



# TOWN OF HUDSON

## Planning Board

Timothy Malley, Chairman

Roger Coutu, Selectmen Liaison



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

### **PUBLIC MEETING TOWN OF HUDSON, NH NOVEMBER 6, 2019**

The Town of Hudson Planning Board will hold a regularly scheduled meeting on Wednesday, November 6, 2019 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)

- 23 October 2019 Meeting Minutes – Decisions

#### VI. OLD BUSINESS (Continued from October 23, 2019 Meeting)

- |  |                                   |
|--|-----------------------------------|
| A. 292 Derry Road Site Plan<br>SP# 04-19 | 292 Derry Road<br>Map 109/Lot 007 |
|--|-----------------------------------|

Purpose of Plan: to add a 8,250 sf warehouse with an office to the existing 1,800 sf professional offices, 88 student daycare, and 10 student karate studio. Application Acceptance & Hearing.

- |  |   |
|--|---|
| B. Flagstone Crossing Site Plan<br>SP# 09-19 | Lowell Rd. / Flagstone Dr.<br>Map 222/Lots 3, 4, 5, & 6 |
|--|---|

Purpose of Plan: To create a multi-use commercial development consisting of a 2,200+/- square foot restaurant with drive-thru, a 5,000+/- square foot bank with drive-thru, and a 10,700+/- square foot of retail space. Application Acceptance & Hearing.

#### VII. OTHER BUSINESS

- A. Site Plan & Subdivision Application Update
- B. Master Plan Update

#### VIII. ADJOURNMENT

All plans and applications are available for review in the Planning Office. Comments may be submitted in writing until 10:00 a.m. on the Tuesday prior to the day of the meeting. The public is invited to attend.

POSTED: Town Hall, Library & Post Office – 10-30-19

\_\_\_\_\_  
Brian Groth, Town Planner

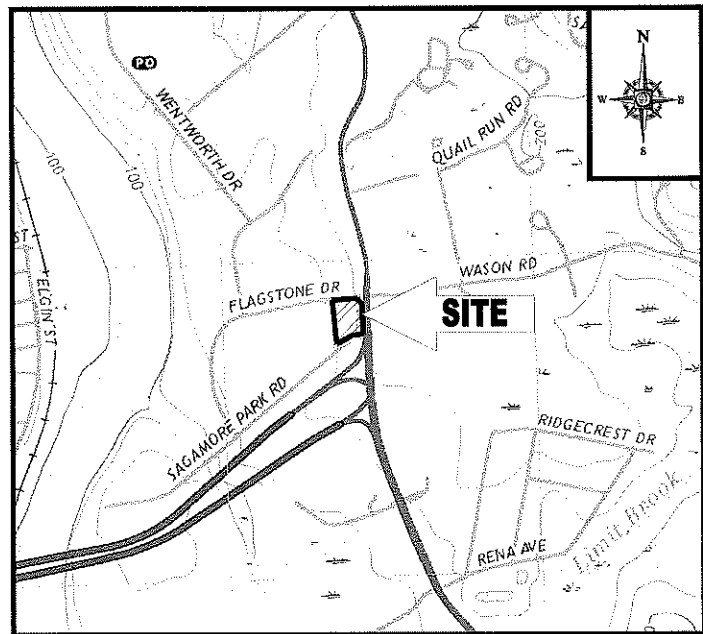
# SITE DEVELOPMENT PLANS

FOR:



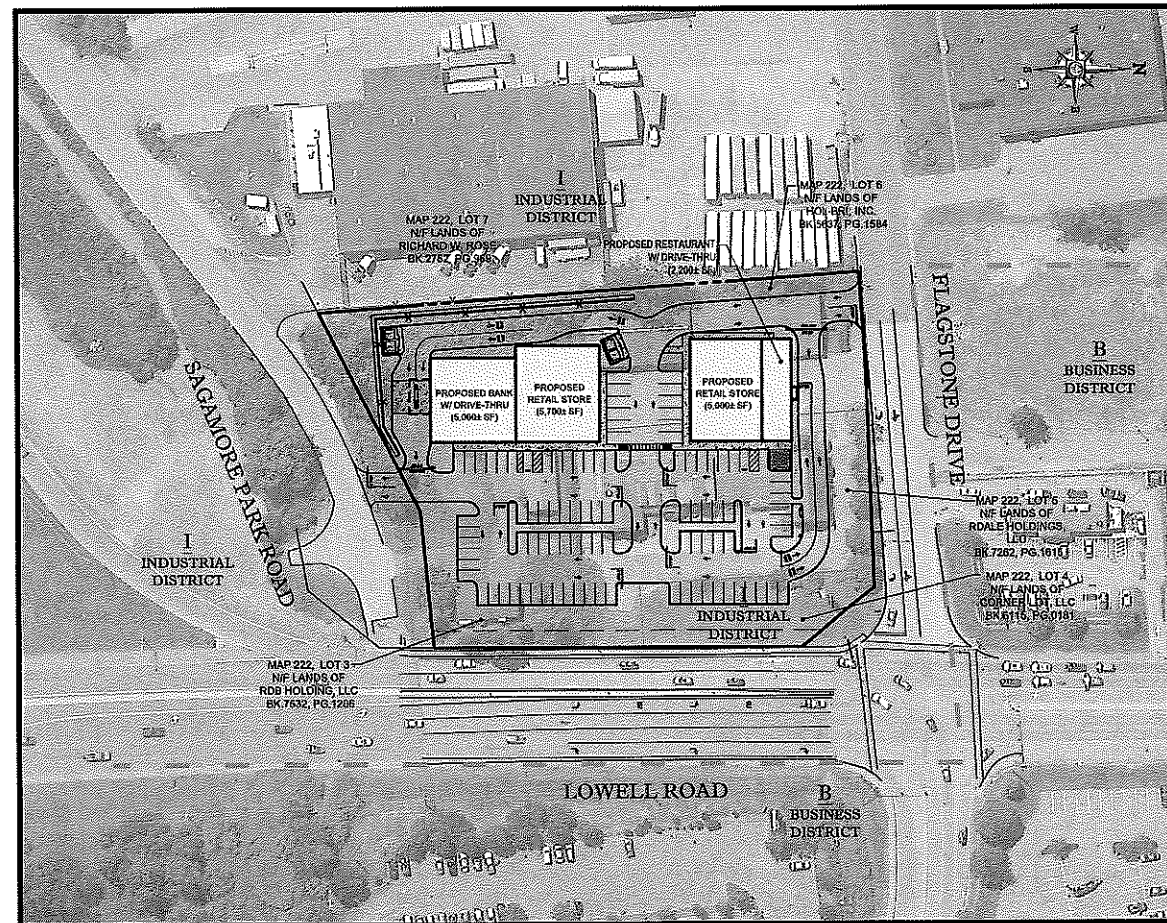
LOCATION OF SITE:  
 225 & 227 LOWELL ROAD, 2 FLAGSTONE DRIVE  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY, NEW HAMPSHIRE  
 MAP #222, LOTS #3, #4, #5, & #6

**RECEIVED**  
 NOV 01 2019  
 TOWN OF HUDSON  
 PLANNING DEPARTMENT



**LOCATION MAP**

SCALE: 1"=1000'  
 PLAN REFERENCE: NASHUA SOUTH USGS QUADRANGLE



**AREA PLAN**

SCALE: 1"=80'

SHEET TITLE	SHEET NUMBER
COVER SHEET	1 OF 18
GENERAL NOTES SHEET	2 OF 18
DEMOLITION PLAN	3 OF 18
SITE PLAN	4 OF 18
GRADING & DRAINAGE PLAN	5 OF 18
UTILITY PLAN	6 OF 18
SOIL EROSION & SEDIMENT CONTROL PLAN	7 OF 18
SOIL EROSION CONTROL NOTES & DETAILS SHEET	8 OF 18
SOIL EROSION CONTROL NOTES & DETAILS SHEET	9 OF 18
LANDSCAPE PLAN	10 OF 18
LANDSCAPE NOTES & DETAILS SHEET	11 OF 18
LIGHTING PLAN	12 OF 18
CONSTRUCTION DETAIL SHEET	13 OF 18
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CONSTRUCTION DETAIL SHEET	15 OF 18
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CONSTRUCTION DETAIL SHEET	18 OF 18
BOUNDARY & TOPOGRAPHIC SURVEY (BY OTHERS)	1 OF 2
BOUNDARY & TOPOGRAPHIC SURVEY (BY OTHERS)	2 OF 2
LOT CONSOLIDATION PLAN (BY OTHERS)	1 OF 1

**SHEET INDEX**

**WAIVER REQUESTS:**

THE FOLLOWING WAIVERS ARE REQUESTED FROM THE TOWN OF HUDSON LAND USE REGULATIONS:

**CHAPTER 275 - SITE PLAN REVIEW**  
 §275:81(2) - PARKING CALCULATIONS:

REQUIRED: ONE HUNDRED TWENTY-NINE (129) PARKING SPACES REQUIRED FOR A DEVELOPMENT INCLUDING A 2,200± SQUARE FOOT COFFEE SHOP, A 5,000± SQUARE FOOT BANK, 6,700± SQUARE FEET OF RETAIL SPACE, AND 4,000± SQUARE FEET OF RESTAURANT SPACE.

REQUESTED: NINETY-EIGHT (98) PARKING SPACES PROVIDED TO SERVE THE PROPOSED DEVELOPMENT.

**CHAPTER 275 - SITE PLAN REVIEW**  
 §275:81(3) - PARKING SPACE DIMENSIONS: (GRANTED AT OCTOBER 23, 2019 PLANNING BOARD HEARING)

REQUIRED: PARKING SPACE DIMENSIONS SHALL BE 10 FEET BY 20 FEET, EXCEPT THAT THE PLANNING BOARD MAY VOTE TO ALLOW DIMENSIONS OF 9 FEET BY 18 FEET.

REQUESTED: PROPOSED PARKING SPACE DIMENSIONS OF 8 FEET BY 18 FEET SPACES FOR THE MAJORITY OF THE SITE, WITH 10 FOOT BY 20 FOOT SPACES PROPOSED FOR PARKING LOCATED ON THE PRIMARY DRIVE AISLE BETWEEN THE TWO BUILDINGS.

**CHAPTER 275 - SITE PLAN REVIEW**  
 §275:81(4) - OFF STREET LOADING SPACES: (GRANTED AT OCTOBER 23, 2019 PLANNING BOARD HEARING)

REQUIRED: "EVERY NON-RESIDENTIAL BUILDING OR STRUCTURE HAVING 5,000 SQUARE FEET OR LESS OF GROSS FLOOR AREA SHALL PROVIDE AT LEAST ONE LOADING AND/OR UNLOADING SPACE. ONE ADDITIONAL SPACE SHALL BE PROVIDED FOR EVERY ADDITIONAL 10,000 SQUARE FEET OF GROSS FLOOR AREA."

REQUESTED: NO DEDICATED LOADING AREAS FOR THE PROPOSED DEVELOPMENT CONSISTING OF ONE 7,200± SQUARE FOOT BUILDING AND ONE 16,700± SQUARE FOOT BUILDING.

**CHAPTER 275 - SITE PLAN REVIEW**  
 §275:11.1(2) - LANDSCAPE REQUIREMENTS: (GRANTED AT OCTOBER 23, 2019 PLANNING BOARD HEARING)

REQUIRED: "ONE SHRUB PER 200 SQUARE FEET OF PAVED AREA SHALL BE PLANTED OR 1.6 SHRUBS PER EVERY PARKING SPACES, CALCULATED AS 157 SHRUBS FOR 80 PARKING SPACES OR 227 SHRUBS FOR 45,400 SQUARE FEET OF PAVED AREA."

REQUESTED: A MINIMUM OF ONE HUNDRED FIFTY-SEVEN (157) SHRUBS PROVIDED, CALCULATED AS 1.6 SHRUBS PER PARKING SPACE.

**CHAPTER 276 - ADMINISTRATIVE REQUIREMENTS AND DEFINITIONS**  
 §276:11.1(2) - LANDSCAPE BUFFERS: (GRANTED AT OCTOBER 23, 2019 PLANNING BOARD HEARING)

REQUIRED: "A GREEN (I.E. GRASS OR LANDSCAPING) AREA SHALL BE SHOWN BETWEEN THE RIGHT-OF-WAY AND ANY PAVEMENT, GRAVEL, OR STRUCTURE WITH A MINIMUM WIDTH OF 33 FEET WHERE THERE IS A 30-FOOT BUILDING SETBACK."

REQUESTED: AN APPROXIMATE 3 FOOT PAVEMENT SETBACK TO THE SAGAMORE PARK ROAD RIGHT-OF-WAY, WITH A RETAINING WALK PROPOSED WITH IN 1 FOOT OF THE SAGAMORE PARK ROAD RIGHT-OF-WAY.

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**REVISIONS**

REV	DATE	COMMENT	BY
1	10/9/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
3			
4			
5			
6			
7			
8			
9			

**PERMIT SET**

PROJECT No.: W191031  
 DRAWN BY: EKR  
 CHECKED BY: AFT/MKB  
 DATE: 09/30/2019  
 SCALE: AS NOTED  
 CAD L.D.: W191031\_S22

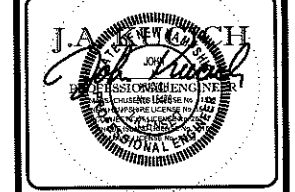
**PROJECT: SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

THE LANNAN COMPANY  
 REAL ESTATE INVESTMENT & DEVELOPMENT

LOCATION OF SITE  
 MAP #222, LOTS #3, #4, #5, & #6  
 225 & 227 LOWELL ROAD  
 2 FLAGSTONE DRIVE  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY,  
 NEW HAMPSHIRE

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SHEET TITLE:  
**COVER SHEET**

SHEET NUMBER:  
**1**  
 OF 18

REV 2 - 10/31/2019

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: \_\_\_\_\_

CHAIRMAN SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

SECRETARY SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

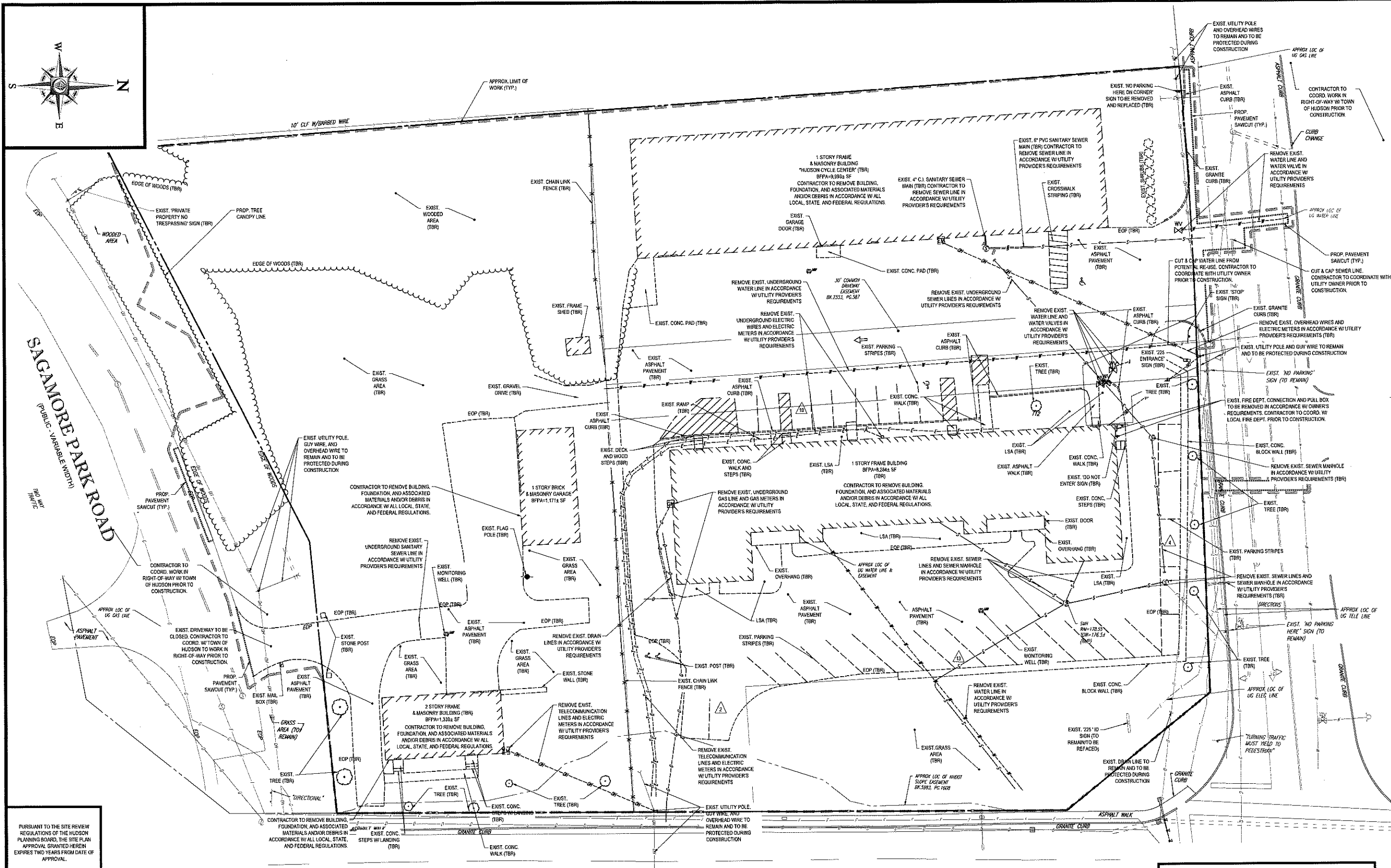
**OWNER SIGNATURE BLOCK**

OWNER SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PREPARED BY  
**BOHLER ENGINEERING**

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.





APPROVED BY THE HUDSON, NH PLANNING BOARD

DATE OF MEETING \_\_\_\_\_  
 CHAIRMAN SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
 SECRETARY SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

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REFER TO GENERAL NOTES SHEET FOR DEMOLITION NOTES

THIS PLAN TO BE UTILIZED FOR DEMOLITION/ REMOVAL PURPOSES ONLY



**BOHLER ENGINEERING**

WE WILL MEET ANY CHALLENGING ENGINEERING, ARCHITECTURE, LAND SURVEYING, PROGRAM MANAGEMENT, LANDSCAPE ARCHITECTURE, SITE AVAILABLE DESIGN, PERMITTING SERVICES, TRANSPORTATION SERVICES

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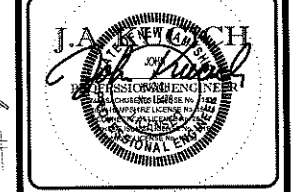
PROJECT: **SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

THE LANNAN COMPANY  
 REAL ESTATE INVESTMENT & DEVELOPMENT

LOCATION OF SITE  
 MAP #222, LOTS #3, #4, #5, & #6  
 225 & 227 LOWELL ROAD  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY,  
 NEW HAMPSHIRE

**BOHLER ENGINEERING**

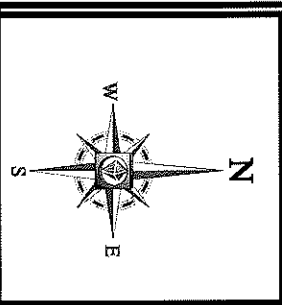
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SHEET TITLE: **DEMOLITION PLAN**

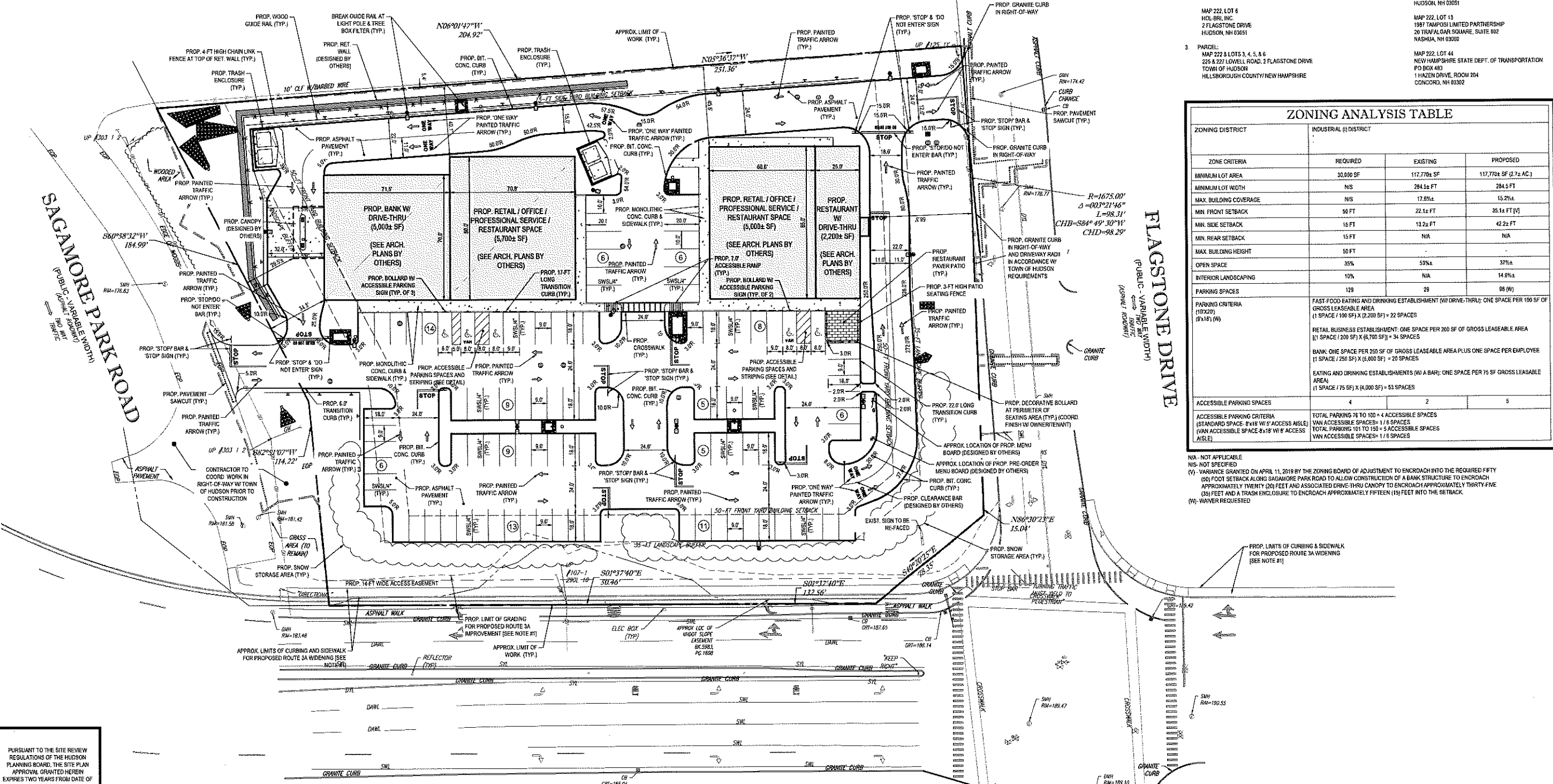
SHEET NUMBER: **3**  
 OF 18

REV 2 - 10/31/2019



### LAND USE / ZONING INFORMATION & NOTES

- APPLICANT: THE LANNAN COMPANY, 70 TAGGETT DRIVE, NASHUA, NH 03060
- OWNER: MAP 222, LOT 3, ROB HOLDINGS, LLC, PO BOX 302, BROOKLINE, NH 03033
- MAP 222, LOT 4, CORNER LOT, LLC, PO BOX 881, BROOKLINE, NH 03033
- MAP 222, LOT 5, ROALE HOLDINGS, LLC, PO BOX 861, BROOKLINE, NH 03033
- MAP 222, LOT 6, HOL, BRL, INC., 2 FLAGSTONE DRIVE, HUDSON, NH 03051
- PARCEL: MAP 222 & LOTS 3, 4, 5, & 6, 225 & 227 LOWELL ROAD, 2 FLAGSTONE DRIVE, TOWN OF HUDSON, HILLSBOROUGH COUNTY/NEW HAMPSHIRE
- ADJUTING PROPERTIES: MAP 222, LOT 7, RICHARD W. ROSE, 3 SAGAMORE PARK ROAD, HUDSON, NH 03051
- MAP 222, LOT 14, NASH TAMPOSI, 20 TRAFALGAR SQUARE, SUITE 602, NASHUA, NH 03060
- MAP 222, LOT 15, JA VENTURA REALTY LLC, 348 MERRIMACK STREET, METHUEN, MA 01484
- MAP 222, LOT 41-1, MANUEL D. & KATHLEEN M. SOUSA, C/O SOUSA REALTY & DEVELOPMENT, 46 LOWELL ROAD, HUDSON, NH 03051
- MAP 222, LOT 13, 1987 TAMPOSI LIMITED PARTNERSHIP, 20 TRAFALGAR SQUARE, SUITE 602, NASHUA, NH 03060
- MAP 222, LOT 44, NEW HAMPSHIRE STATE DEPT. OF TRANSPORTATION, PO BOX 483, 1 HAZEN DRIVE, ROOM 204, CONCORD, NH 03302



ZONING ANALYSIS TABLE			
ZONING DISTRICT	INDUSTRIAL (B) DISTRICT		
ZONE CRITERIA	REQUIRED	EXISTING	PROPOSED
MINIMUM LOT AREA	30,000 SF	117,770± SF	117,770± SF (2.7± AC)
MINIMUM LOT WIDTH	N/A	284.5± FT	284.5 FT
MAX. BUILDING COVERAGE	N/A	17.85±%	15.2±%
MIN. FRONT SETBACK	50 FT	22.1± FT	35.1± FT (1)
MIN. SIDE SETBACK	15 FT	13.2± FT	42.2± FT
MIN. REAR SETBACK	15 FT	N/A	N/A
MAX. BUILDING HEIGHT	50 FT	-	-
OPEN SPACE	35%	53±%	37±%
INTERIOR LANDSCAPING	10%	N/A	14.8±%
PARKING SPACES	129	29	98 (W)
PARKING CRITERIA (192X20) (9x16) (W)	FAST FOOD EATING AND DRINKING ESTABLISHMENT (W/ DRIVE-THRU): ONE SPACE PER 100 SF OF GROSS LEASABLE AREA (1 SPACE / 100 SF) X (2,200 SF) = 22 SPACES		
	RETAIL BUSINESS ESTABLISHMENT: ONE SPACE PER 200 SF OF GROSS LEASABLE AREA (1 SPACE / 200 SF) X (5,700 SF) = 28 SPACES		
	BANK: ONE SPACE PER 250 SF OF GROSS LEASABLE AREA PLUS ONE SPACE PER EMPLOYEE (1 SPACE / 250 SF) X (5,000 SF) = 20 SPACES		
	EATING AND DRINKING ESTABLISHMENTS (W/ A BAR): ONE SPACE PER 75 SF GROSS LEASABLE AREA (1 SPACE / 75 SF) X (4,000 SF) = 53 SPACES		
ACCESSIBLE PARKING SPACES	4	2	5
ACCESSIBLE PARKING CRITERIA (STANDARD SPACE 8'x16' W/ 5' ACCESS AISLE) (VAN ACCESSIBLE SPACE 9'x16' W/ 6' ACCESS AISLE)	TOTAL PARKING 76 TO 100 = 4 ACCESSIBLE SPACES VAN ACCESSIBLE SPACES = 1 / 6 SPACES TOTAL PARKING 111 TO 150 = 5 ACCESSIBLE SPACES VAN ACCESSIBLE SPACES = 1 / 6 SPACES		

REVISIONS			
REV.	DATE	COMMENT	BY
1	10/9/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
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PROJECT: W191031  
 DRAWN BY: EKR  
 CHECKED BY: AFTAKS  
 DATE: 09/30/2019  
 SCALE: AS NOTED  
 CAD I.D.: W191031\_S02

PERMIT SET

PROJECT: **SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

THE LANNAN COMPANY  
 REAL ESTATE PARTNERSHIP & DEVELOPMENT

LOCATION OF SITE  
 MAP #222, LOTS #3, #4, #5, & #6  
 225 & 227 LOWELL ROAD  
 2 FLAGSTONE DRIVE  
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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 \_\_\_\_\_ DATE \_\_\_\_\_  
 CHAIRMAN SIGNATURE \_\_\_\_\_ SECRETARY SIGNATURE \_\_\_\_\_

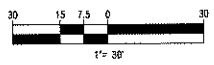
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REFER TO GENERAL NOTES SHEET FOR NOTES

THIS PLAN TO BE UTILIZED FOR SITE LAYOUT PURPOSES ONLY

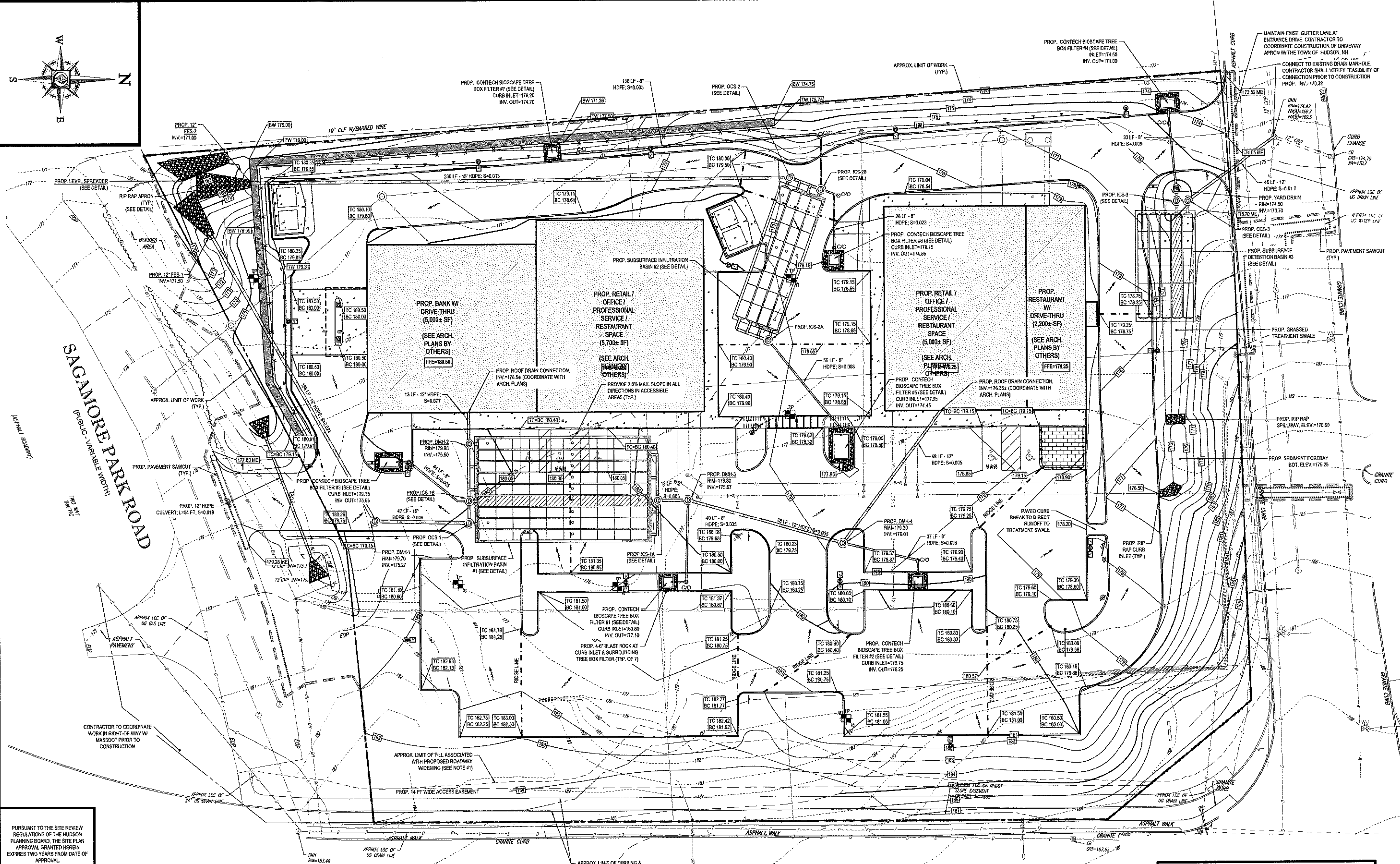
- NOTES:
- APPROXIMATE LIMITS OF LOWELL ROAD (NH ROUTE 3A) IMPROVEMENTS BASED UPON CONCEPTUAL PLANS FOR SAME PROVIDED BY VANASSE HANGEN BRUSTLIN, INC., DATED JUNE 5, 2019.
  - THE SITE DOES NOT CONTAIN FLOOD AREAS NOR ARE THERE FLOOD ZONES PROXIMATE TO THE SITE BASED ON REFERENCED FLOOD INSURANCE RATE MAP 33011C0605D, EFFECTIVE 09/25/2009.



SHEET TITLE: **SITE PLAN**

SHEET NUMBER: **4**  
 OF 18

REV 2 - 10/31/2019



APPROVED BY THE HUDSON, NH PLANNING BOARD

DATE OF MEETING \_\_\_\_\_  
 CHAIRMAN SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
 SECRETARY SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

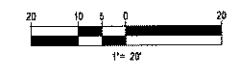


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THIS PLAN TO BE UTILIZED FOR SITE GRADING PURPOSES ONLY

REFER TO GENERAL NOTES SHEET FOR GRADING & UTILITY NOTES

NOTES:  
 1. APPROXIMATE LIMITS OF LOWELL ROAD (NH ROUTE 2A) IMPROVEMENTS BASED UPON CONCEPTUAL PLANS FOR SAME PROVIDED BY VANASSE HANGEN BRUSTLIN, INC. DATED JUNE 5, 2015.



**BOHLER ENGINEERING**

CONSULTING ENGINEERING ARCHITECTURE  
 LAND SURVEYING PROGRAM MANAGEMENT LANDSCAPE ARCHITECTURE  
 RESTAURANT DESIGN PERMITTING SERVICES TRANSPORTATION SERVICES

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REVISIONS

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PERMIT SET

PROJECT No.: W191031  
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 CHECKED BY: AFT/MS  
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PROJECT: **SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

THE LANNAN COMPANY  
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LOCATION OF SITE  
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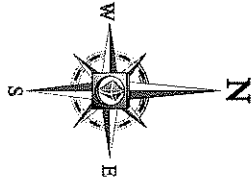
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SHEET TITLE: **GRADING & DRAINAGE PLAN**

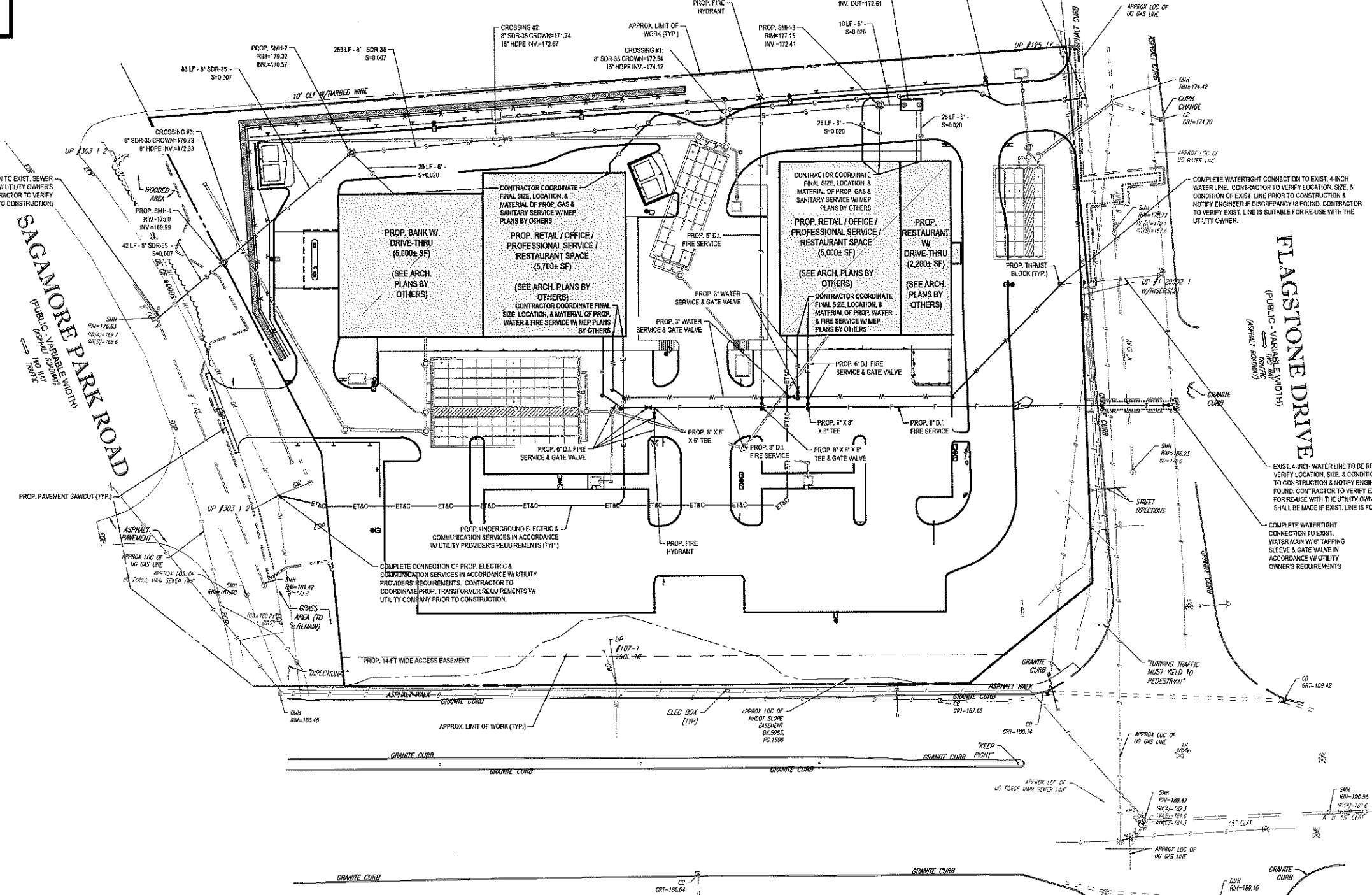
SHEET NUMBER: **5**  
 OF 18

REV 2 - 10/31/2019



COMPLETE WATERTIGHT CONNECTION TO EXIST. SEWER MANHOLE IN ACCORDANCE W/ UTILITY OWNERS REQUIREMENTS. INV.=188.74 (CONTRACTOR TO VERIFY EXIST. INVERT ELEVATION PRIOR TO CONSTRUCTION)

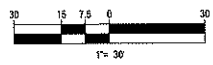
**SAGAMORE PARK ROAD**  
(PUBLIC - VARIABLE WIDTH)  
(ASPHALT ROADWAY)



**FLAGSTONE DRIVE**  
(PUBLIC - VARIABLE WIDTH)  
(ASPHALT ROADWAY)

**LOWELL ROAD**  
(AKA N.H. ROUTE 3A)  
(PUBLIC - VARIABLE WIDTH)  
(ASPHALT ROADWAY)

THIS PLAN TO BE UTILIZED FOR UTILITIES PURPOSES ONLY  
REFER TO GENERAL NOTES SHEET FOR GRADING & UTILITY NOTES



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 \_\_\_\_\_ DATE \_\_\_\_\_  
CHAIRMAN SIGNATURE \_\_\_\_\_ SECRETARY SIGNATURE \_\_\_\_\_



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**BOHLER ENGINEERING**

STATE WIDE CONSULTING ENGINEERING  
LAND SURVEYING PROGRAM MANAGEMENT LANDSCAPE ARCHITECTURE  
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MEMPHIS, TN  
MIAMI, FL  
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REVISIONS

REV	DATE	COMMENT	BY
1	10/3/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/3/2019	PER PEER REVIEW COMMENTS	EKR
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PERMIT SET

PROJECT No.: W191031  
DRAWN BY: EKR  
CHECKED BY: AFTANKB  
DATE: 09/30/2019  
SCALE: AS NOTED  
CAD I.D.: W191031\_GS2

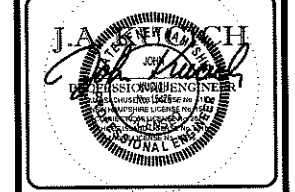
PROJECT: **SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

THE LANNAN COMPANY  
REAL ESTATE INVESTMENT & DEVELOPMENT

LOCATION OF SITE  
MAP #222, LOTS #3, #4, #5, & #6  
225 & 227 LOWELL ROAD  
2 FLAGSTONE DRIVE  
TOWN OF HUDSON  
HILLSBOROUGH COUNTY,  
NEW HAMPSHIRE

**BOHLER ENGINEERING**

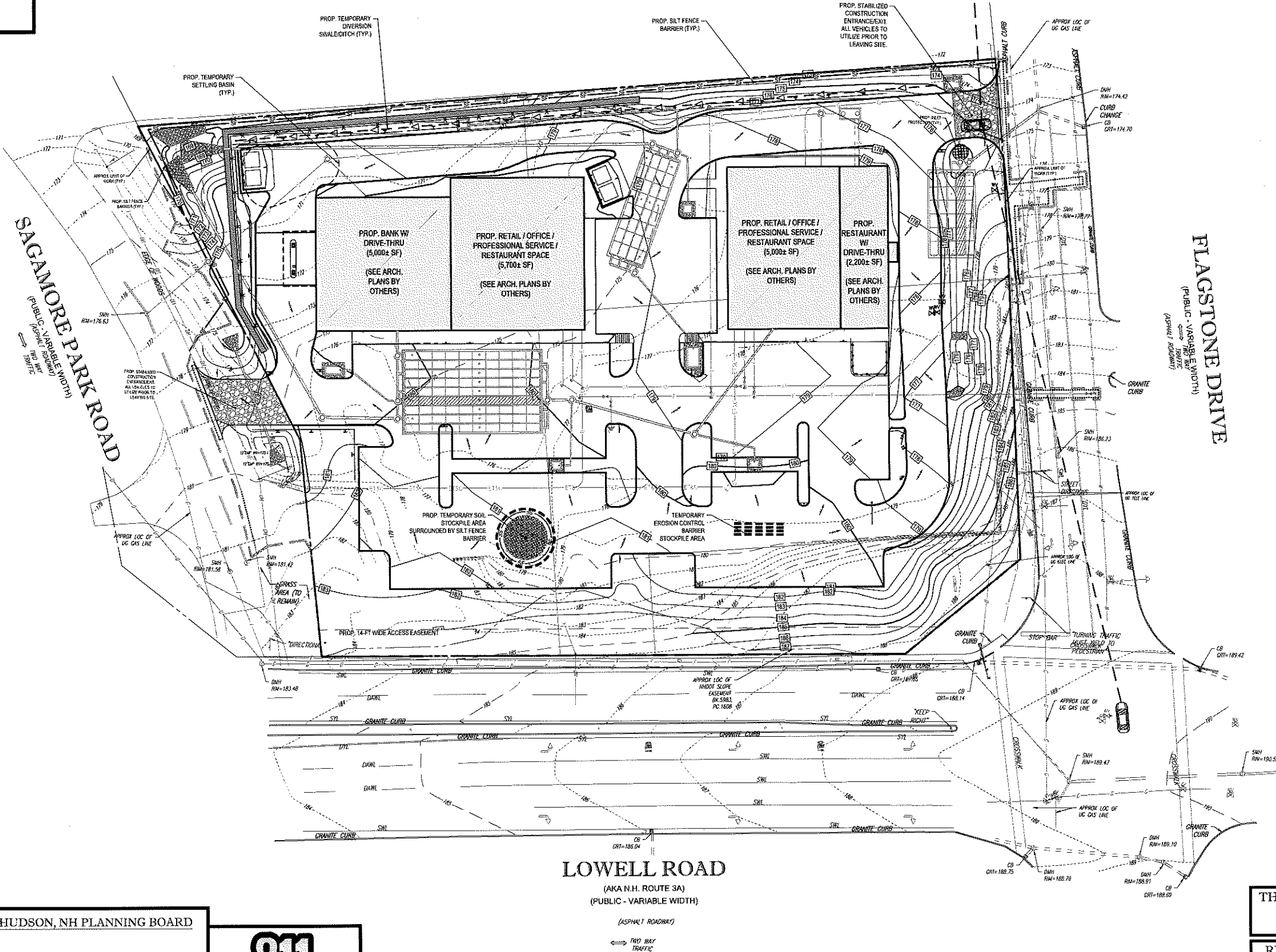
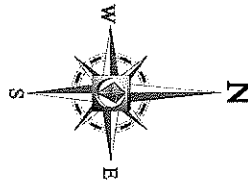
352 TURNPIKE ROAD  
SOUTHBOROUGH, MA 01772  
Phone: (508) 480-9900  
Fax: (508) 480-9080  
[www.BohlerEngineering.com](http://www.BohlerEngineering.com)



SHEET TITLE: **UTILITY PLAN**

SHEET NUMBER: **6**  
OF 18

REV 2 - 10/31/2019



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

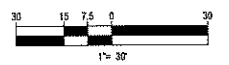
DATE OF MEETING \_\_\_\_\_ DATE \_\_\_\_\_  
 CHAIRMAN SIGNATURE \_\_\_\_\_ SECRETARY SIGNATURE \_\_\_\_\_



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.

THIS PLAN TO BE UTILIZED FOR SITE SOIL AND EROSION CONTROL PURPOSES ONLY

REFER TO SOIL EROSION CONTROL NOTES & DETAIL SHEET FOR EROSION NOTES AND DETAILS



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**REVISIONS**

REV	DATE	COMMENT	BY
1	10/3/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
3			
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**PERMIT SET**

PROJECT No.: W191031  
 DRAWN BY: EKR  
 CHECKED BY: AFT/AMK  
 DATE: 09/30/2019  
 SCALE: AS NOTED  
 CAD I.D.: W191031.S82

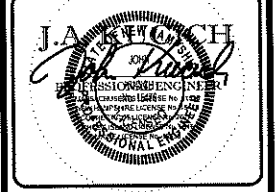
**SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

AT THE LANNAN COMPANY  
 Real Estate Investment & Development

LOCATION OF SITE  
 MAP #222, LOTS #3, #4, #5, & #6  
 225 & 227 LOWELL ROAD  
 2 FLAGSTONE DRIVE  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY,  
 NEW HAMPSHIRE

**BOHLER ENGINEERING**

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SHEET TITLE:  
**SOIL EROSION & SEDIMENT CONTROL PLAN**

SHEET NUMBER:  
**7**  
 OF 18

REV 2 - 10/31/2019



## EROSION & SEDIMENT CONTROL NOTES

- ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE AS SET FORTH IN THE MOST CURRENT STATE SEDIMENT AND EROSION CONTROL MANUAL.
- THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNVEGETATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL. IF THE DISTURBANCE IS WITHIN 100 FEET OF A STREAM OR POOL, THE AREA SHALL BE STABILIZED WITHIN 7 DAYS OR PRIOR TO ANY STORM EVENT (THIS WOULD INCLUDE WETLANDS).
- SEDIMENT BARRIERS (SILT FENCE, STRAW BARRIERS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15% AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 5%.
- INSTALL SILTATION BARRIER AT TOE OF SLOPE TO FILTER SILT FROM RUNOFF. SEE SILTATION BARRIER DETAILS FOR PROPER INSTALLATION. SILTATION BARRIER WILL REMAIN IN PLACE PER NOTE #5.
- ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT, THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UP-SLOPE ARE STABILIZED BY TURF.
- NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO TO ONE (2:1).
- IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCH (DORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
- TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST TO PROTECT FROM SPRING RUNOFF PROBLEMS.
- DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS.
- REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:
  - SIX INCHES OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE.
  - APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TESTING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 500 LB PER ACRE OR 18.4 LB PER 1,000 SF USING 10-20-20 OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (139 LB PER 1,000 SF).
  - FOLLOWING SEED BED PREPARATION, DITCHES AND BACK SLOPES WILL BE SEED TO A MIXTURE OF 47% CREEPING RED FESCUE, 5% REDTOP, AND 48% TALL FESCUE. THE LAWN AREAS WILL BE SEED TO A PREMIUM TURF MIXTURE OF 44% KENTUCKY BLUEGRASS, 44% CREEPING RED FESCUE, AND 12% PERENNIAL RYEGRASS. SEEDING RATE IS 1.03 LBS PER 1,000 SF LAWN QUALITY SOO MAY BE SUBSTITUTED FOR SEED.
  - STRAW MULCH AT THE RATE OF 70-80 LBS PER 1,000 SF. A HYDRO-APPLICATION OF WOOD OR PAPER FIBER SHALL BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS WILL BE USED ON STRAW MULCH FOR WIND CONTROL.
- ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.
- WETLANDS WILL BE PROTECTED WITH STRAWBALES AND/OR SILT FENCE INSTALLED AT THE EDGE OF THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE.
- ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL HAVE AN EXPOSURE WINDOW OF NOT MORE THAN 7 DAYS.
- ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL FOLLOW APPROPRIATE EROSION CONTROL MEASURES PRIOR TO EACH STORM IF NOT BEING ACTIVELY WORKED.

### MULCH

LOCATION	MULCH	RATE (1000 SF)
PROTECT AREA	STRAW	100 POUNDS
WINDY AREA	SHREDDED OR CHOPPED CORNSTALKS STRAW (ANCHORED)	180-275 POUNDS 100 POUNDS
MODERATE TO HIGH VELOCITY AREAS OR STEEP SLOPES GREATER THAN 3:1	JUTE MESH OR EXCELSDIOR MAT	AS REQUIRED

GREATER THAN 3:1 (REFER TO GEOTECHNICAL REPORT FOR FINAL DESIGN REQUIREMENT)

\*A HYDRO-APPLICATION OF WOOD OR PAPER FIBER MAY BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS SHALL BE USED ON STRAW MULCH FOR WIND CONTROL.

**MULCH ANCHORING**  
ANCHOR MULCH WITH PEG AND TWINE (1 SQ. YD./BLOCK). MULCH NETTING (AS PER MANUFACTURER); WOOD CELLULOSE FIBER (750 LBS/ACRE); CHEMICAL TACK (AS PER MANUFACTURER'S SPECIFICATIONS); USE OF A SEPARATED STRAIGHT DISK, NETTING FOR SMALL AREAS AND ROAD DITCHES MAY BE PERMITTED.

## EROSION CONTROL NOTES DURING WINTER CONSTRUCTION

- WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15.
- WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
- EXPOSED AREA SHOULD BE LIMITED TO THAT CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.
- CONTINUATION OF EARTHWORK OPERATION ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.
- AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR SEED AT A RATE OF 100 LB PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE.
- BETWEEN THE DATES OF OCTOBER 15 AND APRIL 15, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MAY BE DORMANT SEED AT A RATE OF 200 - 300% HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE CONTINUOUSLY GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT UNEXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT. EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.
- MULCHING REQUIREMENTS:
  - BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING OR WOOD CELLULOSE FIBER.
  - MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPE EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 5%.
  - MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15% AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 5%.
- AFTER NOVEMBER 1ST THE CONTRACTOR SHALL APPLY DORMANT SEEDING OR MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.
- DURING THE WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.
- STOCKPILING OF MATERIALS (DIRT, WOOD, CONSTRUCTION MATERIALS, ETC.) MUST REMAIN COVERED AT ALL TIMES TO MINIMIZE ANY DUST PROBLEMS THAT MAY OCCUR WITH ADJACENT PROPERTIES AND TO PROVIDE MAXIMUM PROTECTION AGAINST EROSION RUNOFF.
- EXISTING CATCH BASIN STRUCTURES SHALL BE PROTECTED UNTIL SUCH TIME AS THEY ARE REMOVED.

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	DATE
CHAIRMAN SIGNATURE	DATE
SECRETARY 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.

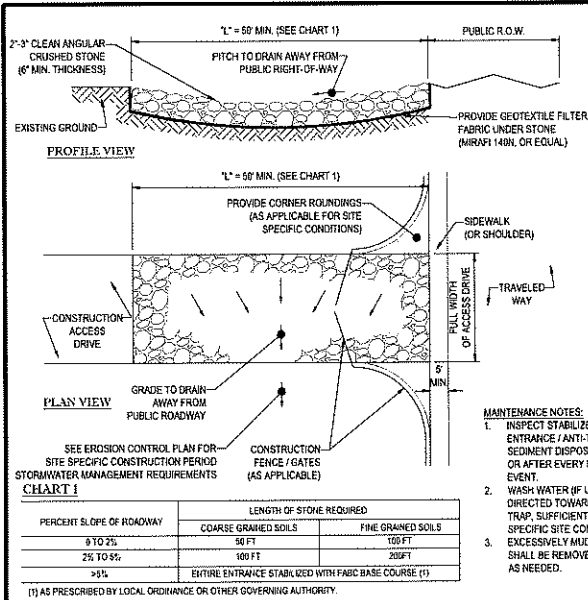
## ALTERATION OF TERRAIN CONSTRUCTION SEQUENCE AND EROSION CONTROL NOTES

- THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
- PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
- PONDS AND SWALES SHALL BE INSTALLED EARLY ON IN THE CONSTRUCTION SEQUENCE (BEFORE ROUGH GRADING THE SITE).
- ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
- ALL ROADWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- ALL CUT AND FILL SLOPES SHALL BE SEED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
- THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
- AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
  - BASE COURSE GRAVEL HAS BEEN INSTALLED IN AREAS TO BE PAVED
  - A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED
  - A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL, SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
  - EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
- ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
- WINTER CONSTRUCTION NOTES:
  - ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING. ELSEWHERE THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
  - ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
  - AFTER NOVEMBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER WHOLE (SEE 3A.3).

