City of Biddeford
Planning Board
September 14, 2022 6:00 PM City Hall
Council Chambers, & Zoom
https://biddeford.zoom.us/j/95541160590?pwd=eUczZFc1NlF6QlNMY0MrMHRpRVNZQT09
Webinar ID #955 4116 0590 Passcode#098732

STATUS: Planning Board Meeting 9-6-22 6:00PM in Council Chambers and hybrid via Zoom

1. **PLEDGE OF ALLEGIANCE**
2. **DECLARATION OF QUORUM/VOTING MEMBERS**
3. **ADJUSTMENTS TO THE AGENDA**
4. **PLANNER'S BUSINESS**
5. **UNFINISHED BUSINESS**
6. **NEW BUSINESS**

   6.A. 2021.42 Public Hearing to review a Preliminary Subdivision Application for South Street Village, LLC to create a 195 Unit Manufactured Housing Park called Hidden Hills at 413 South Street, (Tax Map 7, Lot 8) in the SR1 & RF Zones with the MHP Overlay.

   2021.42 Hidden Hills Subdivision MHP SR.pdf
   SoStVillageTrafficPeerReview9-7-22.pdf
   Site Design - Peer Review Comments.pdf
   Hidden Hills Additional Submission Materials.pdf
   Hidden Hills Updated Plan Set - 8-17-2022.pdf
   6.15.22 Final.HiddenHills5.pdf
   7.14.22 Emails w M C Hidden Hills 2.pdf
   Brown 7-12-22.pdf
   Brown 7-14-22.pdf
   Brown 8-12-22.pdf
   Brown Whitten 7-12-22.pdf
   Brown.pdf
   Chamberlain 8-15-22.pdf
   Curro 5-16-22.pdf
   Emails between Linda Brown & Matthew Chamberlain.pdf
   Southwick to PB 7-12-22.pdf
7. **OTHER BUSINESS**
8. **ADJOURN**

The Board reserves the right to halt official business at 9:30 p.m. Items not heard at tonight's meeting shall be rescheduled to the next meeting of the Board. All materials pertaining to items on the agenda are available for public review at the Biddeford Planning Department, second floor, Biddeford City Hall during normal business hours.

CITY OF BIDDEFORD

Planning and Development Department

Matthew Grooms, AICP
Deputy Director/City Planner
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Matthew.Grooms@biddefordmaine.org

PLANNING BOARD REPORT

TO: Chair Southwick and the Biddeford Planning Board

FROM: Matthew Grooms, AICP, City Planner

DATE: September 8, 2022

RE: 2021.42 Preliminary Plan Review for 195-unit manufactured housing park subdivision at 413 South Street (Tax Map 7/Lot 8) in the RF, SR-1 zones and MHP overlay zone.

MEETING DATE: Wednesday, September 14, 2022 at 6:00 pm

I. INTRODUCTION

South Street Village, LLC has requested preliminary site plan/subdivision review of a 195 unit manufactured housing park on a 312 +/- acre parcel located in the Rural Farm (RF) and Suburban Residential (SR-1) zone with Mobile Home Parks (MHP) overlay zone. The site includes a large freshwater wetland among open field and woods and is traversed by Thatcher Brook. The Planning Board previously reviewed a sketch plan for this proposal in September 2021, and considered the preliminary site plan and subdivision application in May of 2022, where the Board voted to postpone consideration of the application until certain concerns had been addressed. The focus of this review memo is therefore focused on addressing those particular items.

Since the Planning Board's review in May, the applicant has decided to age restrict the development to residents 55 and older. This change, as described in the applicant's cover letter, significantly reduces the amount of traffic generated by the development and eliminates the need for a dedicated school bus turnaround.

II. PROJECT INFORMATION

	SUBJECT	INFORMATION
1.	Applicant/Property Owner	South Street Village, LLC 762 Main Street South Portland, ME 04106
2.	Agent/Engineer	Jeff Amos, P.E. Terradyn Consultants, LLC 41 Campus Drive, Suite 301 New Gloucester, ME 04260

3.	Project Location	413 South Street
4.	Map/Lot	Tax Map 7/Lot 8
5.	City Approvals Required	Major Subdivision/Site Plan
6.	Existing Zoning	Rural Farm (RF) and Suburban Residential (SR-1)
7.	Overlay Zoning	Manufactured Park Overlay (MHP)
8.	Existing Use	Undeveloped property. Forest, fields and wetlands.
9.	Proposed Use	195 unit manufactured housing park
10.	Uses in the Vicinity	Residential
11.	Parcel Size	312.1 acres
12.	Water Supply	Maine Water
13.	Sewerage Disposal	Centralized subsurface septic systems
14.	Solid Waste Disposal	Private Hauler
15.	Fire Protection	City of Biddeford
16.	Parking Spaces Required	2 spaces/dwelling unit
17.	Parking Spaces Provided	418 parking spaces (28 for maintenance garage and community center)
18.	Ownership of Road	Private Streets
19.	Estimated Site Development Costs	Undisclosed
20.	Financial Capacity Letter	Letter received from Evergreen Credit Union confirming financial capacity.
21.	Waivers Needed/Requested	None requested
22.	Waivers Granted	N/A
23.	Additional Approvals/Permits Needed	Site Location of Development Review, DEP Stormwater Review
24.	Fees Paid (LDR Attachment A)	All application fees paid
25.	Planning Board Review History	September 2021, May 2022

III. PLANNING BOARD MEETING – May 18, 2022

At the Planning Board's May 18, 2022 meeting, the Board considered and voted to postpone a preliminary site plan/subdivision application for the South Street Village proposal, requesting that certain additional information be provided prior to the Board reconsidering this request. Those requests included:

- Provide a legal opinion on the proposed unit density with respect to zoning requirements.
- Applicant to consider the addition of sidewalks, bicycle lanes, and facilities to promote public transit usage.
- Complete third party review of traffic study provided by the applicant.
- Schedule meeting with Biddeford Conservation Commission, and hold a site walk.
- Schedule a Planning Board site walk.
- Provide an overview of the differences between modular and mobile homes.
- Provide additional information regarding site maintenance, home owner's association, and infrastructure for proposed pocket parks.

- Applicant to provide update on plans for remaining portion of the property not being developed under this proposal.

IV. COMPLETENESS REVIEW

The application is before the Planning Board as required by Article XI (Site Plan Review) of the Land Development Regulations and Chapter 66 (Subdivisions) subject to Subdivision review and approval. With regards to the subdivision reviews, all applications have a three-tier approval process beginning with a Sketch Plan review, that was reviewed at the Planning Board's 9/29/2021 meeting.

The applicant has submitted an updated preliminary plan application with additional information as requested by the Planning Board at their meeting on May 18, 2022. The content requirements for a preliminary subdivision application are outlined in Sec.66-35 and, and requirements specific to a manufactured housing park are listed in Article VI. Section 45 of the Land Development Regulations. Staff consider the application to be generally complete.

The following items were identified in staff's May 12, 2022 review memo as being outstanding or requiring clarification. Below is an update on the status of these items.

1. S**ec. 66-35(a)(15).** Reserved Fire Lanes. The Application identified reserved fire lanes as being not applicable. In general, the proposed right-of-way widths and anticipated low volumes of traffic, likely do not necessitate reserved fire lanes. The applicant should confirm this with the Fire Department.

2. **Sec. 66-35(a)(16).** The plan does not detail the location of all soil test pits. Mark Hampton Associates completed an evaluation of two hand dug test pits for the proposed stormwater treatment system in July. As a condition, staff recommend that the plans be updated to include the location of soil test pits for all proposed lots.

3. **Sec. 66-35(a)(18).** Sec. 66-35(d)(10). The applicant has not yet provided review or utility capacity letters from required entities, including the power company, City Engineering, police and fire department.

4. **Article VI, Sec.45.(Div.2)D.4**. *Names of abutting owners of properties and the nature of present use of abutting property.* Abutting property across South Street is not included on the submitted plans, and should be considered per the City's definition of 'abutter'.

5. **Article VI, Sec.45 (Div.2)D.4.** *Open Space Management Plan.* This plan has not been provided. As part of the applicant's May submission, they detailed that this information would likely be provided as part of the final subdivision application.

6. **Article VI, Sec.45. (Div.2)D.13.** Park Management Plan. This plan has not been provided. A draft Park Management Plan, dated May 1, 2022 was provided as part of the applicant's earlier preliminary plan submission.

7. **Article VI, Sec. 45. (Div.2)E.6.** *Groundwater Impacts.* The applicant has supplied a Hydrological Assessment of the proposal, prepared by Mark Cengi Geologic, Inc, dated August 9, 2022.

V. REVIEW PROCESS

After determining if the application is complete for substantive review, an item for discussion and action is to determine if the application, prior to review and approval of the preliminary or final plan will require any studies for the Board's consideration. This is outlined in Sec. 66-38.

The preliminary plan review application includes narratives that address how the application conforms to the various applicable standards required by Chapter 66 and by the Land Development Regulations, including Article VI, Sec. 45 Manufactured housing/mobile home parks. The Board should review these with Sec. 66-39(b) in mind and determine if additional information is needed to make a positive finding on the approval criteria.

VI. AREAS OF REVIEW

The proposed development is subject to the following areas of review.

A. Zoning:

The property is predominantly zoned Rural Farm (RF) with a Manufactured Housing Park (MHP) overlay. A narrow strip of the property immediately along South Street is zoned Suburban Residential (SR-1), though that portion of the property is not being developed. The development is proposed to occur entirely within the portion of the site that is zoned MHP overlay, with the remaining portion of the site remaining undisturbed. The MHP overlay permits the development of a manufactured housing park subject to the City's subdivision requirements, and regulations stated under Article VI, Section 45. Park design requirements and limitations are based upon the type of wastewater infrastructure being proposed, with applicable standards as follows:

	Minimum Lot Area	**Minimum Street Frontage**
Public Sewer	6,500 SF	50 Feet
Central Subsurface Wastewater System	12,000 SF	75 Feet
Individual Wastewater Systems	20,000 SF	100 Feet

The applicant is requesting use of central subsurface wastewater systems, servicing between two and three individual lots, with minimum lot size of 12,000 square feet and minimum street frontage of 75 feet. The required setback for individual home sites is a minimum of 15 feet.

B. Subdivision:

The City's subdivision ordinance specifies that the subdivision of property into five or more lots which include roadway and/or utility improvements is considered a major subdivision. A major subdivision requires a minimum of three public meetings; sketch plan, preliminary plan, and final plan review, with varying submittal requirements for each plan type. Sketch Plan and the initial review of the Preliminary Plan occurred in September, 2021 and May, 2022 respectively. Content requirements for a final subdivision plan are outlined in Section 66-52 of the Biddeford Code of Ordinances.

The following are comments that the Board should consider:

Site Landscaping

1. Both the subdivision ordinance (Sec. 66-79) and manufactured housing park performance standards (Sec. 45, Div.2 E.3) require buffering of residential development from adjacent public rights-of-way. These requirements, at 75 feet and 50 feet respectively, are generally met, given the proposed distances between South Street and areas of proposed development. However, the site landscaping plans do not depict any plantings within this buffer zone. Staff previously requested visual renderings from South Street to depict the proposed visual impact of this development. Staff recommend that these renderings be provided.

Net Density Calculation

2. The net density calculations required by the City's Land Development Regulations is likely not applicable due to the state statute (MRS Title 30-A §4358) on manufactured housing. The City has requested a formal determination from the City Attorney on this matter, to determine whether this requirement is applicable. If so, the applicant will be required to revise their density calculations to be consistent with state statute.

Undeveloped Areas of Property

3. As indicated in the May 12th staff report, the application does not detail the proposed future condition of the land immediately to the south of the project site, outside of the MHP overlay zone. The subdivision plan should clarify whether this portion of the property is to be included as part of the project's designated open space area, or whether it will be parceled off for future development.

Open Space

4. Staff previously commented that the applicant did not adequately address the open space requirements for a manufactured housing park, detailed in Article VI, Sec. 34, Div.2 E.3. As part of the applicant's May 17, 2022 submittal of additional information, draft language regarding management of park open space was provided for staff and Board consideration, to be included as part of the overall Park Management Plan. This information indicates that open space areas are to utilized for recreational purposes, and that generally, open space areas are to be maintained in their natural state, with the exception of low impact trails, constructed of bark mulch or other low-impact materials. The agreement would restrict trail locations to areas outside of designated forested buffers and identified wetlands. Staff is supportive of this approach for on-site open space, though would recommend the provision of trails or walkways to better connect residents with the centrally location community building and common community amenities.

Dead End Streets

5. Staff previously requested confirmation that all proposed dead end streets were less than 1,500 feet. In reviewing the plans, staff determined the longest dead end street, Lozolite Lane, is approximate 420 feet, well within that requirement. Therefore, no additional information is requested.

Site Ingress/Egress

6. Manufactured housing parks expected to generate more than 200 daily trips are required to have a minimum of two entrance/exits on a public street. The plan depicts both property entrances off of Waterworks Drive, which at present is a private street. It is anticipated that this street will be improved to City standards and will be accepted as a public street, which would satisfy this requirement.

Environmentally Sensitive Areas

7. Staff previously requested that the wetlands report utilized in delineating wetlands for the property be provided as part of the packet materials, and that the applicant should also address the discrepancy between the 2020 vernal pool assessment and 2021 Existing Conditions Plan which depicts vernal pools. No response was provided to these comments, and staff is asking that this be addressed as part of any future plan submission. \

8. In May, staff requested that the applicant coordinate with Basswood Environmental, the Maine Natural Areas Program (MNAP), and the Maine Department of Inland Fisheries and Wildlife (MDIFW) to comment on the potential impacts of this development on existing plant and wildlife communities. It is also understood that this project will undergo site law review, given the acreage disturbed and scope of the project. The applicant should address this review comment and provide an update on the status of the project's site law review with Maine DEP.

9. Both staff and the Planning Board previously recommended that the applicant meet directly with the Conservation Commission, to provide an overview of the project and answer any questions the Commission may have. While no formal meeting has yet occurred, the Conservation Commission's agent has had an opportunity to walk the site and is developing a report of their findings. Staff still recommend that this item go directly before the Conservation Commission.

10. Ideally, proposed lots would not include any areas of wetland, which would all be included as part of the designated open space area. In reviewing the plan, lot 168 features some identified wetlands at the southerly rear corner of the property. Staff recommend that the Park Management Plan include language prohibiting disturbance of wetland areas without formal review and permitting.

11. A portion of the property is located within the Thatcher Brook Watershed. Staff recommend that the applicant provide a written narrative detailing how the project complies with the recommendations of the Thatcher Brook Watershed Management Plan.

Peer-Review Engineer Comments

The City's peer-review engineer has provided updated comments (attached) which identify where prior comments had been addressed, and where there are still outstanding questions or outstanding comments. In addition, several new comments were also included in the updated review letter. Staff would direct the Board's attention to the following items:

12. Has a standard boundary survey of the parcel been submitted? The applicant responded that a boundary survey was included in Attachment 3. The plans in Attachment 3 in our copy were titled existing conditions plan, not boundary surveys.

13. The applicant should review Section 51 and chapter 62, Table A for dimensional requirements. It appears the private road would be classified as an urban section, major residential road. Pavement radii at intersections must be 25 ft or 30 ft minimum and drives are prohibited off turnarounds. Are waivers of these standards permitted? Drives for lots 72, 73, and 142 are shown off turnarounds.

14. Per section 51.D.1., monumentation should be provided in accordance with section 62-87. It may be that a waiver could be granted by the planning board for alternative monumentation materials. The response indicated that monumentation will be provided per ordinance requirements on the Waterworks Drive right of way and no waiver is necessary. The code requires granite monumentation of the roadways, and it appears if that is not the plan for monumentation of the new roads, a waiver will be required.

15. Additional comment: we assume that the DEP will review the Hydrogeologic Assessment as part of the SLODA review. If for some reason the project does not now require a SLODA permit, the city should consider having this information peer reviewed.

16. Additional comment: The grades of Griffinite Way at Garnet, Lozolite at both Onyx intersections, and Lozolite at Garnet significantly exceed 3%. The streets with the steeper grades are the through street in each instance. We would suggest reaching out to engineering to verify whether or not this is acceptable, as the code requires a maximum grade of 3% at intersections and makes no distinction between the through street or the stop-controlled street.

<u>Peer Review Traffic Engineering Comments</u>

Based upon the scope of the project, the anticipated number of trips, and the potential for significant traffic impacts to South Street, the City has retained a separate third-party traffic engineer, Diane Morabito, P.E., PTOE, with Sewall Engineering, to provide a third party review of the traffic analysis prepared for this application. That review is provided under separate cover as an attachment to this report.

Staff would direct the Board's attention to the following items:

17. Accident Review: There is one high crash location within the study area, the section of South Street that extends from River Road to Fox Hollow Drive. This section has a CRF of 1.06 with nine (9) reported crashes. A collision diagram was provided and evaluated in the TIS. Seven (7) of the nine crashes were single vehicle run off the road crashes, mostly attributed to reckless driving and excessive speed. One crash was a deer hit and there was a single rear-end crash attributed to following too close. This section of South Street is windy and hilly, which may be contributing to the run off the road single vehicle crashes. There are some curve signs but it is recommended that the applicant's Traffic Engineer do a field review to assess if additional advance curve or chevron warning signs are needed given the pattern of crashes.

18. Pedestrian and Bicycle Facilities. South Street in the vicinity of Waterworks Drive is narrow with no sidewalks or significant shoulder to provide for either bicycles or pedestrians. With a large number of active retirees in the development (195 dwelling units), significant pedestrian and bicycle activity is expected. Some connectivity to provide for pedestrians is recommended. Based upon a Google

Earth review, there is an existing sidewalk along South Street from main Street to Cathedral Oaks Drive, which is approximately ¾ miles east of the site.

