April 19, 2022

Mr. Peter Stith, AICP
Principal Planner
Planning Department
City of Portsmouth
One Junkins Avenue
Portsmouth, NH 03801

RE: Conditional Use Permit approval and Site Plan Review approval for property located at 1400 Lafayette Road, and 951 Peverly Hill Road (PU# LU-20-12)

Subject: Approval Expiration and Extension Request #2

Dear Mr. Stith:

The above referenced project was originally approved by the Planning Board on April 30, 2020 and a 1-year extension was granted by the Planning Board on April 15, 2021. On behalf of the applicant, 4 Amigos, LLC, we hereby request an additional one (1) year extension of said approval in accordance with Section 2.14 of the Site Review Regulations. In accordance with the City requirements as part of the 2nd extension request, we are submitting to TAC and the Planning Board for the upcoming May meetings.

The applicant completed the Conditions (precedent) of Approval in November 2021 and has since recorded the approved Site Plan mylar at the registry of deeds on March 17, 2022. Due to the economic impact associated with the COVID-19 pandemic, as well as the rising construction costs, the applicant has decided to reduce the scale of the proposed development.

The minor changes proposed to the Site Plan consist of removing the two 4-story garden style apartment buildings and replacing those with 3-story townhouse units, resulting in a reduction of total residential units from 53 to 32. Additionally, the proposed parking will be reduced from 106 to 95 spaces resulting in a 2400-sf increase in open space with additional community space. There are no other changes associated with the remaining portions of the site plan and conditions associated with the original site plan approval.

It is our opinion that there is no material change that has taken place at the project site since the original approval which would affect this extension request. Please contact our office if you have any questions or need any additional information in order for the Planning Board to act on this request.

Thank you for your consideration.

Very Truly Yours,
GREENMAN-PEDERSEN, INC.

Chris Tymula, PE
Senior Project Manager

cc: Mr. Rick Green - 4 Amigos, LLC
CR MAX-0458219.00

PROPOSED SUBDIVISION AND AMENDED SITE DEVELOPMENT PLANS

for

TAX MAP 252 LOTS 4, 5 & 9

951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801

Prepared for:

4 AMIGOS, LLC

321D LAFAYETTE ROAD
HAMPTON, NEW HAMPSHIRE 03842

ENGINEER:

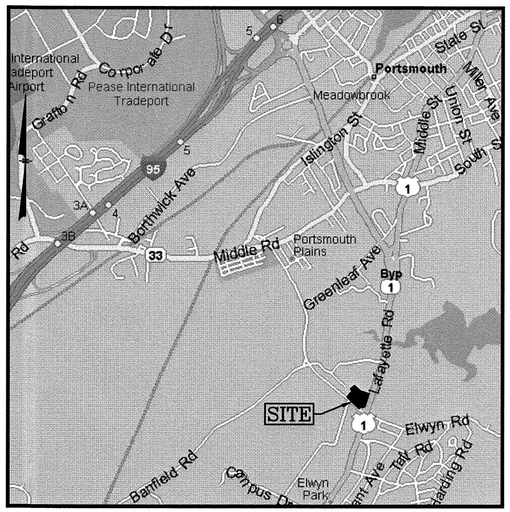
GREENMAN–PEDERSEN, INC. (GPI)
CHRIS TYMULA, PE
44 STILES ROAD, SUITE ONE
SALEM, NH 03079
(603) 893–0720

SURVEYOR:

GREENMAN–PEDERSEN, INC. (GPI)
DAVID R. JORDAN, PE, LLS
44 STILES ROAD, SUITE ONE
SALEM, NH 03079
(603) 893–0720

ARCHITECT:

MICHAEL J KEANE ARCHITECTS PLLC
MICAHEL KEANE
101 KENT PLACE
NEWMARKET, NH 03857
(603) 292–1400



LOCATION MAP
NOT TO SCALE

INDEX TO DRAWINGS

NO.	DESCRIPTION	BY	DATE
5	REVISE ALL SHEETS	CMT	4/15/22
4	REV SHEETS 1, 3–9, P&P, ADD RECORD. SP	CMT	10/18/21
3	REV SHEETS 2–10, 14–15, P&P, ADD SHEET 14A	CMT	8/6/20
2	REV SHEETS 3–11, P&P – A–2.C	CMT	3/9/20
1	REV SHEETS 3–9, P&P, A–1.C	CMT	2/20/20

REVISIONS

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON _____ DATE _____

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYMULA No.17078 – LICENSED PROFESSIONAL ENGINEER – 4/19/22

TITLE SHEET

ASSESSORS MAP 252 – LOTS 4, 5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: NONE	SEPTEMBER 20, 2021		DRAWING NO. 4582CVR.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	1 OF 15

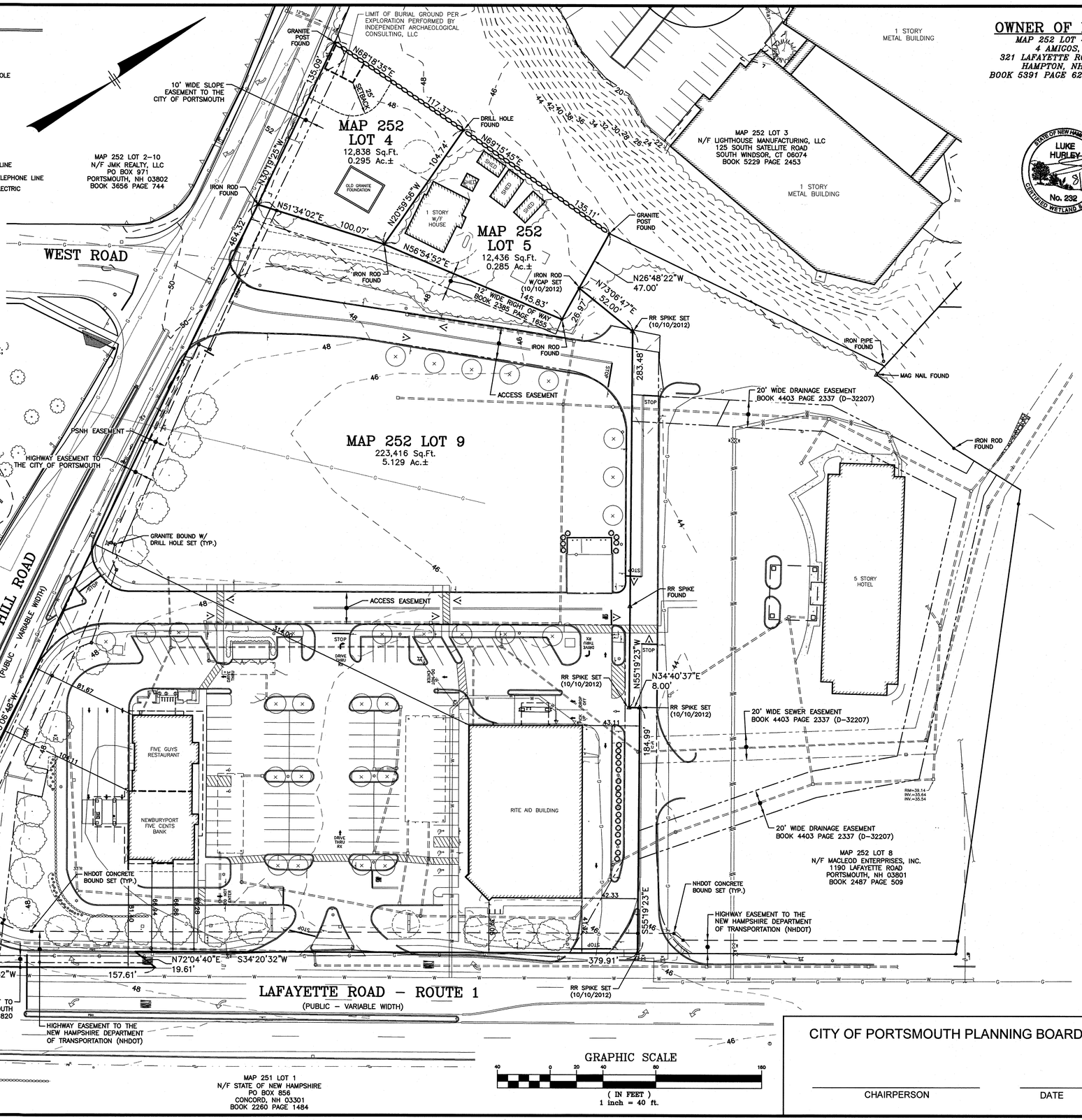
F:\Projects\CAD\458219\4582CVR.dwg COVER 4/19/22 1:26pm sbontanti

LEGEND

O	IRON PIPE OR ROD	UP	UTILITY POLE
⊡	CONCRETE OR GRANITE BOUND	(D)	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	(S)	SEWER MANHOLE
⊙	DRILL HOLE FOUND	(T)	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	□	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	w	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
	OVERHEAD SERVICE WIRES		GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	g	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	g	ABANDONED GAS LINE
BWL	BROKEN WHITE LINE	T	UNDERGROUND TELEPHONE LINE
	SIGN	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
			TREELINE

PLAN REFERENCES:

1) SITE DEVELOPMENT PLANS TAX MAP 252 LOTS 7 & 9, 1390 & 1400 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR 4 AMIGOS, LLC; SCALE: 1"=30'; DATE: DECEMBER 19, 2011 (revised to 8/5/13) BY THIS OFFICE.
2) TRANSPORTATION IMPROVEMENT PROJECT, LAFAYETTE ROAD (ROUTE 1) AT PEVERLY HILL ROAD AND ELWYN ROAD ON THE CITY OF PORTSMOUTH, ROCKINGHAM COUNTY IN THE STATE OF NEW HAMPSHIRE, PROPOSED COMMERCIAL OFF-SITE IMPROVEMENTS PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR 4 AMIGOS, LLC HAMPTON, NEW HAMPSHIRE; SCALE: 1"=20'; DATE: NOVEMBER 2012 BY VANASSE & ASSOCIATES, INC.
3) ALTA/ACSM LAND TITLE SURVEY OF TAX MAP 252 LOTS 3 & 8; SCALE: 1" = 40'; DATE: JUNE 25, 2004 (rev. 8/12/04); PREPARED BY DOUCET SURVEY, INC..
4) ALTA/ACSM LAND TITLE SURVEY OF TAX MAP 252 LOTS 4 & 5; SCALE: 1" = 40'; DATE: NOV. 18, 2004 (rev. 11/22/04); PREPARED BY DOUCET SURVEY, INC.
5) ROCKINGHAM COUNTY REGISTRY OF DEEDS (R.C.R.D.) PLAN #D-37860.
6) R.C.R.D. PLAN #D-37533.
7) R.C.R.D. PLAN #D-37532.
8) R.C.R.D. PLAN #D-34531.
9) R.C.R.D. PLAN #D-33990.
10) R.C.R.D. PLAN #D-32208.
11) R.C.R.D. PLAN #D-32207.
12) R.C.R.D. PLAN #D-32206.
13) R.C.R.D. PLAN #D-28308.
14) R.C.R.D. PLAN #D-27945.
15) R.C.R.D. PLAN #D-12125.
16) R.C.R.D. PLAN #D-11370.
17) R.C.R.D. PLAN #D-8831.
18) R.C.R.D. PLAN #D-4195.
19) R.C.R.D. PLAN #341.
20) R.C.R.D. PLAN #01637.
21) R.C.R.D. PLAN #01332
22) R.C.R.D. BOOK 1165 PAGE 379.

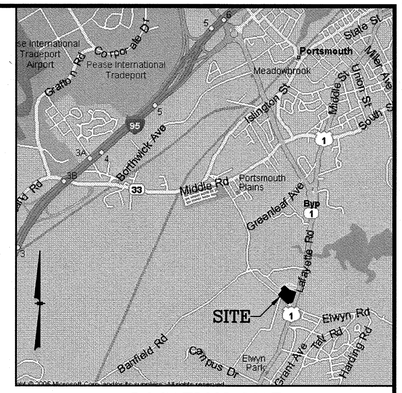


GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

OWNER OF RECORD:

MAP 252 LOT 4, 5 & 9
4 AMIGOS, LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842
BOOK 5391 PAGE 625 & PAGE 638

STATE OF NEW HAMPSHIRE
LUKE HURLEY
No. 232
CERTIFIED WETLAND SCIENTIST



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) ZONE: GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2)
   MIN. LOT SIZE: 10,000 Sq.Ft.
   MIN. LOT FRONTAGE: 50 Ft.
   SETBACKS:
   FRONT: 80 Ft. FROM CL LAFAYETTE ROAD; 30 Ft. FROM PEVERLY HILL R.O.W.
   SIDE: 30 Ft.
   REAR: 50 Ft.
   REFER TO THE CITY OF PORTSMOUTH ZONING ORDINANCE FOR VERIFICATION, ADDITIONAL RESTRICTIONS AND PERMITTED USES.
2) THIS PLAN IS THE RESULT OF ON-THE-GROUND FIELD SURVEY PERFORMED BY THIS OFFICE BETWEEN 2008 AND 2019.
3) BEARINGS SHOWN HEREON ARE BASED ON PLAN REFERENCE #3.
4) ELEVATIONS SHOWN HEREON ARE BASED ON NAVD88. CURB ELEVATIONS SHOWN ARE AT THE "TOE" OF CURB. CURBS ARE 0.50'± HIGH.
5) LOCATION OF UNDERGROUND UTILITIES IS APPROXIMATE ONLY. ADDITIONAL UNDERGROUND UTILITIES OTHER THAN THOSE SHOWN MAY BE ENCOUNTERED.
6) THE SURVEY TRACT IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA (100 YEAR FLOOD) PER FLOOD INSURANCE RATE MAP NUMBER 33015C0270E, WITH AN EFFECTIVE DATE OF MAY 17, 2005.
7) NO WETLANDS WERE FOUND ONSITE.

CERTIFICATION:

I CERTIFY THAT THIS SURVEY AND PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT THIS PLAN IS THE RESULT OF AN ACTUAL SURVEY PERFORMED ON THE GROUND AND HAS AN ERROR OF CLOSURE OF NOT MORE THAN ONE PART IN TEN THOUSAND.

STATE OF NEW HAMPSHIRE
No. 838
DAVID R. JORDAN
LICENSED LAND SURVEYOR

4/19/22

DAVID R. JORDAN, LLS 838 — DATE

NO.	DESCRIPTION	BY	DATE
	REVISIONS		
3	UPDATE ADDRESS	CMT	4/15/22
2	ADDED WETLAND STAMP PER AoT COMMENTS	NID	8/6/20
1	ADDED NOTE 7	NID	4/1/20

EXISTING CONDITIONS PLAN

ASSESSORS MAP 252 - LOTS 4, 5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NEW HAMPSHIRE 03842

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON — DATE

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

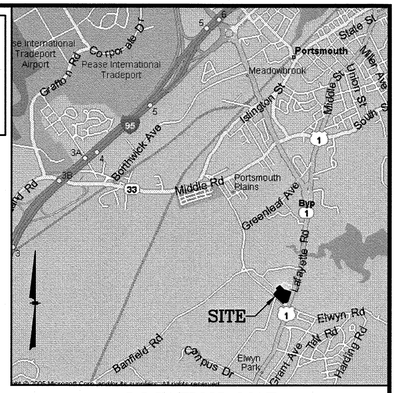
SCALE: 1"=40'	DATE: JANUARY 20, 2020	DRAWING NO. 4582TWS.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
JJW/JAC	JAC	458219	2 OF 15

F:\Projects\CAD\458219\4582TWS.dwg ECP 4/19/22 11:50am sbonfanti

LEGEND

○	IRON PIN FOUND	UP	UTILITY POLE
⊡	CONCRETE BOUND FOUND	DMH	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	SMH	SEWER MANHOLE
⊙	DRILL HOLE FOUND	TMH	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	CB	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING	WV	WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB	FH	FIRE HYDRANT
	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
TBR	TO BE REMOVED		TREELINE
××××××	TO BE REMOVED		

SEE EROSION & SEDIMENT CONTROL PLAN FOR CONSTRUCTION SEQUENCE AND TEMPORARY EROSION CONTROL MEASURES PRIOR TO BEGINNING DEMOLITION ACTIVITIES.



LOCATION MAP

(NOT TO SCALE)

NOTES:

1) ALL EXISTING UTILITY DISCONNECTIONS MUST BE COORDINATED WITH RESPECTIVE UTILITY COMPANIES PRIOR TO BEGINNING DEMOLITION ACTIVITIES.

2) ALL DEMOLITION ACTIVITIES ARE TO BE PERFORMED IN STRICT ADHERENCE TO ALL FEDERAL, STATE AND LOCAL REGULATIONS. CONTRACTOR TO INSTALL EROSION CONTROL DEVICES PRIOR TO BEGINNING DEMOLITION ACTIVITIES.

3) CONDUCT ALL DEMOLITION OPERATIONS IN A MANNER THAT WILL PREVENT INJURY, DAMAGE TO STRUCTURES, ADJACENT BUILDINGS AND ALL PERSONS.

4) REFRAIN FROM USING EXPLOSIVES WITHOUT PRIOR WRITTEN CONSENT OF THE DEVELOPER AND APPLICABLE GOVERNMENTAL AUTHORITIES.

5) CONDUCT DEMOLITION SERVICES IN SUCH A MANNER TO INSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS AND OTHER ADJACENT FACILITIES. DO NOT CLOSE OR OBSTRUCT STREETS, WALKS OR OTHER OCCUPIED FACILITIES WITHOUT PRIOR WRITTEN PERMISSION OF THE DEVELOPER AND APPLICABLE GOVERNMENTAL AUTHORITIES. PROVIDE ALTERNATIVE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS IF REQUIRED BY APPLICABLE GOVERNMENTAL REGULATIONS.

6) USE WATERING, TEMPORARY ENCLOSURES AND OTHER SUITABLE METHODS, AS NECESSARY TO LIMIT THE AMOUNT OF DUST AND DIRT RISING AND SCATTERING IN THE AIR. CLEAN ADJACENT STRUCTURE AND IMPROVEMENTS OF ALL DUST AND DEBRIS CAUSED BY THE DEMOLITION OPERATIONS. RETURN ALL ADJACENT AREAS TO THE CONDITIONS EXISTING PRIOR TO THE START OF WORK.

7) ACCOMPLISH AND PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE UNAUTHORIZED ENTRY OF PERSONS AT ANY TIME.

8) COMPLETELY FILL BELOW GRADE AREAS AND VOIDS RESULTING FROM THE DEMOLITION OF STRUCTURES AND FOUNDATIONS WITH SOIL MATERIALS CONSISTING OF STONE, GRAVEL AND SAND, FREE FROM DEBRIS, TRASH, FROZEN MATERIALS, ROOTS AND OTHER ORGANIC MATTER. STONES USED WILL NOT BE LARGER THAT 6 INCHES IN DIMENSION. MATERIAL FROM DEMOLITION MAY NOT BE USED AS FILL. PRIOR TO PLACEMENT OF FILL MATERIALS, UNDERTAKE ALL NECESSARY ACTION IN ORDER TO INSURE THAT AREAS TO BE FILLED ARE FREE OF STANDING WATER, FROZEN MATERIAL, TRASH, DEBRIS. PLACE FILL MATERIALS LAYERS NOT EXCEEDING 6 INCHES IN LOOSE DEPTH AND COMPACT EACH LAYER AT PLACEMENT TO 95% OPTIMUM DENSITY, GRADE SURFACE TO MEET ADJACENT CONTOURS AND TO PROVIDE SURFACE DRAINAGE.

9) REMOVE FROM THE DESIGNATED SITE, AT THE EARLIEST POSSIBLE TIME, ALL DEBRIS RUBBISH, SALVAGEABLE ITEMS, HAZARDOUS AND COMBUSTIBLE SERVICES. REMOVED MATERIALS MAY NOT BE STORED, SOLD OR BURNED ON SITE. REMOVAL OF HAZARDOUS AND COMBUSTIBLE MATERIALS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE PROCEDURES AS AUTHORIZED BY THE FIRE DEPARTMENT OR OTHER APPROPRIATE REGULATORY AGENCIES AND DEPARTMENTS.

10) PROTECT EXISTING DRAINAGE SYSTEM(S) AS NECESSARY TO PREVENT SEDIMENT FROM ENTERING DURING CONSTRUCTION. SEE EROSION & SEDIMENT CONTROL PLAN.

11) ALL WORK WITHIN ROADWAY RIGHT-OF-WAYS TO CONFORM TO CITY AND NHDOT STANDARDS.

12) THE LIMITS OF WORK SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO THE START OF CONSTRUCTION OR SITE CLEARING.

13) IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY "DIG SAFE" (1-888-344-7233) 72 HOURS PRIOR TO ANY EXCAVATION ON THIS SITE. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER DEPARTMENT TO MARK OUT THEIR UTILITIES.

14) NOTES ON THIS PLAN THAT READ "TBR" REPRESENT FEATURES TO BE REMOVED. ANY FEATURES NOT LABELED "TBR" OR "TO BE REMOVED" SHALL BE CONSIDERED EXISTING TO REMAIN.

15) SEE LANDSCAPE PLAN FOR LIMITS OF CLEARING AND GRUBBING. AFTER CLEARING, STRIP AND STOCKPILE TOP SOIL PER LANDSCAPE PLAN, IF APPLICABLE.

16) THE SITE CONTRACTOR SHALL TAKE NOTICE THAT THIS SITE MIGHT CONTAIN AN UNMARKED BURIAL GROUND WHICH IS REGISTERED WITH THE STATE AS AN ARCHAEOLOGICAL SITE KNOWN AS THE "WILLEY/LIGHTFORD" BURIAL GROUND. ACCORDING TO RECORDS FROM THE 1800'S, THIS BURIAL PLOT WAS 10'x10' LOCATED IN THE SOUTHWEST CORNER OF THE LOT NEAR PEVERLY HILL ROAD. IF THE CONTRACTOR ENCOUNTERS ANY REMAINS, HE SHALL CEASE OPERATIONS AND NOTIFY THE CITY AND THE NH DIVISION OF HISTORICAL RESOURCES (603-271-2813).

17) THE SITE CONTRACTOR SHALL COORDINATE DEMOLITION ACTIVITIES WITH THE COMFORT INN TO MINIMIZE DISTURBANCE TO THEIR OPERATION.

NO.	DESCRIPTION	BY	DATE
6	MISC. REVISIONS	CMT	4/15/22
5	MISC. REVISIONS	CMT	4/5/21
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

DEMOLITION PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYLMULA No.17078 – LICENSED PROFESSIONAL ENGINEER – 4/15/22

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582 SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	3 OF 15

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

LEGEND

O	IRON PIN FOUND	UP	UTILITY POLE
⊡	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	S	SEWER MANHOLE
⊙	DRILL HOLE FOUND	T	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	□	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. CIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
			TREELINE

PROPOSED SIDEWALK EASEMENT

EXISTING MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±
(TO BE COMBINED WITH LOT 9-1)

EXISTING MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±
(TO BE COMBINED WITH LOT 9-1)

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

EXISTING PSNH EASEMENT

EXISTING HIGHWAY EASEMENT TO THE CITY OF PORTSMOUTH

EXISTING HIGHWAY EASEMENT TO NHDOT

PROPOSED LOT LINE

ORIGINAL 2013 APPROVALS

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9-1
PROPOSED:
111,415 Sq.Ft.
2.558 Ac.±

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9
PROPOSED:
137,276 Sq.Ft.
3.151 Ac.±

PROPOSED 12,600 SF (GFA) 3-STORY 12-UNIT CONDO COMPLEX-"A" (TOWNHOUSE STYLE)
PROPOSED 15,100 SF (GFA) 3-STORY 6-UNIT CONDO COMPLEX-"B" (TOWNHOUSE STYLE)
PROPOSED 17,600 SF (GFA) 3-STORY 7-UNIT CONDO COMPLEX-"C" (TOWNHOUSE STYLE)
PROPOSED 20,100 SF (GFA) 3-STORY 8-UNIT CONDO COMPLEX-"D" (TOWNHOUSE STYLE)
PROPOSED 15,100 SF (GFA) 3-STORY 6-UNIT CONDO COMPLEX-"E" (TOWNHOUSE STYLE)

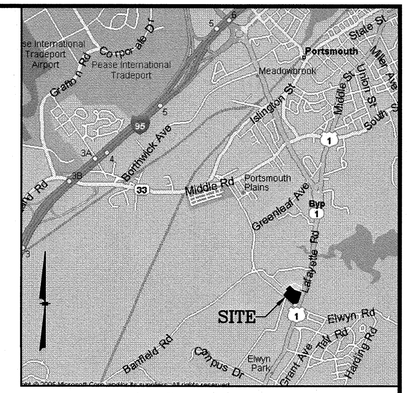
EXISTING FIVE GUYS
EXISTING NEWBURYPORT FIVE CENTS BANK
EXISTING RITE AID

WEST ROAD
PEVERLY HILL ROAD (PUBLIC - VARIABLE WIDTH)
LAFAYETTE ROAD- ROUTE 1 (PUBLIC - VARIABLE WIDTH)
ELWIN ROAD

5 MIN. TO 15' MAX. FRONT BUILDING SETBACK
10' SIDE BUILDING SETBACK
15' REAR BUILDING SETBACK
30' FRONT BUILDING SETBACK
30' SIDE BUILDING SETBACK
80' FRONT BUILDING SETBACK

N68°18'34"E 135.09'
N69°15'45"E 117.
N26°48'22"W 47.00'
N72°06'47"E 52.00'
283.48'
S34°20'32"W 59.03'
S55°27'44"E 51.93'
138.37'
S34°20'19"W
179.46'
S34°20'32"W
Δ=93°57'34" R=30.00' L=49.19'
N55°19'23"W
N34°40'37"E 8.00'
184.99'
S55°19'23"E
379.91'
N30°06'48"W 454.30'
N36°27'59"W 9.57'
N36°31'53"W 53.73'
N36°54'40"W 85.60'
S82°53'53"W 19.15'
S34°20'32"W
157.61'
N72°04'40"E 19.61'

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



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) CURRENT ZONE IS GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2). REFER TO CITY OF PORTSMOUTH ZONING DISTRICTS AND USE REGULATIONS FOR ADDITIONAL INFORMATION.
2) THE PURPOSE OF THIS PLAN IS TO SHOW THE SUBDIVISION OF TWO PARCELS NOTED AS PROPOSED LOTS 9 AND 9-1. LOT 9 WILL CONSIST OF THE EXISTING RETAIL DEVELOPMENT. LOT 9-1 WILL INCLUDE A PROPOSED 32-UNIT TOWNHOUSE STYLE RESIDENTIAL DEVELOPMENT.
3) PROPOSED RESIDENTIAL PARKING BREAKDOWN: (32 UNITS)
   + 64 GARAGE SPACES (TOWNHOUSE STYLE)
   (INCLUDES 2 GARAGE SPACES/UNIT)
   + 29 EXTERIOR SPACES
   = 93 SPACES PROPOSED

TABLE OF ZONING REGULATIONS - PORTSMOUTH, NH

ZONE: GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2)

DESCRIPTION	REQUIRED	PROPOSED LOT 9 RETAIL DEVELOPMENT (PROVIDED)	PROPOSED LOT 9-1 GATEWAY TOWNHOUSE (REQUIRED)	PROPOSED LOT 9-1 GATEWAY TOWNHOUSE (PROVIDED)
MINIMUM LOT AREA Sq. Ft.	10,000 SF	137,276 SF	10,000 SF	111,415 SF
MINIMUM LOT FRONTAGE	50'	>200'	20'	>200'
MINIMUM FRONT YARD SETBACK	LAFAYETTE ROAD - 80 FEET FROM CENTERLINE PEVERLY HILL ROAD - 30 FEET	84.1' LAFAYETTE ROAD 81.7' PEVERLY ROAD	5' MIN. TO 15' MAX.	10' FROM PROPOSED SIDEWALK
MINIMUM REAR YARD SETBACK	50'	N/A	15'	15'
MINIMUM SIDE YARD SETBACK	30'	37.7'	10'	23.5'
MINIMUM FRONT YARD PAVEMENT SETBACK	30' FROM LOT LINE	> 30'		> 30'
PARKING SPACE DIMENSIONS	8.5' x 19'	9' x 19'		8.5' x 19'
MINIMUM NUMBER PARKING SPACES (RESIDENTIAL DEVELOPMENT)	DWELLING UNITS > 750 SF=1.3 SPACES/UNIT VISITOR PARKING=1 SPACE/5 DWELLING UNITS REQ. PARKING =32 UNITS * 1.3 SP/UNITS +32 UNITS * 1 SP/5 UNITS = 48 SPACES REQUIRED	NO CHANGE TO PREVIOUSLY APPROVED PARKING - 92 SPACES ONSITE	48 SPACES (SEE PARKING BREAKDOWN IN TABLE)	93 SPACES (SEE PARKING BREAKDOWN IN NOTE #3 ABOVE)
MINIMUM OPEN SPACE	20%	31,598/137,276=23.0%	20%	26,112/111,415=23.4%
MAXIMUM BUILDING HEIGHT	40', 25'-49' FROM ROW = 45 FEET	< 40'	2.5 STORIES OR 35'	< 35'
MAXIMUM BUILDING COVERAGE	50%	16,389/137,276 = 11.9%	50%	23,900/111,415=21.4%
MAXIMUM FREESTANDING SIGN AREA, HEIGHT & SETBACK	100 SF PER SIDE FOR PRIMARY SIGN 75 SF PER SIDE FOR SECONDARY SIGN (N/A) 20' HEIGHT, 10' SETBACK	EXISTING SIGNAGE TO REMAIN	N/A	N/A
WALL SIGN AREA	UP TO 200 SF, CANNOT EXCEED AGGREGATE	EXISTING SIGNAGE TO REMAIN	N/A	N/A

NO.	DESCRIPTION	BY	DATE
6	MISC. REVISIONS	CMT	4/15/22
5	MISC. REVISIONS	CMT	4/5/21
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

SITE OVERVIEW PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

STATE OF NEW HAMPSHIRE - CHRISTOPHER M. TYMULA No.17078 LICENSED PROFESSIONAL ENGINEER - 4/19/22

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=40'	DATE: JANUARY 20, 2020		DRAWING NO. 4582 SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	4 OF 15

F:\Projects\CAD\458219\4582_SP.dwg OVER 4/19/22 12:49pm sbonfanti

LEGEND

○	IRON PIN FOUND	UP	UTILITY POLE
□	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	S	SEWER MANHOLE
⊙	DRILL HOLE FOUND	T	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	CB	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES		GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
1	NUMBER OF PARKING SPACES		TREELINE

PROPOSED SIDEWALK EASEMENT

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

EXISTING PSNH EASEMENT

EXISTING HIGHWAY EASEMENT TO THE CITY OF PORTSMOUTH

WEST ROAD

PEVERLY HILL ROAD (PUBLIC - VARIABLE WIDTH)

MAP 252 LOT 2-10
N/F JWK REALTY, LLC
PO BOX 971
PORTSMOUTH, NH 03802
BOOK 3656 PAGE 744

MAP 252 LOT 3
N/F LIGHTHOUSE MANUFACTU
125 SOUTH SATELLITE R
SOUTH WINDSOR, CT 06
BOOK 5229 PAGE 24

MAP 252 LOT 8
MACLEOD ENTERPRISES, INC
1190 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
BOOK 2487 PAGE 509

MAP 252 LOT 10
N/F DSM MB II, LLC
875 EAST STREET
TEWKSBURY, MA 08176
BOOK 5583 PAGE 1649

EXISTING MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±
(TO BE COMBINED WITH LOT 9-1)

EXISTING MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±
(TO BE COMBINED WITH LOT 9-1)

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9-1
PROPOSED:
111,415 Sq.Ft.
2.558 Ac.±

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9
PROPOSED:
137,276 Sq.Ft.
3.151 Ac.±

PROPOSED LOT LINE

PROPOSED 12,600 SF (GFA) 3-STORY 5-UNIT CONDO COMPLEX-"A" (TOWNHOUSE STYLE)

PROPOSED 15,100 SF (GFA) 3-STORY 6-UNIT CONDO COMPLEX-"B" (TOWNHOUSE STYLE)

PROPOSED 20,100 SF (GFA) 3-STORY 8-UNIT CONDO COMPLEX-"D" (TOWNHOUSE STYLE)

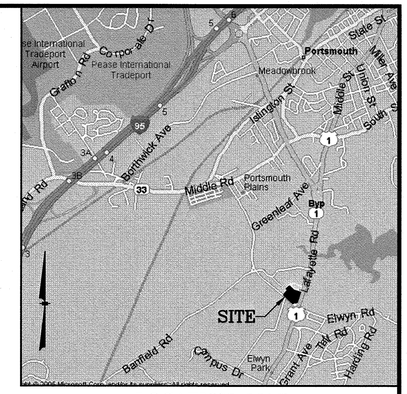
PROPOSED 17,600 SF (GFA) 3-STORY 7-UNIT CONDO COMPLEX-"C" (TOWNHOUSE STYLE)

PROPOSED 15,100 SF (GFA) 3-STORY 6-UNIT CONDO COMPLEX-"E" (TOWNHOUSE STYLE)

EXISTING FIVE GUYS

EXISTING RITE AID

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) TAX MAP 252 LOTS 4, 5 & 9

2) ZONING DISTRICT: GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2)

3) LOT 9 AREA= 223,416 Sq.Ft. (EXISTING)
= 5.129 Ac.±
LOT 4 AREA = 12,838 Sq.Ft. (EXISTING)
= 0.295 Ac.±
LOT 5 AREA = 12,437 Sq.Ft. (EXISTING)
= 0.285 Ac.±
PROP. LOT 9 AREA = 137,276 Sq.Ft.
= 3.151 Ac.±
PROP. LOT 9-1 AREA = 111,415 Sq.Ft.
= 2.558 Ac.±

4) EXISTING USE: VACANT REAR PARCEL ON PORTION OF LOT 9 AND RESIDENTIAL DWELLING ON LOTS 4 & 5. (FORMER YOKEN'S RESTAURANT AND FUNCTION FACILITY)
PROPOSED USE: MULTI-UNIT RESIDENTIAL DEVELOPMENT & SUBDIVISION/ LOT CONSOLIDATION OF LOTS 4, 5 & 9

5) ALL BUILDINGS AND SITE CONSTRUCTION SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA) AS PUBLISHED IN THE FEDERAL REGISTER, REVISED IN 2010.

6) THE LOCATIONS OF EXISTING SUBSURFACE UTILITIES SHOWN ON THIS PLAN WERE COMPILED FROM AVAILABLE RECORD DRAWINGS AND ARE NOT WARRANTED TO BE CORRECT. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING SUBSURFACE UTILITIES PRIOR TO PERFORMING ANY WORK.

7) WRITTEN DIMENSIONS ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR.

8) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE 1-888-344-7233 (72 HOURS PRIOR TO ANY EXCAVATION).

9) ALL CONSTRUCTION SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE CITY OF PORTSMOUTH AND THE STATE OF NEW HAMPSHIRE.

10) THE SITE IS NOT WITHIN THE 100 YEAR FLOOD BOUNDARY AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR ROCKINGHAM COUNTY, NEW HAMPSHIRE PANEL 270 OF 681, MAP NUMBER 33015C0270E, EFFECTIVE DATE: MAY 17, 2005.

11) ALL CONSTRUCTION SHALL CONFORM TO THESE PLANS AND THE STANDARD CONSTRUCTION DRAWINGS AS SUPPLIED BY RITE AID CORPORATION.

12) A SIGN PERMIT SHALL BE OBTAINED PRIOR TO INSTALLATION.

13) PROPOSED SNOW STORAGE AREAS AS SHOWN. ANY EXCESS SNOW TO BE TRUCKED OFF-SITE.

14) THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY GREENMAN-PEDERSEN, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR AND/OR ENGINEER AS INCLUDED IN THE PLAN SET DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE AND/OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.

15) ALL PROPOSED UTILITIES SHALL BE UNDERGROUND.

16) THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING ON-SITE PAVEMENT, CONCRETE PADS, BRICKS, FILL PILES, AND ALL OTHER EXISTING SURFACE AND UNDERGROUND STRUCTURES WHICH ARE NOT RE-USED AS PART OF THE CONSTRUCTION. SEE DEMOLITION PLAN.

17) ALL TRAFFIC CONTROL AND TEMPORARY CONSTRUCTION SIGNAGE ARRANGEMENTS ACCEPTABLE TO THE NHDOT AND CITY DEPARTMENT OF PUBLIC WORKS SHALL BE EMPLOYED DURING OPERATIONS WITHIN THE PUBLIC RIGHT-OF-WAY.

18) ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

19) THE SITE CONTRACTOR SHALL TAKE NOTICE THAT THIS SITE IS REGISTERED WITH THE STATE AS AN ARCHAEOLOGICAL SITE KNOWN AS THE "WILLEY/LIGHTFORD" BURIAL GROUND. THE APPLICANT HAS CONSULTED WITH INDEPENDENT ARCHAEOLOGICAL CONSULTING, LLC (IAC) OF PORTSMOUTH, NH TO FURTHER RESEARCH THE ALLEGED UNMARKED BURIAL GROUND. A SUMMARY REPORT WAS PREPARED BY IAC, DATED 4/27/20, WHICH OUTLINES THE GROUND PENETRATING RADAR TECHNOLOGIES THAT WERE USED TO IDENTIFY THE BURIAL GROUND LOCATED IN THE NORTHWEST CORNER OF MAP 252 LOT 4.

20) THE SITE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE COMFORT INN TO MAINTAIN ACCESS AND MINIMIZE DISRUPTION TO THEIR BUSINESS OPERATION.

21) ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

22) THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

23) ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.

24) EXISTING IMPERVIOUS AREA = 77,229 SF± (69.3%)
PROPOSED IMPERVIOUS AREA = 85,303 SF± (76.6%)

25) REQUIRED STATE/FEDERAL PERMITS:
NHDES ALTERATION OF TERRAIN (AoT): AoT-1856 (8-26-20)
EPA CONSTRUCTION GENERAL PERMIT (SWPPP): PENDING
NHDOT DRIVEWAY PERMIT: 06-379-237 AMENDMENT

NO.	DESCRIPTION	BY	DATE
6	MISC. REVISIONS	CMT	4/15/22
5	MISC. REVISIONS	CMT	4/5/21
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

SITE PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

STATE OF NEW HAMPSHIRE · CHRISTOPHER M. TYMULA No.17078 · PROFESSIONAL ENGINEER (LICENSED) · 4/6/22

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582_SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	5 OF 15

F:\Projects\CAD\458219\4582_SP.dwg SP 4/19/22 12:48pm sbonfanti

LEGEND

○	IRON PIN FOUND		UTILITY POLE
□	CONCRETE BOUND FOUND	Ⓓ	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	Ⓢ	SEWER MANHOLE
⊙	DRILL HOLE FOUND	Ⓣ	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	□	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES	G	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
C.O.	PROP. CLEANOUT		TREELINE
CB-1 Ⓒ	PROP. CATCH BASIN	MEG	MEET EXISTING GRADE
DMH-1 Ⓓ	PROP. DRAIN MANHOLE	47.50	PROP. SPOT ELEVATION
SMH-1 Ⓢ	PROP. SEWER MANHOLE		PROP. CONTOUR ELEVATION
		G.B.	GRADE BREAK

5 MIN. TO 15' MAX. FRONT BUILDING SETBACK

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

MAP 252 LOT 2-10
N/F JMK REALTY, LLC
PO BOX 971
PORTSMOUTH, NH 03802
BOOK 3656 PAGE 744

MAP 252 LOT 2
N/F DSM MB II, LLC
875 EAST STREET
TEWKSBURY, MA 08176
BOOK 5583 PAGE 1649

MAP 252 LOT 8
MACLEOD ENTERPRISES, INC.
1190 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
BOOK 2487 PAGE 509

LIMIT OF BURIAL GROUND PER EXPLORATION PERFORMED BY INDEPENDENT ARCHAEOLOGICAL CONSULTING, LLC

PROP. TREELINE (TYP.)

EXISTING MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±
(TO BE COMBINED WITH LOT 9-1)

EXISTING MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±
(TO BE COMBINED WITH LOT 9-1)

PROPOSED 12,600 SF (GFA) 3-STORY 5-UNIT CONDO COMPLEX-"A" (TOWNHOUSE STYLE) GF=48.50

PROPOSED 15,100 SF (GFA) 3-STORY 6-UNIT CONDO COMPLEX-"B" (TOWNHOUSE STYLE) GF=47.50

PROPOSED 20,100 SF (GFA) 3-STORY 8-UNIT CONDO COMPLEX-"D" (TOWNHOUSE STYLE) GF=46.50

PROPOSED 17,600 SF (GFA) 3-STORY 7-UNIT CONDO COMPLEX-"C" (TOWNHOUSE STYLE) GF=46.50

PROPOSED 15,100 SF (GFA) 3-STORY 6-UNIT CONDO COMPLEX-"E" (TOWNHOUSE STYLE) GF=46.50

UNDERGROUND INFILTRATION SYSTEM #1 (SEE DETAIL)

UNDERGROUND INFILTRATION SYSTEM #2 (SEE DETAIL)

U/G INFIL. SYS. #3 (SEE DETAIL)

2% GARAGE SLOPE (TYP.)

PROP. 6" DIA. ROOF DRAIN

GRADE BREAK

GRADE TO DRAIN

WEST ROAD

PEVERLY HILL ROAD (PUBLIC - VARIABLE WIDTH)

5 MIN. TO 15' MAX. FRONT BUILDING SETBACK

30' FRONT BUILDING SETBACK

10' SIDE BUILDING SETBACK

30' SIDE BUILDING SETBACK

15' REAR BUILDING SETBACK

PROPOSED LOT LINE

EXISTING FIVE GUYS

EXISTING RITE AID

HIGHWAY EASEMENT TO THE CITY OF PORTSMOUTH

PSNH EASEMENT

ACCESS EASEMENT

20' WIDE DRAINAGE EASEMENT BOOK 4403 PAGE 2337 (D-32207)

20' WIDE SEWER EASEMENT BOOK 4403 PAGE 2337 (D

EX.DMH CONVERT EXIST. CB FRAME & GRATE TO NEW DMH FRAME & GRATE

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9-1
PROPOSED:
137,276 Sq.Ft.
3.151 Ac.±

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9-1
PROPOSED:
111,415 Sq.Ft.
2.558 Ac.±

N68°18'35"E 135.09'
N69°15'45"E 117.37'
N26°48'22"W 47.00'
N7°13'06"E 52.00'
N55°19'23"W 283.48'
N34°40'37"E 8.00'
N30°06'48"W 184.99'
N30°06'23"W 464.24'

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

DRAINAGE STRUCTURES

CB-1
RIM=46.30
INV.OUT=43.30

CB-2
RIM=47.20
INV.OUT=43.70

CB-3
RIM=46.15
INV.IN=43.25(CB-4)
INV.OUT=43.15

CB-4
RIM=46.60
INV.OUT=43.60

CB-5(FD)
RIM=45.90
INV.OUT=42.20

CB-6(FD)
RIM=45.60
INV.OUT=42.20

CB-7(FD)
RIM=45.05
INV.OUT=41.05

CB-8(FD)
RIM=47.30
INV.IN=42.70(CB-3)
INV.OUT=42.60

DMH-1
RIM=45.20
INV.IN=39.70(DMH-2)
INV.IN=40.70(CB-7(FD))
INV.OUT=39.60

DMH-2
RIM=46.00
INV.IN=39.95(OCS-3)
INV.IN=39.95(EX CB-6)
INV.OUT=39.85

DMH-3
RIM=46.55
INV.IN=39.50(DMH-3A)
INV.IN=39.80(EX CB-9)
INV.OUT=39.40

DMH-3A
RIM=48.65
INV.IN=40.40(OCS-2)
INV.OUT=40.30

DMH-4
RIM=47.40
INV.IN=41.50(OCS-1)
INV.IN=41.32(EX CB-8)
INV.OUT=41.32

DMH-5(FD)
RIM=47.15
INV.IN=43.00(CB-1)
INV.IN=43.20(CB-2)
INV.OUT=42.90

EX.DMH
RIM=44.80
INV.IN=39.20(DMH-3)
INV.IN=39.20(DMH-1)
INV.OUT=39.08

OUTLET CONTROL STRUCTURE #1 (OCS-1)
RIM=47.75
INV.IN=41.00(INF-1 OUTLET)
INV.OUT=42.00
(SEE DETAIL)

OUTLET CONTROL STRUCTURE #2 (OCS-2)
RIM=48.70
INV.IN=40.50(INF-2 OUTLET)
INV.OUT=40.60
(SEE DETAIL)

OUTLET CONTROL STRUCTURE #3 (OCS-3)
RIM=45.90
INV.IN=41.00(INF-3 OUTLET)
INV.OUT=41.00
(SEE DETAIL)

PROPOSED UNDERGROUND INFILTRATION SYSTEM #1 (INF-1)
(5) 36"ø PERF. HDPE PIPE
57LF, S=0.000 FT/FT
INV.PIPE=41.00
INV.IN=42.00(DMH-1)
INV.OUT=41.00(24")
(SEE DETAIL SHEET)

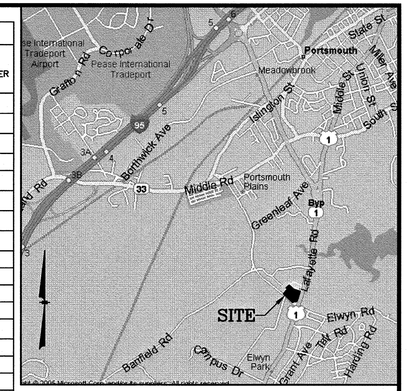
PROPOSED UNDERGROUND INFILTRATION SYSTEM #2 (INF-2)
(4) 36"ø PERF. HDPE PIPE
92LF, S=0.000 FT/FT
INV.PIPES=40.50
INV.IN'S=42.50(CB-3/CB-4)
INV.IN=42.25(INF-4)
INV.OUT=40.50(24")
(SEE DETAIL SHEET)

PROPOSED UNDERGROUND INFILTRATION SYSTEM #3 (INF-3)
(5) 36"ø PERF. HDPE PIPE
57LF, S=0.000 FT/FT
INV.PIPES=41.00
INV.IN'S=42.00(CB-5/CB-6)
INV.OUT=41.00(24")
(SEE DETAIL SHEET)

(FD) DENOTES FIRST DEFENSE UNIT OR APPROVED EQUAL (SEE DETAIL)

DRAINAGE PIPE SCHEDULE

FROM: STRUCTURE NUMBER	PIPE SIZE (INCHES)	TYPE OF PIPE	APPROX. PIPE LENGTH (FEET)	SLOPE OF PIPE (FT./FT.)	TO: STRUCTURE NUMBER
CB-1	12	HDPE	59	0.005	DMH-5(FD)
CB-2	12	HDPE	31	0.016	DMH-5(FD)
CB-3	12	HDPE	54	0.008	CB-8(FD)
CB-4	12	HDPE	36	0.010	CB-3
CB-5(FD)	12	HDPE	12	0.017	INF-3 INLET-1
CB-6(FD)	12	HDPE	9	0.022	INF-3 INLET-2
CB-7(FD)	12	HDPE	34	0.010	DMH-1
CB-8(FD)	12	HDPE	7	0.014	INF-2 INLET-1
DMH-1	18	HDPE	43	0.009	EX.DMH
DMH-2	12	HDPE	30	0.005	DMH-1
DMH-3	18	HDPE	38	0.005	EX.DMH
DMH-3A	15	HDPE	168	0.005	DMH-3
DMH-5(FD)	12	HDPE	15	0.059	INF-1 INLET
INF-1 OUTLET	24	HDPE	7	0.000	OCS-1
INF-2 OUTLET	24	HDPE	5	0.000	OCS-2
INF-3 OUTLET	24	HDPE	9	0.000	OCS-3
OCS-1	12	HDPE	50	0.010	DMH-4
OCS-2	15	HDPE	41	0.005	DMH-3A
OCS-3	12	HDPE	33	0.032	DMH-2



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) ALL SITE DRAINAGE PIPE SHALL BE CORRUGATED HIGH-DENSITY POLYETHYLENE PIPE WITH STANDARD JOINTS, DUAL-WALL, SMOOTH INTERIOR AS MANUFACTURED BY ADS, INC., OR APPROVED EQUAL, UNLESS OTHERWISE NOTED ON PLAN.
2) ALL ROOF DRAIN PIPE SHALL BE MINIMUM 6" PVC(SDR-35).
3) ELEVATIONS ARE BASED ON NAVD 1988 DATUM.
4) ALL PROPOSED ELEVATIONS AS SHOWN ARE BOTTOM OF CURB ELEVATIONS, UNLESS OTHERWISE NOTED.
5) ANY UTILITY FIELD ADJUSTMENTS SHALL BE APPROVED BY THE LOCAL AUTHORITIES AND THE DEVELOPER PRIOR TO INSTALLATION.
6) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR IS TO VERIFY EXACT LOCATION PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES.
7) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIG-SAFE (1-888-344-7233) 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION.
8) THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE SITE CONSTRUCTION SINCE THE DISTURBANCE EXCEEDS ONE ACRE. (ACTUAL DISTURBANCE AREA = 115,000 SF) THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND MADE ACCESSIBLE TO THE PUBLIC. A COMPLETED NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET: FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
9) SEE UTILITIES PLAN FOR SERVICE CONNECTIONS.
10) CONTRACTOR TO USE EXTREME CAUTION TO INSURE THAT NO PONDING OCCURS AT PROPOSED DRIVEWAYS.
11) ALL CONSTRUCTION SHALL CONFORM TO MUNICIPAL DPW AND ALL APPLICABLE STATE AND FEDERAL STANDARDS. ALL CASTINGS ARE PER DPW REQUIREMENTS.
12) ALL TRAFFIC CONTROL AND TEMPORARY CONSTRUCTION SIGNAGE ARRANGEMENTS, ACCEPTABLE TO THE PORTSMOUTH DEPARTMENT OF PUBLIC WORKS AND NHDOT, SHALL BE EMPLOYED DURING OPERATIONS WITHIN THE PUBLIC RIGHT-OF-WAY.
13) ALL ADA ACCESSIBLE WALKWAYS CANNOT EXCEED 5% RUNNING SLOPE AND 2% CROSS SLOPE, RAMPS CANNOT EXCEED 8.33% RUNNING SLOPE AND 2% CROSS SLOPE, AND HC PARKING STALLS AND ACCESS AISLES CANNOT EXCEED 2% SLOPE IN ANY DIRECTION. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL NOTIFY THIS OFFICE OF ANY DISCREPANCIES.
14) SEE EROSION & SEDIMENT CONTROL PLAN FOR CONSTRUCTION SEQUENCE AND EROSION CONTROL MEASURES.
15) THE SITE WILL REQUIRE A NHDES ALTERATION OF TERRAIN (AOT) PERMIT SINCE THE PROJECT WILL DISTURB MORE THAN 100,000 SF OF TERRAIN. CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS IN THAT PERMIT.
16) THE GENERAL CONTRACTOR IS TO PROVIDE 2" RIGID POLYSTYRENE THERMAL INSULATION WITH A MINIMUM "R" VALUE OF 10 AT LOCATIONS WHERE THERE IS LESS THAN 3' OF COVER OVER STORM DRAINS. SEE DETAIL SHEET FOR TRENCH SECTION.
17) ALL CATCH BASINS SHALL BE FITTED WITH A OIL-WATER-DEBRIS HOODS ON THE OUTLET PIPE.
18) FOR DRAINAGE STRUCTURE DETAILS SEE DETAIL SHEETS.
19) ALL PIPE DATA IS CALCULATED TO CENTER OF STRUCTURE, TYP.
20) CONTRACTOR TO REFER TO THE OPERATION & MAINTENANCE (O&M) MANUAL FOR STORMWATER MANAGEMENT SYSTEMS FOR SITE MAINTENANCE DURING AND AFTER CONSTRUCTION.
21) ALL UNDERGROUND INFILTRATION SYSTEMS TO BE CONSTRUCTED WITH RISERS AND CLEANOUTS. SEE DETAIL SHEETS 14 & 14A FOR MORE INFORMATION.

NO.	DESCRIPTION	BY	DATE
6	MISC. REVISIONS	CMT	4/15/22
5	MISC. REVISIONS	CMT	4/5/21
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

GRADING & DRAINAGE PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYMULA No.17078 – LICENSED PROFESSIONAL ENGINEER – 4/19/22

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582 SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	6 OF 15

F:\Projects\CAD\458219\4582 SP.dwg GD 4/19/22 12:46pm sbonfanti

LEGEND

○	IRON PIN FOUNO	⌀	UTILITY POLE
⊡	CONCRETE BOUND FOUNO	ⓓ	ORAIN MANHOLE
△	RAILROAO SPIKE FOUND	Ⓢ	SEWER MANHOLE
⊙	DRILL HOLE FOUND	Ⓣ	TELEPHONE MANHOLE
SSC	EXIST. SLOPEO GRANITE CURB	□	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLIO YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLIO WHITE LINE	T	UNDERGROUNO TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNOERGROUNO ELECTRIC AND TELEPHONE
	SIGN		WETLANO LINE
C.O.	PROP. CLEANOUT		TREELINE
CB-1	PROP. CATCH BASIN		
OMH-1	PROP. ORAIN MANHOLE		
SMH-1	PROP. SEWER MANHOLE		
	PROP. GATE VALVE		

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

MAP 252 LOT 2-10
N/F JMK REALTY, LLC
PO BOX 971
PORTSMOUTH, NH 03802
BOOK 3656 PAGE 744

MAP 252 LOT 1
N/F DSM MB II, LLC
875 EAST STREET
TEWKSBURY, MA 08176
BOOK 5583 PAGE 1649

MAP 252 LOT 8
MACLEOD ENTERPRISES, INC.
1190 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
BOOK 2487 PAGE 509

EXISTING MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±
(TO BE COMBINED WITH LOT 9-1)

EXISTING MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±
(TO BE COMBINED WITH LOT 9-1)

PROPOSED 12,600 SF (GFA) 3-STORY 5-UNIT CONDO COMPLEX-"A" (TOWNHOUSE STYLE) GF=48.50

PROPOSED 15,100 SF (GFA) 3-STORY 6-UNIT CONDO COMPLEX-"B" (TOWNHOUSE STYLE) GF=47.50

PROPOSED 20,100 SF (GFA) 3-STORY 8-UNIT CONDO COMPLEX-"D" (TOWNHOUSE STYLE) GF=46.50

PROPOSED 17,600 SF (GFA) 3-STORY 7-UNIT CONDO COMPLEX-"C" (TOWNHOUSE STYLE) GF=50.50

PROPOSED 15,100 SF (GFA) 3-STORY 6-UNIT CONDO COMPLEX-"E" (TOWNHOUSE STYLE) GF=46.50

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9-1
PROPOSED:
111,415 Sq.Ft.
2.558 Ac.±

PROPOSED LOT LINE

WEST ROAD

PEVERLY HILL ROAD (PUBLIC - VARIABLE WIDTH)

EXISTING FIVE GUYS

EXISTING RITE AID

20' WIDE DRAINAGE EASEMENT BOOK 4403 PAGE 2337 (D-32207)

20' WIDE SEWER EASEMENT BOOK 4403 PAGE 2337 (D-32207)

SEWER STRUCTURES

EX.SMH
RIM=45.74
INV.IN=38.54(PROP.)
INV.=38.54(EXIST.)

SMH-1
RIM=46.20
INV.IN=38.92
INV.OUT=38.82

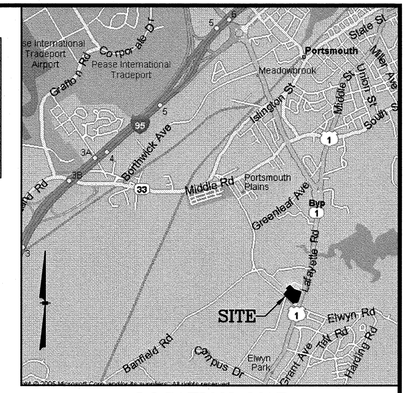
SMH-2
RIM=47.85
INV.IN=39.63
INV.OUT=39.53

SMH-3
RIM=48.10
INV.IN=42.50(OROP)
INV.IN=40.50
INV.OUT=40.40

SMH-4
RIM=47.95
INV.OUT=42.86

SEWER PIPE SCHEDULE

FROM: STRUCTURE NUMBER	PIPE SIZE (INCHES)	TYPE OF PIPE	APPROX. PIPE LENGTH (FEET)	SLOPE OF PIPE (FT./FT.)	TO: STRUCTURE NUMBER
SMH-1	8	PVC	55	0.005	EX.SMH
SMH-2	8	PVC	122	0.005	SMH-1
SMH-3	8	PVC	152	0.005	SMH-2
SMH-4	8	PVC	71	0.005	SMH-3



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) ALL SANITARY SEWER PIPE SHALL BE PVC (SDR-35), UNLESS OTHERWISE NOTED.
2) ALL WATER PIPE SHALL BE COPPER OR CLDIP, AS NOTEO ON PLAN.
3) ANY UTILITY FIELD ADJUSTMENTS SHALL BE APPROVED BY THE LOCAL AUTHORITIES AND THE DEVELOPER PRIOR TO INSTALLATION.
4) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR IS TO VERIFY EXACT LOCATION PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO NOTIFY THE DESIGN ENGINEER OF ANY OISCREPANCIES.
5) ALL CONSTRUCTION SHALL CONFORM TO MUNICIPAL DPW AND ALL APPLICABLE STATE AND FEDERAL STANDARDS.
6) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIG-SAFE (1-888-344-7233) PRIOR TO COMMENCING ANY EXCAVATION.
7) ALL ELECTRIC, TELEPHONE AND CABLE TV LINES ARE TO BE UNDERGROUND AND INSTALLED IN CONFORMANCE WITH APPLICABLE UTILITY CO. SPECIFICATIONS. ALL BUILDINGS SHALL BE CONNECTED TO THE CITY FIRE ALARM SYSTEM.
8) THE CONTRACTOR IS TO COORDINATE WITH THE MUNICIPAL DPW REGAROING WATER PRESSURE AT SERVICE. THE CONTRACTOR IS TO VERIFY IF PRESSURE REDUCING VALVE IS REQUIRED.
9) ANY UTILITIES TO BE TAKEN OUT OF SERVICE SHALL BE DISCONNECTEO AS DIRECTEO BY UTILITY COMPANY ANO LOCAL OPW.
10) SEE GRAOING & ORAINAGE PLAN FOR ORAINAGE INSTALLATION DETAILS.
11) A MINIMUM OF 18" OF VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN BOTTOM OF WATER MAIN AND TOP OF SEWER, AND AT ALL DRAINAGE PIPE CROSSINGS. A MINIMUM OF 10' HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN ALL WATER AND SEWER MAINS (INCLUDING SERVICE CONNECTIONS), AND ALL ORAIN PIPE AND SEWER MAINS.
12) THIS SITE WILL REQUIRE A NHDES WASTEWATER CONNECTION PERMIT. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS IN THAT PERMIT. THE CONTRACTOR SHALL ALSO COMPLY WITH THE TECHNICAL SPECIFICATIONS AS PREPARED BY THIS OFFICE, WHICH ARE PART OF THIS PERMIT.
13) ALL WATER LINES SHALL BE INSTALLED IN ACCROANCE WITH THE CITY OF PORTSMOUTH STANDARDS AND SPECIFICATIONS.
14) ALL SEWER LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF PORTSMOUTH AND NHDES STANDARDS AND SPECIFICATIONS.
15) ALL UTILITY CONSTRUCTION SHALL BE WITNESSED BY A THIRD PARTY INSPECTOR TO BE DETERMINED BY THE CITY OF PORTSMOUTH PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
16) MAINTENANCE, REPAIRS & INSPECTIONS OF EXISTING SEWER MAIN TO BE COMPLETED IN ACCORDANCE WITH CITY AGREEMENT & DPW CORRESPONDENCE DATED MAY 2021.

PUBLIC UTILITIES

UTILITIES	AVAILABLE
(SEWER) CITY OF PORTSMOUTH PUBLIC WORKS DEPT., PETER RICE 603-427-1530	YES
(WATER) CITY OF PORTSMOUTH PUBLIC WORKS DEPT., PETER RICE 603-427-1530	YES
(GAS) NORTHERN UTILITIES, DAVID BEAULIEU 603-294-5144	YES
(ELECTRIC) PUBLIC SERVICE OF NEW HAMPSHIRE (PSNH), MARK COLLINS 603-332-4227 x5325	YES
(TELEPHONE) FAIRPOINT COMMUNICATIONS, DAVID KESTNER 603-743-1114	YES

NO.	DESCRIPTION	BY	DATE
6	MISC. REVISIONS	CMT	4/15/22
5	REVISE TRANSFORMER/ELECTRICAL LAYOUT PER EVERSOURCE	CMT	4/5/21
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

UTILITY PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYNULA No.17078 – LICENSED PROFESSIONAL ENGINEER
4/18/22

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582 SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	7 OF 15

F:\Projects\CAD\458219\4582 SP.dwg, UT 4/19/22 12:45pm sbonfanti

LEGEND

○	IRON PIN FOUND	UP	UTILITY POLE
□	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	S	SEWER MANHOLE
⊙	DRILL HOLE FOUND	T	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB		CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
C.O.	PROP. CLEANOUT		TREELINE
CB–1	PROP. CATCH BASIN		
DMH–1	PROP. DRAIN MANHOLE		
SMH–1	PROP. SEWER MANHOLE		
	PROP. CONTOUR ELEVATION		
G.B.	GRADE BREAK		

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

MAP 252 LOT 2–10
N/F JMK REALTY, LLC
PO BOX 971
PORTSMOUTH, NH 03802
BOOK 3656 PAGE 744

PROP. TREELINE (TYP.)

EXISTING
MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±
(TO BE COMBINED WITH LOT 9–1)

N68°18'35"E 135.09'
N69°16'45"E 117.37'
N69°16'45"E 135.11'

TEMPORARY STOCKPILE AREA

PROPOSED 12,600 SF (GFA) 3–STORY 5–UNIT CONDO COMPLEX–"A" (TOWNHOUSE STYLE)

PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"B" (TOWNHOUSE STYLE)

PROPOSED 17,600 SF (GFA) 3–STORY 7–UNIT CONDO COMPLEX–"C" (TOWNHOUSE STYLE)

PROPOSED 20,100 SF (GFA) 3–STORY 8–UNIT CONDO COMPLEX–"D" (TOWNHOUSE STYLE)

PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"E" (TOWNHOUSE STYLE)

PROP. 6" DIA. ROOF DRAIN

UNDERGROUND INFILTRATION SYSTEM #1 (SEE DETAIL)

UNDERGROUND INFILTRATION SYSTEM #2 (SEE DETAIL)

U/G INF. SYS. #3 (SEE DETAIL)

PROP. SILT FENCE/EROSION BARRIER (TYP)

PROP. TEMPORARY GRAVEL CONSTRUCTION EXIT (TYP.)

PROP. ONSITE INLET PROTECTION (TYP.)

PROP. OFFSITE INLET PROTECTION (TYP.)

CONTRACTOR TO INSTALL TEMPORARY SITE CONSTRUCTION FENCING AROUND PERIMETER OF SITE PRIOR TO CONSTRUCTION & ADJUST LOCATION AS DIRECTED

EXISTING
MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±
(TO BE COMBINED WITH LOT 9–1)

N26°48'22"W 47.00'
N73°06'47"E 52.00'
283.48'

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9-1
PROPOSED:
111,415 Sq.Ft.
2.558 Ac.±

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9
PROPOSED:
137,276 Sq.Ft.
3.151 Ac.±

MAP 252 LOT 8
MACLEOD ENTERPRISES, INC.
1190 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
BOOK 2487 PAGE 509

PROPOSED LOT LINE

N55°19'23"W 184.99'
N34°40'37"E 8.00'
N30°06'48"W 9.57'
N36°27'59"W 9.57'

20' WIDE DRAINAGE EASEMENT
BOOK 4403 PAGE 2337 (D–32207)

20' WIDE SEWER EASEMENT
BOOK 4403 PAGE 2337 (D–32207)

ACCESS EASEMENT

PSNH EASEMENT

HIGHWAY EASEMENT TO THE CITY OF PORTSMOUTH

WEST ROAD

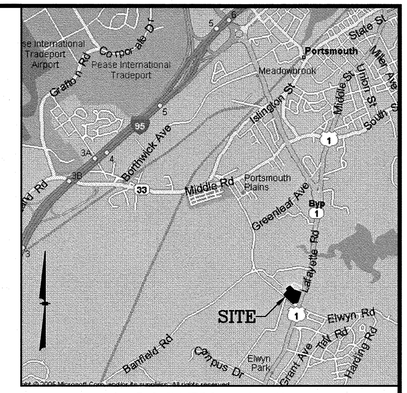
PEVERLY HILL ROAD
(PUBLIC – VARIABLE WIDTH)

EXISTING FIVE GUYS

EXISTING RITE AID

5 STORY HOTEL

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.



LOCATION MAP
(NOT TO SCALE)

NOTES:
1) SEE DETAIL SHEETS FOR EROSION CONTROL NOTES, CONSTRUCTION SEQUENCE, AND DETAILS.

NO.	DESCRIPTION	BY	DATE
6	MISC. REVISIONS	CMT	4/15/22
5	MISC. REVISIONS	CMT	4/5/21
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

EROSION & SEDIMENT CONTROL PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYMULA No.17078 – LICENSED PROFESSIONAL ENGINEER – 4/19/22

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582 SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	8 OF 15

F:\Projects\CAD\458219\4582 SP.dwg EROS 4/19/22 12:45pm sbonfanti

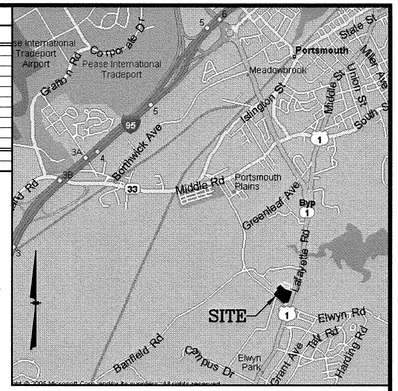
LEGEND

○	IRON PIN FOUND		UTILITY POLE
□	CONCRETE BOUND FOUND	Ⓓ	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	Ⓢ	SEWER MANHOLE
⊙	DRILL HOLE FOUND	Ⓣ	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	□	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
			TREELINE

TREE PLANTING SCHEDULE

PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES					
ABS	4	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	2"– 2 1/2" CAL.	
AG	7	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	6' – 7' HT.	MULTI–STEM
AF	11	ACER FREEMANII 'AUTUMN BLAZE'	AUTUMN BLAZE MAPLE	3" CAL.	
GT	8	GLEDITSIA TRIACANTHOS "HALKA"	HALKA HONEYLOCUST	2"– 2 1/2" CAL.	
GE	13	GYMNOCLADUS DIOICUS 'ESPRESSO'	ESPRESSO KENTUCKY COFFEETREE	2"– 2 1/2" CAL.	
NS	11	NYSSA SYLVATICA	BLACK GUM TREE	2 1/2"– 3" CAL.	
AR	5	ACER RUBRUM	RED MAPLE	3" CAL.	
QR	5	QUERCUS RUBRA	RED OAK	2"– 2 1/2" CAL.	
AC	3	AMELANCHIER CANADENSIS	SERVICEBERRY	6' – 7' HT.	MULTI–STEM
SHRUBS					
IG	20	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	#7 CONTAINER	MIN. SIZE 30" HT.

1 / XX — PLANT DESIGNATION / PLANT QUANTITY



LOCATION MAP
(NOT TO SCALE)

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

SITE PLAN PLANTING REQUIREMENTS:

THE PURPOSE OF PLANTING REQUIREMENTS IS TO ENHANCE THE LONG–TERM SURVIVAL PROSPECTS OF THE PLANT MATERIALS USED IN SITE LANDSCAPING. THESE STANDARDS ARE ALSO MEANT TO ENSURE THAT THE BENEFITS OF SITE LANDSCAPING (BUFFERING, AESTHETIC ENHANCEMENT, EROSION CONTROL, ETC.) ARE REALIZED AS EARLY AFTER PLANTING AS POSSIBLE. THE FOLLOWING STANDARDS FOR PLANTING REQUIREMENTS SHALL APPLY.

(A) PLANTING HOLES FOR TREES SHALL BE AT LEAST TWO TO THREE TIMES THE WIDTH OF THE ROOT BALL AND SHALL BE NO DEEPER THAN THE ROOT BALL.

(B) SHRUBS SHALL HAVE A PLANTING HOLE THREE TO FIVE TIMES THE WIDTH OF THE ROOT BALL AND SHALL NOT BE DEEPER THAN THE ROOT BALL ITSELF.

(C) EVERGREEN TREES SHALL BE FULLY BRANCHED WITH A MINIMUM 5–FOOT HEIGHT AT THE TIME OF PLANTING.

(D) DECIDUOUS TREES SHALL BE FULLY BRANCHED AND A MINIMUM SIZE OF 2 INCHES IN CALIPER AT THE TIME OF PLANTING.

(E) SHRUBS SHALL BE FULLY BRANCHED WITH A MINIMUM OF 2½ FEET HEIGHT AT PLANTING.

(F) EXISTING LANDSCAPING, TREES AND PLANTING MATERIALS TO BE RETAINED SHALL BE PROTECTED WITH A SNOW FENCE OR OTHER DURABLE METHOD AS NECESSARY DURING CONSTRUCTION TO AVOID DAMAGE TO ROOT ZONES AS WELL AS ABOVE GROUND VEGETATION.

(G) WHEN APPROPRIATE FOR TREES PLACED WITHIN SIDEWALKS, TREE GRATES SHALL BE USED TO PREVENT EXCESSIVE SOIL COMPACTION AND TO ADD INTEREST TO THE PAVEMENT. TREE GRATES SHALL BE FABRICATED OF A STRONG, DURABLE MATERIAL, INSTALLED FLUSH WITH GRADE, AND PROVIDE AN EXPANDABLE CENTER OPENING TO ALLOW FOR CONTINUED TREE GROWTH.

(H) WHERE APPLICABLE, TREE GUARDS SHALL BE INSTALLED TO PROTECT THE BASE OF THE TREE FROM STREET ACTIVITY.

(I) TREE WELLS OVER 6 INCHES DEEP OR OTHER LANDSCAPE FEATURES THAT HAVE THE POTENTIAL TO PRESENT A FALLING HAZARD TO THE PUBLIC SHALL HAVE GRATES, FENCES OR OTHER PROTECTIVE MEASURES INSTALLED.

(J) ALL TREES WHERE REQUIRED SHALL BE WELLED AND PROTECTED AGAINST CHANGE OF GRADE.

NOTES:

1) ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITION (AMERICAN ASSOCIATION OF NURSERYMEN, INC.).
2) 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY–PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUNDCOVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.
3) PLANT PIT BACKFILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PART OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON–SITE TOPSOIL AS PART OF BACKFILL WHEN AVAILABLE.
4) ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.
5) ALL SOD, SEED, SHRUB AND TREE AREAS SHALL RECEIVE 6" PH CORRECTED TOPSOIL. AFTER TOPSOIL IS SPREAD EVENLY OVER ENTIRE AREA, ALL CLODS, LUMPS, STONES AND OTHER DELETERIOUS MATERIAL SHALL BE RAKED UP AND REMOVED.
6) APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW:

LIMESTONE: 100 LBS./1,000 SQUARE FEET.
FERTILIZER: 500 LBS/ACRE OF 10–20–20 OR 1000 LBS/ACRE OF 5–10–10.
MULCH: HAY MULCH APPROXIMATELY 3 TONS/ACRE

SEED MIX (SLOPES LESS THAN 4:1)	LBS/ACRE
CREEPING RED FESCUE	20
TALL FESCUE	15
PERENNIAL RYEGRASS	5
REDTOP	2
	42

7) FOR TEMPORARY EROSION CONTROL NOTES, SEE EROSION & SEDIMENT CONTROL PLAN.
8) NEWLY GRADED AREAS REQUIRING SLOPE PROTECTION OUTSIDE OF NORMAL SEEDING SEASON SHALL RECEIVE STRAW MULCH AT THE APPROXIMATE RATE OF NO MORE THAN 3 TONS PER ACRE.
9) ANY CHANGES IN PLANT LOCATIONS OR TYPES SHALL BE APPROVED BY THE DEVELOPER AND CITY PRIOR TO INSTALLATION.
10) PLANTINGS SHALL BE GUARANTEED BY THE CONTRACTOR FOR ONE YEAR AFTER WRITTEN ACCEPTANCE BY THE DEVELOPER.
11) EXPOSED SOILS SHALL BE SEEDED OR HAY MULCHED WITHIN 72 HOURS OF FINAL GRADING.
12) ALL WORK SHALL BE COORDINATED WITH APPLICABLE EPA NPDES/SWPPP PERMIT WORK AS REQUIRED.
13) THE CONTRACTOR SHALL INSTALL AN IRRIGATION SYSTEM TO PROVIDE COMPLETE COVERAGE OF ALL SEED, SOD AREAS AND SHRUB BEDS. THE SYSTEM SHALL INCLUDE A TIMER WITH RAIN SENSOR AND SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES.
14) THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.
15) ALL REQUIRED PLANT MATERIALS SHALL BE TENDED AND MAINTAINED IN A HEALTHY GROWING CONDITION, REPLACED WHEN NECESSARY, AND KEPT FREE OF REFUSE AND DEBRIS. ALL REQUIRED FENCES AND WALLS SHALL BE MAINTAINED IN GOOD REPAIR.
16) THE PROPERTY OWNER SHALL BE RESPONSIBLE TO REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE AND QUANTITY OF PLANT MATERIALS AS ORIGINALLY INSTALLED, UNLESS ALTERNATIVE PLANTINGS ARE REQUESTED, JUSTIFIED AND APPROVED BY THE PLANNING BOARD OR PLANNING DIRECTOR.

