

Town of Gorham Amended Quarry Application Phase 1 Quarry Expansion

For

Shaw Brothers Construction, Inc. 341 Mosher Road Gorham, Maine 04038

Prepared by:

Sebago Technics, Inc. 75 John Roberts Road, Suite 4A South Portland, Maine 04106

December 2023



December 18, 2023 05159

Carol Eyerman, Town Planner Gorham Planning Board Town of Gorham Municipal Offices 75 South Street, Suite 1 Gorham, Maine 04038

<u>Amended Quarry Application; Shaw Brothers Quarry</u> 341 Mosher Road, Tax Map 31, Lot 15, Shaw Brothers Construction, Inc.

Dear Carol:

On behalf of Shaw Brothers Construction, Inc., we are pleased to submit this letter, the enclosed plans, application form, and associated exhibits for an Amended Quarry application for their existing quarry operation located off Mosher Road and depicted on the Town of Gorham Tax Map 31 as Lot 15. The Gorham Planning Board approved the original quarry application at their meeting on March 31, 2008. Additionally, the applicant obtained a quarry license and variance from the Maine Department of Environmental Protection for an externally drained quarry. The quarry approval was amended by the Planning Board at their meeting on June 20, 2016 to relocate the crushing operation outside of the quarry limits and onto a 33-acre laydown and stockpiling area on the abutting lot southerly of the quarry depicted on Tax Map 34 as Lot 9. The requested amendment is only in association with the quarry operation and not any other aspects of the Shaw Brothers Industrial Campus.

The original quarry approval included a buffer along the property lines which was modified in accordance with a granted waiver to allow for a 100 foot buffer. Removal of overburden was allowed from the 100-foot buffer to 150 feet from the property line without blasting. Blasting was approved at 150 feet from the property line, however, the maximum slope from 150 feet to 200 feet will be 3 to 1. The applicant has recently obtained the property to the north of the quarry which extends to Queen Street as shown on Tax Map 34 as Lot 14. As the original northerly property line which required a buffer no longer exists, and as the Industrial Zone line extends the full extent of Tax Map 31, Lot 15, the applicant proposes to amend the quarry approval to eliminate the originally required northerly property line buffer and to extract the material to the original property line within the 150 feet that did not permit blasting.

As depicted on the enclosed Overall Grading Plan included within the plan set, the applicant proposes to extend the northerly edge of the Phase 1 quarry to the original property line. No quarrying is proposed outside of the original property line. The first 100 feet of the excavation as measured from the original property-line will be final graded at a 3:1 slope. As this expansion will-slightly increase the area of the excavation, and as the quarry externally drains to a wetpond for treatment and detention, the grading of the pond will be modified accordingly as shown, simply to provide the permananet pool volume mandated by Chapter 500 design requirements. As Phase 1 does not propose any excavation below the water table, no impacts on groundwater will occur. Additionally, the applicant requested a review of the proposed

expansion as it related to noise by Bodwell EnviroAcoustics, LLC who provided a memorandum included in the application stating that as the originally approved site was in compliance as measured in 2016, this expansion will also be in compliance.

As the quarry requires a permit from the Maine Department of Environmental Protection (MDEP), along with a variance for draining externally, an application to amend the originally approved variance is also being submitted to the MDEP for review and approval. The application to the Department includes the same plan set and revisions to the wet pond, stormwater management report and model as submitted to the Town.

In support of this application, we have assembled 15 Copies of materials consisting of seven (7) full-size sets and eight (8) 11x17 sets along with the required application fee. We look forward to working with the Town and Planning Board at their next regularly scheduled meeting to discussthe amendment in mokre detail. Upon your review of this application, please feel free to contact me with any questions or if require further information. Thank you for your consideration.

Sincerely,

SEBAGO TECHNICS, INC

Shawn M. Frank, P.E. Senior Project Manager

cc: Shaw Brothers Construction, Inc.



Community Development Planning Division

Thomas M. Poirier, Director of Community Development tpoirier@gorham.me.us
Carol Eyerman, Town Planner ceyerman@gorham.me.us

GORHAM MUNIC	CIPAL	L CENTE	E R , 75 S	outh Stree	t, Gorhan	ı, M	E 04038			Tel:	207-222-1620
			GR	AVEL	PIT A	PP	LICA	FION			
□ NEW GRA	□ NEW GRAVEL PIT □ GRAVEL PIT AMENDMENT □ GRAVEL PIT EXPANSION							KPANSION			
FEES FOR PLAN REVIEW			\$1,000. NEW G \$1,500.0 GRAVE \$1,000.0 GRAVE \$1,200.0 NEW G \$3,500.0 increase AMENI \$2,500.0	d depending DMENT or	O.00 for LOTAL TO THE PANSION O.00 for LOTAL TO THE PANSION O.00 for LOTAL TO THE PAUS \$3,00 g on project EXPANS plus \$2,00	egal egal T egal Revie 00.00 et).	Ad more Ad Ad Ad ew and Le Engineer	's Estimate	es Escrow — may need t Legal Servic — may need t	es Escrow	Amount Paid \$ 3600.00 Date Paid: 12/18/23
PROPERTY DESCRIPTION		arcel ID	Map 341 M	31 Tosher Re	Lot(s)	1:	5	Zoning District	Industrial	Total Land Area	60.5 Ac.
PROPERTY OWNER'S INFORMATION		ame(s) hone mail			PO Box 69 Gorham, ME 04069)				
APPLICANT'S INFORMATION	Pl	ame(s) hone mail	(207)83	rothers Cons 39-2552 Shawbrothe		nc.	Mailing A	Address	PO Box Gorham	69 , ME 04069)
APPLICANT'S AGENT INFORMATION		ame hone mail	e Shawn Frank, PE (207)200-2062			Name of Business Sebago Technics, Inc. Mailing Address 75 John Roberts Road South Portland, ME 041		ad			
	Exist Gene Applic	ing Use: C	Quarry of the control	operation	approved activity	or u	i se: o this applic	cation is sub	ard in 200		

THE FOLLOWING QUESTIONS PERTAIN TO A NEW GRAVEL PIT APPLICATION

The original signed copy of this form must be accompanied by the required application fee, required number of application forms, plans, and other necessary submissions.

(1 copy of original application/etc., 1 electronic copy, 8 reduced size (11x17) plans, 7 full size (24x36) plans)

Chec That		THE FOLLOWING QUESTIONS MAY APPLY. (Answer Yes/No or comment Does Not Apply).	Explain or comment as needed for clarification	
YES	NO	REQUIRED GENERAL	INFORMATION	
		Complete the attached Agent Authorization form		
		Attached are copies of the deed to the property, option to purchase the property or other documentation to demonstrate right, title or interest in the property on the part of the applicant		
		Does the owner hold any interest in abutting or contiguous property? If yes, please explain:		
		Identify any and all easements on property. Attach copies of all easement deeds.		
		Copies of any and all existing covenants or deed restrictions.		
		Identify location of all building setbacks, yards and buffers required by Ordinance		
		Names and addresses of all abutting property owners, including those in neighboring towns, if applicable.		
		Vicinity map showing general location of the site within the Town based upon a reduction of the Town tax maps.		
		Boundaries of all contiguous property under the control of the owner or applicant, regardless of whether all or part is being developed at this time.		
		Name, registration number and seal of the architect, engineer and/or similar professional who prepared the plan.		
		Boundary Survey, if proposed pit is greater than 5 acres		
		Location and Boundaries of property, of existing and proposed excavation areas with surface area measurements	ACRES	
		Present use of abutting properties		
		Location of access roads, parking areas and all structures		
		Required buffer areas, existing and proposed slope ratios		
		Applicable plan requirements under Chapters 2 and 4		
YES	NO	EXISTING CON	DITIONS	
		Location and size of any existing sewer and water mains, culverts and drains, on-site sewage disposal systems, wells and power and telephone lines and poles on the property to be developed and of any that will serve the development from abutting streets or land.		

		Location, names and dimensions of existing driveways, streets and right-of-ways within or adjacent to the proposed development.	
		Location, dimensions and ground floor elevations of all existing buildings on site.	
		Location and dimensions of parking and loading areas and walkways on site.	
		Location of intersecting roads or driveways within two hundred (200) feet of the site.	
		Location of open drainage courses, floodplains, wetlands, stands of trees, and other important natural features, with a description of such features to be retained.	
		Identify rivers, streams, ponds or wetlands within 250' of the site	
		Location of all surface and groundwater, depth to ground water	
		Erosion and Sedimentation Control Plan to standards of C.C.S. & W.C.D.	
		Hydrogeological Study, if proposed pit is >5A	
		Does the proposed excavation overlay a state mapped sand and gravel aquifer? (yes or no)	
		Identify rivers, streams, ponds or wetlands within 250' of the site	
		Direction of existing surface water drainage across the site.	
		Location, front view and dimensions of existing signs.	
		Location and dimensions of any existing easements and copies of existing covenants or deed restrictions.	
		Location of the nearest fire hydrant, dry hydrant or other water supply for fire protection and any existing fire protection systems.	
YES	NO	PROPOSED DEVELOP	MENT ACTIVITY
		Location and dimensions of all provisions for water, evidence of their adequacy for the proposed use, including test pit data if on-site sewage disposal is proposed.	
		Direction of proposed surface water drainage across the site.	
		Provisions for handling solid wastes, including the location and proposed treatment of any on-site collection or storage facilities.	
		Location, dimensions and ground floor elevations of all proposed buildings or expansion on the site.	

		Location and dimensions of proposed driveways, parking and loading dock areas and walkways.	
		Location, front view, materials and dimensions of proposed signs, together with the method for securing the sign.	
		Location and type of exterior lighting.	
		Proposed landscaping and buffering.	
		Construction schedule, including anticipated beginning and completion dates.	
ATTACH I	PLANS THA RADES AND	AT SHOW CONSTRUCTION DETAILS FOR PARKING DRAINAGE, AS APPLICABLE FOR CLARITY.	GAREA(S), CONSTRUCTIONS NOTES,
YES	NO	UTILITI	ES
		Location of all utilities, including fire protection systems.	
		Public Sewer: Attach a letter from the Portland Water District (PWD) that verifies that public sewer can be connected to, and that the existing system has available capacity. Estimated gallons per day.	
		Septic System: Subsurface waste disposal. Attach a copy of the HHE 200 Report.	
		Public Water: Attach a letter from the Portland Water District (PWD) that verifies the site can be served for the foreseeable future and that the proposed water plan meets or exceeds design requirements of the PWD.	
		Fire Protection: Attach a letter from the Town of Gorham Fire Chief that verifies all design requirements for fire service and or fire protection are satisfactory.	
		Who is the electrical provider? Power will be: underground overhead Single Phase; 2 Phase; 3 Phase.	
1000		Who is the Telephone provider?	
		Who is the Natural Gas provider?	
YES	NO	SIGNAC	EE
		Are there existing signs on-site? If so, how many are there and what is the total sign area in square feet?	
		Is there proposed new signage? If so, how many signs are proposed and what is the total proposed square footage? Attach schematic drawings for EACH proposed sign, indicate the sign area in square feet, and show location on the site plan.	
YES	NO	FLOODPLAIN AND SHO	DRELAND ZONING
		Is any part of the property within the Shoreland Overlay District	
		Is any part of the property within a flood hazard area that	

		is subject to periodic flooding? If yes, explain.	
		Are the 100 yr. Floodplain Zones and the Shoreland Zoning boundaries shown on the site plan?	
YES	NO	AESTHETICS AND ENVIR	ONMENTAL IMPACT
		Is this property an important historic or natural site, or adjacent to such a site? If yes, explain:	
YES	NO	BUSINESS I	HOURS
		Days of Operation:	
		Hours of Operation:	
		This is a year round operation.	
		This is a seasonal operation. If so, what are the months of operation?	
		Will there be more than one shift? If yes, please describe:	
YES	NO	TRAFF	IC
		Estimate the number of vehicle trips entering and exiting the site on a daily basis.	
		Estimate the number of vehicles entering and exiting the site during the busiest a.m. hour (list hours):	
		Estimate the number of vehicles entering and exiting the site during the busiest p.m. hour (list hours):	
		Will there be delivery truck service? If so indicate the following: size(ft wide x ft long), number, type and frequency of delivery and service vehicles:	
YES	NO	POST CONSTRUCTION STORM	MWATER MANAGEMENT
		Will the construction activity disturb one acre or more?	
		Is the parcel located within the Town of Gorham MS4 area?	
YES	NO	STATE AND LOCA	AL PERMITS
		Is a Maine Department of Environmental Protection (MDEP) Permit required? If so, list the permit.	
		Is an Army Corps of Engineers approval/permit required? I so, list the permit.	f
		Are there any State or Federal approval required? If so, list the approval.	
		Are there any State or Federal Licenses/ Permits required? If so, list the license/permit.	
		A Maine Construction General Permit (MCGP) is required where the area of disturbance is greater than one acre. Is at MCGP permit required?	
		Is a variance from the Zoning Board of Appeals required? If yes, please describe:	

		List all other municipal permits and licenses required:	
THE FO	DLLOWI	NG QUESTIONS PERTAIN TO A <u>GRAVEI</u> APPLICATION	PIT AMENDMENT/EXPANSION
The <u>origin</u> plan set plu	al signed cop us 15 sets of	by of this form must be accompanied by the required fees, or the plans, maps, drawings, and other necessary submissions	ne electronic copy of the application form and
Chec That	k All Apply	THE FOLLOWING MAY APPLY. (Answer Yes/No or comment Does Not Apply).	Explain or comment as needed for clarification
YES	NO	GENERAL INFORMATION	
	4	Is this application an amendment to an approved Site Plan? If yes, please identify the applicant and date of approval.	This application is an amendment to the quarry operation approved in 2008.
4		Copies of documents that show 'Right, Title and/or Interest' in the property are attached. If not, please explain.	
4		Does the owner hold any interest in abutting or contiguous property? If yes, please explain.	The Shaw Brothers Industrial campus and recently obtained land to the north
	4	A list of all abutting property owners has been submitted. If not, please explain.	Town Planning Office to provide
		EY PREPARED BY A REGISTERED PROFESSIONAL SU D IF THE PROPOSED AREA OF EXPANSION IS 5 ACRE	
	21	Is the proposed area of expansion five areas or more?	
	4	Any and all easements on property have been identified and copies of all easement deeds are attached. If not, please explain.	Not applicable to this lot
4		The property boundaries are shown and labeled on the map.	
4		The areas for expansion of excavation (w/surface area measurements) are shown on the plan.	
4		An estimated time schedule for future excavation has been submitted. If not, please explain.	
4		Existing Parking areas are shown on the plan.	
4		Road access to the excavation site is shown on the plan.	
	4	Exposed ground water areas are shown on the plan.	Not applicable at this time
4		All temporary and permanent structures are shown on the plan.	
4		A narrative that describes all accessory activities related to the site, including the processing of materials brought to the site from another location, has been submitted.	
	4	The location of hazardous materials and storage of such is shown on the plan.	Hazardous materials associated with blasting are not stored on site
4		The erosion and sedimentation control plan has been revised in accordance with this amendment	
4		A Reclamation Plan pursuant to Section 6 has been revised in accordance with this amendment.	
YES	NO	Submission requirements of Chapter 2, Subsection 2	-1, C. 3) b) if expansion of 5 acres or more

		A Hydro-geological study has been submitted. If not, please explain.				
		A Traffic Study has been submitted. If not, please explain.				
	PARKING					
		Total number of parking spaces required under the Zoning Ordinance:				
		Number of existing parking spaces:				
		Estimated number of parking spaces required by proposed use is:				
		Existing paved area is (sq. ft.):				
		Proposed new paved area is(sq. ft.):				
		Number of proposed new parking spaces:				
		Size of spaces: (9' x 18'):				
		Width of maneuvering aisles(ft.):				
ATTACH I GRADES A	PLANS THA AND DRAIN	AT SHOW CONSTRUCTION DETAILS FOR PARKING AN NAGE, AS APPLICABLE FOR CLARITY.	REA(S), CONSTRUCTIONS NOTES, FINAL			
YES	NO	SIGNAGE				
		Are there existing signs on-site? If so, how many are there and what is the total sign area in square feet?				
		Is there proposed new signage? If so, how many signs are proposed and what is the total proposed square footage?				
		C DRAWINGS FOR EACH PROPOSED SIGN, INDICATE IN THE SITE PLAN.	THE SIGN AREA IN SQUARE FEET, &			
YES	NO	BUSINESS HO	URS			
		Days of Operation:				
		Hours of Operation:				
		What are the months of operation?				
		Will there be more than one shift? If yes, please explain.				
YES	NO	AESTHETICS AND ENVIRON	MENTAL IMPACT			
		Does this amendment affect property that is of historical importance or adjacent to such a site? If yes, explain:				
YES	NO	FLOODPLAIN AND SHORI	ELAND ZONING			
		Is any part of the property within the Shoreland Overlay District? If yes, explain.				
		Is any part of the property within a flood hazard area that is subject to periodic flooding? If yes, explain.				
YES	NO	TRAFFIC				
		Estimate the number of vehicle trips entering and exiting the site on a daily basis.				
		Estimate the number of vehicles entering and exiting the site during the busiest a.m. hour (list hours):				