VII. CONCLUSION

The submitted application provides some additional materials as requested at the Planning Board's May 18th meeting, however a number of requested items have not been supplied. The Planning Board should determine if there is sufficient information to begin its substantive review of the application. If so, it should determine if there is information that is needed prior to preliminary approval, as it related to Sec. 66-39(b). If the application is not complete, it can be tabled until such time the outstanding information is provided. The Board may also consider conditioning a preliminary approval on those items needed to be addressed to satisfy the intent of Sec. 66-39(b). The latter should be detailed and clear on expectations.

A. Draft Conditions of Approval

Prior to the submission of a final subdivision plan:

i. **The applicant shall provide a detailed response along with associated updates to plans and other materials in response to the review comments provided in this report, the City's third-party peer reviewers, and the Planning Board at its September 14, 2022 Meeting.**

B. Sample Motions

C. Motion to approve the Preliminary Subdivision and Site Plan for 416 South Street, Hidden Hills Manufactured Housing Park, a 195-unit manufactured housing park (Tax Map 7/Lot 8) in the Rural Farm (RF) and Suburban Residential (SR-1) zones and Manufactured Housing Park (MHP) overlay zone.

D. Motion to deny the project based upon the following reasons:

i. _____

VIII. ATTACHMENTS

A. Site Design Final Review Comments

B. Sewall Traffic Engineering Review Comments

Sewall
The evolution of expertise

September 7, 2022

Mr. Matthew R, Grooms, AICP
City Planner/Deputy Director
Department of Planning & Development
City of Biddeford
205 Main Street
Biddeford, ME 04005

RE: TRAFFIC IMPACT REVIEW – SOUTH STREET VILLAGE

Dear Matthew,

As requested, James W. Sewall Co. (Sewall) has completed preliminary review of "Traffic Impact Study for Proposed Hidden Hills Housing Park, Waterworks Drive, Biddeford, Maine". The study was prepared by William Bray, P.E. of Barton & Loguidice and dated August 12, 2022. My review comments are summarized below:

1. **Traffic Volumes.** The traffic counts were conducted at an appropriate time of year, during both the AM and PM peak hours as is customary for residential developments. The counts were factored to peak summer conditions utilizing MaineDOT Group I factors. The October 2021 counts were factored by a seasonal factor of 1.047, which I believe must be an older factor. I get a higher factor of 1.058 using the MaineDOT 2020 and 2021 seasonal factors. The minor increase in volumes would not be expected to have any significant impact on the analysis results or findings of this study.

2. **Traffic Growth Rate.** While the data was not presented in the traffic impact study (TIS), I reviewed historical AADTs for the study area and concur with the use of a 1 % annual traffic growth rate to project the 2021 volumes to the 2024 analysis year.

3. **Trip Generation and Assignments.** I concur with the trip generation results obtained utilizing the newest 11th Edition ITE report. The age-restricted housing development will generate from 47 to 76 one-way trips in peak hours. I concur with the trip assignments for the AM peak hour. I

believe there is an error in the PM trip assignments with more traffic destined to and from the more rural area to the west versus to and from the east, as in the AM period. However, given the low volumes the flipping of these results would be expected to have no significant impact given the following capacity analysis results.

4. **Capacity Analysis.** The traffic analysis indicates that the intersection of South Street and Waterworks Drive will operate at a very good LOS "A". Hence, there are no capacity concerns.

5. **Sight Distance.** Mr. Bray cites MaineDOT Entrance Permit sight distance requirements in the TIS. Sight distances should conform to the Design Standards of the Biddeford Ordinances. These standards require 350' for the 35-mph speed limit versus the 305' MaineDOT standard cited in the study. However, Mr. Bray reports over 375' or more of sight distance in both directions at all three access points, which meets the higher Biddeford standard. It is important to note that Sewall has not conducted a field review to verify the reported sight distances.

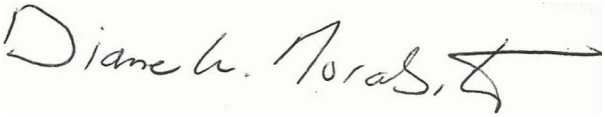
6. **Accident Review.** Mr. Bray included accident data for an appropriate study area on South Street (River Road to Main Street) for the most recent 3-year period. There is one high crash location within the study area, the section of South Street that extends from River Road to Fox Hollow Drive. This section has a CRF of 1.06 with nine (9) reported crashes. A collision diagram was provided and evaluated in the TIS. Seven (7) of the nine crashes were single vehicle run off the road crashes, mostly attributed to reckless driving and excessive speed. One crash was a deer hit and there was a single rear-end crash attributed to following too close. This section of South Street is windy and hilly, which may be contributing to the run off the road single vehicle crashes. There are some curve signs but it is recommended that the applicant's Traffic Engineer do a field review to assess if additional advance curve or chevron warning signs are needed given the pattern of run off the road crashes.

7. **Pedestrian and Bicycle Facilities.** South Street in the vicinity of Waterworks Drive is narrow with no sidewalks or significant shoulder to provide for either bicycles or pedestrians. With a large number of active retirees in this development (195 dwelling units), significant pedestrians and bicyclists would be expected. Some connectivity to provide for pedestrians is recommended. Based upon a google Earth review, there is an existing sidewalk along South Street from Main Street to Cathedral Oaks Drive, which is approximately ¾ mile east of the site.

To summarize, it is recommended that the applicant's Traffic Engineer conduct a field review of the South Street high crash link to determine if additional advance warning signs would be beneficial in reducing run off the road crashes. My other outstanding concern is safety for pedestrians and bicycles along South Street given the lack of sidewalk and shoulder in the vicinity of the site and the large number of dwelling units.

As always, please don't hesitate to contact me if you have any questions or concerns regarding my preliminary review findings.

Sincerely,



Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering

Site Design Associates
Consulting Engineering and Land Planning

September 6, 2022

Matthew Grooms, City Planner
Via email

RE: Hidden Hills Subdivision
413 South Street

Dear Matt;

Per your request Site Design Associates has undertaken a review of the revised preliminary plans and documentation submitted in support of a preliminary subdivision application for the referenced project.

As we indicated previously, it appears the project will require permits from the Maine DEP under the Natural Resources Protection Act and the Site Location of Development Act. We will review the stormwater quantity and quality analysis in the context of the city land use code and standard engineering practice when the comments below are addressed, but assume that the DEP will perform a detailed stormwater review based on their standards.

Based on our review we offer the following comments for your, the planning board's, and the applicant's consideration, numbered per our original comments:

1. Addressed.
2. Has a standard boundary survey of the parcel been submitted? The applicant responded that a boundary survey was included in Attachment 3. The plans in Attachment 3 in our copy were titled existing conditions plan, not boundary surveys.
3. As we previously indicated to you, we recommend that the traffic generation analysis be peer reviewed by a traffic engineer.
4. Addressed.
5. We expect detailed plans of the left turn lane in South Street with the final submission. The applicant responded a left turn lane is no longer warranted.
6. Saw cuts and butt joints should be shown at the Waterworks Drive intersections. These should be called out on the plan as requested. Note 14 on the site plan refers to a sawcut but no reference is made to the type of joint.
7. The applicant should review Section 51 and chapter 62, Table A for dimensional requirements. It appears the private road would be classified as an urban section, major residential road. Pavement radii at intersections must be 25 ft or 30 ft minimum and drives are prohibited off turnarounds. Are waivers of these standards permitted? Drives for lots 72, 73, and 142 are shown off turnarounds.

23 Whitney Way Topsham, Maine 04086
Phone: (207) 449-4275 email: info@sitedesignassociates.biz

8. The plans reflect the opening of Waterworks Drive at Lozolite to install a water main connection. The detail for the repair should be discussed with the city engineer, assuming it will be a public street under moratorium when the water main is installed. Applicant acknowledges this.
9. Culverts and riprap aprons will be required at the intersections of Topaz and Lozolite with Waterworks. The response indicated that culverts are shown under Lozolite and the area above Topaz will be graded to drain to the existing culverts. More spot grades for the Topaz intersection should be provided as it is shown essentially flat.
10. Addressed.
11. We recommend that the radii at the private road intersections with Waterworks Drive be Type I granite. This was addressed. Tipdowns should be shown at the ends of radii.
12. Addressed.
13. Addressed.
14. Addressed.
15. Per section 51.D.1., monumentation should be provided in accordance with section 62-87. It may be that a waiver could be granted by the planning board for alternative monumentation materials. The response indicated that monumentation will be provided per ordinance requirements on the Waterworks Drive right of way and no waiver is necessary. The code requires granite monumentation of the roadways, and it appears if that is not the plan for monumentation of the new roads, a waiver will be required.
16. Addressed.
17. Addressed.
18. The stormwater Inspection and Maintenance plans during construction should be included on the drawings, with the post-construction plan being a written stand-alone document. A portion of this comment remains outstanding. Also, the post-construction Inspection and Maintenance Plan should include separate forms for the BMP's per the DEP checklist.
19. Addressed.
20. Additional comment: Drainage plans should be updated to more clearly and consistently show match lines, subcatchment boundaries, contours, and contour labels, particularly the post-development plans. The scales are also not as depicted by the graphic scale, and should be revised.
21. Additional comment: A treatment plan should be provided.
22. Additional comment: Based on the topography, it appears there should be additional analysis points along the easterly boundary. There are several areas where stormwater runoff is leaving the site at points other than the three analysis points shown.
23. Additional comment: we assume that the DEP will review the Hydrogeologic Assessment as part of the SLODA review. If for some reason the project does not now require a SLODA permit, the city should consider having this information peer reviewed.

24. Additional comment: The grades of Griffinite Way at Garnet, Lozolite at both Onyx intersections, and Lozolite at Garnet significantly exceed 3%. The streets with the steeper grades are the through street in each instance. We would suggest reaching out to engineering to verify whether or not this is acceptable, as the code requires a maximum grade of 3% at intersections and makes no distinction between the through street or the stop-controlled street.

If you have any questions, or require additional information, please do not hesitate to contact me.

Sincerely,
Site Design Associates

Tom Saucier, P.E.
President

Pineland
Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland
565 Congress Street, Suite 201
Portland, ME 04101

August 17, 2022
21-13

Hannah Bonine
Assistant City Planner
Biddeford City Hall
P.O. Box 586
Biddeford, ME 04005

Additional Information & Updated Plans in Support of
Hidden Hills Manufactured Housing Park
413 South Street, Biddeford

Dear Hannah,

On behalf of South Street Village LLC, we are pleased to submit additional information in support of the Subdivision Application for the Hidden Hills Manufactured Housing Park. Since the last planning board meeting, the project has undergone a significant change. The applicants have decided that the development will be an age restricted community. This directly addresses some of the concerns that were brought up by the board. This change will:

- Dramatically reduce the number of people that will be living at the park.
- Reduce the expected water usage
- Reduce the size of the septic systems
- Cut the expected traffic volume in half. See Attachment 1 for the traffic study.
- It also changes the nature of the daily volume since many residents won't be going to work everyday.
- This change will have no impact on the Biddeford school system. There is no longer a need for a school bus shelter or bus turnaround.

The drop in the expected number of residents and the corresponding drop in both the amount of traffic and the different usage pattern means that a turning lane is no longer necessary. The development is well below the threshold for a traffic movement permit.

Mark Cenci of Mark Cenci Geologic has prepared a Hydrogeologic Assessment based upon an analysis of the proposed septic systems. That study can be found in Attachment 2.

The board asked to see more examples of the types of houses that are planned for this development. We will show examples at the next planning board meeting. We will also bring an exhibit that shows the buffering along South Street in an attempt to help the board and public better understand how visible the development will be from the street.

Our responses to the previous engineering comments can be found in Attachment 5.

Prepared by
Terradyn Consultants, LLC

Jeffrey D. Amos, P.E.

LIST OF ATTACHMENTS

Attachment 1	Traffic Study
Attachment 2	Hydrogeologic Assessment
Attachment 3	Stamped Boundary Survey
Attachment 4	Updated Stormwater Report
Attachment 5	Response to Engineering Comments

Barton & Loguidice

TRAFFIC IMPACT STUDY

FOR PROPOSED

HIDDEN HILLS HOUSING PARK

WATERWORKS DRIVE, BIDDEFORD, MAINE

Prepared For: South Street Village, LLC

Prepared By: William Bray, P.E., Senior Managing Engineer
Jacob Sirois, Engineer 1

August 12,2022

Introduction

South Street Village, LLC, is proposing development of Hidden Hills Housing Park, an age restricted senior adult housing development, located on Waterworks Drive in the City of Biddeford (refer to Image 1 for location of the proposed project). The proposed site is located in the southeast quadrant of the intersection of South Street and Waterworks Drive. The site is 312.1 acres with frontage on South Street. The proposed development will provide 195-units of senior adult housing on individual lots. The site will be served by two proposed 20-foot-wide entrances located on the eastern side of Waterworks Drive named Topaz Drive and Lozolite Lane, located 750-feet and 1,230-feet; respectively, away from the existing intersection of South Street and Waterworks Drive. Access to the site will be provided from South Street via Waterworks drive.

The proposed site features 195 individual lots which are provided access by internal roadways which circulate throughout the site, a Maintenance Garage, and a Community Center with outdoor facilities for the residents. The internal roadways which circulate throughout the site are identified as Topaz Drive, Lozolite Lane, Garnet Drive, Ruby Road, Griffinite Way, and Onyx Circle. The internal access roadways are bi-directional and 20-feet wide with a 5-foot-wide sidewalk provided throughout the site.

The purpose of this traffic impact study is to examine existing traffic conditions in the general vicinity of the proposed project, estimate the total number of site trips generated by the project, and make a determination as to whether the existing transportation system can safely accommodate the added traffic demand generated by the project.

Image 1 Proposed Development Site

Existing Traffic Conditions

Manual turning movement traffic counts were conducted at the intersection of River Road and South Street, located approximately 0.72 miles west of the site intersection at Waterworks Drive to establish existing "*peak*" travel conditions at the intersection of Waterworks Drive and South Street. The morning and evening traffic data was collected on October 12th, 2021. All vehicular traffic entering the intersection was recorded in 15-minute intervals between the hours of 7:00 and 9:00 AM and, again,

between 3:00 and 6:00 PM. From a summary of the data, peak hour times were established for both "*peak*" commuter travel periods. The morning peak hour occurs between 7:15 and 8:15 AM, and the evening peak hour falls between 3:15 and 4:15 PM. Copies of the peak hour summary reports for the intersection at River Road and South Street are attached for reference.

Traffic data collected during the month of September requires an adjustment to reflect "*peak*" travel conditions found during the summer months of July and August. MaineDOT provides weekly mean factors for adjusting traffic data collected during other periods of time. MaineDOT utilizes highway classifications of I, II, or III for all State and Local roadways. MaineDOT's 2019 Count Book classifies South Street in the vicinity of the project as a Group I roadway which is defined as: "*urban roadways or those roads that typically see commuter traffic and experience little fluctuation from week to week throughout the year*". Given the Group I classification, minimal seasonal variation occurs throughout a typical year. Utilizing MaineDOT's Weekly Group Mean Factors we receive a seasonal adjustment factor of 1.047 which will be applied to the through volumes at the study intersection.

Given that the traffic counts have been projected from the intersection at River Road and South Street to the intersection of Waterworks drive and South Street, we have estimated the peak hour traffic turning onto and out of Waterworks Drive to be 5 vehicles in both directions, based on observed field conditions.

Figure 1, located in the Appendix, depicts the estimated 2021 design hour traffic conditions at the site intersection.

Future Traffic Growth

This traffic study has been prepared based upon a projected build-out year of 2024. MaineDOT's historical traffic data at the intersection of Main Street and South Street, east of the site, shows a negative annual growth of approximately 0.5% per year has occurred each year between 2016 and 2019.

To conservatively estimate future travel conditions at the study intersection, we have applied an annual growth rate of 1% per year to the 2021 design hour traffic to estimate 2024 design hour traffic conditions. Figure 2 attached in the Appendix of this report depicts the estimated 2024 Design Hour Traffic.

Site Trip Generation

Site Trip Generation: Trip generation for the proposed Hidden Hills Housing Park development was estimated based upon the latest edition (11th) of the Institute of Transportation Engineer's (ITE) Trip Generation Manual (TGM). The expected trip generation for the proposed development was estimated using the relevant land use code from the TGM, **LUC #251 – Senior Adult Housing – Single-Family**, which is described in the ITE TGM as: *a development with a specific age restriction for its residents, typically a minimum of 55 years of age for at least one resident of the household. The dwelling units can be either detached or attached.*

Site Trip Distribution: Vehicle Trips generated by the proposed site were assigned to/from Waterworks Drive based upon the directional splits presented in the ITE TGM for LUC #251.

Table 1 summarizes the trip generation calculations and travel distributions.

Table 1 ITE Trip Generation Calculations						
Land Use	Senior Adult Housing-Single Family - LUC 251					
Time Period	Dwelling Units	Trip Generation Rate Trips/Dwelling Units	Trips Generated	Distribution Entering / Exiting	Enter	Exit
Weekday	195	4.31	840	50% / 50%	420	420
AM Weekday Peak Hour (Street)	195	0.24	47	33% / 67%	16	31
PM Weekday Peak Hour (Street)	195	0.30	59	61% / 39%	36	23
AM Weekday Peak Hour (Generator)	195	0.34	66	43% / 57%	28	38
PM Weekday Peak Hour (Generator)	195	0.39	76	56% / 44%	43	33

The proposed project is projected to generate 47 trips during the AM peak hour of the (street) and 59 trips in the evening peak hour of the street. Peak hour trip generation values forecast for the peak hour of the site (generator) are slightly higher at 66 trips in the AM peak hour and 76 trips in the PM peak hour.