MAP 252 LOT 2–10
N/F JMK REALTY, LLC
PO BOX 971
PORTSMOUTH, NH 03802
BOOK 3656 PAGE 744

EXISTING MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±
(TO BE COMBINED WITH LOT 9–1)

EXISTING MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±
(TO BE COMBINED WITH LOT 9–1)

PROPOSED 12,600 SF (GFA) 3–STORY 5–UNIT CONDO COMPLEX–"A" (TOWNHOUSE STYLE)
PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"B" (TOWNHOUSE STYLE)
PROPOSED 17,600 SF (GFA) 3–STORY 7–UNIT CONDO COMPLEX–"C" (TOWNHOUSE STYLE)
PROPOSED 20,100 SF (GFA) 3–STORY 8–UNIT CONDO COMPLEX–"D" (TOWNHOUSE STYLE)
PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"E" (TOWNHOUSE STYLE)

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9–1
PROPOSED:
111,415 Sq.Ft.
2.558 Ac.±

MAP 252 LOT 8
MACLEOD ENTERPRISES, INC.
1190 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
BOOK 2487 PAGE 509

MAP 252 LOT 9
EXISTING:
223,416 Sq.Ft.
5.129 Ac.±
MAP 252 LOT 9
PROPOSED:
137,276 Sq.Ft.
3.151 Ac.±

PROPOSED LOT LINE
ORIGINAL 2013 APPROVALS
EXISTING FIVE GUYS
EXISTING RITE AID
PEVERLY HILL ROAD (PUBLIC – VARIABLE WIDTH)
ACCESS EASEMENT
20' WIDE DRAINAGE EASEMENT BOOK 4403 PAGE 2337 (D–32207)
20' WIDE SEWER EASEMENT BOOK 4403 PAGE 2337 (
PSNH EASEMENT
HIGHWAY EASEMENT TO THE CITY OF PORTSMOUTH

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

NO.	DESCRIPTION	BY	DATE
6	MISC. REVISIONS	CMT	4/15/22
5	MISC. REVISIONS	CMT	4/5/21
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

LANDSCAPE PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

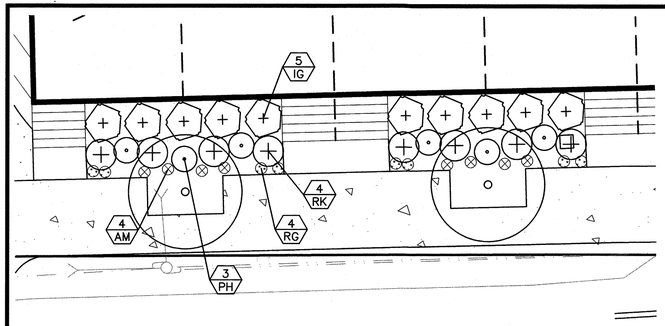
STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYMULA No.17078 – LICENSED PROFESSIONAL ENGINEER – 4/19/22

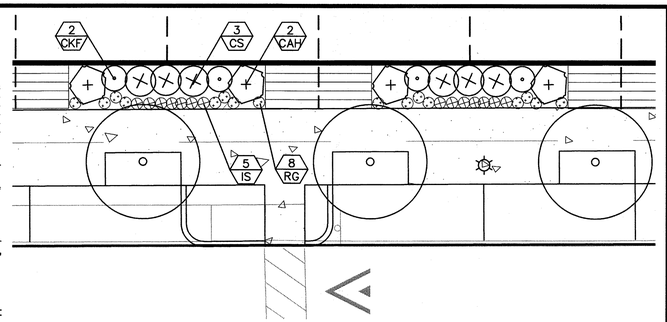
GPI — Engineering, Design, Planning, Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582 SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	9 OF 15

811 DigSafe MA.ME.NH.RI.VT

F:\Projects\CAD\458219\4582 SP.dwg LA 4/19/22 12:45pm sbonfonti





COMPLEX 'A & C' TYPICAL PLANTING SCHEDULE

PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
SHRUBS					
IG	5	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	#7 CONTAINER	MIN. SIZE 30" HT.
RK	4	ROSA 'KNOCK OUT'	KNOCK OUT ROSE	#7 CONTAINER	MIN. SIZE 30" HT.
PERENNIALS & GRASSES					
AM	4	ALCHEMILLA MOLLIS	LADY'S MANTLE	#1 CONTAINER	
RG	4	RUDBECKIA 'GOLDSTURM'	GOLDSTURM BLACK-EYED SUSAN	#1 CONTAINER	
PH	3	PENNISETUM ALOPERCUROIDES 'HAMELN'	DWARF FOUNTAIN GRASS	#1 CONTAINER	

1 / XX — PLANT QUANTITY / PLANT DESIGNATION

COMPLEX 'A & C' TYPICAL PLANTING

SCALE: 1"=10'

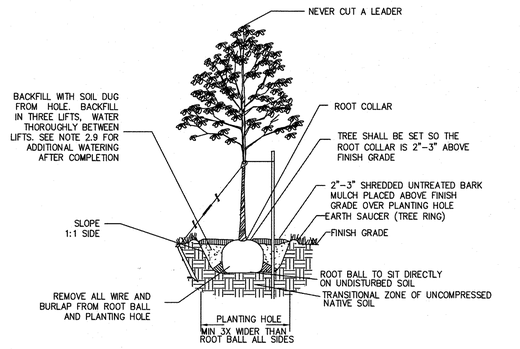
COMPLEX 'B, D & E' TYPICAL PLANTING SCHEDULE

PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
SHRUBS					
CS	3	CORNUS SERICEA 'ALLEMAN'S COMPACTA'	COMPACT REDTWIG DOGWOOD	#3 CONTAINER	MIN. SIZE 30" HT.
CAH	2	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	HUMMINGBIRD SUMMERSWEET	#3 CONTAINER	MIN. SIZE 30" HT.
PERENNIALS & GRASSES					
CKF	2	CALAMAGROSTIS A. 'KARL FOERSTER'	K. F. FEATHER REED GRASS	#1 CONTAINER	
RG	8	RUDBECKIA 'GOLDSTURM'	GOLDSTURM BLACK-EYED SUSAN	#1 CONTAINER	
IS	7	IRIS SIBERICA 'CAESAR'S BROTHER'	CAESAR'S BROTHER SIBERIAN IRIS	#1 CONTAINER	

1 / XX — PLANT QUANTITY / PLANT DESIGNATION

COMPLEX 'B, D & E' TYPICAL PLANTING

SCALE: 1"=10'



TREE PLANTING DETAIL

N.T.S.

PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"-3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

2.8 2"-3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

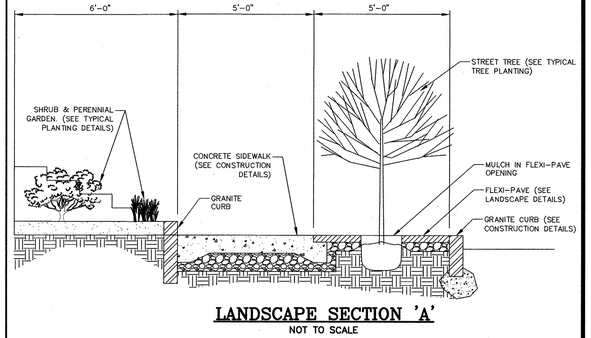
2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON-DAMAGING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

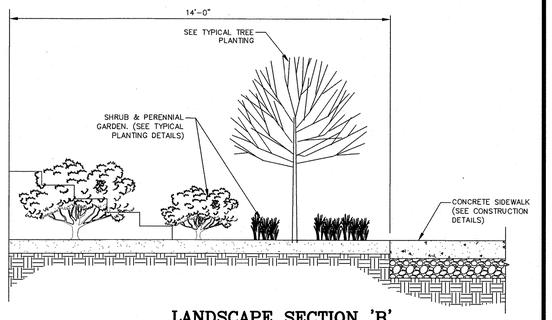
STANDARD DETAIL OF TREE PLANTING

NOT TO SCALE



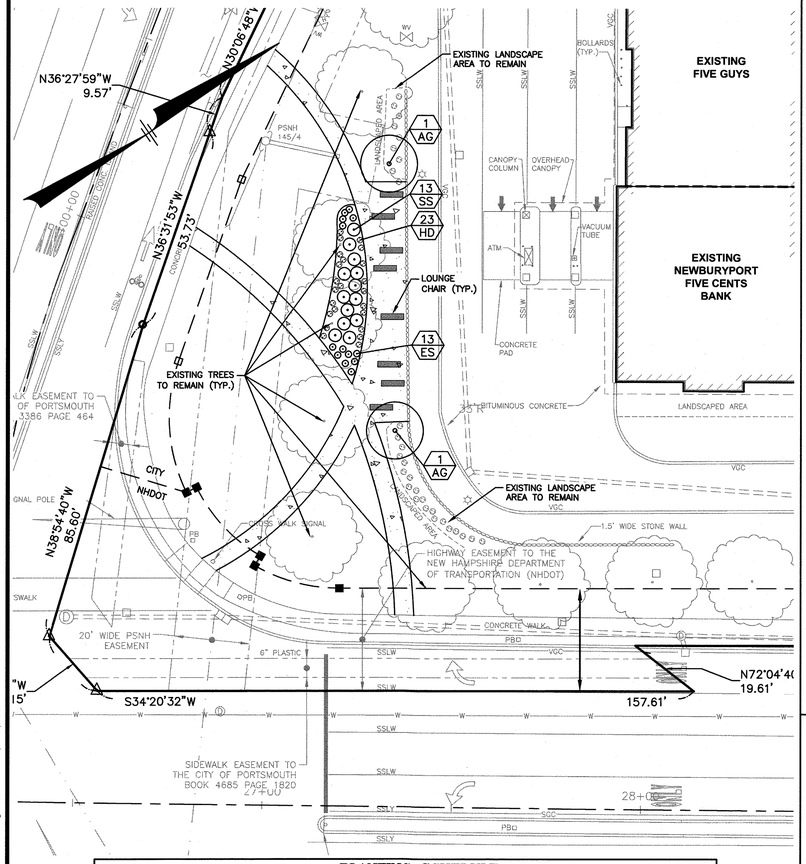
LANDSCAPE SECTION 'A'

NOT TO SCALE



LANDSCAPE SECTION 'B'

NOT TO SCALE



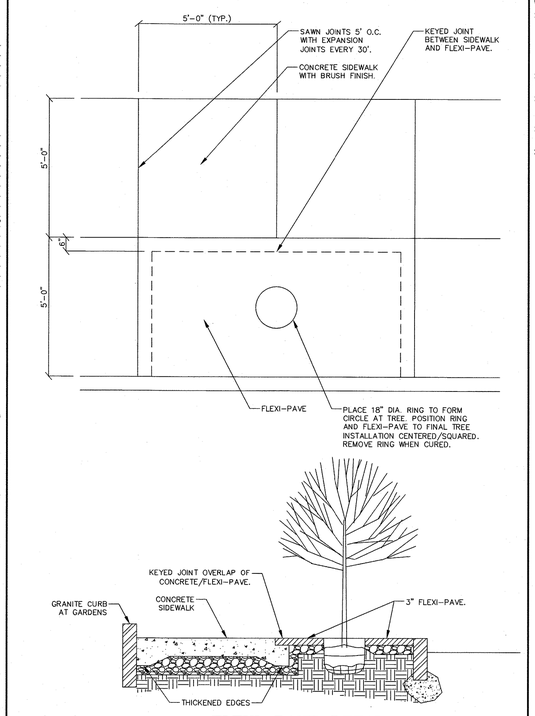
PLANTING SCHEDULE

PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES					
AG	2	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	6' – 7' HT.	MULTI-STEM
PERENNIALS & GRASSES					
HD	23	HEMEROCALLIS 'STELLA DE ORO'	DWARF YELLOW DAYLILY	#1 CONTAINER	
ES	13	ERAGROSTIS SPECTABILIS	PURPLE LOVE GRASS	#1 CONTAINER	
SS	13	SCHIZACHYRIUM S. 'PRAIRIE BLUES'	LITTLE BLUESTEM PRAIRIE BLUES	#1 CONTAINER	

1 / XX — PLANT QUANTITY / PLANT DESIGNATION

PEVERLY HILL RD & LAFAYETTE RD LANDSCAPE DETAIL

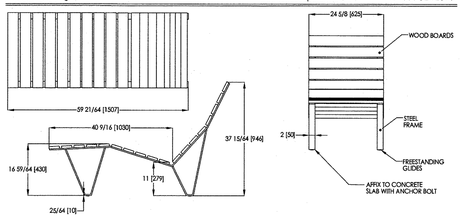
1"=20'



FLEXI-PAVE DETAIL

NOT TO SCALE

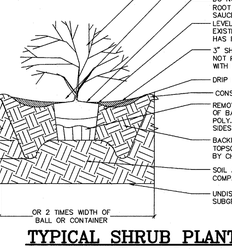
Harpo chaise lounge, freestanding/surface mount — Product Drawing — www.landscapeforms.com — Date: 6/6/2018 — Ph: 800.521.2546



landscapeforms Drawing: AX301-01 Dimensions are in inches [mm]

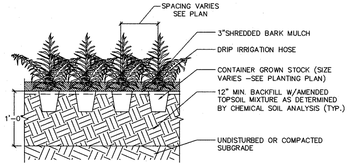
LOUNGE DETAIL

NOT TO SCALE



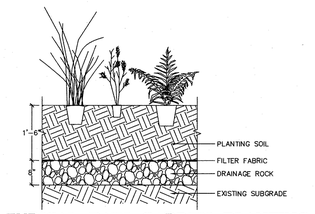
TYPICAL SHRUB PLANTING

NOT TO SCALE



TYPICAL SHRUB PLANTING

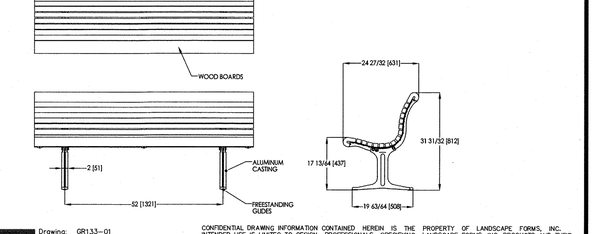
NOT TO SCALE



TYPICAL RAIN GARDEN PLANTING

NOT TO SCALE

Gretchen™ Bocked Bench 72in, Freestanding / Surface Mount, Wood — Product Drawing — www.landscapeforms.com — Date: 6/29/2011 — Ph: 800.521.2546



landscapeforms Drawing: GR133-01 Dimensions are in inches [mm]

TYPICAL BENCH DETAIL

NOT TO SCALE

NO.	DESCRIPTION	BY	DATE
5	MISC. REVISIONS	CMT	4/15/22
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

LANDSCAPE DETAILS

ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

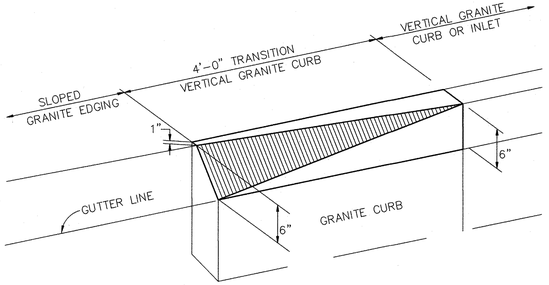
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYMULA No.17078 – PROFESSIONAL ENGINEER – LICENSED – 4/19/22

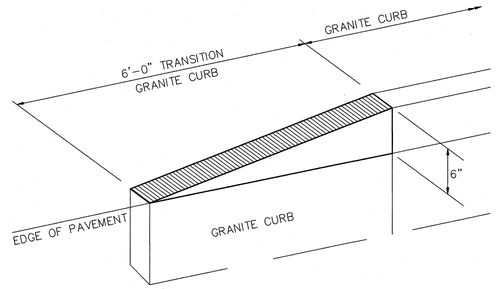
GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: AS SHOWN	DATE: JANUARY 20, 2020		DRAWING NO. 4582_SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	10 OF 15

F:\Projects\CAD\458219\4582_SP.dwg LA DET 4/19/22 11:31am sbonfanti

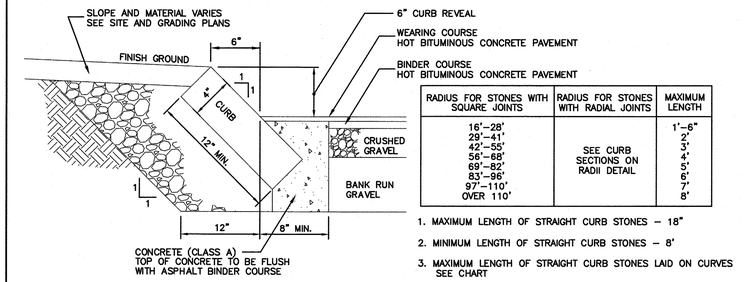


CURB TRANSITION DETAIL
NOT TO SCALE



CURB TRANSITION DETAIL
NOT TO SCALE

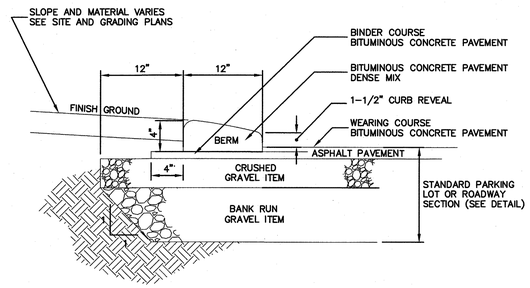
TO BE USED FOR TRANSITION FROM GRANITE CURB TO EDGE OF PAVEMENT



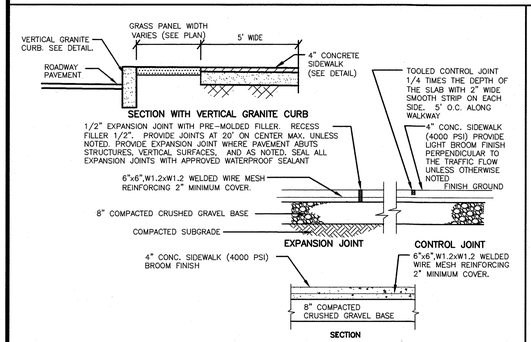
RADIUS FOR STONES WITH SQUARE JOINTS	RADIUS FOR STONES WITH RADIAL JOINTS	MAXIMUM LENGTH
16'–28'	SEE CURB SECTIONS ON RADII DETAIL	1'–6"
29'–41'		2'
42'–55'		3'
56'–68'		4'
69'–82'		5'
83'–96'		6'
97'–110'		7'
OVER 110'		8'

1. MAXIMUM LENGTH OF STRAIGHT CURB STONES – 18'
2. MINIMUM LENGTH OF STRAIGHT CURB STONES – 8'
3. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES SEE CHART
4. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
5. SEE PAVEMENT DETAIL FOR SPECIFICATIONS ON PAVEMENT AND GRAVEL.

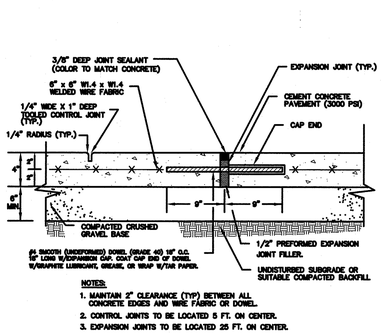
SLOPED GRANITE CURB ON–SITE
NOT TO SCALE



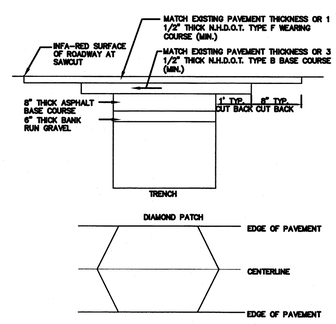
BITUMINOUS CONCRETE BERM DETAIL
NOT TO SCALE



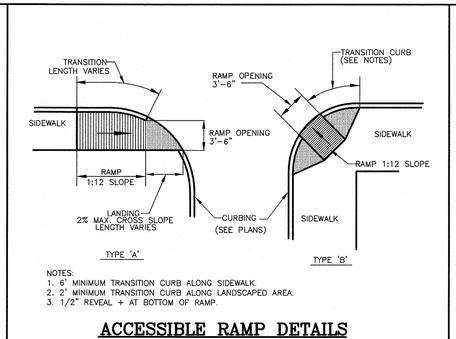
CEMENT CONCRETE SIDEWALK DETAIL IN ROW
NOT TO SCALE



CEMENT CONCRETE SIDEWALK
NOT TO SCALE

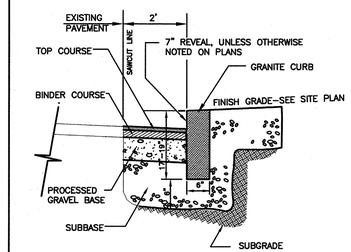


TYPICAL PAVEMENT REPAIR DETAIL IN ROW
NOT TO SCALE

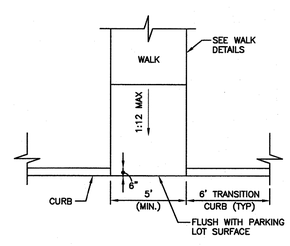


NOTES:
1. 6' MINIMUM TRANSITION CURB ALONG SIDEWALK.
2. 2' MINIMUM TRANSITION CURB ALONG LANDSCAPED AREA.
3. 1/2" REVEAL + AT BOTTOM OF RAMP.

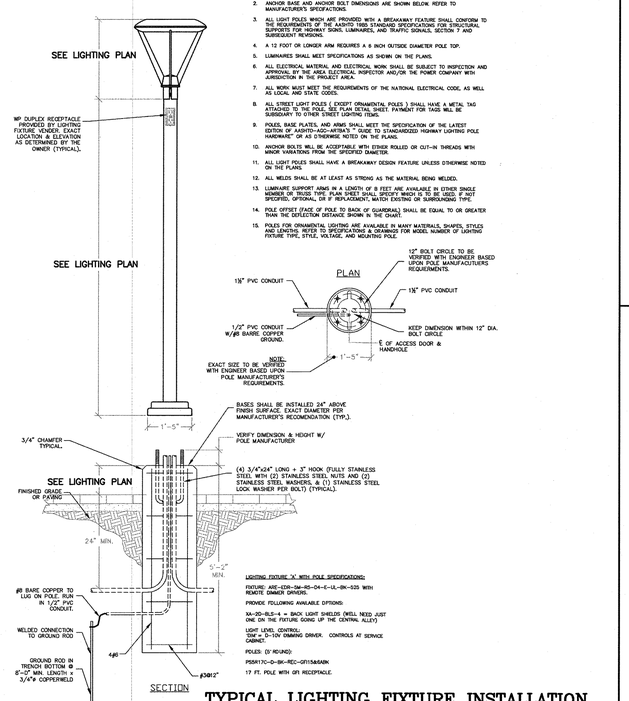
ACCESSIBLE RAMP DETAILS AT SIDEWALK IN R.O.W.
NOT TO SCALE



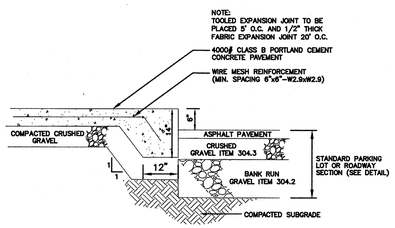
VERTICAL GRANITE CURB–IN ROW
NOT TO SCALE



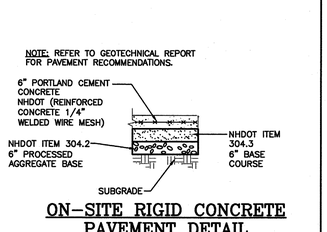
ON–SITE ACCESSIBLE RAMP
NOT TO SCALE



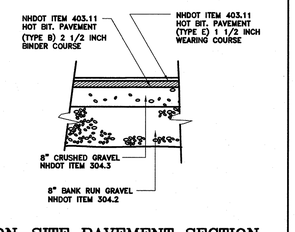
TYPICAL LIGHTING FIXTURE INSTALLATION
NOT TO SCALE



MONOLITHIC CURB/SIDEWALK
NOT TO SCALE

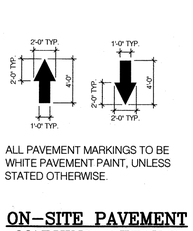


ON–SITE RIGID CONCRETE PAVEMENT DETAIL
NOT TO SCALE



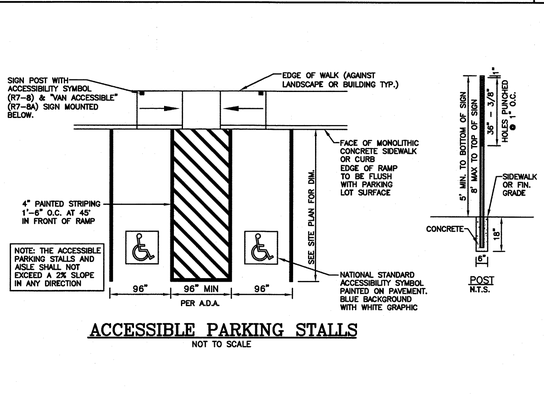
ON–SITE PAVEMENT SECTION FOR PARKING AREAS
NOT TO SCALE

ON–SITE CROSSWALK STRIPING DETAIL
NOT TO SCALE

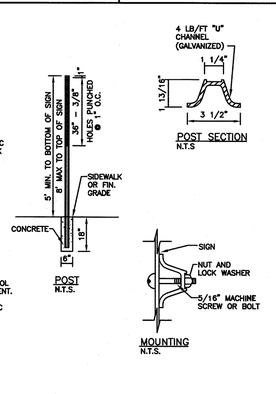


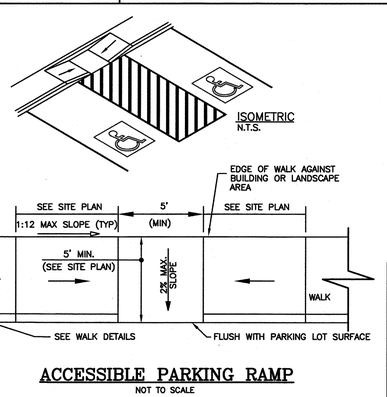
ALL PAVEMENT MARKINGS TO BE WHITE PAVEMENT PAINT, UNLESS STATED OTHERWISE.

ON–SITE PAVEMENT MARKING DETAILS
NOT TO SCALE



ACCESSIBLE PARKING STALLS
NOT TO SCALE





ACCESSIBLE PARKING RAMP
NOT TO SCALE

NO.	DESCRIPTION	BY	DATE
	REVISIONS		
2	UPDATE ADDRESS	CMT	4/15/22
1	REMOVE SPEED TABLE DETAIL, ADD ADA SPACE DET.	CMT	3/9/20

DETAIL SHEET

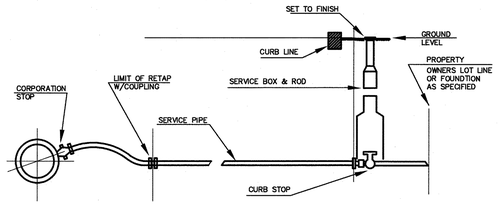
ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYMULA No.17078 LICENSED PROFESSIONAL ENGINEER – 4/6/22

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

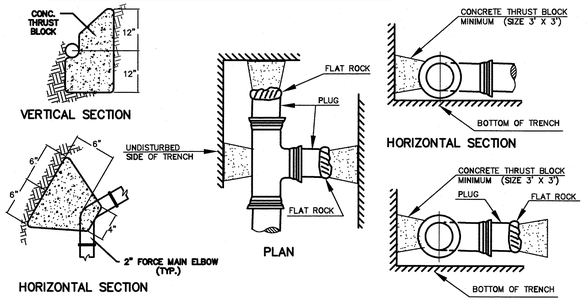
NOT TO SCALE	DATE: JANUARY 20, 2020		DRAWING NO. 4582DET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	11 OF 15



TYPICAL WATER SERVICE CONNECTION

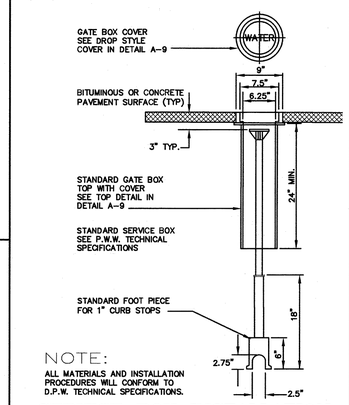
NOT TO SCALE

NOTE: ALL WATER SUPPLY MATERIALS TO MEET OR EXCEED LOCAL WATER WORKS SPECIFICATIONS.



THRUST BLOCK DETAILS

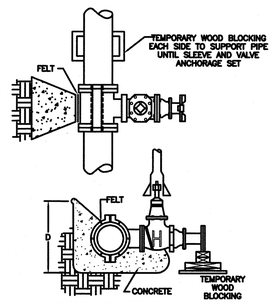
NOT TO SCALE



NOTE:
ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.

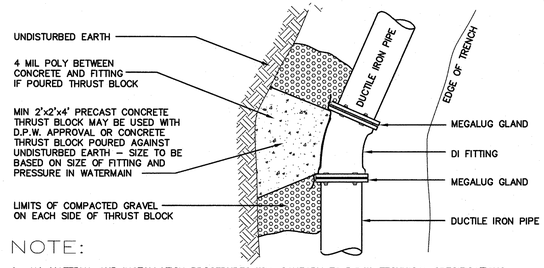
SERVICE BOX INSTALLATION IN PAVEMENT

NOT TO SCALE



TAPPING VALVE AND SLEEVE DETAIL

NOT TO SCALE



NOTE:

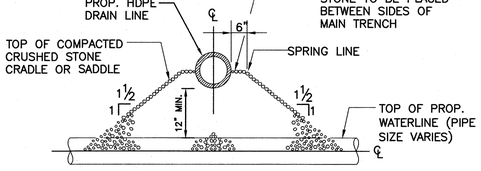
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

TABLE OF DIMENSIONS

PIPE SIZE	90° BEND		45° BEND		22½° BEND		11¼° BEND		TEE&PLUG	
	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.
6"	33"	21"	18"	21"	12"	18"	9"	12"	21"	24"
8"	45"	27"	24"	27"	18"	21"	12"	15"	27"	33"
10"	60"	36"	36"	36"	24"	30"	18"	21"	36"	42"
12"	66"	39"	36"	42"	24"	30"	18"	21"	39"	45"
14"	72"	45"	42"	48"	27"	36"	18"	27"	45"	54"

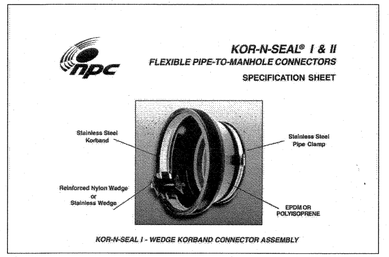
THRUST BLOCKING BEHIND FITTINGS INSTALLATION

NOT TO SCALE



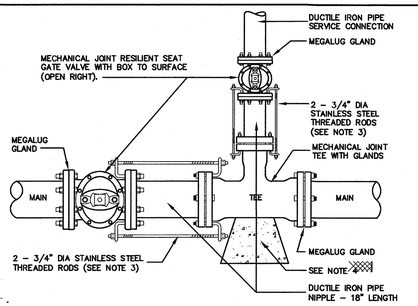
PIPE CROSSING DETAIL

NOT TO SCALE



KOR-N-SEAL DETAIL

NOT TO SCALE

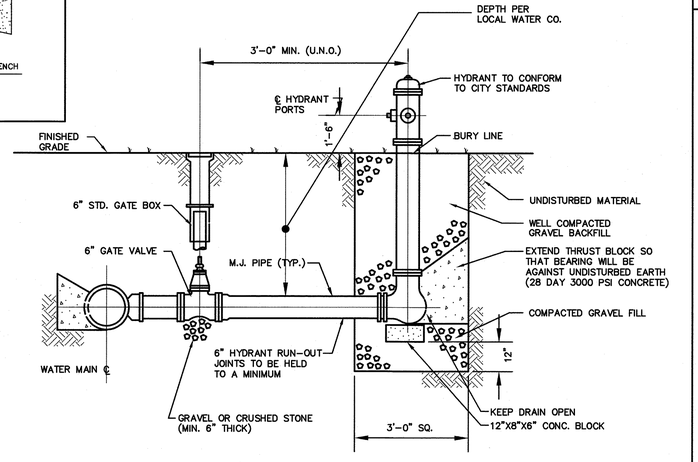


NOTE:

1) ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
2) ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3) ALL THREADED RODS AND NUTS MUST BE STAINLESS STEEL.
4) MIN 2'x2'x4' PRECAST CONCRETE THRUST BLOCK MAY BE USED WITH D.P.W. APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATERMAIN.

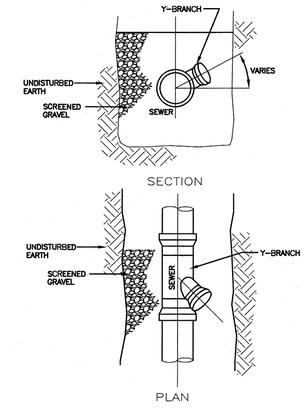
TEE INSTALLATION

NOT TO SCALE



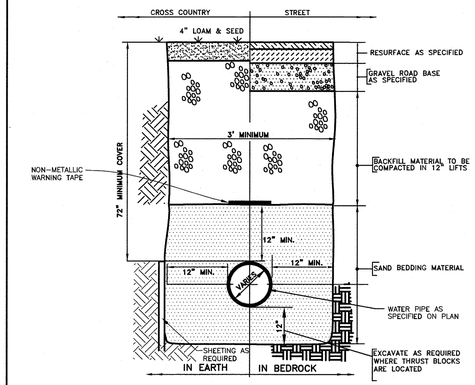
HYDRANT WITH GATE BOX DETAIL

NOT TO SCALE



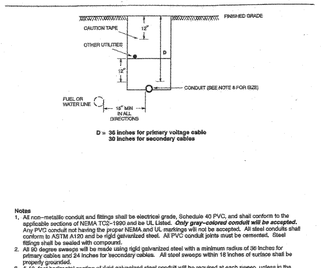
PVC WYE BRANCH

NOT TO SCALE



TYPICAL TRENCH SECTION FOR WATER SERVICE

NOT TO SCALE

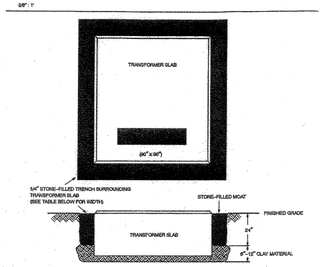


D = 36 inches for primary voltage cable
30 inches for secondary cables

Notes
1. All non-metallic conduit and fittings shall be electrical grade, Schedule 40 PVC, and shall conform to the applicable sections of NEMA TC6-1990 and be UL Listed. *Only gray-colored conduit will be accepted.* Any PVC conduit not having the proper NEMA and UL markings will not be accepted. All steel conduits shall conform to ASTM A120 and be rigid galvanized steel. All PVC conduit joints must be cemented. Steel fittings shall be sealed with compound.
2. All 90 degree sweeps will be made using rigid galvanized steel with a minimum radius of 36 inches for primary cables and 24 inches for secondary cables. All steel sweeps within 18 inches of surface shall be primary cable sized.
3. A 10-foot horizontal section of rigid galvanized steel conduit will be required at each sweep, unless in the opinion of the PSNH designer, the sweep-PVC joint is not subject to failure during cable pulling.
4. The conduit should cross paved areas at approximately 90 degrees.
5. Backfill may be made with excavated material or comparable, unless material is deemed unsuitable by PSNH. Backfill shall be free of frozen lumps, rocks, debris, and rubbish. Organic material shall not be used as backfill. Backfill shall be thoroughly compacted in 6-inch layers.
6. A suitable pulling string, capable of 500 pounds of pull, must be installed in the conduit before PSNH is notified to install cable. The string should be blown into the conduit after the run is assembled to avoid bonding the string to the conduit.
7. Routing of the conduit and inspection prior to backfill will be provided by PSNH. Installation of the conduit will be inspected by a PSNH supervisor. The PSNH supervisor must be notified two business days prior to backfilling the trench. In the event that a cable cannot be successfully pulled through the completed conduit system due to a construction error, it will be the contractor's responsibility to locate and repair the involved conduit. The contractor will be responsible for all resulting expenses.
8. Normal conduit sizes for PSNH are 3-inch for single-phase primary and secondary voltage cables, 4-inch for three-phase secondary, and 5-inch for three-phase primary.
9. All conduit installations must conform to the current edition of the National Electric Safety Code, state and local codes and ordinances, and where applicable, the National Electric Code.

ORIGINAL ISSUE	PRIMARY CABLE INSTALLATION		
APPROVED	NORTHEAST UTILITIES	CONSTRUCTION STANDARD	DTR 50.102

8



Notes
To calculate dimension of the stone-filled moat:
1. Convert gallons of oil in the transformer to cubic feet: Divide gallons by 7.48 to get cubic feet of oil.
2. Divide this number by 0.85 to determine the volume of stone-filled moat required.
3. From the table below select the width necessary to contain the oil.

Volume in Cubic Feet of 24" Deep Stone-Filled Moat

Width of Moat (Feet)	Slab Dimensions in Inches		
	66 x 90	60 x 82	90 x 96
1	47	65	70
2	109	147	158
3	188	244	256

ORIGINAL ISSUE	OIL DETENTION FOR PAD-MOUNTED TRANSFORMERS		
APPROVED	NORTHEAST UTILITIES	CONSTRUCTION STANDARD	DTR 58.311

11

83 101

REQUIREMENTS FOR PADMOUNTED TRANSFORMER SLAB DETAILS

Preparation of Slab

1. Remove all organic topsoil under foundation and compact native material. Backfill, if necessary, with clean well compacted gravel.
2. Concrete shall have a minimum compressive strength of 3,500 PSI at 28 days.
3. All reinforcing bars shall meet A.S.T.M. #615 grade 60 specifications.
4. All reinforcing shall be tied as one unit.
5. Minimum concrete cover over reinforcing steel shall be 3 inches.
6. Top of slab shall be no more than 6 inches above ground level.
7. Chamfer all exposed concrete edges 1 inch.
8. Top of slab shall have a wood float finish.

Notes

1. Elbows should be cut 4 inches above bottom of concrete pad, surrounded with sand, and have a protective cap bushing on them.
2. A 1 inch PVC conduit sleeve shall be incorporated into concrete slab to allow ground grid leads to enter pit openings as shown on details.
3. Installation of Padmount Equipment Grounding Grid is outlined in Construction Standard DTR 56.223 (page 16 of this publication)

Public Service of New Hampshire	CONSTRUCTION REQUIREMENT	ISSUE	DATE
		Original	2/1/00
		Rev.	1/4/06

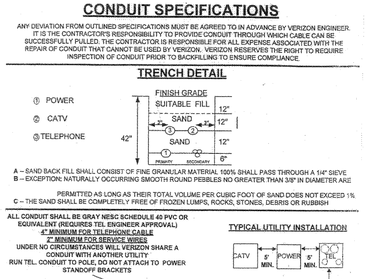
15

ENGINEER: Michael Mullen
TELEPHONE: 603-645-2715

CONDUIT SPECIFICATIONS

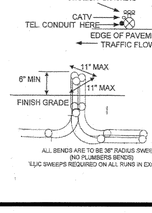
ANY DEVIATION FROM OUTLINED SPECIFICATIONS MUST BE AGREED TO IN ADVANCE BY VERIZON ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE CONDUIT THROUGH WHICH CABLE CAN BE SUCCESSFULLY PULLED. THE CONTRACTOR IS RESPONSIBLE FOR ALL EXPENSE ASSOCIATED WITH THE REPAIR OF CONDUIT THAT CANNOT BE USED BY VERIZON. VERIZON RESERVES THE RIGHT TO REQUIRE INSPECTION OF CONDUIT PRIOR TO BACKFILLING TO ENSURE COMPLIANCE.

TRENCH DETAIL

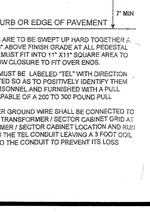


A - SAND BACK FILL SHALL CONSIST OF FINE GRANULAR MATERIAL 100% SHALL PASS THROUGH A 1/4" SIEVE
B - EXCEPTION: NATURALLY OCCURRING SMOOTH ROUND PEBBLES NO GREATER THAN 3/8" IN DIAMETER ARE PERMITTED AS LONG AS THEIR TOTAL VOLUME PER CUBIC FOOT OF SAND DOES NOT EXCEED 1%
C - THE SAND SHALL BE COMPLETELY FREE OF FROZEN LUMPS, ROCKS, STONES, DEBRIS OR RUBBISH

ALL CONDUIT SHALL BE GRAY NESC SCHEDULE 40 PVC OR EQUIVALENT (REQUIRES TEL ENGINEER APPROVAL)
4" MINIMUM FOR TELEPHONE CABLE
2" MINIMUM FOR SERVICE WIRES
UNDER NO CIRCUMSTANCES WILL VERIZON SHARE A CONDUIT WITH ANOTHER UTILITY
RUN TEL. CONDUIT TO POLE, DO NOT ATTACH TO POWER
STANDOFF BRACKETS



TYPICAL UTILITY INSTALLATION



ALL CONDUITS ARE TO BE SWEPT UP HARD TOGETHER A MINIMUM OF 6" ABOVE FINISH GRADE AT ALL PEDESTAL LOCATIONS & MUST FIT INTO 11" X11" SQUARE AREA TO ALLOW CLOSURE TO FIT OVER ENDS.

ALL CONDUITS MUST BE LABELED "TEL" WITH DIRECTION OF RUN INDICATED SO AS TO POSITIVELY IDENTIFY THEM FOR OUR PERSONNEL AND FURNISHED WITH A PULL STRING CAPABLE OF A 200 TO 300 POUND PULL.

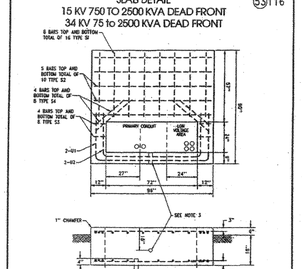
A #6 AWG COPPER GROUND WIRE SHALL BE CONNECTED TO THE POWER CO. TRANSFORMER / SECTOR CABINET GRID AT EACH TRANSFORMER / SECTOR CABINET LOCATION AND RUN FROM THERE TO THE TEL CONDUIT LEAVING A 3 FOOT COIL SECURED TO THE CONDUIT TO PREVENT ITS LOSS.

Public Service of New Hampshire	CONSTRUCTION REQUIREMENT	ISSUE	DATE
		Original	2/1/00
		Rev.	1/4/06

19

3 Ø PADMOUNTED TRANSFORMER SLAB DETAIL
15 KV 750 TO 2500 KVA DEAD FRONT
34 KV 75 to 2500 KVA DEAD FRONT

53116



NOTES:
1. SEE PSNH 101 REQUIREMENTS FOR SLAB DETAILS.
2. SEE DTR 56.223 FOR GROUNDING GRID.
3. 1" PVC CONDUIT FOR GROUND LEADS.
4. ALL REBAR TO BE #5?.
5. CONDUITS EXIT 4" ABOVE BASE OF SLAB.

REINFORCING SCHEDULE

TYPE	NO.	LENGTH	TOTAL
S1	16	4'-0"	72'-0"
S2	10	7'-6"	75'-0"
S3	6	9'-0"	4'-0"
S4	6	7'-0"	18'-0"

CONC. VOLUME=14.44 c.y.
TOP SECTION ONLY

Public Service of New Hampshire	CONSTRUCTION REQUIREMENT	ISSUE	DATE
		Original	2/1/00
		Rev.	1/4/06

19

NO.	DESCRIPTION	BY	DATE
1	UPDATE ADDRESS	CMT	4/15/22
	REVISIONS		

DETAIL SHEET

ASSESSORS MAP 252 - LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE
CHRISTOPHER M. TYNULA No.17078
PROFESSIONAL LICENSED ENGINEER
4/18/22

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

NOT TO SCALE	DATE: JANUARY 20, 2020		DRAWING NO. 458ZDET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	12 OF 15

F:\Projects\CAD\458219\458ZDET.dwg DET 2 4/19/22 11:55am sbonfonti

NOTES

1. MINIMUM SIZE PIPE FOR HOUSE SERVICE SHALL BE 4 INCHES.
2. PIPE AND JOINT MATERIALS

A. VITRIFIED CLAY PIPE
   1. PIPE AND FITTINGS SHALL BE EXTRA STRENGTH CLAY PIPE CONFORMING TO THE REQUIREMENTS OF ASTM C-700.
   2. JOINTS SHALL BE MADE WITH OIL RESISTANT GASKETS IN ACCORDANCE WITH ASTM C-425 TYPE III MANUFACTURERS INSTRUCTIONS FOR INSTALLATION SHALL BE FOLLOWED.

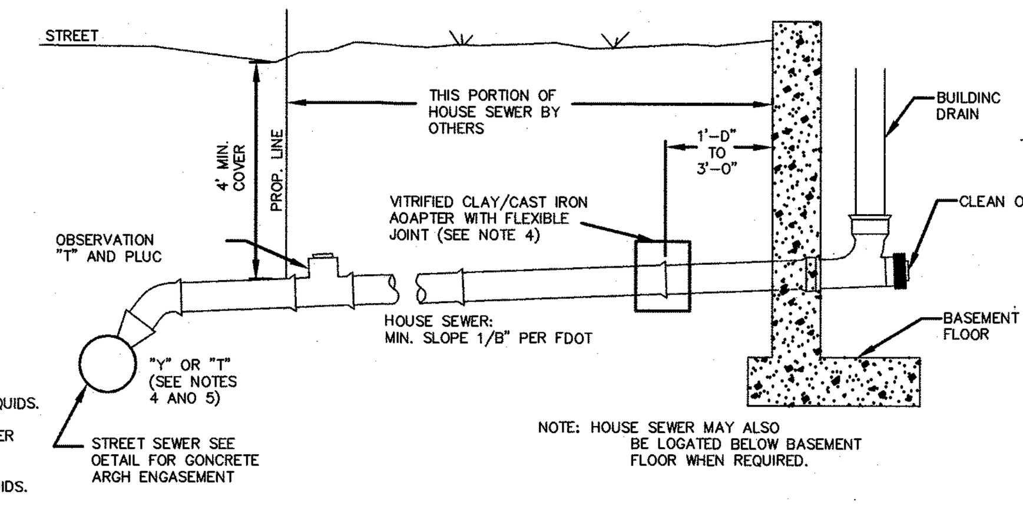
B. ASBESTOS-CEMENT-NON-PRESSURE SEWER PIPE
   1. PIPE AND FITTINGS SHALL CONFORM TO ASTM TENTATIVE SPECIFICATIONS C644 TYPE II.
   2. JOINTS SHALL BE OF THE SLEEVE-COUPLING TYPE CONFORMING TO ASTM SPECIFICATIONS C644 TYPE II. COMPRESSION RINGS SHALL BE OF OIL RESISTANT RUBBER TYPE OR ELASTOMERIC MATERIAL AND SHALL CONFORM TO ASTM SPECIFICATION D1869. MANUFACTURERS INSTRUCTIONS SHALL BE FOLLOWED FOR INSTALLATIONS.

C. CAST IRON PIPE FITTINGS AND JOINTS
   1. CAST IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN NATIONAL STANDARDS INSTITUTE:
      A21.1 THICKNESS DESIGN OF CAST IRON PIPE
      A21.4 CEMENT MORTAR LINING FOR CAST IRON PIPE AND FITTINGS
      A21.6 CAST IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS FOR WATER OR OTHER LIQUIDS.
      A21.8 CAST IRON PIPE CENTRIFUGALLY CAST IN SAND LINED MOLDS FOR WATER OR OTHER LIQUIDS.
      A21.10 CAST IRON FITTINGS, 2 INCHES THROUGH 48 INCHES FOR WATER AND OTHER LIQUIDS.
   2. JOINTS SHALL BE OF THE MECHANICAL OR PUSH ON TYPE JOINTS AND GASKETS SHALL CONFORM TO:
      A21.11 RUBBER GASKET JOINTS FOR CAST IRON PRESSURE PIPE AND FITTINGS.

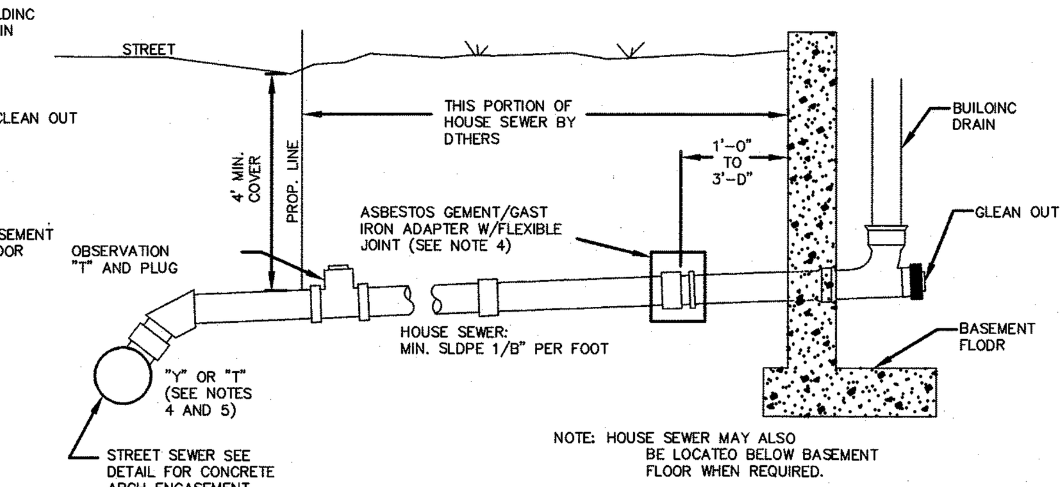
D. DUCTILE IRON PIPE, FITTINGS AND JOINTS
   1. DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE STANDARDS OF THE UNITED STATES OF AMERICA STANDARDS INSTITUTE:
      A21.50 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A536 DUCTILE IRON CASTINGS
      A21.51 DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND LINED MOLDS FOR WATER OR OTHER LIQUIDS.
   2. JOINTS SHALL BE AS SPECIFIED IN C2 ABOVE, CAST IRON PIPE JOINTS.

3. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.
4. JOINTS SHALL BE BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATERTIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER "Y" OR AT THE FOUNDATION WALL, APPROPRIATE ADAPTERS SHALL BE USED.
5. "T" AND "Y" WHERE A "T" OR "Y" IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE IN THE SEWER, FOLLOWING MANUFACTURERS INSTRUCTIONS (USING A BOLTED, CLAMPED OR EPOXY CEMENTED SADDLE TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING. THE PRACTICE OF BREAKING AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH (OR OTHER SUCH MATERIAL) AROUND THE JOINT, OR APPLYING MORTAR TO HOLD THE CONNECTION AND ANY OTHER SIMILAR CRUDE PRACTICES OR INEPT OR HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED, AS SHOWN IN THE DETAIL, UP TO AND INCLUDING 15" DIAMETER.
6. PIPE INSTALLATION THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER. IT SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL, AS SPECIFIED IN NOTE 10, BEDDING AND RE-FILL FOR A DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH APPROPRIATE MECHANICAL DEVICES.

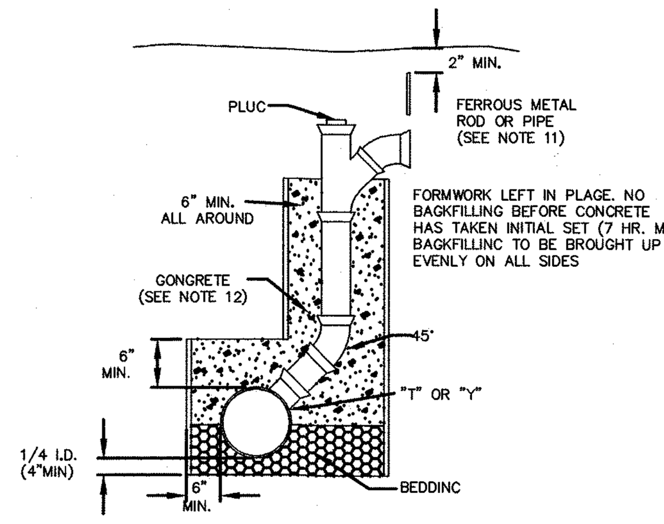
   THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE HOUSE FOUNDATION AT A GRADE OF NOT LESS THAN 1/8 INCH PER FOOT. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.
7. TESTING THE COMPLETED HOUSE SEWER SHALL BE SUBJECTED TO A LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS (PRIOR TO BACKFILLING):
   A. AN OBSERVATION "T" SHALL BE INSTALLED AS SHOWN. WHEN READY TESTING, AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE "T". AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.
   B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS. IF THE TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEANOUT WITH A FLASHLIGHT.
   * DOES NOT APPLY TO INSTALLATIONS WHERE "T's" AND "Y's" ARE USED
   C. FLUORESCENT DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER. IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST MANHOLE DOWNSTREAM. LEAKAGE OBSERVED IN ANY OF THE ABOVE, ALTERNATE TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE AND THE PIPE SHALL BE DUG UP, IF NECESSARY, AND RELAID SO AS TO ASSURE WATERTIGHTNESS.
8. ILLEGAL CONNECTION NOTHING BUT SANITARY WASTE FLOW FROM THE HOUSE TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR ANY OTHER SIMILAR CONNECTION CARRYING RAIN WATER, DRAINAGE OR GROUND WATER SHALL NOT BE PERMITTED.
9. HOUSE WATER SERVICE SHOULD NOT BE LAID IN THE SAME TRENCH AS THE SEWER SERVICE, BUT WHEN NECESSARY, SHALL BE PLACED ABOVE AND TO ONE SIDE OF THE HOUSE SEWER AS SHOWN.
10. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL AND MEETING ASTM C33-67.
    100%-PASSING 1 INCH SCREEN; 90-100%-PASSING 3/4 INCH SCREEN
    20-55%-PASSING 3/8 INCH SCREEN; 0-10%-PASSING #4 SIEVE
    0-5%-PASSING #8 SIEVE
    WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, SCREENED GRAVEL OR CRUSHED STONE (1-1/2 TO 1/2 INCH) SHALL BE USED.
11. LOCATION THE LOCATION OF THE "T" OR "Y" SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE "T" OR "Y", AS DESCRIBED IN THE TYPICAL "CHIMNEY" DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPEFINDER.
12. CONCRETE CONCRETE SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000 PSI) CONCRETE OF THE N.H. DEPT. OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
    CEMENT: 6.0 BAGS/C.Y. WATER: 5.75 GALS./BAG CEMENT
    AGGREGATE: 1-1/2 INCH MAX.
13. CHIMNEYS IF VERTICAL DROP INTO THE SEWER IS GREATER THAN 4 FEET, A CHIMNEY SHALL BE CONSTRUCTED FOR THE HOUSE CONNECTION.



VITRIFIED CLAY SEWER AND HOUSE SEWER

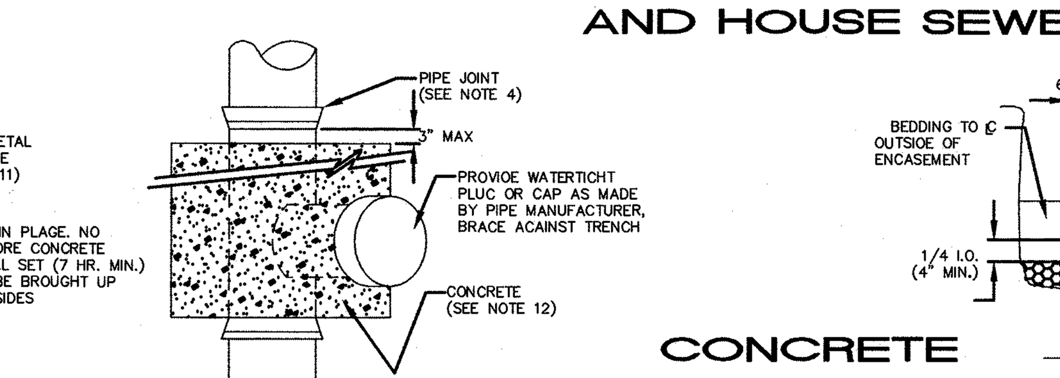


ASBESTOS CEMENT SEWER AND HOUSE SEWER

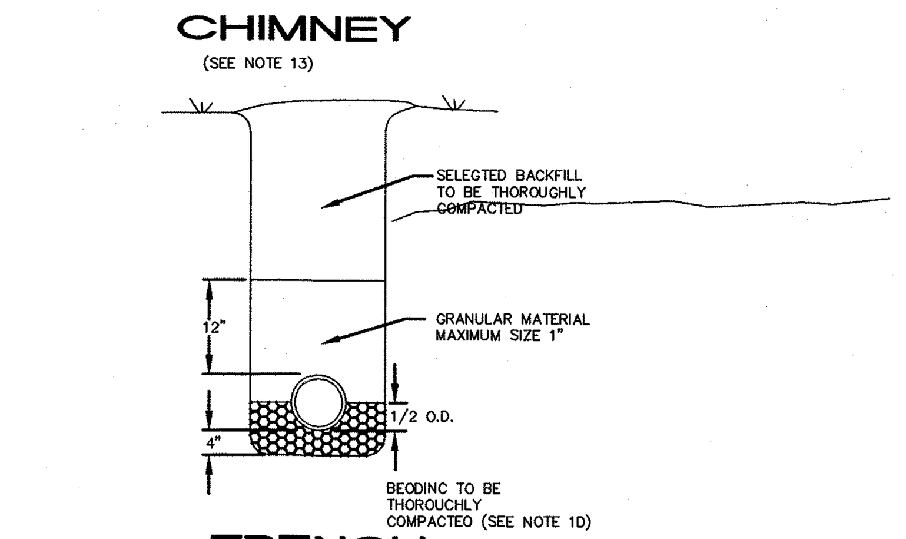


CHIMNEY

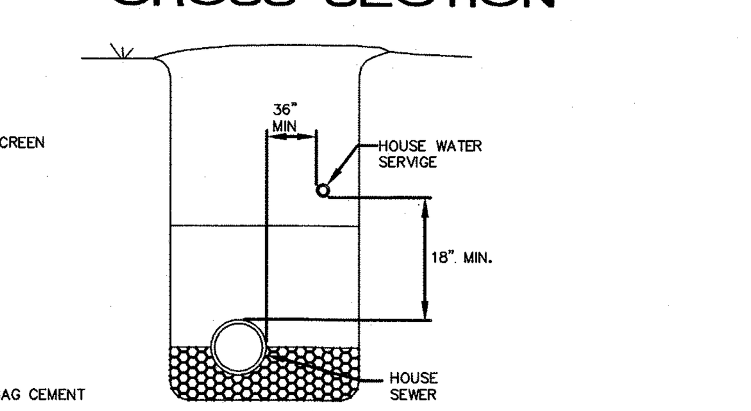
(SEE NOTE 13)



CONCRETE FULL ENCASEMENT



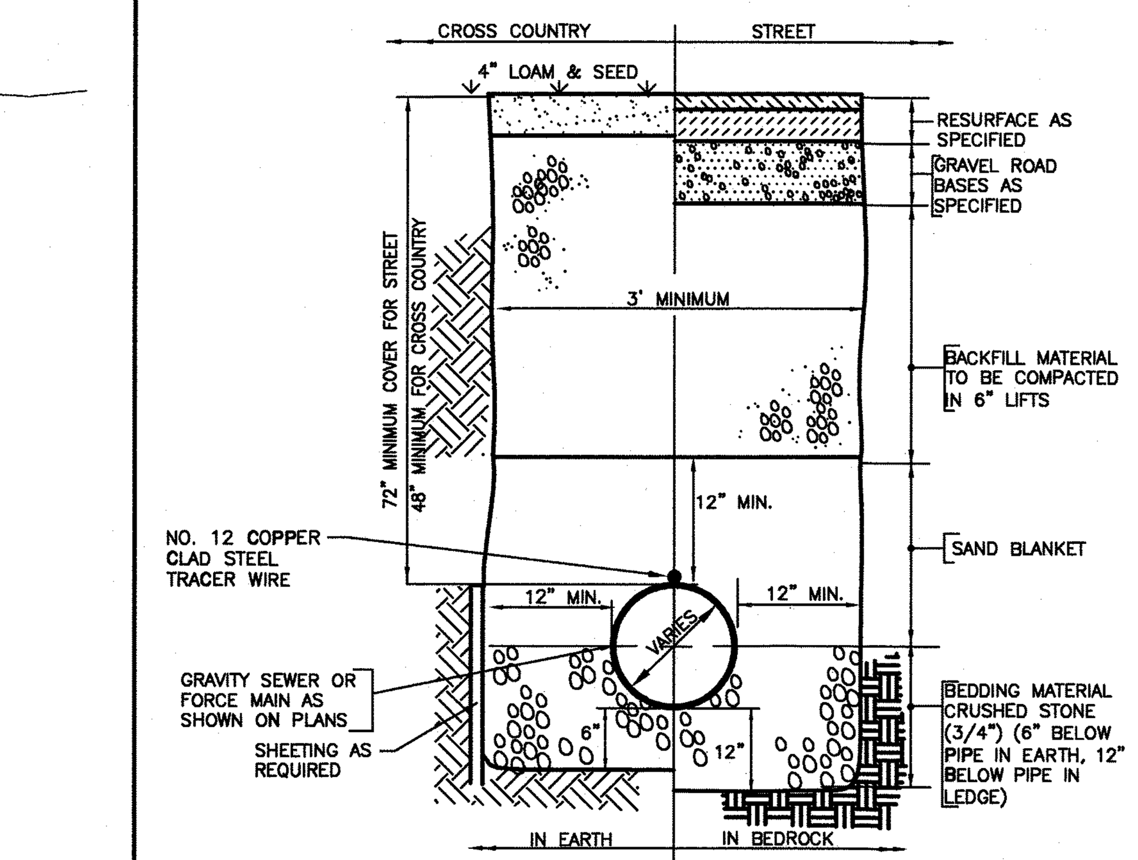
TRENCH CROSS-SECTION



WATER AND SEWER IN SAME TRENCH

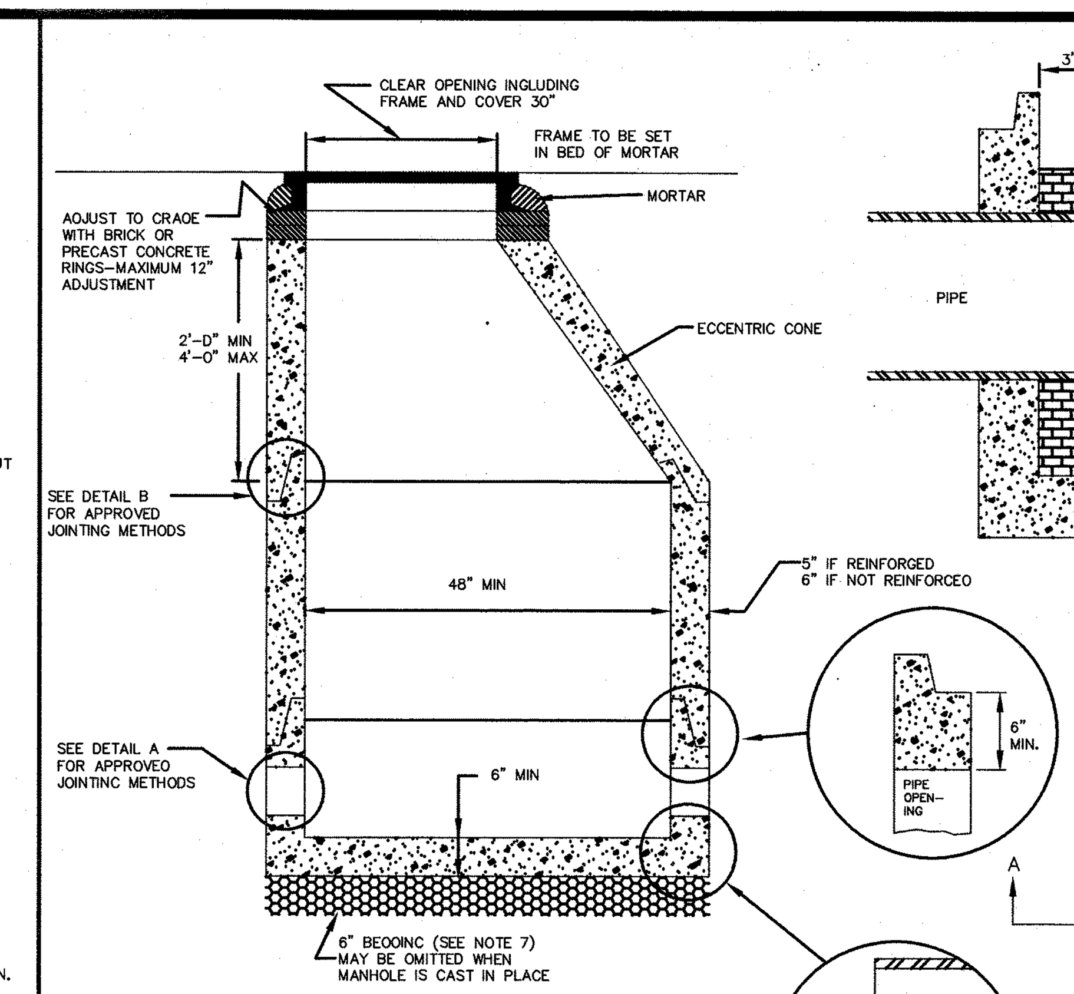
(SEE NOTE 9)

HOUSE SEWER DETAILS

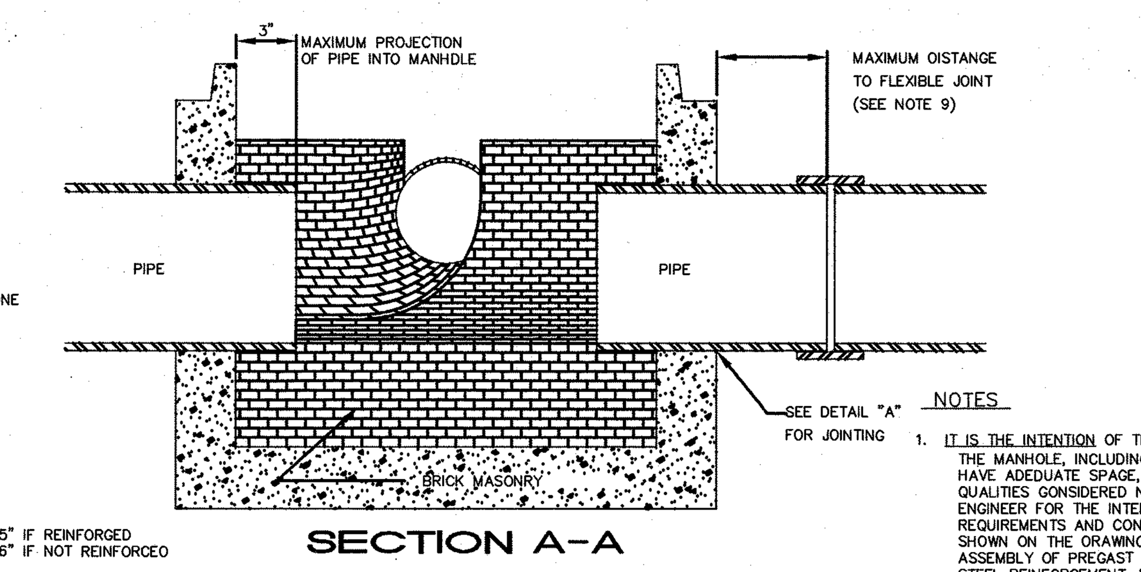


TYPICAL TRENCH SECTION FOR SANITARY SEWER SERVICE

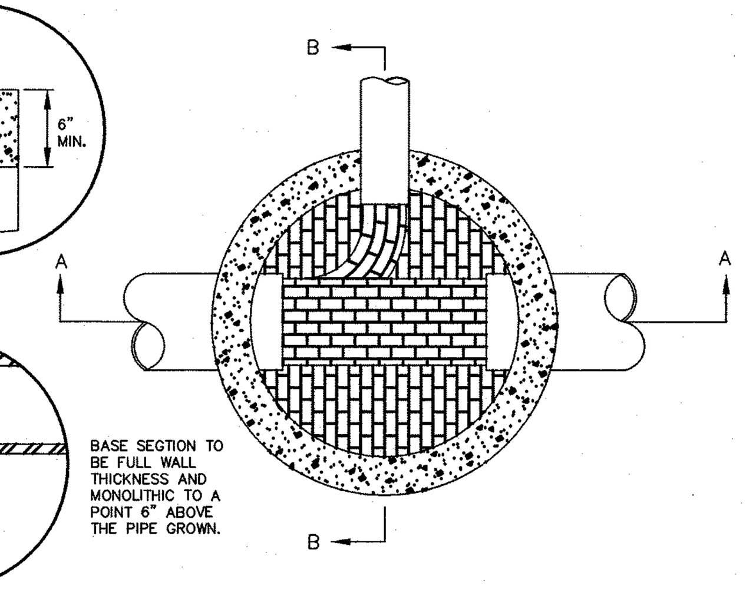
NOT TO SCALE



TYPICAL SECTION

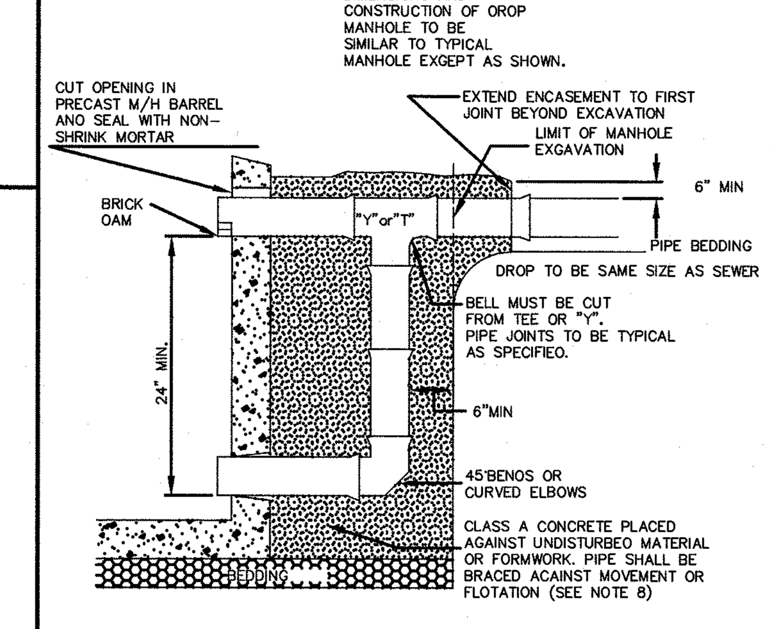


SECTION A-A

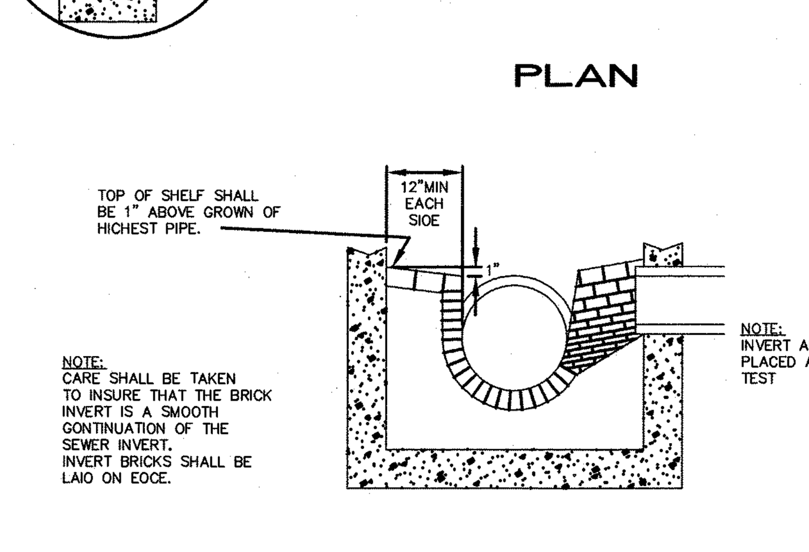


PLAN

NOTE:
DIMENSIONS AND CONSTRUCTION OF DROP MANHOLE TO BE SIMILAR TO TYPICAL MANHOLE EXCEPT AS SHOWN.



DROP MANHOLE

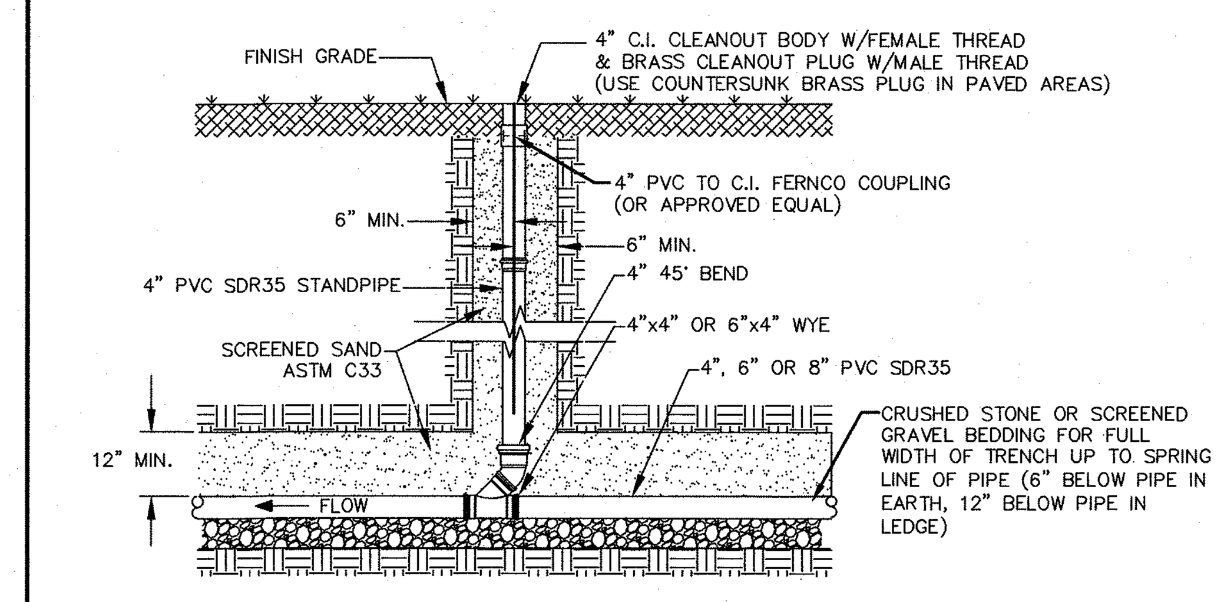


SECTION B-B

NOTES

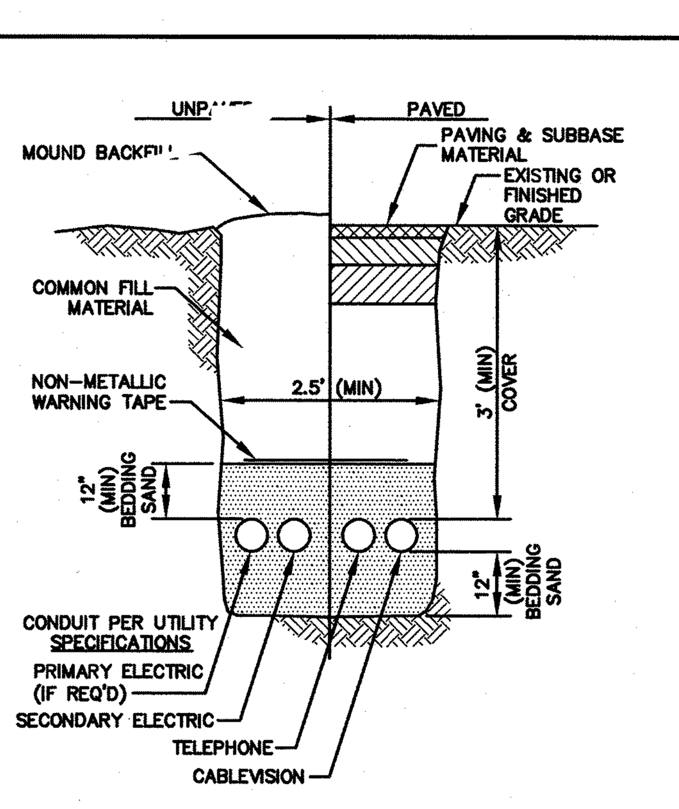
1. IT IS THE INTENTION OF THE ENGINEER THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY BY THE ENGINEER FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H-20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED OR NON-REINFORCED CONCRETE, OR POURED IN PLACE REINFORCED OR NON-REINFORCED CONCRETE.
3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C 478.
4. LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
5. INVERTS AND SHELVES MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE. CROWN AND SLOPE TO DRAIN TOWARD THE FLOW THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
6. FRAMES AND COVERS MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH CLEAR OPENING. A 3 INCH (MINIMUM HEIGHT) LETTER "S" FOR SEWER OR "D" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
7. BEDDING SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33
   100% PASSING 1 INCH SCREEN
   90-100% PASSING 3/4 INCH SCREEN
   20-55% PASSING 3/8 INCH SCREEN
   0-10% PASSING #4 SIEVE
   0-5% PASSING #8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE. SCREENED GRAVEL OR CRUSHED STONE 1-1/2 TO 1/2 INCH SHALL BE USED.
8. CONCRETE FOR DROP SUPPORT SHALL CONFORM TO THE REQUIREMENT FOR CLASS A (3,000 LB.) CONCRETE OF N.H. DEPT. OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG OF CEMENT
   MAX. SIZE OF AGGREGATE: 1 INCH
9. FLEXIBLE JOINT A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:
   RCP & CI PIPE (ALL SIZES): 48"
   AC & VC PIPE (UP THROUGH 12" DIA.): 18"
   AC & VC PIPE (LARGER THAN 12" DIA.): 36"
10. SHALLOW MANHOLE IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED. IT MUST HAVE AN ECCENTRIC ENTRANCE OPENING AND BE CAPABLE OF SUPPORTING H-20 LOADS.