		Estimate the number of vehicles entering and exiting the site during the busiest p.m. hour (list hours):	
		Please indicate the following: size (ft wide x ft long), number, and frequency of trucks exiting the site with gravel loads:	
YES	NO	POST CONSTRUCTION STORMY	VATER MANAGEMENT
4		Will the construction activity disturb one acre or more?	MDEP Variance Permit #L-23528-80-C-A for externally drained quarry to be amended
4		Is the parcel located within the Town of Gorham MS4 area?	
YES	NO	STATE AND LOCAL	PERMITS
4		Is a Maine Department of Environmental Protection (MDEP) Permit required? If yes, list the permit.	NOI Performance Standards for Quarries & Variance Permit #L-23528-80-C-A
	4	Is an Army Corps of Engineers approval/permit required? If yes, list the permit.	
4		Are there any State or Federal approval required? If yes, list the approval.	NOI Performance Standards for Quarries & Variance Permit #L-23528-80-C-A
4		A Maine Construction General Permit (MCGP) is required where the area of disturbance is greater than one acre. Is an MCGP permit required?	
	4	Is a variance from the Zoning Board of Appeals required? If yes, please describe:	
	4	List all other municipal permits and licenses required:	Not Applicable
ADDITION	NAL COMM	IENTS:	
quarry. A requests the existing original p	As the app hat the bung quarry property li	obtained the property to the north of the original dicant's northerly property line is now the Queen affer originally required along property lines be to permit an expansion of the Phase 1 quarry to the net that blasting was not previously permitted. A below the water table, no impacts to groundward	a Street right of way, the applicant eliminated at the northerly limits of excavate within the 150 feet from the As Phase 1 excavation does not
		makes application to the Town of Gorham for approval of the post of his/her knowledge	
	APPLICAN	T OR APPLICANT'S AGENT DATE	18/23
PRINT NAM			

APPLICANT'S CHECKLIST FOR PLAN REQUIREMENTS

SUBMITTALS THAT THE TOWN PLANNER DEEMS SUFFICIENTLY LACKING IN CONTENT WILL NOT BE SCHEDULED FOR PLANNING BOARD REVIEW

devel proje	ollowing checklists include items generally required for opment by the GORHAM LAND USE ORDINANCES and, due to cts specifics, are required to provide a complete and accurate set of , reports and supporting documentation.
A)	Paper size:
	No less than 11" X 17" (reduced) or greater than 24" X 36"

	No less than 11" X 17" (reduced) or greater than 24" X 36
	(full)
B)	Scale size:
	Under 10 acres: no greater than 1" = 30'
	4 10 + acres: 1" = 50'

C) Title block:

Applicant's name and address

Name of preparer of plans with professional information and professional seal

A Parcel's tax map identification (map - lot)

4 Date of plan preparation

D) Boundary survey performed and sealed by licensed surveyor:

4 Identify all existing boundary markers

A Show all proposed boundary monuments (per ordinance)

A Show all metes and bounds, rights of way and easements

A Show names of adjacent lot owners and parcel tax map numbers

E) Provide orientation:

Arrow showing true north and magnetic declination

4 Graphic scale

A Parcel Owners and map and lot

4 Signature blocks

F) Show location and description of:

Elevations of dwelling units, If applicable.

All structures within 50 feet of the project parcel.

All driveway entrances or accesses within 100 feet

G) Show parcel date:

4 Zoning District(s)

Lots

Lot Widths

Lot Depths

Street Frontage

4 Building setback lines

4 Lot Areas

Rights-of-Way

ROW Area

Existing and new street names

4 Wetlands

Wetland setbacks

Common tracts

4 Easements

4 Parcel Areas

Shoreland Zoning setbacks

IT IS THE RESPONSIBILITY OF THE APPLICANT TO PRESENT A CLEAR UNDERSTANDING OF THE PROJECT.

L)	Indicate required landscaping including:
	Type of plant material
	Plant/Tree sizes
	Placement
	Irrigation systems
M)	Legal Documents:
ĺ	Easements
	Deed of Covenants
	PWD Agreement to serve
	Homeowners' Association
	Road Maintenance Docs
,	4 Deed docket & page numbers
N)	Provide a locus map at scale not more than 400 feet to the inch showing the relation to other properties and geographic features
	and show:
	All the area within five hundred (500) feet of the boundary
	line of the proposed development.
	Any smaller area between tract and all existing streets,
	provided any part of such a street used as part of the
	perimeter for the locus map is at least five hundred (500)
0)	feet from any boundary of the proposed development. Show the locations of any:
0)	Parks
	Preserved Open space
	Conservation Easements
	Note on the plan regarding areas to be dedicated for public
P)	use and conditions of such dedication. Identity and locate each:
.,	Easements
	Rights-of-way
	Street alignments
Q)	All intersecting property lines within 50 feet of the parcel. Include plans, profiles and typical sections of all roads and other
(V)	paved ways, including all relevant street data.
	Intersections or
	Distance to nearest intersection
	Driveways onsite
	Distance to nearest driveway
R)	Sight visibility lines Show all existing and proposed Lighting
IC)	Map of all street lighting, attached lighting, and area
	lighting
	Location of lighted signs
	Photo-metrics map
S)	The state of the s
	Indicate the location of any permanently installed
	machinery likely to cause appreciable noise at the lot lines
T)	Provide description of these materials stored on the property:
	Hazardous
	Toxic
	Raw Waste
U)	

bodies, water courses, forest cover, and ledge outcroppings. Show the location of existing and proposed utilities and identity which utilities are to be privately owned/municipally owned. Overhead Electric Underground electric Water Mains Wells Gas Mains Cable TV Sewer Mains Test Pits Septic Tanks Other artificial features Copies of State and Local permit applications: Identify named streams, rivers, ponds on-or-within 2 site Notice of Intent NRPA Permit by Rule All other applicable permits X) Copy of FIRM Map showing boundary to scale. NOTE TO APPLICANT: PRIOR TO THE SITE WALK TEMPORARY MARKERS MUST BE ADEQUATELY PLACED THAT ENABLE THE PLANNING BOARD TO	Show the location of existing and proposed utilities and identity which utilities are to be privately owned/municipally owned. Overhead Electric Underground electric Water Mains Wells Gas Mains Cable TV Sewer Mains Test Pits Septic Tanks Leach Fields Storm drain lines Catch Basins Culverts Gutters Stormwater storage basins	W) Copies of State and Local permit applications: Identify named streams, rivers, ponds on-or-within 250' of site Notice of Intent NRPA Permit by Rule All other applicable permits Copy of FIRM Map showing boundary to scale. NOTE TO APPLICANT: PRIOR TO THE SITE WALK, TEMPORARY MARKERS MUST BE ADEQUATELY PLACED THAT ENABLE THE PLANNING BOARD TO READILY LOCATE AND APPRAISE THE LAYOUT OF
Level spreaders Rain gardens Nearest Fire Hydrant	Rain gardens	

DDODEDTV	PHYSICAL	341 Mosher Road		MAP(S)	31	
PROPERTY DESCRIPTION	ADDRESS/ LOCATION			LOT(S)	15	
APPLICANT(S) INFORMATION	NAME(S)	Shaw Brothers Construction, Inc.		MAILING ADDRESS	PO Box 69 Gorham, ME 04069	
	PHONE	(207)839-2552				
	EMAIL.	dshaw@shawbrother	s.com			
	NAME(S)	SB Aggregates, LLC		HTTINE II	PO Box 69	
OWNER(S) INFORMATION	PHONE	(207)839-2552		MAILING ADDRESS	Gorham, ME 04069	
	EMAIL	dshaw@shawbrothers.c	om			
APPLICANT'S	NAME	Shawn Frank, PE	BUSINESS NAME	Sebago T	echnics, Inc.	
AGENT	DILONE	(207)200-2062			nn Roberts Road	
	PHONE	(207)200-2002	MAILING			
INFORMATION Said agent(s) ma	EMAIL y represent n	sfrank@sebagotechnics.com	ADDRESS officers and the G	South Por	rtland, ME 04106	
INFORMATION Said agent(s) ma	y represent naplete the app	sfrank@sebagotechnics.com ne/us before Gorham Town of aroval of the proposed develo	ADDRESS officers and the G	South Portion Plan	rtland, ME 04106	
Said agent(s) may expedite and company APPLICANT SIGNATION	y represent naplete the apparture	sfrank@sebagotechnics.com ne/us before Gorham Town of the proposed development of the	ADDRESS officers and the Gopment for this po	South Portion Plan	rtland, ME 04106	
Said agent(s) may expedite and company APPLICANT SIGNAD Dan Shaw PLEASE TYPE OR P	email y represent n plete the app ATURE PRINT NAME HE	sfrank@sebagotechnics.com ne/us before Gorham Town of the proposed development of the	ADDRESS Officers and the Gopment for this pa	South Portion Plan	rtland, ME 04106	

Table of Contents

Cover Letter & Application Form

Exhibit 1 Location Maps

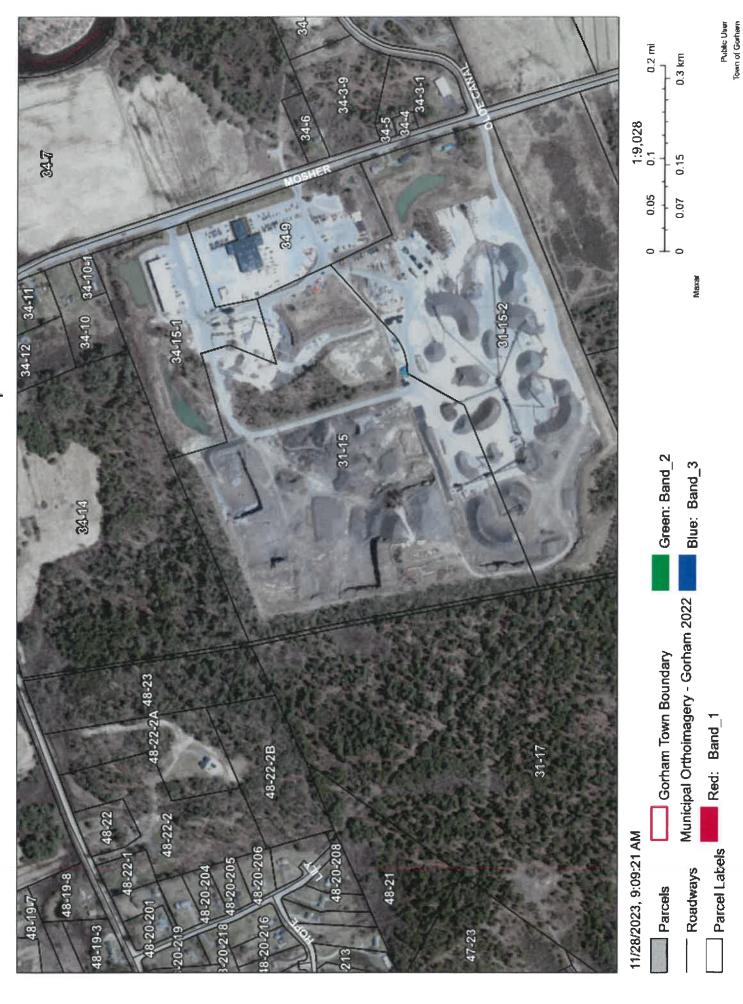
Exhibit 2 Right, Title or Interest

Exhibit 3 Bodwell EnviroAcoustics, LLC

Exhibit 4 Stormwater Management Report

Exhibit 1

Location Maps



Town of Gorham Public Map Viewer

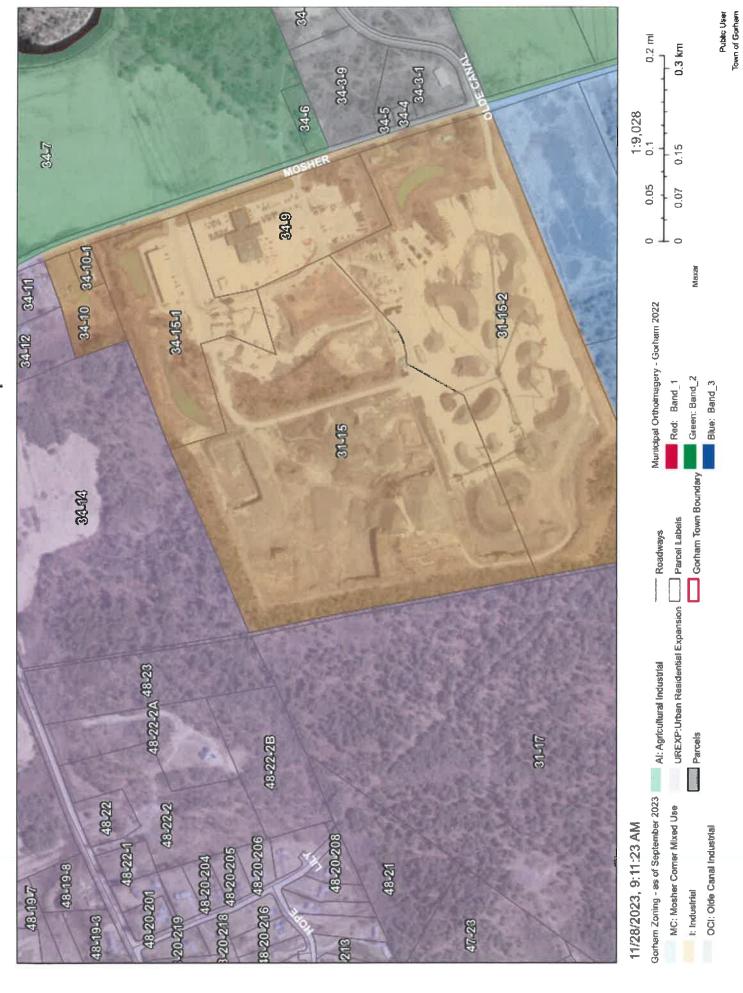


Exhibit 2

Right, Title or Interest

327 MOSHER ROAD

Location 327 MOSHER ROAD

Mblu 31/15///

Acct# 4436

Owner S.B. AGGREGATES LLC

Assessment \$362,600

Appraisal \$362,600

PID 1566

Building Count 1

Current Value

	Appraisal		
Valuation Year	Improvements	Land	Total
2023	\$0	\$362,600	\$362,600
	Assessment		
Valuation Year	Improvements	Land	Total
2023	\$0	\$362,600	\$362,600

Owner of Record

Owner

S.B. AGGREGATES LLC

Sale Price

\$540,000

Co-Owner Address

PO BOX 69

Certificate

341 MOSHER ROAD

Book & Page 24451/24

GORHAM, ME 04038

Sale Date

10/11/2006

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
S.B. AGGREGATES LLC	\$540,000		24451/ 24	10/11/2006
S.B. AGGREGATES LLC	\$938,948		24262/ 29	08/14/2006
SHAW JONATHAN E &	\$938,948		24262/ 25	08/14/2006
SB HOLDINGS INC	\$938,948		23018/ 111	08/12/2005
MORIN BRICK CO	\$0		3212/62	02/07/1972

Building Information

Building 1 : Section 1

Year Built:

Living Area:

0

Replacement Cost:

60

Building Percent Good:

\$0

Replacement Cost

Less Depreciation:

\$0

Building Attributes				
Field Description				
Style	Vacant Land			
Model				
Grade:				
Stories:				
Occupancy				
Exterior Wall 1				
Exterior Wall 2				
Roof Structure:				
Roof Cover				
Interior Wall 1				
Interior Wall 2				
Interior Flr 1				
Interior Flr 2				
Heat Fuel				
Heat Type:				
AC Type:				
Total Bedrooms:				
Total Bthrms:				
Total Half Baths:				
Total Xtra Fixtrs:				
Total Rooms:				
Bath Style:				
Kitchen Style:				
ADU				

Building Photo



(https://images.vgsi.com/photos/GorhamMEPhotos//default.jpg)

Building Layout

(https://images.vgsi.com/photos/GorhamMEPhotos//Sketches/1566_1566.)

