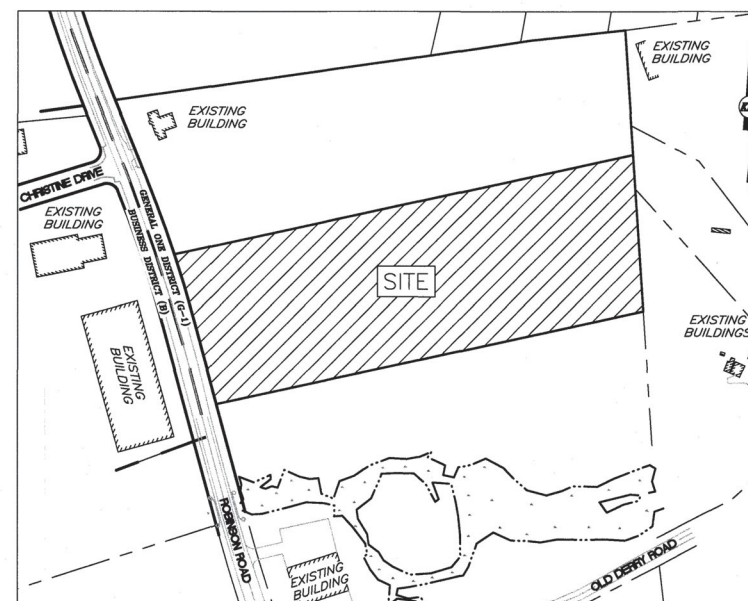
NON-RESIDENTIAL SITE PLAN S.L. CHASSE CONTRACTOR BUILDINGS MAP 105 LOT 17-3 ROBINSON ROAD HUDSON, NEW HAMPSHIRE



VICINITY PLAN
NOT TO SCALE



LOCUS PLAN
SCALE: 1" = 1,000'



EXISTING FEATURES WITHIN 200 FEET
SCALE: 1" = 200'

LEGEND

	WETLAND
	EDGE OF PAVEMENT
	ZONE BOUNDARY
	PROPERTY LINE
	PROPERTY LINE

OWNER OF RECORD/APPLICANT:
SLC DEVELOPMENT, LLC
8 CHRISTINE DRIVE
HUDSON, NEW HAMPSHIRE 03051

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

SHEET TITLE

SHEET No.

- MASTER SITE PLAN 1
- EXISTING CONDITIONS PLAN 2
- NON-RESIDENTIAL SITE LAYOUT PLAN 3
- GRADING, DRAINAGE & UTILITY PLAN 4
- EROSION CONTROL PLAN 5
- LANDSCAPE PLAN 6
- LIGHTING PLAN 7
- SIGHT DISTANCE PLAN & PROFILE 8
- CONSTRUCTION DETAILS



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

APRIL 6, 2021
REVISED MAY 12, 2021
PROJECT NO. 20-0921-2

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.

LEGEND

- GB-TBS GRANITE BOUND TO BE SET
- IPIN-TBS IRON PIN TO BE SET
- ⊙ DH-TBS DRILL HOLE TO BE SET
- ⊕ PROPOSED UTILITY POLE
- ⊕ PROPOSED SIGN
- ⊕ PROPOSED LIGHT
- ⊕ PROPOSED GAS VALVE
- ⊕ PROPOSED WATER VALVE
- ⊕ PROPOSED HYDRANT
- PROPOSED CHAIN LINK FENCE
- PROPOSED BARBED WIRE FENCE
- OHU PROPOSED OVERHEAD UTILITIES
- UGU PROPOSED UNDERGROUND UTILITIES
- PROPOSED GAS LINE
- PROPOSED WATER LINE
- PROPOSED SEWER LINE
- PROPOSED DRAINAGE LINE
- PROPOSED TREE LINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED VERTICAL GRANITE CURB
- PROPOSED 2' CONTOUR
- PROPOSED RETAINING WALL
- PROPOSED BITUMINOUS CURB
- ABUTTER LINE
- PROPERTY LINE
- WETLAND
- EDGE OF PAVEMENT
- 10' CONTOUR
- 2' CONTOUR
- BUILDING SETBACK
- GREEN SPACE BUFFER
- EASEMENT
- ZONE LINE
- IPIN IRON PIN
- ⊕ SB STONE BOUND
- ⊕ UTILITY POLE
- ⊕ GAS VALVE
- ⊕ WATER VALVE
- ⊕ HYDRANT
- ⊕ WATER SHUT OFF
- ⊕ SEWER MANHOLE
- TREE LINE



PURSUANT TO THE 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.

MAP 105 LOT 34
ALBERT D. TREMBLAY
144 OLD DERRY ROAD
HUDSON, NH 03051
H.C.R.D. BK. 7919 PG. 1259

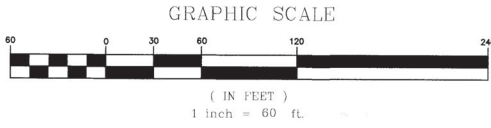
MAP 105 LOT 33
CARLOS M. & MARIA G. DOS SANTOS
142 OLD DERRY ROAD
HUDSON, NH 03051
H.C.R.D. BK. 6526 PG. 988

MAP 105 LOT 32
NIREL, LLC
140 OLD DERRY ROAD
HUDSON, NH 03051
H.C.R.D. BK. 8899 PG. 2935

MAP 105 LOT 17-2
STEEL PROPERTIES, LLC
8 CHRISTINE DRIVE
HUDSON, NH 03051
H.C.R.D. BK. 9327 PG. 197

MAP 105 LOT 17-4
GREY FOX REALTY, LLC
40 TEMPLE STREET
NASHUA, NH 03060
H.C.R.D. BK. 9315, PG. 2447

MAP 110 LOT 39
SLC DEVELOPMENT, LLC
8 CHRISTINE DRIVE
HUDSON, NH 03051
H.C.R.D. BK. 8616 PG. 1205



OWNER OF MAP 105 LOT 17-3

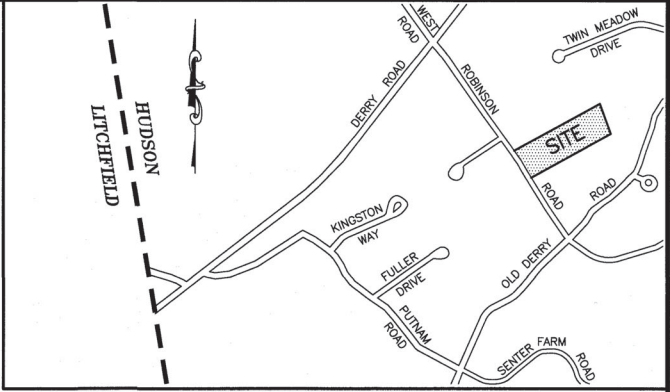
SIGNATURE: _____

DATE: _____

NOTES (CONTINUED):

15. SITE LIGHTING SHALL BE AS SHOWN ON THE PLAN, DIRECTED ONTO SITE, AND SHALL CONFORM WITH ALL APPLICABLE TOWN OF HUDSON ZONING REGULATIONS.
16. 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.
17. HOURS OF REFUSE REMOVAL SHALL BE EXCLUSIVE TO THE HOURS OF 7:00 AM AND 7:00 PM, MONDAY THROUGH SATURDAY ONLY.
18. HOURS OF OPERATION: 6:00 AM TO 6:00 PM, MONDAY THROUGH SATURDAY.
19. APPROVAL OF THIS PLAN SHALL BE SUBJECT TO FINAL ENGINEERING REVIEW.
20. IF LOT DEVELOPMENT INVOLVES BLASTING AND/OR RAMMING OF BEDROCK MATERIALS, SAID ACTIVITIES SHALL BE LIMITED TO THE HOURS BETWEEN 7:00AM AND 5:00PM MONDAY THROUGH FRIDAY ONLY. SAID BLASTING/RAMMING ACTIVITIES SHALL BE PROHIBITED ON WEEKENDS.
21. REFUSE REMOVAL SHALL BE LIMITED TO MONDAY THROUGH FRIDAY, 7:00 AM TO 7:00 PM ONLY. SAID ACTIVITIES SHALL BE PROHIBITED ON SATURDAY AND SUNDAY.
22. SITE IMPROVEMENTS DEPICTED ON THE PLAN SHALL CONFORM WITH TITLE III OF THE AMERICANS WITH DISABILITIES ACT WITH REGARD TO DIMENSION AND GRADE.
23. 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.
24. 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.
25. IDENTIFICATION SIGNAGE SHALL NOT BE ERECTED UNTIL APPROVED BY THE BUILDING INSPECTOR AND ZONING ADMINISTRATOR.
26. PERMITS REQUIRED:

-NHDES ALTERATION OF TERRAIN	PENDING
-NHDES NOTICE OF INTENT	REQUIRED PRIOR TO CONSTRUCTION
-NHDES SUBSURFACE DISPOSAL	PENDING
27. 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.
28. ONSITE DRAINAGE SYSTEM SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH NHDES REQUIREMENTS FOR SUCH SYSTEMS.
29. 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.
30. 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.
31. ALL IMPROVEMENTS SHOWN ON THE SITE PLAN-OF-RECORD, INCLUDING NOTES 1-42, SHALL BE COMPLETED IN THEIR ENTIRETY AND AT THE EXPENSE OF THE APPLICANT OR HIS ASSIGNS.
32. THE TOWN OF HUDSON SHALL RESERVE THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION.
33. 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.
34. IT IS NOT PROPOSED FOR THE FACILITY TO HAVE DUMPSTERS OR OUTDOOR TRASH RECEPTACLES.
35. ONSITE DRAINAGE SYSTEM SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH NHDES REQUIREMENTS FOR SUCH SYSTEMS.
36. 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.
37. 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 TRANSPARENT 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.
38. ALL PROPOSED BUILDING HEIGHTS ARE UNDER 38'.
39. TOTAL AREA OF DISTURBANCE = 255,405 SF
40. THE PROPOSED PROJECT HAS BEEN DESIGNED TO MEET 2018 MS4 REQUIREMENTS.
41. WETLAND MAPPING FOR THIS SITE AND SURROUNDING SITES WAS DONE BY WETLAND SCIENTIST JOSHUA BRIEN, NO. 256, IN APRIL 2020, REFER TO REFERENCE PLAN NUMBER ONE FOR MORE INFORMATION.
42. ALL SIGNS ARE SUBJECT TO APPROVAL BY HUDSON PLANNING BOARD PRIOR TO INSTALLATION.



REFERENCE PLANS: SCALE: 1" = 1,000'
1. "SUBDIVISION PLAN, NOURY INVESTMENTS, LLC, MAP 105 LOTS 16 & 17, ROBINSON ROAD & OLD DERRY ROAD, HUDSON, NEW HAMPSHIRE, DATED NOVEMBER 20, 2019, WITH REVISIONS THROUGH 05/13/20, PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC. (14 SHEETS) H.C.R.D. PLAN NUMBER: 40605

- NOTES:**
1. THE PURPOSE OF THIS PLAN IS TO SHOW THREE PROPOSED INDUSTRIAL BUILDINGS TOTALING 50,400 SF AND ASSOCIATED PARKING ON ROBINSON ROAD ON MAP 105 LOT 17-3 IN THE TOWN OF HUDSON, NEW HAMPSHIRE, AND NO OTHER PURPOSE.
 2. MAP 105 LOT 17 INDICATES TOWN OF HUDSON TAX ASSESSOR'S MAP AND LOT NUMBER.
 3. OWNER OF RECORD: STEEL PROPERTIES, LLC, 8 CHRISTINE DRIVE, HUDSON, N.H. 03051, H.C.R.D. BK. 9327 PG. 197
 4. AREA OF SUBJECT PARCEL = 305,312 SF, OR 7.009 ACRES
 5. BOUNDARY INFORMATION SHOWN HEREON IS BASED UPON AN ACTUAL FIELD SURVEY PERFORMED BY THIS OFFICE DURING DECEMBER 2009 AND AUGUST 2015.
 6. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NGVD29 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA-CRUS.
 7. THE SUBJECT PARCEL IS LOCATED WITHIN THE GENERAL-ONE (G-1) ZONING DISTRICT. DIMENSIONAL REQUIREMENTS ARE AS FOLLOWS FOR LOTS SERVICED WITHOUT MUNICIPAL SEWER AND WATER:

	REQUIRED	PROPOSED
MINIMUM LOT AREA	87,120 SF	305,312 SF
MINIMUM LOT FRONTAGE	200 FT	322.83 (ROBINSON),
MINIMUM BUILDING SETBACKS:		
FRONT	50 FT	142 FT
SIDE	15 FT	48 FT
REAR	15 FT	152 FT
 8. PARCEL WILL BE SERVICED BY INDIVIDUAL SEPTIC AND WELL.
 9. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. KEACH-NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 811.
 10. THE SUBJECT PREMISES IS NOT LOCATED WITHIN A DESIGNATED FLOOD ZONE AS SHOWN ON FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 3301C0508D, PANEL 508 OF 701, AND MAP NUMBER 3301C0508D, PANEL 509 OF 701, EFFECTIVE DATE SEPTEMBER 25, 2009. THE SUBJECT PARCEL IS LOCATED IN ZONES 'A' & 'X'.
 11. 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.
 12. OPEN SPACE: REQUIRED = 40%, PROPOSED = 48%
 13. PARKING CALCULATIONS:

INDUSTRIAL = 1 SPACE/600 SF
BUILDING 1: 1 SPACE/600 SF X 17,480 SF = 29.13 SPACES
BUILDING 2: 1 SPACE/600 SF X 17,480 SF = 29.13 SPACES
BUILDING 3: 1 SPACE/600 SF X 12,920 SF = 21.53 SPACES
OFFICE = 1 SPACE/300 SF
BUILDING 1: 1 SPACE/300 SF X 920 SF = 3.07 SPACES
BUILDING 2: 1 SPACE/300 SF X 920 SF = 3.07 SPACES
BUILDING 3: 1 SPACE/300 SF X 680 SF = 2.27 SPACES
TOTAL BUILDING 1: 29.13 SPACES + 3.07 SPACES = 33 SPACES
BUILDING 2: 29.13 SPACES + 3.07 SPACES = 33 SPACES
BUILDING 3: 21.53 SPACES + 2.27 SPACES = 24 SPACES
TOTAL COMBINED SPACES REQUIRED = 90 SPACES
PROPOSED:
BUILDING 1: 43 SPACES + 2 HANDICAP SPACES = 44 SPACES
BUILDING 2: 32 SPACES + 2 HANDICAP SPACES = 31 SPACES
BUILDING 3: 27 SPACES + 2 HANDICAP SPACES = 26 SPACES
TOTAL PROPOSED = 44 SPACES + 31 SPACES + 26 SPACES = 101 TOTAL SPACES
 14. LOADING:

REQUIRED:
1 SPACE/FIRST 5,000 SF + 1 SPACE/10,000 SF X 45,400 SF = 1 + 4.54 = 6 SPACES
BUILDING 1: 1 + 1.34 = 3 LOADING SPACES
BUILDING 2: 1 + 1.34 = 3 LOADING SPACES
BUILDING 3: 1 + 0 = 1 LOADING SPACE
PROPOSED:
BUILDING 1: 3 SPACES
BUILDING 2: 3 SPACES
BUILDING 3: 1 SPACE
TOTAL PROPOSED: 7 SPACES

MASTER SITE PLAN
S.L. CHASSE STEEL
MAP 105 LOT 17-3
ROBINSON ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD/APPLICANT:
STEEL PROPERTIES, LLC
8 CHRISTINE DRIVE
HUDSON, NH 03051
H.C.R.D. BK. 9327 PG. 197

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

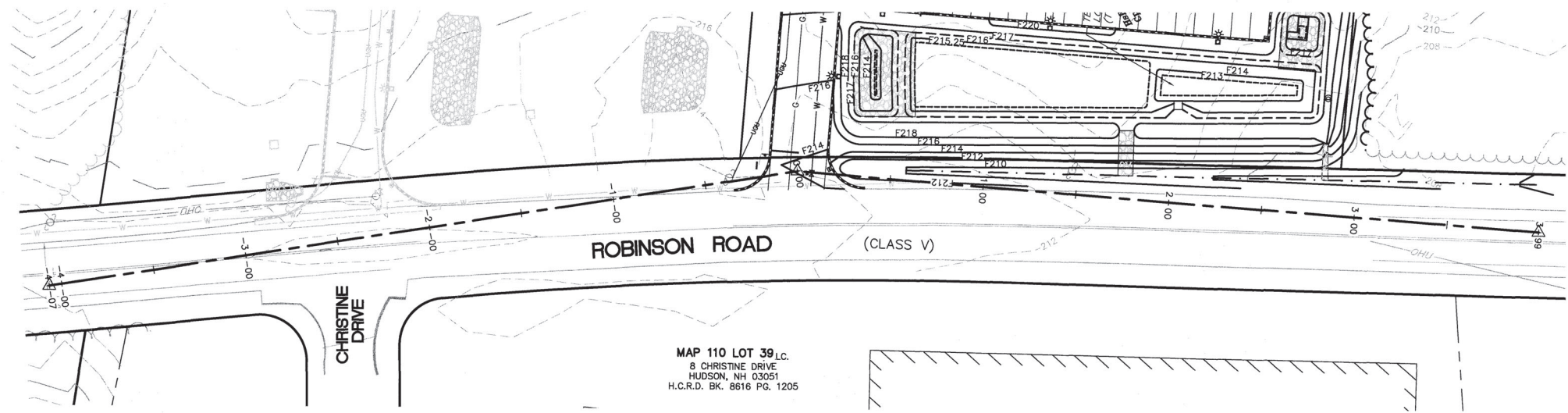
REVISIONS			
No.	DATE	DESCRIPTION	BY
1	05/12/21	TOWN COMMENTS	SCV

DATE: APRIL 6, 2021 SCALE: 1" = 60'
PROJECT NO: 20-0921-1 SHEET 1 OF 12

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

CERTIFICATION:
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. FURTHER, THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY MADE ON THE GROUND BY THIS OFFICE DURING DECEMBER 2009 AND AUGUST OF 2015. SAID SURVEY HAS AN ERROR OF CLOSURE BETTER THAN ONE PART IN TEN THOUSAND (1:10,000).

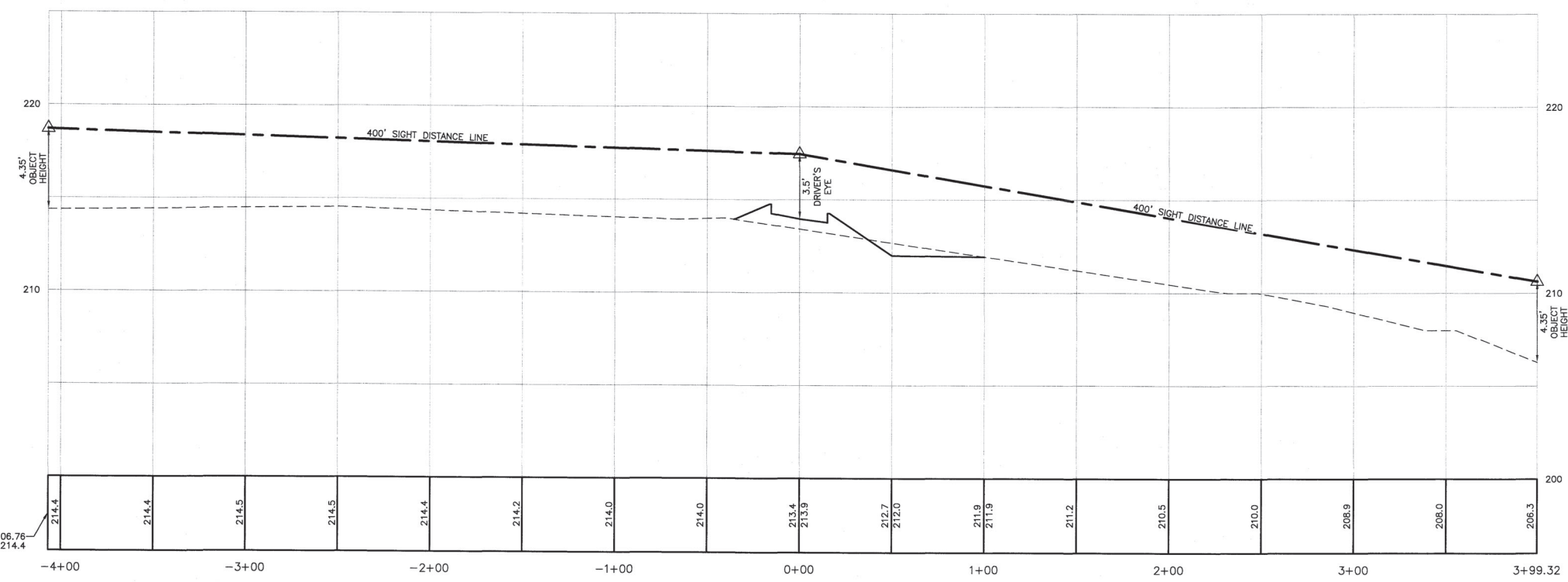
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DATE: _____



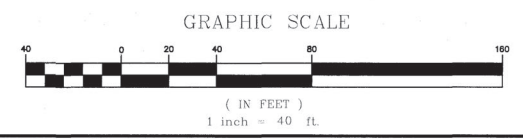
MAP 110 LOT 39 l.c.
8 CHRISTINE DRIVE
HUDSON, NH 03051
H.C.R.D. BK. 8616 PG. 1205

SIGHT DISTANCE PLAN
SCALE: 1" = 40'

- LEGEND**
- UTILITY POLE
 - ABUTTER LINE
 - PROPERTY LINE
 - OVERHEAD UTILITIES
 - TREELINE
 - EDGE OF PAVEMENT
 - VERTICAL GRANITE CURB
 - BITUMINOUS CURB
 - 10' CONTOUR
 - 2' CONTOUR
 - BUILDING SETBACK
 - PROPOSED SIGN
 - PROPOSED LIGHT
 - PROPOSED DRAINAGE MANHOLE
 - PROPOSED CATCH BASIN
 - PROPOSED TREELINE
 - PROPOSED EDGE OF PAVEMENT
 - PROPOSED BITUMINOUS CURB
 - PROPOSED 2' CONTOUR
 - PROPOSED SWALE
 - SITE LIGHTING
 - BUILDING WALL PACK LIGHTING



SIGHT DISTANCE PROFILE
SCALE: 1" = 40' (HORIZ.)
1" = 4' (VERT.)



SIGHT DISTANCE PLAN & PROFILE
S.L. CHASSE STEEL
MAP 105 LOT 17-3
ROBINSON ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD/APPLICANT:
STEEL PROPERTIES, LLC
8 CHRISTINE DRIVE
HUDSON, NH 03051
H.C.R.D. BK. 9327 PG. 197

KM 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: _____

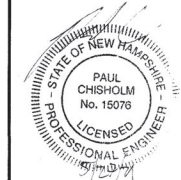
SIGNATURE DATE: _____

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.

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	05/12/21	TOWN COMMENTS	SCV

DATE: APRIL 6, 2021 SCALE: 1" = 40'
PROJECT NO: 20-0921-1 SHEET 8 OF 12



Appendix B: Traffic Counts

Accurate Counts
978-664-2565

N/S Street : Robinson Road
E/W Street : Driveway / Christine Drive
City/State : Hudson, NH
Weather : Clear

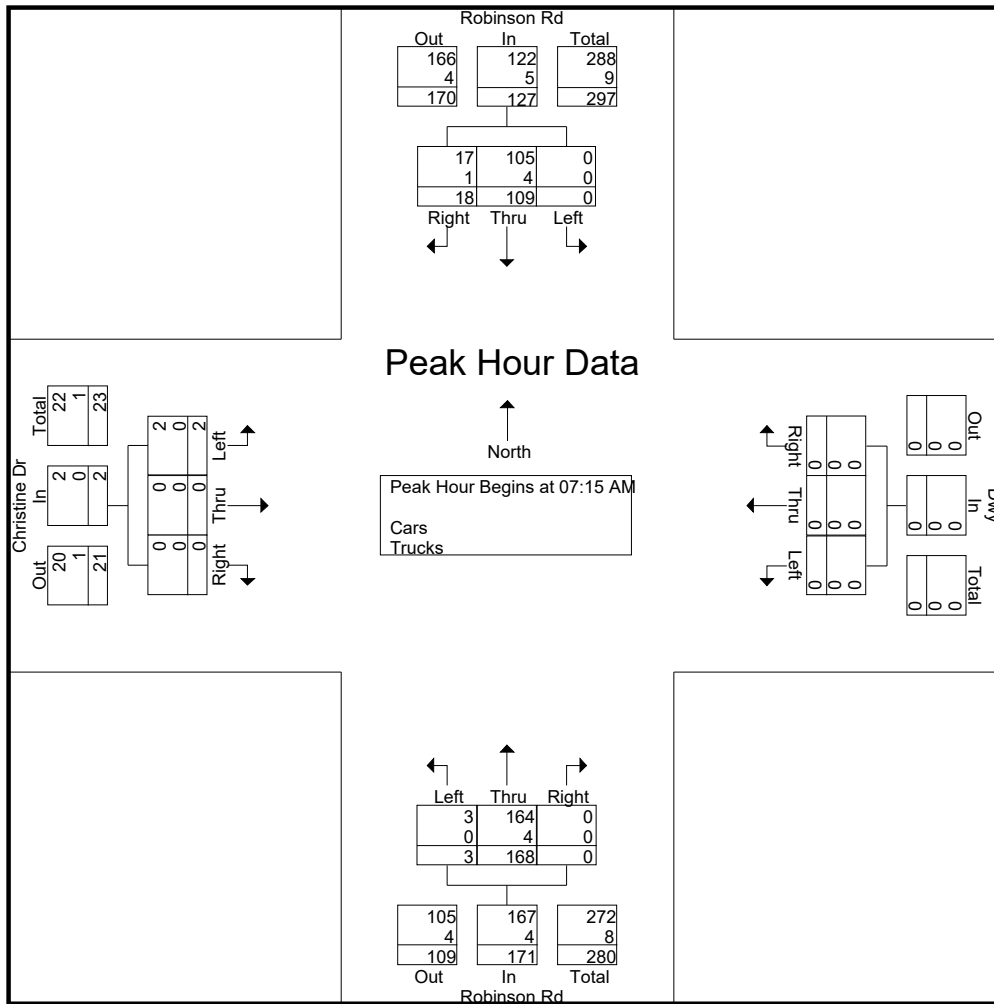
File Name : 15570001
Site Code : 15570001
Start Date : 6/29/2021
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Robinson Rd From North			Dwy From East			Robinson Rd From South			Christine Dr From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	16	1	0	0	0	0	32	0	0	0	0	49
07:15 AM	0	21	3	0	0	0	0	43	0	1	0	0	68
07:30 AM	0	28	4	0	0	0	0	43	0	0	0	0	75
07:45 AM	0	31	5	0	0	0	2	47	0	1	0	0	86
Total	0	96	13	0	0	0	2	165	0	2	0	0	278
08:00 AM	0	29	6	0	0	0	1	35	0	0	0	0	71
08:15 AM	0	16	5	0	0	0	0	34	1	1	0	0	57
08:30 AM	0	29	4	0	0	0	0	35	0	3	0	1	72
08:45 AM	0	23	4	1	0	0	2	28	0	3	0	0	61
Total	0	97	19	1	0	0	3	132	1	7	0	1	261
Grand Total	0	193	32	1	0	0	5	297	1	9	0	1	539
Apprch %	0	85.8	14.2	100	0	0	1.7	98	0.3	90	0	10	
Total %	0	35.8	5.9	0.2	0	0	0.9	55.1	0.2	1.7	0	0.2	
Cars	0	186	30	1	0	0	5	289	1	8	0	1	521
% Cars	0	96.4	93.8	100	0	0	100	97.3	100	88.9	0	100	96.7
Trucks	0	7	2	0	0	0	0	8	0	1	0	0	18
% Trucks	0	3.6	6.2	0	0	0	0	2.7	0	11.1	0	0	3.3

Start Time	Robinson Rd From North				Dwy From East				Robinson Rd From South				Christine Dr From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	21	3	24	0	0	0	0	0	43	0	43	1	0	0	1	68
07:30 AM	0	28	4	32	0	0	0	0	0	43	0	43	0	0	0	0	75
07:45 AM	0	31	5	36	0	0	0	0	2	47	0	49	1	0	0	1	86
08:00 AM	0	29	6	35	0	0	0	0	1	35	0	36	0	0	0	0	71
Total Volume	0	109	18	127	0	0	0	0	3	168	0	171	2	0	0	2	300
% App. Total	0	85.8	14.2		0	0	0		1.8	98.2	0		100	0	0		
PHF	.000	.879	.750	.882	.000	.000	.000	.000	.375	.894	.000	.872	.500	.000	.000	.500	.872
Cars	0	105	17	122	0	0	0	0	3	164	0	167	2	0	0	2	291
% Cars	0	96.3	94.4	96.1	0	0	0	0	100	97.6	0	97.7	100	0	0	100	97.0
Trucks	0	4	1	5	0	0	0	0	0	4	0	4	0	0	0	0	9
% Trucks	0	3.7	5.6	3.9	0	0	0	0	0	2.4	0	2.3	0	0	0	0	3.0

N/S Street : Robinson Road
E/W Street : Driveway / Christine Drive
City/State : Hudson, NH
Weather : Clear



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				08:00 AM				07:15 AM				08:00 AM			
+0 mins.	0	21	3	24	0	0	0	0	0	43	0	43	0	0	0	0
+15 mins.	0	28	4	32	0	0	0	0	0	43	0	43	1	0	0	1
+30 mins.	0	31	5	36	0	0	0	0	2	47	0	49	3	0	1	4
+45 mins.	0	29	6	35	1	0	0	1	1	35	0	36	3	0	0	3
Total Volume	0	109	18	127	1	0	0	1	3	168	0	171	7	0	1	8
% App. Total	0	85.8	14.2		100	0	0		1.8	98.2	0		87.5	0	12.5	
PHF	.000	.879	.750	.882	.250	.000	.000	.250	.375	.894	.000	.872	.583	.000	.250	.500
Cars	0	105	17	122	1	0	0	1	3	164	0	167	6	0	1	7
% Cars	0	96.3	94.4	96.1	100	0	0	100	100	97.6	0	97.7	85.7	0	100	87.5
Trucks	0	4	1	5	0	0	0	0	0	4	0	4	1	0	0	1
% Trucks	0	3.7	5.6	3.9	0	0	0	0	0	2.4	0	2.3	14.3	0	0	12.5

Accurate Counts
978-664-2565

N/S Street : Robinson Road
E/W Street : Driveway / Christine Drive
City/State : Hudson, NH
Weather : Clear

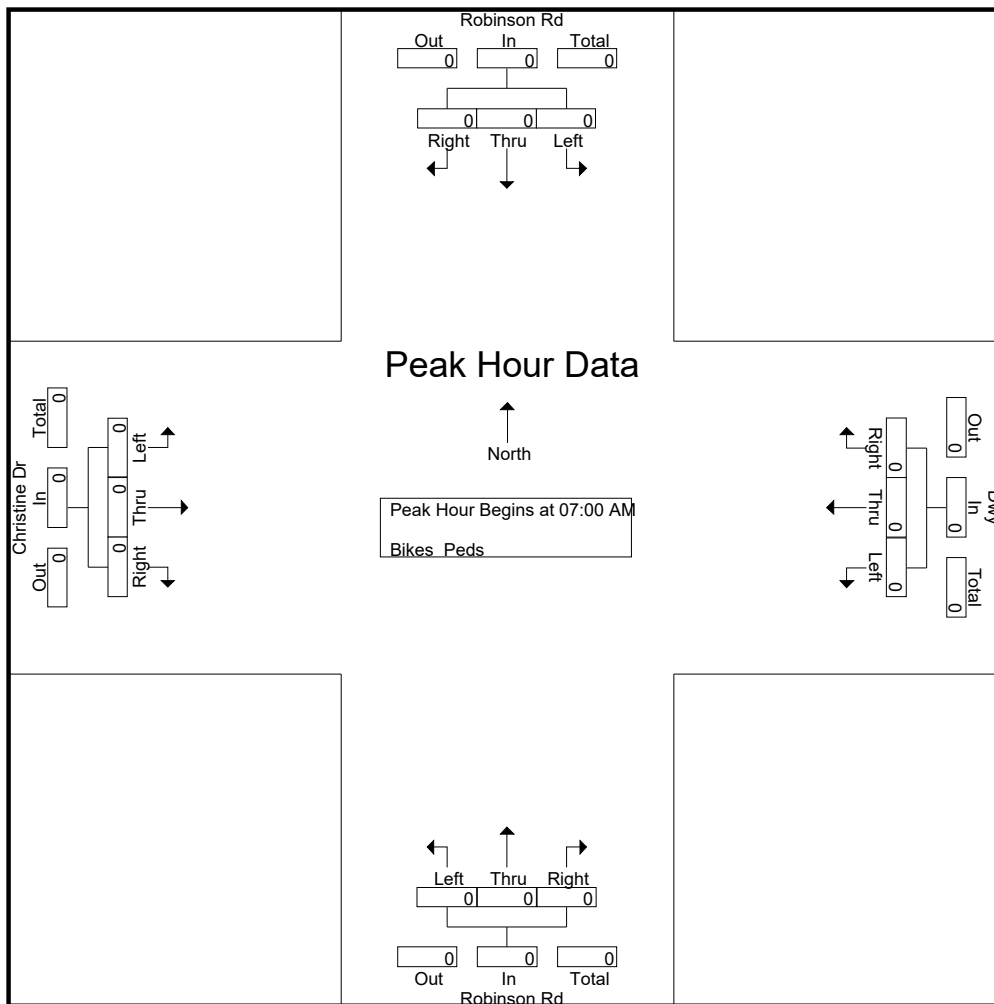
File Name : 15570001
Site Code : 15570001
Start Date : 6/29/2021
Page No : 10

Groups Printed- Bikes Peds

Start Time	Robinson Rd From North				Dwy From East				Robinson Rd From South				Christine Dr From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	0	0	

Start Time	Robinson Rd From North				Dwy From East				Robinson Rd From South				Christine Dr From West				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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	0	0	0	0	0	0	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	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0			
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Robinson Road
E/W Street : Driveway / Christine Drive
City/State : Hudson, NH
Weather : Clear



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

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Robinson Road
 E/W Street : Driveway / Christine Drive
 City/State : Hudson, NH
 Weather : Clear

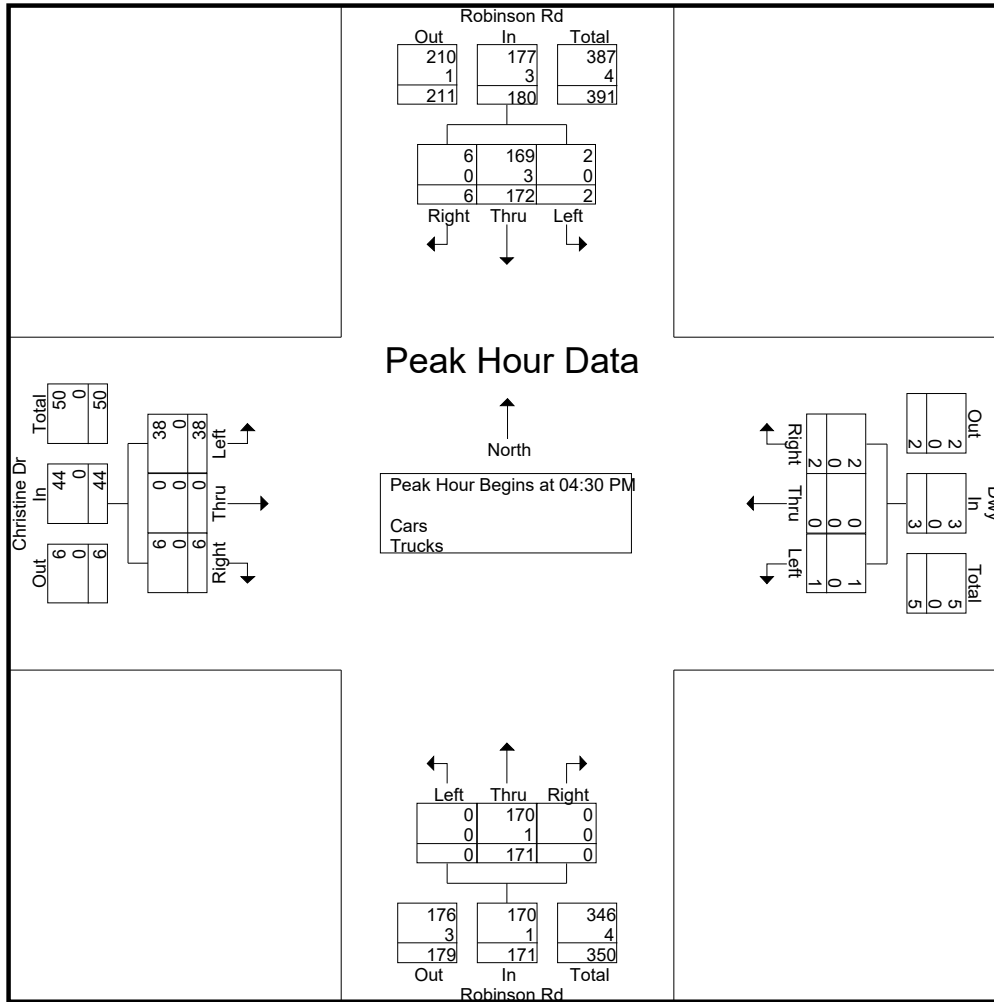
File Name : 15570001
 Site Code : 15570001
 Start Date : 6/29/2021
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	Robinson Rd From North			Dwy From East			Robinson Rd From South			Christine Dr From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	1	41	2	0	0	0	1	38	0	5	0	1	89
04:15 PM	0	38	5	0	0	0	1	25	0	5	0	0	74
04:30 PM	0	31	1	0	0	0	0	49	0	16	0	2	99
04:45 PM	1	39	1	0	0	1	0	41	0	9	0	2	94
Total	2	149	9	0	0	1	2	153	0	35	0	5	356
05:00 PM	0	55	3	0	0	0	0	34	0	4	0	1	97
05:15 PM	1	47	1	1	0	1	0	47	0	9	0	1	108
05:30 PM	0	47	0	0	0	0	0	39	0	0	0	1	87
05:45 PM	0	32	0	0	0	0	0	30	0	3	0	1	66
Total	1	181	4	1	0	1	0	150	0	16	0	4	358
Grand Total	3	330	13	1	0	2	2	303	0	51	0	9	714
Apprch %	0.9	95.4	3.8	33.3	0	66.7	0.7	99.3	0	85	0	15	
Total %	0.4	46.2	1.8	0.1	0	0.3	0.3	42.4	0	7.1	0	1.3	
Cars	3	326	13	1	0	2	2	300	0	51	0	9	707
% Cars	100	98.8	100	100	0	100	100	99	0	100	0	100	99
Trucks	0	4	0	0	0	0	0	3	0	0	0	0	7
% Trucks	0	1.2	0	0	0	0	0	1	0	0	0	0	1

Start Time	Robinson Rd From North				Dwy From East				Robinson Rd From South				Christine Dr From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	31	1	32	0	0	0	0	0	49	0	49	16	0	2	18	99
04:45 PM	1	39	1	41	0	0	1	1	0	41	0	41	9	0	2	11	94
05:00 PM	0	55	3	58	0	0	0	0	0	34	0	34	4	0	1	5	97
05:15 PM	1	47	1	49	1	0	1	2	0	47	0	47	9	0	1	10	108
Total Volume	2	172	6	180	1	0	2	3	0	171	0	171	38	0	6	44	398
% App. Total	1.1	95.6	3.3		33.3	0	66.7		0	100	0		86.4	0	13.6		
PHF	.500	.782	.500	.776	.250	.000	.500	.375	.000	.872	.000	.872	.594	.000	.750	.611	.921
Cars	2	169	6	177	1	0	2	3	0	170	0	170	38	0	6	44	394
% Cars	100	98.3	100	98.3	100	0	100	100	0	99.4	0	99.4	100	0	100	100	99.0
Trucks	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0	4
% Trucks	0	1.7	0	1.7	0	0	0	0	0	0.6	0	0.6	0	0	0	0	1.0

N/S Street : Robinson Road
E/W Street : Driveway / Christine Drive
City/State : Hudson, NH
Weather : Clear



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

	04:45 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	1	39	1	41	0	0	0	0	0	49	0	49	16	0	2	18
+15 mins.	0	55	3	58	0	0	1	1	0	41	0	41	9	0	2	11
+30 mins.	1	47	1	49	0	0	0	0	0	34	0	34	4	0	1	5
+45 mins.	0	47	0	47	1	0	1	2	0	47	0	47	9	0	1	10
Total Volume	2	188	5	195	1	0	2	3	0	171	0	171	38	0	6	44
% App. Total	1	96.4	2.6		33.3	0	66.7		0	100	0		86.4	0	13.6	
PHF	.500	.855	.417	.841	.250	.000	.500	.375	.000	.872	.000	.872	.594	.000	.750	.611
Cars	2	186	5	193	1	0	2	3	0	170	0	170	38	0	6	44
% Cars	100	98.9	100	99	100	0	100	100	0	99.4	0	99.4	100	0	100	100
Trucks	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0
% Trucks	0	1.1	0	1	0	0	0	0	0	0.6	0	0.6	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : Robinson Road
E/W Street : Driveway / Christine Drive
City/State : Hudson, NH
Weather : Clear

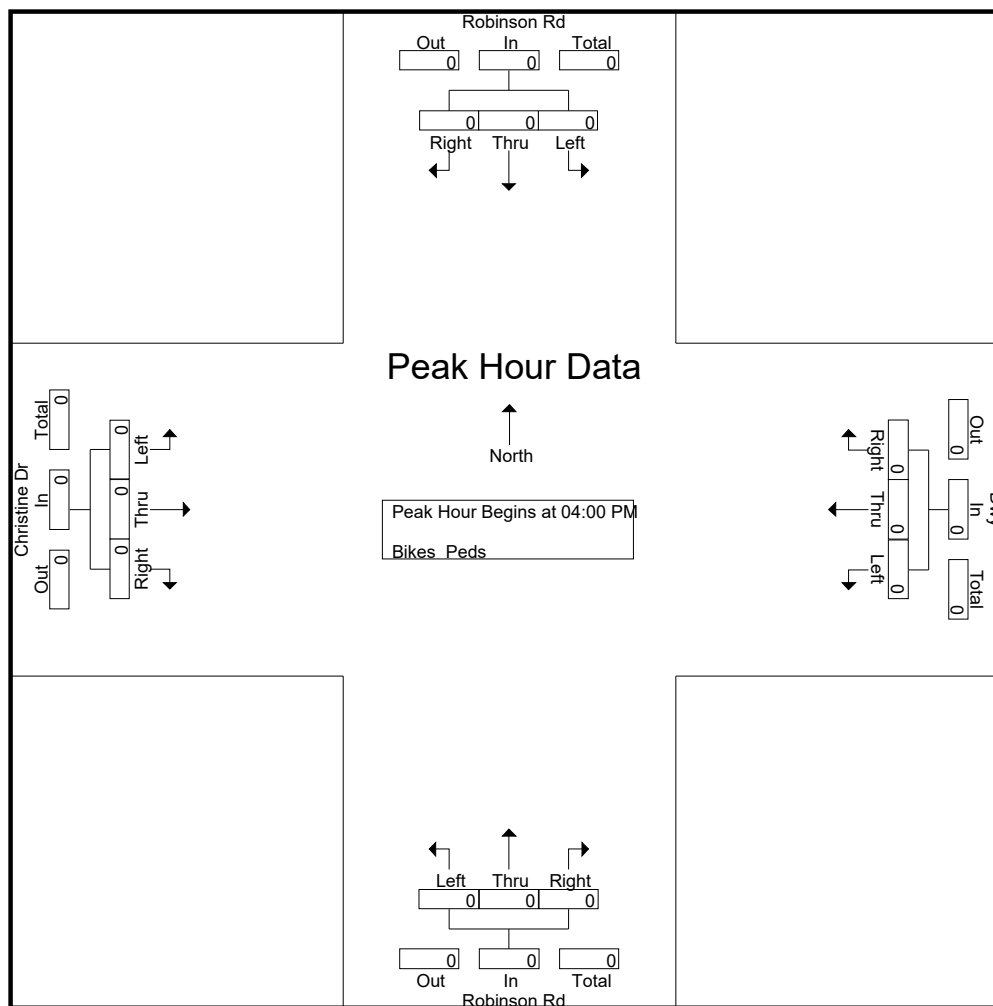
File Name : 15570001
Site Code : 15570001
Start Date : 6/29/2021
Page No : 10

Groups Printed- Bikes Peds

Start Time	Robinson Rd From North				Dwy From East				Robinson Rd From South				Christine Dr From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	2
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	3	0	3
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

Start Time	Robinson Rd From North				Dwy From East				Robinson Rd From South				Christine Dr From West				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0			
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Robinson Road
E/W Street : Driveway / Christine Drive
City/State : Hudson, NH
Weather : Clear



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				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Appendix C: Monthly Traffic Volumes

Year 2019 Monthly Data

Group 4 Averages: Urban Highways

<u>Month</u>	<u>ADT</u>	<u>Adjustment to Average</u>	<u>Adjustment to Peak</u>
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

15570001

Location : Robinson Road
Location : South of Christine Drive
City/State: Hudson, NH
Direction: SB,

6/29/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	0	0	1	2	0	0	0	0	0	0	0	3
1:00	0	0	0	0	0	4	2	0	1	0	0	0	0	7
2:00	0	0	0	0	1	0	2	0	0	0	0	0	0	3
3:00	0	0	0	1	0	1	0	0	0	0	0	0	0	2
4:00	0	0	0	0	3	4	2	1	0	0	0	0	0	10
5:00	0	0	0	0	12	22	11	3	0	0	0	0	0	48
6:00	0	0	0	1	15	34	30	3	0	0	0	0	0	83
7:00	0	0	0	1	8	42	33	5	2	0	0	0	0	91
8:00	0	0	0	2	18	52	28	1	0	0	0	0	0	101
9:00	0	1	0	2	21	47	26	5	0	0	0	0	0	102
10:00	0	0	0	2	15	36	27	7	0	0	0	0	0	87
11:00	0	0	0	2	26	59	34	12	1	0	0	0	0	134
12:00 PM	0	0	0	2	29	58	34	7	0	0	0	0	0	130
1:00	0	0	1	3	14	47	26	6	2	0	0	0	0	99
2:00	1	0	1	3	18	56	38	9	1	0	0	0	1	128
3:00	0	0	0	0	25	65	46	4	4	1	0	0	0	145
4:00	0	0	3	1	17	64	55	12	0	0	0	0	0	152
5:00	0	0	0	0	18	87	58	13	1	1	0	0	0	178
6:00	0	0	0	2	15	49	33	4	2	0	0	0	0	105
7:00	0	0	1	1	18	42	27	4	1	0	0	0	0	94
8:00	0	0	0	0	28	34	12	2	0	0	0	0	0	76
9:00	0	0	0	1	15	23	10	3	3	1	0	0	0	56
10:00	0	0	0	1	7	9	6	3	0	0	0	0	0	26
11:00	0	0	0	2	2	5	2	1	0	0	1	0	0	13
Total	1	1	6	27	326	842	542	105	18	3	1	0	1	1873

Percentile	15th	50th	85th	95th
Speed	34.1	38.4	42.8	45.9
Mean Speed (Average)	38.7			
10 MPH Pace Speed	35-44			
Number in Pace	1380			
Percent in Pace	73.7%			
Number > 40 MPH	670			
Percent > 40 MPH	35.8%			

Accurate Counts
978-664-2565

15570001

Location : Robinson Road
Location : South of Christine Drive
City/State: Hudson, NH
Direction: NB,

6/29/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	0	0	0	2	2	0	0	0	0	0	0	4
1:00	0	0	0	0	2	4	1	0	0	0	0	0	0	7
2:00	0	0	0	0	2	3	0	1	0	0	0	0	0	6
3:00	0	0	0	1	1	1	1	1	0	0	0	0	0	5
4:00	0	0	0	0	5	11	7	2	1	0	0	0	0	26
5:00	0	0	0	3	5	32	25	12	2	0	0	0	0	79
6:00	0	0	1	1	14	42	35	7	3	0	0	0	0	103
7:00	0	0	3	2	23	73	65	12	1	0	0	0	0	179
8:00	0	0	0	1	17	64	48	8	0	0	0	0	0	138
9:00	0	0	0	4	23	50	47	6	1	0	1	0	1	133
10:00	0	0	0	0	19	35	45	11	3	0	0	0	0	113
11:00	0	1	1	2	8	48	46	8	1	0	0	0	0	115
12:00 PM	0	0	0	3	20	71	35	5	0	0	0	0	0	134
1:00	0	0	1	1	14	33	38	15	2	1	0	0	0	105
2:00	0	1	0	2	20	48	37	12	4	0	0	0	2	126
3:00	0	0	0	6	17	57	58	14	2	2	0	0	0	156
4:00	0	1	1	2	12	57	60	27	1	0	0	0	0	161
5:00	0	0	0	2	14	44	67	12	6	0	0	0	0	145
6:00	0	0	0	4	4	40	46	11	1	0	0	0	0	106
7:00	0	1	0	1	13	24	26	10	2	0	0	0	0	77
8:00	0	0	0	2	10	28	13	6	1	1	0	0	0	61
9:00	0	0	0	1	7	15	2	1	2	0	0	0	0	28
10:00	0	0	0	0	1	8	5	0	0	2	0	0	0	16
11:00	0	0	0	0	3	4	1	0	1	0	0	0	0	9
Total	0	4	7	38	254	794	710	181	34	6	1	0	3	2032

Percentile	15th	50th	85th	95th
Speed	35.3	39.7	44	47.1
Mean Speed (Average)	39.8			
10 MPH Pace Speed	35-44			
Number in Pace	1495			
Percent in Pace	73.6%			
Number > 40 MPH	935			
Percent > 40 MPH	46.0%			

Accurate Counts
978-664-2565

Location : Robinson Road
Location : South of Christine Drive
City/State: Hudson, NH
Direction: NB,

15570001

6/30/2021 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	0	1	0	1	0	0	0	0	0	0	2
1:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2
2:00	0	0	0	0	0	3	1	0	0	0	0	0	0	4
3:00	0	0	0	1	0	3	2	0	0	0	0	0	0	6
4:00	0	0	1	1	7	7	10	1	0	0	0	1	0	28
5:00	0	0	0	0	15	27	20	5	6	2	0	0	0	75
6:00	0	1	0	3	14	52	34	9	2	0	0	0	2	117
7:00	0	0	0	9	20	64	68	10	2	0	0	0	0	173
8:00	0	0	0	4	22	82	49	9	0	0	1	0	0	167
9:00	0	0	0	3	22	56	34	9	2	0	0	0	1	127
10:00	0	0	0	5	22	38	39	14	4	0	0	0	0	122
11:00	0	0	0	3	15	51	30	10	3	0	0	0	1	113
12:00 PM	0	0	0	2	15	45	46	11	0	0	0	0	1	120
1:00	0	0	0	2	21	43	42	9	3	1	0	0	1	122
2:00	1	0	0	3	15	35	40	14	1	0	0	0	0	109
3:00	0	0	0	5	27	63	46	15	0	0	0	0	1	157
4:00	0	0	0	3	26	52	57	17	0	0	0	0	0	155
5:00	0	1	0	0	18	46	27	14	2	0	0	0	0	108
6:00	0	0	0	0	11	24	40	12	4	1	0	0	0	92
7:00	0	0	0	2	7	23	15	6	1	0	0	0	0	54
8:00	0	0	0	2	14	17	14	1	0	0	0	0	0	48
9:00	0	0	0	1	8	14	3	1	0	0	0	0	0	27
10:00	0	0	0	1	3	10	3	1	0	0	0	0	0	18
11:00	1	0	0	0	1	3	2	0	0	0	0	0	0	7
Total	2	2	1	50	304	759	624	168	30	4	1	1	7	1953

Percentile	15th	50th	85th	95th
Speed	34.1	39	44	47.1
Mean Speed (Average)	39.7			
10 MPH Pace Speed	35-44			
Number in Pace	1377			
Percent in Pace	70.5%			
Number > 40 MPH	835			
Percent > 40 MPH	42.8%			

Grand Total	2	6	8	88	558	1553	1334	349	64	10	2	1	10	3985
Stats														
Percentile	15th 50th 85th 95th													
Speed	34.7 39.7 44 47.1													
Mean Speed (Average)	39.7													
10 MPH Pace Speed	35-44													
Number in Pace	2871													
Percent in Pace	72.0%													
Number > 40 MPH	1770													
Percent > 40 MPH	44.4%													

Appendix E: Capacity-Analysis Worksheets

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	0	0	0	0	0	186	0	0	117	19
Future Vol, veh/h	2	0	0	0	0	0	0	186	0	0	117	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	90	90	90	87	87	87	88	88	88
Heavy Vehicles, %	100	0	0	2	2	2	0	2	0	2	4	6
Mvmt Flow	4	0	0	0	0	0	0	214	0	0	133	22

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	358	358	144	358	369	214	155	0	0	214	0	0
Stage 1	144	144	-	214	214	-	-	-	-	-	-	-
Stage 2	214	214	-	144	155	-	-	-	-	-	-	-
Critical Hdwy	8.1	6.5	6.2	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	4.4	4	3.3	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	451	572	909	597	560	826	1438	-	-	1356	-	-
Stage 1	672	782	-	788	725	-	-	-	-	-	-	-
Stage 2	610	729	-	859	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	451	572	909	597	560	826	1438	-	-	1356	-	-
Mov Cap-2 Maneuver	451	572	-	597	560	-	-	-	-	-	-	-
Stage 1	672	782	-	788	725	-	-	-	-	-	-	-
Stage 2	610	729	-	859	769	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	0	0	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1438	-	-	451	-	1356	-
HCM Lane V/C Ratio	-	-	-	0.009	-	-	-
HCM Control Delay (s)	0	-	-	13.1	0	0	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	0	6	1	0	2	0	183	0	2	185	6
Future Vol, veh/h	41	0	6	1	0	2	0	183	0	2	185	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	38	38	38	87	87	87	78	78	78
Heavy Vehicles, %	0	2	0	0	2	0	2	1	2	0	2	0
Mvmt Flow	67	0	10	3	0	5	0	210	0	3	237	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	460	457	241	462	461	210	245	0	0	210	0	0
Stage 1	247	247	-	210	210	-	-	-	-	-	-	-
Stage 2	213	210	-	252	251	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.1	6.52	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4.018	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	515	500	803	513	497	835	1321	-	-	1373	-	-
Stage 1	761	702	-	797	728	-	-	-	-	-	-	-
Stage 2	794	728	-	757	699	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	510	499	803	505	496	835	1321	-	-	1373	-	-
Mov Cap-2 Maneuver	510	499	-	505	496	-	-	-	-	-	-	-
Stage 1	761	700	-	797	728	-	-	-	-	-	-	-
Stage 2	789	728	-	745	697	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	12.9		10.3		0		0.1			
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1321	-	-	535	686	1373	-
HCM Lane V/C Ratio	-	-	-	0.144	0.012	0.002	-
HCM Control Delay (s)	0	-	-	12.9	10.3	7.6	0
HCM Lane LOS	A	-	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	0	0	0	0	0	188	0	0	118	19
Future Vol, veh/h	2	0	0	0	0	0	0	188	0	0	118	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	90	90	90	87	87	87	88	88	88
Heavy Vehicles, %	100	0	0	2	2	2	0	2	0	2	4	6
Mvmt Flow	4	0	0	0	0	0	0	216	0	0	134	22

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	361	361	145	361	372	216	156	0	0	216	0	0
Stage 1	145	145	-	216	216	-	-	-	-	-	-	-
Stage 2	216	216	-	145	156	-	-	-	-	-	-	-
Critical Hdwy	8.1	6.5	6.2	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	4.4	4	3.3	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	449	569	908	595	558	824	1436	-	-	1354	-	-
Stage 1	671	781	-	786	724	-	-	-	-	-	-	-
Stage 2	608	728	-	858	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	449	569	908	595	558	824	1436	-	-	1354	-	-
Mov Cap-2 Maneuver	449	569	-	595	558	-	-	-	-	-	-	-
Stage 1	671	781	-	786	724	-	-	-	-	-	-	-
Stage 2	608	728	-	858	769	-	-	-	-	-	-	-