## CONSTRUCTION SEQUENCE

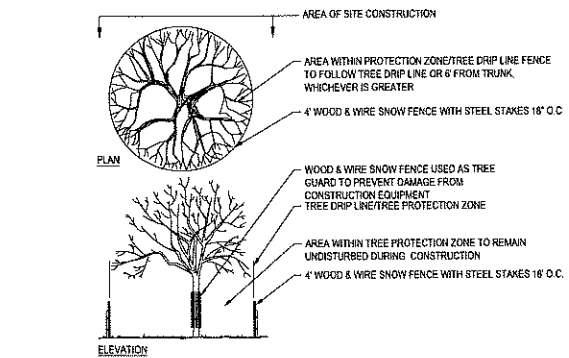
THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:

- INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE/EXIT (AS SHOWN)
- INSTALLATION OF EROSION CONTROL BARRIER (SILT FENCE) (AS SHOWN)
- DEMOLITION OF EXISTING SITE PAVEMENT AND AMENITIES (SEE DEMOLITION PLAN)
- CLEARING AND GRUBBING
- INSTALLATION OF TEMPORARY SWALES AND SEDIMENT BASINS
- EARTHWORK AND EXCAVATION/FILLING AS NECESSARY
- CONSTRUCTION OF UTILITIES
- STABILIZE PERMANENT LAWN AREAS AND SLOPES WITH TEMPORARY SEEDING
- INSTALLATION OF INLET PROTECTION OF ON-SITE UTILITIES (AS SHOWN)
- CONSTRUCTION OF BUILDINGS
- CONSTRUCTION OF ALL CURBING AND LANDSCAPE ISLANDS AS INDICATED ON THE PLANS
- SPREAD TOPSOIL ON SLOPED AREAS AND SEED AND MULCH
- FINAL GRADING OF ALL SLOPED AREAS
- PLACE 6" TOPSOIL ON SLOPES AFTER FINAL GRADING COMPLETED. FERTILIZE, SEED, AND MULCH SEED MIXTURE TO BE INSTALLED AS REQUIRED.
- REMOVAL OF THE TEMPORARY SEDIMENT BASINS
- PAVE PARKING LOT
- LANDSCAPING PER LANDSCAPING PLAN
- REMOVE EROSION CONTROLS AS DISTURBED AREAS BECOME STABILIZED TO 75% STABILIZATION OR GREATER.



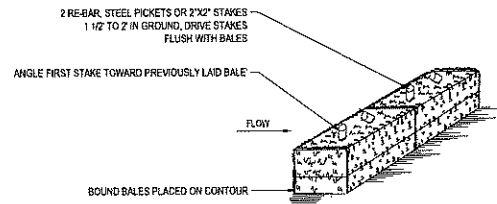
## STABILIZED CONSTRUCTION EXIT

N.T.S.



## TREE PROTECTION DURING CONSTRUCTION

N.T.S.



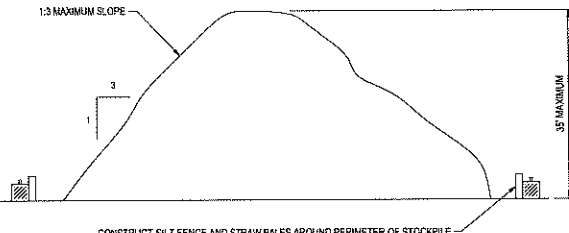
DRAINAGE AREA NO MORE THAN 1/4 AC. PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%.

- NOTES:
- BALES SHALL BE PLACED AT THE TOP OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
  - EACH BALE SHALL BE PLACED SO THE BINDINGS ARE HORIZONTAL.
  - BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR REBARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
  - INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE PROMPTLY AS NEEDED.
  - BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

## STRAW BALE DETAIL

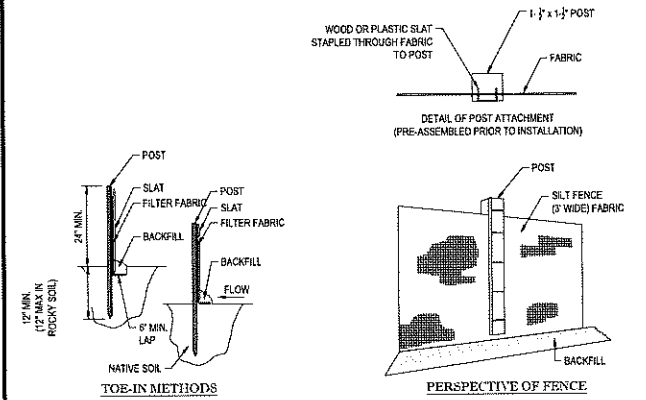
N.T.S.

- INSTALLATION:
- EXCAVATE A 6\"/>



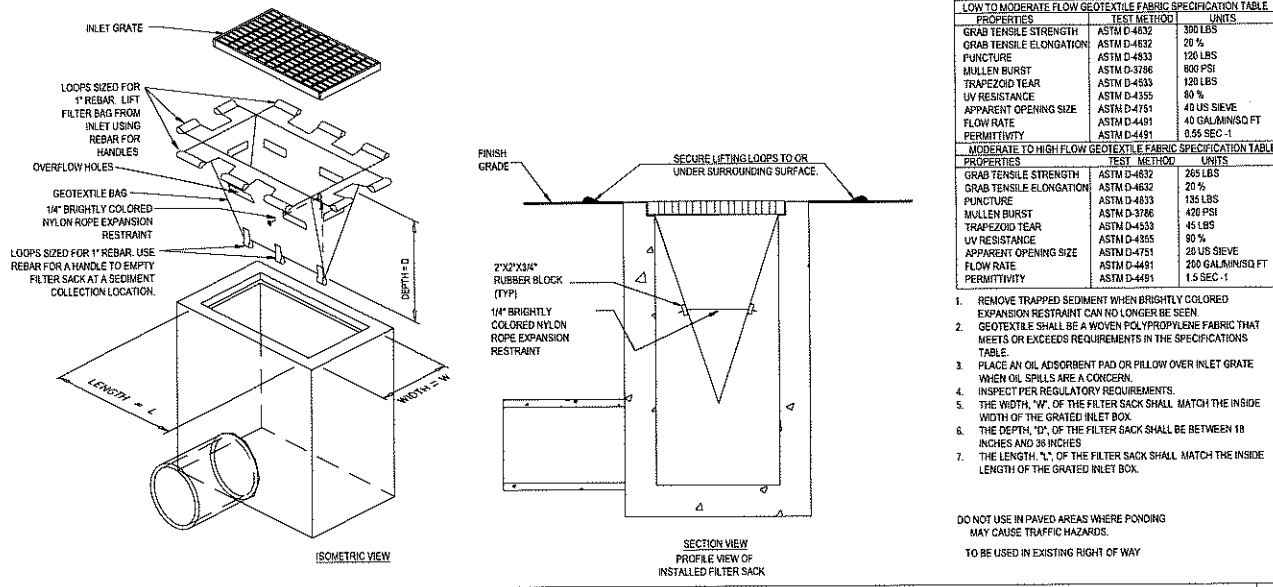
## TEMPORARY STOCKPILE DETAIL

N.T.S.



## TYP. SILTATION FENCE DETAIL

N.T.S.



## INLET PROTECTION (GRATED INLETS)

N.T.S.

LOW TO MODERATE FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE			
PROPERTIES	TEST METHOD	UNITS	
GRAB TENSILE STRENGTH	ASTM D-4832	300 LBS	20%
GRAB TENSILE ELONGATION	ASTM D-4832	20%	
PUNCTURE	ASTM D-4833	120 LBS	
MULLEN BURST	ASTM D-3786	800 PSI	
TRAPEZOID TEAR	ASTM D-4533	120 LBS	
UV RESISTANCE	ASTM D-4355	80%	
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE	
FLOW RATE	ASTM D-4491	200 GAL./MIN/SQ FT	
PERMITTIVITY	ASTM D-4491	0.55 SEC.-1	

MODERATE TO HIGH FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE			
PROPERTIES	TEST METHOD	UNITS	
GRAB TENSILE STRENGTH	ASTM D-4832	265 LBS	
GRAB TENSILE ELONGATION	ASTM D-4832	20%	
PUNCTURE	ASTM D-4833	135 LBS	
MULLEN BURST	ASTM D-3786	420 PSI	
TRAPEZOID TEAR	ASTM D-4533	45 LBS	
UV RESISTANCE	ASTM D-4355	80%	
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE	
FLOW RATE	ASTM D-4491	200 GAL./MIN/SQ FT	
PERMITTIVITY	ASTM D-4491	1.5 SEC.-1	

- REMOVE TRAPPED SEDIMENT WHEN BRIGHTLY COLORED EXPANSION RESTRAINT CAN NO LONGER BE SEEN.
- GEOTEXTILE SHALL BE A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS REQUIREMENTS IN THE SPECIFICATIONS TABLE.
- PLACE AN OIL ADSORBENT PAD OR FLOW OVER INLET GRATE WHEN OIL SPILLS ARE A CONCERN.
- INSPECT PER REGULATORY REQUIREMENTS.
- THE WIDTH, "W", OF THE FILTER SACK SHALL MATCH THE INSIDE WIDTH OF THE GRATED INLET BOX.
- THE DEPTH, "D", OF THE FILTER SACK SHALL BE BETWEEN 18 INCHES AND 36 INCHES.
- THE LENGTH, "L", OF THE FILTER SACK SHALL MATCH THE INSIDE LENGTH OF THE GRATED INLET BOX.

DO NOT USE IN PAVED AREAS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

TO BE USED IN EXISTING RIGHT OF WAY

**BOHLER ENGINEERING**  
 SITE CIVIL AND CONSULTING ENGINEERING  
 LAND SURVEYING PROGRAM MANAGEMENT LANDSCAPE ARCHITECTURE  
 SUSTAINABLE DESIGN PERMITTING SERVICES TRANSPORTATION SERVICES  
 • BALTIMORE, MD • CHARLOTTE, NC  
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 • WASHINGTON, DC  
 • WASHINGTON STATE • WISCONSIN  
 • NORTH CAROLINA

REVISIONS				
REV	DATE	COMMENT	BY	
1	10/9/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR	
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR	
3				
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**PERMIT SET**  
 PROJECT NO: W191031  
 DRAWN BY: EKR  
 CHECKED BY: AFT/ANK  
 DATE: 09/20/2019  
 SCALE: AS NOTED  
 CAD I.D.: W191031\_S52

**PROJECT: SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**  
 THE LANNAN COMPANY  
 LOCATION OF SITE  
 MAP #222, LOTS #3, #4, #5, & #6  
 225 & 227 LOWELL ROAD  
 2 FLAGSTONE DRIVE  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY, NEW HAMPSHIRE

**BOHLER ENGINEERING**  
 352 TURNPIKE ROAD  
 SOUTHBOROUGH, MA 01772  
 Phone: (508) 480-9900  
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**J.A. NEWBERRY**  
 PROFESSIONAL ENGINEER  
 1936 WASHINGTON ST. SUITE 200  
 WASHINGTON, NH 03081  
 TEL: (603) 751-3333  
 FAX: (603) 751-3334

**SHEET TITLE: SOIL EROSION CONTROL NOTES & DETAILS SHEET**  
 SHEET NUMBER: 8 OF 18  
 REV 2 - 10/31/2019

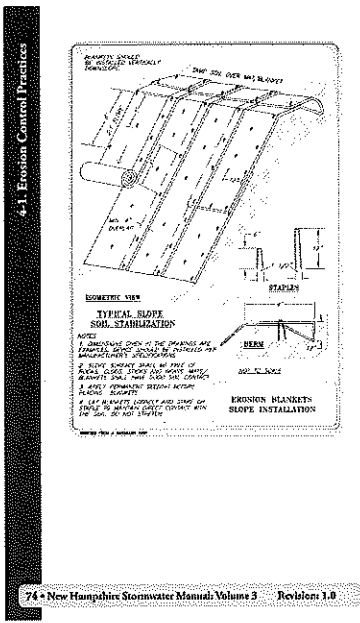
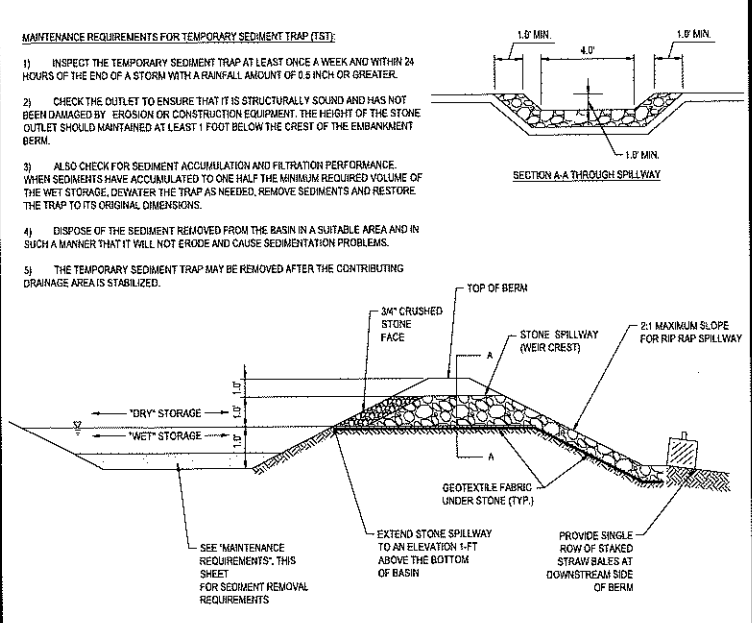


Table 4-1. Seeding Recommendations for Temporary Vegetation

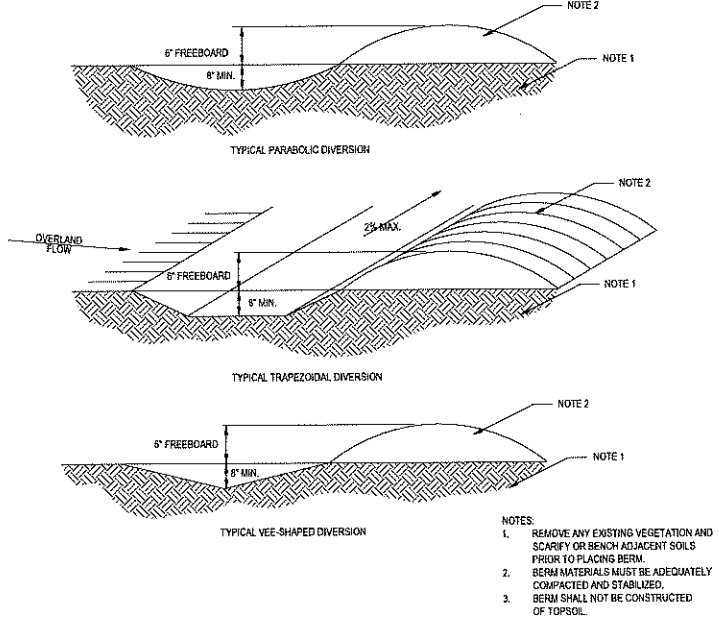
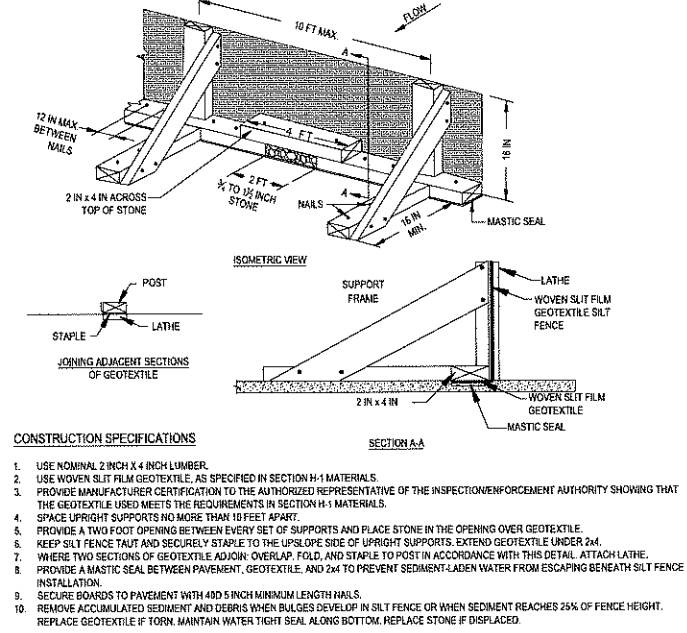
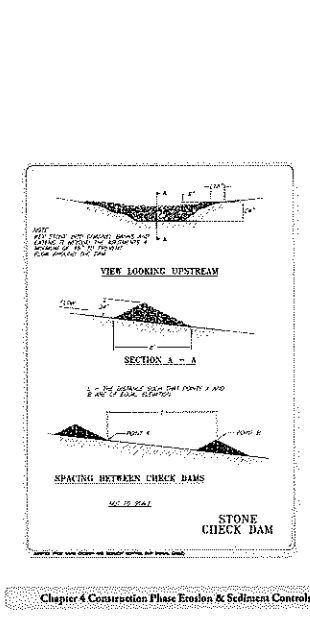
Species	Per Acre bushels (BU) or pounds (lb)	Per 1,000 sq ft	Remarks
Winter Rye	2 BU or 112 lbs.	2.5 lbs	Best for fall seeding. Seed from August 15 to September 15 for best cover. Seed to a depth of 1 inch.
Oats	2.5 BU or 80 lbs.	2 lbs	Best for spring seedings. Seed no later than May 15 for summer protection. Seed to a depth of 1 inch.
Annual Ryegrass	40 lbs.	1 lb	Grows quickly, but is of short duration. Use where appearances are important. Seed early spring and/or between August 15 and September 15. Cover the seed with no more than 0.25 inch of soil.
Perennial Ryegrass	30 lbs.	0.7 lb	Good cover which is longer lasting than annual ryegrass. Seed between April 1 and June 1 and/or between August 15 and September 15. Mulching will allow seeding throughout the growing season. Seed to a depth of approximately 0.5 inch.



EROSION CONTROL BLANKET DETAIL

TEMPORARY SEEDING SPECIFICATION

TEMPORARY SEDIMENT TRAP DETAIL



STONE CHECK DAM DETAIL

SILT FENCE ON PAVEMENT

TEMPORARY DIVERSIONS

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 \_\_\_\_\_

CHAIRMAN SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SECRETARY SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

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

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REVISIONS

REV	DATE	COMMENT	BY
1	10/9/2019	PER ALTERNATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
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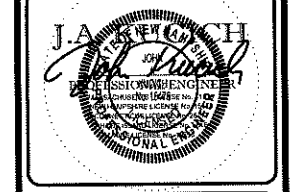
PERMIT SET

PROJECT No.: W191031  
 DRAWN BY: EKR  
 CHECKED BY: AFT/MKB  
 DATE: 09/30/2019  
 SCALE: AS NOTED  
 CAD I.D.: W191031\_S52

PROJECT: **SITE DEVELOPMENT PLANS**  
 FOR  
**FLAGSTONE CROSSING**  
 AT THE LANNAN COMPANY  
 225 & 227 LOWELL ROAD  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY,  
 NEW HAMPSHIRE

**BOHLER ENGINEERING**

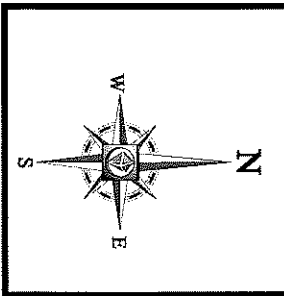
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SHEET TITLE:  
**SOIL EROSION CONTROL NOTES & DETAILS SHEET**

SHEET NUMBER:  
**9**  
 OF 18

REV 2 - 10/31/2019



**'QUICK EROSION CONTROL COVER MIX' AS PREPARED BY:**

ERNST CONSERVATION SEEDS, INC.  
8804 MERCER PIKE, HENRIEVILLE, PA 16335  
PHONE: 800-873-3321 / 814-336-2404  
EMAIL: SALES@ERNSTSEED.COM  
WEBSITE: WWW.ERNSTSEED.COM

APPLICATION RATE: 50 LBS. / ACRE

MIX COMPOSITION:  
50.0% Lolium multiflorum (Annual Ryegrass)  
50.0% Lolium perenne 'Blackcat II' (Perennial Ryegrass)

**SLOPE SEED MIX SPECIFICATIONS**

**'NATIVE DETENTION AREA MIX' AS PREPARED BY:**

ERNST CONSERVATION SEEDS, INC.  
8804 MERCER PIKE, HENRIEVILLE, PA 16335  
PHONE: 800-873-3321 / 814-336-2404  
EMAIL: SALES@ERNSTSEED.COM  
WEBSITE: WWW.ERNSTSEED.COM

APPLICATION RATE: 1/2 LB. / 1000 SQ. FT. (20 LBS. / ACRE)

MIX COMPOSITION:  
28.0% Panicum clandestinum, 'Toga' (Barnyardgrass, 'Toga')  
24.0% Carex vulpoides, PA Ecotype (Fox Sedge, PA Ecotype)  
20.0% Elymus virginicus, PA Ecotype (Virginia Wildrye, PA Ecotype)  
20.0% Panicum virginicum, 'Shawnee' (Switchgrass, 'Shawnee')  
4.0% Agrostis perennans, PA Ecotype (Adiantum Broomgrass, PA Ecotype)  
2.0% Juncus tenuis, PA Ecotype (Soft Rush, PA Ecotype)  
1.0% Juncus effusus (Soft Rush)

**DETENTION BASIN SEED MIX SPECIFICATIONS**

- PRIOR TO SEEDING, AREA IS TO BE TOPSOILED, FINE GRADED, AND RAKED OF ALL DEBRIS LARGER THAN 2" DIAMETER.
- PRIOR TO SEEDING, CONSULT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
- SEEDING RATES:  
• PERENNIAL RYEGRASS 12 LB/1000 SQ FT  
• KENTUCKY BLUEGRASS 11 LB/1000 SQ FT  
• RED FESCUE 12 LB/1000 SQ FT  
• SPREADING FESCUE 12 LB/1000 SQ FT  
• FERTILIZER (16-32-16) 2 LB/1000 SQ FT  
• LIQUID LIME 1 GAL/900 GAL  
• TANK TACKIFIER 25 LB/900 GAL  
• TANK FIBER MULCH 30 LB/1000 SQ FT
- GERMINATION RATES WILL VARY AS TO TIME OF YEAR FOR SOWING. CONTRACTOR TO IRRIGATE SEEDED AREA UNTIL AN ACCEPTABLE STAND OF COVER IS ESTABLISHED BY OWNER.

**HYDROSEED SPECIFICATIONS**

**TOWN OF HUDSON LANDSCAPE REQUIREMENTS**

SECTION	REQUIREMENTS	CALCULATIONS/PROPOSED
ARTICLE 275-C.7	a. A MINIMUM OF 10% OF THE INTERIOR OF A PARKING LOT SHALL BE SET ASIDE FOR LANDSCAPING AREAS EXCLUSIVE OF PAVED PEDESTRIAN SURFACES. b. THE LANDSCAPED AREA SHALL BE CALCULATED AS 10% OF THE TOTAL AREA AND DRIVE AISLES. c. A MINIMUM OF ONE SHADE TREE SHALL BE PLANTED PER 1,600 SQ. FT. OF PAVED AREA, OR 1 SHADE TREE PER EVERY 3 PARKING SPACES, WHICHEVER IS GREATER. d. ONE SHRUB PER 200 SQ. FT. OF PAVED AREA SHALL BE PLANTED OR 1.6 SHRUBS PER EVERY PARKING SPACE. e. THIS SECTION SHALL NOT APPLY TO PARKING AREAS CONSISTING OF A SINGLE ACCESS LANE.	REQUIRED: 10% LANDSCAPE AREA PROVIDED: 24% LANDSCAPE AREA  REQUIRED: PARKING LOT PAVED AREA: 45,400 SQ. FT. / 1,600 SQ. FT. = 28.4, OR 28 TREES PROVIDED: 29 TREES  REQUIRED: PARKING LOT PAVED AREA: 45,400 SQ. FT. / 200 SQ. FT. = 227 SHRUBS (N) / 1.6 X 88 PARKING SPACES = 167 SHRUBS PROVIDED: 163 SHRUBS
ARTICLE 275-C.8	SCREENING SHALL BE PROVIDED FOR VISUAL SEPARATION OF INCOMPATIBLE USES. SCREENING SHALL BE PROVIDED BETWEEN PARKING AND LOADING AREAS AND, IF PRESENT, AND ADJUTING RESIDENTIAL ZONE. SCREENING MAY ALSO BE REQUIRED BETWEEN ADJUTING NONRESIDENTIAL SITES.	PROVIDED

\* (W) = WALKER

**LANDSCAPE SCHEDULE**

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	CONT.
<b>SHADE TREES</b>					
ARA	14	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG COLUMNAR RED MAPLE	2 1/2" CAL.	8" B
PCCA	7	PYRUS CALLERYANA 'CAPITAL'	CAPITAL PEAR	2 1/2" CAL.	8" B
SUBTOTAL:	21				
<b>ORNAMENTAL TREES</b>					
SRS	8	SYRINGA RETICULATA 'IVORY SILK'	IVORY SILK JAPANESE TREE LILAC	1-2"	8" B
SUBTOTAL:	8				
<b>EVERGREEN TREES</b>					
TOE	11	THUJA OCCIDENTALIS 'EMERALD'	EMERALD GREEN ARBORVITAE	5-6"	8" B
SUBTOTAL:	11				
<b>DECIDUOUS SHRUBS</b>					
CA	25	CLETHRA ALNIFOLIA	SUMMERSWEET CLETHRA	24-30"	CONTAINER
NWR	41	ILEX VERTICILLATA 'WINTER RED'	WINTER RED WINTERBERRY HOLLY	30-36"	CONTAINER
PHA	39	PHYSCOPARUS OPULIFOLIUS 'ANGEL'	ANGEL WINTERBERRY	24-30"	CONTAINER
SUBTOTAL:	105				
<b>EVERGREEN SHRUBS</b>					
KLE	38	HALIMA LATIFOLIA 'ELF'	ELF MOUNTAIN LAUREL	18-24"	CONTAINER
RPG	6	RHOODOXANDRUM 'PURPLE GEM'	PURPLE GEM RHOODOXANDRUM	24-30"	CONTAINER
TH	5	TAXUS MEDIA 'HECKSIE'	HICKS YEW	30-36"	B/B
SUBTOTAL:	47				

**BOHLER ENGINEERING**

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• WASHINGTON, DC

**REVISIONS**

REV	DATE	COMMENT	BY
1	10/9/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
3			
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9			

**PERMIT SET**

PROJECT No.: W191031  
DRAWN BY: SVR  
CHECKED BY: AFTAMB  
DATE: 09/30/2019  
SCALE: AS NOTED  
CAD I.D.: W191031\_S22\_LAND

**PROJECT: SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

THE LANNAN COMPANY  
REAL ESTATE INVESTMENT & DEVELOPMENT

LOCATION OF SITE  
MAP #222, LOTS #3, #4, #5, & #6  
225 & 227 LOWELL ROAD  
2 FLAGSTONE DRIVE  
TOWN OF HUDSON  
HILLSBOROUGH COUNTY,  
NEW HAMPSHIRE

**BOHLER ENGINEERING**

352 TURNPIKE ROAD  
SOUTHBOROUGH, MA 01772  
Phone: (508) 480-9900  
Fax: (508) 480-9080  
www.BohlerEngineering.com

**M. J. MARVA**

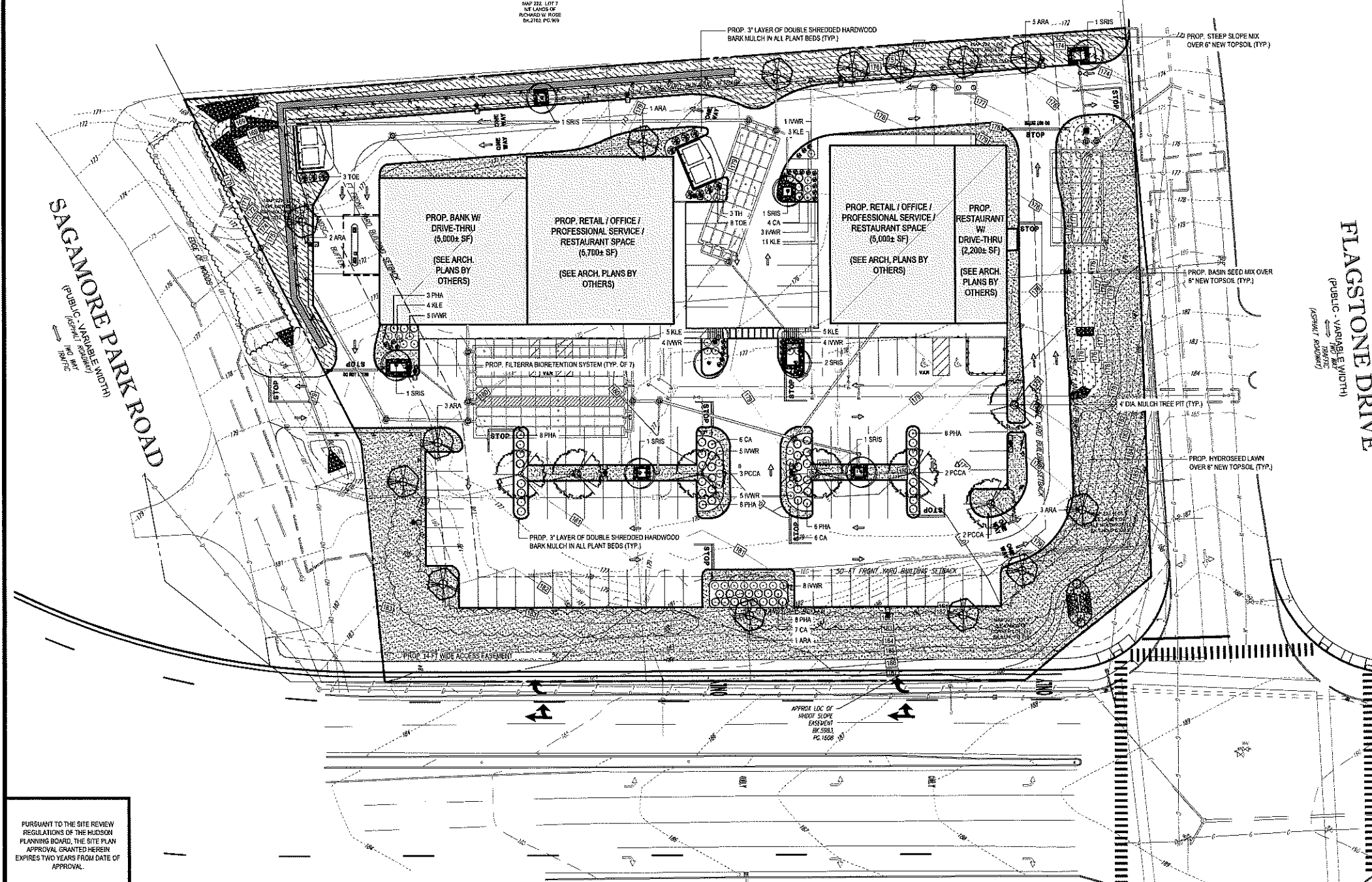
REGISTERED LANDSCAPE ARCHITECT

NEW HAMPSHIRE No. 109  
CONNECTICUT No. 1350

SHEET TITLE:  
**LANDSCAPE PLAN**

SHEET NUMBER:  
**9**  
OF 18

REV 2 - 10/31/2019



**APPROVED BY THE HUDSON, NH PLANNING BOARD**

DATE OF MEETING: \_\_\_\_\_

CHAIRMAN SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

SECRETARY 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.

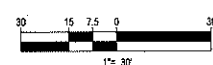
**811**

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**LOWELL ROAD**  
(AKA N.H. ROUTE 3A)  
(PUBLIC - VARIABLE WIDTH)  
(ASPHALT ROADWAY)

TWO WAY TRAFFIC

NOTE: CONTRACTOR TO PROVIDE SCREENING FOR GROUND MOUNTED TRANSFORMERS, IF REQUIRED. CONTRACT ENGINEER ON RECORD IF REQUIRED.



# LANDSCAPE SPECIFICATIONS

## 1. SCOPE OF WORK

1.1 THE LANDSCAPE CONTRACTOR SHALL BE REQUIRED TO PERFORM ALL CLEARING, FINISHED GRADING, SOIL PREPARATION, PERMANENT SEEDING OR SODDING, PLANTING AND MULCHING INCLUDING ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY FOR THE COMPLETION OF THIS PROJECT, UNLESS OTHERWISE CONTRACTED BY THE GENERAL CONTRACTOR.

## 2. MATERIALS

- 2.1 GENERAL - ALL HARDSCAPE MATERIALS SHALL MEET OR EXCEED SPECIFICATIONS AS OUTLINED IN THE STATE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
- 2.2 TOPSOIL - NATURAL, FRIABLE, LOAMY SILT SOIL HAVING AN ORGANIC CONTENT NOT LESS THAN 5%, A PH RANGE BETWEEN 4.5-7.0 IT SHALL BE FREE OF DEBRIS, ROCKS LARGER THAN ONE INCH (1"), WOOD, ROOTS, VEGETABLE MATTER AND CLAY CLODS.
- 2.3 LAWN - ALL DISTURBED AREAS ARE TO BE TREATED WITH A MINIMUM 4" THICK LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, AND SEEDED OR SODDED IN ACCORDANCE WITH THE PERMANENT STABILIZATION METHODS INDICATED ON THE LANDSCAPE PLAN.
- 2.3.1 LAWN SEED MIXTURE SHALL BE FRESH, CLEAN CROP SEED.
- 2.3.2 SOD SHALL BE STRONGLY ROOTED, WEED AND DISEASE FREE WITH A UNIFORM THICKNESS. SOD INSTALLED ON SLOPES GREATER THAN 4:1 SHALL BE PEGGED TO HOLD SOD IN PLACE.
- 2.4 MULCH - ALL PLANTING BEDS SHALL BE MULCHED WITH A 3" THICK LAYER OF DOUBLE SHREDDED HARDWOOD BARK MULCH, UNLESS OTHERWISE STATED ON THE LANDSCAPE PLAN AND/OR LANDSCAPE PLAN NOTES DETAILS.
- 2.5 FERTILIZER
- 2.5.1 FERTILIZER SHALL BE DELIVERED TO THE SITE MIXED AS SPECIFIED IN THE ORIGINAL UNOPENED STANDARD BAGS SHOWING WEIGHT, ANALYSIS AND NAME OF MANUFACTURER. FERTILIZER SHALL BE STORED IN A WEATHER-PROOF PLACE SO THAT IT CAN BE KEPT DRY PRIOR TO USE.
- 2.5.2 FOR THE PURPOSE OF BIDDING, ASSUME THAT FERTILIZER SHALL BE 10% NITROGEN, 5% PHOSPHORUS AND 4% POTASSIUM BY WEIGHT. A FERTILIZER SHOULD NOT BE SELECTED WITHOUT A SOIL TEST PERFORMED BY A CERTIFIED SOIL LABORATORY.
- 2.6 PLANT MATERIAL
- 2.6.1 ALL PLANTS SHALL IN ALL CASES CONFORM TO THE REQUIREMENTS OF THE "AMERICAN STANDARD FOR NURSERY STOCK" (MS129.1) LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION (FORMERLY THE AMERICAN ASSOCIATION OF NURSERYMEN).
- 2.6.2 IN ALL CASES, BOTANICAL NAMES SHALL TAKE PRECEDENCE OVER COMMON NAMES FOR ANY AND ALL PLANT MATERIAL.
- 2.6.3 PLANTS SHALL BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE. TAGS ARE TO REMAIN ON AT LEAST ONE PLANT OF EACH SPECIES FOR VERIFICATION PURPOSES DURING THE FINAL INSPECTION.
- 2.6.4 TREES WITH ABRASION OF THE BARK, SUN SCALDS, DISFIGURATION OR FRESH CUTS OF LIMBS OVER 1/4" WHICH HAVE NOT BEEN COMPLETELY CALLED, SHALL BE REJECTED. PLANTS SHALL NOT BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES.
- 2.6.5 ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH, WELL DEVELOPED BRANCHES, DENSELY FOLIATED, MICROBIUS ROOT SYSTEMS AND BE FREE OF DISEASE, INSECTS, PESTS, EGGS OR LARVAE.
- 2.6.6 CALIPER MEASUREMENTS OF NURSERY GROWN TREES SHALL BE TAKEN AT A POINT ON THE TRUNK SIX INCHES (6") ABOVE THE NATURAL GRADE FOR TREES UP TO AND INCLUDING A FOUR INCH (4") CALIPER SIZE. IF THE CALIPER AT SIX INCHES (6") ABOVE THE GROUND EXCEEDS FOUR INCHES (4") IN CALIPER, THE CALIPER SHOULD BE MEASURED AT A POINT 12" ABOVE THE NATURAL GRADE.
- 2.6.7 SHRUBS SHALL BE MEASURED TO THE AVERAGE HEIGHT OR SPREAD OF THE SHRUB, AND NOT TO THE LONGEST BRANCH.
- 2.6.8 TREES AND SHRUBS SHALL BE HANDLED WITH CARE BY THE ROOT BALL.

## 3. GENERAL WORK PROCEDURES

- 3.1 CONTRACTOR TO UTILIZE WORKMANLIKE INDUSTRY STANDARDS IN PERFORMING ALL LANDSCAPE CONSTRUCTION. THE SITE IS TO BE LEFT IN A CLEAN STATE AT THE END OF EACH WORKDAY. ALL DEBRIS, MATERIALS AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF.
- 3.2 WASTE MATERIALS AND DEBRIS SHALL BE COMPLETELY DISPOSED OF AT THE CONTRACTOR'S EXPENSE. DEBRIS SHALL NOT BE BURNED, INCLUDING ORGANIC MATERIALS, BUT SHALL BE REMOVED COMPLETELY FROM THE SITE.

## 4. SITE PREPARATIONS

- 4.1 BEFORE AND DURING PRELIMINARY GRADING AND FINISHED GRADING, ALL WEEDS AND GRASSES SHALL BE DUG OUT BY THE ROOTS AND DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES OUTLINED HEREIN.
- 4.2 ALL EXISTING TREES TO REMAIN SHALL BE PRUNED TO REMOVE ANY DAMAGED BRANCHES. THE ENTIRE LIMBS OF ANY DAMAGED BRANCH SHALL BE CUT OFF AT THE BRANCH COLLAR. CONTRACTOR SHALL ENSURE THAT CUTS ARE SMOOTH AND STRAIGHT. ANY EXPOSED ROOTS SHALL BE CUT BACK WITH CLEAN, SHARP TOOLS AND TOPSOIL SHALL BE PLACED AROUND THE REMAINDER OF THE ROOTS. EXISTING TREES SHALL BE MONITORED ON A REGULAR BASIS FOR ADDITIONAL ROOT OR BRANCH DAMAGE AS A RESULT OF CONSTRUCTION. ROOTS SHALL NOT BE LEFT EXPOSED FOR MORE THAN ONE (1) DAY. CONTRACTOR SHALL WATER EXISTING TREES AS NEEDED TO PREVENT SHOCK OR DECLINE.
- 4.3 CONTRACTOR SHALL ARRANGE TO HAVE A UTILITY STAKE-OUT TO LOCATE ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY LANDSCAPE MATERIAL. UTILITY COMPANIES SHALL BE CONTACTED THREE (3) DAYS PRIOR TO THE BEGINNING OF WORK.

## 5. TREE PROTECTION

- 5.1 CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES TO REMAIN. A TREE PROTECTION ZONE SHALL BE ESTABLISHED AT THE DUMP LINE OR AT THE LIMIT OF CONSTRUCTION DISTURBANCE, WHICHEVER IS GREATER. LOCAL STANDARDS THAT MAY REQUIRE A MORE STRICT TREE PROTECTION ZONE SHALL BE HONORED.
- 5.2 A FORTY EIGHT INCH (48") HIGH WOODEN SNOW FENCE OR ORANGE COLORED HIGH DENSITY YAS-FENCE, OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE LOCATED AT A MINIMUM OF EIGHT FEET (8') ON CENTER OR AS INDICATED WITHIN THE TREE PROTECTION DETAIL.
- 5.3 WHEN THE TREE PROTECTION FENCING HAS BEEN INSTALLED, IT SHALL BE INSPECTED BY THE APPROVING AGENCY PRIOR TO DEMOLITION, GRADING, TREE CLEARING OR ANY OTHER CONSTRUCTION. THE FENCING ALONG THE TREE PROTECTION ZONE SHALL BE REGULARLY INSPECTED BY THE LANDSCAPE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITY HAS BEEN COMPLETED.
- 5.4 AT NO TIME SHALL MACHINERY, DEBRIS, FALLEN TREES OR OTHER MATERIALS BE PLACED, STOCKPILED OR LEFT STANDING IN THE TREE PROTECTION ZONE.

## 6. SOIL MODIFICATIONS

- 6.1 CONTRACTOR SHALL ATTAIN A SOIL TEST FOR ALL AREAS OF THE SITE PRIOR TO CONDUCTING ANY PLANTING. SOIL TESTS SHALL BE PERFORMED BY A CERTIFIED SOIL LABORATORY.
- 6.2 LANDSCAPE CONTRACTOR SHALL REPORT ANY SOIL OR DRAINAGE CONDITIONS CONSIDERED DETRIMENTAL TO THE GROWTH OF PLANT MATERIAL. SOIL MODIFICATIONS, AS SPECIFIED HEREIN, MAY NEED TO BE CONDUCTED BY THE LANDSCAPE CONTRACTOR DEPENDING ON SITE CONDITIONS.
- 6.3 THE FOLLOWING AMENDMENTS AND QUANTITIES ARE APPROXIMATE AND ARE FOR BIDDING PURPOSES ONLY. COMPOSITION OF AMENDMENTS SHOULD BE REVISED DEPENDING ON THE OUTCOME OF A TOPSOIL ANALYSIS PERFORMED BY A CERTIFIED SOIL LABORATORY.
- 6.3.1 TO INCREASE A SANDY SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS, THOROUGHLY TILL ORGANIC MATTER INTO THE TOP 6-12". USE COMPOSTED BARK, COMPOSTED LEAF MULCH OR PEAT MOSS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MATERIAL WITH A PH HIGHER THAN 7.5.
- 6.3.2 TO INCREASE DRAINAGE, MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR AGRICULTURAL GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 80% OF THE TOTAL MIX. SUBSURFACE DRAINAGE LINES MAY NEED TO BE ADDED TO INCREASE DRAINAGE.
- 6.3.3 MODIFY EXTREMELY SANDY SOILS (MORE THAN 85%) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.

## 7. FINISHED GRADING

- 7.1 UNLESS OTHERWISE CONTRACTED, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE GRADING WITHIN THE DISTURBANCE AREA OF THE SITE.
- 7.2 LANDSCAPE CONTRACTOR SHALL VERIFY THAT SUBGRADE FOR INSTALLATION OF TOPSOIL HAS BEEN ESTABLISHED. THE SUBGRADE OF THE SITE MUST MEET THE FINISHED GRADE LESS THE REQUIRED TOPSOIL THICKNESS (1").
- 7.3 ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THIS SET OF CONSTRUCTION PLANS, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER OR LANDSCAPE ARCHITECT.
- 7.4 ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW FREE FLOW OF SURFACE WATER IN AND AROUND THE PLANTING BEDS. STANDING WATER SHALL NOT BE PERMITTED IN PLANTING BEDS.

## 8. TOPSOILING

- 8.1 CONTRACTOR SHALL PROVIDE A 6" THICK MINIMUM LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, IN ALL PLANTING AREAS. TOPSOIL SHOULD BE SPREAD OVER A PREPARED SURFACE TO ACHIEVE THE DESIRED COMPACTED THICKNESS.
- 8.2 ON SITE TOPSOIL MAY BE USED TO SUPPLEMENT THE TOTAL AMOUNT REQUIRED. TOPSOIL FROM THE SITE MAY BE REJECTED IF IT HAS NOT BEEN PROPERLY REMOVED, STORED AND PROTECTED PRIOR TO CONSTRUCTION.

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	
CHAIRMAN SIGNATURE	DATE
SECRETARY 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.

- 8.3 CONTRACTOR SHALL FURNISH TO THE APPROVING AGENCY AN ANALYSIS OF BOTH IMPORTED AND ON-SITE TOPSOIL TO BE UTILIZED IN ALL PLANTING AREAS. THE PH AND NUTRIENT LEVELS MAY NEED TO BE ADJUSTED THROUGH SOIL MODIFICATIONS AS NEEDED TO ACHIEVE THE REQUIRED LEVELS AS SPECIFIED IN THE MATERIALS SECTION ABOVE.
- 8.4 ALL LAWN AREAS ARE TO BE CULTIVATED TO A DEPTH OF SIX INCHES (6"). ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES SECTION ABOVE. THE FOLLOWING SHALL BE TILLED INTO THE TOP FOUR INCHES (4") IN TWO DIRECTIONS (QUANTITIES BASED ON A 1,000 SQUARE FOOT AREA - FOR BID PURPOSES ONLY [SEE SPECIFICATION 6.A.1]):
- 8.4.1 20 POUNDS GRO-POWER OR APPROVED SOIL CONDITIONER/FERTILIZER
- 8.4.2 20 POUNDS NITRO-FORM (COURSE) 39-0-0 BLUE CHIP OR APPROVED NITROGEN FERTILIZER
- 8.5 THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN CONDITIONS.

## 9. PLANTING

- 9.1 INsofar THAT IT IS FEASIBLE, PLANT MATERIAL SHALL BE PLANTED ON THE DAY OF DELIVERY. IN THE EVENT THAT THIS IS NOT POSSIBLE, LANDSCAPE CONTRACTOR SHALL PROTECT UNPLANTED PLANT MATERIAL. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE DAY PERIOD AFTER DELIVERY. PLANTS THAT WILL NOT BE PLANTED FOR A PERIOD OF TIME GREATER THAN THREE DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH TO HELP PRESERVE ROOT MOISTURE.
- 9.2 PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH ACCEPTED LOCAL PRACTICE. PLANTS SHALL NOT BE INSTALLED IN TOPSOIL THAT IS IN A MUDDY OR FROZEN CONDITION.
- 9.3 ANY INJURED ROOTS OR BRANCHES SHALL BE PRUNED TO MAKE CLEAN CUTS PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. ONLY INJURED OR DISEASED BRANCHING SHALL BE REMOVED.
- 9.4 ALL PLANTING CONTAINERS, BASKETS AND NON-BIODEGRADABLE MATERIALS SHALL BE REMOVED FROM ROOT BALLS DURING PLANTING. NATURAL FIBER BURLAP MUST BE CUT FROM AROUND THE TRUNK OF THE TREE AND FOLDED DOWN AGAINST THE ROOT BALL PRIOR TO BACKFILLING.
- 9.5 POSITION TREES AND SHRUBS AT THEIR INTENDED LOCATIONS AS PER THE PLANS AND SECURE THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO EXCAVATING PITS, MAKING NECESSARY ADJUSTMENTS AS DIRECTED.
- 9.6 PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, THE PROPOSED LANDSCAPE, AS SHOWN ON THE APPROVED LANDSCAPE PLAN, MUST BE INSTALLED, INSPECTED AND APPROVED BY THE APPROVING AGENCY. THE APPROVING AGENCY SHALL TAKE INTO ACCOUNT SEASONAL CONSIDERATIONS IN THIS REGARD AS FOLLOWS. THE PLANTING OF TREES, SHRUBS, VINES OR GRASS COVER SHALL OCCUR ONLY DURING THE FOLLOWING PLANTING SEASONS:
- 9.6.1 PLANTS: MARCH 15 TO DECEMBER 15
- 9.6.2 LAWN: MARCH 15 TO JUNE 15 OR SEPT. 1 TO DECEMBER 1
- 9.6.3 PLANTINGS REQUIRED FOR A CERTIFICATE OF OCCUPANCY SHALL BE PROVIDED DURING THE NEXT APPROPRIATE SEASON AT THE MUNICIPALITY'S DISCRETION. CONTRACTOR SHOULD CONTACT APPROVING AGENCY FOR POTENTIAL SUBSTITUTIONS.
- 9.7 FURTHERMORE, THE FOLLOWING TREE VARIETIES ARE UNUSUALLY SUSCEPTIBLE TO WINTER DAMAGE, WITH TRANSPLANT SHOCK AND THE SEASONAL LACK OF NUTRIENT AVAILABILITY, THE RISK OF PLANT DEATH IS GREATLY INCREASED. IT IS NOT RECOMMENDED THAT THESE SPECIES BE PLANTED DURING THE FALL PLANTING SEASON:

ACER RUBRUM	PLATANUS X ACERIFOLIA
BETULA VARIETIES	POPULUS VARIETIES
CARPINUS VARIETIES	PRUNUS VARIETIES
CRATAEGUS VARIETIES	PYRUS VARIETIES
KOELREUTERIA	QUERCUS VARIETIES
LIRIODENDRON SYRIACIFLUA	TILIA TOMENSOSA
LIRIODENDRON TULIPIFERA	ZELKOVIA VARIETIES

- 9.8 PLANTING PITS SHALL BE DUG WITH LEVEL BOTTOMS, WITH THE WIDTH TWICE THE DIAMETER OF ROOT BALL. THE ROOT BALL SHALL REST ON UNDISTURBED GRADE. EACH PLANT PIT SHALL BE BACKFILLED IN LAYERS WITH THE FOLLOWING PREPARED SOIL MIXED THOROUGHLY:

- 9.8.1 1 PART PEAT MOSS
- 9.8.2 1 PART COMPOSTED COW MANURE BY VOLUME
- 9.8.3 3 PARTS TOPSOIL BY VOLUME
- 9.8.4 21 GRAMS 'AGRIFORM' PLANTING TABLETS (OR APPROVED EQUAL) AS FOLLOWS:
  - 9.8.4.1 2 TABLETS PER 1 GALLON PLANT
  - 9.8.4.2 3 TABLETS PER 5 GALLON PLANT
  - 9.8.4.3 4 TABLETS PER 15 GALLON PLANT
  - 9.8.4.4 LARGER PLANTS: 2 TABLETS PER 1/2" CALIPER OF TRUNK

- 9.8.5 FILL PREPARED SOIL AROUND BALL OF PLANT HALF-WAY AND INSERT PLANT TABLETS. COMPLETE BACKFILL AND WATER THOROUGHLY.
- 9.9 ALL PLANTS SHALL BE PLANTED SO THAT THE TOP OF THE ROOT BALL, THE POINT AT WHICH THE ROOT FLARE BEGINS, IS SET AT GROUND LEVEL AND IN THE CENTER OF THE PIT. NO SOIL IS TO BE PLACED DIRECTLY ON TOP OF THE ROOT BALL.
- 9.10 ALL PROPOSED TREES DIRECTLY ADJACENT TO WALKWAYS OR DRIVEWAYS SHALL BE PRUNED AND MAINTAINED TO A MINIMUM BRANCHING HEIGHT OF 7' FROM BRANCH.
- 9.11 GROUND COVER AREAS SHALL RECEIVE A 1/2" LAYER OF HUMUS RAKED INTO THE TOP 1" OF PREPARED SOIL PRIOR TO PLANTING. ALL GROUND COVER AREAS SHALL BE WEEDED AND TREATED WITH A PRE-EMERGENT CHEMICAL AS PER MANUFACTURER'S RECOMMENDATION.
- 9.12 NO PLANT, EXCEPT GROUND COVERS, GRASSES OR VINES, SHALL BE PLANTED LESS THAN TWO FEET (2') FROM EXISTING STRUCTURES AND SIDEWALKS.
- 9.13 ALL PLANTING AREAS AND PLANTING PITS SHALL BE MULCHED AS SPECIFIED HEREIN TO FILL THE ENTIRE BED AREA OR SAUCER. NO MULCH IS TO TOUCH THE TRUNK OF THE TREE OR SHRUB.
- 9.14 ALL PLANTING AREAS SHALL BE WATERED IMMEDIATELY UPON INSTALLATION IN ACCORDANCE WITH THE WATERING SPECIFICATIONS AS LISTED HEREIN.