Building Sub-Areas (sq ft)	<u>Legend</u>
No Data for Building Sub-Areas	

Extra Features

Extra Features	<u>Legend</u>
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code

4201

Size (Acres)

60.48

Description QRY ACTIVE

Zone I Neighborhood Alt Land Appr No

Category

Frontage Depth 0 0

Assessed Value \$362,600 Appraised Value \$362,600

Outbuildings

Outbuildings	<u>Legend</u>
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2023	\$0	\$362,600	\$362,600
2022	\$0	\$362,600	\$362,600
2021	\$0	\$347,500	\$347,500

Assessment			
Valuation Year	Improvements	Land	Total
2023	\$0	\$362,600	\$362,600
2022	\$0	\$362,600	\$362,600
2021	\$0	\$347,500	\$347,500

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WARRANTY DEED

Doc#:

Maine Statutory Short Form

Know all men by these presents that, Morin Brick Company, a Maine corporation with an office at Auburn, Androscoggin County, Maine and a mailing address of P.O. Box 1510, 130 Morin Brick Road, Auburn, Maine 04210, in consideration of one dollar (\$1.00) and other good and valuable consideration paid by S.B. Aggregates, LLC, grants to S.B. Aggregates, LLC, a Maine limited liability company with an office at Gorham, Cumberland County, Maine and a mailing address of P.O. Box 69, 511 Main Street, Gorham, Maine 04038, with warranty covenants, the real property located at Mosher Road in Gorham, Cumberland County, Maine, described as follows:

A certain parcel of land with any improvements located thereon, situated on the southwesterly side of Route 237, also known as Mosher Road, in Gorham, Cumberland County, Maine, as shown on a Existing Conditions Worksheet of Lachance Brick for Shaw Brothers Construction by Sebago Technics, Inc. dated March 23, 2006, last revision date September 20, 2006, with reference to Job Number 05159EC (the "Plan"), being further bounded and described as follows:

Commencing at a point on the southwesterly side of Route 237 at the northerly corner of land now or formerly of Michael Huskins as described in a deed recorded at Cumberland County Registry of Deeds in Book 14065, Page 121, near a 6" x 6" granite monument 5" high with a drill hole;

Thence North 18°-26'-45" W, by and along the southwesterly sideline of said road, a distance of 516.39 feet to a 5/8-inch capped rebar to be set at the Point of Beginning;

Thence S 71°-33'-15" W, by and along land to be retained by said Grantor, a distance of 430.00 feet to a 5/8-inch capped rebar to be set;

Thence N 18°-26'-45" W, by and along land to be retained by said Grantor, a distance of 506.50 feet to a 5/8-inch capped rebar to be set;

Thence N 71°-33′-15" E, by and along land to be retained by said Grantor, a distance of 430.00 feet to a 5/8-inch capped rebar to be set at the southwesterly sideline of said road;

Thence N 18°-26′-45" W, by and along said road, a distance of 328 feet, more or less, to the premises described in a certain warranty deed from Jonathan E. Shaw and Daniel H. Shaw to S.B. Aggregates, LLC dated August 11, 2006 and recorded in the Cumberland County Registry of Deeds in Book 24262, Page 29;

Thence South 71° - 33° - 15° West along said S.B. Aggregates, LLC land six hundred fifty and 00/100 feet;

Thence South 18° - 26' - 45" East on a course parallel to the westerly sideline of Mosher Road and continuing along said S.B. Aggregates, LLC land nine hundred seventy-six and 60/100 feet (976.60') to a point;

Thence North 71° - 33′ - 15′ East continuing along said S.B. Aggregates, LLC land six hundred fifty and 00/100 feet to a point on the southwesterly sideline of Mosher Road;

Thence North 18°-26′-45″ W, by and along the southwesterly sideline of said road, a distance of 142 feet, more or less to a 5/8-inch capped rebar to be set at the Point of Beginning.

Bearings are based on Grid North.

Granted Pole Access Easement:

Together with a pole access/utility easement appurtenant to the above-described property of Grantee ("Grantee's Property") for the installation, use, maintenance and repair of electrical utilities with a right of entry on foot or in vehicles with all the equipment necessary or reasonably required to accomplish the purpose of accessing three phase power through and across an approximately 10-foot wide swath of Grantor's approximately 5.0acre retained property depicted on the Plan(the "Grantor's Property") from the existing "440 Power Transformer Pole" located on the northerly edge of Grantor's Property to the Grantee's Property. Subject to the following limits and conditions, Grantor covenants and agrees not to discontinue its present contract (with Central Maine Power Company), connection and access for use of three phase power unless and until the Grantee herein has been allowed to take over the expenses of such access for its own benefit, or see to its own assumption or connection of such facility on its property. The foregoing easement and Grantor's obligations are limited and conditioned as follows: (i) this easement shall automatically terminate twenty-five (25) years from the date hereof; (ii) Grantor shall have no obligation to maintain said power contract in the event Grantee does not promptly pay all the charges, costs and expenses related to such contract or any substitutes or replacements of it; (iii) nothing herein shall obligate Grantor to maintain the pole or any other improvements related thereto; (iv) Grantor shall have the unilateral right from time to time to relocate the easement at its sole cost and expense, and as part of such relocation shall endeavor to minimize the disruption of Grantee's power flow during such efforts.

Grantee shall give prior written notice to Grantor as to any work to be performed on the easement, and shall endeavor to minimize the disruption of Grantor's power flow during such efforts. Grantee shall promptly fully repair and restore the Grantor's Property after any entry and work thereon.

Grantee agrees to indemnify and hold harmless the Grantor from and against any and all damages, liabilities, losses, expenses, claims and suits (including the cost of defending the same, including reasonable attorneys' fees) incurred or suffered in consequence of either bodily injury to any person (including death) or damage to any property arising directly out of the Grantee's acts or omissions related to this easement, or the exercise by Grantee of the rights granted by this easement or the breach or violation of the terms hereof by Grantee. Grantor agrees to indemnify and hold harmless the Grantee from and against any and all damages, liabilities, losses, expenses, claims and suits (including the cost of defending the same, including reasonable attorneys' fees) incurred or suffered in consequence of either bodily injury to any person (including death) or damage to any property arising directly out of, or in connection with the breach or violation of the terms hereof by Grantor, and/or Grantor's interference with the use and enjoyment of this pole/utility easement by Grantee.

Reserved Leach Field and Drainage Easement:

Reserving, however, to the Grantor herein, as appurtenant to the Grantor's Property, the perpetual right and easement to repair, maintain and replace the leach field and/or drainage bed of a subsurface wastewater disposal system, or septic system serving the improvements on the Grantor's Property, and to construct, lay, relay, repair, maintain, replace and remove septic utility pipes or lines, with all necessary fixtures and appurtenances along with a right of entry on foot or in vehicles with all the equipment necessary or reasonably required to accomplish the purpose of this easement, within the limits of the existing location of the Grantor's leach field or septic drainage bed, in an area of Grantee's Property approximately 60 feet by 20 feet, being the present location of the leach field and/or drainage bed serving the Grantor's Property, and described as follows:

A certain parcel of land with any improvements located thereon, situated on the southwesterly of, but not adjacent to the southwesterly side of <u>Route 237</u>, also known as Mosher Road, in **Gorham**, Cumberland County, Maine, as shown on the Plan, being further bounded and described as follows:

Commencing at a point on the southwesterly side of Route 237 at the most northeasterly corner of the Grantor's Property;

Thence South 71° - 33′ - 15″ West along the northerly boundary line of Grantor's Property 90 feet, more or less, to a Point of Beginning;

Thence North 18° - 26′ - 45″ West, through Grantee's Property 20 feet, more or less to a point;

Thence South 71° - 33′ - 15″ West through Grantee's Property 60 feet, more or less to a point;

Thence South 18° - 26′ - 45″ East, through Grantee's Property 20 feet, more or less to a point;

Thence North 71° - 33′ - 15″ East along the said northerly boundary line of Grantor's Property 60 feet, more or less, to the Point of Beginning.

The parties to this deed acknowledge that the above description is an approximation of the location of the actual beds and improvements of Grantor's leach field and/or drainage bed, and as such, this easement's area includes (i) any such additional portion of Grantee's Property not described above, but under or upon which are located improvements related to said beds and improvements and (ii) for purposes of conducting any work or repairs and replacements on the said beds and improvements areas in the vicinity of the easement area as are reasonably necessary to conduct such work, repairs and/or replacements.

Grantor agrees to indemnify and hold harmless the Grantee from and against any and all damages, liabilities, losses, expenses, claims and suits (including the cost of defending the same, including reasonable attorneys' fees) incurred or suffered in consequence of either bodily injury to any person (including death) or damage to any property arising directly out of the Grantor's acts or omissions related to this septic easement, or the exercise by Grantor of the rights granted and reserved by this easement or the breach or violation of the terms hereof by Grantor. Grantee agrees to indemnify and hold harmless the Grantor from and against any and all damages, liabilities, losses, expenses, claims and suits (including the cost of defending the same, including reasonable attorneys' fees) incurred or suffered in consequence of either bodily injury to any person (including death) or damage to any property arising directly out of, or in connection with the breach or violation of the terms hereof by Grantee, and/or Grantee's interference with the use and enjoyment of this septic easement by Grantor.

Bearings are based on Grid North.

The above described Grantee's Property is or may be conveyed subject to the following:

- 1. Customer-Owned Line Contract by and between Lachance Brick Company and Central Maine Power Company dated November 7, 1985 and recorded at Cumberland County Registry of Deeds in Book 7028, Page 233.
- 2. Rights and easements granted by Romeo Lachance, Stella Lachance and Pauline Lachance to Central Maine Power Company and New England Telephone and Telegraph Company by instrument dated December 18, 1967 and recorded at Cumberland County Registry of Deeds in Book 3038, Page 758.
- 3. Notice of Layout and Taking by the State of Maine from Ralph H. Lindsey and Goldie J. Lindsey dated September 28, 1950 and recorded at Cumberland County Registry of Deeds in Book 2022, Page 32.
- 4. Highway easement deed from Lachance Bros. Brick Company to the State of Maine dated September 1950 and recorded at Cumberland County Registry of Deeds in Book 2022, Page 414.
- 5. Those matters shown on a certain plan entitled Maine State Highway Commission Right of Way Map, State Aid Highway No. 2, Gorham, Cumberland County, Federal Aid Sec. Project No. S-0124(1), dated June 1950 and recorded in the Cumberland County Registry of Deeds in Plan Book 36, Page 30.
- 6. Rights and easements granted by Lee P. Robinson and Marjorie Robinson to Central Maine Power Company dated May 3, 1950 and recorded at Cumberland County Registry of Deeds in Book 2022, Page 72.
- 7. Rights and easements granted by Lachance Bros. Brick Company to Central Maine Power Company dated May 3, 1950 and recorded at Cumberland County Registry of Deeds in Book 2022, Page 69.
- 8. Rights and easements granted by Anna E. Grondin et al to Portland Water District dated November 23, 1938 and recorded at Cumberland County Registry of Deeds in Book 1564, Page 124.
- 9. Rights and easements granted by Ralph Lindsey and Goldie Lindsey to Central Maine Power Company and New England Telephone and Telegraph Company dated March 23, 1960 and recorded at Cumberland County Registry of Deeds in Book 2553, Page 82.

- Such state of facts disclosed on the Plan and on Property Line Plan of Morin Brick by Allied Engineering, Dated October 18, 1990.
- 11. Deed Restrictions: For so long as Morin Brick Company, its successors and assigns, owns, maintains or operates a brick manufacturing, warehousing, sales or distribution facility on the Grantor's Property, no manufacturing, distribution or sale of any clay- or shale-based brick products or cement-based masonry or cement-based landscape products shall be permitted on the above described and conveyed property owned by Grantee or its affiliates without the express written consent of Morin Brick Company, its successors and assigns. This covenant is intended to prevent competition with the business activities of Morin Brick Company as of the date of this deed, wherever such activities occur, but shall not be interpreted or expanded to preclude activities not currently within the scope of such business as of such date.

Meaning and intending to describe and convey a portion of the premises described in a warranty deed from Lachance Brothers Brick Company to Morin Brick Company dated February 7, 1972 and recorded in the Cumberland County Registry of Deeds in Book 3212, Page 65, and of the premises described in a warranty deed from Lachance Realty, Inc. to Morin Brick Company dated February 7, 1972 and recorded in the Cumberland County Registry of Deeds in Book 3212, Page 62.

This conveyance is made subject to municipal zoning and land use ordinances, utility easements of record, and real estate taxes payable to the local municipalities for the current tax year.

Also hereby conveying all rights, easements, privileges and appurtenances belonging to the premises hereinabove described.

Signed, sealed and delivered

in presence of

Morin Brick Company

Witness

By Peter Lachance, Its President

State of Maine Cumberland, ss.

September **26**, 2006

Then personally appeared before me the above named Peter Lachance, the duly authorized President of **Morin Brick Company**, and acknowledged the foregoing instrument to be his or her free act and deed in his or her said capacity and the free act and deed of said Grantor corporation.

My commission expires:

Notary Public Maine Attorney at Law

rinted name

Received
Recorded Resister of Deeds
Oct 11,2006 10:47:39A
Cumberland Counts
John B OBrien

Sawyer Law LLC, P.A. Gorham, Maine 04038-0001

P.O. Box One, 157 Main Street

Above Space Reserved for Recording Information

WARRANTY DEED

Maine Statutory Short Form

Know all persons by these presents that I, Cory S. Murray, of Gorham, Cumberland County, Maine, with a mailing address of 34 Carnation Drive, Gorham, Maine 04038 (the Grantor herein), for financial consideration, grant to S.B. Aggregates, LLC, a Maine limited liability company, with a place of business in Gorham, Cumberland County, Maine, and a mailing address of P.O. Box 69, 341 Mosher Road, Gorham, Maine 04038 (the Grantee herein), with warranty covenants, the real property in Gorham, Cumberland County, Maine, described as follows:

A certain lot or parcel of land, with any improvements thereon, located on the southerly side of Queen Street, so-called, located in the Town of Gorham, County of Cumberland, State of Maine, being more particularly bounded and described as follows:

Beginning at a 5/8 inch rebar set on the apparent southerly right-of-way limit of said Queen Street marking the northeasterly corner of the premises described in a warranty deed from John R. Crumpton, Jr. to Charles A. Hamblen and Deidre M. Hamblen dated September 20, 2019 and recorded in the Cumberland County Registry of Deeds in Book 36017, Page 120;

thence from said point of beginning South 16° - 09' - 09" West along land now or formerly of Charles A. Hamblen and Deidre M. Hamblen for a distance of one hundred fifty-eight and 76/100 (158.76) feet to a 5/8 inch rebar set;

thence South 05° - 41' - 13" West along land now or formerly of Charles A. Hamblen and Deidre M. Hamblen for a distance of eight hundred six and 24/100 (806.24) feet to a 5/8 inch rebar set;

thence South 07° - 23' - 42" West along land now or formerly of Charles A. Hamblen and Deidre M. Hamblen for a distance of three hundred forty-seven and 18/100 (347.18) feet to a 5/8 inch rebar set on the northerly boundary of land now or formerly of S. B. Aggregates, LLC as described in a warranty deed from Morin Brick Company dated September 26, 2006 and recorded in the Cumberland County Registry of Deeds in Book 24451, Page 24;

Thence North 82° - 35' - 27" East along said land now or formerly of S.B. Aggregates, LLC for a distance of four hundred thirty-two and 55/100 (432.55) feet to a 5/8 inch rebar set;

Thence North 81° - 36′ - 22″ East continuing along said land now or formerly of S.B. Aggregates, LLC, along the remnants of a stonewall, for a distance of six hundred ninety-four and 59/100 (694.59) feet to a 5/8 inch rebar set;

Thence North 84° - 29' - 15" East continuing along said land now or formerly of S.B. Aggregates, LLC for a distance of six hundred fifty-three and 51/100 (653.51) feet to a 5/8 inch rebar set at the southwest corner of other land now or formerly of S. B. Aggregates, LLC as described in a warranty deed from Martin McInnis dated August 4, 2017 and recorded in the Cumberland County Registry of Deeds in Book 34214, Page 77;

Thence North 04° - 11° - 47° West along said land now or formerly of S.B. Aggregates, LLC and along land now or formerly of Gary D. Nelson and Evangeline C. Nelson as described in a warranty deed from Walter A. Nelson et al dated October 15, 1993 and recorded in the Cumberland County Registry of Deeds in Book 11022, Page 240 for a distance of seven hundred and 00/100 (700.00) feet to a ½ inch iron pipe found;

Thence North 04° - 11' - 47" West along land now or formerly of Wayne M. Anderson and Mary E. Anderson as described in a warranty deed from Floyd L. Libby, Jr. and Hazel M. Libby dated July 20, 2001 and recorded in the Cumberland County Registry of Deeds in Book 16551, Page 165 for a distance of three hundred forty-two and 21/100 (342.21) feet to a capped rebar marked "BH2M;"

Thence North 04° - 11′ - 47″ West along land now or formerly of Floyd L. Libby, Jr. and Hazel M. Libby as described in a release deed from Floyd L. Libby, Jr. and Hazel M. Libby dated July 20, 2001 and recorded in the Cumberland County Registry of Deeds in Book 16551, Page 167 for a distance of three hundred thirteen and 41/100 (213.41) feet to a point on the apparent southerly right-of-way limit of said Queen Street being located South 20° - 47′ - 44″ East a distance of 20/100 (0.20) feet from a leaning rebar capped and marked "BH2M;"

Thence South 84° - 01' - 08" West along the apparent southerly right-of-way limit of said Queen Street for a distance of six hundred fifty-eight and 99/100 (658.99) feet to a point and an angle;

Thence South 81° - 59° - 24° West along the apparent southerly right-of-way limit of said Queen Street for a distance of six hundred ninety-two and 20/100 (692.20) feet to a point and an angle;

Thence South 87° - 13' - 05" West along the apparent southerly right-of-way limit of said Queen Street for a distance of one hundred sixty-five and 31/100 (165.31) feet to the point of beginning.

The above-described parcel of land containing 47.70 acres, more or less. All bearings are referenced to Magnetic North 2018. All rebars set are capped, "PLS #1271".

Reference is made to a certain plan entitled "Revised Standard Boundary Survey, Land of John Crumpton, Queen Street, Gorham, Maine," made for John Crumpton by Lost Corner Land Surveying, LLC, survey dated January 2019, plan dated April 8, 2022, Job No. 18-134.

Meaning and intending to describe and convey and hereby conveying the same premises described and conveyed in a certain warranty deed from John R. Crumpton, Jr. to Cory S. Murray dated April 14, 2022 and recorded in the Cumberland County Registry of Deeds in Book 39347, Page 206.

This conveyance is made subject to municipal zoning and land use ordinances, utility easements of record, and real estate taxes payable to the local municipality for the current tax year, which taxes the Grantee herein agrees to pay.