Approach	EB		WB			NB		SB		
HCM Control Delay, s	13.1		0			0		0		
HCM LOS	B		A							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1436	-	-	449	-	1354	-
HCM Lane V/C Ratio	-	-	-	0.009	-	-	-
HCM Control Delay (s)	0	-	-	13.1	0	0	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	0	6	1	0	2	0	185	0	2	187	6
Future Vol, veh/h	41	0	6	1	0	2	0	185	0	2	187	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	38	38	38	87	87	87	78	78	78
Heavy Vehicles, %	0	2	0	0	2	0	2	1	2	0	2	0
Mvmt Flow	67	0	10	3	0	5	0	213	0	3	240	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	466	463	244	468	467	213	248	0	0	213	0	0
Stage 1	250	250	-	213	213	-	-	-	-	-	-	-
Stage 2	216	213	-	255	254	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.1	6.52	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4.018	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	510	496	800	509	493	832	1318	-	-	1369	-	-
Stage 1	759	700	-	794	726	-	-	-	-	-	-	-
Stage 2	791	726	-	754	697	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	505	495	800	501	492	832	1318	-	-	1369	-	-
Mov Cap-2 Maneuver	505	495	-	501	492	-	-	-	-	-	-	-
Stage 1	759	698	-	794	726	-	-	-	-	-	-	-
Stage 2	786	726	-	742	695	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.9		10.3		0		0.1	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1318	-	-	530	682	1369	-	-
HCM Lane V/C Ratio	-	-	-	0.145	0.012	0.002	-	-
HCM Control Delay (s)	0	-	-	12.9	10.3	7.6	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-	-

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	0	0	0	0	0	208	0	0	131	19
Future Vol, veh/h	2	0	0	0	0	0	0	208	0	0	131	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	90	90	90	87	87	87	88	88	88
Heavy Vehicles, %	100	0	0	2	2	2	0	2	0	2	4	6
Mvmt Flow	4	0	0	0	0	0	0	239	0	0	149	22

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	399	399	160	399	410	239	171	0	0	239	0	0
Stage 1	160	160	-	239	239	-	-	-	-	-	-	-
Stage 2	239	239	-	160	171	-	-	-	-	-	-	-
Critical Hdwy	8.1	6.5	6.2	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	4.4	4	3.3	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	421	542	890	561	531	800	1418	-	-	1328	-	-
Stage 1	657	769	-	764	708	-	-	-	-	-	-	-
Stage 2	589	711	-	842	757	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	421	542	890	561	531	800	1418	-	-	1328	-	-
Mov Cap-2 Maneuver	421	542	-	561	531	-	-	-	-	-	-	-
Stage 1	657	769	-	764	708	-	-	-	-	-	-	-
Stage 2	589	711	-	842	757	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.6	0	0	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1418	-	-	421	-	1328	-	-
HCM Lane V/C Ratio	-	-	-	0.01	-	-	-	-
HCM Control Delay (s)	0	-	-	13.6	0	0	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	0	6	1	0	2	0	204	0	2	206	6
Future Vol, veh/h	41	0	6	1	0	2	0	204	0	2	206	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	38	38	38	87	87	87	78	78	78
Heavy Vehicles, %	0	2	0	0	2	0	2	1	2	0	2	0
Mvmt Flow	67	0	10	3	0	5	0	234	0	3	264	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	511	508	268	513	512	234	272	0	0	234	0	0
Stage 1	274	274	-	234	234	-	-	-	-	-	-	-
Stage 2	237	234	-	279	278	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.1	6.52	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4.018	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	476	468	776	475	465	810	1291	-	-	1345	-	-
Stage 1	736	683	-	774	711	-	-	-	-	-	-	-
Stage 2	771	711	-	732	680	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	472	467	776	468	464	810	1291	-	-	1345	-	-
Mov Cap-2 Maneuver	472	467	-	468	464	-	-	-	-	-	-	-
Stage 1	736	681	-	774	711	-	-	-	-	-	-	-
Stage 2	766	711	-	721	678	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.6		10.6		0		0.1	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1291	-	-	497	651	1345	-
HCM Lane V/C Ratio	-	-	-	0.155	0.012	0.002	-
HCM Control Delay (s)	0	-	-	13.6	10.6	7.7	0
HCM Lane LOS	A	-	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	0	1	0	0	0	190	1	8	137	19
Future Vol, veh/h	2	0	0	1	0	0	0	190	1	8	137	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	90	90	90	87	87	87	88	88	88
Heavy Vehicles, %	100	0	0	2	2	2	0	2	0	2	4	6
Mvmt Flow	4	0	0	1	0	0	0	218	1	9	156	22

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	404	404	167	404	415	219	178	0	0	219	0	0
Stage 1	185	185	-	219	219	-	-	-	-	-	-	-
Stage 2	219	219	-	185	196	-	-	-	-	-	-	-
Critical Hdwy	8.1	6.5	6.2	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	4.4	4	3.3	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	418	539	882	557	528	821	1410	-	-	1350	-	-
Stage 1	635	751	-	783	722	-	-	-	-	-	-	-
Stage 2	605	726	-	817	739	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	416	535	882	554	524	821	1410	-	-	1350	-	-
Mov Cap-2 Maneuver	416	535	-	554	524	-	-	-	-	-	-	-
Stage 1	635	746	-	783	722	-	-	-	-	-	-	-
Stage 2	605	726	-	811	734	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	13.7		11.5		0		0.4			
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1410	-	-	416	554	1350	-
HCM Lane V/C Ratio	-	-	-	0.01	0.002	0.007	-
HCM Control Delay (s)	0	-	-	13.7	11.5	7.7	0
HCM Lane LOS	A	-	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-

HCM 6th TWSC
6: Robnson Road & South Driveway

07/21/2021

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	1	2	189	3	19	118
Future Vol, veh/h	1	2	189	3	19	118
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1	2	210	3	21	131

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	385	212	0	0	213	0
Stage 1	212	-	-	-	-	-
Stage 2	173	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	616	826	-	-	1351	-
Stage 1	821	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	606	826	-	-	1351	-
Mov Cap-2 Maneuver	606	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	840	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	737	1351
HCM Lane V/C Ratio	-	-	0.005	0.016
HCM Control Delay (s)	-	-	9.9	7.7
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	0	6	1	0	7	0	201	0	2	188	6
Future Vol, veh/h	41	0	6	1	0	7	0	201	0	2	188	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	38	38	38	87	87	87	78	78	78
Heavy Vehicles, %	0	2	0	0	2	0	2	1	2	0	2	0
Mvmt Flow	67	0	10	3	0	18	0	231	0	3	241	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	491	482	245	487	486	231	249	0	0	231	0	0
Stage 1	251	251	-	231	231	-	-	-	-	-	-	-
Stage 2	240	231	-	256	255	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.1	6.52	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4.018	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	491	484	799	494	481	813	1317	-	-	1349	-	-
Stage 1	758	699	-	776	713	-	-	-	-	-	-	-
Stage 2	768	713	-	753	696	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	479	483	799	487	480	813	1317	-	-	1349	-	-
Mov Cap-2 Maneuver	479	483	-	487	480	-	-	-	-	-	-	-
Stage 1	758	697	-	776	713	-	-	-	-	-	-	-
Stage 2	751	713	-	741	694	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	13.4		9.9		0		0.1			
HCM LOS	B		A							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1317	-	-	505	750	1349	-	-
HCM Lane V/C Ratio	-	-	-	0.153	0.028	0.002	-	-
HCM Control Delay (s)	0	-	-	13.4	9.9	7.7	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.1	0	-	-

HCM 6th TWSC
6: Robnson Road & South Driveway

07/21/2021

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	2	16	185	1	1	194
Future Vol, veh/h	2	16	185	1	1	194
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	-	-	-	-	-
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	2	18	206	1	1	216

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	425	207	0	0	207	0
Stage 1	207	-	-	-	-	-
Stage 2	218	-	-	-	-	-
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	586	833	-	-	1364	-
Stage 1	828	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	585	833	-	-	1364	-
Mov Cap-2 Maneuver	585	-	-	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	796	1364
HCM Lane V/C Ratio	-	-	0.025	0.001
HCM Control Delay (s)	-	-	9.6	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	0	1	0	0	0	210	1	8	150	19
Future Vol, veh/h	2	0	0	1	0	0	0	210	1	8	150	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	90	90	90	87	87	87	88	88	88
Heavy Vehicles, %	100	0	0	2	2	2	0	2	0	2	4	6
Mvmt Flow	4	0	0	1	0	0	0	241	1	9	170	22

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	441	441	181	441	452	242	192	0	0	242	0	0
Stage 1	199	199	-	242	242	-	-	-	-	-	-	-
Stage 2	242	242	-	199	210	-	-	-	-	-	-	-
Critical Hdwy	8.1	6.5	6.2	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	4.4	4	3.3	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	392	513	867	527	503	797	1394	-	-	1324	-	-
Stage 1	623	740	-	762	705	-	-	-	-	-	-	-
Stage 2	586	709	-	803	728	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	390	509	867	524	499	797	1394	-	-	1324	-	-
Mov Cap-2 Maneuver	390	509	-	524	499	-	-	-	-	-	-	-
Stage 1	623	734	-	762	705	-	-	-	-	-	-	-
Stage 2	586	709	-	797	722	-	-	-	-	-	-	-

Approach	EB		WB			NB		SB		
HCM Control Delay, s	14.3		11.9			0		0.3		
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1394	-	-	390	524	1324	-	-
HCM Lane V/C Ratio	-	-	-	0.01	0.002	0.007	-	-
HCM Control Delay (s)	0	-	-	14.3	11.9	7.7	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 6th TWSC
6: Robinson Road & South Driveway

07/21/2021

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	1	2	209	3	19	131
Future Vol, veh/h	1	2	209	3	19	131
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1	2	232	3	21	146

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	422	234	0	0	235
Stage 1	234	-	-	-	-
Stage 2	188	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227
Pot Cap-1 Maneuver	586	803	-	-	1326
Stage 1	802	-	-	-	-
Stage 2	842	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	576	803	-	-	1326
Mov Cap-2 Maneuver	576	-	-	-	-
Stage 1	802	-	-	-	-
Stage 2	828	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	710	1326
HCM Lane V/C Ratio	-	-	0.005	0.016
HCM Control Delay (s)	-	-	10.1	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC
 3: Robinson Road & Christine Drive/North Driveway

07/21/2021

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	0	6	1	0	7	0	220	0	2	207	6
Future Vol, veh/h	41	0	6	1	0	7	0	220	0	2	207	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	38	38	38	87	87	87	78	78	78
Heavy Vehicles, %	0	2	0	0	2	0	2	1	2	0	2	0
Mvmt Flow	67	0	10	3	0	18	0	253	0	3	265	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	537	528	269	533	532	253	273	0	0	253	0	0
Stage 1	275	275	-	253	253	-	-	-	-	-	-	-
Stage 2	262	253	-	280	279	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.1	6.52	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4.018	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	458	456	775	461	453	791	1290	-	-	1324	-	-
Stage 1	736	683	-	756	698	-	-	-	-	-	-	-
Stage 2	747	698	-	731	680	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	446	455	775	454	452	791	1290	-	-	1324	-	-
Mov Cap-2 Maneuver	446	455	-	454	452	-	-	-	-	-	-	-
Stage 1	736	681	-	756	698	-	-	-	-	-	-	-
Stage 2	730	698	-	720	678	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	14.1		10.1		0		0.1			
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1290	-	-	472	724	1324	-	-
HCM Lane V/C Ratio	-	-	-	0.163	0.029	0.002	-	-
HCM Control Delay (s)	0	-	-	14.1	10.1	7.7	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

HCM 6th TWSC
6: Robnson Road & South Driveway

07/21/2021

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	2	16	204	1	1	213
Future Vol, veh/h	2	16	204	1	1	213
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	-	-	-	-	-
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	2	18	227	1	1	237

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	467	228	0	0	228	0
Stage 1	228	-	-	-	-	-
Stage 2	239	-	-	-	-	-
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	554	811	-	-	1340	-
Stage 1	810	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	553	811	-	-	1340	-
Mov Cap-2 Maneuver	553	-	-	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	771	1340
HCM Lane V/C Ratio	-	-	0.026	0.001
HCM Control Delay (s)	-	-	9.8	7.7
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Appendix F: Comments and Responses



FUSS & O'NEILL

August 6, 2021

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

Re: Town of Hudson Planning Board Review – Traffic Study Review
SL Chasse Steel Site Plan, Robinson Road
Tax Map 105 Lot 17-2 & 17-3; Acct. #1350-532
Reference No. 20030249.2020

Dear Mr. Groth:

Fuss & O'Neill (F&O) has reviewed the Traffic Impact and Access Study received on July 23, 2021, related to the above-referenced project. The scope of this review letter is related to the traffic study only. Site plan, subdivision, and other review elements were previously provided.

The following items are noted:

4. Traffic

Fuss & O'Neill, Inc. has reviewed the traffic impact and access prepared by Transportation Engineering, Planning and Policy, LLC (TEPP) for Keach-Nordstrom Associates, Inc. (KNA) dated July 22, 2021, for the proposed commercial redevelopment on Robinson Road in Hudson, New Hampshire (Tax Map 115 Lots 17-2 and 17-3). The project proposes to replace one existing single-family housing unit with a 79,200 square foot light-industrial land use. Access and egress to the site will be provided via two proposed driveways—one on the east side of Robinson Road directly across from Christine Drive and one along Robinson Road 250 feet south of its intersection with Christine Drive. The two driveways will be connected internally to the site.

In review of the TEPP report, we would suggest the following:

- Based on the provided ATR vehicle speeds, it appears that the mean speed and 85th percentile speed for the northbound direction should be 39.7 mph and 44 mph, respectively. These values are represented correctly in Table 2 of the Vehicle Speeds section of the report, but are summarized incorrectly in the text immediately after. The text should be revised to reflect what is shown in Table 2.
- The last column of Table 8 is incorrectly labeled as 2032 No Build. This label should be revised to reflect 2032 Build conditions.

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Vermont

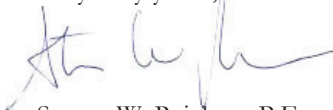
Mr. Brian Groth
August 6, 2021
Page 2 of 2

Overall, the procedures that the TEPP report uses are reasonable, with the appropriate ITE trip generation information used for the scenario provided. The analysis provided evaluated any impacts to Robinson Road at the driveway intersections. It should be noted that this site is within 1,200 feet of the Derry Road signalized intersection with Robinson Road and West Road. It's assumed that the majority of traffic from this site would need to travel through this signalized intersection, which would be up to an additional 27 vehicles in the AM either coming from Derry Road northbound or southbound approach, and up to an additional 21 vehicles in the PM existing the site via the eastbound approach. Should the Town have any concerns about the existing operations of this signalized intersection, we would recommend that the traffic study add additional discussion of the site trips accessing the Derry Road intersection. Since the trips generated by the proposed site are relatively low, a full signalized intersection analysis may not be warranted, but an idea of what the additional queue lengths would be with the addition of the site could be estimated with an evaluation of existing conditions, including some type of adjustment for COVID if Derry Road's current traffic is not back to pre COVID levels.

We concur with TEPP's overall conclusion that, given the relatively low number of new trips expected to be generated by the site's proposed land use (35 during the weekday morning peak hour and 25 during the weekday evening peak hour), there should be minimal impacts on traffic operations of Robinson Road. However, the report does not include the full impacted roadway network, only the adjacent site roadway, so further evaluation as described above may be warranted.

Please feel free to call if you have any questions.

Very truly yours,



Steven W. Reichert, P.E.

**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: 2021.08.06 17:22:52 -04'00'

SWR:

Enclosure

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

RESPONSES BY TEPP LLC

Comment. Based on the provided ATR vehicle speeds, it appears that the mean speed and 85th percentile speed for the northbound direction should be 39.7 mph and 44 mph, respectively. These values are represented correctly in Table 2 of the Vehicle Speeds section of the report, but are summarized incorrectly in the text immediately after. The text should be revised to reflect what is shown in Table 2.

Response. Page 9 shows the revisions.

The last column of Table 8 is incorrectly labeled as 2032 No Build. This label should be revised to reflect 2032 Build conditions.

Response. Page 23, Table 8, shows the revision.

Comment. Overall, the procedures that the TEPP report uses are reasonable, with the appropriate ITE trip generation information used for the scenario provided. The analysis provided evaluated any impacts to Robinson Road at the driveway intersections. It should be noted that this site is within 1,200 feet of the Derry Road signalized intersection with Robinson Road and West Road. It's assumed that the majority of traffic from this site would need to travel through this signalized intersection, which would be up to an additional 27 vehicles in the AM either coming from Derry Road northbound or southbound approach, and up to an additional 21 vehicles in the PM existing the site via the eastbound approach. Should the Town have any concerns about the existing operations of this signalized intersection, we would recommend that the traffic study add additional discussion of the site trips accessing the Derry Road intersection. Since the trips generated by the proposed site are relatively low, a full signalized intersection analysis may not be warranted, but an idea of what the additional queue lengths would be with the addition of the site could be estimated with an evaluation of existing conditions, including some type of adjustment for COVID if Derry Road's current traffic is not back to pre COVID levels.

Response. Pages 15 and 19 show the response.

The Derry Road/Robinson Road/West Road signalized intersection is about 1,200 ft north of the Robinson Road/Christine Drive intersection. Traffic-volume increases at the former intersection due to the proposed redevelopment are up to:

- for the weekday AM-street-peak hour, up to 27 vehicle-trips entering for the site
- for the weekday PM-street-peak hour, up to 21 vehicle-trips leaving the site

This approximates less than one vehicle-trip per signal cycle and constitutes no significant impact. Therefore, no further analysis of the Derry Road/Robinson Road/West Road intersection is warranted.

S.L. CHASSE STEEL – 199 ROBINSON ROAD

SITE PLAN APPLICATION #04-21

STAFF REPORT #4

September 8, 2021

SITE: 199 Robinson Road; Map 105 Lot 17-3

ZONING: General-One (G-1)

PURPOSE OF PLANS: To show three proposed industrial buildings totaling 50,400 SF (including 2,520 SF office space) and associated parking on Robinson Road.

PLANS UNDER REVIEW: Non-residential Site Plan, S.L. Chasse Steel Contractor Buildings, Map 105 Lot 17-3, Robinson Road, Hudson, New Hampshire; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3, Bedford, New Hampshire 03110; prepared for SLC Development, LLC, 8 Christine Drive, Hudson, New Hampshire 03051; consisting of 12 sheets plus a cover page, with general notes 1-41 on Sheet 1; dated April 6, 2021, last revised September 2, 2021.

Note: Included in this packet is revised Sheet 5 showing fire suppression storage tanks.

ATTACHMENTS:

- A. Third Round of Peer Review of SP #04-21 by Fuss & O'Neill, dated August 30, 2021
- B. CAP Fee worksheet.

APPLICATION TRACKING:

- April 7, 2021 – Site Plan applications received.
- May 28, 2021 – Conditional Use Permit application received.
- June 1, 2021 – Revised plans received.
- June 9, 2021 – Public hearing scheduled, SP applications accepted, continued to June 23, 2021.
- June 23, 2021 – Public hearing scheduled, applicant requested continuance to July 28, 2021.
- July 28, 2021 – Public hearing scheduled, applicant requested continuance to August 25, 2021.
- August 17, 2021 – Revised plan sets received.
- August 25, 2021 – Public hearing scheduled.

WAIVER REQUESTS

The Applicant is seeking relief from two land use regulations:

§276-11.1.B(25) – This regulation permits the Planning Board to allow access ways across side lot lines. This enables the application to connect to the Owner’s neighboring Lot 17-3 which is the subject of SP #04-21.

COMMENTS:

FIRE SUPPRESSION SUPPLY

Upon conferring with the Fire Department and Engineering Department, we have found the following:

1. The total fire suppression need to cover both sites is 60,000 gallons/hour for 3 hours, or 180,000 gallons
2. Our consultant’s conservative estimate is that 500 gallons/minute are available, equating to 90,000 gallons over 3 hours.
3. This leaves a gap of 90,000 gallons.
4. 3x 30,000 gallon tanks would cover the supply gap for both sites.
5. Engineering requests an offsite improvement, a surge valve, in order to ensure the 500 gallons/minute is available from town supply. The Town would handle installation.

Additionally, during final design of the sprinkler systems for the respective buildings, if a “quick-response” system is designed and built; further forgiveness on the fire flow may become available. This has the potential to reduce the needs described above. Accordingly, this may mean starting the building permit review prior to recording the final Mylar in order to determine the final tank design.

A revised plan sheet has been provided showing proposed tank locations, if necessary.

(Draft Motions on the follow pages)

DRAFT MOTIONS

To GRANT a waiver:

I move to grant a waiver from §276-11.1.B(25), to allow access across the side lot line between lot 17-2 and Lot 17-4, based on the Board’s discussion, the testimony of the Applicant’s representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion by: _____ Second: _____ Carried/Failed: _____

CONTINUE the public hearing to a date certain:

I move to continue the public hearing for the conditional use permit application and site plan applications for S.L. Chasse Steel at 199; Map 105 Lot 17-3 to date certain, _____, 2021.

Motion by: _____ Second: _____ Carried/Failed: _____

APPROVE the site plan application:

I move to approve the site plan for Non-residential Site Plan, S.L. Chasse Steel Contractor Buildings, Map 105 Lot 17-3, Robinson Road, Hudson, New Hampshire; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3, Bedford, New Hampshire 03110; prepared for SLC Development, LLC, 8 Christine Drive, Hudson, New Hampshire 03051; consisting of 12 sheets plus a cover page, with general notes 1-41 on Sheet 1; dated April 6, 2021, last revised September 2, 2021; subject to, and revised per, the following stipulations:

1. All stipulations of approval shall be incorporated into the Notice of Decision and 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. A cost allocation procedure (CAP) amount of \$69,552 shall be paid prior to the issuance of a Certificate of Occupancy.
4. An offsite improvement, a Surge Valve for the Route 102 Booster Station, is necessitated by this application in tandem with SP #03-21. This shall be coordinated with the Engineering Department.
5. Prior to the issuance of a Certificate of Occupancy, an L.L.S. Certified “as-built” site plan shall be provided to the Planning Department, confirming that the site conforms to the Plan approved by the Planning Board.

6. The final design and size of the fire suppression water supply tanks shall be subject to the Fire Department's determination. The final Plan will reflect the needs identified during the building permit review process, which may begin prior to recording of the Plan. A building permit will not be issued until the Plan is recorded.
7. Prior to the Planning Board endorsement of the Plan, it shall be subject to final administrative review by Town Planner and Town Engineer.
8. The applicant shall schedule a pre-construction meeting with the Town Engineer prior to applying for a building permit.
9. Construction activities involving the subject lot shall be limited to the hours between 7:00 A.M. and 7:00 P.M. No exterior construction activities shall be allowed on Sundays.
10. Blasting or ramming activities shall be limited to the hours between 9:00 A.M and 5:00 P.M, Monday through Friday. Blasting activities are prohibited on Saturday and Sunday.

Motion by: _____ Second: _____ Carried/Failed: _____



August 30, 2021

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

Re: Town of Hudson Planning Board Review
SL Chasse Steel Site Plan, Robinson Road
Tax Map 105 Lot 17-3; Acct. #1350-532
Reference No. 20030249.2020

Dear Mr. Groth:

Fuss & O'Neill (F&O) has reviewed the second submission of the materials received on August 17, 2021, related to the above-referenced project. 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.

Please note that comments related to the proposed development at lot 17-2 will be forwarded with a separate letter. Also, the stormwater design documents provided as part of the review package incorporate both lots, so our drainage related comments have been provided separately.

Previous review comments that did not require further action or input have been removed from this letter for brevity/clarity.

The following items have outstanding issues:

4. Traffic

- b. **Former/Current Fuss & O'Neill Comment:** The applicant should clarify the intent for the uses of each building related to truck loading. Large WB-50 and WB-67 trucks cannot access overhead loading door areas at each building. The applicant should confirm that smaller box trucks are intended for use at this site.

5. Utility Design/Conflicts

- f. *Former Fuss & O'Neill Comment:* The applicant should review with the Hudson Fire Department whether hydrants should be installed along the proposed water main on Robinson Road. If required, hydrants shall meet the requirements of Hudson Engineering Technical Guidelines section 825.4.10.
Current Fuss & O'Neill Comment: The applicant has stated that they are coordinating with the Town and the Fire Department.

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Mr. Brian Groth
August 30, 2021
Page 2 of 4

The following items require Town evaluation or input:

1. Site Plan Review Codes (HR 275)

- a. *Former Fuss & O'Neill Comment: Hudson Regulation (HR) 275-6.I. The scope of this review does not include the adequacy of any fire protection provisions for the proposed buildings. Fuss & O'Neill defers to the Hudson Fire Department for review of proposed fire protection for this facility. We note that the site is proposed to be serviced by a private well. The Town should review the need for an onsite cistern depending on the well capacity.*

Current Fuss & O'Neill Comment: The applicant has stated that they are coordinating with the Town and the Fire Department.

2. Administrative Review Codes (HR 276)

- b. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(6) The owner's signature is not shown on the plan set.*

Current Fuss & O'Neill Comment: The applicant noted that the owner will sign the final plan.

7. Zoning (ZO 334)

- f. *Former Fuss & O'Neill Comment: ZO 334-36.C.(2). The applicant is proposing installation of a water main along Robinson Road that impacts a wetlands buffer. The applicant should review with the Town to determine if the proposed water main requires a Conditional Use Permit in accordance with the Ordinance.*

Current Fuss & O'Neill Comment: The applicant has stated that a Conditional Use Permit had been submitted. No further Fuss & O'Neill comment.

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

1. Site Plan Review Codes (HR 275)

- e. *Former Fuss & O'Neill Comment: HR 275-8.C.(6). The applicant should show the proposed off-street loading spaces on the plan set. We note that 6 spaces are required and the applicant has noted that 7 spaces are provided, but they are not labeled. The applicant should show loading areas on the plan to be sure they do not conflict with circulation on the site and that the size is adequate. / The applicant has shown and labeled 6 loading spaces on the plan set but continued to note that 7 are provided. The applicant should revise the note or add an additional area to the plan set.*

Current Fuss & O'Neill Comment: The applicant has revised the plan to show 7 loading spaces. No further Fuss & O'Neill comment.

- g. *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. / The applicant has provided a copy of the deed. We note no easements were provided, however, the deed references a State of New Hampshire easement.*

Current Fuss & O'Neill Comment: The applicant has stated that the easement noted affected the lot before the 2020 subdivision and does not affect this parcel. No further Fuss & O'Neill comment.

Mr. Brian Groth
August 30, 2021
Page 3 of 4

2. Administrative Review Codes (HR 276)

- f. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(17). We were unable to locate any benchmarks within the Site plan.*

Current Fuss & O'Neill Comment: The applicant has added the benchmark 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 the review package. / The applicant has indicated that the Town has not requested any traffic information, and their understanding is that it is not required to this point. We note that between lots 2 and 3 there are over 130 parking spaces proposed, which may provide traffic impacts that warrant further review.*

Current Fuss & O'Neill Comment: The applicant has submitted a traffic study and our review comments were provided to the Town on August 6, 2021, for the report dated July 23, 2021. Further traffic reviews will be responded to separately.

5. Utility Design/Conflicts

- a. *Former Fuss & O'Neill Comment: HR 275-9.E and 276-13. The applicant has provided a typical septic system detail and shown the approximate location. We note that no water/well details were provided. /The applicant has stated that they are currently working on a water connection to the site, and an off-site water main extension plan was provided. We note that water lines are now shown on the site but details, size and materials are not provided.*

Current Fuss & O'Neill Comment: The applicant has shown details, size and materials are for the proposed water main. No further Fuss & O'Neill comment.

- d. *Former Fuss & O'Neill Comment: The applicant should provide details for sewer manholes, sewer trench, and sewer/drain separation*

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

- e. *Former Fuss & O'Neill Comment: The applicant has provided a water main profile that shows a minimum of 4 feet of cover in some sections. The minimum cover required by the Town of Hudson is 5 feet.*

Current Fuss & O'Neill Comment: The applicant has revised the plan to provide the minimum 5 feet of cover. No further Fuss & O'Neill comment.

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

The review of the drainage design and Alteration of Terrain report was provided under separate letters from Fuss & O'Neill dated April 30, 2021, June 14, 2021, and August 30, 2021.

Mr. Brian Groth
August 30, 2021
Page 4 of 4

Please feel free to call if you have any questions.

Very truly yours,



Steven W. Reichert, P.E.

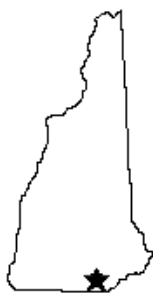
**Steven W.
Reichert, PE**

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: 2021.08.30 14:07:06 -0400'

SWR:

Enclosure

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



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: 09-01-21 Zone # 1 Map/Lot: 105/017-003
199 Robinson Rd.

Project Name: S.L. Chasse Steel

Proposed ITE Use #1: Industrial

Proposed Building Area (square footage): 50,400 S.F.

CAP FEES: (ONE CHECK NEEDED)

1.	(Bank 09) 2070-701	Light Industrial (50,400 s.f @ \$1.38 per s.f)	\$ <u>69,552.00</u>
		Total CAP Fee	\$ <u>69,552.00</u>

Check should be made payable to the Town of Hudson.

Thank you,

Brooke Dabowik

Planning Administrative Aide

S.L. CHASSE STEEL WATERLINE EXTENSION

CONDITIONAL USE PERMIT APPLICATION #07-21

STAFF REPORT #2

September 8, 2021

SITE: 199-201 Robinson Road; Map 105 Lot 017-002 & Map 105 Lot 017-003

ZONING: General-One (G-1)

PURPOSE OF PLAN: To show public water connection from the existing stub approximately 900 feet north of the site to lots 17-2 & 17-3.

PLANS UNDER REVIEW: Offsite Water Main Extension Plan and Profile, S.L. Chasse Steel, Map 105 Lot 17-2 & 17-3, Robinson Road, Hudson, New Hampshire; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3, Bedford, New Hampshire 03110; prepared for Steel Properties, LLC, 8 Christine Drive, Hudson, New Hampshire 03051; consisting of 1 sheet with construction notes 1-4 on Sheet 1; dated May 25, 2021.

ATTACHMENTS:

A. Hudson Conservation Commission's Input, dated June 14, 2021.

APPLICATION TRACKING:

- May 28, 2021 – Application received.
- June 14, 2021 – Site Walk and Recommendation the Conservation Commission
- June 23, 2021 – Public hearing scheduled.
- June 23, 2021 – Public hearing scheduled, applicant requested continuance to July 28, 2021.
- July 28, 2021 – Public hearing scheduled, applicant requested continuance to August 25, 2021.
- August 25, 2021 – Public hearing scheduled, continued to September 8, 2021
- September 8, 2021 – Public hearing scheduled.

COMMENTS & RECOMMENDATIONS:

BACKGROUND

The applicant is proposing development on Lot 017-002 and Lot 017-003, which requires an offsite extension of the waterline along the public right-of-way on Robinson Road to provide town water to both lots. The extension work will run alongside Robinson Road from Map 105 Lot 018-000 to Map 105 Lot 017-003.

The proposed waterline extension will traverse over portions of both delineated wetland and wetland buffer area that run across the road between Map 105 Lot 017-000 and Map 105 Lot 017-001, requiring a conditional use permit from the Planning Board.

STAFF COMMENTS

1. **Use within Wetland Conservation District (§ 334-36):** The proposed waterline extension is a conditional use permitted under § 334-36:C(2). However, such conditional use shall be located and constructed in such a way as to minimize the potential for detrimental impact to the District, and may be permitted only when no viable alternative is available.

The proposed extension is laid out to limit impact to the District by avoiding direct impacts to the wetland. A stipulation of approval is recommended in the event a direct impact occurs in the field.

2. Hudson Conservation Commission Comments

- a. The HCC found the proposed project complies with the Hudson Zoning Ordinance Article IX, §334-36 (C) (2) and §334-37 (2).
 - b. The HCC voted to recommend a favorable acceptance to the Planning Board for the proposed waterline extension (3-0).
 - c. The HCC asked the following recommendations and or notes be added to the plan set as part of the approval process:
 1. Construction and restoration shall comply with Best Management Practices set forth in New Hampshire Storm Water Manual Volume 3: Erosion and Sediment Control
 2. Prior to the start of construction erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer
 3. This motion is based on the plan(s) submitted by the applicant. It is recommended that if additional impacts are necessary the plan be returned to the Conservation Commission for further review.
3. **Lot Number and Lot Line:** Several off-site lot numbers and lines shown on the plan appear to be incorrect.
 - a. Map 105 Lot 11 shown on the plan should be two different lots: Map 105 Lot 011-000 and Map 105 Lot 011-001.
 - b. The lot label for Map 105 Lot 017-000 is missing (the designated wetland is located on this lot).
 - c. Town of Hudson's formal lot number consists of two sets of 3-digit numbers (e.g. Map 105 Lot 011-000). Since the submitted plan includes multiple lots with similar numbering, staff suggests the applicant relabel the lots using the two full sets of 3-digit numbers to avoid confusion.

DRAFT MOTIONS

ACCEPT the conditional use permit application:

I move to accept the conditional use permit application for S.L. Chasse Steel Waterline Extension along Robinson Road from the existing water main to Map 105 Lot 17-3.

Motion by: _____ Second: _____ Carried/Failed: _____

CONTINUE the public hearing to a date certain:

I move to continue the conditional use permit application for S.L. Chasse Steel Waterline Extension along Robinson Road from the existing water main to Map 105 Lot 17-3.to date certain, _____, 2021.

Motion by: _____ Second: _____ Carried/Failed: _____

APPROVE the site plan application:

I move to approve the conditional use permit for Offsite Water Main Extension Plan and Profile, S.L. Chasse Steel, Map 105 Lot 17-2 & 17-3, Robinson Road, Hudson, New Hampshire; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3, Bedford, New Hampshire 03110; prepared for Steel Properties, LLC, 8 Christine Drive, Hudson, New Hampshire 03051; consisting of 1 sheet with construction notes 1-4 on Sheet 1; dated May 25, 2021; subject to, and revised per, the following stipulations:

1. All stipulations of approval shall be incorporated into the Notice of Decision and the Development Agreement, which shall be recorded at the HCRD, together with the Plan.
2. Prior to the Planning Board endorsement of the plans, it shall be subject to final administrative review by Town Planner and Town Engineer, including the plan revisions identified by the Staff Report.
3. Construction activities involving the subject lot shall be limited to the hours between 7:00 A.M. and 7:00 P.M. No exterior construction activities shall be allowed on Sundays.
4. Construction and restoration shall comply with Best Management Practices set forth in New Hampshire Storm Water Manual Volume 3: Erosion and Sediment Control
5. Prior to the start of construction erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer.
6. In the event a wetland impact occurs, the Applicant or its assigns shall notify the Town of Engineering Department and the Department of Environmental Services.

Motion by: _____ Second: _____ Carried/Failed: _____



TOWN OF HUDSON

Conservation Commission



William Collins, Chairman

Dave Morin, Selectmen Liaison

12 School Street • Hudson, New Hampshire 03051 • Tel: 603-886-6008 • Fax: 603-816-1291

Date: June 14, 2021

Case: Robinson Rd. Water Main Extension
Hudson, New Hampshire
Map 205, Lot 17-2 & 17-3
Zone: General One (G1)

Description of work to be performed: The project entails extending an existing water main located near the intersection of Robinson Road and Derry Road (Route 102) approximately 900 feet southerly along Robison Road to supply water service for Map 105 lots 17-2 and 17-3. Total wetland buffer impact if accepted will equal 1,760 sq. ft. total.

Conservation Members Stepping Down: None

Alternates Seated: None

Applicant Representative(s): Tony Basso, Keach-Nordstrom Associates, Inc.

Motion to “Recommend”

Mr. Dickinson moved to recommend a favorable acceptance to the Planning Board for the proposed water main extension along Robinson Road that will be used to service Map 105 lots 17-2 and 17-3. After review the conservation commission members find that the proposed project is in compliance with the Hudson Zoning Ordinance Article IX, §334-36 (C) (2) and §334-37 (2). The HCC does ask that the following recommendations and or notes be added to the plan set as part of the approval process.

1. Construction and restoration shall comply with Best Management Practices set forth in New Hampshire Storm Water Manual Volume 3: Erosion and Sediment Control
2. Prior to the start of construction erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer

3. This motion is based on the plan(s) submitted by the applicant. It is recommended that if additional impacts are necessary the plan be returned to the Conservation Commission for further review.

Motion Second: Mr. Kallgren

Vote: William Kallgren Yes, Ken Dickinson Yes, William Collins Yes

William Collins

William Collins
HCC Chairman

A copy of this recommendation/motion shall be stapled to the CUP application and forward it to the Town Planning Office for inclusion in the Planning Board Member Packets.

AROMA JOES
SITE PLAN APPLICATION #08-21
STAFF REPORT
September 8, 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 30, 2021. [Plan set attached hereto]

AND: Revised Sheet 3, responsive to Staff comment in coordination of pedestrian facilities.

ATTACHMENTS:

- A. Peer Review of Traffic Study, dated August 26, 2021
- B. Applicant response to peer review, received August 30, 2021
- C. Revised Traffic Impact and Access Study, prepared by TEPP, August 30, 2021

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 – Awaiting peer review of traffic study, deferred to September 8, 2021
- August 31, 2021 – Revised plans and studies received.
- September 8, 2021 – Public hearing scheduled.

COMMENTS:

TRAFFIC

Fuss & O'Neill completed their review of the traffic study; this review is **Attachment A**. The review identifies some typos, but more significantly, several points that require additional detail.

TEPP, the Applicant’s traffic engineer, provided a revised Traffic Study (**Attachment C**); the final two pages are direct responses to the peer review.

Staff hopes to have a peer review of this response in advance of the meeting.

ENGINEERING

See **Attachment B** for the Applicant’s response to the engineering peer review. There appears to be different perspectives on drainage analysis, for which Staff will seek additional input in advance of the meeting.

PLANNING

When designing the crosswalk spanning the driveway, the Applicant encountered a challenge with MUTCD standards (Manual on Uniform Traffic Control Devices issued by the Federal Highway Administration). These standards do not allow a vehicular stop bar to be placed immediately after a crosswalk. Instead, the Applicant removed the “jog” from the sidewalk, allowing the stop bar to be placed before the crosswalk. See the revised Sheet 3 for more detail. As a result, the easement will likely be changed but shall be reviewed and approved by Town Counsel.

In practice, it is likely that vehicles will inch up across the sidewalk as they look for opening to exit the site. However, as pedestrians arrive the markings will clearly delineate their right to pass thereby achieving the crosswalk’s objective.

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 30, 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: _____

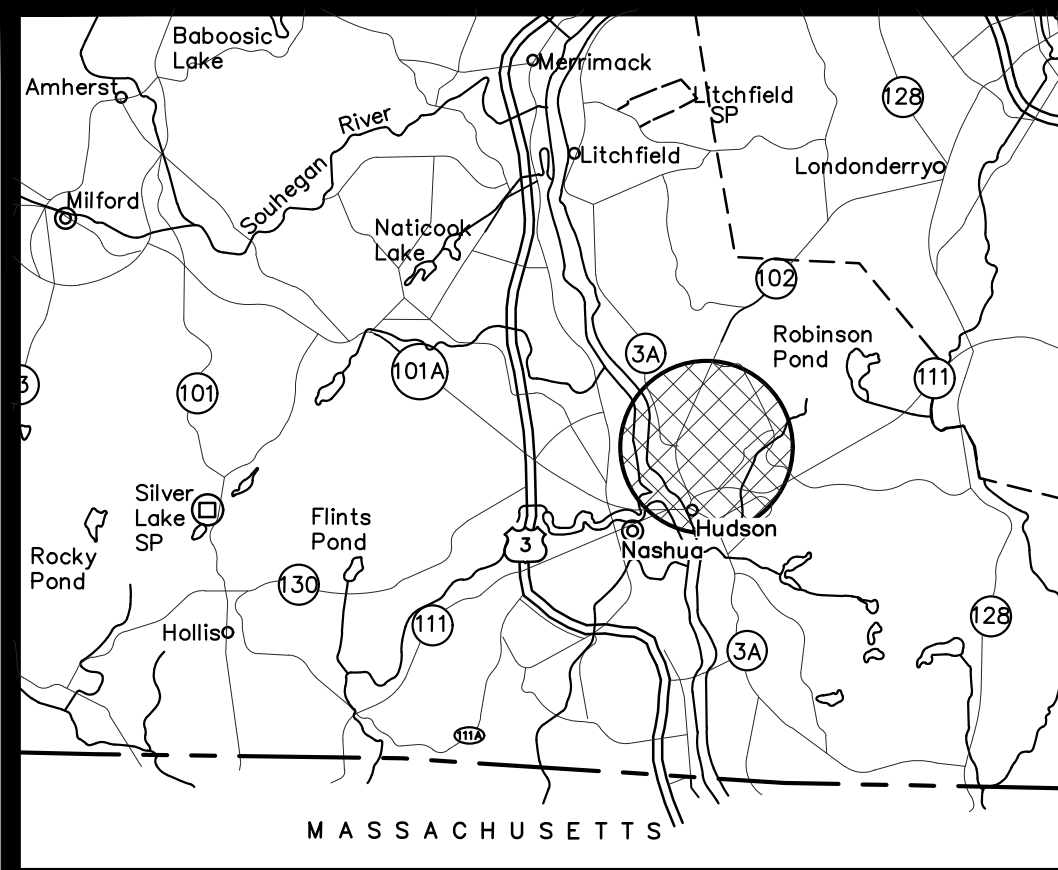
REVISED DRAFT MOTION, CHANGE IN **BOLD**.

APPROVE the site plan application:

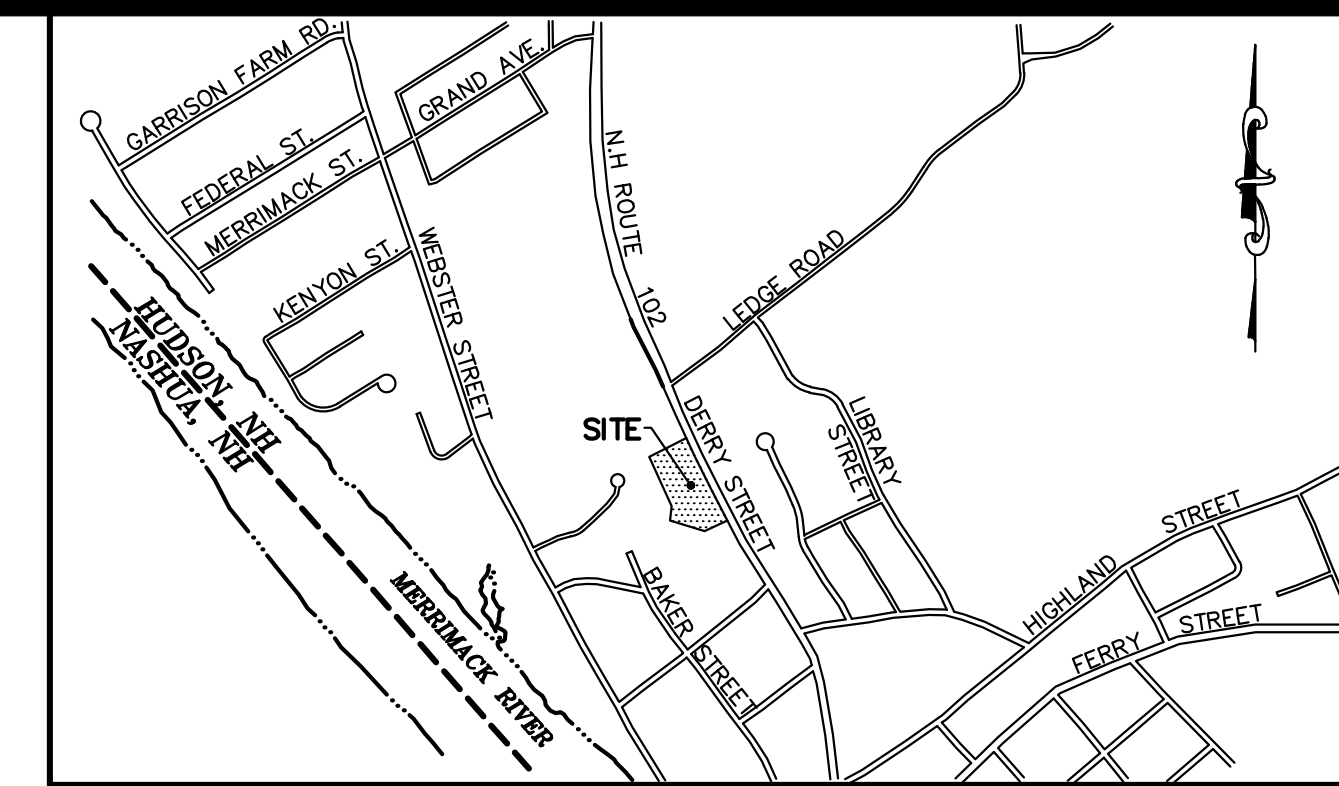
I move to approve the Site Plan: Non-Residential Site Plan, Aroma Joe’s; prepared by Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3B, Bedford, NH 03110; prepared for owner: Steve S. & Hsiang Hwa W. Pan, 13 King Henry Drive, Londonderry, NH 03053 and owner/applicant: Scott Ziefelder, 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 30, 2021; subject to, and revised per, the following stipulations:

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3. Prior to the issuance of a Certificate of Occupancy, an L.L.S. Certified “as-built” site plan shall be provided to the **Planning Department**, 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
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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: _____



VICINITY PLAN
NOT TO SCALE



VICINITY PLAN
SCALE: 1" = 1000'

NON RESIDENTIAL SITE PLAN

AROMA JOE'S

MAP 173; LOTS 29

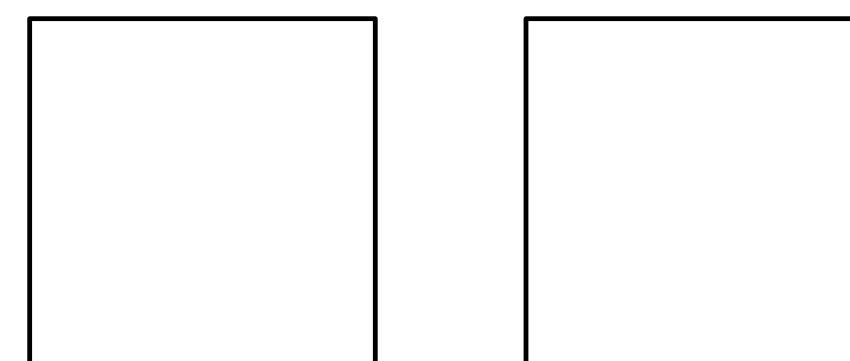
56 DERRY STREET

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
 BARRINGTON, NH 03825

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



KN 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 30, 2021
 PROJECT NO. 21-0311-1

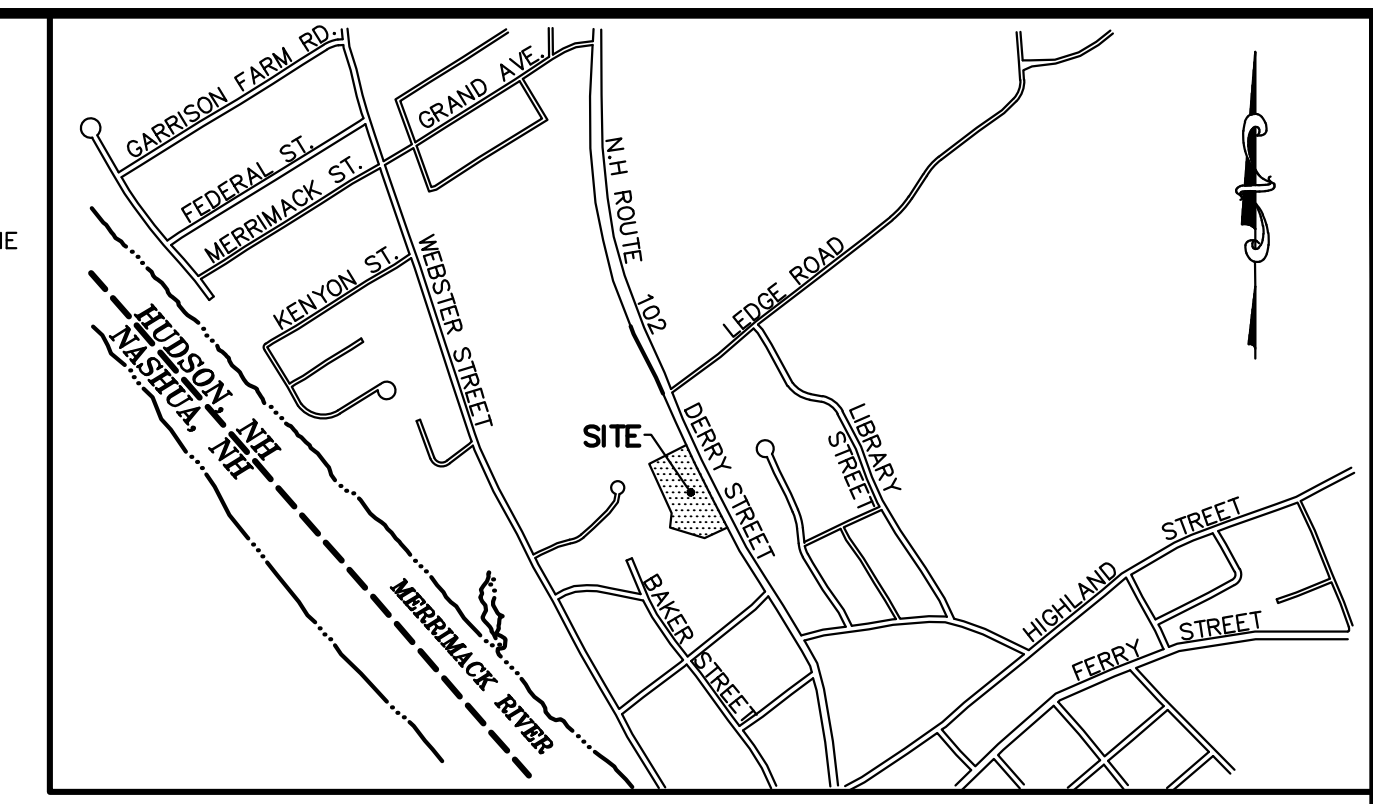
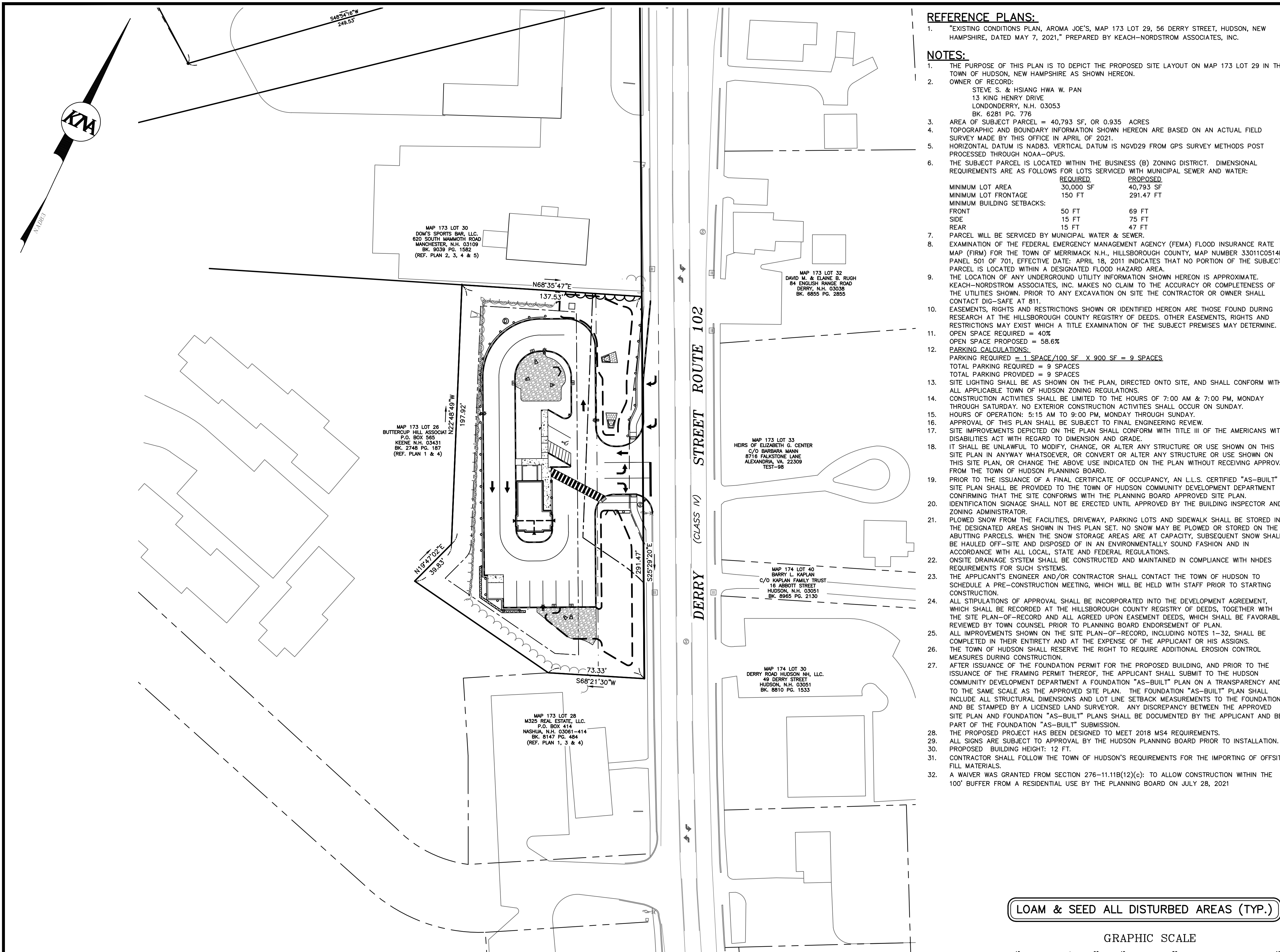
SHEET TITLE

SHEET No.