STANDARD MANHOLE - PART A



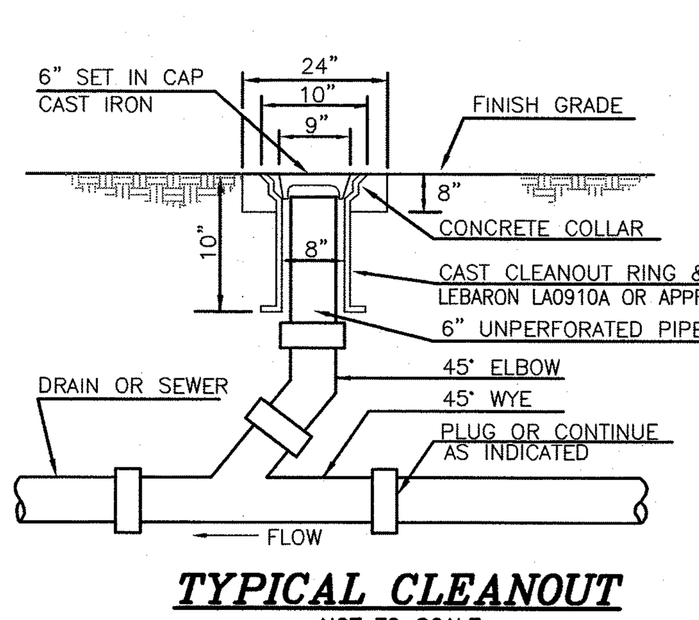
TYPICAL SEWER SERVICE CLEANOUT

NOT TO SCALE



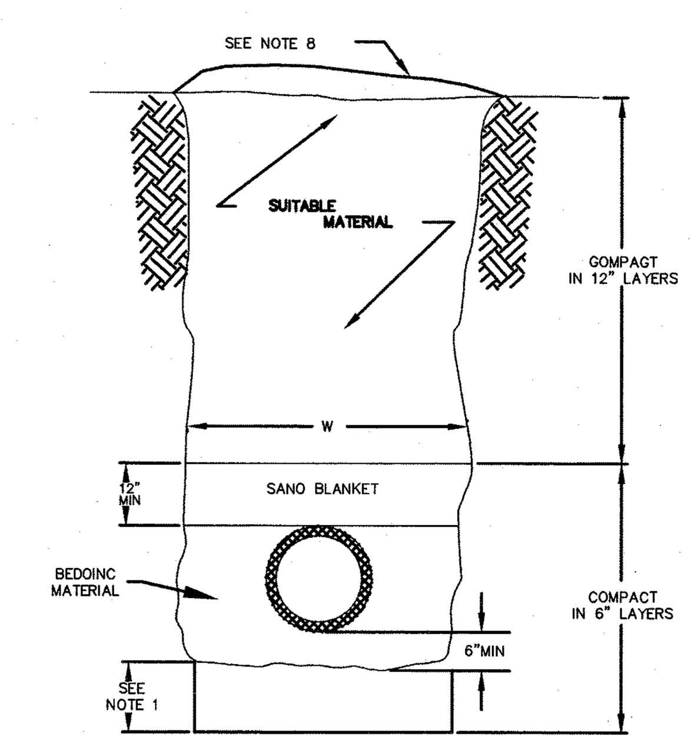
UTILITY TRENCH

NOT TO SCALE

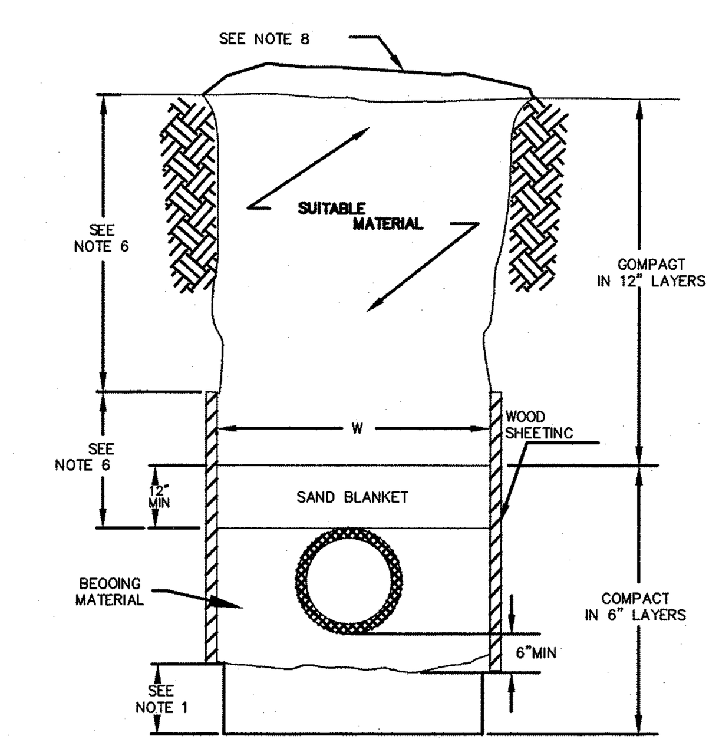


TYPICAL CLEANOUT

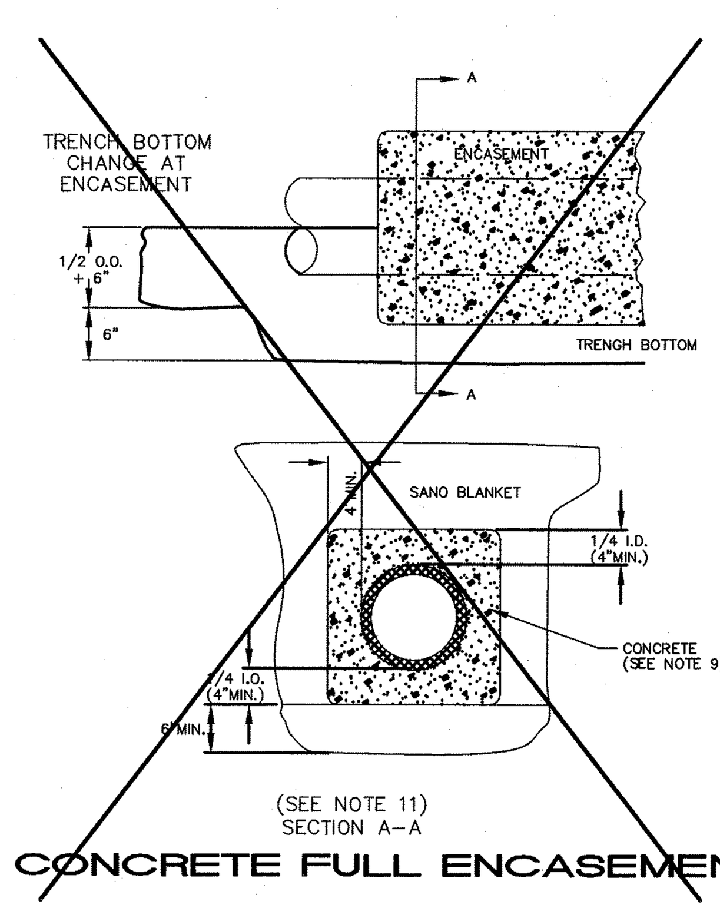
NOT TO SCALE



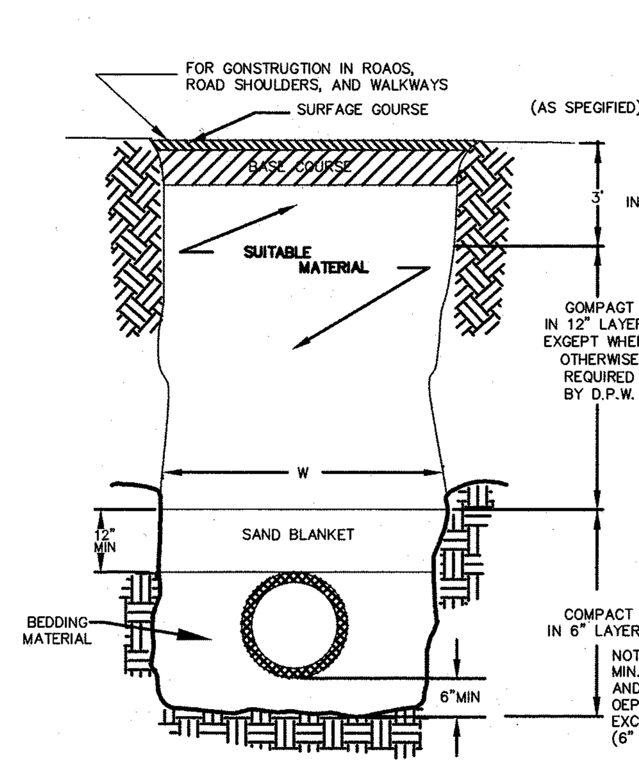
EARTH CONSTRUCTION



EARTH CONSTRUCTION WITH SHEETING



CONCRETE FULL ENCASEMENT



LEDGE CONSTRUCTION

NOTES:

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE, REFILL WITH BEDDING MATERIAL. (SEE ALSO NOTE 7)
2. BEDDING CRUSHED STONE (FINE) FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33. STONE SIZE #67
   100% PASSING 1 INCH SCREEN
   90-100% PASSING 3/4 INCH SCREEN
   20-50% PASSING 3/8 INCH SCREEN
   0-10% PASSING #4 SIEVE
   0-5% PASSING #8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE. GRADED SCREENED GRAVEL OR CRUSHED STONE 1/2 TO 1-1/2 INCH SHALL BE USED.
3. SAND BLANKET CLEAN SAND, FREE FROM ORGANIC MATTER, SO GRADED THAT 90-100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR CAST IRON, DUCTILE IRON AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
4. SUITABLE MATERIAL IN ROADS, ROAD SHOULDERS, WALK WAYS AND TRAVELLED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOPSOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES, OR ANY MATERIAL WHICH AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

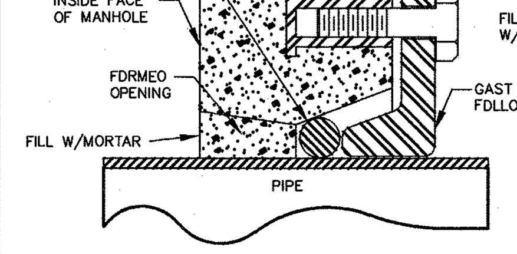
   IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOPSOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE (AND POSSIBLY RECONSTRUCTION, WHEN NECESSARY) WILL BE PRESERVED.
5. BASE COURSE, IF ORDERED BY THE ENGINEER SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE STATE OF N.H. DEPT. OF PUBLIC WORKS AND HIGHWAYS.
6. WOOD SHEETING, IF REQUIRED, IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER. IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE. WHERE THE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISH GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.

   W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES, FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D., W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6
7. INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000#) CONCRETE OF THE N.H. DEPT. OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG OF CEMENT
   MAXIMUM AGGREGATE SIZE: 1 INCH
10. THERE SHALL BE TEN FEET HORIZONTAL SEPARATION BETWEEN SEWER LINE AND WATER MAIN AND 18 INCHES VERTICAL SEPARATION AT CROSSINGS.
    (see also NOTE 12 below)

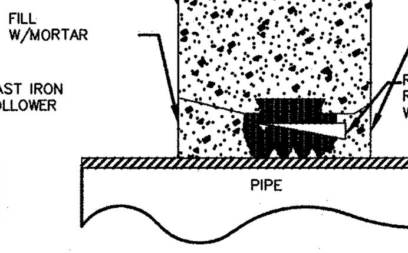
    WHERE THE ABOVE SEPARATION CANNOT BE MADE, A WAIVER OF THE STANDARD OF DESIGN MUST BE REQUESTED FROM THE STANDARD OF DESIGN MUST SEWER COMMISSION.
11. IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MIN). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
12. WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:

    SEWER PIPE SHALL BE CLASS 52 DUCTILE IRON FOR A MINIMUM DISTANCE OF 9 FEET EACH SIDE OF CROSSING.

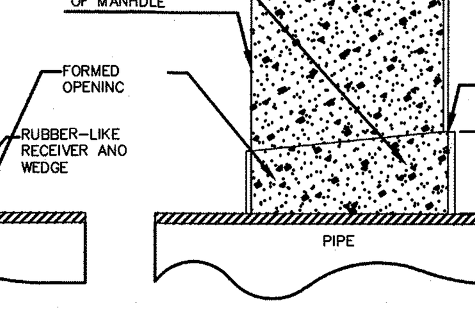
STANDARD TRENCH SECTION



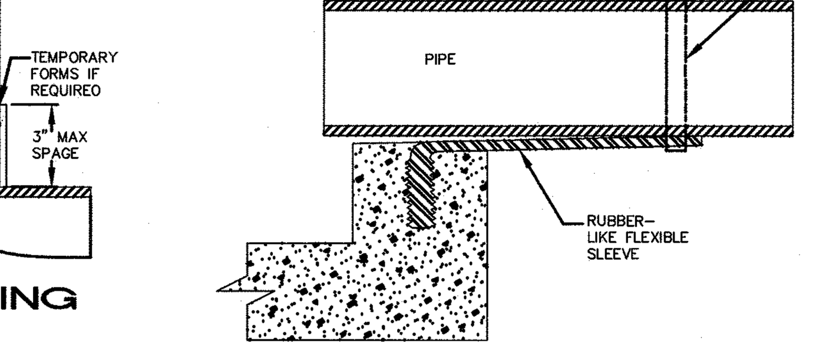
RES-SEAL
(or equal)



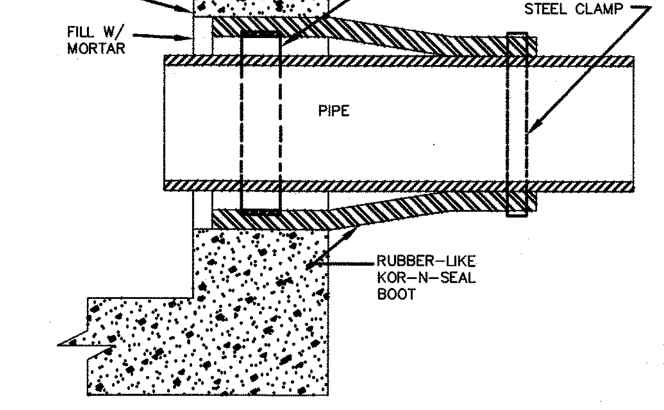
PRESS-WEDGE II
(or equal)



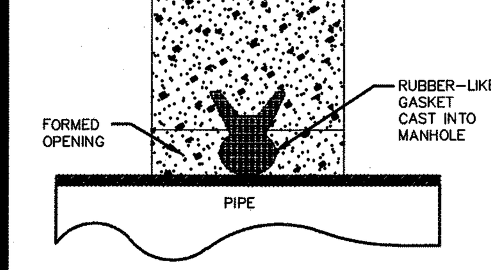
NON-SHRINKING MORTAR
(or equal)



LOCK-JOINT FLEXIBLE MANHOLE SLEEVE
(or equal)



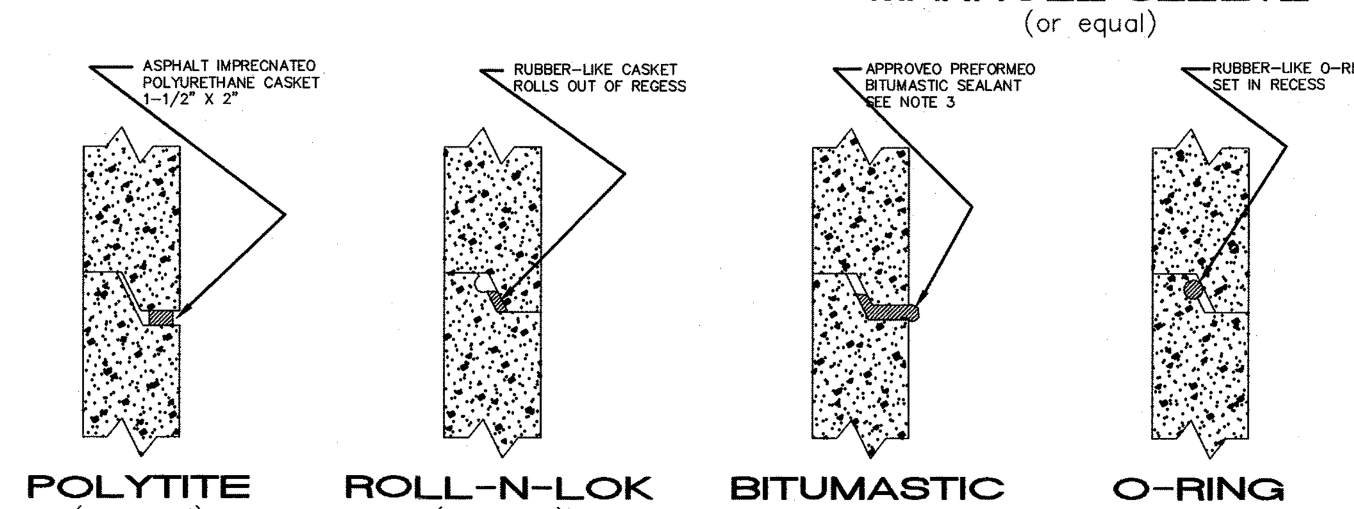
KOR-N-SEAL JOINT SLEEVE
(or equal)



A-LOK
(or equal)

NOTE: ALL GASKETS, SEALANTS, MORTAR ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

DETAIL A



POLYTITE (or equal) | ROLL-N-LOK (or equal) | BITUMASTIC | O-RING

NOTE: ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL B

NOTES

1. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE ENGINEER. WHICH TYPE SHALL BE, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON AN ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND, IN GENERAL, WILL DEPEND FOR WATERTIGHTNESS UPON EITHER AN APPROVED NON-SHRINKING MORTAR OR ELASTOMERICSEALANT.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY. APPROVED BITUMASTIC SEALANTS
   RAM-NEK
   KENT SEAL No. 2

STANDARD MANHOLE - PART B

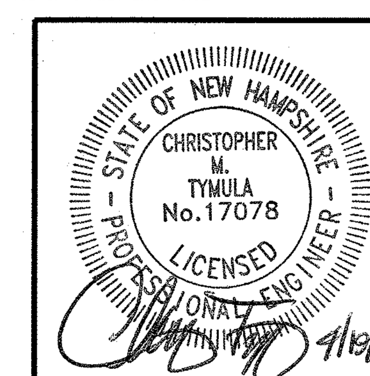
1	UPDATE ADDRESS	CMT	4/15/22
NO.	DESCRIPTION	BY	DATE

REVISIONS

DETAIL SHEET

ASSESSORS MAP 252 - LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842



GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

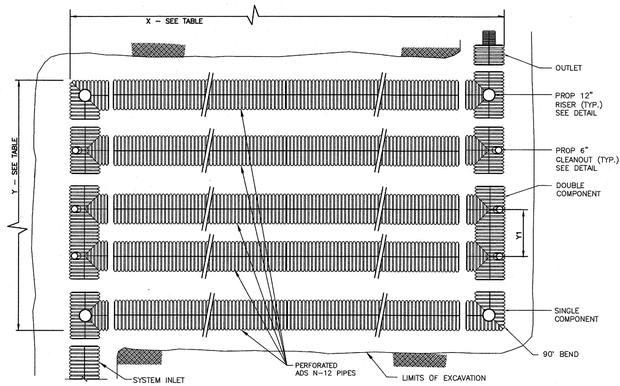
NOT TO SCALE	DATE: JANUARY 20, 2020		DRAWING NO. 4582DET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	13 OF 15

UNDERGROUND SYSTEM NOTES:

1) ALL SITE DRAINAGE PIPE SHALL BE CORRUGATED HIGH-DENSITY POLYETHYLENE PIPE, DUAL WALL, SMOOTH INTERIOR AS MANUFACTURED BY ADS, INC., OR APPROVED EQUAL, UNLESS OTHERWISE NOTED ON PLAN.

2) CONTRACTOR SHOULD CONFIRM SYSTEM PARTS AND PROVIDE SHOP DRAWINGS FROM MANUFACTURER. SUBSTITUTIONS AND SHOP DRAWINGS SHOULD BE APPROVED BY THE ENGINEER.

3) PARTS SPECIFICATIONS SHOWN ARE AS PROVIDED BY ADS, INC., OR APPROVED EQUAL. ANY CHANGES TO THESE SPECIFICATIONS SHOULD BE APPROVED BY DESIGN ENGINEER FOR PERFORMANCE.



NOTE: FOR ADDITIONAL DETAILS, SEE ADS STD-702 & STD-703.

UNDERGROUND STORMWATER INFILTRATION SYSTEM TABLE

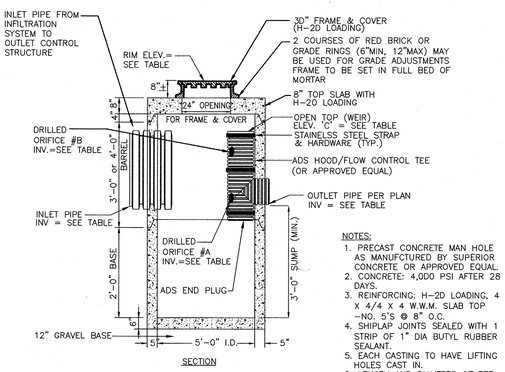
UG INFILTRATION SYSTEM	LENGTH (X)	WIDTH (Y)	SPACING (Y1) (O.C. TYP.) *	PIPE SIZE (INCHES) PERF	INV. PIPE ELEV. (A)	# PIPE ROWS	STONE BED
INFILTRATION SYS#1	57'	24.5'	63"	36"	42.00	5	27.5'x60'
INFILTRATION SYS#2	72'	19.25'	63"	36"	40.50	4	22.25'x75'
INFILTRATION SYS#3	57'	24.5'	63"	36"	41.00	5	27.5'x60'

*SEE TYPICAL CROSS SECTION BELOW.

Table 5-2
Classes of Embedment and Backfill Materials

ASTM D2321[5] Class	ASTM D2321[5] Description	Notation	ASTM D2487 Description	AASHTO M43 Notation	Min. Compaction Required (Std. Proctor Density %)[6]	ASTM D2321[5] Percentage Passing Sieve Sizes 1 ½ in. (40mm)	No. 4 (4.75mm)	No. 200 (0.075mm)	Atterberg Limits LL	PI	Coefficients Uniformity Cu	Curvature Cc
IA[4]	Open-graded, clean manufactured aggregates	N/A	Angular crushed stone or rock, crushed gravel, crushed slag; large voids with little or no fines	5 56	Dumped to Slight	100%	≤10%	<3%	Non Plastic		N/A	
IB	Dense-graded, clean manufactured, processed aggregates	N/A	Angular crushed stone or other Class IA material and stone/sand mixtures with gradations selected to minimize migration of adjacent soils; little or no fines			100%	≤50%	<3%	Non Plastic			
II	Clean, coarse-grained soils	GW	Well-graded gravel, gravel-sand mixtures; little or no fines	57 6 67	Moderate (85%)	100%	<50% of "Coarse Fraction"	<3%	Non Plastic		>4	1 to 3
		GP	Poorly-graded gravels, gravel-sand mixtures; little or no fines								<4	<1 or >3
		SW	Well-graded sands, gravelly sands; little or no fines				>50% of "Coarse Fraction"				>6	1 to 3
		SP	Poorly-graded sands, gravelly sands; little or no fines								<6	<1 or >3
	Coarse-Grained Soils, borderline clean to w/fines	GW-GC, SP-SM	Sands and gravels which are borderline between clean and with fines	N/A		100%	Varies	5% to 12%	Non Plastic		Same as for GW, GP, SW and SP	
III	Coarse-grained soils with fines	GM	Silty gravels, gravel-sand-silt mixtures	Gravel & sand with ~10% fine	Moderate to High (90%)	100%	<50% of "Coarse Fraction"	12% to 50%	N/A	<4 or "A" Line	N/A	
		GC	Clayey gravels, gravel-sand-clay mixtures							>7 & >"A" Line		
		SM	Silty sands, sand-silt mixtures				>50% of "Coarse Fraction"			<4 or "A" Line		
		SC	Clayey sands, sand-clay mixtures							>7 & >"A" Line		
IVA[5]	Inorganic fine-grained soils	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity	N/A	N/R	100%	100%	>50%	<50	<4 or "A" Line	N/A	
		CL	Inorganic clays of low to medium plasticity; gravelly, sandy, or silty clays; lean clays	N/A						>7 & >"A" Line		
IVB	Inorganic fine-grained soils	MH	Inorganic silts; micaceous or diatomaceous fine sandy or silty soils, elastic silts	N/A	N/R	100%	100%	>50%	>50	<"A" Line	N/A	
		CH	Inorganic clays of high plasticity, fat clays	N/A						>"A" Line		
V	Organic soils or Highly organic soils	OL	Organic silts and organic silty clays of low plasticity	N/A	N/R	100%	100%	>50%	<50	<4 or <"A" Line	N/A	
		OH	Organic clays of medium to high plasticity, organic silts	N/A					>50	<"A" Line		
		PT	Peat and other high organic soils	N/A								

Notes:
1) Refer to ASTM D2321 for more complete soil descriptions.
2) Class IVA material has limited applications and can be difficult to place and compact; use ONLY with the approval of a soil expert. Contact ADS for additional information regarding suitability of this backfill material.
3) N/R indicates that use of this material and/or compaction level is not recommended by ASTM D2321 for the backfill envelope.
4) When using open-graded material, additional precaution must be taken to reduce or eliminate the risk of migration of fines from adjacent material. Refer to ASTM D2321 for more complete information.



SECTION

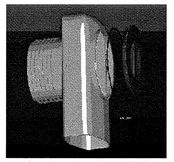
NOTES:
1. PRECAST CONCRETE MAN HOLE AS MANUFCTURED BY SUPERIOR CONCRETE OR APPROVED EQUAL
2. CONCRETE: 4,000 PSI AFTER 28 DAYS.
3. REINFORCING: H-20 LOADING, 4 X 4/4 X 4 W.W.M. SLAB TOP –NO. 5'S @ 8" O.C.
4. SHIPLAP JOINTS SEALED WITH 1 STRIP OF 1" DIA BUTYL RUBBER SEALANT.
5. EACH CASTING TO HAVE LIFTING HOLES CAST IN.
6. LENGTH AND DIAMETER OF TEE VARIES WITH PIPE.

OUTLET CONTROL STRUCTURE TABLE

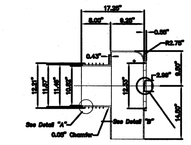
OCS	RIM	ORIFICE	SIZE (IN.)	ELEV.	INV.IN (SIZE)	INV.IN (ELEV)	INV.OUT (SIZE)	INV.OUT (ELEV)
#1	47.75	A	9" DIA.	43.25	24"	41.00	12"	42.00
		–	–	–				
		C	12" DIA.	45.65				
#2	48.65	A	7" DIA.	41.80	24"	40.50	15"	40.60
		–	–	–				
		C	15" DIA.	44.15				
#3	45.90	A	6" DIA.	42.30	24"	41.00	12"	41.00
		–	–	–				
		C	12" DIA.	44.65				

PRECAST CONCRETE OUTLET CONTROL STRUCTURE (OCS) FOR UNDERGROUND INFILTRATION SYSTEM

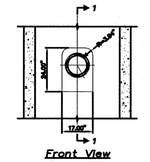
NOT TO SCALE



Enlarged Section 2–2

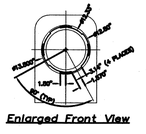


Enlarged Section 1–1



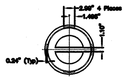
Front View

THE ELIMINATOR CATCH BASIN OIL & DEBRIS TRAP

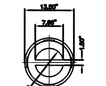


Enlarged Front View

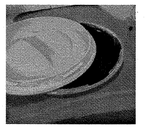
Side View of Cover

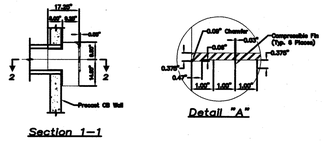


Rear View of Cover w/ Integral Handle



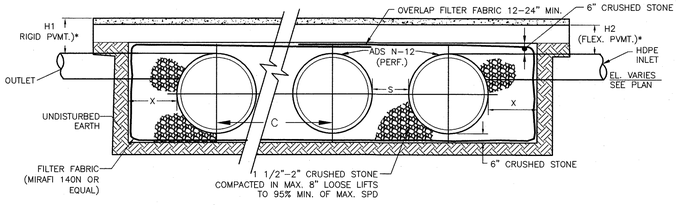
Front View of Cover w/ Integral Handle





Section 1–1

Detail "A"



* H1, H2 = 12" FOR UP TO AND INCLUDING 48" N-12
* H1, H2 = 24" FOR 60" N-12
* FOR TRAFFIC LOAD INSTALLATIONS PROVIDE 24" COVER FOR 42"–60" N-12

NOMINAL DIAMETER	NOMINAL O.D.	TYPICAL SPACING "S"	TYPICAL SPACING "C"	TYPICAL SIDE WALL "X"
12"	14.5"	11"	25.4"	8"
15"	18"	12"	28.9"	8"
18"	21"	13"	33.9"	9"
24"	28"	13"	40.7"	10"
30"	36"	18"	53.1"	18"
36"	42"	21"	63"	18"
42"	48"	24"	71.9"	18"

U.G. INF

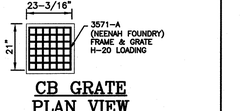
NOTES
1. ALL UNDERGROUND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. SEE GRADING & DRAINAGE PLAN FOR INVERT DATA.
4. EXISTING TOPSOIL, BRUSH, TREES, BOULDERS, FILL AND DEBRIS TO BE REMOVED FOR 5' ALL AROUND UNDERGROUND SYSTEMS DOWN TO NATIVE MATERIAL. BACKFILL WITH STONE BEDDING MATERIAL (CLASS 1A OR 1B).

GENERAL NOTES:

1. ALL REFERENCES TO SAND, STONE, OR GRAVEL MATERIAL ARE PER ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. ALL RETENTION AND DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, LATEST EDITION AND THE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.
3. MEASURES SHOULD BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO THE BACKFILL MATERIAL, WHEN REQUIRED. SEE ASTM D2321.
4. NO STORMWATER FLOWS ARE TO BE DIRECTED TO THE INFILTRATION SYSTEMS UNTIL ALL CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
5. FILTER FABRIC: GEOTEXTILE FABRIC SHALL BE MIRAFI 140N (OR APPROVED EQ.) TO PREVENT THE MIGRATION OF FINES FROM THE NATIVE SOIL INTO THE SELECT BACKFILL MATERIAL.
6. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE OR UNSUITABLE FOR INFILTRATION, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE GEOTECHNICAL ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE GEOTECHNICAL ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL ALL DELETERIOUS OR UNSUITABLE FILL MATERIAL SHALL BE REMOVED BELOW THE TRENCH BOTTOM UNTIL NATIVE MATERIAL IS ENCOUNTERED.
7. BEDDING: SUITABLE MATERIAL SHALL BE CLEAN COMPACT SAND. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER.
8. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE PLACED IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
9. MINIMUM COVER: MINIMUM COVER OVER ALL RETENTION/DETENTION SYSTEMS IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER IS 12" UP TO 36" DIAMETER PIPE AND 24" OF COVER FOR 42" – 60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

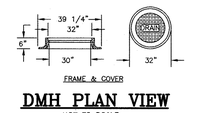
TYPICAL UNDERGROUND INFILTRATION SYSTEM CROSS SECTION

NOT TO SCALE



CB GRATE PLAN VIEW

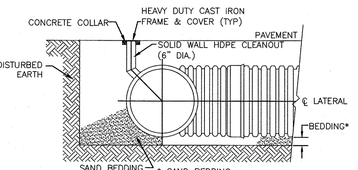
NOT TO SCALE



FRAME & COVER

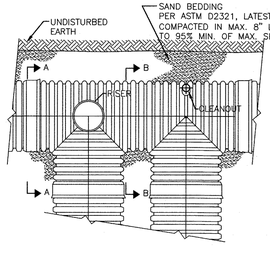
DMH PLAN VIEW

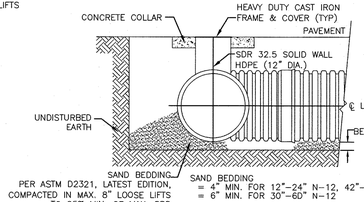
NOT TO SCALE



ADS STANDARD DETAILS DISCLAIMER

ADVANCED DRAINAGE SYSTEMS, INC. ("ADS") HAS PREPARED THIS STANDARD DETAIL TO DEMONSTRATE ADS' RECOMMENDED INSTALLATION OF ITS PRODUCTS FOR THE DEPICTED APPLICATION. IN ADDITION TO ADS' RECOMMENDATIONS, THERE MAY BE OTHER NATIONAL, STATE OR LOCAL SPECIFICATIONS THAT ARE PERTINENT TO THIS APPLICATION. ADS' STANDARD DETAIL IS NOT INTENDED TO SUPERSEDE ANY NATIONAL, STATE OR LOCAL SPECIFICATIONS, AND ADS RECOMMENDS THAT THOSE REQUIREMENTS BE REVIEWED AND CONSULTED PRIOR TO THE INSTALLATION OF ADS' PRODUCTS. ADS HAS NOT AUTHORIZED, AND IT BEARS NO RESPONSIBILITY FOR, ANY REVISIONS, ALTERATIONS OR DEVIATIONS FROM THIS STANDARD DETAIL."

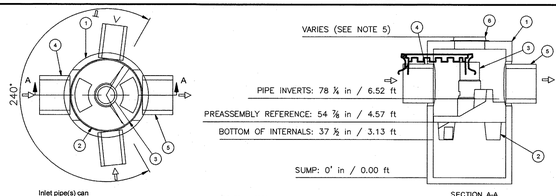




SECTION A–A

TYPICAL RISER AND CLEANOUT DETAILS

NOT TO SCALE



SECTION A-A

GENERAL NOTES:
1. GENERAL ARRANGEMENT DRAWINGS ONLY. CONTACT HYDRO INTERNATIONAL FOR SITE SPECIFIC FABRICATION DRAWINGS.
2. THE DIAMETER OF THE INLET & OUTLET PIPES MAY BE NO MORE THAN 24".
3. MULTIPLE INLET PIPES POSSIBLE (REFER TO PROJECT PLANS).
4. INLET/OUTLET PIPE ANGLE CAN VARY TO ALIGN WITH DRAINAGE NETWORK (REFER TO PROJECT PLANS).
5. PEAK FLOW RATE AND MINIMUM HEIGHT LIMITED BY AVAILABLE COVER AND PIPE DIAMETER.
6. LARGER SEDIMENT STORAGE CAPACITY MAY BE PROVIDED WITH A DEEPER SUMP DEPTH.

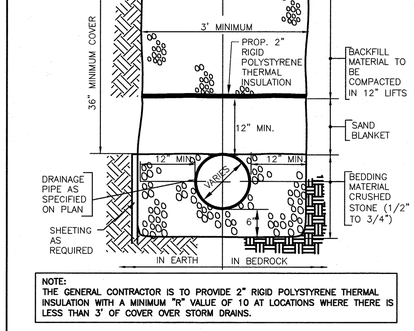
PRODUCT SPECIFICATIONS:
A. THE TREATMENT SYSTEM SHALL USE AN INDUCED VORTEX TO SEPARATE POLLUTANTS FROM STORMWATER RUNOFF.
B. THE TREATMENT SYSTEM SHALL FIT WITHIN THE LIMITS OF EXCAVATION (AREA AND DEPTH) AS SHOWN IN THE PROJECT PLANS AND WILL NOT EXCEED THE DIMENSIONS FOR THE DESIGN FLOW RATES SPECIFIED HEREIN.
C. THE TREATMENT SYSTEM SHALL REMOVE GREATER THAN OR EQUAL TO 80% OF TSS BASED ON THE TARGET PARTICLE SIZE (TPS) OF 106 MICRONS AND/OR 80% OF TSS BASED ON THE TPS OF 230 MICRONS AT 0.7 TIMES THE DESIGN FLOW RATE.
D. THE TREATMENT SYSTEM SHALL CONVEY THE PEAK ON-LINE FLOW RATES OF UP TO 19 CFS WITHOUT CAUSING UPSTREAM SURCHARGE CONDITIONS. FULL-SCALE INDEPENDENT LABORATORY SCOUR TESTING SHALL DEMONSTRATE EFFLUENT CONTROL OF LESS THAN OR EQUAL TO 5 MG/L FOR ALL FLOWS UP TO 200% OF MTFR-106.
E. THE TREATMENT SYSTEM SHALL BE CAPABLE OF CAPTURING AND RETAINING FINE SILT AND SAND SIZE PARTICLES. ANALYSIS OF CAPTURED SEDIMENT FROM FULL-SCALE FIELD INSTALLATIONS SHALL DEMONSTRATE PARTICLE SIZES PREDOMINATELY IN THE 20–MICRON RANGE.

Parts List		
ITEM	SIZE (in)	DESCRIPTION
1	72	I.D. PRECAST MANHOLE
2		LEDGER SUPPORT
3		SEPARATION MODULE
4	30	INLET PIPE (BY OTHERS)
5	30	OUTLET PIPE (BY OTHERS)
6	30	FRAME AND COVER (OR GRATE) (ROUND)

"FIRST DEFENSE" UNIT DETAIL – FD-6HC

(OR APPROVED EQUAL)
NOT TO SCALE

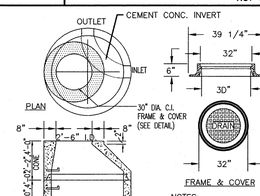
NOTE: CONTRACTOR SHOULD CONFIRM SYSTEM PARTS AND OBTAIN SHOP DRAWINGS FROM MANUFACTURER PRIOR TO CONSTRUCTION.



NOTE:
THE GENERAL CONTRACTOR IS TO PROVIDE 2" RIGID POLYSTYRENE THERMAL INSULATION WITH A MINIMUM "R" VALUE OF 10 AT LOCATIONS WHERE THERE IS LESS THAN 3' OF COVER OVER STORM DRAINS.

TYPICAL TRENCH SECTION FOR STORM DRAIN

NOT TO SCALE



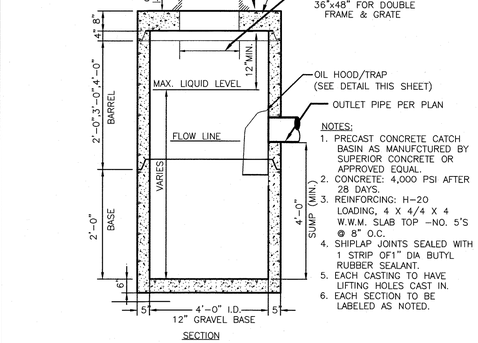
FRAME & COVER

NOTE: BRICKS MAY BE USED FOR GRADE ADJUSTMENTS FRAME TO BE SET IN FULL BED OF MORTAR (USE SS HARD BRICK ONLY, MINIMUM OF 2 COURSES WITH MAXIMUM 12" ADJUSTMENT)

NOTES:
1. PRECAST CONCRETE MANHOLE AS MANUFACTURED BY SUPERIOR CONCRETE OR APPROVED EQUAL.
2. CONCRETE: 4,000 PSI AFTER 28 DAYS.
3. REINFORCING: H-20 LOADING 4 X 4/4 X 4 W.W.M.
4. SHIPLAP JOINTS SEALED WITH 1 STRIP OF 1" DIA. BUTYL RUBBER SEALANT.
5. EACH CASTING TO HAVE LIFTING HOLESCAST IN.
6. EACH SECTION TO BE LABELED AS NOTED.
7. MANHOLE STEPS @ 12" O.C. #PS2–PF–SL.
8. PIPE OPENINGS CAST IN AS REQUIRED.
9. 8" SLAB TOP AVAILABLE.

PRECAST CONCRETE DRAIN MANHOLE

NOT TO SCALE



SECTION

NOTES:
1. PRECAST CONCRETE CATCH BASIN AS MANUFCTURED BY SUPERIOR CONCRETE OR APPROVED EQUAL.
2. CONCRETE: 4,000 PSI AFTER 28 DAYS.
3. REINFORCING: H-20 LOADING, 4 X 4/4 X 4 W.W.M. SLAB TOP –NO. 5'S @ 8" O.C.
4. SHIPLAP JOINTS SEALED WITH 1 STRIP OF1" DIA BUTYL RUBBER SEALANT.
5. EACH CASTING TO HAVE LIFTING HOLES CAST IN.
6. EACH SECTION TO BE LABELED AS NOTED.

PRECAST CONCRETE CATCH BASIN WITH HOOD

NOT TO SCALE

NO.	DESCRIPTION	BY	DATE
2	MISC. REVISIONS	CMT	4/15/22
1	ADDED NOTES PER AoT COMMENTS	NID	8/6/20

REVISIONS

DETAIL SHEET

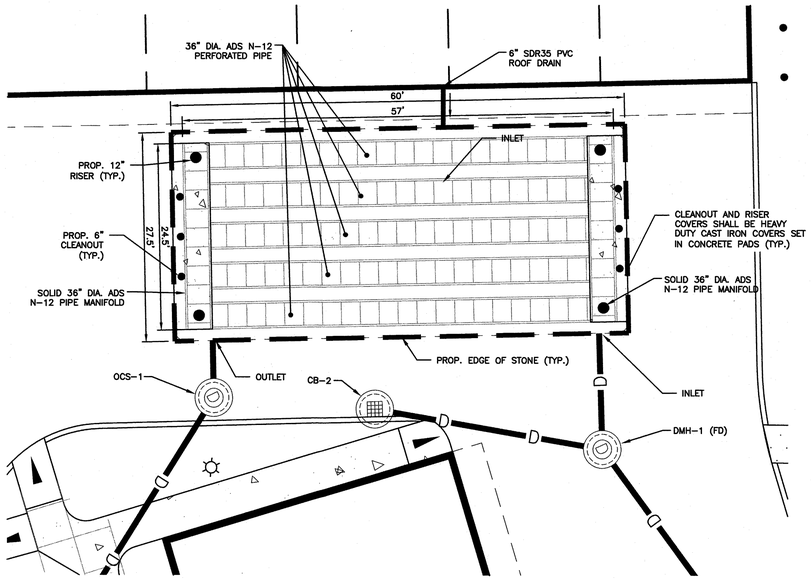
ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE — CHRISTOPHER M. TYMULA No.17078 — LICENSED PROFESSIONAL ENGINEER — 4/18/22

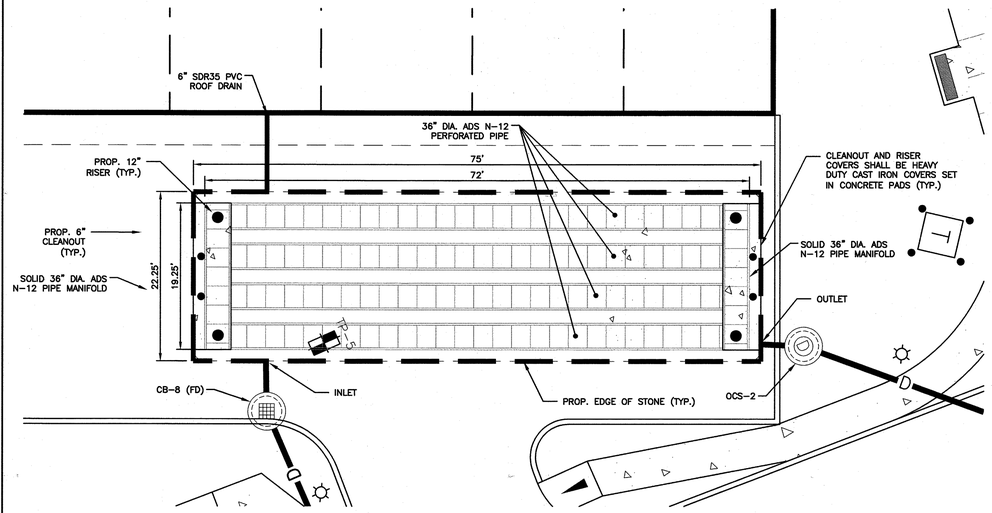
GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

NOT TO SCALE	DATE: JANUARY 20, 2020		DRAWING NO. 4582DET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	14 OF 15



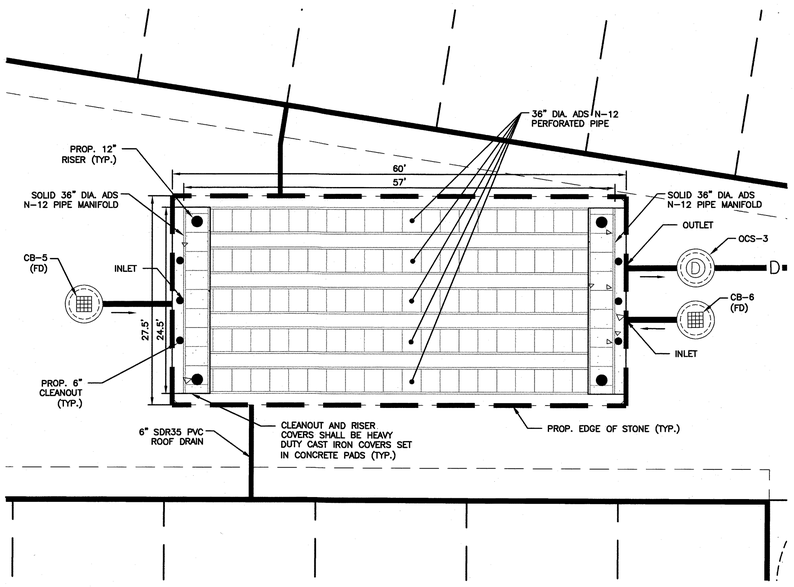
UNDERGROUND INFILTRATION SYSTEM #1 – SCHEMATIC LAYOUT

SCALE: 1"=10'



UNDERGROUND INFILTRATION SYSTEM #2 – SCHEMATIC LAYOUT

SCALE: 1"=10'



UNDERGROUND INFILTRATION SYSTEM #3 – SCHEMATIC LAYOUT

SCALE: 1"=10'

NOTES:

1) SEE SHEET 6 FOR ADDITIONAL INFORMATION ON SITE GRADING AND DRAINAGE.

2) SEE SHEET 14 FOR DETAILED INFORMATION ON THE UNDERGROUND SYSTEMS AND ASSOCIATED DRAINAGE.

NO.	DESCRIPTION	BY	DATE
1	REVISE UNDERGROUND INFILTRATION SYSTEMS	CMT	4/15/22

REVISIONS

DETAIL SHEET

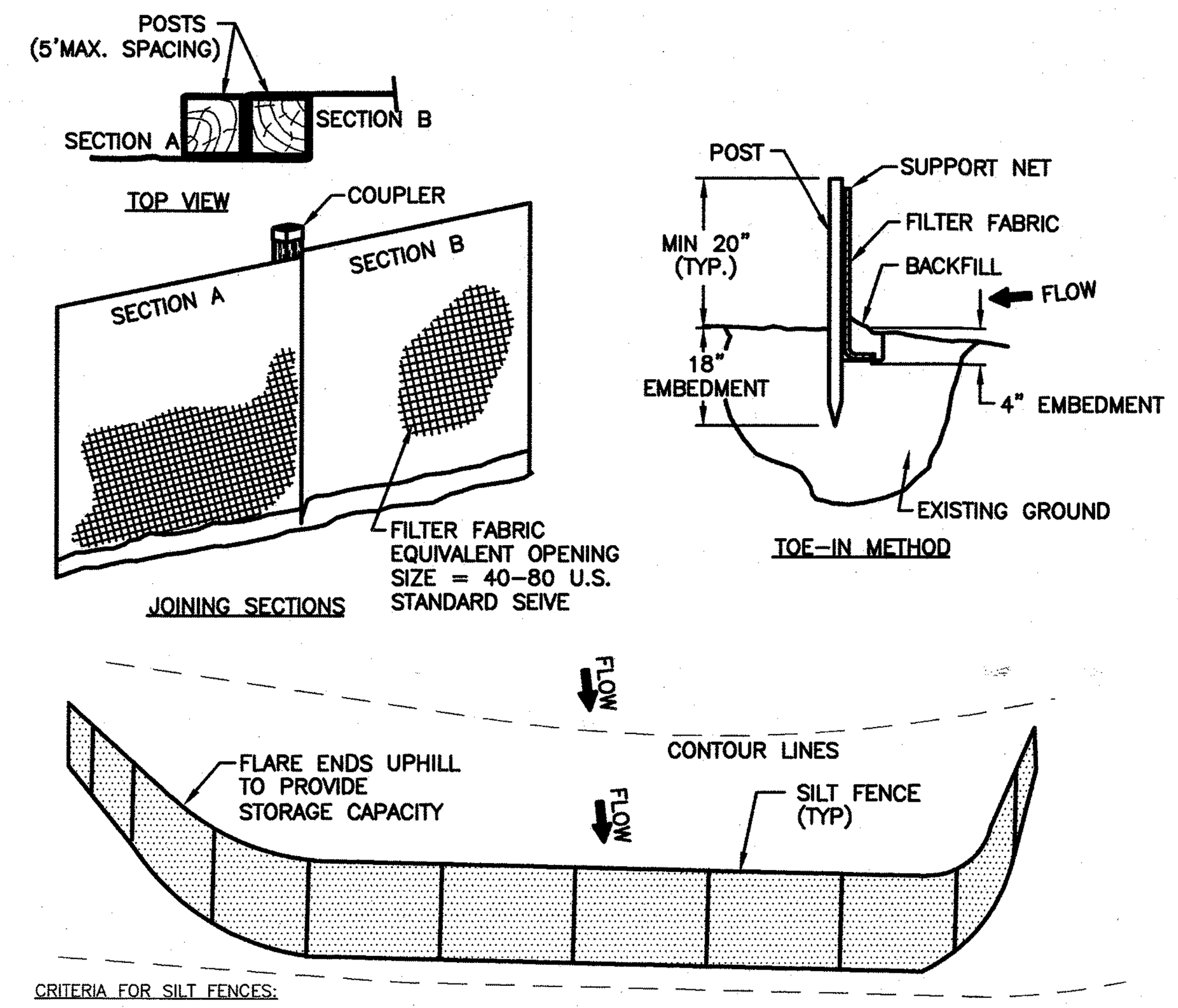
ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYMULA No.17078 – LICENSED PROFESSIONAL ENGINEER
4/18/22

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=10'	DATE: AUGUST 6, 2020		DRAWING NO. 4582DET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	14A OF 15



CRITERIA FOR SILT FENCES:

1) SILT FENCE FILTER CLOTH: THE FABRIC FOR THE SILT FENCE SHALL MEET THE FOLLOWIING SPECIFICATIONS:

FABRIC PROPERTIES:	MINIMUM ACCEPTABLE VALUES	TEST METHOD
GRAB TENSILE STRENGTH (lbs)	9D	ASTM D1682
ELDNGATION AT FAILURE (%)	5D	ASTM D1682
MULLEN BURST STRENGTH (PSI)	19D	ASTM D3786
PUNCTURE STRENGTH (lbs)	4D	ASTM D751
EQUIVELANT OPENING SIZE	4D-8D	US STD SIEVE

2) FENCE POSTS (FOR FABRICATED UNITS) – THE PDSTS SHALL BE A MINIMUM DF 36 INCHES LDNG. WDOD POSTS WILL BE OF SOUND QUALITY HARDWDDD WITH A MINIMUM CRDSS SECTIONAL AREA OF 3.D SQUARE INCHES. STEEL POSTS WILL BE STANDARD T OR U SECTIONS WEIGHING NDT LESS THAN 1 POUND PER LINEAR FOOT. MAXIMUM SPACING SHALL BE 6 LINEAR FEET.

3) WIRE FENCE (FOR FABRICATED UNITS) – WIRE FENCING SHALL BE A MINIMUM 14.5 GUAGE WITH A MAXIMUM 6 INCH MESH OPENING.

4) PREFABRICATED UNITS – PREFABRICATED UNITS MAY BE USED IN LIEU OF THE ABOVE METHOD PROVIDING: (1) THE FILTER CLOTH AND FENCE POSTS MEET THE ABOVE CRITERIA; AND (2) THE UNIT IS INTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

MAINTENANCE:

1) SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.

2) IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.

3) SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STDRM EVENT. THE DEPOSITS SHDULD BE REMOVED WHEN THEY REACH APPROXIMTELY ONE-HALF THE HEIGHT DF THE BARRIER.

4) SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

CONSTRUCTION SPECIFICATIONS:

1) THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.

2) THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND (4" DEEP & 4" WIDE) AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.

3) WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.

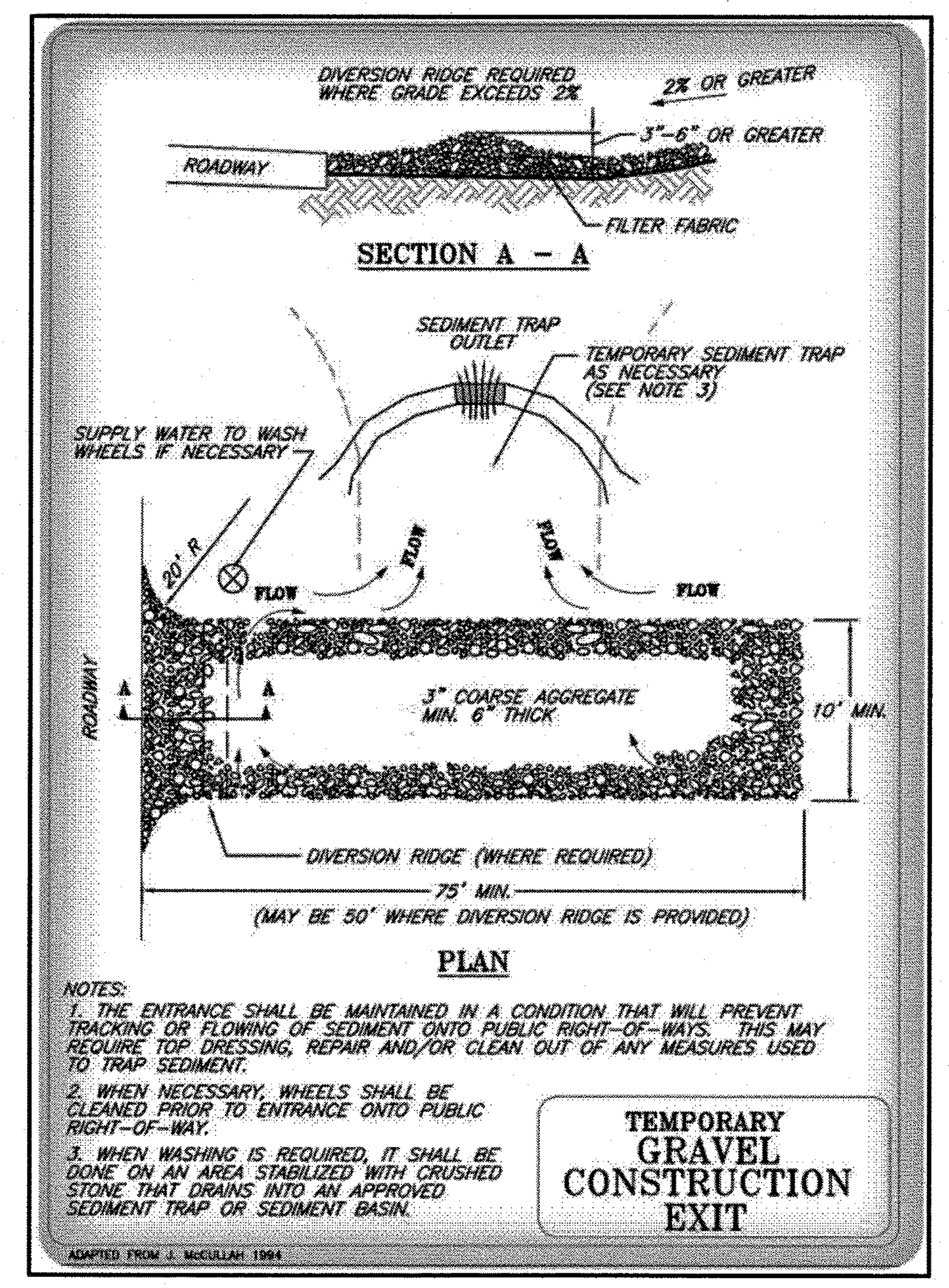
4) FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MID-SECTION AND BOTTOM.

5) WHEN TWO SECTIONS DF FILTER CLOTH ADJOIN EAC OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES (24" IS PREFERRED), FOLDED, AND STAPLED.

6) POSTS TO BE SPACED AT A MAXIMUM OF 6' ON CENTER.

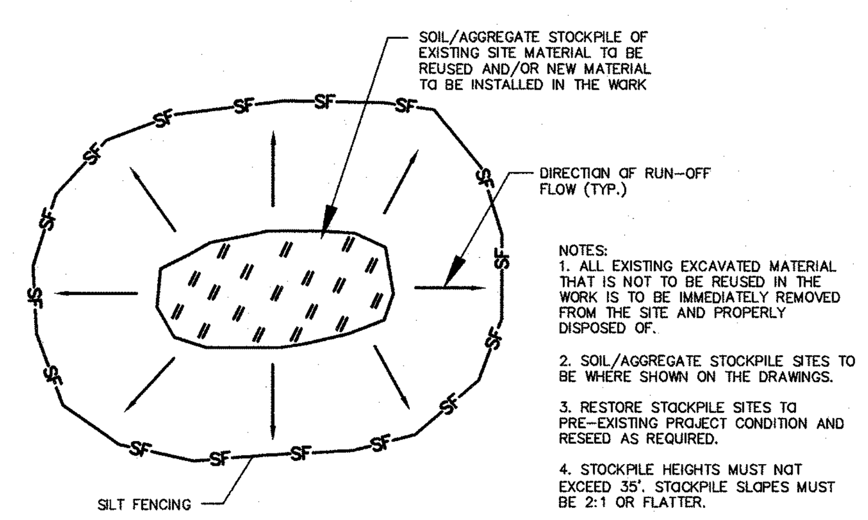
SEDIMENT CONTROL FENCE

NOT TO SCALE



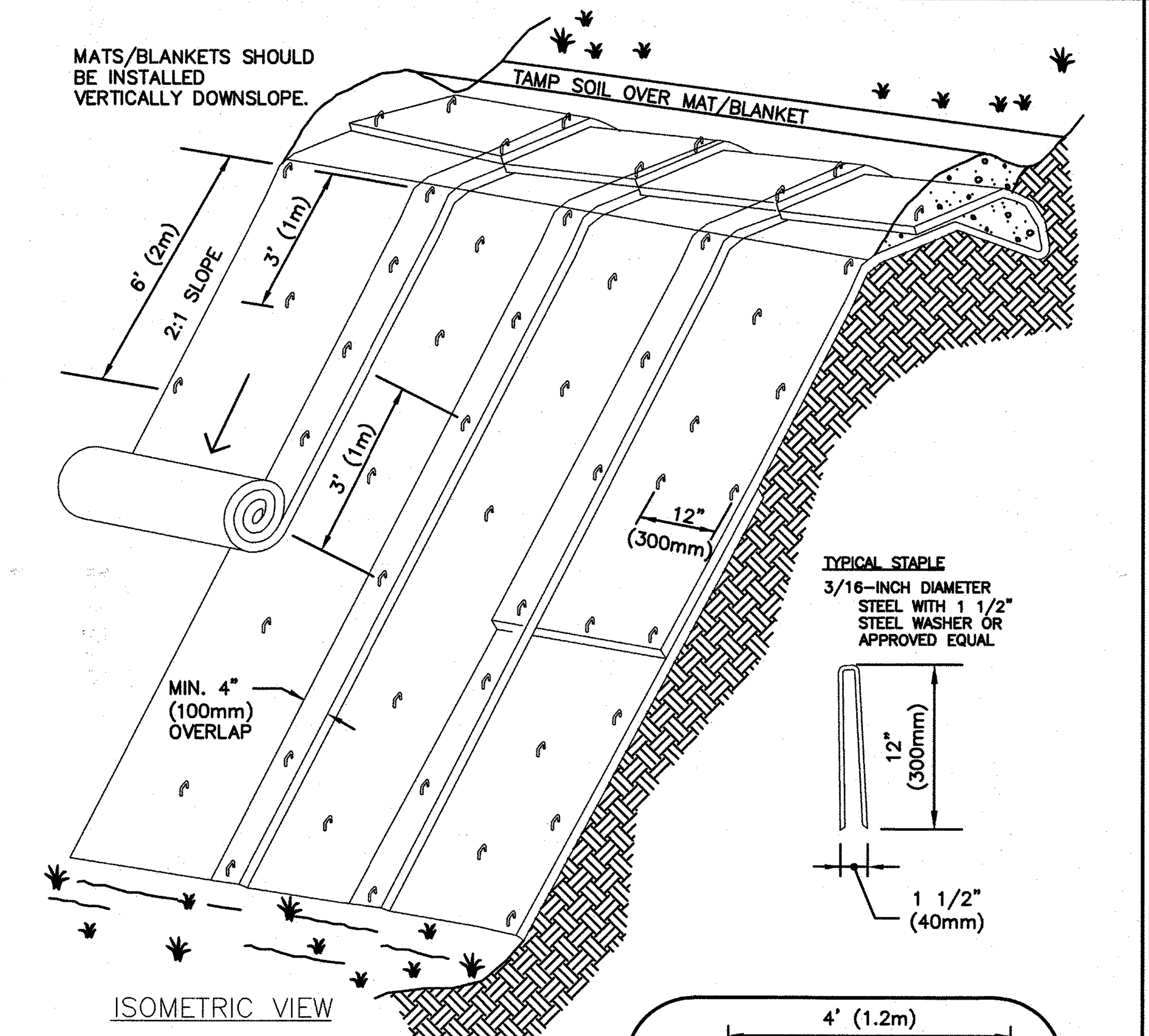
GRAVEL CONSTRUCTION EXIT

NOT TO SCALE

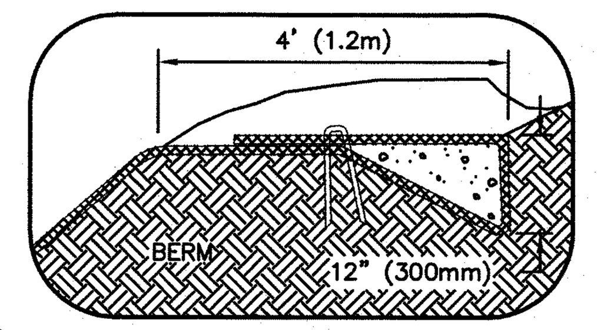


MATERIALS STOCKPILE DETAIL

NOT TO SCALE



TYPICAL SLOPE SOIL STABILIZATION



TYPICAL INSTALLATION OF EROSION CONTROL BLANKETS FOR SLOPES

NOT TO SCALE

NOTES:

1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW. LAY BLANKETS LOOSELY & MAINTAIN DIRECT CONTACT WITH SOIL – DO NOT STRETCH.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE BLANKET END OVER END WITH 6 INCH (MIN.) OVERLAP AND ANCHOR DOWN SLOPE BLANKET IN A 6 INCH DEEP TRENCH.
5. BLANKETS SHALL BE STAPLED ENOUGH TO ANCHOR BLANKET WHILE MAINTAINING CONTACT WITH SOIL. STAPLES SHALL BE PLACED DOWN THE CENTER & STAGGERED WITH THE STAPLES PLACED ALONG EDGES. PATTERN & AMOUNT OF STAPLES VARIES BY MANUFACTURER, SO FOLLOW MANUFACTURERS RECOMMENDATIONS.
6. BLANKET SHALL BE NORTH AMERICAN GREEN SC-150 OR APPROVED EQUAL.

MAINTENANCE & MATS

1. BLANKETS SHALL BE INSPECTED WEEKLY DURING CONSTRUCTION & AFTER A RAINFALL IN EXCESS OF 1/2" IN A 24-HOUR PERIOD.
2. FAILURES SHALL BE REPAIRED IMMEDIATELY. IF ANY OF THE FOLLOWING OCCUR; SLOPE WASHOUT, MAT DISPLACEMENT, DAMAGE TO MAT, THE AFFECTED AREA SHALL BE REPAIRED & RESEEDED & MAT SHALL BE REPLACED OR RE-INSTALLED.

BLANKET SLOPE PROTECTION FOR EROSION CONTROL

NOT TO SCALE

WINTER STABILIZATION NOTES:

MAINTENANCE REQUIREMENTS:

MAINTENANCE MEASURES SHOULD CONTINUE AS NEEDED THROUGHOUT CONSTRUCTION, INCLUDING THE OVER-WINTER PERIOD. AFTER EACH RAINFALL, SNOWSTORM, OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHOULD CONDUCT AN INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUING FUNCTION.

FOR ANY AREA STABILIZED BY TEMPORARY OR PERMANENT SEEDING PRIOR TO THE ONSET OF THE WINTER SEASON, THE CONTRACTOR SHOULD CONDUCT AN INSPECTION IN THE SPRING TO ASCERTAIN THE CONDITION OF VEGETATION COVER, AND REPAIR ANY DAMAGE AREAS OR BARE SPOTS AND RESEED AS REQUIRED TO ACHIEVE AN ESTABLISHED VEGETATIVE CDVER (AT LEAST 85% OF AREA VEGETATED WITH HEALTHY, VIGOROUS GROWTH).

SPECIFICATIONS:

TO ADEQUATELY PROTECT WATER QUALITY DURING COLD WEATHER AND DURING SPRING RUNOFF, THE FOLLOWING STABILIZATION TECHNIQUES SHOULD BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15TH THROUGH MAY 15TH.

1. THE AREA OF EXPOSED, UNSTABILIZED SOIL SHOULD BE LIMITED TO ONE ACRE AND SHOULD BE PROTECTED AGAINST EROSION BY THE METHODS DESCRIBED IN THIS SECTION PRIOR TO ANY THAW OR SPRING MELT EVENT. SUBJECT TO APPLICABLE REGULATIONS, THE ALLOWABLE AREA OF EXPOSED SOIL MAY BE INCREASED IF ACTIVITIES ARE CONDUCTED ACCORDING TO A WINTER CONSTRUCTION PLAN, DEVELOPED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF NEW HAMPSHIRE OR A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL AS CERTIFIED BY THE CSPESC COUNCIL OF ENVIROCERT INTERNATIONAL, INC.

2. STABILIZATION AS FOLLOWS SHOULD BE COMPLETED WITHIN A DAY DF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS:
   A. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHOULD BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING, OR 2 INCHES OF EROSION CONTROL MIX (SEE DESCRIPTION OF EROSION CONTROL MIX BERMS FOR MATERIAL SPECIFICATION).
   B. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHOULD BE SEEDED AND COVERED WITH A PROPERLY INSTALLED AND ANCHORED EROSION CONTROL BLANKET OR WITH A MINIMUM 4 INCH THICKNESS OF EROSION CONTROL MIX, UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER. NOTE THAT COMPOST BLANKETS SHOULD NOT EXCEED 2 INCHES IN THICKNESS OR THEY MAY OVERHEAT.

3. ALL STONE-COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.

4. INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX SHOULD NOT OCCUR OVER SNOW OF GREATER THAN ONE INCH IN DEPTH.

5. ALL MULCH APPLIED DURING WINTER SHOULD BE ANCHORED (E.G., BY NETTING, TRACKING, WOOD CELLULOSE FIBER).

6. STOCKPILES OF SOIL MATERIALS SHOULD BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR WITH A FOUR-INCH LAYER OF EROSION CONTROL MIX. MULCHING SHOULD BE DONE WITHIN 24 HOURS OF STOCKING, AND RE-ESTABLISHED PRIOR TO ANY RAINFALL OR SNOWFALL. NO SOIL STOCKPILE SHOULD BE PLACED (EVEN COVERED WITH MULCH) WITHIN 10D FEET FROM ANY WETLAND DR OTHER WATER RESOURCE AREA.

7. FROZEN MATERIALS, (E.G., FROST LAYER THAT IS REMOVED DURING WINTER CONSTRUCTION), SHOULD BE STOCKPILED SEPARATELY AND IN A LOCATION THAT IS AWAY FROM ANY AREA NEEDING TD BE PROTECTED. STOCKPILES OF FROZEN MATERIAL CAN MELT IN THE SPRING AND BECOME UNWORKABLE AND DIFFICULT TO TRANSPORT DUE TO THE HIGH MOISTURE CONTENT IN THE SOIL.

8. INSTALLATION OF EROSION CONTROL BLANKETS SHOULD NOT OCCUR OVER SNOW OF GREATER THAN ONE INCH IN DEPTH OR ON FROZEN GROUND.

9. ALL GRASS-LINED DITCHES AND CHANNELS SHOULD BE CONSTRUCTED AND STABILIZED BY SEPTEMBER 1. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHOULD BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS, AS DETERMINED BY A QUALIFIED PROFESSIONAL ENGINEER OR A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL AS CERTIFIED BY THE CSPESC COUNCIL OF ENVIROCERT INTERNATIONAL, INC. IF A STONE LINING IS NECESSARY, THE CONTRACTOR MAY NEED TO RE-GRADE THE DITCH AS REQUIRED TO PROVIDE ADEQUATE CROSS-SECTION AFTER ALLOWING FOR PLACEMENT OF THE STONE.

10. ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY DCTOBER 15.

11. 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 NHDOT ITEM 304.3.

12. SEDIMENT BARRIERS THAT ARE INSTALLED DURING FROZEN CONDITIONS SHOULD CONSIST OF EROSION CONTROL MIX BERMS, OR CONTINUOUS CONTAINED BERMS. SILT FENCES AND HAY BALES SHOULD NOT BE INSTALLED WHEN FROZEN CDNDITIONS PREVENT PROPER EMBEDMENT OF THESE BARRIERS.

CONSTRUCTION SEQUENCE NOTES:

1. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY ON-SITE CONSTRUCTION AS SHOWN. ADDITIONAL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED AS SOON AS PRACTICAL.
2. CONSTRUCT TEMPORARY STABILIZED CONSTRUCTION ENTRANCE AS SHOWN DN THIS SHEET.
3. CUT AND STUMP AREAS OF PROPOSED CONSTRUCTION.
4. REMOVE AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE SEEDED TO PREVENT EROSION.
5. CONSTRUCT PONDS, SWALES & LEVEL SPREADERS & STABILIZE PRIOR TO DIRECTING ANY RUNOFF TO THEM.
6. CONSTRUCT ROADWAYS AND PERFORM SITE GRADING, PLACING HAY BALES AND SILTATION FENCES AS REQUIRED TD CONTROL SOIL EROSION. STABILIZE ROADS, PARKING LOTS AND CUT/FILL SLOPES WITHIN 72-HOURS OF ACHIEVING FINISH GRADES.
7. CONSTRUCT RELOCATED DRAINAGE LINE PRIOR TO REMOVING THE EXISTING DRAINAGE LINE AS SHOWN ON DEMDLITION PLAN AND CONNECT RELOCATED DRAINAGE LINE.
8. INSTALL UNDERGROUND UTILITIES AND DRAINAGE SYSTEM.
9. BEGIN TEMPORARY AND PERMANENT SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED OR MULCHED WITHIN 72-HDURS OF ACHIEVING FINISHED GRADES.
1D. DAILY, OR AS REQUIRED, CONSTRUCT, INSPECT, AND IF NECESSARY, RECONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND SEDIMENT TRAPS INCLUDING MULCHING AND SEEDING. AT A MINIMUM, INSPECT EROSION CONTROLS WEEKLY AND AFTER EVERY 1/2" OF RAINFALL.
11. BEGIN EXCAVATION FOR CONSTRUCTION OF BUILDINGS.
12. FINISH PAVING ALL ROADWAYS AND DRIVEWAYS.
13. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
14. AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.
15. APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW:

Limestone: 138 lbs./1,DDD square feet.
Fertilizer: 13.8 lbs./1,DOD SF
Mulch: straw mulch appraximately 3 tans/acre unless erasian cantral matting is used.