## 10. TRANSPLANTING (WHEN REQUIRED)

- 10.1 ALL TRANSPLANTS SHALL BE DUG WITH INTACT ROOT BALLS CAPABLE OF SUSTAINING THE PLANT.
- 10.2 IF PLANTS ARE TO BE STOCKPILED BEFORE REPLANTING, THEY SHALL BE HEALED IN WITH MULCH OR SOIL, ADEQUATELY WATERED AND PROTECTED FROM EXTREME HEAT, SUN AND WIND.
- 10.3 PLANTS SHALL NOT BE DUG FOR TRANSPLANTING BETWEEN APRIL 16 AND JUNE 30.
- 10.4 UPON REPLANTING, BACKFILL SOIL SHALL BE AMENDED WITH FERTILIZER AND ROOT GROWTH HORMONE.
- 10.5 TRANSPLANTS SHALL BE GUARANTEED FOR THE LENGTH OF THE GUARANTEE PERIOD SPECIFIED HEREIN.
- 10.6 F TRANSPLANTS DIE, SHRUBS AND TREES LESS THAN SIX INCHES (6") DBH SHALL BE REPLACED IN KIND. TREES GREATER THAN SIX INCHES (6") DBH MAY BE REQUIRED TO BE REPLACED IN ACCORDANCE WITH THE MUNICIPALITY'S TREE REPLACEMENT GUIDELINES.

## 11. WATERING

- 11.1 NEW PLANTINGS OR LAWN AREAS SHALL BE ADEQUATELY FRIGATED BEGINNING IMMEDIATELY AFTER PLANTING. WATER SHALL BE APPLIED TO EACH TREE AND SHRUB IN SUCH MANNER AS NOT TO DISTURB BACKFILL AND TO THE EXTENT THAT ALL MATERIALS IN THE PLANTING HOLE ARE THOROUGHLY SATURATED. WATERING SHALL CONTINUE AT LEAST UNTIL PLANTS ARE ESTABLISHED.
- 11.2 SITE OWNER SHALL PROVIDE WATER IF AVAILABLE ON SITE AT TIME OF PLANTING. IF WATER IS NOT AVAILABLE ON SITE, CONTRACTOR SHALL SUPPLY ALL NECESSARY WATER. THE USE OF WATERING BAYS IS RECOMMENDED FOR ALL NEWLY PLANTED TREES.
- 11.3 IF AN IRRIGATION SYSTEM HAS BEEN INSTALLED ON THE SITE, IT SHALL BE USED TO WATER PROPOSED PLANT MATERIAL, BUT ANY FAILURE OF THE SYSTEM DOES NOT ELIMINATE THE CONTRACTOR'S RESPONSIBILITY OF MAINTAINING THE DESIRED MOISTURE LEVEL FOR VIGOROUS, HEALTHY GROWTH.

## 12. GUARANTEE

- 12.1 THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANTS FOR A PERIOD OF 1 YEAR FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE APPROVING AGENCY. CONTRACTOR SHALL SUPPLY THE OWNER WITH A MAINTENANCE BOND FOR TEN PERCENT (10%) OF THE VALUE OF THE LANDSCAPE INSTALLATION WHICH WILL BE RELEASED AT THE CONCLUSION OF THE GUARANTEE PERIOD AND WHEN A FINAL INSPECTION HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.
- 12.2 ANY DEAD OR DYING PLANT MATERIAL SHALL BE REPLACED FOR THE LENGTH OF THE GUARANTEE PERIOD. REPLACEMENT OF PLANT MATERIAL SHALL BE CONDUCTED AT THE FIRST SUCCEEDING PLANTING SEASON. ANY DEBRIS SHALL BE DISPOSED OF OFF-SITE, WITHOUT EXCEPTION.
- 12.3 TREES AND SHRUBS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND THROUGHOUT THE 90 DAY MAINTENANCE PERIOD AS SPECIFIED HEREIN. CULTIVATION, WEEDING, WATERING AND THE PREVENTATIVE TREATMENTS SHALL BE PERFORMED AS NECESSARY TO KEEP PLANT MATERIAL IN GOOD CONDITION AND FREE OF INSECTS AND DISEASE.
- 12.4 LAWNS SHALL BE MAINTAINED THROUGH WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGARDING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN FREE OF ERODED OR BARE AREAS.

## 13. CLEANUP

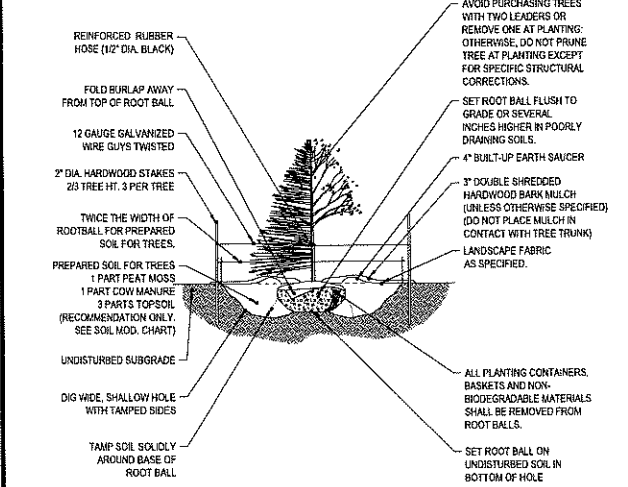
- 13.1 UPON THE COMPLETION OF ALL LANDSCAPE INSTALLATION AND BEFORE THE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL UNUSED MATERIALS, EQUIPMENT AND DEBRIS FROM THE SITE. ALL PAVED AREAS ARE TO BE CLEANED.
- 13.2 THE SITE SHALL BE CLEANED AND LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.

## 14. MAINTENANCE (ALTERNATIVE BID)

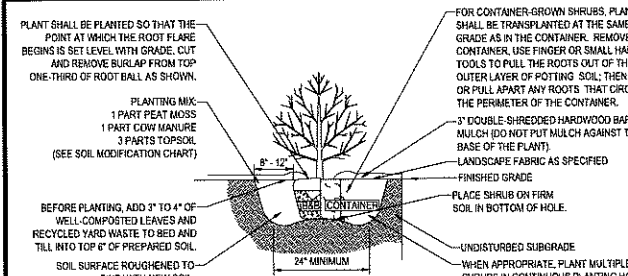
- 14.1 A 90 DAY MAINTENANCE PERIOD SHALL COMMENCE AT THE END OF ALL LANDSCAPE INSTALLATION OPERATIONS. THE 90 DAY MAINTENANCE PERIOD ENSURES TO THE OWNER/OPERATOR THAT THE NEWLY INSTALLED LANDSCAPING HAS BEEN MAINTAINED AS SPECIFIED ON THE APPROVED LANDSCAPE PLAN. ONCE THE INITIAL 90 DAY MAINTENANCE PERIOD HAS EXPIRED, THE OWNER/OPERATOR MAY REQUEST THAT BIDDERS SUBMIT AN ALTERNATE MAINTENANCE BID FOR A MONTHLY MAINTENANCE CONTRACT. THE ALTERNATE MAINTENANCE CONTRACT WILL ENCOMPASS ANY WORK THAT IS CONSIDERED APPROPRIATE TO ENSURE THAT PLANT AND LAWN AREAS ARE HEALTHY AND MAINTAINED TO THE APPROVAL OF THE OWNER/OPERATOR.

## NOTES:

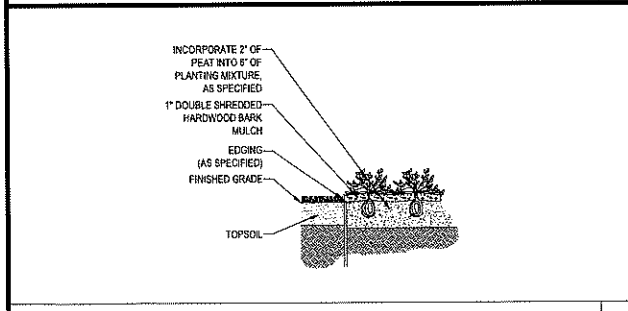
- 1) NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
- 2) REMOVE ALL NON-BIODEGRADABLE MATERIAL AND ROPE FROM TRUNK & TOP OF ROOT BALL. FOLD BURLAP BACK 10' FROM ROOT BALL.
- 3) PLANTING DEPTH SHALL BE THE SAME AS GROWN IN NURSERY.
- 4) THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
- 5) THE BOTTOM OF PLANTING PIT EXCAVATIONS SHOULD BE ROUGH TO AVOID MATING OF SOIL LAYERS AS NEW SOIL IS ADDED. IT IS PREFERABLE TO TILL THE FIRST 1 FT (2 TO 3 IN.) OF PLANTING SOIL INTO THE SUBSOIL.
- 6) REFER TO THE CHART "GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS" TO DETERMINE MINIMUM WIDTH OF PREPARED SOIL.
- 7) SUBSTITUTE ARBORVITAE STAKING SYSTEM WHEN SPECIFIED.



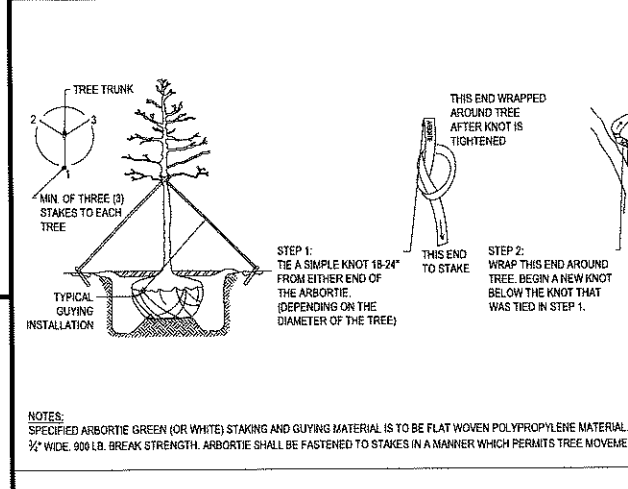
**TREE PLANTING DETAIL** N.T.S.



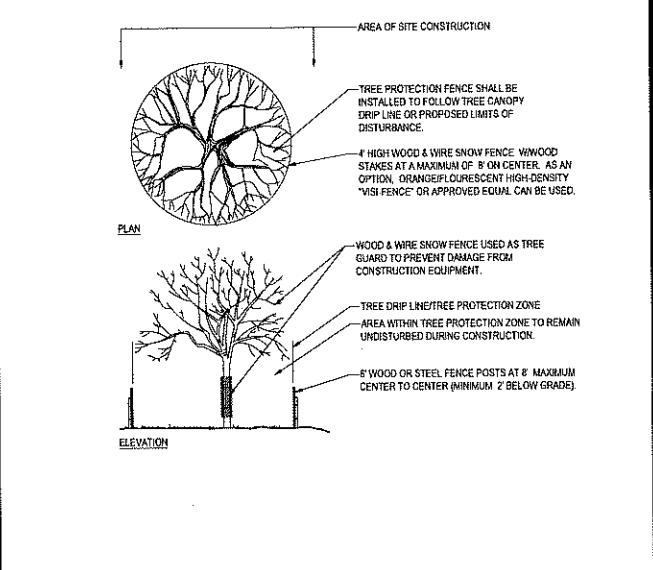
**SHRUB PLANTING DETAIL** N.T.S.



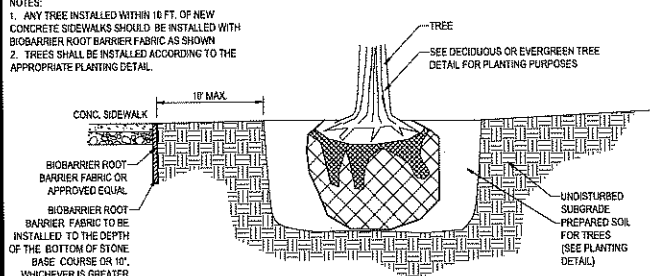
**GROUND COVER PLANTING** N.T.S.



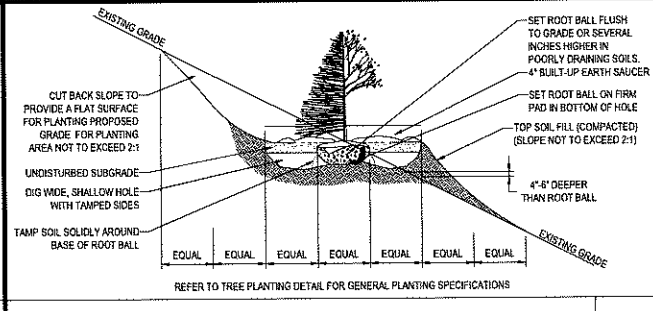
**ARBORTIE STAKING DETAIL** N.T.S.



**TREE PROTECTION DURING SITE CONSTRUCTION** N.T.S.



**BIOBARRIER ROOT BARRIER DETAIL** N.T.S.



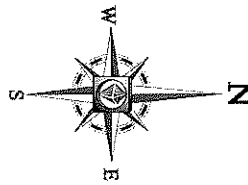
**TREE PLANTING DETAIL - ON SLOPE** N.T.S.

**BOHLER ENGINEERING**

SITE/UTILITY CONSULTING ENGINEERING  
LAND SURVEYING PROGRAM MANAGEMENT LANDSCAPE ARCHITECTURE  
PERMITTING SERVICES TRANSPORTATION SERVICES

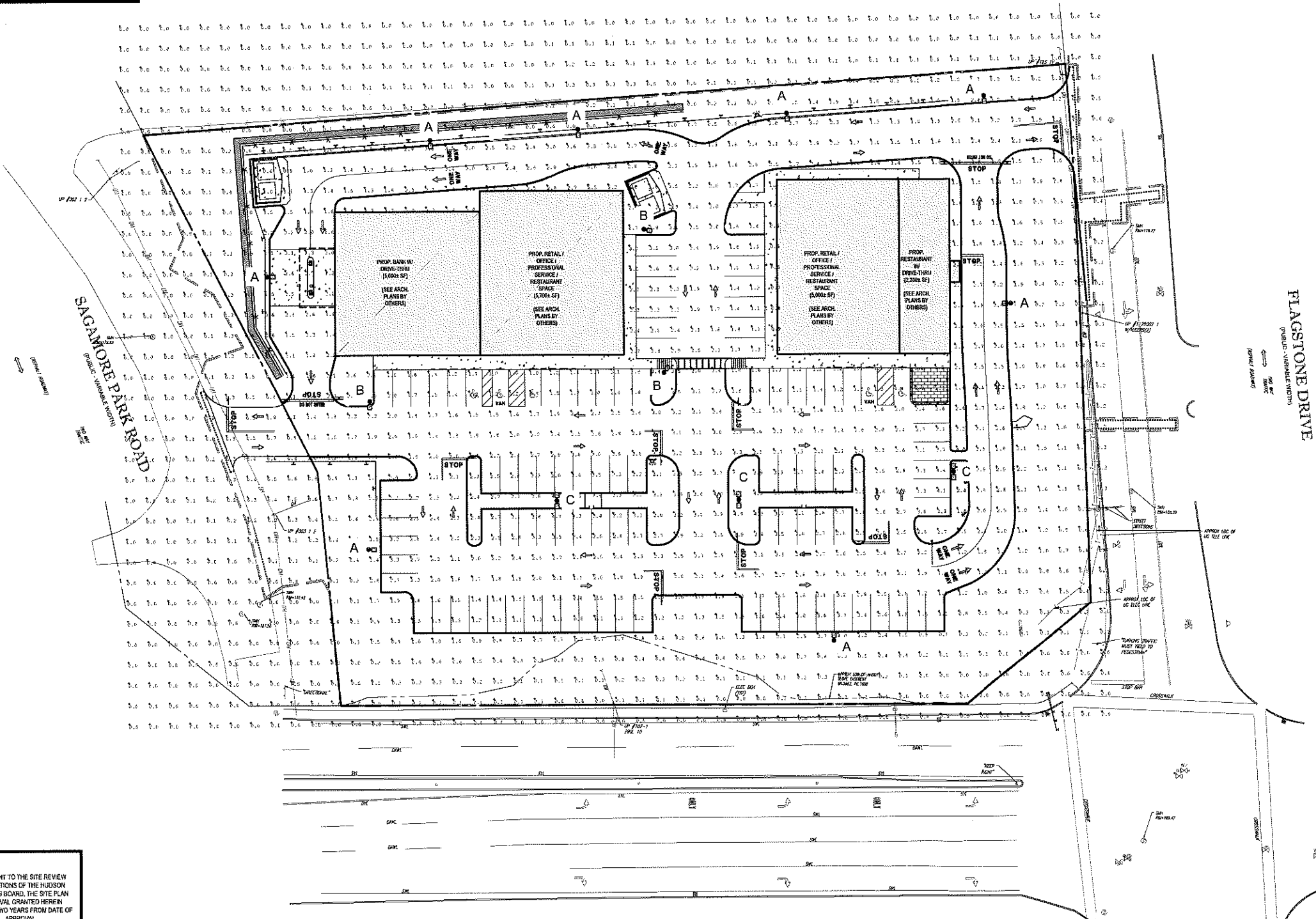
NEW HAMPSHIRE: 109 WASHINGTON ST., SUITE 200, NASHUA, NH 03063  
NEW YORK: 100 W. 42ND ST., SUITE 2100, NEW YORK, NY 10018  
MASSACHUSETTS: 100 STATE ST., SUITE 200, BOSTON, MA 02109  
CONNECTICUT: 100 MAIN ST., SUITE 200, HARTFORD, CT 06103  
VERMONT: 100 STATE ST., SUITE 200, MONTPELIER, VT 05751  
RHODE ISLAND: 100 STATE ST., SUITE 200, PROVIDENCE, RI 02903  
NEW JERSEY: 100 STATE ST., SUITE 200, NEWARK, NJ 07102  
PENNSYLVANIA: 100 STATE ST., SUITE 200, PHILADELPHIA, PA 19103  
DELAWARE: 100 STATE ST., SUITE 200, DOVER, DE 19901  
MARYLAND: 100 STATE ST., SUITE 200, BALTIMORE, MD 21201  
VIRGINIA: 100 STATE ST., SUITE 200, ALEXANDRIA, VA 22304  
NORTH CAROLINA: 100 STATE ST., SUITE 200, RALEIGH, NC 27601  
SOUTH CAROLINA: 100 STATE ST., SUITE 200, COLUMBIA, SC 29201  
FLORIDA: 100 STATE ST., SUITE 200, TAMPA, FL 33601  
ALABAMA: 100 STATE ST., SUITE 200, MONTGOMERY, AL 36101  
MISSISSIPPI: 100 STATE ST., SUITE 200, JACKSON, MS 39201  
LOUISIANA: 100 STATE ST., SUITE 200, NEW ORLEANS, LA 70112  
ARKANSAS: 100 STATE ST., SUITE 200, LITTLE ROCK, AR 72201  
OKLAHOMA: 100 STATE ST., SUITE 200, OKLAHOMA CITY, OK 73101  
KANSAS: 100 STATE ST., SUITE 200, WICHITA, KS 67201  
MINNESOTA: 100 STATE ST., SUITE 200, MINNEAPOLIS, MN 55401  
IOWA: 100 STATE ST., SUITE 200, DES MOINES, IA 50319  
MICHIGAN: 100 STATE ST., SUITE 200, LANSING, MI 48201  
INDIANA: 100 STATE ST., SUITE 200, INDIANAPOLIS, IN 46201  
OHIO: 100 STATE ST., SUITE 200, COLUMBUS, OH 43201  
WEST VIRGINIA: 100 STATE ST., SUITE 200, CHARLESTON, WV 25301  
MONTANA: 100 STATE ST., SUITE 200, BUTTE, MT 59701  
WYOMING: 100 STATE ST., SUITE 200, CHEYENNE, WY 82001  
NEBRASKA: 100 STATE ST., SUITE 200, OMAHA, NE 68101  
NEBRASKA: 100 STATE ST., SUITE 200, OMAHA, NE 68101  
NEBRASKA: 100 STATE ST., SUITE 200, OMAHA, NE 68101

REV	DATE	COMMENT	BY
1	10/9/2019	PER ALTERNATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
3			
4			
5			



**LIGHTING NOTES:**

- THIS LIGHTING PLAN DEPICTS PROPOSED SUSTAINED ILLUMINATION LEVELS CALCULATED USING DATA PROVIDED BY THE NOTED MANUFACTURERS. ACTUAL SUSTAINED SITE ILLUMINATION LEVELS AND PERFORMANCE OF LUMINAIRES MAY VARY DUE TO VARIATIONS IN WEATHER, ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, THE SERVICE LIFE OF EQUIPMENT AND LUMINAIRES AND OTHER RELATED VARIABLE FIELD CONDITIONS.
- THE LIGHT LOSS FACTORS USED IN THESE LIGHTING CALCULATIONS ARE 0.80 FOR ALL LED LUMINAIRES, 0.80 FOR ALL HIGH PRESSURE SODIUM LUMINAIRES OR 0.72 FOR ALL METAL HALIDE LUMINAIRES UNLESS OTHERWISE SPECIFIED. THESE FACTORS ARE INDICATIVE OF TYPICAL LIGHTING INDUSTRY MODELING STANDARDS.
- THE LIGHTING VALUES AND CALCULATION POINTS DEPICTED ON THIS PLAN ARE ALL ANALYZED ON A HORIZONTAL GEOMETRIC PLANE AT ELEVATION ZERO (GROUND LEVEL) UNLESS OTHERWISE NOTED. THE VALUES DEPICTED ON THIS PLAN ARE IN FOOT-CANDLES.
- THE LUMINAIRES, LAMPS AND LENSES MUST BE REGULARLY INSPECTED/MAINTAINED TO ENSURE THAT THEY FUNCTION PROPERLY. THIS WORK SHOULD INCLUDE, BUT NOT BE LIMITED TO, FREQUENT VISUAL INSPECTIONS, CLEANING OF LENSES, AND RELAMPING (IF NECESSARY) AT LEAST ONCE EVERY SIX (6) MONTHS. FAILURE TO FOLLOW THE ABOVE STEPS COULD CAUSE THE LUMINAIRES, LAMPS AND LENSES TO FAIL PROPERLY TO FUNCTION.
- WHERE APPLICABLE, THE EXISTING CONDITION LIGHT LEVELS ILLUSTRATED ARE REPRESENTATIVE OF AN APPROXIMATION UTILIZING LABORATORY DATA FOR SIMILAR FIXTURES, UNLESS ACTUAL FIELD MEASUREMENTS ARE TAKEN WITH A LIGHT METER AND ARE, CONSEQUENTLY, APPROXIMATIONS ONLY. DUE TO FACTORS SUCH AS FIXTURE MAINTENANCE, EQUIPMENT TOLERANCES, WEATHER CONDITIONS, ETC. ACTUAL LIGHT LEVELS MAY DIFFER. EXISTING LIGHT LEVELS DEPICTED ON THIS PLAN SHOULD BE CONSIDERED APPROXIMATE.
- THIS LIGHTING PLAN IS INTENDED TO SHOW THE LOCATIONS AND TYPE OF LUMINAIRES ONLY. POWER SYSTEM, CONDUITS, WIRING, VOLTAGES AND OTHER ELECTRICAL COMPONENTS ARE THE RESPONSIBILITY OF THE ARCHITECT, MEP AND/OR LIGHTING CONTRACTOR, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. THESE ITEMS MUST BE INSTALLED AS REQUIRED BY STATE AND LOCAL REGULATIONS. LIGHT POLE BASES ARE THE RESPONSIBILITY OF THE STRUCTURAL ENGINEER, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR INSTALLING LIGHTING FIXTURES AND APPURTENANCES IN ACCORDANCE WITH ALL APPLICABLE BUILDING AND ELECTRICAL CODES AND ALL OTHER APPLICABLE RULES, REGULATIONS, LAWS AND STATUTES.
- CONTRACTOR MUST BRING TO DESIGNER'S ATTENTION, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, ANY LIGHT LOCATIONS THAT CONFLICT WITH DRAINAGE, UTILITIES, OR OTHER STRUCTURES.
- IT IS THE LIGHTING CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE PROJECT ARCHITECT OR OWNER REGARDING THE POWER SOURCE(S) FROM WITHIN THE BUILDING, AND TIMING DEVICES NECESSARY TO MEET THE DESIGN INTENT.
- THE LIGHTING CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CONTRACTOR REQUIREMENTS INDICATED IN THE SITE PLAN, INCLUDING BUT NOT LIMITED TO, GENERAL NOTES, GRADING AND UTILITY NOTES, THE SITE SAFETY, AND ALL GOVERNMENTAL RULES, LAWS, ORDINANCES, REGULATIONS AND THE LIKE.
- THE CONTRACTOR MUST VERIFY THAT INSTALLATION OF LIGHTING FIXTURES COMPLIES WITH THE REQUIREMENTS FOR SEPARATION FROM OVERHEAD ELECTRICAL WIRES PER STATE REGULATIONS.
- WHEN A BANK ATM IS INCLUDED IN THE PLAN, THE LIGHTING DESIGN REPRESENTS BOHLER'S UNDERSTANDING AND INTERPRETATION OF THE REGULATORY LIGHTING LEVELS INTENDED BY PUBLISHED STANDARDS.
- UPON OWNER'S ACCEPTANCE OF THE COMPLETED PROJECT, THE OWNER SHALL BE RESPONSIBLE FOR ALL MAINTENANCE, SERVICING, REPAIR AND INSPECTION OF THE LIGHTING SYSTEM AND ALL OF ITS COMPONENTS AND RELATED SYSTEMS, TO ENSURE ADEQUATE LIGHTING LEVELS ARE PRESENT AND FUNCTIONING AT ALL TIMES.



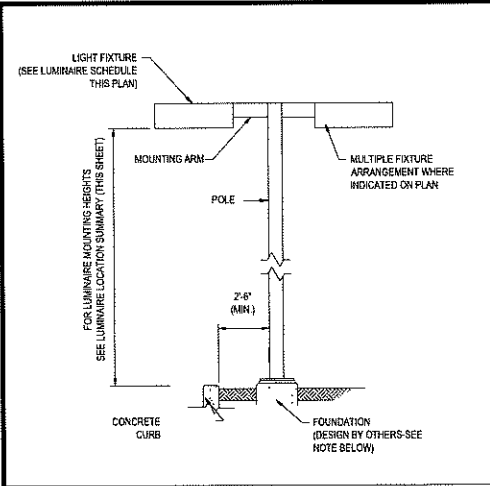
**NUMERIC SUMMARY**

LABEL	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
AREA SUMMARY	ILLUMINANCE	FC	2.33	5.0	0.9	3.88	5.33

**LUMINAIRE SCHEDULE**

SYMBOL	QTY	ARRANGEMENT	LUMENS	LF MOUNTING HEIGHT	DESCRIPTION
A	12	SINGLE	11,986	0.9 22 FT [1]	PHILIPS GARDCO ECOFORM LED ECF-S-32L-1.2A-WW-G2-4 (TYPE IV)
B	2	SINGLE	14,933	0.9 22 FT [1]	PHILIPS GARDCO ECOFORM LED ECF-S-32L-1.2A-WW-G2-5 (TYPE V)
C	2	DOUBLE @ 18"	14,933	0.9 22 FT [1]	PHILIPS GARDCO ECOFORM LED ECF-S-32L-1.2A-WW-G2-5 (TYPE V)

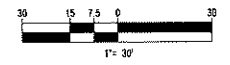
[1] INCLUDES ANTICIPATED 20 FOOT HIGH POLE AND 2-FOOT HIGH CONCRETE BASE REVEAL



**AREA LIGHT DETAIL** N.T.S.

NOTE: THIS DETAIL IS FOR BID AND BUDGETARY PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING A FOUNDATION DESIGN PREPARED BY A QUALIFIED STRUCTURAL ENGINEER CONSIDERING LIGHTING MANUFACTURER REQUIREMENTS, LOCAL WIND LOADS AND SITE SPECIFIC SOIL PARAMETERS.

- SOME SITE CONDITIONS AND/OR LOCATIONS MAY REQUIRE VIBRATION DAMPENING MEASURES AS DETERMINED BY A STRUCTURAL ENGINEER.
- THE STRUCTURAL ENGINEER SHALL BE NOTIFIED OF THE INTENT TO MOUNT ANYTHING TO THE POLE, ASIDE FROM THE LIGHT FIXTURES, INCLUDING BUT NOT LIMITED TO CAMERAS, BANNERS, FLAGS, SIGNAGE, ETC. AS IT WILL IMPACT THE POLE AND FOUNDATION DESIGN.



**THIS PLAN TO BE UTILIZED FOR LIGHTING PURPOSES ONLY**

**BOHLER ENGINEERING**

ARCHITECTURAL ENGINEERING  
LANDSCAPE ARCHITECTURE  
SUSTAINABLE DESIGN  
PROGRAM MANAGEMENT  
TRANSPORTATION SERVICES

OFFICE LOCATIONS:  
 • BOSTON, MA  
 • CHICAGO, IL  
 • CHARLOTTE, NC  
 • DALLAS, TX  
 • DENVER, CO  
 • HOUSTON, TX  
 • LOS ANGELES, CA  
 • MIAMI, FL  
 • NEW YORK, NY  
 • PHILADELPHIA, PA  
 • RICHMOND, VA  
 • SOUTH BEND, IN  
 • TAMPA, FL  
 • WASHINGTON, DC

**REVISIONS**

REV	DATE	COMMENT	BY
1	10/30/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
3			
4			
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6			
7			
8			
9			

**PERMIT SET**

PROJECT NO: W191031  
 DRAWN BY: EKR  
 CHECKED BY: APT/ANK  
 DATE: 09/30/2019  
 SCALE: AS NOTED  
 CAD L.D.: W191031\_SIS

**SITE DEVELOPMENT PLANS**

FOR  
**FLAGSTONE CROSSING**

THE LANNAN COMPANY  
 Real Estate Development & Construction

LOCATION OF SITE  
 MAP #222, LOTS #3, #4, #5, & #6  
 225 & 227 LOWELL ROAD  
 2 FLAGSTONE DRIVE  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY,  
 NEW HAMPSHIRE

**BOHLER ENGINEERING**

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 Phone: (508) 480-9900  
 Fax: (508) 480-9080  
[www.BohlerEngineering.com](http://www.BohlerEngineering.com)



SHEET TITLE:  
**LIGHTING PLAN**

SHEET NUMBER:  
**12**  
 OF 18

REV 2 - 10/31/2019

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

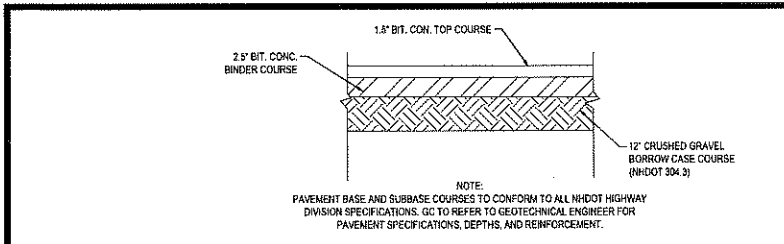
**APPROVED BY THE HUDSON, NH PLANNING BOARD**

DATE OF MEETING: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHAIRMAN SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SECRETARY SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_



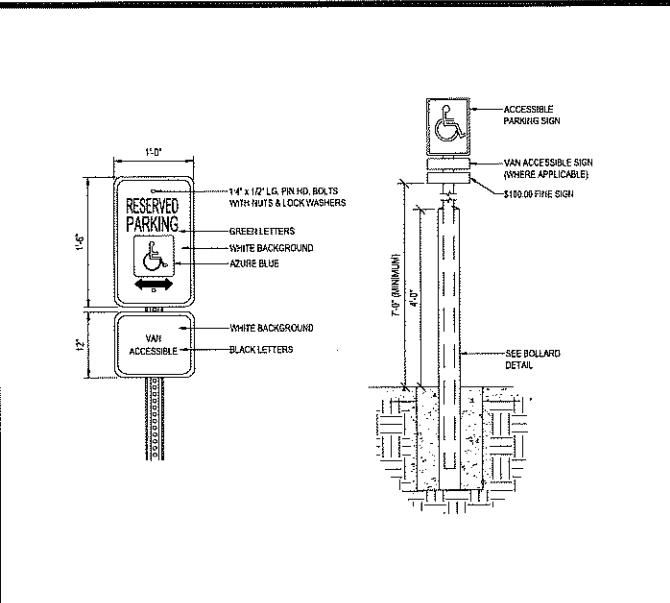
SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

**LOWELL ROAD**  
 (AKA NH ROUTE 3A)  
 (PUBLIC - VARIABLE WIDTH)  
 70' WY  
 20' WY  
 (SIGNAL CONTROL)



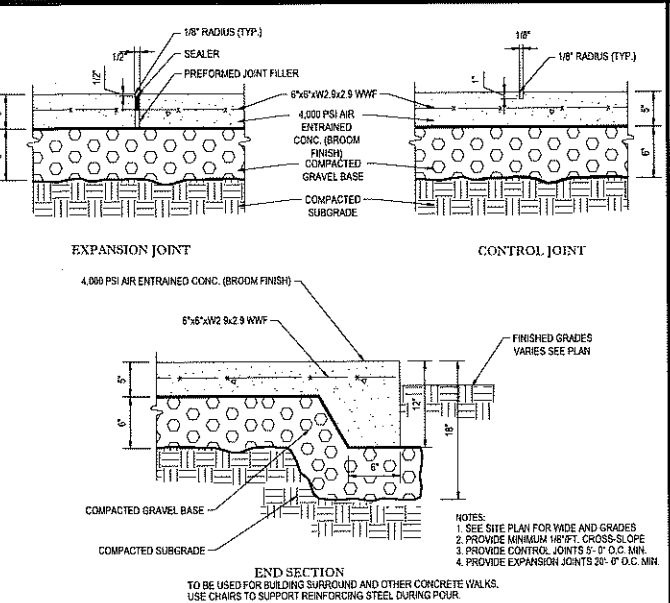
ASPHALT PAVEMENT SECTION

N.T.S.



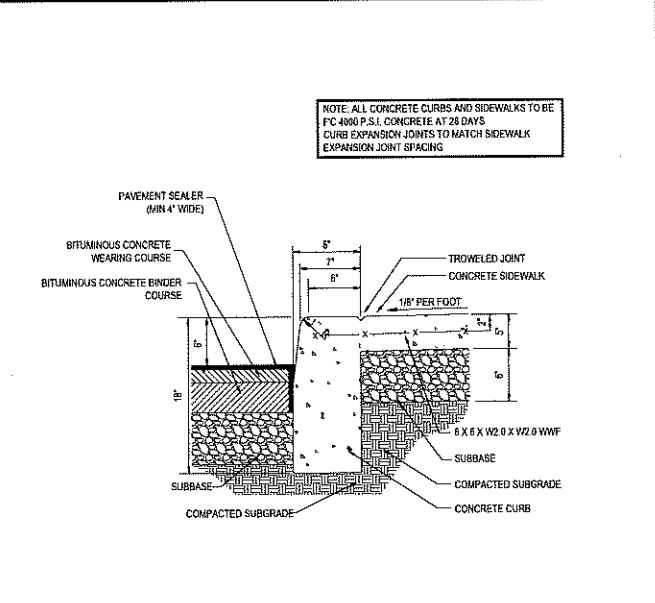
ACCESSIBLE PARKING SIGN W/ BOLLARD DETAIL

N.T.S.



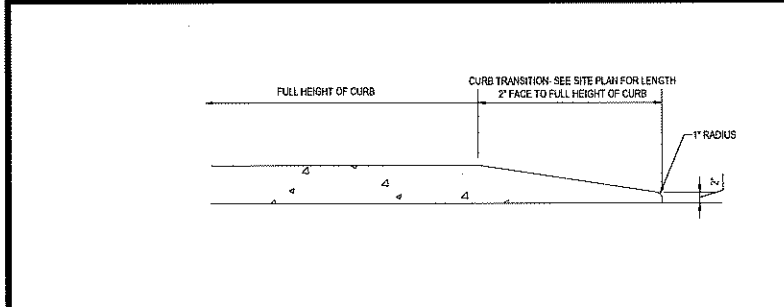
MONOLITHIC CONC. SIDEWALK DETAILS

N.T.S.



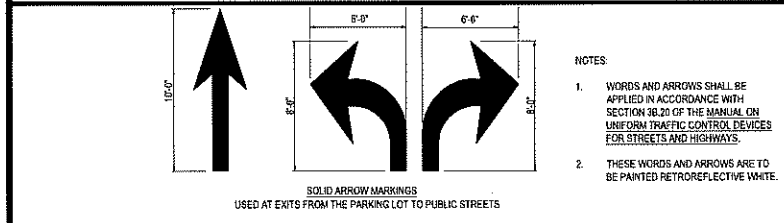
CURB DETAIL W/ MONOLITHIC SIDEWALK ON-SITE

N.T.S.



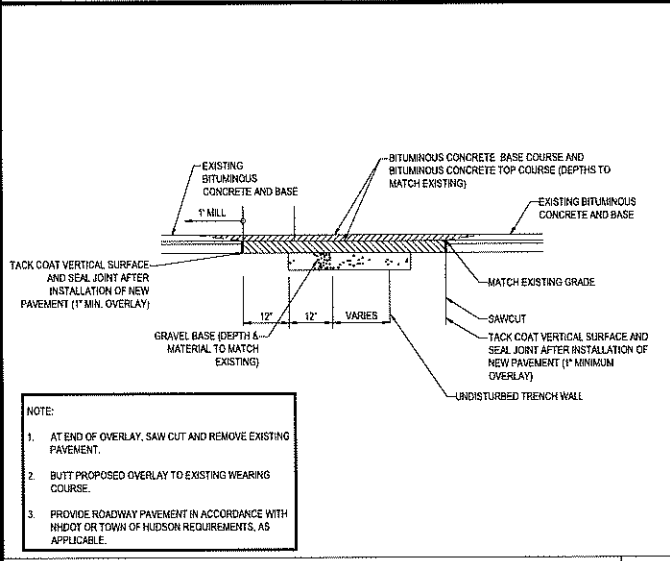
TRANSITION CURB DETAIL

N.T.S.



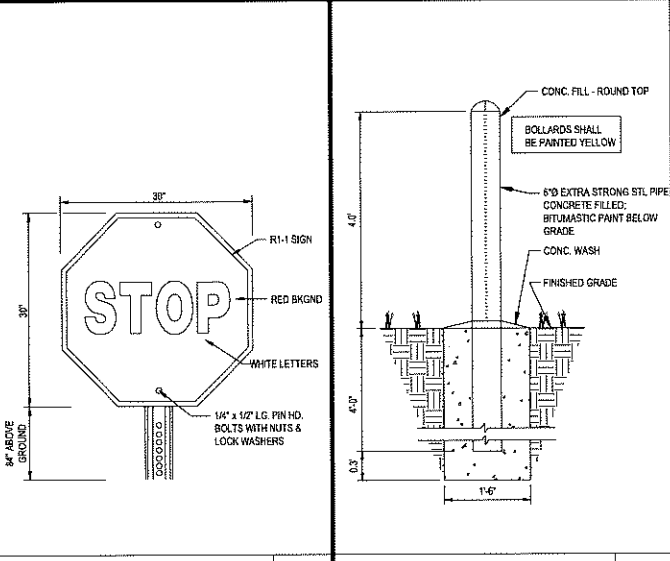
PAINTED TRAFFIC ARROWS

N.T.S.



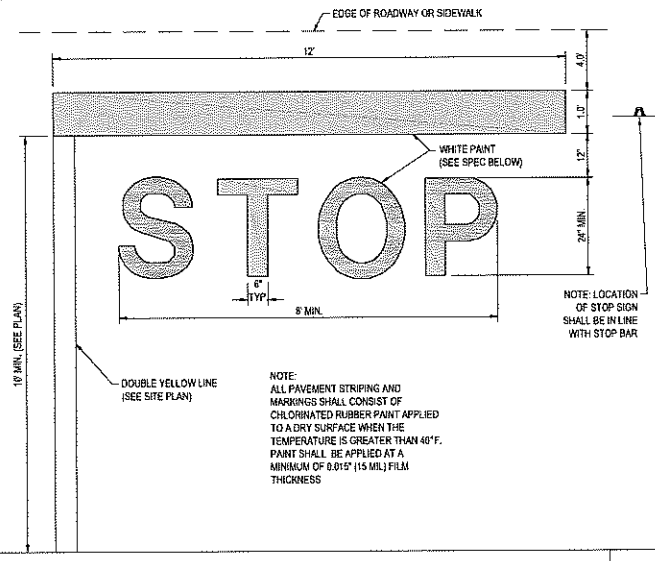
ROADWAY PATCHING DETAIL

N.T.S.



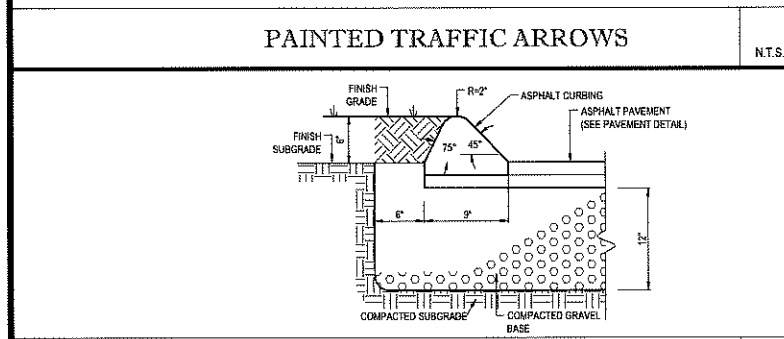
'STOP' SIGN

N.T.S.



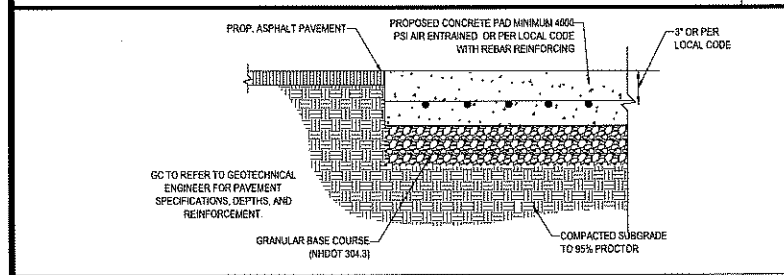
'STOP' BAR DETAIL

N.T.S.



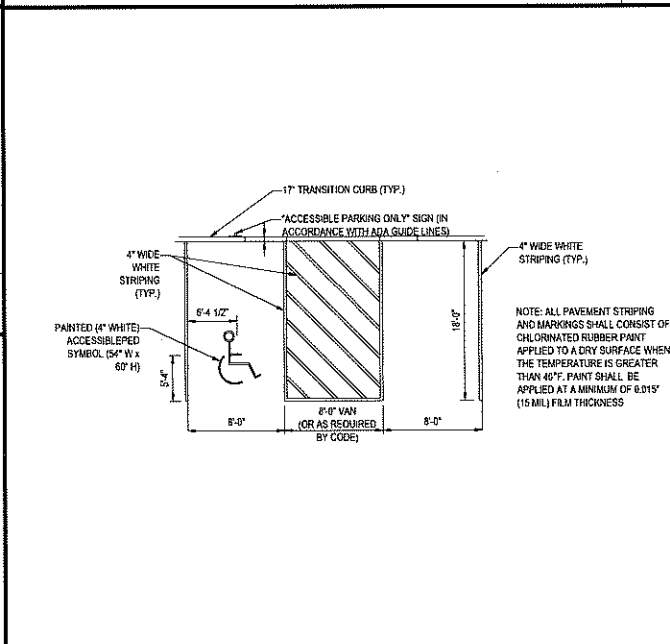
BITUMINOUS CONC. CURB DETAIL

N.T.S.



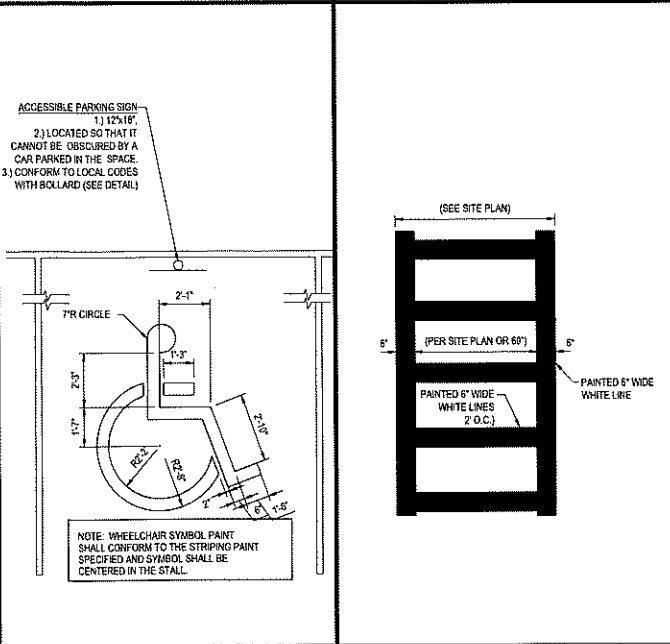
CONCRETE PAD DETAIL

N.T.S.



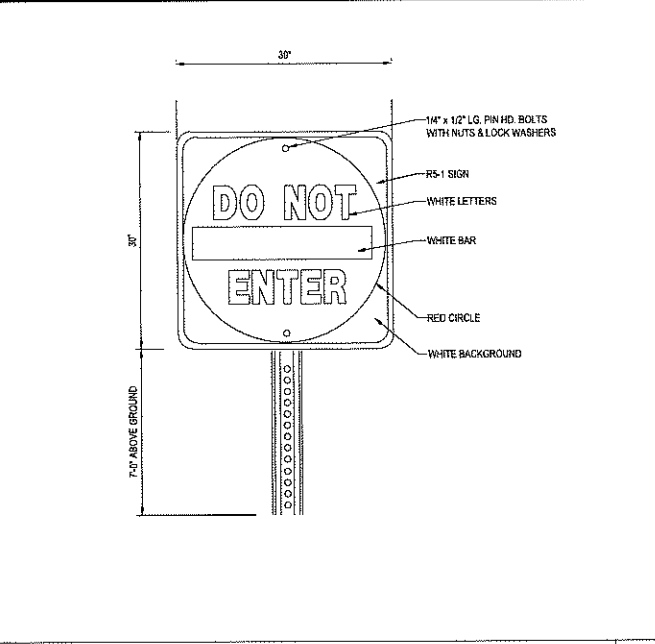
ACCESSIBLE STALL MARKINGS & PARKING LOT STRIPING DETAIL

N.T.S.



ACCESSIBLE PARKING STALL PAINTING DETAIL

N.T.S.



CROSSWALK DETAIL

N.T.S.

**BOHLER ENGINEERING**

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 STATE OF NEW HAMPSHIRE  
 LICENSE NO. 10000

10000 STATE ST. SUITE 200  
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 FAX: (508) 488-9080  
 WWW.BOHLERENGINEERING.COM

REVISIONS			
REV	DATE	COMMENT	BY
1	10/8/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
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9			

**PERMIT SET**

PROJECT No: W191031  
 DRAWN BY: EKR  
 CHECKED BY: AFT/MKB  
 DATE: 09/30/2019  
 SCALE: AS NOTED  
 CAD I.D.: W191031\_S22

**SITE DEVELOPMENT PLANS**  
 FOR  
**FLAGSTONE CROSSING**  
 AT THE LANNAN COMPANY  
 225 & 227 LOWELL ROAD  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY,  
 NEW HAMPSHIRE

**BOHLER ENGINEERING**

352 TURNPIKE ROAD  
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**J.A. BOHLER**  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF NEW HAMPSHIRE  
 LICENSE NO. 10000

**APPROVED BY THE HUDSON, NH PLANNING BOARD**

DATE OF MEETING: \_\_\_\_\_

CHAIRMAN SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

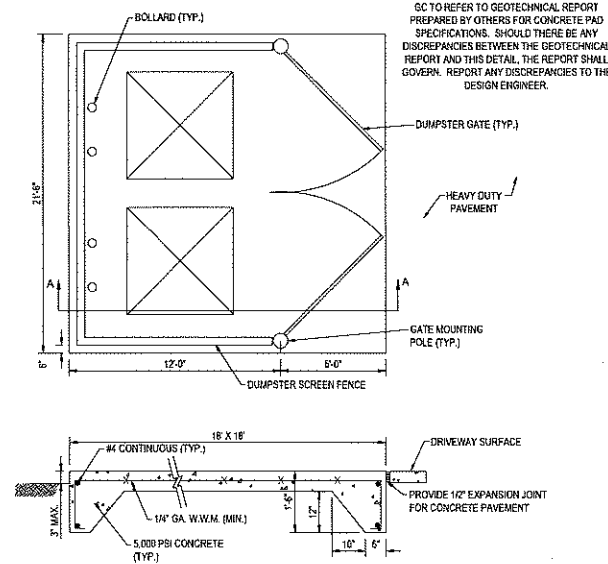
SECRETARY SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

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SHEET TITLE:  
**CONSTRUCTION DETAIL SHEET**

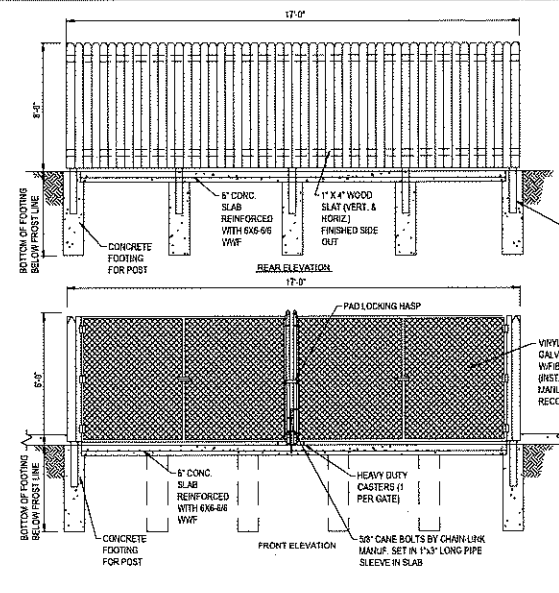
SHEET NUMBER:  
**13**  
 OF 18

REV 2 - 10/31/2019



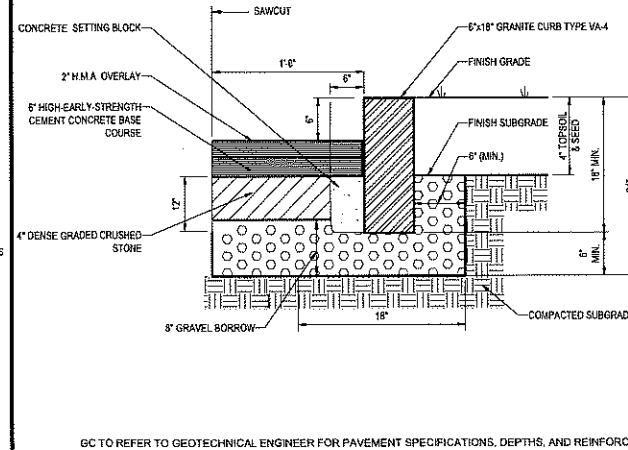
DUMPSTER PAD WITH SCREENING

N.T.S.



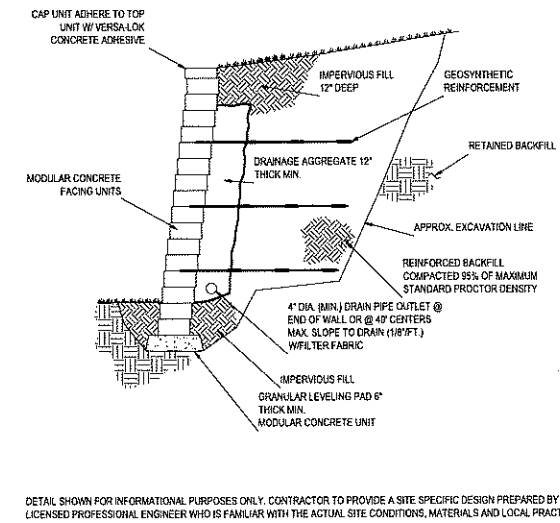
STOCKADE FENCE TRASH ENCLOSURE DETAIL

N.T.S.



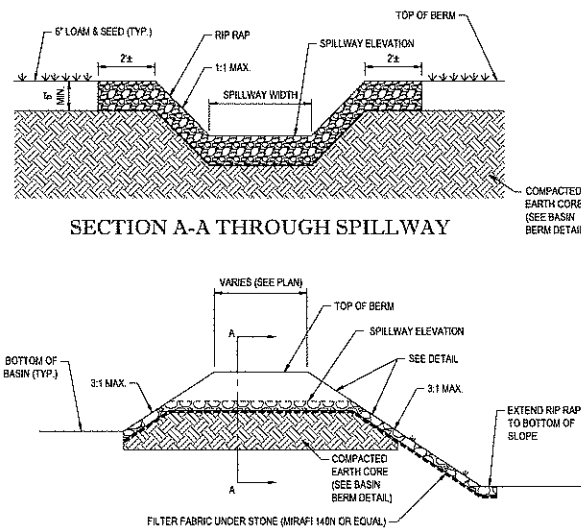
VERTICAL GRANITE CURB DETAIL

N.T.S.