MASTER PLAN	1
EXISTING CONDITIONS/REMOVALS PLAN	2
NON-RESIDENTIAL SITE PLAN	3
GRADING, DRAINAGE, AND UTILITY PLAN	4
EROSION CONTROL PLAN	5
LANDSCAPE PLAN	6
LIGHTING PLAN	7
SIGHT DISTANCE PLAN	8
CONSTRUCTION DETAILS	9-14

EASEMENT PLAN

E1



VICINITY PLAN
SCALE: 1" = 1000'

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:

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

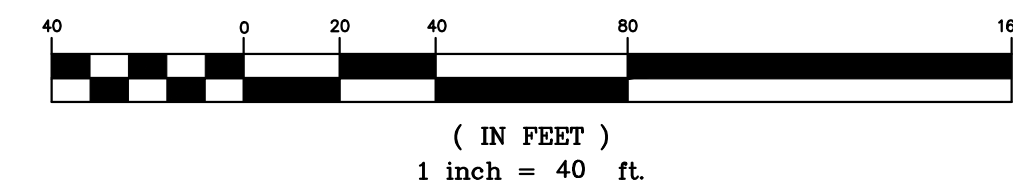
MINIMUM LOT AREA	30,000 SF	REQUIRED	40,793 SF
MINIMUM LOT FRONTAGE	150 FT	PROPOSED	291.47 FT
MINIMUM BUILDING SETBACKS:			
FRONT	50 FT		69 FT
SIDE	15 FT		75 FT
REAR	15 FT		47 FT
- PARCEL WILL BE SERVICED BY MUNICIPAL WATER & SEWER.
- EXAMINATION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF MERRIMACK N.H., HILLSBOROUGH COUNTY, MAP NUMBER 3301100514E, 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.
- 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.
- 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.
- OPEN SPACE REQUIRED = 40%
- OPEN SPACE PROPOSED = 58.6%
- PARKING CALCULATIONS:
PARKING REQUIRED = 1 SPACE/100 SF X 900 SF = 9 SPACES
TOTAL PARKING REQUIRED = 9 SPACES
TOTAL PARKING PROVIDED = 9 SPACES
- SITE LIGHTING SHALL BE AS SHOWN ON THE PLAN, DIRECTED ONTO SITE, AND SHALL CONFORM WITH ALL APPLICABLE TOWN OF HUDSON ZONING REGULATIONS.
- 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. HOURS OF OPERATION: 5:15 AM TO 9:00 PM, MONDAY THROUGH SUNDAY.
- APPROVAL OF THIS PLAN SHALL BE SUBJECT TO FINAL ENGINEERING REVIEW.
- SITE IMPROVEMENTS DEPICTED ON THE PLAN SHALL CONFORM WITH TITLE III OF THE AMERICANS WITH DISABILITIES ACT WITH REGARD TO DIMENSION AND GRADE.
- 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.
- 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.
- IDENTIFICATION SIGNAGE SHALL NOT BE ERRECTED UNTIL APPROVED BY THE BUILDING INSPECTOR AND ZONING ADMINISTRATOR.
- 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 ADJUTING 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.
- ONSITE DRAINAGE SYSTEM SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH NHDES REQUIREMENTS FOR SUCH SYSTEMS.
- 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.
- 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.
- 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.
- THE TOWN OF HUDSON SHALL RESERVE THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION.
- 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.
- THE PROPOSED PROJECT HAS BEEN DESIGNED TO MEET 2018 MS4 REQUIREMENTS.
- ALL SIGNS ARE SUBJECT TO APPROVAL BY THE HUDSON PLANNING BOARD PRIOR TO INSTALLATION.
- PROPOSED BUILDING HEIGHT: 12 FT.
- CONTRACTOR SHALL FOLLOW THE TOWN OF HUDSON'S REQUIREMENTS FOR THE IMPORTING OF OFFSITE FILL MATERIALS.
- 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

LEGEND

- ⊠ GB-F GRANITE BOUND FOUND
- ⊙ IP-F IRON PIN FOUND
- ⊙ IP-S IRON PIN SET WITH CAP
- ⊙ W/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
- ⊙ 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



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

**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: *[Signature]*
DATE: 6-16-2021

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL
3	08/30/2021	REVISED PER REVIEW 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 IRON PIN SET WITH CAP
- ⊙ W/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
- WdC** WINDSOR-URBAN LAND COMPLEX
3 TO 15% SLOPES

SOURCE: USDA-SCS WEB SOIL SURVEY
HILLSBOROUGH COUNTY

MAP 173 LOT 30
DOM'S SPORTS BAR, LLC
620 SOUTH WAMMOTH ROAD
MANCHESTER, N.H. 03109
BK. 9039 PG. 1562
(REF. PLAN 2, 3, 4 & 5)

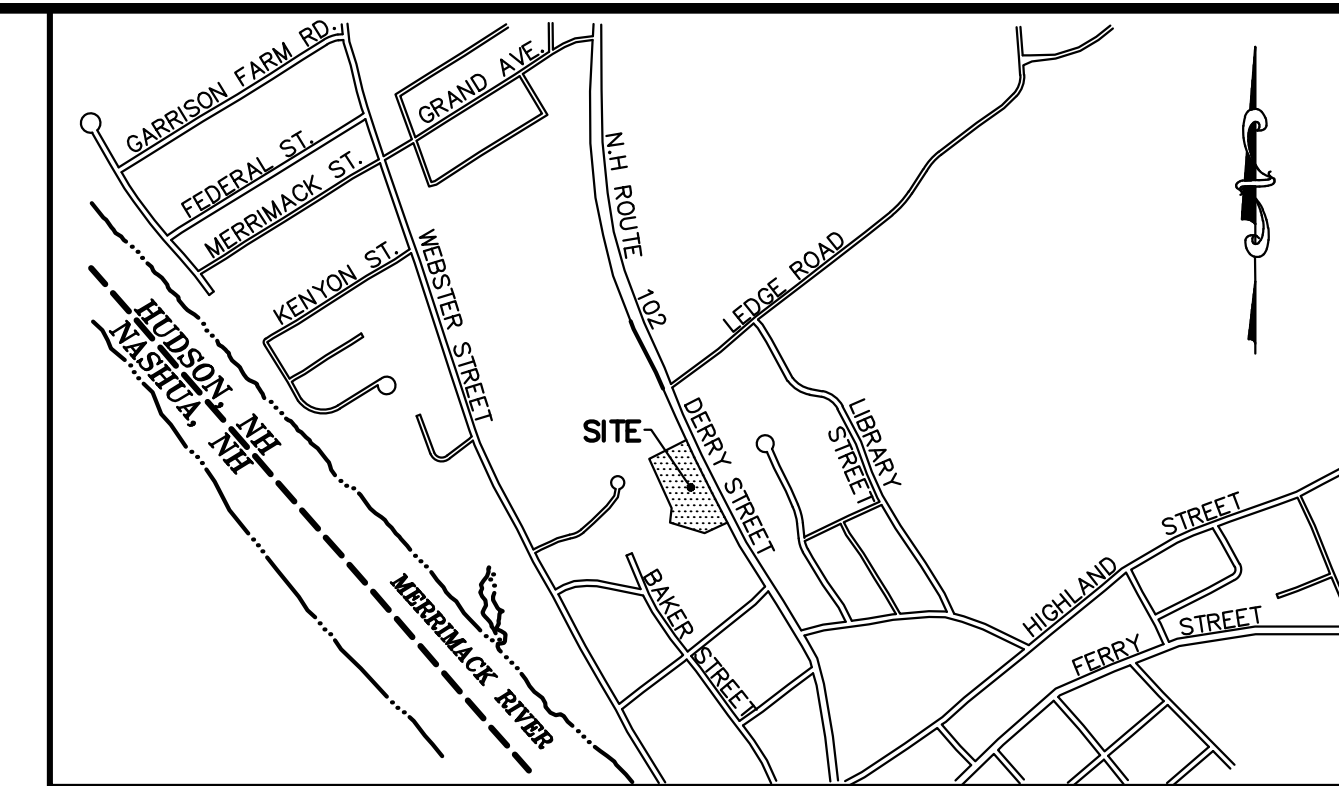
MAP 173 LOT 28
BUTTERCUP HILL ASSOCIATES
P.O. BOX 585
KEENE, N.H. 03431
BK. 2748 PG. 187
(REF. PLAN 1 & 4)

MAP 173 LOT 29
40,793 S.F.
0.936 ACRES

MAP 173 LOT 28
M325 REAL ESTATE, LLC
P.O. BOX 414
NASHUA, N.H. 03061-414
BK. 8147 PG. 494
(REF. PLAN 1, 3 & 4)

MAP 173 LOT 33
HERS OF ELIZABETH G. CENTER
C/O BARBARA MANN
5715 FALKSTONE LANE
ALEXANDRIA, VA 22309
TEST-98

MAP 174 LOT 30
DERRY ROAD HUDSON, N.H. LLC
49 DERRY STREET
HUDSON, N.H. 03051
BK. 8810 PG. 1533

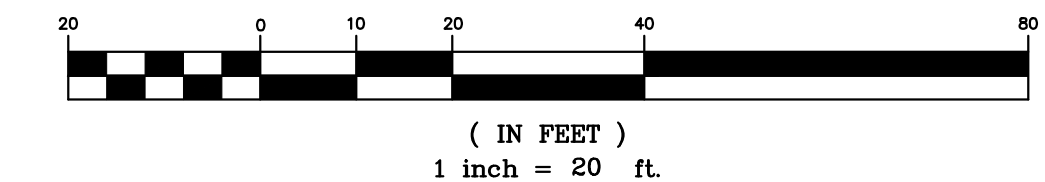


VICINITY PLAN
SCALE: 1" = 1000'

NOTES:

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- EXISTING AREA OF PARCEL = 40,793 S.F. OR 0.935 ACRES.
- OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776
- 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
- TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HEREON ARE BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE IN APRIL OF 2021.
- HORIZONTAL DATUM IS NAD83, VERTICAL DATUM IS NAVD29 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA-OPUS.
- EXAMINATION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF MERRIMACK N.H., HILLSBOROUGH COUNTY, MAP NUMBER 3301100514E, 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.
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GRAPHIC SCALE



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
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KMA KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2801

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

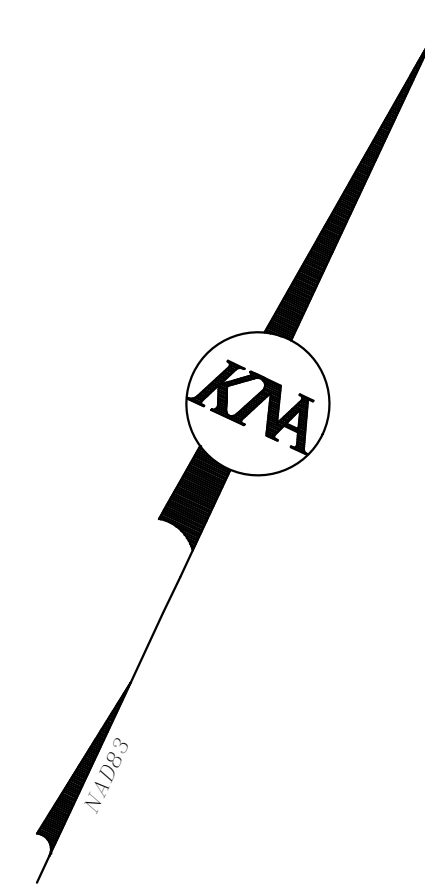
REFERENCE PLANS

- "PLAN OF DAW ACRES," HUDSON, N.H. SCALE: 1"=50'. DATED: JUNE, 1960. PREPARED BY: NED SPAULDING H.C.R.D. PLAN #2473
- "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
- "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.
- "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
- "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
- "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



UTILITY NOTE

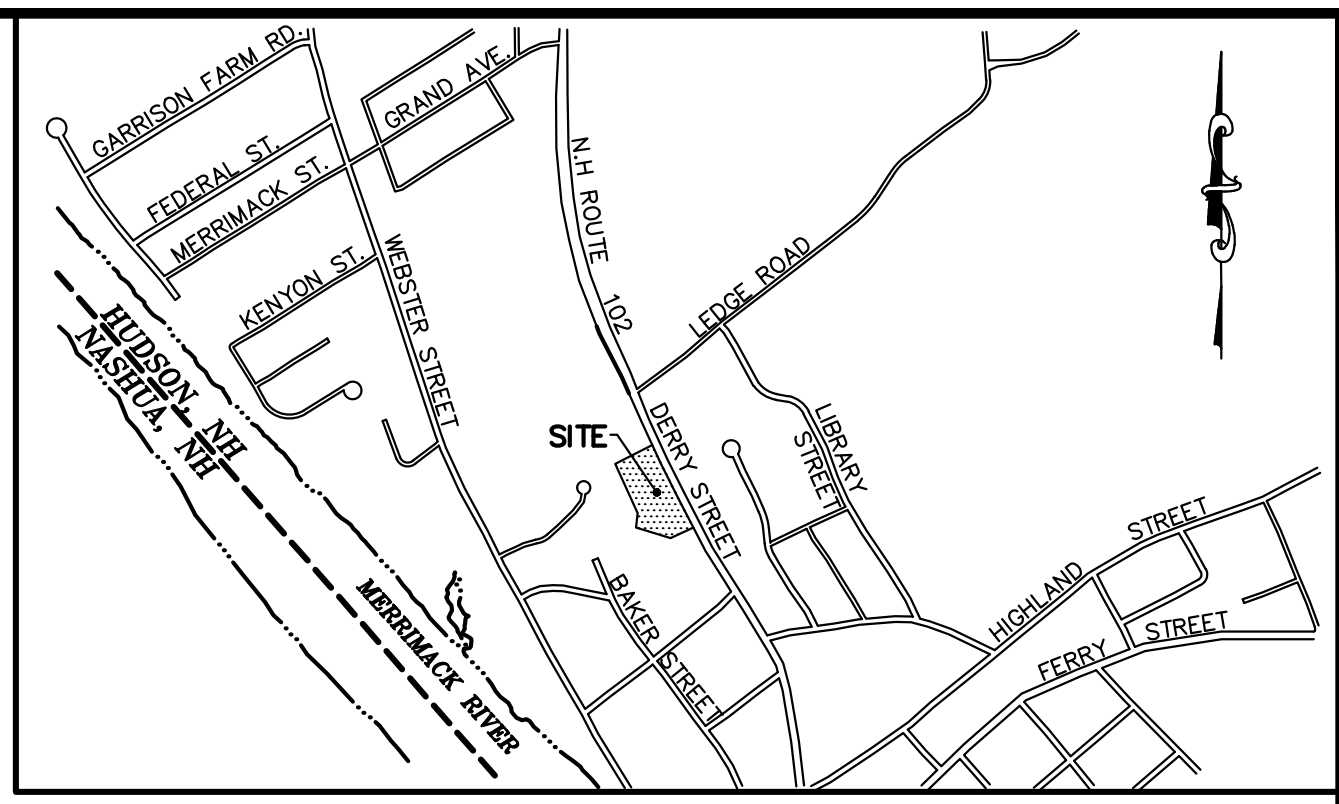
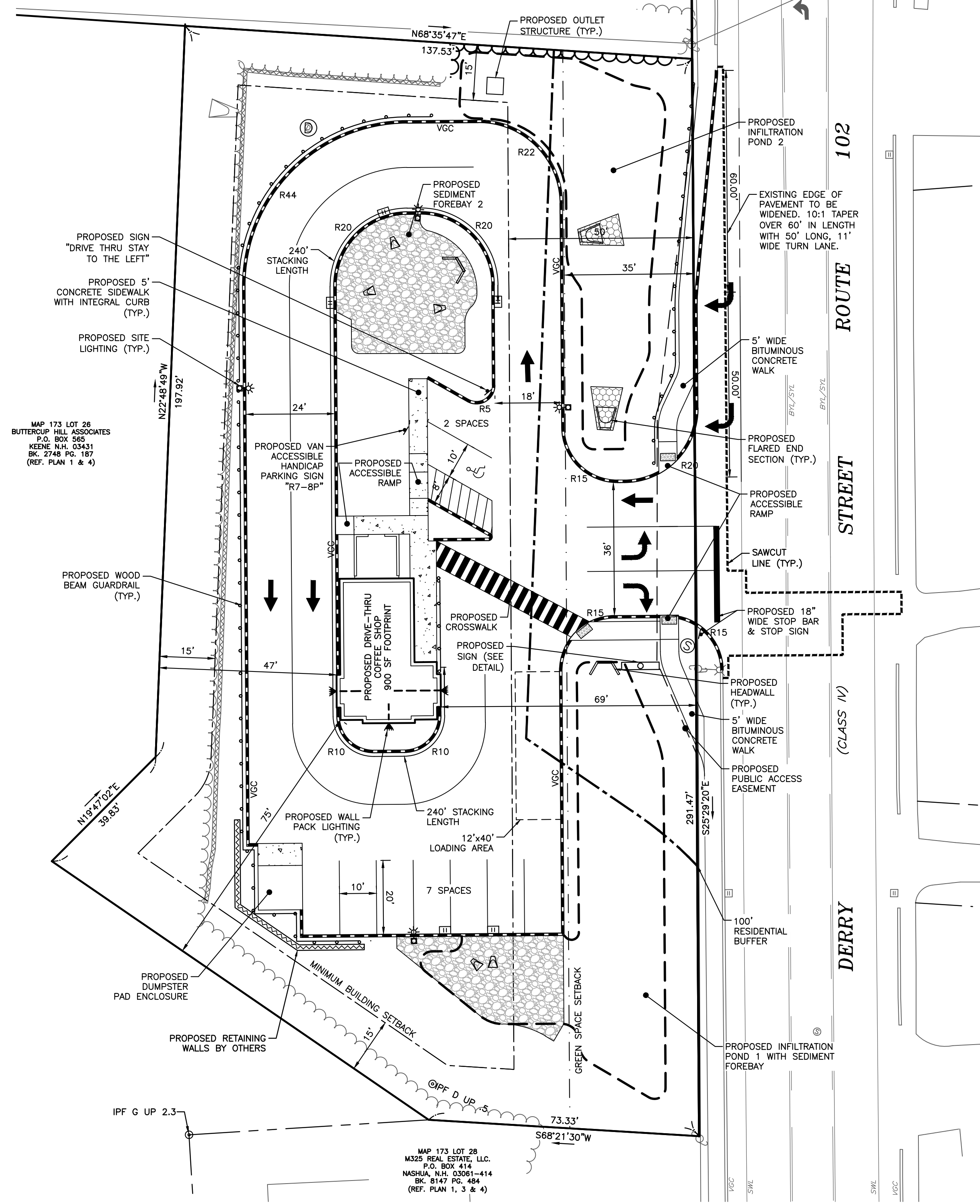
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MAP 173 LOT 30
DOM'S SPORTS BAR, LLC
620 SOUTH MAMMOTH ROAD
MANCHESTER, N.H. 03109
BK. 9039 PG. 1562
(REF. PLAN 2, 3, 4 & 5)

MAP 173 LOT 28
BUTTERCUP HILL ASSOCIATES
P.O. BOX 565
KEENE, N.H. 03431
BK. 2748 PG. 167
(REF. PLAN 1 & 4)

MAP 173 LOT 28
M325 REAL ESTATE, LLC.
P.O. BOX 414
NASHUA, N.H. 03061-414
BK. 8147 PG. 464
(REF. PLAN 1, 3 & 4)



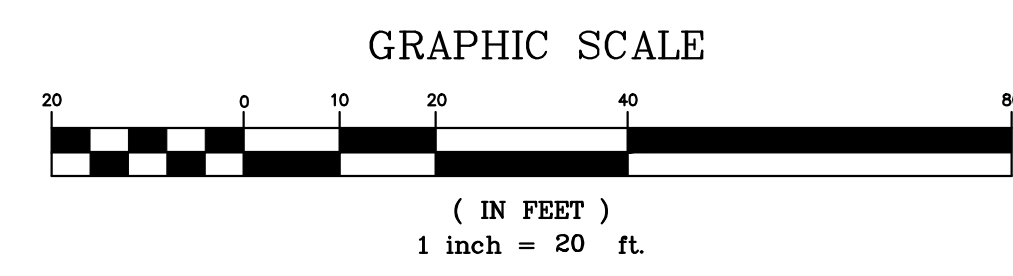
VICINITY PLAN
SCALE: 1" = 1000'

LEGEND

	GRANITE BOUND FOUND
	IRON PIN FOUND
	IRON PIN SET WITH CAP
	UTILITY POLE
	STREET LIGHT
	GAS VALVE
	WATER VALVE
	SEWER MANHOLE
	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
	OVERHEAD UTILITIES
	DRAINAGE LINE
	TREELINE
	RETAINING WALL
	EDGE OF PAVEMENT
	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

SEE SHEET 1 FOR NOTES & REFERENCE PLANS

LOAM & SEED ALL DISTURBED AREAS (TYP.)



NON RESIDENTIAL 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. 6261 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: *[Signature]*

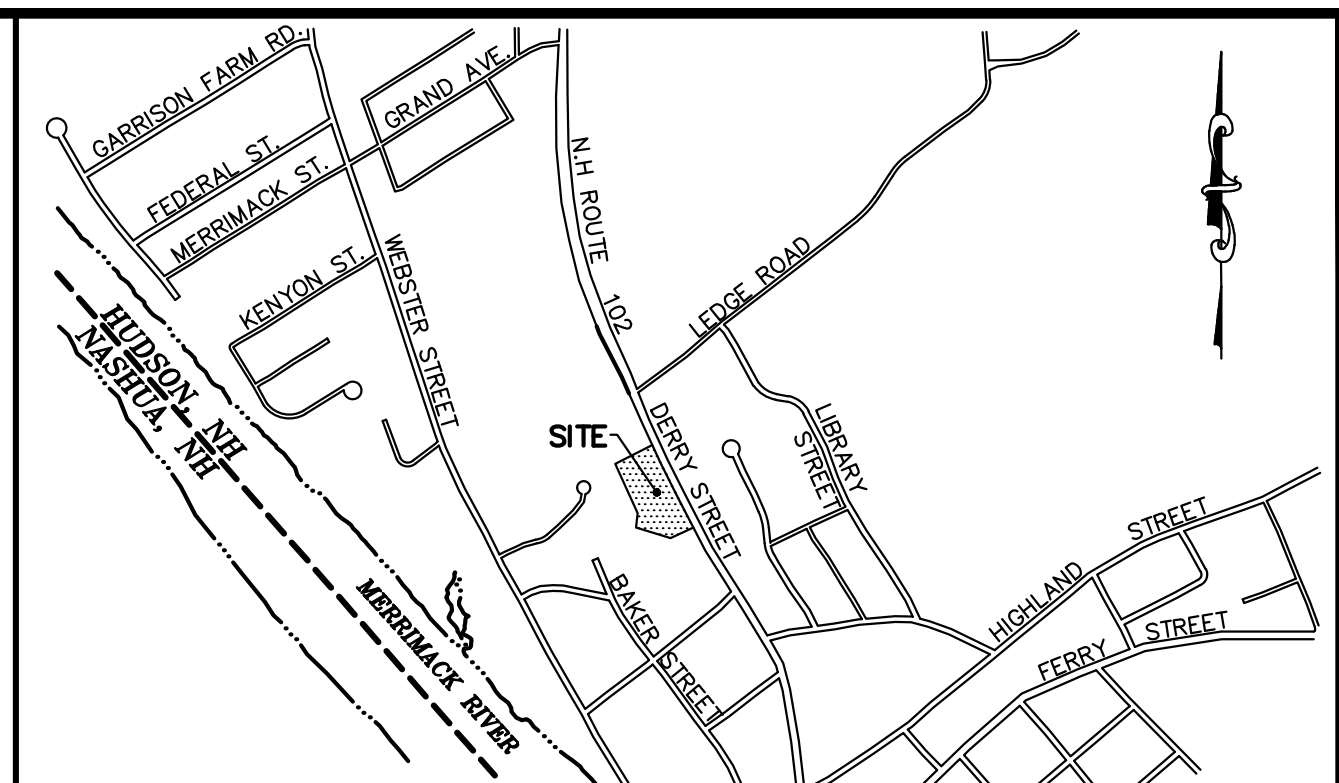
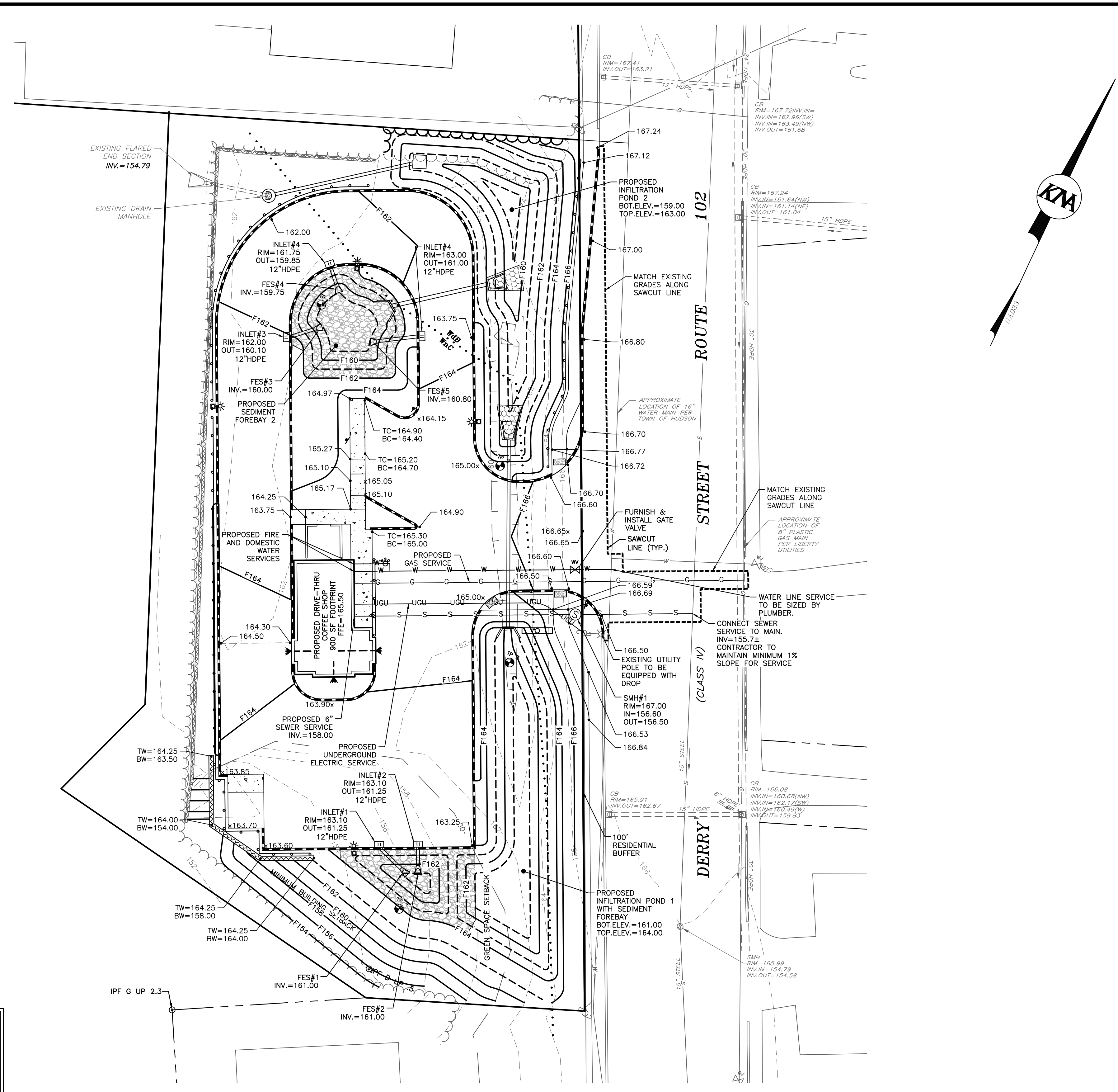
DATE: 6-16-2021

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL
3	08/30/2021	REVISED PER REVIEW COMMENTS	ACL

DATE: JUNE 22, 2021 SCALE: 1"=20'
PROJECT NO: 21-0311-1 SHEET 3 OF 14

LEGEND

- GB-F GRANITE BOUND FOUND
- IP-F IRON PIN FOUND
- IP-S IRON PIN SET WITH CAP
- W/CAP UTILITY POLE
- STREET LIGHT
- GAS VALVE
- WATER VALVE
- SEWER MANHOLE
- DRAINAGE MANHOLE
- CATCH BASIN
- ABUTTER LINE
- PROPERTY LINE
- GAS LINE
- WATER LINE
- SEWER 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
- 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.

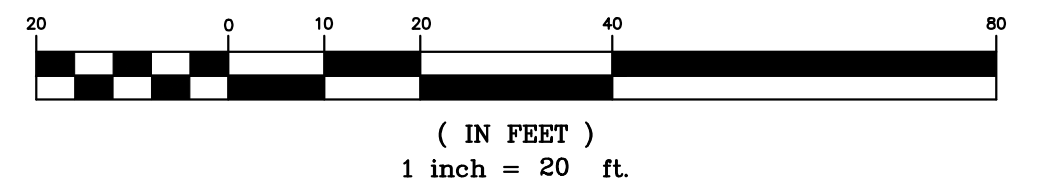
SCS SOIL MAP UNIT KEY

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

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

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE



UTILITY NOTE

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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. 6261 PG. 776

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

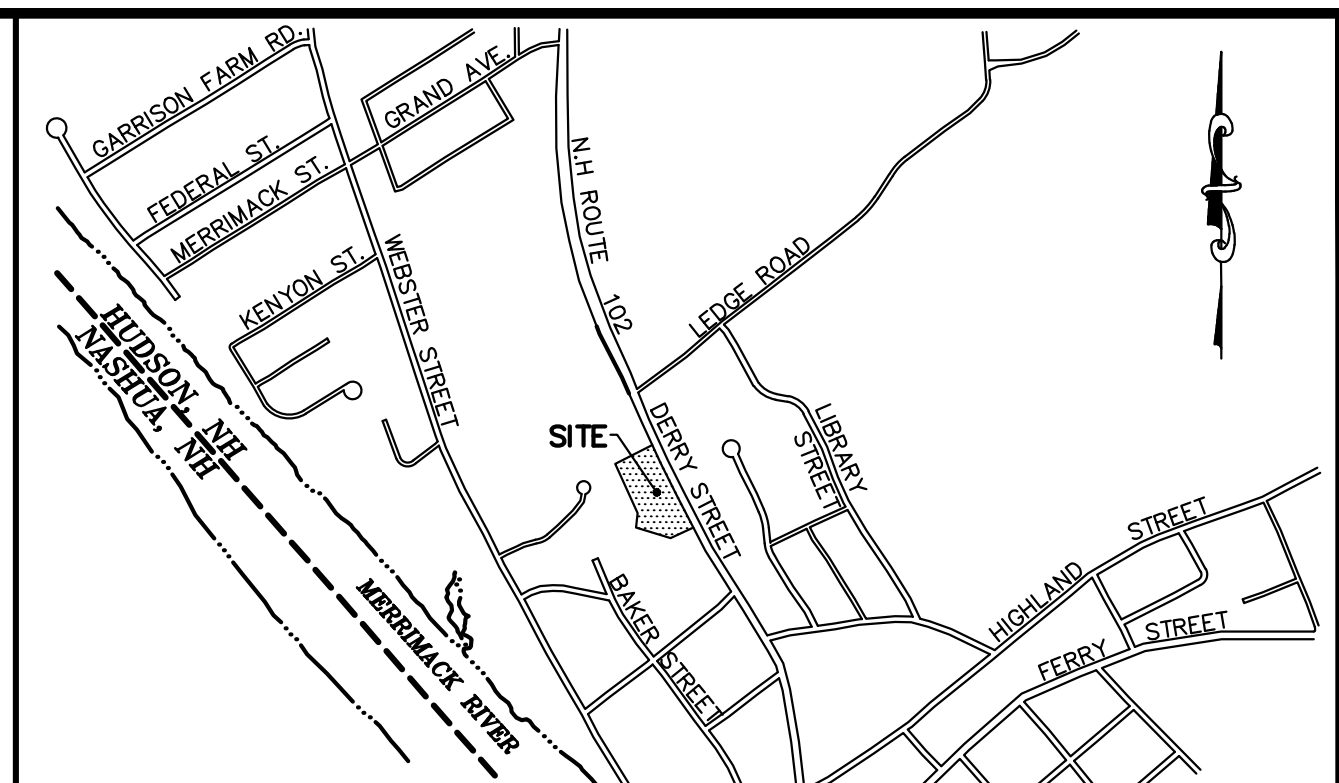
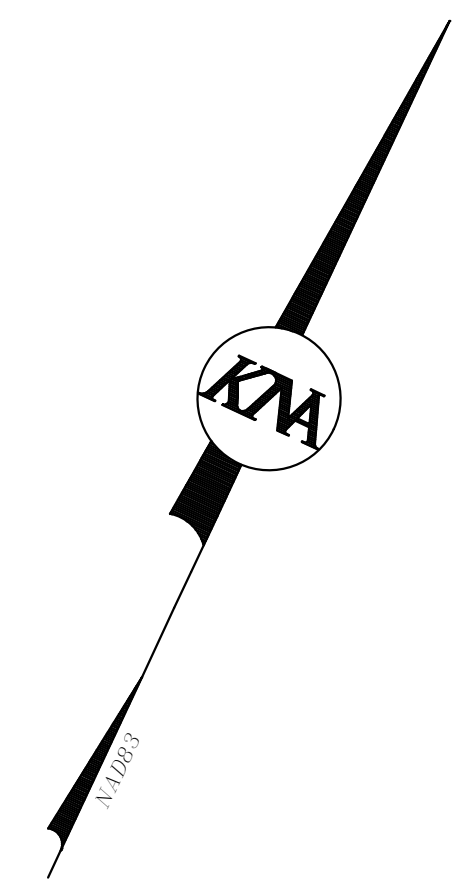
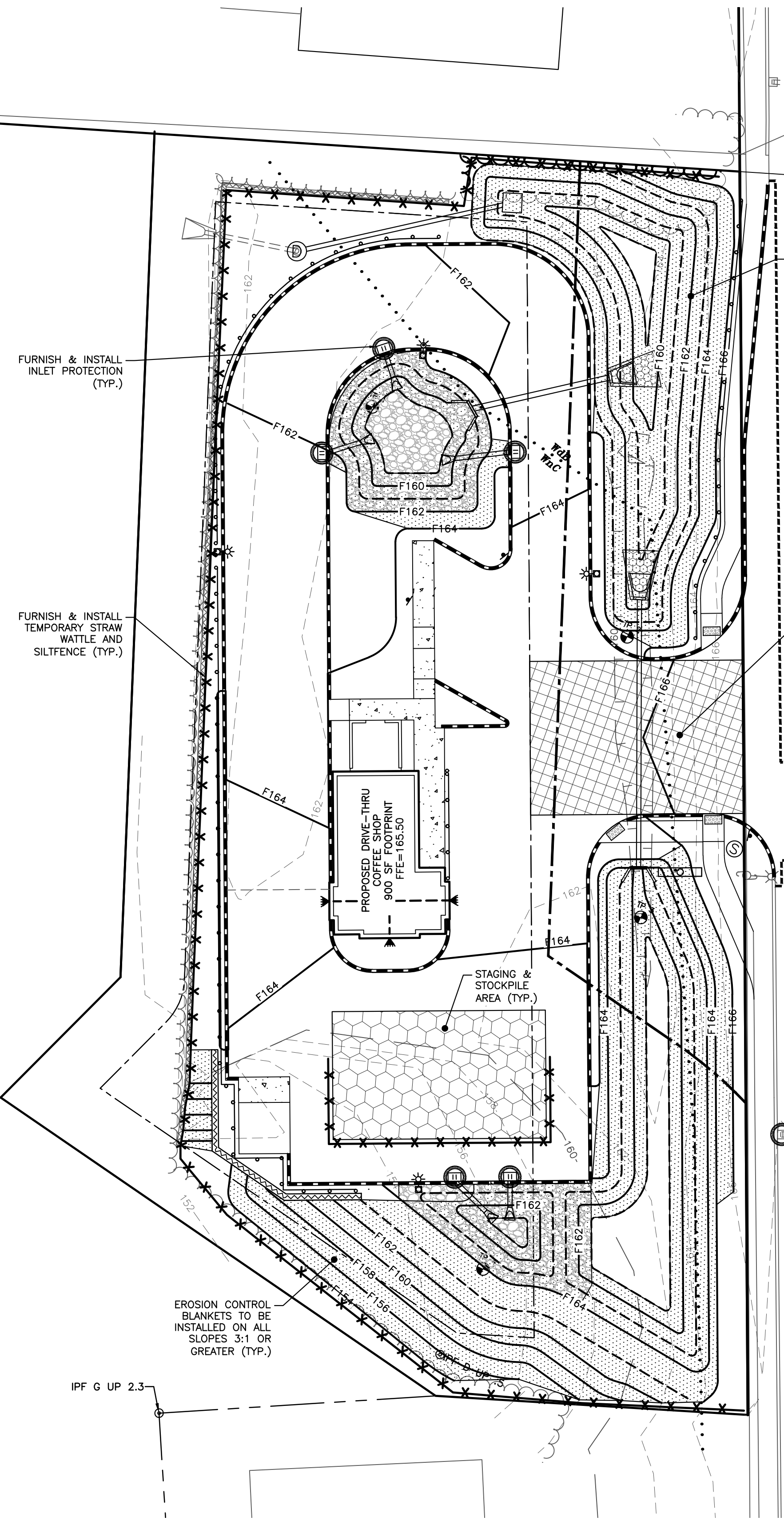
KMA KEACH-NORDSTROM ASSOCIATES, INC.
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DATE: JUNE 22, 2021 SCALE: 1"=20'
PROJECT NO: 21-0311-1 SHEET 4 OF 14

EROSION & SEDIMENT CONTROL LEGEND

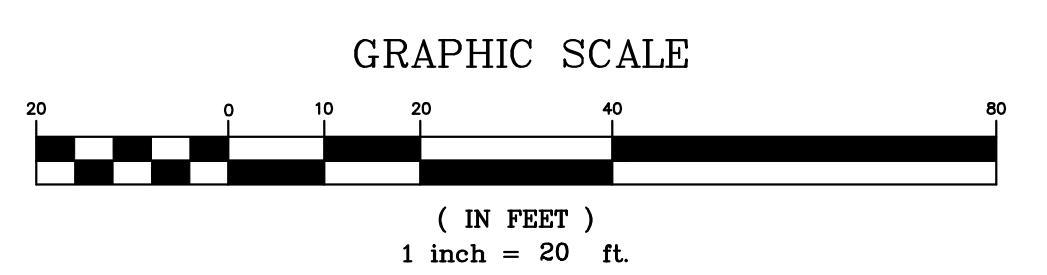
	PERMANENT OUTLET PROTECTION APRON (RIP RAP)
	INLET PROTECTION
	SILT FENCE
	ORANGE CONSTRUCTION FENCING
	TEMPORARY STONE CHECK DAM
	STABILIZED CONSTRUCTION EXIT
	STAGING AND STOCKPILE AREA
	EROSION CONTROL BLANKETS
	NON DISTURBANCE AREA



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 MANUAL 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.)



UTILITY NOTE

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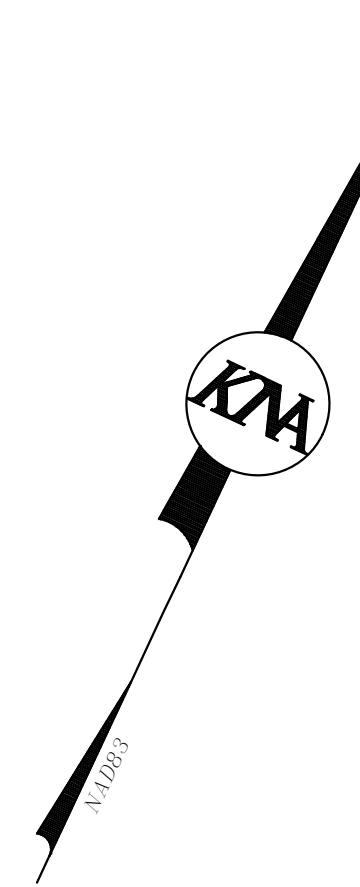
EROSION CONTROL PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD: STEVE S. & HSIANG HWA W. PAN 13 KING HENRY DRIVE LONDONDERRY, N.H. 03053 BK. 6261 PG. 776	APPLICANT: SCOTT ZIELFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825
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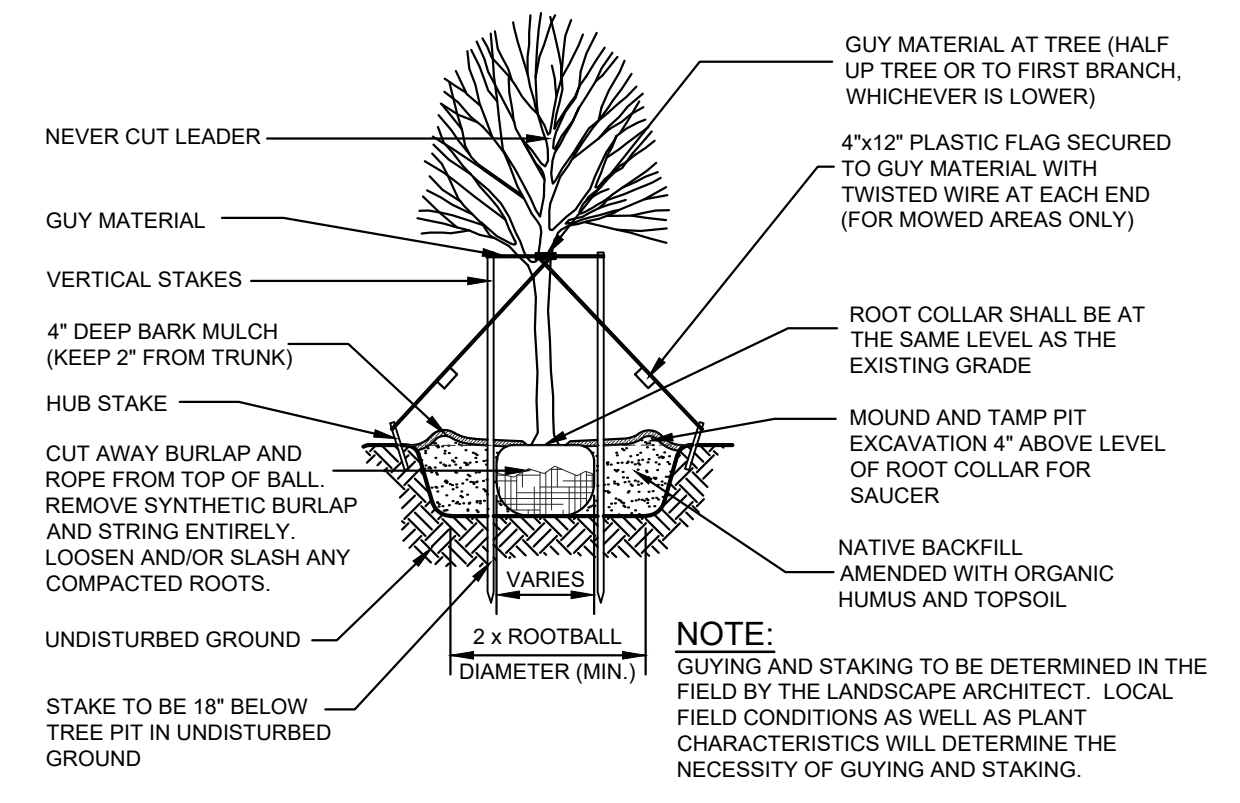
DATE: JUNE 22, 2021 SCALE: 1"=20'
PROJECT NO: 21-0311-1 SHEET 5 OF 14



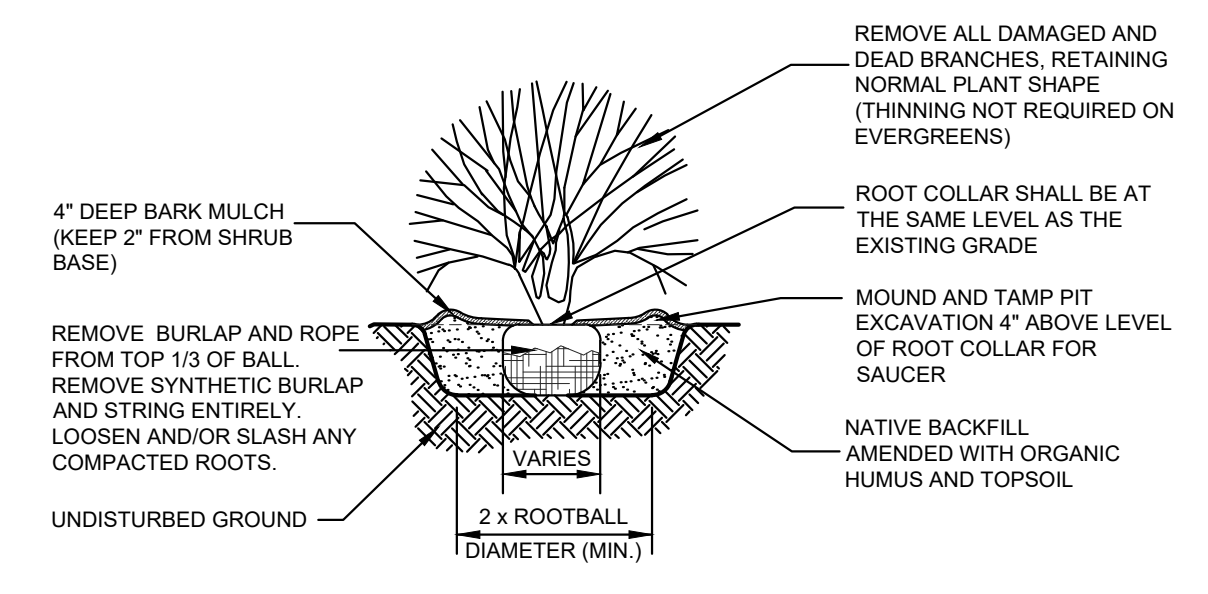
PLANTING SCHEDULE

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

- LANDSCAPE NOTES:**
- THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED SITE LANDSCAPE WHICH PROVIDES CLIMATIC RELIEF AND AESTHETIC APPEAL.
 - 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).
 - 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 FOLLOWS: ORGANIC TOPSOIL, AMENDED WITH 10% WOOD ASH, 10% MANURE, 30% PEATMOSS AND A GRANULAR HYDROGEL TO ABSORB AND RETAIN WATER.
 - PLANTING BEDS AND SAUCERS SHALL RECEIVE A 4" MINIMUM THICKNESS OF PINE/HEMLOCK BARK MULCH OVER A 5oz. POLYPROPYLENE WEED CONTROL FABRIC.
 - 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.
 - PLANT TYPES SHOWN ARE SUBJECT TO AVAILABILITY. SUBSTITUTE MATERIALS CAN BE IMPLEMENTED WITH APPROVAL FROM KEACH NORDSTROM ASSOCIATES PRIOR TO CONSTRUCTION.



DECIDUOUS TREE PLANTING DETAIL
NOT TO SCALE
(JANUARY 2012)

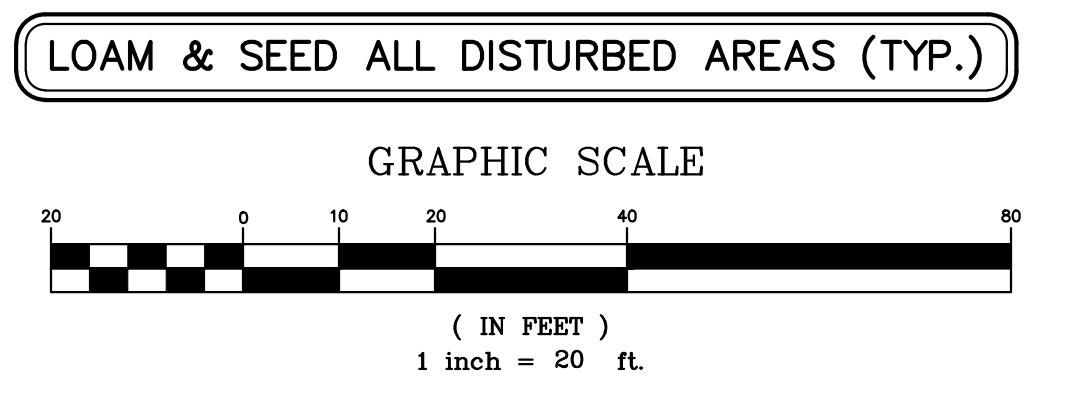


BALLED & BURLAP SHRUB PLANTING DETAIL
NOT TO SCALE
(JANUARY 2012)

LANDSCAPE CALCULATIONS

REQUIRED PARKING LOT INTERIOR LANDSCAPE AREA	
PROPOSED PARKING AREA PAVED:	5,151 SF
10% REQUIRED LANDSCAPE AREA:	515 SF
PROVIDED LANDSCAPE AREA:	1,495 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



- LEGEND**
- GB-F GRANITE BOUND FOUND
 - IPIN-F IRON PIN FOUND
 - DH-F DRILL HOLE FOUND
 - UTILITY POLE
 - ▲ PROPOSED SIGN
 - ★ PROPOSED LIGHT
 - ⊕ PROPOSED HYDRANT
 - ⊕ PROPOSED WELL
 - ⊕ PROPOSED SEWER MANHOLE
 - ⊕ 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

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

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LANDSCAPE 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. 6261 PG. 776	APPLICANT: SCOTT ZIELFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825
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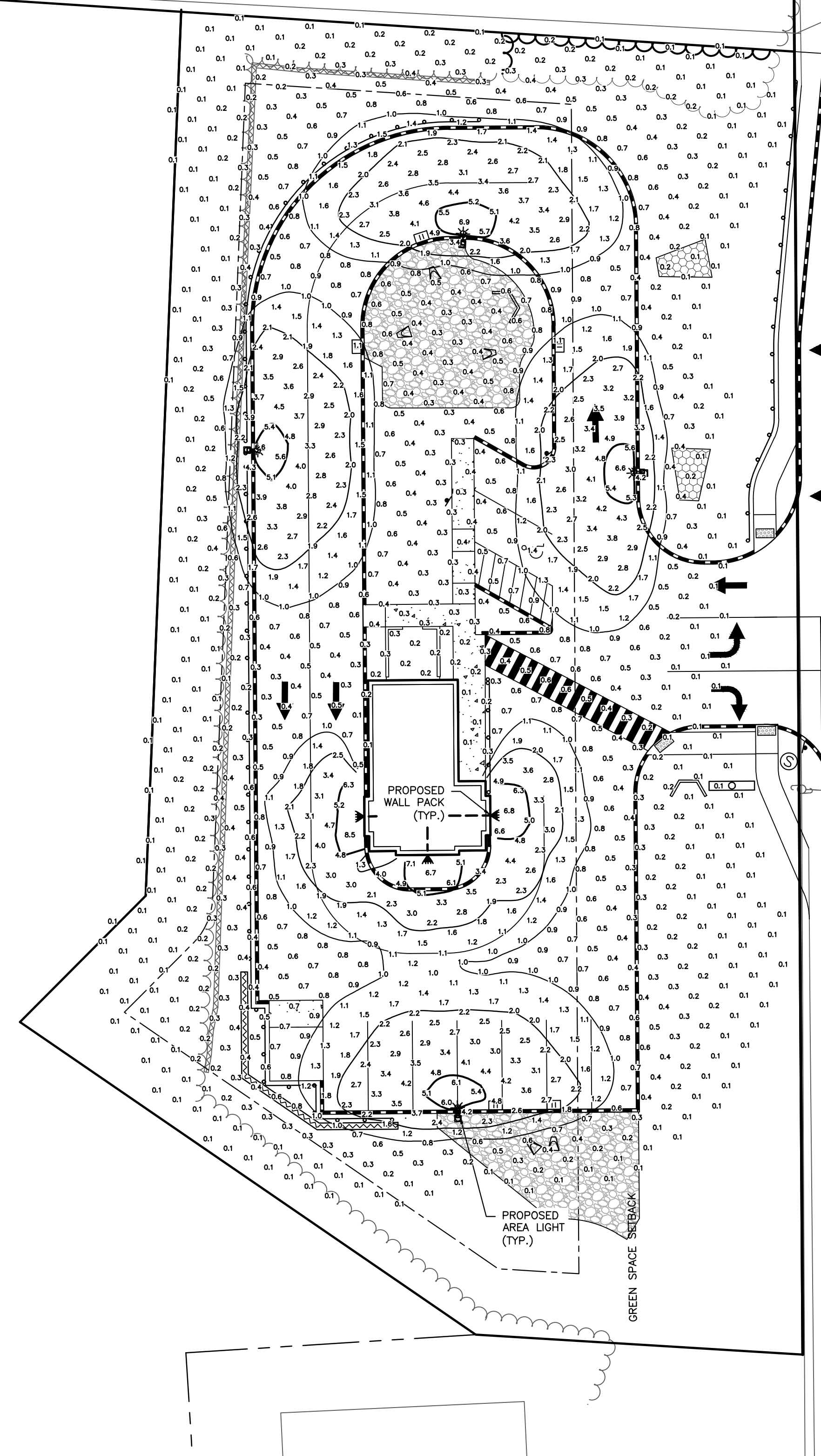
KMA KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL
3	08/30/2021	REVISED PER REVIEW 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 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
- ⊕ PROPOSED UTILITY POLE
- ⊕ PROPOSED SIGN
- ⊕ PROPOSED LIGHT
- ⊕ PROPOSED GAS VALVE
- ⊕ 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
- 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



(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. 6261 PG. 776

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

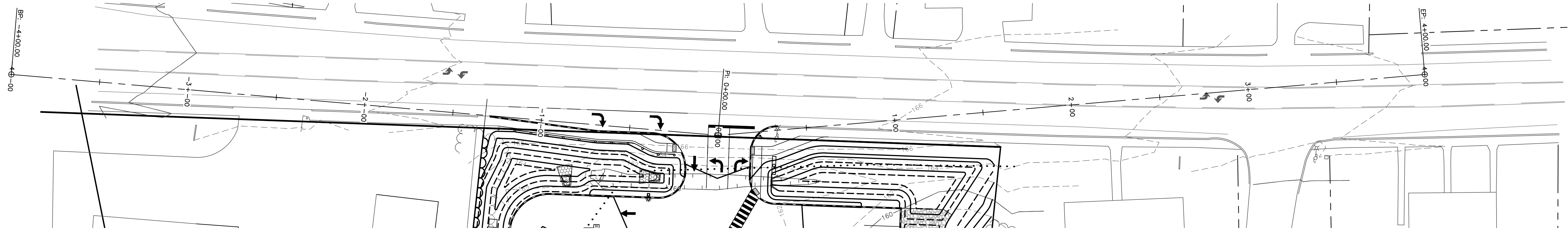
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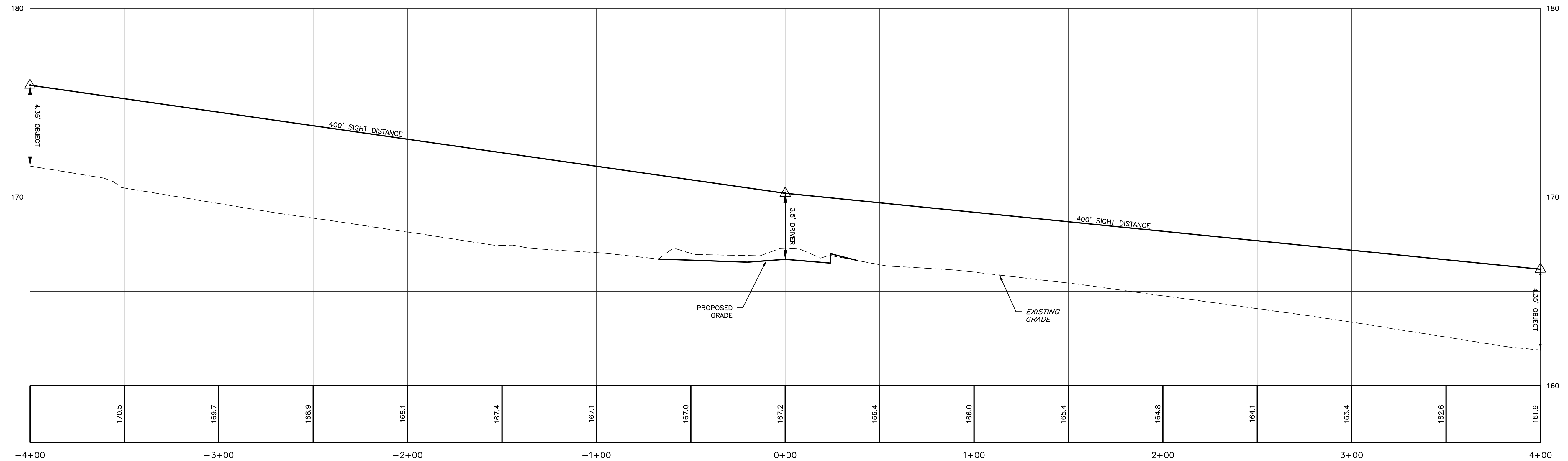
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DATE: JUNE 22, 2021 SCALE: 1"=20'
PROJECT NO: 21-0311-1 SHEET 7 OF 14





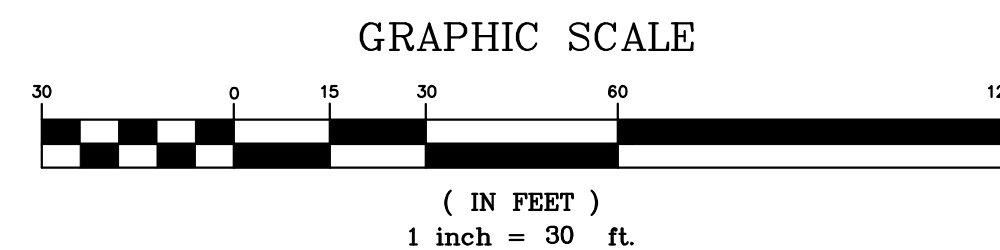
SIGHT DISTANCE PLAN
SCALE: 1" = 30'



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



- 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.