Also hereby conveying all rights, easements, privileges and appurtenances belonging to the premises hereinabove described.

In witness whereof, I, Cory S. Murray, the Grantor herein, have hereunto set my hand and seal this July 14, 2023.

Signed Sealed and Delivered in the presence of

Witness

Cory S. Murray

State of Maine County of Cumberland, ss.

July <u>/4</u>, 2023

Then personally appeared the above named Cory S. Murray and acknowledged the foregoing instrument to be his free act and deed.

My commission expires:

AFFIX NOTARIAL SEAL

Notary Public / Maine Attorney at Law

Printed Name

Below Space Reserved for Recording Information

John W. Sawyer - Attorney at _aw Maine Bar No. 2806

With all powers of a notary public per Title 4 MRSA Section 1056 NO SEAL REQUIRED

Received
Recorded Resister of Deeds
Jul 14,2023 01:21:18P
Cumberland County
Jessica M. Spaulding

-3-

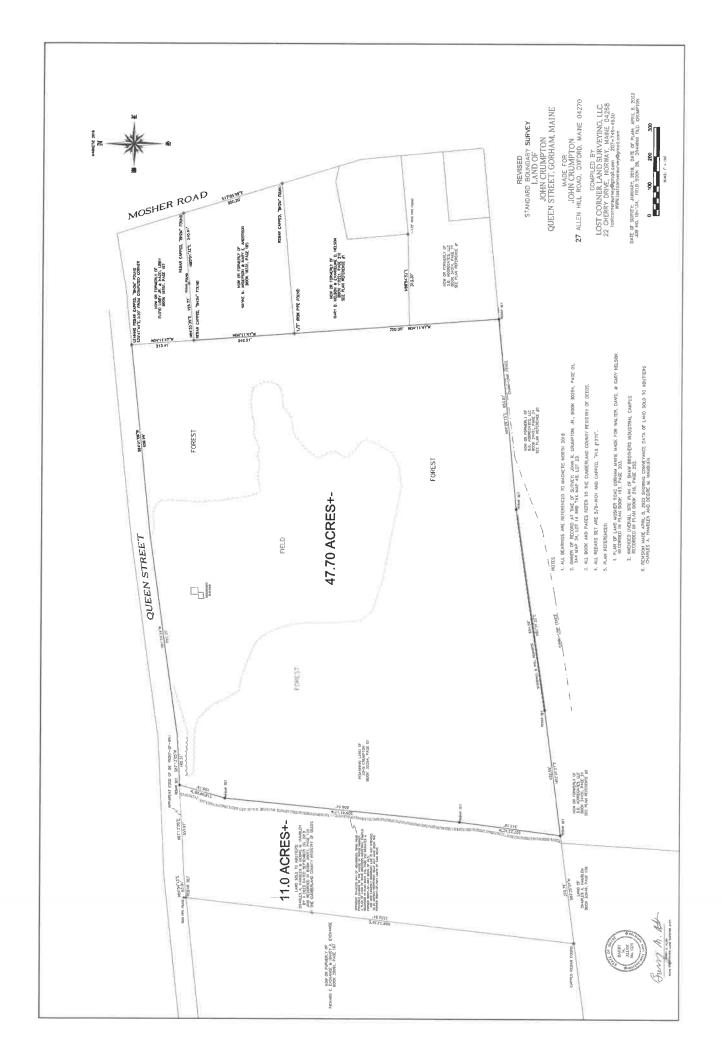


Exhibit 3

Bodwell EnviroAcoustics, LLC



55 Ocean Drive Brunswick, Maine 04011

December 15, 2023

Sean Frank Sebago Technics

Via email

Re: Brickyard Quarry – Sound Level Review of Proposed Quarry Expansion

Dear Sean,

I have reviewed the site and grading plans for the proposed Brickyard Quarry expansion, Shaw Brothers Construction, Inc., which I understand will extend the quarry limit approximately 150 feet north to the original Brickyard site property boundary. The proposed expansion was facilitated by acquisition of a 44-acre parcel of land to the north of the existing quarry site. As part of my review, I examined the 2016 Sound Level Assessment I prepared for the prior Brickyard Expansion to the south where aggregate processing and storage are now located.

As part of the 2016 study, sound testing was conducted in late 2015 at several property line locations around the quarry (see attached Sound Measurement Locations). The 2015 test results indicated that sound levels from routine full operation of the Brickyard facility, including quarry excavation, crushing/screening, and asphalt plant, were in compliance with applicable state and local sound level limits. The applicable sound limits and sound testing results are detailed in the 2016 Sound Level Assessment report.

As reviewed, the proposed quarry expansion to the north will be the same distance from the Brickyard property line, where sound limits apply, as the existing quarry operating area. An overall site grading plan is attached that depicts the limits of the existing and proposed quarry in relation to the Brickyard property lines. The grading plan also depicts the location of a Noise Control Berm for quarry drilling operations, which I understand will also be installed for the proposed quarry expansion. Accordingly, if the design of the proposed expansion is consistent with the existing quarry, including noise control measures, and there are no significant changes to the equipment operations, sound levels at the facility property line from the proposed expansion will essentially be the same as from current quarry operations.

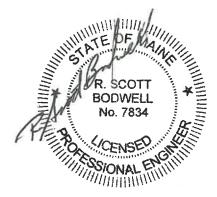
Therefore, assuming that past and current operations are in compliance with applicable sound limits, as demonstrated in late 2015, the proposed expansion will also be in compliance with these sound limits.

Please let me know if you have any questions or need additional information at this time.

Sincerely,

R. Scott Bodwell, P.E.

Bodwell EnviroAcoustics LLC



Attachments:

- 1) Sound Measurement Locations, Sound Level Assessment, February 2016
- 2) Overall Site Grading Plan, Sebago Technics, 11/21/23

From Brickyard Expansion - Sound Level Assessment February 2016



Figure 4-1. Sound Measurement Locations

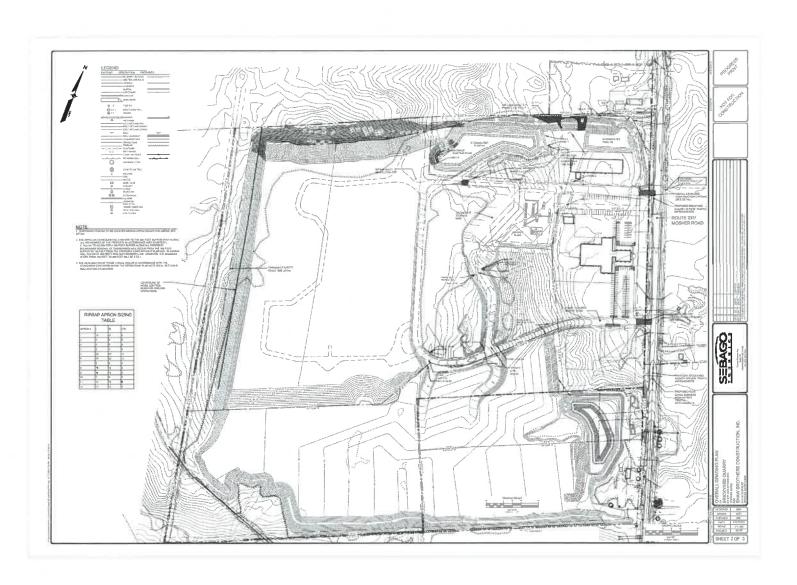


Exhibit 4

Stormwater Management Report



STORMWATER MANAGEMENT REPORT

For

BRICKYARD QUARRY GORHAM, MAINE

Prepared for:

Shaw Brothers Construction Inc. 341 Mosher Road Gorham, Maine 04038

Prepared by:

Sebago Technics, Inc. 75 John Roberts Rd, Suite 4A South Portland, ME 04106

December, 2023

STORMWATER MANAGEMENT REPORT BRICKYARD QUARRY GORHAM, MAINE

1. Introduction

This Stormwater Management Plan Report has been prepared to present analyses performed to address the potential impacts associated with the project due to proposed modification in stormwater runoff characteristics and land cover changes. The stormwater management controls that are outlined in this report have been designed to suit the proposed development and to comply with applicable regulatory requirements.

The proposed development will consist of an expansion to the existing Brickyard Quarry behind the Shaw Brothers office and shop on Mosher Road (Route 237) in Gorham. The expansion of the quarry as shown on the provided plans is proposed to extend approximately 150 feet toward the northern property line to obtain the ledge within the originally required buffer and match the grading design that was previously approved. It is anticipated that the total increase in impervious area associated with the expansion consisting of the floor of the quarry will be around 2.4 acres. The stormwater HydroCAD model, calculations, and plans were updated to accommodate the quarry expansion. The current stormwater management was reviewed to verify that the proposed expansion meets the current Maine DEP standards for flooding and treatment.

2. Stormwater Management

General Standard - Chapter 500, Section 4(C)

Updated BMP sizing and treatment calculations are provided as Appendix 1.

The existing wet pond that treats and detains the quarry operations was reviewed with the additional impervious area. With the additional area directed to the pond, the existing permanent pool volume was not met. The wet pond was expanded toward the west and regraded to meet the required permanent pool volume per DEP standards. Through the pond modifications to treat the associated impervious area from the quarry, 96.4% of new impervious area and 92.9% of new developed area will be receiving treatment. This meets the requirements for the Maine DEP General Standards.

Flooding Standard - Chapter 500, Section 4(F)

The Flooding Standard requires a project's stormwater management system detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2, 10, and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project. As such, a runoff evaluation was performed using the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds - Technical Release #55 (TR-55)". HydroCAD computer software was utilized to perform the calculations. The original stormwater management plan utilized rainfall data from Chapter 500, Appendix H prior to the 2015 updated rainfall events. The HydroCAD models for the pre-development and post-development conditions were updated to reflect the current rainfall duration. Rainfall values for Cumberland County are listed in the table below.

	Storm Frequency Precipitation (in./24 hr) Cumberland County							
2-year	3.1							
10-year	4.6							
25-year	5.8							

The following table presents the results of the peak runoff calculations at the analysis points for the existing and proposed conditions.

	Stormwater Peak Discharge Summary Table										
	2-	Year Sto	rm	10)-Year St	orm	25-Year Storm				
Study Point	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)		
SP1	8.63	5.75	-2.88	28.36	9.41	-18.95	44.37	11.54	-32.83		
SP2	18.40	14.55	-3.85	33.48	27.38	-6.10	45.85	38.06	-7.79		
SP3	4.76	4.55	-0.21	10.55	10.35	-0.20	15.68	15.53	-0.15		
SP4	5.63	5.60	-0.03	12.54	12.50	-0.04	18.66	18.61	-0.05		
SP5	7.47	5.62	-1.85	19.99	13.99	-6.00	31.77	21.68	-10.09		
SP6	3.15	2.48	-0.67	9.51	8.98	-0.53	15.73	15.64	-0.09		
SP7	2.07	1.21	-0.86	5.77	3.50	-2.27	9.29	5.69	-3.60		
SP8	3.51	0.51	-3.00	10.12	2.04	-8.08	16.46	3.67	-12.79		
SP9	2.43	0.67	-1.76	7.47	1.66	-5.81	12.53	2.59	-9.94		

The HydroCAD Data output sheets from this analysis are appended to this report (Appendix 2) along with the Stormwater Management Plans (Appendix 3). The model predicts that the peak runoff rates in the post-development condition at Study Points 1 through 9 are below pre-development runoff rates for the 2, 10, and 25-year storm events with implementation of the stormwater management practices.

3. Summary

It is determined that the existing stormwater management infrastructure with updated rainfall data and the modifications to the wet pond will adequately manage and treat stormwater runoff as required by the Maine DEP.

Prepared by:

SEBAGO TECHNICS, INC.

Dylan J. Stuart Civil Engineer

Appendix 1

Stormwater Quality Calculations

Table 1 IMPERVIOUS AREA / DEVELOPED AREA TREATMENT SUMMARY

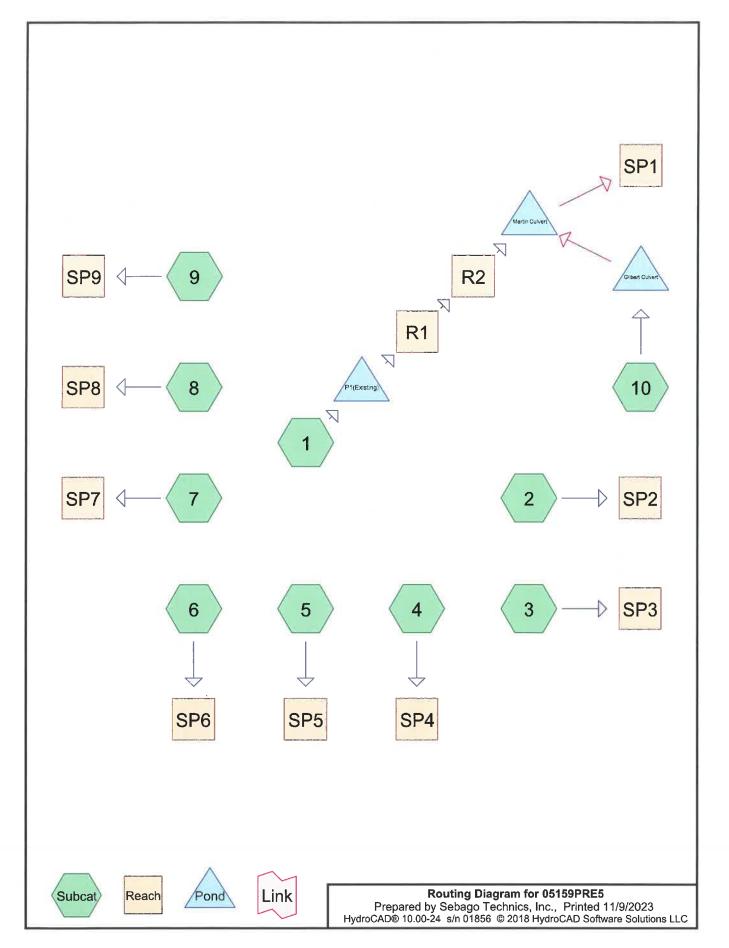
Sucatchment ID (HydroCAD)	Area Description	Total Impervious Area (Ac.)	Total Impervious Area Requiring Treatment (Ac.)	Total Impervious Area Receiving Treatment (Ac.)	Total Developed Area (Ac.)	Total Developed Area Requiring Treatment (Ac.)	Total Developed Area Receiving Treatment (Ac.)
11	Impervious	37.39	35.52	37.39	37.39	35.52	37.39
	Landscape				8.31	6.65	8.31
12	Impervious	0.42	0.40	0.42	0.74	0.70	0.74
	Landscape				0.33	0.26	0.00
13	Impervious	2.67	2.54	2.67	2.67	2.54	2.67
	Landscape				2.43	1.94	2.43
14	Impervious	0.02	0.02	0.00	0.02	0.02	0.00
	Landscape				0.69	0.55	0.00
15	Impervious	0.32	0.30	0.00	0.32	0.30	0.00
	Landscape				0.20	0.16	0.00
21	Impervious	0.41	0.39	0.00	0.41	0.39	0.00
	Landscape				0.54	0.43	0.00
31	Impervious	0.37	0.36	0.00	0.37	0.36	0.00
	Landscape				0.41	0.33	0.00
51	Impervious	0.38	0.36	0.00	0.38	0.36	0.00
	Landscape				0.25	0.20	0.00
TOTAL		41.98	39.88	40.48	55.46	50.72	51.54

TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (Ac.)	40.48
TOTAL IMPERVIOUS AREA (Ac.)	41.98
% OF AREA IMPERVIOUS RECEIVING TREATMENT	96.4%
TOTAL DEVELOPED AREA RECEIVING TREATMENT (Ac.)	51.54
TOTAL DEVELOPED AREA (Ac.)	55.46
% OF AREA DEVELOPED RECEIVING TREATMENT	92.9%

	SEBAGO	TECHN	IICS, INC			ЈОВ	05159					
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Appendix 2A

Existing Conditions HydroCADSummary



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Page 2

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Runoff Area=33.400 ac 0.33% Impervious Runoff Depth>0.72" Flow Length=2,070' Tc=52.9 min CN=71 Runoff=12.14 cfs 2.010 af

Subcatchment2: Runoff Area=16.550 ac 11.78% Impervious Runoff Depth>1.48" Flow Length=990' Tc=26.7 min CN=84 Runoff=18.40 cfs 2.035 af

Subcatchment3: Runoff Area=8.530 ac 4.22% Impervious Runoff Depth>0.87" Flow Length=1,380' Tc=35.6 min CN=74 Runoff=4.76 cfs 0.621 af

Subcatchment4: Runoff Area=7.840 ac 0.00% Impervious Runoff Depth>0.88" Flow Length=680' Tc=19.8 min CN=74 Runoff=5.63 cfs 0.575 af

Subcatchment5: Runoff Area=28.390 ac 0.00% Impervious Runoff Depth>0.59" Flow Length=2,195' Tc=59.9 min CN=68 Runoff=7.47 cfs 1.396 af

Subcatchment6: Runoff Area=16.310 ac 0.00% Impervious Runoff Depth>0.47" Flow Length=1.655' Tc=62.0 min CN=65 Runoff=3.15 cfs 0.643 af