Site Trip Assignment

Peak hour site trips generated by the proposed Waterworks Drive senior adult housing development during both the morning and evening peak hours were assigned through the intersection of Waterworks Drive and South Street based upon existing directional distribution patterns collected at the intersection of River Road and South Street on October 12th, 2021. Copies of the peak hour summary sheets are attached for reference.

Figure 3 in the Appendix depicts the site generated trips following the existing travel patterns.

2024 Pre-Development Traffic

Other Development Traffic: Traffic generated by projects that have been approved by the planning board and/or the Maine Department of Transportation, yet are not opened, must be included in the estimate of pre-development traffic. The City of Biddeford was consulted to identify any and all development projects whose peak hour trips potentially impact the study area. Based on discussions with the City Planners office there are no other projects being reviewed or approved that will impact this intersection.

2024 Pre-Development Traffic: Given that there are no additional trips produced by other developments in the vicinity of the project, the pre-development trips don't vary from the 2024 design hour traffic shown in Figure 2.

2024 Post-Development Traffic

2024 Post-Development Traffic: 2024 post-development traffic estimates were prepared for the study intersection by combining the 2024 design hour traffic (2024 pre-development traffic), shown in Figure

2, with the site generated trips, shown in Figure 3. Figure 4 presents the 2024 post-development traffic forecast for the study intersection.

Left-Turn Lane Warrant Analysis

The National Cooperative Highway Research Program (NCHRP) report 457 provides a process to determine if projected traffic conditions at an intersection warrant a dedicated left-turn lane from the major street to the lower volume roadway. The NCHRP process uses four traffic inputs in determining if a dedicated left-turn lane is warranted: 1) posted speed limit; 2) advancing volume of traffic (both left-turn and through volumes); 3) opposing volume of through traffic and 4) percent of left-turns in the advancing volume.

The NCHRP report stipulates that where applicable the traffic volumes used for the analysis represent "*average*" travel conditions. The 2024 pre-development through traffic volumes were adjusted accordingly applying MaineDOT seasonal adjustment factors. The entry left-turn volumes from the east approach of South Street, used in the analysis, represent 2024 post-development conditions; without adjustment, as depicted on Figure 4. The following table, Table 2, summarizes the inputs and outputs of the analysis.

Table 2
NCHRP Report 457 Analysis: South Street WB at Waterworks Drive

Time Period	Advancing Volume (Va)	Opposing Volume (Vo)	Percent Left-Turns	Warrant Met (Yes/No)
Weekday AM Peak Hour	115	296	11%	No
Weekday PM Peak Hour	242	161	7%	No

As highlighted in the preceding table, a left-turn lane is not warranted at the intersection of South Street and Waterworks Drive. The graph produced by the NCHRP tool, attached at the end of the study, shows that the projected post-development average condition volumes are significantly lower than the minimum volumes which would warrant a left-turn lane.

Capacity Analysis

Capacity analyses of both 2024 Pre- and Post-development traffic conditions were performed for the study intersection at South Street and Waterworks Drive utilizing the Synchro and SimTraffic computer traffic models.

Levels of Service rankings are similar to the academic grading system, where an "A" is very good with little delay and "F" represents very poor conditions.

The following table present the relationship between delay and Level of Service for unsignalized intersections:

Level of Service Criteria for Unsignalized Intersections

Level of Service	Total Control Delay (sec/veh)
A	Up to 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

Table 3 summarizes the results of the capacity analysis completed for the intersection at South Street and Waterworks Drive. The chart compares the results determined for both peak hour time periods based upon 2024 pre- and post-development travel conditions.

Table 3
Level of Service Summary
2024 Pre- and Post-Development Conditions

	2024 Pre-Development				2024 Post-Development			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Intersection/Approach	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS
South Street @ Waterworks Drive								
- South Street EB - Through	0.4	A	0.2	A	0.5	A	0.6	A
- South Street EB - Right	1.2	A	1.3	A	1.1	A	1.3	A
- South Street WB - left	0	A	1.7	A	3.3	A	2.3	A
- South Street WB - Through	0.1	A	0.3	A	0.3	A	0.5	A
- Waterworks Drive - Left	2.5	A	5.5	A	7.0	A	6.7	A
- Waterworks Drive - Right	3.3	A	3.4	A	3.5	A	3.4	A
- **Overall Intersection**	**0.4**	**A**	**0.3**	**A**	**0.9**	**A**	**0.9**	**A**

As shown in the preceding table, the intersection capacity analysis of both 2024 pre- and post-development traffic conditions clearly demonstrates the proposed 195-unit development project has no measurable impact on traffic operations at the intersection of South Street and Waterworks Drive. Each approach of the intersection operates with minimal vehicle delay during both peak hours, representative of Level of Service A conditions; defined as the "best" operating condition. A similar operating condition is predicted for the 2024 post-development conditions, where the Level of Service remains at an A.

Vehicle Sight Distance

The Maine Department of Transportation's Highway Entrance and Driveway Rules require the following sight distances for a non-mobility roadway:

Sight Distance Standards

Speed Limit	Sight Distance
25 mph	**200 feet**
30 mph	250 feet
35 mph	**305 feet**
40 mph	360 feet
45 mph	425 feet
50 mph	495 feet

MaineDOT's Rules and Regulations require sight distance to be measured in accordance with the following procedures: *"Sight distance is measured to and from the point on the centerline of the proposed access that is located 10-feet from the edge of traveled way. The height of the hypothetical person's view is considered to be 3½ feet above the pavement and the height of the object being viewed is considered to be 4¼ feet above the pavement."*

Vehicle sight distance measurements were field determined for the Waterworks Drive approach at South Street, and the proposed site driveway entrances located on Waterworks Drive. The measured distances are listed as follows:

Waterworks Drive @ South Street
Looking Left =375'+
Looking Right = 375'+

Topaz Drive (Northern Site Entrance) @ Waterworks Drive
Looking Left = 700'+
Looking Right = 750' – Can see through intersection with South Street

Lozolite Lane (Southern Site Entrance) @ Waterworks Drive
Looking Left = 500'+
Looking Right = 1,235' – Can see through intersection with South Street

The official speed limit on South Street at Waterworks Drive is 35mph. The Standard Sight Distance required for a speed limit of 35mph is 305-feet. Based upon our field investigation acceptable sight distance is provided in both directions of travel on South Street well in excess of the minimum standard for a posted speed limit of 35mph.

The speed limit on Waterworks Drive at the two site entrances is presently unposted and assumed to be 25mph which requires an unobstructed sight distance of 200-feet. The existing sight distance at both site driveway entrances looking left and right exceeds this requirement.

Existing Road Safety Conditions

Existing site conditions at both proposed driveway locations on Waterworks Drive presently exceed MaineDOT's driveway grade standards of a maximum grade of 10% for a length of 150-feet. The grade of the proposed entrances must meet MaineDOT's driveway standards upon construction

The Maine Department of Transportation's (MaineDOT) Accident Records Section provided the latest three-year (2019 through 2021) crash data for the section of South Street between and including River Road, easterly to the intersection at Main Street for a distance of approximately 1.70 miles. Their report is presented as follows.

2019 - 2021 Crash Summary
South Street between River Road & Main Street

Location	Number of Accidents	Critical Rate Factor
1. South Street @ Hollis Road	1	0.47
2. South Street @ Cathedral Oaks Drive	1	0.40
3. South Street @ Main Street	3	1.16
4. South Street @ Glenview Drive	1	0.55
5. South Street @ River Road	1	0.53
6. South Street btw. Main Street and Cathedral Oaks Drive	2	0.39
7. South Street from Cathedral Oaks Drive, west for 0.12 miles	1	0.35
8. South Street from Old Hollis Road, west for 0.18 miles	1	0.26
9. South Street from Glenview Drive, east for 0.28 miles	2	0.63
10. South Street btw. River Road and Fox Hollow Drive	**9**	**1.06**

The MDOT considers any roadway intersection or segment a high crash location if both of the following criteria are met:

- ***8 or more accidents and,***
- ***A Critical Rate Factor greater than 1.00***

As the data presented in the chart shows, there is one location within the defined study area that meets both of MaineDOT's criteria as a high crash location, located on South Street between River Road and Fox Hollow Drive.

MaineDOT's Safety office prepared a detailed vehicle collision diagram for the high crash location, illustrating the cause and location of each crash. The collision diagram shows that eight (8) out of the nine crashes were single vehicle accidents, with four (4) crashes caused by "reckless driving", and the other four were caused by speed, sleep, oversteering, and a deer in the road.

Summary

1. The proposed Hidden Hills Housing Park, a 195-Unit Development, is expected to produce approximately 47 trips during the morning peak hour, and an additional 59 trips during the evening peak hour.

2. A left-turn lane analysis was completed on the westbound approach of South Street. Separate analyses were completed for both peak hour time periods. The analysis was conducted using the national Cooperative Highway Research program (NCHRP) report 457 and shows a dedicated left-turn lane is not warranted on the westbound approach of South Street at the intersection with Waterworks Drive.

3. A capacity analysis was performed for the study intersection of South Street and Waterworks Drive. The analysis shows the proposed 195-unit development project has no measurable impact on traffic operations at the intersection of South Street and Waterworks Drive. Each approach of the intersection presently operates with minimal vehicle delay during the peak hours, representative of Level of Service A conditions; defined as the "best" operating condition. A similar operating condition is predicted for the 2024 post-development condition, where the Level of Service remains at an A.

4. South Street at the intersection of Waterworks Drive is presently 35mph which requires an unobstructed sight distance of 305-feet. Field measurements indicate sight distance looking left and right from the Waterworks Drive approach exceed 375-feet, well in excess of the minimum standard for a posted speed limit of 35mph.

5. Sight distance measurements looking left and right from the proposed site entrances at Waterworks Drive were measured to be in excess of the requirements for an assumed speed limit of 25mph, with sight distance measurements exceeding 500-feet directionally at both proposed driveway entrances.

William J. Bray, P.E. Date: 08/09/2022

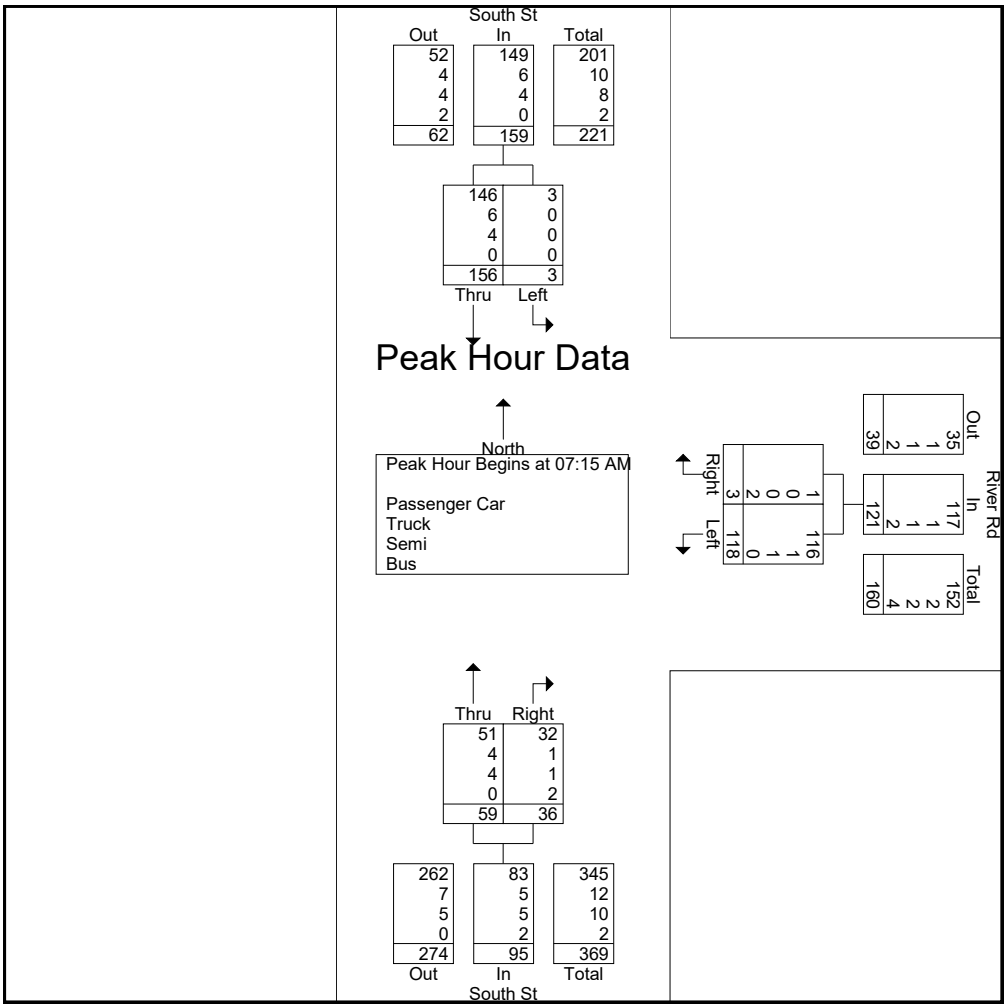
APPENDIX

Traffic Solutions

17 Mount View Dr
Gorham, ME 04038

File Name : Biddeford South St & River Rd 10-12-21 AM
Site Code : 01012211
Start Date : 10/12/2021
Page No : 4

	South St From North			River Rd From East			South St From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	33	0	33	0	25	25	10	**17**	**27**	85
07:30 AM	**48**	**1**	**49**	0	28	28	4	16	20	97
07:45 AM	37	1	38	1	28	29	**13**	12	25	92
08:00 AM	38	1	39	**2**	**37**	**39**	9	14	23	**101**
Total Volume	156	3	159	3	118	121	36	59	95	375
% App. Total	98.1	1.9		2.5	97.5		37.9	62.1		
PHF	.813	.750	.811	.375	.797	.776	.692	.868	.880	.928
Passenger Car	146	3	149	1	116	117	32	51	83	349
% Passenger Car	93.6	100	93.7	33.3	98.3	96.7	88.9	86.4	87.4	93.1
Truck	6	0	6	0	1	1	1	4	5	12
% Truck	3.8	0	3.8	0	0.8	0.8	2.8	6.8	5.3	3.2
Semi	4	0	4	0	1	1	1	4	5	10
% Semi	2.6	0	2.5	0	0.8	0.8	2.8	6.8	5.3	2.7
Bus	0	0	0	2	0	2	2	0	2	4
% Bus	0	0	0	66.7	0	1.7	5.6	0	2.1	1.1

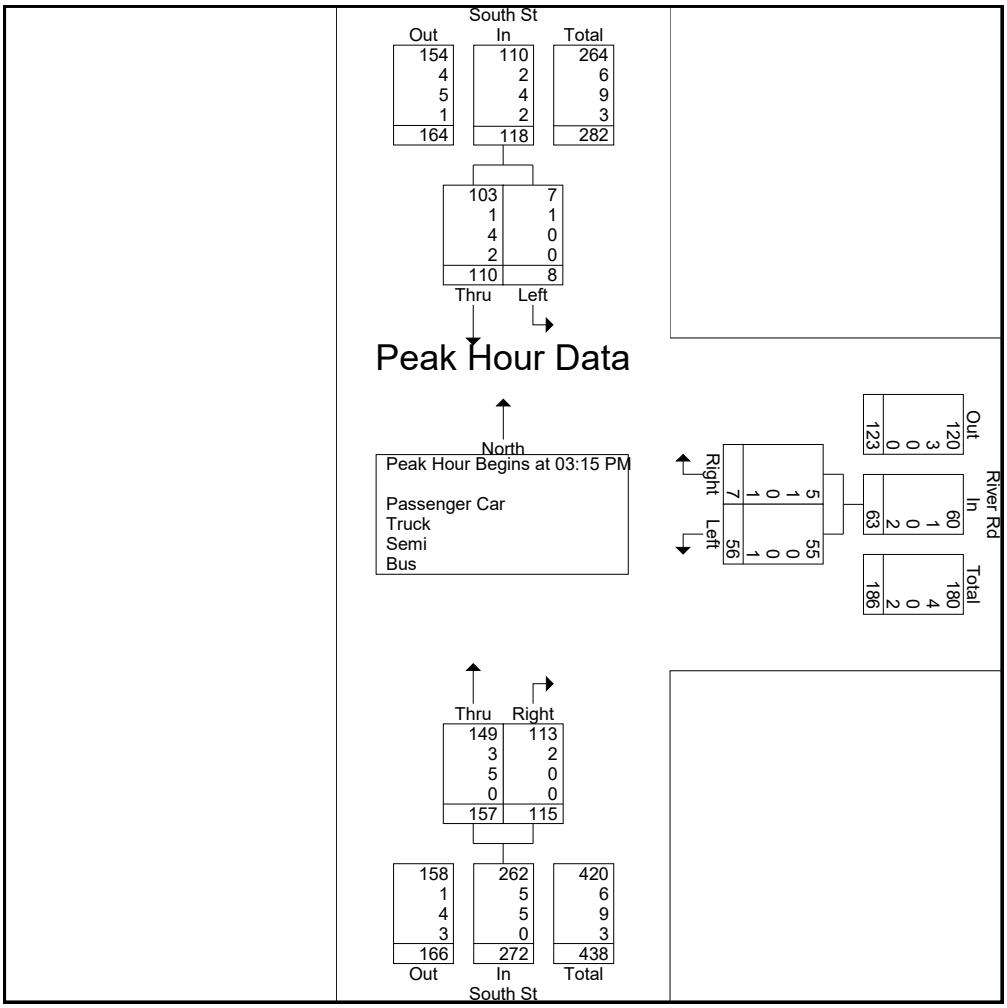


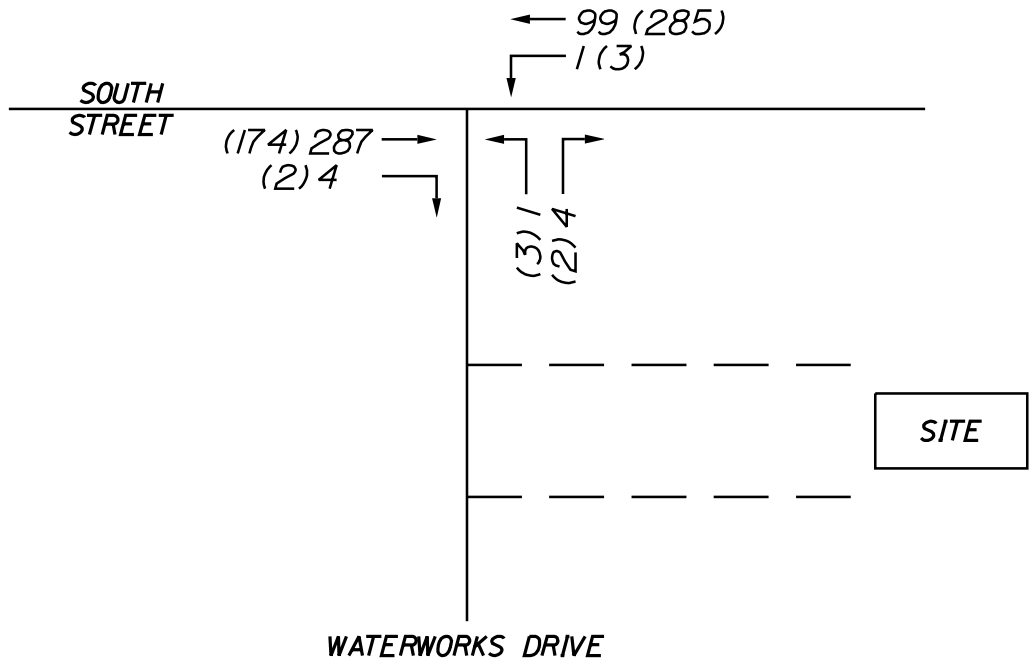
Traffic Solutions

17 Mount View Dr
Gorham, ME 04038

File Name : Biddeford South St & River Rd 10-12-21 PM
Site Code : 01012212
Start Date : 10/12/2021
Page No : 4