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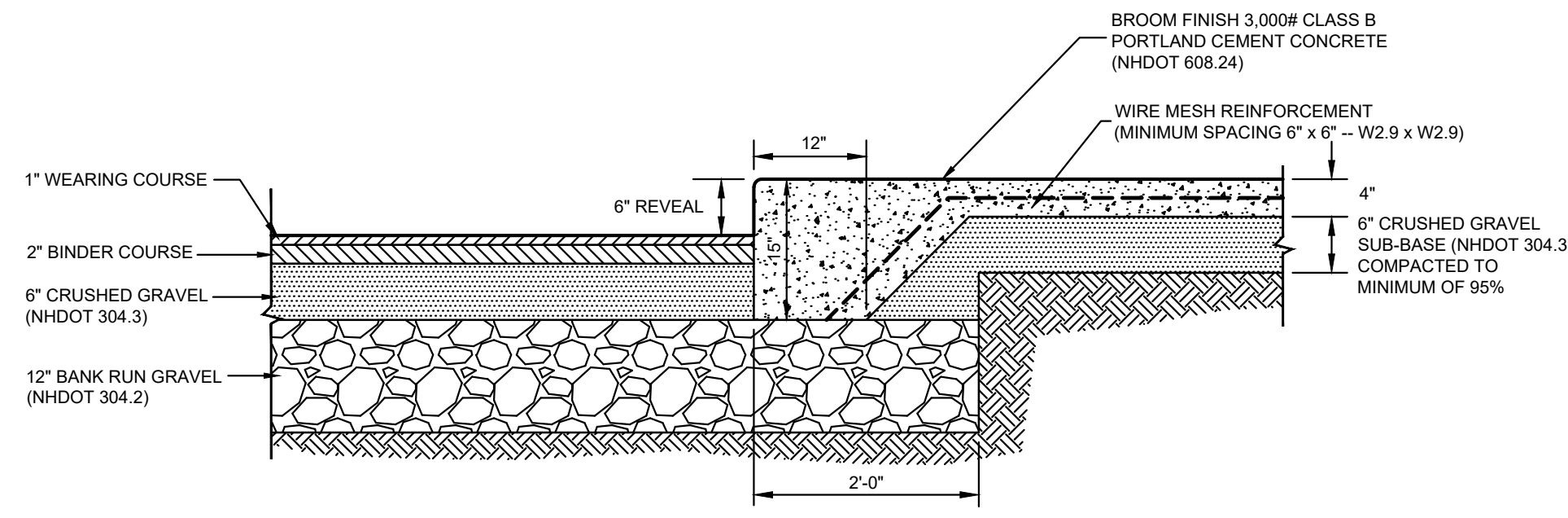
SIGHT DISTANCE PLAN
AROMA JOE'S
MAP 173 LOT 29
56 DERRY STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER OF RECORD: STEVE S. & HSIANG HWA W. PAN 13 KING HENRY DRIVE LONDONDERRY, N.H. 03053 BK. 6261 PG. 776	APPLICANT: SCOTT ZIELFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825
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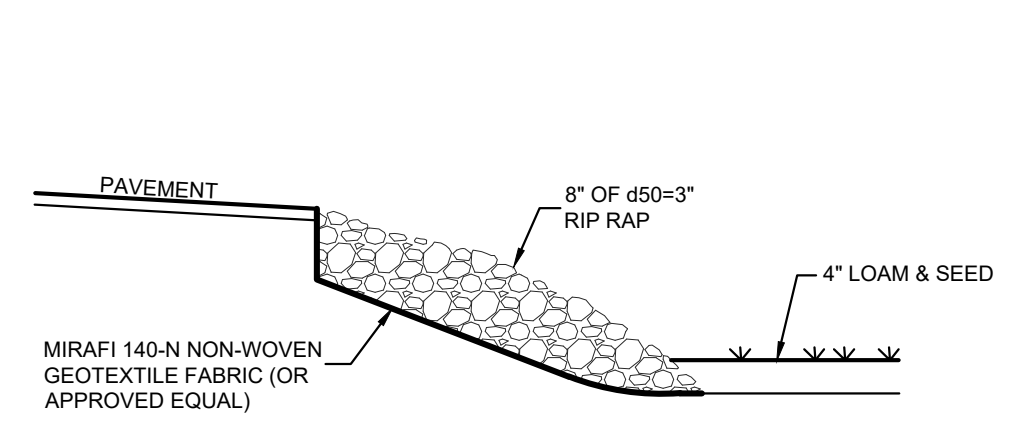
KMA KEACH-NORDSTROM ASSOCIATES, INC.
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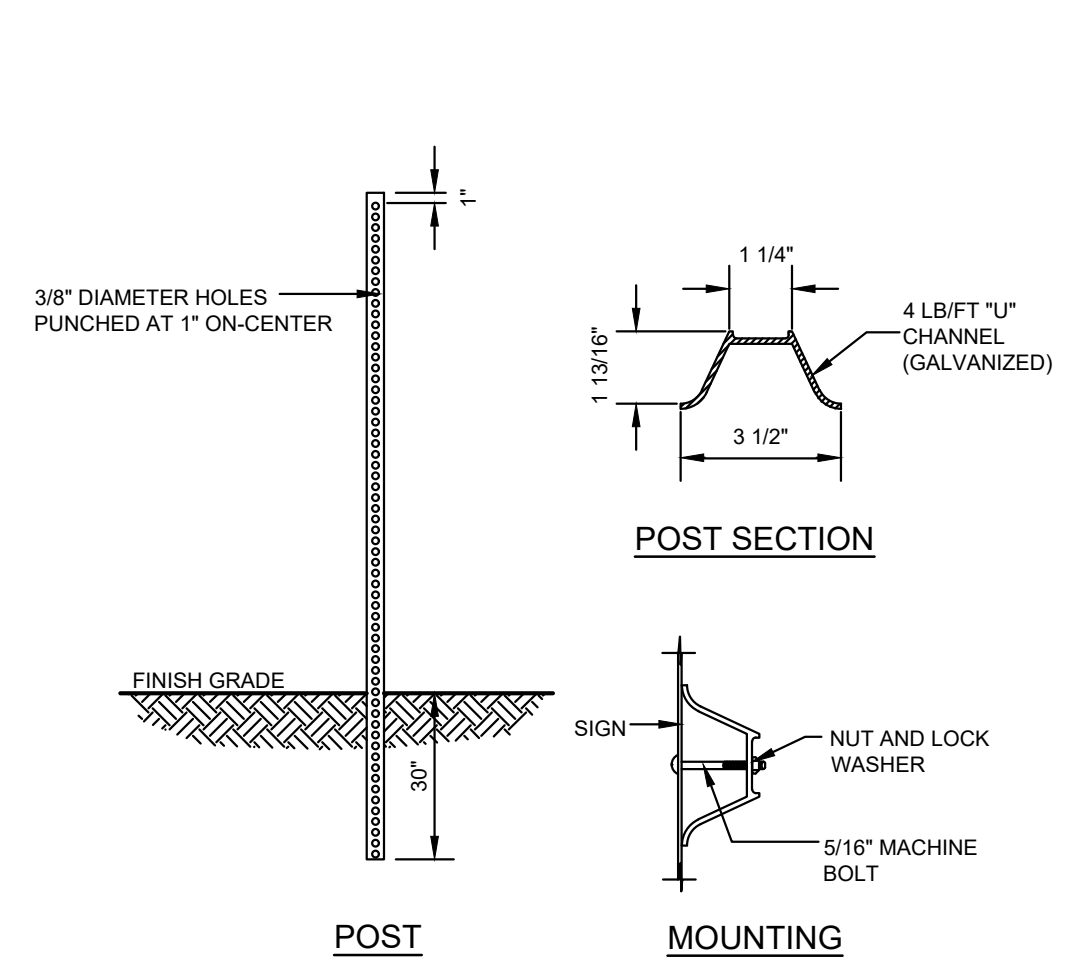
DATE: JUNE 22, 2021	SCALE: 1"=30'
PROJECT NO: 21-0311-1	SHEET 8 OF 14



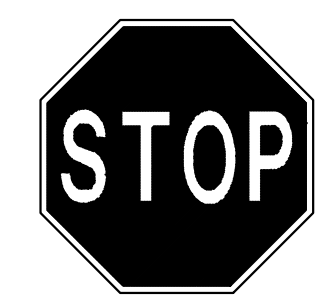
INTEGRAL CURB AND WALK DETAIL
NOT TO SCALE
(MARCH 2008)



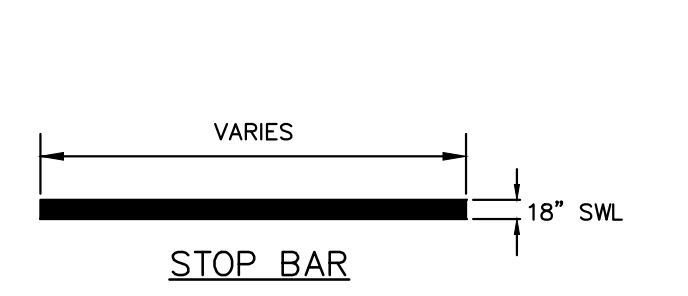
CURB BREAK DETAIL
NOT TO SCALE
(SEPTEMBER 2010)



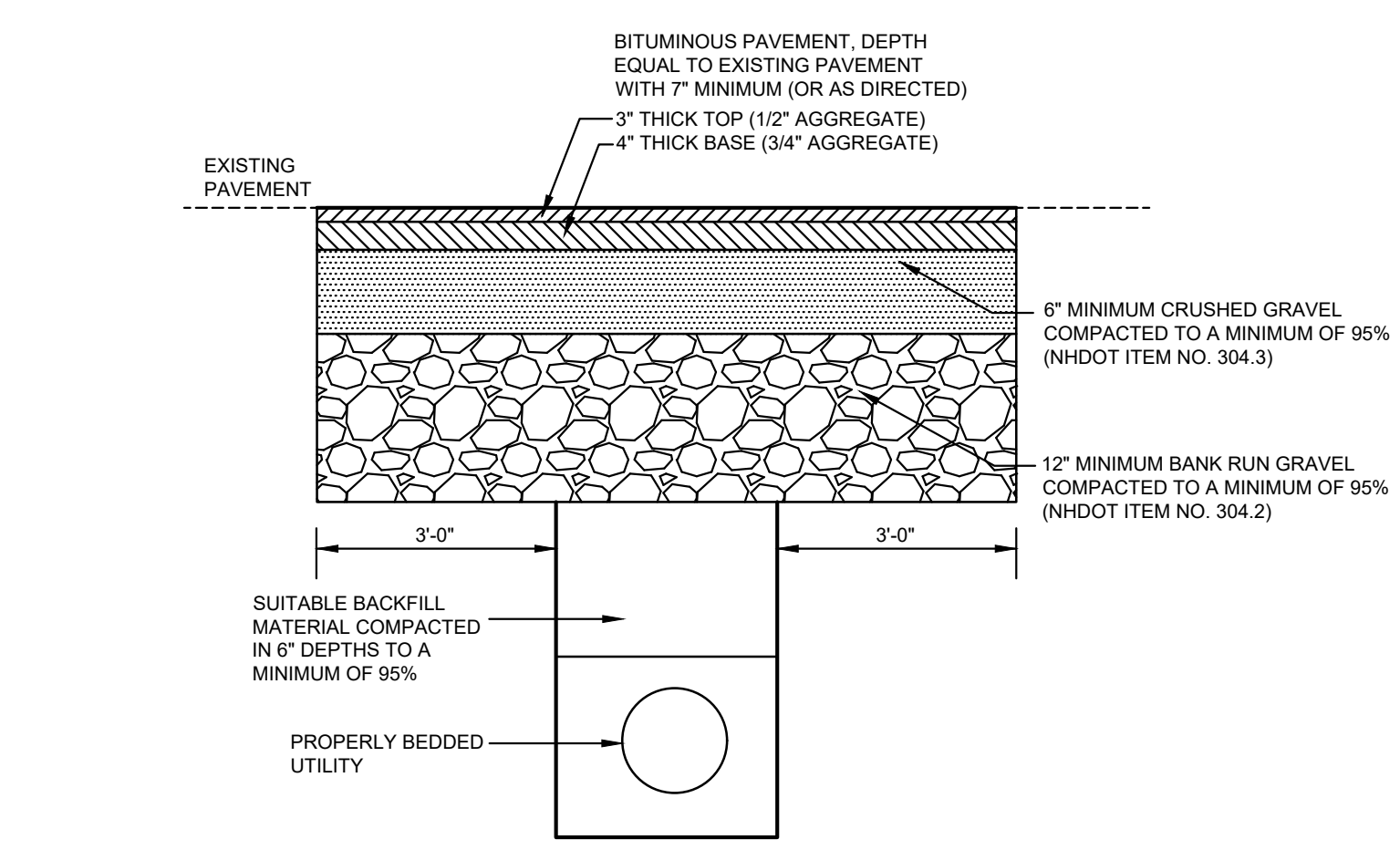
STEEL SIGN POST DETAIL
NOT TO SCALE
(MARCH 2008)



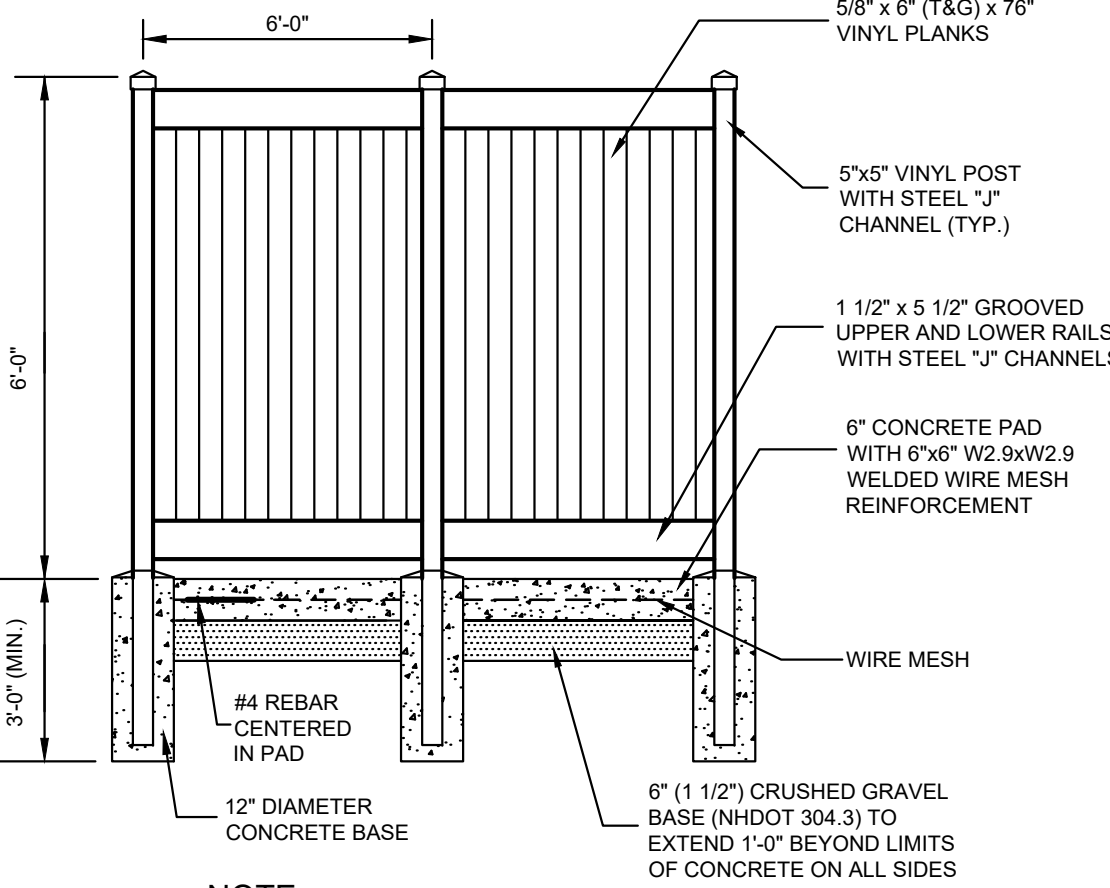
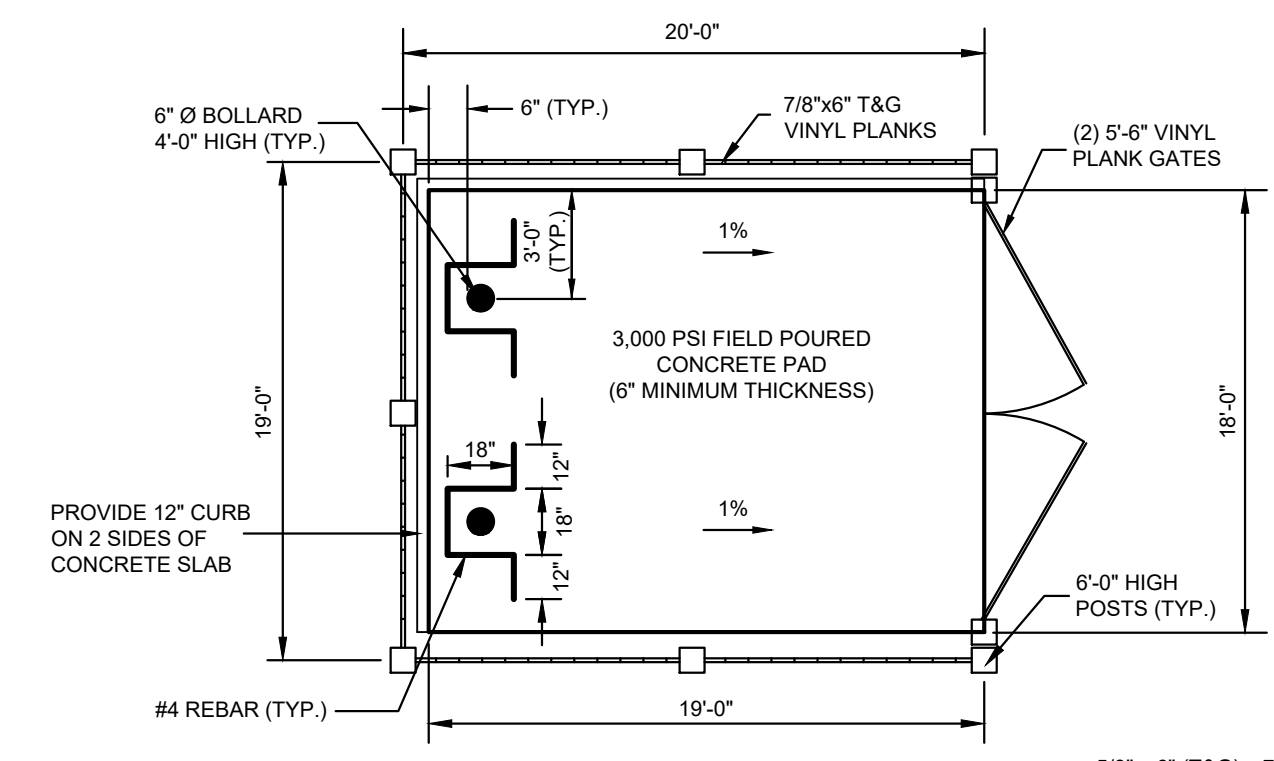
STOP SIGN DETAIL
NOT TO SCALE



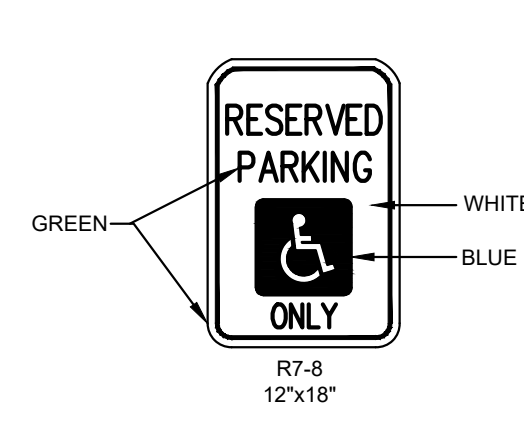
STOP BAR DETAIL
NOT TO SCALE



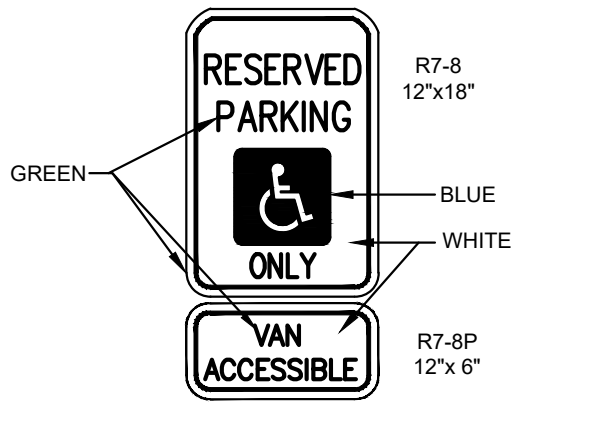
**PERMANENT PAVEMENT REPAIR
IN PUBLIC RIGHT OF WAY**
NOT TO SCALE



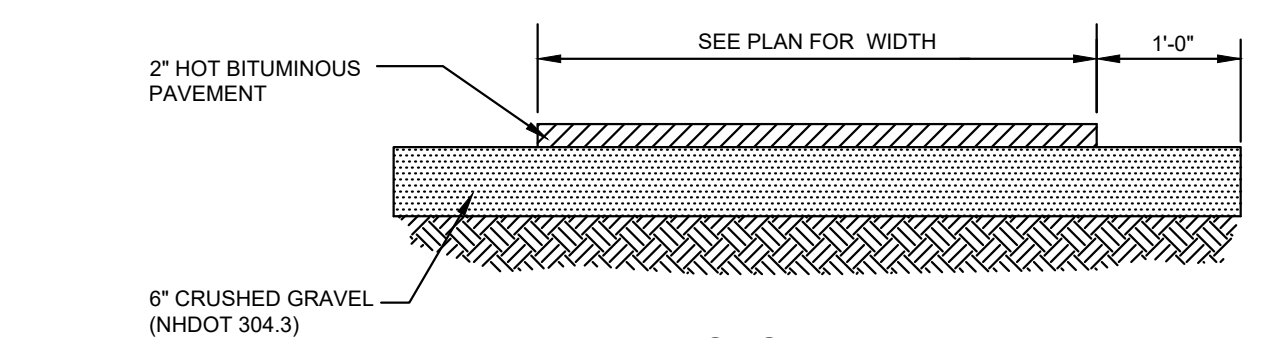
VINYL STOCKADE TRASH ENCLOSURE DETAIL
NOT TO SCALE



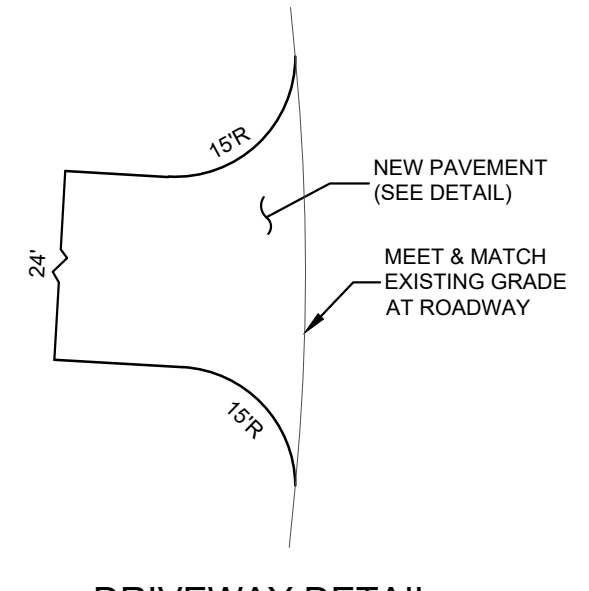
HANDICAP PARKING SIGN DETAIL
NOT TO SCALE
(MARCH 2008)



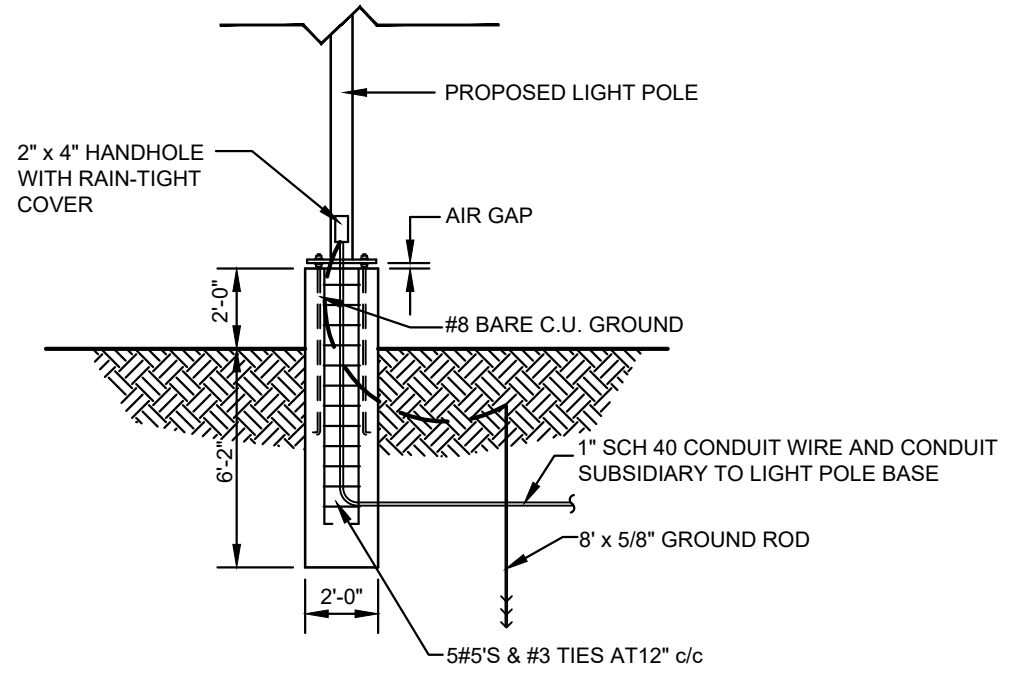
VAN ACCESSIBLE HANDICAP PARKING SIGN DETAIL
NOT TO SCALE
(NOVEMBER 2016)



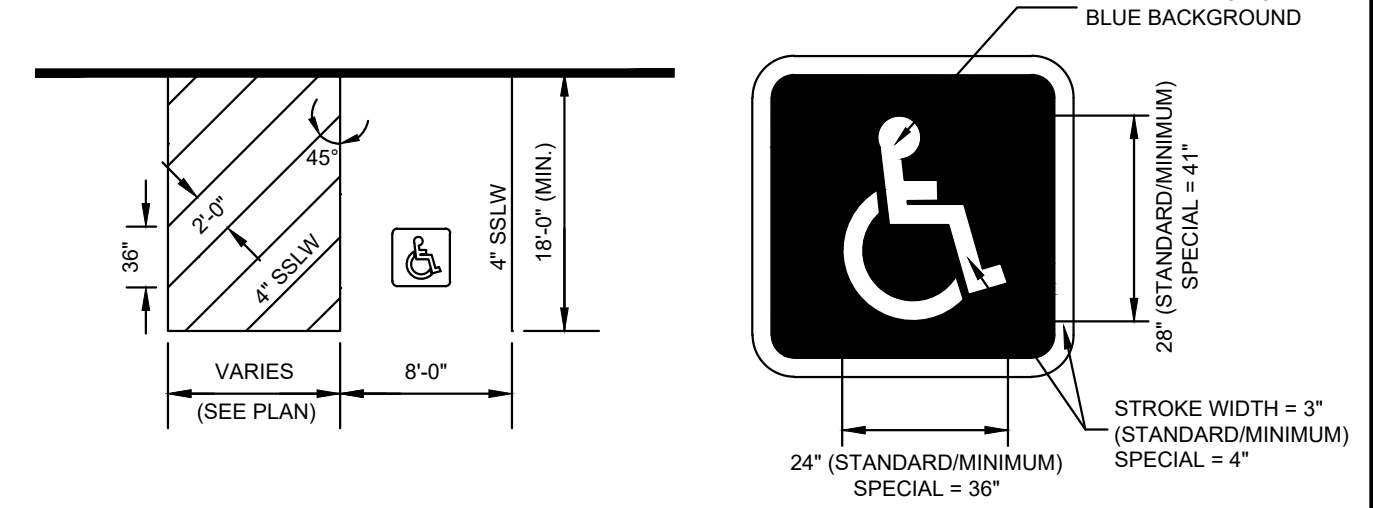
BITUMINOUS WALK DETAIL
NOT TO SCALE
(MARCH 2008)



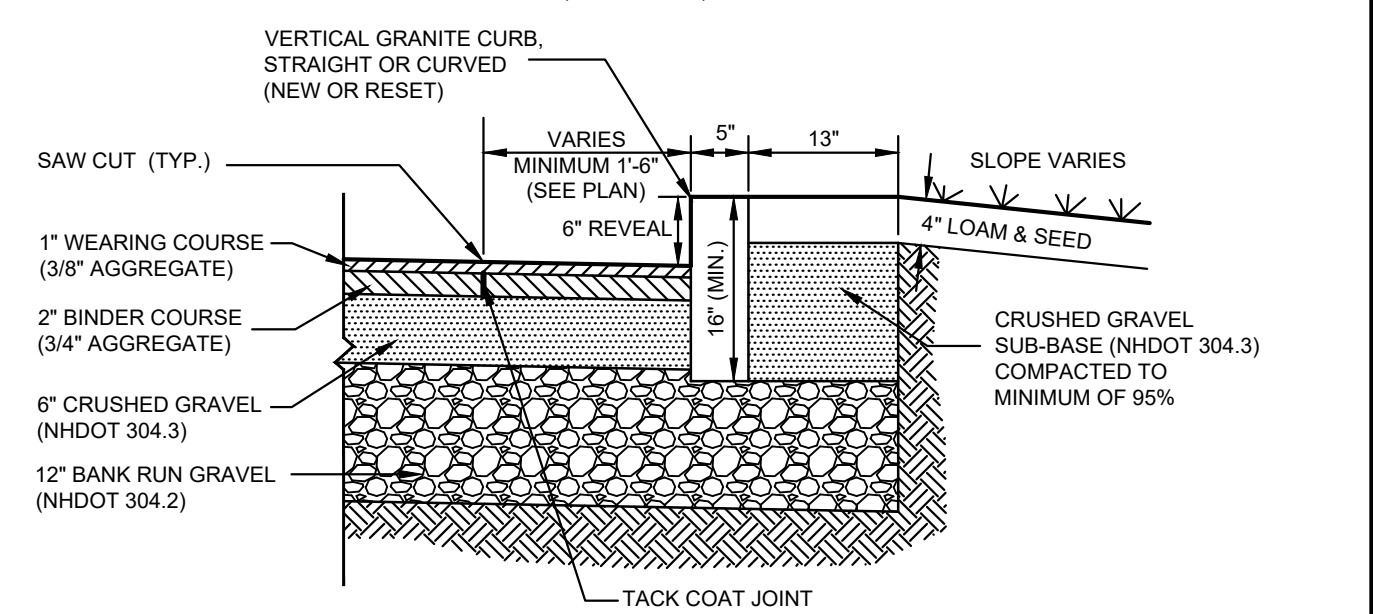
DRIVEWAY DETAIL
NOT TO SCALE



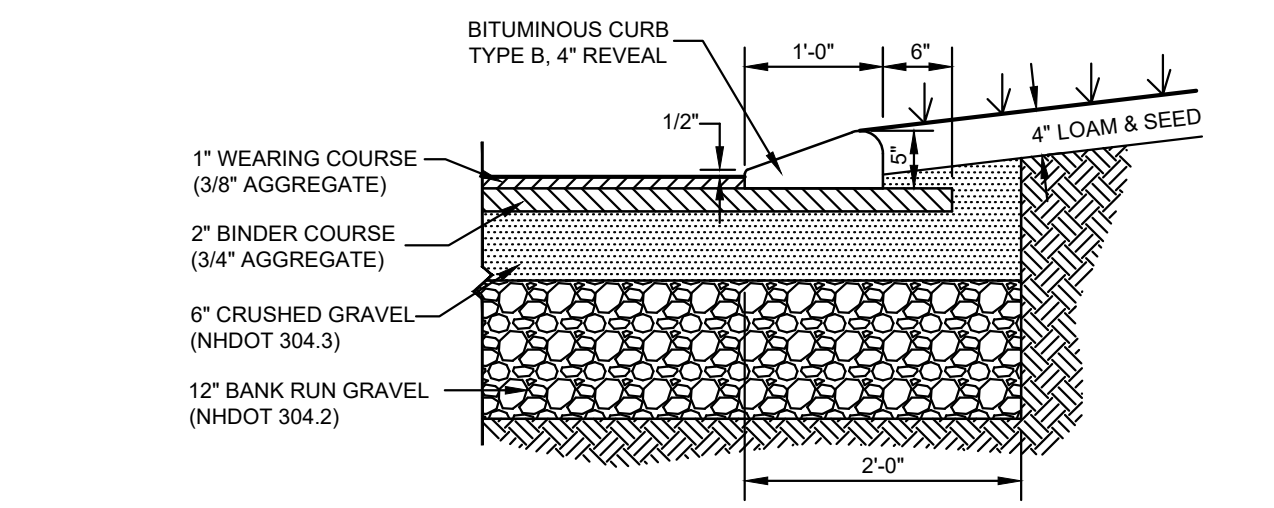
CONCRETE LIGHT POLE BASE DETAIL
NOT TO SCALE
(MARCH 2008)



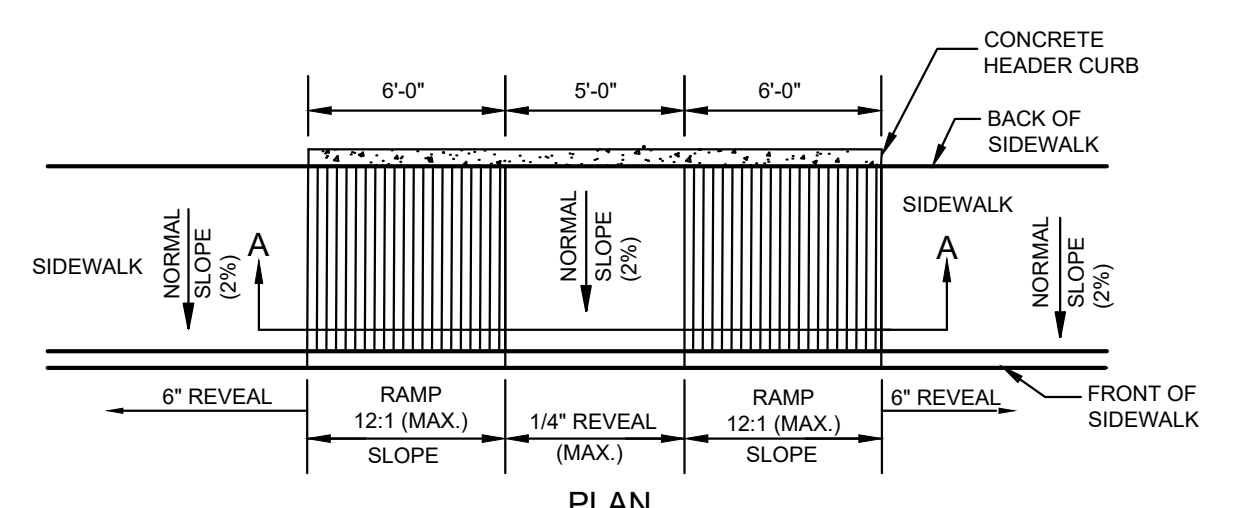
HANDICAP STRIPING DETAIL
NOT TO SCALE
(MARCH 2012)



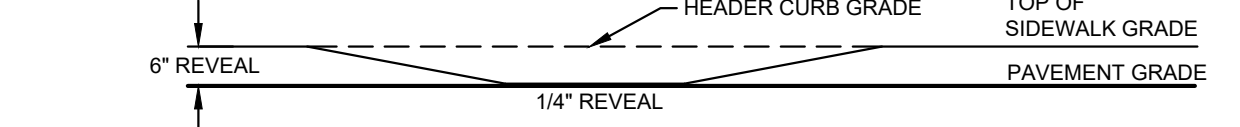
VERTICAL GRANITE CURB DETAIL
NOT TO SCALE
(MARCH 2008)



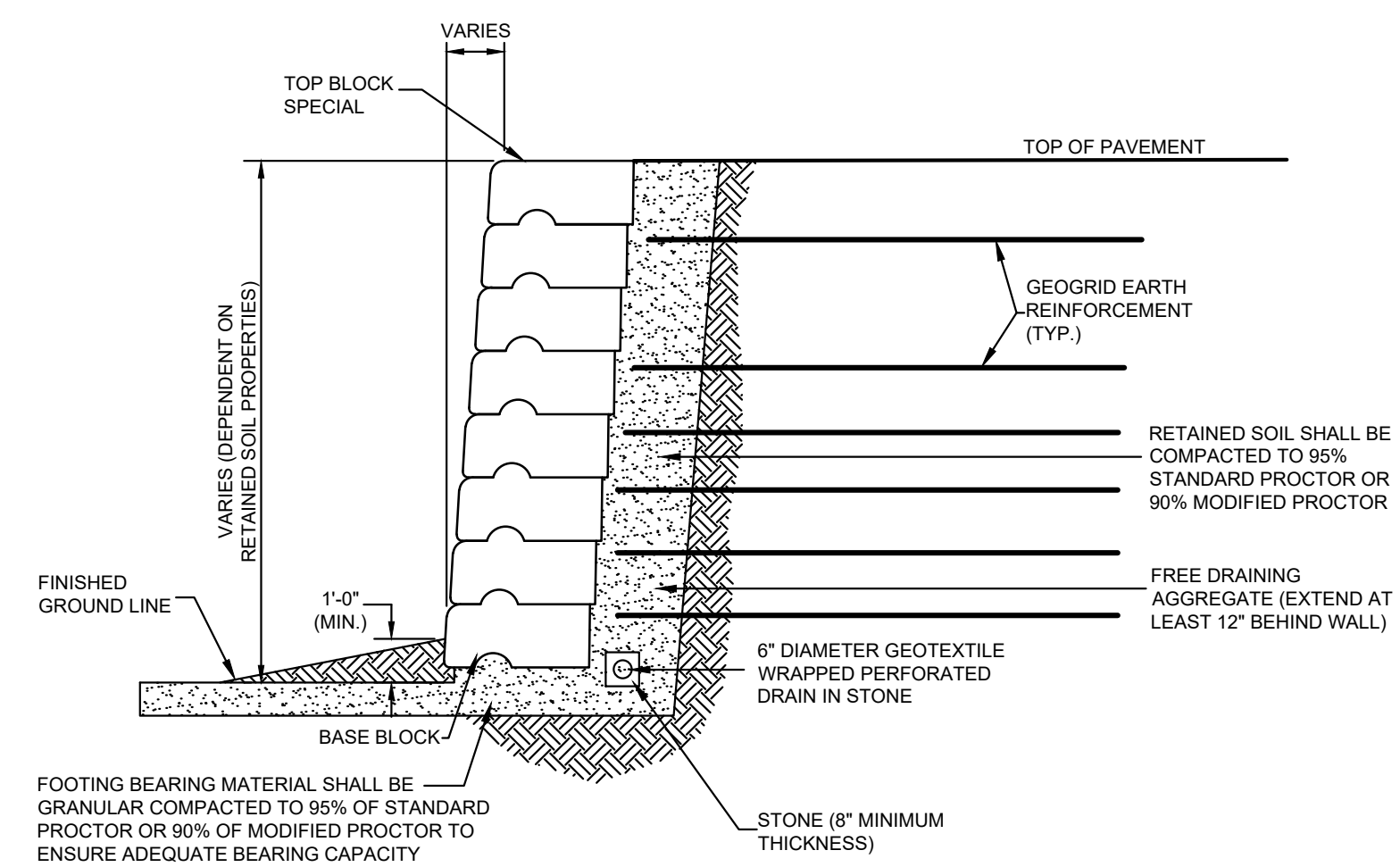
BITUMINOUS CURB TYPE B DETAIL
NOT TO SCALE
(MARCH 2008)



PLAN



SECTION A-A



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

- NOTES:**
- A BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP SHALL BE USED ON PORTLAND CEMENT CONCRETE RAMPS.
 - MAINTAIN THE NORMAL PAVEMENT PROFILE THROUGHOUT THE RAMP AREA.
 - MAINTAIN A MAXIMUM 1/4\"/>

SIDEWALK RAMP
NOT TO SCALE
(JUNE 2012)

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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. 6261 PG. 776	APPLICANT: SCOTT ZIELFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825
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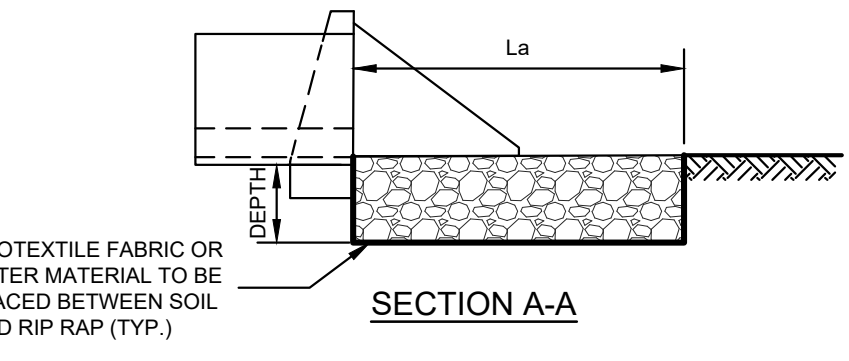
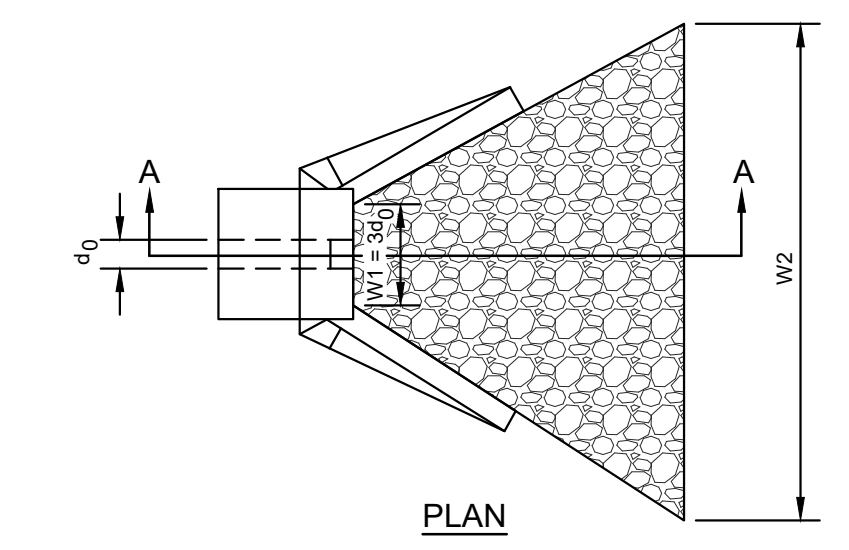
PERCENT OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE
100%	1.5 TO 2.0 d50
85%	1.3 TO 1.8 d50
50%	1.0 TO 1.5 d50
15%	0.3 TO 0.5 d50

CONSTRUCTION SPECIFICATIONS:

- THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
- THE ROCK OR GRAVEL USED FOR FILTER OR RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
- 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.
- 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.

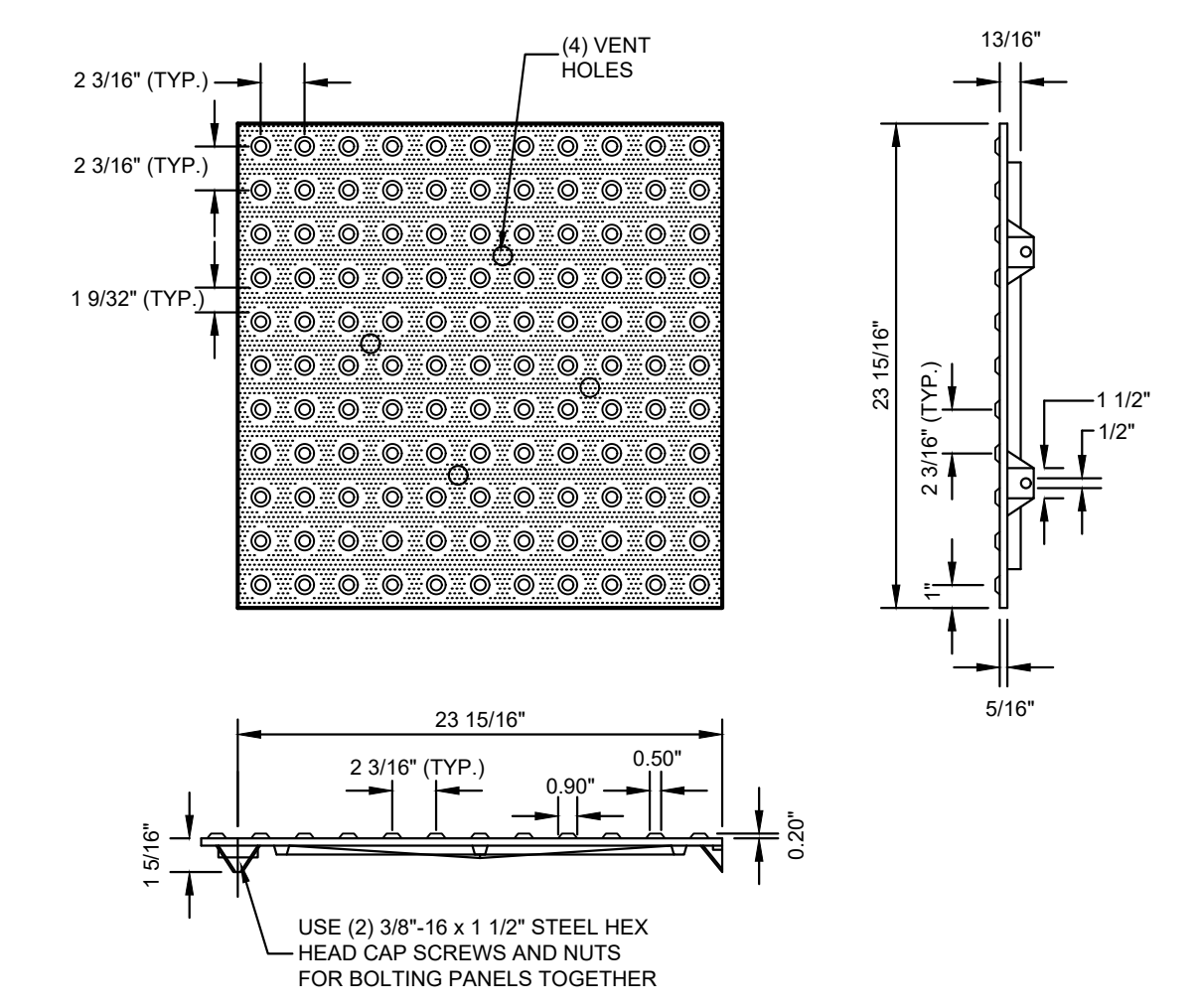
MAINTENANCE:

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.



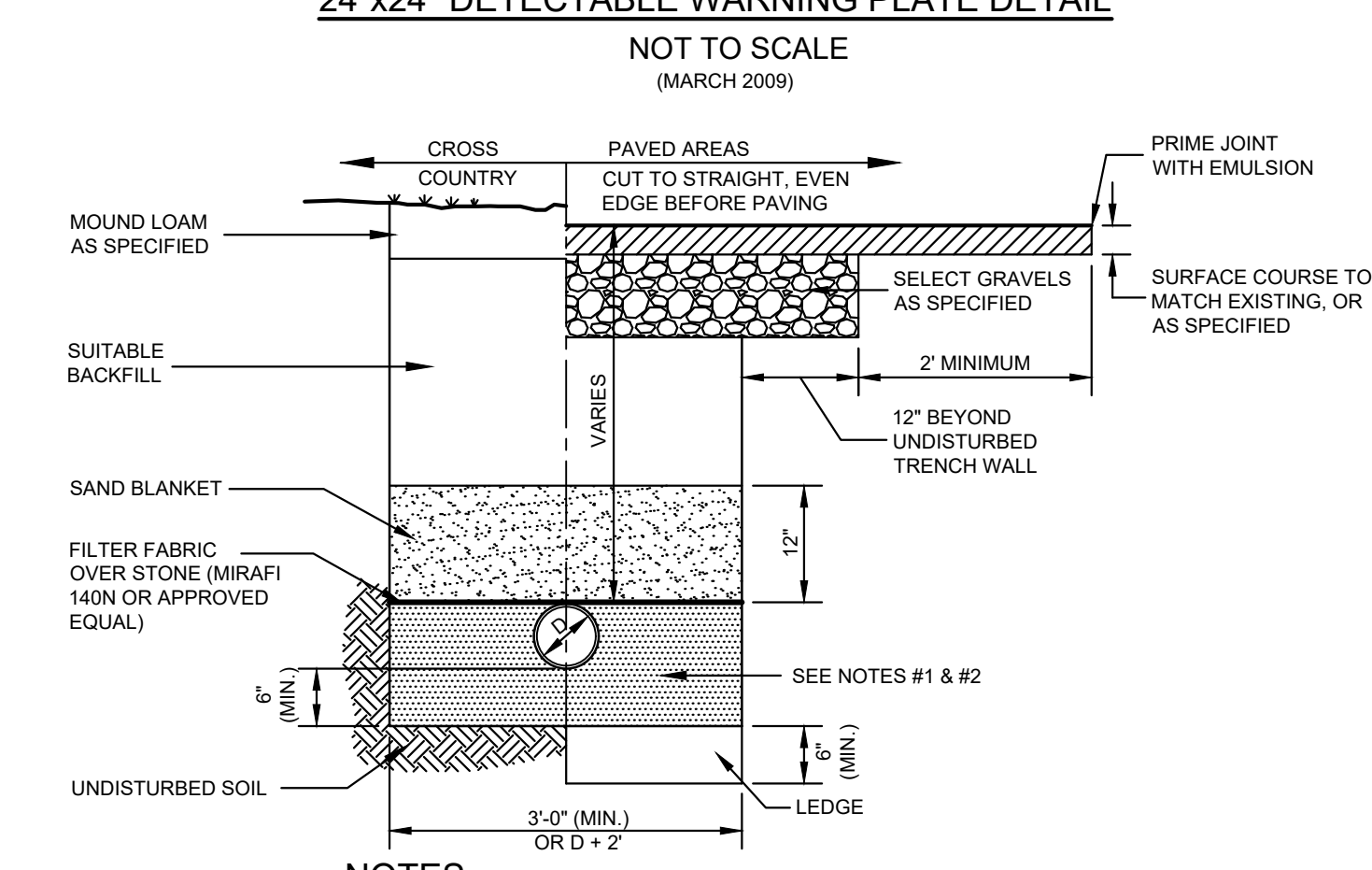
PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL
NOT TO SCALE

LOCATION	La	W1	W2	d50	DEPTH
OUTLET #0	10'	3'	7'	4"	10"
OUTLET #1	10'	3'	7'	4"	8"
INLET #1	10'	4'	8'	4"	10"
INLET #2	7'	3'	10'	4"	10"



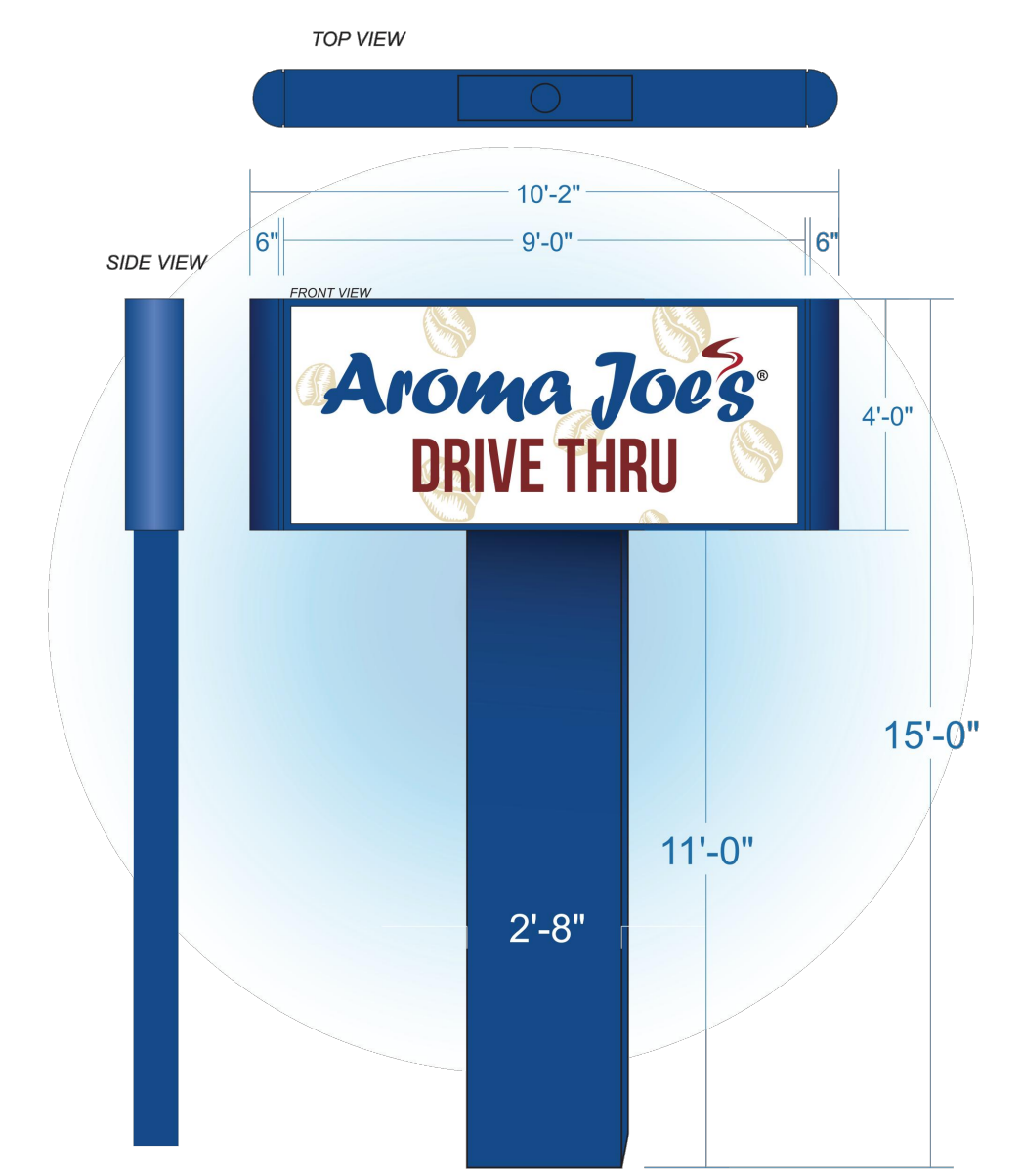
24"x24" DETECTABLE WARNING PLATE DETAIL
NOT TO SCALE
(MARCH 2009)

- NOTES:**
- DETECTABLE WARNING PLATE SHALL BE NEENAH FOUNDRY OR APPROVED EQUAL.
 - THE PLATE MUST COMPLY WITH ADAAG (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES) AND ARCHITECTURAL BARRIER ACT GUIDELINES.
 - MATERIAL SHALL BE CAST GRAY IRON.
 - FINISH: NO PAINT.

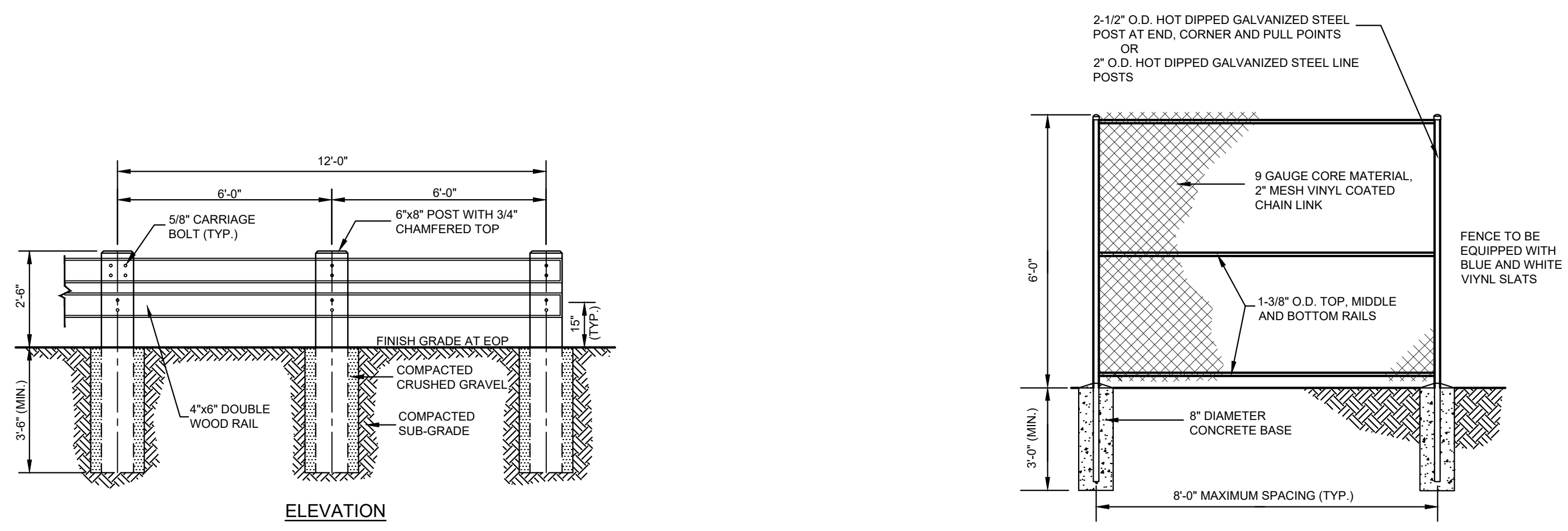


- NOTES:**
- THOROUGHLY COMPACTED SCREENED GRAVEL FOR RCP PIPE. SCREENED GRAVEL TO EXTEND TO SELECT FILL LINE.
 - FOR HDPE OR PVC PIPE, BEDDING SHALL BE 3/4" STONE TO THE TOP OF THE PIPE.