Subcatchment7: Runoff Area=5.290 ac 0.00% Impervious Runoff Depth>0.56" Flow Length=460' Tc=22.3 min CN=67 Runoff=2.07 cfs 0.248 af

Subcatchment8: Runoff Area=12.270 ac 0.00% Impervious Runoff Depth>0.52" Flow Length=800' Tc=37.0 min CN=66 Runoff=3.51 cfs 0.530 af

Subcatchment9: Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>0.45" Flow Length=1,040' Tc=25.9 min CN=64 Runoff=2.34 cfs 0.323 af

Subcatchment10: Runoff Area=1.744 ac 6.42% Impervious Runoff Depth>0.88" Flow Length=530' Tc=25.7 min CN=74 Runoff=1.13 cfs 0.128 af

Reach R1: Avg. Flow Depth=0.25' Max Vel=0.40 fps Inflow=11.96 cfs 1.879 af n=0.150 L=380.0' S=0.0105'/ Capacity=349.08 cfs Outflow=10.38 cfs 1.808 af

Reach R2: Avg. Flow Depth=0.73' Max Vel=0.93 fps Inflow=10.38 cfs 1.808 af n=0.150 L=150.0' S=0.0200'/' Capacity=190.93 cfs Outflow=10.33 cfs 1.797 af

Reach SP1:Inflow=8.63 cfs 1.923 af
Outflow=8.63 cfs 1.923 af

Reach SP2:Inflow=18.40 cfs 2.035 af
Outflow=18.40 cfs 2.035 af

Reach SP3:Inflow=4.76 cfs 0.621 af
Outflow=4.76 cfs 0.621 af

Reach SP4: Inflow=5.63 cfs 0.575 af Outflow=5.63 cfs 0.575 af

05159PRE5 Prepared by Sebago T HydroCAD® 10.00-24 s/n		Type III 24-hr 2-year Rainfall=3.10" Printed 11/9/2023 LC Page 3
Reach SP5:		Inflow=7.47 cfs 1.396 af
		Outflow=7.47 cfs 1.396 af
Reach SP6:		Inflow=3.15 cfs 0.643 af
		Outflow=3.15 cfs 0.643 af
Reach SP7:		Inflow=2.07 cfs 0.248 af
		Outflow=2.07 cfs 0.248 af
Reach SP8:		Inflow=3.51 cfs 0.530 af
		Outflow=3.51 cfs 0.530 af
Reach SP9:		Inflow=2.34 cfs 0.323 af
		Outflow=2.34 cfs 0.323 af
Pond Gilbert Culvert:		torage=570 cf Inflow=1.13 cfs 0.128 af
	Primary=0.92 cfs 0.127 af Secondary=0.00 c	ofs 0.000 af Outflow=0.92 cfs 0.127 af
Pond Martin Culvert:	Peak Elev=92.61' Stora	age=4,852 cf Inflow=10.65 cfs 1.924 af

Total Runoff Area = 138.994 ac Runoff Volume = 8.508 af Average Runoff Depth = 0.73" 98.18% Pervious = 136.462 ac 1.82% Impervious = 2.532 ac

Pond P1(Existing):

Primary=8.63 cfs 1.923 af Secondary=0.00 cfs 0.000 af Outflow=8.63 cfs 1.923 af

Peak Elev=100.26' Storage=0.212 af Inflow=12.14 cfs 2.010 af

Outflow=11.96 cfs 1.879 af

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Runoff Area=33.400 ac 0.33% Impervious Runoff Depth>1.64"

Flow Length=2,070' Tc=52.9 min CN=71 Runoff=29.37 cfs 4.565 af

Subcatchment2: Runoff Area=16.550 ac 11.78% Impervious Runoff Depth>2.71"

Flow Length=990' Tc=26.7 min CN=84 Runoff=33.48 cfs 3.734 af

Subcatchment3: Runoff Area=8.530 ac 4.22% Impervious Runoff Depth>1.87"

Flow Length=1,380' Tc=35.6 min CN=74 Runoff=10.55 cfs 1.331 af

Subcatchment4: Runoff Area=7.840 ac 0.00% Impervious Runoff Depth>1.88"

Flow Length=680' Tc=19.8 min CN=74 Runoff=12.54 cfs 1.231 af

Subcatchment5: Runoff Area=28.390 ac 0.00% Impervious Runoff Depth>1.43"

Flow Length=2,195' Tc=59.9 min CN=68 Runoff=19.99 cfs 3.380 af

Subcatchment6: Runoff Area=16.310 ac 0.00% Impervious Runoff Depth>1.23"

Flow Length=1,655' Tc=62.0 min CN=65 Runoff=9.51 cfs 1.676 af

Subcatchment7: Runoff Area=5.290 ac 0.00% Impervious Runoff Depth>1.39"

Flow Length=460' Tc=22.3 min CN=67 Runoff=5.77 cfs 0.611 af

Subcatchment8: Runoff Area=12.270 ac 0.00% Impervious Runoff Depth>1.31"

Flow Length=800' Tc=37.0 min CN=66 Runoff=10.12 cfs 1.342 af

Subcatchment9: Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>1.19"

Flow Length=1,040' Tc=25.9 min CN=64 Runoff=7.47 cfs 0.862 af

Subcatchment10: Runoff Area=1.744 ac 6.42% Impervious Runoff Depth>1.88"

Flow Length=530' Tc=25.7 min CN=74 Runoff=2.50 cfs 0.273 af

Reach R1: Avg. Flow Depth=0.46' Max Vel=0.58 fps Inflow=29.16 cfs 4.425 af

n=0.150 L=380.0' S=0.0105 '/' Capacity=349.08 cfs Outflow=27.79 cfs 4.327 af

Reach R2: Avg. Flow Depth=1.21' Max Vel=1.23 fps Inflow=27.79 cfs 4.327 af

n=0.150 L=150.0' S=0.0200 '/' Capacity=190.93 cfs Outflow=27.70 cfs 4.311 af

Reach SP1: Inflow=28.36 cfs 4.581 af

Outflow=28.36 cfs 4.581 af

Reach SP2: Inflow=33.48 cfs 3.734 af

Outflow=33.48 cfs 3.734 af

Reach SP3: Inflow=10.55 cfs 1.331 af

Outflow=10.55 cfs 1.331 af

Reach SP4: Inflow=12.54 cfs 1.231 af

Outflow=12.54 cfs 1.231 af

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Type III 24-hr 10-year Rainfall=4.60"

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Reach SP5: Inflow=19.99 cfs 3.380 af

Outflow=19.99 cfs 3.380 af

Reach SP6: Inflow=9.51 cfs 1.676 af

Outflow=9.51 cfs 1.676 af

Reach SP7: Inflow=5.77 cfs 0.611 af

Outflow=5.77 cfs 0.611 af

Reach SP8: Inflow=10.12 cfs 1.342 af

Outflow=10.12 cfs 1.342 af

Reach SP9: Inflow=7.47 cfs 0.862 af

Outflow=7.47 cfs 0.862 af

Pond Gilbert Culvert: Peak Elev=94.69' Storage=1,205 cf Inflow=2.50 cfs 0.273 af

Primary=2.26 cfs 0.273 af Secondary=0.00 cfs 0.000 af Outflow=2.26 cfs 0.273 af

Pond Martin Culvert: Peak Elev=93.66' Storage=13,710 cf Inflow=28.51 cfs 4.584 af

Primary=10.55 cfs 3.552 af Secondary=17.81 cfs 1.030 af Outflow=28.36 cfs 4.581 af

Pond P1(Existing): Peak Elev=100.47' Storage=0.286 af Inflow=29.37 cfs 4.565 af

Outflow=29.16 cfs 4.425 af

Total Runoff Area = 138.994 ac Runoff Volume = 19.005 af Average Runoff Depth = 1.64" 98.18% Pervious = 136.462 ac 1.82% Impervious = 2.532 ac

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Summary for Subcatchment 1:

45.04 cfs @ 12.74 hrs, Volume= 6.935 af, Depth> 2.49" Runoff =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

Area	(ac) (ON Des	cription		
1.	.100	91 Gra	vel roads,	HSG D	
5	.130	78 Mea	dow, non-	grazed, HS	G D
0.	.110	98 Pav	ed parking	& roofs	
4	.600	55 Woo	ods, Good,	HSG B	
19	.500	70 Woo	ods, Good,	HSG C	
2.	.960	77 Woo	ods, Good,	HSG D	
33.	.400	71 Wei	ghted Aver	age	
33.	.290	99.6	57% Pervio	us Area	
0.	.110	0.33	3% Impervi	ous Area	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
26.1	150	0.0300	0.10		Sheet Flow, A to B
					Woods: Light underbrush n= 0.400 P2= 3.00"
5.7	545	0.1000	1.58		Shallow Concentrated Flow, B to C
					Woodland Kv= 5.0 fps
17.8	825	0.0240	0.77		Shallow Concentrated Flow, C to D
					Woodland Kv= 5.0 fps
3.3	550	0.0500	2.81	9.64	Trap/Vee/Rect Channel Flow, D to E
					Bot.W=10.00' D=0.25' Z= 15.0 '/' Top.W=17.50'
					n= 0.040 Winding stream, pools & shoals
52.9	2.070	Total			

Summary for Subcatchment 2:

Runoff 45.85 cfs @ 12.36 hrs, Volume= 5.172 af, Depth> 3.75"

Area (ac)	CN	Description
6.450	91	Gravel roads, HSG D
1.950	98	Paved parking & roofs
1.580	70	Woods, Good, HSG C
2.220	71	Meadow, non-grazed, HSG C
4.350	78	Meadow, non-grazed, HSG D
16.550	84	Weighted Average
14.600		88.22% Pervious Area
1.950		11.78% Impervious Area

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	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	15.5	150	0.1100	0.16		Sheet Flow, A to B
	4.3	430	0.1100	1.66		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, B to C
	6.9	410	0.0200	0.99		Woodland Kv= 5.0 fps Shallow Concentrated Flow, C to D
	0.9	410	0.0200	0.99		Short Grass Pasture Kv= 7.0 fps
-	26.7	990	Total			-

Summary for Subcatchment 3:

Runoff = 15.68 cfs @ 12.50 hrs, Volume= 1.974 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

Area	(ac) C	N Des	cription		
0.	360 9	8 Pave	ed parking	& roofs	
3.	830 7	'1 Mea	dow, non-	grazed, HS	GC
1.	450 7	78 Mea	dow, non-	grazed, HS	G D
2.	210 7	70 Woo	ds, Good,	HSG C	
0.	680 7	77 Woo	ds, Good,	HSG D	
8.	530 7	'4 Wei	ghted Aver	age	
8.	170	95.7	8% Pervio	us Area	
0.	360	4.22	% Impervi	ous Area	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
10.0	150	0.1200	0.25		Sheet Flow, A to B
					Grass: Dense n= 0.240 P2= 3.00"
1.7	210	0.0900	2.10		Shallow Concentrated Flow, B to C
					Short Grass Pasture Kv= 7.0 fps
12.5	390	0.0500	0.52	3.56	Trap/Vee/Rect Channel Flow, C to D
					Bot.W=25.00' D=0.25' Z= 10.0 '/' Top.W=30.00'
					n= 0.240 Sheet flow over Dense Grass
6.0	375	0.0500	1.04	7.13	Trap/Vee/Rect Channel Flow, D to E
					Bot.W=25.00' D=0.25' Z= 10.0 '/' Top.W=30.00'
					n= 0.120
5.4	255	0.0300	0.79	8.92	Trap/Vee/Rect Channel Flow, E to F
					Bot.W=40.00' D=0.25' Z= 20.0 '/' Top.W=50.00'
					n= 0.120
35.6	1,380	Total			

Summary for Subcatchment 4:

Runoff = 18.66 cfs @ 12.28 hrs, Volume= 1.825 af, Depth> 2.79"

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Area	(ac)	CN Des	cription							
0.	.650	71 Mea	dow. non-	grazed, HS	G C					
0.	490			grazed, HS						
3.	.230		ods, Good,							
3.470 77 Woods, Good, HSG D										
7.	7.840 74 Weighted Average									
7.	840		.00% Pervi							
Tc	Length	Slope	Velocity	Capacity	Description					
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)						
14.1	150	0.0500	0.18		Sheet Flow, A to B					
					Grass: Dense n= 0.240 P2= 3.00"					
0.6	75	0.0800	1.98		Shallow Concentrated Flow, B to C					
					Short Grass Pasture Kv= 7.0 fps					
5.1	455	0.0900	1.50		Shallow Concentrated Flow, C to D					
					Woodland Kv= 5.0 fps					
19.8	680	Total								

Summary for Subcatchment 5:

Runoff = 31.77 cfs @ 12.84 hrs, Volume=

5.269 af, Depth> 2.23"

	Area	(ac) C	N Des	cription			
	3.	520	55 Woo	ds, Good,	HSG B		
	18.	180		ds, Good,			
				Meadow, non-grazed, HSG C			
•				ghted Aver			
	∠8.	390	100.	00% Pervi	ious Area		
	т.	1 41-	01	V-1!4	0:	Description	
	Tc	Length	Slope	Velocity	Capacity	Description	
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)		
	21.3	150	0.0500	0.12		Sheet Flow, A to B	
			60 0.0900 1.50		Woods: Light underbrush n= 0.400 P2= 3.00"		
	7.3	660			Shallow Concentrated Flow, B to C		
	_					Woodland Kv= 5.0 fps	
	31.3	1,385	0.0260	0.74	4.15		
	J 1.0	.,000	0.0200	0., .	0	Bot.W=20.00' D=0.25' Z= 10.0 '/' Top.W=25.00'	
						n= 0.120	
7	E0.0	0.405	Total			11- 0,120	
	59.9	2,195	Total				

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Summary for Subcatchment 6:

Runoff = 15.73 cfs @ 12.89 hrs, Volume= 2.688 af, Depth> 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

Area	(ac) C	N Des	cription		
5.	690 5	55 Woo	ds, Good,	HSG B	
10.	390 7	0 Woo	ds, Good,	HSG C	
0.	230 7	77 Woo	ds, Good,	HSG D	
16.	310 6	35 Weig	ghted Aver	age	
16.	310	100.	00% Pervi	ous Area	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
40.5	150	0.0100	0.06		Sheet Flow, A to B
					Woods: Light underbrush n= 0.400 P2= 3.00"
11.3	585	0.0300	0.87		Shallow Concentrated Flow, B to C
					Woodland Kv= 5.0 fps
10.2	920	0.0900	1.50		Shallow Concentrated Flow, C to D
					Woodland Kv= 5.0 fps
62.0	1,655	Total			

Summary for Subcatchment 7:

Runoff = 9.29 cfs @ 12.32 hrs, Volume= 0.960 af, Depth> 2.18"

Area	(ac) (CN Des	cription		
0.	.970	55 Woo	ds, Good,	HSG B	
4.	.320	70 Woo	ds, Good,	HSG C	
5.	.290	67 Wei	ghted Aver	age	
5.	.290	100.	00% Pervi	ous Area	
Tc (min)	Length (feet)		Velocity (ft/sec)	Capacity (cfs)	Description
18.6	150	0.0700	0.13		Sheet Flow, A to B
3.7	310	0.0800	1.41		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps
22.3	460	Total			

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Summary for Subcatchment 8:

Runoff = 16.46 cfs @ 12.54 hrs, Volume=

2.129 af, Depth> 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

	Area	(ac) C	N Des	cription		
3.710 55 Woods, Good, HSG B						
8.460 70 Woods, Good, HSG C						
	0.	100 7	77 Woo	ds, Good,	HSG D	
	12.	270 6	66 Weig	ghted Aver	age	
	12.	270	100.	.00% Pervi	ous Area	
	Tc	Length	Slope	Velocity	Capacity	Description
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	25.1	150	0.0330	0.10		Sheet Flow, A to B
						Woods: Light underbrush n= 0.400 P2= 3.00"
	5.0	415	0.0770	1.39		Shallow Concentrated Flow, B to C
						Woodland Kv= 5.0 fps
	6.9	235	0.0130	0.57		Shallow Concentrated Flow, C to D
						Woodland Kv= 5.0 fps
-	37.0	800	Total			

Summary for Subcatchment 9:

Runoff = 12.53 cfs @ 12.38 hrs, Volume=

1.394 af, Depth> 1.93"

	Area	(ac) C	N Desc	cription		
3.260 55 Woods, Good, HSG B						
5.410 70 Woods, Good, HSG C					HSG C	
	8.	670 6	34 Weig	ghted Aver	age	
	8.	670	100.	00% Pervi	ous Area	
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34	15.5	150	0.1100	0.16		Sheet Flow, A to B Woods: Light underbrush n= 0.400 P2= 3.00"
	2.2	150	0.0500	1.12		Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps
	8.2	740	0.0900	1.50		Shallow Concentrated Flow, C to D Woodland Kv= 5.0 fps
	25.0	1.040	Total			

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Summary for Subcatchment 10:

Runoff = 3.73 cfs @ 12.36 hrs, Volume= 0.405 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