	South St From North			River Rd From East			South St From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:15 PM										
03:15 PM	26	1	27	**4**	14	18	27	41	68	113
03:30 PM	28	1	29	0	12	12	26	30	56	97
03:45 PM	26	**4**	30	0	13	13	**34**	41	**75**	118
04:00 PM	**30**	2	**32**	3	**17**	**20**	28	**45**	73	**125**
Total Volume	110	8	118	7	56	63	115	157	272	453
% App. Total	93.2	6.8		11.1	88.9		42.3	57.7		
PHF	.917	.500	.922	.438	.824	.788	.846	.872	.907	.906
Passenger Car	103	7	110	5	55	60	113	149	262	432
% Passenger Car	93.6	87.5	93.2	71.4	98.2	95.2	98.3	94.9	96.3	95.4
Truck	1	1	2	1	0	1	2	3	5	8
% Truck	0.9	12.5	1.7	14.3	0	1.6	1.7	1.9	1.8	1.8
Semi	4	0	4	0	0	0	0	5	5	9
% Semi	3.6	0	3.4	0	0	0	0	3.2	1.8	2.0
Bus	2	0	2	1	1	2	0	0	0	4
% Bus	1.8	0	1.7	14.3	1.8	3.2	0	0	0	0.9





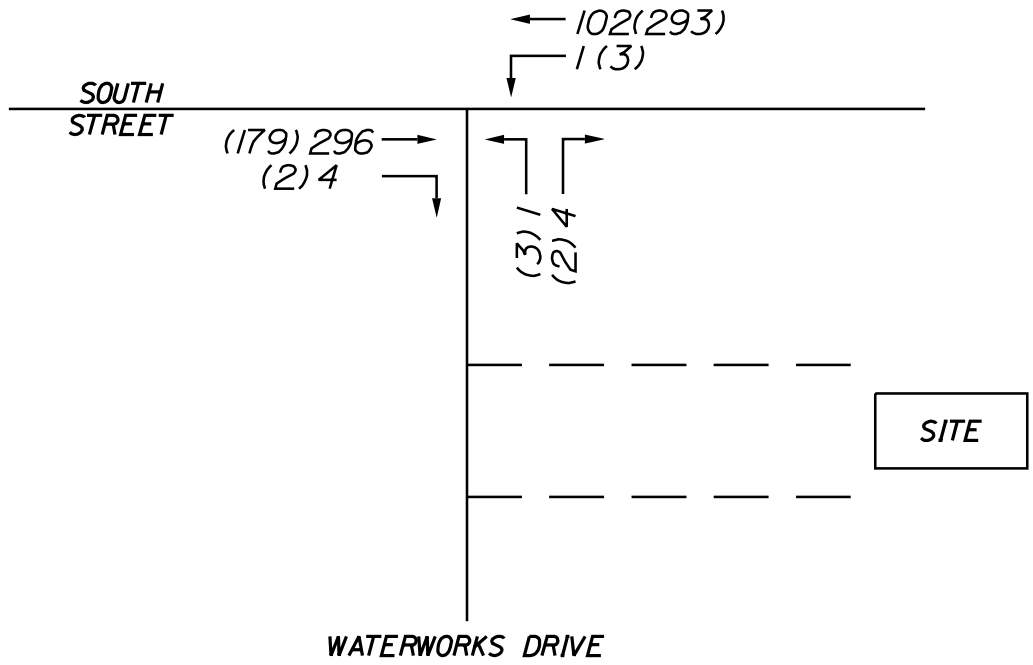
LEGEND
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR

2021 DESIGN HOUR TRAFFIC
WEEKDAY AM & PM PEAK HOUR
FIGURE 1

HIDDEN HILLS
HOUSING PARK
BIDDEFORD, MAINE

DATE: JULY, 2022

Barton & Loguidice

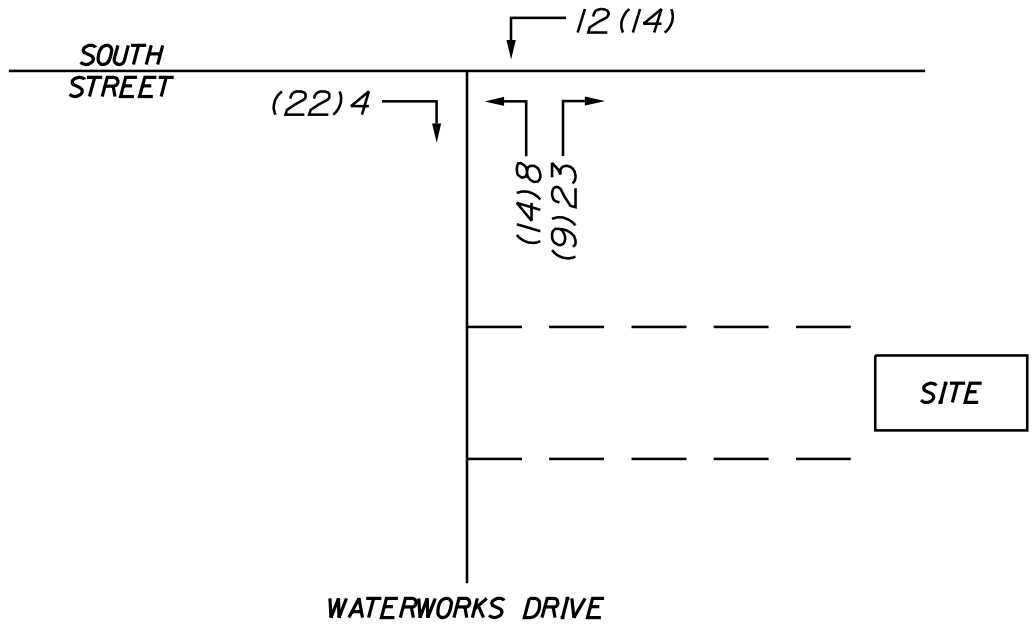


LEGEND
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR

2024 DESIGN HOUR TRAFFIC
WEEKDAY AM & PM PEAK HOURS
FIGURE 2

HIDDEN HILLS
HOUSING PARK
BIDDEFORD, MAINE
DATE: JULY, 2022

Barton & Loguidice

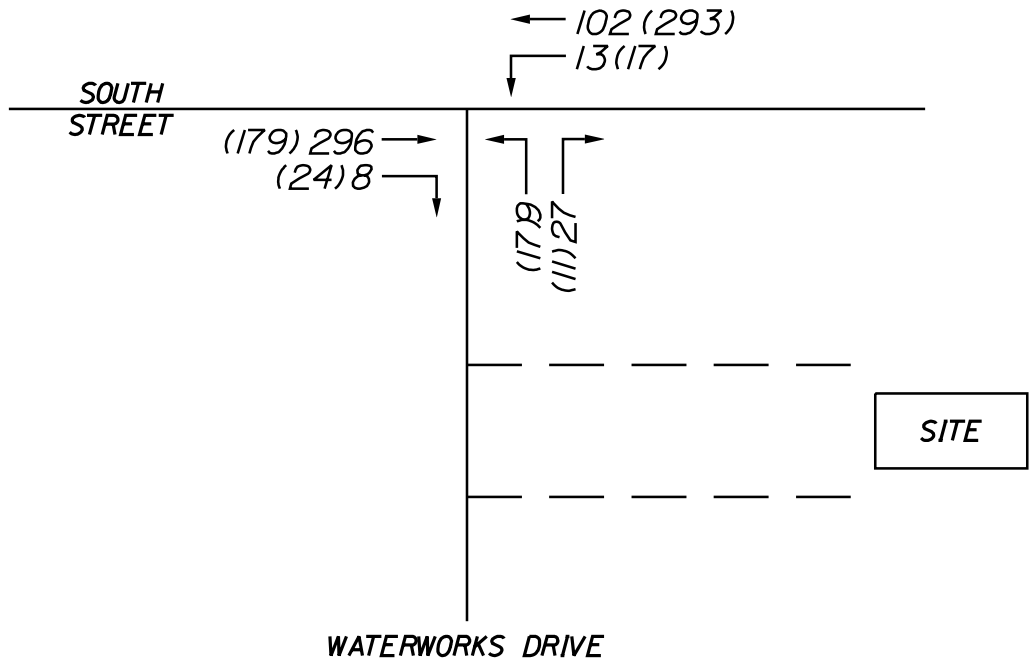


LEGEND
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR

SITE TRIP ASSIGNMENT
WEEKDAY AM & PM PEAK HOURS
FIGURE 3

HIDDEN HILLS
HOUSING PARK
BIDDEFORD, MAINE
DATE: JULY, 2022

Barton & Loguidice



LEGEND
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR

2024 POST-DEVELOPMENT
WEEKDAY AM & PM PEAK HOURS
FIGURE 4

HIDDEN HILLS
HOUSING PARK
BIDDEFORD, MAINE
DATE: JULY, 2022

Barton & Loguidice

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

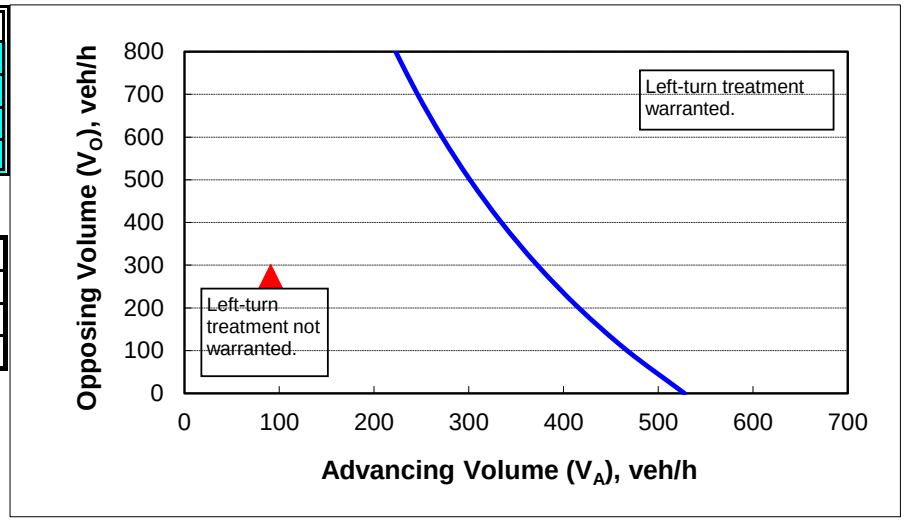
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	14%
Advancing volume (V_A), veh/h:	91
Opposing volume (V_O), veh/h:	274

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	383
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

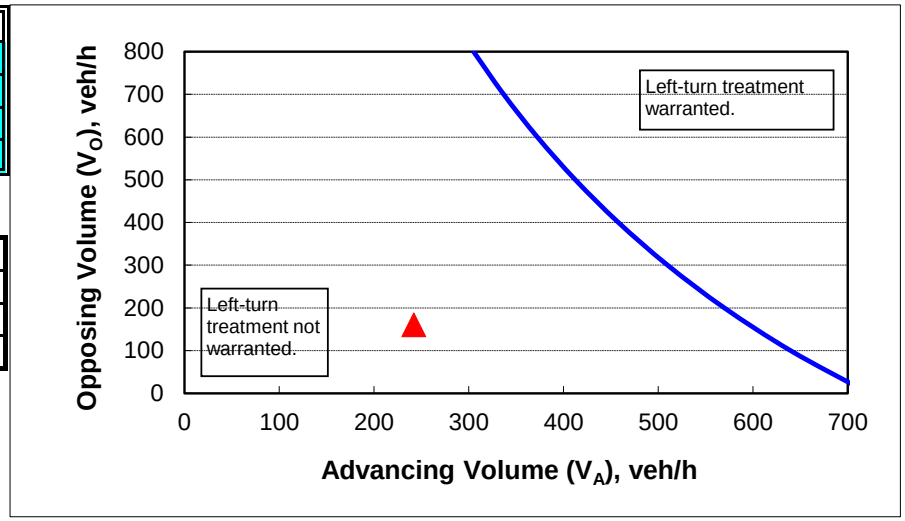
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	7%
Advancing volume (V_A), veh/h:	242
Opposing volume (V_O), veh/h:	161

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	596
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	399	448	408	393	380	406
Vehs Exited	400	445	409	389	382	405
Starting Vehs	4	1	4	1	4	3
Ending Vehs	3	4	3	5	2	3
Travel Distance (mi)	107	120	110	105	103	109
Travel Time (hr)	3.7	4.2	3.8	3.7	3.6	3.8
Total Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Total Stops	12	3	6	3	4	6
Fuel Used (gal)	3.2	3.5	3.2	3.1	3.0	3.2

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	399	448	408	393	380	406
Vehs Exited	400	445	409	389	382	405
Starting Vehs	4	1	4	1	4	3
Ending Vehs	3	4	3	5	2	3
Travel Distance (mi)	107	120	110	105	103	109
Travel Time (hr)	3.7	4.2	3.8	3.7	3.6	3.8
Total Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Total Stops	12	3	6	3	4	6
Fuel Used (gal)	3.2	3.5	3.2	3.1	3.0	3.2

2: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.3	0.2		0.2	0.1	0.1	0.2
Total Del/Veh (s)	0.4	1.2		0.1	2.5	3.3	0.4

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	0.7

Intersection: 2:

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	31
Average Queue (ft)	0	5
95th Queue (ft)	4	24
Link Distance (ft)	677	430
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:12	3:12	3:12	3:12	3:12	3:12
End Time	4:15	4:15	4:15	4:15	4:15	4:15
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	488	516	511	494	435	490
Vehs Exited	490	512	506	493	437	488
Starting Vehs	8	3	1	3	5	3
Ending Vehs	6	7	6	4	3	5
Travel Distance (mi)	132	139	137	133	117	131
Travel Time (hr)	4.6	4.8	4.8	4.6	4.1	4.6
Total Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Total Stops	5	7	7	2	4	5
Fuel Used (gal)	3.8	4.1	4.0	3.9	3.4	3.8

Interval #0 Information Seeding

Start Time	3:12
End Time	3:15
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:15
End Time	4:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	488	516	511	494	435	490
Vehs Exited	490	512	506	493	437	488
Starting Vehs	8	3	1	3	5	3
Ending Vehs	6	7	6	4	3	5
Travel Distance (mi)	132	139	137	133	117	131
Travel Time (hr)	4.6	4.8	4.8	4.6	4.1	4.6
Total Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Total Stops	5	7	7	2	4	5
Fuel Used (gal)	3.8	4.1	4.0	3.9	3.4	3.8

2: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	0.2	0.1	0.2	0.1	0.1	0.2
Total Del/Veh (s)	0.2	1.3	1.7	0.3	5.5	3.4	0.3

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	0.7

Intersection: 2:

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	32
Average Queue (ft)	0	5
95th Queue (ft)	4	22
Link Distance (ft)	677	430
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	442	454	474	450	423	449
Vehs Exited	441	452	474	444	423	447
Starting Vehs	2	3	5	1	4	2
Ending Vehs	3	5	5	7	4	5
Travel Distance (mi)	117	119	126	118	111	118
Travel Time (hr)	4.2	4.3	4.4	4.3	4.0	4.2
Total Delay (hr)	0.2	0.2	0.2	0.2	0.2	0.2
Total Stops	35	49	34	48	42	42
Fuel Used (gal)	3.6	3.6	3.8	3.6	3.4	3.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	442	454	474	450	423	449
Vehs Exited	441	452	474	444	423	447
Starting Vehs	2	3	5	1	4	2
Ending Vehs	3	5	5	7	4	5
Travel Distance (mi)	117	119	126	118	111	118
Travel Time (hr)	4.2	4.3	4.4	4.3	4.0	4.2
Total Delay (hr)	0.2	0.2	0.2	0.2	0.2	0.2
Total Stops	35	49	34	48	42	42
Fuel Used (gal)	3.6	3.6	3.8	3.6	3.4	3.6