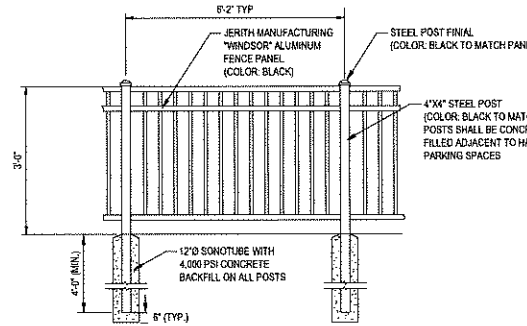


TYPICAL REINFORCED RETAINING WALL

N.T.S.

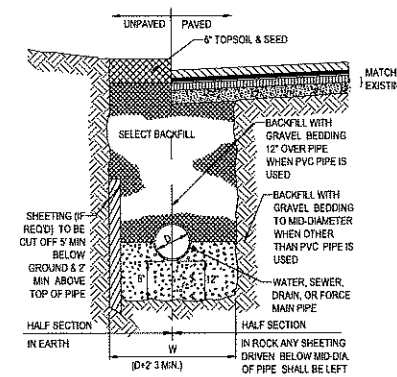


SECTION A-A THROUGH SPILLWAY



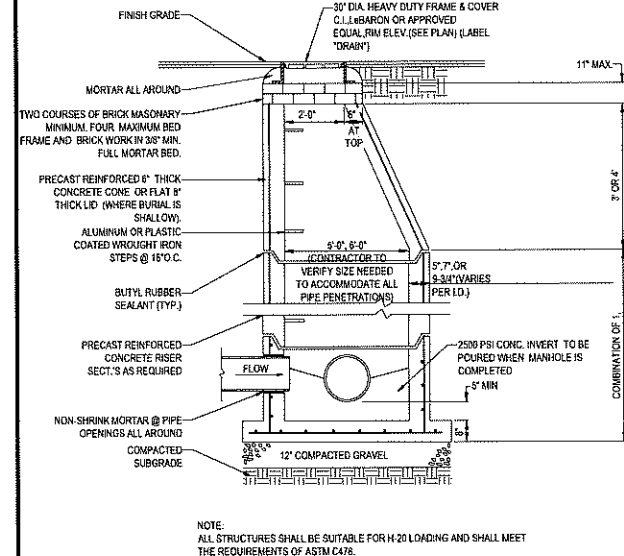
PATIO SEATING FENCE DETAIL

N.T.S.



TYPICAL UTILITY TRENCH

N.T.S.



TYP. PRECAST CONCRETE MANHOLE STORM DRAIN

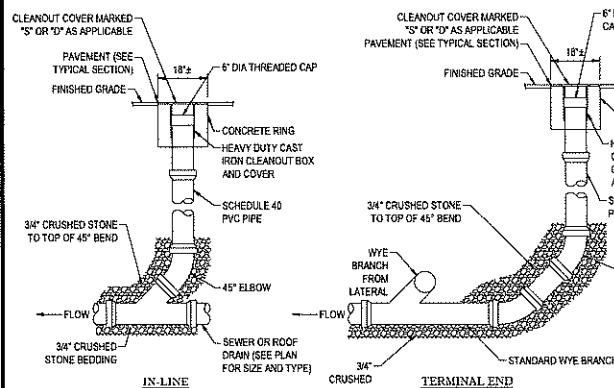
N.T.S.

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

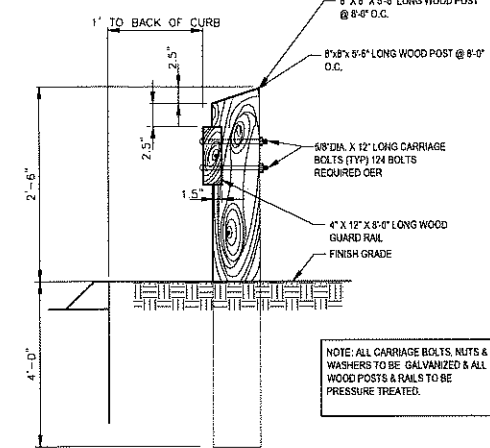
DATE OF MEETING \_\_\_\_\_ DATE \_\_\_\_\_  
 CHAIRMAN SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
 SECRETARY SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

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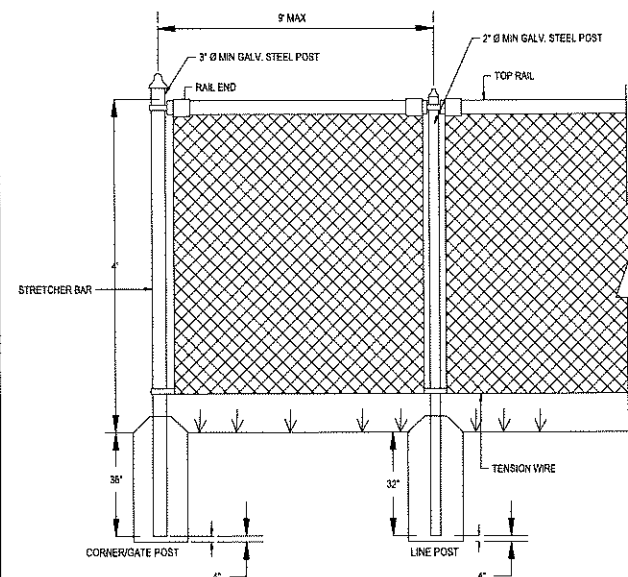
CLEANOUT DETAIL

N.T.S.



WOOD GUIDERAIL DETAIL

N.T.S.



CHAIN LINK FENCE DETAIL

N.T.S.

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 • WASHINGTON, DC

REVISIONS

REV	DATE	COMMENT	BY
1	10/9/2019	PER ALTERNATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
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PERMIT SET

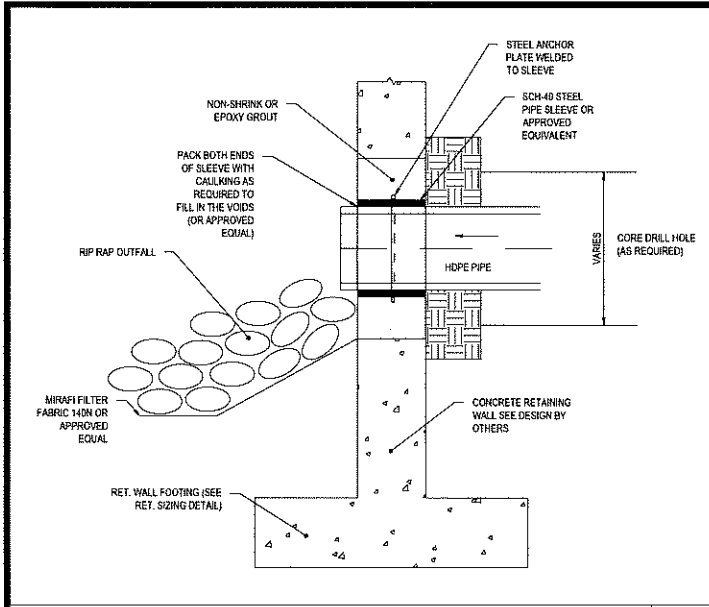
PROJECT NO: W191031  
 DRAWN BY: EKR  
 CHECKED BY: AFT/MKB  
 DATE: 09/30/2019  
 SCALE: AS NOTED  
 CAD I.D.: W191031\_S2

PROJECT: **SITE DEVELOPMENT PLANS**  
 FOR **FLAGSTONE CROSSING**  
 AT THE LANNAN COMPANY  
 LOCATION OF SITE  
 MAP #222, LOTS #3, #4, #5, & #6  
 225 & 227 LOWELL ROAD  
 2 FLAGSTONE DRIVE  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY,  
 NEW HAMPSHIRE

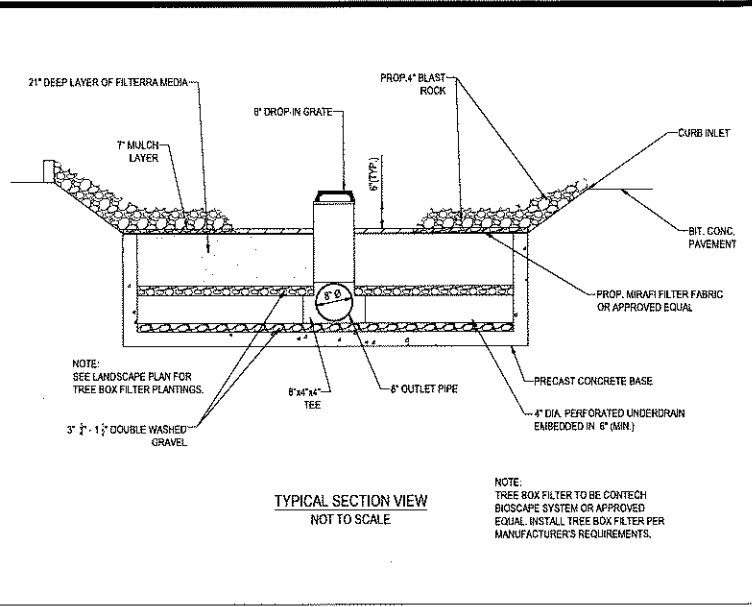
**BOHLER ENGINEERING**  
 352 TURNPIKE ROAD  
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 Phone: (508) 480-9900  
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 www.BohlerEngineering.com

**J.A. WELCH**  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF NEW HAMPSHIRE  
 LICENSE # 1042

SHEET TITLE: **CONSTRUCTION DETAIL SHEET**  
 SHEET NUMBER: **14**  
 OF 18  
 REV 2 - 10/31/2019



TYPICAL PIPE PENETRATION THROUGH RETAINING WALL N.T.S.

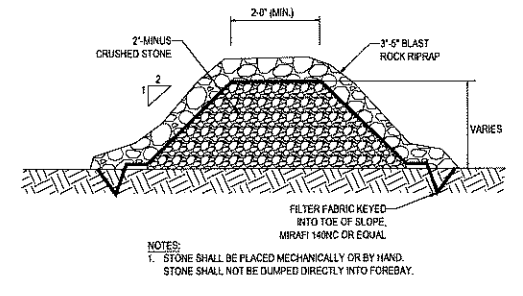


TYPICAL SECTION VIEW NOT TO SCALE

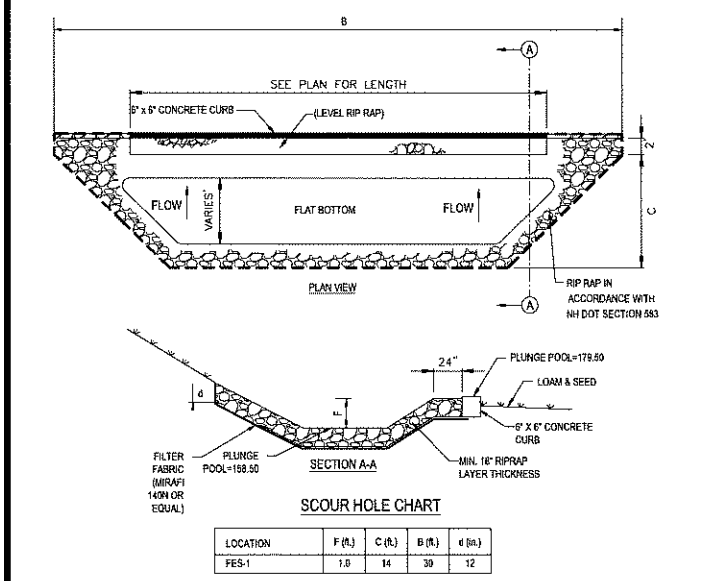
TREE BOX FILTER CHART

LOCATION	INSIDE DIMS.	CURB ELEV.	8" GRATE ELEV.	TOP SOIL MEDIA ELEV.	8" OUTLET ELEV.
TREE BOX FILTER #1	4' X 4'	180.60	179.85	179.35	177.10
TREE BOX FILTER #2	4' X 4'	175.75	175.00	174.50	172.25
TREE BOX FILTER #3	8' X 4'	175.15	174.40	173.90	171.65
TREE BOX FILTER #4	4' X 6'	174.50	173.75	173.25	171.00
TREE BOX FILTER #5	10' X 6'	177.25	176.50	176.00	173.75
TREE BOX FILTER #6	4' X 4'	174.15	173.40	172.90	170.65
TREE BOX FILTER #7	4' X 4'	173.20	172.45	171.95	169.70

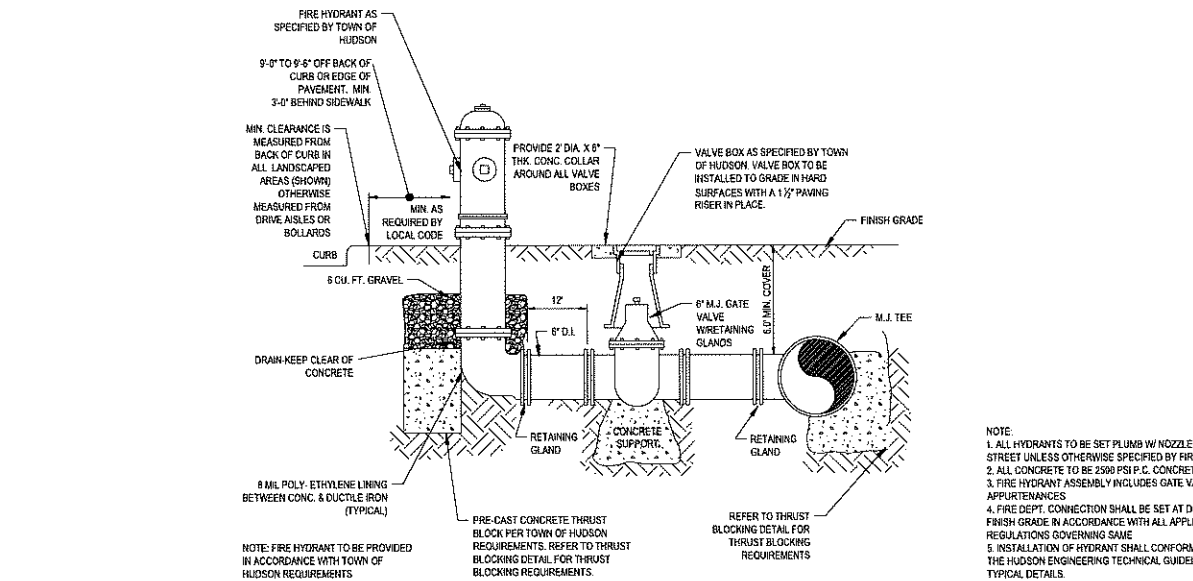
CONTECH BIOSCAPE TREE BOX FILTER N.T.S.



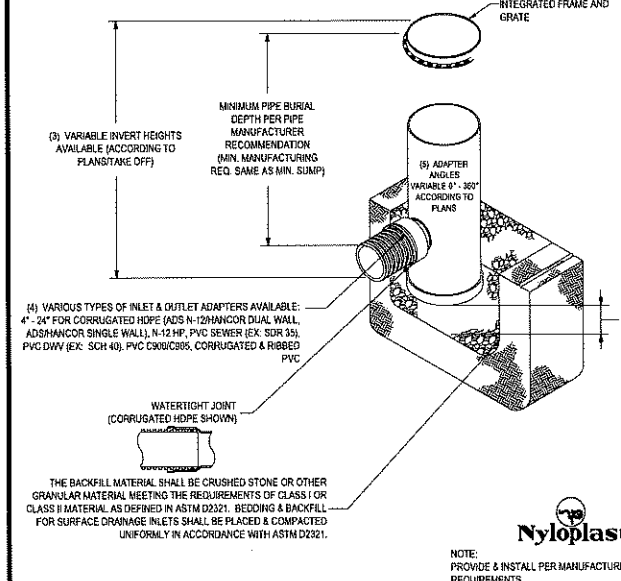
STONE CHECK DAM DETAIL N.T.S.



LEVEL SPREADER N.T.S.



FIRE HYDRANT ASSEMBLY DETAIL N.T.S.



LANDSCAPE CATCH BASIN/DRAIN MANHOLE N.T.S.

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

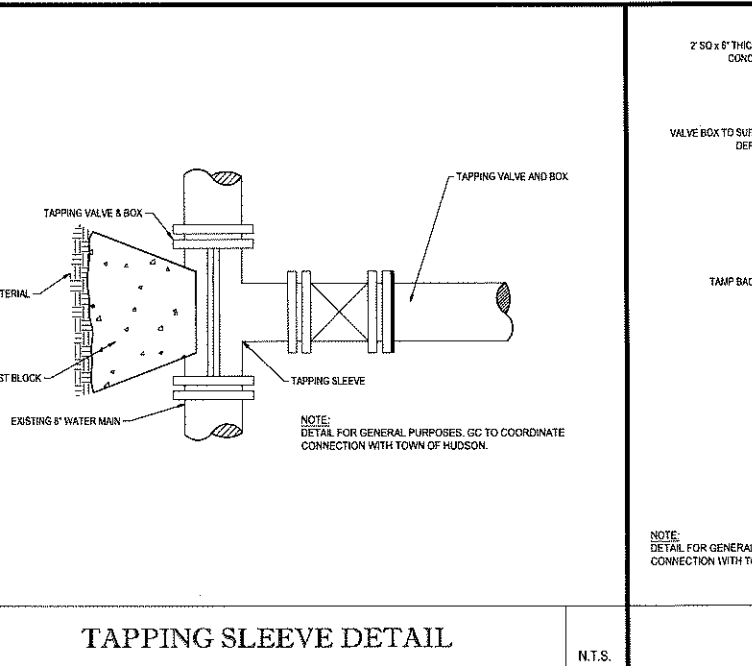
APPROVED BY THE HUDSON, NH PLANNING BOARD

DATE OF MEETING \_\_\_\_\_

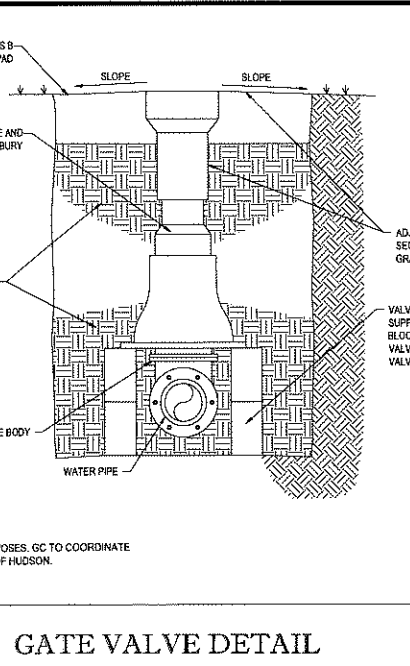
CHAIRMAN SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SECRETARY SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

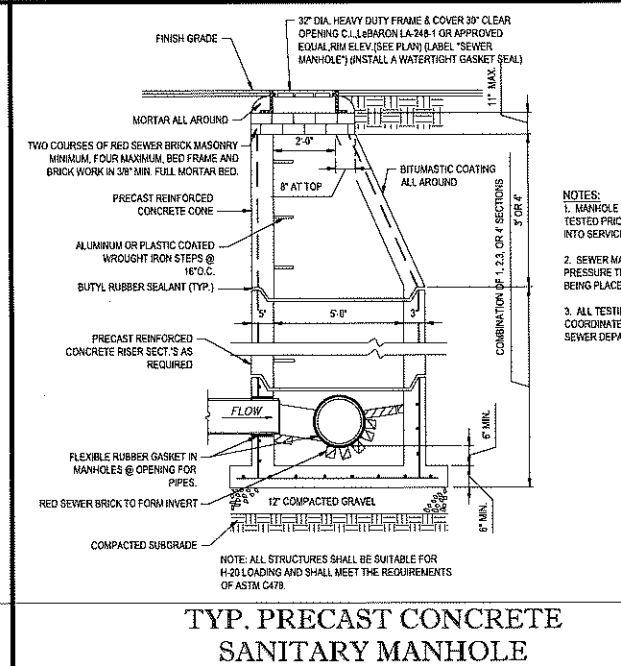
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TAPPING SLEEVE DETAIL N.T.S.



GATE VALVE DETAIL N.T.S.



TYP. PRECAST CONCRETE SANITARY MANHOLE N.T.S.

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DALLAS, TX  
NEW YORK, NY  
NEW YORK, NY  
NORTH HAVEN, CT  
WASHINGTON, DC

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REVISIONS

REV	DATE	COMMENT	BY
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2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
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PERMIT SET

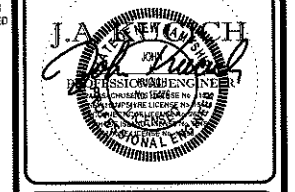
PROJECT No: W191031  
DRAWN BY: EKR  
CHECKED BY: AFT/AMK  
DATE: 09/30/2019  
SCALE: AS NOTED  
CAD I.D.: W191031\_S22

PROJECT: **SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**  
THE LANNAN COMPANY  
1500 E. STATE ST. SUITE 100  
DURHAM, NH 03824

LOCATION OF SITE  
MAP #222, LOTS #3, #4, #5, & #6  
225 & 227 LOWELL ROAD  
2 FLAGSTONE DRIVE  
TOWN OF HUDSON  
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NEW HAMPSHIRE

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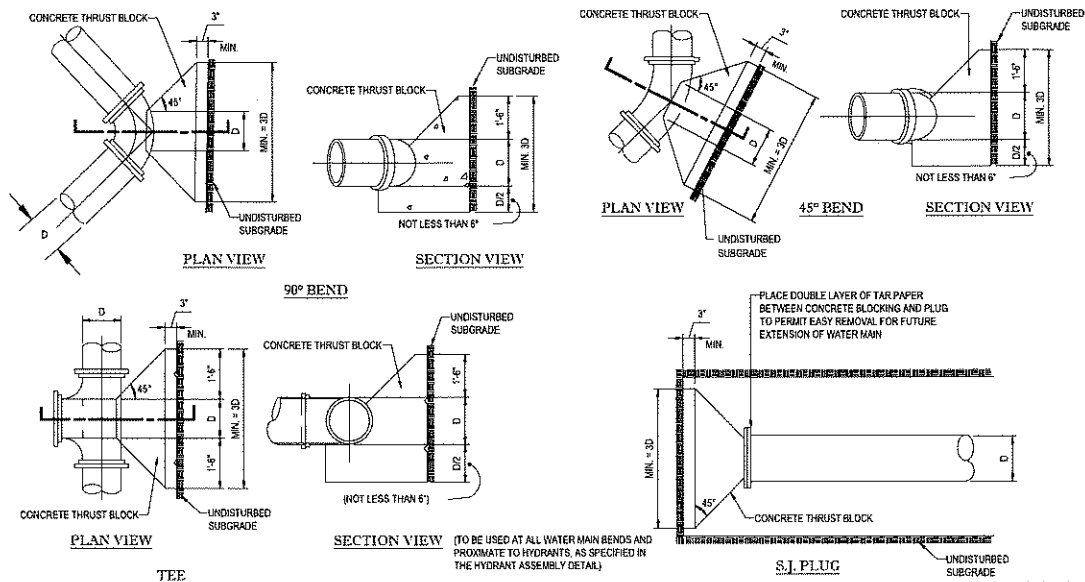


SHEET TITLE: **CONSTRUCTION DETAIL SHEET**

SHEET NUMBER: **15** OF 18

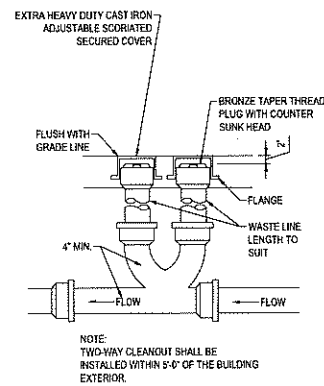
REV 2 - 10/31/2019





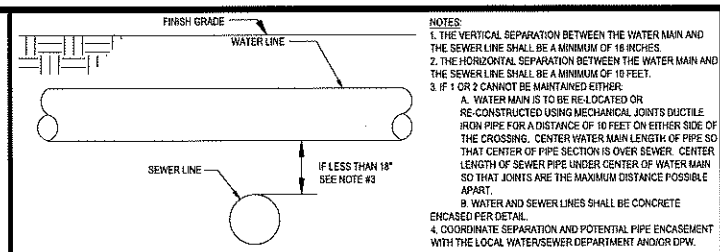
**THRUST BLOCK DETAIL**

N.T.S.



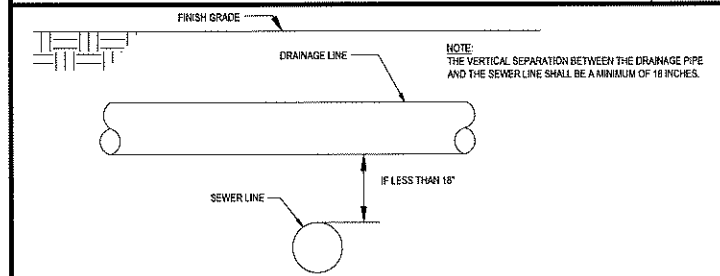
**TWO-WAY CLEANOUT**

N.T.S.



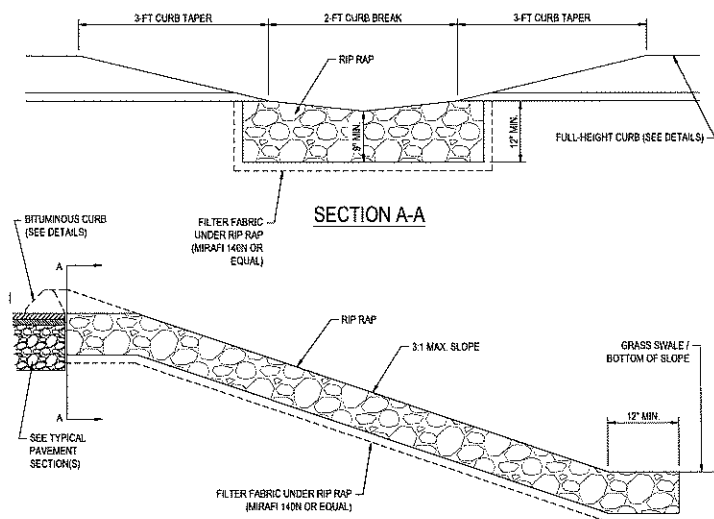
**SEWER & WATER UTILITY CROSSINGS**

N.T.S.



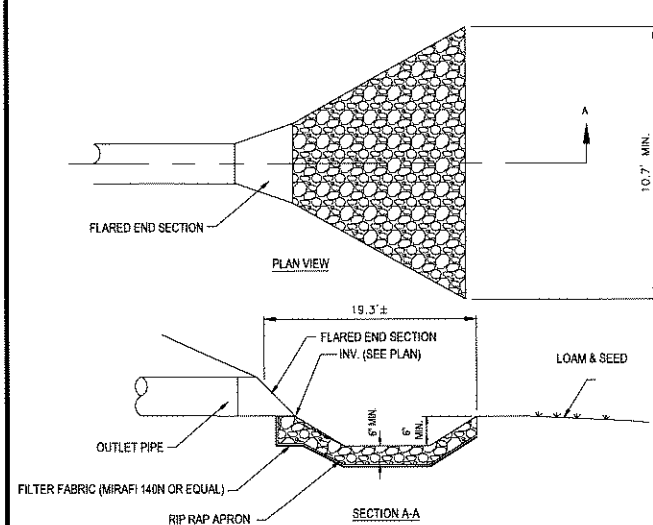
**SEWER & DRAINAGE UTILITY CROSSINGS**

N.T.S.



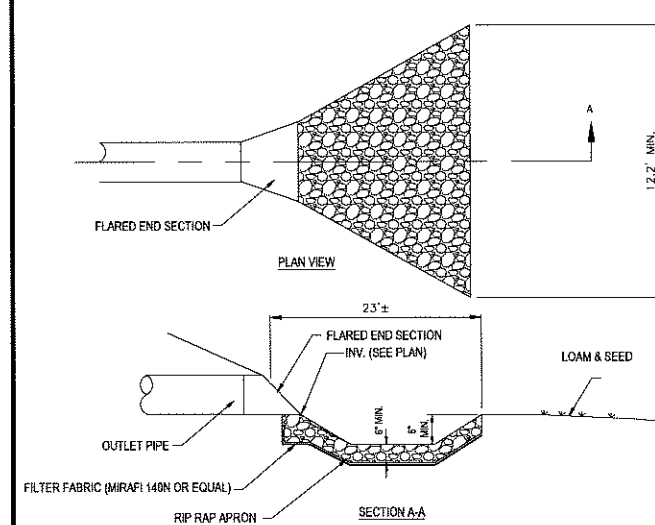
**RIP RAP CURB INLET DETAIL**

N.T.S.



**FLARED END SECTION-1 WITH RIP RAP APRON DETAIL**

N.T.S.



**FLARED END SECTION-2 WITH RIP RAP APRON DETAIL**

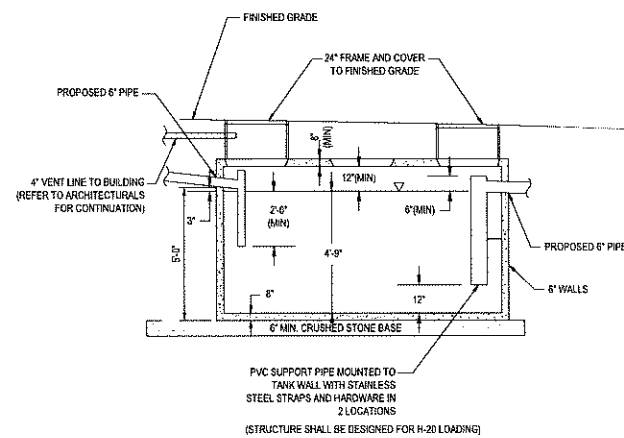
N.T.S.

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**APPROVED BY THE HUDSON, NH PLANNING BOARD**

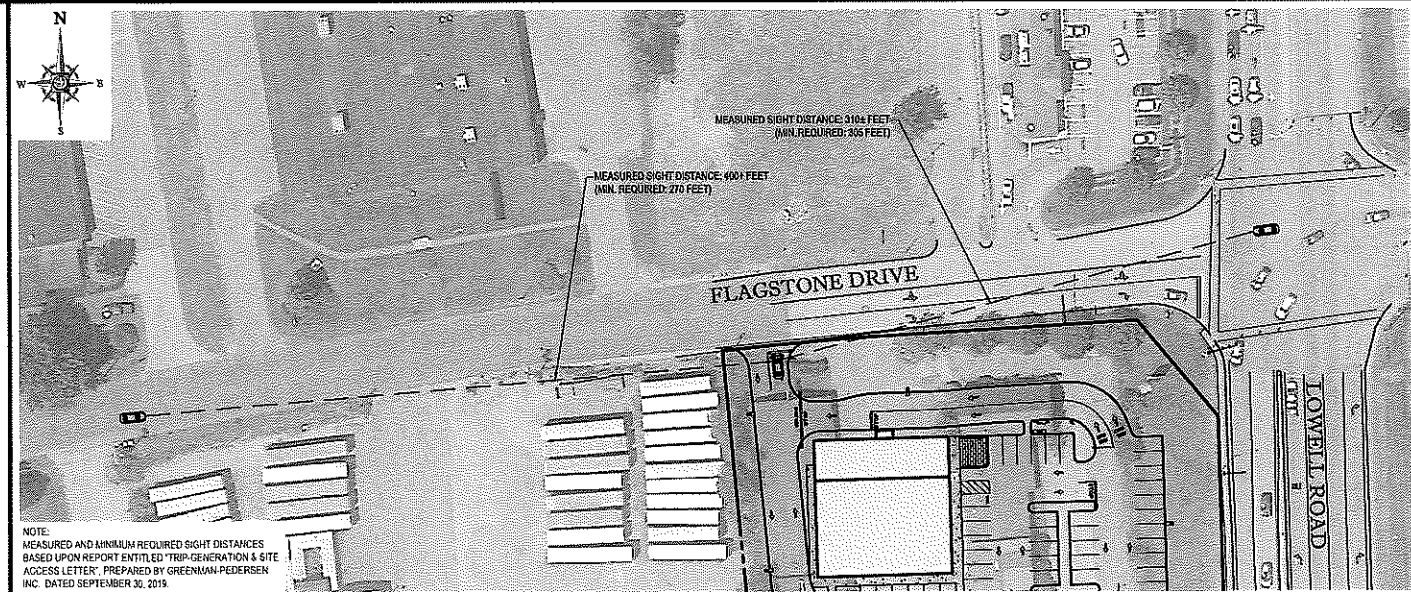
DATE OF MEETING \_\_\_\_\_  
 CHAIRMAN SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
 SECRETARY SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

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**1,500 GALLON GREASE TRAP DETAIL**

N.T.S.



**SIGHT DISTANCE INSET**

1"=50'

**BOHLER ENGINEERING**

OFFICE AND CONSULTING ENGINEERING  
 LAND SURVEYING PROGRAM MANAGEMENT LANDSCAPE ARCHITECTURE  
 SUSTAINABLE DESIGN PERMITTING SERVICES TRANSPORTATION SERVICES

NEW HAMPSHIRE  
 VERMONT  
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 RHODE ISLAND  
 CONNECTICUT  
 NEW JERSEY  
 PENNSYLVANIA  
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 MARYLAND  
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 GEORGIA  
 ALABAMA  
 MISSISSIPPI  
 LOUISIANA  
 ARIZONA  
 CALIFORNIA  
 NEVADA  
 IDAHO  
 UTAH  
 WYOMING  
 MONTANA  
 WISCONSIN  
 ILLINOIS  
 INDIANA  
 OHIO  
 MICHIGAN  
 MINNESOTA  
 WISCONSIN  
 ILLINOIS  
 INDIANA  
 OHIO  
 MICHIGAN  
 MINNESOTA

**REVISIONS**

REV	DATE	COMMENT	BY
1	10/9/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
3			
4			
5			
6			
7			
8			
9			

**PERMIT SET**

PROJECT No: W191031  
 DRAWN BY: EKR  
 CHECKED BY: AFT/MKB  
 DATE: 09/30/2019  
 SCALE: AS NOTED  
 CAD I.D.: W191031\_S22

**PROJECT: SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

FOR THE LANNAN COMPANY  
 THE LANNAN COMPANY  
 1000 E. STATE STREET, NEWTON, MASSACHUSETTS 02459

LOCATION OF SITE  
 MAP #222, LOTS #3, #4, #5, & #6  
 225 & 227 LOWELL ROAD  
 2 FLAGSTONE DRIVE  
 TOWN OF HUDSON  
 HILLSBOROUGH COUNTY, NEW HAMPSHIRE

**BOHLER ENGINEERING**

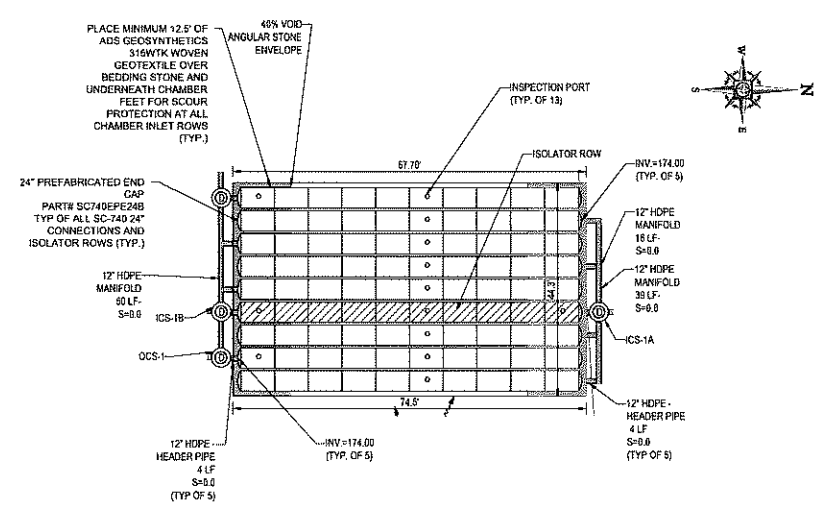
352 TURNPIKE ROAD  
 SOUTHBOROUGH, MA 01772  
 Phone: (508) 480-9900  
 Fax: (508) 480-9080  
 www.BohlerEngineering.com

**J.A. WELCH**  
 REGISTERED PROFESSIONAL ENGINEER  
 CIVIL ENGINEERING  
 STATE OF NEW HAMPSHIRE  
 LICENSE NO. 10228

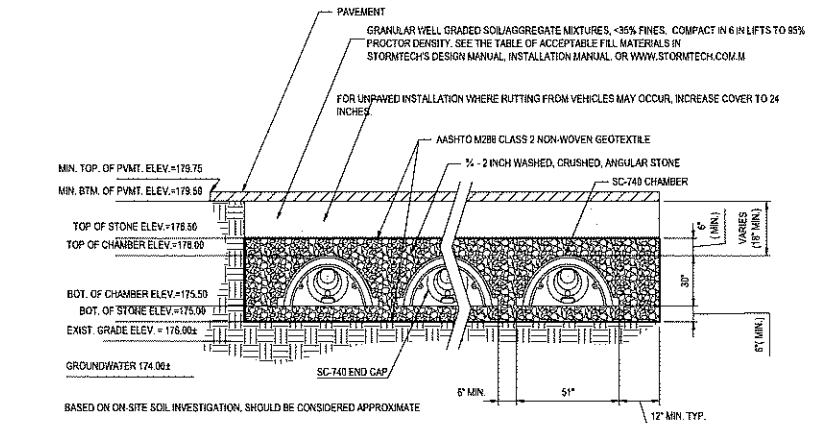
SHEET TITLE:  
**CONSTRUCTION DETAIL SHEET**

SHEET NUMBER:  
**16**  
 OF 18

REV 2 - 10/31/2019



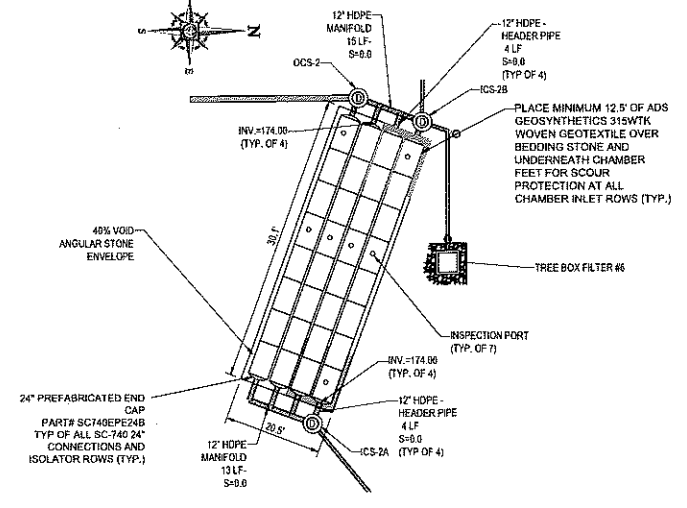
PLAN VIEW  
1"=20'



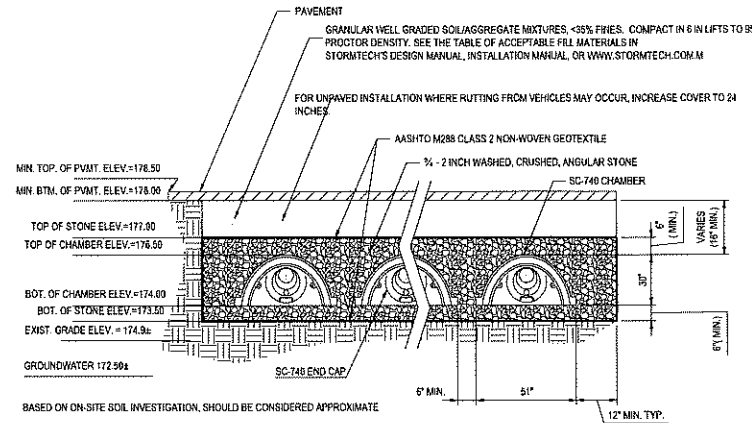
NOTE:  
1. REFER TO GRADING AND DRAINAGE PLAN FOR BOTTOM OF STONE AND CHAMBER INVERT ELEVATIONS REQUIRED FOR EACH SYSTEM.  
2. CONTRACTOR TO COORDINATE WITH MANUFACTURER & LOCAL MUNICIPALITY REGARDING INSTALLATION REQUIREMENT & PROCEDURE. CONTRACTOR TO CONTACT OWNER & ENGINEER OF RECORD IF ANY DISCREPANCIES ARE ENCOUNTERED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

SUBSURFACE INFILTRATION BASIN #1

N.T.S.



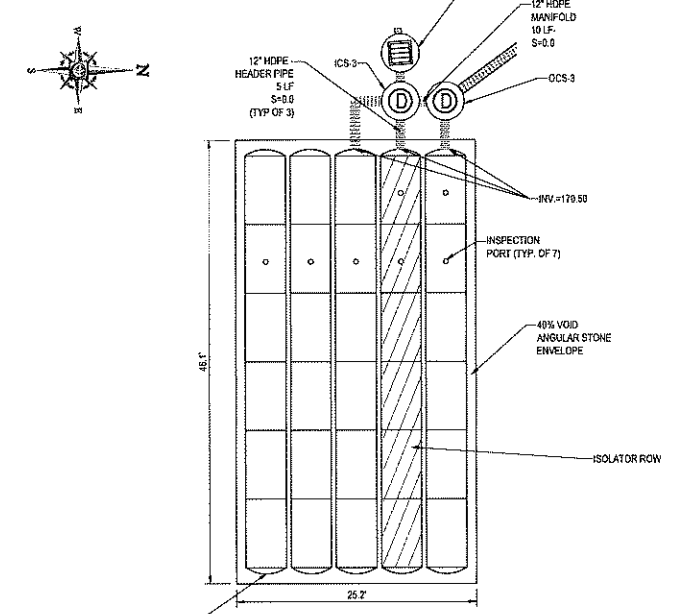
PLAN VIEW  
1"=20'



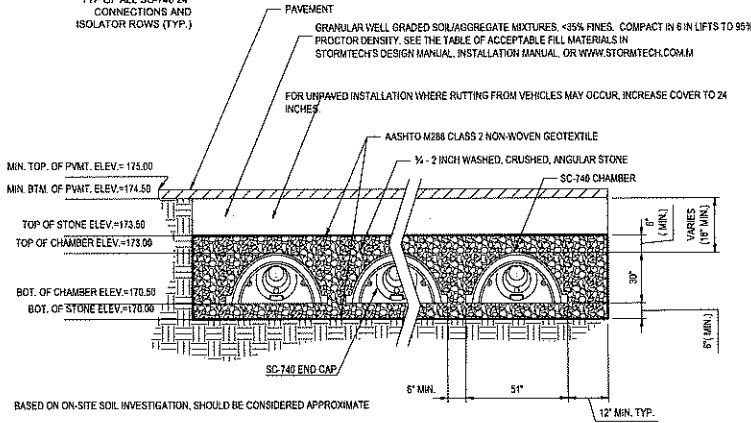
NOTE:  
1. REFER TO GRADING AND DRAINAGE PLAN FOR BOTTOM OF STONE AND CHAMBER INVERT ELEVATIONS REQUIRED FOR EACH SYSTEM.  
2. CONTRACTOR TO COORDINATE WITH MANUFACTURER & LOCAL MUNICIPALITY REGARDING INSTALLATION REQUIREMENT & PROCEDURE. CONTRACTOR TO CONTACT OWNER & ENGINEER OF RECORD IF ANY DISCREPANCIES ARE ENCOUNTERED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

SUBSURFACE INFILTRATION BASIN #2

N.T.S.



PLAN VIEW  
1"=10'



NOTE:  
1. REFER TO GRADING AND DRAINAGE PLAN FOR BOTTOM OF STONE AND CHAMBER INVERT ELEVATIONS REQUIRED FOR EACH SYSTEM.  
2. CONTRACTOR TO COORDINATE WITH MANUFACTURER & LOCAL MUNICIPALITY REGARDING INSTALLATION REQUIREMENT & PROCEDURE. CONTRACTOR TO CONTACT OWNER & ENGINEER OF RECORD IF ANY DISCREPANCIES ARE ENCOUNTERED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

SUBSURFACE DETENTION BASIN #3

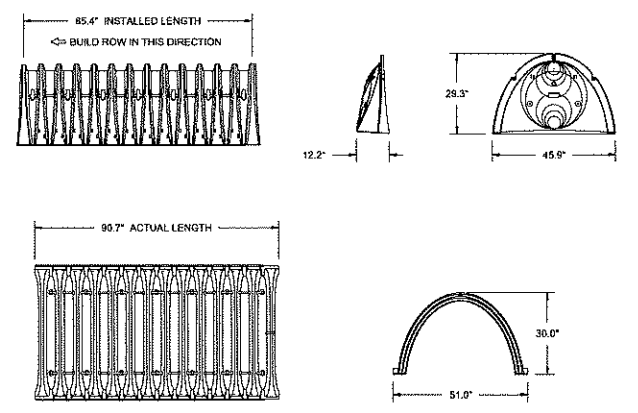
N.T.S.

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 \_\_\_\_\_ DATE \_\_\_\_\_  
CHAIRMAN SIGNATURE \_\_\_\_\_ SECRETARY SIGNATURE \_\_\_\_\_

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.

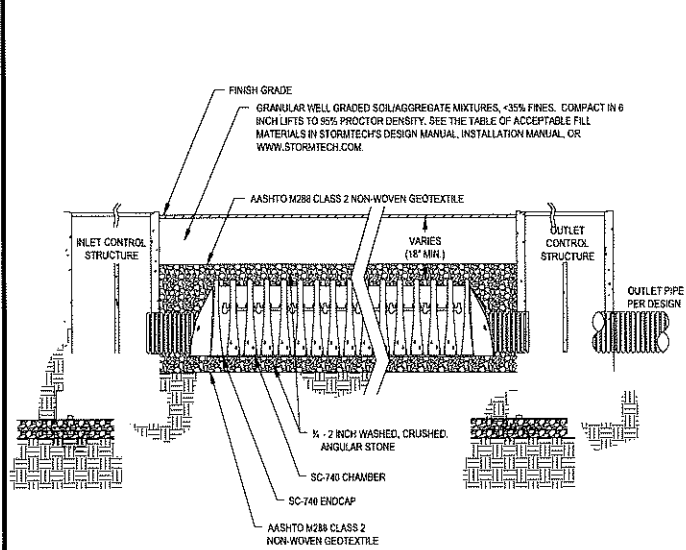


NOMINAL CHAMBER SPECIFICATIONS  
SIZE (W X H X INSTALLED LENGTH)  
CHAMBER STORAGE  
MINIMUM INSTALLED STORAGE WEIGHT

51.0' X 30.0' X 85.4'  
46.9 CUBIC FEET  
74.9 CUBIC FEET  
75.0 lbs.

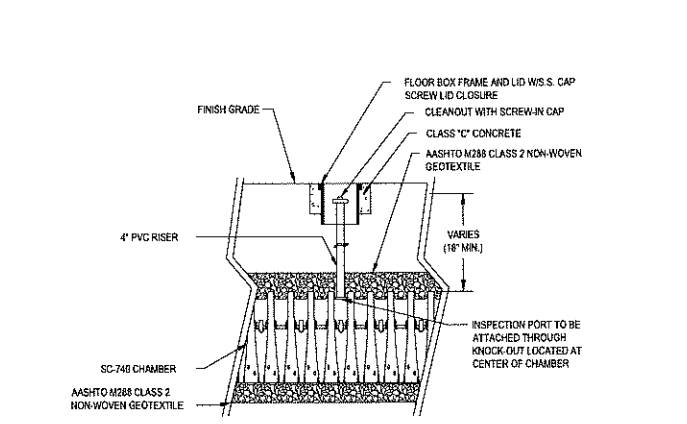
STORMTECH SC-740 CHAMBERS

N.T.S.



STORMTECH SC-740 CHAMBER SYSTEM  
TYPICAL CROSS-SECTION

N.T.S.



STORMTECH SC-740  
INSPECTION PORT

N.T.S.

**BOHLER ENGINEERING**

WITH CIVIL, LANDSCAPE ARCHITECTURE, LAND SURVEYING, PROGRAM MANAGEMENT, SUSTAINABLE DESIGN, PERMITTING SERVICES, TRANSPORTATION SERVICES

CHARLOTTE, NC  
BALTIMORE, MD  
SOUTH BEND, IN  
PHILADELPHIA, PA  
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NORTH HAVEN, CT  
RICHMOND, VA  
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DALLAS, TX  
MEMPHIS, TN  
INDIANAPOLIS, IN  
COLUMBIANA, OH  
COLUMBUS, OH  
CINCINNATI, OH  
CANTON, OH  
COLUMBIANA, OH  
COLUMBUS, OH  
CINCINNATI, OH  
CANTON, OH

REVISIONS			
REV	DATE	COMMENT	BY
1	10/9/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
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9			

**PERMIT SET**

PROJECT No: W191031  
DRAWN BY: EKR  
CHECKED BY: AFT/MKB  
DATE: 09/30/2019  
SCALE: AS NOTED  
CAD I.D.: W191031\_S32

**PROJECT: SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**

THE LANNAN COMPANY  
1000 WESTERN AVENUE, SUITE 200  
NORTH ANDOVER, MA 01854

LOCATION OF SITE  
MAP #222, LOTS #3, #4, #5, & #6  
225 & 227 LOWELL ROAD  
2 FLAGSTONE DRIVE  
TOWN OF HUDSON  
HILLSBOROUGH COUNTY,  
NEW HAMPSHIRE

**BOHLER ENGINEERING**

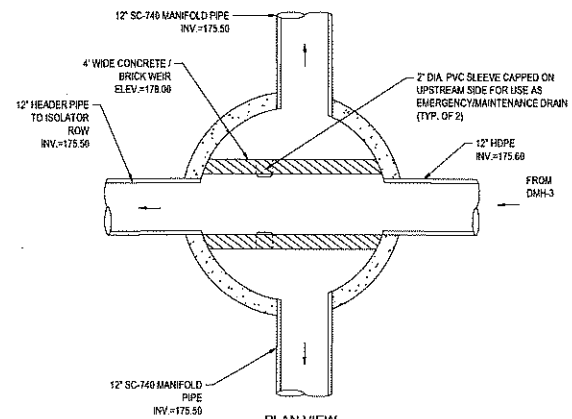
352 TURNPIKE ROAD  
SOUTHBOROUGH, MA 01772  
Phone: (508) 480-9900  
Fax: (508) 480-9080  
www.BohlerEngineering.com

**J.A. LANNAN & COMPANY**  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF NEW HAMPSHIRE  
LICENSE NO. 10838

SHEET TITLE:  
**CONSTRUCTION DETAIL SHEET**

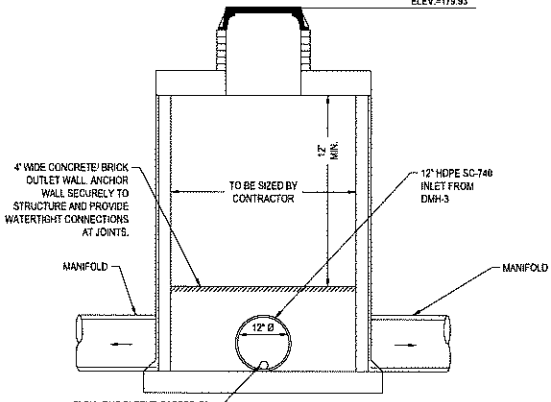
SHEET NUMBER:  
**17**  
OF 18

REV 2 - 10/31/2019



PLAN VIEW

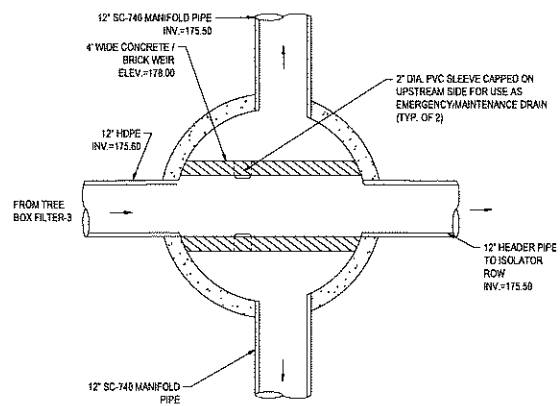
RM ELEV = 179.93



ELEVATION (A-A SECTION)

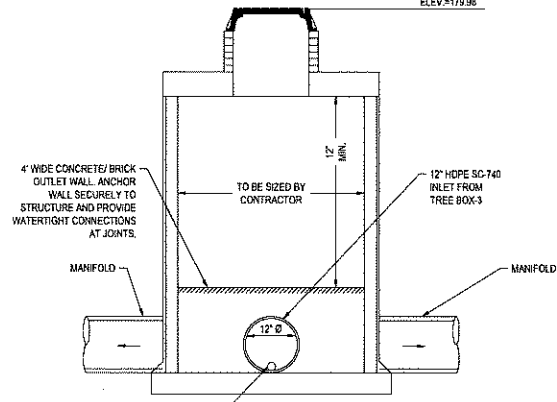
INLET CONTROL STRUCTURE 1A (ICS-1A)

N.T.S.