Area	(ac) C	N Des	cription		
0.	112	98 Pave	ed parking	& roofs	
0.	383		ds, Good,		
1.	249	78 Mea	dow, non-	grazed, HS	G D
1.	744 7	74 Weid	hted Aver	age	
1.	632		8% Pervio		
0.	112	6.42	% Impervi	ous Area	
			•		
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
18.5	150	0.0100	0.14		Sheet Flow, A to B
					Grass: Short n= 0.150 P2= 3.00"
7.0	295	0.0100	0.70		Shallow Concentrated Flow, B to C
					Short Grass Pasture Kv= 7.0 fps
0.2	85	0.0200	6.78	325.55	Trap/Vee/Rect Channel Flow, C to D
					Bot.W=10.00' D=3.00' Z= 2.0 '/' Top.W=22.00'
					n= 0.050
25.7	530	Total			

Summary for Reach R1:

Inflow Area = 33.400 ac, 0.33% Impervious, Inflow Depth > 2.44" for 25-year event

Inflow = 44.80 cfs @ 12.78 hrs, Volume= 6.789 af

Outflow = 43.41 cfs @ 13.04 hrs, Volume= 6.670 af, Atten= 3%, Lag= 15.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.69 fps, Min. Travel Time= 9.2 min Avg. Velocity = 0.34 fps, Avg. Travel Time= 18.8 min

Peak Storage= 23,864 cf @ 12.88 hrs Average Depth at Peak Storage= 0.59'

Bank-Full Depth= 2.00' Flow Area= 240.0 sf, Capacity= 349.08 cfs

100.00' x 2.00' deep channel, n= 0.150 Side Slope Z-value= 10.0 '/' Top Width= 140.00' Length= 380.0' Slope= 0.0105 '/' Inlet Invert= 100.00', Outlet Invert= 96.00'

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Summary for Reach R2:

Inflow Area = 33.400 ac, 0.33% Impervious, Inflow Depth > 2.40" for 25-year event

Inflow = 43.41 cfs @ 13.04 hrs, Volume= 6.670 af

Outflow = 43.27 cfs @ 13.09 hrs, Volume= 6.651 af, Atten= 0%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.39 fps, Min. Travel Time= 1.8 min Avg. Velocity = 0.80 fps, Avg. Travel Time= 3.1 min

Peak Storage= 4,668 cf @ 13.06 hrs Average Depth at Peak Storage= 1.51'

Bank-Full Depth= 3.00' Flow Area= 93.0 sf, Capacity= 190.93 cfs

10.00' x 3.00' deep channel, n= 0.150

Side Slope Z-value= 7.0 '/' Top Width= 52.00'

Length= 150.0' Slope= 0.0200 '/'

Inlet Invert= 96.00', Outlet Invert= 93.00'

‡

Summary for Reach SP1:

Inflow Area = 35.144 ac. 0.63% Impervious. Inflow Depth > 2.41" for 25-year event

Inflow = 44.37 cfs @ 13.11 hrs, Volume= 7.053 af

Outflow = 44.37 cfs @ 13.11 hrs, Volume= 7.053 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP2:

Inflow Area = 16.550 ac, 11.78% Impervious, Inflow Depth > 3.75" for 25-year event

Inflow = 45.85 cfs @ 12.36 hrs, Volume= 5.172 af

Outflow = 45.85 cfs @ 12.36 hrs, Volume= 5.172 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP3:

Inflow Area = 8.530 ac, 4.22% Impervious, Inflow Depth > 2.78" for 25-year event

Inflow = 15.68 cfs @ 12.50 hrs, Volume= 1.974 af

Outflow = 15.68 cfs @ 12.50 hrs, Volume= 1.974 af, Atten= 0%, Lag= 0.0 min

Type III 24-hr 25-year Rainfall=5.80"

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP4:

Inflow Area = 7.840 ac, 0.00% Impervious, Inflow Depth > 2.79" for 25-year event

Inflow = 18.66 cfs @ 12.28 hrs, Volume= 1.825 af

Outflow = 18.66 cfs @ 12.28 hrs, Volume= 1.825 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP5:

Inflow Area = 28.390 ac, 0.00% Impervious, Inflow Depth > 2.23" for 25-year event

Inflow = 31.77 cfs @ 12.84 hrs, Volume= 5.269 af

Outflow = 31.77 cfs @ 12.84 hrs, Volume= 5.269 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP6:

Inflow Area = 16.310 ac, 0.00% Impervious, Inflow Depth > 1.98" for 25-year event

Inflow = 15.73 cfs @ 12.89 hrs, Volume= 2.688 af

Outflow = 15.73 cfs @ 12.89 hrs, Volume= 2.688 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP7:

Inflow Area = 5.290 ac, 0.00% Impervious, Inflow Depth > 2.18" for 25-year event

Inflow = 9.29 cfs @ 12.32 hrs, Volume= 0.960 af

Outflow = 9.29 cfs @ 12.32 hrs, Volume= 0.960 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP8:

Inflow Area = 12.270 ac, 0.00% Impervious, Inflow Depth > 2.08" for 25-year event

Inflow = 16.46 cfs @ 12.54 hrs, Volume= 2.129 af

Outflow = 16.46 cfs @ 12.54 hrs, Volume= 2.129 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP9:

Inflow Area = 8.670 ac, 0.00% Impervious, Inflow Depth > 1.93" for 25-year event

Inflow = 12.53 cfs @ 12.38 hrs, Volume= 1.394 af

Outflow = 12.53 cfs @ 12.38 hrs, Volume= 1.394 af, Atten= 0%, Lag= 0.0 min

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond Gilbert Culvert:

6.42% Impervious, Inflow Depth > 2.79" for 25-year event Inflow Area = 1.744 ac. Inflow 3.73 cfs @ 12.36 hrs, Volume= 0.405 af 3.46 cfs @ 12.46 hrs, Volume= Outflow = 0.405 af, Atten= 7%, Lag= 6.0 min 0.405 af Primary = 3.46 cfs @ 12.46 hrs, Volume= 0.00 cfs @ 5.00 hrs. Volume= Secondary = 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 94.92' @ 12.46 hrs Surf.Area= 3,223 sf Storage= 1,612 cf

Plug-Flow detention time= 7.1 min calculated for 0.405 af (100% of inflow) Center-of-Mass det. time= 6.8 min (816.2 - 809.4)

Volume	Inve	ert Avail.Sto	orage Storag	je Description	
#1	94.0	0' 6,7	00 cf Custo	m Stage Data (Pr	ismatic)Listed below
Elevation	20	Surf.Area	Inc.Store	Cum.Store	
(fee		(sq-ft)	(cubic-feet)	(cubic-feet)	
94.0		0	0	0	
95.0	00	3,500	1,750	1,750	
95.6	60	13,000	4,950	6,700	
Device	Routing	Invert	Outlet Devi	ces	
#1	Primary	94.38'	15.0" Rou	nd Culvert	
					headwall, Ke= 0.900
					3.95' S= 0.0172 '/' Cc= 0.900
#2	Primary	93.70'			oth interior, Flow Area= 1.23 sf
#2 Filliary		33.70			headwall, Ke= 0.900
					3.56' S= 0.0044 '/' Cc= 0.900
			n= 0.013 C	orrugated PE, smo	oth interior, Flow Area= 0.79 sf
#3	Seconda	ry 95.50'			road-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60
			, ,		0 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.45 cfs @ 12.46 hrs HW=94.92' (Free Discharge)

-1=Culvert (Inlet Controls 1.00 cfs @ 1.97 fps)

-2=Culvert (Barrel Controls 2.45 cfs @ 3.25 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=94.00' (Free Discharge)

3=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

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Summary for Pond Martin Culvert:

0.63% Impervious, Inflow Depth > 2.41" for 25-year event Inflow Area = 35.144 ac.

Inflow 44.48 cfs @ 13.08 hrs, Volume= 7.056 af

44.37 cfs @ 13.11 hrs, Volume= Outflow 7.053 af, Atten= 0%, Lag= 1.9 min

10.86 cfs @ 13.11 hrs, Volume= 4.488 af Primary = 33.50 cfs @ 13.11 hrs, Volume= Secondary = 2.565 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 93.85' @ 13.11 hrs Surf.Area= 11.847 sf Storage= 15,663 cf

Plug-Flow detention time= 7.7 min calculated for 7.029 af (100% of inflow)

Center-of-Mass det. time= 7.6 min (869.0 - 861.4)

Volume	invert /	Avail.Storage	Storage Description	
#1	90.00'	17,150 cf	Custom Stage Data (Prismatic)Listed below	
Elevation	Surf Ar	roa Inc	oc Store Cum Store	

Elevation	Surf.Area	Inc.Store	Cum.Store
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)
90.00	0	0	0
91.00	400	200	200
92.00	2,500	1,450	1,650
93.00	8,000	5,250	6,900
94.00	12,500	10,250	17,150

Device	Routing	Invert	Outlet Devices
#1	Primary	89.85'	15.0" Round Culvert
	·		L= 30.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 89.85' / 89.42' S= 0.0143 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	93.30'	30.0' long x 15.0' breadth Broad-Crested Rectangular Weir
	•		Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.86 cfs @ 13.11 hrs HW=93.85' (Free Discharge) -1=Culvert (Inlet Controls 10.86 cfs @ 8.85 fps)

Secondary OutFlow Max=33.42 cfs @ 13.11 hrs HW=93.85' (Free Discharge) 2=Broad-Crested Rectangular Weir (Weir Controls 33.42 cfs @ 2.01 fps)

Summary for Pond P1(Existing):

Inflow Area = 33.400 ac, 0.33% Impervious, Inflow Depth > 2.49" for 25-year event

Inflow 45.04 cfs @ 12.74 hrs, Volume= 6.935 af

44.80 cfs @ 12.78 hrs, Volume= 6.789 af, Atten= 1%, Lag= 2.2 min Outflow

44.80 cfs @ 12.78 hrs, Volume= 6.789 af Primary

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 100.61' @ 12.78 hrs Surf.Area= 0.312 ac Storage= 0.337 af

Plug-Flow detention time= 14.3 min calculated for 6.766 af (98% of inflow)

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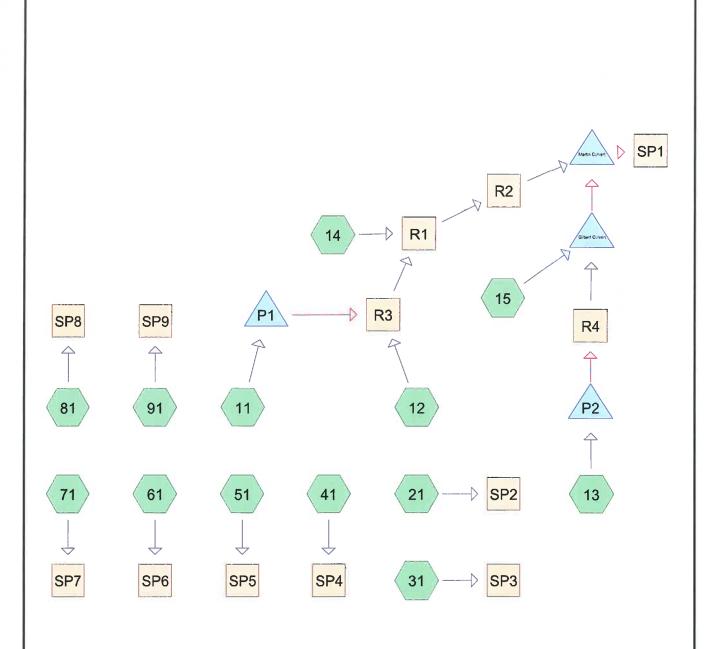
Center-of-Mass det. time= 7.2 min (843.3 - 836.1)

Volume	Invert	Avail.Storage	e Storage Description	
#1	99.00'	0.845 af	f Custom Stage Data (Prismatic)Listed below	====0
Elevation (feet)	11 79	140	Store Cum.Store -feet) (acre-feet)	
99.00	0.00	0 0	0.000 0.000	
100.00	0.23	0 0	0.115 0.115	
102.00	0.50	0 0	0.730 0.845	
Device I	Routing	Invert O	Dutlet Devices	
#1	Primary	He	85.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64	

Primary OutFlow Max=44.76 cfs @ 12.78 hrs HW=100.61' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 44.76 cfs @ 2.10 fps)

Appendix 2B

Proposed Conditions HydroCAD Summary











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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment11: Runoff Area=47.350 ac 78.33% Impervious Runoff Depth>2.28"

Flow Length=1,065' Slope=0.0050 '/' Tc=66.3 min CN=94 Runoff=49.04 cfs 8.980 af

Subcatchment12: Runoff Area=8.460 ac 0.35% Impervious Runoff Depth>0.77"

Flow Length=1,690' Tc=50.1 min CN=72 Runoff=3.42 cfs 0.543 af

Subcatchment13: Runoff Area=10.420 ac 32.92% Impervious Runoff Depth>1.59"

Flow Length=1,065' Tc=81.9 min CN=86 Runoff=6.89 cfs 1.378 af

Subcatchment14: Runoff Area=1.685 ac 0.00% Impervious Runoff Depth>0.93"

Flow Length=715' Tc=29.0 min CN=75 Runoff=1.10 cfs 0.130 af

Subcatchment15: Runoff Area=1.291 ac 0.00% Impervious Runoff Depth>0.72"

Flow Length=265' Slope=0.0050 '/' Tc=58.8 min CN=71 Runoff=0.44 cfs 0.077 af

Subcatchment21: Runoff Area=14.280 ac 12.75% Impervious Runoff Depth>1.34"

Flow Length=975' Tc=26.1 min CN=82 Runoff=14.55 cfs 1.595 af

Subcatchment31: Runoff Area=8.730 ac 2.75% Impervious Runoff Depth>0.82"

Flow Length=1,380' Tc=35.6 min CN=73 Runoff=4.55 cfs 0.599 af

Subcatchment41: Runoff Area=7.700 ac 0.00% Impervious Runoff Depth>0.88"

Flow Length=605' Tc=19.2 min CN=74 Runoff=5.60 cfs 0.565 af

Subcatchment51: Runoff Area=16.000 ac 0.00% Impervious Runoff Depth>0.68"

Flow Length=1,375' Tc=49.1 min CN=70 Runoff=5.62 cfs 0.905 af

Subcatchment61: Runoff Area=11.010 ac 0.00% Impervious Runoff Depth>0.38"

Flow Length=575' Slope=0.0900 '/' Tc=21.5 min CN=62 Runoff=2.48 cfs 0.349 af

Subcatchment71: Runoff Area=3.930 ac 0.00% Impervious Runoff Depth>0.52"

Flow Length=220' Slope=0.0800 '/' Tc=31.5 min CN=66 Runoff=1.21 cfs 0.170 af

Subcatchment81: Runoff Area=3.777 ac 0.00% Impervious Runoff Depth>0.31"

Flow Length=260' Slope=0.0130 '/' Tc=39.6 min CN=60 Runoff=0.51 cfs 0.098 af

Subcatchment91: Runoff Area=1.223 ac 0.00% Impervious Runoff Depth>0.69"

Flow Length=240' Tc=18.9 min CN=70 Runoff=0.67 cfs 0.070 af

Reach R1: Avg. Flow Depth=0.17' Max Vel=0.31 fps Inflow=5.20 cfs 3.035 af

n=0.150 L=380.0' S=0.0105 '/' Capacity=349.08 cfs Outflow=5.19 cfs 2.796 af

Reach R2: Avg. Flow Depth=0.50' Max Vel=0.76 fps Inflow=5.19 cfs 2.796 af

n=0.150 L=150.0' S=0.0200 '/' Capacity=190.93 cfs Outflow=5.18 cfs 2.758 af

Reach R3: Avg. Flow Depth=0.91' Max Vel=4.53 fps Inflow=5.10 cfs 2.908 af

18.0" Round Pipe n=0.013 L=90.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=5.10 cfs 2.904 af

O	51	59	P	O.S	T5

Type III 24-hr 2-year Rainfall=3.10"

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Reach R4: Avg. Flow Depth=0.07' Max Vel=0.13 fps Inflow=0.50 cfs 0.296 af

n=0.150 L=160.0' S=0.0070 '/' Capacity=63.25 cfs Outflow=0.50 cfs 0.269 af

Reach SP1: Inflow=5.75 cfs 3.090 af

Outflow=5.75 cfs 3.090 af

Reach SP2: Inflow=14.55 cfs 1.595 af

Outflow=14.55 cfs 1.595 af

Reach SP3: Inflow=4.55 cfs 0.599 af

Outflow=4.55 cfs 0.599 af

Reach SP4: Inflow=5.60 cfs 0.565 af

Outflow=5.60 cfs 0.565 af

Reach SP5: Inflow=5.62 cfs 0.905 af

Outflow=5.62 cfs 0.905 af

Reach SP6: Inflow=2.48 cfs 0.349 af

Outflow=2.48 cfs 0.349 af

Reach SP7: Inflow=1.21 cfs 0.170 af

Outflow=1.21 cfs 0.170 af

Reach SP8: Inflow=0.51 cfs 0.098 af

Outflow=0.51 cfs 0.098 af

Reach SP9: Inflow=0.67 cfs 0.070 af

Outflow=0.67 cfs 0.070 af

Pond Gilbert Culvert: Peak Elev=94.20' Storage=358 cf Inflow=0.64 cfs 0.346 af

Primary=0.63 cfs 0.340 af Secondary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.340 af