2: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	0.3	0.2	0.2	0.1	0.1	0.2
Total Del/Veh (s)	0.5	1.1	3.3	0.3	7.0	3.5	0.9

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	1.3

Intersection: 2:

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	45	53
Average Queue (ft)	4	24
95th Queue (ft)	27	50
Link Distance (ft)	677	430
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:12	3:12	3:12	3:12	3:12	3:12
End Time	4:15	4:15	4:15	4:15	4:15	4:15
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	552	587	561	542	495	548
Vehs Exited	551	584	559	540	498	547
Starting Vehs	6	4	4	3	5	3
Ending Vehs	7	7	6	5	2	6
Travel Distance (mi)	145	154	147	143	131	144
Travel Time (hr)	5.2	5.5	5.4	5.1	4.7	5.2
Total Delay (hr)	0.3	0.3	0.3	0.2	0.2	0.2
Total Stops	37	45	30	31	28	34
Fuel Used (gal)	4.5	4.7	4.6	4.4	4.0	4.4

Interval #0 Information Seeding

Start Time	3:12
End Time	3:15
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:15
End Time	4:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	552	587	561	542	495	548
Vehs Exited	551	584	559	540	498	547
Starting Vehs	6	4	4	3	5	3
Ending Vehs	7	7	6	5	2	6
Travel Distance (mi)	145	154	147	143	131	144
Travel Time (hr)	5.2	5.5	5.4	5.1	4.7	5.2
Total Delay (hr)	0.3	0.3	0.3	0.2	0.2	0.2
Total Stops	37	45	30	31	28	34
Fuel Used (gal)	4.5	4.7	4.6	4.4	4.0	4.4

2: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.2	0.2	0.3	0.3	0.1	0.1	0.2
Total Del/Veh (s)	0.6	1.3	2.3	0.5	6.7	3.4	0.9

Total Network Performance

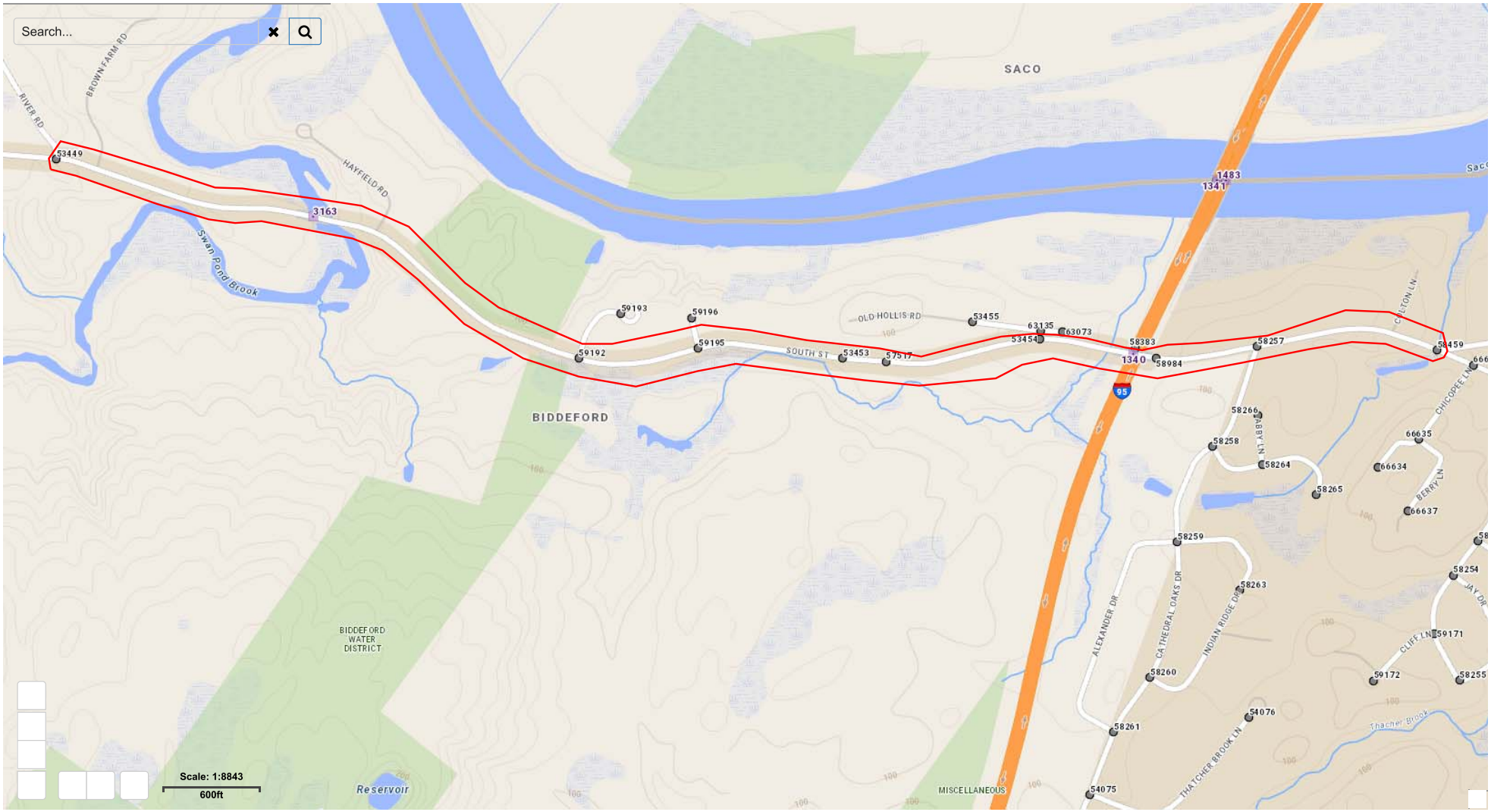
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	1.4

Intersection: 2:

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	39	41
Average Queue (ft)	3	20
95th Queue (ft)	21	45
Link Distance (ft)	677	430
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0


Search...
SACO
BIDDEFORD
RIVER RD
BROWN FARM RD
HAYFIELD RD
Swan Pond Brook
OLD HOLLIS RD
SOUTH ST
CLEVELAND LN
CHICOPEE LN
ABBY LN
BERRY LN
ALEXANDER DR
CATHEDRAL OAKS DR
INDIAN RIDGE DR
CLIFF LN
JAY DR
THATCHER BROOK LN
Thacher Brook
BIDDEFORD WATER DISTRICT
Reservoir
MISCELLANEOUS
95
1483
1341
1340
3163
53449
59193
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54076
54075
Scale: 1:8843
600ft

Maine Department Of Transportation - Office of Safety, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ **Crash Summary I** ☐ **Section Detail** ☑ **Crash Summary II** ☐ **1320 Public** ☐ **1320 Private** ☐ **1320 Summary**

REPORT DESCRIPTION

Biddeford
South St. from Main St. to River Rd.

REPORT PARAMETERS

Year 2019, Start Month 1 through Year 2021 End Month: 12

Route: **3110151**	Start Node: **58459**	Start Offset: **0**	☐ **Exclude First Node**
	End Node: **57517**	End Offset: **0**	☐ **Exclude Last Node**
Route: **3110891**	Start Node: **57517**	Start Offset: **0**	☑ **Exclude First Node**
	End Node: **53449**	End Offset: **0**	☐ **Exclude Last Node**

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
53454	3110151 - 1.91	Int of OLD HOLLIS RD SOUTH ST	2	1	0	0	0	1	0	100.0	1.592	0.21	0.45	0.00
												Statewide Crash Rate:	0.13	
58257	3110151 - 1.65	Int of CATHEDRAL OAKS DR SOUTH ST	2	1	0	0	0	0	1	0.0	1.930	0.17	0.43	0.00
												Statewide Crash Rate:	0.13	
57517	3110151 - 2.09	Non Int SOUTH ST	2	0	0	0	0	0	0	0.0	1.499	0.00	0.46	0.00
												Statewide Crash Rate:	0.13	
58459	3110151 - 1.43	Int of MAIN ST SOUTH ST	2	3	0	1	0	0	2	33.3	2.038	0.49	0.42	1.16
												Statewide Crash Rate:	0.13	
58984	3110151 - 1.77	Non Int SOUTH ST	2	0	0	0	0	0	0	0.0	1.591	0.00	0.45	0.00
												Statewide Crash Rate:	0.13	
53453	3110891 - 0.05	Non-Int SOUTH ST	2	0	0	0	0	0	0	0.0	1.356	0.00	0.47	0.00
												Statewide Crash Rate:	0.13	
59195	3110891 - 0.22	Int of GLENNVIEW DR SOUTH ST	2	1	0	0	0	0	1	0.0	1.286	0.26	0.47	0.00
												Statewide Crash Rate:	0.13	
59192	3110891 - 0.36	Int of FOX HOLLOW DR SOUTH ST	2	0	0	0	0	0	0	0.0	1.266	0.00	0.47	0.00
												Statewide Crash Rate:	0.13	
53449	3110891 - 1.02	Int of RIVER RD SOUTH ST	2	1	0	0	1	0	0	100.0	1.310	0.25	0.47	0.00
												Statewide Crash Rate:	0.13	
Study Years:	3.00	**NODE TOTALS:**		7	0	1	1	1	4	42.9	13.868	0.17	0.26	0.64

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
58257	58459	3939981	0 - 0.22	3110151 - 1.43	0.22	2	2	0	0	0	0	2	0.0	0.00418	159.35	410.50	0.00
Int of CATHEDRAL OAKS DR SOUTH ST				RD INV 31 10151											Statewide Crash Rate: 159.73		
58257	58984	3122829	0 - 0.12	3110151 - 1.65	0.12	2	1	0	0	0	0	1	0.0	0.00191	174.59	502.61	0.00
Int of CATHEDRAL OAKS DR SOUTH ST				RD INV 31 10151											Statewide Crash Rate: 159.73		
53454	58984	3119837	0 - 0.14	3110151 - 1.77	0.14	2	0	0	0	0	0	0	0.0	0.00223	0.00	483.17	0.00
Int of OLD HOLLIS RD SOUTH ST				RD INV 31 10151											Statewide Crash Rate: 159.73		
53454	57517	3139364	0 - 0.18	3110151 - 1.91	0.18	2	1	0	0	1	0	0	100.0	0.00283	117.63	454.02	0.00
Int of OLD HOLLIS RD SOUTH ST				RD INV 31 10151											Statewide Crash Rate: 159.73		
53453	57517	241543	0 - 0.05	3110891 - 0	0.05	2	0	0	0	0	0	0	0.0	0.00071	0.00	630.09	0.00
Non-Int SOUTH ST				RD INV 31 10891											Statewide Crash Rate: 159.73		
59195	53453	1951279	0 - 0.17	3110891 - 0.05	0.17	2	2	0	0	0	0	2	0.0	0.00219	304.45	485.30	0.00
Int of GLENNVIEW DR SOUTH ST				RD INV 31 10891											Statewide Crash Rate: 159.73		
59192	59195	3139365	0 - 0.14	3110891 - 0.22	0.14	2	0	0	0	0	0	0	0.0	0.00179	0.00	510.78	0.00
Int of FOX HOLLOW DR SOUTH ST				RD INV 31 10891											Statewide Crash Rate: 159.73		
53449	59192	5076691	0 - 0.66	3110891 - 0.36	0.66	2	9	0	1	2	0	6	33.3	0.00817	367.03	347.25	1.06
Int of RIVER RD SOUTH ST				RD INV 31 10891											Statewide Crash Rate: 159.73		
Study Years:	3.00			**Section Totals:**	1.68		15	0	1	3	0	11	26.7	0.02402	208.15	274.07	0.76
				Grand Totals:	1.68		22	0	2	4	1	15	31.8	0.02402	305.29	371.74	0.82

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
58257	58459	3939981	0 - 0.22	3110151 - 1.43	2	0	0	0	0	2	2019-42502	02/17/2019	1.55	PD
											2021-5408	02/27/2021	1.64	PD
58257	58984	3122829	0 - 0.12	3110151 - 1.65	1	0	0	0	0	1	2019-2179	01/08/2019	1.73	PD
53454	58984	3119837	0 - 0.14	3110151 - 1.77	0	0	0	0	0	0				
53454	57517	3139364	0 - 0.18	3110151 - 1.91	1	0	0	1	0	0	2019-64943	09/16/2019	2.08	B
53453	57517	241543	0 - 0.05	3110891 - 0	0	0	0	0	0	0				
59195	53453	1951279	0 - 0.17	3110891 - 0.05	2	0	0	0	0	2	2021-20850	08/08/2021	0.08	PD
											2021-16251	06/24/2021	0.16	PD
59192	59195	3139365	0 - 0.14	3110891 - 0.22	0	0	0	0	0	0				
53449	59192	5076691	0 - 0.66	3110891 - 0.36	9	0	1	2	0	6	2019-75573	12/05/2019	0.53	PD
											2019-75639	10/23/2019	0.59	A
											2019-55369	06/11/2019	0.63	PD
											2021-34866	12/08/2021	0.81	PD
											2020-16988	07/18/2020	0.82	PD
											2019-62328	08/20/2019	0.94	PD
											2021-8073	03/31/2021	0.94	PD
											2021-34872	12/04/2021	0.98	B
											2020-20539	08/28/2020	1.01	B
				Totals:	15	0	1	3	0	11				

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												Hour of Day													
Day Of Week	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**Un**	**Tot**
SUNDAY	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	3
MONDAY	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
TUESDAY	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	4
WEDNESDAY	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	4
THURSDAY	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
FRIDAY	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	3
SATURDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	1	0	0	0	0	4
Totals	1	0	0	0	0	0	2	0	1	1	0	0	2	2	1	1	4	2	0	2	2	0	1	0	0	**22**

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-Passenger Car	18	23-Bicyclist	1
2-(Sport) Utility Vehicle	3	24-Witness	3
3-Passenger Van	0	25-Other	0
4-Cargo Van (10K lbs or Less)	0	26-Construction	0
5-Pickup	8	27-Farm Vehicle	0
6-Motor Home	0	**Total**	**34**
7-School Bus	0		
8-Transit Bus	0		
9-Motor Coach	0		
10-Other Bus	0		
11-Motorcycle	1		
12-Moped	0		
13-Low Speed Vehicle	0		
14-Autocycle	0		
15-Experimental	0		
16-Other Light Trucks (10,000 lbs or Less)	0		
17-Medium/Heavy Trucks (More than 10,000 lbs)	0		
18-ATV - (4 wheel)	0		
20-ATV - (2 wheel)	0		
21-Snowmobile	0		
22-Pedestrian	0		

Crash Summary II - Characteristics

Crashes by Driver Action at Time of Crash

Driver Action at Time of Crash	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Contributing Action	3	6	1	0	0	0	10
Ran Off Roadway	3	0	0	0	0	0	3
Failed to Yield Right-of-Way	1	0	0	0	0	0	1
Ran Red Light	0	0	0	0	0	0	0
Ran Stop Sign	0	0	0	0	0	0	0
Disregarded Other Traffic Sign	0	0	0	0	0	0	0
Disregarded Other Road Markings	0	0	0	0	0	0	0
Exceeded Posted Speed Limit	1	0	0	0	0	0	1
Drove Too Fast For Conditions	4	0	0	0	0	0	4
Improper Turn	0	0	0	0	0	0	0
Improper Backing	0	0	0	0	0	0	0
Improper Passing	0	0	0	0	0	0	0
Wrong Way	0	0	0	0	0	0	0
Followed Too Closely	2	0	0	0	0	0	2
Failed to Keep in Proper Lane	1	0	0	0	0	0	1
Operated Motor Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner	6	0	0	0	0	0	6
Swerved or Avoided Due to Wind, Slippery Surface, Motor Vehicle, Object, Non-Motorist in Roadway	0	0	0	0	0	0	0
Over-Correcting/Over-Steering	0	0	0	0	0	0	0
Other Contributing Action	1	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0
Total	**22**	**6**	**1**	**0**	**0**	**0**	**29**

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Apparently Normal	19	6	1	0	0	0	26
Physically Impaired	0	0	0	0	0	0	0
Emotional(Depressed, Angry, Disturbed, etc.)	0	0	0	0	0	0	0
Ill (Sick)	0	0	0	0	0	0	0
Asleep or Fatigued	1	0	0	0	0	0	1
Under the Influence of Medications/Drugs/Alcohol	1	1	0	0	0	0	2
Other	1	0	0	0	0	0	1
Total	**22**	**7**	**1**	**0**	**0**	**0**	**30**

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	4	0	0	0	0	4
20-24	6	0	0	0	0	6
25-29	4	0	0	0	0	4
30-39	8	0	0	0	0	8
40-49	2	0	0	0	0	2
50-59	3	0	0	0	0	3
60-69	2	0	0	0	0	2
70-79	0	0	0	0	0	0
80-Over	0	0	0	0	0	0
Unknown	1	1	0	0	0	2
Total	**30**	**1**	**0**	**0**	**0**	**31**

Crash Summary II - Characteristics

Most Harmful Event

Most Harmful Event	Total
1-Overturn / Rollover	2
2-Fire / Explosion	0
3-Immersion	0
4-Jackknife	0
5-Cargo / Equipment Loss Or Shift	0
6-Fell / Jumped from Motor Vehicle	0
7-Thrown or Falling Object	0
8-Other Non-Collision	1
9-Pedestrian	0
10-Pedalcycle	1
11-Railway Vehicle - Train, Engine	0
12-Animal	1
13-Motor Vehicle in Transport	13
14-Parked Motor Vehicle	0
15-Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle	1
16-Work Zone / Maintenance Equipment	0
17-Other Non-Fixed Object	2
18-Impact Attenuator / Crash Cushion	0
19-Bridge Overhead Structure	0
20-Bridge Pier or Support	0
21-Bridge Rail	0
22-Cable Barrier	0
23-Culvert	1
24-Curb	0
25-Ditch	0
26-Embankment	0
27-Guardrail Face	1
28-Guardrail End	0
29-Concrete Traffic Barrier	0
30-Other Traffic Barrier	0
31-Tree (Standing)	3
32-Utility Pole / Light Support	2
33-Traffic Sign Support	0
34-Traffic Signal Support	0
35-Fence	1
36-Mailbox	1
37-Other Post, Pole, or Support	0
38-Other Fixed Object (wall, building, tunnel, etc.)	0
39-Unknown	0
40-Gate or Cable	0
41-Pressure Ridge	0
Total	**30**

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	0
2-Traffic Signals (Flashing)	0
3-Advisory/Warning Sign	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	9
6-Yield Sign	0
7-Curve Warning Sign	2
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	0
13-None	11
14-Other	0
Total	**22**

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	2	2
B	4	4
C	1	4
PD	15	0
Total	**22**	**10**

Road Character

Road Grade	Total
1-Level	12
2-On Grade	9
3-Top of Hill	1
4-Bottom of Hill	0
5-Other	0
Total	**22**

Light

Light Condition	Total
1-Daylight	14
2-Dawn	1
3-Dusk	0
4-Dark - Lighted	5
5-Dark - Not Lighted	2
6-Dark - Unknown Lighting	0
7-Unknown	0
Total	**22**

Crash Summary II - Characteristics

Crashes by Year and Month

Month	2019	2020	2021	Total
JANUARY	1	1	0	2
FEBRUARY	1	0	1	2
MARCH	0	0	1	1
APRIL	0	1	0	1
MAY	0	0	0	0
JUNE	1	2	1	4
JULY	0	1	0	1
AUGUST	1	1	1	3
SEPTEMBER	1	1	0	2
OCTOBER	1	0	0	1
NOVEMBER	0	1	0	1
DECEMBER	1	1	2	4
Total	**7**	**9**	**6**	**22**

Report is limited to the last 10 years of data.