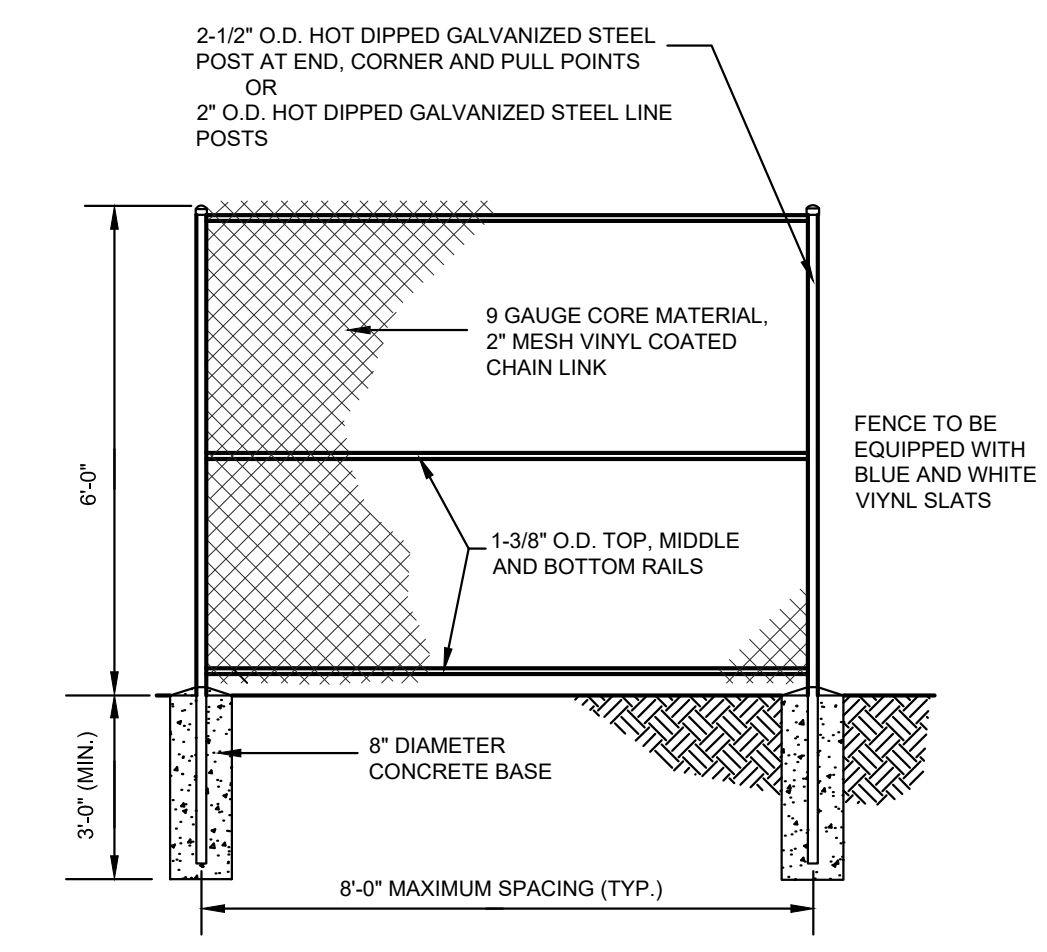
STORM DRAINAGE TRENCH DETAIL
NOT TO SCALE
(MARCH 2008)



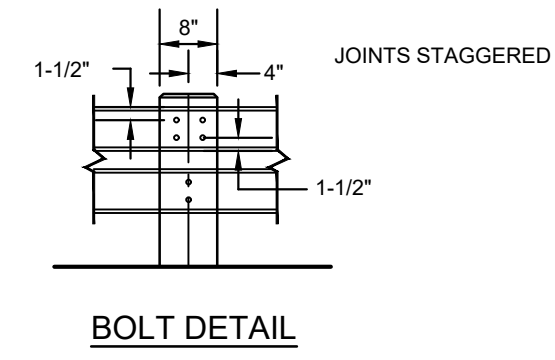
FREESTANDING SIGN DETAIL
NOT TO SCALE



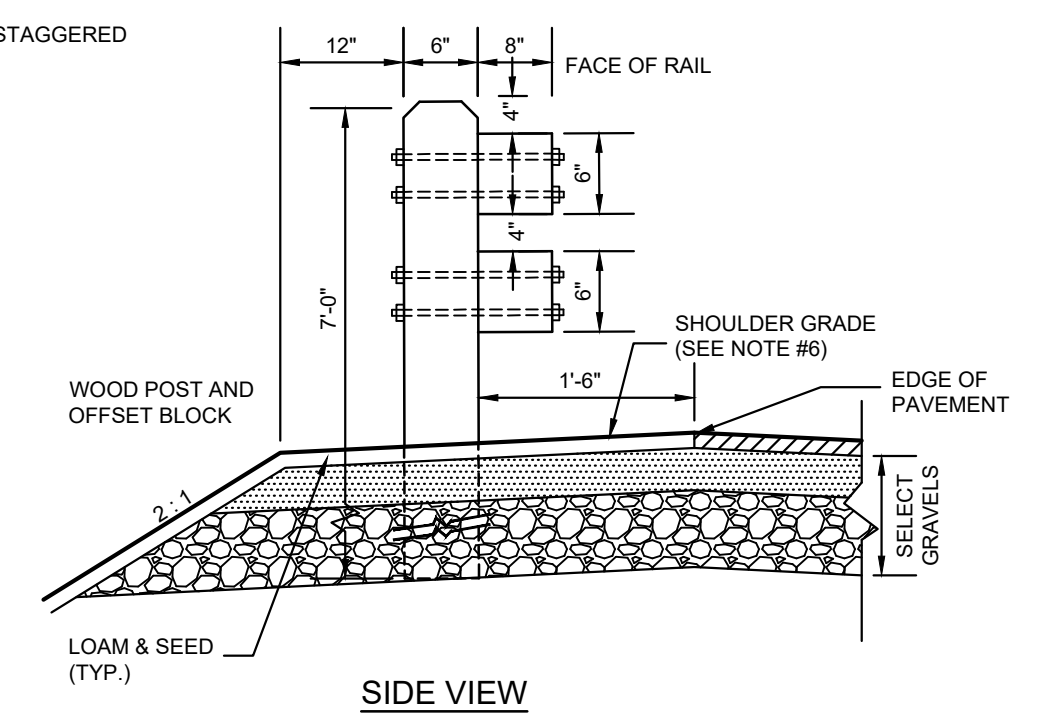
ELEVATION



CHAIN LINK FENCE DETAIL
NOT TO SCALE
(MARCH 2008)



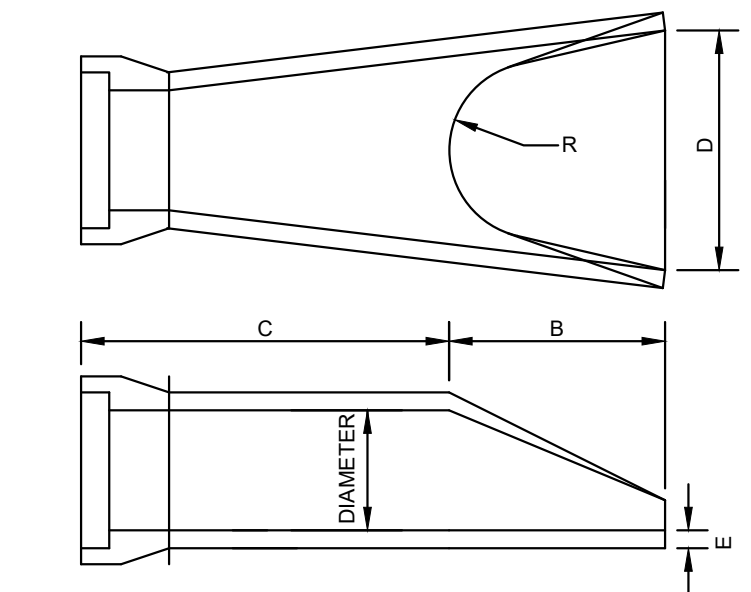
BOLT DETAIL



SIDE VIEW

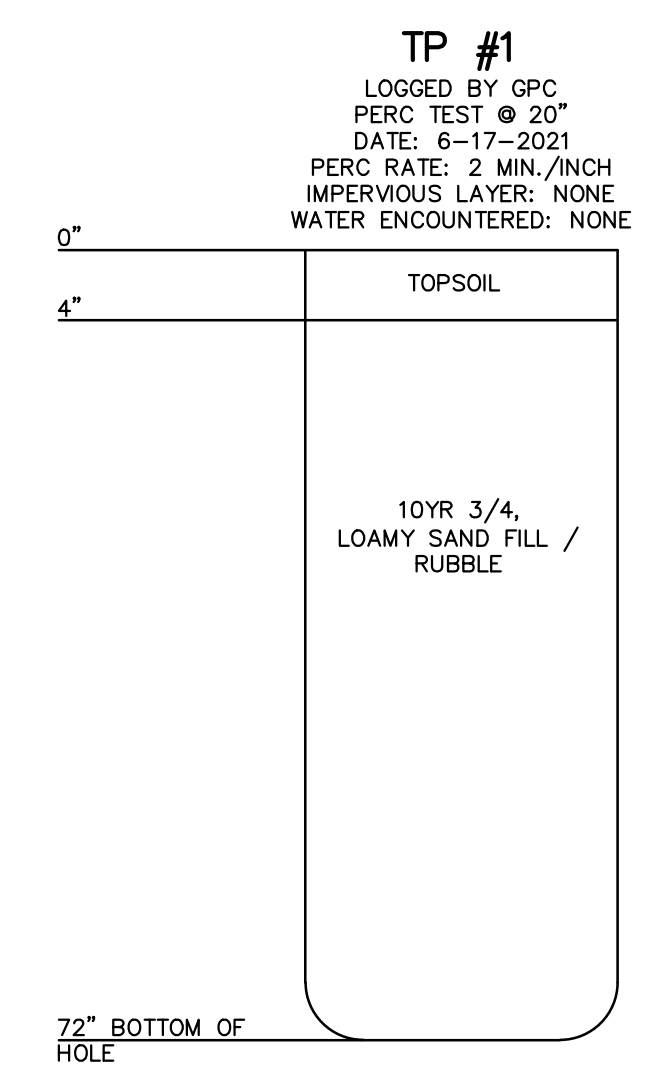
- NOTES:**
- ALL TIMBERS SHALL BE PRESSURE TREATED.
 - PAY LIMIT = PER LINEAR FOOT INCLUDING END SECTION.
 - ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED.

WOOD BEAM GUARDRAIL
NOT TO SCALE
(AUGUST 2011)



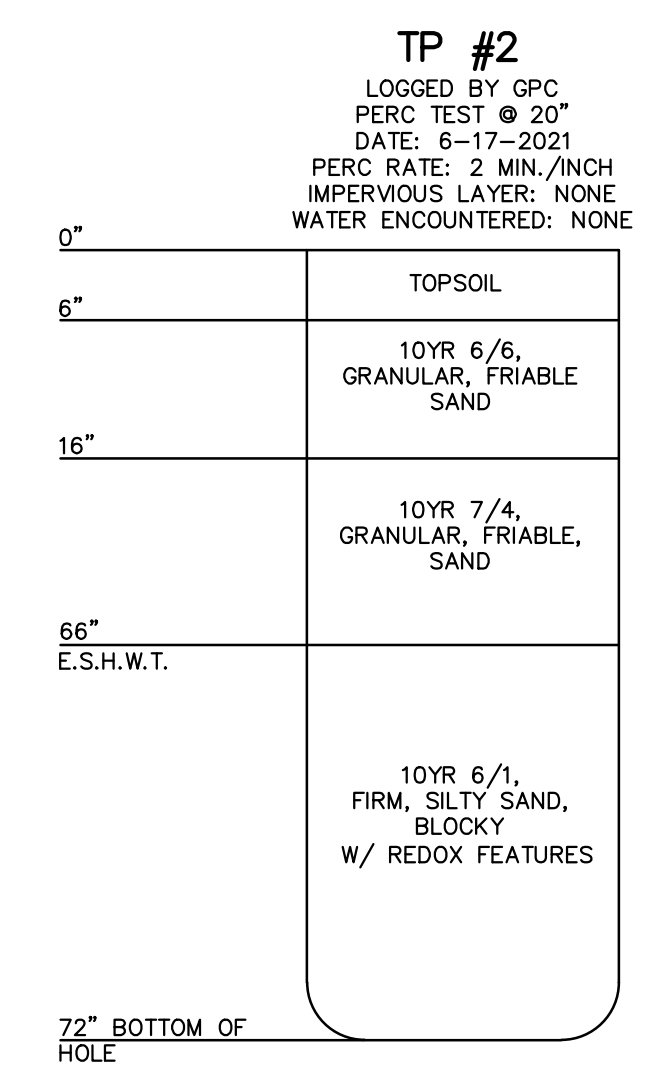
DIAMETER	A	B	C	D	E	R
12"	4"	2'-0"	4'-0 7/8"	2'-0"	2"	9"
15"	6"	2'-3"	3'-10"	2'-6"	2 1/4"	11"
18"	9"	2'-3"	3'-10"	3'-0"	2 1/2"	12"
21"	9"	2'-11"	3'-2"	3'-8"	2 3/4"	13"
24"	9 1/2"	3'-7 1/2"	2'-6"	4'-0"	3"	14"
30"	12"	4'-6"	1'-7 3/4"	5'-0"	3 1/2"	15"
36"	15"	5'-3"	2'-10 3/4"	6'-0"	4"	20"

RCP FLARED END SECTION DETAIL
NOT TO SCALE
(MARCH 2008)



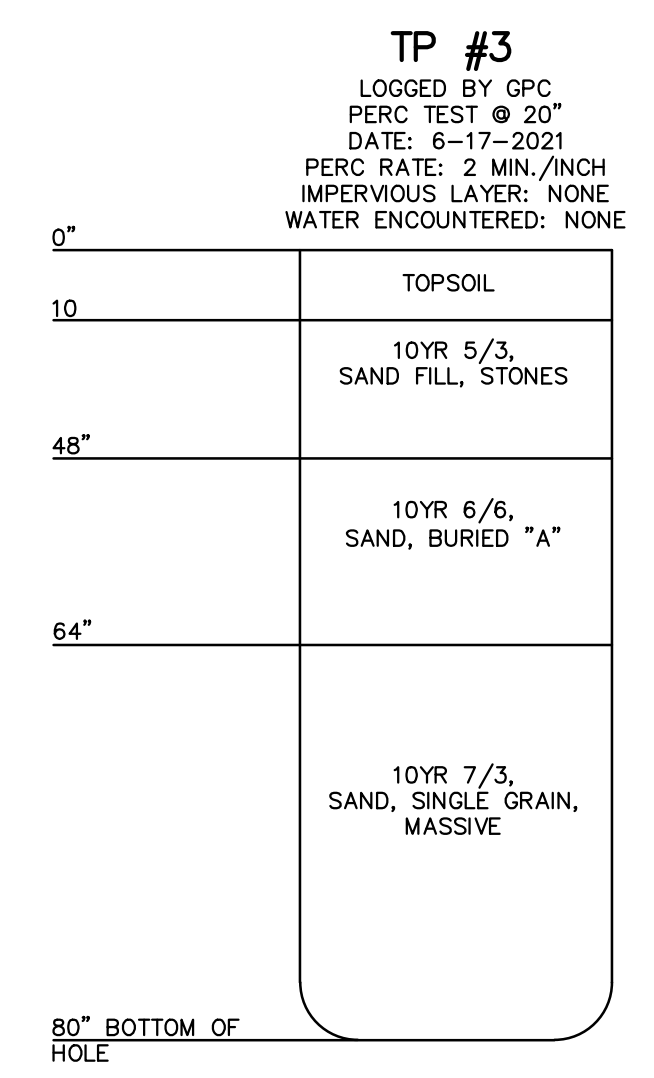
TP #1

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



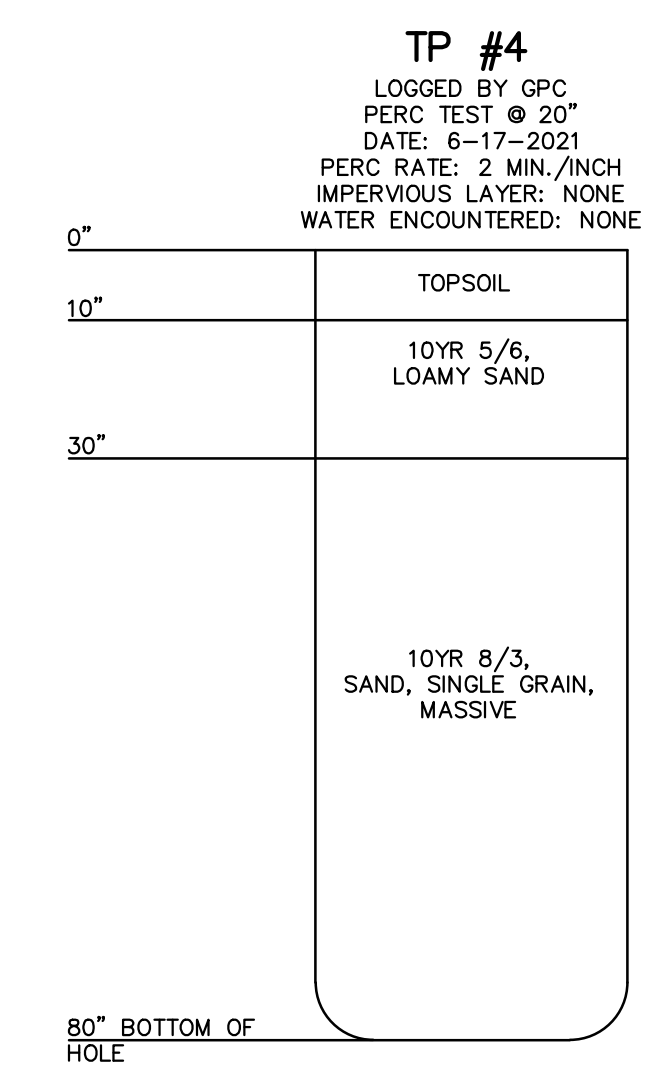
TP #2

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

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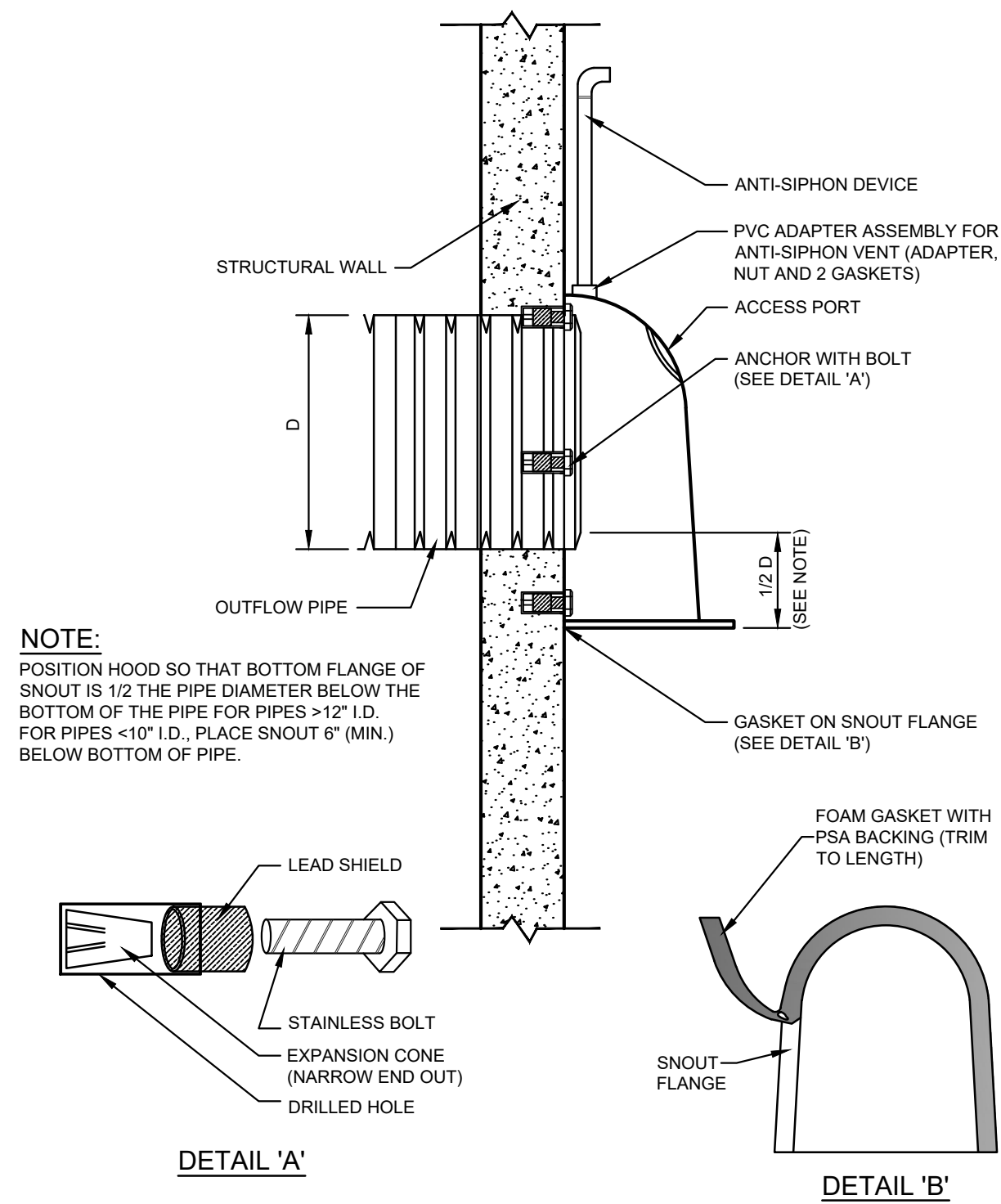
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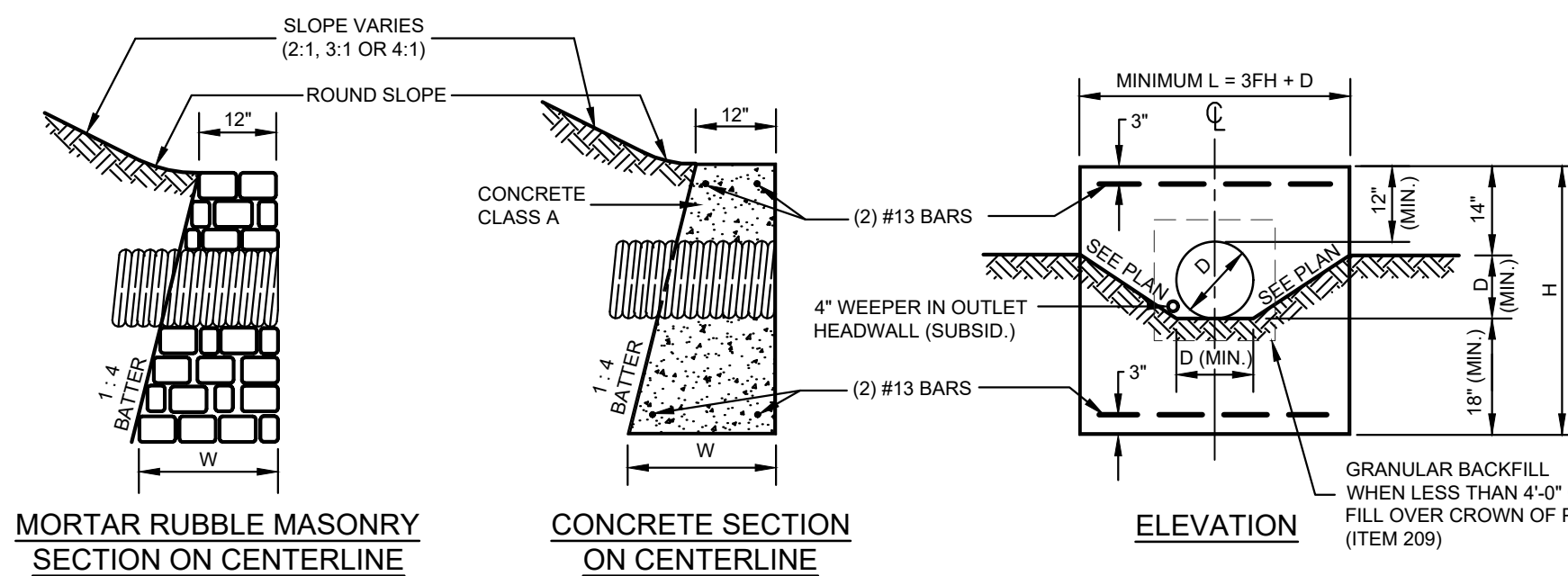
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3	08/30/2021	REVISED PER REVIEW COMMENTS	ACL

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



SNOUT OIL AND DEBRIS STOP DETAIL (OR EQUAL)
NOT TO SCALE
(MARCH 2008)

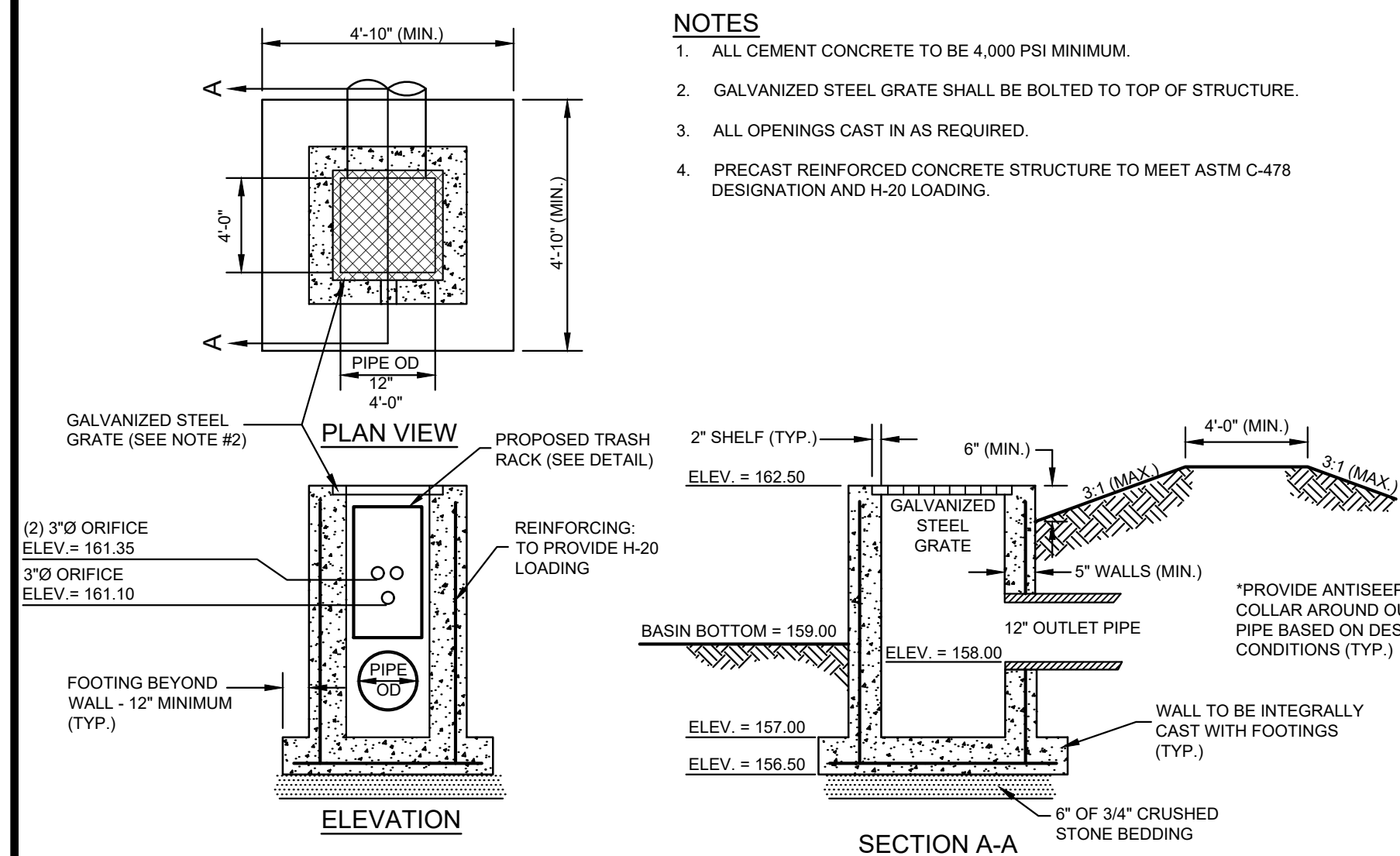


NOTE:
DIMENSIONS SHOWN ARE TO PAYMENT LINES. MORTAR RUBBLE MASONRY TO BE STEPPED OUTSIDE PAYMENT LINES ON SLOPING FACES.

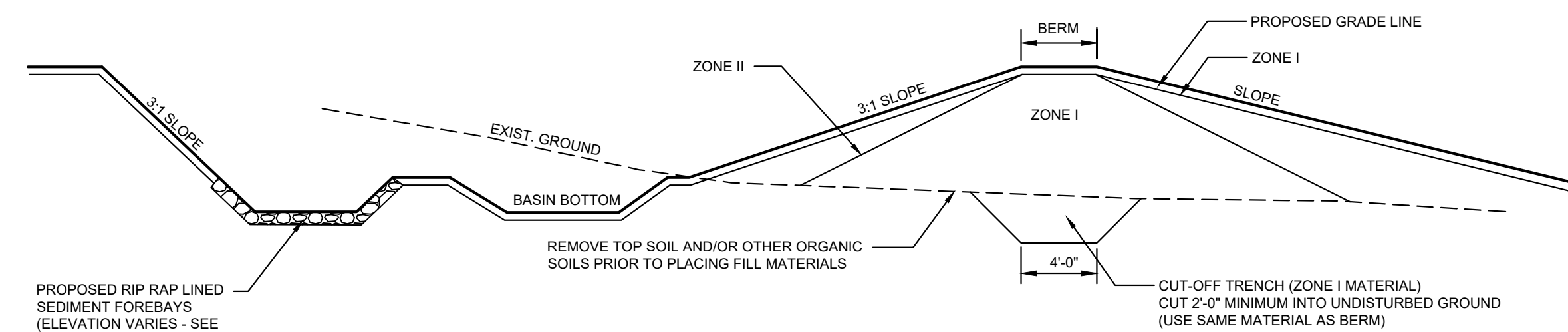
DIAMETER D (INCH)	AREA OF PIPE (SF)	MASONRY PER FOOT OF WALL (CU. YD.)	MASONRY PER HOLE (CU. FT.)	MASONRY PER STANDARD HEADER (CU. YD.)	STEEL PER STANDARD HEADER (LB)	LENGTH OF BARS	PIPE EXC. 1' DEPTH (CU. YD.)	HEADER EXC. PER HEADER 1' DEPTH (CU. YD.)	ITEM 209 PER LINEAR FOOT	HEADER LENGTH L	HEADER HEIGHT H	FILL HEIGHT FH	1\"/>		
													MASONRY IN CORNER FRUSTRUM (CU. YD.)	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



OUTLET STRUCTURE #1
NOT TO SCALE



STORMWATER PONDS CONSTRUCTION SEQUENCE

- CONTRACTOR TO NOTIFY DIG-SAFE 72 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- 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.
- 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.
- 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 SEEDDED WITH WINTER RYE AND, IF NECESSARY, SURROUNDED WITH HAY BALES IN ORDER TO PREVENT LOSS DUE TO EROSION.
- CONSTRUCT TEMPORARY CULVERTS AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. ALL SUCH CROSSINGS SHALL BE PROTECTED WITH HAY BALE BARRIERS TO LIMIT EROSION.
- CONSTRUCT CUT-OFF TRENCH (PART OF ZONE I).
- CONSTRUCT BROAD CRESTED WEIR, ANTI SEEP COLLARS, HEADWALL, AND RIP RAP OUTLET PROTECTION AS SHOWN ON PLANS.
- CONSTRUCT ZONE I PORTION OF EARTH EMBANKMENT.
- CONSTRUCT ZONE II PORTION OF EARTH EMBANKMENT.
- 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, SEEDDED 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.
- 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).
- AFTER STABILIZATION, REMOVE AND SUITABLY DISPOSE OF TEMPORARY EROSION CONTROL MEASURES.
- 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.
- 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.

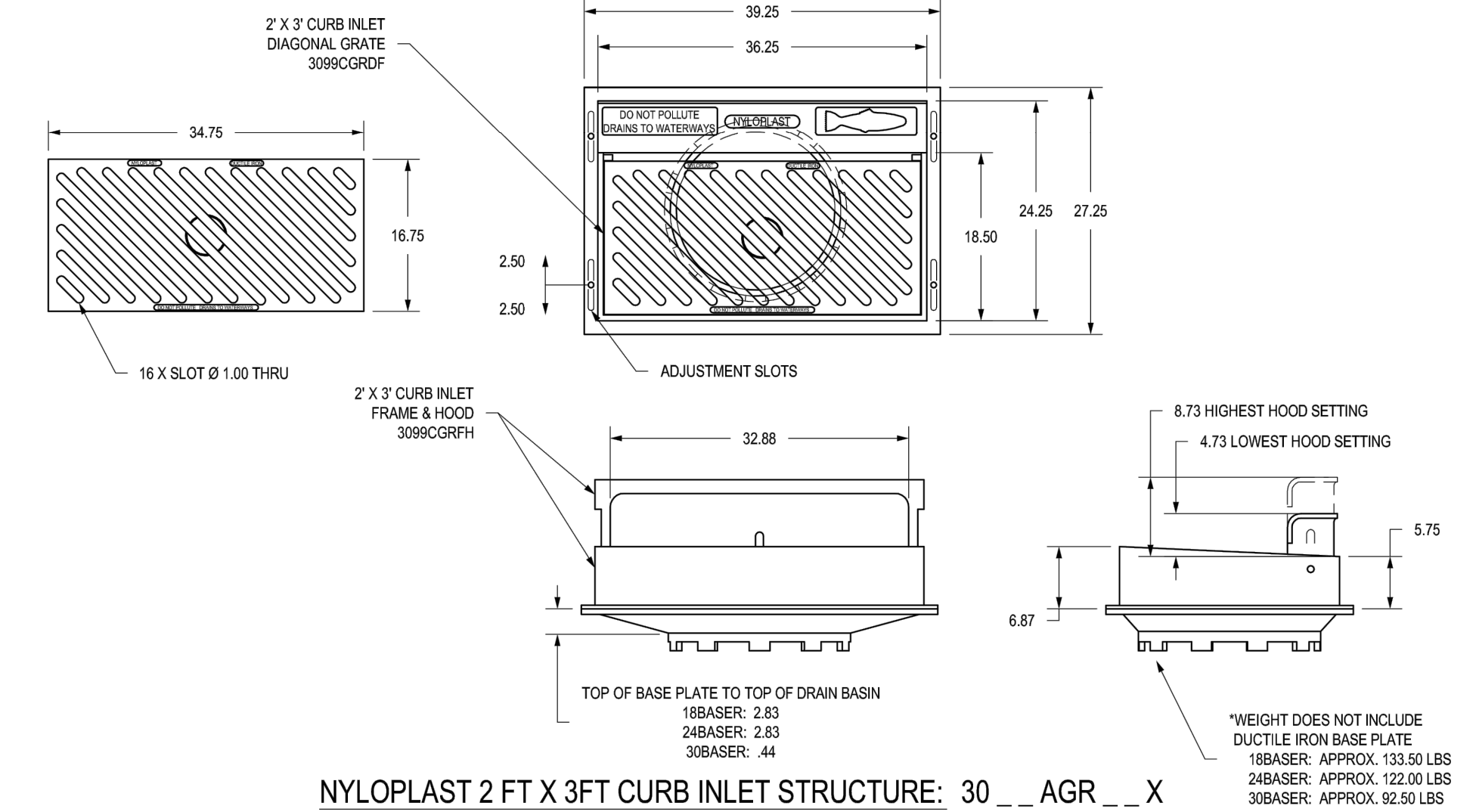
INFILTRATION POND DETAIL
NOT TO SCALE

MATERIAL TYPE/SPECIFICATIONS

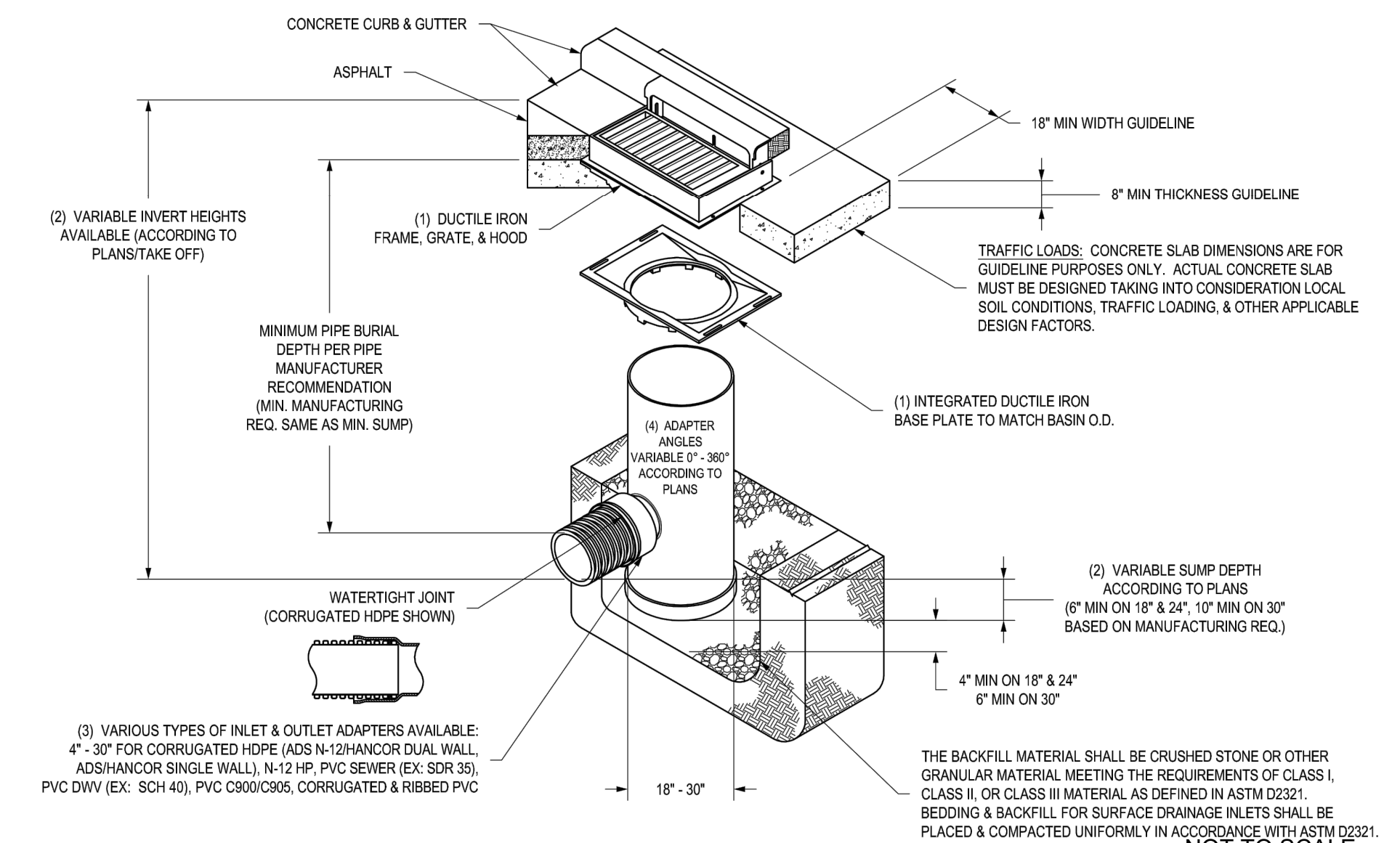
- ZONE I**
WELL GRADED MIXTURE OF GRAVEL, SAND, SILT OR CLAY WITH MAX. 6-INCH SIZE STONE AND GEADATION AS INDICATED BELOW. PLACE IN MAX. 12-INCH THICK LIFTS TO 95% OF MAX. DRY DENSITY IN ACCORDANCE WITH ASTM D1557.
SCARIFY SURFACE PRIOR TO PLACING SUBSEQUENT LIFT. IN ADDITION, REMOVE ORGANIC SOILS.
- | SIIEVE 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.
- | SIIEVE SIZE | PERCENT BY WEIGHT PASSING |
|-------------|-----------------------------|
| 1-INCH | 100 |
| NO. 4 | 70-100 |
| NO. 200 | 0-12 (IN SAND PORTION ONLY) |

3099CGRDF & 3099CGRFH

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



NYLOPLAST 2 FT X 3 FT CURB INLET STRUCTURE: 30 __ AGR __ X



NYLOPLAST TYPICAL DETAILS

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. 6261 PG. 776

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

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

No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL
3	08/30/2021	REVISED PER REVIEW COMMENTS	ACL

DATE: JUNE 22, 2021 **SCALE:** AS SHOWN
PROJECT NO: 21-0311-1 **SHEET:** 11 OF 14

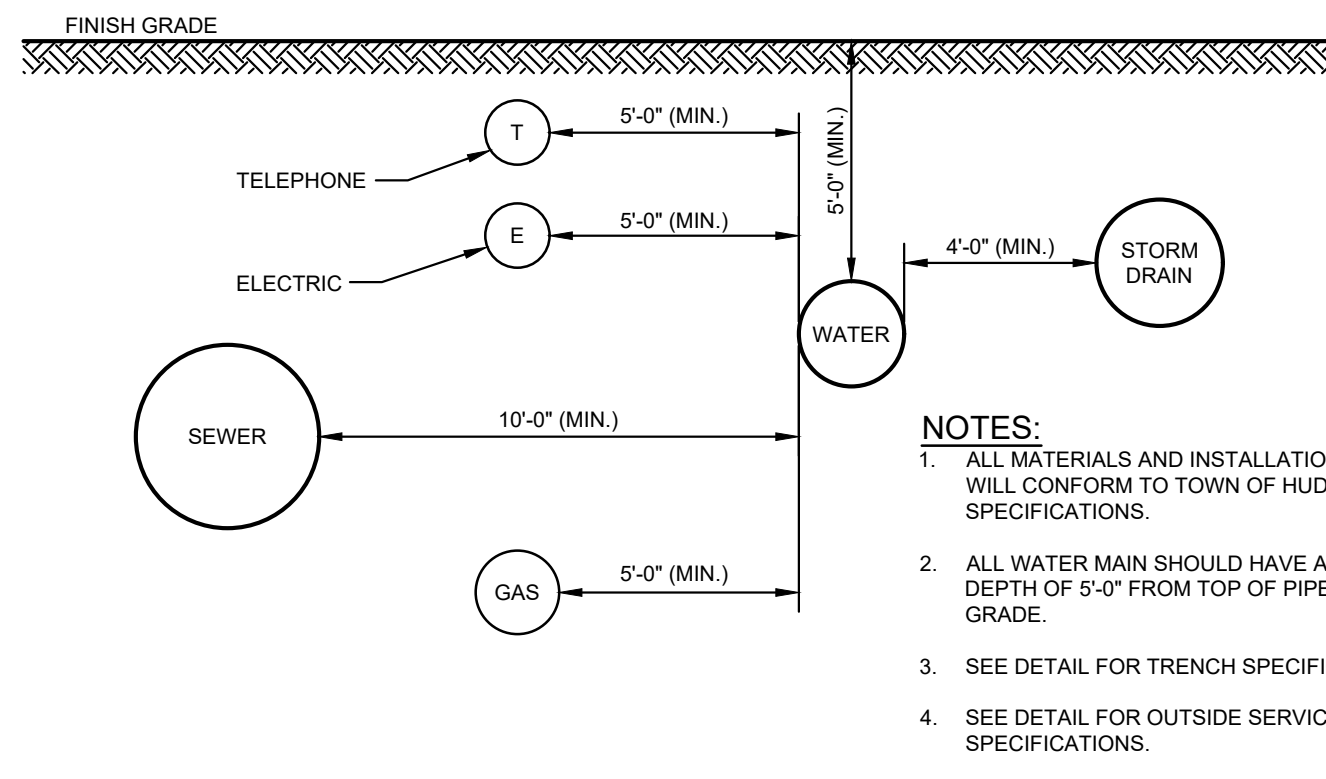
PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL.

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

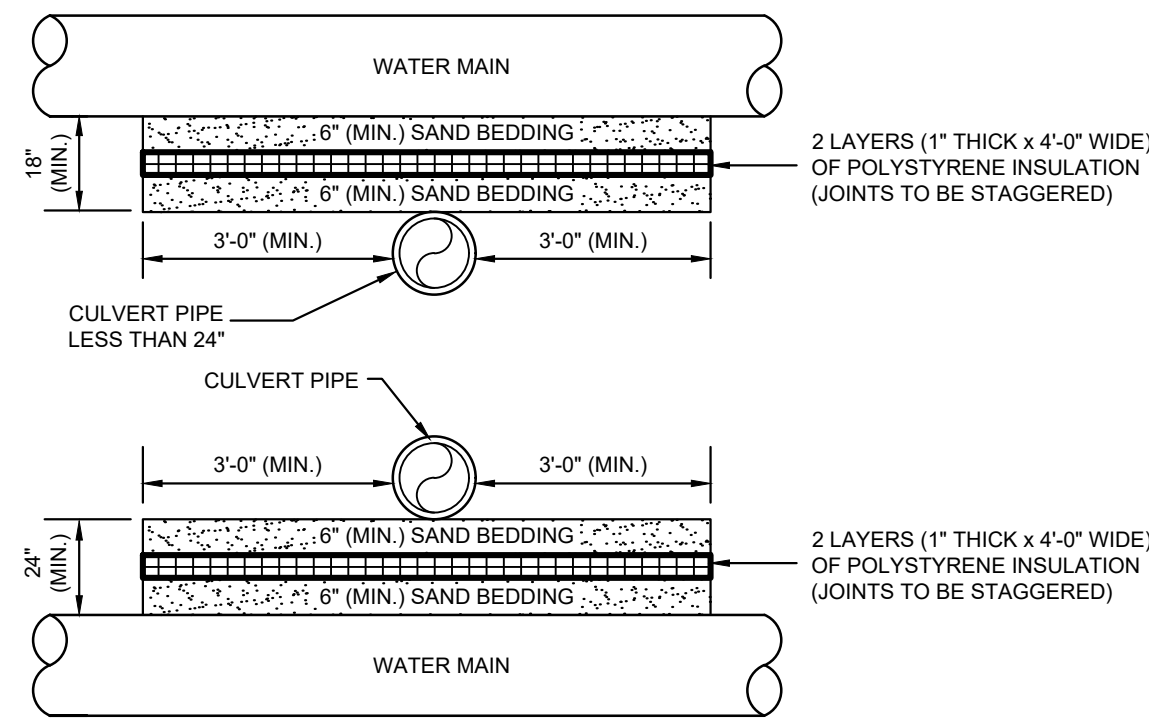
SIGNATURE DATE: _____

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.

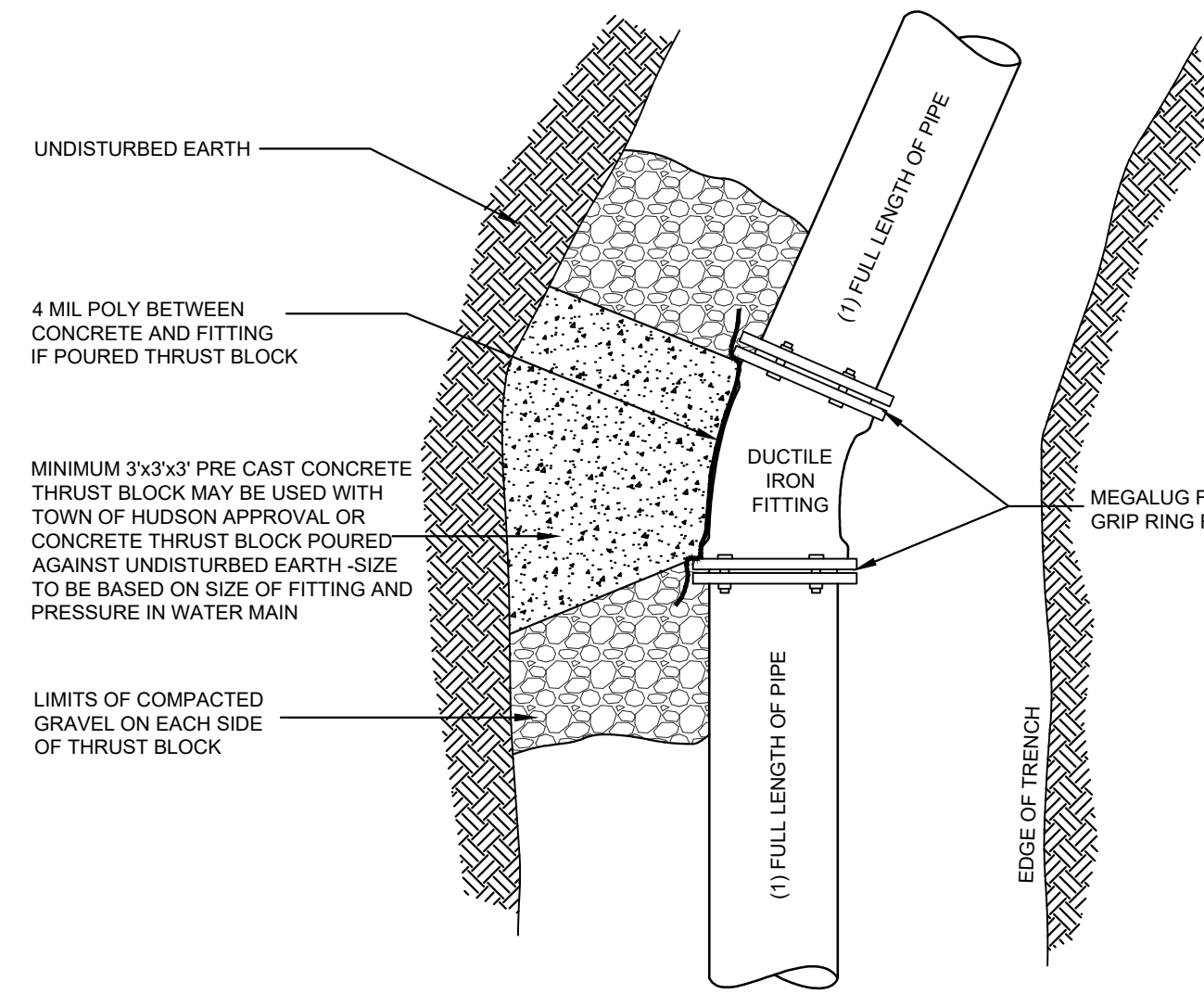


UTILITY SEPARATION (MAIN) DETAIL
(A-01)
NOT TO SCALE
(MARCH 2008)



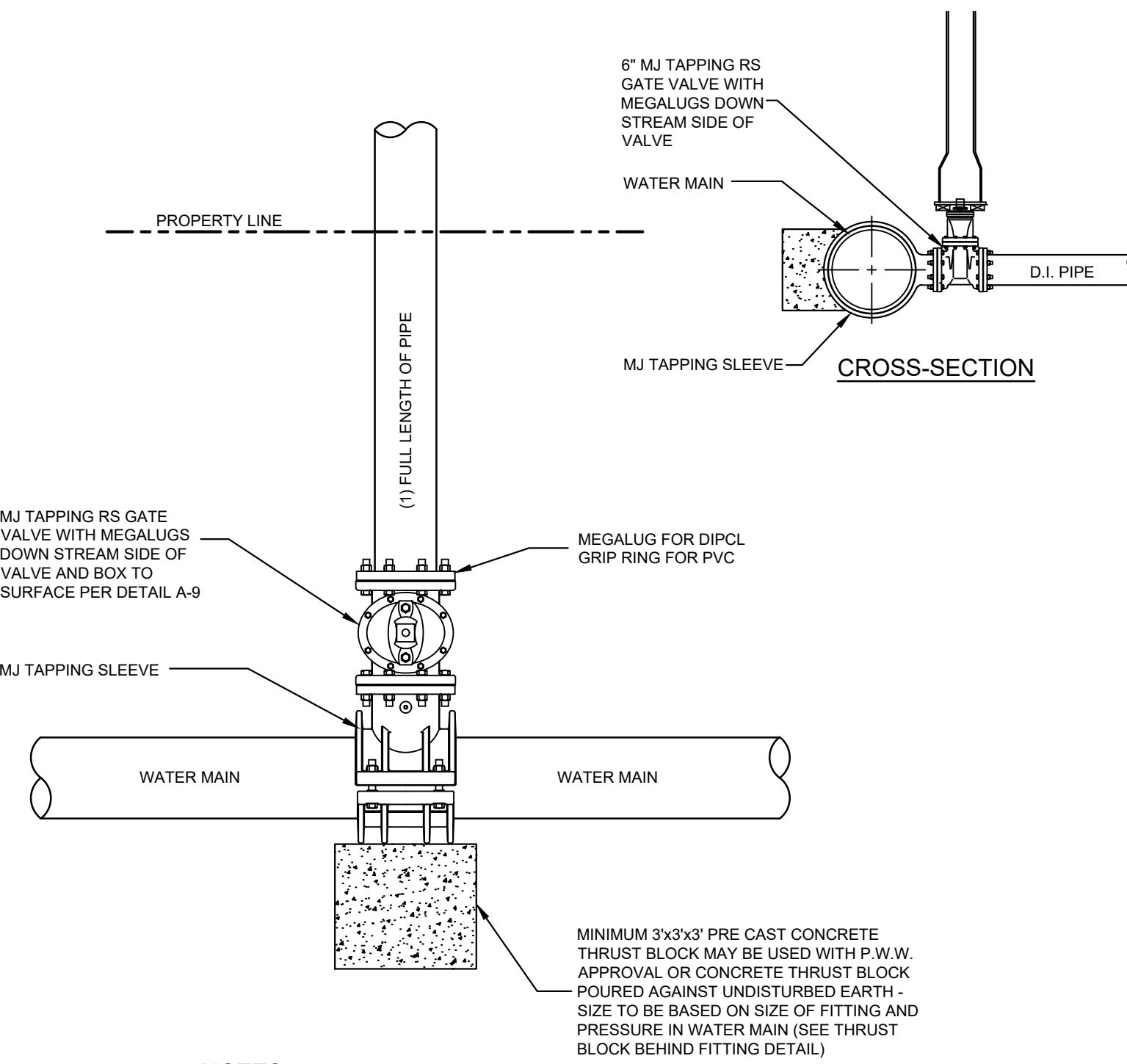
WATER PIPE CROSSING INSULATION DETAIL
(A-07)
NOT TO SCALE
(JUNE 2012)

WATER PIPE CROSSING INSULATION DETAIL
NOT TO SCALE
(JUNE 2012)



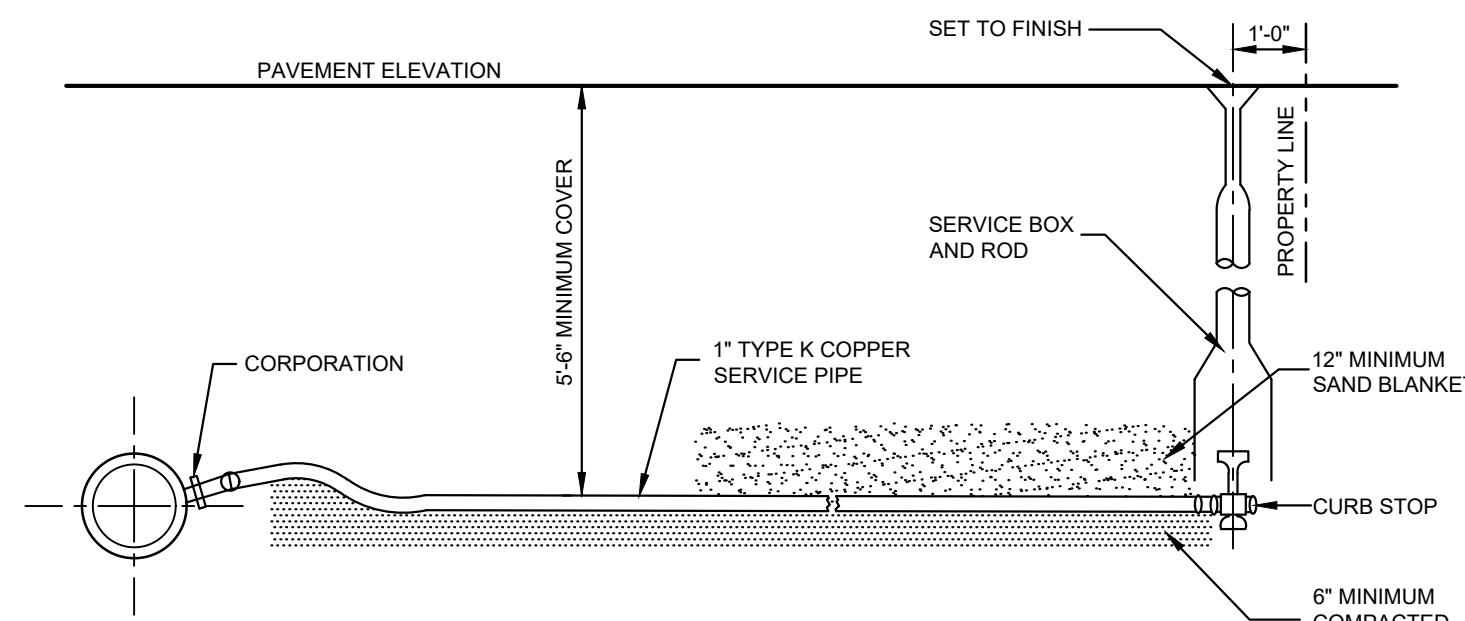
- NOTES:**
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
 2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
 3. 3/4"Ø S.S. RODS SHALL BE USED IN CONJUNCTION WITH REQUIRED S.S. NUTS. RODS ARE TO BE ATTACHED TO FITTINGS 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)

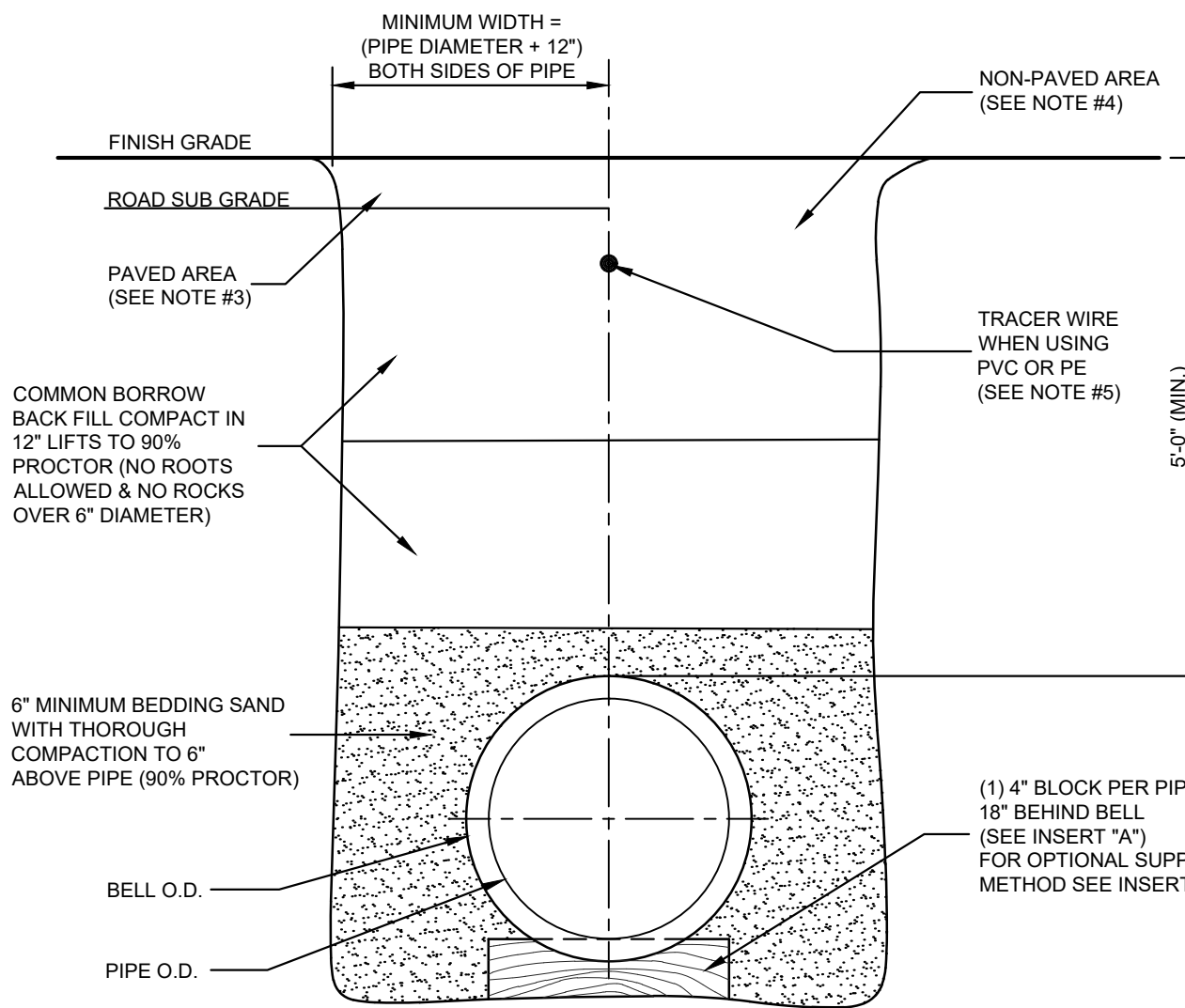


- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
 2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.