Pond Martin Culvert: Peak Elev=91.42' Storage=810 cf Inflow=5.75 cfs 3.098 af

Primary=5.75 cfs 3.090 af Secondary=0.00 cfs 0.000 af Outflow=5.75 cfs 3.090 af

Pond P1: Peak Elev=106.73' Storage=526,828 cf Inflow=49.04 cfs 8.980 af

Primary=4.64 cfs 2.365 af Secondary=0.00 cfs 0.000 af Outflow=4.64 cfs 2.365 af

Peak Elev=99.56' Storage=188,631 cf Inflow=6.89 cfs 1.378 af

Primary=0.50 cfs 0.296 af Secondary=0.00 cfs 0.000 af Outflow=0.50 cfs 0.296 af

Total Runoff Area = 135.856 ac Runoff Volume = 15.461 af Average Runoff Depth = 1.37" 68.64% Pervious = 93.246 ac 31.36% Impervious = 42.610 ac

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment11: Runoff Area=47.350 ac 78.33% Impervious Runoff Depth>3.65"

Flow Length=1,065' Slope=0.0050 '/' Tc=66.3 min CN=94 Runoff=76.74 cfs 14.397 af

Subcatchment12: Runoff Area=8.460 ac 0.35% Impervious Runoff Depth>1.71"

Flow Length=1,690' Tc=50.1 min CN=72 Runoff=8.02 cfs 1.208 af

Subcatchment13: Runoff Area=10.420 ac 32.92% Impervious Runoff Depth>2.84"

Flow Length=1,065' Tc=81.9 min CN=86 Runoff=12.17 cfs 2.465 af

Subcatchment14: Runoff Area=1.685 ac 0.00% Impervious Runoff Depth>1.95"

Flow Length=715' Tc=29.0 min CN=75 Runoff=2.39 cfs 0.274 af

Subcatchment15: Runoff Area=1.291 ac 0.00% Impervious Runoff Depth>1.64"

Flow Length=265' Slope=0.0050 '/' Tc=58.8 min CN=71 Runoff=1.06 cfs 0.176 af

Subcatchment21: Runoff Area=14.280 ac 12.75% Impervious Runoff Depth>2.53"

Flow Length=975' Tc=26.1 min CN=82 Runoff=27.38 cfs 3.011 af

Subcatchment31: Runoff Area=8.730 ac 2.75% Impervious Runoff Depth>1.80"

Flow Length=1,380' Tc=35.6 min CN=73 Runoff=10.35 cfs 1.308 af

Subcatchment41: Runoff Area=7.700 ac 0.00% Impervious Runoff Depth>1.88"

Flow Length=605' Tc=19.2 min CN=74 Runoff=12.50 cfs 1.209 af

Subcatchment51: Runoff Area=16.000 ac 0.00% Impervious Runoff Depth>1.57"

Flow Length=1,375' Tc=49.1 min CN=70 Runoff=13.99 cfs 2.097 af

Subcatchment61: Runoff Area=11.010 ac 0.00% Impervious Runoff Depth>1.07"

Flow Length=575' Slope=0.0900 '/' Tc=21.5 min CN=62 Runoff=8.98 cfs 0.985 af

Subcatchment71: Runoff Area=3.930 ac 0.00% Impervious Runoff Depth>1.32"

Flow Length=220' Slope=0.0800 '/' Tc=31.5 min CN=66 Runoff=3.50 cfs 0.431 af

Subcatchment81: Runoff Area=3.777 ac 0.00% Impervious Runoff Depth>0.95"

Flow Length=260' Slope=0.0130 '/' Tc=39.6 min CN=60 Runoff=2.04 cfs 0.298 af

Subcatchment91: Runoff Area=1.223 ac 0.00% Impervious Runoff Depth>1.59"

Flow Length=240' Tc=18.9 min CN=70 Runoff=1.66 cfs 0.162 af

Reach R1: Avg. Flow Depth=0.23' Max Vel=0.37 fps Inflow=9.81 cfs 5.344 af

n=0.150 L=380.0' S=0.0105 '/' Capacity=349.08 cfs Outflow=8.59 cfs 4.982 af

Reach R2: Avg. Flow Depth=0.66' Max Vel=0.88 fps Inflow=8.59 cfs 4.982 af

n=0.150 L=150.0' S=0.0200'/' Capacity=190.93 cfs Outflow=8.59 cfs 4.922 af

Reach R3: Avg. Flow Depth=1.50' Max Vel=4.79 fps Inflow=14.59 cfs 7.832 af

18.0" Round Pipe n=0.013 L=90.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=7.69 cfs 5.069 af

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Reach R4: Avg. Flow Depth=0.14' Max Vel=0.21 fps Inflow=1.75 cfs 0.823 af

n=0.150 L=160.0' S=0.0070 '/' Capacity=63.25 cfs Outflow=1.74 cfs 0.777 af

Reach SP1: Inflow=9.41 cfs 5.721 af

Outflow=9.41 cfs 5.721 af

Reach SP2: Inflow=27.38 cfs 3.011 af

Outflow=27.38 cfs 3.011 af

Reach SP3: Inflow=10.35 cfs 1.308 af

Outflow=10.35 cfs 1.308 af

Reach SP4: Inflow=12.50 cfs 1.209 af

Outflow=12.50 cfs 1.209 af

Reach SP5: Inflow=13.99 cfs 2.097 af

Outflow=13.99 cfs 2.097 af

Reach SP6: Inflow=8.98 cfs 0.985 af

Outflow=8.98 cfs 0.985 af

Reach SP7: Inflow=3.50 cfs 0.431 af

Outflow=3.50 cfs 0.431 af

Reach SP8: Inflow=2.04 cfs 0.298 af

Outflow=2.04 cfs 0.298 af

Reach SP9: Inflow=1.66 cfs 0.162 af

Outflow=1.66 cfs 0.162 af

Pond Gilbert Culvert: Peak Elev=94.61' Storage=1,061 cf Inflow=1.87 cfs 0.953 af

Primary=1.87 cfs 0.934 af Secondary=0.00 cfs 0.000 af Outflow=1.87 cfs 0.934 af

Pond Martin Culvert: Peak Elev=93.01' Storage=6,995 cf Inflow=9.88 cfs 5.856 af

Primary=9.41 cfs 5.721 af Secondary=0.00 cfs 0.000 af Outflow=9.41 cfs 5.721 af

Pond P1: Peak Elev=107.68' Storage=650,323 cf Inflow=76.74 cfs 14.397 af

Primary=13.13 cfs 6.623 af Secondary=0.00 cfs 0.000 af Outflow=13.13 cfs 6.623 af

Pond P2: Peak Elev=100.43' Storage=219,412 cf Inflow=12.17 cfs 2.465 af

Primary=1.75 cfs 0.823 af Secondary=0.00 cfs 0.000 af Outflow=1.75 cfs 0.823 af

Total Runoff Area = 135.856 ac Runoff Volume = 28.023 af Average Runoff Depth = 2.48" 68.64% Pervious = 93.246 ac 31.36% Impervious = 42.610 ac

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Summary for Subcatchment 11:

Runoff 98.68 cfs @ 12.86 hrs, Volume= 18.750 af, Depth> 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

	Area	(ac)	CN	Des	cription		
*	1.	600	98	Pone	d		
	32.	800	98	Pave	ed parking	& roofs	
	1.	900	91		/el roads, l		
		310	78		. ,	grazed, HS	G D
	0.	050	77	Woo	ds, Good,	HSG D	
*	2.	690	98	Expa	anded area	a of quarry	
	47.	350	94	Weig	ghted Aver	age	
	10.	260		21.6	7% Pervio	us Area	
	37.	090		78.3	3% Imperv	ious Area	
					-		
	Тс	Length		Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	35.5	150	0.	0050	0.07		Sheet Flow, A to B
							Grass: Dense n= 0.240 P2= 3.00"
	30.8	915	0.	0050	0.49		Shallow Concentrated Flow, B to C
_							Short Grass Pasture Kv= 7.0 fps
	66.3	1.065	To	otal			

Summary for Subcatchment 12:

12.16 cfs @ 12.70 hrs, Volume= Runoff

1.821 af, Depth> 2.58"

Area (ac)	CN	Description
0.030	98	Paved parking & roofs
0.410	91	Gravel roads, HSG D
7.500	70	Woods, Good, HSG C
0.520	77	Woods, Good, HSG D
8.460	72	Weighted Average
8.430		99.65% Pervious Area
0.030		0.35% Impervious Area

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	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	21.3	150	0.0500	0.12		Sheet Flow, A to B Woods: Light underbrush n= 0.400 P2= 3.00"
	3.2	195	0.0400	1.00		Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps
	13.3	620	0.0240	0.77		Shallow Concentrated Flow, C to D Woodland Kv= 5.0 fps
	0.2	50	0.0050	4.97	8.78	<u>'</u>
	12.0	675	0.0500	0.94	3.21	n= 0.011 Trap/Vee/Rect Channel Flow, E to F Bot.W=10.00' D=0.25' Z= 15.0 '/' Top.W=17.50'
2	50.1	1,690	Total			n= 0.120

Summary for Subcatchment 13:

Runoff = 16.48 cfs @ 13.06 hrs, Volume= 3.375

3.375 af, Depth> 3.89"

	Area	(ac) (N Des	cription					
	2.	2.800 98		Paved parking & roofs					
	1.	700		vel roads, i					
	4.500		78 Mea	dow, non-	G D				
	0.	790	71 Mea	dow, non-	grazed, HS	GC			
*	0.	630	98 Pon	d	•				
	10.	420	86 Wei	ghted Aver	age				
		990		8% Pervio					
	3.	430	32.9	2% Impen	vious Area				
				•					
	Tc	Length	Slope	Velocity	Capacity	Description			
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	19.8	150	0.0600	0.13		Sheet Flow, A to B			
						Woods: Light underbrush n= 0.400 P2= 3.00"			
	1.6	120	0.0600	1.22		Shallow Concentrated Flow, B to C			
						Woodland Kv= 5.0 fps			
	60.4	725	0.0100	0.20	0.07	Trap/Vee/Rect Channel Flow, C to D			
						Bot.W=3.00' D=0.10' Z= 3.0 '/' Top.W=3.60'			
						n= 0.150 Sheet flow over Short Grass			
	0.1	70	0.0290	12.26	38.52	Pipe Channel, D to E			
						24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'			
						n= 0.013 Corrugated PE, smooth interior			
	81.9	1,065	Total						

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Summary for Subcatchment 14:

Runoff = 3.52 cfs @ 12.41 hrs, Volume= 0.404 af, Depth> 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

Area	(ac) C	N Des	cription		
0.	719 7	'1 Mea	1 Meadow, non-		SG C
0.	966 7	'8 Mea	dow, non-	razed, HS	G D
1.	685 7	'5 Weig	ghted Aver	age	
1.	685	100.	00% Pervi	ous Area	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
10.7	70	0.0600	0.11		Sheet Flow, A to B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.2	195	0.0400	1.00		Shallow Concentrated Flow, B to C
					Woodland Kv= 5.0 fps
15.0	450	0.0100	0.50		Shallow Concentrated Flow, C to D
					Woodland Kv= 5.0 fps
29.0	715	Total			

Summary for Subcatchment 15:

Runoff = 1.63 cfs @ 12.82 hrs, Volume= 0.267 af, Depth> 2.49"

Area	(ac) C	N Des	cription		
0.	321 6	35 Brus	h, Good, l	HSG C	
0.	970 7	73 Brus	h, Good, I	HSG D	
1.	291 7		ghted Aver		
1.	291	100.	00% Pervi	ous Area	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.4	150	0.0050	0.05		Sheet Flow, A to B
5.4	115	0.0050	0.35		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps
58.8	265	Total			10

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Summary for Subcatchment 21:

Runoff = 38.06 cfs @ 12.36 hrs, Volume= 4.224 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

A	ea (ac)	С	N Des	cription						
1.820 98 Paved parking & r					& roofs					
	3.350	9	1 Grav	Gravel roads, HSG D						
	2.010	7	'1 Mea	Meadow, non-grazed, HSG C						
	5.290	7	8 Mea	dow, non-	grazed, HS	G D				
	1.810	7	0 Woo	ds, Good,	HSG C					
	14.280	8	2 Weig	ghted Avei	rage					
	12.460			5% Pervio						
	1.820		12.7	5% Impen	vious Area					
•	Tc Lei	ngth	Slope	Velocity	Capacity	Description				
(mi	n) (f	eet)	(ft/ft)	(ft/sec)	(cfs)					
15	.5	150	0.1100	0.16		Sheet Flow, A to B				
						Woods: Light underbrush n= 0.400 P2= 3.00"				
3	.7	415	0.1370	1.85		Shallow Concentrated Flow, B to C				
						Woodland Kv= 5.0 fps				
6	.9	410	0.0200	0.99		Shallow Concentrated Flow, C to D				
						Short Grass Pasture Kv= 7.0 fps				
26	.1	975	Total							

Summary for Subcatchment 31:

Runoff = 15.53 cfs @ 12.50 hrs, Volume= 1.954 af, Depth> 2.69"

Area (ac)	CN	Description
2.640	70	Woods, Good, HSG C
4.180	71	Meadow, non-grazed, HSG C
1.340	78	Meadow, non-grazed, HSG D
0.330	89	Gravel roads, HSG C
0.240	98	Paved parking & roofs
8.730	73	Weighted Average
8.490		97.25% Pervious Area
0.240		2.75% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	150	0.1200	0.25		Sheet Flow, A to B
					Grass: Dense n= 0.240 P2= 3.00"
1.7	210	0.0900	2.10		Shallow Concentrated Flow, B to C
12.5	390	0.0500	0.52	3.56	Short Grass Pasture Kv= 7.0 fps Trap/Vee/Rect Channel Flow, C to D
12.0	390	0.0000	0.52	3.50	Bot.W=25.00' D=0.25' Z= 10.0 '/' Top.W=30.00' n= 0.240
6.0	375	0.0500	1.04	7.13	Trap/Vee/Rect Channel Flow, D to E Bot.W=25.00' D=0.25' Z= 10.0 '/' Top.W=30.00'
					n= 0.120
5.4	255	0.0300	0.79	8.92	•
					Bot.W=40.00' D=0.25' Z= 20.0 '/' Top.W=50.00' n= 0.120
35.6	1.380	Total			

Summary for Subcatchment 41:

Runoff = 18.61 cfs @ 12.27 hrs, Volume= 1.793 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

A	rea (ac)	С	N Des	cription			
	0.640	7	1 Mea	dow, non-	grazed, HS	GC	
	0.360	7			grazed, HS		
	3.230	7	0 Woo	ds, Good,	HSG C		
	3.470	7	7 Woo	ods, Good,	HSG D		
	7.700	7	4 Wei	ghted Aver	age		
	7.700		100.	.00% Pervi	ous Area		
						-	
100	. 10°- 10°-	ngth	Slope	Velocity	Capacity	Description	
(m	in) (f	eet)	(ft/ft)	(ft/sec)	(cfs)		
14	4.1	150	0.0500	0.18		Sheet Flow, A to B	
						Grass: Dense n= 0.240 P2= 3.00"	
	5.1	455	0.0900	1.50		Shallow Concentrated Flow, B to C	
						Woodland Kv= 5.0 fps	
19	9.2	605	Total				

Summary for Subcatchment 51:

Runoff = 21.68 cfs @ 12.69 hrs, Volume= 3.211 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

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Area	(ac) C	N Des	cription				
0.	430 9	91 Grav	el roads, l	HSG D			
1.	1.000 55 Woods, Good, HSG B						
8.380 70 Woods, Good, HSG C							
6.	190 7	71 Mea	dow, non-	grazed, HS	SG C		
16.	000 7	70 Weig	hted Aver	age			
16.	.000		00% Pervi	-			
Tc	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
23.2	150	0.0400	0.11		Sheet Flow, A to B		
					Woods: Light underbrush n= 0.400 P2= 3.00"		
8.0	50	0.0400	1.00		Shallow Concentrated Flow, B to C		
					Woodland Kv= 5.0 fps		
0.3	75	0.0050	4.97	8.78	Pipe Channel, C to D		
					18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38'		
					n= 0.011		
24.8	1,100	0.0260	0.74	4.15	•		
					Bot.W=20.00' D=0.25' Z= 10.0 '/' Top.W=25.00'		
					n= 0.120		
49.1	1.375	Total					

Summary for Subcatchment 61:

Runoff = 15.64 cfs @ 12.32 hrs, Volume= 1.627 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

Area (ac)	CN	Desc	cription		
5.520	55	Woo	ds, Good,	HSG B	
3.730	70	Woo	ds, Good,	HSG C	
0.210	77	. Woo	ds, Good,	HSG D	
0.300	58			grazed, HS	
1.250	71	Mea	dow, non-	grazed, HS	GC
11.010	62	Weig	ghted Aver	age	
11.010		100.	00% Pervi	ous Area	
	ngth eet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	150	0.0900	0.15	77,	Sheet Flow, A to B
4.7	425	0.0900	1.50		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps
21.5	575	Total			

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Summary for Subcatchment 71:

5.69 cfs @ 12.46 hrs, Volume= Runoff

0.683 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

	Area	(ac) C	N Des	cription				
	0.	960 5	55 Woo	ds, Good,	HSG B			
	2.	970 7	70 Woo	ds, Good,	HSG C			
	3.930 66 Weighted Average							
	3.	930	100.	00% Pervi	ous Area			
	Тс	Length	Slope	Velocity	Capacity	Description		
-	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
_	30.7	150	0.0800	0.08		Sheet Flow, A to B		
						Woods: Dense underbrush n= 0.800 P2= 3.00"		
	0.8	70	0.0800	1.41		Shallow Concentrated Flow, B to C		
-						Woodland Kv= 5.0 fps		
	31.5	220	Total					