PLAN VIEW

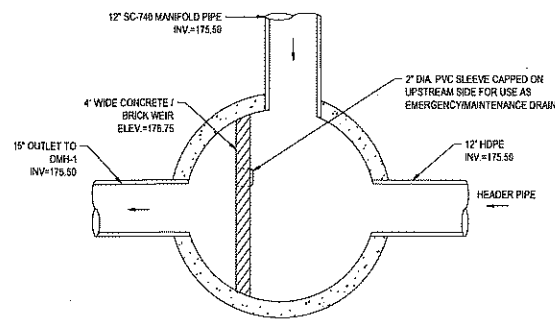
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ELEVATION (A-A SECTION)

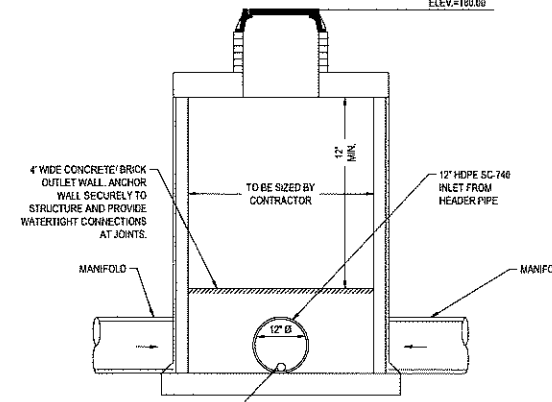
INLET CONTROL STRUCTURE 1B (ICS-1B)

N.T.S.



PLAN VIEW

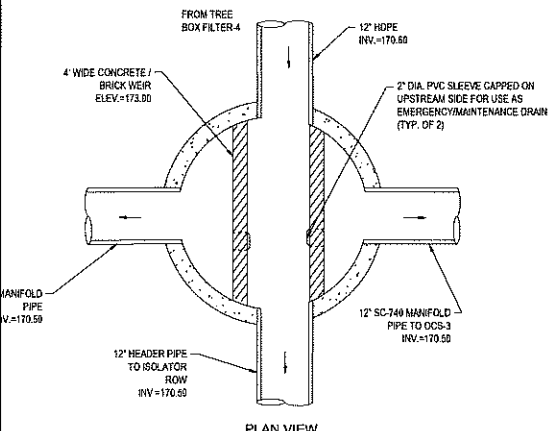
RM ELEV = 180.60



ELEVATION (A-A SECTION)

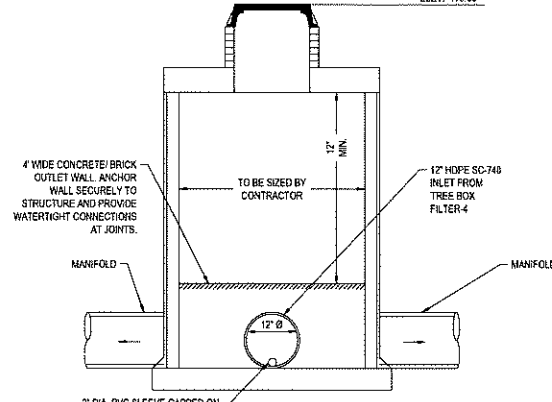
OUTLET CONTROL STRUCTURE 1 (OCS-1)

N.T.S.



PLAN VIEW

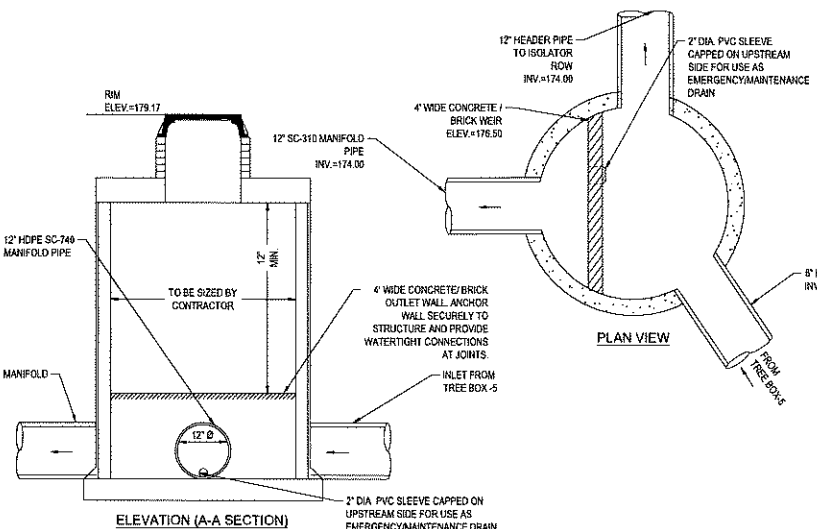
RM ELEV = 178.00



ELEVATION (A-A SECTION)

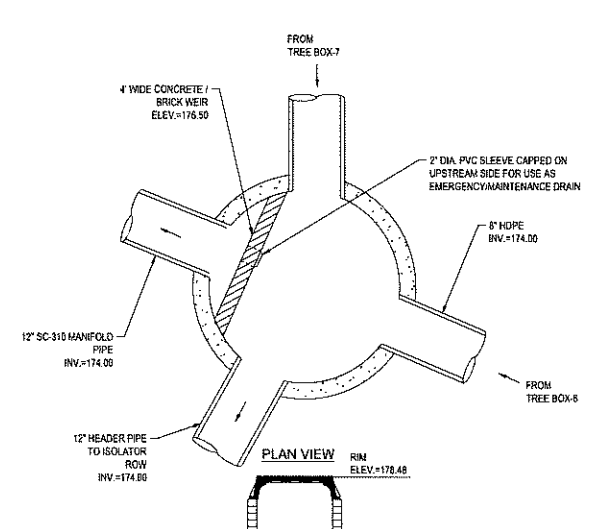
INLET CONTROL STRUCTURE 3 (ICS-3)

N.T.S.



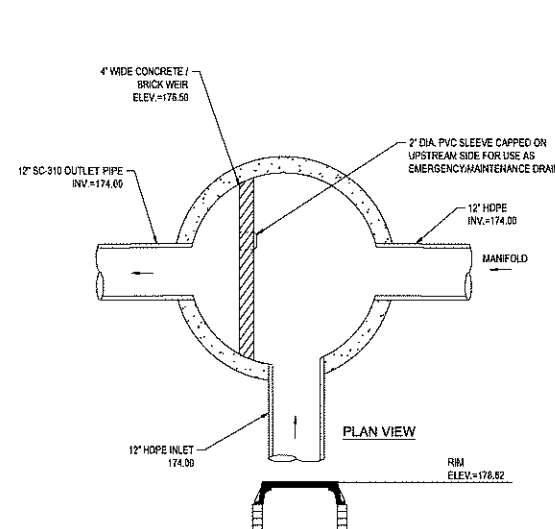
INLET CONTROL STRUCTURE 2A (ICS-2A)

N.T.S.



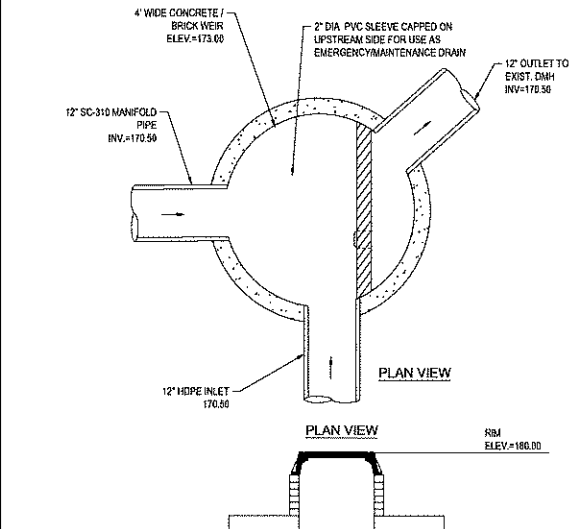
INLET CONTROL STRUCTURE 2B (ICS-2B)

N.T.S.



OUTLET CONTROL STRUCTURE 2 (OCS-2)

N.T.S.



OUTLET CONTROL STRUCTURE 3 (OCS-3)

N.T.S.

**BOHLER ENGINEERING**

SITE VISIT AND CONSULTING ENGINEERING  
LANDSCAPE ARCHITECTURE  
SUSTAINABLE DESIGN  
PROGRAM MANAGEMENT

CHARLOTTE, NC  
ATLANTA, GA  
CHICAGO, IL  
DENVER, CO  
HOUSTON, TX  
LOS ANGELES, CA  
MIAMI, FL  
MINNEAPOLIS, MN  
NEW YORK, NY  
PHILADELPHIA, PA  
PORTLAND, OR  
SAN ANTONIO, TX  
WASHINGTON, DC

**REVISIONS**

REV	DATE	COMMENT	BY
1	10/9/2019	PER ALTERATION OF TERRAIN APPLICATION	EKR
2	10/31/2019	PER PEER REVIEW COMMENTS	EKR
3			
4			
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7			
8			
9			

**PERMIT SET**

PROJECT No.: W191031  
DRAWN BY: ERF  
CHECKED BY: AFTAKB  
DATE: 09/30/2019  
SCALE: AS NOTED  
CAD ID: W191031\_S32

**SITE DEVELOPMENT PLANS FOR FLAGSTONE CROSSING**  
FOR THE LANNAN COMPANY  
REAL ESTATE INVESTMENT & DEVELOPMENT

LOCATION OF SITE  
MAP #222, LOTS #3, #4, #5, & #6  
225 & 227 LOWELL ROAD  
2 FLAGSTONE DRIVE  
TOWN OF HUDSON  
HILLSBOROUGH COUNTY, NEW HAMPSHIRE

**BOHLER ENGINEERING**

352 TURNPIKE ROAD  
SOUTHBOROUGH, MA 01772  
Phone: (508) 480-9900  
Fax: (508) 480-9080  
www.BohlerEngineering.com

**J.A. NEWBORN**  
REGISTERED PROFESSIONAL ENGINEER  
LICENSE NO. 10456-E  
EXPIRES 12/31/2021

SHEET TITLE:  
**CONSTRUCTION DETAIL SHEET**

SHEET NUMBER:  
**18**  
OF 18

REV 2 - 10/31/2019

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

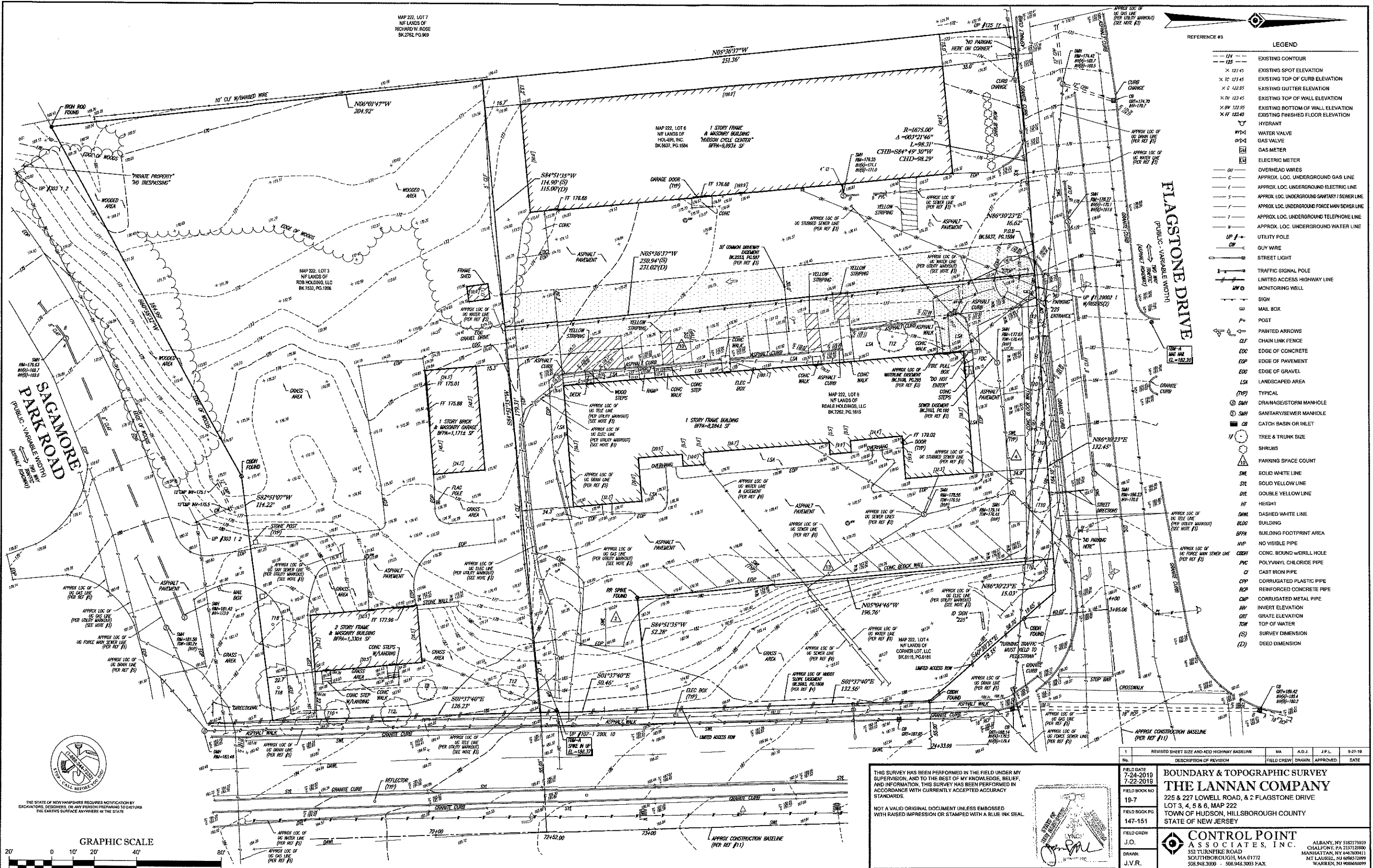
**APPROVED BY THE HUDSON, NH PLANNING BOARD**

DATE OF MEETING: \_\_\_\_\_

CHAIRMAN SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

SECRETARY 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.



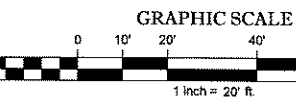
REFERENCE #3

LEGEND

- EXISTING CONTOUR
- x 123.45 EXISTING SPOT ELEVATION
- x TO 123.45 EXISTING TOP OF CURB ELEVATION
- x G 123.55 EXISTING GUTTER ELEVATION
- x H 123.45 EXISTING TOP OF WALL ELEVATION
- x BW 123.55 EXISTING BOTTOM OF WALL ELEVATION
- x FF 123.45 EXISTING FINISHED FLOOR ELEVATION
- HYDRANT
- WATER VALVE
- GAS VALVE
- GAS METER
- ELECTRIC METER
- OVERHEAD WIRES
- APPROX. LOC. UNDERGROUND GAS LINE
- APPROX. LOC. UNDERGROUND ELECTRIC LINE
- APPROX. LOC. UNDERGROUND SANITARY / SEWER LINE
- APPROX. LOC. UNDERGROUND FORCE MAIN SEWER LINE
- APPROX. LOC. UNDERGROUND TELEPHONE LINE
- APPROX. LOC. UNDERGROUND WATER LINE
- UTILITY POLE
- GUY WIRE
- STREET LIGHT
- TRAFFIC SIGNAL POLE
- LIMITED ACCESS HIGHWAY LINE
- MONITORING WELL
- SIGN
- MAIL BOX
- POST
- PAINTED ARROWS
- CHAIN LINK FENCE
- EDGE OF CONCRETE
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- LANDSCAPED AREA
- TYPICAL
- DRAINAGE/STORM MANHOLE
- SANITARY/SEWER MANHOLE
- CATCH BASIN OR INLET
- TREE & TRUNK SIZE
- SHRUBS
- PARKING SPACE COUNT
- SOLID WHITE LINE
- SOLID YELLOW LINE
- DOUBLE YELLOW LINE
- HEIGHT
- DASHED WHITE LINE
- BUILDING
- BFPN BUILDING FOOTPRINT AREA
- NO VISIBLE PIPE
- CONC. BOUND W/DRILL HOLE
- PVC POLYVINYL CHLORIDE PIPE
- CI CAST IRON PIPE
- CPP CORRUGATED PLASTIC PIPE
- CCP REINFORCED CONCRETE PIPE
- CMP CORRUGATED METAL PIPE
- INVERT ELEVATION
- GRATE ELEVATION
- TOP OF WATER
- SURVEY DIMENSION
- DEED DIMENSION

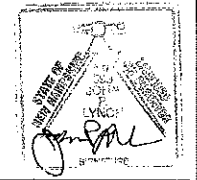
CONTROL POINT ASSOCIATES, INC. ALL RIGHTS RESERVED. ORIGINAL PROJECT OR COPY OF THIS SURVEY IS THE PROPERTY OF CONTROL POINT ASSOCIATES, INC. IT IS TO BE USED ONLY FOR THE PURPOSE CHURNALLY ATTACHED. WITHOUT THE WRITTEN PERMISSION OF CONTROL POINT ASSOCIATES, INC.

THE STATE OF NEW HAMPSHIRE REQUIRES NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE



THIS SURVEY HAS BEEN PERFORMED IN THE FIELD UNDER MY SUPERVISION, AND TO THE BEST OF MY KNOWLEDGE, BELIEF AND INFORMATION, THIS SURVEY HAS BEEN PERFORMED IN ACCORDANCE WITH CURRENTLY ACCEPTED ACCURACY STANDARDS.

NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION OR STAMPED WITH A BLUE INK SEAL.

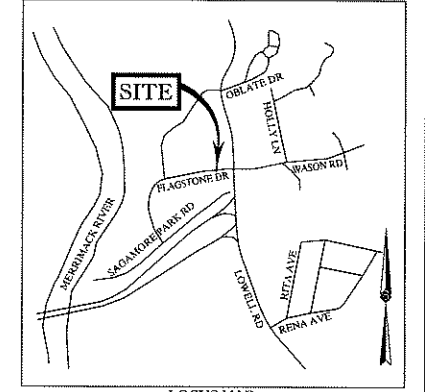


**JOHN P. LYNCH**  
NEW HAMPSHIRE PROFESSIONAL LAND SURVEYOR #689

1	REVISED SHEET SIZE AND ADD HIGHWAY BASELINE	MA	A.D.J.	J.P.L.	9-21-19
No.	DESCRIPTION OF REVISION	FIELD CREW	DRAWN	APPROVED	DATE
FIELD DATE: 7-24-2019 7-22-2019 FIELD BOOK NO: 19-7 FIELD BOOK PG: 147-151 FIELD CREW: J.O., J.V.R. DRAWN: J.V.R. DATE: 9/27/2019					
<b>BOUNDARY &amp; TOPOGRAPHIC SURVEY</b> <b>THE LANNAN COMPANY</b> 225 & 227 LOWELL ROAD, & 2 FLAGSTONE DRIVE LOT 3, 4, 5 & 6, MAP 222 TOWN OF HUDSON, HILLSBOROUGH COUNTY STATE OF NEW JERSEY					
<b>CONTROL POINT ASSOCIATES, INC.</b> 352 TURNPIKE ROAD SCITTSBOROUGH, NJ 08872 908.948.3000 - 908.948.3003 FAX					
REVIEWED	APPROVED	DATE	SCALE	FILE NO.	DWG. NO.
A.J.D.	G.L.H.	7-26-2019	1"=20'	03-190036	2 OF 2



FOR USE OF REGISTRY OF DEEDS



LOCUS MAP  
NOT TO SCALE

APPROVED BY THE  
TOWN OF HUDSON N.H. PLANNING BOARD

CHAIRMAN	DATE

REFERENCES:

1. THE TAX ASSESSOR'S MAP OF HUDSON, HILLSBOROUGH COUNTY, MAP 222.
2. MAP ENTITLED "BOUNDARY & TOPOGRAPHIC SURVEY, THE LANNAN COMPANY" PREPARED BY CONTROL POINT ASSOCIATES, INC. DATED JULY 26, 2019.
3. MAP ENTITLED "225-227 LOWELL ROAD HUDSON, NH 03051, ALTANSPS LAND TITLE SURVEY" DATED OCTOBER 23, 2018, PREPARED BY MHF DESIGN CONSULTANTS, INC.
4. MAP ENTITLED "225-227 LOWELL ROAD HUDSON, NH 03051, LOT CONSOLIDATION PLAN" DATED OCTOBER 23, 2018, PREPARED BY MHF DESIGN CONSULTANTS, INC.
5. MAP ENTITLED "SUBDIVISION PLAN LOTS 4343-00 & 4343-01 OF GERARD L. & MEDORA M. VIENS" DATED FEBRUARY 1973, RECORDED IN THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN NO. 8416.
6. MAP ENTITLED "SITE PLAN HUDSON CYCLE CENTER INC." DATED OCTOBER 14, 1985, PREPARED BY ALLAN H. SWANSON, INC. RECORDED IN THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS IN DRAWER 94, PLAN 22716.
7. MAP ENTITLED "LOT LINE RELOCATION (LOTS 4 AND 4-1, MAP 10) LOWELL ROAD, HUDSON, NEW HAMPSHIRE, PREPARED FOR B. FOREST TAYLOR" DATED JULY 28, 1983, PREPARED BY ALLAN H. SWANSON, INC. RECORDED IN THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN 15843.
8. MAP ENTITLED "AS-BUILT PLAN (LOT 4, MAP 10) SEABORN, A CONDOMINIUM, LOWELL ROAD HUDSON, N.H. PREPARED FOR B. FOREST TAYLOR" DATED OCTOBER 18, 1983, PREPARED BY ALLAN H. SWANSON, INC. RECORDED IN THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN 16318.
9. MAP ENTITLED "SUBDIVISION PLAN, SAGAMORE INDUSTRIAL PARK" DATED AUGUST 1974, PREPARED BY A.E. MAYNARD CIVIL ENGINEER, RECORDED IN THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN 7939.
10. MAP ENTITLED "PLANS OF PROPOSED F.E. EVERETT TURNPIKE - EXIT 2 CONNECTOR TO NEW HAMPSHIRE ROUTE 3A, N.H. PROJECT NO. 16025-B" AS-BUILT PLANS DATED JUNE 28, 2001, PREPARED BY DELEW CATHER SHEETS 125, 127 & 152 OF 294.

I CERTIFY 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.

NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION OR STAMPED WITH A BLACK INK SEAL.

**JOHN P. LYNCH** DATE  
NEW HAMPSHIRE PROFESSIONAL LAND SURVEYOR #899

FIELD DATE  
7-24-2019  
7-22-2019

FIELD BOOK NO.  
19-7

FIELD BOOK PG.  
147-151

FIELD CREW  
J.O.

DRAWN:  
J.V.R.

REVIEWED:  
A.J.D.

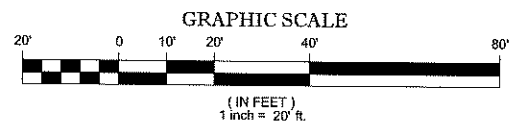
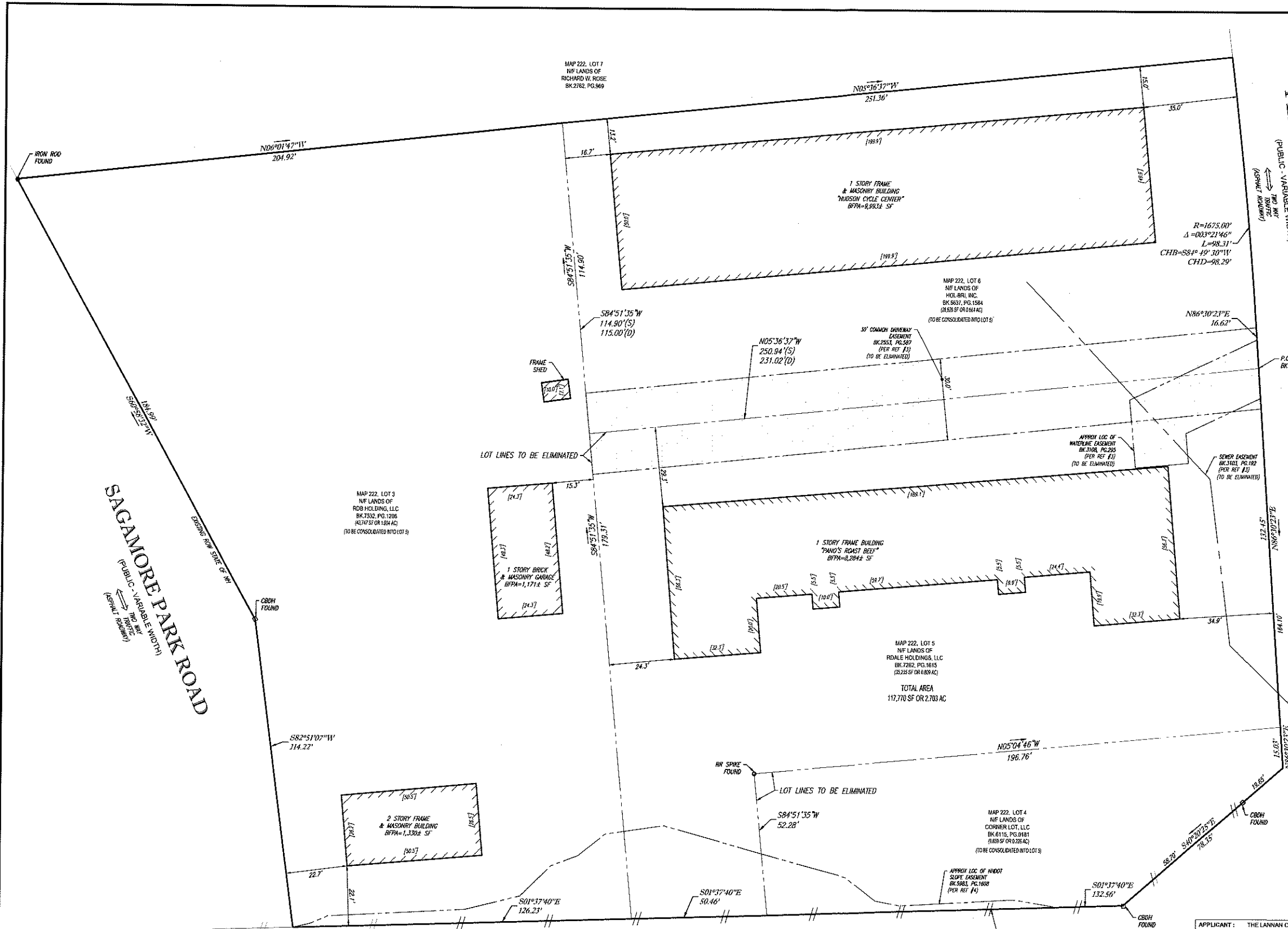
APPROVED: DATE SCALE FILE NO. DWG. NO.  
J.P.L. 10-28-2019 1"=20' 03-190036 1 OF 1

**CONTROL POINT ASSOCIATES, INC.**  
ALBANY, NY 5183175010  
CHALFONT, PA 2151720000  
MANHATTAN, NY 6467800111  
MT LAUREL, NJ 6098527009  
WARREN, NJ 9086680099

OWNERS OF RECORD

LOT 3 OWNER: MAILING ADDRESS:	RBD HOLDING, LLC PO BOX 601 BROOKLINE, NH 03033	DATE:	
LOT 4 OWNER: MAILING ADDRESS:	CORNER LOT, LLC PO BOX 601 BROOKLINE, NH 03033	DATE:	
LOT 5 OWNER: MAILING ADDRESS:	RDAL HOLDINGS, LLC PO BOX 601 BROOKLINE, NH 03033	DATE:	
LOT 6 OWNER: MAILING ADDRESS:	HOL-BRL, INC. 2 FLAGSTONE DRIVE BROOKLINE, NH 03033	DATE:	

- NOTES:
1. PROPERTY KNOWN AS LOTS 3, 4, 5 & 6 AS SHOWN ON THE TOWN OF HUDSON, HILLSBOROUGH COUNTY, STATE OF NEW HAMPSHIRE; MAP NO. 222.
  2. LOT 3 AREA = 43,747 SQUARE FEET OR 1.004 ACRES.  
LOT 4 AREA = 9,859 SQUARE FEET OR 0.226 ACRES.  
LOT 5 AREA = 36,235 SQUARE FEET OR 0.830 ACRES.  
LOT 6 AREA = 28,929 SQUARE FEET OR 0.664 ACRES.  
TOTAL AREA = 117,770 SQUARE FEET OR 2.703 ACRES.
  3. THIS PLAN IS BASED ON INFORMATION PROVIDED BY A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC. AND OTHER REFERENCE MATERIAL AS LISTED HEREON.
  4. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN.
  5. THE PURPOSE OF THIS PLAN IS TO SHOW A CONSOLIDATION OF MAP 222 LOTS 3, 4, 5 & 6 WITH THE RESULTING LOT BEING MAP 222 LOT 5.
  6. OTHER IMPROVEMENTS HAVE NOT BEEN SHOWN.



FOR USE OF REGISTRY OF DEEDS

**LOWELL ROAD**

(AKA N.H. ROUTE 3A)  
(PUBLIC - VARIABLE WIDTH)  
THRU WAY  
(ASPHALT ROADWAY)

APPLICANT: THE LANNAN COMPANY  
ADDRESS: 70 TAGGART DRIVE NASHUA, NH 03060

# FLAGSTONE CROSSING

## SITE PLAN APPLICATION SP#09-19

### STAFF REPORT

November 6, 2019

*Please reference Staff Reports from 3/13/19 & 10/23/19 for additional information*

**SITE:** 225 & 227 Lowell Rd., 2 Flagstone Dr – Map 222 Lots 3,4,5 & 6

**ZONING:** Industrial (I)

**PURPOSE OF PLANS:** Multi-tenant (four) commercial development consisting of a 2,200 sf restaurant with drive-thru, a 5,000 sf bank with drive-thru, and 10,700 sf of retail space (2 tenant spaces).

**PLANS UNDER REVIEW:** Site Development Plans for Flagstone Crossing; prepared by Bohler Engineering, 352 Turnpike Rd., Southborough, MA 01772; prepared for The Lannan Company, 7D Taggart Drive, Nashua, NH 03060; consisting of 16 sheets, general notes 1-30, on sheet 2; dated September 30, 2019, last revised October 31, 2019.

#### ATTACHMENTS:

- A. Fuss & O'Neill review letter dated 10/18/19
- B. Applicant response to F&O review, dated 10/31/19
- C. Applicant response to Town Department comments, dated 10/31/19
- D. Parking Demand Memorandum & Waiver Request dated 10/31/19
- E. Trip Generation Letter from GPI, dated 9/30/19

#### APPLICATION TRACKING:

- March 3, 2019 – Design review phase at Planning Board.
- July 30, 2019 – Applicant met with staff (Land Use & Fire).
- October 23, 2019 – Public hearing held, plan accepted, hearing continued.
- October 26, 2019 – Site Walk conducted (no quorum).
- November 6, 2019 – Public hearing continuance scheduled.

#### COMMENTS & RECOMMENDATIONS:

##### Previous Meeting

AT the October 23, 2019 meeting, the Planning Board accepted the plan, approved four waivers, voted to conduct a site walk, and voted to continue the hearing to November 6, 2019.

The waivers granted were:

- §275-8.4 – Parking Space dimensions, to allow 9'x18' spaces in some areas.
- §275-8.6 – Off-street loading requirements, to allow an alternate loading strategy.
- §275-8.7 – Landscaping requirements in parking lots, to allow 1.6 shrubs per space.

- §276.11.1.22 – Green area, relief from the green area required along frontage on Sagamore Park Drive.

The Board also asked Staff to receive legal opinion on the Impact Fee Credit process, discussed below.

### **Site Walk**

On Saturday October 26, 2019 at 12:45pm, Mr. Collins, Mr. Van der Veen and Mr. Groth attended a site walk conducted by the applicant. Mr. Groth found the walk to be very insightful in terms of observing the relationship of the proposed buildings within the context of the site and its environs, and will continue recommending site walks for significant applications.

### **Variety of Uses**

As the Board knows, the application proposes two buildings containing a variety of uses as is typical in shopping centers. The applicant has made it known that the use of the two ~5,000 square-foot spaces has yet to be determined as they seek tenants. The applicant would like flexibility in the uses allowed under a potential site plan approval. See *Attachment C* for more detail from the applicant.

Their proposal requires an additional waiver with respect to parking count, particularly because the applicant wants to have the option of leasing to a restaurant with a bar. Their proposal suggests that between shared trips (one trip, visiting multiple tenants) and shared parking (spaces are used at different times of day by the various uses) that the parking provided adequately meets the parking demand generated by their site. Planning staff agrees with their assessment.

### **Impact Fee Credits: ROW exchange**

As discussed at the previous meeting, the applicant is proposing to donate the land required for the Town's CMAQ road project as a credit to the Impact Fees owed by this development. The Impact Fee for this project is \$58,891. The applicant estimates the value of the land to be conveyed to the Town to be \$83,333, at a rate of \$18.68 per square-foot, and based on their purchase price. It should be noted that NH DOT typically uses an estimate range of \$20-\$25 per square foot in land acquisitions scenarios such as this, and the Town's CMAQ project consultant (VHB) estimated a cost of \$22.50 per square-foot in their ROW acquisition cost.

Town Counsel has advised the Planning Board to decide whether or not to utilize the "Credit" provision of the Zoning Ordinance and if so, if the benefit of the exchange meets or exceeds the Impact Fee owed. Should it pass, the matter moves onto the Board of Selectmen for their approval of receipt of the land.

If approved, the site plan approval motion should contain a condition that the Board of Selectmen accept the land and/or easement.

**Architecture**

At the October 23, 2019 Planning Board meeting, Mr. Groth asked that the applicant provide greater consideration for the architectural compatibility of their buildings with the character of Hudson. It is the Planner's understanding that the applicant's architect designed the facades and massing of the building with Hudson in mind, choosing more traditional New England elements rather than contemporary, modern styles which were actually requested by one of the potential tenants. The applicant's architect was able to satisfy the tenant's desires while maintaining traditional New England design.

**WAIVER REQUESTS**

The applicant is requesting an additional waiver, as mentioned above:

1. §275-8.C.2 – Parking Calculations – based on principles of shared trips and shared parking.

**DRAFT MOTIONS**

**CONTINUE the public hearing to a date certain: (if accepted but not ready for approval)**

I move to defer the public hearing for Flagstone Crossing, 225 & 227 Lowell Rd., Map 222 Lots 3,4,5, & 6, date certain, December 11, 2019.

Motion by: \_\_\_\_\_ Second: \_\_\_\_\_ Carried/Failed: \_\_\_\_\_

**GRANT a waiver:**

I move to grant a waiver from §275-8.C.2, 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: \_\_\_\_\_

**MERGE the lots (do ONLY in conjunction with site plan approval):**

I move to approve the application to merge lots by Richard Wheeler for Tax Map 222, Lots 3, 4, 5, & 6.

Motion by: \_\_\_\_\_ Second: \_\_\_\_\_ Carried/Failed: \_\_\_\_\_

*Draft Motions continue on the following page*



**APPROVE the application:**

I move to approve the site plan amendment for Site Development Plans for Flagstone Crossing; prepared by Bohler Engineering, 352 Turnpike Rd., Southborough, MA 01772; prepared for The Lannan Company, 7D Taggart Drive, Nashua, NH 03060; consisting of 16 sheets, notes 1-30 on sheet 2; dated September 30, 2019, last revised October 31, 2019; 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. Prior to the issuance of a final certificate of occupancy, a L.L.S. certified "As Built" site plan shall be provided to the Town of Hudson Land Use Division, confirming that the site conforms to the Planning Board approved site plan.
3. This plan is subject to final engineering review.
4. The Planning Board accepts the conveyance of an easement to use the land along Lowell Road required for the Town's addition of an on-ramp lane to the Sagamore Bridge in lieu of payment of the Impact Fee, pursuant to §334-74.9, with the condition that said conveyance is accepted by the Board of Selectmen.
5. Should the conveyance not be executed per condition #4 above, a cost allocation procedure (CAP) amount of \$58,891 shall be paid prior to the issuance of a Certificate of Occupancy.
6. Construction activities involving this plan shall be limited to the hours between 7:00 A.M. and 7:00 P.M., Monday through Saturday. No exterior construction activities shall occur on Sunday.
7. Active and substantial development will have occurred when:
  - A. The existing buildings have been demolished.
  - B. Rough grading has been completed.

Motion by: \_\_\_\_\_ Second: \_\_\_\_\_ Carried/Failed: \_\_\_\_\_.



FUSS & O'NEILL

October 18, 2019

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

Re: Town of Hudson Planning Board Review  
Flagstone Crossing Site Plan, 225-227 Lowell Road  
Tax Map 222, Lots 3, 4, 5 & 6; Acct. #1350-938  
Reference No. 20030249.1840

Dear Mr. Groth:

Fuss & O'Neill, Inc. has reviewed the first submission of the materials received between October 3 and October 11, 2019, related to the above-referenced project. Authorization to proceed was received on October 2, 2019. 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.

We have included a copy of Fuss & O'Neill's evaluation of the checklist for your reference. We note that several items could not be verified by Fuss & O'Neill and require action by the Town.

The project would consolidate a four-lot site into a single 2.7 acre lot containing a bank, a restaurant, and two retail stores. Proposed improvements to the site include the demolition of all of the existing buildings within the site, the construction of several driveways, parking areas, drainage improvements, landscaping, lighting, and other associated site improvements. The proposed buildings would be serviced by Municipal sewer and Municipal water. The project also includes coordination with the Town of Hudson's CMAQ Lowell Road Widening project with an access easement along Lowell Road.

The Gateway Building  
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Mr. Brian Groth

October 18, 2019

Page 3 of 8

- j. HR 276-11.1.B.(4)(b). The applicant has provided an approval block that is not quite in the lower left hand corner of the plans.
- k. HR 276-11.1.B.(6). The Owner's signature is not on the plan.
- l. HR 276-11.1.B.(7). The applicant has not included the addresses of abutting property owners on the plans.
- m. HR 276-11.1.B.(12). The applicant has proposed a portion of all of the parking spaces along the east side of the site and the six parking spaces along the south side of the site to be located within the 50 foot front building setback.
- n. HR 276-11.1.B.(15). The applicant has not shown all buildings within 50 feet of the tract on the plans.
- o. HR 276-11.1.B.(16). The applicant has not shown all roadways, driveways, travel or parking areas within 200 feet of the tract.
- p. HR 276-11.1.B.(20). The applicant has not noted the heights of the existing buildings within the lots to be consolidated, but since all are proposed to be removed we feel this information is not necessary.
- q. HR 276-11.1.B.(22). The applicant has requested a waiver from the requirement to provide a 35 foot landscape buffer along Sagamore Park Road.
- r. HR 276-11.1.B.(24). The applicant has not noted the proposed amount of open space on the plans. It appears that the open space shown does not meet the 35% minimum required by the Regulation.

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

- a. HR 193.10.C. The applicant has proposed a driveway slope on the Flagstone Drive driveway that exceeds the maximum allowed by Town of Hudson Construction Standard details.
- b. HR 193.10.C. The applicant has provided an Asphalt Pavement Section detail which does not include proposed depths of the select and pavement materials, instead it references a geotechnical report dated 8/3/17 for pavement depths and specifications. The applicant should provide this information on the plans, not in a reference to another document.
- c. HR 193.10.F. The applicant has not shown sight distances for the proposed Flagstone Drive driveway on the plan set.
- d. HR 193.10.J. The applicant has included a Driveway Construction detail in the plans that appears to show an existing roadway cross section of 2" top course above 6" concrete base course. The applicant should confirm that this detail is applicable to the existing conditions at Flagstone Drive and Sagamore Park Road or revise as appropriate.
- e. The applicant has provided a Roadway Patching detail that doesn't agree with the Town of Hudson's Construction Standard detail R-5. The fill layers should be stepped as shown in the Town detail.



Mr. Brian Groth  
October 18, 2019  
Page 5 of 8

#### 4. Utility Design/Conflicts

- a. HR 275-9.E and 276-13. The applicant has noted that the water service from Flagstone Drive shall be verified for suitability for re-use with the utility owner. The applicant should note the proposed size of this water service on the plans.
- b. HR 275-9.F and 276-13. The applicant has noted that the Contractor is to coordinate the final size, location, and material of the proposed water and fire services with the MEP plans by others. This information should be included on these plans and coordinated with the various Town agencies (Water Utility, Fire Department).
- c. HR 275-9.E. and 276-13. The applicant has noted in the Fire Hydrant Assembly detail that the hydrant will be provide in accordance with Town of Hudson requirements. The detail should note that installation shall conform to section 825.4.10 of the Hudson Engineering Technical Guidelines and standard details.
- d. HR 275-9.E and 276-13. The applicant has shown proposed fire service connections to the subject buildings. Fuss & O'Neill did not review this project for fire protection adequacy or code conformance.
- e. HR 275-9.E and 276-13. The applicant has noted that the Contractor is to coordinate the final size, location, and material of the proposed sewer and gas services with the MEP plans by others. This information should be included on these plans.
- f. HR 275-9.E and 276-13. The applicant has shown sewer pipe grading at SMI I-2 with less than the minimum cover required by Town of Hudson standards. The applicant should review and address.
- g. HR 275-9.E. and 276-13. The applicant should note on the plans the proposed invert into the existing sewer manhole on Sagamore Park Road.
- h. HR 275-9.E. and 276-13. The applicant has shown removal of the existing water line and cutting and capping of the existing sewer line in Flagstone Drive. The applicant has also shown removal of water and sewer lines within the site that appear to be connected to utilities in Lowell Road. Removal of these lines should be coordinated with the Utility provider to determine where to remove/cap these utilities.
- i. HR 276-13.D. The applicant has noted that transformer requirements will be coordinated with the utility company prior to construction. We note that any above ground utility apparatus must be screened year-round per the Regulation.

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

- a. HR 290-5.H. We note the applicant's Drainage Report calculations do not account for frozen ground conditions. The applicant should provide additional information related to how the design addresses this condition.
- b. HR 290-5.L.5. The applicant should label the ponds and the study points on the Proposed Drainage Tributary Map to correlate with the HydroCAD model.



Mr. Brian Groth  
October 18, 2019  
Page 7 of 8

- g. ZO 334-60.C. We note that the existing sign is located less than 50% of the front building setback from the public right-of-way. The Town should review to determine if relocation of the existing sign is required.
- h. ZO 334-83. The applicant should note on the plans that the subject parcel does not fall within a special flood hazard area.

**7. Erosion Control/Wetland Impacts**

- a. The Town should reserve the right to require additional erosion control measures.

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

- a. HR 275-8.C.(7). The applicant has requested a waiver from the Regulation requiring a minimum of one shrub per 200 square feet of paved area/1.6 shrubs per parking space.
- b. HR 275-8.C.(7). The applicant should coordinate the location of proposed trees with proposed light poles as several appear to be shown in the same location.
- c. The applicant should note whether there are any special requirements for tree planting within the Bioscape tree box filters and include corresponding details on the plans.
- d. HR 276-11.1.B.(14). The applicant should note hours of operation for the site lighting along with the means for operation (timer, photocell, etc.).

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

- a. HR 275-9.G. No copies of applicable approvals or permits were provided in the package received for review.
- b. HR 275-9.G. The applicant has noted within the project narrative that a New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain Permit is required. The applicant should forward all relevant AOT permit documentation to the Town for their records.
- c. HR 275-9.G. The applicant has not noted whether an NHDES Sewer Connection Permit is required for this project.
- d. HR 275-9.G. The applicant has not noted the need to obtain a driveway permit from the Town for this project.
- e. HR 275-9.G. The applicant has noted that a demolition permit is required from the Town.
- f. ZO 334-58. The applicant should note that a sign permit will be required prior to modification of the existing sign near the Lowell Road/Flagstone Drive intersection, and for any other site/building signs proposed.
- g. Additional local permitting may be required.



October 31, 2019

Town of Hudson  
Planning Board  
12 School Street  
Hudson, NH 03051

Attention: Mr. Brian Groth, Town Planner

**Re: Town of Hudson Planning Board Review Response  
Flagstone Crossing  
225-227 Lowell Road, 2 Flagstone Drive  
Tax Map 222; Lots 3, 4, 5 & 6**

Dear Members of the Board:

Bohler Engineering is in receipt of the comments letter from Fuss & O'Neill, dated October 18, 2019 relative to the subject site. On behalf of Applicant, The Lannan Company, Bohler Engineering offers the following responses. For clarity, the original comments are in italics, while our responses are directly below in bold type.

*1. Site Plan Review Codes and Administrative Requirements and Definitions*

- a. Hudson Regulation (HR) 27 5-6. I. The scope of this review does not include the adequacy of any fire protection provisions for the site. The applicant should review with the Hudson Fire Department to confirm that any proposed measures are acceptable.*

**Response:**

**Comment acknowledge. The Applicant is in receipt of a review letter from the Town of Hudson Fire Department, dated October 9, 2019, and has enclosed a response letter relative to same.**

- b. HR 275-6.T. (1) Several minor off-site improvements are proposed as a part of the Flagstone Crossing project. Construction of a new driveway at Sagamore Park Road with installation of associated signs and striping is included, along with granite curb installation along Flagstone Drive, and utility connection/disconnection work in Flagstone Drive. The applicant has noted that the existing driveway at Sagamore Park Road will be closed and the Contractor will coordinate with the Town to work in the Right-of-Way prior to construction. The*



- g. *HR 275-9.F. and 276-11.1.B.(20). The applicant has noted several existing utility easements on the plans. NHDOT slope easement is also shown on the plans. Copies of these easements were not included in the review package, and the applicant has not indicated if any of these easements will be discontinued as a part of this project.*

**Response:**                    **The existing NHDOT slope easement is proposed to remain and documentation associated with same is enclosed with this response. Existing utility easements interior of the site are proposed to be discontinued, as shown on the enclosed Lot Consolidation Plan.**

- h. *HR 275-9.F. The applicant has shown the approximate limits of the Town's adjacent CMAQ Lowell Road Widening project on the plans, and noted a proposed access easement for this work.*

**Response:**                    **Comment acknowledged. The Applicant intends to continue to work with the Town relative to coordinating proposed on-site improvements with the CMAQ Lowell Road Widening project.**

- i. *HR 276-7.C. The applicant has requested four waivers for the project. All waivers that are granted by the Planning Board should be noted on the plans.*

**Response:**                    **The requested waivers have been noted on Sheet 1 of the enclosed Site Development Plans.**

- j. *HR 27G-11.1.B.(4)(b). The applicant has provided an approval block that is not quite in the lower left hand corner of the plans.*

**Response:**                    **The approval block has been located at the lower left-hand corner of the plans, as shown on the enclosed Site Development Plans.**

- k. *HR 276-11.1.B.(6). The Owner's signature is not on the plan.*

**Response:**                    **The Owner's signature was included on the Site Development Plans initially submitted to the Town of Hudson Planning Board and will be included on the approved set prior to Planning Board endorsement.**

- l. *HR 276-11.1.B. (7). The applicant has not included the addresses of abutting property owners on the plans.*

**Response:**                    **The addresses of abutting property owners has been included on the plans, as shown on Sheet 4 of the enclosed Site Development Plans.**

- m. *HR 276-11.1.B. (12). The applicant has proposed a portion of all of the parking spaces along the east side of the site and the six parking spaces along the south side of the site to be located within the 50 foot front building setback.*



- b. *HR 193.10.C. The applicant has provided an Asphalt Pavement Section detail which does not include proposed depths of the select and pavement materials, instead it references a geotechnical report dated 8/ 3/17 for pavement depths and specifications. The applicant should provide this information on the plans, not in a reference to another document.*

**Response:** **An updated typical Asphalt Pavement Section has been provided, as shown on Sheet 13 of the enclosed Site Development Plans. Final design of the proposed asphalt section is anticipated to be provided by the Geotechnical Engineer subsequent to Planning Board review.**

- c. *HR 193.10.E. The applicant has not shown sight distances for the proposed Flagstone Drive driveway on the plan set.*

**Response:** **Required and proposed sight distances at the proposed Flagstone Drive driveway are reflected on the 'Sight Distance Inset' included on Sheet 16 of the enclosed Site Development Plans, based upon the "Trip-Generation & Site Access Letter" prepared by Greenman-Pedersen, Inc.**

- d. *HR 193.10.J. The applicant has included a Driveway Construction detail in the plans that appears to show an existing roadway cross section of 2" top course above 6" concrete base course. The applicant should confirm that this detail is applicable to the existing condition at Flagstone Drive and Sagamore Park Road or revise as appropriate.*

**Response:** **The proposed Driveway Construction detail is not anticipated to be applicable to the proposed driveway connections, as noted, and has been removed from the enclosed Site Development Plans.**

- e. *The applicant has provided a Roadway Patching detail that doesn't agree with the Town of Hudson's Construction Standard detail R-5. The fill layers should be stepped as shown in the Town detail.*

**Response:** **The Roadway Patching detail has been updated per the Town of Hudson's Construction Standard detail, as shown on Sheet 13 of the enclosed Site Development Plans.**

### 3. Traffic

**\* Response to "Traffic Section" provided by Greenman-Pedersen, Inc. (GPI)**

*In 2018, the site had been considered for the development of a convenience store gas station with 12 vehicle fueling positions. A traffic study prepared for the previously proposed development found that during the design year of 2028, the intersection of Lowell Road at Flagstone Drive / Watson Road would operate at Level of Service (LOS) F in the no-build condition with overall average delay at the intersection expected to increase by 30 seconds or less in the build condition. The study also found that the construction of an additional southbound lane at the intersection combined with signal retiming*





*utility owner. The applicant should note the proposed size of his water service on the plans.*

**Response:** **Town records indicate the existing water service proposed for re-use is a 4-inch diameter service, as noted on Sheet 6 of the enclosed Site Development Plans.**

- b. *HR 275-9.E and 276-13. The applicant has noted that the Contractor is to coordinate the final size, location, and material of the proposed water and fire services with the MEP plans by others. This information should be included on these plans and coordinated with the various Town agencies (Water Utility, Fire Department).*

**Response:** **The anticipated sizes of proposed water and fire services have been included on the enclosed Site Development Plans. Modifications to the service sizes and locations may be required upon further development of the building plans, and same will be coordinated with the various Town agencies, as appropriate.**

- c. *HR 275-9.E. and 276-13. The applicant has noted in the Fire Hydrant Assembly detail that the hydrant will be provide in accordance with Town of Hudson requirements. The detail should note that installation shall conform to section 825.4.10 of the Hudson Engineering Technical Guidelines and standard details.*

**Response:** **The Fire Hydrant Assembly detail has been updated to note the applicable section from the Hudson Engineering Technical Guidelines and standard detail, as shown on Sheet 15 of the enclosed Site Development Plans.**

- d. *HR 275-9.E and 276-13. The applicant has shown proposed fire service connections to the subject buildings. Fuss & O'Neill did not review this project for fire protection adequacy or code conformance.*

**Response:** **Comment acknowledged. The Applicant is in receipt of a review letter from the Town of Hudson Fire Department, dated October 9, 2019, and has enclosed a response relative to same.**

- e. *HR 275-9.E and 276-13. The applicant has noted that the Contractor is to coordinate the final size, location, and material of the proposed sewer and gas services with the MEP plans by others. This information should be included on these plans.*

**Response:** **The anticipated sizes and locations of proposed sewer services have been included on the enclosed Site Development Plans. Modifications to the service sizes and locations may be required upon further development of the building plans, and same will be coordinated with the various Town agencies, as appropriate.**



Hampshire Stormwater Center website, while frost penetration was observed for filtration systems, it did not affect the overall hydraulic performance. Further, the report indicates that that the level of performance in filter media practices is not reduced, particularly in comparison to alternative treatment practices. Additionally, the subsurface infiltration practices are anticipated to be impact less than traditional surface infiltration practices, as the infiltrating surfaces is anticipated to be below frost depth with high-void crushed stone proposed at the bottom of the practice.

- b. *HR 290-5.L.5. The applicant should label the ponds and the study points on the Proposed Drainage Tributary Map to correlate with the HydroCAD model.*

**Response:** Ponds and study points have been noted on the enclosed Proposed Drainage Tributary Map, correlating with the HydroCAD model.