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five or More Leg Intersection	Driveways	Bridges	Interchanges	Other	Parking Lot	Private Way	Cross Over	Railroad Crossing	Traffic Circle-Roundabout	Total
Object in Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear End - Sideswipe	0	1	3	0	0	0	0	0	0	0	0	0	0	0	4
Head-on - Sideswipe	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Intersection Movement	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Went Off Road	5	6	2	0	0	0	0	0	0	0	0	0	0	0	13
All Other Animal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackknife	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrown or Falling Object	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Bear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deer	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Moose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**6**	**9**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**22**

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Blowing Sand, Soil, Dirt												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Clear												
Dark - Lighted	3	1	0	0	0	0	0	0	0	0	0	4
Dark - Not Lighted	1	0	0	0	0	0	0	0	0	0	1	2
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	12	1	0	0	0	0	0	0	0	0	1	14
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Cloudy												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	1	0	0	0	0	0	0	0	0	0	0	1
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Fog, Smog, Smoke												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rain												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Severe Crosswinds												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Sleet, Hail (Freezing Rain or Drizzle)												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Snow												
Dark - Lighted	0	0	0	0	0	0	1	0	0	0	0	1
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**17**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**22**

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

LOW NODE: **53449** HIGH NODE: **59192** REGION: **1** U/R: **URBAN**

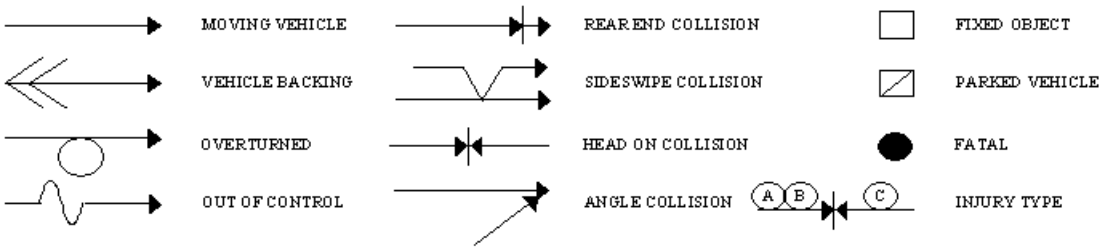
DESCRIPTION: **South St from River Rd to Fox Hollow Dr**

RTE # / RD #: **3100891** DATE DRAWN: **6/27/2022** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2019** STUDY TO: **12/31/2021**

CRASH RATE: **367.03** CRF: **1.6** % INJURY: **33.3** TOTAL CRASHES: **9**

LEGEND



- - - - - - **PATH OF**: P PEDESTRIAN B BICYCLE A ANIMAL S SLED

PAVEMENT: D - DRY, I - ICY, W - WET, S - SNOW

WEATHER: C - CLEAR, F - FOG, R - RAIN, SL - SLEET, S - SNOW, CL - CLOUDY

TIME: A - AM, P - PM

Biddeford

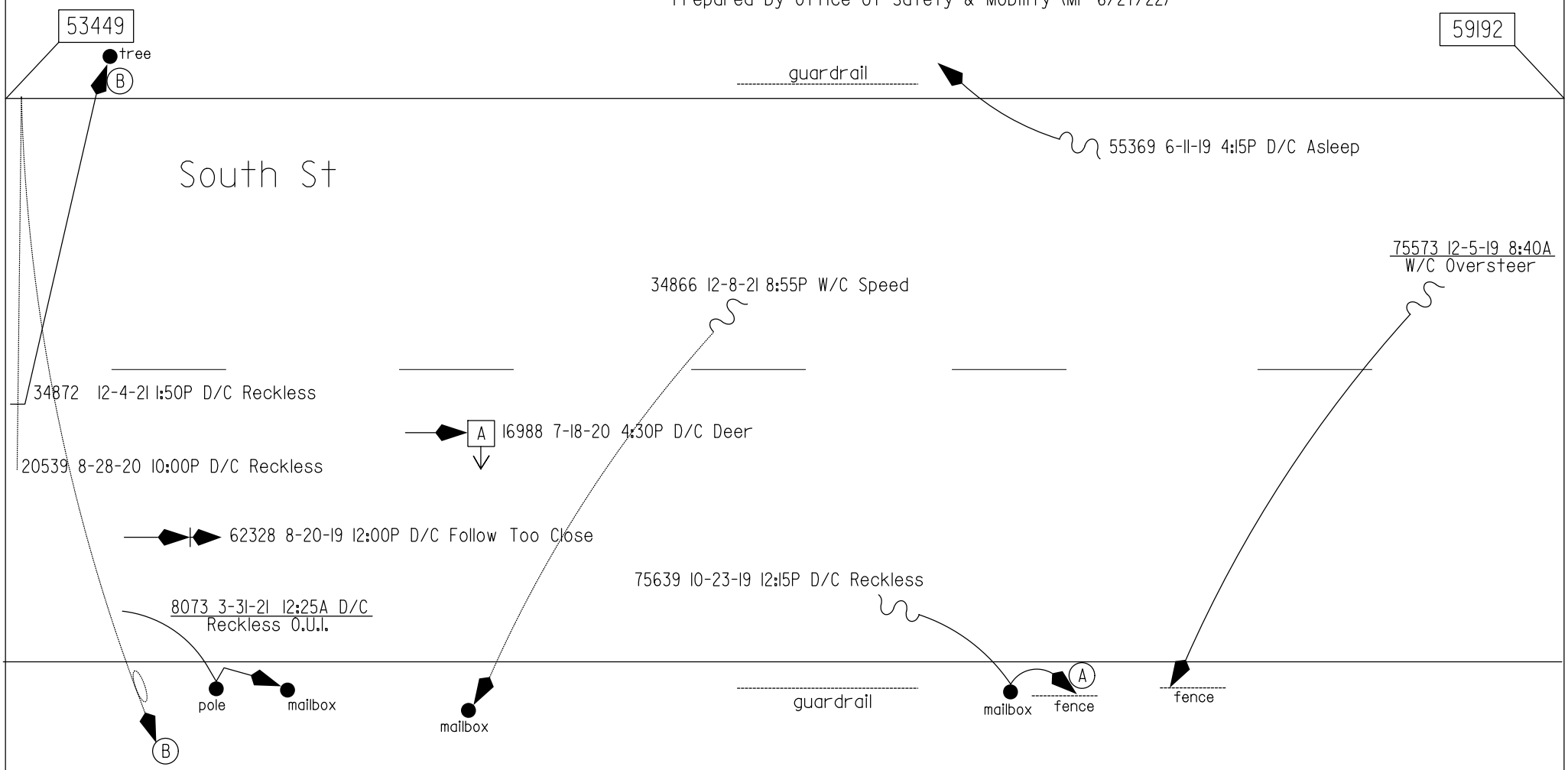
Link: 53449-59192

Element: 5076691

Study Period: 2019-2021

# of Crashes: 9 / CRF: 1.06

Prepared by Office of Safety & Mobility (MP 6/27/22)



Search...
BOOM RD
SACO
RIVER RD
BROWN FARM RD
Swan Pond Brook
HAYFIELD RD
53449
59193
59196
59195
59192
53455
63135
63073
53454
58383
53453
57517
SOUTH ST
95
BIDDEFO
BIDDEFORD WATER DISTRICT
ALEXANDER DR
58260
58261
MISCELLANEOUS
54075
72514
Scale: 1:13236
1000ft

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

- [x] Crash Summary I - Single Element
- [ ] Section Detail
- [x] Crash Summary II
- [ ] 1320 Public
- [ ] 1320 Private
- [ ] 1320 Summary

REPORT DESCRIPTION

Biddeford
South St from River Rd to Fox Hollow Drive

REPORT PARAMETERS

Year 2019, Start Month 1 through Year 2021 End Month: 12

Route: 3110891	Start Node: 59192	Start Offset: 0	[x] Exclude First Node
	End Node: 53449	End Offset: 0	[x] Exclude Last Node

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
53449	59192	5076691	0 - 0.66	3110891 - 0.36	0.66	2	9	0	1	2	0	6	33.3	0.00817	367.03	347.25	1.06
Int of RIVER RD SOUTH ST				RD INV 31 10891											Statewide Crash Rate: 159.73		
Study Years: 3.00				Section Totals:	0.66		9	0	1	2	0	6	33.3	0.00817	367.03	347.25	1.06

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
53449	59192	5076691	0 - 0.66	3110891 - 0.36	9	0	1	2	0	6	2019-75573	12/05/2019	0.53	PD
											2019-75639	10/23/2019	0.59	A
											2019-55369	06/11/2019	0.63	PD
											2021-34866	12/08/2021	0.81	PD
											2020-16988	07/18/2020	0.82	PD
											2019-62328	08/20/2019	0.94	PD
											2021-8073	03/31/2021	0.94	PD
											2021-34872	12/04/2021	0.98	B
											2020-20539	08/28/2020	1.01	B
				Totals:	9	0	1	2	0	6				

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												Hour of Day													
													PM													
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MONDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUESDAY	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
WEDNESDAY	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	3
THURSDAY	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
FRIDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
SATURDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
Totals	1	0	0	0	0	0	0	0	1	0	0	0	2	1	0	0	2	0	0	0	1	0	1	0	0	9

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-Passenger Car	6	23-Bicyclist	0
2-(Sport) Utility Vehicle	1	24-Witness	1
3-Passenger Van	0	25-Other	0
4-Cargo Van (10K lbs or Less)	0	26-Construction	0
5-Pickup	3	27-Farm Vehicle	0
6-Motor Home	0	Total	11
7-School Bus	0		
8-Transit Bus	0		
9-Motor Coach	0		
10-Other Bus	0		
11-Motorcycle	0		
12-Moped	0		
13-Low Speed Vehicle	0		
14-Autocycle	0		
15-Experimental	0		
16-Other Light Trucks (10,000 lbs or Less)	0		
17-Medium/Heavy Trucks (More than 10,000 lbs)	0		
18-ATV - (4 wheel)	0		
20-ATV - (2 wheel)	0		
21-Snowmobile	0		
22-Pedestrian	0		

Crash Summary II - Characteristics

Crashes by Driver Action at Time of Crash

Driver Action at Time of Crash	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Contributing Action	1	1	0	0	0	0	2
Ran Off Roadway	1	0	0	0	0	0	1
Failed to Yield Right-of-Way	0	0	0	0	0	0	0
Ran Red Light	0	0	0	0	0	0	0
Ran Stop Sign	0	0	0	0	0	0	0
Disregarded Other Traffic Sign	0	0	0	0	0	0	0
Disregarded Other Road Markings	0	0	0	0	0	0	0
Exceeded Posted Speed Limit	0	0	0	0	0	0	0
Drove Too Fast For Conditions	1	0	0	0	0	0	1
Improper Turn	0	0	0	0	0	0	0
Improper Backing	0	0	0	0	0	0	0
Improper Passing	0	0	0	0	0	0	0
Wrong Way	0	0	0	0	0	0	0
Followed Too Closely	1	0	0	0	0	0	1
Failed to Keep in Proper Lane	0	0	0	0	0	0	0
Operated Motor Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner	5	0	0	0	0	0	5
Swerved or Avoided Due to Wind, Slippery Surface, Motor Vehicle, Object, Non-Motorist in Roadway	0	0	0	0	0	0	0
Over-Correcting/Over-Steering	0	0	0	0	0	0	0
Other Contributing Action	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0
Total	9	1	0	0	0	0	10

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Apparently Normal	6	1	0	0	0	0	7
Physically Impaired	0	0	0	0	0	0	0
Emotional(Depressed, Angry, Disturbed, etc.)	0	0	0	0	0	0	0
Ill (Sick)	0	0	0	0	0	0	0
Asleep or Fatigued	1	0	0	0	0	0	1
Under the Influence of Medications/Drugs/Alcohol	1	0	0	0	0	0	1
Other	1	0	0	0	0	0	1
Total	9	1	0	0	0	0	10

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	2	0	0	0	0	2
20-24	3	0	0	0	0	3
25-29	2	0	0	0	0	2
30-39	1	0	0	0	0	1
40-49	1	0	0	0	0	1
50-59	0	0	0	0	0	0
60-69	1	0	0	0	0	1
70-79	0	0	0	0	0	0
80-Over	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Total	10	0	0	0	0	10

Crash Summary II - Characteristics

Most Harmful Event

Most Harmful Event	Total
1-Overturn / Rollover	1
2-Fire / Explosion	0
3-Immersion	0
4-Jackknife	0
5-Cargo / Equipment Loss Or Shift	0
6-Fell / Jumped from Motor Vehicle	0
7-Thrown or Falling Object	0
8-Other Non-Collision	0
9-Pedestrian	0
10-Pedalcycle	0
11-Railway Vehicle - Train, Engine	0
12-Animal	1
13-Motor Vehicle in Transport	2
14-Parked Motor Vehicle	0
15-Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle	0
16-Work Zone / Maintenance Equipment	0
17-Other Non-Fixed Object	0
18-Impact Attenuator / Crash Cushion	0
19-Bridge Overhead Structure	0
20-Bridge Pier or Support	0
21-Bridge Rail	0
22-Cable Barrier	0
23-Culvert	1
24-Curb	0
25-Ditch	0
26-Embankment	0
27-Guardrail Face	0
28-Guardrail End	0
29-Concrete Traffic Barrier	0
30-Other Traffic Barrier	0
31-Tree (Standing)	2
32-Utility Pole / Light Support	1
33-Traffic Sign Support	0
34-Traffic Signal Support	0
35-Fence	1
36-Mailbox	1
37-Other Post, Pole, or Support	0
38-Other Fixed Object (wall, building, tunnel, etc.)	0
39-Unknown	0
40-Gate or Cable	0
41-Pressure Ridge	0
Total	10

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	0
2-Traffic Signals (Flashing)	0
3-Advisory/Warning Sign	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	2
6-Yield Sign	0
7-Curve Warning Sign	2
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	0
13-None	5
14-Other	0
Total	9

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	1	1
B	2	2
C	0	0
PD	6	0
Total	9	3

Road Character

Road Grade	Total
1-Level	4
2-On Grade	4
3-Top of Hill	1
4-Bottom of Hill	0
5-Other	0
Total	9

Light

Light Condition	Total
1-Daylight	6
2-Dawn	0
3-Dusk	0
4-Dark - Lighted	1
5-Dark - Not Lighted	2
6-Dark - Unknown Lighting	0
7-Unknown	0
Total	9

Crash Summary II - Characteristics

Crashes by Year and Month

Month	2019	2020	2021	Total
JANUARY	0	0	0	0
FEBRUARY	0	0	0	0
MARCH	0	0	1	1
APRIL	0	0	0	0
MAY	0	0	0	0
JUNE	1	0	0	1
JULY	0	1	0	1
AUGUST	1	1	0	2
SEPTEMBER	0	0	0	0
OCTOBER	1	0	0	1
NOVEMBER	0	0	0	0
DECEMBER	1	0	2	3
Total	4	2	3	9

Report is limited to the last 10 years of data.

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five or More Leg Intersection	Driveways	Bridges	Interchanges	Other	Parking Lot	Private Way	Cross Over	Railroad Crossing	Traffic Circle-Roundabout	Total
Object in Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear End - Sideswipe	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Head-on - Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Went Off Road	2	5	0	0	0	0	0	0	0	0	0	0	0	0	7
All Other Animal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackknife	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrown or Falling Object	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deer	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Moose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	7	0	0	0	0	0	0	0	0	0	0	0	0	9

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Blowing Sand, Soil, Dirt												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Clear												
Dark - Lighted	1	0	0	0	0	0	0	0	0	0	0	1
Dark - Not Lighted	1	0	0	0	0	0	0	0	0	0	1	2
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	5	0	0	0	0	0	0	0	0	0	1	6
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Cloudy												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Fog, Smog, Smoke												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rain												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Severe Crosswinds												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Sleet, Hail (Freezing Rain or Drizzle)												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	7	0	0	0	0	0	0	0	0	0	2	9

Mark Cenci
Geologic, Inc.