Summary for Subcatchment 81:

3.67 cfs @ 12.60 hrs, Volume= Runoff

0.505 af, Depth> 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

Area	(ac) C	N Des	cription		
2.	417 !	55 Woo	ds, Good,	HSG B	
1.	320	70 Woo	ds, Good,	HSG C	
0.	040	77 Woo	ds, Good,	HSG D	
3.	777 6	0 Wei	ghted Aver	age	
3.	777	100.	00% Pervi	ous Area	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
36.4	150	0.0130	0.07		Sheet Flow, A to B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.2	110	0.0130	0.57		Shallow Concentrated Flow, B to C
					Woodland Kv= 5.0 fps
39.6	260	Total			

Summary for Subcatchment 91:

Runoff

2.59 cfs @ 12.27 hrs, Volume=

0.248 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=5.80"

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Area	(ac) C	N Des	cription						
1	1.223 70 Woods, Good, HSG C								
1	.223	100.	00% Pervi	ous Area					
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
16.8	150	0.0900	0.15	(3.0)	Sheet Flow, A to B				
2.1	90	0.0200	0.71		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps				
18.9	240	Total							

Summary for Reach R1:

Inflow Area = 57.495 ac, 64.56% Impervious, Inflow Depth > 1.17" for 25-year event

Inflow = 11.22 cfs @ 12.37 hrs, Volume= 5.617 af

Outflow = 9.85 cfs @ 12.96 hrs, Volume= 5.263 af, Atten= 12%, Lag= 35.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.39 fps, Min. Travel Time= 16.1 min Avg. Velocity = 0.25 fps, Avg. Travel Time= 25.6 min

Peak Storage= 9,553 cf @ 12.68 hrs Average Depth at Peak Storage= 0.25'

Bank-Full Depth= 2.00' Flow Area= 240.0 sf. Capacity= 349.08 cfs

100.00' x 2.00' deep channel, n= 0.150

Side Slope Z-value= 10.0 '/' Top Width= 140.00'

Length= 380.0' Slope= 0.0105 '/'

Inlet Invert= 100.00'. Outlet Invert= 96.00'

‡

Summary for Reach R2:

Inflow Area = 57.495 ac, 64.56% Impervious, Inflow Depth > 1.10" for 25-year event

Inflow = 9.85 cfs @ 12.96 hrs, Volume= 5.263 af

Outflow = 9.83 cfs @ 13.04 hrs, Volume= 5.204 af, Atten= 0%, Lag= 4.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.92 fps, Min. Travel Time= 2.7 min Avg. Velocity = 0.61 fps, Avg. Travel Time= 4.1 min

Peak Storage= 1,603 cf @ 12.99 hrs Average Depth at Peak Storage= 0.71'

Bank-Full Depth= 3.00' Flow Area= 93.0 sf, Capacity= 190.93 cfs

Type III 24-hr 25-year Rainfall=5.80"

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10.00' x 3.00' deep channel, n= 0.150 Side Slope Z-value= 7.0 '/' Top Width= 52.00' Length= 150.0' Slope= 0.0200 '/' Inlet Invert= 96.00', Outlet Invert= 93.00'



Summary for Reach R3:

Inflow Area = 55.810 ac, 66.51% Impervious, Inflow Depth > 2.50" for 25-year event

Inflow = 25.56 cfs @ 14.26 hrs, Volume= 11.636 af

Outflow = 7.74 cfs @ 12.37 hrs, Volume= 5.213 af, Atten= 70%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.77 fps, Min. Travel Time= 0.3 min Avg. Velocity = 3.41 fps, Avg. Travel Time= 0.4 min

Peak Storage= 159 cf @ 12.40 hrs Average Depth at Peak Storage= 1.50' Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe n= 0.013 Corrugated PE, smooth interior Length= 90.0' Slope= 0.0050 '/' Inlet Invert= 100.45', Outlet Invert= 100.00'



Summary for Reach R4:

Inflow Area = 10.420 ac, 32.92% Impervious, Inflow Depth > 1.79" for 25-year event

Inflow = 3.56 cfs @ 15.11 hrs, Volume= 1.552 af

Outflow = 3.54 cfs @ 15.40 hrs, Volume= 1.493 af, Atten= 1%, Lag= 17.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity = 0.27 fps, Min. Travel Time = 9.9 min Avg. Velocity = 0.21 fps, Avg. Travel Time = 12.5 min

Type III 24-hr 25-year Rainfall=5.80"

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Peak Storage= 2,112 cf @ 15.24 hrs Average Depth at Peak Storage= 0.22'

Bank-Full Depth= 1.00' Flow Area= 100.0 sf, Capacity= 63.25 cfs

50.00' x 1.00' deep channel, n= 0.150

Side Slope Z-value= 50.0 '/' Top Width= 150.00'

Length= 160.0' Slope= 0.0070 '/'

Inlet Invert= 95.50', Outlet Invert= 94.38'



Summary for Reach SP1:

Inflow Area = 69.206 ac, 58.59% Impervious, Inflow Depth > 1.16" for 25-year event

Inflow = 11.54 cfs @ 15.53 hrs, Volume= 6.718 af

Outflow = 11.54 cfs @ 15.53 hrs, Volume= 6.718 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP2:

Inflow Area = 14.280 ac, 12.75% Impervious, Inflow Depth > 3.55" for 25-year event

Inflow = 38.06 cfs @ 12.36 hrs, Volume= 4.224 af

Outflow = 38.06 cfs @ 12.36 hrs, Volume= 4.224 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP3:

Inflow Area = 8.730 ac, 2.75% Impervious, Inflow Depth > 2.69" for 25-year event

Inflow = 15.53 cfs @ 12.50 hrs, Volume= 1.954 af

Outflow = 15.53 cfs @ 12.50 hrs, Volume= 1.954 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP4:

Inflow Area = 7.700 ac, 0.00% Impervious, Inflow Depth > 2.79" for 25-year event

Inflow = 18.61 cfs @ 12.27 hrs, Volume= 1.793 af

Outflow = 18.61 cfs @ 12.27 hrs, Volume= 1.793 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Summary for Reach SP5:

16.000 ac, 0.00% Impervious, Inflow Depth > 2.41" for 25-year event Inflow Area =

Inflow 21.68 cfs @ 12.69 hrs, Volume= 3.211 af

Outflow 21.68 cfs @ 12.69 hrs, Volume= 3.211 af. Atten= 0%. Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP6:

Inflow Area = 11.010 ac, 0.00% Impervious, Inflow Depth > 1.77" for 25-year event

15.64 cfs @ 12.32 hrs, Volume= Inflow 1.627 af

Outflow 15.64 cfs @ 12.32 hrs, Volume= 1.627 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP7:

3.930 ac, 0.00% Impervious, Inflow Depth > 2.09" for 25-year event Inflow Area =

5.69 cfs @ 12.46 hrs, Volume= Inflow 0.683 af

Outflow 5.69 cfs @ 12.46 hrs, Volume= 0.683 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP8:

Inflow Area = 3.777 ac, 0.00% Impervious, Inflow Depth > 1.61" for 25-year event

Inflow 3.67 cfs @ 12.60 hrs, Volume= 0.505 af

3.67 cfs @ 12.60 hrs, Volume= Outflow 0.505 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP9:

1.223 ac, 0.00% Impervious, Inflow Depth > 2.44" for 25-year event Inflow Area =

Inflow 2.59 cfs @ 12.27 hrs, Volume= 0.248 af

2.59 cfs @ 12.27 hrs, Volume= Outflow 0.248 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond Gilbert Culvert:

Inflow Area = 11.711 ac, 29.29% Impervious, Inflow Depth > 1.80" for 25-year event

Inflow = 3.79 cfs @ 15.37 hrs, Volume= 1.760 af

Outflow = 3.77 cfs @ 15.48 hrs, Volume= 1.734 af, Atten= 0%, Lag= 6.6 min

3.77 cfs @ 15.48 hrs, Volume= Primary 1.734 af 0.00 cfs @ 5.00 hrs, Volume= 0.000 af Secondary =

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Peak Elev= 94.98' @ 15.48 hrs Surf.Area= 3,444 sf Storage= 1,722 cf

Plug-Flow detention time= 8.2 min calculated for 1.728 af (98% of inflow) Center-of-Mass det. time= 4.8 min (976.2 - 971.4)

Volume	Inve	rt Avail.Sto	rage Storage	Description		
#1	94.00	0' 6,70	00 cf Custom	Stage Data (Pr	rismatic)Listed below	
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		
94.0		0	0	0		
95.0	00	3,500	1,750	1,750		
95.6	60	13,000	4,950	6,700		
Device	Routing	Invert	Outlet Devices	S		
#1	Primary	94.38'	15.0" Round	Culvert		
	·		Inlet / Outlet Ir	nvert= 94.38' / 9	headwall, Ke= 0.900 3.95' S= 0.0172 '/' Cc= 0.900 both interior, Flow Area= 1.23 sf	
#2	Primary	93.70'	12.0" Round	Culvert		
			L= 32.0' CPF	p, projecting, no	headwall, Ke= 0.900	
			Inlet / Outlet Ir	nvert= 93.70' / 93	3.56' S= 0.0044 '/' Cc= 0.900	
#3	Secondar	y 95.50'		•	ooth interior, Flow Area= 0.79 sf road-Crested Rectangular Weir	
#3	Secondar	у 95.50	Head (feet) 0	.20 0.40 0.60 (0.80	

Primary OutFlow Max=3.77 cfs @ 15.48 hrs HW=94.98' (Free Discharge)

1=Culvert (Inlet Controls 1.23 cfs @ 2.09 fps)

2=Culvert (Barrel Controls 2.55 cfs @ 3.28 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=94.00' (Free Discharge)

3=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond Martin Culvert:

Inflow Area =	69.206 ac, 5	8.59% Impervious,	Inflow Depth > 1.2	20" for 25-year event
Inflow =	11.87 cfs @	13.02 hrs, Volume	= 6.938 af	
Outflow =	11.54 cfs @	15.53 hrs, Volume	= 6.718 af,	Atten= 3%, Lag= 150.8 min
Primary =	10.05 cfs @	15.53 hrs, Volume	= 6.400 af	
Secondary =	1.48 cfs @	15.53 hrs, Volume	= 0.318 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 93.37' @ 15.53 hrs Surf.Area= 9,660 sf Storage= 10,681 cf

Plug-Flow detention time= 14.2 min calculated for 6.718 af (97% of inflow) Center-of-Mass det. time= 6.4 min (961.9 - 955.5)

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Volume	Inve	ert Avail.Sto	rage Storage	Description	
#1	90.0	00' 17,15	0 cf Custon	n Stage Data (P	rismatic)Listed below
Elevation (fee		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
90.0	00	0	0	0	
91.0	00	400	200	200	
92.0	00	2,500	1,450	1,650	
93.0	00	8,000	5,250	6,900	
94.0	00	12,500	10,250	17,150	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	89.85'	15.0" Round	d Culvert	*
#2	Seconda	ry 93.30'	Inlet / Outlet n= 0.013 Co 30.0' long x Head (feet)	Invert= 89.85' / 8 rrugated PE, sm 15.0' breadth E 0.20 0.40 0.60	conforming to fill, Ke= 0.500 39.42' S= 0.0143 '/' Cc= 0.900 cooth interior, Flow Area= 1.23 sf Broad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 .70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.05 cfs @ 15.53 hrs HW=93.37' (Free Discharge) 1=Culvert (Inlet Controls 10.05 cfs @ 8.19 fps)

Secondary OutFlow Max=1.45 cfs @ 15.53 hrs HW=93.37' (Free Discharge) —2=Broad-Crested Rectangular Weir (Weir Controls 1.45 cfs @ 0.70 fps)

Summary for Pond P1:

Inflow Area =	47.350 ac, 78.33% Impervious, Inflow	v Depth > 4.75" for 25-year event
Inflow =	98.68 cfs @ 12.86 hrs, Volume=	18.750 af
Outflow =	23.15 cfs @ 14.32 hrs, Volume=	9.815 af, Atten= 77%, Lag= 87.7 min
Primary =	17.19 cfs @ 14.32 hrs, Volume=	9.138 af
Secondary =	5.96 cfs @ 14.32 hrs. Volume=	0.677 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Starting Elev= 103.65' Surf.Area= 62,918 sf Storage= 223,484 cf

Peak Elev= 108.42' @ 14.32 hrs Surf.Area= 144,893 sf Storage= 754,732 cf (531,248 cf above start)

Plug-Flow detention time= 440.2 min calculated for 4.682 af (25% of inflow) Center-of-Mass det. time= 163.6 min (955.9 - 792.3)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	993,495 cf	Custom Stage Data (Prismatic)Listed below

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Elevation	Surf.Area	Inc.Store	Cum.Store
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)
99.00	38,202	0	0
100.00	42,040	40,121	40,121
101.00	45,939	43,990	84,111
102.00	49,898	47,919	132,029
103.00	53,919	51,909	183 <u>,</u> 938
104.00	67,764	60,842	244,779
106.00	119,149	186,913	431,692
108.00	140,355	259,504	691,196
110.00	161,944	302,299	993,495

Device	Routing	Invert	Outlet Devices	
#1	Primary	106.00'	18.0" Round Culvert	
	-		L= 50.0' CMP, mitered to conform to fill, Ke= 0.700	
			Inlet / Outlet Invert= 106.00' / 104.00' S= 0.0400 '/' Cc= 0.900	
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf	
#2	Primary	106.00'	15.0" Round Culvert	
	-		L= 50.0' CMP, mitered to conform to fill, Ke= 0.700	
			Inlet / Outlet Invert= 106.00' / 104.00' S= 0.0400 '/' Cc= 0.900	
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf	
#3	Primary	103.65'	0.50 cfs Exfiltration when above 103.65'	
#4	Secondary	108.20'	21.0' long x 25.0' breadth Broad-Crested Rectangular Weir	
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60	
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63	

Primary OutFlow Max=17.19 cfs @ 14.32 hrs HW=108.42' (Free Discharge)

1=Culvert (Inlet Controls 9.70 cfs @ 5.49 fps)

-2=Culvert (Inlet Controls 6.99 cfs @ 5.69 fps)

Secondary OutFlow Max=5.82 cfs @ 14.32 hrs HW=108.42' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 5.82 cfs @ 1.26 fps)

Summary for Pond P2:

Inflow Area =	10.420 ac, 32.92% Impervious, Inflow	v Depth > 3.89" for 25-year event
Inflow =	16.48 cfs @ 13.06 hrs, Volume=	3.375 af
Outflow =	3.56 cfs @ 15.11 hrs, Volume=	1.552 af, Atten= 78%, Lag= 123.2 min
Primary =	3.16 cfs @ 15.11 hrs, Volume=	1.525 af
Secondary =	0.40 cfs @ 15.11 hrs, Volume=	0.026 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Starting Elev= 98.00' Surf.Area= 27,500 sf Storage= 141,300 cf

Peak Elev= 100.94' @ 15.11 hrs Surf.Area= 39,752 sf Storage= 238,690 cf (97,390 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow) Center-of-Mass det. time= 153.5 min (981.9 - 828.4)

⁻³⁼Exfiltration (Exfiltration Controls 0.50 cfs)

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Volume	inv	ert Ava	il.Storage	Storage	Description	
#1	90.	00' 2	83,050 cf	Custon	Stage Data (P	rismatic)Listed below
Elevation Surf.Area			c.Store	Cum.Store		
(fee	et)	(sq-ft)	(cub	ic-feet)	(cubic-feet)	
90.00 0			0	0		
92.0	00	15,000		15,000	15,000	
94.00 18,900			33,900	48,900		
96.0	00	23,000	,	41,900	90,800	
98.0	00	27,500		50,500	141,300	
99.0	00	30,000		28,750	170,050	
100.0	00	36,000		33,000	203,050	
101.0	00	40,000		38,000	241,050	
102.0	00	44,000		42,000	283,050	
Device	Routing	In		let Device		
#1	Primary	98	3.40' 0.50	0.50 cfs Exfiltration when above 98.40'		
#2	Primary	99	.80' 12.0	12.0" Round Culvert		
			L= 2	24.0' CP	P, mitered to cor	nform to fill, Ke= 0.700
				Inlet / Outlet Invert= 99.80' / 99.00' S= 0.0333 '/' Cc= 0.900		
			n= (0.013 Coi	rrugated PE, sm	ooth interior, Flow Area= 0.79 sf
#3	Seconda	ary 100	.90' 16.0)' long x	28.0' breadth B	road-Crested Rectangular Weir
			Hea	d (feet) (0.20 0.40 0.60	0.80 1.00 1.20 1.40 1.60
				Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63		

Primary OutFlow Max=3.16 cfs @ 15.11 hrs HW=100.94' (Free Discharge)

1=Exfiltration (Exfiltration Controls 0.50 cfs)

Secondary OutFlow Max=0.32 cfs @ 15.11 hrs HW=100.94' (Free Discharge) 3=Broad-Crested Rectangular Weir (Weir Controls 0.32 cfs @ 0.52 fps)

⁻²⁼Culvert (Inlet Controls 2.66 cfs @ 3.39 fps)

Appendix 3

Stormwater Management Plans