Permanent Seed Mix	lbs./acre
Creeping Red Fescue	2D
Tall Fescue	2D
Redtap	2
TOTAL	42

Temparary Seed Mix:	lbs./acre
Winter Rye (Aug. 15–Sept. 15)	112
Oats (Na later than May 15)	80

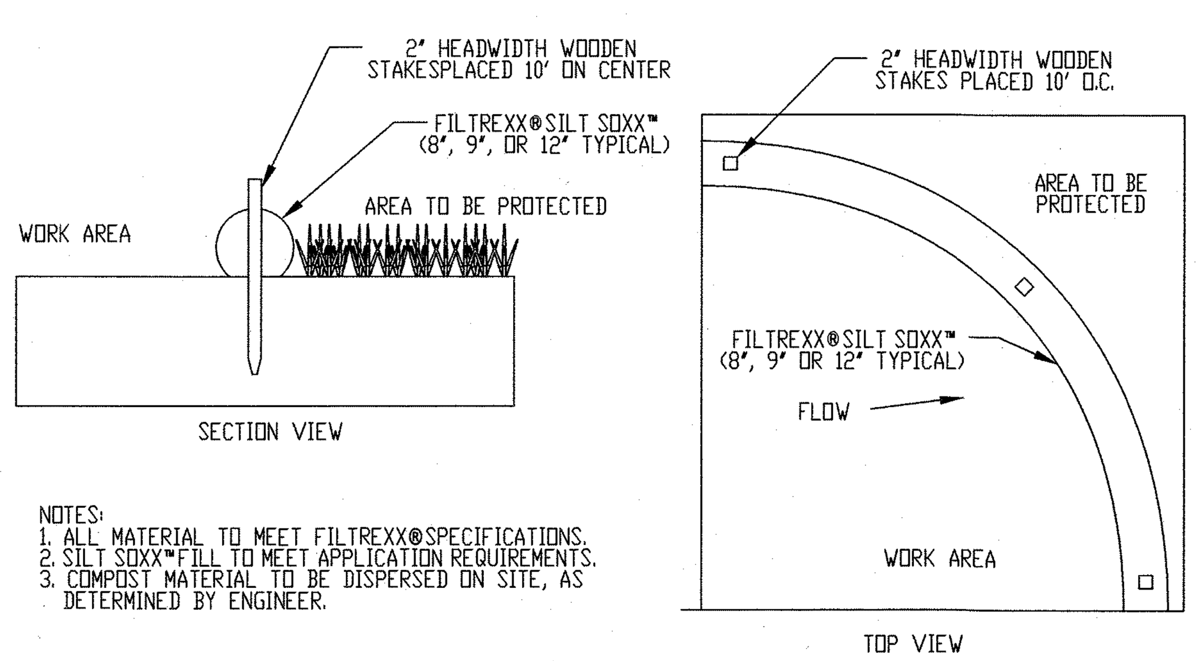
16. NEWLY GRADED AREAS REQUIRING SLOPE PROTECTION OUTSIDE OF NORMAL SEEDING SEASON SHALL RECEIVE HAY MULCH AT THE APPROXIMATE RATE OF NO MORE THAN 2 TONS PER ACRE.
17. THE CONTRACTOR AND DEVELOPER MUST MANAGE THE PROJECT TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 38D0 RELATIVE TO INVASIVE SPECIES.
18. FUGITIVE DUST MUST BE CDNTROLLED IN ACCORDANCE WITH ENV-A 10DD.

EROSION CONTROL NOTES:

1. THE EROSION CONTROL PROCEDURES SHALL CONFORM TO THE NH STORMWATER MANUAL, VOLUME 3, EROSION & SEDIMENT CONTROLS DURING CONSTRUCTION, DECEMBER 2D08.
2. DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED: THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. WHEN LAND IS EXPOSED DURING DEVELOPMENT, THE EXPOSURE SHOULD BE KEPT TO THE SHORTEST PRACTICAL PERIOD OF TIME AS APPROVED BY THE ENGINEER. LAND SHOULD NOT BE LEFT EXPOSED DURING THE WINTER MONTHS.
3. LIMIT OF MAXIMUM AREA OF EXPOSED SOIL AT ANY ONE TIME TO LESS THAN 5 ACRES. THE EXPOSED AREA THAT IS BEING ACTIVELY WORKED DURING WINTER IS TO BE LESS THAN 1 ACRES DURING THE WINTER SEASON.
4. ALL PERMANENT STORM WATER STRUCTURES SHALL BE STABILIZED PRIOR TO DIRECTING FLOW INTO THEM. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
   A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
   B) A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED.
   C) A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED.
   D) OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
5. SILT FENCE SHALL BE INSTALLED AND MAINTAINED DURING AND AFTER DEVELOPMENT TO REMOVE SEDIMENT FROM RUNOFF WATER AND FROM LAND UNDERGOING DEVELOPMENT. WHERE PDSSIBLE, NATURAL DRAINAGE WAYS SHOULD BE UTILIZED AND LEFT OPEN TO REMOVE EXCESS SURFACE WATER. SILT FENCE TO BE MAINTAINED AND CLEANED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
6. ALL DISTURBED AREAS AND SIDE SLOPES WHICH ARE FINISHED GRADED, WITH NO FURTHER CONSTRUCTION TO TAKE PLACE, SHALL BE LOAMED AND SEEDED WITHIN 72 HOURS AFTER FINAL GRADING. A MINIMUM OF 4" OF LOAM SHALL BE INSTALLED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA. THE SEED MIX SHALL BE AS DESIGNATED BELOW.
7. ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, AND WHICH WILL BE REGRADED LATER DURING CONSTRUCTION SHALL BE MACHINE HAY MULCHED AND SEEDED WITH RYE GRASS TO PREVENT EROSION. THE MAXIMUM LENGTH OF TIME FOR THE EXPOSURE OF DISTURBED SOILS SHALL BE 45 DAYS. HAY OR STRAW MULCH SHALL BE APPLIED TO ALL FRESHLY SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE. BALES SHALL BE UNSPOILED, AIR DRIED, AND FREE FROM WEED, SEEDS AND ANY COARSE MATERIAL.
8. DURING GRADING OPERATIONS INSTALL HAY BALE BARRIERS ALONG TOE OF SLOPE OF FILL AREAS WHERE SHOWN. BARRIERS ARE TO BE MAINTAINED UNTIL DISTURBED AREAS ARE PAVED OR GRASSED.
9. THE FILL MATERIAL SHALL BE OF APPROVED SOIL TYPE FREE FROM STUMPS, ROOTS, WOOD, ETC. TO BE PLACED IN 12" LIFTS OR AS SPECIFIED. BULLDOZERS, TRUCKS, TRACTORS, OR ROLLERS MAY BE USED FOR COMPACTION BY ROUTING THE EQUIPMENT TO ALL AREAS OR EACH LAYER.
1D. AVOID THE USE OF FUTURE OPEN SPACES (LOAM & SEED) WHEREVER POSSIBLE DURING CONSTRUCTION. CONSTRUCTION TRAFFIC SHALL USE THE ROADBEDS OF FUTURE ROADS.

TEMPORARY EROSION CONTROL MEASURES:

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
2. HAY BALE BARRIERS AND SEDIMENT TRAPS SHALL BE INSTALLED AS REQUIRED. BARRIERS AND TRAPS ARE TO BE MAINTAINED AND CLEANED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
3. BALED HAY AND MULCH SHALL BE MOWINGS OF ACCEPTABLE HERBACEOUS GROWTH, FREE FROM NOXIOUS WEEDS OR WDODY STEMS, AND SHALL BE DRY. ND SALT HAY SHALL BE USED.
4. FILL MATERIAL SHALL BE FREE FROM STUMPS, WOOD, ROOTS, ETC.
5. STDCKPILED MATERIALS SHALL BE PLACED ONLY IN AREAS SHOWN ON THE PLANS. STOCKPILES SHALL BE PROTECTED BY SILTATION FENCE AND SEEDED TO PREVENT EROSION. THESE MEASURES SHALL REMAIN UNTIL ALL MATERIAL HAS BEEN PLACED OR DISPOSED OFF SITE.
6. ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED. A MINIMUM OF 4 INCHES OF LOAM SHALL BE INSTALLED AND SEEDING AS SPECIFIED.
7. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED.
8. PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
9. ALL CATCH BASIN INLETS WILL BE PROTECTED WITH LOW PDINT SEDIMENTATION BARRIER.
1D. ALL STORM DRAINAGE OUTLETS WILL BE STABILIZED AND CLEANED AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
11. ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTER AREA.
12. JUTE MATTING OR APPROVED EQUIVALENT SHALL BE PROVIDED ON ALL SLOPES GREATER THAN 3:1.
13. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMPs ARE STABILIZED.



NOTES:
1. ALL MATERIAL TO MEET FILTREXX®SPECIFICATIONS.
2. SILT SOXX™FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Sediment control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Sediment control may be required to reduce effective slope length or sediment removal may be necessary. Sediment control shall be inspected until area above has been permanently stabilized and construction activity has ceased.

1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Sediment control when accumulation has reached 1/2 of the effective height of the Sediment control, or as directed by the Engineer. Alternatively, a new Sediment control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Sediment control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia™ will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, Sediment control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

FILTREXX® SILT SOXX™

GPI | Formerly MHF Design Consultants, Inc. | Engineering | Design | Planning | Construction Management

TEST PIT DATA

Client: 4 Amigos LLC
Project Address: 1400 Lafayette Road
Town, State: Portsmouth, NH
Job Number: 458219
Date: December 16, 2019
Performed by: Diane Pantermoller

Test Pit No. 12-1 — ESHWT: >54" — Refusal: 54" — SCS Soil: Chatfield-Hollis-Canton — Standing Water: None — Roots: None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-48"	A	Loamy Sand	10yr 3/2	FR	
48-54"	B	Loamy Sand	10yr 5/6	FR	None visible

Test Pit No. 12-2 — ESHWT: >120" — Refusal: >120" — SCS Soil: Chatfield-Hollis-Canton — Standing Water: None — Roots: 54"

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-9"	A	Loamy Sand	10yr 3/2	FR	
9-18"	B	Loamy Sand	10yr 5/6	FR	
18-120"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

Test Pit No. 12-3 — ESHWT: >122" — Refusal: >122" — SCS Soil: Chatfield-Hollis-Canton — Standing Water: None — Roots: None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-30"	Fill	Mixed Soils/pavement			Mixed Soils/Urban Fill/Pavement Gravel
30-122"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

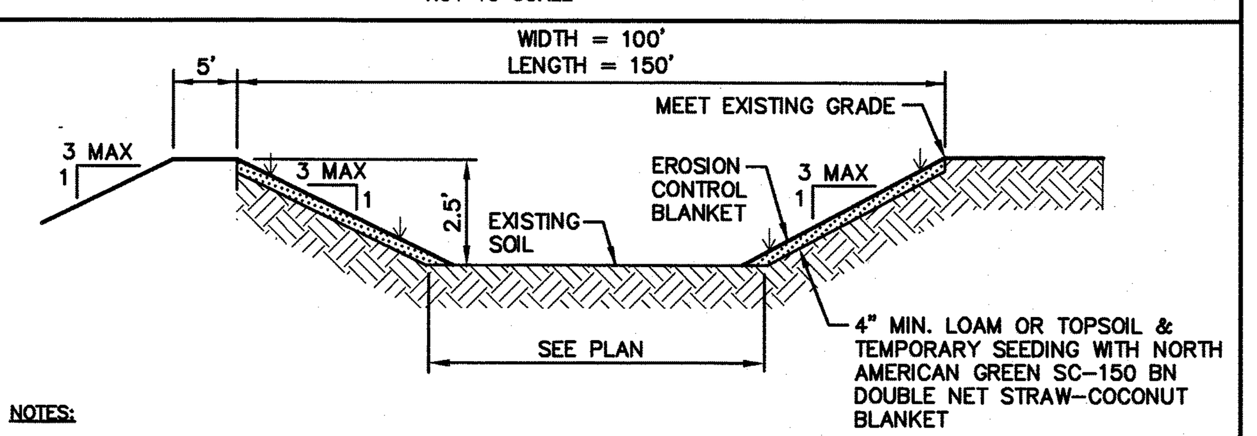
Test Pit No. 12-4 — ESHWT: >120" — Refusal: >120" — SCS Soil: Chatfield-Hollis-Canton — Standing Water: None — Roots: None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-120"	Fill	Mixed Soils			Bricks, Urban Fill

Test Pit No. 12-5 — ESHWT: >120" — Refusal: >120" — SCS Soil: Chatfield-Hollis-Canton — Standing Water: None — Roots: None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-36"	Fill	Mixed Soils			Bricks, Urban Fill
36-120"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

Greenman-Pedersen, Inc. 44 Stiles Road, Suite One Salem, NH 03079 p 6D3-893-0720
An Equal Opportunity Employer

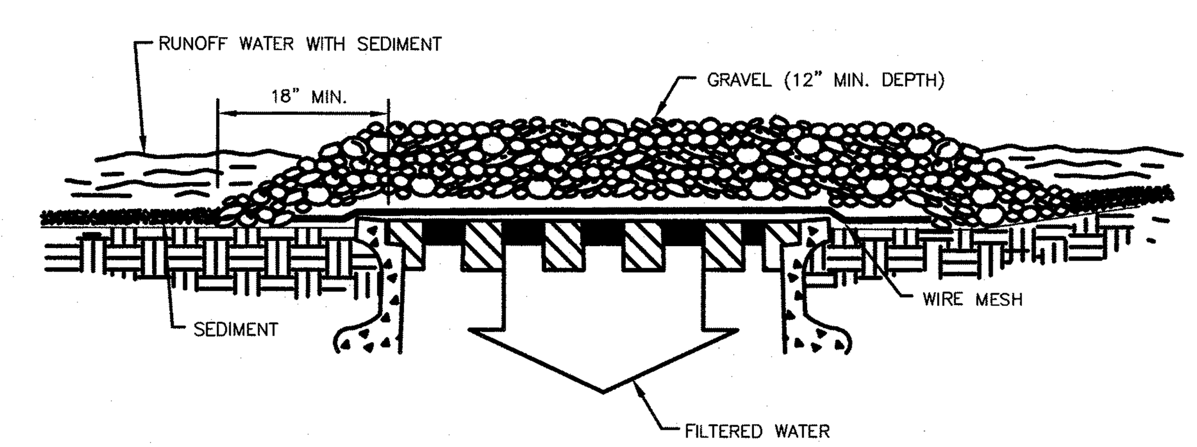


NOTES:

1. SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER, AND SHALL BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION.
2. THE SPILLWAY ON THE TRAP SHOULD BE A MINIMUM OF 1 FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
3. THE TRAP SHALL BE CLEANED WHEN 50% OF THE ORIGINAL VOLUME IS FILLED. MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.

TEMPORARY SEDIMENT TRAP TYPICAL CROSS SECTION

NOT TO SCALE



CONSTRUCTION SEQUENCE:

1) A WIRE MESH SHOULD BE PLACED DVER THE DROP INLET OR CURB OPENING SO THAT THE ENTIRE OPENING AND A MINIMUM OF 12 INCHES AROUND THE OPENING ARE CDVERED BY THE MESH. THE MESH MAY BE ORDINARY HARDWARE CLOTH OR WIRE MESH WITH OPENINGS UP TO 1/2 INCH.

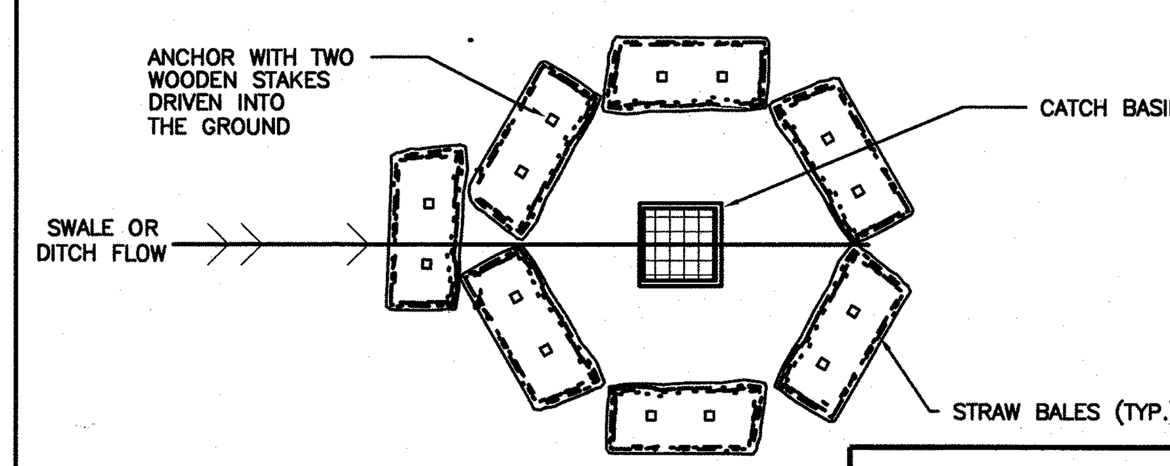
2) THE WIRE MESH SHOULD BE COVERED WITH CLEAN COARSE AGGREGATE SUCH AS SEWER STONE FOR A MINIMUM DEPTH OF 12 INCHES.

3) THE COARSE AGGREGATE SHOULD EXTEND AT LEAST 18 INCHES ON ALL SIDES OF THE DRAIN OPENING.

MAINTENANCE: ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAIN STORM AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM THE TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED OF IN A SUITABLE AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURAL OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

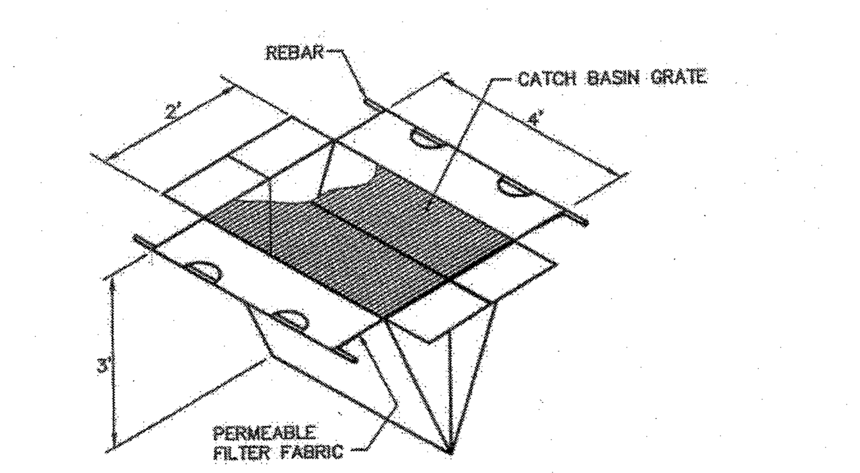
ON-SITE INLET PROTECTION DETAIL

NOT TO SCALE



LOW POINT SEDIMENTATION CONTROL BARRIER

NOT TO SCALE



SILTATION BAG

NOT TO SCALE

USE "SILTSACK" AS MANUFACTURED BY ATLANTIC CONSTRUCTION FABRICS, INC. OR EQUIVALENT

INLET PROTECTION DETAIL

NOT TO SCALE

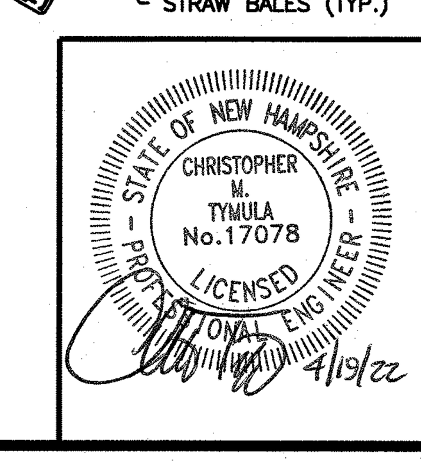
NO.	DESCRIPTION	BY	DATE
2	UPDATE ADDRESS	CMT	4/15/22
1	ADDED NOTES, SEDIMENT TRAP DETAIL PER AoT COMMENTS	NID	8/6/20

REVISIONS

DETAIL SHEET

ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

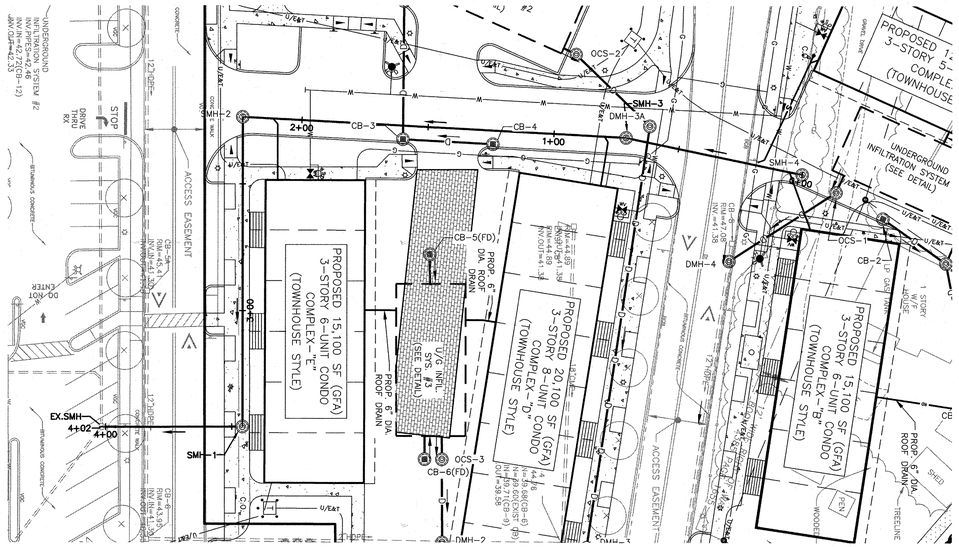


GPI | Engineering | Design | Planning | Construction Management
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079
603.893.0720 GPINET.COM

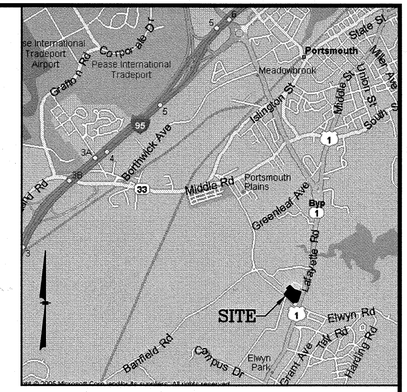
NOT TO SCALE	DATE: JANUARY 20, 2020		DRAWING NO. 4582DET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	15 OF 15

LEGEND

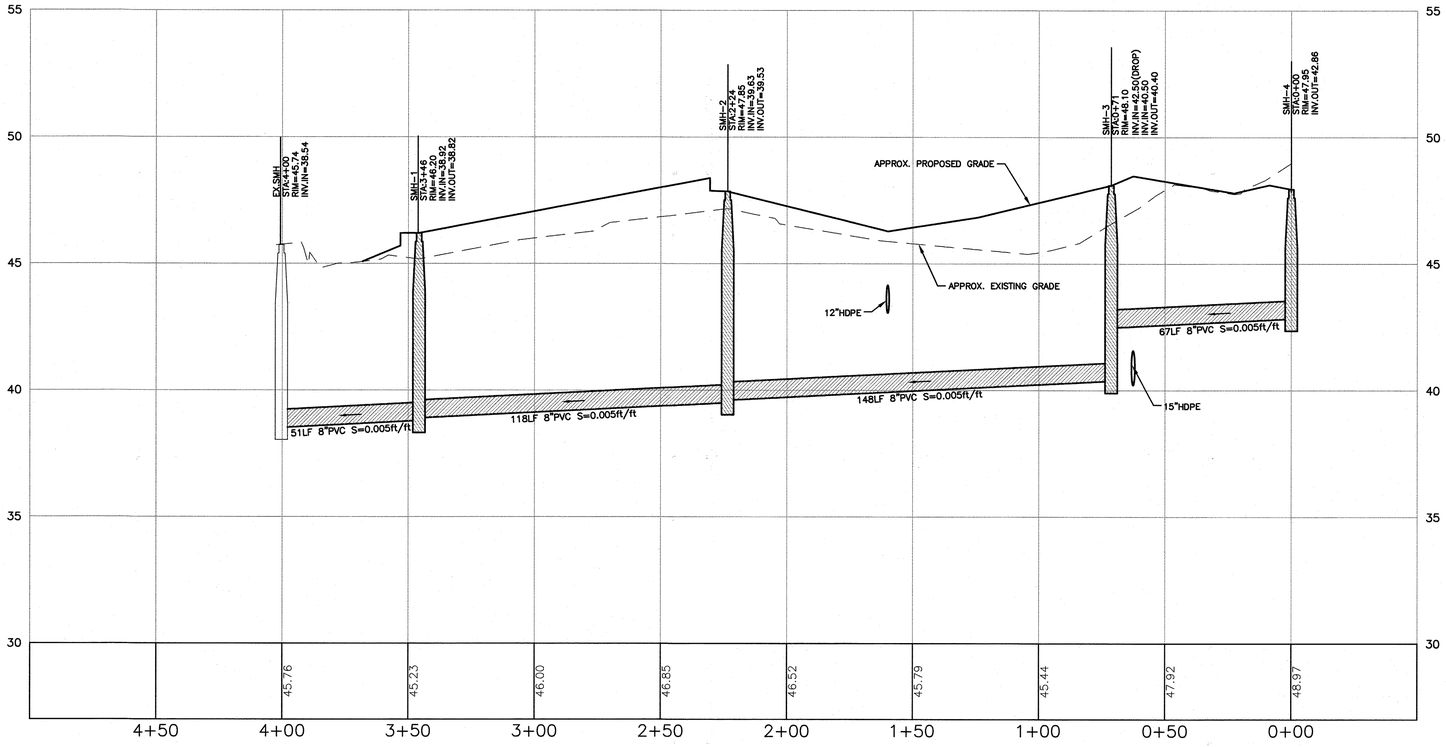
○	IRON PIN FOUND		UTILITY POLE
⊡	CONCRETE BOUND FOUND	◎	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	Ⓢ	SEWER MANHOLE
⊙	DRILL HOLE FOUND	Ⓣ	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	□	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
C.O.	PROP. CLEANOUT		TREELINE
CB–1	PROP. CATCH BASIN		
DMH–1	PROP. DRAIN MANHOLE		
SMH–1	PROP. SEWER MANHOLE		
	PROP. GATE VALVE		



PLAN
SCALE: 1"=30'



LOCATION MAP
(NOT TO SCALE)



PROFILE
SCALE: 1"=30'H/3'V

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

NO.	DESCRIPTION	BY	DATE
5	MISC. REVISIONS	CMT	4/15/22
4	REVISE BUILDING NUMBERS, ADD STREET ADDRESS	CMT	8/19/20
3	MISC. REVISIONS	CMT	8/6/20
2	MISC. REVISIONS PER TAC	CMT	3/9/20
1	MISC. REVISIONS PER TAC	CMT	2/20/20

REVISIONS

SEWER PLAN/PROFILE

ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE – CHRISTOPHER M. TYMULA No.17078 – LICENSED PROFESSIONAL ENGINEER – 4/19/22

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582 SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	1 OF 1

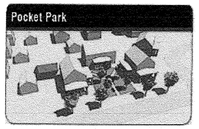
F:\Projects\CAD\458219\4582 SP.dwg SEWER PROF 4/19/22 11:31am sbonfonti

A Portsmouth street scene that is comparable to the **Wide Sidewalk** community space - 10' wide sidewalk with street trees, the front gardens are set back 6' more.

Cross - block walkways offer pedestrian connectivity and can have attractive gardens.

Portsmouth **Pocket Park**

Outdoor cafe space in Portsmouth.



A **community space** available for informal activities in close proximity to neighborhood residences. A **pocket park** is spatially defined by buildings. Its landscape shall consist of **paths**, lawns and trees, formally disposed. The minimum size shall be 500 sq. ft.

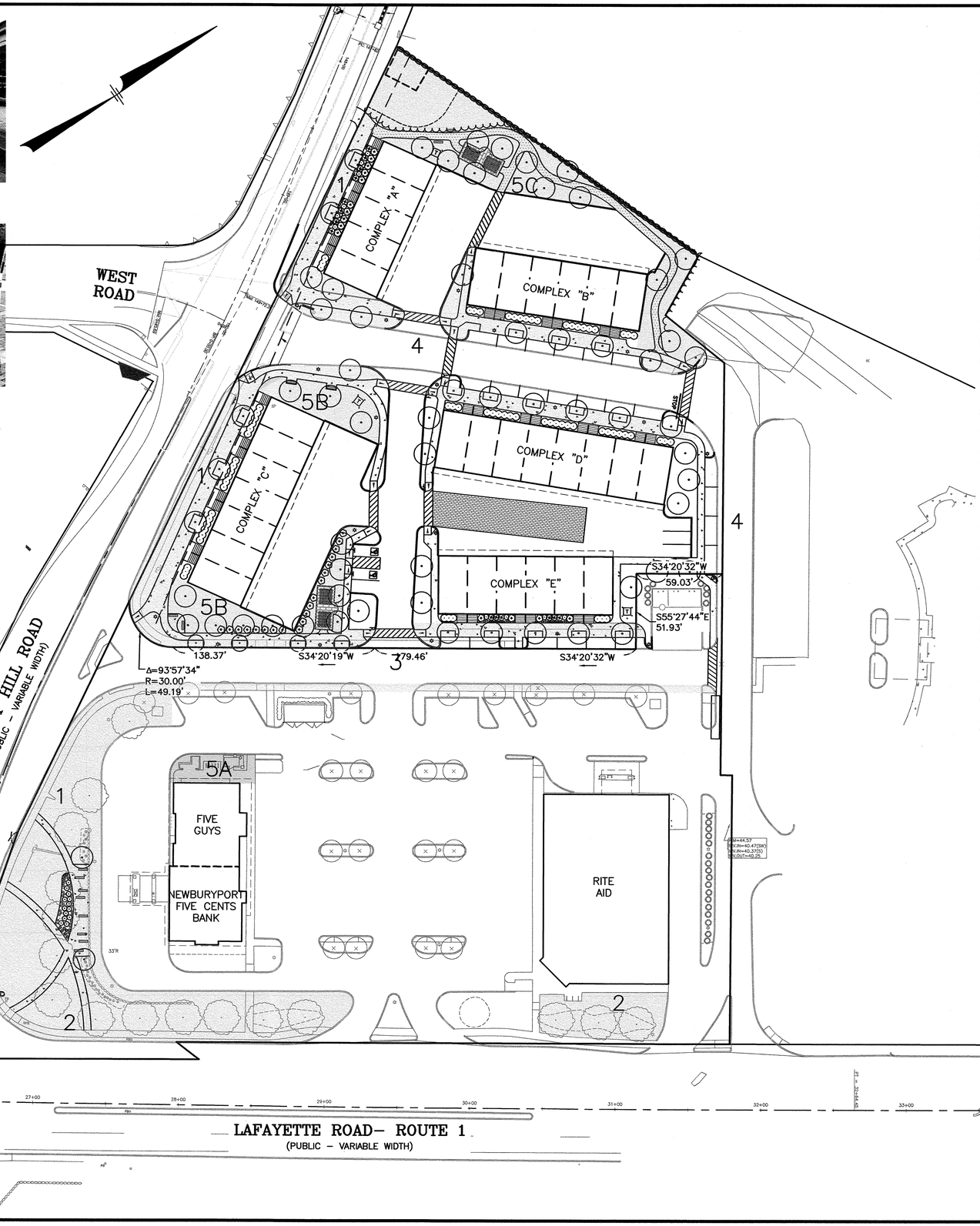
Permitted Districts: All Districts

A wide pedestrian **sidewalk** (a minimum of 10' in width unless otherwise defined by the Ordinance) located between the building façade and the public right of way. Wide pedestrian **sidewalks** provide space between the **façade** and the curbline for comfortable pedestrian movement, **street** trees and **street** furniture.

Permitted Districts: All Districts

An outdoor dining cafe community space is permitted as an ancillary activity of a food and drink establishment where the principal use is otherwise allowed in the district. The area must provide deeded public access to qualify as Community Space in the Character Districts.

Permitted districts: G1, G2, CD4-L2, CD4, CD4-W, CD-5



Defining Community Space:

The gateway zoning district requires a clear definition of community space area as well as the typology of community space, based upon defined types in the Gateway Zoning District in the project's design. There is an overall requirement of 20% open space - which the project complies with a calculation at 24.1% of the total site is proposed as non-paved and non-building space, but there is not an actual numerical value required for community space. At the same time, the community space requirements mandates an acceptable percentage of open space must have a viable function for the aesthetic and social life of the project. The Planning process will make a determination on the appropriateness of the community space, but the objective of the projects design is to maximize that opportunity in balance with the projects density and development pattern.

The approach for community space in the project design is first to make all public street frontages community space in the form of Widened Sidewalks with street trees and sidewalk amenities and street furniture. Additional landscaped areas can have added Community Space values in smaller discrete locales.

1. Frontage on Peverly Hill Road:
We initially considered that we could use this frontage as a Greenway designation, but we perceived that the Greenway typology in the community space assumed something greater in width. Therefore we have used the **Wide Pedestrian Sidewalk**. The current plan shows 25 feet from the right of way to the face of the building, so the 10 foot sidewalk and landscaping along the building more than adequately fits. Entrances to the building doorways are shown on each of the corners. Wide Pedestrian Sidewalks can have parallel garden spaces as linear rain gardens to capture, detain, and treat roof runoff from the buildings and the sidewalks. Street tree plantings in the 10 foot sidewalk can use Flexi pave, a pervious surfacing material that also functions to protect the tree roots.

The city has planned a sidewalk and striped bicycle lanes along this whole frontage. It's assumed that the city will basically require the project to build this sidewalk and it is proposed to be done at 10'. There are questions if the widened sidewalk should be within or outside of the city right of way.

2. Frontage on Lafayette Road to Rite Aid / Five Guys and Newburyport Bank property:
We are not anxious to make major changes to the parking areas because of lease requirements for Rite Aid. The percentage of building and parking is at somewhat a disadvantage except for the frontage along Lafayette Road because of the high percentage of building and parking coverage and the layout. Nevertheless, the project must integrate the entire property area for open space and community space.

The landscape frontage on Lafayette Road around the corner onto Peverly Hill Road has opportunities for landscaping to activate the space for social uses. The plan shows the corner area incorporating the attractive stone wall with a patio and walkway for seating areas. Designated as a **Pocket Park** the prominent street frontage location is a landmark public space location.

3. Frontage Road facing Rite Aid and Five Guys:
This is the project's principal view from Lafayette Road and represents the transition from the commercial frontage to the residential neighborhood development as proposed. The previous project layout had 10 feet from the curb to the face of the buildings. In recognition that the entrance stairs for each of the townhouse unit pairs are not public space - the plan has been revised to set the bottom stair at the 10' edge, and to position the frontage gardens as 6' of additional streetscape space. Parallel on - street parking has also been located along this frontage for visitor parking.

The most appropriate community space for this street frontage is the **Wide Pedestrian Sidewalk**. That requires a minimum 10 foot space for widened paved sidewalk with street trees and street furniture. It's kind of a downtown street like experience and there are plenty of examples of this scale and character throughout the city in attractive neighborhoods. Wide Pedestrian Sidewalks can have parallel garden spaces as linear rain gardens to capture, detain, and treat roof runoff from the buildings and the sidewalks. Street tree plantings in the 10 foot sidewalk can use Flexi pave, a pervious surfacing material that also functions to protect the tree roots.

4. Side connecting streets:
The street frontage connecting Peverly Hill Road and the frontage to the hotel have a similar condition of being a pre-existing condition to which we must adapt the neighborhood design. On the frontage between Complexes "B" & "D", the use of the **Wide Pedestrian Sidewalk** is the best and most efficient community space because it is the front door to all the new housing and a public streetscape. The hotel facing directional only has room for a 5' widewalk but it is a lesser perspective.

5. Within the project itself there are also some additional community spaces:

A. Outdoor dining patio for Five Guys fits into a community space category of Outdoor Dining Cafe.

B. The north and south ends of Complex 'C' contain green space, trees and benches and are classified as Pocket Parks.

C. The northern portion of the site behind Complexes 'A' and 'B' is a natural woodland area of native trees and ground covers is also best designated as a Pocket Park.

NO.	DESCRIPTION	BY	DATE
2	MISC. REVISIONS	CMT	4/15/22
1	MISC. REVISIONS	CMT	3/9/20

REVISIONS

COMMUNITY SPACE OVERVIEW PLAN

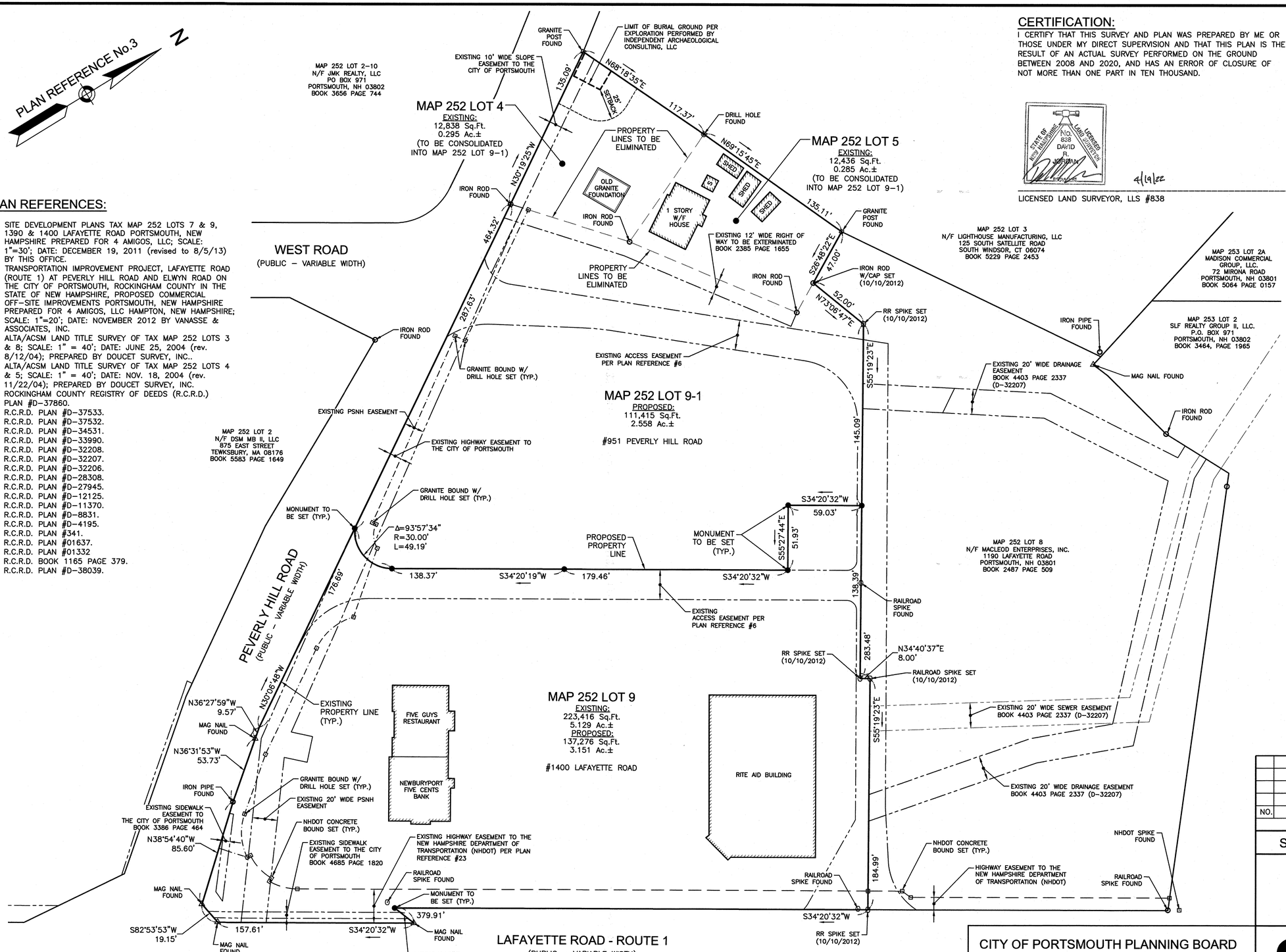
ASSESSORS MAP 252 – LOTS 4,5 & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: NTS	DATE: JANUARY 20, 2020		DRAWING NO. 4582COM–SPACE.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	1 OF 1

F:\Projects\CAD\458219\4582COM-SPACE.dwg SP 4/19/22 12:57pm sbonfanti



PLAN REFERENCES:

1) SITE DEVELOPMENT PLANS TAX MAP 252 LOTS 7 & 9, 1390 & 1400 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR 4 AMIGOS, LLC; SCALE: 1"=30'; DATE: DECEMBER 19, 2011 (revised to 8/5/13) BY THIS OFFICE.
2) TRANSPORTATION IMPROVEMENT PROJECT, LAFAYETTE ROAD (ROUTE 1) AT PEVERLY HILL ROAD AND ELWYN ROAD ON THE CITY OF PORTSMOUTH, ROCKINGHAM COUNTY IN THE STATE OF NEW HAMPSHIRE, PROPOSED COMMERCIAL OFF-SITE IMPROVEMENTS PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR 4 AMIGOS, LLC HAMPTON, NEW HAMPSHIRE; SCALE: 1"=20'; DATE: NOVEMBER 2012 BY VANASSE & ASSOCIATES, INC.
3) ALTA/ACSM LAND TITLE SURVEY OF TAX MAP 252 LOTS 3 & 8; SCALE: 1" = 40'; DATE: JUNE 25, 2004 (rev. 8/12/04); PREPARED BY DOUCET SURVEY, INC..
4) ALTA/ACSM LAND TITLE SURVEY OF TAX MAP 252 LOTS 4 & 5; SCALE: 1" = 40'; DATE: NOV. 18, 2004 (rev. 11/22/04); PREPARED BY DOUCET SURVEY, INC.
5) ROCKINGHAM COUNTY REGISTRY OF DEEDS (R.C.R.D.) PLAN #D-37860.
6) R.C.R.D. PLAN #D-37533.
7) R.C.R.D. PLAN #D-37532.
8) R.C.R.D. PLAN #D-34531.
9) R.C.R.D. PLAN #D-33990.
10) R.C.R.D. PLAN #D-32208.
11) R.C.R.D. PLAN #D-32207.
12) R.C.R.D. PLAN #D-32206.
13) R.C.R.D. PLAN #D-28308.
14) R.C.R.D. PLAN #D-27945.
15) R.C.R.D. PLAN #D-12125.
16) R.C.R.D. PLAN #D-11370.
17) R.C.R.D. PLAN #D-8831.
18) R.C.R.D. PLAN #D-4195.
19) R.C.R.D. PLAN #341.
20) R.C.R.D. PLAN #01637.
21) R.C.R.D. PLAN #01332
22) R.C.R.D. BOOK 1165 PAGE 379.
23) R.C.R.D. PLAN #D-38039.

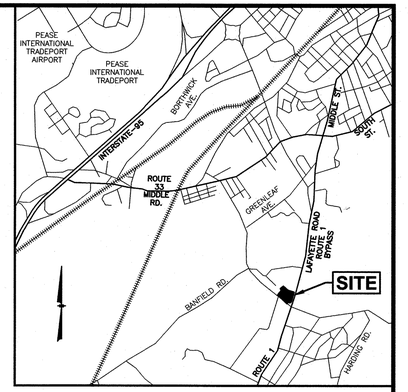
CERTIFICATION:

I CERTIFY THAT THIS SURVEY AND PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT THIS PLAN IS THE RESULT OF AN ACTUAL SURVEY PERFORMED ON THE GROUND BETWEEN 2008 AND 2020, AND HAS AN ERROR OF CLOSURE OF NOT MORE THAN ONE PART IN TEN THOUSAND.

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — NO. 838 — DAVID R. JORDAN

4/19/22

LICENSED LAND SURVEYOR, LLS #838



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) THE PURPOSE OF THIS PLAN IS TO CONSOLIDATE MAP 252 LOT 4, MAP 252 LOT 5 AND A PORTION OF MAP 252 LOT 9 INTO A NEW PARCEL TO BE IDENTIFIED AS MAP 252 LOT 9-1.
2) TOTAL PARCEL AREA:
   EXISTING:
   MAP 252 LOT 4 = 12,838 Sq.Ft OR 0.295 Ac.±.
   MAP 252 LOT 5 = 12,436 Sq.Ft. OR 0.285 Ac.±.
   MAP 252 LOT 9 = 223,417 Sq.Ft. OR 5.129 Ac.±.
   TOTAL = 248,691 Sq.Ft. OR 5.709 Ac.±
   PROPOSED:
   MAP 252 LOT 9 = 137,276 Sq.Ft OR 3.151 Ac.±.
   MAP 252 LOT 9-1 = 111,415 Sq.Ft OR 2.558 Ac.±.
   TOTAL = 248,691 Sq.Ft. OR 5.709 Ac.±
3) ZONE: GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2)

MIN. LOT SIZE:	10,000 Sq.Ft.
MIN. LOT FRONTAGE:	50 Ft.
SETBACKS:	
FRONT	80 Ft. FROM CL LAFAYETTE ROAD
	30 Ft. FROM PEVERLY HILL R.O.W.
SIDE	30 Ft.
REAR	50 Ft.

   REFER TO THE CITY OF PORTSMOUTH ZONING ORDINANCE FOR VERIFICATION, ADDITIONAL RESTRICTIONS AND PERMITTED USES.
4) THIS PLAN IS THE RESULT OF ON-THE-GROUND FIELD SURVEY PERFORMED BY THIS OFFICE BETWEEN 2008 AND 2020.
5) BEARINGS SHOWN HEREON ARE BASED ON PLAN REFERENCE #3.
6) LOCATION OF UNDERGROUND UTILITIES ARE NOT SHOWN.
7) THE SURVEY TRACT IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA (100 YEAR FLOOD) PER FLOOD INSURANCE RATE MAP NUMBER 33015C0270E, WITH AN EFFECTIVE DATE OF MAY 17, 2005.
8) SEE SITE REDEVELOPMENT PLANS FOR EXISTING AND PROPOSED UTILITIES, BUILDINGS, CURB LINES, SIDEWALKS AND OTHER PHYSICAL SITE FEATURES.

OWNER OF RECORD:

MAP 252 LOTS 4, 5, & 9
4 AMIGOS, LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NEW HAMPSHIRE 03842
BOOK 5391 PAGES 625 & 638

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

SUBDIVISION & LOT CONSOLIDATION PLAN

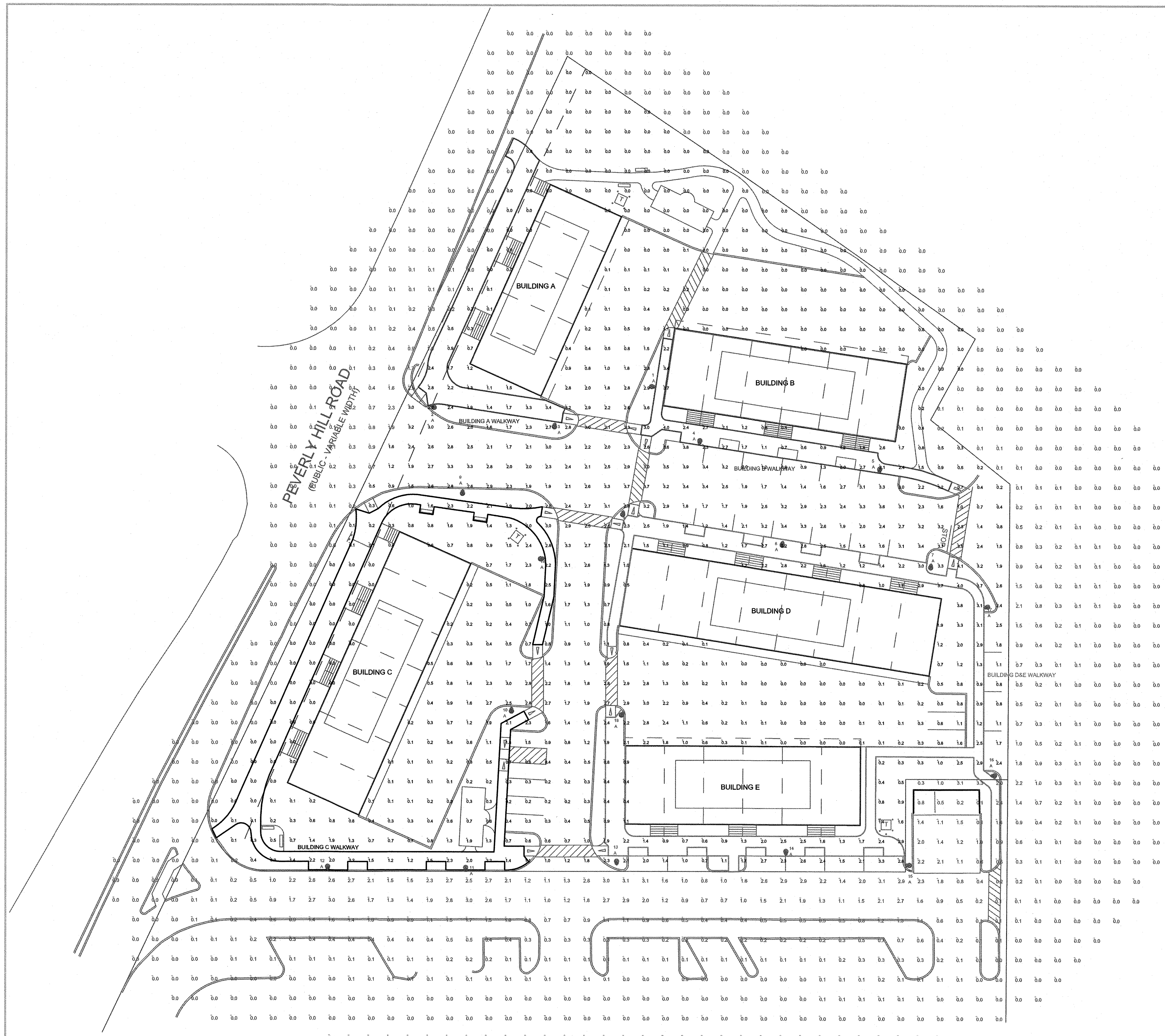
ASSESSORS MAP 252 LOTS 4, 5, & 9
951 PEVERLY HILL ROAD & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NEW HAMPSHIRE 03842

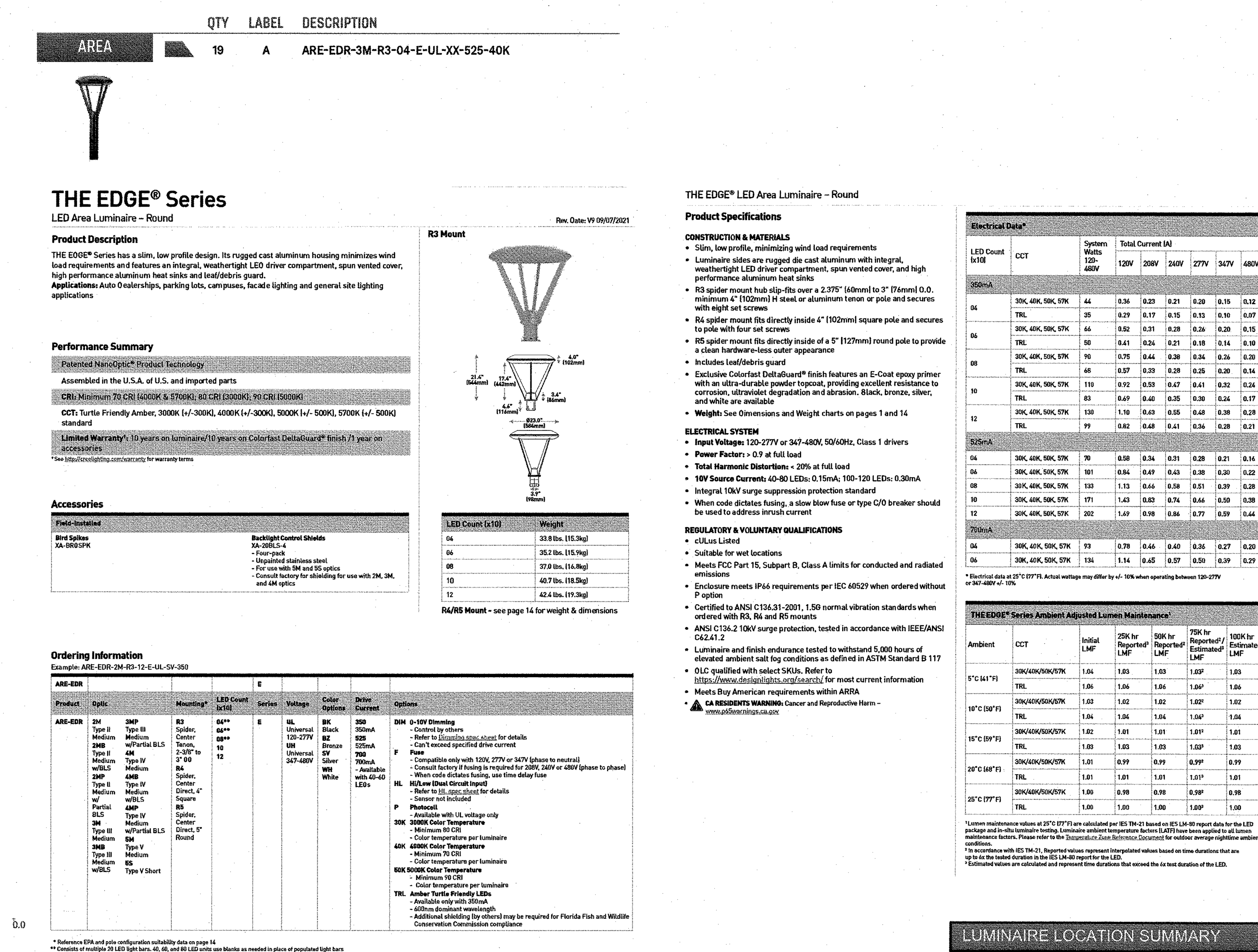
CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON _____ DATE _____

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=40'	DATE: APRIL 15, 2022		DRAWING NO. 4582 SUBD LLA.dwg
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
DPD	AKC/DRJ	MAX-458219.00	1 OF 1





LUMINAIRE LOCATION SUMMARY

LUM NO.	LABEL	MTG. HT.
1	A	15
2	A	15
3	A	15
4	A	15
5	A	15
6	A	15
7	A	15
8	A	15
9	A	15
10	A	15
11	A	15
12	A	15
13	A	15
14	A	15
15	A	15
16	A	15
17	A	15
18	A	15
19	A	15

NOTE:

- ALL AREA LIGHTS ON NEW 12 FT. POLE MOUNTED ON 1 FT. CONCRETE BASE + 1.8' SPIDER MOUNTING = 15' NOMINAL OVERALL MOUNTING HEIGHT

FOOTCANDLE LEVELS CALCULATED AT GRADE USING INITIAL LUMEN VALUES

LABEL	AVG	MAX	MIN	AVG/MIN	MAX/MIN
OUTSIDE PROPERTY LINES	0.29	3.3	0.0	N.A.	N.A.
WITHIN PROPERTY LINES	1.10	4.1	0.0	N.A.	N.A.
BUILDING A WALKWAY	1.15	3.4	0.0	N.A.	N.A.
BUILDING B WALKWAY	2.11	4.0	0.6	3.52	6.67
BUILDING C WALKWAY	0.99	2.8	0.0	N.A.	N.A.
BUILDING D&E WALKWAY	1.74	4.0	0.4	4.35	10.00

LUMINAIRE SCHEDULE

SYMBOL	QTY	LABEL	ARRANGEMENT	LUMENS	LLF	BUG RATING	WATTS/LUMINAIRE	TOTAL WATTS	MANUFACTURER	CATALOG LOGIC
	19	A	Single	6731	1.040	B2-U0-G2	70	1330	Cree Lighting	ARE-EDR-3M-R3-04-E-UL-XX-525-40K

REDLEONARD ASSOCIATES

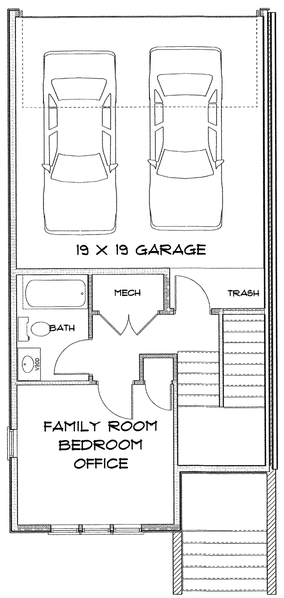
1340 Kemper Meadow Dr, Forest Park, OH 45240

513-574-9500 | redleonard.com

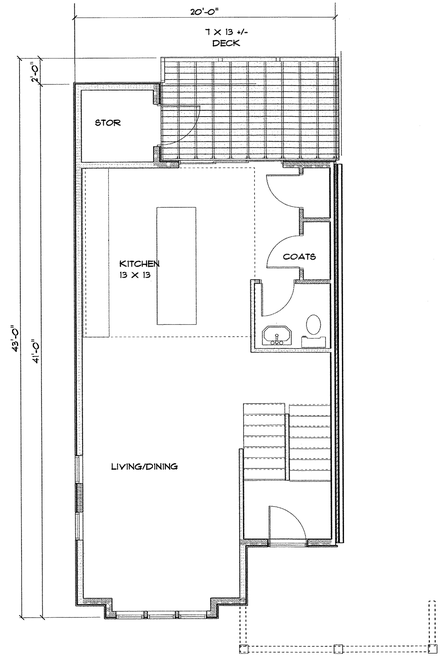
SCALE: 1" = 30'
LAYOUT BY: JSG
DWG SIZE: D
DATE: 4/6/22

PROJECT NAME:
4 AMIGOS
PORTSMOUTH, NH

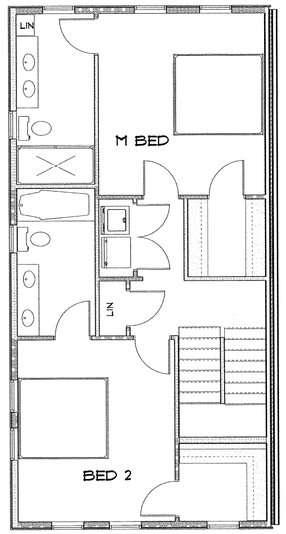
DRAWING NUMBER:
RL-8016-S1



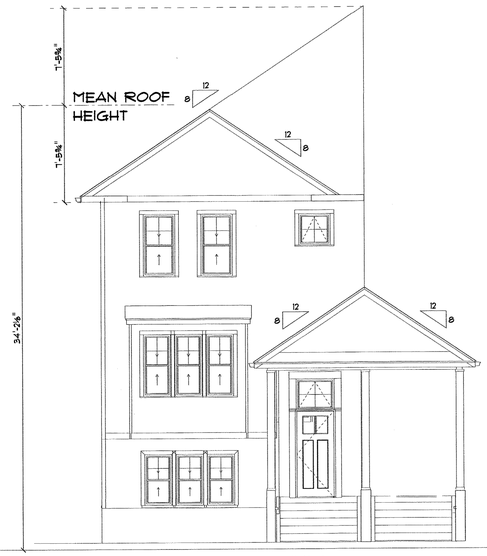
TYPICAL GARAGE LEVEL PLAN
SCALE: 3/16" = 1'-0"



TYPICAL SECOND FLOOR PLAN
SCALE: 3/16" = 1'-0"



TYPICAL THIRD FLOOR PLAN
SCALE: 3/16" = 1'-0"



ASSUMED AVERAGE GRADE TO BE VERIFIED
FACADE MODULATION WHERE REQUIRED IS
PROPOSED TO BE ACHIEVED BY MATERIAL CHANGES
ROOF, DORMERS AND FENESTRATION VARIATIONS

FRONT ELEVATION DIMENSION
SCALE: 3/16" = 1'-0"

mjk
Michael J. Keane
Architects, PLLC
ARCHITECTURE
PLANNING
DESIGN
101 Kent Place
Newmarket, NH
03857
603-292-1400
mjkarchitects.com

CONSULTANTS

REVISIONS

APPROVALS

CONCEPT NOT FOR CONSTRUCTION
1/19/2020

Accept only origiani stamp and signature
copies may contain unauthorized modifications

PROJECT

MAP 252- LOTS 4,5 &9
1400 LAFAYETTE ROAD
PORTSMOUTH NH

FOR

4 AMIGOS, LLC
321 LAFAYETTE ROAD
HAMPTON NH 03842,

TITLE

BUILDING B TYPICAL UNIT

DRAWN BY:

CHECKED BY:

DATE:

SCALE: AS NOTED

DRAWING NO.

1 OF 1

DO NOT SCALE PRINTS

STORMWATER MANAGEMENT REPORT

SITE DEVELOPMENT PLANS
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

GPI

GPI

44 Stiles Road, Suite One
Salem, NH 03079
(603) 893-0720

Prepared For:

4 Amigos, LLC
321D Lafayette Road
Hampton, NH 03842

January 21, 2020

Revised: April 15, 2022

STATE OF NEW HAMPSHIRE
CHRISTOPHER M. TYMULA
No. 17078
LICENSED PROFESSIONAL ENGINEER
4/19/22

4 Amigos, LLC
Site Development Plans
Stormwater Management Report

TABLE OF CONTENTS

Stormwater Management Report
Proposed Site Development Plans
1400 Lafayette Road, Portsmouth, NH 03801
Revised: April 15, 2022

SECTION 1 EXECUTIVE SUMMARY

This report contains the stormwater management analysis for the proposed site development at 1400 Lafayette Road in Portsmouth, New Hampshire. The analysis includes both pre- and post-drain calculations of stormwater runoff rates from the project site. This analysis has been prepared in accordance with both the City of Portsmouth requirements and the New Hampshire Department of Environmental Services (NHDES) Stormwater Manual, Volume 2.

The project site consists of three parcels of land identified as Tax Map 252 Lots 4, 5 & 9 with a combined size of 5.71 acres located north of the intersection of Lafayette Road & Peverly Hill Road.

This vacant pad site is part of the former Yoken's Restaurant and Function Facility which was partially redeveloped in 2013 to include the adjacent pharmacy, bank & restaurant development. Lots 4 & 5 are residential lots which are now proposed to be combined with the new residential development.

The applicant is proposing a multi-unit residential condo development which includes five 3-story Townhouse Style buildings. Access is provided from both Lafayette Road & Peverly Hill Road. Onsite parking includes a combination of street parking and individual townhouse garages.

A new stormwater management system has been designed as part of the proposed development to collect and treat the runoff from the new impervious surface areas. Several stormwater best management practices will be implemented as part of this project. These include deep-sump, hooded catch basins, First Defense hydrodynamic separators, and three underground infiltration systems. The proposed closed drainage system within the site will discharge treated water to the existing closed drainage system that discharges to the north which ultimately flows to Sagamore Creek.

The study watershed area is approximately 6.0-acres that primarily drains northerly across the site towards an existing onsite drainage system. For analysis purposes, the site was modeled with multiple design points as described in the Drainage Summary (Table 1) of this report.

As outlined by NHDES AoT there is a 10-year window for phased developments. Since this current phase of the overall development is within the 10-year window the stormwater analysis, post-development conditions described herein are compared with pre-development conditions prior to the 2013 redevelopment phase, with some adjustments made to current storm/rainfall intensities. Refer to Table 1 and associated notes.

TABLE 1: PEAK RATE ANALYSIS SUMMARY

Design Storm	Pre circa 2013[1] (cfs)	Adjusted pre circa 2013[2] (cfs)	Post circa 2013[1] (cfs)	Adjusted Post circa 2013[2] (cfs)	Proposed[3] (cfs)	Change[5] (cfs)
DESIGN POINT #1 (Existing Catch Basin 3A)[4]						
2-year	-	-	1.1	1.4	1.4	0.0
10-year	-	-	1.7	2.2	2.2	0.0
25-year	-	-	2.0	2.8	2.8	0.0
50-year	-	-	2.2	3.4	3.3	-0.1
DESIGN POINT #3 (Existing Catch Basin)						
2-year	7.0	8.8	2.7	3.9	5.1	-3.7
10-year	10.3	13.7	5.0	9.8	10.4	-3.3
25-year	12.6	17.6	7.2	13.1	15.4	-2.2
50-year	13.9	21.1	8.7	16.3	17.5	-3.6
DESIGN POINT #4 (Hotel Property)						
2-year	2.4	2.9	1.3	1.6	1.7	-1.2
10-year	3.4	4.5	1.8	2.4	2.8	-1.7
25-year	4.2	5.8	2.2	3.1	3.6	-2.2
50-year	4.6	6.9	2.5	3.7	4.3	-2.6

(All values shown are peak rates in CFS)

Lots 4 & 5 which drain towards Design Point #2 were not part of the original study area; therefore, the pre-development for this design point is based on current site conditions.

Design Storm	Pre-development (cfs)	Post-development (cfs)	Change (cfs)
DESIGN POINT #2 (Lot 3)			
2-year	0.8	0.3	-0.5
10-year	2.1	0.7	-1.4
25-year	3.3	1.1	-2.2
50-year	4.5	1.5	-3.0

(All values shown are peak rates in CFS)

[1] Previous analysis used the SCS Soil Distribution Map rainfall data in accordance with 2013 regulations.

[2] Previous analysis adjusted to use current "Extreme Precipitation" data plus 15% coastal increase per current NHDES requirements.

[3] Uses current "Extreme Precipitation" plus 15% coastal increase per current NHDES requirements.

[4] Existing catch basin 3A was a proposed catch basin in the 2013 post-development and was therefore not present for the 2013 pre-development.

[5] Change values for Design Point #1 reported as difference between Adjusted Post circa 2013 and Proposed columns. Change values for Design Points #3 and #4 reported as difference between Adjusted Pre circa 2013 and Proposed Columns.

In conclusion, by incorporating a new on-site drainage system that includes provisions for stormwater treatment and infiltration, there will be a decrease in the peak rate of runoff as a result of this project.

SECTION 2 EXISTING CONDITIONS

As previously stated, the existing conditions used for this stormwater analysis date back to the condition prior to the 2013 redevelopment project. Accordingly, the below description is consistent with the description provided in the previous stormwater report submitted at that time with the exception of Lots 4 & 5 which were not part of the original analysis. These two residential lots contain a small house, some grass areas, a few sheds and about 50 wooded coverage, all of which drains overland towards the rear of the property onto adjacent Lot 3.

Portsmouth Tax Map 252 Lot 9 is a 5.1-acre parcel of land located in the Gateway District (GW) in Portsmouth, NH. The parcel of land is the location of the former Yoken's Restaurant and Function Facility. The site is bounded by Lafayette Road to the east, Peverly Road to the south, residential property to the west and the Comfort Inn to the north. Onsite topography ranges from 1-5% and slopes towards the Comfort Inn along the north.

The Yoken's building has been razed, but for analysis purposes the former building and impervious area has been modeled in the existing conditions as if it were still existing. The remainder of the site is mostly paved, occupying approximately 93% of the site, with limited green space.

The existing drainage system consists of a series of catch basins and manholes which ultimately discharge north of the site boundary towards a drainage swale north of the Comfort Inn. This ultimately flows to Sagamore Creek. For analysis purposes, the existing catch basin, labeled CB D and the Hotel Property have been labeled as the design points. These areas represent the runoff discharging from the site as either shallow concentrated flows or flows into the existing drainage system via pipe flow.

The existing onsite catch basins consist of shallow structures with varying pipe sizes and material type. Based on the shallow flat pipes, along the front of the site near Lafayette Road, the existing conditions HydroCAD model indicated several existing catch basins overtopping for even the more frequent less intense design storms. In order to check the runoff results for accuracy due to any modeling limitations in the software, we modeled this portion of the existing site as one subcatchment to compare the results with the individually modeled areas. This "check" is shown in the HydroCAD model as subcatchment "Check". The results of this analysis indicate a level of precision of approximately 10% which indicates predevelopment runoff rates appear to be reasonable for comparison to the post development design points. Ultimately any runoff will drain northerly across the site as overland flow and eventually towards the drainage swale located north of the existing Comfort Inn property.

The existing soils are also classified by the Soil Survey of Rockingham County (NRCS Manual) as 140C "Chatfield-Hollis-Canton Complex", 299 "Udorthents" and 699 "Urban Land" (see soil map), and described by NRCS as follows:

> 140C - Chatfield-Hollis-Canton complex (SCS Classification "B") consists of 8 to 15 percent slopes and are very stony. These gently sloping soils occur as areas so intermingled that mapping them separately was not practical. They are on low, knobby hills and ridges that in most places have a northeast orientation. Areas are irregularly shaped and are 4 to 400 acres in size. They are about 35 percent Chatfield soil, 20 percent Hollis soil, 20 percent Canton soil, and 25 percent other soils. Stones cover 0.01 to 3 percent of the surface.
>
> 299 - Udorthents (SCS Classification "Unknown") consists of areas of soils formed by cutting or filling for construction projects. Udorthents are near or adjacent to most of the soils of the survey area. Because of the extreme variability of Udorthents, a reference pedon is not given.
>
> 699 - Urban Land (SCS Classification "Unknown") consists of land that is covered by streets, parking lots and buildings. Areas are rectangular or irregularly shaped and are 4 to 250 acres in size. Inclusions make up 15 percent or less of the map unit. They consist of scattered areas of soil throughout the map unit.

Based on the majority of the site consisting of Udorthents and Urban land having no known hydrologic soil classification, the analysis used the hydrologic soil group classification B consistent with Chatfield-Hollis-Canton complex present onsite. Additionally test pits were performed onsite indicating loamy sand and sands consistent with a "B" soil.

SECTION 3 PROPOSED CONDITIONS

The applicant is proposing a multi-unit residential condo development which includes five 3-story Townhouse Style buildings. Access is provided from both Lafayette Road & Peverly Hill Road. Onsite parking includes a combination of street parking and individual townhouse garages.

A new stormwater management system has been designed as part of the proposed development to collect and treat the runoff from the new impervious surface areas. Several stormwater best management practices will be implemented as part of this project. These include deep-sump, hooded catch basins, First Defense hydrodynamic separators, and three underground infiltration systems. The proposed closed drainage system within the site will discharge treated water to the existing closed drainage system that discharges to the north which ultimately flows to Sagamore Creek.

In order to safeguard against oil or gas introduction into the drainage system, stormwater runoff from parking areas and driveways will be collected in hooded catch basins with deep sumps and routed to a First Defense hydrodynamic separator. Such pretreatment of stormwater reduces both suspended solids and oils in the drainage system and is recommended by NHDES.

Another safeguard against future intrusion of contaminants into the groundwater is the implementation of an Inspection & Maintenance Manual (I&M), which will assure proper function of drainage components and reduce sediment entering the system. To prevent erosion and sedimentation during construction, Best Management Practices including stabilized construction exits, silt fence, catch basin inserts, and temporary and permanent seeding have been incorporated into the construction sequence.

The total area of disturbance related to the proposed construction on this property is approximately 115,000 square feet; therefore the project is subject to US EPA Construction General Permit requirements.

Due to disturbing more than 15,000 sf of area, the City of Portsmouth requires Enhanced Stormwater Treatment Standards to be followed. Per the NHDES “BMP Pollutant Removal Efficiency” table contained within the New Hampshire Stormwater Manual, the underground infiltration systems have a Total Suspended Soils (TSS) Removal Rate of 90% and a Total Nitrogen (TN) Removal Rate of 60%. This satisfies the requirements of §7.6.2-1(a) of the Site Plan Review Regulations (See Appendix F). In addition to these enhanced requirements, following approval from the City, relevant information will need to be submitted to the Pollutant Tracking and Accounting Program (PTAP) online data portal managed by the UNH Stormwater Center. The Planning Department will be notified of the PTAP data submittal.

SECTION 4 STORMWATER MODELING METHODOLOGY

The drainage system for this project was modeled using HydroCAD, a stormwater modeling computer program that analyzes the hydrology, and hydraulics of stormwater runoff. HydroCAD is based largely on the hydrology techniques developed by the Soil Conservation Service (SCS/NRCS), combined with other hydrology and hydraulics calculations. For a given rainfall event, these techniques are used to generate hydrographs throughout a watershed. This provides verification that a given drainage system is adequate for the area under consideration, or to predict where flooding or erosion is likely to occur.

In HydroCAD, each watershed is modeled as a Subcatchment, streams and culverts as a Reach (or Pond, depending on available storage capacity), and large wetlands and other natural or artificial storage areas as a Pond. SCS hydrograph generation and routing procedures were used to model both Pre-development and Post-development runoff conditions.

The Pre-development and Post-development watershed limits and the subcatchment characteristics were determined using both USGS and on-the-ground topographic survey information and through visual, on-site inspection. Conservative estimates were used at all times in estimating the hydrologic characteristics of each watershed or subcatchment.

STORMWATER MANAGEMENT REPORT

SITE DEVELOPMENT PLANS
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

GPI

GPI

44 Stiles Road, Suite One
Salem, NH 03079
(603) 893-0720

Prepared For:

4 Amigos, LLC
321D Lafayette Road
Hampton, NH 03842

January 21, 2020

Revised: April 15, 2022

STATE OF NEW HAMPSHIRE
CHRISTOPHER M. TYMULA
No. 17078
LICENSED PROFESSIONAL ENGINEER
4/19/22

4 Amigos, LLC
Site Development Plans
Stormwater Management Report

TABLE OF CONTENTS

Stormwater Management Report
Proposed Site Development Plans
1400 Lafayette Road, Portsmouth, NH 03801
Revised: April 15, 2022

SECTION 1 EXECUTIVE SUMMARY

This report contains the stormwater management analysis for the proposed site development at 1400 Lafayette Road in Portsmouth, New Hampshire. The analysis includes both pre- and post-drain calculations of stormwater runoff rates from the project site. This analysis has been prepared in accordance with both the City of Portsmouth requirements and the New Hampshire Department of Environmental Services (NHDES) Stormwater Manual, Volume 2.

The project site consists of three parcels of land identified as Tax Map 252 Lots 4, 5 & 9 with a combined size of 5.71 acres located north of the intersection of Lafayette Road & Peverly Hill Road.

This vacant pad site is part of the former Yoken's Restaurant and Function Facility which was partially redeveloped in 2013 to include the adjacent pharmacy, bank & restaurant development. Lots 4 & 5 are residential lots which are now proposed to be combined with the new residential development.

The applicant is proposing a multi-unit residential condo development which includes five 3-story Townhouse Style buildings. Access is provided from both Lafayette Road & Peverly Hill Road. Onsite parking includes a combination of street parking and individual townhouse garages.

A new stormwater management system has been designed as part of the proposed development to collect and treat the runoff from the new impervious surface areas. Several stormwater best management practices will be implemented as part of this project. These include deep-sump, hooded catch basins, First Defense hydrodynamic separators, and three underground infiltration systems. The proposed closed drainage system within the site will discharge treated water to the existing closed drainage system that discharges to the north which ultimately flows to Sagamore Creek.

The study watershed area is approximately 6.0-acres that primarily drains northerly across the site towards an existing onsite drainage system. For analysis purposes, the site was modeled with multiple design points as described in the Drainage Summary (Table 1) of this report.

As outlined by NHDES AoT there is a 10-year window for phased developments. Since this current phase of the overall development is within the 10-year window the stormwater analysis, post-development conditions described herein are compared with pre-development conditions prior to the 2013 redevelopment phase, with some adjustments made to current storm/rainfall intensities. Refer to Table 1 and associated notes.

TABLE 1: PEAK RATE ANALYSIS SUMMARY

Design Storm	Pre circa 2013[1] (cfs)	Adjusted pre circa 2013[2] (cfs)	Post circa 2013[1] (cfs)	Adjusted Post circa 2013[2] (cfs)	Proposed[3] (cfs)	Change[5] (cfs)
DESIGN POINT #1 (Existing Catch Basin 3A)[4]						
2-year	-	-	1.1	1.4	1.4	0.0
10-year	-	-	1.7	2.2	2.2	0.0
25-year	-	-	2.0	2.8	2.8	0.0
50-year	-	-	2.2	3.4	3.3	-0.1
DESIGN POINT #3 (Existing Catch Basin)						
2-year	7.0	8.8	2.7	3.9	5.1	-3.7
10-year	10.3	13.7	5.0	9.8	10.4	-3.3
25-year	12.6	17.6	7.2	13.1	15.4	-2.2
50-year	13.9	21.1	8.7	16.3	17.5	-3.6
DESIGN POINT #4 (Hotel Property)						
2-year	2.4	2.9	1.3	1.6	1.7	-1.2
10-year	3.4	4.5	1.8	2.4	2.8	-1.7
25-year	4.2	5.8	2.2	3.1	3.6	-2.2
50-year	4.6	6.9	2.5	3.7	4.3	-2.6

(All values shown are peak rates in CFS)

Lots 4 & 5 which drain towards Design Point #2 were not part of the original study area; therefore, the pre-development for this design point is based on current site conditions.