LARGE SERVICE AND/OR TAPPING SLEEVE DETAIL
(A-21)
NOT TO SCALE
(MARCH 2008)



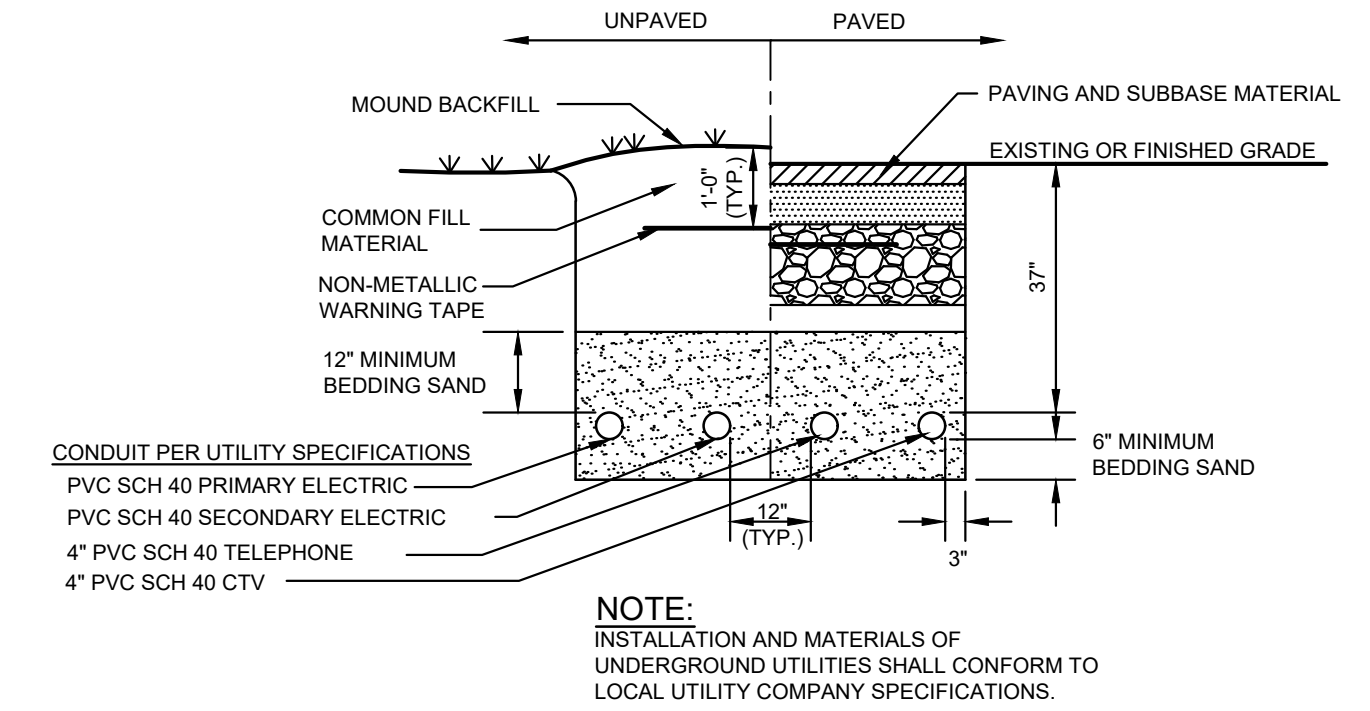
WATER SERVICE CONNECTION
NOT TO SCALE
(MARCH 2008)



- 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.
 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)

- 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 HEREON 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 MEASURES 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 CONSTRUCTION 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.



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. 6261 PG. 776

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

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

REVISIONS			
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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: _____

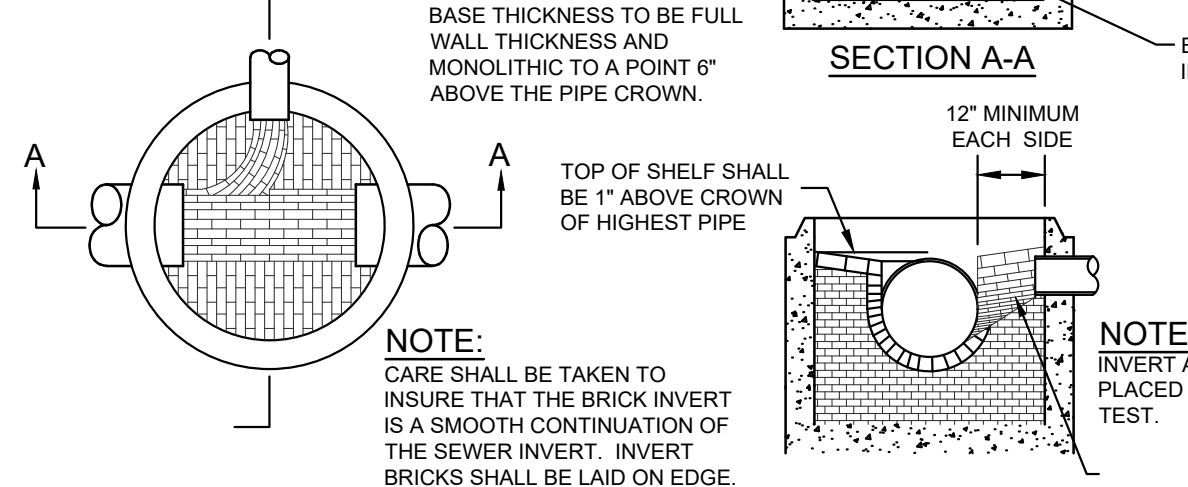
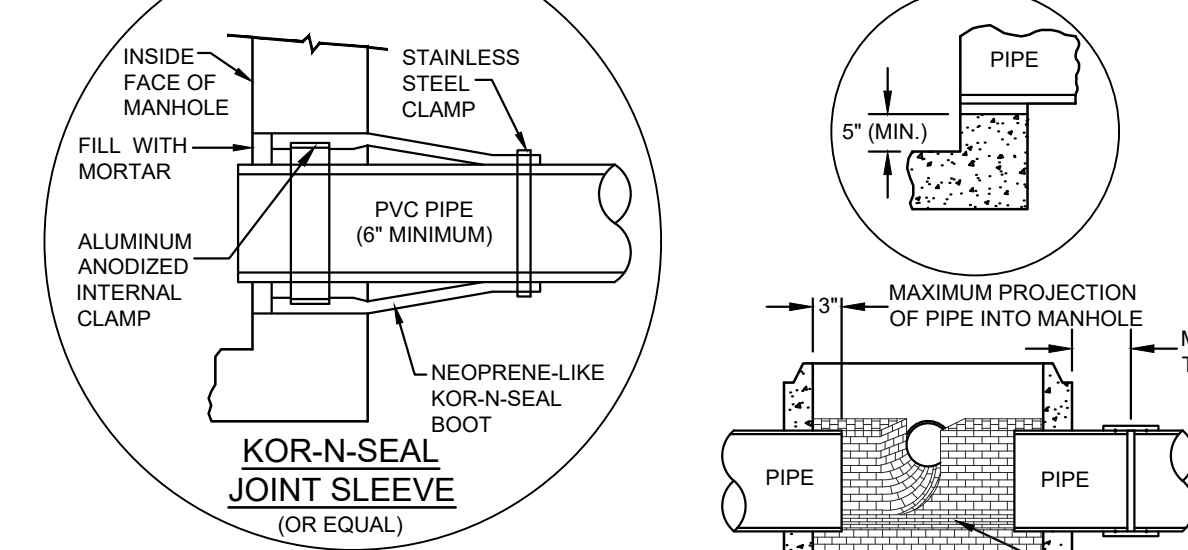
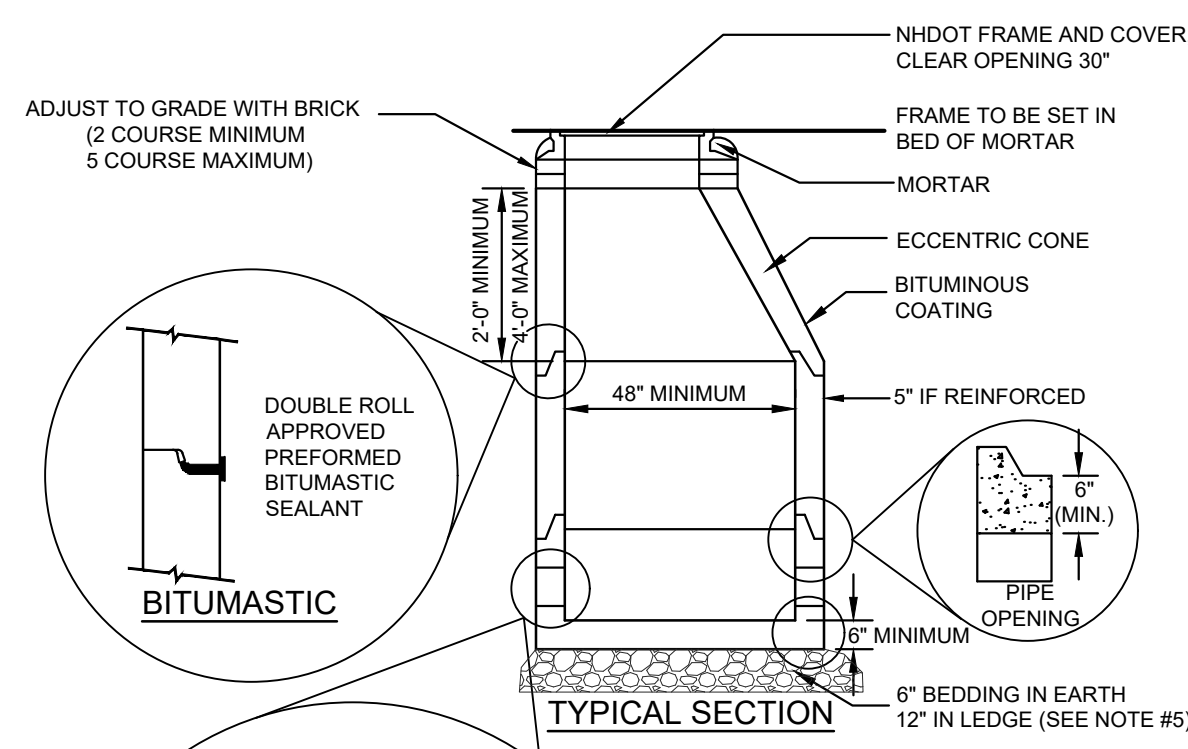
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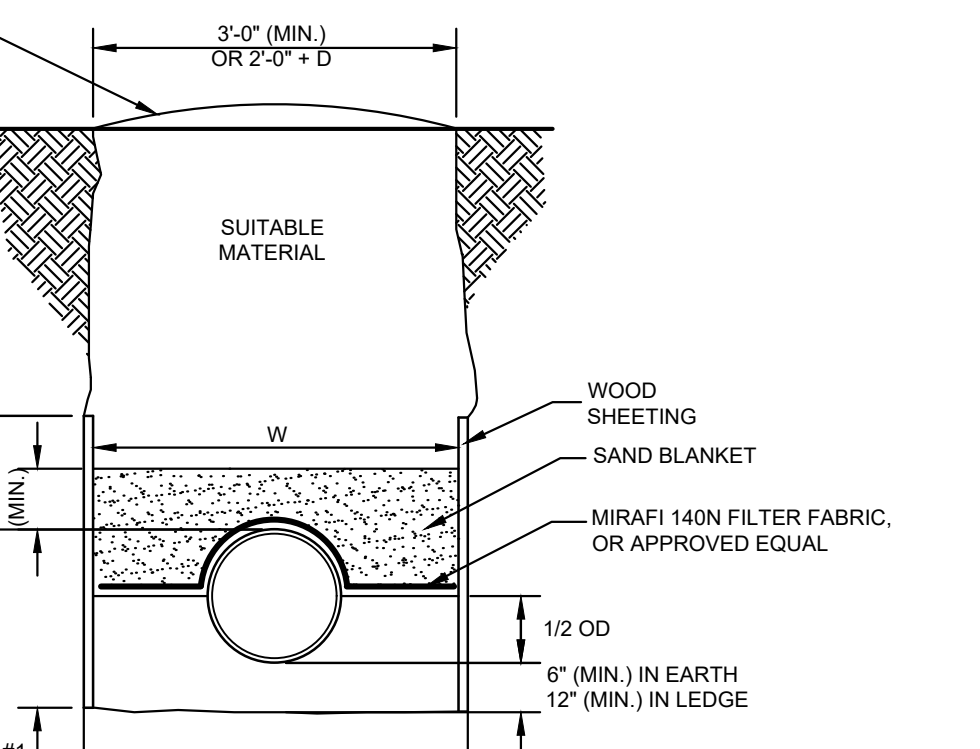
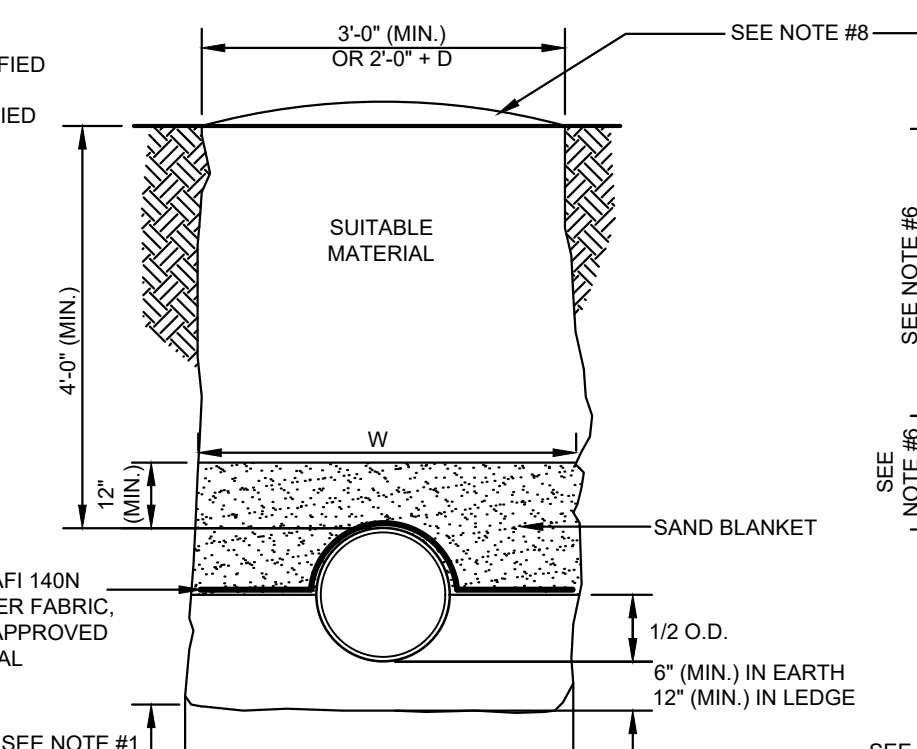
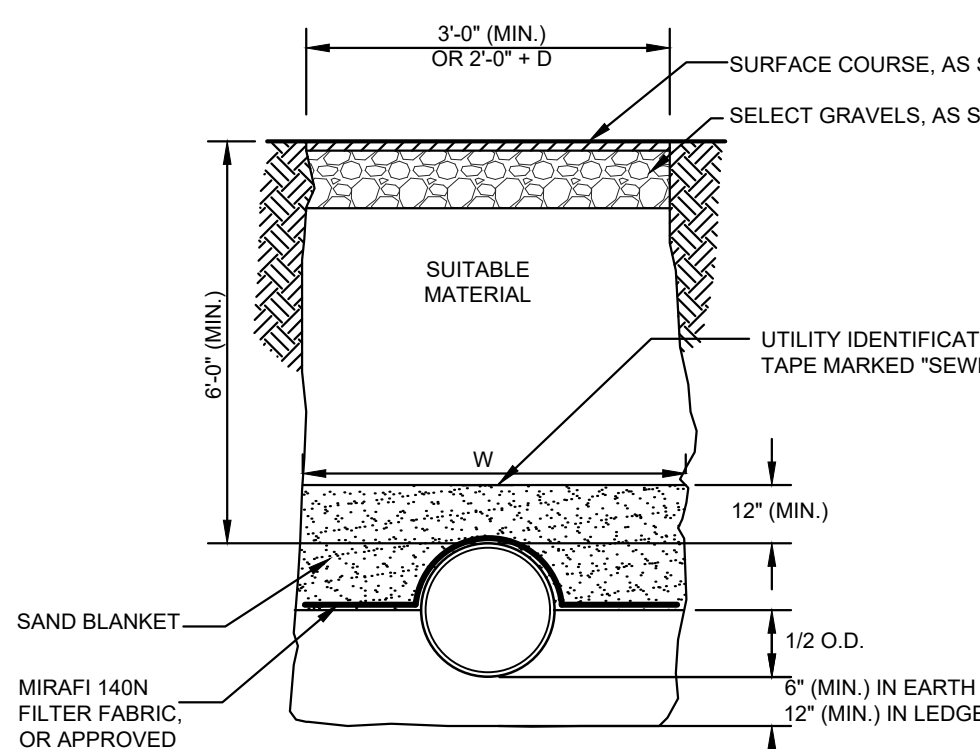
NOTES: (NHDES ENV WQ700 - 2015)

- ALL COMPONENT PARTS OF MANHOLE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE AND SPACE NECESSARY FOR THE INTENDED SERVICE.
- MANHOLE STRUCTURES SHALL HAVE A LIFE EXPECTANCY IN EXCESS OF 25 YEARS.
- 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.
- BARRELS, CONCRETE GRADE RINGS AND CONE SECTIONS SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE AND SHALL CONFORM TO ASTM C478.
- 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. BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 6 INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
- 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.
- PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
A. ELASTOMERIC RUBBER SLEEVE WITH WATER-TIGHT 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 WATER-TIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
- MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
- 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.
- ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP-PROOFING COATING.
- 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 SLOPED AFTER TESTING.
- 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 MANUFACTURE(S) AS CONFORMING 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 AA 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 8 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED IN LIEU OF A CONE SECTION, PROVIDED THE SLAB HAS AN ECCENTRIC ENTRANCE OPENING AND IS CAPABLE OF SUPPORTING H-20 LOADS.
- 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 ACCEPTED TEST HOLD TIME FOR A 1-INCH Hg PRESSURE DROP TO 9 INCH Hg SHALL BE:
a. NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP IN DEPTH;
b. NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP; AND
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.



NOTES:

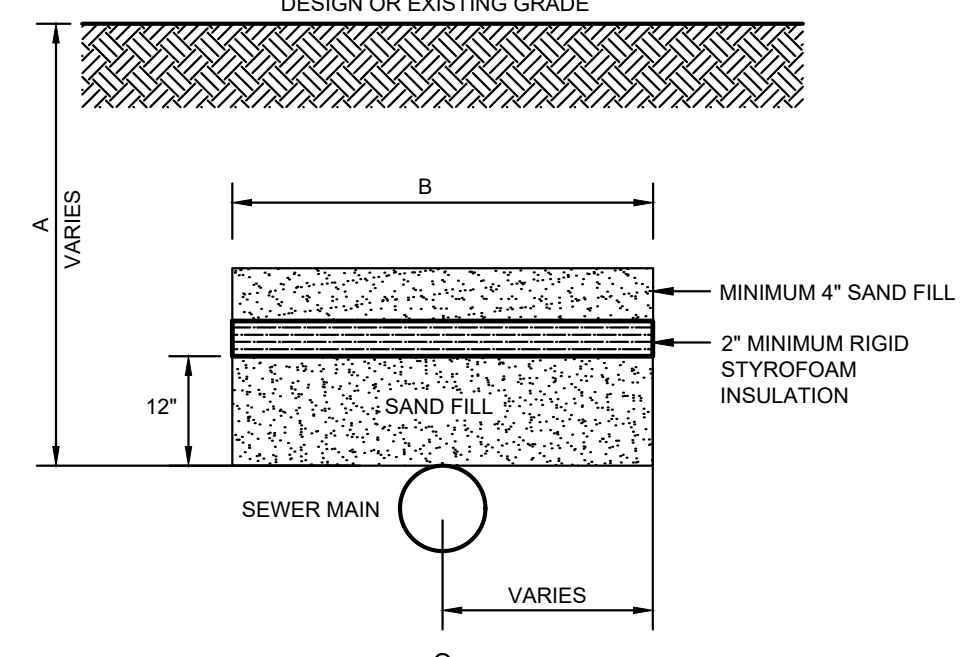
- ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE. REFILL WITH BEDDING MATERIAL. ALSO SEE NOTE #7.
BEDDING: CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33-03 STONE SIZE NO. 67.
100% PASSING 1 INCH SCREEN
90 - 100% PASSING 3/4 INCH SCREEN
20 - 55% PASSING 3/8 INCH SCREEN
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.
- 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.
- MIRAFI 140 N FILTER FABRIC, OR APPROVED EQUAL, SHALL BE INSTALLED ABOVE PIPE.



SANITARY SEWER TRENCH DETAIL NOT TO SCALE (MARCH 2008)

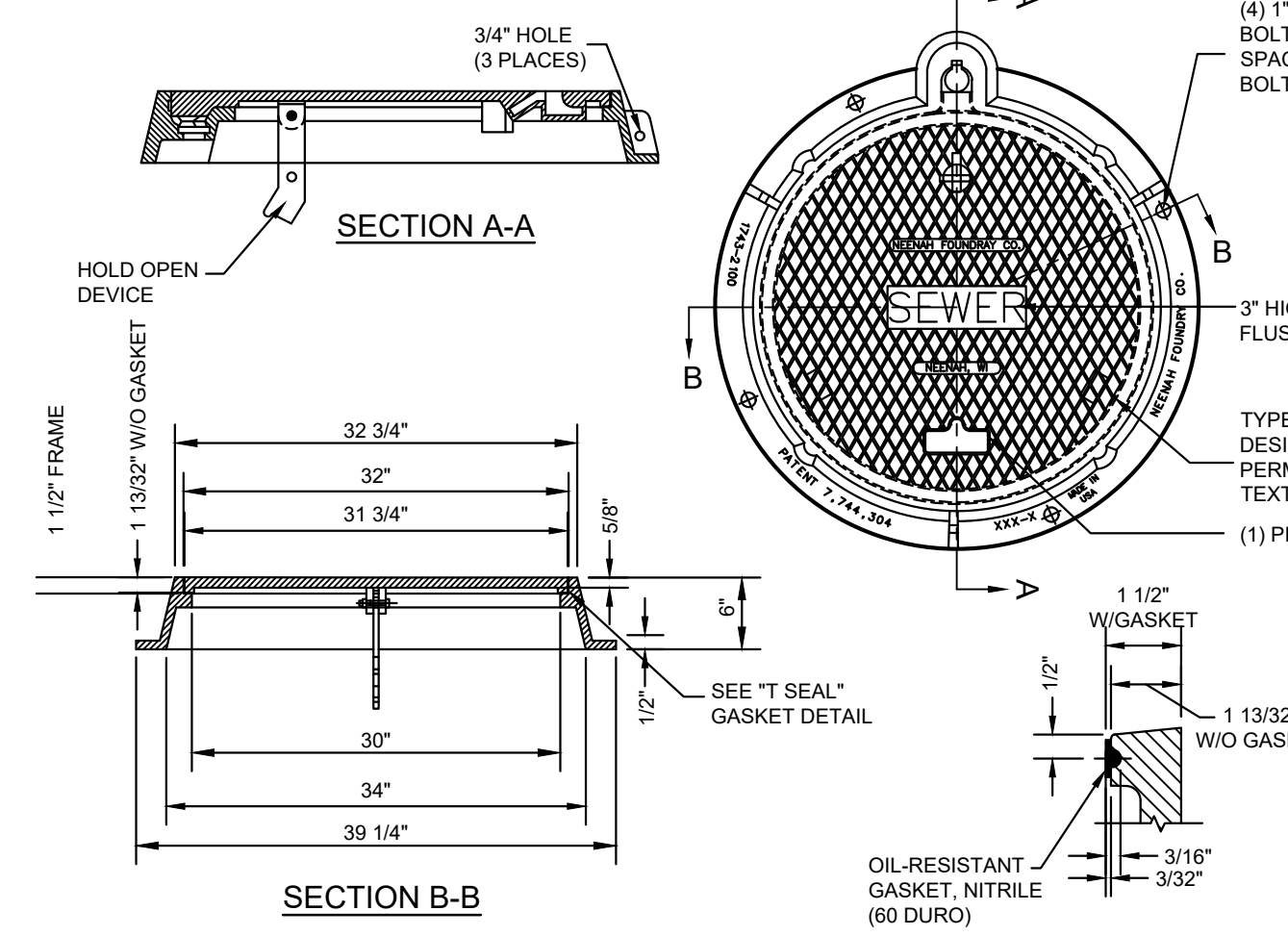
NOT TO SCALE (MARCH 2008)

- 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.
- FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUND TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
- 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 D3034-03s
DI SHALL BE CORROSION PROTECTED IN CORROSIVE ENVIRONMENTS
B. WHERE WATER LINES AND SEWER LINES CROSS, THEY SHOULD CROSS AS PERPENDICULAR AS POSSIBLE AND THE WATER MAIN SHALL CROSS AT LEAST 18\"/>



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

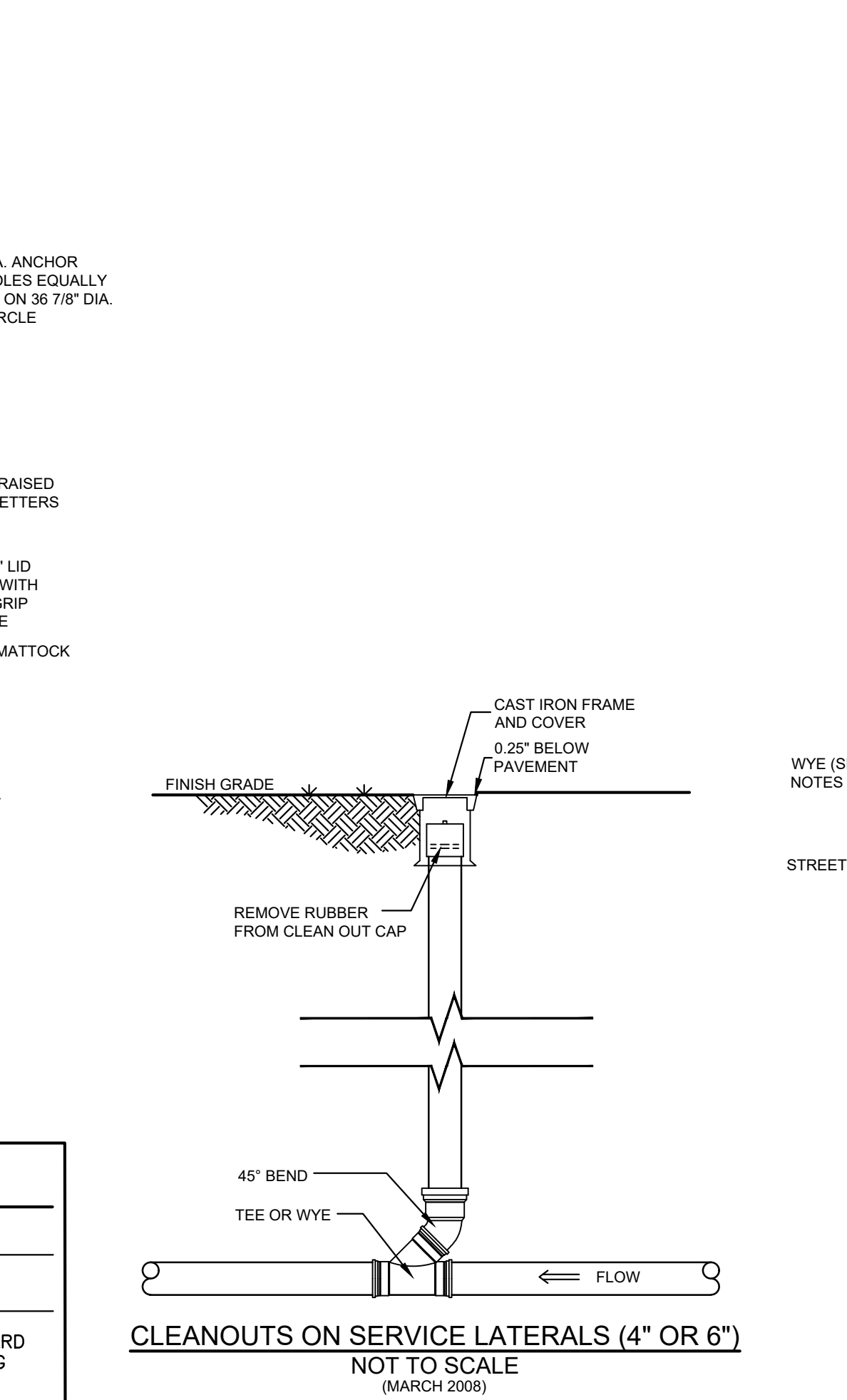
SEWER MAIN INSULATION DETAIL NOT TO SCALE



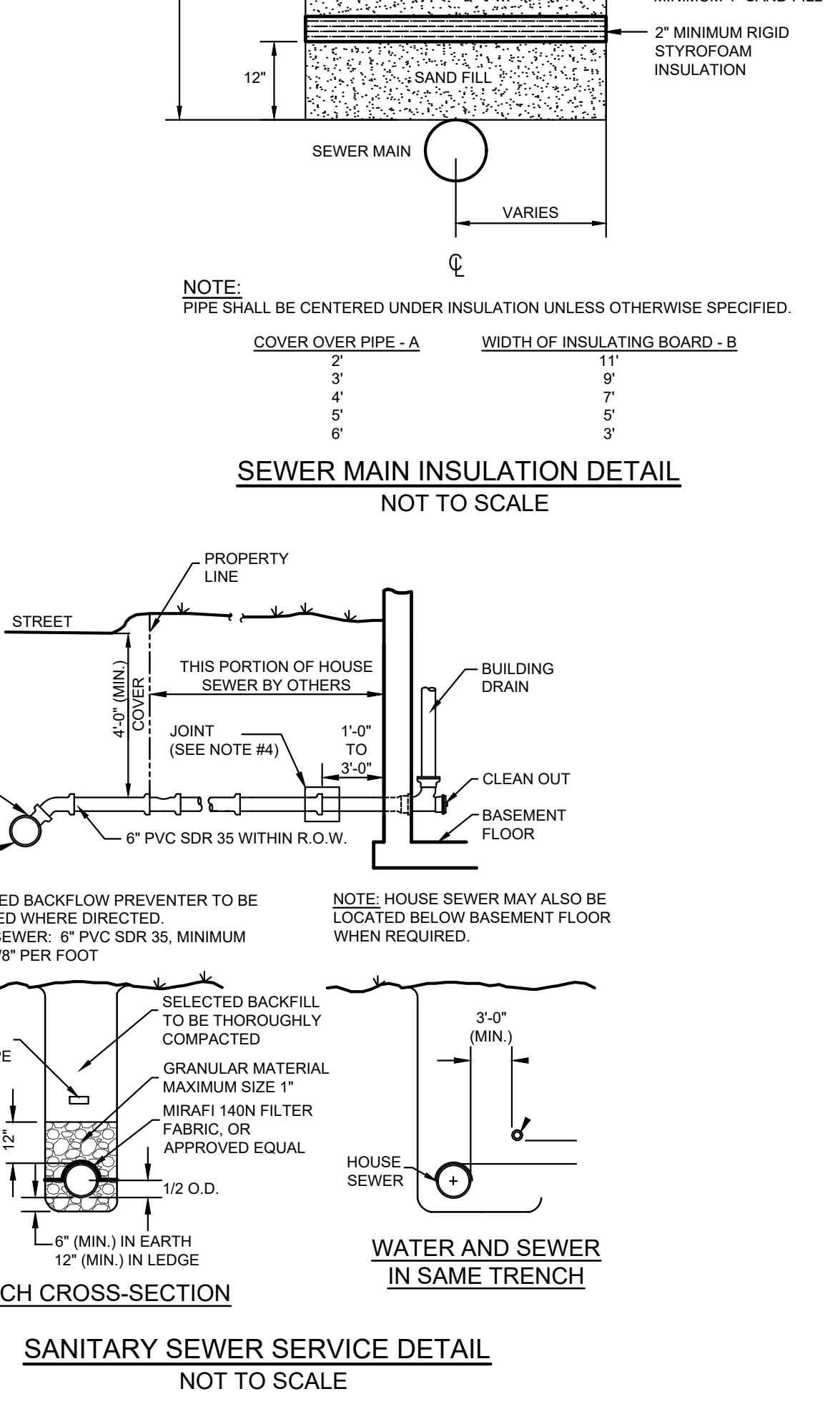
- NOTES:**
SPECIFICATIONS:
• MEETS H-20 LOADING REQUIREMENTS
• COMPONENT #: FRAME 1743-2100, LID 1743-5317
• MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
• FINISH: NO PAINT
• WEIGHT: FRAME 149#, LID 162#

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

SANITARY SEWER MANHOLE NOT TO SCALE



SANITARY SEWER SERVICE DETAIL NOT TO SCALE



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. 6261 PG. 776

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

KM 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
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL
3	08/30/2021	REVISED PER REVIEW 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. 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 RESEED.
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:

Table with 3 columns: EXISTING SOIL PH, TONS/ACRE, POUNDS/CUBIC YARD. Rows show pH ranges from 4.0-4.4 to 5.0-5.4 with corresponding application rates.

FERTILIZER SHALL BE APPLIED AT THE FOLLOWING RATE:

Table with 3 columns: INITIAL APPLICATION, POUNDS/1,000 SF, MEASUREMENT FACTOR. Rows show application rates for different soil pH ranges.

Table with 3 columns: REFERTILIZATION, POUNDS/1,000 SF, MEASUREMENT FACTOR. Rows show refertilization rates for different soil pH ranges.

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.
2. LIME SHALL BE A CALCIC OR DOLOMITIC GROUND AGRICULTURAL LIMESTONE CONTAINING NOT LESS THAN 95% OF EITHER CALCIUM OR MAGNESIUM CARBONATE.
3. FERTILIZER SHALL BE STANDARD COMMERCIAL GRADE FERTILIZER CONFORMING TO ALL STATE AND FEDERAL RULES AND REGULATIONS AND TO THE STANDARDS AND OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS.
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:

Table with 4 columns: KIND OF SEED, MINIMUM PURITY (%), MINIMUM GERMANATION (%), POUNDS/ACRE (TOTAL 120 POUNDS). Lists various grass and legume seeds.

SEED MIXTURE FOR SLOPE AREAS SHALL CONSIST OF THE FOLLOWING:

Table with 4 columns: KIND OF SEED, MINIMUM PURITY (%), MINIMUM GERMANATION (%), POUNDS/ACRE (TOTAL 95 POUNDS). Lists various grass seeds for slope stabilization.

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 SEEING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 4:1, AND SEEING AND PLACING 3 TO 4 TONS OF MULCH NETTING ANCHORED NETTING ELSEWHERE.
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 MDOT 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.

APPROVED BY THE HUDSON, NH PLANNING BOARD

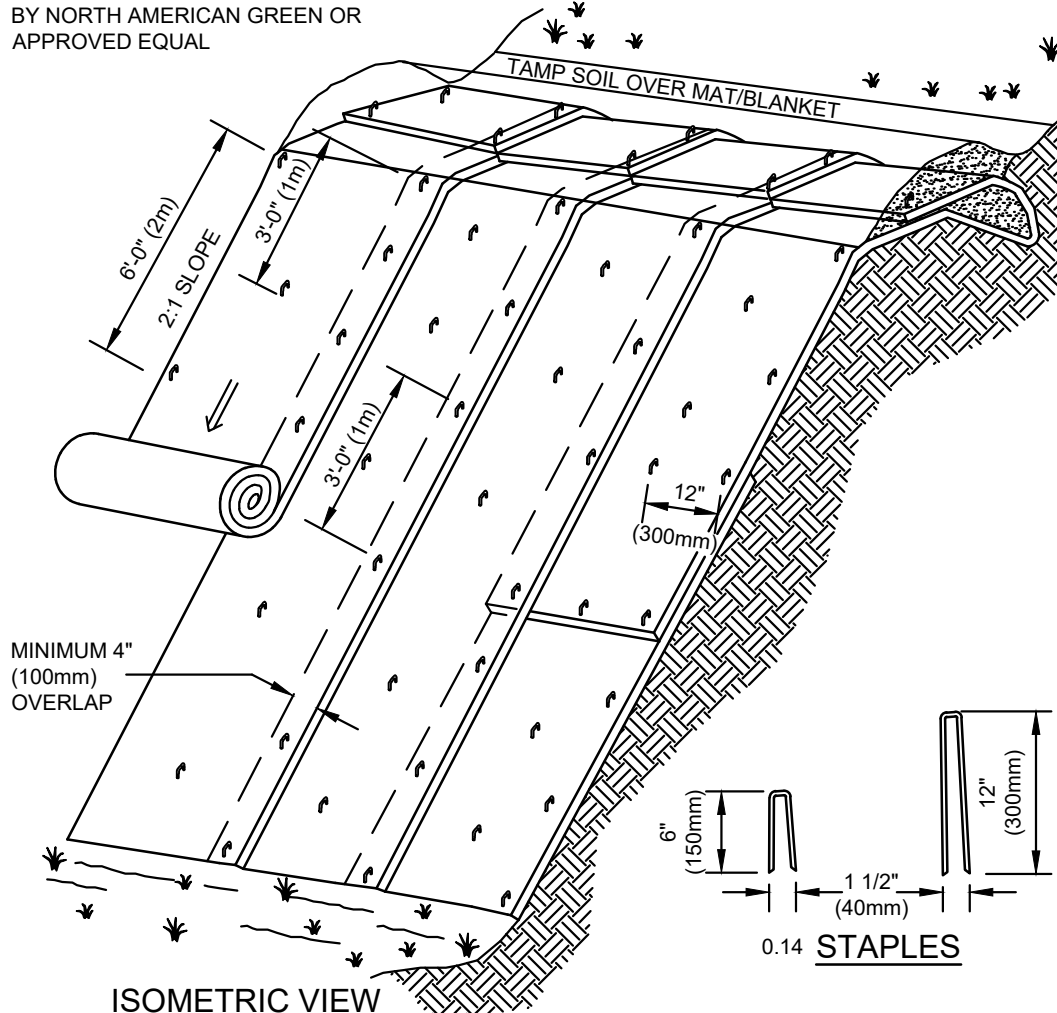
DATE OF MEETING: _____

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.

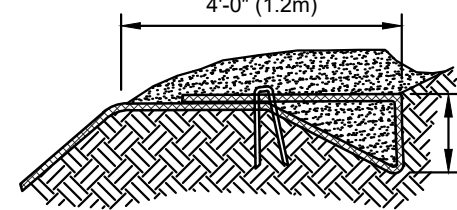
MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWN SLOPE AND SHALL BE DOUBLE NET STRAW BLANKETS BY NORTH AMERICAN GREEN OR APPROVED EQUAL.



- 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)

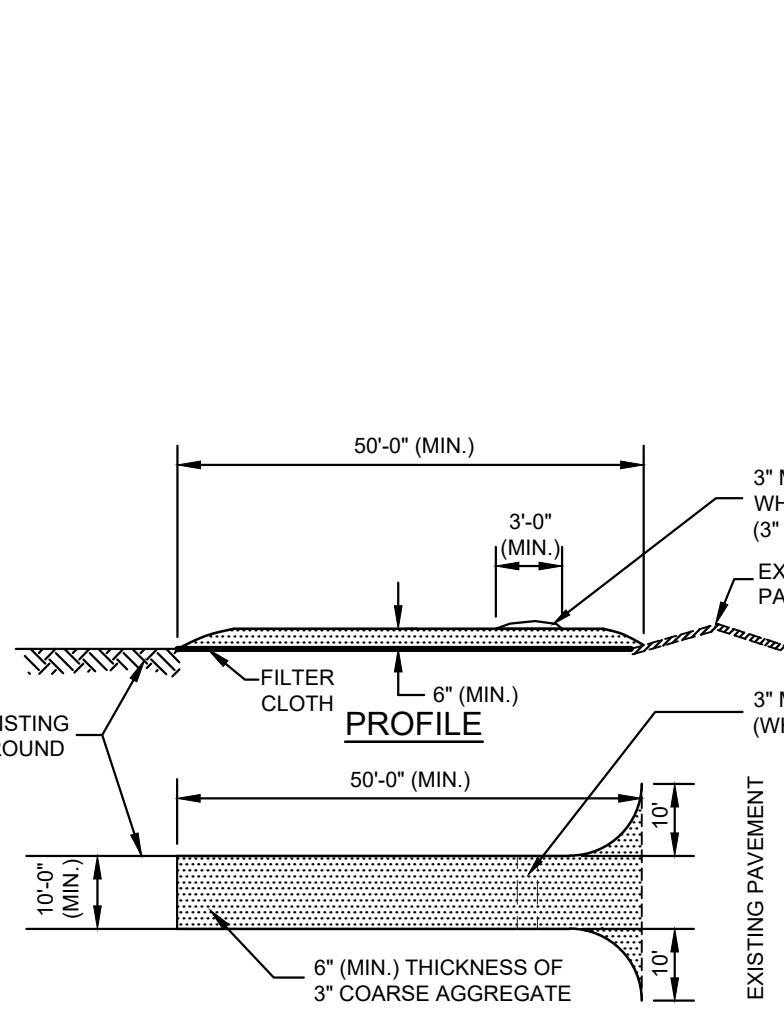


ISOMETRIC VIEW

BERM

STABILIZED CONSTRUCTION EXIT DETAIL

NOT TO SCALE (APRIL 2018)



STABILIZED CONSTRUCTION EXIT DETAIL

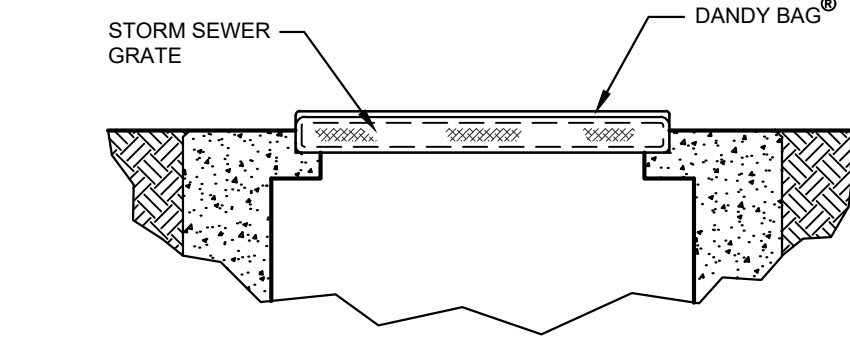
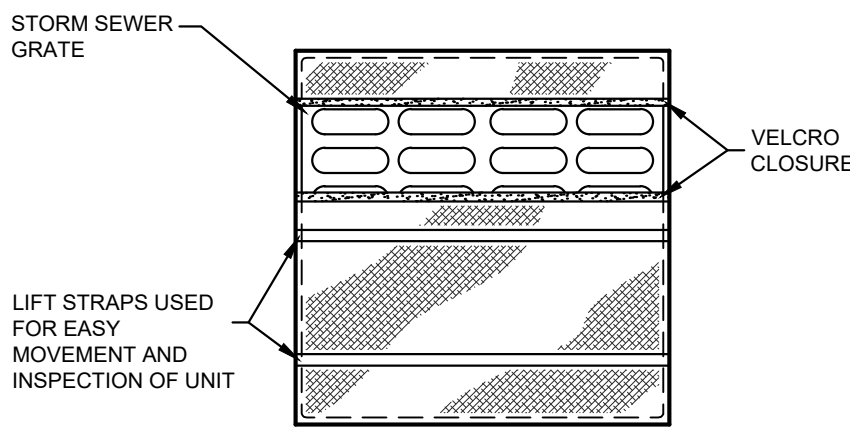
NOT TO SCALE (APRIL 2018)

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.

CONSTRUCTION SPECIFICATIONS:

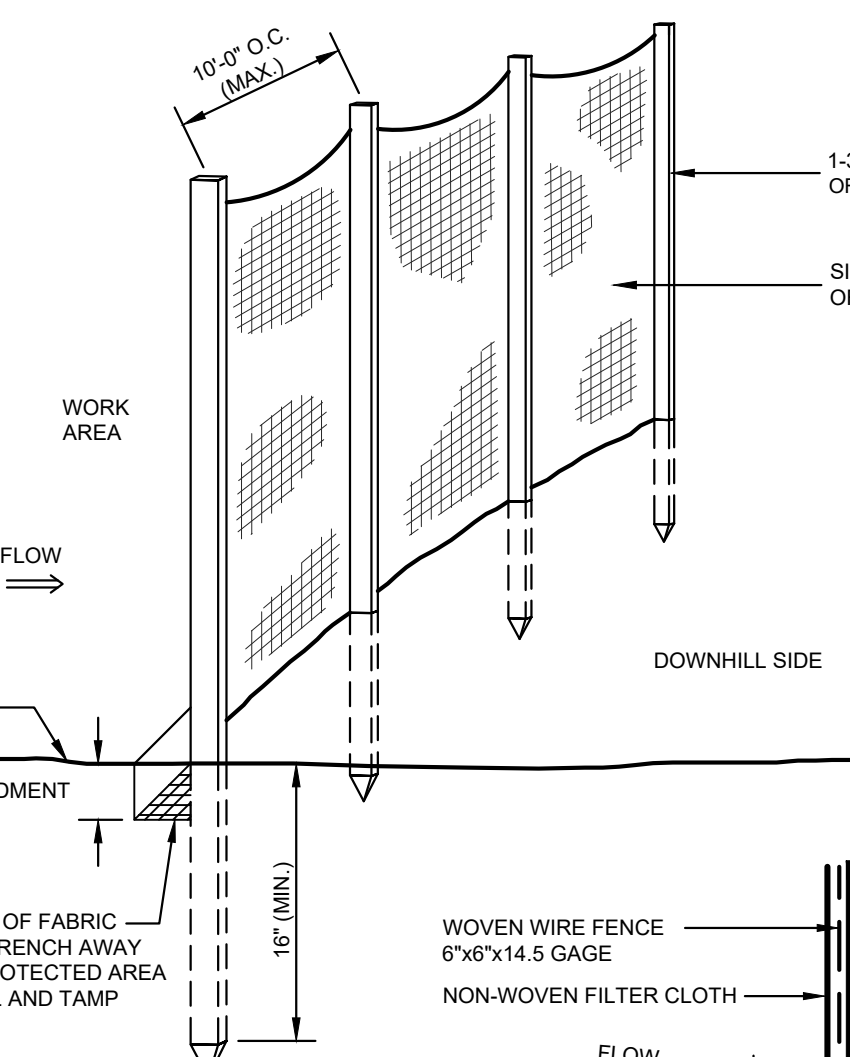
- 1. STONE FOR A STABILIZED CONSTRUCTION EXIT SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED EXIT SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE 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)

Table with 4 columns: MECHANICAL PROPERTIES, TEST METHOD, UNITS, MARV. Lists properties like Grab Tensile Strength, Grab Tensile Elongation, Puncture Strength, etc.

DANDY BAG® NOT TO SCALE (APRIL 2010)



PERSPECTIVE VIEW

NOT TO SCALE

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.
8. 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.
9. 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.
10. 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.
11. 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 SURFACE 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 STABILIZED AND PROTECTED WITH HAY BALE BARRIERS TO LIMIT EROSION. RUNOFF MUST BE PROTECTED 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 COMPLETION 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 TO 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 REGULATIONS.
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 REGULATIONS.
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 DEPOSITED 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 ENVA 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 NOT 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

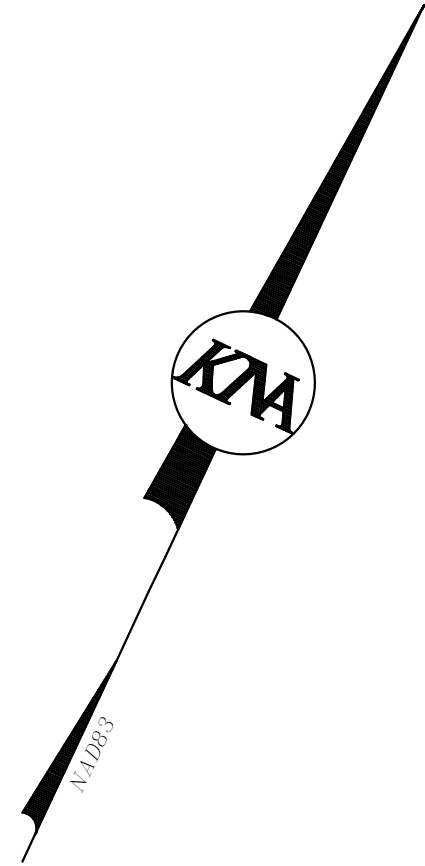
AROMA JOE'S MAP 173 LOT 29 56 DERRY STREET HUDSON, NEW HAMPSHIRE HILLSBOROUGH COUNTY

Table with 2 columns: OWNER OF RECORD, APPLICANT. Lists Steve S. & Hsiang Hwa W. Pan and Scott Ziefelder.

KM KEACH-NORDSTROM ASSOCIATES, INC. Civil Engineering Land Surveying Landscape Architecture 10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2801

Table with 4 columns: No., DATE, DESCRIPTION, BY. Lists revision details for review comments and approvals.

Table with 2 columns: DATE, SCALE, PROJECT NO., SHEET. Lists date (June 22, 2021), scale (As Shown), project number (21-0311-1), and sheet number (14 of 14).