CERTIFIED GEOLOGIST/LICENSED SITE EVALUATOR

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www.markcenci.com

Hydrogeological Assessment of the Hidden Hills Housing Park South Street, Biddeford

Date: August 9, 2022

Summary of the Assessment:

The proposed project meets the ground water quality requirements of the Site Location of Development Act.

Purpose of Assessment:

The purpose of the assessment is to predict the locations and extents of wastewater plumes on the property in order to meet the requirements of the Site Location of Development Act (the *SLODA*).

Project Summary:

The project is a residential subdivision of 195 two-bedroom mobile home units. Water will be provided by the public drinking water supply system. Wastewater will be disposed on site by 91 wastewater disposal systems. There are combined disposal areas for two and three residences. There are also disposal systems for the maintenance garage and the community center.

Information used in the assessment:

Information used includes soil descriptions, a high-intensity soil map and a wetlands delineation by Mark Hampton, LSS, LSE, a plan of the project with topographic contours by Terradyn Consultants, LLC, and a search of published geologic and hydrogeologic information,

Location of the project:

The site is located on a low knoll, or 'shelf", easterly of a northeasterly trending ridge, between Saco River and Thacher Brook (see Figure 1). Ground surface slopes are mostly gentle, on the order of 1 to 3% in the development area. There are some moderately steep slopes on the northerly portion of the property above a drainage swale. Drainage is to the Saco River, by way of flow through linear wetland troughs. Drainage is somewhat radial. There is a watershed divide on the property. Flow is northerly to an unnamed stream and southerly to Thacher Brook. Both features flow to the Saco.

Surficial and bedrock geology of the area:

The area is mapped (see Figure 2) as an association of thin glacial till over shallow bedrock and fine grained glacio-marine sediments of the Presumpscot Formation by Carol Hildreth on the *Surficial Geology of the Biddeford Quadrangle, York County Maine* (ME Geol. Surv, Open-File Report 99-109). The high-intensity soil survey by Hampton agrees with this generalized mapping. Hampton describes an association of Lyman-Tunbridge, Lamoine, Buxton, Brayton and Scantic soils. The Brayton and Scantic areas are most likely coincident with wetlands on the property. The Brayton being a low-lying, tilly soil and the Scantic being the low lying silty/clay soil.

Bedrock beneath the site is mapped by Arthur Hussey, *et al,* (see Figure 3) as granites of the Biddeford Pluton on the *Bedrock Geology of the Kittery 1:100,000 Quadrangle, Maine and New Hampshire* (ME Geol. Surv. Open-File Map 08-78). Depth to bedrock is shallow in portions of the property, as per Hampton. The Water Well Database of the Maine Geological Survey shows no water wells in the vicinity of the parcel (see Figure 4).

Nearly all the wastewater disposal systems will be located on soils classified by Hampton as Lamoine. Lamoine is a soil formed in glacio-marine sediments that are fine grained, with silts and clays in the substratum. They tend to be coarser in the upper soil horizons, but the textures do not become predominately sand.

Hydrogeology of the site:

The source of groundwater on this site is precipitation. Precipitation falling on the site seeps into the soil and descends until restrictive soil layers or the water table is encountered. Thereupon the flow of groundwater is down gradient towards wetlands and points of discharge into streams. The property is not mapped as a Significant Sand and Gravel Aquifer by the Maine Geological Survey

Slopes are gentle and soil textures are fine grained. Recharge is average to below average on this site. According to the recharge estimates in Part II, Section 17. of the *SLODA*, soil recharge should be no more than 20% of annual precipitation.

The hydraulic conductivity of the soil is estimated to be 4 feet per day. The hydraulic gradient is estimated to be 2%. The effective porosity is estimated to be 25%. Dispersivity should be higher than average, because of the tendency to have seasonally varying vertical flow in the soils. In times of soil saturation, ground water flow will take place faster in the upper soil horizons, but under seasonally dry conditions, flow will largely be within the unsaturated substrata. These flow variations cause the suspended nutrients to be dispersed in three dimensions.

The groundwater flow directions can be discerned from topography. Analysis of flow patterns reveals a highly variable flow regime, from the small knolls and side slopes to linear troughs, occupied by wetlands.

Impact on groundwater quality:

Nitrate-nitrogen (NO3-N) is the chemical to assess for impact on groundwater. NO3-N is generated by subsurface wastewater disposal systems. It is a conservative contaminant, meaning it does not readily degrade in groundwater, nor does it attenuate, or attach itself to soil particles. Nitrate-nitrogen is limited to 10 mg/liter in public drinking water supplies by the Primary Drinking Water Standard. The *SLODA* requires NO3-N to be at concentrations below 10 mg/liter at the project property line in order to safeguard the groundwater on abutting properties.

The analysis of NO3-N impacts was calculated by SOLUTRANS, a 32-bit Windows program for modeling three-dimensional solute transport written by Dr. Charles R. Fitts of Fitts Geosolutions and the University of Southern Maine. The program is based on the analytical solutions of Liej *et al* (1991, 1993). The solutions in SOLUTRANS assume a uniform, one-dimensional flow field, and allows three-dimensional dispersion, retardation and first-order decay. The model is not a dilution/mass balance model, so the requirement that drought conditions be assumed is met.

Variables entered into the calculations that are site specific include an estimated seepage velocity of 0.3 feet per day, a hydraulic gradient of 2% (0.02), an effective porosity of 25% (0.25), an initial nitrogen concentration of 40 mg/liter, retardation of 1, a decay constant of zero, longitudinal, lateral and vertical dispersivities of 15, 5 and 0.5 feet respectively. A depth corrector to simulate three-dimensional effects, based on hydraulic factors and the gallons per day disposed was also entered.

Calculations were performed and the results indicate the 10 mg/liter NO3-N plumes will be approximately 75 feet in length, measured from the disposal areas. The curve of the results is attached. Using the inferred groundwater flow directions at each disposal site, the plumes were

drawn by Mark Cenci Geologic at a length of 80 feet and provided to Terradyn Consultants to be included on a plan. The plumes were evaluated with respect to the project property lines. No plumes exist the project at concentrations in excess of 10 mg/liter. All plumes, but the systems arrayed adjacent to the Maine Turnpike, move to wetlands where bio-chemical processes will effectively remove nitrogen from groundwater.

The cleansing capacity of wetlands is well known and used as a primary, secondary and tertiary treatment in constructed wetlands. Wetlands are particularly effective for septic systems, where treatment in tanks, disposal areas and downgradient soils nitrify ammonia to nitrite and nitrate. The stripping of the oxygen in the carbon-rich and anoxic wetlands and release of nitrogen gases to the atmosphere, as well as plant uptake of nutrients, is effective.

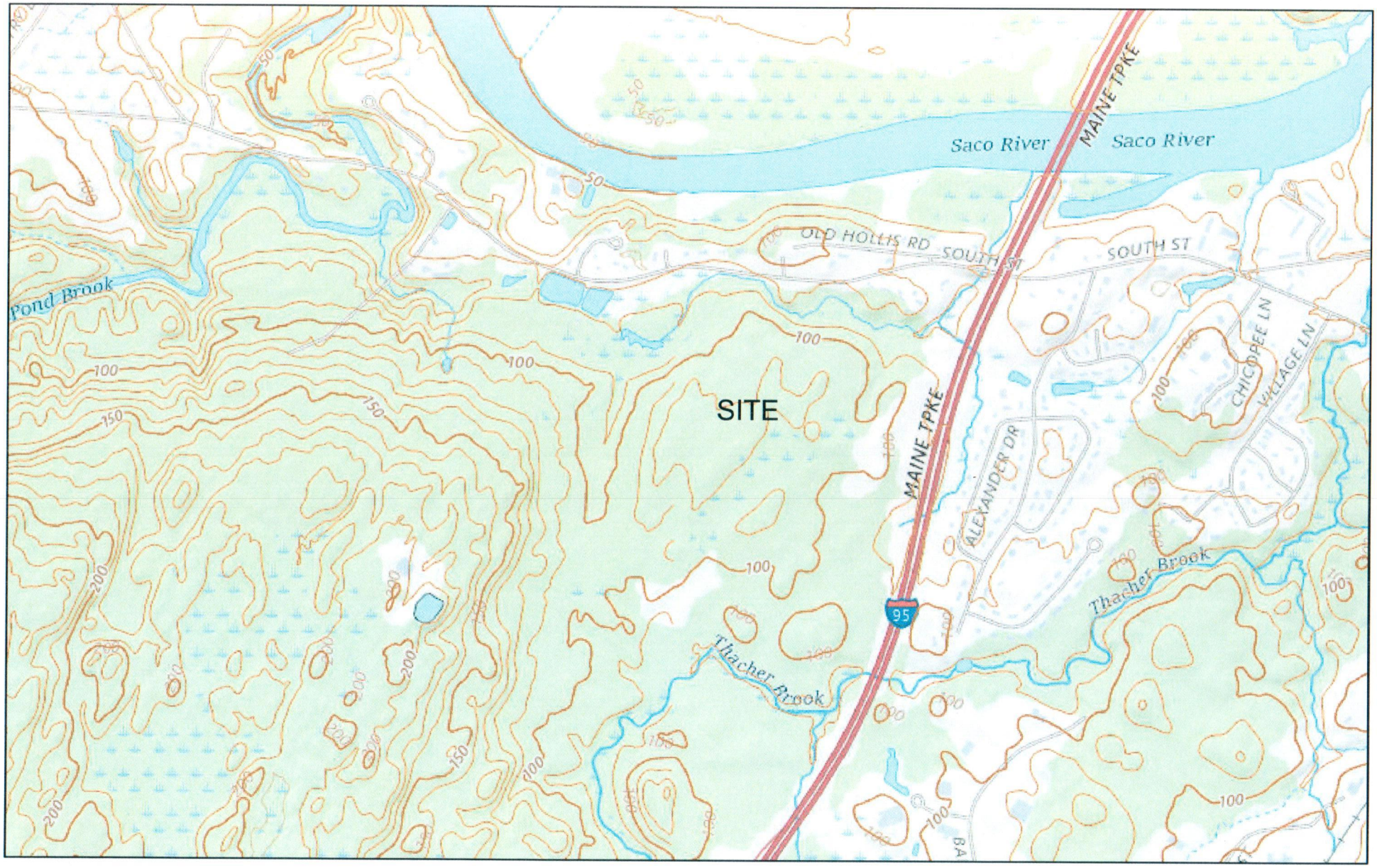
Conclusions:

The array of wastewater disposal areas presented on the plan of the project meets the requirements of the *SLODA* that NO3-N in groundwater remain at concentrations below 10 mg/liter at the project property lines.

Favorable factors on this site include the spatial array of the systems, the size of the parcel and the distances to property lines, the presence of wetland areas below nearly all the systems and the available supply of public water for potable use.

Mark Cenci, LG # 467

FIGURE 1



8/5/2022, 1:35:17 PM

Normal Intermediate Contours

Normal Index Contours

1:18,056

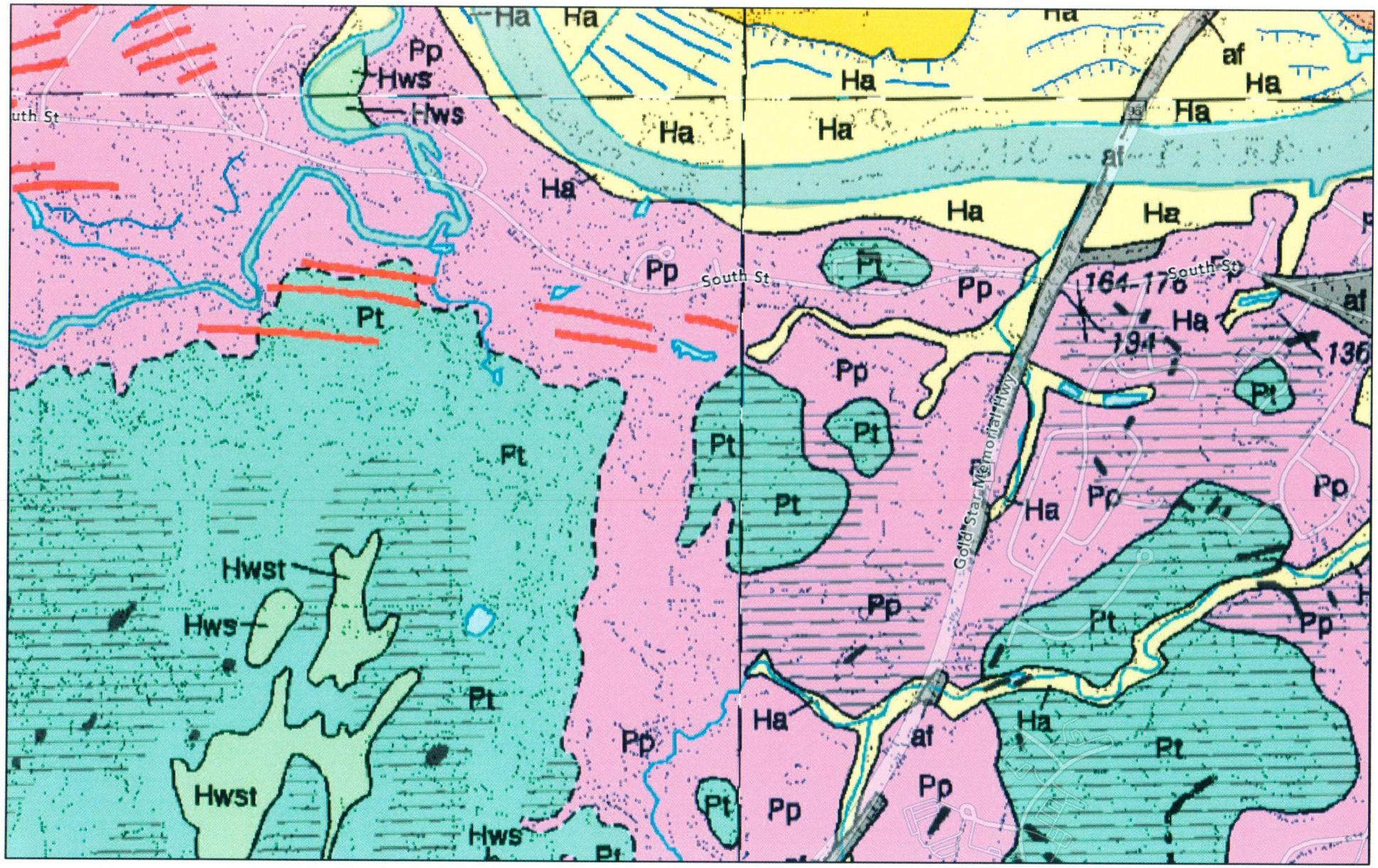
0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography

USGS
2021 USGS

FIGURE 2. Surficial Geology 1:24,000



8/5/2022, 1:40:36 PM

Image

Red: Band_1

Green: Band_2

Blue: Band_3

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Esri Community Maps Contributors, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau,

Maine Geological Survey

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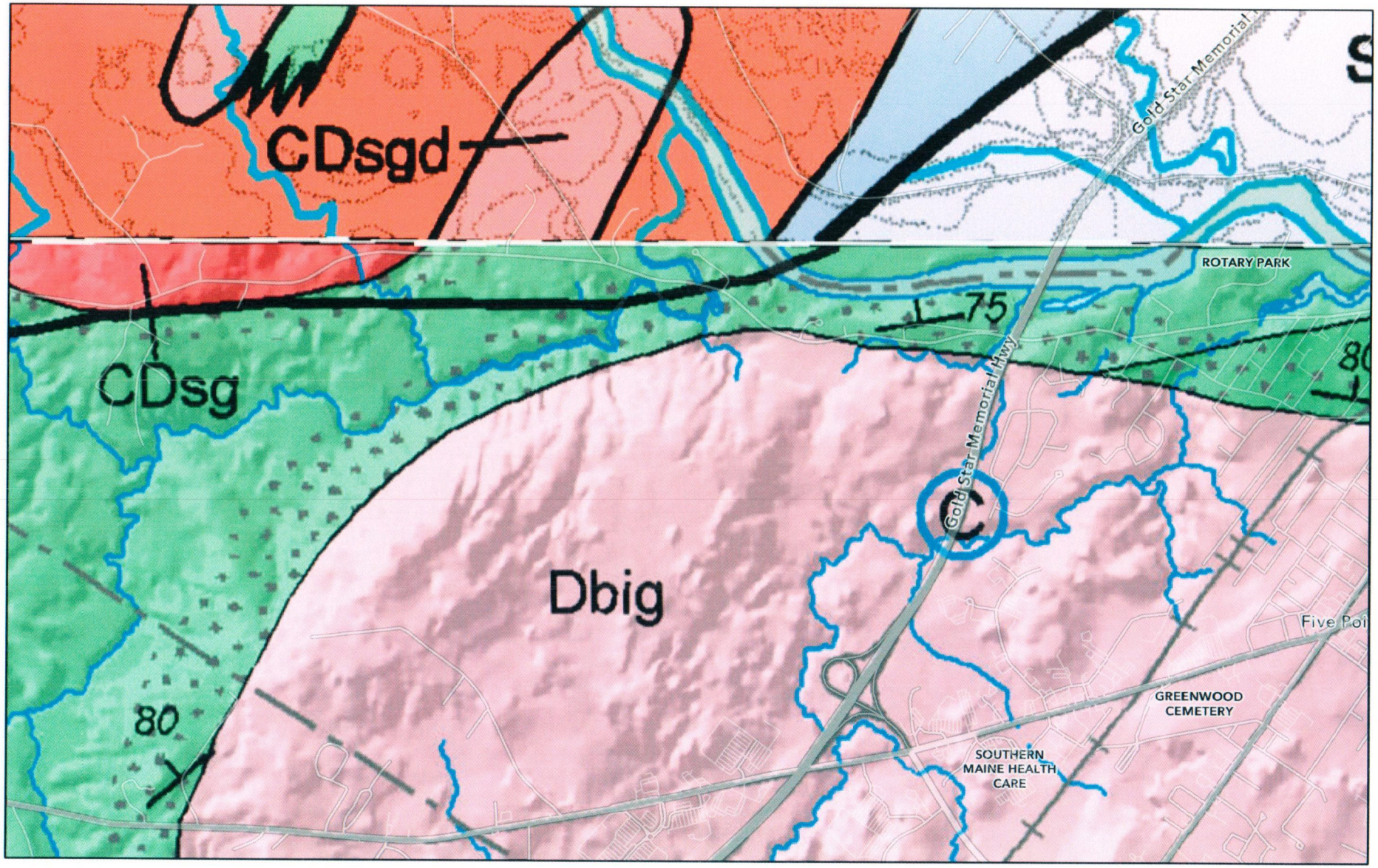
FIGURE 3. Bedrock Geology 100K