Design Storm	Pre-development (cfs)	Post-development (cfs)	Change (cfs)
DESIGN POINT #2 (Lot 3)			
2-year	0.8	0.3	-0.5
10-year	2.1	0.7	-1.4
25-year	3.3	1.1	-2.2
50-year	4.5	1.5	-3.0

(All values shown are peak rates in CFS)

[1] Previous analysis used the SCS Soil Distribution Map rainfall data in accordance with 2013 regulations.

[2] Previous analysis adjusted to use current "Extreme Precipitation" data plus 15% coastal increase per current NHDES requirements.

[3] Uses current "Extreme Precipitation" plus 15% coastal increase per current NHDES requirements.

[4] Existing catch basin 3A was a proposed catch basin in the 2013 post-development and was therefore not present for the 2013 pre-development.

[5] Change values for Design Point #1 reported as difference between Adjusted Post circa 2013 and Proposed columns. Change values for Design Points #3 and #4 reported as difference between Adjusted Pre circa 2013 and Proposed Columns.

In conclusion, by incorporating a new on-site drainage system that includes provisions for stormwater treatment and infiltration, there will be a decrease in the peak rate of runoff as a result of this project.

SECTION 2 EXISTING CONDITIONS

As previously stated, the existing conditions used for this stormwater analysis date back to the condition prior to the 2013 redevelopment project. Accordingly, the below description is consistent with the description provided in the previous stormwater report submitted at that time with the exception of Lots 4 & 5 which were not part of the original analysis. These two residential lots contain a small house, some grass areas, a few sheds and about 50 wooded coverage, all of which drains overland towards the rear of the property onto adjacent Lot 3.

Portsmouth Tax Map 252 Lot 9 is a 5.1-acre parcel of land located in the Gateway District (GW) in Portsmouth, NH. The parcel of land is the location of the former Yoken's Restaurant and Function Facility. The site is bounded by Lafayette Road to the east, Peverly Road to the south, residential property to the west and the Comfort Inn to the north. Onsite topography ranges from 1-5% and slopes towards the Comfort Inn along the north.

The Yoken's building has been razed, but for analysis purposes the former building and impervious area has been modeled in the existing conditions as if it were still existing. The remainder of the site is mostly paved, occupying approximately 93% of the site, with limited green space.

The existing drainage system consists of a series of catch basins and manholes which ultimately discharge north of the site boundary towards a drainage swale north of the Comfort Inn. This ultimately flows to Sagamore Creek. For analysis purposes, the existing catch basin, labeled CB D and the Hotel Property have been labeled as the design points. These areas represent the runoff discharging from the site as either shallow concentrated flows or flows into the existing drainage system via pipe flow.

The existing onsite catch basins consist of shallow structures with varying pipe sizes and material type. Based on the shallow flat pipes, along the front of the site near Lafayette Road, the existing conditions HydroCAD model indicated several existing catch basins overtopping for even the more frequent less intense design storms. In order to check the runoff results for accuracy due to any modeling limitations in the software, we modeled this portion of the existing site as one subcatchment to compare the results with the individually modeled areas. This "check" is shown in the HydroCAD model as subcatchment "Check". The results of this analysis indicate a level of precision of approximately 10% which indicates predevelopment runoff rates appear to be reasonable for comparison to the post development design points. Ultimately any runoff will drain northerly across the site as overland flow and eventually towards the drainage swale located north of the existing Comfort Inn property.

The existing soils are also classified by the Soil Survey of Rockingham County (NRCS Manual) as 140C "Chatfield-Hollis-Canton Complex", 299 "Udorthents" and 699 "Urban Land" (see soil map), and described by NRCS as follows:

> 140C - Chatfield-Hollis-Canton complex (SCS Classification "B") consists of 8 to 15 percent slopes and are very stony. These gently sloping soils occur as areas so intermingled that mapping them separately was not practical. They are on low, knobby hills and ridges that in most places have a northeast orientation. Areas are irregularly shaped and are 4 to 400 acres in size. They are about 35 percent Chatfield soil, 20 percent Hollis soil, 20 percent Canton soil, and 25 percent other soils. Stones cover 0.01 to 3 percent of the surface.
>
> 299 - Udorthents (SCS Classification "Unknown") consists of areas of soils formed by cutting or filling for construction projects. Udorthents are near or adjacent to most of the soils of the survey area. Because of the extreme variability of Udorthents, a reference pedon is not given.
>
> 699 - Urban Land (SCS Classification "Unknown") consists of land that is covered by streets, parking lots and buildings. Areas are rectangular or irregularly shaped and are 4 to 250 acres in size. Inclusions make up 15 percent or less of the map unit. They consist of scattered areas of soil throughout the map unit.

Based on the majority of the site consisting of Udorthents and Urban land having no known hydrologic soil classification, the analysis used the hydrologic soil group classification B consistent with Chatfield-Hollis-Canton complex present onsite. Additionally test pits were performed onsite indicating loamy sand and sands consistent with a "B" soil.

SECTION 3 PROPOSED CONDITIONS

The applicant is proposing a multi-unit residential condo development which includes five 3-story Townhouse Style buildings. Access is provided from both Lafayette Road & Peverly Hill Road. Onsite parking includes a combination of street parking and individual townhouse garages.

A new stormwater management system has been designed as part of the proposed development to collect and treat the runoff from the new impervious surface areas. Several stormwater best management practices will be implemented as part of this project. These include deep-sump, hooded catch basins, First Defense hydrodynamic separators, and three underground infiltration systems. The proposed closed drainage system within the site will discharge treated water to the existing closed drainage system that discharges to the north which ultimately flows to Sagamore Creek.

In order to safeguard against oil or gas introduction into the drainage system, stormwater runoff from parking areas and driveways will be collected in hooded catch basins with deep sumps and routed to a First Defense hydrodynamic separator. Such pretreatment of stormwater reduces both suspended solids and oils in the drainage system and is recommended by NHDES.

Another safeguard against future intrusion of contaminants into the groundwater is the implementation of an Inspection & Maintenance Manual (I&M), which will assure proper function of drainage components and reduce sediment entering the system. To prevent erosion and sedimentation during construction, Best Management Practices including stabilized construction exits, silt fence, catch basin inserts, and temporary and permanent seeding have been incorporated into the construction sequence.

The total area of disturbance related to the proposed construction on this property is approximately 115,000 square feet; therefore the project is subject to US EPA Construction General Permit requirements.

Due to disturbing more than 15,000 sf of area, the City of Portsmouth requires Enhanced Stormwater Treatment Standards to be followed. Per the NHDES “BMP Pollutant Removal Efficiency” table contained within the New Hampshire Stormwater Manual, the underground infiltration systems have a Total Suspended Soils (TSS) Removal Rate of 90% and a Total Nitrogen (TN) Removal Rate of 60%. This satisfies the requirements of §7.6.2-1(a) of the Site Plan Review Regulations (See Appendix F). In addition to these enhanced requirements, following approval from the City, relevant information will need to be submitted to the Pollutant Tracking and Accounting Program (PTAP) online data portal managed by the UNH Stormwater Center. The Planning Department will be notified of the PTAP data submittal.

SECTION 4 STORMWATER MODELING METHODOLOGY

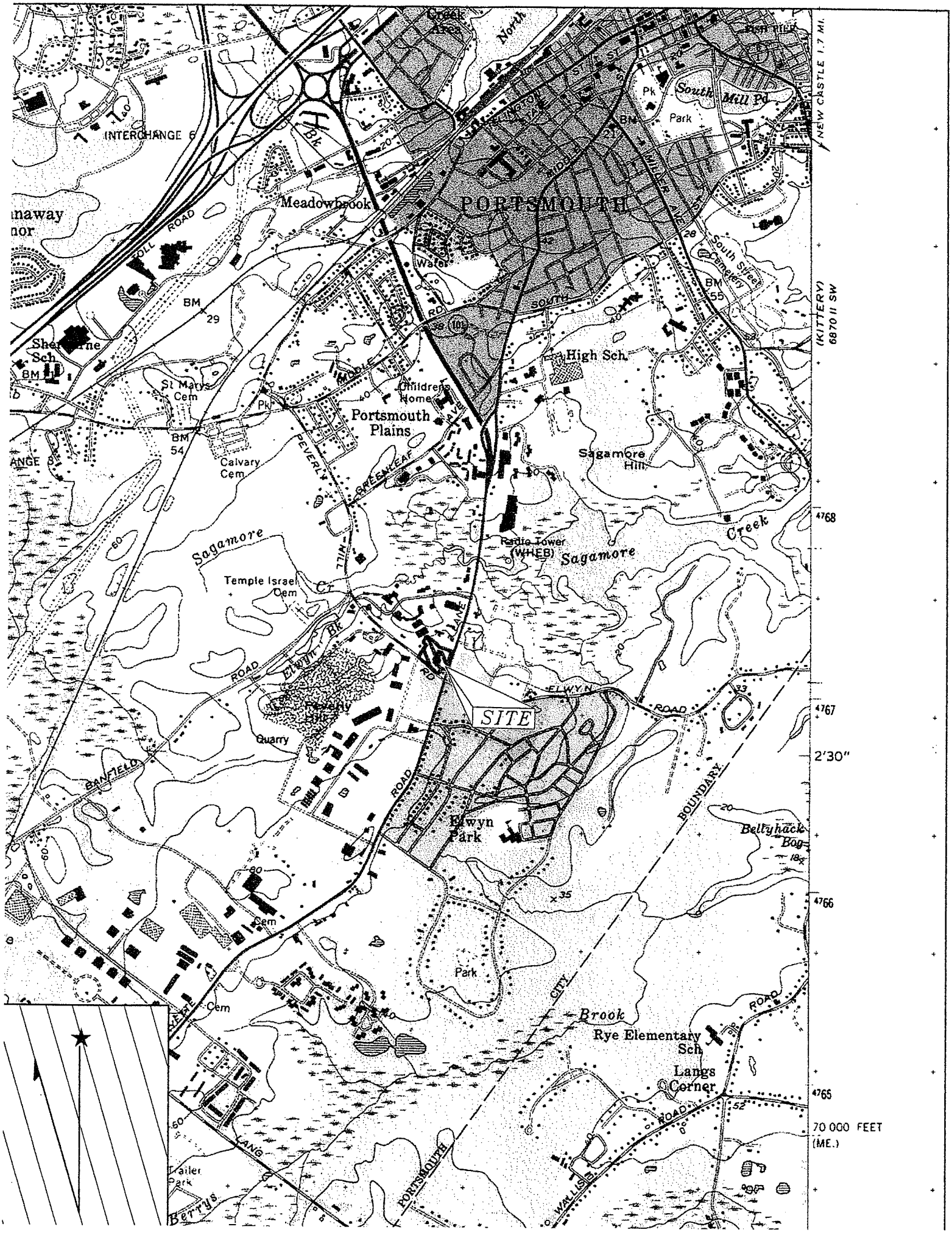
The drainage system for this project was modeled using HydroCAD, a stormwater modeling computer program that analyzes the hydrology, and hydraulics of stormwater runoff. HydroCAD is based largely on the hydrology techniques developed by the Soil Conservation Service (SCS/NRCS), combined with other hydrology and hydraulics calculations. For a given rainfall event, these techniques are used to generate hydrographs throughout a watershed. This provides verification that a given drainage system is adequate for the area under consideration, or to predict where flooding or erosion is likely to occur.

In HydroCAD, each watershed is modeled as a Subcatchment, streams and culverts as a Reach (or Pond, depending on available storage capacity), and large wetlands and other natural or artificial storage areas as a Pond. SCS hydrograph generation and routing procedures were used to model both Pre-development and Post-development runoff conditions.

The Pre-development and Post-development watershed limits and the subcatchment characteristics were determined using both USGS and on-the-ground topographic survey information and through visual, on-site inspection. Conservative estimates were used at all times in estimating the hydrologic characteristics of each watershed or subcatchment.

APPENDIX A

USGS Map


INTERCHANGE 6
Meadowbrook
PORTSMOUTH
North Mill Pond
South Mill Pd
Park
Water
High Sch.
Children's Home
Portsmouth Plains
St Marys Cem
Calvary Cem
Sagamore Hill
Radio Tower (WHEB)
Sagamore Creek
Temple Israel Cem
Elwyn Park
Quarry
SITE
Elwyn Park
Bellyhack Bog
Rye Elementary Sch
Langs Corner
Brook
Trailer Park
Berrys
BM 29
BM 54
BM 55
NEW CASTLE 1.7 MI.
(KITTERY) 6870 II SW
4768
4767
4766
4765
2'30"
70 000 FEET (ME.)

APPENDIX B

NRCS Soil Information

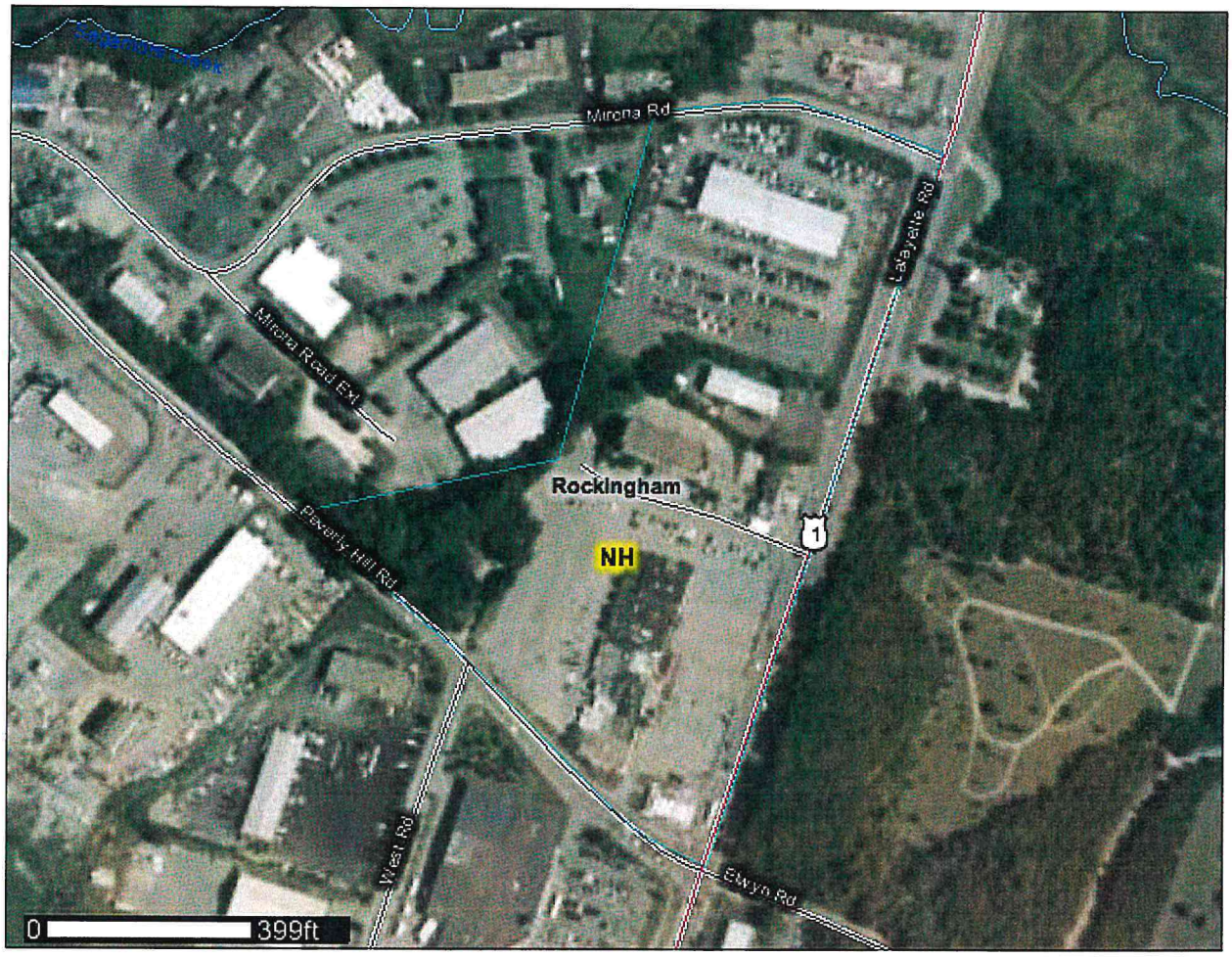
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire



September 30, 2011

Preface

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

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

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

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

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

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

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

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

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

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

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

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report
Soil Map

MAP LEGEND

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

Soils
- Soil Map Units

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

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

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

MAP INFORMATION

Map Scale: 1:2,940 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 11, Oct 27, 2009

Date(s) aerial images were photographed: 8/23/2003

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

Map Unit Legend

Rockingham County, New Hampshire (NH015)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, very stony	3.8	20.2%
299	Udorthents, smoothed	4.1	22.1%
699	Urban land	10.7	57.7%
Totals for Area of Interest		**18.6**	**100.0%**

Map Unit Descriptions

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

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

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

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

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

140C—Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, very stony

Map Unit Setting

Elevation: 0 to 2,100 feet
Mean annual precipitation: 28 to 46 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 60 to 195 days

Map Unit Composition

Chatfield and similar soils: 35 percent
Canton and similar soils: 20 percent
Hollis and similar soils: 20 percent
Minor components: 25 percent

Description of Chatfield

Setting

Parent material: Till

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.5 inches)

Interpretive groups

Land capability (nonirrigated): 6s

Typical profile

0 to 20 inches: Fine sandy loam
20 to 31 inches: Cobbly fine sandy loam
31 to 35 inches: Unweathered bedrock

Description of Hollis

Setting

Parent material: Till

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water capacity: Very low (about 1.6 inches)

Interpretive groups
Land capability (nonirrigated): 6s

Typical profile
0 to 2 inches: Fine sandy loam
2 to 13 inches: Cobbly fine sandy loam
13 to 17 inches: Unweathered bedrock

Description of Canton

Setting
Parent material: Till

Properties and qualities
Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.3 inches)

Interpretive groups
Land capability (nonirrigated): 6s

Typical profile
0 to 5 inches: Gravelly fine sandy loam
5 to 21 inches: Gravelly fine sandy loam
21 to 60 inches: Loamy sand

Minor Components

Not named
Percent of map unit: 7 percent

Newfields
Percent of map unit: 5 percent

Ossipee and greenwood
Percent of map unit: 5 percent
Landform: Bogs

Scarboro
Percent of map unit: 3 percent
Landform: Depressions

Walpole
Percent of map unit: 3 percent
Landform: Depressions

Rock outcrop
Percent of map unit: 2 percent

299—Udorthents, smoothed

Map Unit Composition

Udorthents and similar soils: 100 percent

Description of Udorthents

Properties and qualities

Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

699—Urban land

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent

Minor Components

Not named

Percent of map unit: 15 percent

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

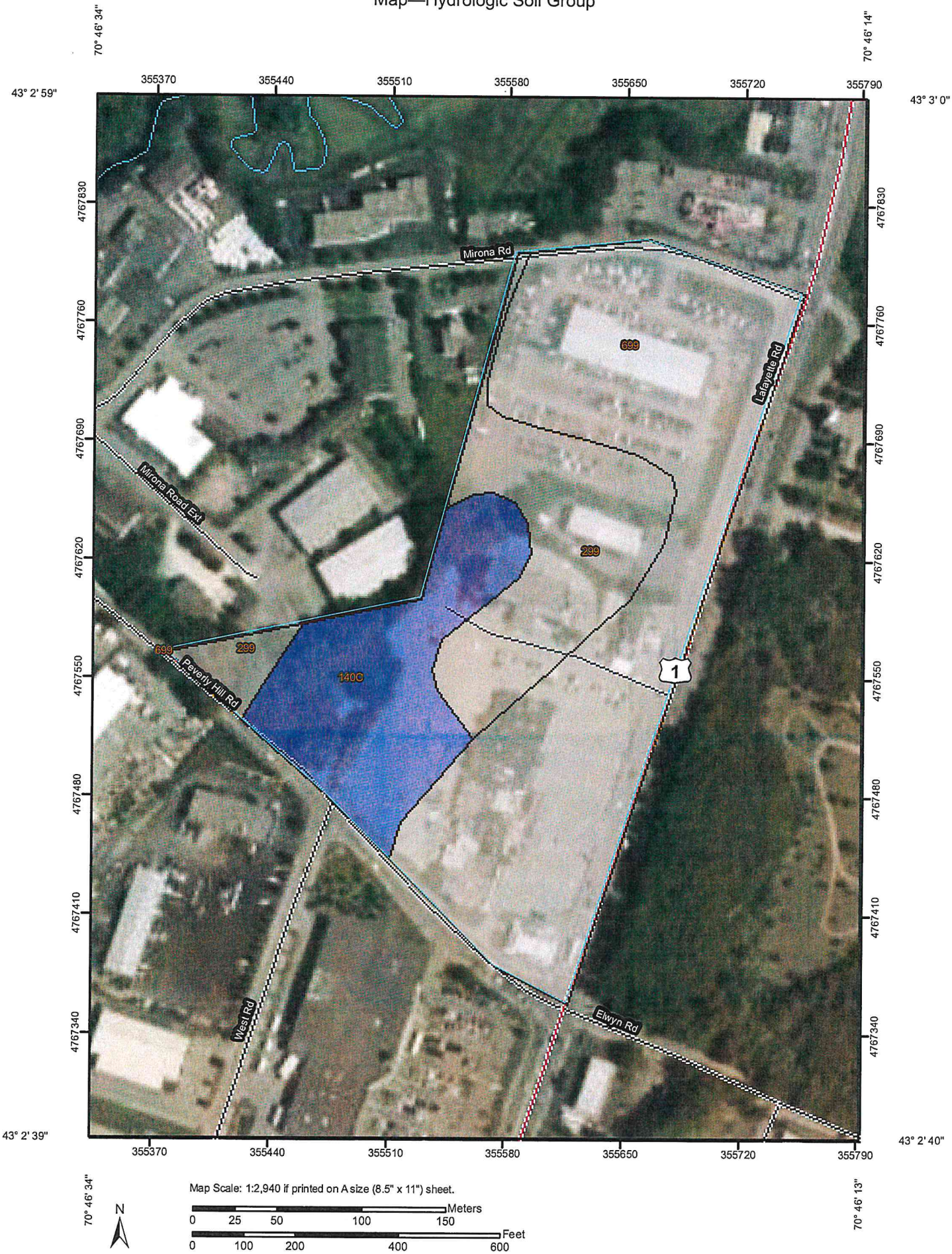
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:2,940 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 11, Oct 27, 2009

Date(s) aerial images were photographed: 8/23/2003

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

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Rockingham County, New Hampshire (NH015)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, very stony	B	3.8	20.2%
299	Udorthents, smoothed		4.1	22.1%
699	Urban land		10.7	57.7%
Totals for Area of Interest			**18.6**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://soils.usda.gov/

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://soils.usda.gov/

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.glti.nrcs.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

APPENDIX C

Test Pit Logs

TEST PIT DATA

Client: 4 Amigos LLC
Project Address: 1400 Lafayette Road
Town, State: Portsmouth, NH
Job Number: 458219
Date: December 16, 2019
Performed by: Diane Pantermoller

Test Pit No.	**12-1**	SCS Soil:		Chatfield-Hollis-Canton
ESHWT:	>54"	Standing Water:		None
Refusal:	54"	Roots:		None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-48"	A	Loamy Sand	10yr 3/2	FR	
48-54"	B	Loamy Sand	10yr 5/6	FR	None visible

Test Pit No.	**12-2**	SCS Soil:		Chatfield-Hollis-Canton
ESHWT:	>120"	Standing Water:		None
Refusal:	>120"	Roots:		54"

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-9"	A	Loamy Sand	10yr 3/2	FR	
9-18"	B	Loamy Sand	10yr 5/6	FR	
18-120"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

Test Pit No.	**12-3**	SCS Soil:		Chatfield-Hollis-Canton
ESHWT:	>122"	Standing Water:		None
Refusal:	>122"	Roots:		None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-30"	Fill	Mixed Soils/pavement			Mixed Soils/Urban Fill/Pavement Gravel
30-122"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

Test Pit No.	**12-4**	SCS Soil:		Chatfield-Hollis-Canton
ESHWT:	>120"	Standing Water:		None
Refusal:	>120"	Roots:		None

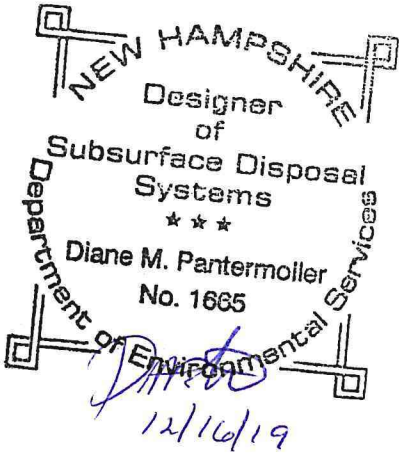
Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-120"	Fill	Mixed Soils			Bricks, Urban Fill

Test Pit No.	**12-5**	SCS Soil:		Chatfield-Hollis-Canton
ESHWT:	>120"	Standing Water:		None
Refusal:	>120"	Roots:		None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-36"	Fill	Mixed Soils			Bricks, Urban Fill
36-120"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

Test Pit No.	**12-6**	SCS Soil:	Chatfield-Hollis-Canton
ESHWT:	>120"	Standing Water:	None
Refusal:	>120"	Roots:	None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-12"	A	Loamy Sand	10yr 3/2	FR	
12-34"	B	Loamy Sand	10yr 5/6	FR	
34-120"	C	Medium Sand	2.5y 7/4	FR	



APPENDIX D

Pre-Development HydroCAD Printouts

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=0.67"
Flow Length=415' Tc=6.7 min CN=61 Runoff=0.68 cfs 2,846 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=0.67"
Flow Length=180' Tc=5.4 min CN=61 Runoff=0.17 cfs 690 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=3.14"
Flow Length=100' Tc=2.2 min CN=95 Runoff=1.42 cfs 4,082 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=0.86"
Flow Length=183' Tc=3.2 min CN=65 Runoff=0.77 cfs 2,504 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=2.19"
Flow Length=160' Tc=3.2 min CN=85 Runoff=0.67 cfs 1,866 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=2.19"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.27 cfs 722 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=2.93"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=1.01 cfs 2,877 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=3.14"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.33 cfs 916 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=3.14"
Flow Length=336' Tc=3.2 min CN=95 Runoff=1.10 cfs 3,283 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=2.73"
Flow Length=109' Tc=1.0 min CN=91 Runoff=0.76 cfs 2,023 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=3.35"
Flow Length=168' Tc=3.4 min CN=97 Runoff=1.57 cfs 4,897 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=44.14' Inflow=0.76 cfs 2,023 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=0.76 cfs 2,023 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=3.86 cfs 13,456 cf
Primary=3.86 cfs 13,456 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=42.56' Inflow=1.42 cfs 4,082 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=1.42 cfs 4,082 cf

Pond EX. CB5: EX. CB-5 Peak Elev=42.71' Inflow=1.10 cfs 3,538 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=1.10 cfs 3,538 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=42.20' Inflow=1.38 cfs 4,454 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=1.38 cfs 4,454 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=41.64' Inflow=2.39 cfs 7,331 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=2.39 cfs 7,331 cf

Pond EX. CB8: EX. CB-8 Peak Elev=41.84' Inflow=0.67 cfs 1,866 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=0.67 cfs 1,866 cf

Pond EX. CB9: EX. CB-9 Peak Elev=40.80' Inflow=0.93 cfs 2,589 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=0.93 cfs 2,589 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=40.63' Inflow=3.43 cfs 10,610 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=3.43 cfs 10,610 cf

Pond EX.CB: EXISTING CB Peak Elev=41.64' Inflow=0.17 cfs 690 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=0.17 cfs 690 cf

Pond EX.INF2: EXIST. INFILTRATION SYSTEM Peak Elev=44.13' Storage=684 cf Inflow=0.76 cfs 2,023 cf
Discarded=0.04 cfs 1,769 cf Primary=0.15 cfs 255 cf Outflow=0.19 cfs 2,024 cf

Total Runoff Area = 182,849 sf Runoff Volume = 26,708 cf Average Runoff Depth = 1.75"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=1.75"
Flow Length=415' Tc=6.7 min CN=61 Runoff=2.22 cfs 7,485 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=1.75"
Flow Length=180' Tc=5.4 min CN=61 Runoff=0.56 cfs 1,815 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=5.02"
Flow Length=100' Tc=2.2 min CN=95 Runoff=2.21 cfs 6,541 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=2.07"
Flow Length=183' Tc=3.2 min CN=65 Runoff=2.10 cfs 6,039 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=3.94"
Flow Length=160' Tc=3.2 min CN=85 Runoff=1.18 cfs 3,351 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=3.94"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.48 cfs 1,298 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=4.80"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=1.60 cfs 4,714 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=5.02"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.52 cfs 1,468 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=5.02"
Flow Length=336' Tc=3.2 min CN=95 Runoff=1.71 cfs 5,260 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=4.58"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.24 cfs 3,390 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=5.26"
Flow Length=168' Tc=3.4 min CN=97 Runoff=2.41 cfs 7,675 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=45.06' Inflow=1.24 cfs 3,390 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.24 cfs 3,390 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=9.80 cfs 26,537 cf
Primary=9.80 cfs 26,537 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=42.81' Inflow=2.21 cfs 6,541 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.21 cfs 6,541 cf

Pond EX. CB5: EX. CB-5 Peak Elev=47.39' Inflow=4.34 cfs 6,406 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=4.34 cfs 6,406 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=47.03' Inflow=4.56 cfs 7,874 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=4.56 cfs 7,874 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=46.56' Inflow=5.74 cfs 12,588 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=5.74 cfs 12,588 cf

Pond EX. CB8: EX. CB-8 Peak Elev=42.08' Inflow=1.18 cfs 3,351 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.18 cfs 3,351 cf

Pond EX. CB9: EX. CB-9 Peak Elev=41.60' Inflow=1.64 cfs 4,649 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=1.64 cfs 4,649 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=41.46' Inflow=7.80 cfs 19,053 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=7.80 cfs 19,053 cf

Pond EX.CB: EXISTING CB Peak Elev=41.95' Inflow=0.56 cfs 1,815 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=0.56 cfs 1,815 cf

Pond EX.INF2: EXIST. INFILTRATION SYSTEM Peak Elev=45.04' Storage=931 cf Inflow=1.24 cfs 3,390 cf
Discarded=0.04 cfs 2,245 cf Primary=3.13 cfs 1,145 cf Outflow=3.18 cfs 3,390 cf

Total Runoff Area = 182,849 sf Runoff Volume = 49,037 cf Average Runoff Depth = 3.22"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=2.79"
Flow Length=415' Tc=6.7 min CN=61 Runoff=3.68 cfs 11,933 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=2.79"
Flow Length=180' Tc=5.4 min CN=61 Runoff=0.93 cfs 2,894 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=6.53"
Flow Length=100' Tc=2.2 min CN=95 Runoff=2.83 cfs 8,495 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=3.20"
Flow Length=183' Tc=3.2 min CN=65 Runoff=3.30 cfs 9,314 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=5.37"
Flow Length=160' Tc=3.2 min CN=85 Runoff=1.59 cfs 4,570 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=5.37"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.65 cfs 1,769 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=6.29"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=2.07 cfs 6,181 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=6.53"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.67 cfs 1,907 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=6.53"
Flow Length=336' Tc=3.2 min CN=95 Runoff=2.19 cfs 6,832 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=6.06"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.62 cfs 4,487 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=6.76"
Flow Length=168' Tc=3.4 min CN=97 Runoff=3.07 cfs 9,875 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=54.99' Inflow=1.62 cfs 4,487 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.62 cfs 4,487 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=13.05 cfs 38,038 cf
Primary=13.05 cfs 38,038 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.07' Inflow=2.83 cfs 8,495 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.83 cfs 8,495 cf

Pond EX. CB5: EX. CB-5 Peak Elev=54.90' Inflow=4.81 cfs 8,784 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=4.81 cfs 8,784 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=51.46' Inflow=5.24 cfs 10,691 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=5.24 cfs 10,691 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=50.32' Inflow=7.30 cfs 16,871 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=7.30 cfs 16,871 cf

Pond EX. CB8: EX. CB-8 Peak Elev=42.67' Inflow=1.59 cfs 4,570 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.59 cfs 4,570 cf

Pond EX. CB9: EX. CB-9 Peak Elev=42.36' Inflow=2.20 cfs 6,340 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=2.20 cfs 6,340 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=42.01' Inflow=10.18 cfs 26,105 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=10.18 cfs 26,105 cf

Pond EX.CB: EXISTING CB Peak Elev=42.25' Inflow=0.93 cfs 2,894 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=0.93 cfs 2,894 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=54.90' Storage=1,000 cf Inflow=1.62 cfs 4,487 cf
Discarded=0.05 cfs 2,535 cf Primary=3.73 cfs 1,952 cf Outflow=3.78 cfs 4,487 cf

Total Runoff Area = 182,849 sf Runoff Volume = 68,258 cf Average Runoff Depth = 4.48"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=3.85"
Flow Length=415' Tc=6.7 min CN=61 Runoff=5.15 cfs 16,455 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=3.85"
Flow Length=180' Tc=5.4 min CN=61 Runoff=1.31 cfs 3,991 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=7.92"
Flow Length=100' Tc=2.2 min CN=95 Runoff=3.40 cfs 10,310 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=4.32"
Flow Length=183' Tc=3.2 min CN=65 Runoff=4.50 cfs 12,588 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=6.72"
Flow Length=160' Tc=3.2 min CN=85 Runoff=1.96 cfs 5,719 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=6.72"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.80 cfs 2,214 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=7.68"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=2.50 cfs 7,545 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=7.92"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.80 cfs 2,314 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=7.92"
Flow Length=336' Tc=3.2 min CN=95 Runoff=2.64 cfs 8,292 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=7.44"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.96 cfs 5,510 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=8.16"
Flow Length=168' Tc=3.4 min CN=97 Runoff=3.68 cfs 11,917 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=60.70' Inflow=1.96 cfs 5,510 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.96 cfs 5,510 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=16.28 cfs 49,277 cf
Primary=16.28 cfs 49,277 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.42' Inflow=3.40 cfs 10,310 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=3.40 cfs 10,310 cf

Pond EX. CB5: EX. CB-5 Peak Elev=60.52' Inflow=5.25 cfs 11,038 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=5.25 cfs 11,038 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=55.76' Inflow=6.03 cfs 13,353 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=6.03 cfs 13,353 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=54.03' Inflow=8.44 cfs 20,898 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=8.44 cfs 20,898 cf

Pond EX. CB8: EX. CB-8 Peak Elev=43.54' Inflow=1.96 cfs 5,719 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.96 cfs 5,719 cf

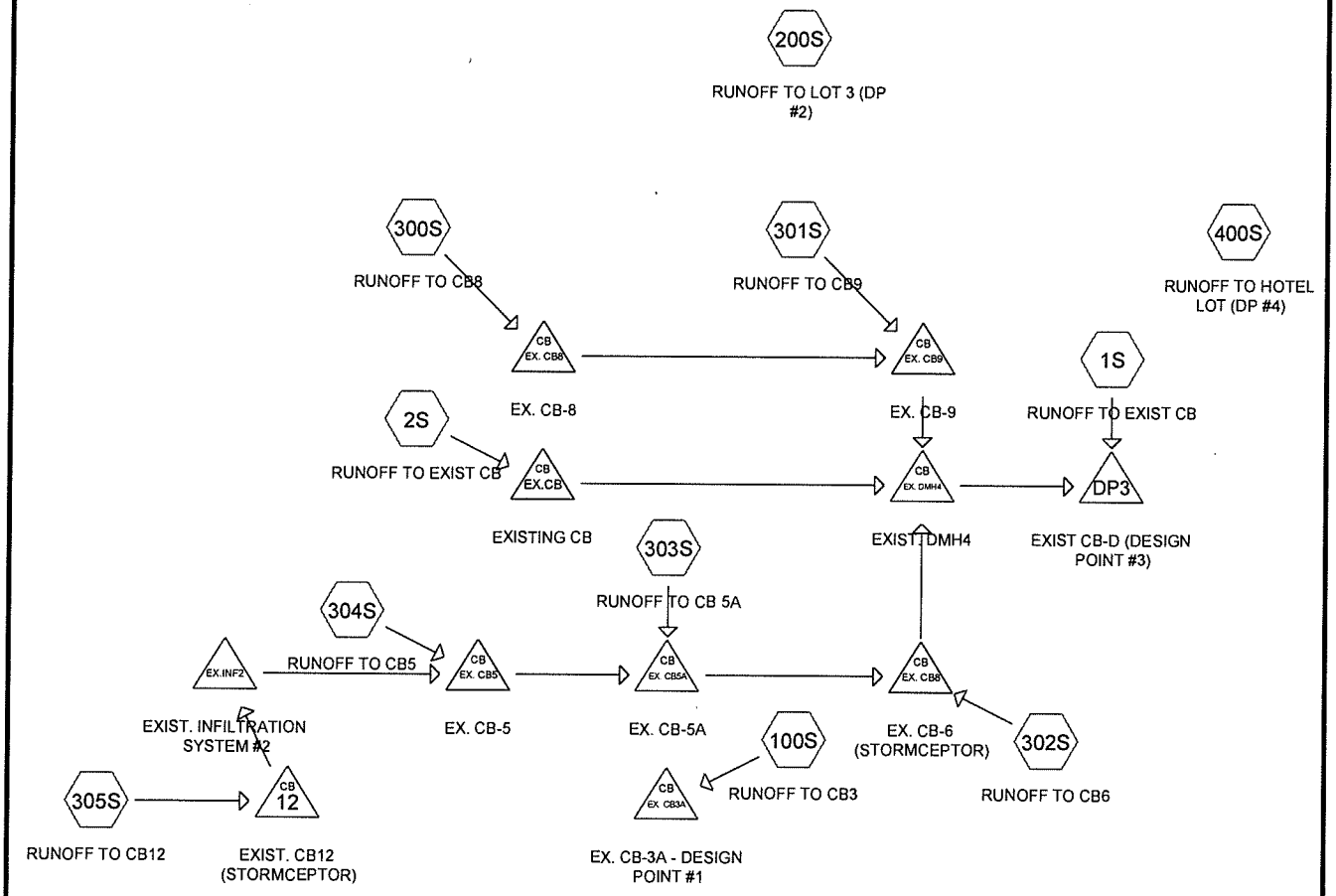
Pond EX. CB9: EX. CB-9 Peak Elev=43.02' Inflow=2.72 cfs 7,933 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=2.72 cfs 7,933 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=42.52' Inflow=12.27 cfs 32,822 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=12.27 cfs 32,822 cf

Pond EX.CB: EXISTING CB Peak Elev=42.66' Inflow=1.31 cfs 3,991 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=1.31 cfs 3,991 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=60.55' Storage=1,000 cf Inflow=1.96 cfs 5,510 cf
Discarded=0.06 cfs 2,764 cf Primary=3.72 cfs 2,747 cf Outflow=3.76 cfs 5,511 cf

Total Runoff Area = 182,849 sf Runoff Volume = 86,856 cf Average Runoff Depth = 5.70"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf



Subcat Reach Pond Link

Routing Diagram for 4582-Predrain

Prepared by Greenman-Pedersen, Inc., Printed 1/21/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
80,830	61	>75% Grass cover, Good, HSG B (1S, 2S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S)
77,698	98	Paved parking, HSG B (100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S)
2,430	98	Roofs, HSG B (200S)
21,891	55	Woods, Good, HSG B (200S, 300S, 301S, 400S)
182,849	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
182,849	HSG B	1S, 2S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S
0	HSG C	
0	HSG D	
0	Other	
182,849		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	80,830	0	0	0	80,830	>75% Grass cover, Good
0	77,698	0	0	0	77,698	Paved parking
0	2,430	0	0	0	2,430	Roofs
0	21,891	0	0	0	21,891	Woods, Good
0	**182,849**	**0**	**0**	**0**	**182,849**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	12	43.09	42.72	16.0	0.0231	0.013	12.0	0.0	0.0
2	EX. CB3A	41.82	41.56	46.0	0.0057	0.013	12.0	0.0	0.0
3	EX. CB5	41.93	41.50	170.0	0.0025	0.013	12.0	0.0	0.0
4	EX. CB5A	41.15	41.30	98.0	-0.0015	0.013	12.0	0.0	0.0
5	EX. CB6	40.55	39.68	165.0	0.0053	0.013	12.0	0.0	0.0
6	EX. CB8	41.38	40.64	128.0	0.0058	0.013	12.0	0.0	0.0
7	EX. CB9	40.09	39.40	30.0	0.0230	0.013	12.0	0.0	0.0
8	EX. DMH4	39.58	39.40	36.0	0.0050	0.013	18.0	0.0	0.0
9	EX.CB	41.38	39.60	132.0	0.0135	0.025	18.0	0.0	0.0
10	EX.INF2	42.50	42.34	32.0	0.0050	0.013	12.0	0.0	0.0

Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Rainfall events imported from "4582-Postdrain.hcp"
2	EX.INF2	The soils present in the area of the infiltration system consist of Urban Land (NRCS classification 699). Due to the limited information provided for this soil type, 140C Chatfield-Hollis-Canton Complex was used as the closest soil present within the site.
3		The bottom of the stone in the infiltration system is approximately 6' below existing grade. Per USDA Soil Data Mart, the lowest value for the Saturated Ksat Value for this soil at a depth of 21-60"' +/- is 42.33 micrometers/second.
4		Per NHDES Stormwater Manual: Vol. 2, pages 16-17 using a factor of safety of 2, the infiltration rate for this system is as follows:
5		42.33/2 (FS) = 21.17 micro/sec.
6		Converting to inches/hr with a conversion factor of 0.1417 = (21.17 * 0.1417 = 3.00 in/hr)

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=2.79"
Flow Length=415' Tc=6.7 min CN=61 Runoff=3.68 cfs 11,933 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=2.79"
Flow Length=180' Tc=5.4 min CN=61 Runoff=0.93 cfs 2,894 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=6.53"
Flow Length=100' Tc=2.2 min CN=95 Runoff=2.83 cfs 8,495 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=3.20"
Flow Length=183' Tc=3.2 min CN=65 Runoff=3.30 cfs 9,314 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=5.37"
Flow Length=160' Tc=3.2 min CN=85 Runoff=1.59 cfs 4,570 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=5.37"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.65 cfs 1,769 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=6.29"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=2.07 cfs 6,181 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=6.53"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.67 cfs 1,907 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=6.53"
Flow Length=336' Tc=3.2 min CN=95 Runoff=2.19 cfs 6,832 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=6.06"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.62 cfs 4,487 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=6.76"
Flow Length=168' Tc=3.4 min CN=97 Runoff=3.07 cfs 9,875 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=54.99' Inflow=1.62 cfs 4,487 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.62 cfs 4,487 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=13.05 cfs 38,038 cf
Primary=13.05 cfs 38,038 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.07' Inflow=2.83 cfs 8,495 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.83 cfs 8,495 cf

Pond EX. CB5: EX. CB-5 Peak Elev=54.90' Inflow=4.81 cfs 8,784 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=4.81 cfs 8,784 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=51.46' Inflow=5.24 cfs 10,691 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=5.24 cfs 10,691 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=50.32' Inflow=7.30 cfs 16,871 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=7.30 cfs 16,871 cf

Pond EX. CB8: EX. CB-8 Peak Elev=42.67' Inflow=1.59 cfs 4,570 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.59 cfs 4,570 cf

Pond EX. CB9: EX. CB-9 Peak Elev=42.36' Inflow=2.20 cfs 6,340 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=2.20 cfs 6,340 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=42.01' Inflow=10.18 cfs 26,105 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=10.18 cfs 26,105 cf

Pond EX.CB: EXISTING CB Peak Elev=42.25' Inflow=0.93 cfs 2,894 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=0.93 cfs 2,894 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=54.90' Storage=1,000 cf Inflow=1.62 cfs 4,487 cf
Discarded=0.05 cfs 2,535 cf Primary=3.73 cfs 1,952 cf Outflow=3.78 cfs 4,487 cf

Total Runoff Area = 182,849 sf Runoff Volume = 68,258 cf Average Runoff Depth = 4.48"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf

Summary for Subcatchment 1S: RUNOFF TO EXIST CB

Runoff = 3.68 cfs @ 12.10 hrs, Volume= 11,933 cf, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
51,345	61	>75% Grass cover, Good, HSG B
51,345		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	25	0.0400	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
4.3	390	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.7	415	Total			

Summary for Subcatchment 2S: RUNOFF TO EXIST CB

Runoff = 0.93 cfs @ 12.08 hrs, Volume= 2,894 cf, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
12,454	61	>75% Grass cover, Good, HSG B
12,454		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	25	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
1.1	155	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.4	180	Total			

Summary for Subcatchment 100S: RUNOFF TO CB3

Runoff = 2.83 cfs @ 12.03 hrs, Volume= 8,495 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,102	61	>75% Grass cover, Good, HSG B
14,521	98	Paved parking, HSG B
15,623	95	Weighted Average
1,102		7.05% Pervious Area
14,521		92.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.7	90	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.2	100	Total			

Summary for Subcatchment 200S: RUNOFF TO LOT 3 (DP #2)

Runoff = 3.30 cfs @ 12.05 hrs, Volume= 9,314 cf, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
20,275	55	Woods, Good, HSG B
4,643	98	Paved parking, HSG B
7,628	61	>75% Grass cover, Good, HSG B
2,430	98	Roofs, HSG B
34,976	65	Weighted Average
27,903		79.78% Pervious Area
7,073		20.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	25	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.3	30	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	128	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	183	Total			

Summary for Subcatchment 300S: RUNOFF TO CB8

Runoff = 1.59 cfs @ 12.05 hrs, Volume= 4,570 cf, Depth= 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
2,960	61	>75% Grass cover, Good, HSG B
633	55	Woods, Good, HSG B
6,625	98	Paved parking, HSG B
10,218	85	Weighted Average
3,593		35.16% Pervious Area
6,625		64.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	35	0.1000	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
1.0	125	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	160	Total			

Summary for Subcatchment 301S: RUNOFF TO CB9

Runoff = 0.65 cfs @ 12.03 hrs, Volume= 1,769 cf, Depth= 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
492	61	>75% Grass cover, Good, HSG B
789	55	Woods, Good, HSG B
2,675	98	Paved parking, HSG B
3,956	85	Weighted Average
1,281		32.38% Pervious Area
2,675		67.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	10	0.0500	0.17		**Sheet Flow,** Range n= 0.130 P2= 3.22"
0.1	6	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	110	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	126	Total			

Summary for Subcatchment 302S: RUNOFF TO CB6

Runoff = 2.07 cfs @ 12.04 hrs, Volume= 6,181 cf, Depth= 6.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,571	61	>75% Grass cover, Good, HSG B
10,220	98	Paved parking, HSG B
11,791	93	Weighted Average
1,571		13.32% Pervious Area
10,220		86.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	8	0.0100	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.9	114	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	122	Total			

Summary for Subcatchment 303S: RUNOFF TO CB 5A

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.67 cfs @ 12.01 hrs, Volume= 1,907 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
280	61	>75% Grass cover, Good, HSG B
3,227	98	Paved parking, HSG B
3,507	95	Weighted Average
280		7.98% Pervious Area
3,227		92.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.6	95	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	105	Total			

Summary for Subcatchment 304S: RUNOFF TO CB5

Runoff = 2.19 cfs @ 12.05 hrs, Volume= 6,832 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
878	61	>75% Grass cover, Good, HSG B
11,686	98	Paved parking, HSG B
12,564	95	Weighted Average
878		6.99% Pervious Area
11,686		93.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	16	0.0200	0.96		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
2.9	320	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	336	Total			

Summary for Subcatchment 305S: RUNOFF TO CB12

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf, Depth= 6.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,690	61	>75% Grass cover, Good, HSG B
7,200	98	Paved parking, HSG B
8,890	91	Weighted Average
1,690		19.01% Pervious Area
7,200		80.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.1	11	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	88	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	109	Total			

Summary for Subcatchment 400S: RUNOFF TO HOTEL LOT (DP #4)

Runoff = 3.07 cfs @ 12.05 hrs, Volume= 9,875 cf, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
194	55	Woods, Good, HSG B
16,901	98	Paved parking, HSG B
430	61	>75% Grass cover, Good, HSG B
17,525	97	Weighted Average
624		3.56% Pervious Area
16,901		96.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	10	0.0500	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.22"
0.3	30	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	128	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	168	Total			

Summary for Pond 12: EXIST. CB12 (STORMCEPTOR)

[58] Hint: Peaked 9.05' above defined flood level

Inflow Area = 8,890 sf, 80.99% Impervious, Inflow Depth = 6.06" for 25-Year event
Inflow = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf
Outflow = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.99' @ 12.07 hrs
Flood Elev= 45.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.09'	**12.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.09' / 42.72' S= 0.0231 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.01 hrs HW=45.11' TW=45.16' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond DP3: EXIST CB-D (DESIGN POINT #3)

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 114,725 sf, 36.29% Impervious, Inflow Depth = 3.98" for 25-Year event
Inflow = 13.05 cfs @ 12.05 hrs, Volume= 38,038 cf
Primary = 13.05 cfs @ 12.05 hrs, Volume= 38,038 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1

Inflow Area = 15,623 sf, 92.95% Impervious, Inflow Depth = 6.53" for 25-Year event
Inflow = 2.83 cfs @ 12.03 hrs, Volume= 8,495 cf
Outflow = 2.83 cfs @ 12.03 hrs, Volume= 8,495 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.83 cfs @ 12.03 hrs, Volume= 8,495 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.07' @ 12.03 hrs
Flood Elev= 44.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.82'	**12.0" Round Culvert** L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.82' / 41.56' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.82 cfs @ 12.03 hrs HW=43.06' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 2.82 cfs @ 3.71 fps)

Summary for Pond EX. CB5: EX. CB-5

[58] Hint: Peaked 7.22' above defined flood level
[80] Warning: Exceeded Pond EX.INF2 by 5.37' @ 12.05 hrs (8.77 cfs 3,014 cf)

Inflow Area = 21,454 sf, 88.03% Impervious, Inflow Depth = 4.91" for 25-Year event
Inflow = 4.81 cfs @ 12.15 hrs, Volume= 8,784 cf
Outflow = 4.81 cfs @ 12.15 hrs, Volume= 8,784 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.81 cfs @ 12.15 hrs, Volume= 8,784 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.90' @ 12.05 hrs
Flood Elev= 47.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.93'	**12.0" Round Culvert** L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.93' / 41.50' S= 0.0025 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.23 cfs @ 12.15 hrs HW=48.17' TW=45.09' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 4.23 cfs @ 5.39 fps)

Summary for Pond EX. CB5A: EX. CB-5A

[58] Hint: Peaked 6.05' above defined flood level
[80] Warning: Exceeded Pond EX. CB5 by 2.27' @ 12.04 hrs (3.63 cfs 469 cf)

Inflow Area = 24,961 sf, 88.59% Impervious, Inflow Depth = 5.14" for 25-Year event
Inflow = 5.24 cfs @ 12.03 hrs, Volume= 10,691 cf
Outflow = 5.24 cfs @ 12.03 hrs, Volume= 10,691 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.24 cfs @ 12.03 hrs, Volume= 10,691 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 51.46' @ 12.04 hrs
Flood Elev= 45.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.30'	**12.0" Round Culvert** L= 98.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.15' / 41.30' S= -0.0015 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.03 hrs HW=48.19' TW=50.10' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond EX. CB6: EX. CB-6 (STORMCEPTOR)

[58] Hint: Peaked 6.42' above defined flood level
[80] Warning: Exceeded Pond EX. CB5A by 2.27' @ 12.03 hrs (4.44 cfs 583 cf)

Inflow Area = 36,752 sf, 87.98% Impervious, Inflow Depth = 5.51" for 25-Year event
Inflow = 7.30 cfs @ 12.03 hrs, Volume= 16,871 cf
Outflow = 7.30 cfs @ 12.03 hrs, Volume= 16,871 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.30 cfs @ 12.03 hrs, Volume= 16,871 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.32' @ 12.03 hrs
Flood Elev= 43.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.55'	**12.0" Round Culvert** L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.55' / 39.68' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.93 cfs @ 12.03 hrs HW=50.06' TW=41.99' (Dynamic Tailwater)
1=Culvert (Outlet Controls 6.93 cfs @ 8.82 fps)

Summary for Pond EX. CB8: EX. CB-8

Inflow Area = 10,218 sf, 64.84% Impervious, Inflow Depth = 5.37" for 25-Year event
Inflow = 1.59 cfs @ 12.05 hrs, Volume= 4,570 cf
Outflow = 1.59 cfs @ 12.05 hrs, Volume= 4,570 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.05 hrs, Volume= 4,570 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 42.67' @ 12.05 hrs
Flood Elev= 47.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.38'	**12.0" Round Culvert** L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.38' / 40.64' S= 0.0058 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.05 hrs HW=42.54' TW=42.08' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.85 cfs @ 2.55 fps)

Summary for Pond EX. CB9: EX. CB-9

[80] Warning: Exceeded Pond EX. CB8 by 0.08' @ 12.04 hrs (0.65 cfs 23 cf)

Inflow Area =	14,174 sf,	65.61% Impervious,	Inflow Depth =	5.37"	for 25-Year event
Inflow =	2.20 cfs @	12.04 hrs, Volume=	6,340 cf		
Outflow =	2.20 cfs @	12.04 hrs, Volume=	6,340 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	2.20 cfs @	12.04 hrs, Volume=	6,340 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.36' @ 12.04 hrs
Flood Elev= 45.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.09'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.09' / 39.40' S= 0.0230 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.11 cfs @ 12.04 hrs HW=42.32' TW=41.65' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 3.11 cfs @ 3.96 fps)

Summary for Pond EX. DMH4: EXIST. DMH4

[80] Warning: Exceeded Pond EX. CB9 by 0.52' @ 12.15 hrs (2.72 cfs 452 cf)
[80] Warning: Exceeded Pond EX.CB by 0.03' @ 12.03 hrs (0.16 cfs 6 cf)

Inflow Area =	63,380 sf,	65.69% Impervious,	Inflow Depth =	4.94"	for 25-Year event
Inflow =	10.18 cfs @	12.03 hrs, Volume=	26,105 cf		
Outflow =	10.18 cfs @	12.03 hrs, Volume=	26,105 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	10.18 cfs @	12.03 hrs, Volume=	26,105 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.01' @ 12.03 hrs
Flood Elev= 44.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.58'	**18.0" Round Culvert** L= 36.0' RCP, sq.cut end projecting, Ke= 0.500

Inlet / Outlet Invert= 39.58' / 39.40' S= 0.0050 '/' Cc= 0.900
n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=10.18 cfs @ 12.03 hrs HW=42.01' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 10.18 cfs @ 5.76 fps)

Summary for Pond EX.CB: EXISTING CB

Inflow Area =	12,454 sf,	0.00% Impervious,	Inflow Depth =	2.79"	for 25-Year event
Inflow =	0.93 cfs @	12.08 hrs, Volume=	2,894 cf		
Outflow =	0.93 cfs @	12.08 hrs, Volume=	2,894 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	0.93 cfs @	12.08 hrs, Volume=	2,894 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.25' @ 12.06 hrs
Flood Elev= 44.89'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.38'	**18.0" Round Culvert**
			L= 132.0' CMP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 41.38' / 39.60' S= 0.0135 '/' Cc= 0.900
			n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=1.10 cfs @ 12.08 hrs HW=42.12' TW=41.43' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.10 cfs @ 1.83 fps)

Summary for Pond EX.INF2: EXIST. INFILTRATION SYSTEM #2

The soils present in the area of the infiltration system consist of Urban Land (NRCS classification 699). Due to the limited information provided for this soil type, 140C Chatfield-Hollis-Canton Complex was used as the closest soil present within the site.

The bottom of the stone in the infiltration system is approximately 6' below existing grade. Per USDA Soil Data Mart, the lowest value for the Saturated Ksat Value for this soil at a depth of 21-60"' +/- is 42.33 micrometers/second.

Per NHDES Stormwater Manual: Vol. 2, pages 16-17 using a factor of safety of 2, the infiltration rate for this system is as follows:

42.33/2 (FS) = 21.17 micro/sec.
Converting to inches/hr with a conversion factor of 0.1417 = (21.17 * 0.1417 = 3.00 in/hr)

---

[93] Warning: Storage range exceeded by 9.57'
[58] Hint: Peaked 9.90' above defined flood level
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=8)
[80] Warning: Exceeded Pond 12 by 5.27' @ 12.06 hrs (8.68 cfs 1,614 cf)

Inflow Area = 8,890 sf, 80.99% Impervious, Inflow Depth = 6.06" for 25-Year event
Inflow = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf
Outflow = 3.78 cfs @ 12.15 hrs, Volume= 4,487 cf, Atten= 0%, Lag= 8.1 min
Discarded = 0.05 cfs @ 12.06 hrs, Volume= 2,535 cf
Primary = 3.73 cfs @ 12.15 hrs, Volume= 1,952 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.90' @ 12.06 hrs Surf.Area= 582 sf Storage= 1,000 cf
Flood Elev= 45.00' Surf.Area= 582 sf Storage= 922 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 78.7 min (850.0 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	583 cf	**13.23'W x 44.00'L x 3.33'H Field A** 1,941 cf Overall - 484 cf Embedded = 1,457 cf x 40.0% Voids
#2A	42.50'	372 cf	**ADS N-12 24"** x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 3 Rows
#3	42.50'	14 cf	**24.0" Round Pipe Storage** x 4 Inside #1 L= 1.1'
#4	42.50'	31 cf	**24.0" Round Pipe Storage** -Impervious L= 10.0'
		1,000 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	**12.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.34' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	43.90'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	44.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	42.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.05 cfs @ 12.06 hrs HW=54.63' (Free Discharge)
└**4=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 12.15 hrs HW=45.06' TW=48.21' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

APPENDIX E

Post-Development HydroCAD Printouts

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: DRAINS TO CB-1 Runoff Area=4,516 sf 100.00% Impervious Runoff Depth=3.47"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.45 cfs 1,304 cf

Subcatchment2S: DRAINS TO CB-2 Runoff Area=5,065 sf 94.14% Impervious Runoff Depth=3.24"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=96 Runoff=0.49 cfs 1,369 cf

Subcatchment3S: DRAINS TO CB-3 Runoff Area=7,497 sf 72.05% Impervious Runoff Depth=2.45"
Flow Length=98' Tc=3.8 min CN=88 Runoff=0.53 cfs 1,532 cf

Subcatchment4S: DRAINS TO CB-4 Runoff Area=2,857 sf 62.60% Impervious Runoff Depth=2.11"
Flow Length=71' Tc=3.5 min CN=84 Runoff=0.18 cfs 502 cf

Subcatchment5S: DRAINS TO CB-5 Runoff Area=3,924 sf 100.00% Impervious Runoff Depth=3.47"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.39 cfs 1,133 cf

Subcatchment6S: DRAINS TO CB-6 Runoff Area=3,628 sf 100.00% Impervious Runoff Depth=3.47"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=98 Runoff=0.32 cfs 1,048 cf

Subcatchment7S: Subcat 7S Runoff Area=1,293 sf 98.96% Impervious Runoff Depth=3.47"
Tc=0.0 min CN=98 Runoff=0.13 cfs 373 cf

Subcatchment8S: DRAINS TO CB-8 Runoff Area=5,929 sf 100.00% Impervious Runoff Depth=3.47"
Flow Length=80' Slope=0.0150 '/' Tc=0.8 min CN=98 Runoff=0.59 cfs 1,712 cf

Subcatchment9S: ROOF D Runoff Area=6,400 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.63 cfs 1,848 cf

Subcatchment10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.47 cfs 1,386 cf

Subcatchment11S: ROOF A Runoff Area=5,600 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.55 cfs 1,617 cf

Subcatchment12S: ROOF E Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.39 cfs 1,155 cf

Subcatchment13S: ROOF F Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.47 cfs 1,386 cf

Subcatchment100S: RUNOFF TO EX. Runoff Area=16,015 sf 91.98% Impervious Runoff Depth=3.14"
Flow Length=182' Tc=3.5 min CN=95 Runoff=1.38 cfs 4,185 cf

Subcatchment200S: Drains to Northern Runoff Area=11,417 sf 19.04% Impervious Runoff Depth=1.02"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=68 Runoff=0.29 cfs 970 cf

Subcatchment300S: DRAINS TO EX. CB-8 Runoff Area=16,949 sf 77.39% Impervious Runoff Depth=2.64"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=90 Runoff=1.36 cfs 3,723 cf

Subcatchment301S: DRAINS TO EX. CB-9 Runoff Area=8,852 sf 82.02% Impervious Runoff Depth=2.73"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=91 Runoff=0.70 cfs 2,015 cf

Subcatchment302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 82.88% Impervious Runoff Depth=2.83"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=1.19 cfs 3,407 cf

Subcatchment303S: RUNOFF TO EX. CB 5A Runoff Area=4,916 sf 86.65% Impervious Runoff Depth=2.93"
Flow Length=106' Tc=0.9 min CN=93 Runoff=0.45 cfs 1,200 cf

Subcatchment304S: RUNOFF TO EX. CB5 Runoff Area=19,066 sf 75.73% Impervious Runoff Depth=2.54"
Flow Length=336' Tc=3.3 min CN=89 Runoff=1.42 cfs 4,040 cf

Subcatchment305S: RUNOFF TO CB12 Runoff Area=8,890 sf 82.86% Impervious Runoff Depth=2.83"
Flow Length=109' Tc=1.0 min CN=92 Runoff=0.78 cfs 2,095 cf

Subcatchment400S: Drains to Hotel Lot - Runoff Area=21,981 sf 86.10% Impervious Runoff Depth=2.93"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=93 Runoff=1.73 cfs 5,364 cf

Pond CB1: PROP. CB-1 Peak Elev=43.88' Inflow=0.92 cfs 2,691 cf
12.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=0.92 cfs 2,691 cf

Pond CB2: PROP. CB-2 Peak Elev=44.05' Inflow=0.49 cfs 1,369 cf
12.0" Round Culvert n=0.013 L=31.0' S=0.0161 '/' Outflow=0.49 cfs 1,369 cf

Pond CB3: PROP. CB-3 Peak Elev=43.65' Inflow=0.71 cfs 2,034 cf
12.0" Round Culvert n=0.013 L=54.0' S=0.0083 '/' Outflow=0.71 cfs 2,034 cf

Pond CB4: PROP. CB-4 Peak Elev=43.86' Inflow=0.18 cfs 502 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0097 '/' Outflow=0.18 cfs 502 cf

Pond CB5: PROP. CB-5 Peak Elev=42.51' Inflow=0.39 cfs 1,133 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.39 cfs 1,133 cf

Pond CB6: PROP. CB-6 Peak Elev=42.48' Inflow=0.32 cfs 1,048 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.32 cfs 1,048 cf

Pond CB7: PROP. CB-7 Peak Elev=41.23' Inflow=0.13 cfs 373 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0103 '/' Outflow=0.13 cfs 373 cf

Pond CB8: PROP. CB-8 Peak Elev=43.25' Inflow=1.20 cfs 3,746 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=1.20 cfs 3,746 cf

Pond DMH1: PROP. DMH-1 Peak Elev=40.62' Inflow=3.09 cfs 9,420 cf
18.0" Round Culvert n=0.013 L=43.0' S=0.0093 '/' Outflow=3.09 cfs 9,420 cf

Pond DMH2: PROP. DMH-2 Peak Elev=40.92' Inflow=2.99 cfs 9,046 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=2.99 cfs 9,046 cf

Pond DMH3: PROP. DMH-3 Peak Elev=40.39' Inflow=2.05 cfs 5,987 cf
18.0" Round Culvert n=0.013 L=38.0' S=0.0053 '/' Outflow=2.05 cfs 5,987 cf

Pond DMH3A: PROP. DMH-3A Peak Elev=40.48' Inflow=0.10 cfs 134 cf
15.0" Round Culvert n=0.013 L=168.0' S=0.0048 '/' Outflow=0.10 cfs 134 cf

Pond DMH4: PROP DMH-4 Peak Elev=42.02' Inflow=1.36 cfs 3,839 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0058 '/' Outflow=1.36 cfs 3,839 cf

Pond DMH5: PROP. DMH-1 Peak Elev=43.41' Inflow=1.41 cfs 4,060 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0227 '/' Outflow=1.41 cfs 4,060 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=44.15' Inflow=0.78 cfs 2,095 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=0.78 cfs 2,095 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=40.21' Inflow=5.13 cfs 15,407 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=5.13 cfs 15,407 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=42.55' Inflow=1.38 cfs 4,185 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=1.38 cfs 4,185 cf

Pond EX. CB5: EX. CB-5 Peak Elev=42.95' Inflow=1.42 cfs 4,330 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=1.42 cfs 4,330 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=42.52' Inflow=1.80 cfs 5,530 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=1.80 cfs 5,530 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=42.12' Inflow=2.99 cfs 8,937 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0051 '/' Outflow=2.99 cfs 8,937 cf

Pond EX. CB8: EX. CB-8 Peak Elev=42.21' Inflow=1.36 cfs 3,723 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0060 '/' Outflow=1.36 cfs 3,723 cf

Pond EX. CB9: EX. CB-9 Peak Elev=40.96' Inflow=2.05 cfs 5,853 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0097 '/' Outflow=2.05 cfs 5,853 cf

Pond EX.INF2: EXIST. INFILTRATIONSYSTEM Peak Elev=44.15' Storage=690 cf Inflow=0.78 cfs 2,095 cf
Discarded=0.04 cfs 1,806 cf Primary=0.17 cfs 290 cf Outflow=0.21 cfs 2,096 cf

Pond INF-1: U/G INF-1 Peak Elev=43.41' Storage=1,615 cf Inflow=1.80 cfs 5,215 cf
Discarded=0.22 cfs 5,099 cf Primary=0.09 cfs 116 cf Outflow=0.31 cfs 5,215 cf

Pond INF-2: U/G INF-2 Peak Elev=41.98' Storage=1,709 cf Inflow=1.73 cfs 5,364 cf
Discarded=0.23 cfs 5,230 cf Primary=0.10 cfs 134 cf Outflow=0.32 cfs 5,365 cf

Pond INF-3: U/G INF-3 Peak Elev=42.47' Storage=1,685 cf Inflow=1.76 cfs 5,416 cf
Discarded=0.22 cfs 5,307 cf Primary=0.08 cfs 109 cf Outflow=0.30 cfs 5,417 cf

Total Runoff Area = 182,849 sf Runoff Volume = 43,366 cf Average Runoff Depth = 2.85"
17.37% Pervious = 31,764 sf 82.63% Impervious = 151,085 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: DRAINS TO CB-1 Runoff Area=4,516 sf 100.00% Impervious Runoff Depth=5.37"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.69 cfs 2,022 cf

Subcatchment2S: DRAINS TO CB-2 Runoff Area=5,065 sf 94.14% Impervious Runoff Depth=5.14"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=96 Runoff=0.76 cfs 2,169 cf

Subcatchment3S: DRAINS TO CB-3 Runoff Area=7,497 sf 72.05% Impervious Runoff Depth=4.25"
Flow Length=98' Tc=3.8 min CN=88 Runoff=0.90 cfs 2,656 cf

Subcatchment4S: DRAINS TO CB-4 Runoff Area=2,857 sf 62.60% Impervious Runoff Depth=3.83"
Flow Length=71' Tc=3.5 min CN=84 Runoff=0.32 cfs 913 cf

Subcatchment5S: DRAINS TO CB-5 Runoff Area=3,924 sf 100.00% Impervious Runoff Depth=5.37"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.60 cfs 1,757 cf

Subcatchment6S: DRAINS TO CB-6 Runoff Area=3,628 sf 100.00% Impervious Runoff Depth=5.37"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=98 Runoff=0.49 cfs 1,624 cf

Subcatchment7S: Subcat 7S Runoff Area=1,293 sf 98.96% Impervious Runoff Depth=5.37"
Tc=0.0 min CN=98 Runoff=0.20 cfs 579 cf

Subcatchment8S: DRAINS TO CB-8 Runoff Area=5,929 sf 100.00% Impervious Runoff Depth=5.37"
Flow Length=80' Slope=0.0150 '/' Tc=0.8 min CN=98 Runoff=0.90 cfs 2,654 cf

Subcatchment9S: ROOF D Runoff Area=6,400 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.96 cfs 2,865 cf

Subcatchment10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.72 cfs 2,149 cf

Subcatchment11S: ROOF A Runoff Area=5,600 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.84 cfs 2,507 cf

Subcatchment12S: ROOF E Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.60 cfs 1,791 cf

Subcatchment13S: ROOF F Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.72 cfs 2,149 cf

Subcatchment100S: RUNOFF TO EX. Runoff Area=16,015 sf 91.98% Impervious Runoff Depth=5.02"
Flow Length=182' Tc=3.5 min CN=95 Runoff=2.16 cfs 6,705 cf

Subcatchment200S: Drains to Northern Runoff Area=11,417 sf 19.04% Impervious Runoff Depth=2.33"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=68 Runoff=0.72 cfs 2,212 cf

Subcatchment300S: DRAINS TO EX. CB-8 Runoff Area=16,949 sf 77.39% Impervious Runoff Depth=4.47"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=90 Runoff=2.25 cfs 6,309 cf

Subcatchment301S: DRAINS TO EX. CB-9 Runoff Area=8,852 sf 82.02% Impervious Runoff Depth=4.58"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=91 Runoff=1.14 cfs 3,376 cf

Subcatchment302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 82.88% Impervious Runoff Depth=4.69"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=1.92 cfs 5,645 cf

Subcatchment303S: RUNOFF TO EX. CB 5A Runoff Area=4,916 sf 86.65% Impervious Runoff Depth=4.80"
Flow Length=106' Tc=0.9 min CN=93 Runoff=0.71 cfs 1,966 cf

Subcatchment304S: RUNOFF TO EX. CB5 Runoff Area=19,066 sf 75.73% Impervious Runoff Depth=4.36"
Flow Length=336' Tc=3.3 min CN=89 Runoff=2.38 cfs 6,925 cf

Subcatchment305S: RUNOFF TO CB12 Runoff Area=8,890 sf 82.86% Impervious Runoff Depth=4.69"
Flow Length=109' Tc=1.0 min CN=92 Runoff=1.26 cfs 3,472 cf

Subcatchment400S: Drains to Hotel Lot - Runoff Area=21,981 sf 86.10% Impervious Runoff Depth=4.80"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=93 Runoff=2.75 cfs 8,789 cf

Pond CB1: PROP. CB-1 Peak Elev=44.09' Inflow=1.41 cfs 4,171 cf
12.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=1.41 cfs 4,171 cf

Pond CB2: PROP. CB-2 Peak Elev=44.15' Inflow=0.76 cfs 2,169 cf
12.0" Round Culvert n=0.013 L=31.0' S=0.0161 '/' Outflow=0.76 cfs 2,169 cf

Pond CB3: PROP. CB-3 Peak Elev=43.87' Inflow=1.22 cfs 3,568 cf
12.0" Round Culvert n=0.013 L=54.0' S=0.0083 '/' Outflow=1.22 cfs 3,568 cf

Pond CB4: PROP. CB-4 Peak Elev=44.00' Inflow=0.32 cfs 913 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0097 '/' Outflow=0.32 cfs 913 cf

Pond CB5: PROP. CB-5 Peak Elev=42.99' Inflow=0.60 cfs 1,757 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.60 cfs 1,757 cf

Pond CB6: PROP. CB-6 Peak Elev=42.99' Inflow=0.49 cfs 1,624 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.49 cfs 1,624 cf

Pond CB7: PROP. CB-7 Peak Elev=41.65' Inflow=0.20 cfs 579 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0103 '/' Outflow=0.20 cfs 579 cf

Pond CB8: PROP. CB-8 Peak Elev=43.49' Inflow=1.96 cfs 6,223 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=1.96 cfs 6,223 cf

Pond DMH1: PROP. DMH-1 Peak Elev=41.65' Inflow=6.24 cfs 17,752 cf
18.0" Round Culvert n=0.013 L=43.0' S=0.0093 '/' Outflow=6.24 cfs 17,752 cf

Pond DMH2: PROP. DMH-2 Peak Elev=42.05' Inflow=6.13 cfs 17,173 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=6.13 cfs 17,173 cf

Pond DMH3: PROP. DMH-3 Peak Elev=41.57' Inflow=4.27 cfs 12,896 cf
18.0" Round Culvert n=0.013 L=38.0' S=0.0053 '/' Outflow=4.27 cfs 12,896 cf

Pond DMH3A: PROP. DMH-3A Peak Elev=41.60' Inflow=0.83 cfs 1,750 cf
15.0" Round Culvert n=0.013 L=168.0' S=0.0048 '/' Outflow=0.83 cfs 1,750 cf

Pond DMH4: PROP DMH-4 Peak Elev=43.19' Inflow=2.68 cfs 7,770 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0058 '/' Outflow=2.68 cfs 7,770 cf

Pond DMH5: PROP. DMH-1 Peak Elev=43.87' Inflow=2.16 cfs 6,340 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0227 '/' Outflow=2.16 cfs 6,340 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=47.71' Inflow=1.26 cfs 3,472 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.26 cfs 3,472 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=41.34' Inflow=10.42 cfs 30,648 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=10.42 cfs 30,648 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=42.79' Inflow=2.16 cfs 6,705 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.16 cfs 6,705 cf

Pond EX. CB5: EX. CB-5 Peak Elev=48.37' Inflow=3.91 cfs 8,114 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=3.91 cfs 8,114 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=46.72' Inflow=4.19 cfs 10,079 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=4.19 cfs 10,079 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=45.98' Inflow=5.65 cfs 15,725 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0051 '/' Outflow=5.65 cfs 15,725 cf

Pond EX. CB8: EX. CB-8 Peak Elev=43.41' Inflow=2.25 cfs 6,309 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0060 '/' Outflow=2.25 cfs 6,309 cf

Pond EX. CB9: EX. CB-9 Peak Elev=42.31' Inflow=3.83 cfs 11,146 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0097 '/' Outflow=3.83 cfs 11,146 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=47.68' Storage=1,000 cf Inflow=1.26 cfs 3,472 cf
Discarded=0.05 cfs 2,282 cf Primary=2.70 cfs 1,189 cf Outflow=2.75 cfs 3,472 cf

Pond INF-1: U/G INF-1 Peak Elev=43.80' Storage=2,077 cf Inflow=2.76 cfs 8,131 cf
Discarded=0.24 cfs 6,670 cf Primary=0.88 cfs 1,461 cf Outflow=1.12 cfs 8,132 cf