- c. *The applicant should keep the Town informed of all communications with NHDES related to the Alteration of Terrain (AoT) permit and provide copies of all documentation received for the Town's records.*

**Response:** A copy of Alteration of Terrain application was provided to the Town concurrently with submission to NHDES. The Applicant will provide all communication relative to same to the Town for reference.

- d. *The applicant should note that the stage discharge tables for the Stormtech chambers are swapped. The stage discharge table for Basin #2 is on the back of the NHDES worksheet for Basin #1 and the stage discharge table for Basin #1 is on the back of the NHDES worksheet for Basin #2.*

**Response:** Comment acknowledged.

- e. *The applicant should provide a dimension table for the Riprap Apron Detail that correlates to the riprap calculations in the Drainage Report. The applicant should also update the plans to reflect the correct dimensions for the proposed riprap.*

**Response:** The Rip Rap Apron Detail has been updated per the riprap calculations included in the Drainage Report, as shown on Sheet 16 of the enclosed Site Development Plans.

- f. *The applicant should evaluate the proposed grades for the drain line between OCS-2 and FES-2 where it crosses the proposed sewer service line to verify that there is adequate separation between these utilities.*

**Response:** Information relative to the proposed crossing of the sewer and drain lines is included on Sheet 6 of the enclosed Site Development Plans. Adequate separation is provided between the lines.



**Response:** **Comment acknowledged.**

*d. ZO 334-27. The applicant was granted a variance by the Zoning Board of Adjustment on April 25, 2019, to allow construction of the bank structure, drive-through canopy, and trash enclosure within the front building setback from Sagamore Park Road. A copy of the ZBA's Notice of Decision was included in the review package.*

**Response:** **Comment acknowledged.**

*e. ZO 1.0 334-33. The applicant has not shown any wetlands within the subject site.*

**Response:** **No wetlands were identified on the site. Please see enclosed letter from TES Environmental Consultants, LLC, dated July 20, 2019, indicating same.**

*f. ZO 334-58 and HR 276-11.1.B.(13). The applicant has noted that the existing sign on lot 4 will be refaced. Details for the refaced sign were not included in the plans. The applicant should coordinate all sign details with the Town as part of the sign permit process.*

**Response:** **Comment acknowledged. Coordination is ongoing with Zoning and Planning Staff relative to proposed signage improvements.**

*g. ZO 334-60.C. We note that the existing sign is located less than 50% of the front building setback from the public right-of-way. The Town should review to determine if relocation of the existing sign is required.*

**Response:** **Coordination is ongoing with Zoning and Planning Staff relative to proposed signage improvements.**

*h. ZO 334-83. The applicant should note on the plans that the subject parcel does not fall within a special flood hazard area.*

**Response:** **Notation that the subject parcel does not fall within a special flood hazard area is included on Sheet 4 of the enclosed Site Development Plans.**

**7. Erosion Control/ Wetland Impacts**

*a. The Town should reserve the right to require additional erosion control measures.*

**Response:** **Comment acknowledged. Erosion & Sediment Control Plans are included as part of the enclosed Site Development Plans. Additionally, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared prior to construction as required under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES). A copy of same can be provided upon request.**



**Response:** A copy of Alteration of Terrain application was provided to the Town concurrently with submission to NHDES. The Applicant will provide all communication relative to same to the Town for reference.

- c. *HR 275-9.C. The applicant has not noted whether an NHDES Sewer Connection Permit is required for this project.*

**Response:** An NHDES Sewer Connection Permit is not anticipated to be required for this project.

- d. *HR 275-9.G. The applicant has not noted the need to obtain a driveway permit from the Town for this project.*

**Response:** A Driveway Permit Application is anticipated for be required from the Town and same will be filed prior to construction.

- e. *HR 275-9.G. The applicant has noted that a demolition permit is required from the Town.*

**Response:** Comment acknowledged.

- f. *ZO 334-58. The applicant should note that a sign permit will be required prior to modification of the existing sign near the Lowell Road / Flagstone Drive intersection, and for any other site/ building signs proposed.*

**Response:** Comment acknowledged. Coordination with the Town is ongoing relative to requisite sign permits.

- g. *Additional local permitting may be required.*

**Response:** Comment acknowledged. The Applicant intends to coordinate with the Town relative to any other requisite local permits.

10. Other

- a. *At the Sagamore Park Road driveway the applicant has shown proposed guiderail with the posts on the traffic side of the rail. The applicant should correct this detail.*

**Response:** The guide rail has been updated as suggested, as shown on Sheet 4 of the enclosed Site Development Plans.

- b. *The applicant should provide a copy of the retaining wall design, prepared and stamped by the licensed professional engineer, to the Town for their records.*

**Response:** The proposed retaining wall design is proposed to be designed by a structural engineer prior to construction. A copy of the retaining wall design can be provided to the Town prior to construction of same.



C

October 31, 2019

Town of Hudson  
Planning Board  
12 School Street  
Hudson, NH 03051

Attention: Mr. Brian Groth, Town Planner

**Re: Response to Fire Department Comments  
Flagstone Crossing  
225-227 Lowell Road, 2 Flagstone Drive, Hudson, NH  
Tax Map 222, Lots 3, 4, 5, and 6**

Dear Members of the Board:

Bohler Engineering is in receipt of the comments letter from the Fire Department, dated October 9, 2019 relative to the subject site. On behalf of Applicant, The Lannan Company, Bohler Engineering offers the following responses. For clarity, the original comments are in italics, while our responses are directly below in bold type.

- Comment #1*                      *Please provide the markings for fire apparatus in accordance with NFPA 1, 2015 Edition.*
- Response:**                      **Proposed bypass lanes around drive-through queues are proposed to be delineated by pavement striping. No additional markings are anticipated to be required, however the Applicant will continue to work with the Fire Department relative to their markings and signage requirements.**
- Comment #2*                      *The driveway shall have a permanent sign approved by the Hudson Fire Department noting the addresses of the buildings that are accessed from the driveway.*
- Response:**                      **Comment acknowledged. The Applicant will continue to work with the Fire Department relative to the specific signage requirements.**
- Comment #3*                      *Addressing will need to be obtained from the Hudson Fire Department prior to a building permit being issued.*
- Response:**                      **Comment acknowledged. The Applicant will continue to work with the Fire Department relative to obtaining addressing.**
- Comment #4*                      *Please make sure snow areas are noted on the final plan.*



**Response:** Proposed snow storage areas are noted on Sheet 4 of the enclosed Site Development Plans, and will be noted on the final plan.

**Comment #5** *As noted during the conceptual review, a minimum of one additional hydrant shall be added along the rear yard setback between the buildings. This will supply additional water supply to the site for fire suppression activities. This will equal two hydrants onsite, one in the proposed location and one on the rear set back.*

**Response:** An additional hydrant has been proposed along the rear yard setback between the buildings, as shown on Sheet 6 of the enclosed Site Development Plans.

Life Safety and Fire Protection Concerns

**Comment #1** *The proposed change may require an approved sprinkler system. The Hudson Fire Department upon review of the building plans makes this determination. This requirement is in accordance with the International Building Code (IBC), 2015 Edition and THE CODE OF THE TOWN OF HUDSON (HTC) - current revision, Chapter 210, Article VI. It may be possible following the IBC to separate the tenants by providing firewalls in the building. This would eliminate the need to sprinkle the building according to the HTC. Separate occupancies may still require a sprinkler system according to the IBC, State Code, applicable code or ordinance. Further plan reviews will uncover those requirements.*

**Response:** It is anticipated at this time that sprinkler systems will be proposed for the building. The Applicant will continue to work with the Fire Department relative to same upon preparation of building plans.

**Comment #2** *Any fire protection system changes shall be monitored by an approved fire alarm system. The fire alarm system shall be connected to the Hudson Fire Department's municipal fire alarm system or a substantially equivalent system in accordance with HTC, Chapter 210. A site plan detailing the aerial or underground layout to the municipal fire alarm connection must be provided before the utilities are completed for this project. Any required fire alarm system component must remain accessible and visible at all times.*

**Response:** The Applicant will work with the Fire Department relative to fire alarm connection requirements upon preparation of the building plans.

**Comment #3** *Will there be inside or outside storage above the exempt amounts of hazardous materials, liquids, or chemicals presenting a physical or health hazard as listed in IBC Sections 307, 414, or 415?*

**Response:** No reportable quantities of hazardous materials, liquids, or chemicals are anticipated to be proposed on-site.

**Comment #3** *All storage either inside or outside of hazardous materials, liquids, or chemicals presenting a physical or health hazard as listed in NFPA 1, Section 20.15.2.2 shall be in accordance with the applicable portions of the following:*

*NFPA 13, Standard for the Installation of Sprinkler Systems*



**BOHLER**  
ENGINEERING

*NFPA 30, Flammable and Combustible Liquids Code*  
*NFPA 308, Code for the Manufacture and Storage of Aerosol Products*  
*NFPA 230, Standard for the Fire Protection of Storage*  
*NFPA 430, Code for the Storage of Liquid and Solid Oxidizers*  
*NFPA 432, Code for the Storage of Organic Peroxide Formulations*  
*NFPA 434, Code for the Storage of Pesticides*

**Response:**                    **No reportable quantities of hazardous materials, liquids, or chemicals are anticipated to be proposed on-site.**

We trust the above as well as the attached information are sufficient for your continued review of the project. Should you have any questions or require additional information, please do not hesitate to contact me at (508) 480-9900.

Sincerely,

Matthew K. Bombaci, P.E.



October 31, 2019

Town of Hudson  
Planning Board  
12 School Street  
Hudson, NH 03051

Attention: Mr. Brian Groth, Town Planner

**Re: Response to Town Engineer Comments  
Flagstone Crossing  
225-227 Lowell Road, 2 Flagstone Drive, Hudson, NH  
Tax Map 222, Lots 3, 4, 5, and 6**

Dear Members of the Board:

Bohler Engineering is in receipt of the comments email from the Town Engineer, dated October 02, 2019 relative to the subject site. On behalf of Applicant, The Lannan Company, Bohler Engineering offers the following responses. For clarity, the original comments are in italics, while our responses are directly below in bold type.

*Comment #1 Applicant shall install a manhole at the property line/right of way for access/cleanout purposes.*

**Response: An additional sewer manhole is proposed at the Sagamore Park Road property boundary / right-of-way, as shown on the enclosed Site Development Plans.**

*Comment #2 All offsite improvements, if any, along Flagstone Drive shall be in coordination with Lowell Road Widening Town Project.*

**Response: Comment acknowledge. The Applicant intends to work with the Town relative to proposed improvements associated with the Lowell Road Widening Town Project.**

*Comment #3 Applicant shall transfer ownership / record the easement required for Lowell Road widening, prior or at the time of the site plan recording.*





October 31, 2019

Town of Hudson  
Planning Board  
12 School Street  
Hudson, NH 03051

Attention: Mr. Brian Groth, Town Planner

**Re: Response to Office of the Assessor Comments  
Flagstone Crossing  
225 & 227 Lowell Road, 2 Flagstone Drive, Hudson, NH  
Tax Map 222, Lots 3, 4, 5 (and Sublots 5-1 thru 5-8), and Lot 6**

Dear Members of the Board:

Bohler Engineering is in receipt of the comments letter from the Office of the Assessor, dated October 02, 2019 relative to the subject site. On behalf of Applicant, The Lannan Company, Bohler Engineering offers the following responses. For clarity, the original comments are in italics, while our responses are directly below in bold type.

*Comment #1*                      *I recommend keeping one of the lots as the remaining Lot number to use for purposes of the various Lot mergers, and we also do not incorporate alpha lot designations within the Map/Lot/Sublot setup, therefore we recommend that the merger document have Tax Map 222 Lot 005 Sublot 000 as the remainder Lot from the mergers and for that to be used going forward in the process.*

**Response:**                      **We have updated the plan to denote the consolidated lot as "Map 222, Lot 5" as recommended. Please refer to the Lot Consolidation Plan included within the enclosed Site Development Plans.**

We trust the above as well as the attached information are sufficient for your continued review of the project. Should you have any questions or require additional information, please do not hesitate to contact me at (508) 480-9900. Thank you.

Sincerely,

Matthew K. Bombaci, P.E.



D

## Memorandum

**DATE:** October 31, 2019

**TO:** Town of Hudson Planning Board

**FROM:** Matthew Bombaci, Bohler Engineering  
Heather Monticup, GPI / Greenman-Pedersen, Inc.

**RE:** Anticipated Parking Demand Calculations  
Flagstone Crossing  
225 & 227 Lowell Road, 2 Flagstone Drive, Hudson, NH

On behalf of the Applicant, The Lannan Company, we are providing this memorandum to accompany a waiver request from the requisite number of parking spaces under the Land Use Regulations for the subject development currently before the Planning Board for Site Plan Review. The current development plan includes a 2,200± square foot Starbucks, a 5,000± square foot bank, and 10,700± square feet of additional space whose final use is to be determined. While the uses within the remainder of the available space are not determined, they could include retail uses, office uses, professional services, or restaurants, and may change over time as new tenants move in. The final mix of uses will have differing peak hours of parking demand, however may require relief from number of parking spaces required under the Land Use Regulations. We have provided calculations to support a waiver from the parking requirements to allow for up to 4,000 square feet of restaurant space for the ninety-eight (98) spaces proposed. While the final development may not include this amount of restaurant space, this allows the Applicant reasonable and justifiable flexibility in their final development program without modifications to the approval.

### Institute of Transportation Engineers (ITE) Parking Demand Analysis:

To assess the anticipated parking demand for the proposed development program, parking generation rates based on ITE Parking Generation Manual (5<sup>th</sup> Edition) were utilized. The proposed uses are anticipated to have differing hours of peak parking demand requirements. For example, the peak parking demand for the proposed Starbucks is anticipated to be between 8-10 AM, when the proposed neighboring retail space and restaurant/lounge space is not anticipated to be open. Alternatively, the peak parking demand for the proposed restaurant/lounge space is anticipated to be 6 PM or later, when the proposed Starbucks is anticipated to have limited demand. Accordingly, anticipated parking demand under the ITE Parking Generation Manual is calculated for the Weekday AM peak period, the Weekday PM peak period, and the Saturday afternoon peak period.

The anticipated 85<sup>th</sup> percentile parking demand based upon the ITE Parking Generation Manual are calculated as follows:

<u>Use:</u>	<u>Floor Area:</u>	<u>Formula:</u>	<u>Req'd Spaces:</u>
Bank	5,000 SF	1 Space / 250 SF	20 Spaces
Retail Store	6,700 SF	1 Space / 200 SF	34 Spaces
Coffee Shop	2,200 SF	1 Space / 100 SF	22 Spaces
Restaurant/Lounge/Bar	4,000 SF	1 Space / 75 SF	53 Spaces
		<b>Total Spaces Req'd:</b>	<b>129 Spaces</b>

As calculated above, the required number of parking spaces is 129 spaces, exceeding the number of spaces anticipated to be required utilizing ITE data. The requirements of the Land Use Regulations do not account for developments which included multiple uses which will have shared parking trips and differing hours of peak parking demand. Accordingly, we have respectfully requested a waiver to allow for a reduction in the parking requirements from up to one hundred twenty-nine (129) spaces to the ninety-eight (98) spaces proposed.

Conclusion:

In summary, the ninety-eight (98) parking spaces provided for the proposed development is anticipated to be sufficient for the anticipated development program consisting of a 2,200± square foot Starbucks, a 5,000± square foot bank, 6,700± square feet of retail space, and up to 4,000± square feet of restaurant/lounge/bar space. On behalf of the Applicant, we respectfully request the Planning Board varies the parking requirements as requested on the enclosed Waiver Request Form.

Please do not hesitate to contact our office should you have any questions or wish to discuss in detail.

Sincerely,  
Bohler Engineering



Matthew K. Bombaci

GPI / Greenman-Pedersen, Inc,



Heather L. Monticup

**SUBDIVISION/SITE PLAN WAIVER REQUEST FORM**  
**Town of Hudson, New Hampshire**

Name of Subdivision/Site Plan: Flagstone Crossing

Street Address: 225 & 227 Lowell Road, 2 Flagstone Drive

I Richard Lannan, The Lannan Company hereby request that the Planning Board waive the requirements of item §275-8(C)(2) - Parking Calculations of the Subdivision/Site Plan Checklist in reference to a plan presented by Bohler Engineering (name of surveyor and engineer) dated October 31, 2019 for property tax map(s) 222 and lot(s) 3, 4, 5 & 6 in the Town of Hudson, NH.

As the aforementioned applicant, I, herein, acknowledge that this waiver is requested in accordance with the provisions set forth in RSA 674:36, II (n), i.e. (For Subdivisions) and RSA 674:44, III (e) (For Site-Plans). Without the Planning Board granting said waiver, it would pose an unnecessary hardship upon me (the applicant), and the granting of this waiver would not be contrary to the spirit and intent of the Subdivision/Site Plan regulations.


Hardship reason(s) for granting this waiver (if additional space is needed please attach the appropriate documentation hereto):

The Applicant requests to reduce the requisite number of parking spaces from 129 spaces to 98 spaces to allow for a development consisting of a 2,200± square foot Starbucks, a 5,000± square foot bank, 6,700± square feet of retail space, and up to 4,000± square feet of restaurant/lounge/bar space. Granting of this waiver allows for the Applicant flexibility to pursue a reasonable development program under the presumptive approval from the Planning Board. Please see enclosed Anticipated Parking Demand Calculations Memorandum for additional information.

Reason(s) for granting this waiver, relative to not being contrary to the Spirit and Intent of the Subdivision/Site Plan regulations: (if additional space is needed please attach the appropriate documentation hereto):

The proposed development is anticipated to consist of multiple uses with varying periods of peak parking demand. For example, the peak parking demand of the proposed Starbucks is anticipated to occur in the early morning, when a typical retail store will not have opened. Additionally, shared parking between multiple uses is anticipated to occur (i.e. a patron visits the Starbucks and a retail establishment during a single visit). An Anticipated Parking Demand Calculations Memorandum has been enclosed with this request reflecting anticipated parking demand for various peak parking demand periods based upon Institute of Transportation Engineers data and anticipated shared trips, indicating 98 spaces is anticipated to be sufficient for the time periods analyzed. The Land Use Regulations do not provide a use category accounting for multiple uses sharing a single parking area. We believe the waiver request meets the spirit of the Site Plan Regulations by allowing the Applicant reasonable flexibility for their development program while providing an appropriate number of parking spaces.

Signed:

  
Applicant or Authorized Agent Richard G. LANNAN

Planning Board Action:

Waiver Granted \_\_\_\_\_

Waiver Not Granted \_\_\_\_\_

September 30, 2019

MAX-2019028.01

Mr. Richard Lannan  
The Lannan Company  
7D Taggart Drive  
Nashua, New Hampshire 03060

SUBJECT: Trip-Generation & Site Access Letter  
Flagstone Crossing (Mixed-Use Development)  
225 & 227 Lowell Road (NH Route 3A) and 2 Flagstone Drive  
Hudson, New Hampshire

Dear Mr. Lannan:

**Greenman-Pedersen Inc.** (GPI) has prepared this letter to evaluate the expected trips associated with the mixed-use development to be located at 225 & 227 Lowell Road (NH Route 3A) in Hudson, New Hampshire. The site currently contains a mostly vacant retail building containing a restaurant and mix of retail uses as well as another building containing Hudson Cycle Center. As part of the redevelopment, the existing buildings will be razed and a ±5,000 square foot (SF) bank with drive-through window, ±10,700 SF of retail space, and a ±2,200 SF coffee shop with drive-through window will be constructed. Access and egress to the existing site is provided via one curb cut on Flagstone Drive. As part of the redevelopment, this full access/egress driveway will be relocated closer to the western property line, further from the intersection of Flagstone Drive and Lowell Road (NH Route 3A). The site is bounded by Flagstone Drive to the north, Sagamore Park Road and Circumferential Highway to the south, Lowell Road to east, and Diggins & Rose moving company to the west. The site in relation to the surrounding roadways is shown on Figure A1 attached to this letter.

A Cumberland Farms development was recently proposed on this site and a *Traffic Impact and Access Study*<sup>1</sup> (TIAS) was prepared relative to same by our office, dated October 2018; however, the project did not move forward. This letter will provide a comparison to the previously proposed project. The findings and conclusions in the previous TIAS prepared for the project site are valid for the proposed development as the Flagstone Crossing project is expected to generate similar traffic volumes and to comply with the recommended improvements previously suggested.

## Existing Conditions

### Geometry

Lowell Road (NH Route 3A) is oriented in the north-south direction and classified as a Principal Arterial. Directional travel is separated by a raised median. The speed limit on Lowell Road, south of Flagstone Drive (adjacent to the site), is posted at 35 mph. The speed limit on Lowell Road, north of Flagstone Drive is posted at 30 mph.

Flagstone Drive is oriented in the east-west direction and is a local roadway. Directional travel is separated by a double-yellow centerline. The statutory speed limit on Flagstone Drive is 30 mph.

Flagstone Drive and Wason Road intersect Lowell Road (NH Route 3A) from the west and east, respectively, to form a four-way signalized intersection. The Lowell Road northbound approach consists of an exclusive left-turn

<sup>1</sup> Greenman-Pedersen, Inc. (GPI); *Traffic Impact and Access Study*, Cumberland Farms, Hudson, NH; October 24, 2018.

lane, two through lanes, and an exclusive right-turn lane. The Lowell Road southbound approach consists of an exclusive left-turn lane, a through lane, and a shared through/right-turn lane. The Flagstone Drive eastbound approach consists of a shared left-turn/through lane and an exclusive right-turn lane. The Wason Road westbound approach consists of an exclusive left-turn lane, a shared left-turn/through lane, and an exclusive right-turn lane. The northbound/southbound phasing includes protected left-turns leading with a westbound right-turn overlap. The eastbound/southbound phasing is split-phased, leading with Wason Road and ending with Flagstone Drive.

**Collisions**

Collision data for the study area intersections were obtained from the Hudson Police Department for the most-recent complete three-year period (2016 through 2018). A summary of the collision data is provided in Table 1 and the back-up is attached to this letter.

The intersection of Lowell Road at Flagstone Drive and Wason Road has experienced 26 reported collisions over the three-year study period, averaging 8.67 collisions per year. Four of the 26 reported collisions resulted in injury, four percent of the collisions occurred in wet/icy conditions, and 23 percent occurred during commuter peaks. Nine of the crashes were due to following too close, six were due to driver inattention, three were due to failure to yield, two were due to driver distraction, one was due to the traffic control device, one was due to an improper turn, one was a hit and run, one was due to driving while intoxicated, one was due to a medical emergency, and one was unknown. The Town of Hudson is currently in the design stages of a Congestion Mitigation and Air Quality (CMAQ) project that will add an additional southbound lane to Lowell Road between the Sagamore Bridge (Circumferential Highway) southbound on-ramp and the Haffner’s gas station and car wash facility (215 Lowell Road) driveway. Additionally, the CMAQ project will optimize the traffic signal phasing and timings at the intersection of Lowell Road at Flagstone Drive and Wason Road. With the reduction in congestion at this intersection, it is possible that the frequency of crashes decreases.

The intersection of Flagstone Drive at the retail driveway did not experience any collisions over the three-year study period. The intersection of Flagstone Drive at the Dunkin’ Donuts and Burger King driveways experienced two reported collisions over the three-year study period, averaging 0.67 collisions per year. Neither of the crashes resulted in personal injury, one occurred in wet/icy conditions, and neither occurred during commuter peaks. One of the crashes was due to an improper turn and one was the result of driver inattention.

**Table 1  
 COLLISION SUMMARY**

Location	Number of Collisions		Severity <sup>a</sup>				Percent During <sup>b</sup>	
	Total	Average per Year	PD	PI	F	U	Wet/Icy Conditions	Commuter Peak
Lowell Rd. at Flagstone Dr. and Wason Rd.	26	8.67	22	4	--	--	4%	23%
Flagstone Dr. at Retail Driveway	0	0.00	--	--	--	--	0%	0%
Flagstone Dr. at Dunkin' Donuts / Burger King Driveway	2	0.67	2	--	--	--	50%	0%

Source: Town of Hudson Police Department Crash Records (2016-2018).

<sup>a</sup> PD = property damage only; PI = personal injury; F = fatality, U = unknown.

<sup>b</sup> Percent of vehicle incidents that occurred during the weekday AM and weekday PM commuter peak periods.

## **Design Conditions**

### **Sight Distance**

Access and egress to the existing site is provided via one curb cut on Flagstone Drive. As part of the redevelopment, this full access/egress driveway will be relocated closer to the western property line, further from the intersection of Flagstone Drive and Lowell Road (NH Route 3A). To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway on Flagstone Drive to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).<sup>2</sup> AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. In addition, the available sight distances were compared with the Town of Hudson's requirement of 400 feet of All-Season Safe Sight Distance.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. SSD is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. The ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes ISDs reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied. The ISD design values for right turns from a minor street are less than the design values for left turns because, in making right turns, drivers generally accept gaps that are slightly shorter than those accepted in making left turns.

The SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. The ISD, however, must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the proposed site driveway were measured in the field and compared to minimum requirements as established by AASHTO and the Town of Hudson. Since the distance required to stop a vehicle is dependent on the speed of that vehicle, speed studies were conducted as presented in the *Existing Conditions: Vehicle Speeds* section. Based on both the posted speed limit and the observed speeds, the SSD and ISD

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<sup>2</sup> A Policy on Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials (AASHTO); 2004.

requirements at the site driveway intersections were calculated. The required minimum sight distances for each direction are compared to the available distances, as shown in Table 2.

**Table 2  
 SIGHT DISTANCE SUMMARY**

Location/Direction	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
	Measured	Minimum Required <sup>a</sup>	Measured	Minimum Required <sup>b</sup>	Desirable <sup>c</sup>
<b>Flagstone Drive at Site Driveway:</b>					
<i>East of Intersection (westbound)</i>	310	305	345	305	355
<i>West of Intersection (eastbound)</i>	400+	270	400	270	290

<sup>a</sup> Values based on AASHTO requirements for an 85<sup>th</sup> percentile speed 38 mph (EB and WB) on Flagstone Drive.

<sup>b</sup> Values based on AASHTO requirements for SSD.

<sup>c</sup> Values based on AASHTO requirements for a statutory speed limit of 30 mph on Flagstone Drive.

As indicated in Table 2, available sight distances at the proposed site driveway exceeds the minimum requirements as recommended by AASHTO. West of the site driveway intersection, sight distances meet or exceed the 400 feet of All-Season Safe Sight Distance, however, east of the site driveway, the sight distance is restricted to the center of the intersection with Lowell Road. Since a signal is located at this intersection, vehicles will likely be traveling less than 38 mph as they exit the signalized intersection and approach the site driveway. To ensure the safe and efficient flow of traffic to and from the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from the edge of Flagstone Drive at the site driveway so as not to inhibit the available sight lines.

**Trip Generation**

The site currently contains a mostly vacant retail building containing a restaurant and mix of retail uses as well as another building containing Hudson Cycle Center. As part of the redevelopment, the existing buildings will be razed and a ±5,000 square foot (SF) bank with drive-through window, ±10,700 SF of retail space, and a ±2,200 SF coffee shop with drive-through window will be constructed. Traffic to be generated by the proposed development project was forecast using the trip-generation information provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*<sup>3</sup> for LUC 912 (Drive-In Bank), LUC 820 (Shopping Center), and LUC 937 (Coffee/Donut Shop with Drive-Through Window). All trip-generation data are provided in the attachments.

Studies have shown that for developments of mixed-use or multi-use sites, it is realistic to assume that there will be some multi-use trips within the site itself. As this proposed project has various types of uses, it is likely that trips will be shared between the retail and restaurant uses. Accordingly, a multi-use rate was used to calculate the external trips generated by the site based on data published in the ITE *Trip Generation Handbook*.<sup>4</sup> These data revealed a 27 percent internal capture rate for the weekday daily, a 5 percent internal capture rate during the weekday AM peak hour, a 29 percent internal capture rate during the weekday PM peak hour, a 6 percent internal

<sup>3</sup> *Trip Generation, 10<sup>th</sup> Edition*. Institute of Transportation Engineers; Washington, DC; 2017.

<sup>4</sup> *Trip Generation Handbook*; 3<sup>rd</sup> Edition; Institute of Transportation Engineers; Washington, DC; August 2014.



capture rate for the Saturday daily, and a 10 percent internal capture rate during the Saturday midday peak hour. The Multi-Use Development Trip Generation and Internal Capture Worksheets are provided in the attachments.

Not all of the vehicle trips expected to be generated by the proposed development represent *new* trips on the study area roadway system. Studies have shown that for developments such as the one proposed, a substantial portion of the site-generated vehicle trips are already present in the adjacent passing stream of traffic or are diverted from another route to the proposed site. Based on information published in the ITE *Trip Generation Handbook*, the average *pass-by* trip percentage is 29 percent during the weekday AM peak hour, 35 percent during the weekday PM peak hour, and 38 percent during the Saturday midday peak hour for Drive-In Bank, 34 percent during the weekday PM peak hour and 26 percent during the Saturday midday peak hour for Shopping Center, and 49 percent during the weekday AM peak hour and 50 percent during the weekday PM peak hour for Fast-Food Restaurant with Drive-Through Window. It should be noted that the volume of *pass-by* traffic does not reduce the total volume of traffic generated by the development and the *total* trips generated will still be realized as turning movements at the site driveways. Table 3 summarizes the results of the trip-generation estimates. The *pass-by* data are provided in the attachments.

**Table 3  
 PEAK-HOUR TRIP-GENERATION SUMMARY**

Time Period/Direction	Proposed External Trips			Total Trips <sup>d</sup>	Pass-By Trips <sup>e</sup>	New Trips <sup>f</sup>
	Drive-In Bank <sup>a</sup>	Shopping Center <sup>b</sup>	Coffee/Donut Shop <sup>c</sup>			
<b>Weekday AM Peak Hour:</b>						
<i>In</i>	26	5	97	128	54	74
<i>Out</i>	17	4	93	114	54	60
<i>Total</i>	43	9	190	242	108	134
<b>Weekday PM Peak Hour:</b>						
<i>In</i>	36	14	33	83	33	50
<i>Out</i>	41	17	28	86	33	53
<i>Total</i>	77	31	61	169	66	103
<b>Saturday Midday Peak Hour:</b>						
<i>In</i>	62	23	86	171	73	98
<i>Out</i>	57	20	89	166	73	93
<i>Total</i>	119	43	175	337	146	191

<sup>a</sup> Based on ITE LUC 912 (Drive-In Bank) for 5,000 SF.

<sup>b</sup> Based on ITE LUC 820 (Shopping Center) for 10,700 SF.

<sup>c</sup> Based on ITE LUC 937 (Coffee/Donut Shop with Drive-Through Window) for 2,200 SF.

<sup>d</sup> Total Proposed External Trips.

<sup>e</sup> Based on pass-by data published in the ITE *Trip Generation Handbook*.

<sup>f</sup> Total Proposed External Trips minus Pass-By Trips.

As shown in Table 3, the proposed development is expected to generate 242 total vehicle trips (128 entering and 114 exiting) during the weekday AM peak hour, 169 total vehicle trips (83 entering and 86 exiting) during the weekday PM peak hour, and 337 total vehicle trips (171 entering and 166 exiting) during the Saturday midday peak hour.

**Trip Generation Comparison**

A Cumberland Farms development was previously proposed on the site and the permitting process began through the Town of Hudson. As mentioned, a TIAS was prepared for the project and the Town's Peer Review Consultant, Fuss & O'Neill, provided comments on the TIAS. Through discussions with the Town's Engineer, it was determined that for this project a *Trip-Generation Letter* may suffice for traffic purposes based on the previous study already conducted for the site. Accordingly, the proposed mixed-use trip generation estimates have been compared to the previously proposed Cumberland Farms trip generation estimates as well as the trips associated with a fully re-occupied existing site. Traffic to be generated by the re-occupancy of the existing site was also forecast using the trip-generation information provided in the ITE *Trip Generation Manual* LUC 210 (Single-Family Detached Housing), LUC 820 (Shopping Center), and LUC 150 (Warehousing). The square footages were obtained from the property record cards. This comparison is provided in Table 4.

**Table 4  
 PEAK-HOUR TRIP-GENERATION COMPARISON**

Time Period/Direction	Mixed Use Development Trips <sup>a</sup>	Cumberland Farms Trips <sup>b</sup>	Re-Occupied Site Trips <sup>c</sup>
<b>Weekday AM Peak Hour:</b>			
<i>In</i>	128	169	25
<i>Out</i>	<u>114</u>	<u>168</u>	<u>12</u>
<i>Total</i>	242	337	37
<b>Weekday PM Peak Hour:</b>			
<i>In</i>	83	138	26
<i>Out</i>	<u>86</u>	<u>138</u>	<u>39</u>
<i>Total</i>	169	276	65
<b>Saturday Midday Peak Hour:</b>			
<i>In</i>	171	140	24
<i>Out</i>	<u>166</u>	<u>139</u>	<u>20</u>
<i>Total</i>	337	279	44

<sup>a</sup> ITE LUC 912 (Drive-In Bank) for 5,000 SF, LUC 820 (Shopping Center) for 10,700 SF, and LUC 937 (Coffee/Donut Shop with Drive-Through Window) for 2,200 SF from Table 3.

<sup>b</sup> ITE LUC 960 (Super Convenience Market/Gas Station) for 12 VFPS from Table 4 of TIAS dated October 24, 2018.

<sup>c</sup> ITE LUC 210 (Single-Family Detached Housing) for 1 dwelling unit, ITE LUC 820 (Shopping Center) for 9,300 SF, and ITE LUC 150 (Warehousing) for 10,000 SF.

The proposed mixed-use development is expected to generate 95 *fewer* vehicles trips during the weekday AM peak hour, 107 *fewer* vehicles trips during the weekday PM peak hour, and 58 *more* vehicle trips during the Saturday midday peak hour in comparison to the previously proposed Cumberland Farms development.

### **Trip Distribution**

Having estimated project-generated vehicle trips, the next step is to determine the distribution of project traffic and assign these trips to the local roadway network. The directional distribution of site traffic is dependent on expected travel routes to and from the site and existing travel patterns. Accordingly, approximately 30 percent of the site-generated traffic is expected to travel to and from the north along Lowell Road (NH Route 3A), 45 percent is expected to and from the south along Lowell Road (NH Route 3A), 20 percent is expected to and from the east along Wason Road, and 5 percent is expected to and from the west along Flagstone Drive.

Based on the traffic-generation and distribution estimates for this project, the traffic volumes associated with the proposed mixed-use development were assigned to the roadway network. The site-generated traffic networks are attached as Figures A2, A3, and A4 for the weekday AM, weekday PM and Saturday midday peak hours, respectively.

### **Recommended Improvements**

The Town of Hudson is currently in the design stages of a CMAQ project that will add an additional southbound lane to Lowell Road between the Sagamore Bridge (Circumferential Highway) southbound on-ramp and the Haffner's gas station and car wash facility (215 Lowell Road) driveway. In addition, the CMAQ project will also optimize the traffic signal phasing and timings at the intersection of Lowell Road at Flagstone Drive and Wason Road. Accordingly, it is expected that the site-generated traffic associated with the proposed mixed-use development will be incorporated into the traffic volumes used to optimize the signal timings as part of the CMAQ project.

During the permitting of the Cumberland Farms development on this site, it was determined that a by-pass shoulder on Flagstone Drive would be beneficial to ensure that traffic turning into the proposed mixed-use site does not back up traffic on Flagstone Drive and onto Lowell Road (NH Route 3A). Since the trip generation estimates for the currently proposed mixed-use development and the previously proposed Cumberland Farms are similar, a by-pass shoulder is recommended for the proposed mixed-use development project as well.

### **Response to Fuss & O'Neil Comments**

As noted previously, a TIAS was prepared for the previous Cumberland Farms development on the site. That TIAS was submitted to the Town of Hudson, reviewed by Fuss & O'Neil, and comments were provided. The Fuss & O'Neil comment letter is attached to this letter for reference. There were five comments pertaining to the TIAS prepared for the Cumberland Farms project. Four of the comments did not require a response. The final comment suggested that since the site has frontage along Flagstone Drive, the Town should consider acquiring right-of-way along the site frontage for future roadway improvements or at least make sure that no permanent structures, utilities, signs, or landscaping is placed within the area that could be a future right-turn lane so that if/when such an improvement is made, it will not adversely affect the site layout. The project, as proposed, provides a 35-foot landscaped buffer to the Flagstone Drive right-of-way and does not propose any permanent structures, utilities, signs, or landscaping in close proximity to the Flagstone Drive curb line.

### Summary

- The site currently contains a mostly vacant retail building containing a restaurant and mix of retail uses as well as another building containing Hudson Cycle Center. As part of the redevelopment, the existing buildings will be razed and a ±5,000 square foot (SF) bank with drive-through window, ±10,700 SF of retail space, and a ±2,200 SF coffee shop with drive-through window will be constructed.
- Access and egress to the existing site is provided via one curb cut on Flagstone Drive. As part of the redevelopment, this full access/egress driveway will be relocated closer to the western property line.
- Based on the most recent three-year data from the Hudson Police Department, the intersection Lowell Road at Flagstone Drive and Wason Road has experienced 26 reported collisions over the three-year study period, averaging 8.67 collisions per year. The Town of Hudson is currently in the design stages of a CMAQ project which is expected to reduce congestion and possibly reduce the frequency of crashes. The intersection of Flagstone Drive at the retail driveway did not experience any collisions over the three-year study period. The intersection of Flagstone Drive at the Dunkin' Donuts and Burger King driveways experienced two reported collisions over the three-year study period, averaging 0.67 collisions per year.
- Sight distances at the proposed site driveway exceeds the minimum requirements as recommended by AASHTO. West of the site driveway intersection, sight distances meet or exceed the 400 feet of All-Season Safe Sight Distance, however, east of the site driveway, the sight distance is restricted to the center of the intersection with Lowell Road. Since a signal is located at this intersection, vehicles will likely be traveling less than 38 mph as they exit the signalized intersection and approach the site driveway.
- The proposed mixed-use development is expected to generate 95 fewer vehicles trips during the weekday AM peak hour, 107 fewer vehicles trips during the weekday PM peak hour, and 58 more vehicle trips during the Saturday midday peak hour in comparison to the previously proposed Cumberland Farms development.
- It is expected that the Town of Hudson will request a 14-foot wide permanent easement for the widening required on Lowell Road adjacent to the site as part of the CMAQ project.
- Similar to the Cumberland Farms development previously proposed on this site, a by-pass shoulder on Flagstone Drive is recommended to ensure traffic turning into the site does not back up traffic on Flagstone Drive and onto Lowell Road (NH Route 3A).
- As suggested by Fuss & O'Neil, the project, as proposed, provides a 35-foot landscaped buffer to the Flagstone Drive right-of-way and does not propose any permanent structures, utilities, signs, or landscaping in close proximity to the Flagstone Drive curb line.
- The findings and conclusions in the previous TIAS prepared for the project site are valid for the proposed development as a by-pass shoulder is proposed for the Flagstone Crossing project and traffic signal timing modifications will be incorporated through the CMAQ project and include the traffic volumes associated with the mixed-use development.

Should you have any questions, or require additional information, please contact me at (978) 570-2968.

Sincerely,

**GREENMAN-PEDERSEN, INC.**



Heather L. Monticup, P.E.  
Assistant Vice President / Director of Land Development Traffic

enclosure(s)

cc: Austin Turner, Bohler Engineering

**TRIP-GENERATION & SITE ACCESS LETTER**

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Mixed-Use Development – Hudson, New Hampshire

**ATTACHMENTS**

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**SITE LOCATION MAP (FIGURE A1)**

**COLLISION DATA**

**TRIP-GENERATION WORKSHEETS**

**SITE-GENERATED NETWORKS (FIGURE A2, FIGURE A3, FIGURE A4)**

**FUSS & O'NEIL COMMENT LETTER**

TRIP-GENERATION & SITE ACCESS LETTER

Mixed-Use Development - Hudson, New Hampshire

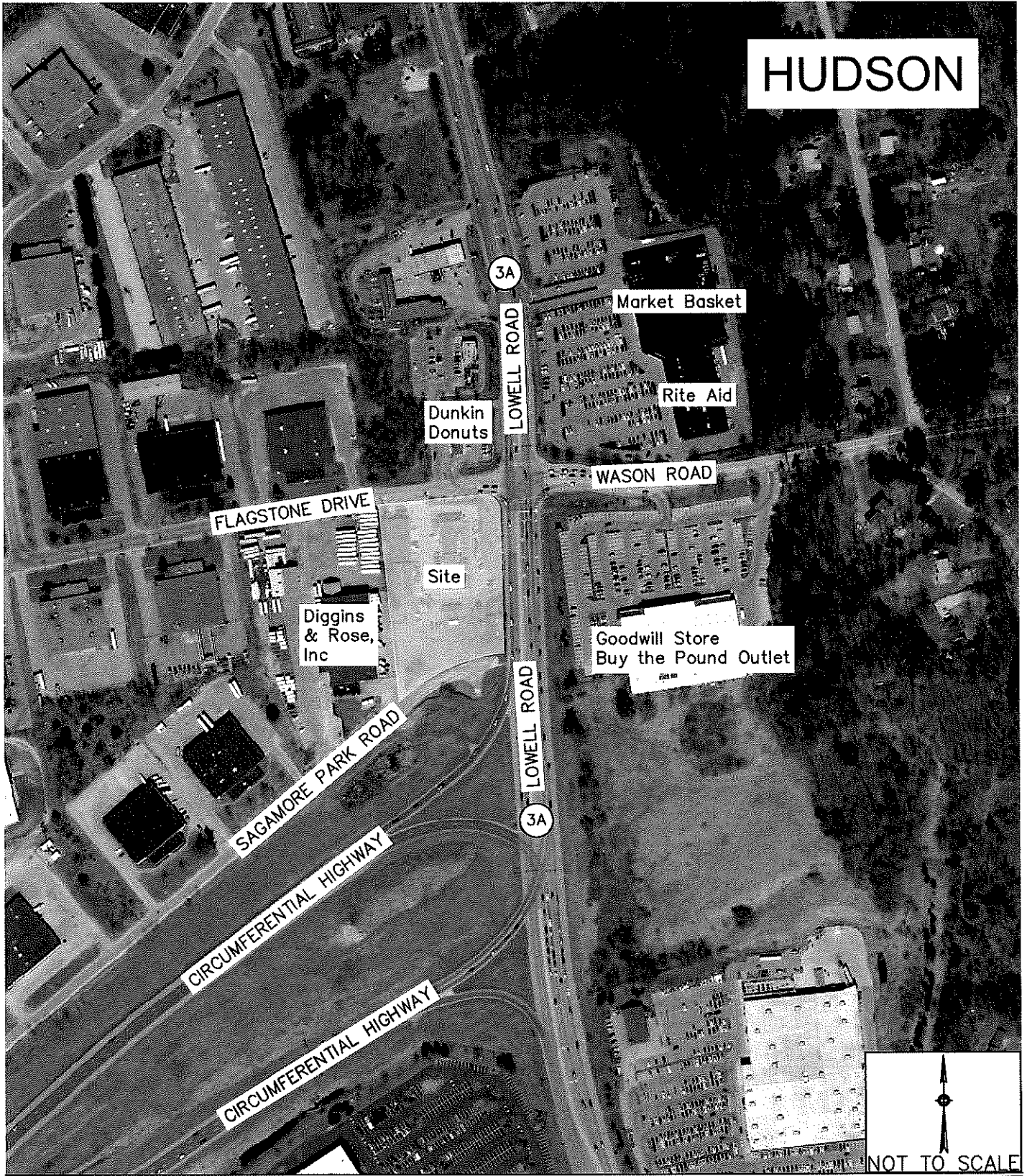


Figure 1  
Project Location Map

HUDSON NEW HAMPSHIRE POLICE DEPARTMENT									
Accident study for the intersection of Lowell Rd. @ Flagstone Dr./Wason Rd. from 1/1/2014 to 12/31/2016									
AC#	Date	Day	Time	Veh's	Injury	#Injured	Cause	Weather	
14-124-AC	2/19/2014								
14-307-AC	7/7/2014								
14-410-AC	9/14/2014								
14-425-AC	9/23/2014								
14-495-AC	10/24/2014								
14-575-AC	12/1/2014								
14-579-AC	12/2/2014								
AC#	Date								
15-225-AC	4/23/2015								
15-414-AC	8/8/2015								
15-604-AC	12/2/2015								
15-606-AC	12/2/2015								
15-659-AC	12/28/2015								
16-1-AC	1/4/2016	Monday	1704	2	yes	1	Following Too Close	Clear	
16-58-AC	1/27/2016	Wednesday	1613	2	no		Improper Turn	Clear	
16-61-AC	1/28/2016	Thursday	1416	2	no		Unable to Determine	Clear	
16-134-AC	3/5/2016	Saturday	1419	2	no		Driver Inattention	Clear	
16-177-AC	4/1/2016	Friday	905	2	no		Driver Inattention	Cloudy	
16-229-AC	5/2/2016	Monday	659	2	no		Hit and Run	Rain	
16-374-AC	8/6/2016	Saturday	1215	2	no		Failure To Yield	Clear	
16-391-AC	8/15/2016	Monday	751	2	no		Driver Inattention	Clear	
16-489-AC	10/10/2016	Monday	1009	2	no		Failure To Yield	Clear	
16-616-AC	12/8/2016	Thursday	708	2	no		Traffic Control Device	Cloudy	

<b>HUDSON NEW HAMPSHIRE POLICE DEPARTMENT</b>								
<b>Accident study for the intersection of Flagstone Dr. and entrance to 225 Lowell Rd. from 1/1/2014 to 12/31/2016</b>								
There were no accidents at this location during this time period.								
<b>Accident study for the intersection of Flagstone Dr. and Dunkin Donuts/Burger King Driveway from 1/1/2014 to 12/31/2016</b>								
<b>AC#</b>	<b>Date</b>	<b>Day</b>	<b>Time</b>	<b>Veh's</b>	<b>Injury</b>	<b>#Injured</b>	<b>Cause</b>	<b>Weather</b>
14-523-AC	11/12/2014							
15-69-AC	1/29/2015							
15-197-AC	4/7/2015							



**HUDSON NEW HAMPSHIRE POLICE DEPARTMENT**

**Accident study for the intersection of Lowell Rd. @ Flagstone Dr./Wason Rd. from 1/1/2017 to 12/31/2018**

AC#	Date	Day	Time	Veh's	Injury	#Injured	Cause	Weather
17-81-AC	2/14/2017	Tuesday	1842	2	no		Driving While Intoxicated	Clear
17-215-AC	5/13/2017	Saturday	1129	2	no		Failure to Yield	Clear
17-308-AC	7/3/2017	Monday	600	2	no		Following Too Close	Clear
17-342-AC	7/23/2017	Sunday	635	2	no		Following Too Close	Clear
17-358-AC	7/29/2017	Saturday	736	3	yes	2	Medical Emergency	Clear
17-568-AC	11/12/2017	Sunday	1112	2	0		Following Too Close	Clear
17-638-AC	12/13/2017	Wednesday	1215	2	yes	1	Following Too Close	Clear
18-13-AC	1/8/2018	Monday	1542	2	no		Following Too Close	Clear
18-114-AC	2/24/2018	Saturday	1149	4	no		Driver Distraction	Clear
18-131-AC	3/3/2018	Saturday	918	2	no		Driver Distraction	Cloudy
18-262-AC	5/7/2018	Monday	748	3	no		Following Too Close	Clear
18-269-AC	5/11/2018	Friday	1725	2	no		Driver Inattention	Clear
18-462-AC	8/21/2018	Tuesday	1152	2	no		Driver Inattention	Clear
18-517-AC	9/26/2018	Wednesday	1055	3	no		Driver Inattention	Clear
18-541-AC	10/9/2018	Tuesday	1555	2	yes	2	Following Too Close	Clear
18-568-AC	11/12/2018	Sunday	1112	2	no		Following Too Close	Clear

**Accident study for the intersection of Flagstone Dr. and entrance to 225 Lowell Rd. from 1/1/2017 to 12/31/2018**

There were no accidents at this location during this time period.

**Accident study for the intersection of Flagstone Dr. and Dunkin Donuts/Burger King Driveway from 1/1/2017 to 12/31/2018**

AC#	Date	Day	Time	Veh's	Injury	#Injured	Cause	Weather
17-528-AC	10/24/2017	Tuesday	2011	2	no		Improper Turn	Rain
18-499-AC	9/11/2018	Tuesday	1259	2	no		Driver Inattention	Cloudy

Size	Units	Land Use
10,700 KSF		LUC 820
5,000 KSF		LUC 912
2,200 KSF		LUC 937

	Pass-By Rates			TOTAL
	LUC 820	LUC 912	LUC 937	
Weekday Daily	26%	32%	50%	-
Weekday AM Peak Hour	26%	29%	49%	-
Weekday PM Peak Hour	34%	35%	50%	-
Saturday Daily	26%	38%	50%	-
Saturday Midday Peak Hour	26%	38%	50%	-

Assumed LUC 937 pass-by rates using LUC 934

		Total Trips				External Trips				Pass-By Trips				New Primary Trips			
		LUC 820	LUC 912	LUC 937	TOTAL	LUC 820	LUC 912	LUC 937	TOTAL	LUC 820	LUC 912	LUC 937	TOTAL	LUC 820	LUC 912	LUC 937	TOTAL
Weekday Daily	Entering	202	266	902	1,370	101	133	766	1,000	32	52	359	443	69	81	407	557
	Exiting	202	266	902	1,370	143	189	668	1,000	32	52	359	443	111	137	309	557
	Total	404	532	1,804	2,740	244	322	1,434	2,000	64	104	718	886	180	218	716	1,114
Weekday AM Peak Hour	Entering	6	26	100	134	5	26	97	128	1	6	47	54	4	20	50	74
	Exiting	4	20	96	120	4	17	93	114	1	6	47	54	3	11	46	60
	Total	10	46	196	254	9	43	190	242	2	12	94	108	7	31	96	134
Weekday PM Peak Hour	Entering	19	51	47	117	14	36	33	83	5	13	15	33	9	23	18	50
	Exiting	21	51	48	120	17	41	28	86	5	13	15	33	12	28	13	53
	Total	40	102	95	237	31	77	61	169	10	26	30	66	21	51	31	103
Saturday Daily	Entering	247	216	1,181	1,644	227	199	1,121	1,547	57	74	566	697	170	125	555	850
	Exiting	247	216	1,181	1,644	215	188	1,144	1,547	57	74	566	697	158	114	578	850
	Total	494	432	2,362	3,288	442	387	2,265	3,094	114	148	1,132	1,394	328	239	1,133	1,700
Saturday Midday Peak Hour	Entering	25	67	97	189	23	62	86	171	6	23	44	73	17	39	42	98
	Exiting	23	65	96	184	20	57	82	165	5	23	44	73	14	34	45	93
	Total	48	132	193	373	43	119	175	337	12	46	88	146	31	73	87	191

**Institute of Transportation Engineers (ITE)**  
**Land Use Code (LUC) 820 - Shopping Center**  
**General Urban/Suburban**

Average Vehicle Trips Ends vs: 1000 Sq. Ft. Gross Floor Area  
Independent Variable (X): 10.700

**AVERAGE WEEKDAY DAILY**

$T = 37.75 * (X)$   
 $T = 37.75 * 10.700$   
 $T = 403.93$   
 $T = 404$  vehicle trips  
with 50% ( 202 vpd) entering and 50% ( 202 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 0.94 * (X)$   
 $T = 0.94 * 10.700$   
 $T = 10.06$   
 $T = 10$  vehicle trips  
with 62% ( 6 vph) entering and 38% ( 4 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 3.81 * (X)$   
 $T = 3.81 * 10.700$   
 $T = 40.77$   
 $T = 40$  vehicle trips  
with 48% ( 19 vph) entering and 52% ( 21 vph) exiting.

**SATURDAY DAILY**

$T = 46.12 * (X)$   
 $T = 46.12 * 10.700$   
 $T = 493.48$   
 $T = 494$  vehicle trips  
with 50% ( 247 vpd) entering and 50% ( 247 vpd) exiting.

**SATURDAY PEAK HOUR OF GENERATOR**

$T = 4.50 * (X)$   
 $T = 4.50 * 10.700$   
 $T = 48.15$   
 $T = 48$  vehicle trips  
with 52% ( 25 vph) entering and 48% ( 23 vph) exiting.

**Institute of Transportation Engineers (ITE)**  
**Land Use Code (LUC) 912 - Drive-In Bank**  
**General Urban/Suburban**

Average Vehicle Trips Ends vs: 1,000 Sq. Ft. Gross Floor Area  
Independent Variable (X): 5.000

**AVERAGE WEEKDAY DAILY**

$$T = 82.87 * (X) + 117.10$$

$$T = 82.87 * 5.000 + 117.10$$

$$T = 531.45$$

T = 532 vehicle trips  
with 50% ( 266 vpd) entering and 50% ( 266 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 9.50 * (X)$$

$$T = 9.5 * 5.000$$

$$T = 47.50$$

T = 48 vehicle trips  
with 58% ( 28 vph) entering and 42% ( 20 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 20.45 * (X)$$

$$T = 20.45 * 5.000$$

$$T = 102.25$$

T = 102 vehicle trips  
with 50% ( 51 vph) entering and 50% ( 51 vph) exiting.