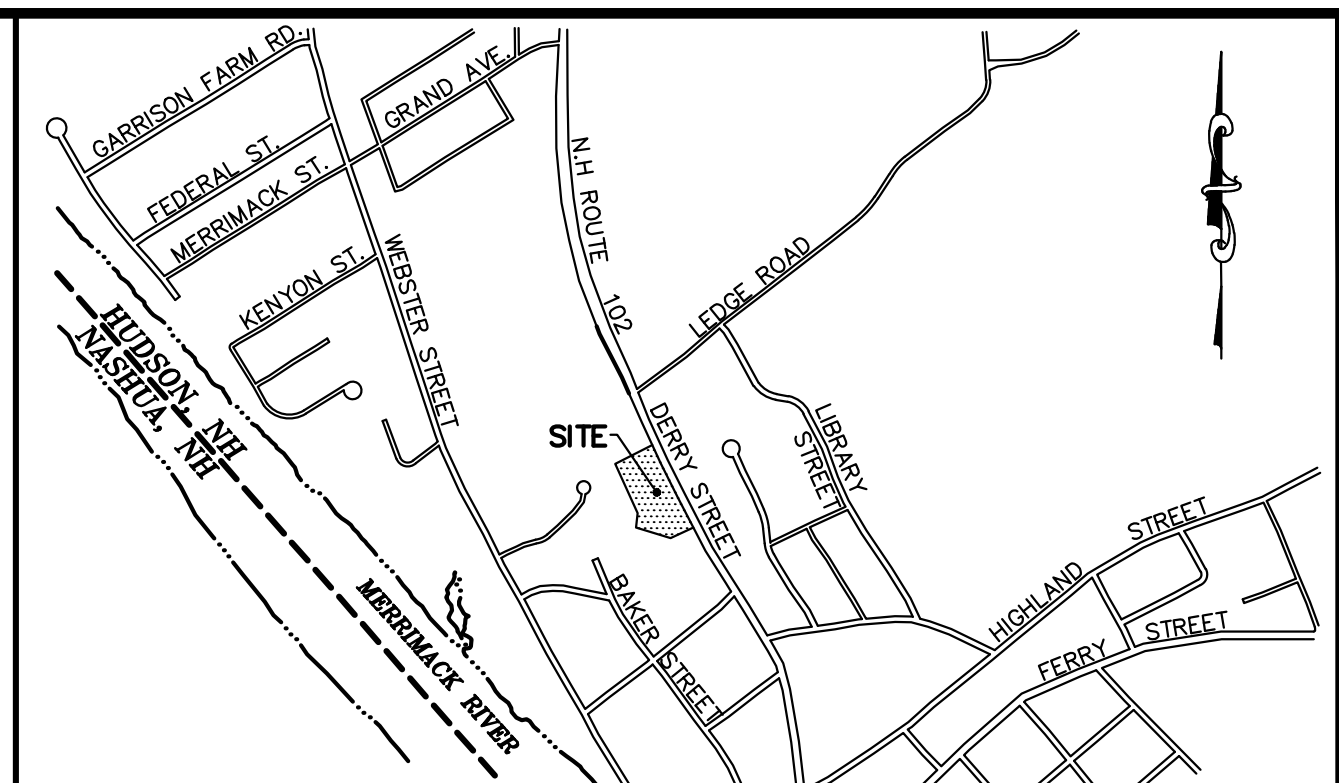
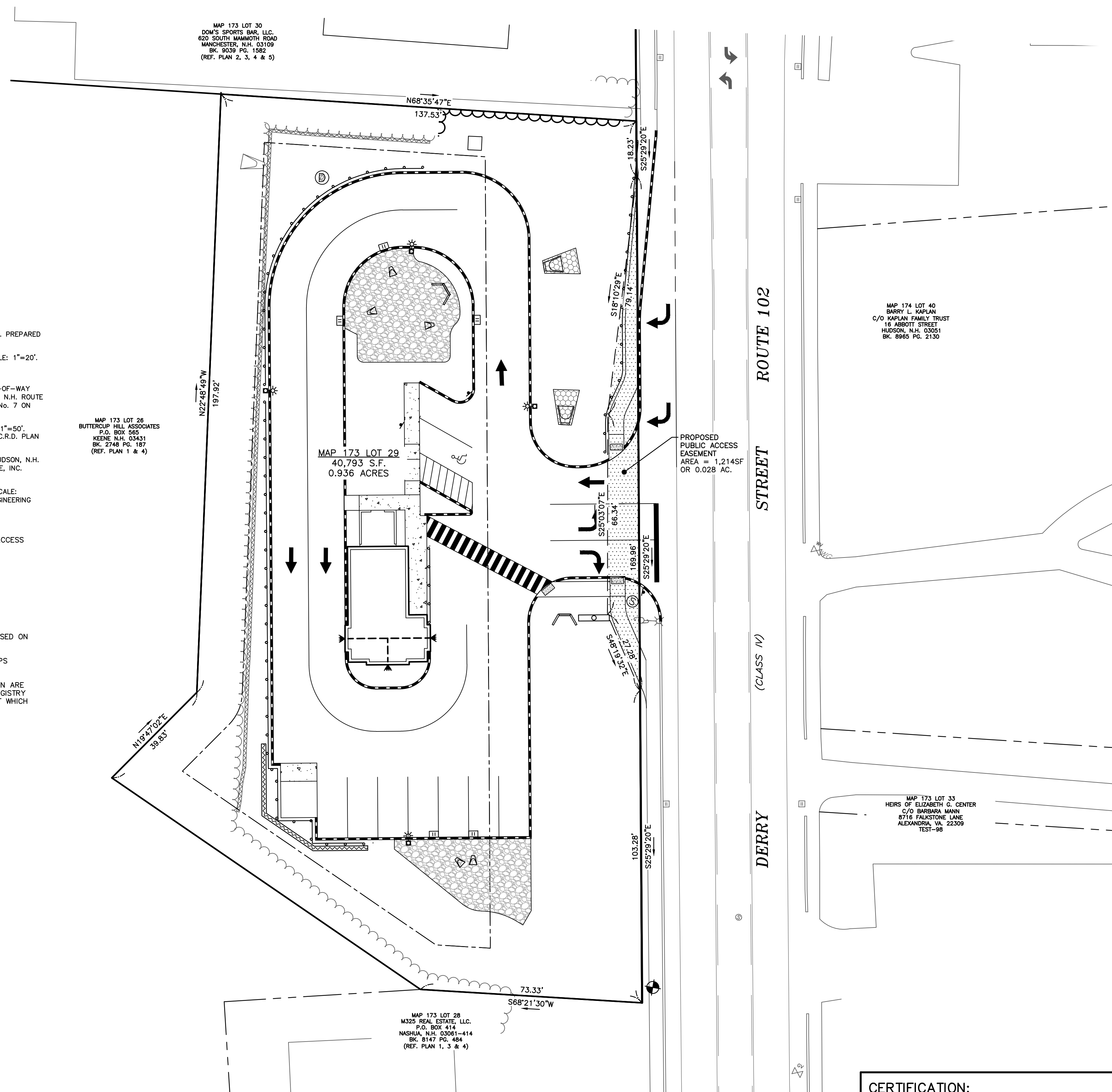


REFERENCE PLANS

- "PLAN OF DAW ACRES," HUDSON, N.H. SCALE: 1"=50'. DATED: JUNE, 1960. PREPARED BY: NED SPAULDING H.C.R.D. PLAN #2473
- "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
- "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.
- "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
- "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
- "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:

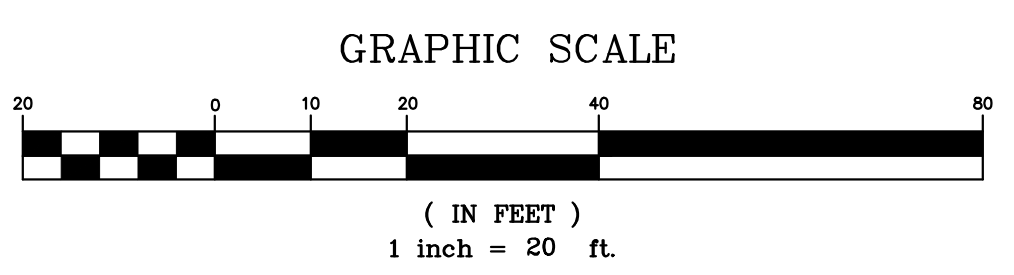
- THE PURPOSE OF THIS PLAN IS TO DEPICT THE PROPOSED PUBLIC ACCESS EASEMENT ON MAP 173 LOT 29 IN THE TOWN OF HUDSON, NEW HAMPSHIRE AS SHOWN HEREON.
- EXISTING AREA OF PARCEL = 40,793 S.F. OR 0.935 ACRES.
- OWNER OF RECORD:
STEVE S. & HSIANG HWA W. PAN
13 KING HENRY DRIVE
LONDONDERRY, N.H. 03053
BK. 6281 PG. 776
- TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HEREON ARE BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE IN APRIL OF 2021.
- HORIZONTAL DATUM IS NAD83, VERTICAL DATUM IS NAVD29 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA-OPUS.
- 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.



VICINITY PLAN
SCALE: 1" = 1000'

LEGEND

- GB-F GRANITE BOUND FOUND
- IP-F IRON PIN FOUND
- IP-S IRON PIN SET WITH CAP
- W/CAP UTILITY POLE
- SL STREET LIGHT
- GV GAS VALVE
- WV WATER VALVE
- SM SEWER MANHOLE
- DM DRAINAGE MANHOLE
- CB CATCH BASIN
- AL ABUTTER LINE
- PL PROPERTY LINE
- OHU OVERHEAD UTILITIES
- DL DRAINAGE LINE
- TL TREELINE
- EW EDGE OF PAVEMENT
- VGC VERTICAL GRANITE CURB
- SB SETBACK
- 100' RESIDENTIAL BUFFER
- GSB GREEN SPACE BUFFER
- PS PROPOSED SIGN
- PL PROPOSED LIGHT
- GV PROPOSED GAS VALVE
- WV PROPOSED WATER VALVE
- WV PROPOSED WOOD GUARDRAIL
- TL PROPOSED TREELINE
- EP PROPOSED EDGE OF PAVEMENT
- RG PROPOSED RETAINING WALL
- VGC PROPOSED VERTICAL GRANITE CURB
- OS PROPOSED OUTLET STRUCTURE



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

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

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 _____



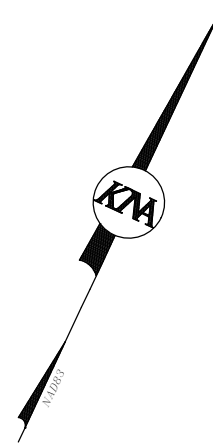
PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

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

SIGNATURE DATE: _____

SIGNATURE DATE: _____

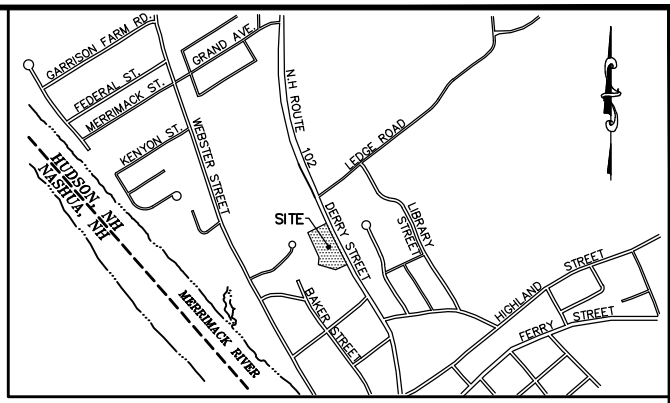
SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.



MAP 173 LOT 30
DOM'S SPORTS BAR, LLC
620 SOUTH MAMMOTH ROAD
MANCHESTER, N.H. 03109
BK. 9039 PG. 1582
(REF. PLAN 2, 3, 4 & 5)

MAP 173 LOT 28
BUTTERCUP HILL ASSOCIATES
P.O. BOX 565
KEENE, N.H. 03431
BK. 2748 PG. 187
(REF. PLAN 1 & 4)

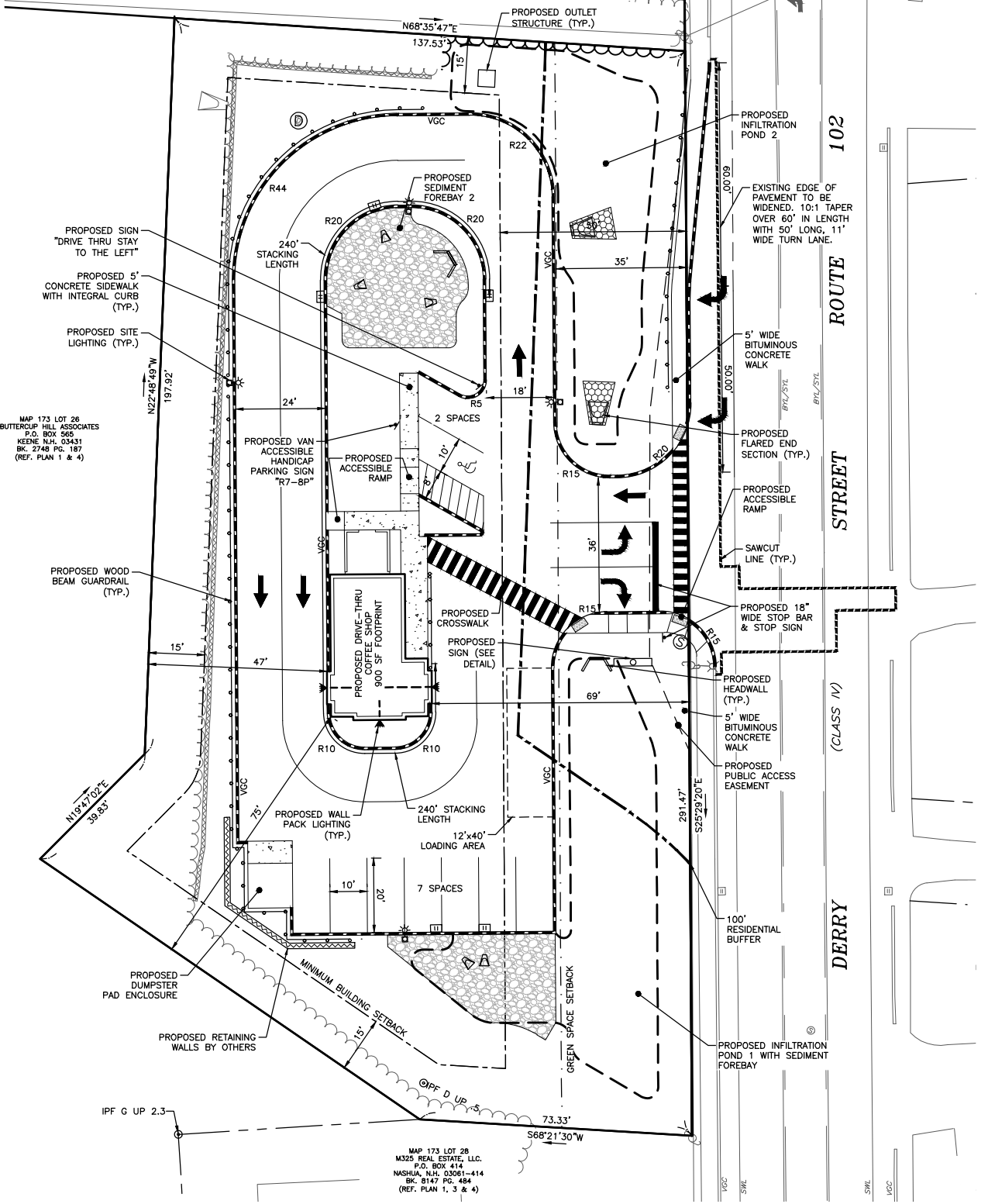
MAP 173 LOT 28
M320 REAL ESTATE, LLC
P.O. BOX 412
NASHUA, N.H. 03061-4114
BK. 8147 PG. 484
(REF. PLAN 1, 3 & 4)



VICINITY PLAN
SCALE: 1" = 1000'

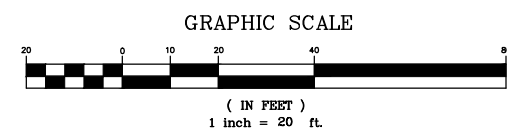
LEGEND

□ GB-F	GRANITE BOUND FOUND
⊙ IP-F	IRON PIN FOUND
⊙ IP-S	IRON PIN SET WITH CAP
⊙ W/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
---	EDGE OF PAVEMENT
---	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



SEE SHEET 1 FOR NOTES & REFERENCE PLANS

LOAM & SEED ALL DISTURBED AREAS (TYP.)



NON RESIDENTIAL 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. 6261 PG. 776

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

KM 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

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL
3	08/30/2021	REVISED PER REVIEW COMMENTS	ACL

DATE: JUNE 22, 2021 SCALE: 1"=20'
PROJECT NO: 21-0311-1 SHEET 3 OF 14



August 26, 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, Traffic Study
Tax Map 173 Lot 29; Acct. #1350-970
Reference No. 20030249.2040

Dear Mr. Groth:

Fuss & O'Neill, Inc. has reviewed the Traffic Impact and Access Study prepared by Transportation Engineering, Planning and Policy (TEPP) for Keach-Nordstrom Associates, Inc. (KNA) dated July 1, 2021, for the proposed commercial development at 56 Derry Road in Hudson, New Hampshire (Tax Map 173 Lot 29). The project proposes the development of a 900 square foot (sf) drive-through coffee shop on the currently vacant land at 56 Derry Road. Access and egress to the site will be provided via a proposed driveway on the west side of Derry Road, with one lane for access. For egress, a dedicated left turn lane and a dedicated right turn lane will be provided.

Please note that site plan, stormwater, and other project related comments were provided under separate letters dated July 9, 2021, and August 3, 2021.

In review of the TEPP report the following items are noted:

4. Traffic

- a. Provide more detail regarding the proposed use in the introduction of the report; the introduction omits the size of the coffee shop and that the shop will not provide indoor seating.
- b. Revise the street name displayed in Table 3 – Sight Distances to Derry Road instead of Portland Street and revise the data in the table accordingly if what is currently shown in the table is sight distance data for a different traffic impact study.
- c. In the summary of Table 4 – Calculated Weekday Vehicle Trip-Generation, the 2032 total vehicle-trips are presented as “117 (58 in and 539 out)” for the weekday AM peak hour. The number of trips exiting the site should be revised to match what is shown in Table 4.

50 Commercial Street
Manchester, NH
03101
t 603.668.8223
800.286.2469
www.fando.com

California
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Mr. Brian Groth
August 26, 2021
Page 2 of 3

- d. Although we agree that the trip generation information compiled in the ITE Trip Generation Manual for land use code 938 is not applicable to the proposed land use due to the small sample size, it is unclear if the method used in the TEPP report as an alternative is acceptable. The TEPP report mentions that Stephen G. Pernaw & Company, Inc. has published appropriate trip generation information for the proposed land use. The report then uses the information presumably from the Stephen G. Pernaw & Company, Inc. publication but does not provide the publication itself or specify the project the information comes from, so it is unclear whether the information used in the TEPP report to calculate traffic volumes generated by the proposed development is correct or appropriate. Relevant information from the Stephen G. Pernaw publication should be provided and the methodology used for determining the proposed development's generated trips should be further explained in the report.
- e. Table 5 – Trip Distribution and Network Assignment assigns all site-generated traffic coming from/going to the south on Derry Road. This should be revised to reflect the applied distributions.
- f. The title of the last column of Table 8 – Capacity Analysis Summary should be corrected to the 2032 Build condition.
- g. The v/c ratio and queue length for the northbound left turn movement at the Derry Road/Site Driveway intersection during the 2032 Build in Table 8 are flipped according to the attached Synchro reports. This should be revised.
- h. The attached site plan shows a proposed southbound right turn storage lane at the Derry Road/Site Driveway intersection for access into the site. The Build condition Synchro reports and capacity analysis results in the TEPP report do not appear to reflect this lane configuration change and should be revised accordingly. If this lane configuration change is being proposed, it should also be discussed in the report.
- i. The site plan should include signage per MUTCD for the proposed right turn lane.
- j. We recommend the applicant and Town consider the installation of a left turn arrow in the center turning lane for northbound Derry Street traffic to formalize the site entrance, similar to turn arrows further north along the Derry Street center turning lane.

Fuss & O'Neill needs clarification on the methodology used of the trip generation calculations used in the TEPP report to determine if TEPP's overall conclusion, that there should be minimal impacts on traffic operations at the Derry Road and Ledge Road intersection, is appropriate. As for

Mr. Brian Groth
August 26, 2021
Page 3 of 3

the Derry Road and Site Driveway intersection, we suggest revising the analysis to include any proposed roadway improvements before further review.

Please feel free to call if you have any questions.

Very truly yours,



Steven W. Reichert, P.E.

**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: 2021.08.26 14:22:05 -0400'

SWR:

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

August 30, 2021

Brian Groth
Town Planner
Town of Hudson
12 School Street
Hudson, New Hampshire 03051

**Subject: Response to Fuss & O'Neill Review Letter
Aroma Joe's Site Plan, 56 Derry Street
Tax Map 173, Lot 29
KNA Project No. 21-0311-1**

Dear Mr. Groth:

Our office is in receipt of Fuss & O'Neill's review comments dated August 16, 2021. Based on the comments, we have made the required modifications to the plan set and attached a copy for final review. A response to each comment has been provided below.

Site Plan Review Codes (HR 275)

- a. 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.

The space shown in the Site Plan Sheet will not be a painted space, and therefore the delivery truck will be able to utilize the entire length of curb as well as the parking space to park. The anticipated truck length is 53 feet and will have enough room along that curb line to park and pull out of the site from that location.

- b. 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.

Spot grades have been added and can be seen on the Grading, Drainage and Utility Plan.

- c. 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.

A draft easement has been created and sent to the Town of Hudson to review. The draft easement has been included in this submittal.

Driveway Review Codes (HR 275-8)

- a. 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.

A crosswalk has been added from the sidewalk to the proposed building and can be seen on the Site Plan. Signage has not been added at this time, as KNA believes the painted crosswalk and detectable warning plates to be adequate for pedestrian traffic.

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

- a. 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.

While this method is one of the standard methods for calculating seasonal high water table depth for a pond on an undisturbed site, this site is different. This site has been cleared, graded, and a retaining wall put in many years ago. Three out of the four test pits found no seasonal high-water table at up to 80" deep. KNA believes this to be a more accurate representation of the water table than the single test pit that does show the seasonal high. Taking into account the other test pit data the following elevations for season high water table were found (using the bottom of the test pit depth as no water table was encountered): TP #1 – 156.000, TP#3 – 153.33, and TP #4 – 148.33. As the site is relatively flat, the elevation of 156.00 was conservatively used for the water table depth for the entire site.

- b. The applicant has provided BMP worksheets. We continue to recommend the applicant provide the required Infiltration Feasibility Report.

An infiltration feasibility report has not been included in this submittal as it is not required and KNA believes the infiltration to be adequate based on HydroCAD calculations and BMP worksheets. All drainage calculations were done in accordance with state regulations.

- c. 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.

A letter from the Wetland Scientist has been included in this submittal.

- d. 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.

Snow storage areas have been updated and can be seen on the Landscape Plan.

- e. 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.

The 3 in./hr used is with the factor of safety taken into account for the soil type. Also, 2.0 min/inch percolation rate equals about 30 inches per hour, therefore KNA feels that the 3 in./hr used after the factor of safety was subtracted is a conservative infiltration rate.

- f. 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.

Rip rap calculations have been updated and the detail on sheet 10 has been updated as well and included in this submittal.

- g. 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.

No comment.

Landscaping (HR 275-8.C.(7))

- a. 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.

Proposed business hours have been updated and included in the Master Plan as note #15.

Other

- a. The applicant should update Derry Road plan references to Derry Street.

All references to Derry Road have been updated to Derry Street

Respectfully,



Allison Lewis, EIT
Project Engineer
Keach Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, NH 03110

Civil Engineering

Land Surveying

Landscape Architecture



RIP RAP OUTLET PROTECTION APRON CALCULATIONS

Project: Aroma Joess
 KNA #: 21-0311-1
 Date: 8/30/2021

The purpose of this spreadsheet is to calculate the dimensions of Inlet/Outlet Protection apron (Riprap) required during the SCS/NRCS 25-year Type III 24-hr storm event. The spillway weir(s) Inlet/Outlet apron protection will be sized for the SCS/NRCS 25-year Type III 24-hr storm event.

Required In: Q peak flow in CFS
 Do diameter in feet of outlet or width of channel
 Tw tall water at end of apron

Depending on the tail water conditions, either column 1 or column 2 is used for calculations

Column One where $T_w < 1/2 D_o$
 Length of Apron $L_a = (1.80 D_o * 3/2) + 7 D_o$
 $L_a = 3 * Q / D_o + 3/2 * 7 D_o$

Column Two where $T_w > 1/2 D_o$
 $L_a = 3 * Q / D_o + 3/2 * 7 D_o$
 $W1 = 3 * D_o$
 $W2 = 3 * D_o + 0.4 * L_a$

Width of Apron at outfall
 $W1 = 3 * D_o$
 $W2 = 3 * D_o + L_a$

If defined channel, then use channel width for W1 and W2
 Rock Rip Rap Size: $d50 = (0.02 * Q^{.43}) / (T_w^{.75} * D_o)$

RIRAP GRADATION ENVELOPE

Calculation Summary Table:	Description (Optional)	Q-25 (cfs)	Do (ft)	Tw (ft)	Calculated Output		USE	d100		d85		d50		d15		depth in	Depth In.	Length ft.	USE	
					La	W1		W2	FROM in	TO in	FROM in	TO in	FROM in	TO in	FROM in				TO in	W1 ft.
Outlet #1	Sediment Forebay #1	1.07	1.00	1.80	10	3	4	6	8	5	7	4	6	1	2	10	10	10	3	7
Outlet #1	Sediment Forebay #2	1.15	1.00	1.32	10	3	3	5	6	4	5	3	5	1	2	7.5	8	10	3	7
Inlet #1	Infiltration Pond 2 Inlet from S.F.	0.88	1.25	1.67	10	4	4	6	8	5	7	4	6	1	2	10	10	10	4	8
Inlet #2	Infiltration Pond 2 Inlet from Infil 1	0.11	1.00	0.50	7	3	4	6	8	5	7	4	6	1	2	10	10	7	3	10

*All rip rap for this project is sized to the largest flow outlet as a conservative measure.

* Center Apron with Headwall and Outlet Pipe (All Cases)

* Line Apron with 6.0 oz. Geotextile Fabric (All Cases)



July 9, 2020

Re: Environmental Services
56 Derry Street
Hudson, NH
KNA # 21-0311-1

Dear Ms. Lewis,

Joshua Brien, CWS 256 of Keach-Nordstrom Associates, Inc. (KNA) has completed an on-site investigation on the above referenced parcel. This investigation was completed in spring of 2021. These services were requested as part of an investigation into presence or lack thereof jurisdictional wetlands within the Tax map 173, Lot 29 also known as 56 Derry Street, Hudson, New Hampshire.

Wetland identification was performed according to the methodology presented in the Corps of Engineers Wetland Delineation Manual (Technical report Y-87-1) Jan 1987 and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and North-East Region, version 2.0. January 2012, US Army Corps of Engineers. This methodology requires the presence of indicators for three parameters: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for 14 days during the growing season.

At this time, I am pleased to report that, there are no areas found within the parcel that qualify as jurisdictional wetlands under the aforementioned criteria.

If you have any further questions or concerns, please do not hesitate to contact me at (603) 627-2881 or via email at jbrien@keachnordstrom.com

Sincerely,

A handwritten signature in blue ink, appearing to read 'Joshua M. Brien', is written over a horizontal line.

Joshua M Brien, CWS 256
Keach-Nordstrom Associates, Inc.



Return to: Town of Hudson
12 School Street
Hudson, New Hampshire 03051

EASEMENT DEED

Scott Zielfelder, an individual, of 169 Canaan Back Road, Barrington, New Hampshire 02825, for consideration paid, grants to the Town of Hudson, a body corporate and politic organized and existing under the laws of the State of New Hampshire, with a mailing address of 12 School Street, Hudson, County of Hillsborough, State of New Hampshire 03051 ("Grantee"), with QUITCLAIM COVENANTS:

Certain rights and easements, described below, over land situated in Hudson, Hillsborough County, New Hampshire, as follows:

1. Perpetual, non-exclusive rights and easements for a sidewalk, identified as Proposed Public Access Easement (the "Easement Area") on a plan entitled "Easement Plan, Aroma Joe's, Map 173, Lot 29, 56 Derry Street, Hudson, New Hampshire", dated June 22, 2021, through revision #2 dated 8/12/2021, prepared by Keach-Nordstrom Associates, Inc. and recorded in the Hillsborough County Registry of Deeds as Plan No. _____ (hereinafter "Plan").

2. The aforesaid easement shall be on the following conditions:

a. This Easement Area shall include the perpetual right to enter upon the real estate described at any time that the Grantee, its successors or assigns, may see fit to construct and maintain a public sidewalk and public walkway within the Easement Area. This Easement Area shall allow public pedestrian and non-motorized traffic and shall permit maintenance, repair and replacement of the pavement in the easement area.

b. All construction within said Easement Area shall be undertaken in a commercially reasonable manner.

B. Use of said Easement Area shall, except where required for construction and maintenance, not interfere with the use and enjoyment of the traveled portions of the property of which the Easement Areas are a part.

C. The Grantor, for itself and its successors and assigns, hereby covenants that it will not erect or permit any building or any other structure upon the Easement Area (except as shown on the Plan) which in the reasonable judgment of the Grantee, might unreasonably interfere with the proper maintenance of underground facilities actually constructed in the Easement Areas by Grantee, or service in connection therewith, but otherwise, Grantor shall be prohibited from use of the Easement Areas for any purpose including ingress and egress, driveways, parking areas, landscaping and the like.

The above premises is not homestead property of the Grantor herein.

This transfer is exempt from documentary tax stamps pursuant to RSA 78-B:2, I, as it consists of a transfer of title to a municipality in the State of New Hampshire.

For Grantor's title see deed recorded in the Hillsborough County Registry of Deeds at Book _____, Page _____.

Signatures on Pages to Follow

GRANTOR:

Scott Zielfelder

STATE OF NEW HAMPSHIRE

_____, ss

_____, 202__

Then personally appeared Scott Zielfelder, known to me, or satisfactorily proven to be the person whose name is subscribed to the foregoing instrument and acknowledged that he executed the same for the purposes contained therein, before me

Notary Public

My commission expires:

GRANTEE:

Town of Hudson

By: _____

STATE OF NEW HAMPSHIRE
COUNTY OF HILLSBOROUGH

The foregoing instrument was acknowledged before me this _____ day of _____, 202__, by _____, as _____ of the Town of Hudson.

Justice of the Peace / Notary Public
My Commission Expires: _____

TRAFFIC IMPACT AND ACCESS STUDY

**56 DERRY ROAD
Hudson, New Hampshire**

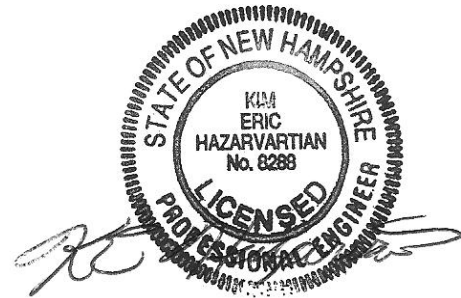
August 31, 2021

Prepared for Keach-Nordstrom Associates, Inc.

TRAFFIC-IMPACT AND ACCESS STUDY

**56 DERRY ROAD
Hudson, New Hampshire**

Revised August 31, 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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- Appendix A: Project Plan
- Appendix B: Traffic Counts
- Appendix C: Monthly Traffic Volumes
- Appendix D: Vehicle Speeds
- Appendix E: Trip Generation
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- Appendix G: Comments and Responses



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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 with no indoor seating and a floor area of about 900 square feet (sf)
- have one driveway to the west side of Derry Road, with a one-lane entrance and a two-lane exit, and with a potential right-turn lane on the Derry Road southbound approach

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 with no indoor seating and a floor area of about 900 sf
- have one driveway to the west side of Derry Road, with a one-lane entrance and a two-lane exit, and with a potential right-turn lane on the Derry Road southbound approach

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



Figure 1. Site location.

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

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.

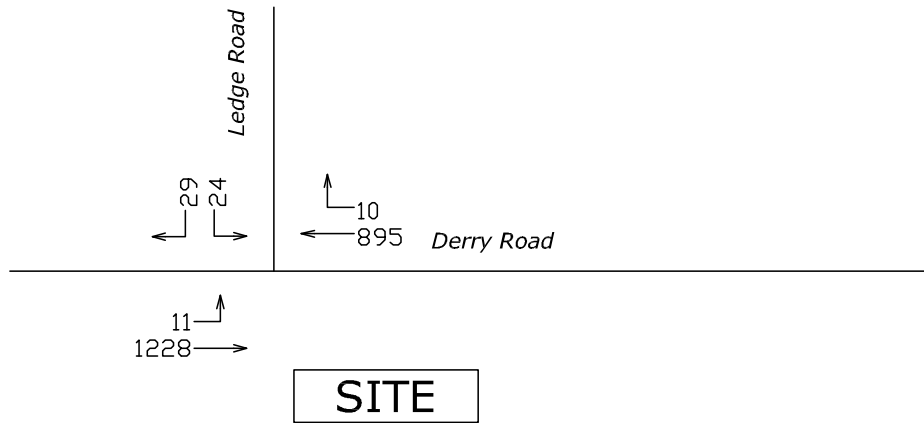
Derry Road near the site frontage showed about:

- 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

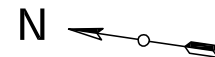
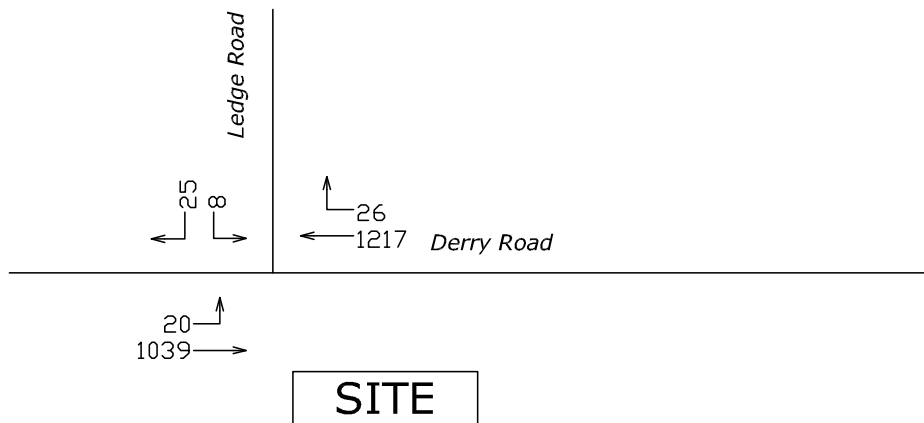
VEHICLE SPEEDS

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



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.

Location and Direction	Speeds (mph)		
	Speed Limit	Mean ^a	85 th 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 intersections¹ 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. Appendix A includes a sight-distance plan.

Table 3. Sight distances.				
Intersection, Movements, and View	Available Sight Distance (ft) ^a	Speeds (miles per hour)		
		Limit	SSD Provides For	ISD Provides For
Derry Road/Driveway for Driveway Movements				
Derry Road to/from South	At Least 400	30	45+	36+
Derry Road to/from North	At Least 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

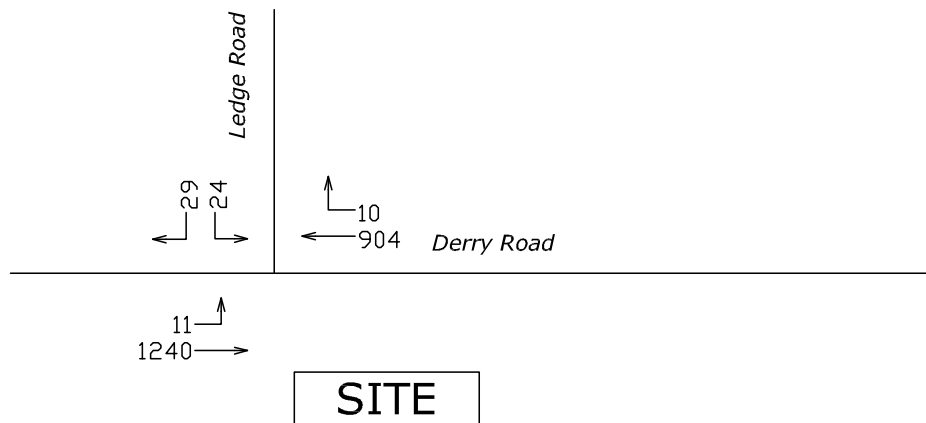
Background-traffic growth:

- 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

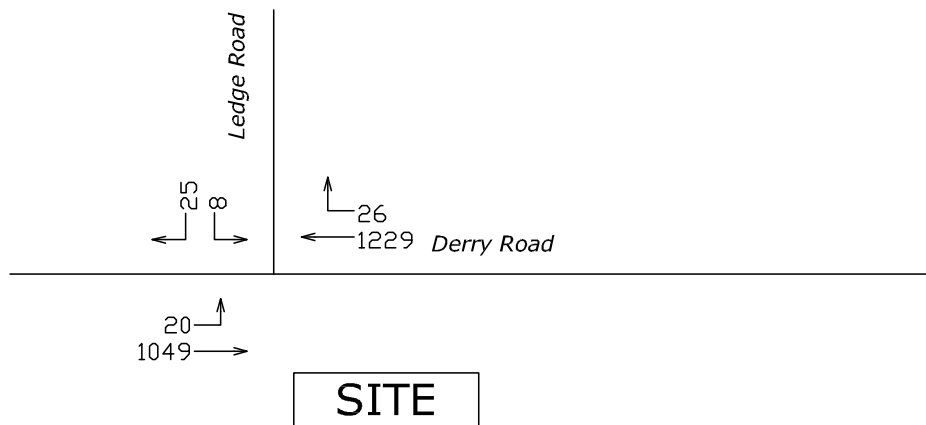
This TIAS uses a 1.0-percent annual growth rate. This yields about 11.6-percent growth between 2021 and 2032.

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.



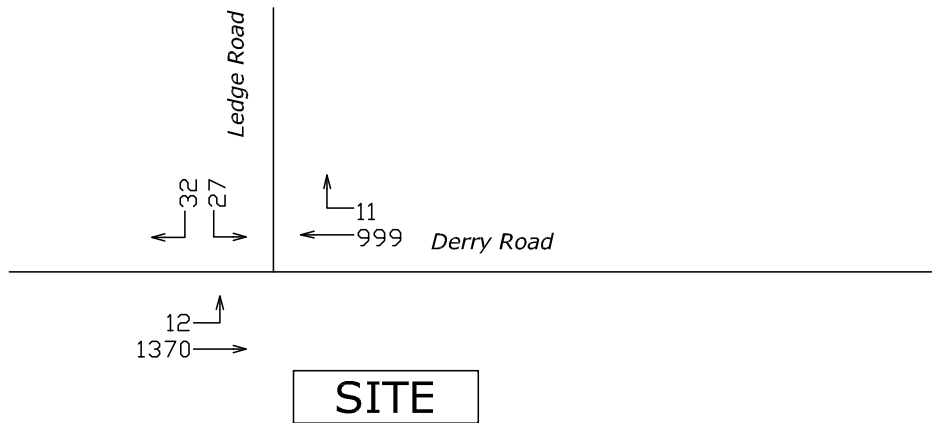
Weekday AM-Street-Peak Hour



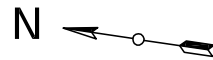
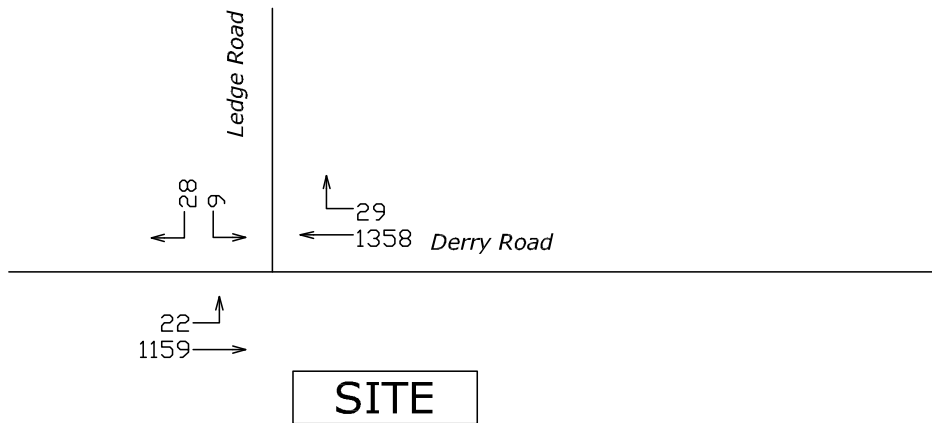
Not to Scale

Weekday PM-Street-Peak Hour

Figure 3. 2022 no-build traffic volumes.



Weekday AM-Street-Peak Hour



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 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, which is in Appendix E.

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 site⁸

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

	Daily ^a	AM-Street-Peak Hour		PM-Street-Peak Hour			
		Total ^b	In	Out	Total ^c	In	Out
2022 Vehicle-Trips							
Primary	69	12	6	6	4	2	2
<u>Pass-By^d</u>	<u>560</u>	<u>94</u>	<u>47</u>	<u>47</u>	<u>36</u>	<u>18</u>	<u>18</u>
Total	629	106	53	53	40	20	20
2032 Vehicle-Trips							
Primary	78	13	6	7	6	3	3
<u>Pass-By^d</u>	<u>616</u>	<u>104</u>	<u>52</u>	<u>52</u>	<u>38</u>	<u>19</u>	<u>19</u>
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 59 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 North	45
<u>Derry Road to/from South</u>	<u>55</u>
Total	100

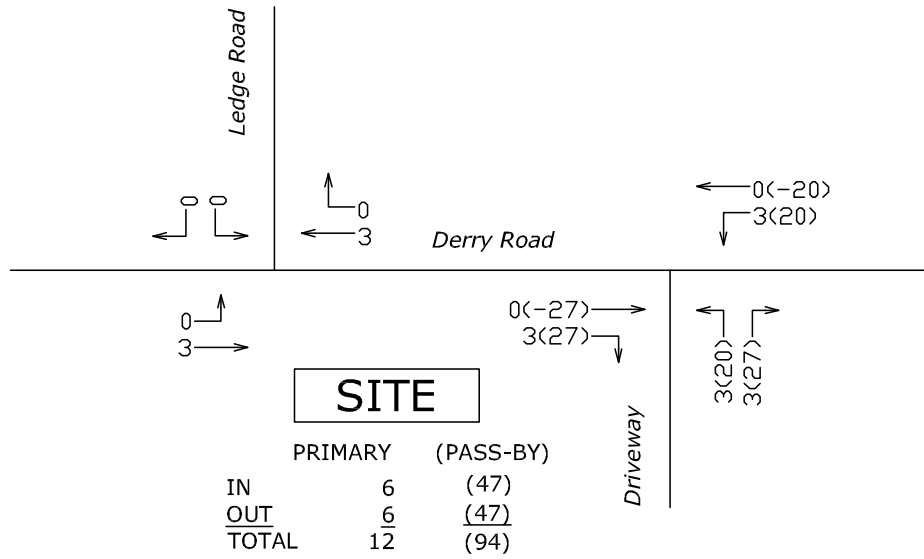
BUILD TRAFFIC VOLUMES

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.

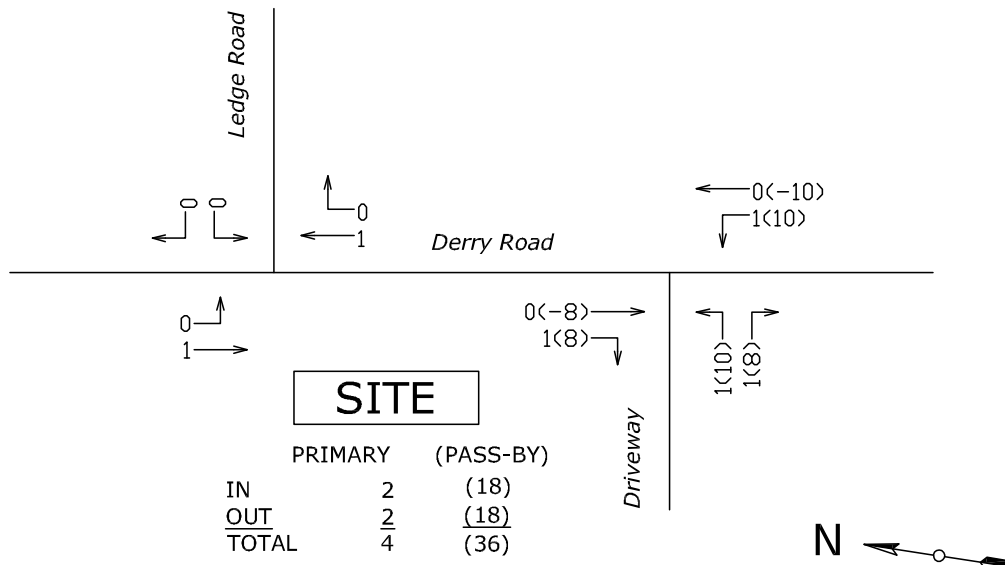
TRAFFIC-VOLUME CHANGES

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

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



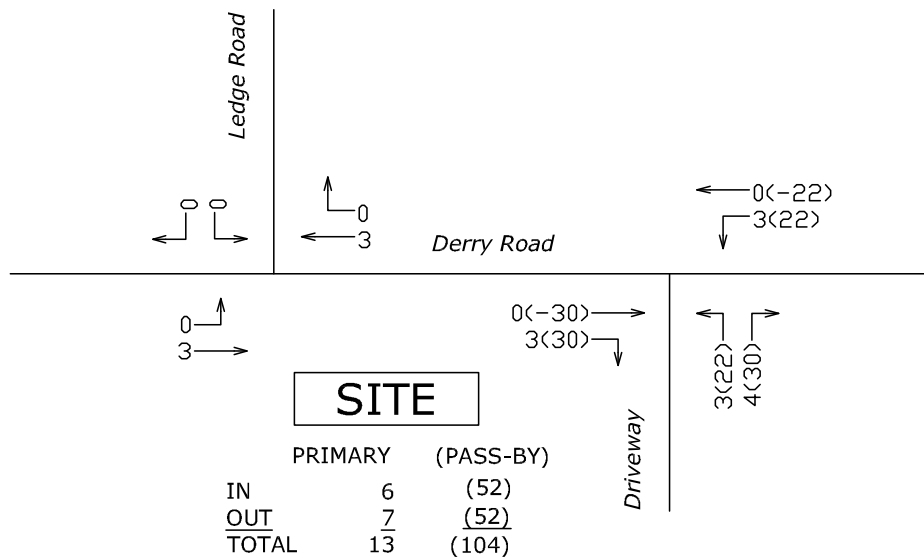
Weekday AM-Street-Peak Hour



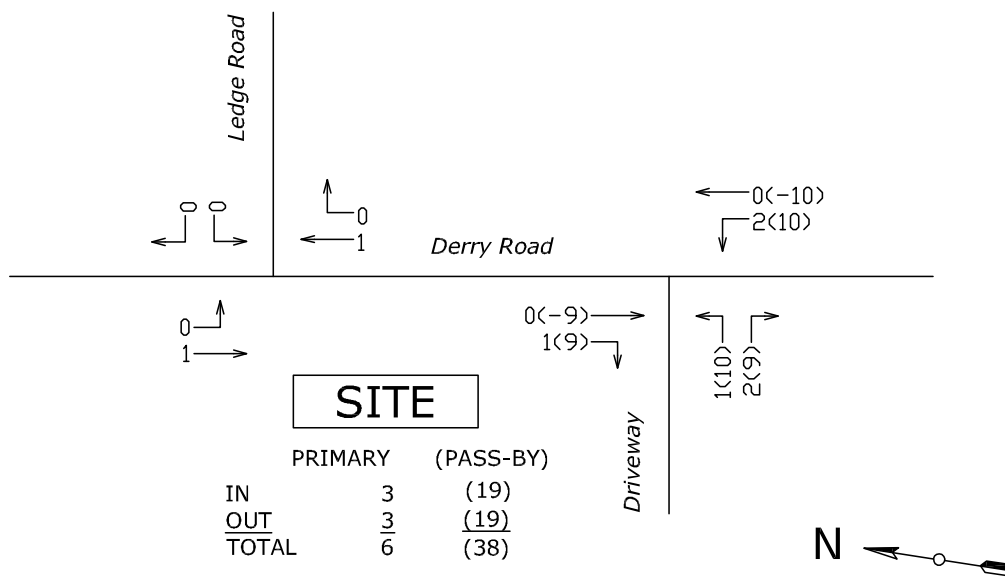
Not to Scale

Weekday PM-Street-Peak Hour

Figure 5. 2022 site traffic volumes.



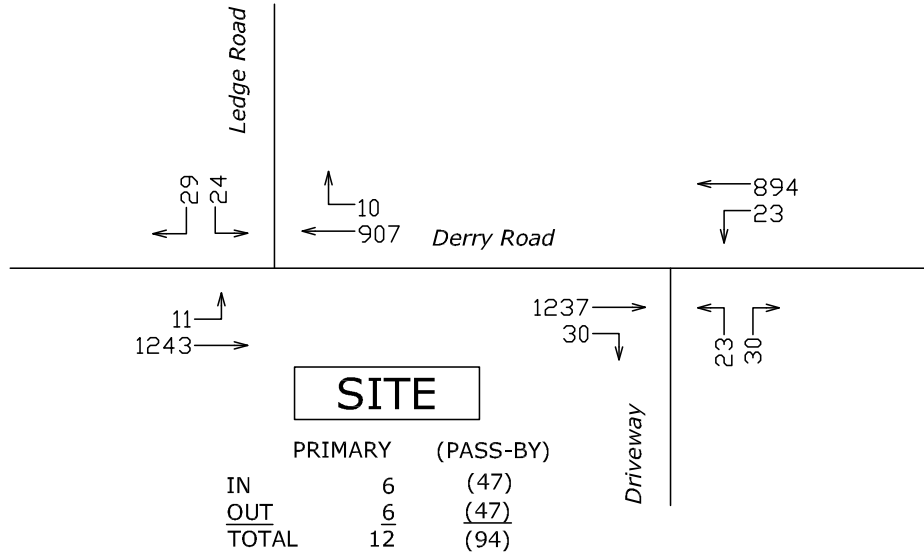
Weekday AM-Street-Peak Hour



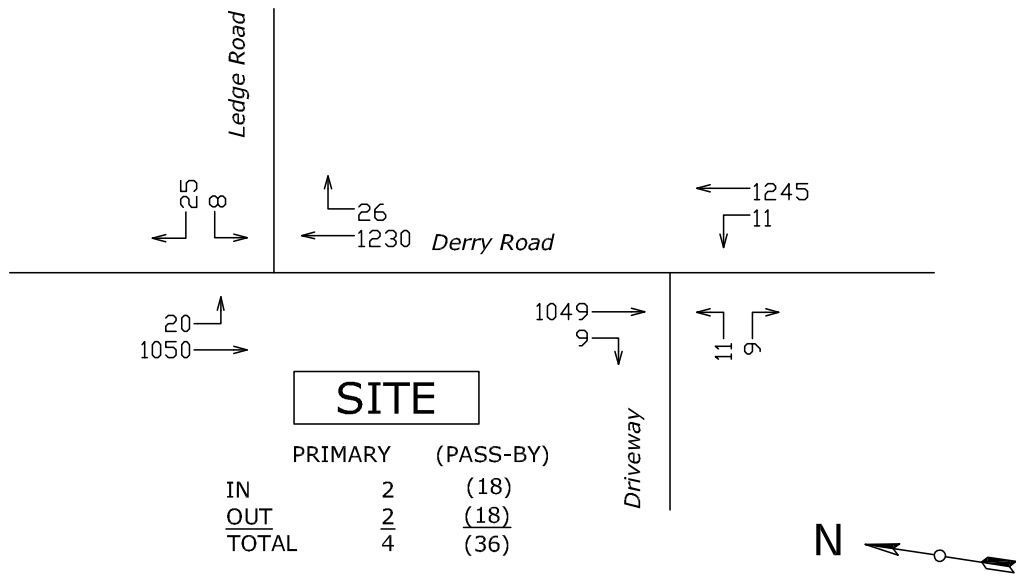
Not to Scale

Weekday PM-Street-Peak Hour

Figure 6. 2032 site traffic volumes.



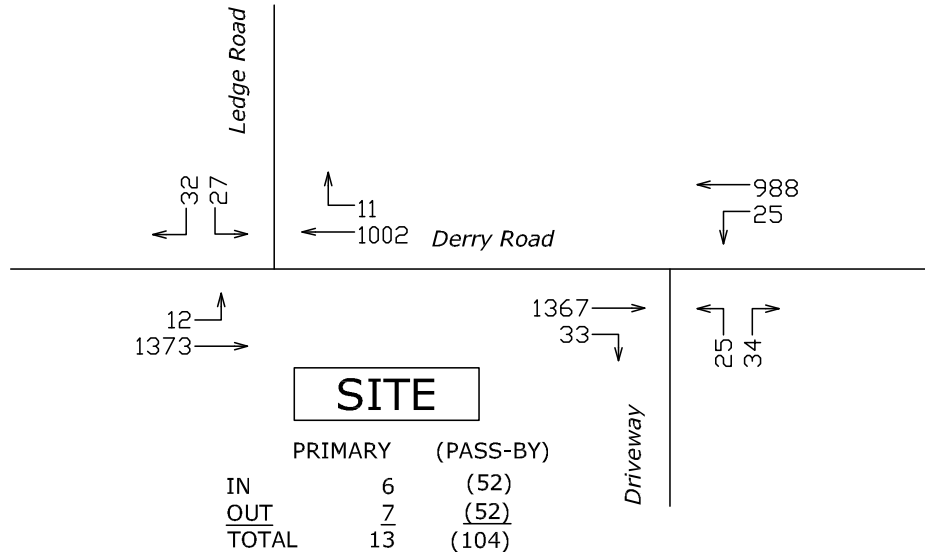
Weekday AM-Street-Peak Hour



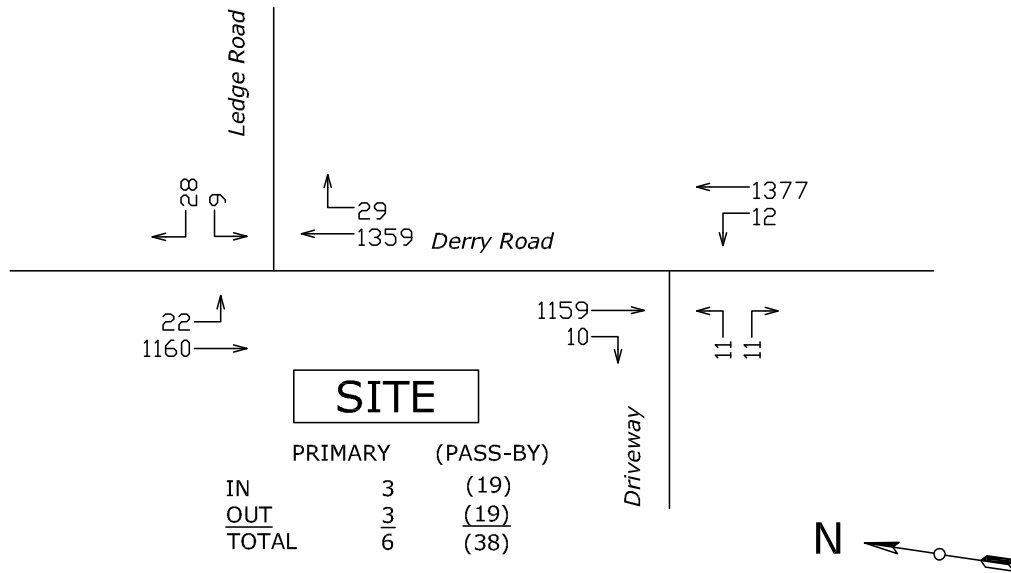
Not to Scale

Weekday PM-Street-Peak Hour

Figure 7. 2022 build traffic volumes.



Weekday AM-Street-Peak Hour



Not to Scale

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.