Pond INF-2: U/G INF-2 Peak Elev=42.51' Storage=2,335 cf Inflow=2.77 cfs 8,730 cf
Discarded=0.26 cfs 6,980 cf Primary=0.83 cfs 1,750 cf Outflow=1.09 cfs 8,731 cf

Pond INF-3: U/G INF-3 Peak Elev=42.99' Storage=2,294 cf Inflow=2.68 cfs 8,395 cf
Discarded=0.25 cfs 6,948 cf Primary=0.63 cfs 1,448 cf Outflow=0.87 cfs 8,396 cf

Total Runoff Area = 182,849 sf Runoff Volume = 71,232 cf Average Runoff Depth = 4.67"
17.37% Pervious = 31,764 sf 82.63% Impervious = 151,085 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: DRAINS TO CB-1 Runoff Area=4,516 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.88 cfs 2,590 cf

Subcatchment2S: DRAINS TO CB-2 Runoff Area=5,065 sf 94.14% Impervious Runoff Depth=6.64"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=96 Runoff=0.97 cfs 2,804 cf

Subcatchment3S: DRAINS TO CB-3 Runoff Area=7,497 sf 72.05% Impervious Runoff Depth=5.71"
Flow Length=98' Tc=3.8 min CN=88 Runoff=1.19 cfs 3,567 cf

Subcatchment4S: DRAINS TO CB-4 Runoff Area=2,857 sf 62.60% Impervious Runoff Depth=5.25"
Flow Length=71' Tc=3.5 min CN=84 Runoff=0.43 cfs 1,251 cf

Subcatchment5S: DRAINS TO CB-5 Runoff Area=3,924 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.76 cfs 2,250 cf

Subcatchment6S: DRAINS TO CB-6 Runoff Area=3,628 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=98 Runoff=0.62 cfs 2,081 cf

Subcatchment7S: Subcat 7S Runoff Area=1,293 sf 98.96% Impervious Runoff Depth=6.88"
Tc=0.0 min CN=98 Runoff=0.25 cfs 741 cf

Subcatchment8S: DRAINS TO CB-8 Runoff Area=5,929 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=80' Slope=0.0150 '/' Tc=0.8 min CN=98 Runoff=1.14 cfs 3,400 cf

Subcatchment9S: ROOF D Runoff Area=6,400 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=1.22 cfs 3,670 cf

Subcatchment10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment11S: ROOF A Runoff Area=5,600 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=1.07 cfs 3,211 cf

Subcatchment12S: ROOF E Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.76 cfs 2,293 cf

Subcatchment13S: ROOF F Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment100S: RUNOFF TO EX. Runoff Area=16,015 sf 91.98% Impervious Runoff Depth=6.53"
Flow Length=182' Tc=3.5 min CN=95 Runoff=2.77 cfs 8,708 cf

Subcatchment200S: Drains to Northern Runoff Area=11,417 sf 19.04% Impervious Runoff Depth=3.51"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=68 Runoff=1.11 cfs 3,337 cf

Subcatchment300S: DRAINS TO EX. CB-8 Runoff Area=16,949 sf 77.39% Impervious Runoff Depth=5.94"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=90 Runoff=2.95 cfs 8,391 cf

Subcatchment301S: DRAINS TO EX. CB-9 Runoff Area=8,852 sf 82.02% Impervious Runoff Depth=6.06"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=91 Runoff=1.49 cfs 4,468 cf

Subcatchment302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 82.88% Impervious Runoff Depth=6.17"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=2.49 cfs 7,437 cf

Subcatchment303S: RUNOFF TO EX. CB 5A Runoff Area=4,916 sf 86.65% Impervious Runoff Depth=6.29"
Flow Length=106' Tc=0.9 min CN=93 Runoff=0.91 cfs 2,577 cf

Subcatchment304S: RUNOFF TO EX. CB5 Runoff Area=19,066 sf 75.73% Impervious Runoff Depth=5.83"
Flow Length=336' Tc=3.3 min CN=89 Runoff=3.13 cfs 9,255 cf

Subcatchment305S: RUNOFF TO CB12 Runoff Area=8,890 sf 82.86% Impervious Runoff Depth=6.17"
Flow Length=109' Tc=1.0 min CN=92 Runoff=1.63 cfs 4,573 cf

Subcatchment400S: Drains to Hotel Lot - Runoff Area=21,981 sf 86.10% Impervious Runoff Depth=6.29"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=93 Runoff=3.55 cfs 11,522 cf

Pond CB1: PROP. CB-1 Peak Elev=44.67' Inflow=1.79 cfs 5,342 cf
12.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=1.79 cfs 5,342 cf

Pond CB2: PROP. CB-2 Peak Elev=44.63' Inflow=0.97 cfs 2,804 cf
12.0" Round Culvert n=0.013 L=31.0' S=0.0161 '/' Outflow=0.97 cfs 2,804 cf

Pond CB3: PROP. CB-3 Peak Elev=44.05' Inflow=1.62 cfs 4,818 cf
12.0" Round Culvert n=0.013 L=54.0' S=0.0083 '/' Outflow=1.62 cfs 4,818 cf

Pond CB4: PROP. CB-4 Peak Elev=44.14' Inflow=0.43 cfs 1,251 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0097 '/' Outflow=0.43 cfs 1,251 cf

Pond CB5: PROP. CB-5 Peak Elev=43.67' Inflow=0.76 cfs 2,250 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.76 cfs 2,250 cf

Pond CB6: PROP. CB-6 Peak Elev=43.67' Inflow=0.62 cfs 2,081 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.62 cfs 2,081 cf

Pond CB7: PROP. CB-7 Peak Elev=43.80' Inflow=0.25 cfs 741 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0103 '/' Outflow=0.25 cfs 741 cf

Pond CB8: PROP. CB-8 Peak Elev=43.68' Inflow=2.57 cfs 8,218 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=2.57 cfs 8,218 cf

Pond DMH1: PROP. DMH-1 Peak Elev=43.80' Inflow=9.35 cfs 24,654 cf
18.0" Round Culvert n=0.013 L=43.0' S=0.0093 '/' Outflow=9.35 cfs 24,654 cf

Pond DMH2: PROP. DMH-2 Peak Elev=44.84' Inflow=9.13 cfs 23,913 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=9.13 cfs 23,913 cf

Pond DMH3: PROP. DMH-3 Peak Elev=43.49' Inflow=6.03 cfs 18,756 cf
18.0" Round Culvert n=0.013 L=38.0' S=0.0053 '/' Outflow=6.03 cfs 18,756 cf

Pond DMH3A: PROP. DMH-3A Peak Elev=43.64' Inflow=1.32 cfs 3,224 cf
15.0" Round Culvert n=0.013 L=168.0' S=0.0048 '/' Outflow=1.32 cfs 3,224 cf

Pond DMH4: PROP DMH-4 Peak Elev=45.82' Inflow=4.01 cfs 11,064 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0058 '/' Outflow=4.01 cfs 11,064 cf

Pond DMH5: PROP. DMH-1 Peak Elev=44.61' Inflow=2.75 cfs 8,146 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0227 '/' Outflow=2.75 cfs 8,146 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=60.24' Inflow=1.63 cfs 4,573 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.63 cfs 4,573 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=43.10' Inflow=15.37 cfs 43,411 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=15.37 cfs 43,411 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.03' Inflow=2.77 cfs 8,708 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.77 cfs 8,708 cf

Pond EX. CB5: EX. CB-5 Peak Elev=60.16' Inflow=5.37 cfs 11,254 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=5.37 cfs 11,254 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=55.64' Inflow=6.18 cfs 13,831 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=6.18 cfs 13,831 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=53.54' Inflow=8.66 cfs 21,267 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0051 '/' Outflow=8.66 cfs 21,267 cf

Pond EX. CB8: EX. CB-8 Peak Elev=46.30' Inflow=2.95 cfs 8,391 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0060 '/' Outflow=2.95 cfs 8,391 cf

Pond EX. CB9: EX. CB-9 Peak Elev=44.82' Inflow=5.26 cfs 15,532 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0097 '/' Outflow=5.26 cfs 15,532 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=60.16' Storage=1,000 cf Inflow=1.63 cfs 4,573 cf
Discarded=0.06 cfs 2,574 cf Primary=3.54 cfs 1,999 cf Outflow=3.59 cfs 4,573 cf

Pond INF-1: U/G INF-1 Peak Elev=44.53' Storage=2,912 cf Inflow=3.52 cfs 10,440 cf
Discarded=0.28 cfs 7,767 cf Primary=2.14 cfs 2,673 cf Outflow=2.42 cfs 10,440 cf

Pond INF-2: U/G INF-2 Peak Elev=43.15' Storage=3,054 cf Inflow=3.60 cfs 11,429 cf
Discarded=0.30 cfs 8,205 cf Primary=1.32 cfs 3,224 cf Outflow=1.62 cfs 11,429 cf

Pond INF-3: U/G INF-3 Peak Elev=43.67' Storage=3,057 cf Inflow=3.41 cfs 10,753 cf
Discarded=0.29 cfs 8,107 cf Primary=1.00 cfs 2,646 cf Outflow=1.29 cfs 10,753 cf

Total Runoff Area = 182,849 sf Runoff Volume = 93,630 cf Average Runoff Depth = 6.14"
17.37% Pervious = 31,764 sf 82.63% Impervious = 151,085 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: DRAINS TO CB-1 Runoff Area=4,516 sf 100.00% Impervious Runoff Depth=8.28"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=1.05 cfs 3,116 cf

Subcatchment2S: DRAINS TO CB-2 Runoff Area=5,065 sf 94.14% Impervious Runoff Depth=8.04"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=96 Runoff=1.16 cfs 3,393 cf

Subcatchment3S: DRAINS TO CB-3 Runoff Area=7,497 sf 72.05% Impervious Runoff Depth=7.08"
Flow Length=98' Tc=3.8 min CN=88 Runoff=1.46 cfs 4,421 cf

Subcatchment4S: DRAINS TO CB-4 Runoff Area=2,857 sf 62.60% Impervious Runoff Depth=6.60"
Flow Length=71' Tc=3.5 min CN=84 Runoff=0.54 cfs 1,570 cf

Subcatchment5S: DRAINS TO CB-5 Runoff Area=3,924 sf 100.00% Impervious Runoff Depth=8.28"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.91 cfs 2,708 cf

Subcatchment6S: DRAINS TO CB-6 Runoff Area=3,628 sf 100.00% Impervious Runoff Depth=8.28"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=98 Runoff=0.75 cfs 2,504 cf

Subcatchment7S: Subcat 7S Runoff Area=1,293 sf 98.96% Impervious Runoff Depth=8.28"
Tc=0.0 min CN=98 Runoff=0.30 cfs 892 cf

Subcatchment8S: DRAINS TO CB-8 Runoff Area=5,929 sf 100.00% Impervious Runoff Depth=8.28"
Flow Length=80' Slope=0.0150 '/' Tc=0.8 min CN=98 Runoff=1.37 cfs 4,091 cf

Subcatchment9S: ROOF D Runoff Area=6,400 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=1.46 cfs 4,416 cf

Subcatchment10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=1.10 cfs 3,312 cf

Subcatchment11S: ROOF A Runoff Area=5,600 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=1.28 cfs 3,864 cf

Subcatchment12S: ROOF E Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,760 cf

Subcatchment13S: ROOF F Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=1.10 cfs 3,312 cf

Subcatchment100S: RUNOFF TO EX. Runoff Area=16,015 sf 91.98% Impervious Runoff Depth=7.92"
Flow Length=182' Tc=3.5 min CN=95 Runoff=3.33 cfs 10,569 cf

Subcatchment200S: Drains to Northern Runoff Area=11,417 sf 19.04% Impervious Runoff Depth=4.68"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=68 Runoff=1.48 cfs 4,448 cf

Subcatchment300S: DRAINS TO EX. CB-8 Runoff Area=16,949 sf 77.39% Impervious Runoff Depth=7.32"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=90 Runoff=3.59 cfs 10,336 cf

Subcatchment301S: DRAINS TO EX. CB-9 Runoff Area=8,852 sf 82.02% Impervious Runoff Depth=7.44"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=91 Runoff=1.81 cfs 5,487 cf

Subcatchment302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 82.88% Impervious Runoff Depth=7.56"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=3.01 cfs 9,105 cf

Subcatchment303S: RUNOFF TO EX. CB 5A Runoff Area=4,916 sf 86.65% Impervious Runoff Depth=7.68"
Flow Length=106' Tc=0.9 min CN=93 Runoff=1.10 cfs 3,146 cf

Subcatchment304S: RUNOFF TO EX. CB5 Runoff Area=19,066 sf 75.73% Impervious Runoff Depth=7.20"
Flow Length=336' Tc=3.3 min CN=89 Runoff=3.81 cfs 11,435 cf

Subcatchment305S: RUNOFF TO CB12 Runoff Area=8,890 sf 82.86% Impervious Runoff Depth=7.56"
Flow Length=109' Tc=1.0 min CN=92 Runoff=1.98 cfs 5,599 cf

Subcatchment400S: Drains to Hotel Lot - Runoff Area=21,981 sf 86.10% Impervious Runoff Depth=7.68"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=93 Runoff=4.29 cfs 14,066 cf

Pond CB1: PROP. CB-1 Peak Elev=45.56' Inflow=2.14 cfs 6,428 cf
12.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=2.14 cfs 6,428 cf

Pond CB2: PROP. CB-2 Peak Elev=45.52' Inflow=1.16 cfs 3,393 cf
12.0" Round Culvert n=0.013 L=31.0' S=0.0161 '/' Outflow=1.16 cfs 3,393 cf

Pond CB3: PROP. CB-3 Peak Elev=44.39' Inflow=1.99 cfs 5,992 cf
12.0" Round Culvert n=0.013 L=54.0' S=0.0083 '/' Outflow=1.99 cfs 5,992 cf

Pond CB4: PROP. CB-4 Peak Elev=44.40' Inflow=0.54 cfs 1,570 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0097 '/' Outflow=0.54 cfs 1,570 cf

Pond CB5: PROP. CB-5 Peak Elev=44.67' Inflow=0.91 cfs 2,708 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.91 cfs 2,708 cf

Pond CB6: PROP. CB-6 Peak Elev=44.67' Inflow=0.75 cfs 2,504 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.75 cfs 2,504 cf

Pond CB7: PROP. CB-7 Peak Elev=45.01' Inflow=0.30 cfs 892 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0103 '/' Outflow=0.30 cfs 892 cf

Pond CB8: PROP. CB-8 Peak Elev=44.28' Inflow=3.13 cfs 10,082 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=3.13 cfs 10,082 cf

Pond DMH1: PROP. DMH-1 Peak Elev=45.01' Inflow=11.19 cfs 31,190 cf
18.0" Round Culvert n=0.013 L=43.0' S=0.0093 '/' Outflow=11.19 cfs 31,190 cf

Pond DMH2: PROP. DMH-2 Peak Elev=46.60' Inflow=10.94 cfs 30,298 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=10.94 cfs 30,298 cf

Pond DMH3: PROP. DMH-3 Peak Elev=44.47' Inflow=6.33 cfs 24,350 cf
18.0" Round Culvert n=0.013 L=38.0' S=0.0053 '/' Outflow=6.33 cfs 24,350 cf

Pond DMH3A: PROP. DMH-3A Peak Elev=44.51' Inflow=1.85 cfs 4,675 cf
15.0" Round Culvert n=0.013 L=168.0' S=0.0048 '/' Outflow=1.85 cfs 4,675 cf

Pond DMH4: PROP DMH-4 Peak Elev=47.63' Inflow=4.02 cfs 14,188 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0058 '/' Outflow=4.02 cfs 14,188 cf

Pond DMH5: PROP. DMH-1 Peak Elev=45.50' Inflow=3.30 cfs 9,822 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0227 '/' Outflow=3.30 cfs 9,822 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=69.07' Inflow=1.98 cfs 5,599 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.98 cfs 5,600 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=44.08' Inflow=17.52 cfs 55,540 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=17.52 cfs 55,540 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.38' Inflow=3.33 cfs 10,569 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=3.33 cfs 10,569 cf

Pond EX. CB5: EX. CB-5 Peak Elev=71.03' Inflow=6.95 cfs 14,231 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=6.95 cfs 14,231 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=62.95' Inflow=7.98 cfs 17,377 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=7.98 cfs 17,377 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=60.11' Inflow=10.94 cfs 26,483 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0051 '/' Outflow=10.94 cfs 26,483 cf

Pond EX. CB8: EX. CB-8 Peak Elev=48.41' Inflow=3.59 cfs 10,336 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0060 '/' Outflow=3.59 cfs 10,336 cf

Pond EX. CB9: EX. CB-9 Peak Elev=46.33' Inflow=5.42 cfs 19,675 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0097 '/' Outflow=5.42 cfs 19,675 cf

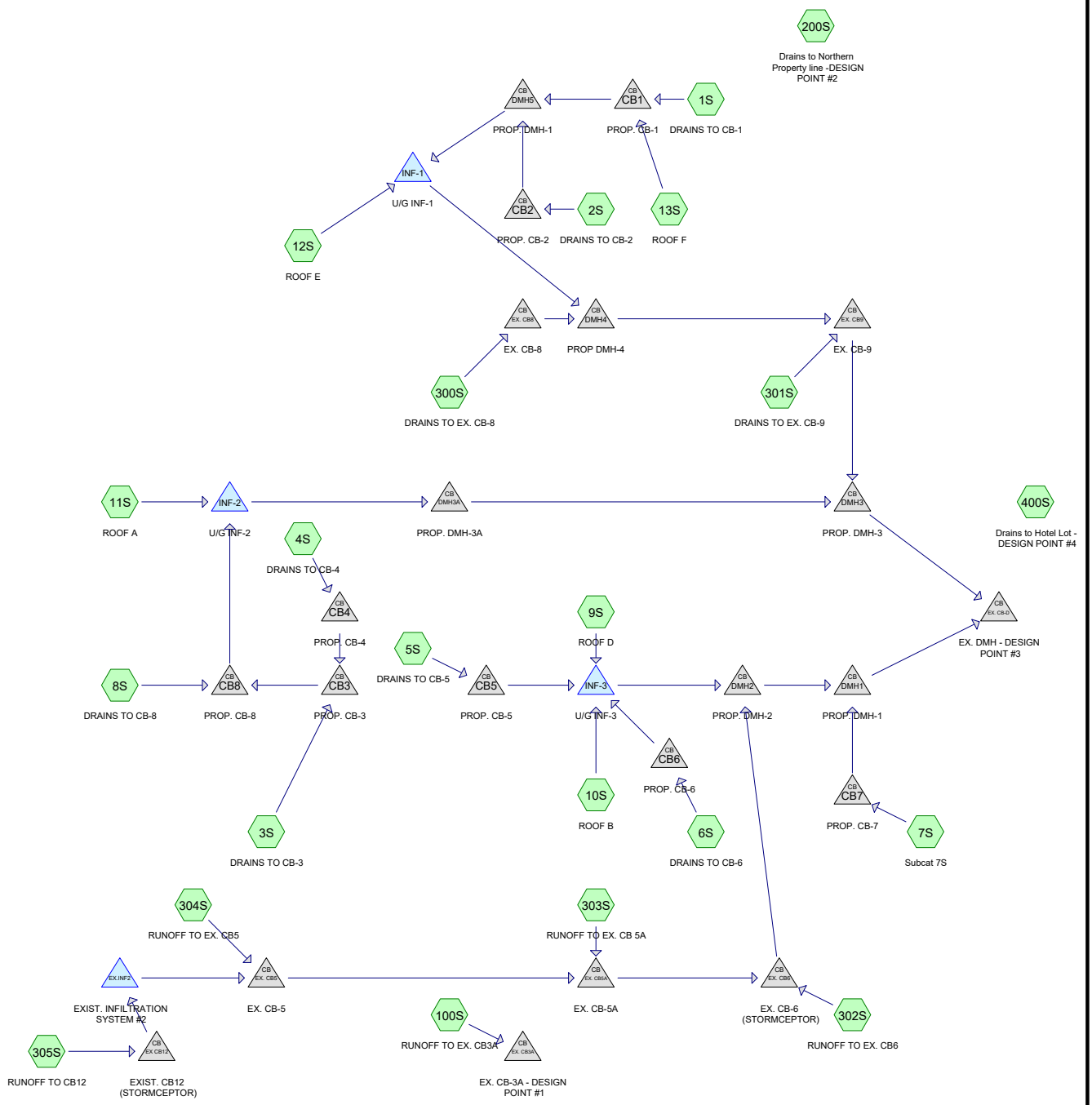
Pond EX.INF2: EXIST. INFILTRATION Peak Elev=68.89' Storage=1,000 cf Inflow=1.98 cfs 5,600 cf
Discarded=0.07 cfs 2,804 cf Primary=3.39 cfs 2,796 cf Outflow=3.45 cfs 5,600 cf

Pond INF-1: U/G INF-1 Peak Elev=45.40' Storage=3,644 cf Inflow=4.21 cfs 12,581 cf
Discarded=0.33 cfs 8,730 cf Primary=2.48 cfs 3,852 cf Outflow=2.79 cfs 12,582 cf

Pond INF-2: U/G INF-2 Peak Elev=44.10' Storage=3,799 cf Inflow=4.36 cfs 13,946 cf
Discarded=0.36 cfs 9,271 cf Primary=1.85 cfs 4,675 cf Outflow=2.20 cfs 13,947 cf

Pond INF-3: U/G INF-3 Peak Elev=44.66' Storage=3,812 cf Inflow=4.08 cfs 12,939 cf
Discarded=0.35 cfs 9,124 cf Primary=1.37 cfs 3,815 cf Outflow=1.72 cfs 12,939 cf

Total Runoff Area = 182,849 sf Runoff Volume = 114,550 cf Average Runoff Depth = 7.52"
17.37% Pervious = 31,764 sf 82.63% Impervious = 151,085 sf



Routing Diagram for 4582-Postdrain--Rev1
Prepared by Greenman-Pedersen, Inc., Printed 4/18/2022
HydroCAD® 10.10-7a s/n 01710 © 2021 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
31,764	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S)
125,486	98	Paved parking, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S)
25,599	98	Roofs, HSG B (9S, 10S, 11S, 12S, 13S)
182,849	**92**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
182,849	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S
0	HSG C	
0	HSG D	
0	Other	
182,849		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	31,764	0	0	0	31,764	>75% Grass cover, Good	
0	125,486	0	0	0	125,486	Paved parking	
0	25,599	0	0	0	25,599	Roofs	
0	**182,849**	**0**	**0**	**0**	**182,849**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	CB1	43.30	43.00	59.0	0.0051	0.013	0.0	12.0	0.0
2	CB2	43.70	43.20	31.0	0.0161	0.013	0.0	12.0	0.0
3	CB3	43.15	42.70	54.0	0.0083	0.013	0.0	12.0	0.0
4	CB4	43.60	43.25	36.0	0.0097	0.013	0.0	12.0	0.0
5	CB5	42.20	42.00	12.0	0.0167	0.013	0.0	12.0	0.0
6	CB6	42.20	42.00	9.0	0.0222	0.013	0.0	12.0	0.0
7	CB7	41.05	40.70	34.0	0.0103	0.013	0.0	12.0	0.0
8	CB8	42.60	42.50	7.0	0.0143	0.013	0.0	12.0	0.0
9	DMH1	39.60	39.20	43.0	0.0093	0.013	0.0	18.0	0.0
10	DMH2	39.85	39.70	30.0	0.0050	0.013	0.0	18.0	0.0
11	DMH3	39.40	39.20	38.0	0.0053	0.013	0.0	18.0	0.0
12	DMH3A	40.30	39.50	168.0	0.0048	0.013	0.0	15.0	0.0
13	DMH4	41.32	40.64	118.0	0.0058	0.013	0.0	12.0	0.0
14	DMH5	42.00	41.75	11.0	0.0227	0.013	0.0	12.0	0.0
15	EX CB12	43.09	42.72	16.0	0.0231	0.013	0.0	12.0	0.0
16	EX. CB-D	39.09	32.55	164.0	0.0399	0.013	0.0	18.0	0.0
17	EX. CB3A	41.82	41.56	46.0	0.0057	0.013	0.0	12.0	0.0
18	EX. CB5	41.93	41.50	170.0	0.0025	0.013	0.0	12.0	0.0
19	EX. CB5A	41.15	41.30	98.0	-0.0015	0.013	0.0	12.0	0.0
20	EX. CB6	40.55	39.95	118.0	0.0051	0.013	0.0	12.0	0.0
21	EX. CB8	41.38	41.32	10.0	0.0060	0.013	0.0	12.0	0.0
22	EX. CB9	40.09	39.80	30.0	0.0097	0.013	0.0	12.0	0.0
23	EX.INF2	42.50	42.34	32.0	0.0050	0.013	0.0	12.0	0.0
24	INF-1	42.00	41.50	50.0	0.0100	0.013	0.0	12.0	0.0
25	INF-2	40.60	40.40	41.0	0.0049	0.013	0.0	15.0	0.0
26	INF-3	41.00	39.95	33.0	0.0318	0.013	0.0	12.0	0.0

Notes Listing (all nodes)

Line#	Node Number	Notes
1	EX.INF2	The soils present in the area of the infiltration system consist of Urban Land (NRCS classification 699). Due to the limited information provided for this soil type, 140C Chatfield-Hollis-Canton Complex was used as the closest soil present within the site.
2		The bottom of the stone in the infiltration system is approximately 6' below existing grade. Per USDA Soil Data Mart, the lowest value for the Saturated Ksat Value for this soil at a depth of 21-60"' +/- is 42.33 micrometers/second.
3		Per NHDES Stormwater Manual: Vol. 2, pages 16-17 using a factor of safety of 2, the infiltration rate for this system is as follows:
4		42.33/2 (FS) = 21.17 micro/sec.
5		Converting to inches/hr with a conversion factor of 0.1417 = (21.17 * 0.1417 = 3.00 in/hr)

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: DRAINS TO CB-1 Runoff Area=4,516 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.88 cfs 2,590 cf

Subcatchment2S: DRAINS TO CB-2 Runoff Area=5,065 sf 94.14% Impervious Runoff Depth=6.64"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=96 Runoff=0.97 cfs 2,804 cf

Subcatchment3S: DRAINS TO CB-3 Runoff Area=7,497 sf 72.05% Impervious Runoff Depth=5.71"
Flow Length=98' Tc=3.8 min CN=88 Runoff=1.19 cfs 3,567 cf

Subcatchment4S: DRAINS TO CB-4 Runoff Area=2,857 sf 62.60% Impervious Runoff Depth=5.25"
Flow Length=71' Tc=3.5 min CN=84 Runoff=0.43 cfs 1,251 cf

Subcatchment5S: DRAINS TO CB-5 Runoff Area=3,924 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.76 cfs 2,250 cf

Subcatchment6S: DRAINS TO CB-6 Runoff Area=3,628 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=98 Runoff=0.62 cfs 2,081 cf

Subcatchment7S: Subcat 7S Runoff Area=1,293 sf 98.96% Impervious Runoff Depth=6.88"
Tc=0.0 min CN=98 Runoff=0.25 cfs 741 cf

Subcatchment8S: DRAINS TO CB-8 Runoff Area=5,929 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=80' Slope=0.0150 '/' Tc=0.8 min CN=98 Runoff=1.14 cfs 3,400 cf

Subcatchment9S: ROOF D Runoff Area=6,400 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=1.22 cfs 3,670 cf

Subcatchment10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment11S: ROOF A Runoff Area=5,600 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=1.07 cfs 3,211 cf

Subcatchment12S: ROOF E Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.76 cfs 2,293 cf

Subcatchment13S: ROOF F Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment100S: RUNOFF TO EX. Runoff Area=16,015 sf 91.98% Impervious Runoff Depth=6.53"
Flow Length=182' Tc=3.5 min CN=95 Runoff=2.77 cfs 8,708 cf

Subcatchment200S: Drains to Northern Runoff Area=11,417 sf 19.04% Impervious Runoff Depth=3.51"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=68 Runoff=1.11 cfs 3,337 cf

Subcatchment300S: DRAINS TO EX. CB-8 Runoff Area=16,949 sf 77.39% Impervious Runoff Depth=5.94"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=90 Runoff=2.95 cfs 8,391 cf

Subcatchment301S: DRAINS TO EX. CB-9 Runoff Area=8,852 sf 82.02% Impervious Runoff Depth=6.06"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=91 Runoff=1.49 cfs 4,468 cf

Subcatchment302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 82.88% Impervious Runoff Depth=6.17"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=2.49 cfs 7,437 cf

Subcatchment303S: RUNOFF TO EX. CB 5A Runoff Area=4,916 sf 86.65% Impervious Runoff Depth=6.29"
Flow Length=106' Tc=0.9 min CN=93 Runoff=0.91 cfs 2,577 cf

Subcatchment304S: RUNOFF TO EX. CB5 Runoff Area=19,066 sf 75.73% Impervious Runoff Depth=5.83"
Flow Length=336' Tc=3.3 min CN=89 Runoff=3.13 cfs 9,255 cf

Subcatchment305S: RUNOFF TO CB12 Runoff Area=8,890 sf 82.86% Impervious Runoff Depth=6.17"
Flow Length=109' Tc=1.0 min CN=92 Runoff=1.63 cfs 4,573 cf

Subcatchment400S: Drains to Hotel Lot - Runoff Area=21,981 sf 86.10% Impervious Runoff Depth=6.29"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=93 Runoff=3.55 cfs 11,522 cf

Pond CB1: PROP. CB-1 Peak Elev=44.67' Inflow=1.79 cfs 5,342 cf
12.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=1.79 cfs 5,342 cf

Pond CB2: PROP. CB-2 Peak Elev=44.63' Inflow=0.97 cfs 2,804 cf
12.0" Round Culvert n=0.013 L=31.0' S=0.0161 '/' Outflow=0.97 cfs 2,804 cf

Pond CB3: PROP. CB-3 Peak Elev=44.05' Inflow=1.62 cfs 4,818 cf
12.0" Round Culvert n=0.013 L=54.0' S=0.0083 '/' Outflow=1.62 cfs 4,818 cf

Pond CB4: PROP. CB-4 Peak Elev=44.14' Inflow=0.43 cfs 1,251 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0097 '/' Outflow=0.43 cfs 1,251 cf

Pond CB5: PROP. CB-5 Peak Elev=43.67' Inflow=0.76 cfs 2,250 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.76 cfs 2,250 cf

Pond CB6: PROP. CB-6 Peak Elev=43.67' Inflow=0.62 cfs 2,081 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.62 cfs 2,081 cf

Pond CB7: PROP. CB-7 Peak Elev=43.80' Inflow=0.25 cfs 741 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0103 '/' Outflow=0.25 cfs 741 cf

Pond CB8: PROP. CB-8 Peak Elev=43.68' Inflow=2.57 cfs 8,218 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=2.57 cfs 8,218 cf

Pond DMH1: PROP. DMH-1 Peak Elev=43.80' Inflow=9.35 cfs 24,654 cf
18.0" Round Culvert n=0.013 L=43.0' S=0.0093 '/' Outflow=9.35 cfs 24,654 cf

Pond DMH2: PROP. DMH-2 Peak Elev=44.84' Inflow=9.13 cfs 23,913 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=9.13 cfs 23,913 cf

Pond DMH3: PROP. DMH-3 Peak Elev=43.49' Inflow=6.03 cfs 18,756 cf
18.0" Round Culvert n=0.013 L=38.0' S=0.0053 '/' Outflow=6.03 cfs 18,756 cf

Pond DMH3A: PROP. DMH-3A Peak Elev=43.64' Inflow=1.32 cfs 3,224 cf
15.0" Round Culvert n=0.013 L=168.0' S=0.0048 '/' Outflow=1.32 cfs 3,224 cf

Pond DMH4: PROP DMH-4 Peak Elev=45.82' Inflow=4.01 cfs 11,064 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0058 '/' Outflow=4.01 cfs 11,064 cf

Pond DMH5: PROP. DMH-1 Peak Elev=44.61' Inflow=2.75 cfs 8,146 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0227 '/' Outflow=2.75 cfs 8,146 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=60.24' Inflow=1.63 cfs 4,573 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.63 cfs 4,573 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=43.10' Inflow=15.37 cfs 43,411 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=15.37 cfs 43,411 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.03' Inflow=2.77 cfs 8,708 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.77 cfs 8,708 cf

Pond EX. CB5: EX. CB-5 Peak Elev=60.16' Inflow=5.37 cfs 11,254 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=5.37 cfs 11,254 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=55.64' Inflow=6.18 cfs 13,831 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=6.18 cfs 13,831 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=53.54' Inflow=8.66 cfs 21,267 cf
12.0" Round Culvert n=0.013 L=118.0' S=0.0051 '/' Outflow=8.66 cfs 21,267 cf

Pond EX. CB8: EX. CB-8 Peak Elev=46.30' Inflow=2.95 cfs 8,391 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0060 '/' Outflow=2.95 cfs 8,391 cf

Pond EX. CB9: EX. CB-9 Peak Elev=44.82' Inflow=5.26 cfs 15,532 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0097 '/' Outflow=5.26 cfs 15,532 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=60.16' Storage=1,000 cf Inflow=1.63 cfs 4,573 cf
Discarded=0.06 cfs 2,574 cf Primary=3.54 cfs 1,999 cf Outflow=3.59 cfs 4,573 cf

Pond INF-1: U/G INF-1 Peak Elev=44.53' Storage=2,912 cf Inflow=3.52 cfs 10,440 cf
Discarded=0.28 cfs 7,767 cf Primary=2.14 cfs 2,673 cf Outflow=2.42 cfs 10,440 cf

Pond INF-2: U/G INF-2 Peak Elev=43.15' Storage=3,054 cf Inflow=3.60 cfs 11,429 cf
Discarded=0.30 cfs 8,205 cf Primary=1.32 cfs 3,224 cf Outflow=1.62 cfs 11,429 cf

Pond INF-3: U/G INF-3 Peak Elev=43.67' Storage=3,057 cf Inflow=3.41 cfs 10,753 cf
Discarded=0.29 cfs 8,107 cf Primary=1.00 cfs 2,646 cf Outflow=1.29 cfs 10,753 cf

Total Runoff Area = 182,849 sf Runoff Volume = 93,630 cf Average Runoff Depth = 6.14"
17.37% Pervious = 31,764 sf 82.63% Impervious = 151,085 sf

Summary for Subcatchment 1S: DRAINS TO CB-1

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.88 cfs @ 12.01 hrs, Volume= 2,590 cf, Depth= 6.88"
Routed to Pond CB1 : PROP. CB-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
4,516	98	Paved parking, HSG B
4,516	98	Weighted Average
0		0.00% Pervious Area
4,516		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0240	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.1	26	0.0240	3.14		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	51	Total			

Summary for Subcatchment 2S: DRAINS TO CB-2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.97 cfs @ 12.01 hrs, Volume= 2,804 cf, Depth= 6.64"
Routed to Pond CB2 : PROP. CB-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
297	61	>75% Grass cover, Good, HSG B
4,768	98	Paved parking, HSG B
5,065	96	Weighted Average
297		5.86% Pervious Area
4,768		94.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0160	0.96		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.4	60	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	85	Total			

Summary for Subcatchment 3S: DRAINS TO CB-3

Runoff = 1.19 cfs @ 12.05 hrs, Volume= 3,567 cf, Depth= 5.71"
Routed to Pond CB3 : PROP. CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
2,095	61	>75% Grass cover, Good, HSG B
5,402	98	Paved parking, HSG B
7,497	88	Weighted Average
2,095		27.95% Pervious Area
5,402		72.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	25	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.2	10	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	63	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.8	98	Total			

Summary for Subcatchment 4S: DRAINS TO CB-4

Runoff = 0.43 cfs @ 12.05 hrs, Volume= 1,251 cf, Depth= 5.25"
Routed to Pond CB4 : PROP. CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,069	61	>75% Grass cover, Good, HSG B
1,788	98	Paved parking, HSG B
2,857	84	Weighted Average
1,069		37.40% Pervious Area
1,788		62.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	25	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.2	10	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	36	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	71	Total			

Summary for Subcatchment 5S: DRAINS TO CB-5

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.76 cfs @ 12.01 hrs, Volume= 2,250 cf, Depth= 6.88"
Routed to Pond CB5 : PROP. CB-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
3,924	98	Paved parking, HSG B
3,924	98	Weighted Average
0		0.00% Pervious Area
3,924		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	25	0.0130	0.88		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.2	22	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	47	Total			

Summary for Subcatchment 6S: DRAINS TO CB-6

Runoff = 0.62 cfs @ 12.06 hrs, Volume= 2,081 cf, Depth= 6.88"
Routed to Pond CB6 : PROP. CB-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
3,628	98	Paved parking, HSG B
3,628	98	Weighted Average
0		0.00% Pervious Area
3,628		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	25	0.0150	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.3	15	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	60	Total			

Summary for Subcatchment 7S: Subcat 7S

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.25 cfs @ 12.00 hrs, Volume= 741 cf, Depth= 6.88"
Routed to Pond CB7 : PROP. CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
13	61	>75% Grass cover, Good, HSG B
1,279	98	Paved parking, HSG B
1,293	98	Weighted Average
13		1.04% Pervious Area
1,279		98.96% Impervious Area

Summary for Subcatchment 8S: DRAINS TO CB-8

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.14 cfs @ 12.01 hrs, Volume= 3,400 cf, Depth= 6.88"
Routed to Pond CB8 : PROP. CB-8

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
5,929	98	Paved parking, HSG B
5,929	98	Weighted Average
0		0.00% Pervious Area
5,929		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0150	0.93		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	80	Total			

Summary for Subcatchment 9S: ROOF D

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.22 cfs @ 12.01 hrs, Volume= 3,670 cf, Depth= 6.88"
Routed to Pond INF-3 : U/G INF-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
6,400	98	Roofs, HSG B
6,400		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					**Direct Entry,**

Summary for Subcatchment 10S: ROOF B

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.92 cfs @ 12.01 hrs, Volume= 2,752 cf, Depth= 6.88"
Routed to Pond INF-3 : U/G INF-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,800	98	Roofs, HSG B
4,800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					**Direct Entry,**

Summary for Subcatchment 11S: ROOF A

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.07 cfs @ 12.01 hrs, Volume= 3,211 cf, Depth= 6.88"
Routed to Pond INF-2 : U/G INF-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
5,600	98	Roofs, HSG B
5,600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					**Direct Entry,**

Summary for Subcatchment 12S: ROOF E

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.76 cfs @ 12.01 hrs, Volume= 2,293 cf, Depth= 6.88"
Routed to Pond INF-1 : U/G INF-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,000	98	Roofs, HSG B
4,000		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					**Direct Entry,**

Summary for Subcatchment 13S: ROOF F

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.92 cfs @ 12.01 hrs, Volume= 2,752 cf, Depth= 6.88"
Routed to Pond CB1 : PROP. CB-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,800	98	Roofs, HSG B
4,800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					**Direct Entry,**

Summary for Subcatchment 100S: RUNOFF TO EX. CB3A

Runoff = 2.77 cfs @ 12.05 hrs, Volume= 8,708 cf, Depth= 6.53"
Routed to Pond EX. CB3A : EX. CB-3A - DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,285	61	>75% Grass cover, Good, HSG B
14,730	98	Paved parking, HSG B
16,015	95	Weighted Average
1,285		8.02% Pervious Area
14,730		91.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	15	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.2	10	0.0200	0.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
1.2	157	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	182	Total			

Summary for Subcatchment 200S: Drains to Northern Property line -DESIGN POINT #2

Runoff = 1.11 cfs @ 12.08 hrs, Volume= 3,337 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
9,243	61	>75% Grass cover, Good, HSG B
2,174	98	Paved parking, HSG B
11,417	68	Weighted Average
9,243		80.96% Pervious Area
2,174		19.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.9	5	0.0200	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.1	15	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	92	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.2	132	Total			

Summary for Subcatchment 300S: DRAINS TO EX. CB-8

Runoff = 2.95 cfs @ 12.03 hrs, Volume= 8,391 cf, Depth= 5.94"
Routed to Pond EX. CB8 : EX. CB-8

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
3,832	61	>75% Grass cover, Good, HSG B
13,117	98	Paved parking, HSG B
16,949	90	Weighted Average
3,832		22.61% Pervious Area
13,117		77.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0180	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
1.6	254	0.0180	2.72		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	279	Total			

Summary for Subcatchment 301S: DRAINS TO EX. CB-9

Runoff = 1.49 cfs @ 12.05 hrs, Volume= 4,468 cf, Depth= 6.06"
Routed to Pond EX. CB9 : EX. CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,592	61	>75% Grass cover, Good, HSG B
7,260	98	Paved parking, HSG B
8,852	91	Weighted Average
1,592		17.98% Pervious Area
7,260		82.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0230	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.1	5	0.0230	0.80		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.6	102	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	127	Total			

Summary for Subcatchment 302S: RUNOFF TO EX. CB6

Runoff = 2.49 cfs @ 12.04 hrs, Volume= 7,437 cf, Depth= 6.17"
Routed to Pond EX. CB6 : EX. CB-6 (STORMCEPTOR)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
2,474	61	>75% Grass cover, Good, HSG B
11,981	98	Paved parking, HSG B
14,456	92	Weighted Average
2,474		17.12% Pervious Area
11,981		82.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	8	0.0100	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.4	17	0.0100	0.73		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.8	97	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.9	122	Total			

Summary for Subcatchment 303S: RUNOFF TO EX. CB 5A

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.91 cfs @ 12.01 hrs, Volume= 2,577 cf, Depth= 6.29"
Routed to Pond EX. CB5A : EX. CB-5A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
656	61	>75% Grass cover, Good, HSG B
4,260	98	Paved parking, HSG B
4,916	93	Weighted Average
656		13.35% Pervious Area
4,260		86.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.5	81	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	106	Total			

Summary for Subcatchment 304S: RUNOFF TO EX. CB5

Runoff = 3.13 cfs @ 12.05 hrs, Volume= 9,255 cf, Depth= 5.83"
Routed to Pond EX. CB5 : EX. CB-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,627	61	>75% Grass cover, Good, HSG B
14,438	98	Paved parking, HSG B
19,066	89	Weighted Average
4,627		24.27% Pervious Area
14,438		75.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
2.9	311	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.3	336	Total			

Summary for Subcatchment 305S: RUNOFF TO CB12

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.63 cfs @ 12.01 hrs, Volume= 4,573 cf, Depth= 6.17"
Routed to Pond EX CB12 : EXIST. CB12 (STORMCEPTOR)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,524	61	>75% Grass cover, Good, HSG B
7,365	98	Paved parking, HSG B
8,890	92	Weighted Average
1,524		17.14% Pervious Area
7,365		82.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.1	11	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	88	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	109	Total			

Summary for Subcatchment 400S: Drains to Hotel Lot - DESIGN POINT #4

Runoff = 3.55 cfs @ 12.07 hrs, Volume= 11,522 cf, Depth= 6.29"
Routed to nonexistent node CB-D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
3,056	61	>75% Grass cover, Good, HSG B
18,924	98	Paved parking, HSG B
21,981	93	Weighted Average
3,056		13.90% Pervious Area
18,924		86.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	25	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.6	35	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	195	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.9	255	Total			

Summary for Pond CB1: PROP. CB-1

Inflow Area = 9,316 sf,100.00% Impervious, Inflow Depth = 6.88" for 25-Year event
Inflow = 1.79 cfs @ 12.01 hrs, Volume= 5,342 cf
Outflow = 1.79 cfs @ 12.01 hrs, Volume= 5,342 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.79 cfs @ 12.01 hrs, Volume= 5,342 cf
Routed to Pond DMH5 : PROP. DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.67' @ 12.10 hrs
Flood Elev= 46.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.30'	**12.0" Round Culvert** L= 59.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.30' / 43.00' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.38 cfs @ 12.01 hrs HW=44.51' TW=44.35' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.38 cfs @ 1.85 fps)

Summary for Pond CB2: PROP. CB-2

Inflow Area = 5,065 sf, 94.14% Impervious, Inflow Depth = 6.64" for 25-Year event
Inflow = 0.97 cfs @ 12.01 hrs, Volume= 2,804 cf
Outflow = 0.97 cfs @ 12.01 hrs, Volume= 2,804 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.97 cfs @ 12.01 hrs, Volume= 2,804 cf
Routed to Pond DMH5 : PROP. DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.63' @ 12.10 hrs
Flood Elev= 47.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.70'	**12.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.70' / 43.20' S= 0.0161 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.01 hrs HW=44.43' TW=44.35' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.64 cfs @ 1.45 fps)

Summary for Pond CB3: PROP. CB-3

Inflow Area = 10,354 sf, 69.44% Impervious, Inflow Depth = 5.58" for 25-Year event
Inflow = 1.62 cfs @ 12.05 hrs, Volume= 4,818 cf
Outflow = 1.62 cfs @ 12.05 hrs, Volume= 4,818 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.05 hrs, Volume= 4,818 cf
Routed to Pond CB8 : PROP. CB-8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.05' @ 12.05 hrs
Flood Elev= 46.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.15'	**12.0" Round Culvert** L= 54.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.15' / 42.70' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.65 cfs @ 12.05 hrs HW=44.04' TW=43.66' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.65 cfs @ 2.95 fps)

Summary for Pond CB4: PROP. CB-4

Inflow Area = 2,857 sf, 62.60% Impervious, Inflow Depth = 5.25" for 25-Year event
Inflow = 0.43 cfs @ 12.05 hrs, Volume= 1,251 cf
Outflow = 0.43 cfs @ 12.05 hrs, Volume= 1,251 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.05 hrs, Volume= 1,251 cf
Routed to Pond CB3 : PROP. CB-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.14' @ 12.06 hrs
Flood Elev= 46.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.60'	**12.0" Round Culvert** L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.60' / 43.25' S= 0.0097 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.05 hrs HW=44.14' TW=44.05' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.42 cfs @ 1.41 fps)

Summary for Pond CB5: PROP. CB-5

Inflow Area = 3,924 sf,100.00% Impervious, Inflow Depth = 6.88" for 25-Year event
Inflow = 0.76 cfs @ 12.01 hrs, Volume= 2,250 cf
Outflow = 0.76 cfs @ 12.01 hrs, Volume= 2,250 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.76 cfs @ 12.01 hrs, Volume= 2,250 cf
Routed to Pond INF-3 : U/G INF-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.67' @ 12.20 hrs
Flood Elev= 45.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.20'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.20' / 42.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.25 cfs @ 12.01 hrs HW=42.93' TW=42.92' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.25 cfs @ 0.57 fps)

Summary for Pond CB6: PROP. CB-6

Inflow Area = 3,628 sf,100.00% Impervious, Inflow Depth = 6.88" for 25-Year event
Inflow = 0.62 cfs @ 12.06 hrs, Volume= 2,081 cf
Outflow = 0.62 cfs @ 12.06 hrs, Volume= 2,081 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.62 cfs @ 12.06 hrs, Volume= 2,081 cf
Routed to Pond INF-3 : U/G INF-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.67' @ 12.20 hrs
Flood Elev= 45.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.20'	**12.0" Round Culvert** L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.20' / 42.00' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.06 hrs HW=43.25' TW=43.31' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB7: PROP. CB-7

Inflow Area = 1,293 sf, 98.96% Impervious, Inflow Depth = 6.88" for 25-Year event
Inflow = 0.25 cfs @ 12.00 hrs, Volume= 741 cf
Outflow = 0.25 cfs @ 12.00 hrs, Volume= 741 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.00 hrs, Volume= 741 cf
Routed to Pond DMH1 : PROP. DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 43.80' @ 12.04 hrs
Flood Elev= 45.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.05'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.05' / 40.70' S= 0.0103 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.00 hrs HW=41.49' TW=41.79' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond CB8: PROP. CB-8

Inflow Area = 16,283 sf, 80.57% Impervious, Inflow Depth = 6.06" for 25-Year event
Inflow = 2.57 cfs @ 12.04 hrs, Volume= 8,218 cf
Outflow = 2.57 cfs @ 12.04 hrs, Volume= 8,218 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.57 cfs @ 12.04 hrs, Volume= 8,218 cf
Routed to Pond INF-2 : U/G INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.68' @ 12.04 hrs
Flood Elev= 47.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.60'	**12.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.60' / 42.50' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.56 cfs @ 12.04 hrs HW=43.68' TW=42.63' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.56 cfs @ 3.77 fps)

Summary for Pond DMH1: PROP. DMH-1

[80] Warning: Exceeded Pond CB7 by 0.77' @ 12.03 hrs (3.32 cfs 769 cf)
[80] Warning: Exceeded Pond DMH2 by 0.20' @ 12.19 hrs (3.77 cfs 433 cf)

Inflow Area = 67,372 sf, 86.20% Impervious, Inflow Depth = 4.39" for 25-Year event
Inflow = 9.35 cfs @ 12.02 hrs, Volume= 24,654 cf
Outflow = 9.35 cfs @ 12.02 hrs, Volume= 24,654 cf, Atten= 0%, Lag= 0.0 min
Primary = 9.35 cfs @ 12.02 hrs, Volume= 24,654 cf
Routed to Pond EX. CB-D : EX. DMH - DESIGN POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.80' @ 12.03 hrs
Flood Elev= 45.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.60'	**18.0" Round Culvert** L= 43.0' CPP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 39.60' / 39.20' S= 0.0093 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.02 hrs HW=43.02' TW=43.09' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH2: PROP. DMH-2

[80] Warning: Exceeded Pond INF-3 by 1.67' @ 12.04 hrs (2.05 cfs 195 cf)

Inflow Area = 66,079 sf, 85.95% Impervious, Inflow Depth = 4.34" for 25-Year event
Inflow = 9.13 cfs @ 12.02 hrs, Volume= 23,913 cf
Outflow = 9.13 cfs @ 12.02 hrs, Volume= 23,913 cf, Atten= 0%, Lag= 0.0 min
Primary = 9.13 cfs @ 12.02 hrs, Volume= 23,913 cf
Routed to Pond DMH1 : PROP. DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.84' @ 12.04 hrs
Flood Elev= 46.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.85'	**18.0" Round Culvert**
			L= 30.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 39.85' / 39.70' S= 0.0050 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.70 cfs @ 12.02 hrs HW=43.47' TW=43.02' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.70 cfs @ 3.23 fps)

Summary for Pond DMH3: PROP. DMH-3

[80] Warning: Exceeded Pond DMH3A by 2.47' @ 12.05 hrs (6.01 cfs 1,426 cf)
[80] Warning: Exceeded Pond EX. CB9 by 0.07' @ 12.23 hrs (0.98 cfs 35 cf)

Inflow Area = 66,065 sf, 86.55% Impervious, Inflow Depth = 3.41" for 25-Year event
Inflow = 6.03 cfs @ 12.02 hrs, Volume= 18,756 cf
Outflow = 6.03 cfs @ 12.02 hrs, Volume= 18,756 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.03 cfs @ 12.02 hrs, Volume= 18,756 cf
Routed to Pond EX. CB-D : EX. DMH - DESIGN POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.49' @ 12.03 hrs
Flood Elev= 46.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.40'	**18.0" Round Culvert**
			L= 38.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 39.40' / 39.20' S= 0.0053 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.02 hrs HW=42.48' TW=42.95' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH3A: PROP. DMH-3A

[80] Warning: Exceeded Pond INF-2 by 0.85' @ 12.04 hrs (1.19 cfs 46 cf)

Inflow Area = 21,883 sf, 85.54% Impervious, Inflow Depth = 1.77" for 25-Year event
Inflow = 1.32 cfs @ 12.16 hrs, Volume= 3,224 cf
Outflow = 1.32 cfs @ 12.16 hrs, Volume= 3,224 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.16 hrs, Volume= 3,224 cf
Routed to Pond DMH3 : PROP. DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.64' @ 12.04 hrs
Flood Elev= 48.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.30'	**15.0" Round Culvert** L= 168.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.30' / 39.50' S= 0.0048 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.79 cfs @ 12.16 hrs HW=41.67' TW=41.48' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.79 cfs @ 1.65 fps)

Summary for Pond DMH4: PROP DMH-4

[80] Warning: Exceeded Pond EX. CB8 by 1.70' @ 12.09 hrs (4.93 cfs 1,050 cf)
[80] Warning: Exceeded Pond INF-1 by 1.58' @ 12.05 hrs (3.39 cfs 519 cf)

Inflow Area = 35,330 sf, 88.31% Impervious, Inflow Depth = 3.76" for 25-Year event
Inflow = 4.01 cfs @ 12.09 hrs, Volume= 11,064 cf
Outflow = 4.01 cfs @ 12.09 hrs, Volume= 11,064 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.01 cfs @ 12.09 hrs, Volume= 11,064 cf
Routed to Pond EX. CB9 : EX. CB-9

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 45.82' @ 12.05 hrs
Flood Elev= 47.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.32'	**12.0" Round Culvert** L= 118.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.32' / 40.64' S= 0.0058 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.85 cfs @ 12.09 hrs HW=45.49' TW=43.55' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.85 cfs @ 4.90 fps)

Summary for Pond DMH5: PROP. DMH-1

Inflow Area = 14,382 sf, 97.94% Impervious, Inflow Depth = 6.80" for 25-Year event
Inflow = 2.75 cfs @ 12.01 hrs, Volume= 8,146 cf
Outflow = 2.75 cfs @ 12.01 hrs, Volume= 8,146 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.75 cfs @ 12.01 hrs, Volume= 8,146 cf
Routed to Pond INF-1 : U/G INF-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.61' @ 12.14 hrs
Flood Elev= 47.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.00'	**12.0" Round Culvert** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.00' / 41.75' S= 0.0227 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.51 cfs @ 12.01 hrs HW=44.35' TW=43.91' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.51 cfs @ 3.20 fps)

Summary for Pond EX CB12: EXIST. CB12 (STORMCEPTOR)

[58] Hint: Peaked 14.30' above defined flood level

Inflow Area = 8,890 sf, 82.86% Impervious, Inflow Depth = 6.17" for 25-Year event
Inflow = 1.63 cfs @ 12.01 hrs, Volume= 4,573 cf
Outflow = 1.63 cfs @ 12.01 hrs, Volume= 4,573 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.63 cfs @ 12.01 hrs, Volume= 4,573 cf
Routed to Pond EX.INF2 : EXIST. INFILTRATION SYSTEM #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 60.24' @ 12.08 hrs
Flood Elev= 45.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.09'	**12.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.09' / 42.72' S= 0.0231 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.01 hrs HW=45.71' TW=46.93' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond EX. CB-D: EX. DMH - DESIGN POINT #3

[80] Warning: Exceeded Pond DMH1 by 0.19' @ 12.18 hrs (3.69 cfs 409 cf)
[80] Warning: Exceeded Pond DMH3 by 0.78' @ 12.02 hrs (7.53 cfs 1,514 cf)

Inflow Area = 133,437 sf, 86.38% Impervious, Inflow Depth = 3.90" for 25-Year event
Inflow = 15.37 cfs @ 12.02 hrs, Volume= 43,411 cf
Outflow = 15.37 cfs @ 12.02 hrs, Volume= 43,411 cf, Atten= 0%, Lag= 0.0 min
Primary = 15.37 cfs @ 12.02 hrs, Volume= 43,411 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.10' @ 12.02 hrs
Flood Elev= 44.18'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.09'	**18.0" Round Culvert** L= 164.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.09' / 32.55' S= 0.0399 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=15.27 cfs @ 12.02 hrs HW=43.06' (Free Discharge)
1=Culvert (Inlet Controls 15.27 cfs @ 8.64 fps)

Summary for Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1

Inflow Area = 16,015 sf, 91.98% Impervious, Inflow Depth = 6.53" for 25-Year event
Inflow = 2.77 cfs @ 12.05 hrs, Volume= 8,708 cf
Outflow = 2.77 cfs @ 12.05 hrs, Volume= 8,708 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.77 cfs @ 12.05 hrs, Volume= 8,708 cf
Routed to nonexistent node DMH3B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.03' @ 12.05 hrs
Flood Elev= 44.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.82'	**12.0" Round Culvert** L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.82' / 41.56' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.77 cfs @ 12.05 hrs HW=43.03' (Free Discharge)
1=Culvert (Barrel Controls 2.77 cfs @ 3.70 fps)

Summary for Pond EX. CB5: EX. CB-5

[58] Hint: Peaked 12.48' above defined flood level
[80] Warning: Exceeded Pond EX.INF2 by 5.18' @ 12.11 hrs (8.61 cfs 3,460 cf)

Inflow Area = 27,955 sf, 77.99% Impervious, Inflow Depth = 4.83" for 25-Year event
Inflow = 5.37 cfs @ 12.04 hrs, Volume= 11,254 cf
Outflow = 5.37 cfs @ 12.04 hrs, Volume= 11,254 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.37 cfs @ 12.04 hrs, Volume= 11,254 cf
Routed to Pond EX. CB5A : EX. CB-5A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 60.16' @ 12.06 hrs
Flood Elev= 47.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.93'	**12.0" Round Culvert** L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.93' / 41.50' S= 0.0025 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.40 cfs @ 12.04 hrs HW=59.14' TW=54.12' (Dynamic Tailwater)
1=Culvert (Outlet Controls 5.40 cfs @ 6.88 fps)

Summary for Pond EX. CB5A: EX. CB-5A

[58] Hint: Peaked 10.23' above defined flood level
[80] Warning: Exceeded Pond EX. CB5 by 0.38' @ 12.19 hrs (1.49 cfs 136 cf)

Inflow Area = 32,871 sf, 79.29% Impervious, Inflow Depth = 5.05" for 25-Year event
Inflow = 6.18 cfs @ 12.02 hrs, Volume= 13,831 cf
Outflow = 6.18 cfs @ 12.02 hrs, Volume= 13,831 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.18 cfs @ 12.02 hrs, Volume= 13,831 cf
Routed to Pond EX. CB6 : EX. CB-6 (STORMCEPTOR)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 55.64' @ 12.05 hrs
Flood Elev= 45.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.30'	**12.0" Round Culvert** L= 98.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.15' / 41.30' S= -0.0015 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.02 hrs HW=51.64' TW=51.93' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond EX. CB6: EX. CB-6 (STORMCEPTOR)

[58] Hint: Peaked 9.59' above defined flood level
[80] Warning: Exceeded Pond EX. CB5A by 0.37' @ 12.18 hrs (1.80 cfs 183 cf)

Inflow Area = 47,327 sf, 80.39% Impervious, Inflow Depth = 5.39" for 25-Year event
Inflow = 8.66 cfs @ 12.04 hrs, Volume= 21,267 cf
Outflow = 8.66 cfs @ 12.04 hrs, Volume= 21,267 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.66 cfs @ 12.04 hrs, Volume= 21,267 cf
Routed to Pond DMH2 : PROP. DMH-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.54' @ 12.04 hrs
Flood Elev= 43.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.55'	**12.0" Round Culvert** L= 118.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.55' / 39.95' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=8.11 cfs @ 12.04 hrs HW=53.43' TW=44.81' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 8.11 cfs @ 10.33 fps)

Summary for Pond EX. CB8: EX. CB-8

Inflow Area = 16,949 sf, 77.39% Impervious, Inflow Depth = 5.94" for 25-Year event
Inflow = 2.95 cfs @ 12.03 hrs, Volume= 8,391 cf
Outflow = 2.95 cfs @ 12.03 hrs, Volume= 8,391 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.95 cfs @ 12.03 hrs, Volume= 8,391 cf
Routed to Pond DMH4 : PROP DMH-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 46.30' @ 12.06 hrs
Flood Elev= 47.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.38'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.38' / 41.32' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.19 cfs @ 12.03 hrs HW=45.26' TW=44.93' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 2.19 cfs @ 2.79 fps)

Summary for Pond EX. CB9: EX. CB-9

[80] Warning: Exceeded Pond DMH4 by 0.07' @ 12.04 hrs (0.72 cfs 26 cf)

Inflow Area = 44,183 sf, 87.05% Impervious, Inflow Depth = 4.22" for 25-Year event
Inflow = 5.26 cfs @ 12.09 hrs, Volume= 15,532 cf
Outflow = 5.26 cfs @ 12.09 hrs, Volume= 15,532 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.26 cfs @ 12.09 hrs, Volume= 15,532 cf
Routed to Pond DMH3 : PROP. DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.82' @ 12.04 hrs
Flood Elev= 45.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.09'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.09' / 39.80' S= 0.0097 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.77 cfs @ 12.09 hrs HW=43.55' TW=42.56' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.77 cfs @ 4.79 fps)

Summary for Pond EX.INF2: EXIST. INFILTRATION SYSTEM #2

The soils present in the area of the infiltration system consist of Urban Land (NRCS classification 699). Due to the limited information provided for this soil type, 140C Chatfield-Hollis-Canton Complex was used as the closest soil present within the site.

The bottom of the stone in the infiltration system is approximately 6' below existing grade. Per USDA Soil Data Mart, the lowest value for the Saturated Ksat Value for this soil at a depth of 21-60"' +/- is 42.33 micrometers/second.

Per NHDES Stormwater Manual: Vol. 2, pages 16-17 using a factor of safety of 2, the infiltration rate for this system is as follows:

42.33/2 (FS) = 21.17 micro/sec.
Converting to inches/hr with a conversion factor of 0.1417 = (21.17 * 0.1417 = 3.00 in/hr)

---

[93] Warning: Storage range exceeded by 14.83'
[58] Hint: Peaked 15.16' above defined flood level
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=11)
[80] Warning: Exceeded Pond EX CB12 by 5.24' @ 12.12 hrs (8.65 cfs 2,202 cf)

Inflow Area = 8,890 sf, 82.86% Impervious, Inflow Depth = 6.17" for 25-Year event
Inflow = 1.63 cfs @ 12.01 hrs, Volume= 4,573 cf
Outflow = 3.59 cfs @ 12.22 hrs, Volume= 4,573 cf, Atten= 0%, Lag= 12.3 min
Discarded = 0.06 cfs @ 12.07 hrs, Volume= 2,574 cf
Primary = 3.54 cfs @ 12.22 hrs, Volume= 1,999 cf
Routed to Pond EX. CB5 : EX. CB-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 60.16' @ 12.07 hrs Surf.Area= 582 sf Storage= 1,000 cf
Flood Elev= 45.00' Surf.Area= 582 sf Storage= 922 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 78.1 min (845.7 - 767.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	583 cf	**13.23'W x 44.00'L x 3.33'H Field A** 1,941 cf Overall - 484 cf Embedded = 1,457 cf x 40.0% Voids
#2A	42.50'	372 cf	**ADS N-12 24"** x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 3 Rows
#3	42.50'	14 cf	**24.0" Round Pipe Storage** x 4 Inside #1 L= 1.1'
#4	42.50'	31 cf	**24.0" Round Pipe Storage**-Impervious L= 10.0'

1,000 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	**12.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.34' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	43.90'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	44.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	42.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.06 cfs @ 12.07 hrs HW=60.14' (Free Discharge)
└**4=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 12.22 hrs HW=45.00' TW=46.81' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond INF-1: U/G INF-1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=270)

Inflow Area = 18,381 sf, 98.38% Impervious, Inflow Depth = 6.82" for 25-Year event
Inflow = 3.52 cfs @ 12.01 hrs, Volume= 10,440 cf
Outflow = 2.42 cfs @ 12.13 hrs, Volume= 10,440 cf, Atten= 31%, Lag= 7.3 min
Discarded = 0.28 cfs @ 12.13 hrs, Volume= 7,767 cf
Primary = 2.14 cfs @ 12.13 hrs, Volume= 2,673 cf
Routed to Pond DMH4 : PROP DMH-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.53' @ 12.13 hrs Surf.Area= 1,650 sf Storage= 2,912 cf
Flood Elev= 45.75' Surf.Area= 1,650 sf Storage= 3,868 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 45.2 min (786.3 - 741.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	41.50'	1,910 cf	**27.50'W x 60.00'L x 4.50'H Field A** 7,425 cf Overall - 2,649 cf Embedded = 4,776 cf x 40.0% Voids
#2A	42.00'	2,123 cf	**ADS N-12 36"** x 15 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= -10.00' x 7.10 sf x 5 rows 24.50' Header x 7.10 sf x 2 = 347.9 cf Inside
		4,033 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	42.00'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.00' / 41.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Discarded	41.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 38.50'
#3	Device 1	43.25'	**9.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	45.65'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.28 cfs @ 12.13 hrs HW=44.53' (Free Discharge)
└**2=Exfiltration** (Controls 0.28 cfs)

Primary OutFlow Max=1.67 cfs @ 12.13 hrs HW=44.52' TW=43.91' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.67 cfs of 2.83 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.67 cfs @ 3.78 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond INF-2: U/G INF-2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=243)

Inflow Area = 21,883 sf, 85.54% Impervious, Inflow Depth = 6.27" for 25-Year event
Inflow = 3.60 cfs @ 12.02 hrs, Volume= 11,429 cf
Outflow = 1.62 cfs @ 12.16 hrs, Volume= 11,429 cf, Atten= 55%, Lag= 8.5 min
Discarded = 0.30 cfs @ 12.16 hrs, Volume= 8,205 cf
Primary = 1.32 cfs @ 12.16 hrs, Volume= 3,224 cf
Routed to Pond DMH3A : PROP. DMH-3A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.15' @ 12.16 hrs Surf.Area= 1,669 sf Storage= 3,054 cf
Flood Elev= 44.25' Surf.Area= 1,669 sf Storage= 3,898 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 48.2 min (806.7 - 758.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.00'	1,946 cf	**22.25'W x 75.00'L x 4.50'H Field A** 7,509 cf Overall - 2,645 cf Embedded = 4,864 cf x 40.0% Voids
#2A	40.50'	2,119 cf	**ADS N-12 36"** x 12 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +5.00' x 7.10 sf x 4 rows 19.25' Header x 7.10 sf x 2 = 273.3 cf Inside
		4,065 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	40.60'	**15.0" Round Culvert** L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.60' / 40.40' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	40.00'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 37.00'
#3	Device 1	41.80'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	44.15'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.30 cfs @ 12.16 hrs HW=43.14' (Free Discharge)
└**2=Exfiltration** (Controls 0.30 cfs)

Primary OutFlow Max=1.32 cfs @ 12.16 hrs HW=43.14' TW=41.67' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.32 cfs of 7.16 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.32 cfs @ 4.94 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond INF-3: U/G INF-3

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=258)
[80] Warning: Exceeded Pond CB5 by 0.06' @ 12.05 hrs (0.95 cfs 310 cf)
[80] Warning: Exceeded Pond CB6 by 0.06' @ 12.04 hrs (0.93 cfs 319 cf)

Inflow Area = 18,752 sf,100.00% Impervious, Inflow Depth = 6.88" for 25-Year event
Inflow = 3.41 cfs @ 12.02 hrs, Volume= 10,753 cf
Outflow = 1.29 cfs @ 12.19 hrs, Volume= 10,753 cf, Atten= 62%, Lag= 10.4 min
Discarded = 0.29 cfs @ 12.19 hrs, Volume= 8,107 cf
Primary = 1.00 cfs @ 12.19 hrs, Volume= 2,646 cf
Routed to Pond DMH2 : PROP. DMH-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.67' @ 12.19 hrs Surf.Area= 1,650 sf Storage= 3,057 cf
Flood Elev= 44.75' Surf.Area= 1,650 sf Storage= 3,868 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 49.1 min (787.7 - 738.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.50'	1,910 cf	**27.50'W x 60.00'L x 4.50'H Field A** 7,425 cf Overall - 2,649 cf Embedded = 4,776 cf x 40.0% Voids
#2A	41.00'	2,123 cf	**ADS N-12 36"** x 15 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= -10.00' x 7.10 sf x 5 rows 24.50' Header x 7.10 sf x 2 = 347.9 cf Inside
		4,033 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	41.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.00' / 39.95' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Discarded	40.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 37.50'
#3	Device 1	42.30'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	44.65'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.29 cfs @ 12.19 hrs HW=43.67' (Free Discharge)
└─**2=Exfiltration** (Controls 0.29 cfs)

Primary OutFlow Max=1.00 cfs @ 12.19 hrs HW=43.67' TW=41.75' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.00 cfs of 5.24 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.00 cfs @ 5.09 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

APPENDIX F

Supplemental Calculations and Backup Data

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.93	**1yr**	2.36	2.82	3.23	3.95	4.56	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.44	3.94	4.69	5.34	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.14	4.08	4.59	**5yr**	3.61	4.41	5.05	5.95	6.72	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.25	1.73	2.23	2.90	3.76	4.88	5.54	**10yr**	4.32	5.33	6.10	7.12	8.00	**10yr**
25yr	0.48	0.76	0.97	1.34	1.77	2.34	**25yr**	1.53	2.14	2.78	3.63	4.75	6.19	7.12	**25yr**	5.47	6.84	7.82	9.05	10.08	**25yr**
50yr	0.54	0.86	1.10	1.54	2.07	2.76	**50yr**	1.79	2.53	3.29	4.33	5.67	7.41	8.60	**50yr**	6.56	8.27	9.45	10.84	12.01	**50yr**
100yr	0.60	0.97	1.25	1.77	2.42	3.26	**100yr**	2.09	2.98	3.91	5.16	6.78	8.88	10.40	**100yr**	7.85	10.00	11.42	13.00	14.31	**100yr**
200yr	0.67	1.10	1.43	2.05	2.83	3.84	**200yr**	2.44	3.52	4.62	6.14	8.10	10.64	12.58	**200yr**	9.41	12.10	13.80	15.59	17.07	**200yr**
500yr	0.80	1.31	1.71	2.49	3.48	4.77	**500yr**	3.00	4.38	5.77	7.72	10.24	13.52	16.18	**500yr**	11.96	15.56	17.73	19.84	21.56	**500yr**

+15% Rainfall

2-yr	3.70
10-yr	5.61
25-yr	7.12
50-yr	8.52

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **U/G INF-1**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
0.42	ac	A = Area draining to the practice	
0.41	ac	A_I = Impervious area draining to the practice	
0.98	decimal	I = percent impervious area draining to the practice, in decimal form	
0.93	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.39	ac-in	WQV= 1" x Rv x A	
1,416	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
354	cf	25% x WQV (check calc for sediment forebay volume)	
First Defense Unit		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
1,436	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
1,650	sf	A_{SA} = surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
3.4	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
41.50	feet	E_{BTM} = elevation of the bottom of the basin	
38.95	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
2.55	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
41.5	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
4.50	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
Yes	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
Stone		If a trench is proposed, material in trench	
		If a basin is proposed, basin floor material	
	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
	:1	If a basin is proposed, pond side slopes	← ≥3:1
43.80	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
45.35	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
45.75	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: Eshwt was calculated by measuring 10' depth from the existing grade. Nearest test pit was dug to 10' depth without encountering water. Further test pits may be needed to verify groundwater levels.