**SATURDAY DAILY**

$$T = 86.48 * (X)$$

$$T = 86.48 * 5.000$$

$$T = 432.40$$

T = 432 vehicle trips  
with 50% ( 216 vpd) entering and 50% ( 216 vpd) exiting.

**SATURDAY PEAK HOUR OF GENERATOR**

$$T = 26.35 * (X)$$

$$T = 26.35 * 5.000$$

$$T = 131.75$$

T = 132 vehicle trips  
with 51% ( 67 vph) entering and 49% ( 65 vph) exiting.

**Institute of Transportation Engineers (ITE)**

**Land Use Code (LUC) 937 - Coffee Donut Shop with Drive-Through Window**

**General Urban/Suburban**

Average Vehicle Trips Ends vs: 1,000 Sq. Ft. Gross Floor Area  
Independent Variable (X): 2.200

**AVERAGE WEEKDAY DAILY**

T = 820.38 \* (X)  
T = 820.38 \* 2.20  
T = #####  
T = 1,804 vehicle trips  
with 50% ( 902 vph) entering and 50% ( 902 vph) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

T = 88.99 \* (X)  
T = 88.99 \* 2.200  
T = 195.78  
T = 196 vehicle trips  
with 51% ( 100 vph) entering and 49% ( 96 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

T = 43.38 \* (X)  
T = 43.38 \* 2.200  
T = 95.44  
T = 95 vehicle trips  
with 50% ( 47 vph) entering and 50% ( 48 vph) exiting.

**SATURDAY DAILY**

$$\frac{\text{ITE LUC 934 Saturday Daily Trip Rate}}{\text{ITE LUC 934 Weekday Daily Trip Rate}} = \frac{\text{ITE LUC 937 Saturday Daily Trip Rate}}{\text{ITE LUC 937 Weekday Daily Trip Rate}}$$

$$\frac{616.12}{470.95} = \frac{(Y)}{820.38} \quad Y = 1073.26$$

T = Y \* 2.200  
T = 2361.2  
T = 2,362 vehicle trips  
with 50% ( 1,181 vpd) entering and 50% ( 1,181 vpd) exiting.  
*(same distribution split as ITE LUC 934 during the Saturday Daily period)*

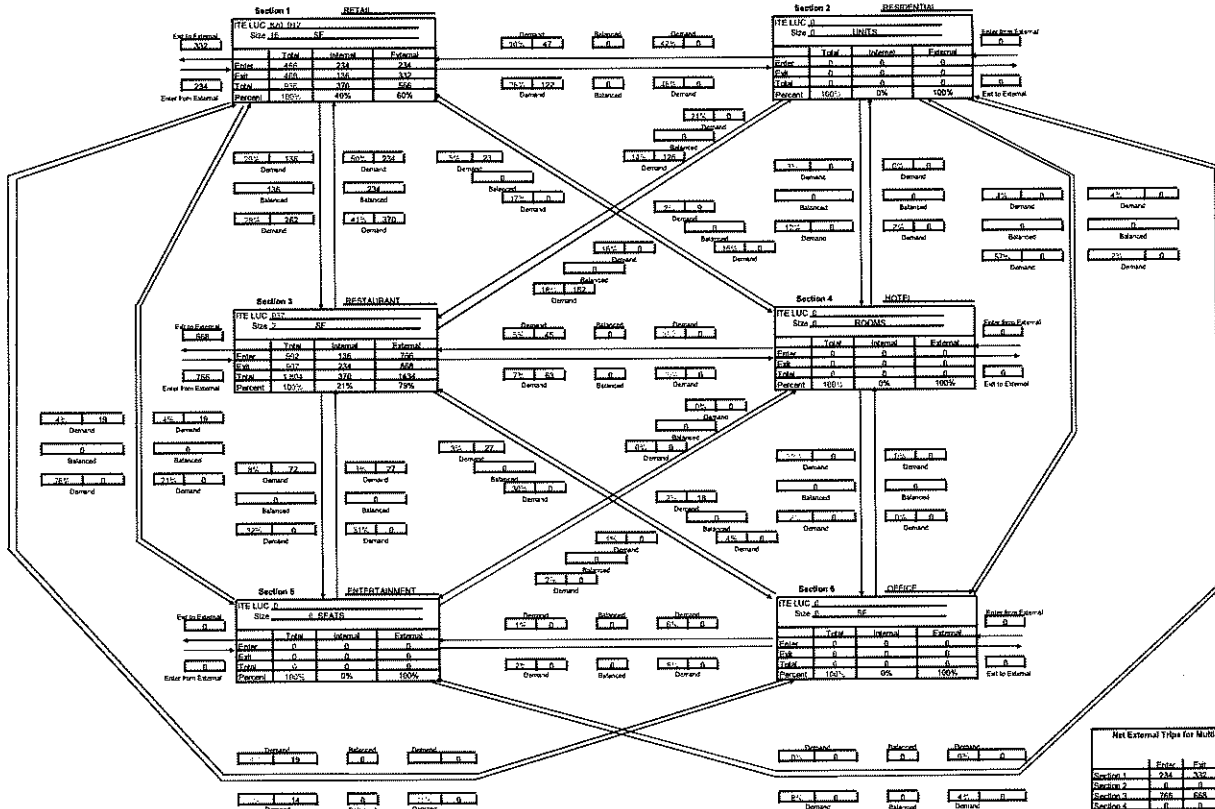
**SATURDAY PEAK HOUR OF GENERATOR**

T = 87.70 \* (X)  
T = 87.70 \* 2.200  
T = 192.94  
T = 193 vehicle trips  
with 50% ( 97 vph) entering and 50% ( 96 vph) exiting.

Analyst: Douglas S. Heppel, P.E.  
Date: August 8, 2019

MULTI-USE DEVELOPMENT  
TRIP GENERATION  
AND INTERNAL CAPTURE SUMMARY

Name of Dvlp: Houson, NH Mixed-Use Development  
Time Period: Weekday Daily



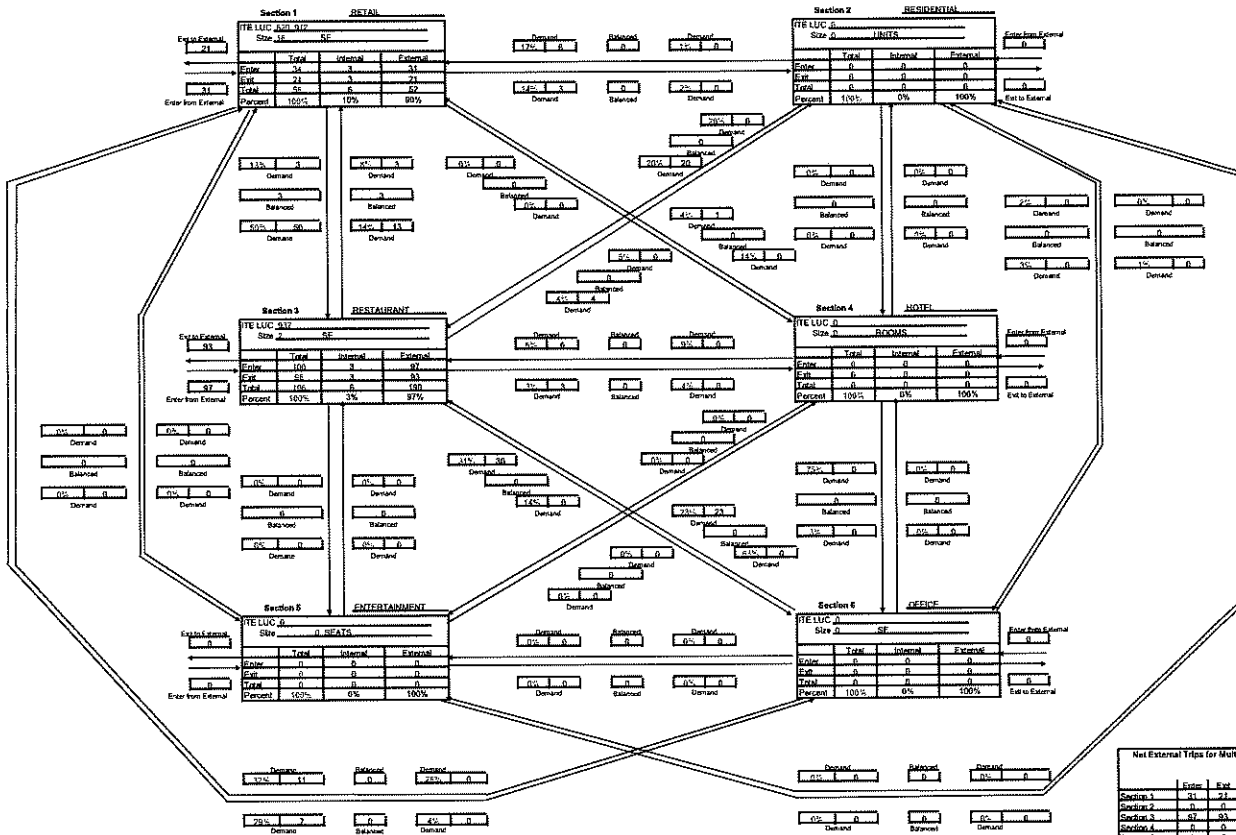
Section	Enter	Exit	Total	Trips (City Est.)
Section 1	234	332	566	836
Section 2	0	0	0	0
Section 3	756	658	1414	1504
Section 4	0	0	0	0
Section 5	0	0	0	0
Section 6	0	0	0	0
TOTAL	990	1000	2000	2744

Based on Weekday PM from ITE Trip Generation Handbook, 3rd Edition, August 2014.  
Source: ITE Trip Generation Handbook, 3rd Edition, August 2014, Chapter 10, Table 10.10, ITE Trip Generation Handbook, 3rd Edition, August 2014.

Analyst: Douglas S. Herbert, P.E.  
 Date: August 9, 2019

**MULTI-USE DEVELOPMENT  
 TRIP GENERATION  
 AND INTERNAL CAPTURE SUMMARY**

Name of Dvlp: Hudson NH Mixed-Use Development  
 Time Period: Weekday AM



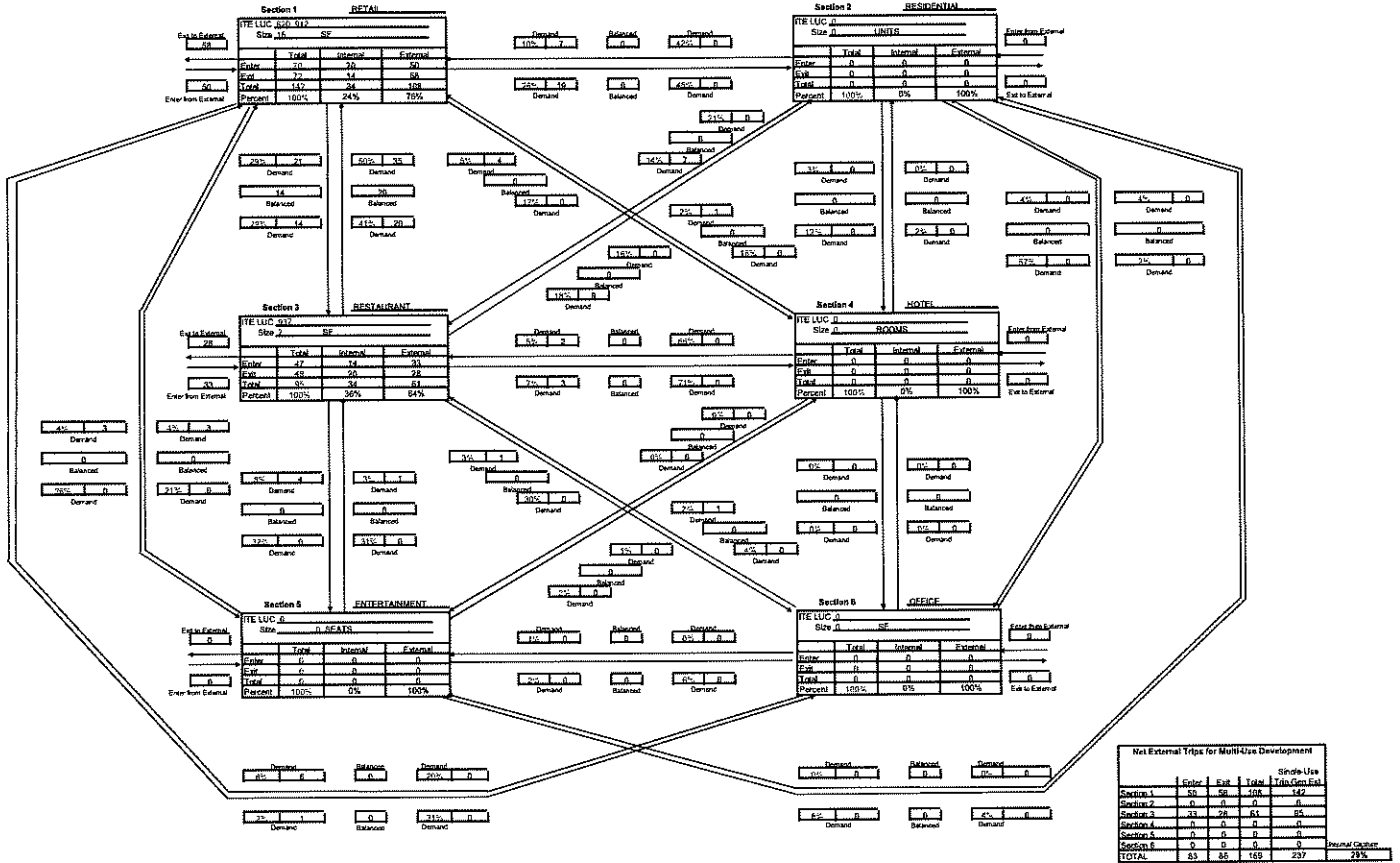
Section	Enter	Exit	Total	Single Use Trips/Day/Year
Section 1	31	21	52	58
Section 2	0	0	0	0
Section 3	67	69	136	136
Section 4	0	0	0	0
Section 5	0	0	0	0
Section 6	0	0	0	0
<b>TOTAL</b>	<b>128</b>	<b>114</b>	<b>242</b>	<b>254</b>

Based on ITE Trip Generation Handbook, 3rd Edition, August 2014.

**MULTI-USE DEVELOPMENT  
TRIP GENERATION  
AND INTERNAL CAPTURE SUMMARY**

Analyst: Douglas S. Helwig, P.E.  
Date: August 9, 2019

Name of Dvlp: Hudson, NH Mixed-Use Development  
Time Period: Weekday PM



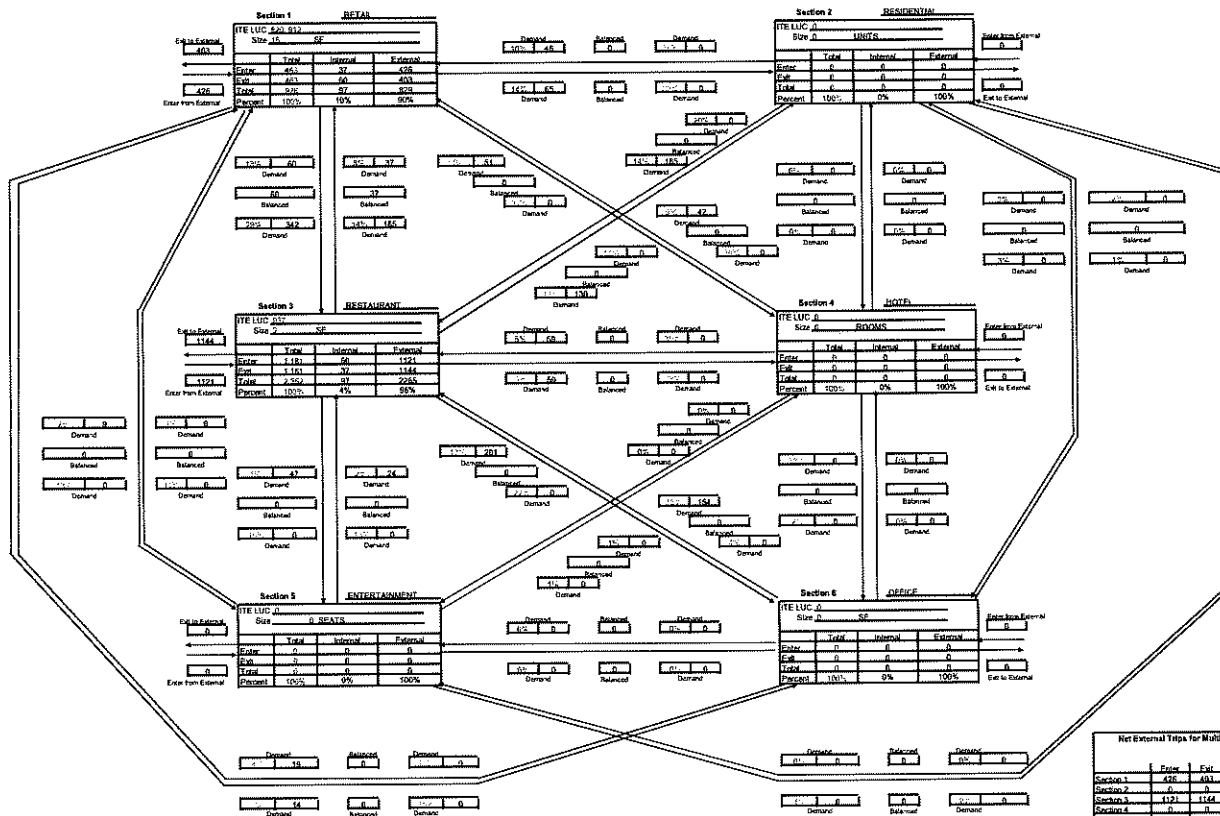
Based on ITE Trip Generation Handbook, 3rd Edition, August 2014.



Analyst: Douglas S. Haines, P.E.  
 Date: August 8, 2018

**MULTI-USE DEVELOPMENT  
 TRIP GENERATION  
 AND INTERNAL CAPTURE SUMMARY**

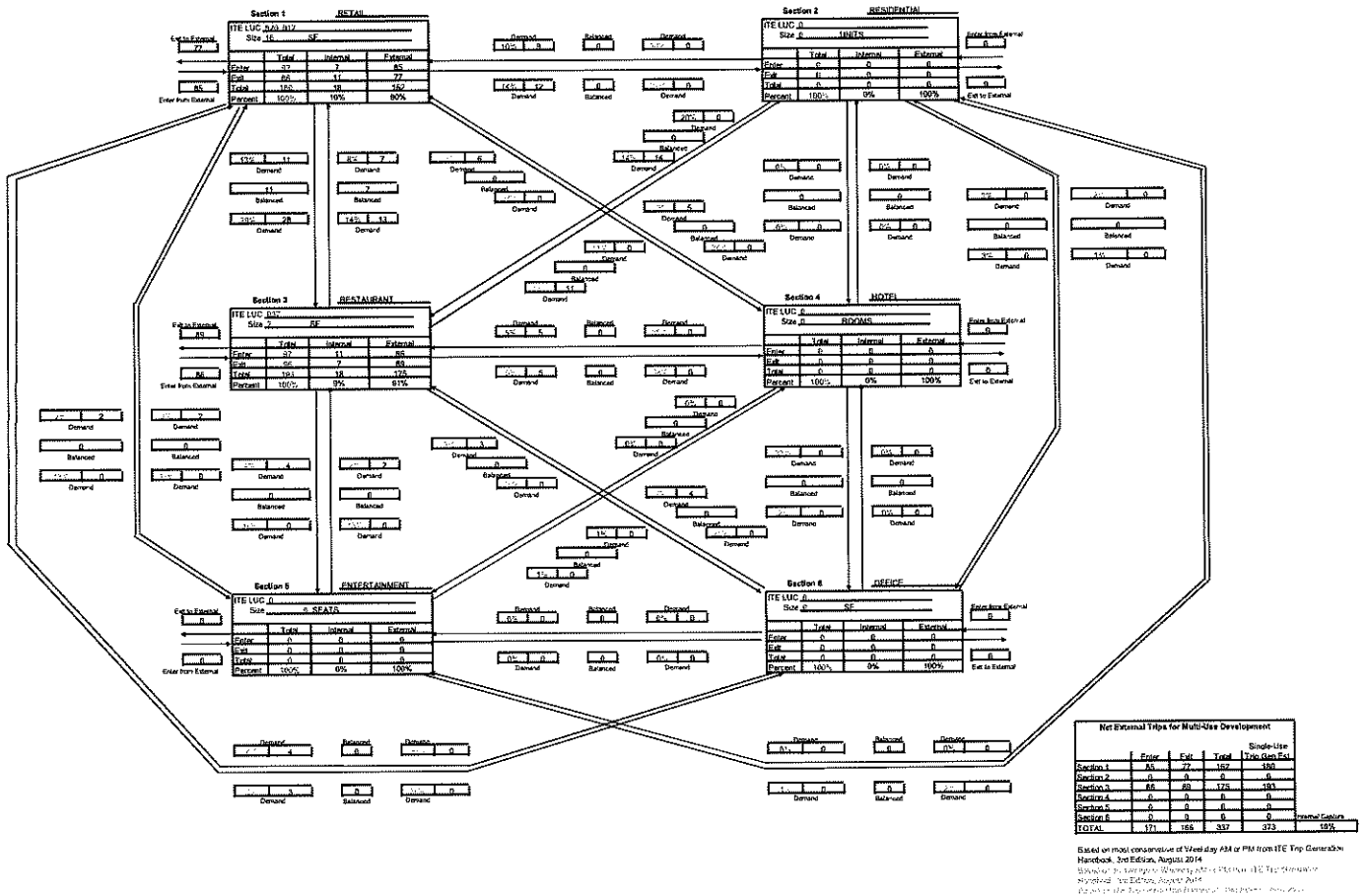
Name of DvP: Lithuan, NH Mixed-Use Development  
 Time Period: Saturday Daily



Section	Enter	Exit	Total	Single-Use Trip Dem. Ex.
Section 1	426	426	828	828
Section 2	0	0	0	0
Section 3	1121	1121	2252	2252
Section 4	0	0	0	0
Section 5	0	0	0	0
Section 6	0	0	0	0
<b>TOTAL</b>	<b>1547</b>	<b>1547</b>	<b>3094</b>	<b>3094</b>

Based on 1900s conservative of Weekday AM or PM from ITE Trip Generation Handbook, 3rd Edition, August 2014  
 Excerpted from ITE Trip Generation Handbook, 3rd Edition, August 2014  
 Appendix A, Table A-10.1

MULTI-USE DEVELOPMENT  
TRIP GENERATION  
AND INTERNAL CAPTURE SUMMARY



**Table F.9 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period  
Land Use Code 820—Shopping Center**

SIZE (1,000 SQ. FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
53	Port Orange, FL	1993	162	2:00-6:00 p.m.	59	—	—	41	—	—	TPD Inc.
9	Kissimmee, FL	1994	107	2:00-6:00 p.m.	66	20	14	34	—	—	TPD Inc.
77	Edgewater, FL	1992	365	2:00-6:00 p.m.	46	—	—	54	—	—	TPD Inc.
82	Deltona, FL	1992	336	2:00-6:00 p.m.	34	—	—	66	—	—	TPD Inc.
78	Orlando, FL	1991	702	2:00-6:00 p.m.	55	23	22	45	—	—	TPD Inc.
45	Orlando, FL	1992	844	2:00-6:00 p.m.	56	24	20	44	—	—	TPD Inc.
50	Orlando, FL	1992	555	2:00-6:00 p.m.	41	41	18	59	—	—	TPD Inc.
52	Orlando, FL	1995	665	2:00-6:00 p.m.	42	33	25	58	—	—	TPD Inc.
17	Orlando, FL	1994	196	2:00-6:00 p.m.	66	—	—	34	—	—	TPD Inc.
60	Orlando, FL	1995	1,583	3:00-7:00 p.m.	40	38	22	60	—	—	TPD Inc.
158	Crestwood, KY	June 1993	129	4:00-6:00 p.m.	36	39	25	64	759	—	Barton- Aschman Assoc.
118	Louisville area, KY	June 1993	133	4:00-6:00 p.m.	22	51	27	78	3,555	—	Barton- Aschman Assoc.
74	Louisville, KY	June 1993	187	4:00-6:00 p.m.	30	43	27	70	922	—	Barton- Aschman Assoc.
59	Louisville area, KY	June 1993	247	4:00-6:00 p.m.	31	52	17	69	2,659	—	Barton- Aschman Assoc.
145	Louisville area, KY	June 1993	210	4:00-6:00 p.m.	53	30	17	47	2,636	—	Barton- Aschman Assoc.
104	Louisville area, KY	June 1993	281	4:00-6:00 p.m.	28	50	22	72	2,111	—	Barton- Aschman Assoc.
235	Louisville, KY	June 1993	211	4:00-6:00 p.m.	35	29	36	65	2,593	—	Barton- Aschman Assoc.
71	Louisville, KY	June 1993	109	4:00-6:00 p.m.	25	42	33	75	1,559	—	Barton- Aschman Assoc.
350	Worcester, MA	Apr. 1994	224	4:00-6:00 p.m.	18	45	37	82	2,112	—	ICSC
738	East Brunswick, NJ	Apr. 1994	283	4:00-6:00 p.m.	14	79	7	86	8,059	—	ICSC
294	Philadelphia, PA	Apr. 1994	213	4:00-6:00 p.m.	25	51	24	75	4,055	—	ICSC
256	Hamden, CT	Apr. 1994	208	4:00-6:00 p.m.	27	51	22	73	3,422	—	ICSC
418	Glen Burnie, MD	Apr. 1994	281	4:00-6:00 p.m.	20	51	29	80	5,610	—	ICSC
560	Harrisonburg, VA	Apr. 1994	437	4:00-6:00 p.m.	19	49	32	81	3,051	—	ICSC

**Table F.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday,  
PM Peak Period Land Use Code 820—Shopping Center**

SITE ID (NO. 71-93A)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (B)	NON-PASS-BY TRIP (C)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
361	Glan Allen, VA	Apr. 1994	315	4:00-6:00 p.m.	17	54	29	83	2,034	—	ICSC
375	Shelby, NC	May 1994	214	4:00-6:00 p.m.	30	46	22	70	3,053	—	ICSC
413	Texas City, TX	May 1994	228	4:00-6:00 p.m.	28	52	20	72	589	—	ICSC
488	Texas City, TX	May 1994	257	4:00-6:00 p.m.	12	75	13	68	1,094	—	ICSC
293	Berwyn, IL	May 1994	282	4:00-6:00 p.m.	24	70	6	76	4,606	—	ICSC
667	Bourbonais, IL	May 1994	200	4:00-6:00 p.m.	16	53	31	84	2,770	—	ICSC
225	Bellevue, IL	May 1994	264	4:00-6:00 p.m.	35	32	33	65	1,970	—	ICSC
255	Bettendorf, IA	May 1994	222	4:00-6:00 p.m.	24	37	39	76	3,706	—	ICSC
808	Laguna Hills, CA	June 1994	240	4:00-6:00 p.m.	13	73	14	87	4,035	—	ICSC
450	Hanford, CA	May 1994	321	4:00-6:00 p.m.	23	49	28	77	2,787	—	ICSC
800	San Jose, CA	May 1994	205	4:00-6:00 p.m.	21	51	28	79	7,474	—	ICSC
598	Greeley, CO	May 1994	205	4:00-6:00 p.m.	17	55	28	83	3,840	—	ICSC
581	Pueblo, CO	May 1994	296	4:00-6:00 p.m.	18	53	29	82	2,939	—	ICSC
476	Bellevue, WA	May 1994	234	4:00-6:00 p.m.	26	54	20	74	3,427	—	ICSC
720	Frammingham, MA	Dec 1982	92	3:30-7:00 p.m.	23	39	36	77	—	73,628	Raymond Keyes Assoc.
890	Newark, DE	July 1984	179	3:00-6:00 p.m.	12	49	39	88	—	—	Raymond Keyes Assoc.
402	Manassas, VA	June 1984	87	4:00-6:00 p.m.	48	25	27	52	—	—	Raymond Keyes Assoc.
462	Ross, PA	June 1980	175	5:30-7:00 p.m.	35	—	—	64	—	27,200	Raymond Keyes Assoc.
234	Huntington LI, NY	Nov. 1985	181	4:00-7:00 p.m.	46	21	33	54	—	34,830	Raymond Keyes Assoc.
658	Wayne, NJ	Sept. 1984	243	3:00-6:00 p.m.	27	61	12	73	—	85,600	Raymond Keyes Assoc.
1,200	Washington, DC	1980	364	4:00-6:00 p.m.	25	35	40	75	—	—	Grove-Slide
800	Southern CA	—	1,000	4:00-6:00 p.m.	12	45	43	88	—	—	Frischer
451	Portland, OR	—	—	5:00-6:00 p.m.	25	—	—	75	—	—	Buttke
113	Portland, OR	—	—	5:00-6:00 p.m.	17	—	—	83	—	—	Buttke

**Table F.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM  
Peak Period Land Use Code 820—Shopping Center**

NO. (1,000) OF FT (GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
622	Ramsey, MN	Nov. 1985	46	4:00-9:00 p.m.	44	26	30	56	—	36,370	Raymond Keyes Assoc.
736	Pensacola, FL	Oct. 1985	383	3:00-7:00 p.m.	26	35	39	74	—	—	Raymond Keyes Assoc.
84	Dover, DE	July 1985	218	3:30-7:00 p.m.	50	6	44	50	—	—	Raymond Keyes Assoc.
500	Meriden, CT	Apr. 1985	—	4:00-6:00 p.m.	8	—	—	92	—	—	Connecticut DOT
660	Enfield, CT	Apr. 1985	—	4:00-6:00 p.m.	22	—	—	78	—	—	Connecticut DOT
645	Waterford, CT	Apr. 1985	—	4:00-6:00 p.m.	14	—	—	86	—	—	Connecticut DOT
1,060	West Hartford, CT	Apr. 1985	—	4:00-6:00 p.m.	17	—	—	83	—	—	Connecticut DOT
131	Pr. Georges Co., MD	1982/83	86	4:00-6:00 p.m.	74	—	—	26	—	—	JHK
181	Pr. Georges Co., MD	1982/83	105	4:00-6:00 p.m.	36	—	—	64	—	—	JHK
100	Pr. Georges Co., MD	1982/83	93	4:00-6:00 p.m.	36	—	—	64	—	—	JHK
475	Pr. Georges Co., MD	1982/83	130	4:00-6:00 p.m.	20	—	—	80	—	—	JHK
60	Pr. Georges Co., MD	1982/83	72	4:00-6:00 p.m.	72	—	—	28	—	—	JHK
90	Pr. Georges Co., MD	1982/83	91	4:00-6:00 p.m.	58	—	—	42	—	—	JHK
78	Pr. Georges Co., MD	1982/83	113	4:00-6:00 p.m.	59	—	—	41	—	—	JHK
44	Pr. Georges Co., MD	1982/83	97	4:00-6:00 p.m.	51	—	—	49	—	—	JHK
467	Pr. Georges Co., MD	1982/83	99	4:00-6:00 p.m.	56	—	—	44	—	—	JHK
352	W. Orange, NJ	Mar. 1986	149	4:00-6:00 p.m.	38	19	43	62	—	21,520	Raymond Keyes Assoc.
176	Tarpon Springs, FL	May 1986	124	3:00-7:00 p.m.	37	28	35	63	—	34,080	Raymond Keyes Assoc.
762	Orlando, FL	Fall 1985	182	4:00-6:00 p.m.	25	52	23	75	—	—	Kimley-Horn and Assoc. Inc.
166	Orlando, FL	Fall 1985	124	4:00-6:00 p.m.	27	48	25	73	—	—	Kimley-Horn and Assoc. Inc.
129	Orlando, FL	Fall 1985	116	4:00-6:00 p.m.	28	50	22	72	—	—	Kimley-Horn and Assoc. Inc.
71	Orlando, FL	Fall 1985	81	4:00-6:00 p.m.	50	44	6	50	—	—	Kimley-Horn and Assoc. Inc.

**Table F.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM Peak Period Land Use Code 820—Shopping Center**

SIZE (1,000 SQ FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK-HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
921	Albany, NY	July & Aug. 1985	196	4:00-6:00 p.m.	23	42	35	77	—	60,950	Raymond Keyes Assoc
108	Overland Park, KS	July 1988	111	4:30-5:30 p.m.	26	61	13	74	—	34,000	—
118	Overland Park, KS	Aug 1988	123	4:30-5:30 p.m.	25	55	20	75	—	—	—
256	Greece, NY	June 1988	120	4:00-6:00 p.m.	38	62	—	62	—	23,410	Sear Brown
160	Greece, NY	June 1988	76	4:00-6:00 p.m.	29	71	—	71	—	57,306	Sear Brown
550	Greece, NY	June 1988	117	4:00-6:00 p.m.	48	52	—	52	—	40,763	Sear Brown
51	Boca Raton, FL	Dec. 1987	110	4:00-6:00 p.m.	33	34	33	67	—	42,225	Kimley-Horn and Assoc. Inc.
1,090	Ross Twp, PA	July 1988	411	2:00-8:00 p.m.	34	56	10	66	—	51,500	Wilbur Smith and Assoc.
97	Upper Dublin Twp, PA	Winter 1988/89	—	4:00-6:00 p.m.	41	—	—	59	—	34,000	McMahon Associates
118	Tredyffrin Twp, PA	Winter 1988/89	—	4:00-6:00 p.m.	24	—	—	76	—	10,000	Booz Allen & Hamilton
122	Lawnside, NJ	Winter 1988/89	—	4:00-6:00 p.m.	37	—	—	63	—	20,000	Pennoni Associates
126	Boca Raton, FL	Winter 1988/89	—	4:00-6:00 p.m.	43	—	—	57	—	40,000	McMahon Associates
150	Willow Grove, PA	Winter 1988/89	—	4:00-6:00 p.m.	39	—	—	61	—	26,000	Booz Allen & Hamilton
153	Broward Cnty., FL	Winter 1988/89	—	4:00-6:00 p.m.	50	—	—	50	—	85,000	McMahon Associates
153	Arden, DE	Winter 1988/89	—	4:00-6:00 p.m.	30	—	—	70	—	26,000	Orth-Rodgers & Assoc. Inc.
154	Doylestown, PA	Winter 1988/89	—	4:00-6:00 p.m.	32	—	—	68	—	29,000	Orth-Rodgers & Assoc. Inc.
164	Middletown Twp, PA	Winter 1988/89	—	4:00-6:00 p.m.	33	—	—	67	—	25,000	Booz Allen & Hamilton
166	Haddon Twp, NJ	Winter 1988/89	—	4:00-6:00 p.m.	20	—	—	80	—	6,000	Pennoni Associates
205	Broward Cnty., FL	Winter 1988/89	—	4:00-6:00 p.m.	55	—	—	45	—	62,000	McMahon Associates

**Table F.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM Peak Period Land Use Code 820—Shopping Center**

SIZE (1,000 SQ FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK-HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
237	W. Windsor Twp, NJ	Winter 1988/89	—	4:00-6:00 p.m.	48	—	—	52	—	46,000	Booz Allen & Hamilton
242	Willow Grove, PA	Winter 1988/89	—	4:00-6:00 p.m.	37	—	—	63	—	26,000	McMahon Associates
297	Whitehall, PA	Winter 1988/89	—	4:00-6:00 p.m.	33	—	—	67	—	26,000	Orth-Rodgers & Assoc. Inc.
360	Broward Cnty., FL	Winter 1988/89	—	4:00-6:00 p.m.	44	—	—	56	—	73,000	McMahon Associates
370	Pittsburgh, PA	Winter 1988/89	—	4:00-6:00 p.m.	19	—	—	81	—	33,000	Wilbur Smith
150	Portland, OR	—	519	4:00-6:00 p.m.	68	6	26	32	—	25,000	Kittelson and Associates
150	Portland, OR	—	655	4:00-6:00 p.m.	65	7	28	35	—	30,000	Kittelson and Associates
760	Calgary, Alberta	Oct.-Dec 1987	15,436	4:00-6:00 p.m.	20	39	41	80	—	—	City of Calgary DOT
178	Bordentown, NJ	Apr. 1989	154	2:00-6:00 p.m.	35	—	—	65	—	37,980	Raymond Keyes Assoc.
144	Manalapan, NJ	July 1990	176	3:30-6:15 p.m.	32	44	24	68	—	69,347	Raymond Keyes Assoc.
549	Natick, MA	Feb 1989	—	4:45-5:45 p.m.	33	26	41	67	—	48,782	Raymond Keyes Assoc.

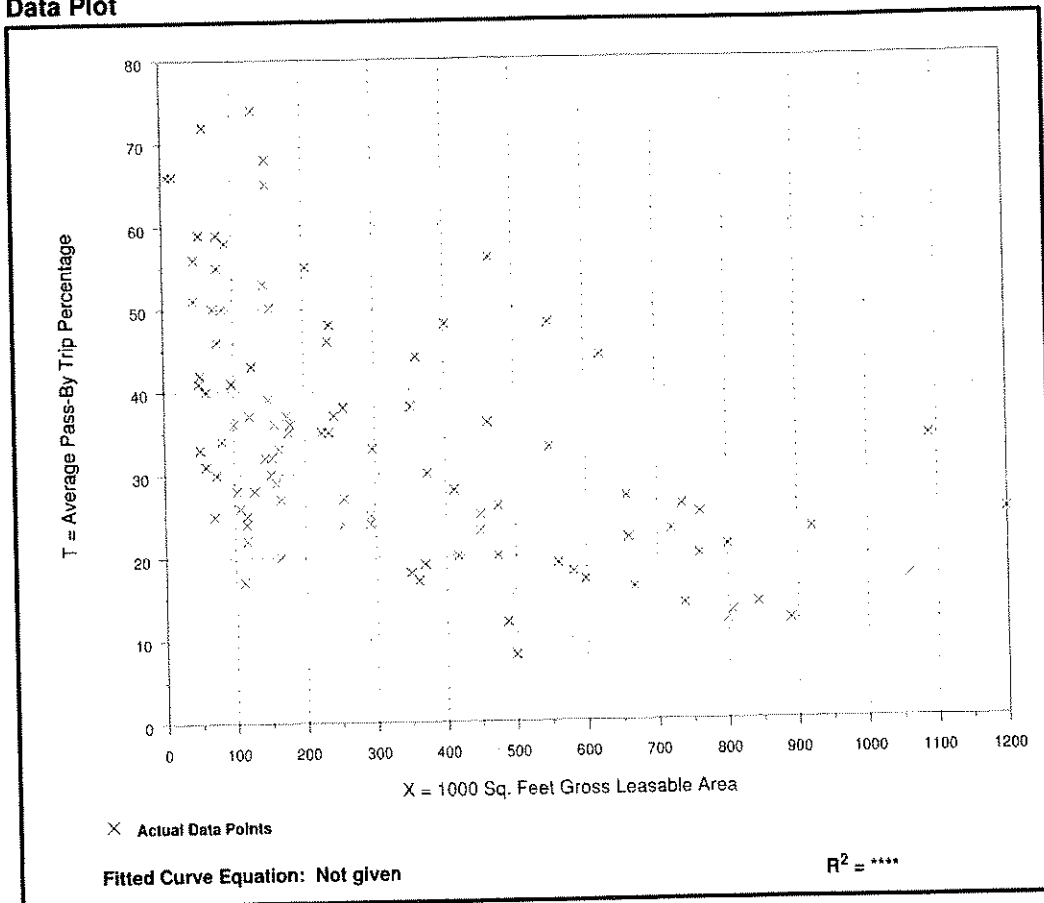
Average Pass-By Trip Percentage: 34

"—" means no data were provided

**Figure F.7 Shopping Center (820)**

**Average Pass-By Trip Percentage vs: 1000 Sq. Feet Gross Leasable Area**  
**On a: Weekday, P.M. Peak Period**  
Number of Studies: 100  
Average 1000 Sq. Feet GLA: 329

**Data Plot**



**Figure F.8 Shopping Center (820)**

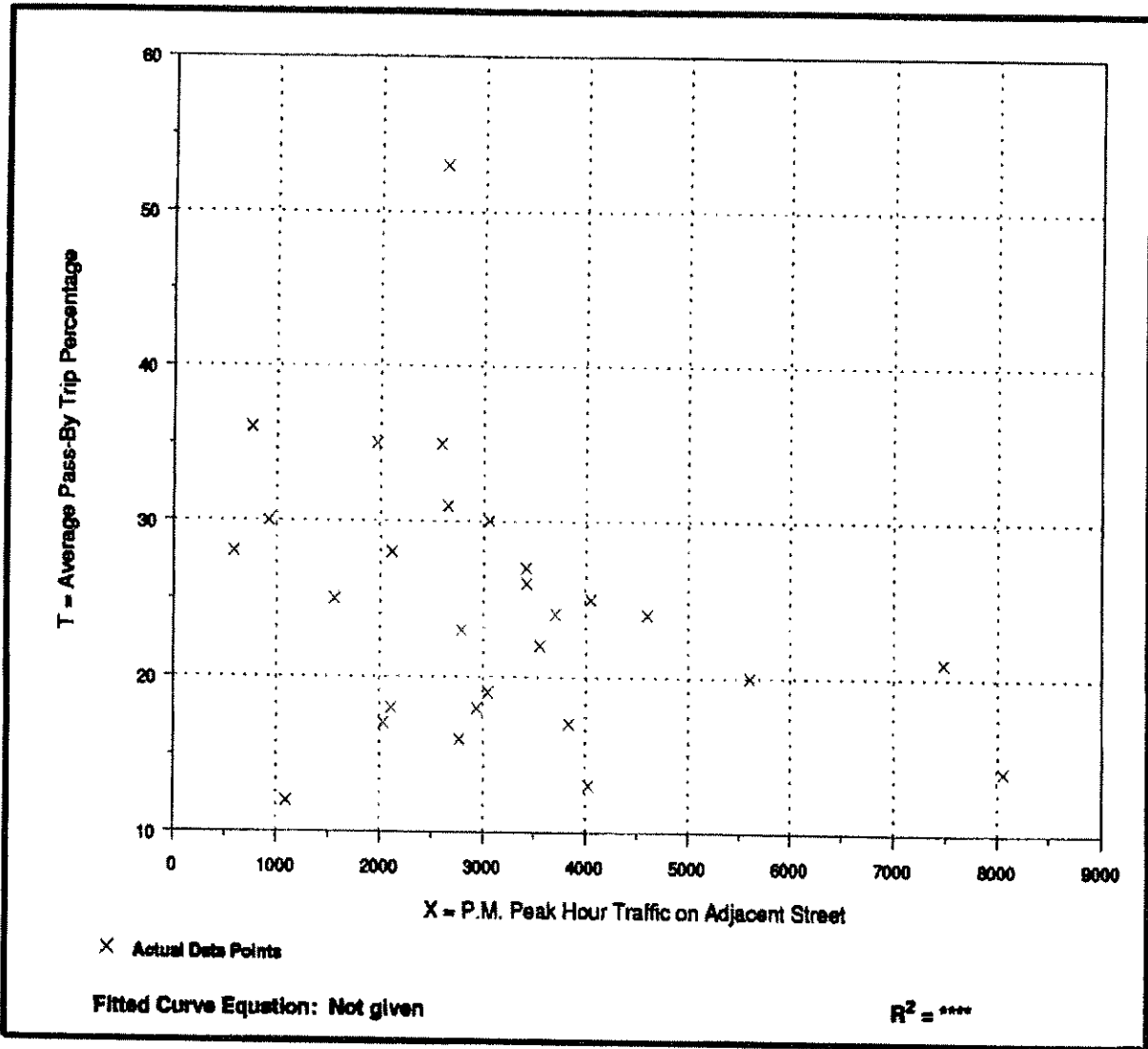
**Average Pass-By Trip Percentage vs: PM Peak Hour Traffic on Adjacent Street**

**On a: Weekday, PM Peak Period**

Number of Studies: 28

Average PM Peak Hr. Traf. On Adj. Street: 3,122

**Data Plot**



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**Table F.10 Pass-By and Non-Pass-By Trips Saturday, Mid-Day Peak Period  
Land Use Code 820—Shopping Center**

SITE (FUND NO CT. ORA)	LOCATION	SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (S)	NON-PASS-BY TRIPS (S)			ADJ. TRIP (S) PER HOUR	SOURCE
						PRIMARY	DIVERTED	TOTAL		
720	Framingham, MA	Feb. 1984	258	11:00 a.m.—4:00 p.m.	23	34	43	77	—	Raymond Keyes Assoc.
600	Brandywine, DE	Apr. 1983	256	10:00 a.m.—3:00 p.m.	17	50	33	83	—	Raymond Keyes Assoc.
880	Christiana, DE	July 1984	198	11:00 a.m.—4:00 p.m.	5	55	40	95	—	Raymond Keyes Assoc.
234	Huntington LI, NY	Nov. 1985	223	11:00 a.m.—3:00 p.m.	39	22	39	61	—	Raymond Keyes Assoc.
658	Wayne, NJ	Sept. 1984	329	11:00 a.m.—4:00 p.m.	46	44	10	54	—	Raymond Keyes Assoc.
622	Ramsey Cnly, MN	Nov. 1985	119	11:00 a.m.—3:00 p.m.	23	21	56	77	—	Raymond Keyes Assoc.
736	Pensacola, FL	Oct. 1985	660	11:00 a.m.—3:00 p.m.	20	31	49	80	—	Raymond Keyes Assoc.
430	Ross, PA	June 1980	425	11:00 a.m.—4:00 p.m.	22	—	—	78	—	Raymond Keyes Assoc.
176	Tampa Springs, FL	May 1986	188	11:00 a.m.—3:00 p.m.	31	42	27	69	—	Raymond Keyes Assoc.
144	Manalapan, NJ	July 1990	264	11:00 a.m.—3:15 p.m.	31	47	22	69	63,362	Raymond Keyes Assoc.
549	Natick, MA	Feb. 1989	—	2:15—3:15 p.m.	28	39	33	72	46,782	Raymond Keyes Assoc.

Average Pass-By Trip Percentage: 26

“—” means no data were provided

**Table F.24 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period  
Land Use Code 890—Furniture Store**

SIZE (1,000 SQ FT. GFA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
						PRIMARY	DIVERTED	TOTAL		
41	Allamonte Springs, FL	1995	212	2:00–6:00 p.m.	49	20	31	51	—	TPD Inc.
17	Daytona Beach, FL	1994	39	2:00–6:00 p.m.	69	—	—	31	—	TPD Inc.
24	Orlando, FL	1991	103	2:00–6:00 p.m.	42	—	—	58	—	TPD Inc.

Average Pass-By Trip Percentage: 53

“—” means no data were provided

**Table F.25 Pass-By and Non-Pass-By Trips Weekday, AM Peak Period  
Land Use Code 912—Drive-in Bank**

SIZE (1,000 SQ FT. GFA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
						PRIMARY	DIVERTED	TOTAL		
3.8	Camp Hill Mall, PA	March 2005	11	7:45–8:45 a.m.	27	—	—	73	—	McMahon Associates, Inc.
3.8	Exeter Twp, PA	March 2005	9	8:00–9:00 a.m.	24	—	—	76	—	McMahon Associates, Inc.
3.8	York, PA	March 2005	22	7:45–8:45 a.m.	34	—	—	66	—	McMahon Associates, Inc.
3.8	York, PA	March 2005	30	8:00–9:00 a.m.	27	—	—	73	—	McMahon Associates, Inc.
3.8	Mountain Road, PA	March 2005	34	7:30–8:30 a.m.	40	—	—	60	—	McMahon Associates, Inc.
3.8	Muhlenberg, PA	March 2005	7	8:00–9:00 a.m.	27	—	—	73	—	McMahon Associates, Inc.
3.8	York, PA	March 2005	15	8:00–9:00 a.m.	18	—	—	84	—	McMahon Associates, Inc.
3.8	Derry Street, PA	March 2005	27	8:00–9:00 a.m.	36	—	—	64	—	McMahon Associates, Inc.

Average Pass-By Trip Percentage: 29

“—” means no data were provided

**Table F.26 Pass-By and Non-Pass-By Trips Weekday, Mid-Day Peak Period  
Land Use Code 912—Drive-in Bank**

SIZE (1,000 SQ FT. GFA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
						PRIMARY	DIVERTED	TOTAL		
3.6	Arlington, WA	Sept. 2007	—	11:00 a.m.–2:00 p.m.	34	42	24	66	—	657
2.7	Lynnwood, WA	Sept. 2007	—	11:00 a.m.–2:00 p.m.	26	58	16	74	—	657
2.8	Redmond, WA	Sept. 2007	—	11:00 a.m.–2:00 p.m.	30	53	17	70	—	657
3.6	Snohomish, WA	July 2007	—	11:00 a.m.–2:00 p.m.	15	—	—	85	—	657

Average Pass-By Trip Percentage: 26

“—” means no data were provided

**Table F.27 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period  
Land Use Code 912—Drive-in Bank**

SIZE (1,000 SQ FT/AC)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET DEVELOP. VOLUME	SOURCE
						PRIMARY	DIVERTED	TOTAL		
16.0	Overland Park, KS	Dec. 1988	20	4:30-5:30 p.m.	15	55	30	85	—	—
3.3	Louisville area, KY	July 1993	—	4:00-6:00 p.m.	48	22	30	52	2,570	Barton-Aschman Assoc.
3.4	Louisville area, KY	July 1993	—	4:00-6:00 p.m.	64	22	14	36	2,266	Barton-Aschman Assoc.
3.4	Louisville area, KY	July 1993	75	4:00-6:00 p.m.	57	11	32	43	1,955	Barton-Aschman Assoc.
3.5	Louisville area, KY	June 1993	53	4:00-6:00 p.m.	47	32	21	53	2,785	Barton-Aschman Assoc.
6.4	Louisville area, KY	June 1993	66	4:00-6:00 p.m.	53	20	27	47	2,610	Barton-Aschman Assoc.
3.8	Colonial Park, PA	March 2005	56	4:00-5:00 p.m.	43	—	—	57	—	McMahon Associates, Inc.
3.8	Camp Hill Mall, PA	March 2005	38	4:15-5:15 p.m.	41	—	—	59	—	McMahon Associates, Inc.
3.8	Exeter Twp, PA	March 2005	14	4:00-5:00 p.m.	24	—	—	76	—	McMahon Associates, Inc.
3.8	York, PA	March 2005	63	4:00-5:00 p.m.	29	—	—	71	—	McMahon Associates, Inc.
3.8	York, PA	March 2005	70	4:00-5:00 p.m.	29	—	—	71	—	McMahon Associates, Inc.
3.8	Palmyra, PA	March 2005	29	4:15-5:15 p.m.	27	—	—	73	—	McMahon Associates, Inc.
3.8	Mountain Road, PA	March 2005	41	4:00-5:00 p.m.	25	—	—	75	—	McMahon Associates, Inc.
3.8	Hummelstown, PA	March 2005	37	4:00-6:00 p.m.	31	—	—	69	—	McMahon Associates, Inc.
3.8	Muhlenberg, PA	March 2005	19	4:00-6:00 p.m.	29	—	—	71	—	McMahon Associates, Inc.
3.6	York, PA	March 2005	34	4:00-6:00 p.m.	21	—	—	79	—	McMahon Associates, Inc.
3.8	Derry Street, PA	March 2005	36	4:00-6:00 p.m.	29	—	—	71	—	McMahon Associates, Inc.
3.6	Arlington, WA	Sept. 2007	—	4:00-6:00 p.m.	42	50	8	58	—	657
2.7	Lynnwood, WA	Sept. 2007	—	4:00-6:00 p.m.	26	66	8	74	—	657
2.8	Redmond, WA	Sept. 2007	—	4:00-6:00 p.m.	21	55	24	79	—	657
3.6	Snohomish, WA	July 2007	—	4:00-6:00 p.m.	29	—	—	71	—	657

Average Pass-By Trip Percentage: 35

“—” means no data were provided

### Figure F.15 Drive-in Bank (912)

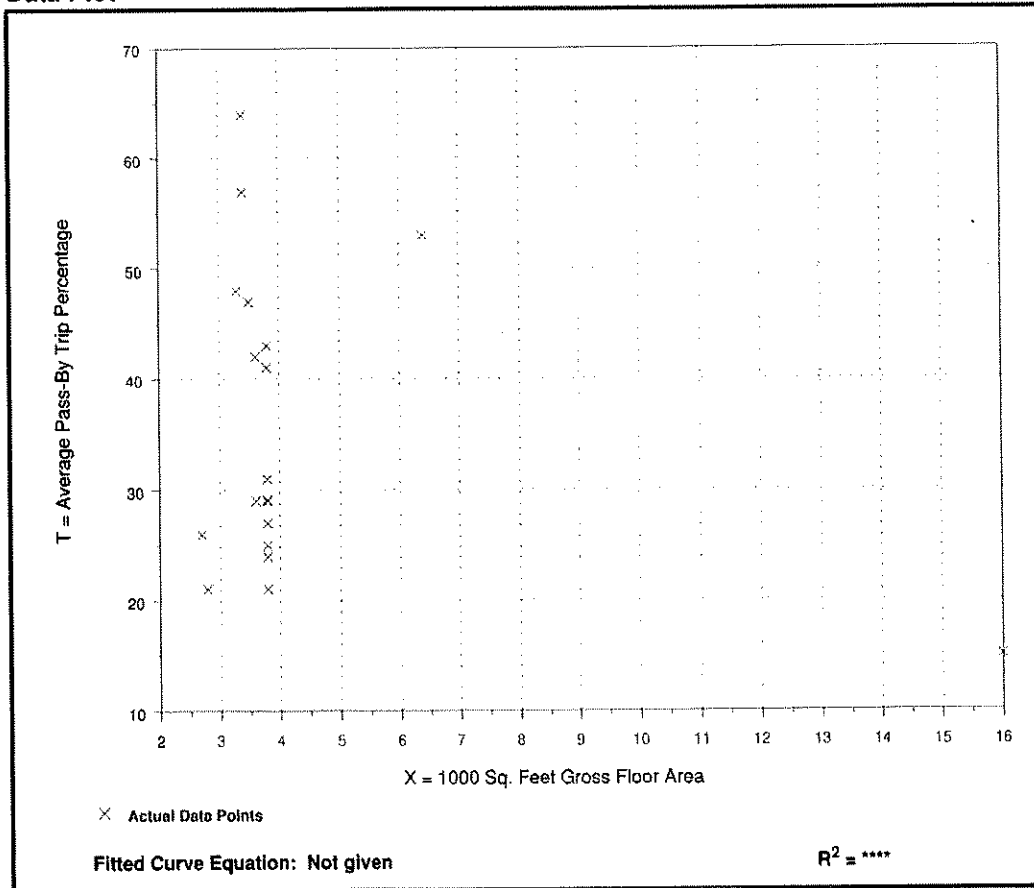
Average Pass-By Trip Percentage vs: 1000 Sq. Feet Gross Floor Area

On a: Weekday, P.M. Peak Period

Number of Studies: 21

Average 1000 Sq. Feet GFA: 4

#### Data Plot



**Table F.28 Pass-By and Non-Pass-By Trips Saturday, Mid-Day Peak Period  
Land Use Code 912—Drive-in Bank**

SIZE (1,000 SQ FT GFA)	LOCATION	SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
						PRIMARY	DIVERTED	TOTAL		
3.8	Colonial Park, PA	March 2005	63	11:15 a.m.–12:15 p.m.	33	—	—	67	—	McMahon Associates, Inc.
3.8	Camp Hill Mall, PA	March 2005	103	11:00 a.m.–12:00 p.m.	77	—	—	23	—	McMahon Associates, Inc.
3.8	Exeter Twp, PA	March 2005	34	10:30–11:30 a.m.	37	—	—	63	—	McMahon Associates, Inc.
3.8	York, PA	March 2005	53	10:15–11:15 a.m.	33	—	—	67	—	McMahon Associates, Inc.
3.8	York, PA	March 2005	25	10:45–11:45 a.m.	12	—	—	88	—	McMahon Associates, Inc.