Level of Service	Control Delay (seconds/vehicle)	
	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
- 2022 and 2032 build with a potential right-turn lane on the Derry Road southbound approach to the driveway intersection

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 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, No Right-Turn Lane on Derry Road Southbound Approach, Unsignalized, Weekday AM-Street-Peak Hour																				
Derry Road NB L	---	---	---	---	---	---	---	---	---	---	---	---	B	12.9	0.053	0.2	B	14.1	0.066	0.02
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, No Right-Turn Lane on Derry Road Southbound Approach, 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
Derry Road/Driveway Intersection, with Right-Turn Lane on Derry Road Southbound Approach, Unsignalized, Weekday AM-Street-Peak Hour																				
Derry Road NB L	---	---	---	---	---	---	---	---	---	---	---	---	B	12.9	0.053	0.2	B	14.1	0.066	0.02
Driveway EB L	---	---	---	---	---	---	---	---	---	---	---	---	E	37.2	0.187	0.7	E	46.0	0.242	0.9
Driveway EB R	---	---	---	---	---	---	---	---	---	---	---	---	D	29.8	0.187	0.7	E	38.1	0.259	1.0
Derry Road/Driveway Intersection, with Right-Turn Lane on Derry Road Southbound Approach, 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	20.9	0.042	0.1	C	24.2	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 with no indoor seating and a floor area of about 900 sf
- have one driveway to the west side of Derry Road, with a one-lane entrance and a two-lane exit, and with a potential right-turn lane on the Derry Road southbound approach

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

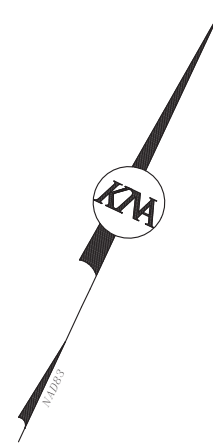
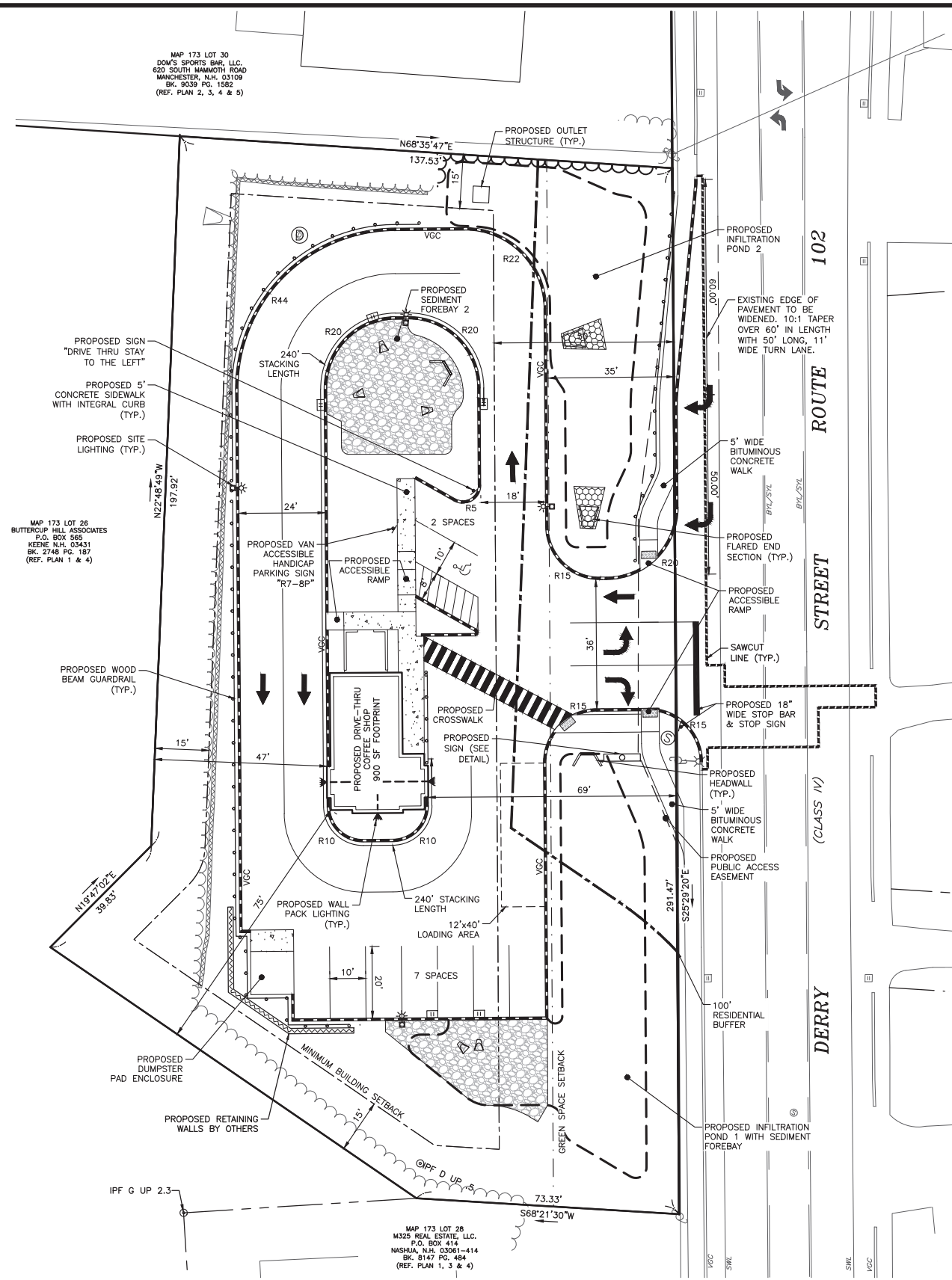
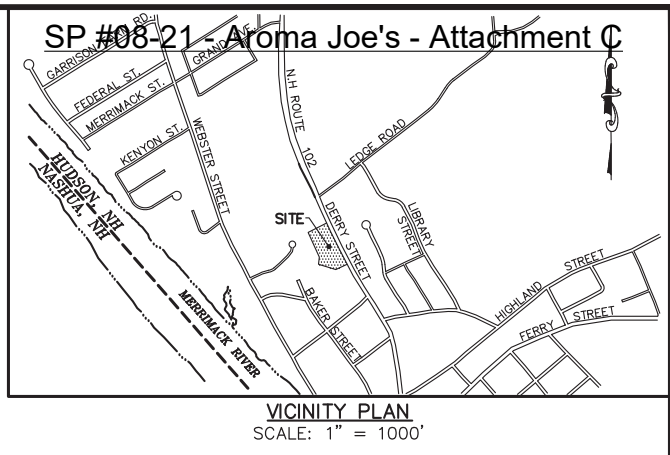
Analysis indicates no significant area impact due to the proposed redevelopment.



APPENDIX



Appendix A: Project Plan



MAP 173 LOT 30
DOM'S SPORTS BAR, LLC
620 SOUTH MAMMOTH ROAD
MANCHESTER, N.H. 03109
BK. 9039 PG. 1582
(REF. PLAN 2, 3, 4 & 5)

MAP 173 LOT 28
BUTTERCUP HILL ASSOCIATES
P.O. BOX 565
KEENE, N.H. 03431
BK. 2748 PG. 187
(REF. PLAN 1 & 4)

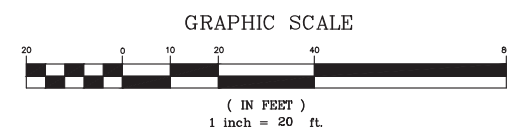
MAP 173 LOT 28
M320 REAL ESTATE, LLC
P.O. BOX 416
NASHUA, N.H. 03061-4114
BK. 8147 PG. 484
(REF. PLAN 1, 3 & 4)

LEGEND

	GRANITE BOUND FOUND
	IRON PIN FOUND
	IRON PIN SET WITH CAP
	UTILITY POLE
	STREET LIGHT
	GAS VALVE
	WATER VALVE
	SEWER MANHOLE
	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
	OVERHEAD UTILITIES
	DRAINAGE LINE
	TREELINE
	RETAINING WALL
	EDGE OF PAVEMENT
	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

SEE SHEET 1 FOR NOTES & REFERENCE PLANS

LOAM & SEED ALL DISTURBED AREAS (TYP.)



NON RESIDENTIAL 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. 6261 PG. 776

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

KMA 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.

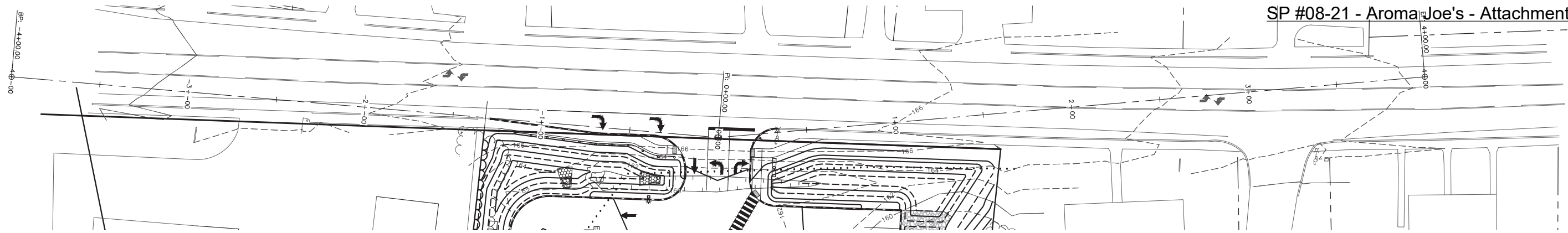
OWNER OF MAP 173 LOT 29

SIGNATURE: *[Signature]*

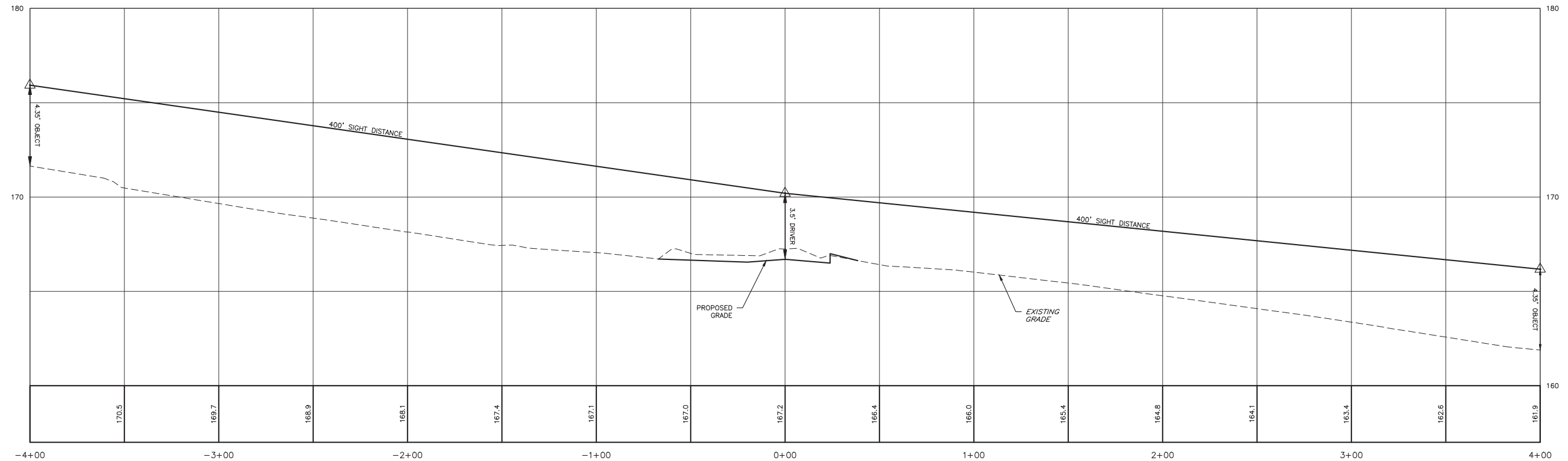
DATE: 6-16-2021

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL
3	08/30/2021	REVISED PER REVIEW COMMENTS	ACL

DATE: JUNE 22, 2021 SCALE: 1"=20'
PROJECT NO: 21-0311-1 SHEET 3 OF 14



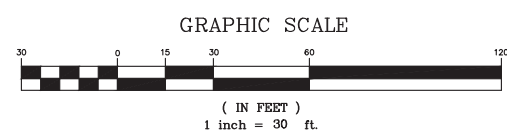
SIGHT DISTANCE PLAN
SCALE: 1" = 30'



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



- 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.



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.

SIGHT DISTANCE 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. 6261 PG. 776	APPLICANT: SCOTT ZIELFELDER 169 CANAAN BACK ROAD BARRINGTON, NH 03825
---	---

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

No.	DATE	DESCRIPTION	BY
1	07/23/2021	REVISED PER REVIEW COMMENTS	PDC
2	08/12/2021	REVISED PER PLANNING BOARD COMMENTS	ACL
3	08/30/2021	REVISED PER REVIEW COMMENTS	ACL

DATE: JUNE 22, 2021 SCALE: 1"=30'
PROJECT NO: 21-0311-1 SHEET 8 OF 14



Appendix B: Traffic Counts

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

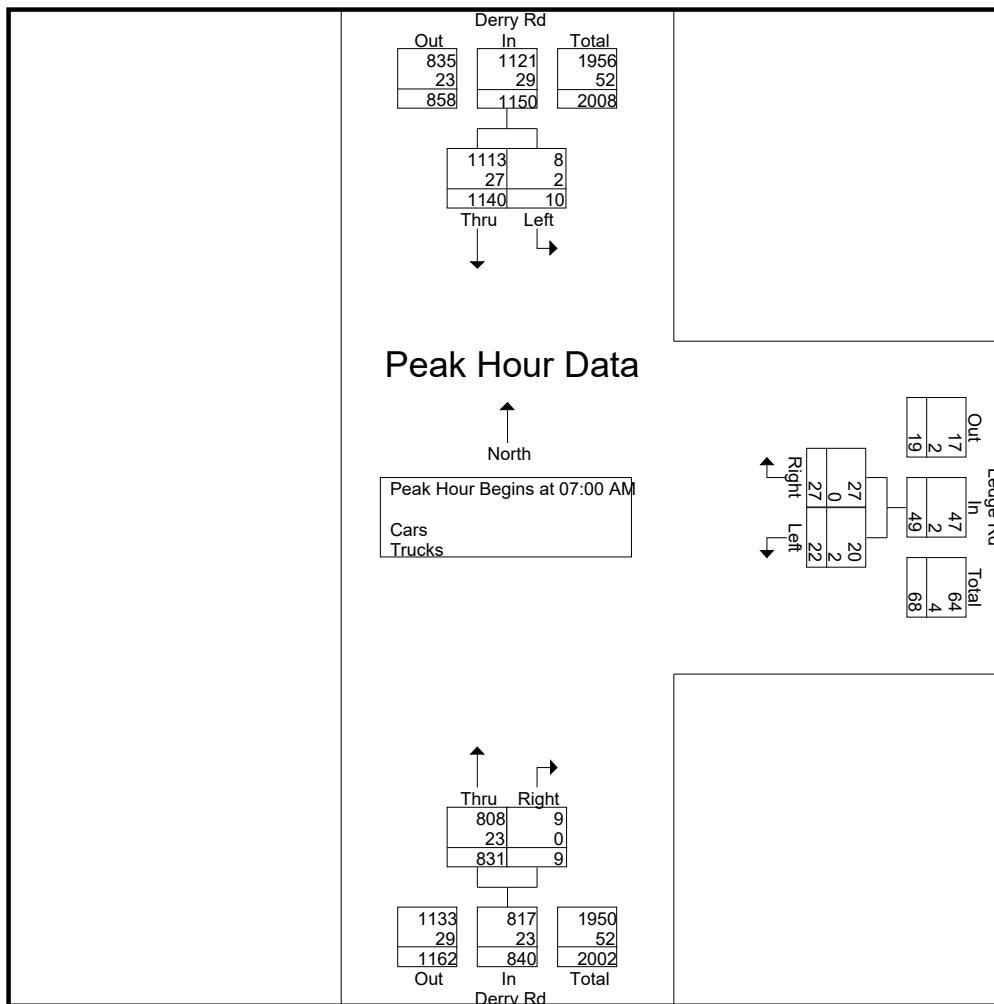
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Site Code : 15530001
Start Date : 6/2/2021
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Derry Rd From North		Ledge Rd From East		Derry Rd From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
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

Start Time	Derry Rd From North			Ledge Rd From East			Derry Rd From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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



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

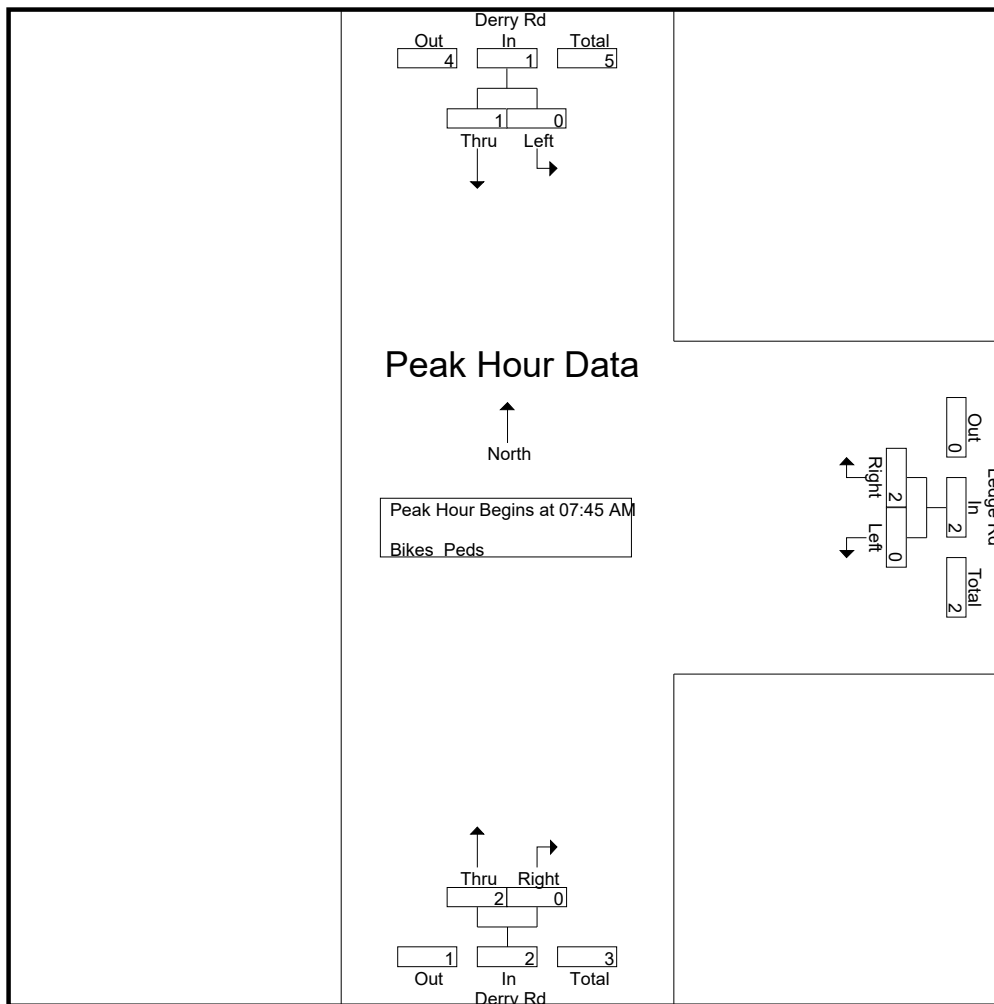
N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

Groups Printed- Bikes Peds

Start Time	Derry Rd From North			Ledge Rd From East			Derry Rd From South			Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
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	

Start Time	Derry Rd From North			Ledge Rd From East			Derry Rd From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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



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

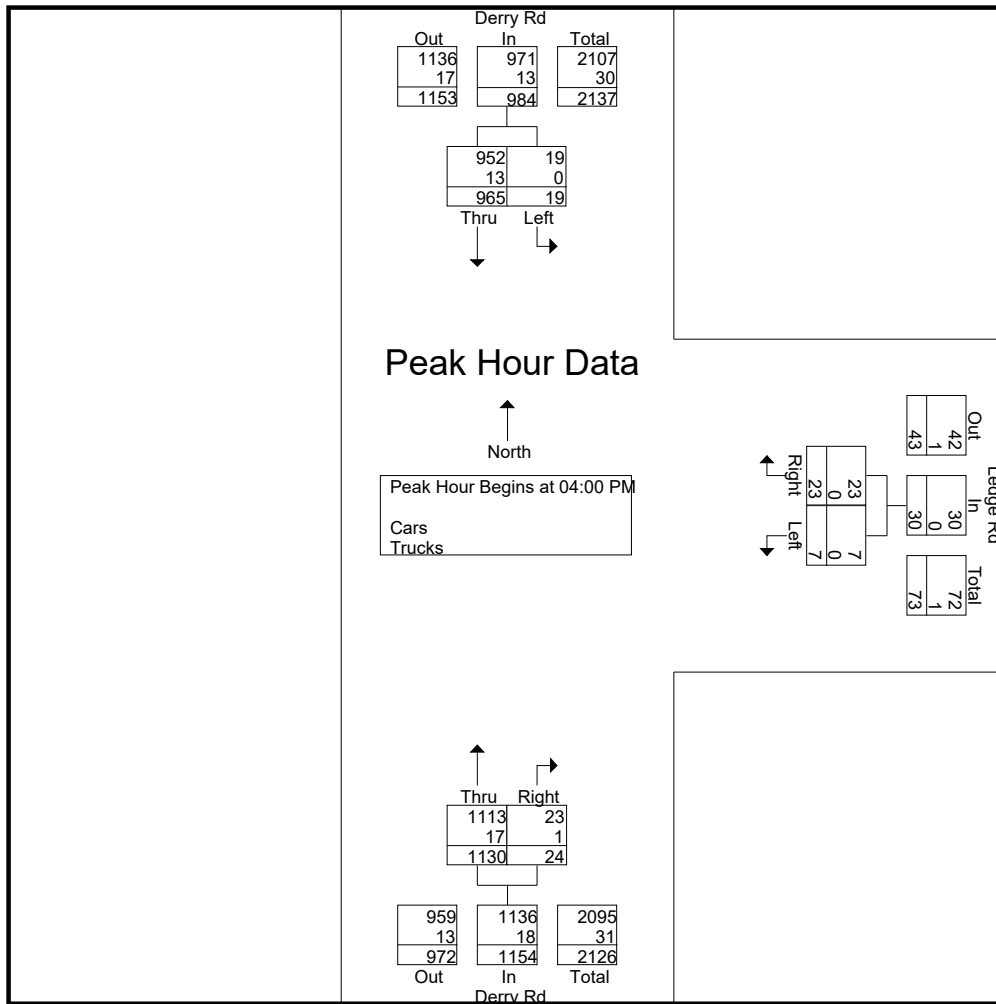
N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

Groups Printed- Cars - Trucks

Start Time	Derry Rd From North		Ledge Rd From East		Derry Rd From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
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

Start Time	Derry Rd From North			Ledge Rd From East			Derry Rd From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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



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

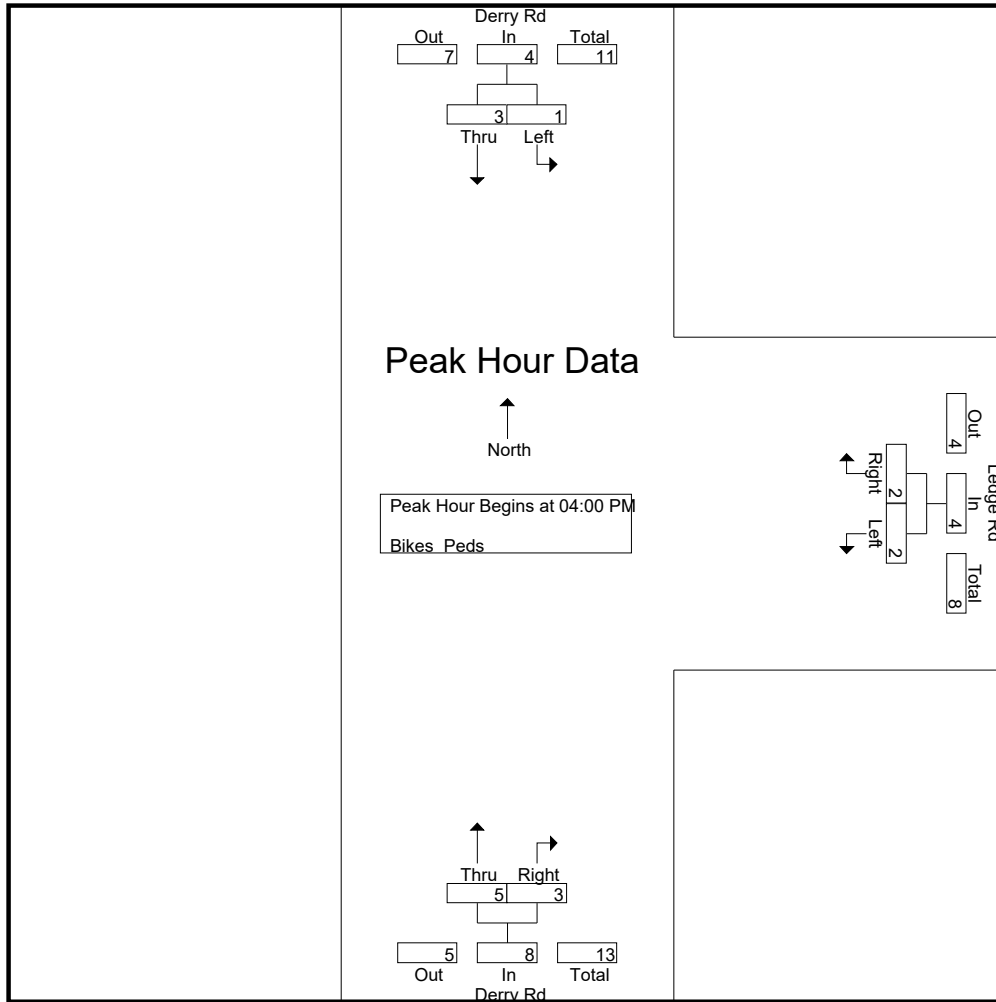
N/S Street : Derry Road
E/W Street : Ledge Road
City/State : Hudson, NH
Weather : Clear

Groups Printed- Bikes Peds

Start Time	Derry Rd From North			Ledge Rd From East			Derry Rd From South			Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
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	

Start Time	Derry Rd From North			Ledge Rd From East			Derry Rd From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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



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

<u>Month</u>	<u>ADT</u>	<u>Adjustment to Average</u>	<u>Adjustment to Peak</u>
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

15530001

Location : Derry Road
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

15530001

Location : Derry Road
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

15530001

Location : Derry Road
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

15530001

Location : Derry Road
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: Trip Generation

TRAFFIC IMPACT ASSESSMENT

PROPOSED DRIVE-THRU COFFEE SHOP

Northwood, New Hampshire

October 2019

Prepared for

New Hampshire Land Consultants, PLLC



**Stephen G. Pernaw
& Company, Inc.**

SITE GENERATED TRAFFIC

To estimate the quantity of vehicle trips that will be produced by the proposed drive-thru coffee shop, Pernaw & Company, Inc. considered using the standard trip generation rates published by the Institute of Transportation Engineers (ITE)¹. However, Land Use Code (LUC) 938 (Coffee/Donut Shop with Drive-Through Window and No Indoor Seating) pertains to sites with a very small gross floor area (90 sf average). For this type of land use our experience has confirmed that the traffic volume passing a coffee shop is a far better indicator of vehicle-trips than the square footage of the building.

Consequently, transaction data for a similar drive-thru Aroma Joe's in Tilton, New Hampshire was obtained and combined with Tilton traffic count data to establish a local "capture rate" for that store. The Tilton site is an excellent match as it is also located on a state-maintained highway with a high school located nearby. The AM and PM capture rates were then applied to the 2030 No-Build traffic volumes passing the Northwood site to arrive at the trip generation estimates for the proposed coffee shop. The vehicle-trips associated with the greenhouse shop, office, and single-family residence were estimated using ITE Land Use Codes 820, 712 and 210, respectively. Table 1 on Page 11 summarizes the trip generation estimates for the subject site. The site driveway on Bow Lake Road is expected to accommodate approximately 93 vehicle-trips (47 arrivals, 46 departures) during the morning peak hour and 35 vehicle-trips (17 arrivals, 18 departures) during the evening peak hour period.

It should be noted that the majority of the vehicle-trips generated by the site will be drawn from the existing traffic stream on US4 as "pass-by" trips. According to ITE statistics, approximately 89% of the coffee shop trips will be pass-by trips. The high percentage of pass-by traffic means that that net increases on the adjacent street system will be much less than the total trips shown in Table 1; particularly where the "primary" trips or new trips to the area will be split between points east and west on the highway (and on Bow Lake Road).

Appendix E shows the travel patterns and traffic volumes associated with both trips types, along with the derivation of the trip generation estimates.

¹ Institute of Transportation Engineers, *Trip Generation*, 10th edition (Washington, D.C., 2017).
1951A

Table 1

Trip Generation Summary

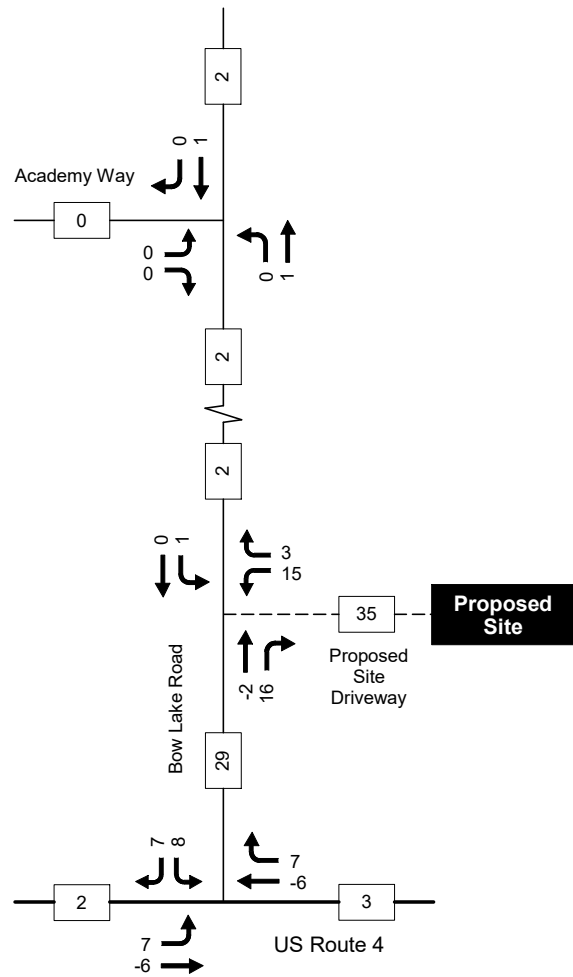
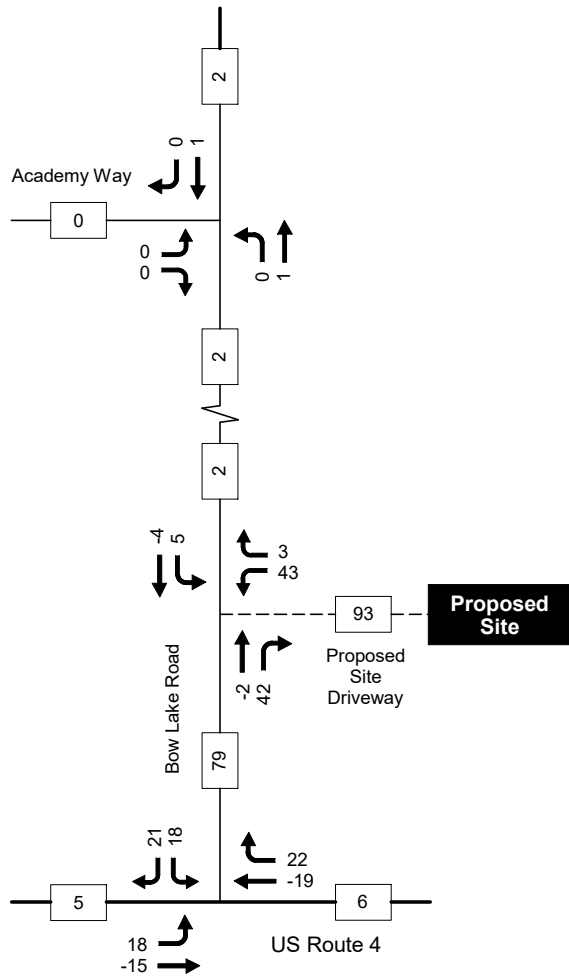
	Coffee Shop (965 sf)		Retail ² (250 sf)	Office ³ (203 sf)	Single-Family Residence ⁴	2030 Total	Primary Trips	Pass-By Trips ⁵
	2020 Estimate ¹	2030 Estimate ¹						
AM Peak Hour	Entering	41 veh	1 veh	1 veh	0 veh	47 veh	7 veh	40 veh
	Exiting	<u>41 veh</u>	<u>0 veh</u>	<u>0 veh</u>	<u>1 veh</u>	<u>46 veh</u>	<u>6 veh</u>	<u>40 veh</u>
	Total	82 trips	90 trips	1 trips	1 trips	93 trips	13 trips	80 trips
PM Peak Hour	Entering	14 veh	0 veh	0 veh	1 veh	17 veh	3 veh	14 veh
	Exiting	<u>14 veh</u>	<u>16 veh</u>	<u>1 veh</u>	<u>0 veh</u>	<u>18 veh</u>	<u>4 veh</u>	<u>14 veh</u>
	Total	28 trips	32 trips	1 trips	1 trips	35 trips	7 trips	28 trips

¹ Trip Generation Computations (See Appendix E)
² ITE Land Use Code 820 - Shopping Center (250 sf)
³ ITE Land Use Code 712 - Small Office Building (203 sf)
⁴ ITE Land Use Code 210 - Single-Family Detached Housing (1 Dwelling Unit)
⁵ ITE Land Use Code 938 - Pass-By Trips = 89%, Page 216 of ITE Handbook

Appendix E

Site Generated Traffic Volumes / Trip Distribution

Pernaw & Company, Inc

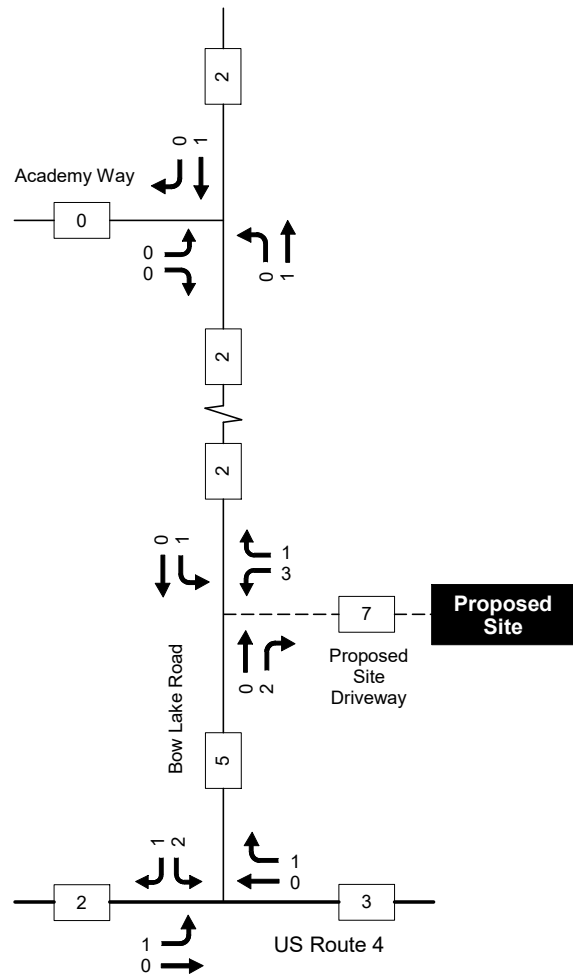
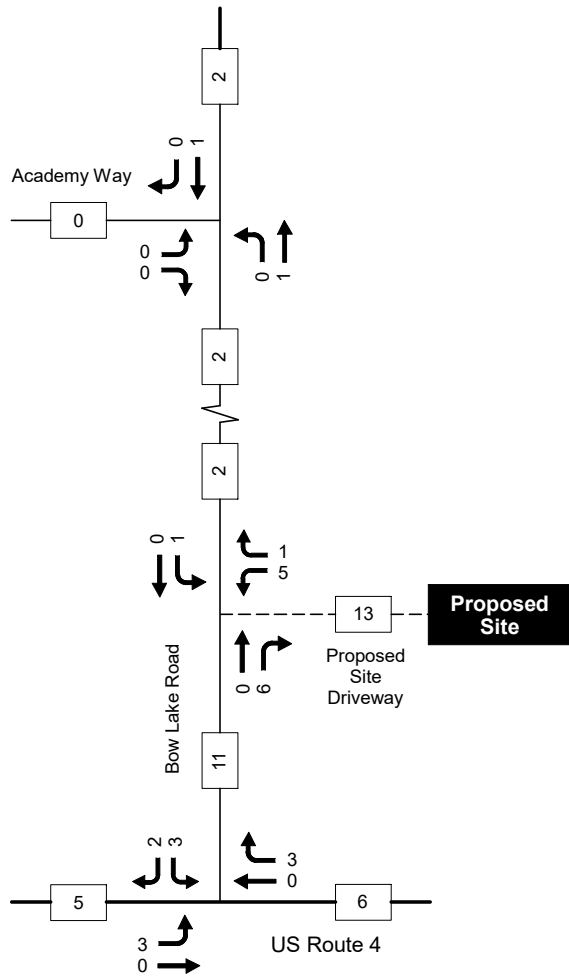


AM PEAK HOUR

PM PEAK HOUR



Pernaw & Company, Inc

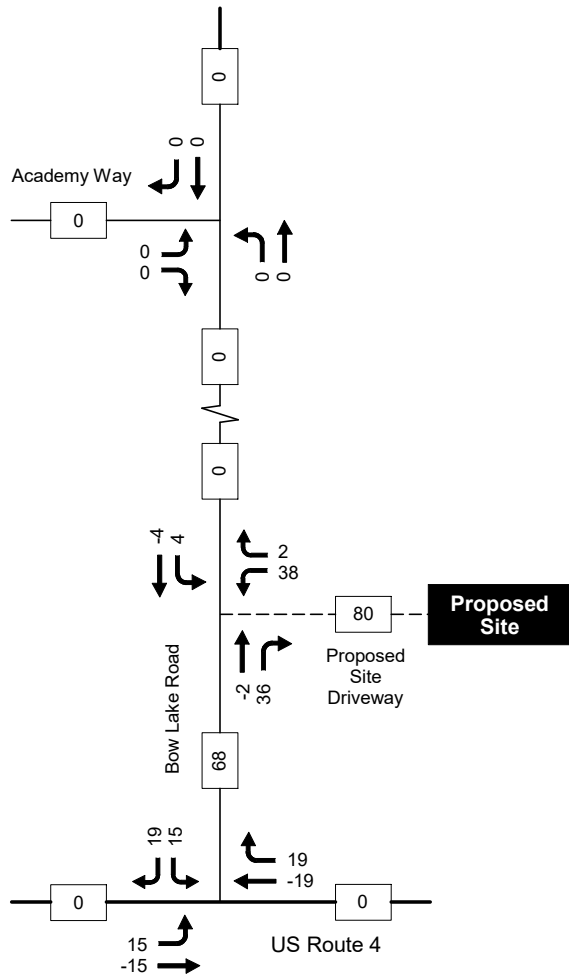


AM PEAK HOUR

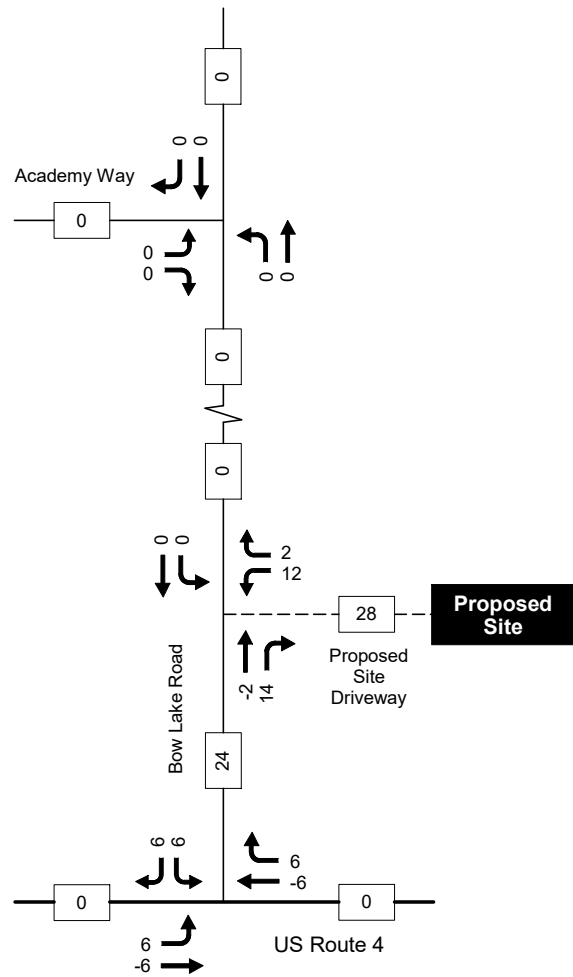
PM PEAK HOUR



Pernaw & Company, Inc



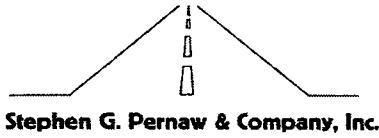
AM PEAK HOUR



PM PEAK HOUR



CALCULATION SHEET #08-21 - Aroma Joe's - Attachment C



Project:	Coffee Shop	Job Number:	1951A
Calculated By:	SGP	Date:	10/8/2019
Checked By:	CFA	Date:	10/9/2019
Sheet No:	1	Of:	1
Subject:	Trip Generation Computations		

I. Givens:	
A. Intersection turning movement counts conducted on 9/10/19 at US4/Bow Lake Road:	AM peak hour = 1,590 veh., PM peak hour = 1,551 veh. (see Figure 2).
B. Peak-month seasonal adjustment factor = 1.04 (see Appendix D).	
C. Background growth rate = 1.0 percent/year, compounded annually.	
D. Similar site data (Tilton, NH):	AM = 33 customers, AM avg weekday volume = 1,354 veh. (capture rate = 0.0244)
	PM = 12 customers, PM avg weekday volume = 1,399 veh. (capture rate = 0.0086)
II. Calculate 2020 and 2030 No-Build traffic volumes:	
A. 2020 AM No-Build entering volume = 1,590 X 1.04 X 1.01 = 1,670 vehicles	
B. 2030 AM No-Build entering volume = 1,590 X 1.04 X 1.01 ¹¹ = 1,845 vehicles	
C. 2020 PM No-Build entering volume = 1,551 X 1.04 X 1.01 = 1,629 vehicles	
D. 2030 PM No-Build entering volume = 1,551 X 1.04 X 1.01 ¹¹ = 1,800 vehicles	
III. Calculate trips using Aroma Joe's capture rates:	
A. 2020 AM vehicle arrivals = 1,670 X 0.0244 = 41, therefore departures = 41, therefore AM trips = 82.	
B. 2030 AM vehicle arrivals = 1,845 X 0.0244 = 45, therefore departures = 45, therefore AM trips = 90.	
C. 2020 PM vehicle arrivals = 1,629 X 0.0086 = 14, therefore departures = 14, therefore PM trips = 28.	
D. 2030 PM vehicle arrivals = 1,800 X 0.0086 = 16, therefore departures = 16, therefore PM trips = 32.	

StatBridge
POS

Print Date: 09/15/19
To Date: 09/15/19

** OPEN **

TransDate>08/19/19- 08/20/19- 08/21/19- 08/22/19- 08/23/19- 08/24/19- 08/25/19- # of Weeks: 4
09/09/19 09/10/19 09/11/19 09/12/19 09/13/19 09/14/19 09/15/19

hour	MON	TUE	WED	THUR	FRI	SAT	SUN	TOTAL	AVE
-- Units Produced (sold and "free"; excl. meals) --									
5 am	0	0	1	0	0	1	0	2	0
6 am	7	9	11	10	9	6	2	54	8
7 am	16	20	22	22	21	13	8	122	17
8 am	36	35	40	42	45	26	19	243	35
9 am	21	24	20	22	27	33	29	171	24
10 am	21	15	17	21	22	33	32	161	23
11 am	30	17	18	18	15	36	38	177	25
12 noon	19	20	17	17	15	33	32	153	22
1 pm	18	14	15	14	19	26	27	133	19
2 pm	13	22	13	16	17	26	25	122	17
3 pm	11	22	19	14	22	14	22	126	18
4 pm	12	18	12	17	15	18	14	106	15
5 pm	13	11	10	15	14	14	13	91	13
6 pm	13	13	16	14	13	12	14	95	14
7 pm	7	9	8	12	11	9	8	64	9
8 pm	5	5	4	6	4	6	6	36	5
9 pm	1	2	2	3	3	1	0	12	2
10 pm	0	0	0	0	0	0	0	0	0
11 pm	0	0	0	0	0	0	0	0	0
12 mid	0	0	0	0	0	0	0	0	0
1 am	0	0	0	0	0	0	0	0	0
2 am	0	0	0	0	0	0	0	0	0
3 am	0	0	0	0	0	0	0	0	0
4 am	0	0	0	0	0	0	0	0	0
TOTALS	244	246	242	268	278	301	289	1868	267

hour	MON	TUE	WED	THUR	FRI	SAT	SUN	TOTAL	AVE
-- Tickets (Customers) --									
5 am	0	0	1	0	0	1	0	2	0
6 am	6	7	9	8	6	5	2	43	6
7 am	16	18	21	20	20	19	7	111	16
8 am	29	32	33	35	34	29	13	195	28
9 am	19	21	19	19	22	22	21	143	20
10 am	17	13	13	17	17	23	22	122	17
11 am	17	14	14	14	16	24	27	126	18
12 noon	15	15	12	12	12	21	21	108	15
1 pm	14	11	12	12	15	18	18	100	14
2 pm	11	10	10	12	13	16	16	88	13
3 pm	9	16	13	14	14	11	14	91	13
4 pm	11	14	10	13	12	13	9	82	12
5 pm	10	9	8	13	10	11	10	70	10
6 pm	10	9	12	10	8	8	10	67	10
7 pm	6	6	5	4	7	4	6	46	7
8 pm	3	4	3	4	4	4	5	27	4
9 pm	1	2	1	3	3	1	0	11	2
10 pm	0	0	0	0	0	0	0	0	0
11 pm	0	0	0	0	0	0	0	0	0
12 mid	0	0	0	0	0	0	0	0	0
1 am	0	0	0	0	0	0	0	0	0
2 am	0	0	0	0	0	0	0	0	0
3 am	0	0	0	0	0	0	0	0	0
4 am	0	0	0	0	0	0	0	0	0
TOTALS	194	201	196	214	213	214	200	1432	205

AG=33
AG=12



Appendix F: Capacity-Analysis Worksheets

HCM 6th TWSC

1: Derry Road & Ledge Road

06/30/2021

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
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	NBRWBLn1	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

HCM 6th TWSC
1: Derry Road & Ledge Road

06/30/2021

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
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	NBRWBLn1	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

HCM 6th TWSC

1: Derry Road & Ledge Road

06/30/2021

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T		Y	T
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
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	NBRWBLn1	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

HCM 6th TWSC

1: Derry Road & Ledge Road

06/30/2021

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
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	NBRWBLn1	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

HCM 6th TWSC

1: Derry Road & Ledge Road

06/30/2021

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P		Y	↑
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
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	NBRWBLn1	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

HCM 6th TWSC

1: Derry Road & Ledge Road

06/30/2021

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
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	NBRWBLn1	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

HCM 6th TWSC
1: Derry Road & Ledge Road

06/30/2021

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T		T	T
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
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	NBRWBLn1	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

HCM 6th TWSC
5: Derry Road & Driveway

06/30/2021

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	-	-

HCM 6th TWSC

1: Derry Road & Ledge Road

06/30/2021

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
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	NBRWBLn1	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

HCM 6th TWSC
5: Derry Road & Driveway

06/30/2021

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	-	-

HCM 6th TWSC

1: Derry Road & Ledge Road

06/30/2021

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
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	NBRWBLn1	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

HCM 6th TWSC
5: Derry Road & Driveway

06/30/2021

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

HCM 6th TWSC

1: Derry Road & Ledge Road

06/30/2021

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
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	NBRWBLn1	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

HCM 6th TWSC
5: Derry Road & Driveway

06/30/2021

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	-	-

HCM 6th TWSC
5: Derry Road & Driveway

08/31/2021

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	-	-	50
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	2419	1374	1407	0	-	0
Stage 1	1374	-	-	-	-	-
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	36	178	482	-	-	-
Stage 1	235	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	34	178	482	-	-	-
Mov Cap-2 Maneuver	137	-	-	-	-	-
Stage 1	222	-	-	-	-	-
Stage 2	339	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	482	-	137	178	-	-
HCM Lane V/C Ratio	0.053	-	0.187	0.187	-	-
HCM Control Delay (s)	12.9	-	37.2	29.8	-	-
HCM Lane LOS	B	-	E	D	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	0.7	-	-

HCM 6th TWSC
5: Derry Road & Driveway

08/31/2021

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	-	-	50
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	2573	1166	1176	0	-	0
Stage 1	1166	-	-	-	-	-
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	236	594	-	-	-
Stage 1	296	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	236	594	-	-	-
Mov Cap-2 Maneuver	128	-	-	-	-	-
Stage 1	290	-	-	-	-	-
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	236	-	-
HCM Lane V/C Ratio	0.021	-	0.095	0.042	-	-
HCM Control Delay (s)	11.2	-	36.1	20.9	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	0.1	-	-

HCM 6th TWSC
5: Derry Road & Driveway

08/31/2021

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	-	-	50
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	2673	1519	1556	0	-	0
Stage 1	1519	-	-	-	-	-
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	~ 25	146	422	-	-	-
Stage 1	200	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 23	146	422	-	-	-
Mov Cap-2 Maneuver	115	-	-	-	-	-
Stage 1	187	-	-	-	-	-
Stage 2	300	-	-	-	-	-

Approach

	EB	NB	SB
HCM Control Delay, s	41.4	0.3	0
HCM LOS	E		

Minor Lane/Major Mvmt

	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	422	-	115	146	-	-
HCM Lane V/C Ratio	0.066	-	0.242	0.259	-	-
HCM Control Delay (s)	14.1	-	46	38.1	-	-
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

HCM 6th TWSC
5: Derry Road & Driveway

08/31/2021

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	-	-	50
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	2844	1288	1299	0	-	0
Stage 1	1288	-	-	-	-	-
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	200	533	-	-	-
Stage 1	259	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	19	200	533	-	-	-
Mov Cap-2 Maneuver	108	-	-	-	-	-
Stage 1	253	-	-	-	-	-
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	200	-	-
HCM Lane V/C Ratio	0.025	-	0.113	0.061	-	-
HCM Control Delay (s)	11.9	-	42.5	24.2	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0.2	-	-



Appendix G: Comments and Responses



August 26, 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, Traffic Study
Tax Map 173 Lot 29; Acct. #1350-970
Reference No. 20030249.2040

Dear Mr. Groth:

Fuss & O'Neill, Inc. has reviewed the Traffic Impact and Access Study prepared by Transportation Engineering, Planning and Policy (TEPP) for Keach-Nordstrom Associates, Inc. (KNA) dated July 1, 2021, for the proposed commercial development at 56 Derry Road in Hudson, New Hampshire (Tax Map 173 Lot 29). The project proposes the development of a 900 square foot (sf) drive-through coffee shop on the currently vacant land at 56 Derry Road. Access and egress to the site will be provided via a proposed driveway on the west side of Derry Road, with one lane for access. For egress, a dedicated left turn lane and a dedicated right turn lane will be provided.

Please note that site plan, stormwater, and other project related comments were provided under separate letters dated July 9, 2021, and August 3, 2021.

In review of the TEPP report the following items are noted:

4. Traffic

- a. Provide more detail regarding the proposed use in the introduction of the report; the introduction omits the size of the coffee shop and that the shop will not provide indoor seating.
- b. Revise the street name displayed in Table 3 – Sight Distances to Derry Road instead of Portland Street and revise the data in the table accordingly if what is currently shown in the table is sight distance data for a different traffic impact study.
- c. In the summary of Table 4 – Calculated Weekday Vehicle Trip-Generation, the 2032 total vehicle-trips are presented as “117 (58 in and 539 out)” for the weekday AM peak hour. The number of trips exiting the site should be revised to match what is shown in Table 4.

50 Commercial Street
Manchester, NH
03101
t 603.668.8223
800.286.2469
www.fando.com

California
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Mr. Brian Groth
August 26, 2021
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- d. Although we agree that the trip generation information compiled in the ITE Trip Generation Manual for land use code 938 is not applicable to the proposed land use due to the small sample size, it is unclear if the method used in the TEPP report as an alternative is acceptable. The TEPP report mentions that Stephen G. Pernaw & Company, Inc. has published appropriate trip generation information for the proposed land use. The report then uses the information presumably from the Stephen G. Pernaw & Company, Inc. publication but does not provide the publication itself or specify the project the information comes from, so it is unclear whether the information used in the TEPP report to calculate traffic volumes generated by the proposed development is correct or appropriate. Relevant information from the Stephen G. Pernaw publication should be provided and the methodology used for determining the proposed development's generated trips should be further explained in the report.
- e. Table 5 – Trip Distribution and Network Assignment assigns all site-generated traffic coming from/going to the south on Derry Road. This should be revised to reflect the applied distributions.
- f. The title of the last column of Table 8 – Capacity Analysis Summary should be corrected to the 2032 Build condition.
- g. The v/c ratio and queue length for the northbound left turn movement at the Derry Road/Site Driveway intersection during the 2032 Build in Table 8 are flipped according to the attached Synchro reports. This should be revised.
- h. The attached site plan shows a proposed southbound right turn storage lane at the Derry Road/Site Driveway intersection for access into the site. The Build condition Synchro reports and capacity analysis results in the TEPP report do not appear to reflect this lane configuration change and should be revised accordingly. If this lane configuration change is being proposed, it should also be discussed in the report.
- i. The site plan should include signage per MUTCD for the proposed right turn lane.
- j. We recommend the applicant and Town consider the installation of a left turn arrow in the center turning lane for northbound Derry Street traffic to formalize the site entrance, similar to turn arrows further north along the Derry Street center turning lane.

Fuss & O'Neill needs clarification on the methodology used of the trip generation calculations used in the TEPP report to determine if TEPP's overall conclusion, that there should be minimal impacts on traffic operations at the Derry Road and Ledge Road intersection, is appropriate. As for

Mr. Brian Groth
August 26, 2021
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the Derry Road and Site Driveway intersection, we suggest revising the analysis to include any proposed roadway improvements before further review.

Please feel free to call if you have any questions.

Very truly yours,



Steven W. Reichert, P.E.

**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: 2021.08.26 14:22:05 -0400'

SWR:

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

RESPONSES BY TEPP LLC

Comment 4.a. Provide more detail regarding the proposed use in the introduction of the report; the introduction omits the size of the coffee shop and that the shop will not provide indoor seating.

Response. Pages 1, 5, and 31 show the revisions.

Comment 4.b. Revise the street name displayed in Table 3 – Sight Distances to Derry Road instead of Portland Street and revise the data in the table accordingly if what is currently shown in the table is sight distance data for a different traffic impact study.

Response. Page 14, Table 3, shows the revision.

Comment 4.c. In the summary of Table 4 – Calculated Weekday Vehicle Trip-Generation, the 2032 total vehicle-trips are presented as “117 (58 in and 539 out)” for the weekday AM peak hour. The number of trips exiting the site should be revised to match what is shown in Table 4.

Response. Page 19 shows the revision.

Comment 4.d. Although we agree that the trip generation information compiled in the ITE Trip Generation Manual for land use code 938 is not applicable to the proposed land use due to the small sample size, it is unclear if the method used in the TEPP report as an alternative is acceptable. The TEPP report mentions that Stephen G. Pernaw & Company, Inc. has published appropriate trip generation information for the proposed land use. The report then uses the information presumably from the Stephen G. Pernaw & Company, Inc. publication but does not provide the publication itself or specify the project the information comes from, so it is unclear whether the information used in the TEPP report to calculate traffic volumes generated by the proposed development is correct or appropriate. Relevant information from the Stephen G. Pernaw publication should be provided and the methodology used for determining the proposed development’s generated trips should be further explained in the report.

Response. Page 19, Table 8, footnotes show calculations. Appendix E includes relevant information from the publication.

Comment 4.e. Table 5 – Trip Distribution and Network Assignment assigns all site-generated traffic coming from/going to the south on Derry Road. This should be revised to reflect the applied distributions.

Response. Page 20, Table 5, shows the revisions.

Comment 4.f. The title of the last column of Table 8 – Capacity Analysis Summary should be corrected to the 2032 Build condition.

Response. Page 29, Table 8, shows the revision.

Comment 4.g. The v/c ratio and queue length for the northbound left turn movement at the Derry Road/Site Driveway intersection during the 2032 Build in Table 8 are flipped according to the attached Synchro reports. This should be revised.

Response. Page 29, Table 8, shows the revisions.

Comment 4.h. The attached site plan shows a proposed southbound right turn storage lane at the Derry Road/Site Driveway intersection for access into the site. The Build condition Synchro reports and capacity analysis results in the TEPP report do not appear to reflect this lane configuration change and should be revised accordingly. If this lane configuration change is being proposed, it should also be discussed in the report.

Response. Pages 1, 5, and 31 shows the revisions. Page 29, Table 8, shows the revision.

Comment 4.i. The site plan should include signage per MUTCD for the proposed right turn lane.

Response. Keach-Nordstrom Associates, Inc. will be providing a plan that shows the signage.

Comment 4.j. We recommend the applicant and Town consider the installation of a left turn arrow in the center turning lane for northbound Derry Street traffic to formalize the site entrance, similar to turn arrows further north along the Derry Street center turning lane.

Response. TEPP LLC recommends that the Town consider retaining the simple and consistent two-way-left-turn lane treatment along the subject segment of Derry Road.