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **U/G INF-2**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
0.50	ac	A = Area draining to the practice	
0.43	ac	A_I = Impervious area draining to the practice	
0.86	decimal	I = percent impervious area draining to the practice, in decimal form	
0.82	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.41	ac-in	WQV= 1" x Rv x A	
1,496	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
374	cf	25% x WQV (check calc for sediment forebay volume)	
First Defense Unit		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
1,506	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
1,669	sf	A_{SA} = surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
3.6	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
40.00	feet	E_{BTM} = elevation of the bottom of the basin	
36.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.00	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
40.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
4.50	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
Yes	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
Stone		If a trench is proposed, material in trench	
		If a basin is proposed, basin floor material	
	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
	:1	If a basin is proposed, pond side slopes	← ≥3:1
42.51	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
44.07	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
44.25	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **U/G INF-3**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
0.43	ac	A = Area draining to the practice	
0.43	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.41	ac-in	WQV= 1" x Rv x A	
1,483	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
371	cf	25% x WQV (check calc for sediment forebay volume)	
First Defense Unit		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
1,493	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
1,650	sf	A_{SA} = surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
3.6	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
40.50	feet	E_{BTM} = elevation of the bottom of the basin	
35.30	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
5.20	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
40.5	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
4.50	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
Yes	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
Stone		If a trench is proposed, material in trench	
		If a basin is proposed, basin floor material	
	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
	:1	If a basin is proposed, pond side slopes	← ≥3:1
42.99	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
44.66	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
44.75	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Stage-Area-Storage for Pond INF-1: U/G INF-1

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
41.50	1,650	0	42.02	1,741	343
41.51	1,652	7	42.03	1,743	349
41.52	1,653	13	42.04	1,744	354
41.53	1,655	20	42.05	1,746	360
41.54	1,657	26	42.06	1,748	366
41.55	1,659	33	42.07	1,750	371
41.56	1,660	40	42.08	1,751	377
41.57	1,662	46	42.09	1,753	382
41.58	1,664	53	42.10	1,755	387
41.59	1,666	59	42.11	1,757	393
41.60	1,667	66	42.12	1,758	398
41.61	1,669	73	42.13	1,760	403
41.62	1,671	79	42.14	1,762	408
41.63	1,673	86	42.15	1,764	413
41.64	1,674	92	42.16	1,765	418
41.65	1,676	99	42.17	1,767	423
41.66	1,678	106	42.18	1,769	428
41.67	1,680	112	42.19	1,771	433
41.68	1,681	119	42.20	1,772	438
41.69	1,683	125	42.21	1,774	443
41.70	1,685	132	42.22	1,776	447
41.71	1,687	139	42.23	1,778	452
41.72	1,688	145	42.24	1,779	457
41.73	1,690	152	42.25	1,781	461
41.74	1,692	158	42.26	1,783	467
41.75	1,694	165	42.27	1,785	472
41.76	1,695	172	42.28	1,786	479
41.77	1,697	178	42.29	1,788	486
41.78	1,699	185	42.30	1,790	492
41.79	1,701	191	42.31	1,792	499
41.80	1,702	198	42.32	1,793	506
41.81	1,704	205	42.33	1,795	514
41.82	1,706	211	42.34	1,797	521
41.83	1,708	218	42.35	1,799	529
41.84	1,709	224	42.36	1,800	536
41.85	1,711	231	42.37	1,802	544
41.86	1,713	238	42.38	1,804	552
41.87	1,715	244	42.39	1,806	560
41.88	1,716	251	42.40	1,807	568
41.89	1,718	257	42.41	1,809	576
41.90	1,720	264	42.42	1,811	584
41.91	1,722	271	42.43	1,813	593
41.92	1,723	277	42.44	1,814	601
41.93	1,725	284	42.45	1,816	609
41.94	1,727	290	42.46	1,818	618
41.95	1,729	297	42.47	1,820	627
41.96	1,730	304	42.48	1,821	635
41.97	1,732	310	42.49	1,823	644
41.98	1,734	317	42.50	1,825	653
41.99	1,736	323	42.51	1,827	662
42.00	1,737	330	42.52	1,828	671
42.01	1,739	336	42.53	1,830	680

Stage-Area-Storage for Pond INF-1: U/G INF-1 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
42.54	1,832	689
42.55	1,834	698
42.56	1,835	708
42.57	1,837	717
42.58	1,839	726
42.59	1,841	736
42.60	1,842	745
42.61	1,844	755
42.62	1,846	764
42.63	1,848	774
42.64	1,849	783
42.65	1,851	793
42.66	1,853	803
42.67	1,855	813
42.68	1,856	822
42.69	1,858	832
42.70	1,860	842
42.71	1,862	852
42.72	1,863	862
42.73	1,865	872
42.74	1,867	882
42.75	1,869	893
42.76	1,870	903
42.77	1,872	913
42.78	1,874	923
42.79	1,876	933
42.80	1,877	944
42.81	1,879	954
42.82	1,881	964
42.83	1,883	975
42.84	1,884	985
42.85	1,886	996
42.86	1,888	1,006
42.87	1,890	1,017
42.88	1,891	1,027
42.89	1,893	1,038
42.90	1,895	1,049
42.91	1,897	1,059
42.92	1,898	1,070
42.93	1,900	1,081
42.94	1,902	1,091
42.95	1,904	1,102
42.96	1,905	1,113
42.97	1,907	1,124
42.98	1,909	1,135
42.99	1,911	1,146
43.00	1,912	1,156
43.01	1,914	1,167
43.02	1,916	1,178
43.03	1,918	1,189
43.04	1,919	1,200
43.05	1,921	1,211
43.06	1,923	1,222
43.07	1,925	1,233
43.08	1,926	1,244
43.09	1,928	1,256
43.10	1,930	1,267
43.11	1,932	1,278
43.12	1,933	1,289
43.13	1,935	1,300
43.14	1,937	1,311
43.15	1,939	1,323
43.16	1,940	1,334
43.17	1,942	1,345
43.18	1,944	1,356
43.19	1,946	1,368
43.20	1,947	1,379
43.21	1,949	1,390
43.22	1,951	1,402
43.23	1,953	1,413
43.24	1,954	1,424
43.25	1,956	1,436
43.26	1,958	1,447
43.27	1,960	1,458
43.28	1,961	1,470
43.29	1,963	1,481
43.30	1,965	1,493
43.31	1,967	1,504
43.32	1,968	1,516
43.33	1,970	1,527
43.34	1,972	1,539
43.35	1,974	1,550
43.36	1,975	1,562
43.37	1,977	1,573
43.38	1,979	1,585
43.39	1,981	1,596
43.40	1,982	1,608
43.41	1,984	1,619
43.42	1,986	1,631
43.43	1,988	1,643
43.44	1,989	1,654
43.45	1,991	1,666
43.46	1,993	1,677
43.47	1,995	1,689
43.48	1,996	1,701
43.49	1,998	1,712
43.50	2,000	1,724
43.51	2,002	1,736
43.52	2,003	1,747
43.53	2,005	1,759
43.54	2,007	1,771
43.55	2,009	1,782
43.56	2,010	1,794
43.57	2,012	1,806

Storage below lowest outlet orifice

Stage-Area-Storage for Pond INF-1: U/G INF-1 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
43.58	2,014	1,817	44.10	2,105	2,425
43.59	2,016	1,829	44.11	2,107	2,437
43.60	2,017	1,841	44.12	2,108	2,448
43.61	2,019	1,852	44.13	2,110	2,460
43.62	2,021	1,864	44.14	2,112	2,471
43.63	2,023	1,876	44.15	2,114	2,483
43.64	2,024	1,888	44.16	2,115	2,495
43.65	2,026	1,899	44.17	2,117	2,506
43.66	2,028	1,911	44.18	2,119	2,517
43.67	2,030	1,923	44.19	2,121	2,529
43.68	2,031	1,934	44.20	2,122	2,540
43.69	2,033	1,946	44.21	2,124	2,552
43.70	2,035	1,958	44.22	2,126	2,563
43.71	2,037	1,970	44.23	2,128	2,575
43.72	2,038	1,981	44.24	2,129	2,586
43.73	2,040	1,993	44.25	2,131	2,598
43.74	2,042	2,005	44.26	2,133	2,609
43.75	2,044	2,017	44.27	2,135	2,620
43.76	2,045	2,028	44.28	2,136	2,632
43.77	2,047	2,040	44.29	2,138	2,643
43.78	2,049	2,052	44.30	2,140	2,654
43.79	2,051	2,063	44.31	2,142	2,666
43.80	2,052	2,075	44.32	2,143	2,677
43.81	2,054	2,087	44.33	2,145	2,688
43.82	2,056	2,099	44.34	2,147	2,699
43.83	2,058	2,110	44.35	2,149	2,711
43.84	2,059	2,122	44.36	2,150	2,722
43.85	2,061	2,134	44.37	2,152	2,733
43.86	2,063	2,146	44.38	2,154	2,744
43.87	2,065	2,157	44.39	2,156	2,755
43.88	2,066	2,169	44.40	2,157	2,766
43.89	2,068	2,181	44.41	2,159	2,778
43.90	2,070	2,192	44.42	2,161	2,789
43.91	2,072	2,204	44.43	2,163	2,800
43.92	2,073	2,216	44.44	2,164	2,811
43.93	2,075	2,228	44.45	2,166	2,822
43.94	2,077	2,239	44.46	2,168	2,833
43.95	2,079	2,251	44.47	2,170	2,844
43.96	2,080	2,263	44.48	2,171	2,855
43.97	2,082	2,274	44.49	2,173	2,866
43.98	2,084	2,286	44.50	2,175	2,877
43.99	2,086	2,298	44.51	2,177	2,888
44.00	2,087	2,309	44.52	2,178	2,898
44.01	2,089	2,321	44.53	2,180	2,909
44.02	2,091	2,332	44.54	2,182	2,920
44.03	2,093	2,344	44.55	2,184	2,931
44.04	2,094	2,356	44.56	2,185	2,942
44.05	2,096	2,367	44.57	2,187	2,952
44.06	2,098	2,379	44.58	2,189	2,963
44.07	2,100	2,391	44.59	2,191	2,974
44.08	2,101	2,402	44.60	2,192	2,984
44.09	2,103	2,414	44.61	2,194	2,995

Stage-Area-Storage for Pond INF-1: U/G INF-1 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
44.62	2,196	3,006	45.14	2,287	3,497
44.63	2,198	3,016	45.15	2,289	3,505
44.64	2,199	3,027	45.16	2,290	3,512
44.65	2,201	3,037	45.17	2,292	3,519
44.66	2,203	3,048	45.18	2,294	3,527
44.67	2,205	3,058	45.19	2,296	3,534
44.68	2,206	3,069	45.20	2,297	3,541
44.69	2,208	3,079	45.21	2,299	3,547
44.70	2,210	3,089	45.22	2,301	3,554
44.71	2,212	3,100	45.23	2,303	3,560
44.72	2,213	3,110	45.24	2,304	3,566
44.73	2,215	3,120	45.25	2,306	3,571
44.74	2,217	3,130	45.26	2,308	3,576
44.75	2,219	3,141	45.27	2,310	3,581
44.76	2,220	3,151	45.28	2,311	3,586
44.77	2,222	3,161	45.29	2,313	3,590
44.78	2,224	3,171	45.30	2,315	3,595
44.79	2,226	3,181	45.31	2,317	3,600
44.80	2,227	3,191	45.32	2,318	3,605
44.81	2,229	3,201	45.33	2,320	3,610
44.82	2,231	3,211	45.34	2,322	3,615
44.83	2,233	3,220	45.35	2,324	3,620
44.84	2,234	3,230	45.36	2,325	3,625
44.85	2,236	3,240	45.37	2,327	3,630
44.86	2,238	3,250	45.38	2,329	3,635
44.87	2,240	3,259	45.39	2,331	3,640
44.88	2,241	3,269	45.40	2,332	3,646
44.89	2,243	3,279	45.41	2,334	3,651
44.90	2,245	3,288	45.42	2,336	3,657
44.91	2,247	3,298	45.43	2,338	3,662
44.92	2,248	3,307	45.44	2,339	3,668
44.93	2,250	3,316	45.45	2,341	3,673
44.94	2,252	3,326	45.46	2,343	3,679
44.95	2,254	3,335	45.47	2,345	3,685
44.96	2,255	3,344	45.48	2,346	3,691
44.97	2,257	3,353	45.49	2,348	3,697
44.98	2,259	3,362	45.50	2,350	3,703
44.99	2,261	3,371	45.51	2,352	3,710
45.00	2,262	3,380	45.52	2,353	3,716
45.01	2,264	3,389	45.53	2,355	3,723
45.02	2,266	3,398	45.54	2,357	3,730
45.03	2,268	3,406	45.55	2,359	3,736
45.04	2,269	3,415	45.56	2,360	3,743
45.05	2,271	3,424	45.57	2,362	3,749
45.06	2,273	3,432	45.58	2,364	3,756
45.07	2,275	3,441	45.59	2,366	3,763
45.08	2,276	3,449	45.60	2,367	3,769
45.09	2,278	3,457	45.61	2,369	3,776
45.10	2,280	3,465	45.62	2,371	3,782
45.11	2,282	3,473	45.63	2,373	3,789
45.12	2,283	3,481	45.64	2,374	3,796
45.13	2,285	3,489	45.65	2,376	3,802

Stage-Area-Storage for Pond INF-1: U/G INF-1 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
45.66	2,378	3,809
45.67	2,380	3,815
45.68	2,381	3,822
45.69	2,383	3,829
45.70	2,385	3,835
45.71	2,387	3,842
45.72	2,388	3,848
45.73	2,390	3,855
45.74	2,392	3,862
45.75	2,394	3,868
45.76	2,395	3,875
45.77	2,397	3,881
45.78	2,399	3,888
45.79	2,401	3,895
45.80	2,402	3,901
45.81	2,404	3,908
45.82	2,406	3,914
45.83	2,408	3,921
45.84	2,409	3,928
45.85	2,411	3,934
45.86	2,413	3,941
45.87	2,415	3,947
45.88	2,416	3,954
45.89	2,418	3,961
45.90	2,420	3,967
45.91	2,422	3,974
45.92	2,423	3,980
45.93	2,425	3,987
45.94	2,427	3,994
45.95	2,429	4,000
45.96	2,430	4,007
45.97	2,432	4,013
45.98	2,434	4,020
45.99	2,436	4,027
46.00	**2,437**	**4,033**

Stage-Area-Storage for Pond INF-2: U/G INF-2

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
40.00	1,669	0	40.52	1,770	347
40.01	1,671	7	40.53	1,772	353
40.02	1,673	13	40.54	1,774	358
40.03	1,675	20	40.55	1,776	364
40.04	1,677	27	40.56	1,778	370
40.05	1,678	33	40.57	1,780	375
40.06	1,680	40	40.58	1,782	381
40.07	1,682	47	40.59	1,784	386
40.08	1,684	53	40.60	1,785	392
40.09	1,686	60	40.61	1,787	397
40.10	1,688	67	40.62	1,789	403
40.11	1,690	73	40.63	1,791	408
40.12	1,692	80	40.64	1,793	413
40.13	1,694	87	40.65	1,795	418
40.14	1,696	93	40.66	1,797	423
40.15	1,698	100	40.67	1,799	428
40.16	1,700	107	40.68	1,801	433
40.17	1,702	113	40.69	1,803	438
40.18	1,704	120	40.70	1,805	443
40.19	1,706	127	40.71	1,807	448
40.20	1,708	133	40.72	1,809	453
40.21	1,710	140	40.73	1,811	458
40.22	1,712	147	40.74	1,813	462
40.23	1,713	154	40.75	1,815	467
40.24	1,715	160	40.76	1,817	472
40.25	1,717	167	40.77	1,819	478
40.26	1,719	174	40.78	1,820	485
40.27	1,721	180	40.79	1,822	492
40.28	1,723	187	40.80	1,824	499
40.29	1,725	194	40.81	1,826	505
40.30	1,727	200	40.82	1,828	513
40.31	1,729	207	40.83	1,830	520
40.32	1,731	214	40.84	1,832	527
40.33	1,733	220	40.85	1,834	535
40.34	1,735	227	40.86	1,836	543
40.35	1,737	234	40.87	1,838	550
40.36	1,739	240	40.88	1,840	558
40.37	1,741	247	40.89	1,842	566
40.38	1,743	254	40.90	1,844	575
40.39	1,745	260	40.91	1,846	583
40.40	1,747	267	40.92	1,848	591
40.41	1,748	274	40.93	1,850	600
40.42	1,750	280	40.94	1,852	608
40.43	1,752	287	40.95	1,854	617
40.44	1,754	294	40.96	1,855	625
40.45	1,756	300	40.97	1,857	634
40.46	1,758	307	40.98	1,859	643
40.47	1,760	314	40.99	1,861	652
40.48	1,762	320	41.00	1,863	661
40.49	1,764	327	41.01	1,865	670
40.50	1,766	334	41.02	1,867	679
40.51	1,768	340	41.03	1,869	688

Stage-Area-Storage for Pond INF-2: U/G INF-2 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
41.04	1,871	697
41.05	1,873	706
41.06	1,875	715
41.07	1,877	725
41.08	1,879	734
41.09	1,881	744
41.10	1,883	753
41.11	1,885	763
41.12	1,887	772
41.13	1,889	782
41.14	1,890	792
41.15	1,892	802
41.16	1,894	811
41.17	1,896	821
41.18	1,898	831
41.19	1,900	841
41.20	1,902	851
41.21	1,904	861
41.22	1,906	871
41.23	1,908	881
41.24	1,910	892
41.25	1,912	902
41.26	1,914	912
41.27	1,916	922
41.28	1,918	933
41.29	1,920	943
41.30	1,922	953
41.31	1,924	964
41.32	1,925	974
41.33	1,927	985
41.34	1,929	995
41.35	1,931	1,006
41.36	1,933	1,016
41.37	1,935	1,027
41.38	1,937	1,038
41.39	1,939	1,048
41.40	1,941	1,059
41.41	1,943	1,070
41.42	1,945	1,080
41.43	1,947	1,091
41.44	1,949	1,102
41.45	1,951	1,113
41.46	1,953	1,124
41.47	1,955	1,135
41.48	1,957	1,146
41.49	1,959	1,156
41.50	1,960	1,167
41.51	1,962	1,178
41.52	1,964	1,189
41.53	1,966	1,200
41.54	1,968	1,212
41.55	1,970	1,223
41.56	1,972	1,234
41.57	1,974	1,245
41.58	1,976	1,256
41.59	1,978	1,267
41.60	1,980	1,278
41.61	1,982	1,290
41.62	1,984	1,301
41.63	1,986	1,312
41.64	1,988	1,323
41.65	1,990	1,335
41.66	1,992	1,346
41.67	1,994	1,357
41.68	1,996	1,368
41.69	1,997	1,380
41.70	1,999	1,391
41.71	2,001	1,403
41.72	2,003	1,414
41.73	2,005	1,425
41.74	2,007	1,437
41.75	2,009	1,448
41.76	2,011	1,460
41.77	2,013	1,471
41.78	2,015	1,483
41.79	2,017	1,494
41.80	2,019	1,506
41.81	2,021	1,517
41.82	2,023	1,529
41.83	2,025	1,540
41.84	2,027	1,552
41.85	2,029	1,563
41.86	2,031	1,575
41.87	2,032	1,587
41.88	2,034	1,598
41.89	2,036	1,610
41.90	2,038	1,621
41.91	2,040	1,633
41.92	2,042	1,645
41.93	2,044	1,656
41.94	2,046	1,668
41.95	2,048	1,680
41.96	2,050	1,691
41.97	2,052	1,703
41.98	2,054	1,715
41.99	2,056	1,727
42.00	2,058	1,738
42.01	2,060	1,750
42.02	2,062	1,762
42.03	2,064	1,773
42.04	2,066	1,785
42.05	2,067	1,797
42.06	2,069	1,809
42.07	2,071	1,820

Storage below lowest outlet orifice

Stage-Area-Storage for Pond INF-2: U/G INF-2 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
42.08	2,073	1,832	42.60	2,174	2,444
42.09	2,075	1,844	42.61	2,176	2,455
42.10	2,077	1,856	42.62	2,178	2,467
42.11	2,079	1,867	42.63	2,180	2,478
42.12	2,081	1,879	42.64	2,182	2,490
42.13	2,083	1,891	42.65	2,184	2,502
42.14	2,085	1,903	42.66	2,186	2,513
42.15	2,087	1,915	42.67	2,188	2,525
42.16	2,089	1,926	42.68	2,190	2,536
42.17	2,091	1,938	42.69	2,192	2,548
42.18	2,093	1,950	42.70	2,194	2,559
42.19	2,095	1,962	42.71	2,196	2,571
42.20	2,097	1,974	42.72	2,198	2,582
42.21	2,099	1,985	42.73	2,200	2,594
42.22	2,101	1,997	42.74	2,202	2,605
42.23	2,102	2,009	42.75	2,204	2,617
42.24	2,104	2,021	42.76	2,206	2,628
42.25	2,106	2,033	42.77	2,208	2,640
42.26	2,108	2,044	42.78	2,209	2,651
42.27	2,110	2,056	42.79	2,211	2,663
42.28	2,112	2,068	42.80	2,213	2,674
42.29	2,114	2,080	42.81	2,215	2,685
42.30	2,116	2,092	42.82	2,217	2,697
42.31	2,118	2,103	42.83	2,219	2,708
42.32	2,120	2,115	42.84	2,221	2,719
42.33	2,122	2,127	42.85	2,223	2,731
42.34	2,124	2,139	42.86	2,225	2,742
42.35	2,126	2,151	42.87	2,227	2,753
42.36	2,128	2,162	42.88	2,229	2,764
42.37	2,130	2,174	42.89	2,231	2,776
42.38	2,132	2,186	42.90	2,233	2,787
42.39	2,134	2,198	42.91	2,235	2,798
42.40	2,136	2,209	42.92	2,237	2,809
42.41	2,137	2,221	42.93	2,239	2,820
42.42	2,139	2,233	42.94	2,241	2,831
42.43	2,141	2,245	42.95	2,243	2,842
42.44	2,143	2,256	42.96	2,244	2,854
42.45	2,145	2,268	42.97	2,246	2,865
42.46	2,147	2,280	42.98	2,248	2,876
42.47	2,149	2,292	42.99	2,250	2,887
42.48	2,151	2,303	43.00	2,252	2,898
42.49	2,153	2,315	43.01	2,254	2,909
42.50	2,155	2,327	43.02	2,256	2,920
42.51	2,157	2,339	43.03	2,258	2,930
42.52	2,159	2,350	43.04	2,260	2,941
42.53	2,161	2,362	43.05	2,262	2,952
42.54	2,163	2,374	43.06	2,264	2,963
42.55	2,165	2,385	43.07	2,266	2,974
42.56	2,167	2,397	43.08	2,268	2,985
42.57	2,169	2,409	43.09	2,270	2,995
42.58	2,171	2,420	43.10	2,272	3,006
42.59	2,173	2,432	43.11	2,274	3,017

Stage-Area-Storage for Pond INF-2: U/G INF-2 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
43.12	2,276	3,027	43.64	2,377	3,522
43.13	2,278	3,038	43.65	2,379	3,530
43.14	2,279	3,049	43.66	2,381	3,538
43.15	2,281	3,059	43.67	2,383	3,545
43.16	2,283	3,070	43.68	2,385	3,552
43.17	2,285	3,080	43.69	2,386	3,560
43.18	2,287	3,091	43.70	2,388	3,566
43.19	2,289	3,101	43.71	2,390	3,573
43.20	2,291	3,112	43.72	2,392	3,580
43.21	2,293	3,122	43.73	2,394	3,586
43.22	2,295	3,132	43.74	2,396	3,592
43.23	2,297	3,143	43.75	2,398	3,597
43.24	2,299	3,153	43.76	2,400	3,603
43.25	2,301	3,163	43.77	2,402	3,607
43.26	2,303	3,173	43.78	2,404	3,612
43.27	2,305	3,184	43.79	2,406	3,617
43.28	2,307	3,194	43.80	2,408	3,622
43.29	2,309	3,204	43.81	2,410	3,627
43.30	2,311	3,214	43.82	2,412	3,632
43.31	2,313	3,224	43.83	2,414	3,637
43.32	2,314	3,234	43.84	2,416	3,642
43.33	2,316	3,244	43.85	2,418	3,647
43.34	2,318	3,254	43.86	2,420	3,652
43.35	2,320	3,263	43.87	2,421	3,657
43.36	2,322	3,273	43.88	2,423	3,663
43.37	2,324	3,283	43.89	2,425	3,668
43.38	2,326	3,293	43.90	2,427	3,673
43.39	2,328	3,302	43.91	2,429	3,679
43.40	2,330	3,312	43.92	2,431	3,684
43.41	2,332	3,321	43.93	2,433	3,690
43.42	2,334	3,331	43.94	2,435	3,695
43.43	2,336	3,340	43.95	2,437	3,701
43.44	2,338	3,350	43.96	2,439	3,707
43.45	2,340	3,359	43.97	2,441	3,713
43.46	2,342	3,368	43.98	2,443	3,719
43.47	2,344	3,377	43.99	2,445	3,725
43.48	2,346	3,387	44.00	2,447	3,731
43.49	2,348	3,396	44.01	2,449	3,738
43.50	2,349	3,405	44.02	2,451	3,745
43.51	2,351	3,414	44.03	2,453	3,751
43.52	2,353	3,422	44.04	2,455	3,758
43.53	2,355	3,431	44.05	2,456	3,765
43.54	2,357	3,440	44.06	2,458	3,771
43.55	2,359	3,449	44.07	2,460	3,778
43.56	2,361	3,457	44.08	2,462	3,785
43.57	2,363	3,466	44.09	2,464	3,791
43.58	2,365	3,474	44.10	2,466	3,798
43.59	2,367	3,482	44.11	2,468	3,805
43.60	2,369	3,490	44.12	2,470	3,811
43.61	2,371	3,499	44.13	2,472	3,818
43.62	2,373	3,507	44.14	2,474	3,825
43.63	2,375	3,515	44.15	2,476	3,831

Stage-Area-Storage for Pond INF-2: U/G INF-2 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
44.16	2,478	3,838
44.17	2,480	3,845
44.18	2,482	3,851
44.19	2,484	3,858
44.20	2,486	3,865
44.21	2,488	3,872
44.22	2,490	3,878
44.23	2,491	3,885
44.24	2,493	3,892
44.25	2,495	3,898
44.26	2,497	3,905
44.27	2,499	3,912
44.28	2,501	3,918
44.29	2,503	3,925
44.30	2,505	3,932
44.31	2,507	3,938
44.32	2,509	3,945
44.33	2,511	3,952
44.34	2,513	3,958
44.35	2,515	3,965
44.36	2,517	3,972
44.37	2,519	3,978
44.38	2,521	3,985
44.39	2,523	3,992
44.40	2,525	3,998
44.41	2,526	4,005
44.42	2,528	4,012
44.43	2,530	4,018
44.44	2,532	4,025
44.45	2,534	4,032
44.46	2,536	4,038
44.47	2,538	4,045
44.48	2,540	4,052
44.49	2,542	4,058
44.50	**2,544**	**4,065**

Stage-Area-Storage for Pond INF-3: U/G INF-3

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
40.50	1,650	0	41.02	1,741	343
40.51	1,652	7	41.03	1,743	349
40.52	1,653	13	41.04	1,744	354
40.53	1,655	20	41.05	1,746	360
40.54	1,657	26	41.06	1,748	366
40.55	1,659	33	41.07	1,750	371
40.56	1,660	40	41.08	1,751	377
40.57	1,662	46	41.09	1,753	382
40.58	1,664	53	41.10	1,755	387
40.59	1,666	59	41.11	1,757	393
40.60	1,667	66	41.12	1,758	398
40.61	1,669	73	41.13	1,760	403
40.62	1,671	79	41.14	1,762	408
40.63	1,673	86	41.15	1,764	413
40.64	1,674	92	41.16	1,765	418
40.65	1,676	99	41.17	1,767	423
40.66	1,678	106	41.18	1,769	428
40.67	1,680	112	41.19	1,771	433
40.68	1,681	119	41.20	1,772	438
40.69	1,683	125	41.21	1,774	443
40.70	1,685	132	41.22	1,776	447
40.71	1,687	139	41.23	1,778	452
40.72	1,688	145	41.24	1,779	457
40.73	1,690	152	41.25	1,781	461
40.74	1,692	158	41.26	1,783	467
40.75	1,694	165	41.27	1,785	472
40.76	1,695	172	41.28	1,786	479
40.77	1,697	178	41.29	1,788	486
40.78	1,699	185	41.30	1,790	492
40.79	1,701	191	41.31	1,792	499
40.80	1,702	198	41.32	1,793	506
40.81	1,704	205	41.33	1,795	514
40.82	1,706	211	41.34	1,797	521
40.83	1,708	218	41.35	1,799	529
40.84	1,709	224	41.36	1,800	536
40.85	1,711	231	41.37	1,802	544
40.86	1,713	238	41.38	1,804	552
40.87	1,715	244	41.39	1,806	560
40.88	1,716	251	41.40	1,807	568
40.89	1,718	257	41.41	1,809	576
40.90	1,720	264	41.42	1,811	584
40.91	1,722	271	41.43	1,813	593
40.92	1,723	277	41.44	1,814	601
40.93	1,725	284	41.45	1,816	609
40.94	1,727	290	41.46	1,818	618
40.95	1,729	297	41.47	1,820	627
40.96	1,730	304	41.48	1,821	635
40.97	1,732	310	41.49	1,823	644
40.98	1,734	317	41.50	1,825	653
40.99	1,736	323	41.51	1,827	662
41.00	1,737	330	41.52	1,828	671
41.01	1,739	336	41.53	1,830	680

Stage-Area-Storage for Pond INF-3: U/G INF-3 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
41.54	1,832	689
41.55	1,834	698
41.56	1,835	708
41.57	1,837	717
41.58	1,839	726
41.59	1,841	736
41.60	1,842	745
41.61	1,844	755
41.62	1,846	764
41.63	1,848	774
41.64	1,849	783
41.65	1,851	793
41.66	1,853	803
41.67	1,855	813
41.68	1,856	822
41.69	1,858	832
41.70	1,860	842
41.71	1,862	852
41.72	1,863	862
41.73	1,865	872
41.74	1,867	882
41.75	1,869	893
41.76	1,870	903
41.77	1,872	913
41.78	1,874	923
41.79	1,876	933
41.80	1,877	944
41.81	1,879	954
41.82	1,881	964
41.83	1,883	975
41.84	1,884	985
41.85	1,886	996
41.86	1,888	1,006
41.87	1,890	1,017
41.88	1,891	1,027
41.89	1,893	1,038
41.90	1,895	1,049
41.91	1,897	1,059
41.92	1,898	1,070
41.93	1,900	1,081
41.94	1,902	1,091
41.95	1,904	1,102
41.96	1,905	1,113
41.97	1,907	1,124
41.98	1,909	1,135
41.99	1,911	1,146
42.00	1,912	1,156
42.01	1,914	1,167
42.02	1,916	1,178
42.03	1,918	1,189
42.04	1,919	1,200
42.05	1,921	1,211
42.06	1,923	1,222
42.07	1,925	1,233
42.08	1,926	1,244
42.09	1,928	1,256
42.10	1,930	1,267
42.11	1,932	1,278
42.12	1,933	1,289
42.13	1,935	1,300
42.14	1,937	1,311
42.15	1,939	1,323
42.16	1,940	1,334
42.17	1,942	1,345
42.18	1,944	1,356
42.19	1,946	1,368
42.20	1,947	1,379
42.21	1,949	1,390
42.22	1,951	1,402
42.23	1,953	1,413
42.24	1,954	1,424
42.25	1,956	1,436
42.26	1,958	1,447
42.27	1,960	1,458
42.28	1,961	1,470
42.29	1,963	1,481
42.30	1,965	1,493
42.31	1,967	1,504
42.32	1,968	1,516
42.33	1,970	1,527
42.34	1,972	1,539
42.35	1,974	1,550
42.36	1,975	1,562
42.37	1,977	1,573
42.38	1,979	1,585
42.39	1,981	1,596
42.40	1,982	1,608
42.41	1,984	1,619
42.42	1,986	1,631
42.43	1,988	1,643
42.44	1,989	1,654
42.45	1,991	1,666
42.46	1,993	1,677
42.47	1,995	1,689
42.48	1,996	1,701
42.49	1,998	1,712
42.50	2,000	1,724
42.51	2,002	1,736
42.52	2,003	1,747
42.53	2,005	1,759
42.54	2,007	1,771
42.55	2,009	1,782
42.56	2,010	1,794
42.57	2,012	1,806

Storage below lowest outlet orifice

Stage-Area-Storage for Pond INF-3: U/G INF-3 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
42.58	2,014	1,817	43.10	2,105	2,425
42.59	2,016	1,829	43.11	2,107	2,437
42.60	2,017	1,841	43.12	2,108	2,448
42.61	2,019	1,852	43.13	2,110	2,460
42.62	2,021	1,864	43.14	2,112	2,471
42.63	2,023	1,876	43.15	2,114	2,483
42.64	2,024	1,888	43.16	2,115	2,495
42.65	2,026	1,899	43.17	2,117	2,506
42.66	2,028	1,911	43.18	2,119	2,517
42.67	2,030	1,923	43.19	2,121	2,529
42.68	2,031	1,934	43.20	2,122	2,540
42.69	2,033	1,946	43.21	2,124	2,552
42.70	2,035	1,958	43.22	2,126	2,563
42.71	2,037	1,970	43.23	2,128	2,575
42.72	2,038	1,981	43.24	2,129	2,586
42.73	2,040	1,993	43.25	2,131	2,598
42.74	2,042	2,005	43.26	2,133	2,609
42.75	2,044	2,017	43.27	2,135	2,620
42.76	2,045	2,028	43.28	2,136	2,632
42.77	2,047	2,040	43.29	2,138	2,643
42.78	2,049	2,052	43.30	2,140	2,654
42.79	2,051	2,063	43.31	2,142	2,666
42.80	2,052	2,075	43.32	2,143	2,677
42.81	2,054	2,087	43.33	2,145	2,688
42.82	2,056	2,099	43.34	2,147	2,699
42.83	2,058	2,110	43.35	2,149	2,711
42.84	2,059	2,122	43.36	2,150	2,722
42.85	2,061	2,134	43.37	2,152	2,733
42.86	2,063	2,146	43.38	2,154	2,744
42.87	2,065	2,157	43.39	2,156	2,755
42.88	2,066	2,169	43.40	2,157	2,766
42.89	2,068	2,181	43.41	2,159	2,778
42.90	2,070	2,192	43.42	2,161	2,789
42.91	2,072	2,204	43.43	2,163	2,800
42.92	2,073	2,216	43.44	2,164	2,811
42.93	2,075	2,228	43.45	2,166	2,822
42.94	2,077	2,239	43.46	2,168	2,833
42.95	2,079	2,251	43.47	2,170	2,844
42.96	2,080	2,263	43.48	2,171	2,855
42.97	2,082	2,274	43.49	2,173	2,866
42.98	2,084	2,286	43.50	2,175	2,877
42.99	2,086	2,298	43.51	2,177	2,888
43.00	2,087	2,309	43.52	2,178	2,898
43.01	2,089	2,321	43.53	2,180	2,909
43.02	2,091	2,332	43.54	2,182	2,920
43.03	2,093	2,344	43.55	2,184	2,931
43.04	2,094	2,356	43.56	2,185	2,942
43.05	2,096	2,367	43.57	2,187	2,952
43.06	2,098	2,379	43.58	2,189	2,963
43.07	2,100	2,391	43.59	2,191	2,974
43.08	2,101	2,402	43.60	2,192	2,984
43.09	2,103	2,414	43.61	2,194	2,995

Stage-Area-Storage for Pond INF-3: U/G INF-3 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
43.62	2,196	3,006	44.14	2,287	3,497
43.63	2,198	3,016	44.15	2,289	3,505
43.64	2,199	3,027	44.16	2,290	3,512
43.65	2,201	3,037	44.17	2,292	3,519
43.66	2,203	3,048	44.18	2,294	3,527
43.67	2,205	3,058	44.19	2,296	3,534
43.68	2,206	3,069	44.20	2,297	3,541
43.69	2,208	3,079	44.21	2,299	3,547
43.70	2,210	3,089	44.22	2,301	3,554
43.71	2,212	3,100	44.23	2,303	3,560
43.72	2,213	3,110	44.24	2,304	3,566
43.73	2,215	3,120	44.25	2,306	3,571
43.74	2,217	3,130	44.26	2,308	3,576
43.75	2,219	3,141	44.27	2,310	3,581
43.76	2,220	3,151	44.28	2,311	3,586
43.77	2,222	3,161	44.29	2,313	3,590
43.78	2,224	3,171	44.30	2,315	3,595
43.79	2,226	3,181	44.31	2,317	3,600
43.80	2,227	3,191	44.32	2,318	3,605
43.81	2,229	3,201	44.33	2,320	3,610
43.82	2,231	3,211	44.34	2,322	3,615
43.83	2,233	3,220	44.35	2,324	3,620
43.84	2,234	3,230	44.36	2,325	3,625
43.85	2,236	3,240	44.37	2,327	3,630
43.86	2,238	3,250	44.38	2,329	3,635
43.87	2,240	3,259	44.39	2,331	3,640
43.88	2,241	3,269	44.40	2,332	3,646
43.89	2,243	3,279	44.41	2,334	3,651
43.90	2,245	3,288	44.42	2,336	3,657
43.91	2,247	3,298	44.43	2,338	3,662
43.92	2,248	3,307	44.44	2,339	3,668
43.93	2,250	3,316	44.45	2,341	3,673
43.94	2,252	3,326	44.46	2,343	3,679
43.95	2,254	3,335	44.47	2,345	3,685
43.96	2,255	3,344	44.48	2,346	3,691
43.97	2,257	3,353	44.49	2,348	3,697
43.98	2,259	3,362	44.50	2,350	3,703
43.99	2,261	3,371	44.51	2,352	3,710
44.00	2,262	3,380	44.52	2,353	3,716
44.01	2,264	3,389	44.53	2,355	3,723
44.02	2,266	3,398	44.54	2,357	3,730
44.03	2,268	3,406	44.55	2,359	3,736
44.04	2,269	3,415	44.56	2,360	3,743
44.05	2,271	3,424	44.57	2,362	3,749
44.06	2,273	3,432	44.58	2,364	3,756
44.07	2,275	3,441	44.59	2,366	3,763
44.08	2,276	3,449	44.60	2,367	3,769
44.09	2,278	3,457	44.61	2,369	3,776
44.10	2,280	3,465	44.62	2,371	3,782
44.11	2,282	3,473	44.63	2,373	3,789
44.12	2,283	3,481	44.64	2,374	3,796
44.13	2,285	3,489	44.65	2,376	3,802

Stage-Area-Storage for Pond INF-3: U/G INF-3 (continued)

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
44.66	2,378	3,809
44.67	2,380	3,815
44.68	2,381	3,822
44.69	2,383	3,829
44.70	2,385	3,835
44.71	2,387	3,842
44.72	2,388	3,848
44.73	2,390	3,855
44.74	2,392	3,862
44.75	2,394	3,868
44.76	2,395	3,875
44.77	2,397	3,881
44.78	2,399	3,888
44.79	2,401	3,895
44.80	2,402	3,901
44.81	2,404	3,908
44.82	2,406	3,914
44.83	2,408	3,921
44.84	2,409	3,928
44.85	2,411	3,934
44.86	2,413	3,941
44.87	2,415	3,947
44.88	2,416	3,954
44.89	2,418	3,961
44.90	2,420	3,967
44.91	2,422	3,974
44.92	2,423	3,980
44.93	2,425	3,987
44.94	2,427	3,994
44.95	2,429	4,000
44.96	2,430	4,007
44.97	2,432	4,013
44.98	2,434	4,020
44.99	2,436	4,027
45.00	**2,437**	**4,033**

GPI Project No.	458219	**Sheet**	1 of 3
Project Description	4 Amigos, LLC		
Task	Drawdown Calculations		
Calculated By	SJB	**Date**	04/15/22
Checked By		**Date**	

Greenman-Pedersen, Inc.

Drawdown within 72 hours Analysis for Static Method

Proposed Underground Infiltration System #1

Infiltration Rate:	3.00	inches/hour (Ksat conversion from NHDES, see Hydrocad node for additional information)
Design Infiltration Rate:	3.00	inches/hour
Total Volume:	1,436	cf
Basin bottom area:	1,650	sf

Time $_{drawdown}$ = (Required Recharge Volume in cubic feet as determined by the Static Method)(1/Design Infiltration Rate in inches per hour)(conversion for inches to feet)(1/bottom area in feet)

Time $_{drawdown}$ = (1,436 cf) (1 / 3.00 in/hr) (1ft/12 in.) (1 / 1,650 sf)

= 3.48 hours

Drawdown within 72 hours Analysis for Static Method

Proposed Underground Infiltration System #2

Infiltration Rate:	3.00	inches/hour (Ksat conversion from NHDES, see Hydrocad node for additional information)
Design Infiltration Rate:	3.00	inches/hour
Total Volume:	1,506	cf
Basin bottom area:	1,669	sf

Time $_{drawdown}$ = (Required Recharge Volume in cubic feet as determined by the Static Method)(1/Design Infiltration Rate in inches per hour)(conversion for inches to feet)(1/bottom area in feet)

Time $_{drawdown}$ = (1,506 cf) (1 / 3.00 in/hr) (1ft/12 in.) (1 / 1,669 sf)

= 3.61 hours

Drawdown within 72 hours Analysis for Static Method

Proposed Underground Infiltration System #3

Infiltration Rate:	3.00	inches/hour (Ksat conversion from NHDES, see Hydrocad node for additional information)
Design Infiltration Rate:	3.00	inches/hour
Total Volume:	1,493	cf
Basin bottom area:	1,650	sf

Time $_{drawdown}$ = (Required Recharge Volume in cubic feet as determined by the Static Method)(1/Design Infiltration Rate in inches per hour)(conversion for inches to feet)(1/bottom area in feet)

Time $_{drawdown}$ = (1,493 cf) (1 / 3.00 in/hr) (1ft/12 in.) (1 / 1,650 sf)

= 3.62 hours

Appendix B.
BMP Pollutant Removal Efficiency

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis

Best Management Practice (BMP) removal efficiencies for pollutant loading analysis for total suspended solids (TSS), total nitrogen (TN), and total phosphorus (TP) are presented in the table below. These removal efficiencies were developed by reviewing various literature sources and using best professional judgment based on literature values and general expectation of how values for different BMPS should relate to one another. The intent is to update this information and add BMPs and removal efficiencies for other parameters as more information/data becomes available in the future.

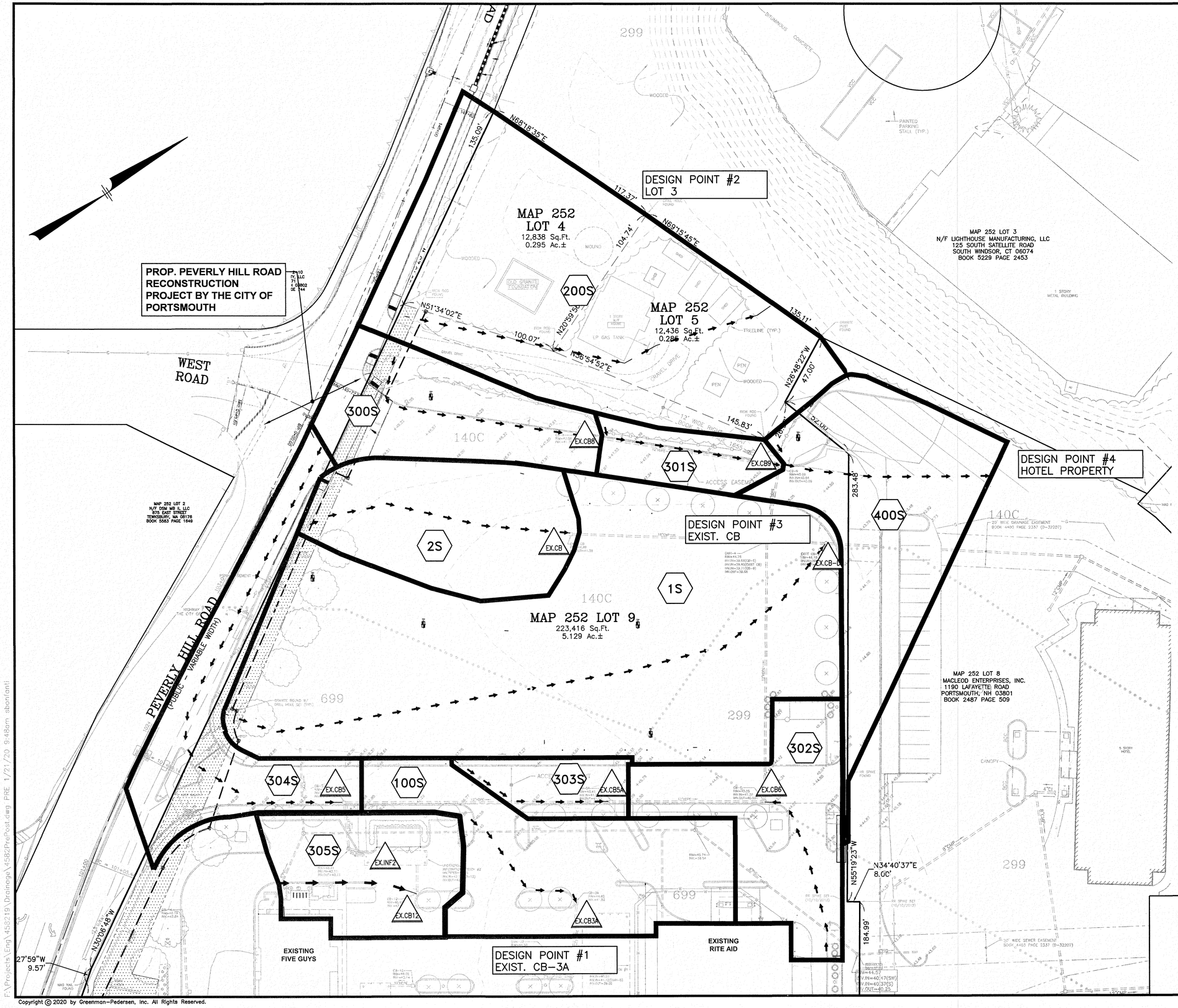
NHDES will consider other BMP removal efficiencies if sufficient documentation is provided.

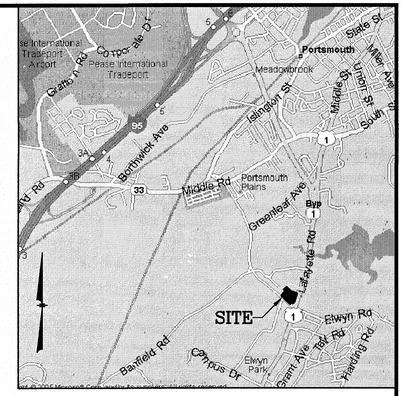
Please note that all BMPs must be designed in accordance with the specifications in the Alteration of Terrain (AoT) Program Administrative Rules (Env-Wq 1500). If BMPs are not designed in accordance with the AoT Rules, NHDES may require lower removal efficiencies to be used in the analysis.

BMP in Series: When BMPs are placed in series, the BMP with the highest removal efficiency shall be the efficiency used in the model for computing annual loadings. Adding efficiencies together is generally not allowed because removals typically decrease rapidly with decreasing influent concentration and, in the case of primary BMPs (i.e., stormwater ponds, infiltration and filtering practices), pre-treatment is usually part of the design and is therefore, most likely already accounted for in the efficiencies cited for these BMPs.

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Stormwater Ponds	Wet Pond		B, F	70%	35%	45%
	Wet Extended Detention Pond		A, B	80%	55%	68%
	Micropool Extended Detention Pond	TBA				
	Multiple Pond System	TBA				
	Pocket Pond	TBA				
Stormwater Wetlands	Shallow Wetland		A, B, F, I	80%	55%	45%
	Extended Detention Wetland		A, B, F, I	80%	55%	45%
	Pond/Wetland System	TBA				
	Gravel Wetland		H	95%	85%	64%
Infiltration Practices	Infiltration Trench (≥75 ft from surface water)		B, D, I	90%	55%	60%
	Infiltration Trench (<75 ft from surface water)		B, D, I	90%	10%	60%
	Infiltration Basin (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Infiltration Basin (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Dry Wells			90%	55%	60%
	Drip Edges			90%	55%	60%
Filtering Practices	Aboveground or Underground Sand Filter that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Aboveground or Underground Sand Filter that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Aboveground or Underground Sand Filter with underdrain		A, I, F, G, H	85%	10%	45%
	Tree Box Filter	TBA				
	Bioretention System		I, G, H	90%	65%	65%
	Permeable Pavement that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Permeable Pavement that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Permeable Pavement with underdrain		Use TN and TP values for sand filter w/ underdrain and outlet pipe	90%	10%	45%

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Treatment Swales	Flow Through Treatment Swale	TBA				
Vegetated Buffers	Vegetated Buffers		A, B, I	73%	40%	45%
Pre-Treatment Practices	Sediment Forebay	TBA				
	Vegetated Filter Strip		A, B, I	73%	40%	45%
	Vegetated Swale		A, B, C, F, H, I	65%	20%	25%
	Flow-Through Device - Hydrodynamic Separator		A, B, G, H	35%	10%	5%
	Flow-Through Device - ADS Underground Multichamber Water Quality Unit (WQU)		G, H	72%	10%	9%
	Other Flow-Through Devices	TBA				
	Off-line Deep Sump Catch Basin		J, K, L, M	15%	5%	5%





LOCATION MAP
(NOT TO SCALE)

WATERSHED LEGEND:

(1) SUBCATCHMENT: A relatively homogeneous area of land that drains into a single reach or pond. Each subcatchment generates a runoff hydrograph. (A subcatchment may also be used to account for the rain falling directly on the surface of a pond.)

[1] REACH: A uniform stream, channel, or pipe that conveys water from one point to another reach or pond. The outflow of each reach is determined by a hydrograph routing calculation.

(1) POND: A pond, swamp, dam, or other impoundment that fills with water from one or more sources and empties in a manner determined by a weir, culvert, or other device(s) at its outlet. The outflow(s) of each pond is determined by a hydrograph routing calculation. The primary and/or secondary outflow may drain into a reach or into another pond.

Time of Concentration Path (Tc)

SOIL LEGEND

602 SOIL TYPE DESIGNATION

SOIL BOUNDARY

OWNER OF RECORD:

MAP 252 LOT 7
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NO.	DESCRIPTION	BY	DATE

REVISIONS

PRE-DEVELOPMENT DRAINAGE PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 21, 2020		DRAWING NO. 4582PREPOST.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
SJB	CMT	458219	1 OF 1

F:\Projects\Eng\458219\Drainage\4582PrePost.dwg PRE 1/21/20 9:42am sbonfanti

EXISTING
MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±
(TO BE COMBINED WITH
LOT 3)

DESIGN POINT #2

MAP 252
LOT 2
12,838 Sq.Ft.
0.295 Ac.±

MAP 252
LOT 5
12,436 Sq.Ft.
0.285 Ac.±

EXISTING
MAP 252 LOT 5
12,436 Sq. Ft.
0.285 Ac.±
(TO BE COMBINED WITH
LOT 9-2)

DESIGN POINT #4
HOTEL PROPERTY

DESIGN POINT #3
EXIST. CB

DESIGN POINT #1
EXIST. CB-3A

ORIGINAL 2013
APPROVALS

MAP 252 LOT 2-10
N/F JMK REALTY, LLC
PO BOX 971
PORTSMOUTH, NH 03802
BOOK 3656 PAGE 744

MAP 252 LOT 2
N/F DSM MB II, LLC
875 EAST STREET
TEWKSBURY, MA 08176
BOOK 5583 PAGE 1649

MAP 252 LOT 3
N/F LIGHTHOUSE MANUFACTURING, LLC
125 SOUTH SATELLITE ROAD
SOUTH WINDSOR, CT 06074
BOOK 5229 PAGE 2453

MAP 252 LOT 8
MACLEOD ENTERPRISES, INC.
1190 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
BOOK 2487 PAGE 509

CONVERT EXIST. CB FRAME & GRATE TO NEW DMH FRAME & GRATE

WEST ROAD

PEVERLY HILL ROAD
(PUBLIC - VARIABLE WIDTH)

1S 2S 3S 4S 5S 6S 7S 8S 9S 10S 11S 12S 13S
100S 200S 300S 301S 302S 303S 304S 305S 400S

INF-1 INF-2 INF-3 CB-1 CB-2 CB-3 CB-4 CB-5 CB-6 CB-7 CB-8
OCS-1 OCS-2 OCS-3

EX.CB8 EX.CB9 EX.CB-D EX.CB5 EX.CB5A EX.CB6 EX.INF2 EX.CB12 EX.CB3A

2% GARAGE SLOPE (TYP.)

1 STORY METAL BUILDING

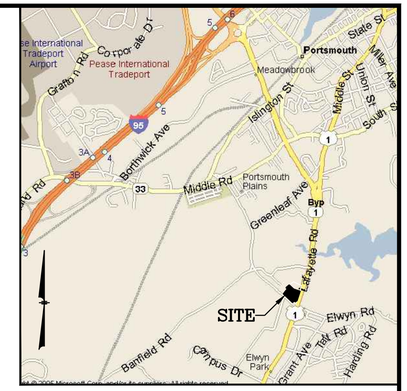
5 STORY HOTEL

FIVE GUYS RESTAURANT

81.67

104.11

43.11



LOCATION MAP
(NOT TO SCALE)

WATERSHED LEGEND:

1 — SUBCATCHMENT: A relatively homogeneous area of land that drains into a single reach or pond. Each subcatchment generates a runoff hydrograph. (A subcatchment may also be used to account for the rain falling directly on the surface of a pond.)

1 — REACH: A uniform stream, channel, or pipe that conveys water from one point to another reach or pond. The outflow of each reach is determined by a hydrograph routing calculation.

1 — POND: A pond, swamp, dam, or other impoundment that fills with water from one or more sources and empties in a manner determined by a weir, culvert, or other device(s) at its outlet. The outflow(s) of each pond is determined by a hydrograph routing calculation. The primary and/or secondary outflow may drain into a reach or into another pond.

Time of Concentration Path (Tc)

SOIL LEGEND

602 — SOIL TYPE DESIGNATION

SOIL BOUNDARY

OWNER OF RECORD:

MAP 252 LOT 7
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

NO.	DESCRIPTION	BY	DATE
1	MISC. REVISIONS	CMT	4/15/22

REVISIONS

POST-DEVELOPMENT DRAINAGE PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI — Engineering, Design, Planning, Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 21, 2020		DRAWING NO. 4582POSTDRAIN_REV1.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
SJB	CMT	458219	1 OF 1

F:\Projects\Eng\458219\Drainage\Rev 4-15-22\4582PostDrain REV1.dwg CD 4/19/22 10:18am stonfont

INSPECTION & MAINTENANCE MANUAL FOR STORMWATER MANAGEMENT SYSTEMS

SITE DEVELOPMENT PLANS
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

GPI

44 Stiles Road, Suite One
Salem, NH 03079
(603) 893-0720

Responsible Party:

4 Amigos, LLC
321D Lafayette Road
Hampton, NH 03842
Contact: Rick Green
603-765-6510

January 21, 2020
Revised: April 15, 2022

4 Amigos, LLC
Site Development Plans
Inspection & Maintenance Manual

TABLE OF CONTENTS

SECTION 1 I & M DOCUMENTATION REQUIREMENTS

4 Amigos, LLC shall be responsible for the continued operation, and maintenance of all stormwater management systems in accordance with this manual and the requirements of NHDES AOT Env-Wq 1507.07. Logs of inspections and maintenance shall be maintained and filed with the City of Portsmouth as needed. Copies will need to be kept for the most recent three years and made available to the Planning Board, Conservation Commission, and NHDES upon request.

Logs shall include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the cleanout of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. Disposal of the accumulated sediment and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

All stormwater facilities associated with this development are identified on Figure 1 contained within Section 3 of this manual and listed individually on the log form included herein, and shall be inspected and maintained in accordance with the procedures outlined in Section 4.

SECTION 2 BMP SPECIFIC I & M PROCEDURES

Driveway/Parking Lot Sweeping

Sweeping shall be done once in the early fall and then immediately following spring snowmelt to remove sand and other debris and when visual buildup of debris is apparent. Pavement surfaces shall be swept at other times such as in the fall after leaves have dropped to remove accumulated debris. Since contaminants typically accumulate within 12 inches of the curbline, street cleaning operations should concentrate in cleaning curb and gutter lines for maximum pollutant removal efficiency. Other areas shall also be swept periodically when visual buildup of debris is apparent. Once removed from paved surfaces, the sweeping must be handled and disposed of properly. Disposal of the accumulated sediment and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

Deep Sump Hooded Catch Basins

Inspect and clean as required all catch basins at least four times per year including at the end of the foliage and snow removal seasons. Sediment must be removed whenever the depth of deposits is greater than or equal to one half the depth from the bottom of sump to the invert of the lowest pipe in the basin. If the basin outlet is designed with a hood to trap floatable materials check to ensure watertight seal is working. Damaged hoods should be replaced when noted by inspection. At a minimum, remove floating debris and hydrocarbons at the time of the inspection. Sediment and debris can be removed by a clamshell bucket; however, a vacuum truck is preferred. Disposal of the accumulated sediment and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

Hydrodynamic Separator (First Defense Unit)

Initial maintenance to be performed twice a year for the first year after the unit is online and operational. A vacuum truck must be used at a minimum of once per year for sediment removal. Refer to the attached First Defense Owner's manual for operation and maintenance procedures and schedules thereafter.

Subsurface Stormwater Infiltration Systems

All subsurface systems should initially be inspected within the first three months after completion of the site's construction. Preventive maintenance should be performed at least every six months and sediment shall be removed from pretreatment BMP's after every major storm event. The Infiltration System shall be inspected on regular bi-annual scheduled dates. During the first year of operation, the system shall be inspected after at least two large storm events (> 1 inch) to ensure that it is fully drained within 72 hours. If standing water is present more than 72 hours after a rainfall event, the infiltration system shall be cleaned.

Ponded water in the system indicates potential infiltration failure in the bottom of the pipe and/or stone. In this case, accumulated sediment shall be removed from the bottom utilizing water jets and/or truck mounted vacuum equipment. Sediment and debris removal should be through the use of truck mounted vacuum equipment. Outlet pipes should be flushed to point of discharge on the same frequency as mentioned above. Disposal of the accumulated sediment

and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

The following is the recommended procedure to inspect the underground system in service:

1. Locate the riser or cleanout section of the system. The riser/cleanout will typically be 6 or 12" in diameter or larger.
2. Remove the lid from the riser/cleanout.
3. Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be permitted to enter the system.
4. Inspect each manifold, all laterals, and outlet pipes for sediment build up, obstructions, or other problems. Obstructions should be removed at this time.
5. If measured sediment build up is between 2" to 8", cleaning should be considered; if sediment build up exceeds 8", cleaning should be performed at the earliest opportunity. A thorough cleaning of the system (manifolds and laterals) shall be performed by water jets and/or truck mounted vacuum equipment.

Pretreatment BMP's shall be inspected and cleaned during the regular bi-annual inspections.

The inlet and outlet of the subsurface systems should be checked periodically to ensure that flow structures are not blocked by debris. All pipes connecting the structures to the system should be checked for debris that may obstruct flow. Inspections should be conducted monthly during wet weather conditions from March to November.

Vegetated Areas

Inspect slopes and embankments early in the growing season to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. During the summer months, all landscape features are to be maintained with the minimum possible amount of fertilizers, pesticides or herbicides.

Winter Maintenance

Proposed snow storage is located along the edge of the roadways. Any excess snow is to be trucked offsite. During the winter months all snow is to be stored such that snowmelt is controlled. Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. The minimum amount of deicing chemicals needed is to be used. It is recommended that winter maintenance contractors be current UNHT2 Green SnowPro Certified applicators or equivalent. In addition, a NHDES Salt Applicator Certification is recommended, but not required. Information on these certifications can be found in the links provided below:

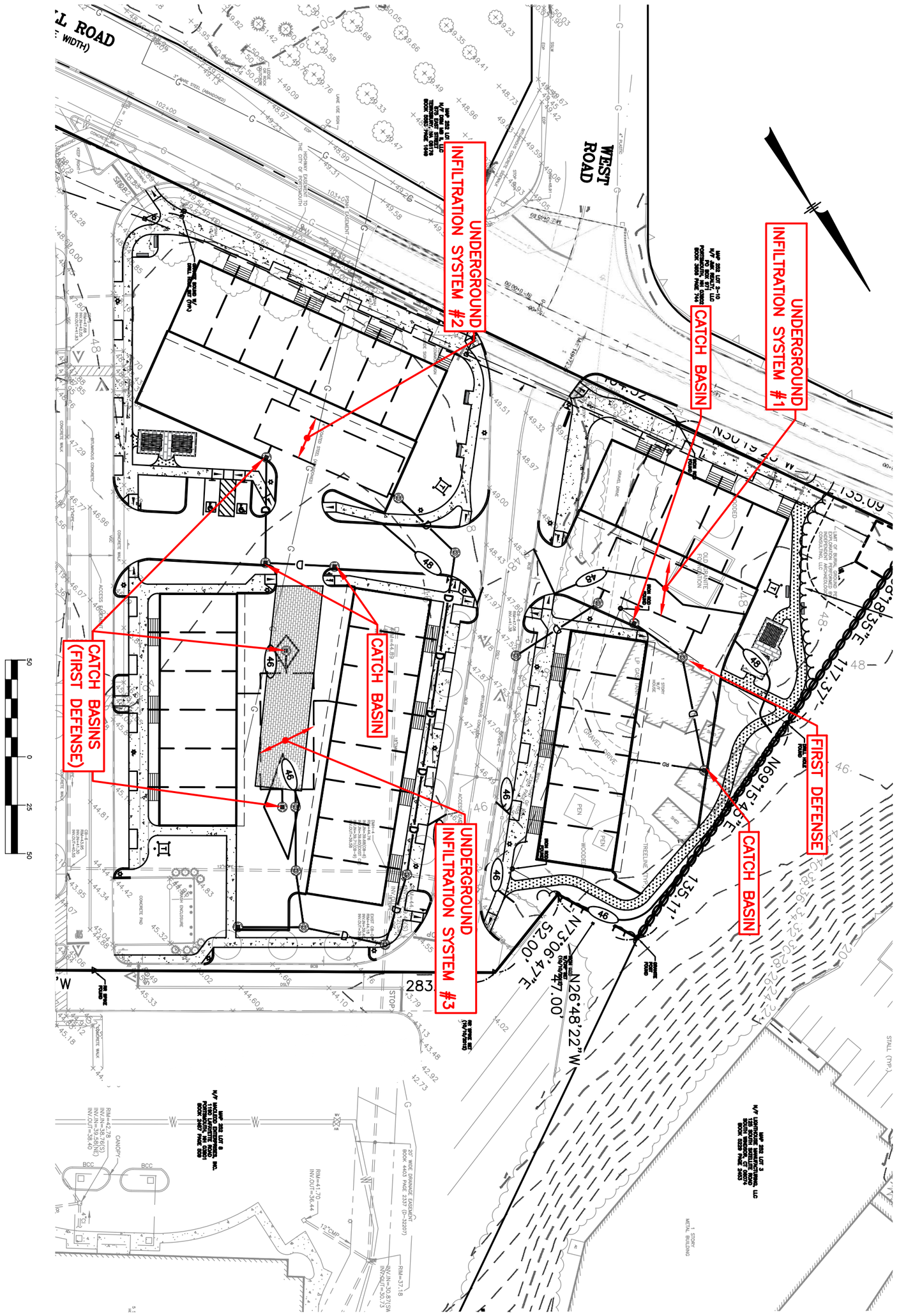
- http://t2.unh.edu/green-snopro-training-and-nhdes-certification
- http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/salt-applicator-certification.htm

Control of Invasive Species

During maintenance activities, check for the presence of invasive species. Invasive species must be managed/removed in accordance with RSA 430:530 and AGR 3800. See Section 4 of this manual for information from the University of New Hampshire Cooperative Extension and the New Hampshire Guide to Upland Invasive Species from the New Hampshire Department of Agriculture Markets and Food, Plant Industry Division or the information provided on their website (http://www.agriculture.nh.gov/divisions/plant-industry/invasive-plants.htm).

SECTION 3 LONG TERM MAINTENANCE PLAN EXHIBIT

F:\Projects\CAD\458219\4582 SP.dwg LTMP 4/19/22 9:52am sbonfanti



LONG TERM MAINTENANCE PLAN EXHIBIT

1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road, Suite One
Salem, NH 03079

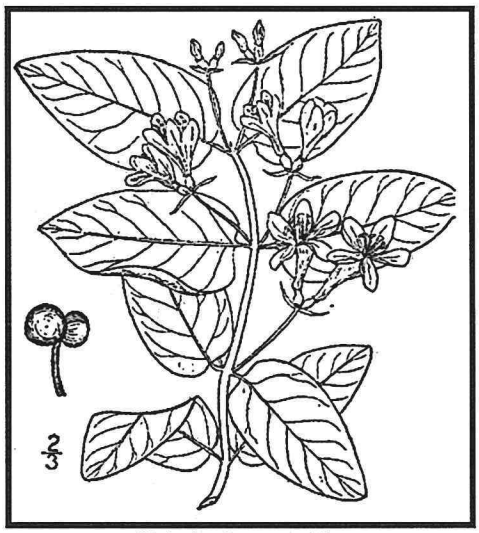
DRAWN BY:	SJB
MHF JOB #:	458219
DATE:	1/21/20
REV.:	4/15/22 –
FIGURE	1

SECTION 4 CONTROL OF INVASIVE SPECIES

UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions.* Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

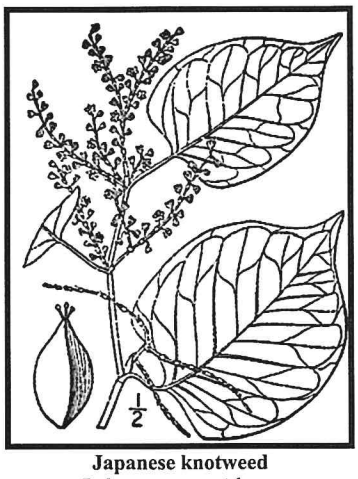
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

<table>
<tr><th>Non-Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">garlic mustard
(Alliaria petiolata)
spotted knapweed
(Centaurea maculosa)
▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling.
black swallow-wort
(Cynanchum nigrum)
▪ May cause skin rash. Wear gloves and long sleeves when handling.
pale swallow-wort
(Cynanchum rossicum)
giant hogweed
(Heracleum mantegazzianum)
▪ Can cause major skin rash. Wear gloves and long sleeves when handling.
dame's rocket
(Hesperis matronalis)
perennial pepperweed
(Lepidium latifolium)
purple loosestrife
(Lythrum salicaria)
Japanese stilt grass
(Microstegium vimineum)
mile-a-minute weed
(Polygonum perfoliatum)</td><td rowspan="2">Fruits and Seeds
  </td><td>Prior to flowering
Depends on scale of infestation
Small infestation
▪ Pull or cut plant and leave on site with roots exposed.

Large infestation
▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting).
▪ Monitor. Remove any re-sprouting material.</td></tr>
<tr><td>During and following flowering
Do nothing until the following year or remove flowering heads and bag and let rot.

Small infestation
▪ Pull or cut plant and leave on site with roots exposed.

Large infestation
▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting).
▪ Monitor. Remove any re-sprouting material.</td></tr>
<tr><td>common reed
(Phragmites australis)
Japanese knotweed
(Polygonum cuspidatum)
Bohemian knotweed
(Polygonum x bohemicum)</td><td>Fruits, Seeds, Plant Fragments
Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.</td><td>Small infestation
▪ Bag all plant material and let rot.
▪ Never pile and use resulting material as compost.
▪ Burn.

Large infestation
▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile.
▪ Monitor and remove any sprouting material.
▪ Pile, let dry, and burn.</td></tr>
</table>

January 2010

CONTACT INFORMATION

TERRESTRIAL PLANTS

Douglas Cygan, Invasive Species Coordinator, NH Department of Agriculture, Markets & Food, Division of Plant Industry, 29 Hazen Drive, Concord, NH 03301
(603) 271-3488, douglas.cygan@agr.nh.gov
Website: www.agriculture.nh.gov

AQUATIC PLANTS

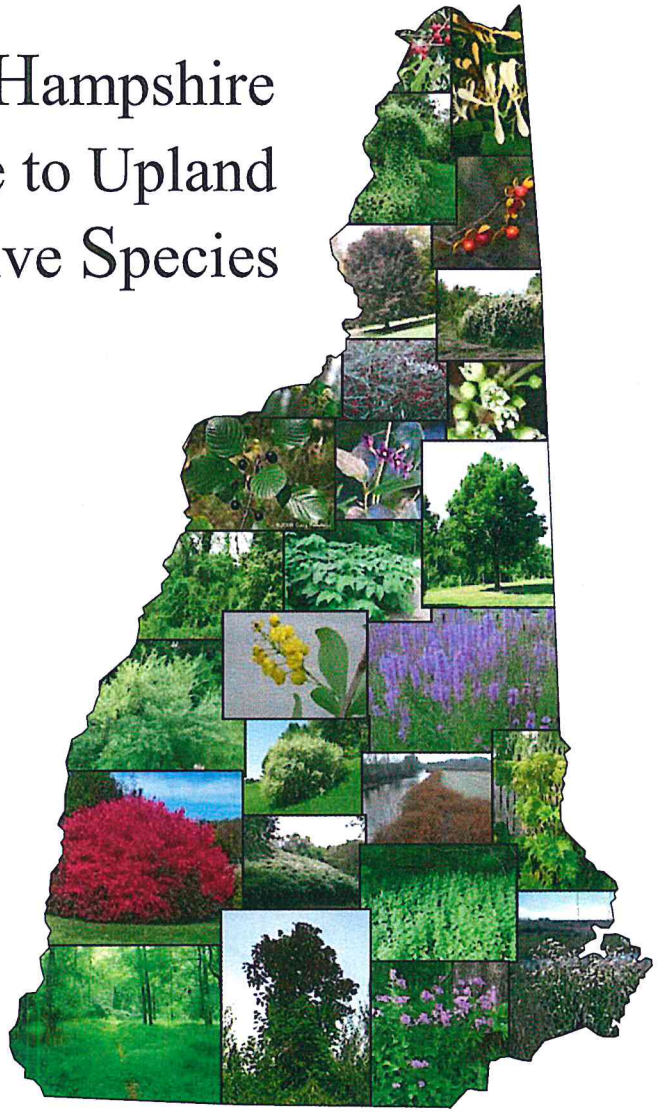
Amy Smagula, Clean Lakes and Exotic Species Coordinator, NH Department of Environmental Services, 29 Hazen Drive, PO Box 95, Concord, NH 03302
(603) 271-2248, asmagula@des.state.nh.us.

RESOURCES

NH Coastal Watershed Invasive Plant Partnership (CWIPP)
www.des.nh.gov/organization/divisions/water/wmb/coastal/cwipp/index.htm
Invasive Plant Atlas of New England (IPANE)
http://invasives.eeb.uconn.edu/ipane
Natural Resource Conservation Service (NRCS)
http://plants.usda.gov
New England Wildflower Society (NEWS)
www.newfs.org
New Hampshire Department of Agriculture, Markets & Food (DAMF)
www.agriculture.nh.gov
New Hampshire Department of Resources & Economic Development, Natural Heritage Bureau (DRED)
http://www.naturalheritage.org
New Hampshire Department of Resources & Economic Development, Division of Forests and Lands (DRED)
http://www.nhdfl.org/organization/div_nhnhi.htm
New Hampshire Department of Environmental Services (DES)
www.des.state.nh.us/wmb/exoticspecies
New Hampshire Fish & Game Department
www.wildlife.state.nh.us
The Nature Conservancy (TNC)
www.nature.org
U.S. Department of Agriculture's Animal Plant Health Inspection Service (USDA APHIS)
www.aphis.usda.gov
University of New Hampshire Cooperative Extension (UNHCE)
www.ceinfo.unh.edu

Funding for the printing of this booklet provided by:
U.S. Department of Agriculture's Animal Plant Health Inspection Service

New Hampshire Guide to Upland Invasive Species



New Hampshire
Department of Agriculture
Markets and Food, Plant Industry Division

3rd Edition
2011

Douglas Cygan

Introduction

Throughout the world, non-native invasive species have become an overwhelming problem resulting in impacts to the natural environment and managed landscapes. Invasive species typically possess certain traits that give them an advantage over most native species. The most common traits include the production of many offspring, early and rapid development, and adaptability and high tolerance to many environmental conditions. These traits allow invasive species to be highly competitive and, in many cases, suppress native species. Studies show that invasives can reduce natural diversity, impact endangered or threatened species, reduce wildlife habitat, create water quality impacts, stress and reduce forest and agricultural crop production, damage personal property, and cause health problems.

Invasive species began arriving in North America in the mid-to-late 1700s by various means. Many were brought here for ornamental uses, erosion control, or to provide for wildlife habitat. Others arrived inadvertently through international travel and commerce.

Impacts and Actions

Biologists have found that invasive species cover more than 100 million acres of land in the U.S. and their population numbers continue to spread. The repeated process of spread has become so extreme that invasive species cost the United States billions of dollars per year. This is a result of lost agricultural and forest crops, impacts to natural resources and the environment, and the control efforts required to eradicate them.

On February 3, 1999, President Clinton signed Executive Order 13112, which established the National Invasive Species Council. The Council is responsible for assessing the impacts of invasive species, providing the nation with guidance and leadership on invasive species issues, and seeing that federal programs are coordinated and compatible with state and local initiatives.

Each state is also required to participate by evaluating and responding to their invasive species concerns. In the summer of 2000, the State of New Hampshire passed House Bill 1258-FN, which created the Invasive Species Act (ISA) and the New Hampshire Invasive Species Committee.

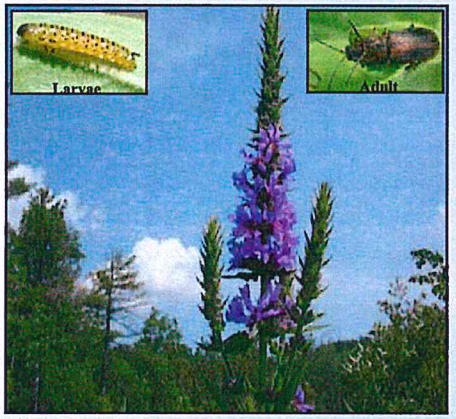
GLOSSARY OF PLANT TERMS

Alternate: Arranged singly at each node, as leaves or buds on different sides of a stem.
Annual: Living or growing for only one year or season.
Aril: A fleshy, usually brightly colored cover of a seed that develops from the ovule stalk and partially or entirely envelops the seed.
Axis: The point at which the leaf is attached to the main stem or branch.
Berry: A small, juicy, fleshy fruit.
Biennial: Having a life cycle that normally takes two growing seasons to complete.
Capsule: A dry dehiscent fruit that develops from two or more united capsules.
Compound: Composed of more than one part.
Deciduous: Shedding or losing foliage at the end of the growing season.
Dehiscent: The spontaneous opening of a fruit at maturity.
Drupe: A fleshy fruit usually having a single hard stone enclosing a seed.
Entire: Referring to a leaf not having an indented margin.
Filiform: Having the form resembling a thread or filament.
Furrowed: A rut groove or narrow depression.
Glabrous: Having no hairs or projections; smooth.
Imbricate: To be arranged with regular overlapping edges.
Inflorescence: A cluster of small flowers arranged on a flower stalk.
Lanceolate: A leaf tapering from a rounded base toward an apex, lance-shaped
Lenticels: The small, corky pores or narrow lines on the surface of the stems of woody plants that allow the interchange of gases between the interior tissue and the surrounding air.
Lustrous: Having a sheen or glow.
Native: A species that originated in a certain place or region; indigenous.
Naturalized: Adapted or acclimated to a new environment without cultivation.
Opposite: Growing in pairs on either side of a stem.
Ovate: Broad or rounded at the base and tapering toward the end.
Panicle: A branched cluster of flowers in which the branches are racemes
Peduncle: The stalk of a solitary flower of an inflorescence.
Peltate: Leaf being round with the stem attached near its center.
Perennial: Living three or more years.
Perfect: Having both stamens and pistals in the same flower.
Pod: A dry, several-sealed, dehiscent fruit.
Pubescent: Covered in fine short hairs.
Raceme: Elongated cluster of flowers along the main stem in which the flowers at the base open first.
Rhizome: A horizontal, usually underground stem that often sends out roots and shoots from its nodes.
Samara: A winged, often one-seed indehiscent fruit as of the ash, elm or maple.
Simple: Having no divisions or branches; not compound.
Umbel: A flat-topped or rounded inflorescence.

Lythrum salicaria - Purple Loosestrife

Family: Lythraceae
Native to: Eurasia

Description: Perennial growing 30-80" tall by $^{2}/_{3}$'s as wide. **Stems:** 4-6 sided, turning woody in summer. **Leaves:** Opposite to whorled, lanceolate, 2-4" long. **Flowers:** Spiked raceme, purple to magenta, June to October. **Fruit:** Capsule. **Habitat:** Mostly found in wetlands and aquatic systems, full to partial sun. **Spread:** Each plant can produce approximately 2.5-4.5 million seeds. Seeds dispersed by water, wildlife and humans. **Comments:** Invades wetlands suppressing native species and destroying wildlife habitat. **Controls:** Hand pull, use a spade to dig larger plants or use biocontrols (*Galerucella Spp.*, top left is a larvae & top right is an adult).

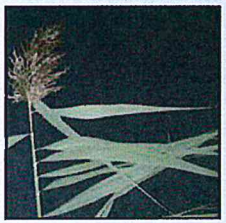


Photos by Douglas Cygan

Phragmites australis - Common Reed

Family: Poaceae
Native to: Eurasia

Description: Perennial rhizomatous grass growing 14' tall. **Stems:** Called 'culms' are large, hollow and grow up to 1" dia. **Leaves:** Lanceolate, up to 24" long, bluish-green in color. **Flowers:** Panicles with many spikelets having seven small reddish flowers. **Habitat:** Mostly found in marshlands, but also grows in freshwater wetlands and aquatic systems, full to partial sun. **Spread:** Spreads primarily by rhizomes. **Comments:** Forms dense colonies that suppress native species and alter wildlife habitat. **Controls:** Hand pull small plants. Use a spade to dig larger plants or apply herbicides.



Photos by Douglas Cygan

New Hampshire Invasive Species Committee

The New Hampshire Invasive Species Committee (ISC) is an advisory group for the Commissioner of the NH Department of Agriculture, Markets & Food (DAMF) on matters concerning invasive species in the state. The ISC consists of 11 appointed members representing the following: the NH Department of Agriculture, the NH Department of Environmental Services, the NH Department of Resources & Economic Development, the NH Department of Transportation, the NH Department of Fish & Game, The College of Life Science & Agriculture of the University of NH, the UNH Cooperative Extension, environmental interests, horticultural interests, general public interests, and livestock owners & feed growers interests. The ISC meets regularly to conduct the following efforts:

- Review information;
- Evaluate and discuss potentially invasive plant, insect and fungi species of concern;
- Host guest presentations on related topics;
- Develop outreach and educational materials;
- Formulate management practices as guidance for the control of invasive species; and
- Prepare lists of proposed prohibited and restricted species.