Average Pass-By Trip Percentage: 38  
 "—" means no data were provided

**Table F.29 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period  
Land Use Code 931—Quality Restaurant**

SEATS	SIZE (1,000 SQ FT GFA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS- BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
							PRIMARY	DIVERTED	TOTAL		
240	12	Louisville area, KY	July 1993	36	4:00–6:00 p.m.	26	36	38	74	4,145	Barton- Aschman Assoc.
—	8	Orlando, FL	1992	168	4:00–6:00 p.m.	45	—	—	55	—	TPD Inc.
—	8.8	Orlando, FL	1992	84	2:00–6:00 p.m.	44	40	16	56	—	TPD Inc.
—	6.5	Orlando, FL	1995	173	2:00–6:00 p.m.	62	—	—	38	—	TPD Inc.

Average Pass-By Trip Percentage: 44  
 "—" means no data were provided

**Table F.31 Pass-By and Non-Pass-By Trips Weekday, AM Peak Period  
Land Use Code 934—Fast-Food Restaurant with Drive-Through Window**

RATA	SIZE (1,000 SQ FT)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
							PRIMARY	DIVERTED	TOTAL		
—	<5	Chicago suburbs, IL	1987	84	7:00–9:00 a.m.	44	—	—	56	—	Kenig, O'Hara, Humes, Flock
88	1.4	Louisville area, KY	1993	—	7:00–9:00 a.m.	62	22	16	38	1,407	Barton-Aschman Assoc.
100	3.6	Louisville, KY	1993	—	7:00–9:00 a.m.	32	47	21	68	437	Barton-Aschman Assoc.
87	4.2	New Albany, IN	1993	—	7:00–9:00 a.m.	46	23	31	54	1,049	Barton-Aschman Assoc.
150	3.0	Louisville area, KY	1993	—	7:00–9:00 a.m.	43	14	43	57	2,903	Barton-Aschman Assoc.
—	3.3	varies	1996	—	6:00–9:00 a.m.	68	—	—	32	—	Oracle Engineering

Average Pass-By Trip Percentage: 49

"—" means no data were provided

**Table F.32 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period  
Land Use Code 934—Fast-Food Restaurant with Drive-Through Window**

ROUTE	SPEED (1,000 FT/HR) (MPH)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. TRIP VOLUME	SOURCE
							PRIMARY	DIVERTED	TOTAL		
—	~2.6	Minn-St Paul, MN	1987	50	3:00–7:00 p.m.	25	27	48	75	—	—
—	<5.0	Chicago suburbs, IL	1987	80	3:00–6:00 p.m.	38	—	—	62	—	Kenig, O'Hara, Humes, Flock
—	<5.0	Chicago suburbs, IL	1987	100	3:00–6:00 p.m.	55	—	—	45	—	Kenig, O'Hara, Humes, Flock
—	<5.0	Chicago suburbs, IL	1987	159	3:00–6:00 p.m.	56	—	—	44	—	Kenig, O'Hara, Humes, Flock
—	<5.0	Chicago suburbs, IL	1987	225	3:00–6:00 p.m.	48	—	—	52	—	Kenig, O'Hara, Humes, Flock
—	<5.0	Chicago suburbs, IL	1987	86	3:00–6:00 p.m.	35	—	—	65	—	Kenig, O'Hara, Humes, Flock
—	<5.0	Chicago suburbs, IL	1987	84	3:00–6:00 p.m.	44	—	—	56	—	Kenig, O'Hara, Humes, Flock
88	1.3	Louisville area, KY	1993	—	4:00–6:00 p.m.	66	22	10	32	2,055	Barton-Aschman Assoc.
120	1.9	Louisville area, KY	1993	33	4:00–6:00 p.m.	67	24	9	33	2,447	Barton-Aschman Assoc.
87	4.2	New Albany, IN	1993	—	4:00–6:00 p.m.	56	25	19	44	1,632	Barton-Aschman Assoc.
150	3.0	Louisville area, KY	1993	—	4:00–6:00 p.m.	31	31	38	69	4,250	Barton-Aschman Assoc.
—	3.1	Kissimmee, FL	1995	28	2:00–6:00 p.m.	71	—	—	29	—	TPD Inc.
—	3.1	Apopka, FL	1996	29	2:00–6:00 p.m.	38	—	—	62	—	TPD Inc.
—	2.6	Winter Springs, FL	1995	47	2:00–6:00 p.m.	66	—	—	34	—	TPD Inc.
—	4.3	Longwood, FL	1994	304	2:00–6:00 p.m.	62	—	—	38	—	TPD Inc.
—	3.2	Altamonte Springs, FL	1996	202	2:00–6:00 p.m.	40	39	21	60	—	TPD Inc.
—	2.9	Winter Park, FL	1996	271	2:00–6:00 p.m.	41	41	18	59	—	TPD Inc.
—	3.3*	several	1996	varies	4:00–6:00 p.m.	62	—	—	36	—	Oracle Engineering

\*Average of several combined studies.

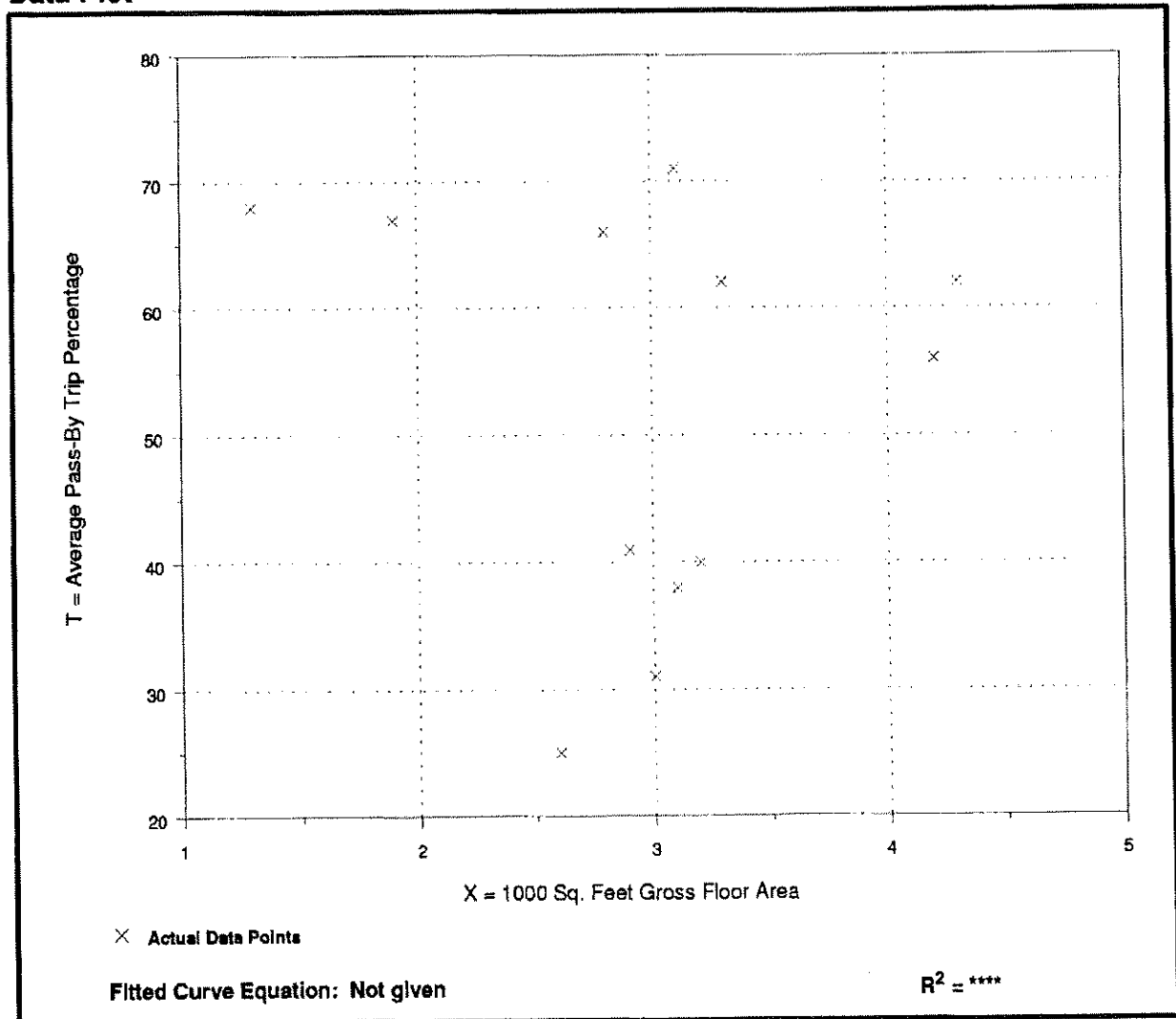
Average Pass-By Trip Percentage: 50

“—” means no data were provided

**Figure F.17 Fast-Food Restaurant with Drive-Through Window (934)**

Average Pass-By/Trip Percentage vs: 1,000 Sq. Ft. Gross Floor Area  
On a: Weekday, PM Peak Period  
Number of Studies: 12  
Average 1,000 Sq. Ft. GFA: 3.0

**Data Plot**





**TRAFFIC IMPACT AND ACCESS STUDY**

Cumberland Farms – Hudson, New Hampshire

**Table 4  
PEAK-HOUR TRIP-GENERATION SUMMARY**

Time Period/Direction	Existing Total Trips <sup>a</sup>	Proposed Total Trips <sup>b</sup>	Additional Trips		
			Total Trips <sup>c</sup>	Pass-By Trips <sup>d</sup>	New Trips <sup>e</sup>
<b>Weekday AM Peak Hour:</b>					
<i>In</i>	1	169	168	106	62
<i>Out</i>	<u>0</u>	<u>168</u>	<u>168</u>	<u>106</u>	<u>62</u>
<i>Total</i>	1	337	336	212	124
<b>Weekday PM Peak Hour:</b>					
<i>In</i>	18	138	120	79	41
<i>Out</i>	<u>20</u>	<u>138</u>	<u>118</u>	<u>79</u>	<u>39</u>
<i>Total</i>	38	276	238	158	80
<b>Saturday Midday Peak Hour:</b>					
<i>In</i>	27	140	113	71	42
<i>Out</i>	<u>26</u>	<u>139</u>	<u>113</u>	<u>71</u>	<u>42</u>
<i>Total</i>	53	279	226	142	84

<sup>a</sup> Based on counts conducted on Thursday, October 12, 2017 and Saturday, October 14, 2017.

<sup>b</sup> ITE LUC 960 (Super Convenience Market/Gas Station) for 12 VFPS.

<sup>c</sup> Proposed Trips minus Existing Trips.

<sup>d</sup> 63 percent of Total Additional Trips during Weekday AM peak hour, 66 percent of Total Additional Trips during the Weekday PM and 63 percent of Total Additional Trips Saturday Midday peak hours.

<sup>e</sup> Total Additional Trips minus Pass-By Trips.

As shown in Table 4, the proposed redevelopment is expected to generate 124 *new* vehicles trips (62 entering and 62 exiting) during the weekday AM peak hour, 80 *new* vehicles trips (41 entering and 39 exiting) during the weekday PM peak hour, and 84 *new* vehicle trips (42 entering and 42 exiting) during the Saturday midday peak hour. It should be noted that the volume of *pass-by* traffic does not reduce the total volume of traffic generated by the development and the *total* trips generated will still be realized as turning movements at the site driveways.

**Trip Distribution**

Having estimated project-generated vehicle trips, the next step is to determine the distribution of project traffic and assign these trips to the local roadway network. The directional distribution of site traffic is dependent on expected travel routes to and from the site and existing travel patterns. Accordingly, approximately 30 percent of the site-generated traffic is expected to travel to and from the north along Lowell Road (NH Route 3A), 45 percent is expected to and from the south

2 Flagstone Drive	10,000 SF	Warehouse	LUC 150 (Warehousing)
225 Lowell Road	9,300 SF	Retail	LUC 820 (Shopping Center)
227 Lowell Road	1 Unit	Residence	LUC 210 (Single-Family Detached Housing)

	<u>LUC 150</u>	<u>LUC 820</u>	<u>LUC 210</u>	<u>TOTAL</u>
Weekday AM				
In	20	5	0	25
<u>Out</u>	<u>7</u>	<u>4</u>	<u>1</u>	<u>12</u>
Total	27	9	1	37
Weekday PM				
In	8	17	1	26
<u>Out</u>	<u>21</u>	<u>18</u>	<u>0</u>	<u>39</u>
Total	29	35	1	65
Saturday MIDDAY				
In	1	22	1	24
<u>Out</u>	<u>0</u>	<u>20</u>	<u>0</u>	<u>20</u>
Total	1	42	1	44

***Institute of Transportation Engineers (ITE)***

**Land Use Code (LUC) 150 - Warehousing**

**General Urban/Suburban**

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area  
Independent Variable (X): 10.000

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 0.12 * (X) + 25.32$$

$$T = 0.12 * 10.000 + 25.32$$

$$T = 26.52$$

T = 27 vehicle trips  
with 77% ( 20 vph) entering and 23% ( 7 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 0.12 * (X) + 27.82$$

$$T = 0.12 * 10.000 + 27.82$$

$$T = 29.02$$

T = 29 vehicle trips  
with 27% ( 8 vph) entering and 73% ( 21 vph) exiting.

**SATURDAY PEAK HOUR OF GENERATOR**

$$T = 0.05 * (X)$$

$$T = 0.05 * 10.000$$

$$T = 0.50$$

T = 1 vehicle trips  
with 64% ( 1 vph) entering and 36% ( 0 vph) exiting.

***Institute of Transportation Engineers (ITE)***  
**Land Use Code (LUC) 820 - Shopping Center**  
**General Urban/Suburban**

Average Vehicle Trips Ends vs: 1000 Sq. Ft. Gross Floor Area  
Independent Variable (X): 9.300

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 0.94 * (X)$$

$$T = 0.94 * 9.300$$

$$T = 8.74$$

$$T = 9 \text{ vehicle trips}$$

with 62% ( 5 vph) entering and 38% ( 4 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 3.81 * (X)$$

$$T = 3.81 * 9.300$$

$$T = 35.43$$

$$T = 35 \text{ vehicle trips}$$

with 48% ( 17 vph) entering and 52% ( 18 vph) exiting.

**SATURDAY PEAK HOUR OF GENERATOR**

$$T = 4.50 * (X)$$

$$T = 4.50 * 9.300$$

$$T = 41.85$$

$$T = 42 \text{ vehicle trips}$$

with 52% ( 22 vph) entering and 48% ( 20 vph) exiting.

**Institute of Transportation Engineers (ITE)**  
**Land Use Code (LUC) 210 - Single-Family Detached Housing**  
**General Urban/Suburban**

Average Vehicle Trips Ends vs: Dwelling Units  
Independent Variable (X): 1

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 0.74 * (X)$   
 $T = 0.74 * 1$   
 $T = 0.74$   
 $T = 1$  vehicle trips  
with 25% ( 0 vph) entering and 75% ( 1 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

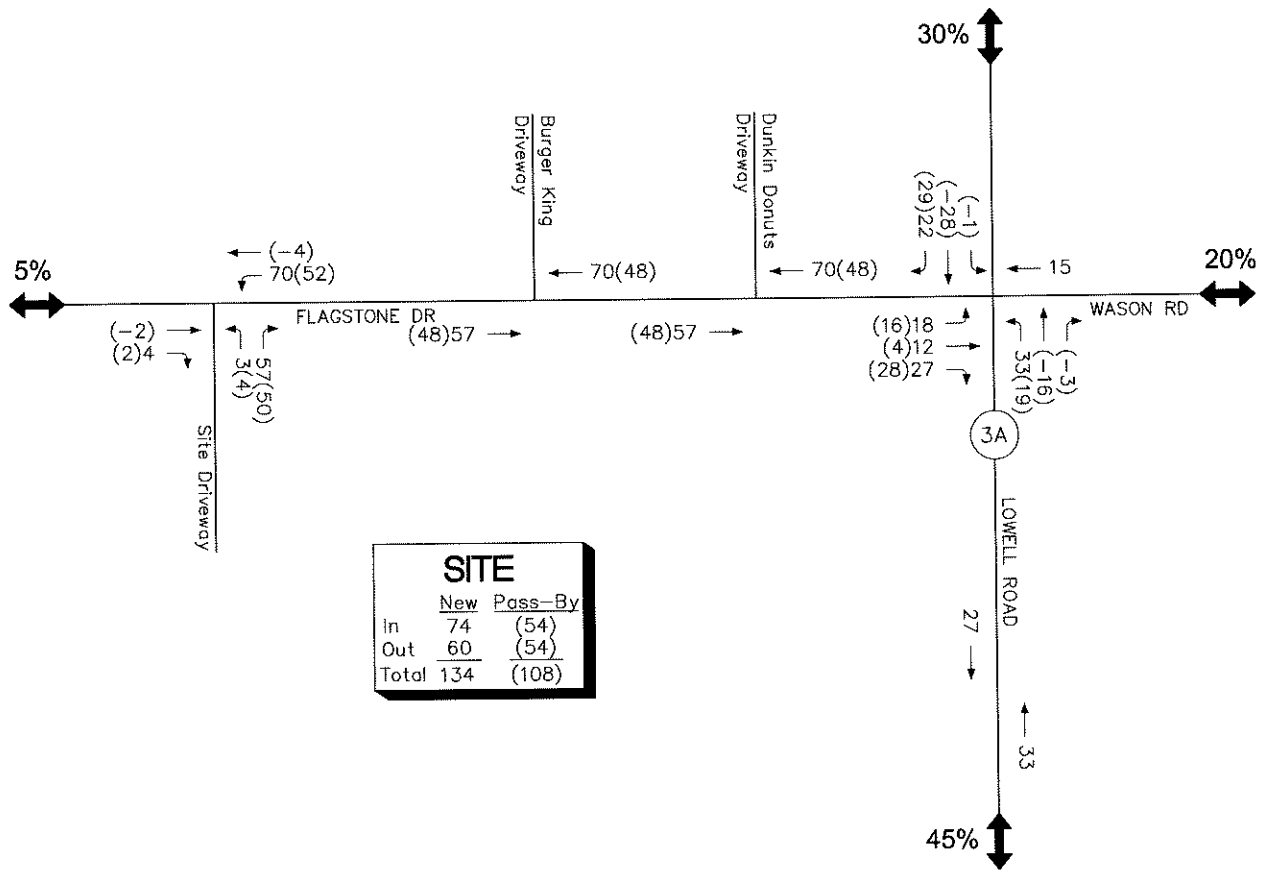
$T = 0.99 * (X)$   
 $T = 0.99 * 1$   
 $T = 0.99$   
 $T = 1$  vehicle trips  
with 63% ( 1 vph) entering and 37% ( 0 vph) exiting.

**SATURDAY PEAK HOUR OF GENERATOR**

$T = 0.93 * (X)$   
 $T = 0.93 * 1$   
 $T = 0.93$   
 $T = 1$  vehicle trips  
with 54% ( 1 vph) entering and 46% ( 0 vph) exiting.

TRIP-GENERATION & SITE ACCESS LETTER

Mixed-Use Development - Hudson, New Hampshire

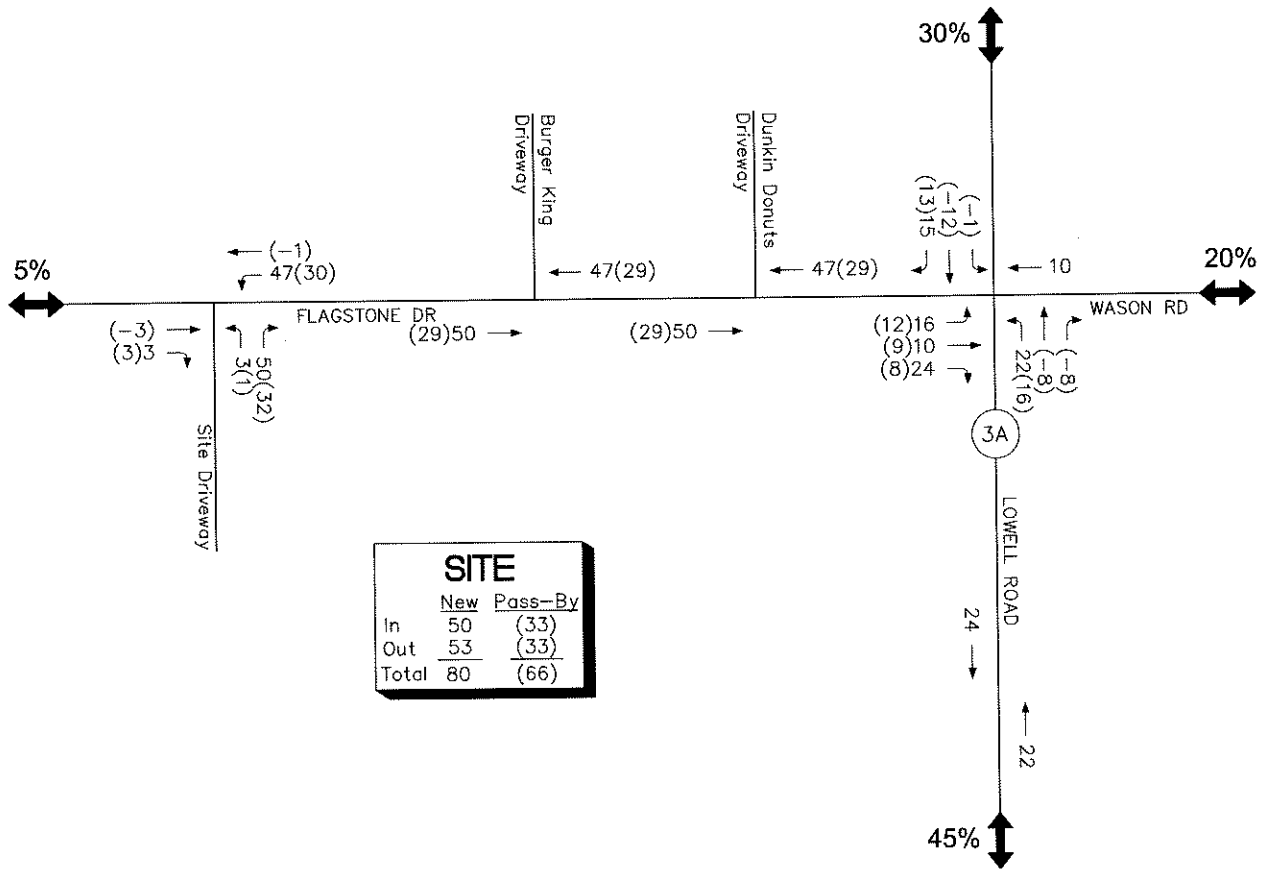


NOT TO SCALE

Figure A2  
Site-Generated  
Weekday AM  
Peak Hour Traffic Volumes

TRIP-GENERATION & SITE ACCESS LETTER

Mixed-Use Development - Hudson, New Hampshire



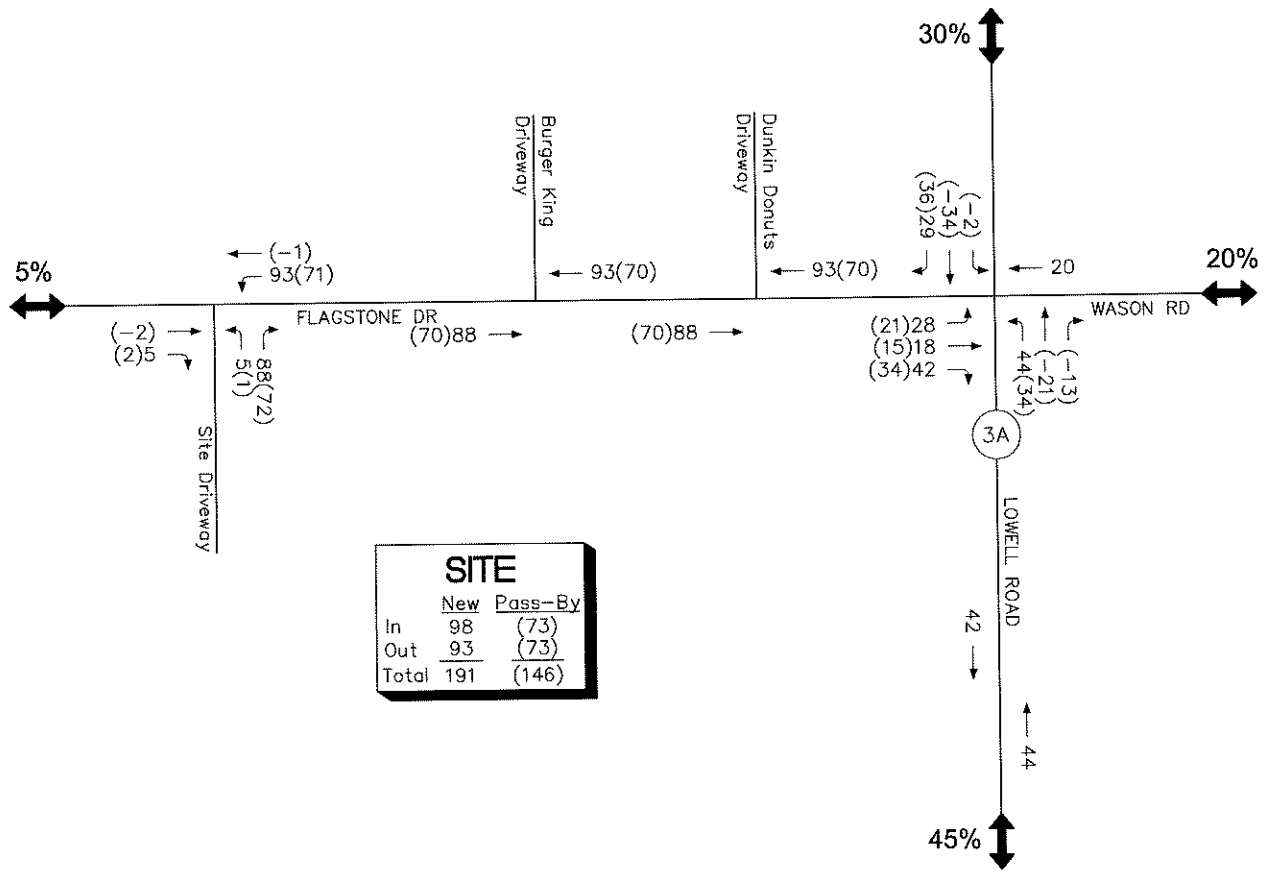
SITE		
	New	Pass-By
In	50	(33)
Out	53	(33)
Total	80	(66)

NOT TO SCALE

Figure A3  
Site-Generated  
Weekday PM  
Peak Hour Traffic Volumes

TRIP-GENERATION & SITE ACCESS LETTER

Mixed-Use Development - Hudson, New Hampshire



NOT TO SCALE

Figure A4  
Site-Generated  
Saturday Midday  
Peak Hour Traffic Volumes





# FUSS & O'NEILL

RECEIVED  
NOV 14 2018  
MHF Design Consultants, Inc.

November 12, 2018

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

Re: Town of Hudson Planning Board Review  
Cumberland Farms Site Plan, 225-227 Lowell Road  
Tax Map 222, Lots 3, 4, 5 & 6; Acct. #1350-923  
Reference No. 20030249.1780

Dear Mr. Groth:

Fuss & O'Neill, Inc. has reviewed the first submission of the materials received on October 29, 2018, related to the above-referenced project. Authorization to proceed was received on October 29, 2018. 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.

We have included a copy of Fuss & O'Neill's evaluation of the checklist for your reference. We note that several items could not be verified by Fuss & O'Neill and require action by the Town.

The project would redevelop a four-lot site into a convenience store and gas station with twelve vehicle fueling positions. Proposed improvements to the site include the demolition of existing buildings within the site, the construction of several driveways, parking areas, drainage improvements, landscaping, and other associated site improvements. The four lots are proposed to be consolidated into one lot. The proposed convenience store will be serviced by Municipal sewer and Municipal water. The project also includes proposed off-site improvements along Flagstone Drive, and coordination with the Town of Hudson's CMAQ Lowell Road Widening project.

The following items are noted:

**1. Site Plan Review Codes and Administrative Requirements and Definitions**

- a. Hudson Regulation (HR) 275-6.I. The scope of this review does not include the

540 No Commercial Street  
Manchester, NH  
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t 603.668.8802  
www.fandoc.com

California  
Connecticut  
Maine  
Massachusetts  
New Hampshire  
Rhode Island  
Vermont



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- adequacy of any fire protection provisions for the site. The applicant should review with the Hudson Fire Department to confirm that proposed measures are acceptable.
- b. HR 275-6.T.(1) The applicant has proposed installation of off-site improvements on a plan from GPI which include minor widening along the north side of Flagstone Drive to accommodate a westbound bypass shoulder, revised crosswalks at the Flagstone Drive/Lowell Road intersection, relocation of a signal mast arm, and new paved sidewalks and concrete tipdowns at the intersection. Improvements along Flagstone Drive will be performed as a part of the construction of this project. Improvements shown at Lowell Road including the relocated mast arm and sidewalks are noted as to be performed by the Town's CMAQ Lowell Road Widening project. We note that a detail for constructing the widened pavement area on Flagstone Drive was not included in the plan set.
  - c. HR 275-8.C.(2)(a) and ZO 334-15.A. The applicant has provided parking calculations for the proposed use. Parking calculations indicate that the proposed site does not meet the minimum number of spaces required. The applicant has requested a waiver from this Regulation. We noted that in the parking calculations and waiver request the applicant has calculated the total number of spaces required as 48. Our calculations have determined this number to be 49 parking spaces.
  - d. HR 275-9.F. and 276-11.1.B.(20). The applicant has noted several existing easements on the plan set that will be eliminated with the proposed lot consolidation. A NHDOT slope easement is also shown on the plans. A copy of this easement was not included in the review package nor was it discussed in the applicant's narrative commentary related to the proposed 14-foot wide easement along Lowell Road. The applicant should provide clarification on the dispensation of this easement.
  - e. HR 276-7.C. The applicant has requested six waivers for the project. All waivers that are granted by the Planning Board should be noted on the plans.
  - f. HR 276-11.1.B.(6). The Owner's signature is not on the plan.
  - g. HR 276-11.1.B.(8). The applicant has provided a locus plan but has not noted the scale (one inch equals 1,000 feet scale is required by the Regulation).
  - h. HR 276-11.1.B.(12). The applicant has proposed a parking area within the building setback. The applicant has requested a waiver from this Regulation.
  - i. HR 276-11.1.B.(15). The applicant has not shown all buildings within 50 feet of the tract on the plans but has included an aerial image on the cover sheet that depicts these buildings.
  - j. HR 276-11.1.B.(16). The applicant has not shown all roadways, driveways, travel or parking areas within 200 feet of the tract, but has included an aerial image on the cover sheet that depicts these features. We note that the aerial image is not to scale (the Regulation requires a scale of not less than one inch equals 100 feet for aerial photography).
  - k. HR 276-11.1.B.(17). We were unable to locate any benchmarks within the plan set.



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- l. HR 276-11.1.B.(20). The applicant has not noted the heights of the existing buildings within the lots to be consolidated, but since all are proposed to be removed we feel this information is not necessary.
- m. HR 276-11.1.B.(22). The applicant has proposed a green area adjacent to the Right-of-Way line that may be less than the minimum required by the Regulation (35 feet for a 50 foot building setback) if the 14 foot wide NHDOT fee interest for the Lowell Road widening project is incorporated. The applicant has requested a waiver from the Regulation for this potential occurrence.

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

- a. HR 193.10.C. The applicant has shown grading on the entrance driveway off of Lowell Road that appears to be sloping both towards the grade break and towards the road. The applicant should review and clarify the intent for grading at this driveway.
- b. HR 193.10.C. The applicant has proposed a driveway slope on the Flagstone Drive driveway that exceeds the maximum allowed by Town of Hudson Construction Standard details.
- c. HR 193.10.C. The applicant has not provided spot grades or profiles for the Flagstone Drive driveway to ensure that drainage is adequate where the driveway meets the roadway.
- d. HR 193.10.C. The applicant has not provided a separate driveway detail for the site, but has proposed a typical onsite pavement section detail that doesn't match the Town of Hudson Standard for depth of subbase material for a driveway. Also, the applicant has noted that the final paving design shall be specified in a Geotechnical Report to be provided by Cumberland Farms, and that Cumberland Farms will approve the final pavement and materials specification prior to construction. This information needs to be provided to the Town for evaluation and documentation.
- e. HR 193.10.E. The applicant has shown sight distances for the proposed Flagstone Drive driveway on the plan set. We note that the west sight line runs directly through proposed landscaping. The applicant should evaluate the impacts of this proposed landscaping to sight lines and address as appropriate.
- f. HR 193.10.G. The applicant has proposed more than one driveway for the subject parcel. The applicant has requested a waiver from this Regulation.
- g. HR 193.10.J. The applicant has not provided a tie-in detail for the connections of the proposed driveways to the existing pavement.

## 3. Traffic

Fuss & O'Neill has reviewed the Traffic Impact and Access study prepared by GPI dated October 2018 in support of this development, and has the following comments:



Mr. Brian Groth  
Fuss & O'Neill Reference No. 20030249.1780  
November 12, 2018  
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- a. The study follows standard State and Town guidelines for such studies. We do note that it is unlikely that the opening year of the site will be in 2018, as assumed. As such, the analysis years should have been 2019 and 2029. However, the analysis of an additional year of background traffic growth at 1% would not likely alter the findings or conclusions of the report regarding the relative impact of the project and the associated mitigation being proposed.
- b. The study included traffic from other known developments. However, the additional 'new' traffic from the gas station development to the north of the site in the No-Build case was added only to the north-south through movements at the Lowell Road/Wason Road intersection and not to any of the other turning movements. It might be expected that some of that traffic would be coming from the side streets as well. Nevertheless, the magnitude of this re-distribution would likely have minimal effect on the overall analysis.
- c. This signalized intersection is and will continue to be highly congested during peak hours with significant queuing on most approaches, notably on Flagstone Drive, where the average and peak queues at the signal affect the operations of both the Dunkin Donuts and Burger King driveways. The unsignalized capacity analysis results for these two driveways assume that they are operating independently and are not affected by the proximity of the signal and the resulting blockage by queues on Flagstone Drive. As such, the actual operation of these driveways is likely at a lower Level of Service than reflected in the report.
- d. The project's proposed mitigation includes signal timing adjustments and the reservation of sufficient right-of-way along their Lowell Road frontage for the Town to construct a third southbound lane through the intersection as part of their CMAQ grant, which the analyses show offsets the projected traffic impact of the project. While this will be beneficial to the corridor, the intersection is still projected to be very close to capacity during weekday peak hours without additional lanes beyond the one being considered. Queuing on Flagstone Drive will likely continue to block the Dunkin Donut and Burger King driveways and spill back towards the site drive, which is only 180 feet from the stop bar.
- e. Since the site also has frontage along Flagstone Drive, the Town should consider acquiring a similar reservation of right-of-way along Flagstone Drive for future roadway improvements, such as a second right turn lane exiting Flagstone Drive that would accommodate the heaviest turning movement on this approach. At a minimum, no permanent structures, utilities, signs or landscaping should be placed within this area so that if/when such an improvement is made, it will not adversely affect the site layout.



Mr. Brian Groth  
Fuss & O'Neill Reference No. 20030249.1780  
November 12, 2018  
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#### 4. Utility Design/Conflicts

- a. HR 275-9.E. and 276-13. The applicant has not shown a curb stop or service valve on the proposed water service line within the Town Right-of-Way on Flagstone Drive.
- b. HR 275-9.E. and 276-13. The applicant has shown the irrigation well supply line connecting to the water service line from Flagstone Drive on the Utility Plan. The applicant should clarify if the intent is for these to be two separate lines and revise the plan accordingly.
- c. HR 275-9.E. and 276-13. The applicant has not shown any sizing information or installation details for the proposed irrigation well and supply line piping.
- d. HR 275-9.E. and 276-13. The applicant has proposed the water and gas services to be closer than five feet where they enter the site from Flagstone Drive.
- e. HR 275-9.E. and 276-13. The applicant has not shown a proposed fire service connection to the subject building. Fuss & O'Neill did not review this project for fire protection adequacy or code conformance.
- f. HR 275-9.E. and 276-13. The applicant has shown sewer pipe grading at SMH-1 with less than the minimum cover required by Town of Hudson standards. The applicant should review and address.
- g. HR 275-9.E. and 276-13. The applicant has not provided any sizing calculations for the proposed grease trap.

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

- a. HR 289-20.C.(1). We note an increase in runoff volume in the 2-Year Storm for Design Points #2 and #3, as well as within the 10-Year Storm for Design Points #1, #2, and #3. The applicant should comment on this volumetric increase in relation to downstream abutters. We also note the NHDES AoT requirement of Env-Wq 1507.05, and 2 year runoff volume analysis.
- b. HR 290-4.B. The cumulative lot area to be consolidated is nearly 118,000 sf. It appears that the majority of the lot is proposed to be disturbed by construction activities, as well as a portion of Sagamore Park Road which is proposed to be disturbed to connect to the NHDOT drain line. The drainage report notes that the total area of disturbance is 110,000 square feet and the applicant has noted that an NHDES AoT permit is required.
- c. HR 290-4.B.(10). At Design Points #2 and #3 Post-development rates exceed Pre-development runoff rates in the 2-year and 10-year storm events. The applicant should review and address this proposed increase.
- d. HR 290-5.B. There are discrepancies between the Concrete Outlet Control Structure (OCS#1) on detail sheet 16 with the Stormwater Management Report. The applicant should review and address as needed.



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- i. The number of 6" orifices (2) in the Stormwater Management Report does not match the Orifice "A" on the plans (1).
- ii. The plans call for a 24" beehive grate, while the Stormwater Management Report calls for 24"x 24" horizontal grate.
- e. HR 290-5.H. The applicant's Drainage Report calculations do not account for frozen ground conditions. The applicant should provide additional information/insight, or request a waiver from this requirement.
- f. HR 290-5.L.(1). The applicant should keep the Town informed of all communication with NHDES in relation to the Alteration of Terrain Permit discussions to ensure NHDES comments do not alter drainage design/calculations.
- g. HR 290-5.L.10.M. The Stormwater Management Report includes the connection of a private site to an NHDOT Drainage Line (DMH 6). The applicant should review this connection with both the Town and NHDOT to ensure the proposed connection is permitted.
- h. The Construction Sequence Notes on page 9 of the plan set do not coordinate with the Construction Sequence on page 10 of the Stormwater Management Report. The applicant should review and coordinate these sequences.
- i. The outlet from the proposed Bioretention Basin (OCS-1) is shown to cross under the existing 8" clay sewer line with what appears to be minimal separation between the two utilities. The applicant has not provided a sewer/storm drain crossing detail. The applicant should review this crossing with the Town and discuss the need to upgrade this portion of sewer pipe from clay to PVC.
- j. On Sheet 4 of 17, Map 222 Lot 3 has the "proposed" and "existing" areas reversed. The applicant should review and correct.

## 6. Zoning (ZO 334)

- a. ZO 334-20. The subject site is located in the Industrial (I) zoning district and the proposed uses are permitted within this district.
- b. ZO 334-33. The applicant has not shown any wetlands within the subject site.
- c. ZO 334-60.J. The applicant has proposed a street number color on the proposed freestanding sign detail that differs from the Regulation (green proposed/black or white required).
- d. ZO 334-83. The applicant should note on the plans that the subject parcel does not fall within a special flood hazard area.

## 7. Erosion Control/Wetland Impacts

- a. HR 290-5.K.(16). The applicant has not indicated the proposed method of stump disposal.



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- b. HR 290-5.K.(20). The applicant should review the need for erosion controls outside the limits of construction of the drain line connecting to DMH #6.
  - c. HR 290-5.K.(22). The applicant should review the proposed snow storage areas to ensure they are coordinated with the proposed landscaping. We note that there are several trees proposed for the snow storage area at the south end of the parking lot east of the building.
  - d. The Town should reserve the right to require additional erosion control measures.
- 8. Landscaping (HR 275-8.C.(7) & 276-11.1.B.(20)) and Lighting (HR 276-11.1.B.(14))**
- a. HR 275-8.C.(7)(a). The applicant has requested a waiver from the Regulation requiring a minimum of 10% landscaped areas in the interior of a parking lot.
  - b. HR 275-8.C.(7)(c). The applicant has requested a waiver from the Regulation requiring a minimum of one shade tree per 1,600 square feet of paved area/one shade tree per every five parking spaces.
  - c. HR 275-8.C.(7)(d). The applicant has requested a waiver from the Regulation requiring a minimum of one shrub per 200 square feet of paved area/1.6 shrubs per parking space.
  - d. HR 276-11.1.B.(14). The applicant has noted that the hours of operation for the site are 24 hours per day. Hours of operation for the site lighting should be noted, along with the means for operation (timer, photocell, etc.).
- 9. State and Local Permits (HR 275-9.G.)**
- a. HR 275-9.G. No copies of applicable approvals or permits were provided in the package received for review.
  - b. HR 275-9.G. The applicant has noted within the drainage report that a New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain Permit is required. The applicant should forward all relevant AOT permit documentation to the Town for their records.
  - c. HR 275-9.G. The applicant has not noted whether an NHDES Sewer Connection Permit is required for this project.
  - d. HR 275-9.G. The applicant has not noted the need to obtain driveway permits from the Town and the NHDOT for this project.
  - e. HR 275-9.G. The applicant has noted that a demolition permit is required from the Town.
  - f. ZO 334-58. The applicant has noted that a sign permit will be obtained prior to installation.
  - g. Env-Or 400. Evidence of NHDES approval of the proposed underground fuel storage facility was not included in Fuss and O'Neill's review package.
  - h. Additional local permitting may be required.



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**10. Other**

- a. Fuel storage and mechanical details were not provided. Compliance with local, state and federal codes and requirements for underground fuel storage, fuel dispensers, and fuel island fire protection systems was not included in the scope of this review.
- b. The applicant has not included a detail for the proposed bituminous concrete sidewalk in the plans.
- c. The applicant has not shown the resetting of existing granite curbing on the Roadway Improvements Plan for the widened area of Flagstone Drive.

Please feel free to call if you have any questions.

Very truly yours,

A handwritten signature in black ink, appearing to read 'S. Reichert'.

Steven W. Reichert, PE

A handwritten signature in black ink, appearing to read 'Paul Konieczka'.

Paul Konieczka, AICP

SWR:PK:mjt

Enclosure

cc: Town of Hudson Engineering Division – File  
MHF Design Consultants  
44 Stiles Road, Suite One  
Salem, NH 03079  
(603) 893-0720



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

**MINUTES/DECISIONS OF THE PLANNING BOARD  
MEETING DATE: OCTOBER 23, 2019**

In attendance = X	Alternate Seated = S	Partial Attendance = P	Excused Absence = E
Tim Malley Chair <input checked="" type="checkbox"/>	Jordan Ulery Vice-Chair <input checked="" type="checkbox"/>	William Collins Secretary <input checked="" type="checkbox"/>	Charlie Brackett Member <input checked="" type="checkbox"/>
Dillon Dumont Member <input type="checkbox"/>	Ed Van der Veen Member <input checked="" type="checkbox"/>	Elliott Veloso Alternate <input type="checkbox"/>	Roger Coutu 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 7:03 P.M.
- II. PLEDGE OF ALLEGIANCE
- III. ROLL CALL
- IV. MINUTES OF PREVIOUS MEETING(S)

- 9 October 19 Meeting Minutes – Decisions

Mr. Ulery moved to accept the 9 October 19 Meeting Minutes (as written/amended).

Motion seconded by Mr. Coutu. Motion carried 5/0/1 (Brackett abstained)

V. CORRESPONDENCE

- A. Request to Release Tax Map Update Funds for 2020 Aerial Imagery Flyover by Elvis Dhima, Town Engineer, dated October 15, 2019.

Mr. Van der Veen moved to recommend to the Board of Selectman the release of \$13,500.00 from Tax Map Update Fee Account 1312-505 for the 2020 aerial flyover in accordance with the written request for same from the Town Engineer (please see attached memo from Town Engineer, Elvis Dhima, dated 15 OCT 2019).

Motion seconded by Mr. Brackett. All in favor – motion carried.

- B. Request to Release Recreation Impact Fees by Steve Malizia, Town Administrator, dated October 23, 2019.

Mr. Collins moved to approve the release of \$6,000.00 from the Recreation Impact Fee Account 2000-2050-000-182 for the Engineering Analysis of Liberty Field by Wilcox and Barton, as recommended by the Board of Selectman.

Motion seconded by Mr. Brackett. All in favor – motion carried.

VI. NEW BUSINESS

- A. Syntech Microwave – Accessory Garage                      8 Rebel Road  
SP# 08-19    Map 101/Lot 021

Purpose of Plan: To replace an existing concrete pad with a 2,000 square foot accessory-use storage garage. Application Acceptance & Hearing.

Mr. Collins moved to accept the site plan application for Syntech Microwave, 8 Rebel Road, Map 101/Lot 021.

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

**WAIVERS GRANTED:**

1. §275-11.1.B.14 – Exterior Lighting

Mr. Collins moved to grant the requested waiver of §275-11.1.B.14 – Exterior Lighting – based on the testimony of the Applicant’s representative, the Board’s discussion, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion seconded by Mr. Ulery. All in favor – motion carried.

2. §275-8.C.6 – Loading Spaces

Mr. Collins moved to grant the requested waiver of §275-8.C.6 – Loading Spaces – based on the testimony of the Applicant’s representative, the Board’s discussion, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

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

3. §276-11.1.B.16 – Features within 200 feet

Mr. Collins moved to grant the requested waiver of §276-11.1.B.16 – Features within 200 feet - based on the testimony of the Applicant’s representative, the Board’s discussion, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion seconded by Mr. Ulery. All in favor – motion carried.

Mr. Ulery moved to approve the site plan application for Site Plan; prepared by The Dubai Group, Inc., 84 Range Rd., Windham, NH 03087; prepared for Syntech Microwave Incorporated, 8 Rebel Rd., Hudson, NH 03051; consisting of 5 sheets, notes 1-12 on sheet 3; dated September 17, 2019; 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. Prior to the issuance of a final certificate of occupancy, a L.L.S. certified “As-Built” site plan shall be provided to the Town of Hudson Land Use Division, confirming that the site conforms to the Planning Board approved site plan.
3. This plan is subject to final engineering review.
4. Construction activities involving this plan shall be limited to the hours between 7:00 A.M. and 7:00 P.M., Monday through Saturday. No exterior construction activities shall occur on Sunday.
5. Active and substantial development will have occurred when:
  - a) The existing concrete pad has been removed.
6. All existing stipulations shall remain in effect.

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

B. Flagstone Crossing Site Plan SP# 09-19	Lowell Rd. / Flagstone Dr. Map 222/Lots 3, 4, 5, & 6
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Purpose of Plan: To create a multi-use commercial development consisting of a 2,200+/- square foot restaurant with drive-thru, a 5,000+/- square foot bank with drive-thru, and a 10,700+/- square foot of retail space. Application Acceptance & Hearing.

Mr. Ulery moved to accept the site plan application for Flagstone Crossing, 225 & 227 Lowell Rd., Map 222/Lots 3, 4, 5, & 6.

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

Mr. Collins moved to conduct a site walk of the project site on Saturday, October 26, 2019, at 12:45 P.M.

Motion seconded by Mr. Ulery. All in favor – motion carried.

**WAIVER REQUESTS:**

1. §275-8(4) – Parking Space Dimensions

Mr. Collins moved to grant the requested waiver §275-8(4) – Parking Space Dimensions – on the testimony of the Applicant’s representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion seconded by Mr. Ulery. All in favor – motion carried.

2. §275-8(6) – Off-Street Loading Spaces

Mr. Collins moved to grant the requested waiver §275-8(6) – Off-Street Loading Spaces - on the testimony of the Applicant’s representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion seconded by Mr. Ulery. Motion carried 5/1/0 (Van der Veen).

3. §275-11.1(22) – Landscape Buffers

Mr. Collins moved to grant the requested waiver §275-11.1(22) – Landscape Buffers - on the testimony of the Applicant’s representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion seconded by Mr. Ulery. All in favor – motion carried.

4. §275-8(7) – Landscaping Requirements

Mr. Collins moved to grant the requested waiver §275-8(7) – Landscaping Requirements - on the testimony of the Applicant’s representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

Motion seconded by Mr. Ulery. All in favor – motion carried.

Mr. Collins moved to defer the public hearing for Flagstone Crossing, 225 & 227 Lowell Rd., Map 222/Lots 3, 4, 5, & 6, date certain, November 6, 2019.

VII. OLD BUSINESS

- |  |                                   |
|--|-----------------------------------|
| A. 292 Derry Road Site Plan<br>SP# 04-19 | 292 Derry Road<br>Map 109/Lot 007 |
|--|-----------------------------------|

Purpose of Plan: to add a 8,250 sf warehouse with an office to the existing 1,800 sf professional offices, 88 student daycare, and 10 student karate studio. Application Acceptance & Hearing.

Mr. Coutu moved to defer the public hearing for 292 & 294 Derry Road, Map 109/Lot 007, per the applicant’s request, date certain, November 6, 2019.

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

VIII. ADJOURNMENT

Motion to adjourn by Mr. Ulery. Seconded by Mr. Coutu. All in favor – motion carried.

Meeting adjourned at 9:04 p.m.

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William Collins, Secretary