(*Note: This committee is not charged with the evaluation or listing of aquatic plant species, which is conducted by the Department of Environmental Services under RSA-487:16-a. However, a brief description of the program and four of the aquatic species are described on pages 29 & 30 of this book*).

New Hampshire Rules

In accordance with the Invasive Species Act (ISA), HB 1258-FN, the DAMF is the lead state agency for terrestrial invasive plants, insects and fungi species. The DAMF has the responsibility for the evaluation, publication and development of rules on invasive plant species. This is for the purpose of protecting the health of native species, the environment, commercial agriculture, forest crop production, and human health. Therefore, the rule, Agr 3800, states "**No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living or viable portion of any listed prohibited invasive plant species, which includes all of their cultivars and varieties, listed"** (see the New Hampshire Department of Agriculture's website at www.agriculture.nh.gov to review the complete set of rules).

Invasive Upland Plant Species (Agr 3800)

Invasive Insect Species

(To see the complete list of all 16 invasive insects refer to rules Agr 3800)

Invasive Aquatic Plant Species

To see the complete list of invasive aquatic plants refer to DES's Env-Wq 1300 rules

New Hampshire Department of Environmental Services Aquatic Invasive Plant Species

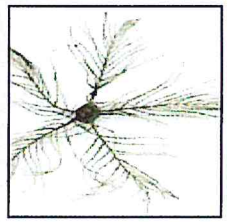
"Exotic aquatic species" are plants or animals that are not part of New Hampshire's native aquatic flora and fauna. Since the first exotic aquatic plant infestation in New Hampshire was discovered in 1965 in Lake Winnipesaukee, exotic aquatic plant infestations have increased to a total of 83 infestations in 72 waterbodies in 2008. Species present include variable milfoil (63 waterbodies), Eurasian milfoil (3 waterbodies), fanwort (9 waterbodies), water chestnut (1 waterbody) and Brazilian elodea (1 waterbody), Curly Leaf Pondweed (3 waterbodies), and European Naiad (3 waterbodies), and Didymo (1 waterbody). Most of these exotic plants can propagate by fragmentation as well as by seed.

Exotic aquatic plant fragments can easily become attached to aquatic recreational equipment, such as boats, motors, and trailers, and can spread from waterbody to waterbody through transient boating activities. Infestations can have detrimental effects on the ecological, recreational, aesthetic, and economic values of the state's precious surface waters, limiting use of the waterbodies and decreasing shorefront property values by as much as 1020 percent according to a UNH study (Halstead, et al., 2001).

Myriophyllum heterophyllum - Variable Milfoil

Family: Haloragaceae
Native to: Eurasia

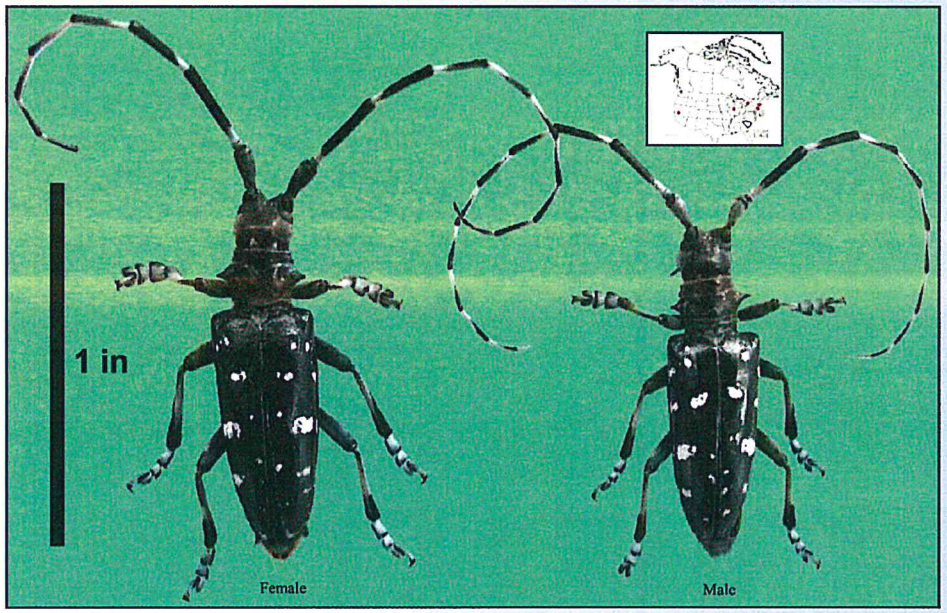
Description: Submerged aquatic perennial growing 20' tall. **Stems:** Round, thick and reddish. **Leaves:** Feathery leaflets surrounding the stem. **Flowers:** Stalks that emerge above the water with green leaves, June to August. **Habitat:** Lakes, ponds, calm streams, and other similar aquatic systems with full to partial sun. **Spread:** It reproduces primarily by vegetative propagules when individual plant segments break off, and dispersed by water movement, humans, and boats. **Comments:** Invades water bodies, suppresses native species and destroys fish habitat. **Controls:** Prevention, hand pulling, bottom screening, and aquatic herbicide use.



Photos by Amy Smagula

Anoplophora glabripennis - Asian Longhorned Beetle

Family: Cerambycidae
Native to: Europe



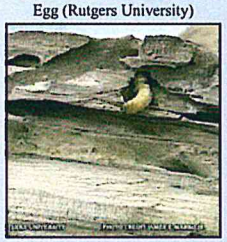
Asian Longhorned Beetle—*Anoplophora glabripennis* (Photo by Chris Rallis)

The Asian longhorned beetle (ALB) is a serious threat to a large variety of deciduous hardwoods in North America. ALB is a large glossy black insect with white spots dotting its elytra. Adults grow to 1-1.5" long and have whitish bandings on their antennae. Females are typically bigger than males. Tree injury occurs when larvae tunnel through the xylem (heartwood) of the host, thus weakening the tree. Hosts trees include, but aren't limited to: Maple, Chestnut, Poplar, Willow, Birch, Elm, and Mountain ash. Adult females chew a crater in the bark and lay 1-egg per site. Upon hatching the larvae feed on the wood and emerge as adults in 1-2 years through perfect $^{3}/_{8}$" diameter exit holes. Other signs include coarse wood shavings called frass, oozing sap, oviposition sites, leaf-feeding damage, and mature beetles. **If found, please call the NH Dept. of Agriculture at (603) 271-2561.**


Oviposition Site


Egg (Rutgers University)


Sap flow from injury


Larval damage (Rutgers Univ.)


Adult feeding damage on leaf


3/8" diameter exit hole

Photos by Douglas Cygan, Chris Rallis & Rutgers University

DO NOT MOVE FIREWOOD

WHAT YOU CAN DO

There are many things that you, as an individual, can do to help control the spread of invasive species and preserve native flora and fauna:

- Minimize impacts to natural vegetation, soils, and drainage.
- Learn how to identify invasive plants and know how to tell them apart from native species.
- Control invasives on your property by following recommended practices.
- When landscaping, ask your local garden center or contact your County Extension Service about alternative plantings.
- Become active in local or regional initiatives to control invasives.
- After working in an area with invasive species remove any soil, or propagules that may have adhered to clothing, shoes, vehicle tires, etc.

CONTROL METHODS

Mechanical: Mechanical control involves hand pulling, digging, cultivation, mowing, cutting or utilizing some type of physical barrier such as a tarpaulin, mulch, wood chips, etc. This method is most effective when populations of unwanted species are low.

Cultural: Cultural control is the manipulation of a plant community to prevent the introduction or spread of an unwanted species. This can be accomplished by modifying the growing environment such as the soil, available light or moisture, or planting trees or shrubs that can outcompete the invasive species.

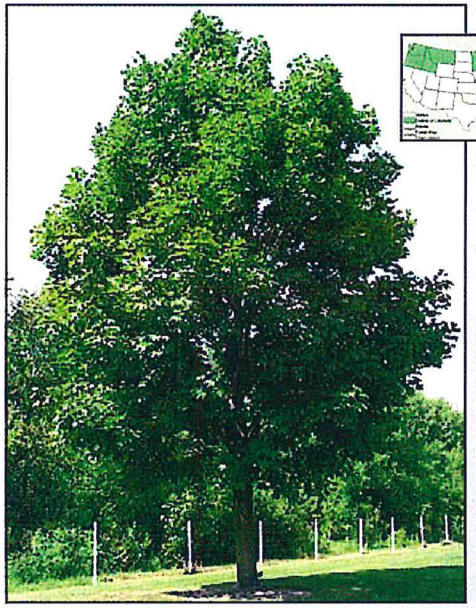
Chemical: Chemical control involves the use of an approved herbicide to manage a targeted species. The application method must be chosen to avoid damage to beneficial or native species. The applicator must adhere to all State and Federal pesticide regulations and in many cases be licensed by the state. For more information, contact the NH Department of Agriculture's Pesticide Control Division at 603-271-3550 or www.agriculture.nh.gov.

Biological: Biological control is the use of native or introduced beneficial organisms to naturally reduce populations of unwanted species. Most biological controls are found to be self-sustaining and host specific.

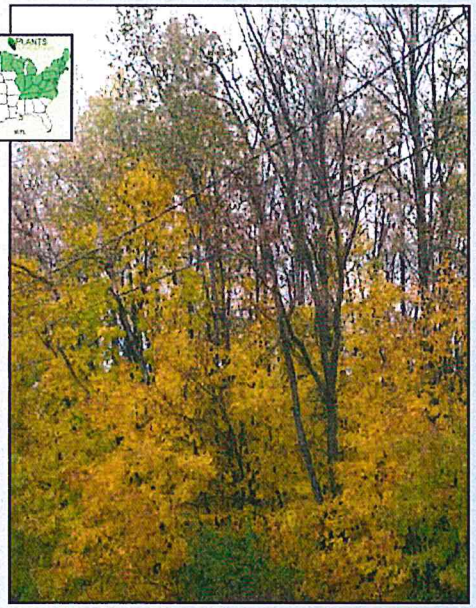

Pulling Digging Cutting-Hand tools Herbiciding Mowing Cutting-Saws Biocontrols

Acer platanoides - Norway Maple

Family: Aceraceae
Native to: Europe

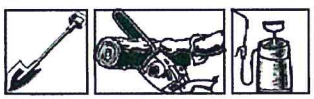


Norway Maple—*Acer platanoides*



Norway Maple (in yellow) Invasion in Franklin, NH

Description: Large deciduous tree 60' high by 40' wide. **Bark:** Grayish and somewhat furrowed. **Twigs:** Smooth, olive-brown. **Buds:** Terminal, imbricate, rounded, smooth, greenish-red. **Leaves:** Opposite, 4-7" wide, 5-lobed, dark green to dark red above, lustrous below. **Flowers:** Greenish-yellow, April. **Fruit:** Horizontal samara. **Zone:** 3-7. **Habitat:** Moist, well drained soils, full sun to partial shade. **Spread:** Seeds spread by wind and water. **Comments:** Leaf stalks exude milky white sap. Fast growing, buds break earlier than most native species. Naturalizes in woodlands where it can outcompete native species. **Controls:** Pull or dig seedlings/saplings. Cut large trees and prune suckers when they sprout. Herbicide: foliar spray, cut-stem, bark banding, or slash bark with ax and apply to wounds.



Milky white sap-leaf petiole

Leaf with winged seed

Terminal buds rounded

Flowers greenish-yellow

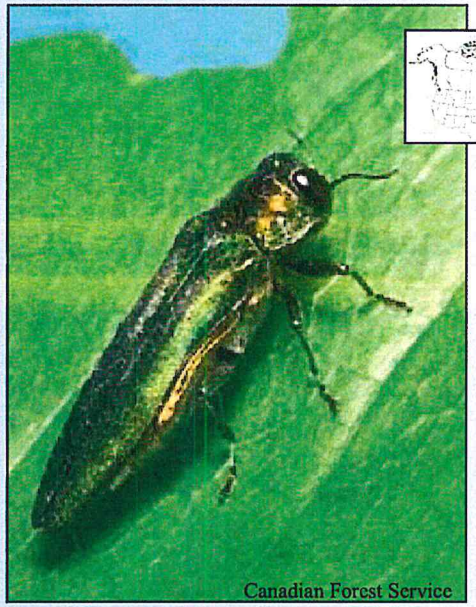
Bark is grayish & furrowed

Leaves turn yellow in Fall

Photos by Douglas Cygan

Agrilus planipennis - Emerald Ash Borer

Family: Buprestidae
Native to: Asia



Emerald Ash Borer—*Agrilus planipennis*

Dead standing Ash trees (Canadian Forest Service)

Emerald Ash Borers (EAB) are small invasive wood boring beetles that attack all species of ash trees (*Fraxinus spp.*). Native to East Asia, it is suspected that they were accidentally introduced to North America in infested wood packing material. The adults are 3/8" to ½" in length by 1/16" in width. Their bodies have a dark metallic green appearance. Adults emerge from a D-shaped exit hole from late May to mid-July and live for 3-6 weeks, during which time they feed on ash foliage, and fly 1-mile or so in search of a mate and to lay eggs. Females will lay 60-90 eggs in the crevices of ash tree bark. Larvae emerging from the eggs create distinctive S-shaped feeding galleries within the cambium which is directly beneath the bark. These feeding galleries can girdle the tree and result in tree death. Movement of EAB into new uninfested areas is principally through transportation of firewood.

If found, please contact the NH Dept. of Agriculture at (603) 271-2561.

Egg

Larvae in feeding galleries

Adult with wings spread

Feeding galleries in cambium

D-shaped exit hole

EAB Purple prism trap

Photos by Douglas Cygan & Chris Rallis

DO NOT MOVE FIREWOOD

Adelges tsugae - Hemlock Wooly Adelgid

Family: Adelgidae
Native to: Asia

Hemlock Wooly Adelgid—*Adelges tsugae* Nests

Hemlock trees dead from Adelgid (www.earthportal.org)

Hemlock Wooly Adelgid (*Adelges tsugae*) (HWA) is a serious pest to all North American hemlock trees (*Tsuga spp.*). It is native to Japan & China and was first found in the Pacific Northwest in the 1920's. By the 1950's it had reached the east coast and now infects hemlock trees from Georgia to Maine. It spreads by movement of nursery stock, wind and animals. These insects are extremely small averaging about $^{1}/_{8}$" in length with piercing-sucking mouth parts similar in appearance to aphids. All adults are females with each producing 50-300 eggs. To protect themselves & their eggs they produce a white-waxy covering. Adults insert their piercing mouth parts into the stem at the base of the needles. Trees die from needle loss & lack of nutrition. **If found, please call the NH Dept. of Agriculture at (603) 271-2561.**

Adult female laying eggs

Egg mass in protective nest

Eggs & crawlers (Chris Rallis)

Heavily infested branch

Crawlers (Chris Rallis)

Crawler leaving nest (Chris Rallis)

Photos by Douglas Cygan & Chris Rallis

DO NOT MOVE FIREWOOD

Ailanthus altissima - Tree of Heaven

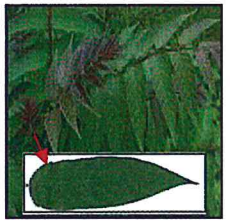
Family: Simaroubaceae
Native to: China

Tree of Heaven—*Ailanthus altissima*

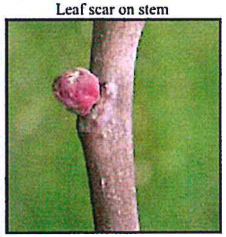
Tree of Heaven invasion

Description: Deciduous tree up to 60' tall by 40' wide. **Bark:** Grayish, slightly furrowed. **Twigs:**Reddish-brown. **Leaves:** Compound, 18-24" long with 13-25 leaflets arranged alternately on stem, lanceolate, 3-5" long with 2-4 teeth near base. **Flowers:** Panicles, 8-16" long, yellowish-green, mid-June. **Fruit:** Samara. **Zone:** 4-8. **Habitat:** Highly adaptable and pollution tolerant, full sun to partial shade. **Spread:** Seeds are wind dispersed. **Comments:** Very fast growing, dense canopy shades out native species. **Controls:** Remove seedlings and saplings by hand. Larger trees can be mechanically removed or cut. To prevent suckering, if trees are cut, apply herbicide to cut portion of stump.

Leaf scar on stem

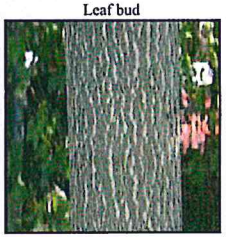


Compound leaves & leaf



Leaf bud

Flowers yellowish-green



Bark grayish & furrowed

Winged seed cluster

Photos by Douglas Cygan

Alliaria petiolata - Garlic Mustard

Family: Cruciferae
Native to: Europe

Garlic Mustard—*Alliaria petiolata*

Woodland invasion (photo by Cornell University)

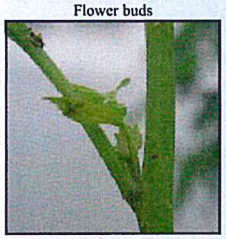
Description: Cool season biennial, 2nd year plants flower and reach 2-3$^1/_2$' tall. **Leaves:** Triangular, coarsely toothed, heart-shaped. **Flowers:** Umbel, small, 4-petals, white, April-May. **Fruit:** Pods, seeds turn black when mature. **Zone:** 4-8. **Habitat:** Prefers moist shaded floodplains, forests and roadsides, adaptable to most soil and light conditions. **Spread:** Seeds spread by water and wildlife. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

Basal rosette

Leaf

Flower buds

Flowers 4-petaled, white



Stems

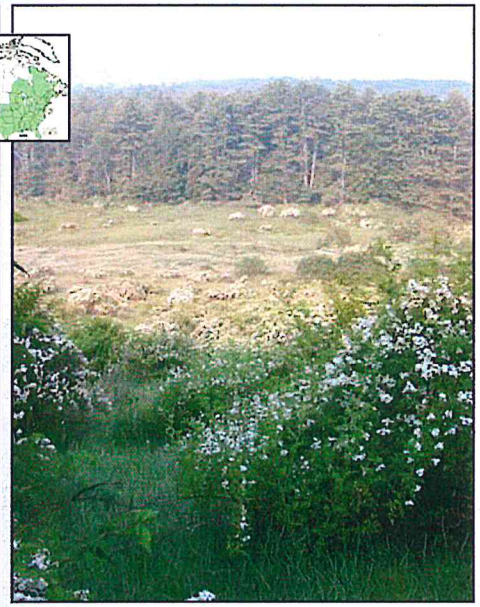
Seed pods

Photos by Douglas Cygan

Rosa multiflora - Multiflora Rose

Family: Rosaceae
Native to: Japan & Korea

Multiflora Rose-*Rosa multiflora*

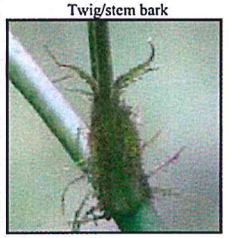


Multiflora Rose invasion, Canterbury, NH

Description: Hardy shrub / climber reaching up to 15' or more in height and 10' in width. **Stems:** Long and arching, forming dense clumps, thorns may or may not be present. **Leaves:** Alternately arranged, compound with 7-9 leaflets and having feather margins at base. **Flowers:** Clusters of white or pink, June to July. **Fruit:** Rose hips turn red in fall. **Zone:** 3-8. **Habitat:** Prefers moist, well drained soils, full sun. **Spread**: Fruits with seeds are dispersed by birds. **Comments:** Very aggressive, leading to competition and displacement of native species. **Controls:** Hand or mechanical removal, cutting, or herbicide application.

Twig/stem bark

Leaves



Feathery margin at base of leaf

Flowers white

Fall color

Fruit is called a hip

Photos by Douglas Cygan

Rhamnus cathartica - Common Buckthorn

Family: Rhamnaceae
Native to: Eurasia

Description: Deciduous shrub or small tree measuring 20' by 15'. **Bark:** Grayish to brown with raised lenticels. **Stems:** Cinnamon colored with terminal spine. **Leaves:** Opposite, simple and broadly ovate with toothed margins. **Flowers:** Inconspicuous, 4-petaled, greenish-yellow, mid-June. **Fruit:** Fleshy, 1/4" diameter turning black in the fall. **Zone:** 3-7. **Habitat:** Adapts to most conditions including pH, heavy shade to full sun. **Spread:** Seeds are bird dispersed. **Comments: Highly:** Aggressive, fast growing, outcompetes native species. **Controls:** Remove seedlings and saplings by hand. Larger trees can be cut or plants can be treated with an herbicide.

Photos courtesy of John M. Randall/The Nature Conservancy

Rhamnus frangula - Glossy Buckthorn

Family: Rhamnaceae
Native to: Japan

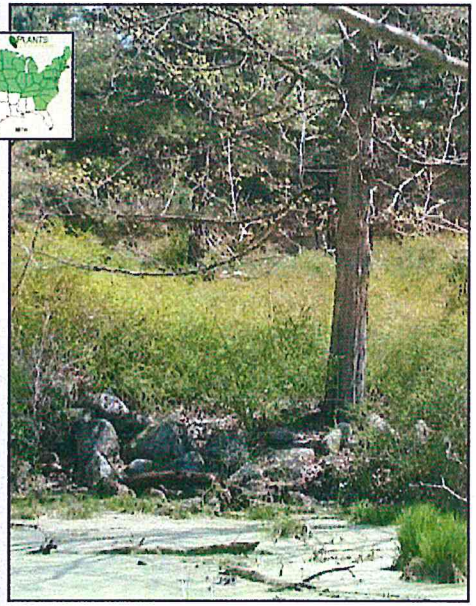
Description: Tall deciduous shrub up to 20' in height by 15' wide, **Bark:** Grayish with whitish lenticels. **Twigs:** Reddish-brown. **Leaves:** Ovate, 4-5" long by 3-4" wide, arranged oppositely or whorled on stem. **Flowers:** Small, greenish-white, mid-June. **Fruit:** Fleshy, turning black in the fall. **Zone:** 2-7. **Habitat:** Highly adaptable and pollution tolerant, full sun to partial shade. **Spread:** Seeds are bird dispersed. **Comments:** Very fast growing, dense canopy shades out native species. **Controls:** Remove seedlings and saplings by hand. Larger trees can be cut or herbicide may be used.

Photos by Douglas Cygan

Berberis thunbergii - Japanese Barberry

Family: Berberidaceae
Native to: Japan

Japanese Barberry-*Berberis thunbergii*

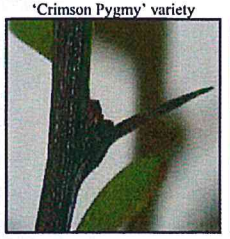


Japanese Barberry invasion, Antrim, NH

Description: Deciduous shrub, 2-4$^{1}/_{2}$' tall. **Leaves:** Ovate, simple, entire. Color varies depending on variety. **Flowers:** Small yellowish, bloom in May in clusters of 2-4. **Fruit:** Drupe, turning red in summer. **Zone:** 4-8. **Habitat:** Prefers well drained soils in semi shade and often occurring in forests, roadsides, and open fields. **Spread:** Seeds are dispersed by wildlife. **Comments:** Forms dense thickets in natural environments where it becomes established, resulting in impacts to native flora and fauna. **Controls:** Remove small immature plants by hand. Dig larger plants with a garden spade or remove mechanically. Cut stems at base or control with herbicide treatment.

'Crimson Pygmy' variety

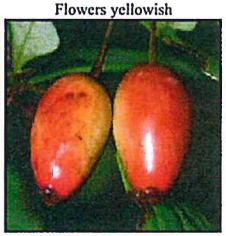
Leaves



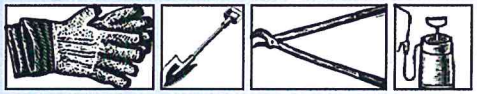
Thorn

Flowers yellowish

Frost covered Barberry



Fruit is a fleshy drupe



Photos by Douglas Cygan

Berberis vulgaris - European Barberry

Family: Berberidaceae
Native to: China

European Barberry-*Berberis vulgaris*

Woodland invasion, Claremont, NH

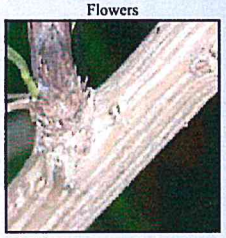
Description: Shrub 3-8' in height by 3-6' in width. **Stems:** Tan bark with 3 long spines at each leaf axis. **Leaves:** Alternate, simple, $^1/_2$"-1$^1/_2$" long, bright green above, dull below. **Flowers:** Perfect, yellow, $^1/_2$" long, mid-April to May. **Fruit:** Oblong drupe turning pale red in fall. **Zone:** 4-8. **Habitat:** Prefers full sun to partial shade and open spaces to wooded areas. **Spread:** Seeds are dispersed by birds and wildlife. **Comments:** Highly adaptable to most environments and is pollution tolerant. **Controls:** Hand pull young plants. Cut or mechanically remove older larger plants or apply approved herbicides for large populations.

Thorns

Leaves

Flowers

Flowers whitish-yellow



Stems

Seed pods

Photos by Douglas Cygan

Polygonum cuspidatum - Japanese Knotweed

Family: Polygonaceae
Native to: Japan

Description: Perennial reaching 10' in height and width. Bohemian Knotweed (*Reynoutria x bohemica*) is similar. **Stems:** Greenish, hollow and jointed, similar to bamboo. **Leaves:** Alternate, broadly ovate, 3-7" long. **Flowers:** Small, whitish, forming panicles, August-September. **Seeds:** Calyx, brown, triangular. **Habitat:** Found in woodland sites, open spaces, ditches, roadsides, riverbanks. Prefers moist, well-drained soils. **Spread:** Stem & root fragments, and by seed. **Comments:** Aggressive, spreads quickly along surface waters and in right-of-ways. **Controls: Do <u>not</u> mow**, cut stems at base then smother by covering area with heavy-duty fabric/plastic, herbicides also recommended.

Photos by Douglas Cygan

Polygonum perfoliatum - Mile-a-Minute Vine

Family: Polygonaceae
Native to: Asia

Description: Very fast growing herbaceous perennial vine growing to 25' in height. **Stems:** Greenish with stiff barbs used for support. **Leaves:** Alternate, triangular in shape with clasping bract at the base, 1-3" long. **Flowers:** Racemes, inconspicuous and white forming at the bract, August - October. **Seeds:** An achene within a greenish, berry-like fruit. **Habitat:** Grows in partial shade to full sun, fields, roadsides & forests. Prefers moist, well-drained soils. **Spread:** Seed spread by birds & wildlife. **Comments:** Fast growing, aggressive. **Controls:** Mowing, hand cutting or herbicide use is recommended.

Photos by Leslie J. Mehrhoff

Microstegium vimineum - Japanese Stilt Grass

Family: Poaceae
Native to: Asia

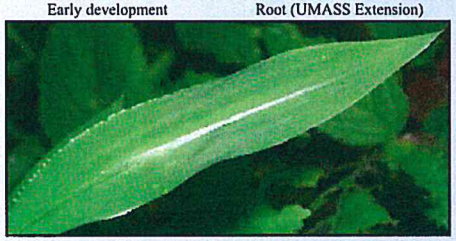
Japanese Stilt Grass—*Microstegium vimineum*

Japanese Stilt Grass woodland invasion

Description: Weak-stemmed annual grass, reaching 2-4' tall. **Leaves:** Lanceolate, tapered at both ends, 2-3" long with silvery stripe of reflective hairs down the midrib. **Flowers:** Racemes occur at the ends of the stalk itself, late August. **Fruit:** Achenes develop in late fall. **Zone:** 5-11. **Habitat:** Occurs along riverbanks, floodplains, forests and roadsides, adaptable to most soil and light conditions. **Spread:** Seeds spread by water, wildlife & humans. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

Early development

Root (UMASS Extension)



Leaf with silvery reflective hairs along midrib

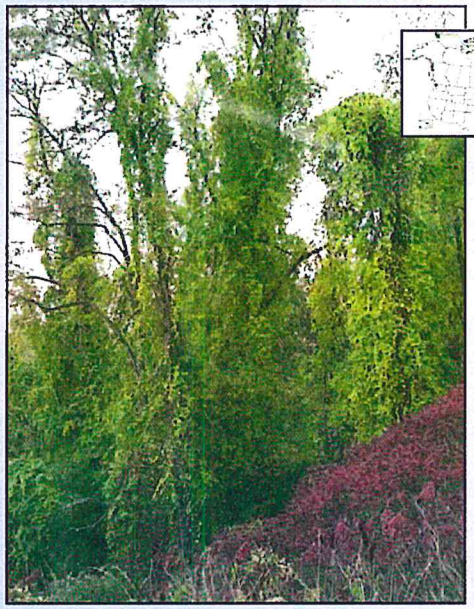
Fall-leaves turn purplish

Seed-Achene

Photos courtesy of Leslie J. Mehrhoff/UCONN-IPANE and UMASS Extension

Celastrus orbiculatus - Oriental Bittersweet

Family: Celastraceae
Native to: Japan, China



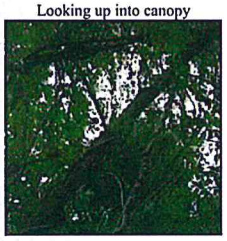
Oriental Bittersweet-*Celastrus orbiculatus*

Oriental Bittersweet invasion, Concord, NH

Description: Deciduous vine reaching heights of 40-60'. **Bark:** Tannish, furrowed. **Leaves:** Alternate, ovate, bluntly toothed, 3-4" long by 2/3's as wide, tapered at the base. **Flowers:** Small, greenish, blooming in spring. **Fruit:** Yellow dehiscent capsule surrounding an orange-red aril. *Fruits occur in the axils of the stems whereas native bittersweet (Celastrus scandens) fruits at the ends.* **Zone:** 4-8. **Habitat:** Disturbed edges, roadsides, fields, forests and along rivers and streams. **Spread:** Birds and humans. **Comments:** Very aggressive, climbs up and over trees and smothers them. Do not buy wreaths made of these vines. **Controls:** Difficult to manage. Cutting, pulling, or recommended herbicide use applied to foliage, bark, or cut-stump.

Looking up into canopy

Leaves



Native trees being strangled

Flowers yellowish-white

Mature Orange-yellow fruit

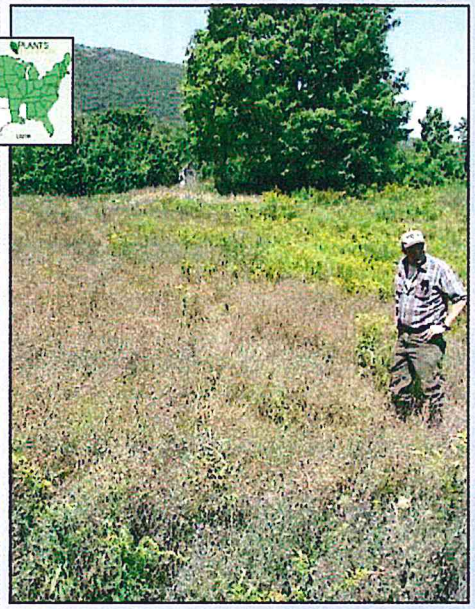
Fruit is a fleshy capsule

Photos by Douglas Cygan

Centaurea maculosa - Spotted Knapweed

Family: Compositae
Native to: Eurasia

Spotted Knapweed—*Centaurea maculosa*



Invasion (photo by Leslie Mehrhoff)

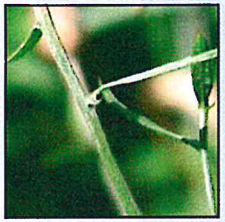
Description: Tall erect herbaceous perennial living 3-5 years. **Leaves:** Alternate, divided, Pale green, 1-3" long. **Flowers:** Aster-like, terminal, purple, July-August. **Fruit:** Each plant produces thousands of brownish seeds per year. **Zone:** 3-10. **Habitat:** Invades dry sunny roadsides, fields and waste places. Its large taproot allows it to survive harsh winters and draught **Spread:** Seeds spread by wind and wildlife. **Comments:** Plants spread quickly into natural meadows and fields leading to competition and displacement of native species. Roots excrete a toxin killing off other plants. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

Basal rosette

Leaf

Seed head

Flowers—Aster like



Stems

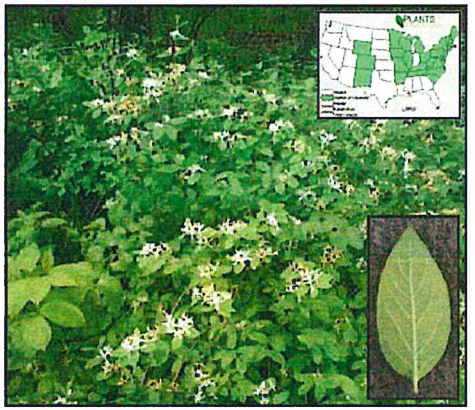
Seeds

Photos by Leslie Mehrhoff & Douglas Cygan

Lonicera morrowii - Morrow's Honeysuckle

Family: Caprifoliaceae
Native to: Japan

Description: Shrub reaching 6-8' tall. **Stems:** Smooth, glabrous, Tannish, hollow. **Leaves:** Ovate, simple, entire, opposite, pubescent beneath, 1-2$^1/_2$" long. **Flowers:** Tubular, white, turning yellow with age, May to June. **Fruits:** Berry turning red. **Zone:** 3 . **Habitat:** Moist to wet shaded floodplains, forests, roadsides, fields, waste places. **Spread:** Seeds are dispersed by wildlife and humans. **Comments:** Rapidly invades sites, forming a dense vegetative layer that outcompetes native flora and fauna species. **Controls:** Hand control is effective for small plants, while mechanical removal and repetitive cutting also work well. Herbicide treatment is better for areas with greater infestations.

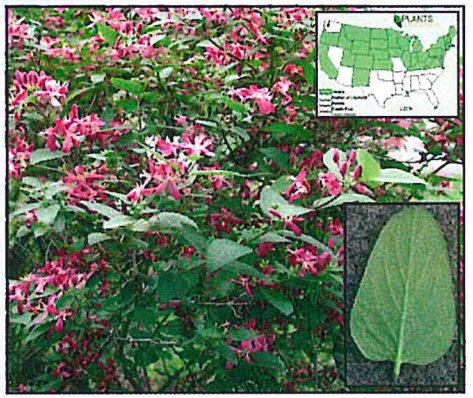


Photos by Douglas Cygan & Leaf Photo by Leslie J. Mehrhoff

Lonicera tatarica - Tatarian Honeysuckle

Family: Caprifoliaceae
Native to: Eurasia

Description: Upright deciduous shrub reaching 6-15' tall. **Stems:** Smooth, glabrous, tan, hollow. **Leaves:** Ovate, smooth, bluish-green, opposite, 1-2$^1/_2$" long. **Flowers:** Tubular, pink or white, April to May. **Fruit:** Berry with two seeds, turning red in fall. **Zone:** 3. **Habitat:** Under story species in woodland sites, also invades open spaces. Thrives in moist soils. **Spread:** Seeds dispersed by wildlife and humans. **Comments:** Rapidly invades forests, fields, roadsides and floodplains. Outcompetes native species. **Controls:** Hand control is effective for small plants while mechanical removal, cutting and chemical applications are better for larger stands.

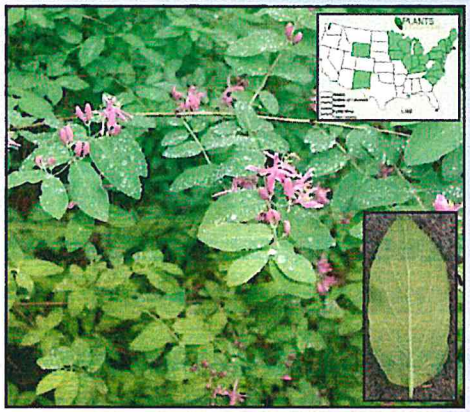


Photos by Leslie J. Mehrhoff & Berry Photo by Douglas Cygan

Lonicera x bella - Showy Bush Honeysuckle

Family: Caprifoliaceae
Native to: Eurasia

Description: Shrub reaching 20' in height and width. **Stems:** Greenish to tan with corky wings. **Leaves:** Oppositely arranged, simple and elliptic, 1-3" long by half as wide, light green. **Flowers:** Yellow, white or pink, May to early June. **Fruit:** Fleshy red, forming in pairs in leaf axis. **Zone:** 4. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread:** Seeds are dispersed by birds. **Comments:** *L. x bella* is a cross between *L. tatarica* & *L. morrowii*. Spreads into natural areas forming dense stands, which displace native species. **Controls**: Hand or mechanical removal, continuous cutting, girdling, and herbicide treatment.

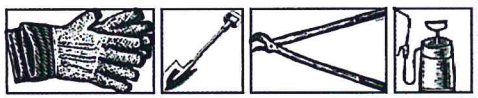


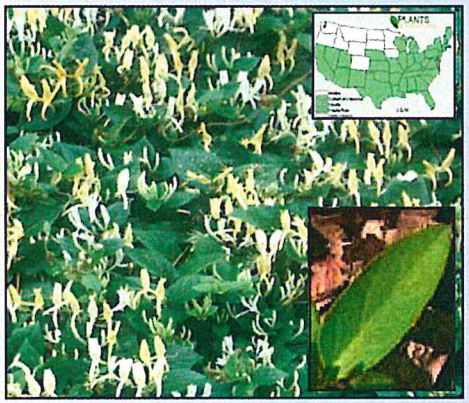
Photos courtesy of Leslie J. Mehrhoff/UCONN-IPANE

Lonicera japonica - Japanese Honeysuckle

Family: Caprifoliaceae
Native to: Eurasia

Description: Climbing vine. **Stems:** Reddish-brown, pubescent. **Leaves:** Opposite and not clasping the stem as opposed to the three native honeysuckle vines that do clasp the stem, oblong, $1^1/_2$-2" long, rounded at base. **Flowers:** Tubular, white or yellow, fragrant, May to mid-July. **Fruit:** Berry, smooth, blackish to slightly purplish. **Zone:** 4-8. **Habitat:** Prefers moist soils and full sun to partial shade. **Spread:** Seeds spread by wildlife. **Comments:** Vines grow quickly, covering native vegetation, resulting in loss of habitat. **Controls:** hand or mechanical removal, cutting, girdling, chemical.



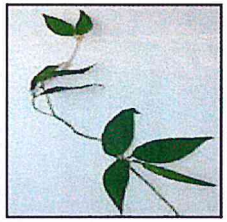


Photos courtesy of John M. Randall/The Nature Conservancy
& Leaf Photo by Leslie J. Mehrhoff

Cynanchum nigrum - Black Swallow-Wort

Family: Asclepiadaceae
Native to: Eurasia

Description: Perennial herbaceous vine that grows to 6'. **Leaves:** Opposite, lanceolate, dark glossy green, simple with a smooth edge, 2-4" long. **Flowers:** Small $^1/_4$", 5-petaled, purplish, from June to September. **Seed:** Seeds are similar to those of milkweed. **Zone:** 4 to 8. **Habitat:** It prefers full to partial sun. **Spread:** Seeds dispersed by wind. **Comments:** Invades roadsides, fields, disturbed sites, meadows, and woodlands, outcompeting native species. **Controls:** Hand pull young plants. Remove and destroy seed pods before they open. Apply herbicides as a foliar spray during the growing season. If plants are to be dug, use a spade and make sure that all root fragments are removed.

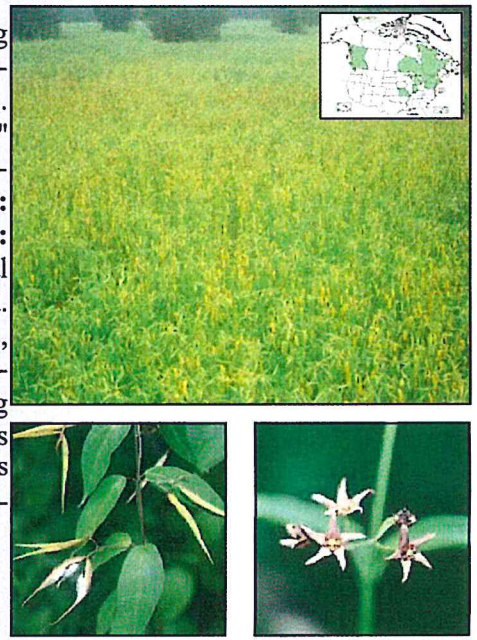


Photos by Douglas Cygan

Cynanchum rossicum - Pale Swallow-Wort

Family: Asclepiadaceae
Native to: China

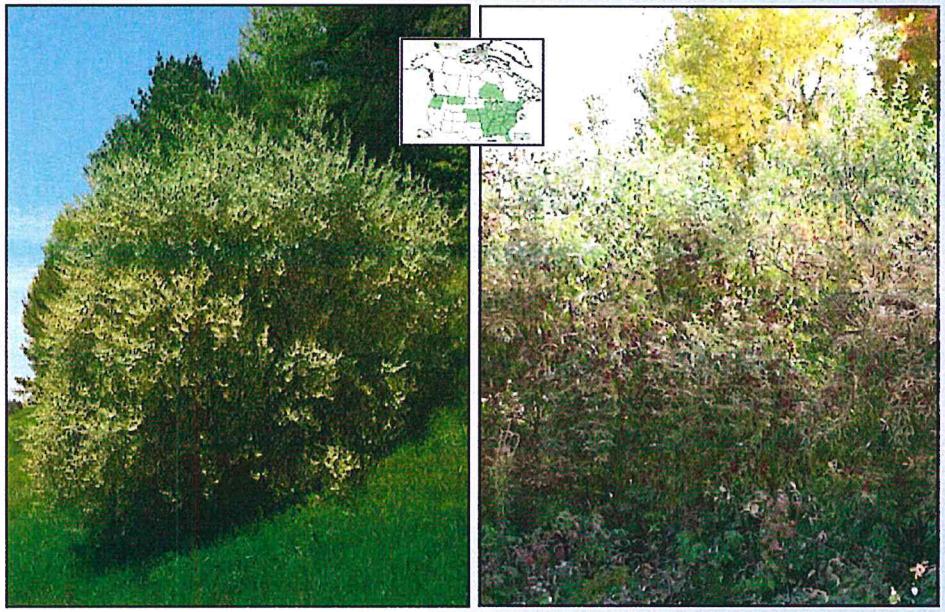
Description: Perennial vine growing to 3-6'. Very similar to black swallow-wort with the exception of the flowers. **Leaves:** Opposite, lanceolate, 2-4" long. **Flowers:** Magenta, $^3/_8$", flowering from June to September. **Seed:** Seeds are similar to milkweed. **Zone:** 4 to 8. **Habitat:** It prefers full to partial sun. **Spread:** Seeds dispersed by wind. **Comments:** Invades roadsides, fields, disturbed sites, meadows and woodlands. **Controls:** Hand pull young plants. Remove and destroy seed pods before they open. Apply herbicides as a foliar spray. Dig using a spade to ensure all root fragments are removed.



Photos courtesy of John M. Randall/The Nature Conservancy

Elaeagnus umbellata - Autumn Olive

Family: Elaeagnaceae
Native to: Asia



Autumn Olive—Elaeagnus umbellata

Autumn Olive invasion in Concord, NH

Description: Weedy deciduous shrub measuring 20' by 20'. **Bark:** Silvery-gray and smooth with whitish lenticels. **Stems:** Cinnamon-brown. **Leaves:** Elliptical, 2-3" long, glossy, green above and silverish below. **Flowers:** Solitary, whitish, 4-petaled, mid-June. **Fruit:** Drupe. **Zone:** 3-8. **Habitat:** Naturalizes in open spaces exposed to full sun. **Spread:** Seeds dispersed by birds and wildlife. **Comments:** Very aggressive. Outcompetes and displaces native species. **Controls:** Remove seedlings and saplings by hand. Larger shrubs can be mechanically removed, or cut and apply herbicide to stump.

Silvery-gray Bark

Leaves

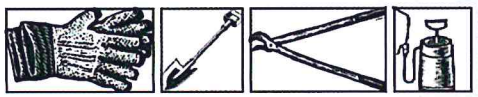
Terminal bud

Flowers whitish

Fall Color

Fruit is a fleshy drupe

Photos by Douglas Cygan



Ligustrum obtusifolium - Blunt-leaved Privet

Family: Oleaceae
Native to: Europe

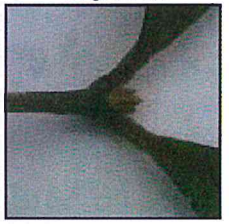
Blunt-leaved Privet-*Ligustrum obtusifolium*

Blunt-leaved Privet (Photo: Leslie J. Mehrhoff)

Description: Shrub reaching 12' tall by 10-12' wide. **Stems:** Greenish, smooth. **Leaves:** Opposite, simple and elliptic, 1-3" long by half as wide, blunt tipped, light green. **Flowers:** Small white panicles, May to early June. **Fruit:** Small blackish drupe. **Zone:** 4-7. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread:** Seeds dispersed by birds. **Comments**: Becomes established in natural areas leading to competition and displacement of native species. **Controls:** Hand or mechanical removal, cutting, herbicide applications such as foliar or cut-stem.

Twig/stem bark

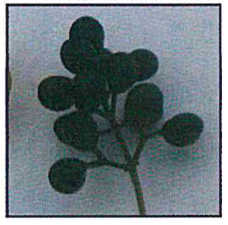
Leaves



Terminal bud

Flowers white

Fall color

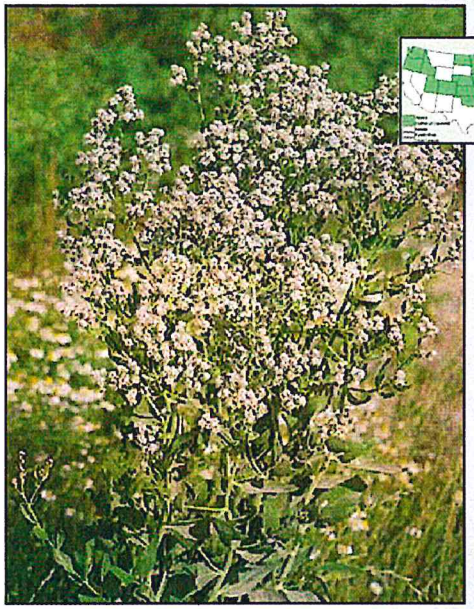


Fruit is a dark drupe

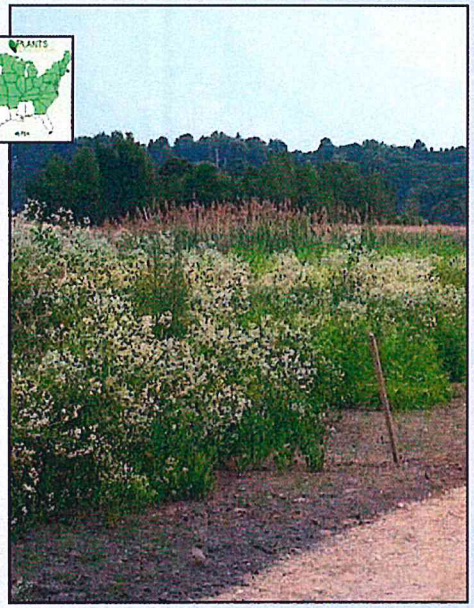
Photos by Douglas Cygan & Leslie Mehrhoff

Lepidium latifolium - Perennial Pepperweed

Family: Cruciferae
Native to: Eurasia

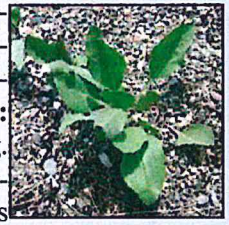


Perennial Pepperweed—*Lepidium latifolium*



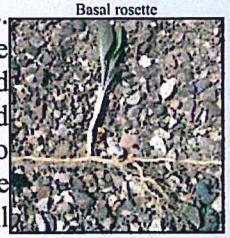
Perennial Pepperweed invasion Seacoast area, NH

Description: Long lived perennial growing 2-4' tall. **Leaves:** Alternate, lanceolate with serrated edge. **Flowers:** Terminal, tightly clustered, white, July. **Fruit:** Silicle, rounded, flattish, hairy $^{1}/_{16}$" long. **Zone:** 4-8. **Habitat:** Prefers wet, brackish soils such as coastal tidal marshes and ditches, wetlands, and floodplains. **Spread:** Seeds and creeping rhizome fragments spread by water, wildlife and humans. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native coastal wetland species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.



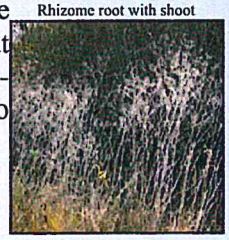
Basal rosette

Leaf



Rhizome root with shoot

Flower head



Persistent stems

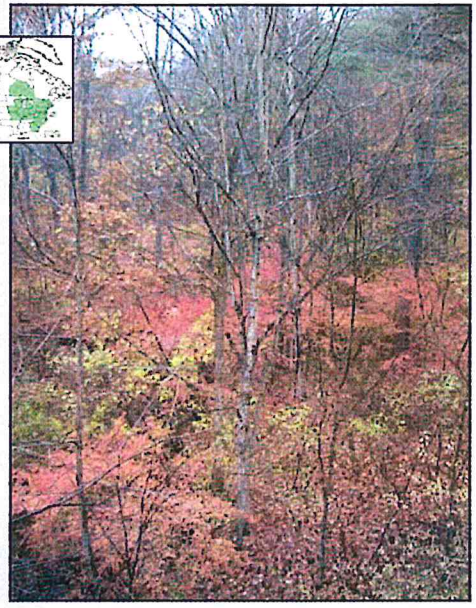
Seeds (photo—USDA)

Photos by Kevin Lucey & Jennifer Forman

Euonymus alatus - Burning Bush

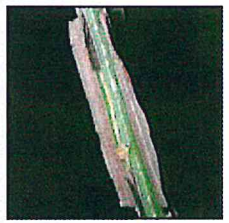
Family: Celastraceae
Native to: Asia

Burning Bush-*Euonymus alatus*



Burning Bush invasion, Boscawen, NH

Description: Deciduous shrub reaching 20' in height and width. **Stems:** Greenish with corky wings. **Leaves:** Oppositely arranged, simple and elliptic, 1-3" long by half as wide, light green. **Flowers:** Inconspicuous greenish-yellow, May to June. **Fruit:** Fleshy green capsule turning red in fall. **Zone:** 3 to 8. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread**: Seeds are dispersed by birds and wildlife. **Comments:** Outcompetes and displaces native species. **Controls:** Hand remove seedlings and saplings. Use a spade or shovel to dig out larger plants. Large populations may be controlled with herbicide use.



Corky-winged bark

Leaves

Terminal buds

Flowers yellowish-white

Fall color

Fruit is a fleshy capsule

Photos by Douglas Cygan

Heracleum mantegazzianum - Giant Hogweed

Family: Apiaceae
Native to: China

Giant Hogweed-*Heracleum mantegazzianum*

Open field invasion (Photo-Bugwood.org)

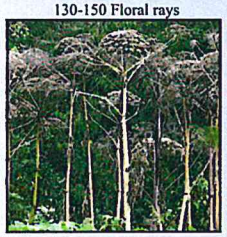
Description: Biennial growing to 15' tall. **Stems:** Greenish with purple splotches, 2-4" diameter with coarse hairs, hollow. **Leaves:** Large, compound, deeply incised, 3-5' wide, hairy on underside. **Flowers:** White inflorescence, 1-2' in diameter, May-June. **Seeds:** Flattened, $^{3}/_{8}$" long, ovate with 4 brown resin canals. **Zone:** 3-8. **Habitat:** Found in wet areas, roadsides, gardens, open spaces, full sun to partial shade. **Spread:** Seeds dispersed by water, wildlife and humans. **Comments:** The clear, watery sap is phototoxic to human skin, causing severe blistering and burns. Spreads readily and displaces native species. **Controls:** Remove plants by digging up tap root. Herbicide can also be used as a foliar treatment.

Purple spotted, hairy stem

Leaf

130-150 Floral rays

Flowers whitish umbel



Persistent dead stalks

Seeds with resinous veins

Photos by Douglas Cygan

Hesperis matronalis - Dame's Rocket

Family: Brassicaceae
Native to: Eurasia

Dame's Rocket—*Hesperis matronalis*

Dame's Rocket invasion

Description: Cool season biennial, 2nd year plants flower and reach 30" tall. **Leaves:** Alternately arranged and lanceolate in shape with toothed margins. **Flowers:** Terminal racemes, 4-petals, purplish, early to mid spring. **Fruit:** Pods, seeds turn brown when mature. **Zone:** 4-8. **Habitat:** Prefers partial sun, moist to mesic conditions such as floodplains, forests and roadsides, adaptable to full sun with adequate moisture. **Spread:** Seeds spread by water and wildlife. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

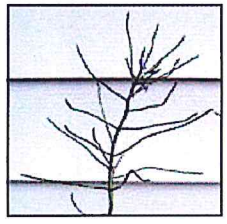
Basal rosette

Leaf

Flower buds

Flowers 4-petaled, white

Stems



Seed pods

Photos by Leslie Mehroff

SECTION 5 STORMWATER INSPECTION & MAINTENANCE LOG

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

General Information			
Project Name	Residential Development Plans	**Location**	Portsmouth, NH
		Start/ End Time	
Date of Inspection			
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			

	Site Specific BMP's	Maintenance Interval
1	Street Sweeping	1 year
2	Deep Sump Catch Basins	6 months
3	Underground Infiltration Systems (#1-3)	6 months
4	Hydrodynamic Separators (First Defense Units)	3 months (See separate maintenance log for First Defense Unit)

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

BMP Description	Corrective Action Required?	Notes
Street Sweeping		
Evidence of debris accumulation	☐ Yes ☐ No	
Evidence of oil grease	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Deep Sump Catch Basins		
Grates clear of debris	☐ Yes ☐ No	
Inlet and outlet clear of debris	☐ Yes ☐ No	
Evidence of oil grease	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	Sediment Depth =
Evidence of structural deterioration	☐ Yes ☐ No	
Evidence of flow bypassing facility	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Underground Infiltration System #1		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Underground Infiltration System #2		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

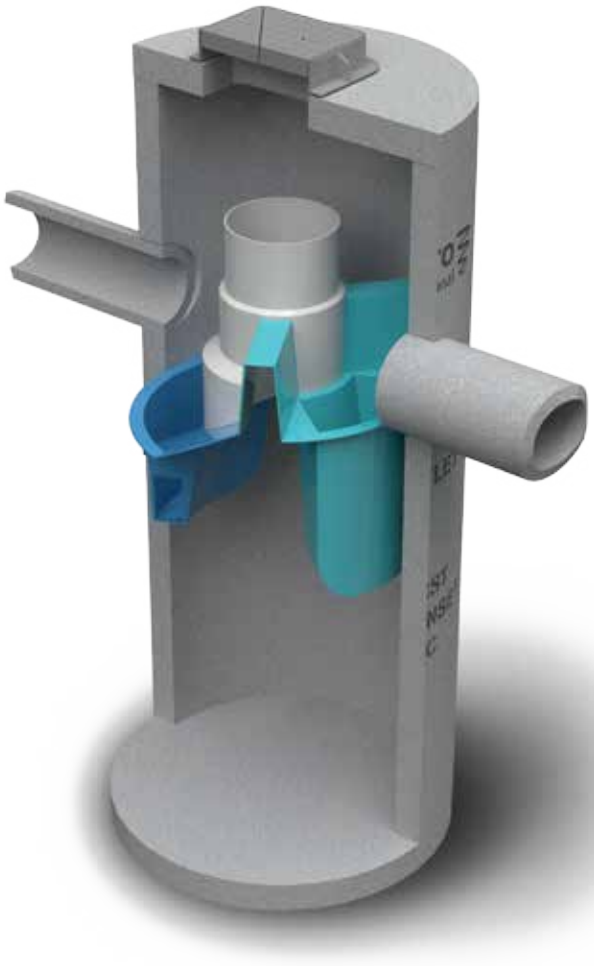
BMP Description	Corrective Action Required?	Notes
Underground Infiltration System #3		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Hydrodynamic Separators (First Defense Units)		
See separate maintenance log for First Defense Unit		

NOTE: Photos shall be provided with each inspection log and shall be sufficiently labeled to identify photo location.

SECTION 6 DE-ICING LOG

Deicing Log

Date Applied	Type of Deicing Material	Amount Applied



Operation and Maintenance Manual

First Defense® and First Defense®-HC

Vortex Separator for Stormwater Treatment

Stormwater Solutions

Turning Water Around ...®

Table of Contents

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

I. First Defense® by Hydro International

Introduction

The First Defense® is an enhanced vortex separator that combines an effective and economical stormwater treatment chamber with an integral peak flow bypass. It efficiently removes total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® is available in several model configurations (refer to *Section II. Model Sizes & Configurations*, page 4) to accommodate a wide range of pipe sizes, peak flows and depth constraints.

Operation

The First Defense® operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is fabricated with durable non-corrosive components. No manual procedures are required to operate the unit and maintenance is limited to monitoring accumulations of stored pollutants and periodic clean-outs. The First Defense® has been designed to allow for easy and safe access for inspection, monitoring and clean-out procedures. Neither entry into the unit nor removal of the internal components is necessary for maintenance, thus safety concerns related to confined-space-entry are avoided.

Pollutant Capture and Retention

The internal components of the First Defense® have been designed to optimize pollutant capture. Sediment is captured and retained in the base of the unit, while oil and floatables are stored on the water surface in the inner volume (Fig.1).

The pollutant storage volumes are isolated from the built-in bypass chamber to prevent washout during high-flow storm events. The sump of the First Defense® retains a standing water level between storm events. This ensures a quiescent flow regime at the onset of a storm, preventing resuspension and washout of pollutants captured during previous events.

Accessories such as oil absorbent pads are available for enhanced oil removal and storage. Due to the separation of the oil and floatable storage volume from the outlet, the potential for washout of stored pollutants between clean-outs is minimized.

Applications

- Stormwater treatment at the point of entry into the drainage line
- Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- Pretreatment for filters, infiltration and storage

Advantages

- Inlet options include surface grate or multiple inlet pipes
- Integral high capacity bypass conveys large peak flows without the need for “offline” arrangements using separate junction manholes
- Proven to prevent pollutant washout at up to 500% of its treatment flow
- Long flow path through the device ensures a long residence time within the treatment chamber, enhancing pollutant settling
- Delivered to site pre-assembled and ready for installation

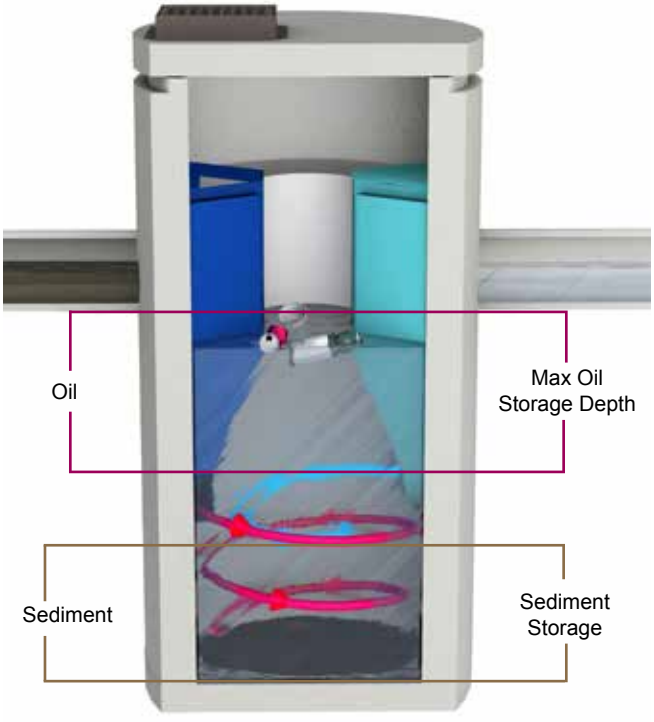


Fig.1 Pollutant storage volumes in the First Defense®.

II. Model Sizes & Configurations

The First Defense® inlet and internal bypass arrangements are available in several model sizes and configurations. The components of the First Defense®-4HC and First Defense®-6HC have modified geometries as to allow greater design flexibility needed to accommodate various site constraints.

All First Defense® models include the internal components that are designed to remove and retain total suspended solids (TSS), gross solids, floatable trash and hydrocarbons (Fig.2a - 2b). First Defense® model parameters and design criteria are shown in Table 1.

First Defense® Components

1. **Built-In Bypass**
2. **Inlet Pipe**
3. **Inlet Chute**
4. **Floatables Draw-off Port**
5. **Outlet Pipe**
6. **Floatables Storage**
7. **Sediment Storage**
8. **Inlet Grate or Cover**

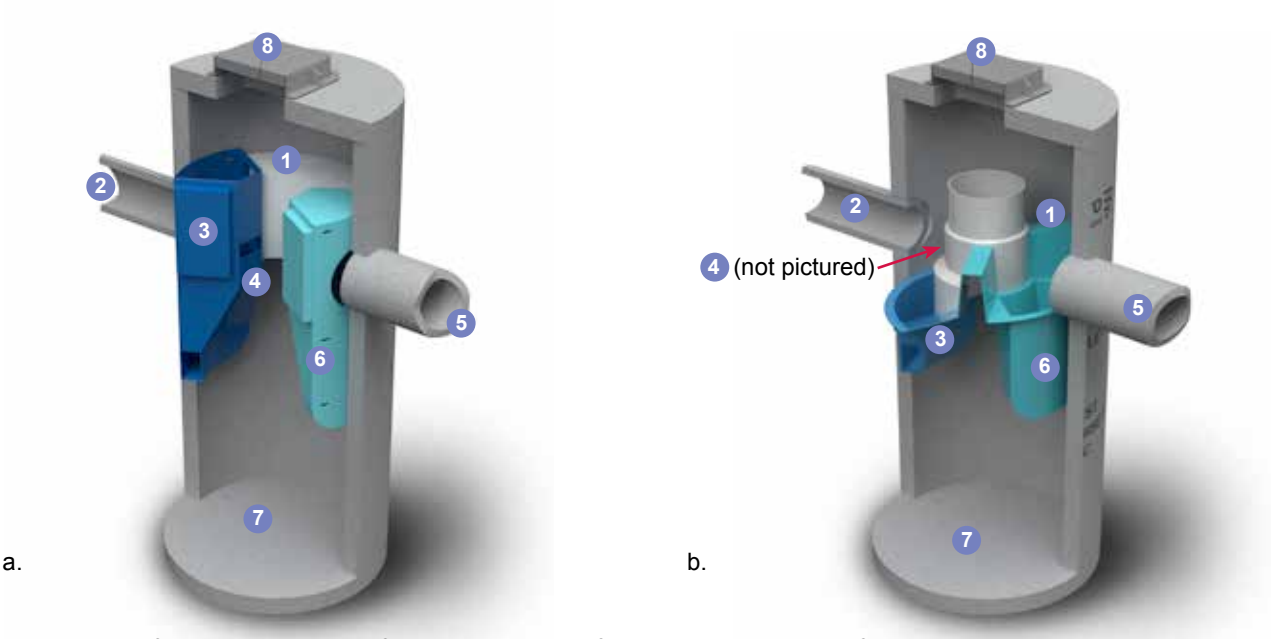


Fig.2a) First Defense®-4 and First Defense®-6; b) First Defense®-4HC and First Defense®-6HC, with higher capacity dual internal bypass and larger maximum pipe diameter.

Table 1. First Defense® Pollutant Storage Capacities and Maximum Clean out Depths

First Defense® Model Number	Diameter	Oil Storage Capacity	Oil Clean Out Depth	Maximum Sediment Storage Capacity[1]		Recommended Sediment Clean-out Capacity	
				Volume	Depth	Volume	Depth
	(ft / m)	(gal / L)	(in / cm)	(yd^3 / m^3)	(in / cm)	(yd^3 / m^3)	(in / cm)
FD-4	4 / 1.2	180 / 681	<23.5 / 60	1.3 / 1.0	33 / 84	0.7 / 0.5	18 / 46
FD-4HC		191 / 723	<24.4 / 62				
FD-6	6 / 1.8	420 / 1,590	<23.5 / 60	3.3 / 2.5	37.5 / 95	1.3 / 1.0	15 / 38
FD-6HC		496 / 1,878	<28.2 / 72				

NOTE

[1] Sediment storage capacity and clean out depth may vary, as larger sediment storage sump volumes are provided when required.

III. Maintenance

Overview

The First Defense® protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the First Defense®. The First Defense® will capture and retain sediment and oil until the sediment and oil storage volumes are full to capacity. When sediment and oil storage capacities are reached, the First Defense® will no longer be able to store removed sediment and oil. Maximum pollutant storage capacities are provided in Table 1.

The First Defense® allows for easy and safe inspection, monitoring and clean-out procedures. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables. Access ports are located in the top of the manhole.

Maintenance events may include Inspection, Oil & Floatables Removal, and Sediment Removal. Maintenance events do not require entry into the First Defense®, nor do they require the internal components of the First Defense® to be removed. In the case of inspection and floatables removal, a vactor truck is not required. However, a vactor truck is required if the maintenance event is to include oil removal and/or sediment removal.

Maintenance Equipment Considerations

The internal components of the First Defense®-HC have a centrally located circular shaft through which the sediment storage sump can be accessed with a sump vac hose. The open diameter of this access shaft is 15 inches in diameter (Fig.3). Therefore, the nozzle fitting of any vactor hose used for maintenance should be less than 15 inches in diameter.

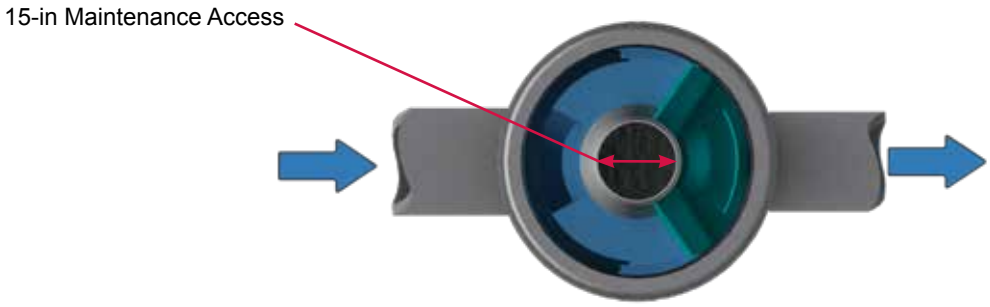


Fig.3 The central opening to the sump of the First Defense®-HC is 15 inches in diameter.

Determining Your Maintenance Schedule

The frequency of clean out is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. A simple probe such as a Sludge-Judge® can be used to determine the level of accumulated solids stored in the sump. This information can be recorded in the maintenance log (see page 9) to establish a routine maintenance schedule.

The vactor procedure, including both sediment and oil / flotables removal, for a 6-ft First Defense® typically takes less than 30 minutes and removes a combined water/oil volume of about 765 gallons.

Inspection Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities. Fig.4 shows the standing water level that should be observed.

4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the components and water surface.

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel.

6. On the Maintenance Log (see page 9), record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.

7. Securely replace the grate or lid.

8. Take down safety equipment.

9. Notify Hydro International of any irregularities noted during inspection.

Floatables and Sediment Clean Out

Floatables clean out is typically done in conjunction with sediment removal. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables (Fig.5).

Floatables and loose debris can also be netted with a skimmer and pole. The access port located at the top of the manhole provides unobstructed access for a vactor hose and skimmer pole to be lowered to the base of the sump.

Scheduling

- Floatables and sump clean out are typically conducted once a year during any season.

- Floatables and sump clean out should occur as soon as possible following a spill in the contributing drainage area.

Fig.4 Floatables are removed with a vactor hose (First Defense model FD-4, shown).

Recommended Equipment

- Safety Equipment (traffic cones, etc)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge Judge®)
- Vactor truck (flexible hose recommended)
- First Defense® Maintenance Log

Floatables and sediment Clean Out Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.

4. Remove oil and floatables stored on the surface of the water with the vactor hose (Fig.5) or with the skimmer or net (not pictured).

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel and record it in the Maintenance Log (page 9).

6. Once all floatables have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris off the sump floor (Fig.5).

7. Retract the vactor hose from the vessel.

8. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components, blockages, or irregularly high or low water levels.

9. Securely replace the grate or lid.

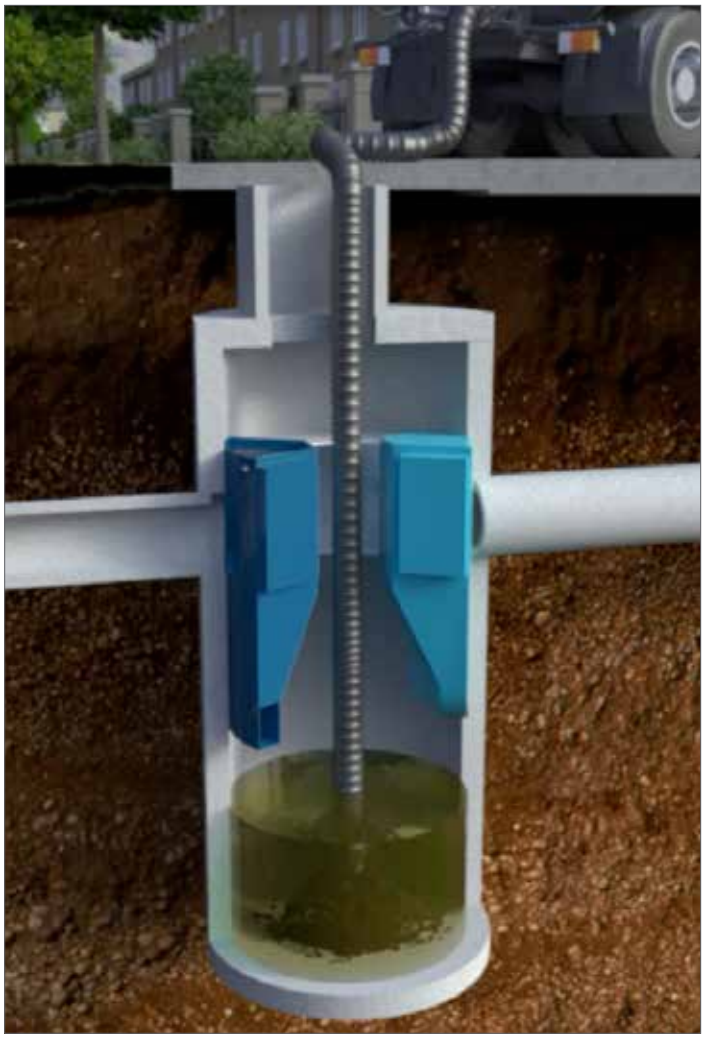


Fig.5 Sediment is removed with a vactor hose (First Defense model FD-4, shown).

Maintenance at a Glance

Activity	Frequency
Inspection	- Regularly during first year of installation - Every 6 months after the first year of installation
Oil and Floatables Removal	- Once per year, with sediment removal - Following a spill in the drainage area
Sediment Removal	- Once per year or as needed - Following a spill in the drainage area
NOTE: For most clean outs the entire volume of liquid does not need to be removed from the manhole. Only remove the first few inches of oils and floatables from the water surface to reduce the total volume of liquid removed during a clean out.	

First Defense® Installation Log

HYDRO INTERNATIONAL REFERENCE NUMBER:	
SITE NAME:	
SITE LOCATION:	
OWNER:	CONTRACTOR:
CONTACT NAME:	CONTACT NAME:
COMPANY NAME:	COMPANY NAME:
ADDRESS:	ADDRESS:
TELEPHONE:	TELEPHONE:
FAX:	FAX:

INSTALLATION DATE: / /

MODEL SIZE (CIRCLE ONE): **FD-4** **FD-4HC** **FD-6** **FD-6HC**

INLET (CIRCLE ALL THAT APPLY): **GRATED INLET (CATCH BASIN)** **INLET PIPE (FLOW THROUGH)**

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

First Defense® Inspection and Maintenance Log

Date	Initials	Depth of Floatables and Oils	Sediment Depth Measured	Volume of Sediment Removed	Site Activity and Comments

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

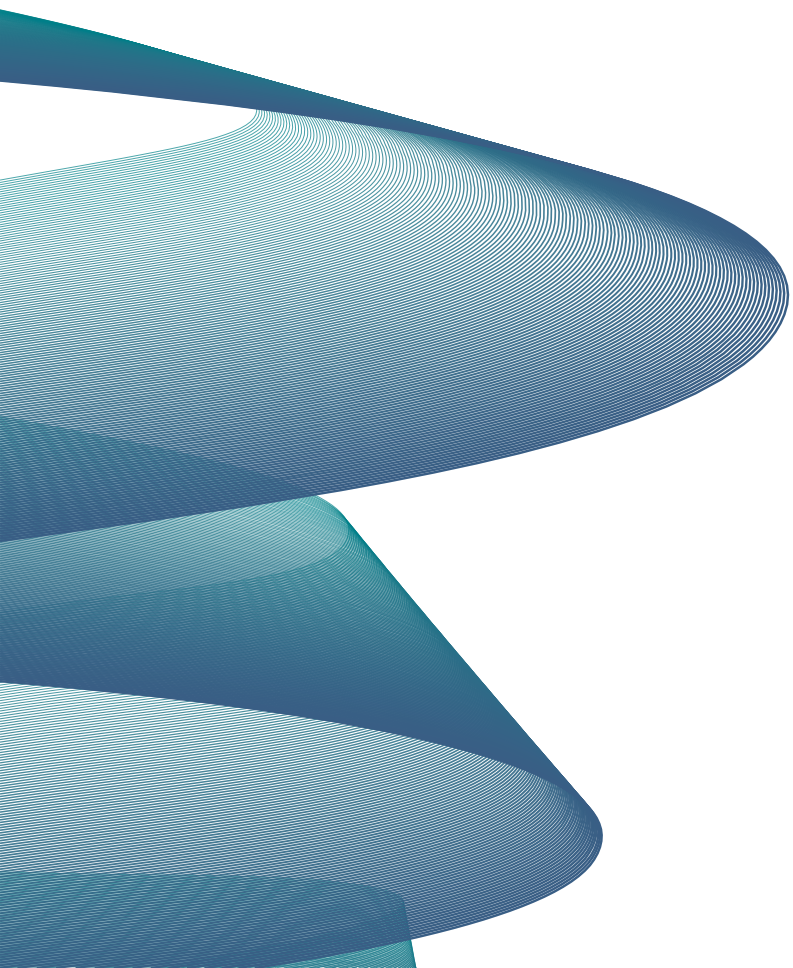
Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

What is HX?

HX is Hydro Experience, it is the essence of Hydro. It's interwoven into every strand of Hydro's story, from our products to our people, our engineering pedigree to our approach to business and problem-solving.

HX is a stamp of quality and a mark of our commitment to optimum process performance. A Hydro solution is tried, tested and proven.

There is no equivalent to Hydro HX.



Stormwater Solutions

94 Hutchins Drive
Portland, ME 04102

Tel: (207) 756-6200
Fax: (207) 756-6212
stormwaterinquiry@hydro-int.com

www.hydro-int.com

Turning Water Around...®

FD_O+M_D1502