8/5/2022, 1:56:37 PM

Image

Red: Band_1

Green: Band_2

1:36,112

0 0.23 0.45 0.9 mi

0 0.35 0.7 1.4 km

Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maine Geological Survey

Maine Geological Survey

Maine Geological Survey | Esri Community Maps Contributors, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA | Esri Community Maps Contributors, Esri, HERE, Garmin, SafeGraph,

FIGURE 4. Maine Well Database

8/5/2022, 2:36:20 PM

Well Depth (ft)
- 50.1 - 100
- 100.1 - 150
- 200.1 - 250
- 250.1 - 300
- 300.1 - 400
- 400.1 - 500

Well Yield (gpm)
- 1.1 - 2
- 4.1 - 6
- 6.1 - 8
- 15.1 - 20
- 25.1 - 50

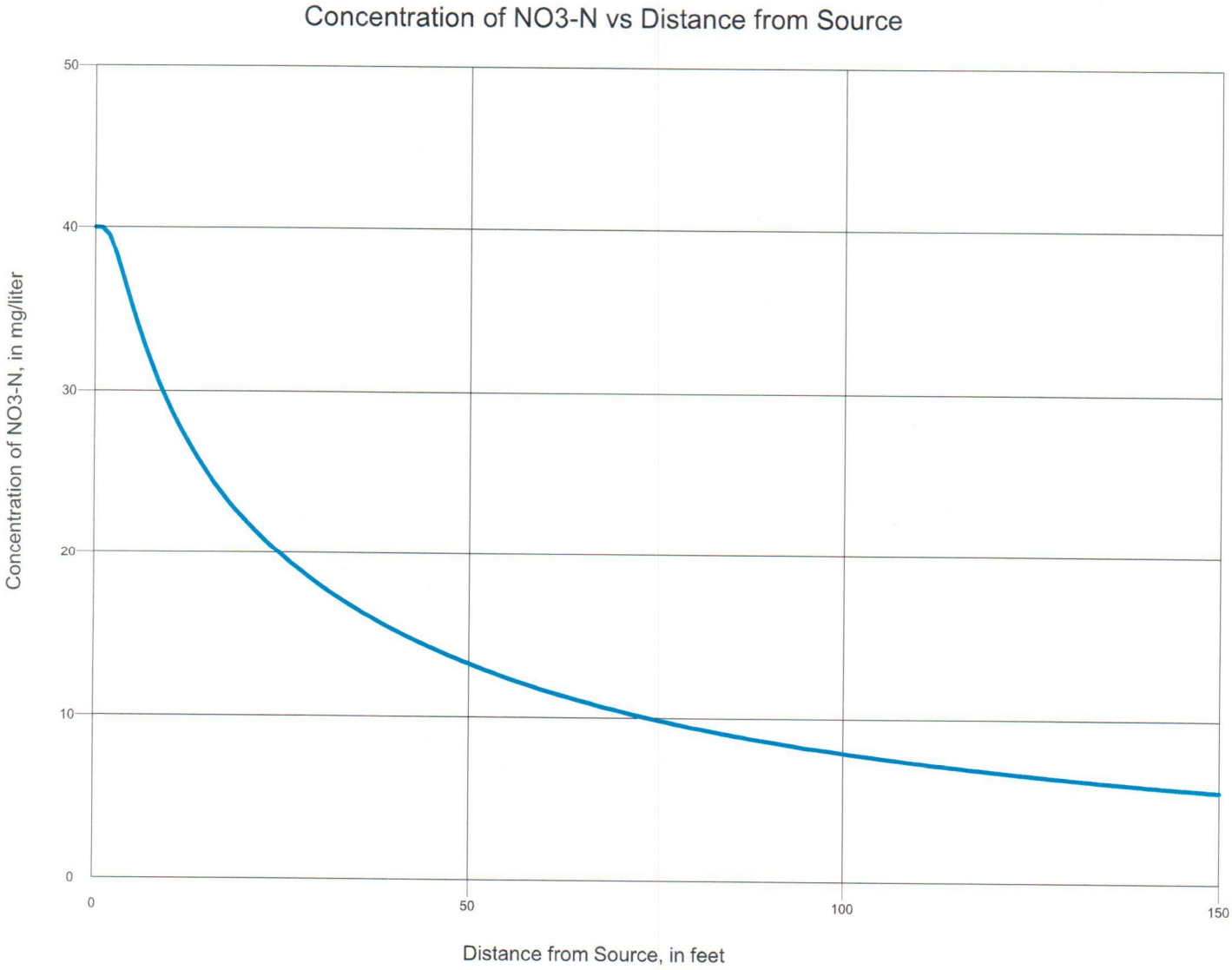
1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Esri, HERE, Garmin, GeoTechnologies, Inc., NGA, USGS

Maine Geological Survey
2015


Concentration of NO3-N vs Distance from Source
Concentration of NO3-N, in mg/liter
50
40
30
20
10
0
0
50
100
150
Distance from Source, in feet

RECORDING DATA

STATE OF MAINE
YORK COUNTY REGISTRY OF DEEDS
RECEIVED _____
AT h____ m ____M. RECORDED IN
FILE NUMBER _____

REGISTRAR

LEGEND

- PROPERTY LINE
- ABUTTER LINE
- RIGHT-OF-WAY LINE
- TIE LINE
- SETBACK
- EASEMENT
- BUFFER
- FLOODPLAIN
- WOODS ROAD/TRAIL
- ZONE LINE
- BUILDING
- EDGE WETLAND
- EDGE VERNAL POOL
- STREAM
- WATERCOURSE
- EDGE PAVEMENT
- PAVEMENT PAINT
- EDGE GRAVEL
- CURB LINE
- TREELINE
- 120 / 118 CONTOURS
- ×120.00 SPOT GRADE
- W WATER
- CULVERT
- OHU OVERHEAD UTILITY
- UGU UNDERGROUND UTILITY
- RIPRAP
- N/F NOW OR FORMERLY
- A.G. ABOVE GRADE
- B.G. BELOW GRADE
- MONUMENT FOUND
- IRON PIPE/ROD FOUND
- BLAZED DECIDUOUS TREE
- BLAZED CONIFEROUS TREE
- WATER GATE VALVE
- HYDRANT
- WETLANDS
- CATCH BASIN
- UTILITY POLE
- GUY WIRE

GENERAL NOTES:

1. THE RECORD OWNER OF THE PARCEL IS SOUTH STREET VILLAGE, LLC BY DEED DATED AUGUST 15, 2017 AND RECORDED AT THE YORK COUNTY REGISTRY OF DEEDS IN BOOK 17541, PAGE 869, AND IS SHOWN AS LOT 8 ON THE CITY OF BIDDEFORD TAX MAP 7, AND LOTS 38 ON MAP 2.
2. THE PROPERTY IS LOCATED IN THE RURAL FARM (RF) DISTRICT AND PARTIALLY WITHIN THE SUBURBAN RESIDENTIAL 1 (SR1), MOBILE HOME PARK (MHP), AND SHORELAND OVERLAY ZONES AS SHOWN.

   LAND USE REGULATIONS FOR THE RF ARE AS FOLLOWS:

MINIMUM LOT SIZE:	20,000 S.F.
MINIMUM STREET FRONTAGE:	120' (PUBLIC WATER)
MINIMUM FRONT YARD:	40' (MAJOR R/W) 25' (OTHER R/W)
MINIMUM SIDE YARD:	25'
MINIMUM REAR YARD:	25'
MAXIMUM BUILDING HEIGHT:	3 STORIES OR 35'

   * SEE ORDINANCE FOR MORE PARTICULAR INFORMATION.
3. TOTAL AREA OF PARCEL IS APPROXIMATELY 320 ACRES.
4. BOUNDARY INFORMATION SHOWN HEREON IS BASED UPON PLAN REF. A TIED TO FIELD MEASUREMENTS OBSERVED BY NORTHERN SURVEY ENGINEERING, LLC IN NOVEMBER, 2021. A RECORDS SEARCH WAS COMPLETED AS PART OF THIS SURVEY TO DEFINE ANY RECORD ENCUMBRANCES OR CONVEYANCES, AND ALL FINDINGS ARE SHOWN HEREON.
5. TOPOGRAPHIC INFORMATION SHOWN HEREON IS DERIVED FROM DATA COLLECTED IN NOVEMBER, 2021 USING AN UNMANNED AERIAL VEHICLE (UAV) SURVEY-GRADE LIDAR SENSOR. THE RESULTING SURFACE WAS GROUND-TRUTHED AND VERIFIED TO MEET THE NATIONAL MAP ACCURACY STANDARDS FOR 1-FOOT CONTOURS.
6. BOOK AND PAGE REFERENCES SHOWN HEREON ARE IN REFERENCE TO THE YORK COUNTY REGISTRY OF DEEDS (Y.C.R.D.).
7. BEARINGS SHOWN HEREON ARE IN REFERENCE TO GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802-NAD83. ELEVATIONS DEPICTED HEREON ARE IN REFERENCE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED GPS OBSERVATIONS.
8. UTILITY INFORMATION DEPICTED HEREON IS COMPILED USING PHYSICAL SURFACE EVIDENCE LOCATED IN THE FIELD IN CONJUNCTION WITH ANY RECORD INFORMATION AVAILABLE AT THE TIME OF THIS SURVEY (SUE LEVEL C), AND MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS AND/OR DESIGNERS NEED TO CONTACT DIG-SAFE SYSTEMS, INC. (1-888-DIG-SAFE) AND FIELD VERIFY EXISTING UTILITIES PRIOR TO CONSTRUCTION AND/OR EXCAVATION.
9. THE LOCUS PROPERTY AS DEPICTED HEREON FALLS PARTIALLY WITHIN A SPECIAL FLOOD HAZARD AREA AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR BIDDEFORD, MAINE, YORK COUNTY, COMMUNITY-PANEL NUMBERS 2301450003B & 2301450008B, HAVING AN EFFECTIVE DATE OF MAY 15, 1984. THE LOCUS FALLS WITHIN AN AREA IDENTIFIED AS ZONE A, AREAS OF 100-YEAR FLOOD, BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS NOT DETERMINED. LIMITS ARE SHOWN HEREON BY DIGITIZING THE FEMA MAPPING AND IS APPROXIMATE.
10. A WETLAND DELINEATION AND VERNAL POOL ASSESSMENT WAS COMPLETED BY MARK HAMPTON ASSOCIATES IN APRIL & MAY, 2020, THE RESULTS OF WHICH WERE PROVIDED TO THIS SURVEYOR IN DIGITAL FORMAT AND OVERLAYED ONTO THIS SURVEY. NO WETLAND FLAGGING WAS OBSERVED DURING THE COURSE OF THE FIELD SURVEY.

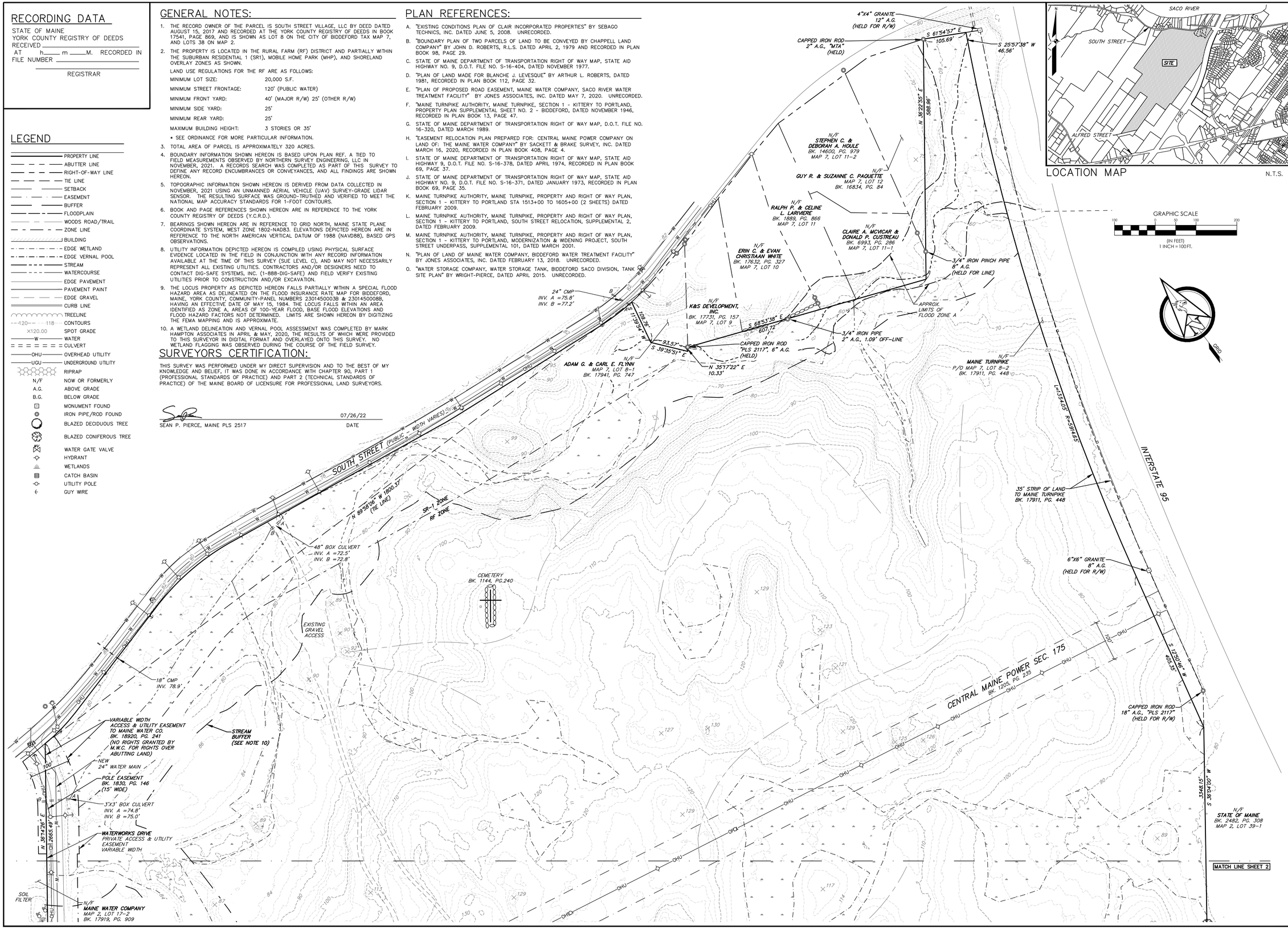
SURVEYORS CERTIFICATION:

THIS SURVEY WAS PERFORMED UNDER MY DIRECT SUPERVISION AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT WAS DONE IN ACCORDANCE WITH CHAPTER 90, PART 1 (PROFESSIONAL STANDARDS OF PRACTICE) AND PART 2 (TECHNICAL STANDARDS OF PRACTICE) OF THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS.

SEAN P. PIERCE, MAINE PLS 2517 — 07/26/22 DATE

PLAN REFERENCES:

A. "EXISTING CONDITIONS PLAN OF CLAIR INCORPORATED PROPERTIES" BY SEBAGO TECHNICS, INC. DATED JUNE 5, 2008. UNRECORDED.
B. "BOUNDARY PLAN OF TWO PARCELS OF LAND TO BE CONVEYED BY CHAPPELL LAND COMPANY" BY JOHN D. ROBERTS, R.L.S. DATED APRIL 2, 1979 AND RECORDED IN PLAN BOOK 98, PAGE 29.
C. STATE OF MAINE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, STATE AID HIGHWAY NO. 9, D.O.T. FILE NO. S-16-404, DATED NOVEMBER 1977.
D. "PLAN OF LAND MADE FOR BLANCHE J. LEVESQUE" BY ARTHUR L. ROBERTS, DATED 1981, RECORDED IN PLAN BOOK 112, PAGE 32.
E. "PLAN OF PROPOSED ROAD EASEMENT, MAINE WATER COMPANY, SACO RIVER WATER TREATMENT FACILITY" BY JONES ASSOCIATES, INC. DATED MAY 7, 2020. UNRECORDED.
F. "MAINE TURNPIKE AUTHORITY, MAINE TURNPIKE, SECTION 1 - KITTERY TO PORTLAND, PROPERTY PLAN SUPPLEMENTAL SHEET NO. 2 - BIDDEFORD, DATED NOVEMBER 1946, RECORDED IN PLAN BOOK 13, PAGE 47.
G. STATE OF MAINE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, D.O.T. FILE NO. 16-320, DATED MARCH 1989.
H. "EASEMENT RELOCATION PLAN PREPARED FOR: CENTRAL MAINE POWER COMPANY ON LAND OF: THE MAINE WATER COMPANY" BY SACKETT & BRAKE SURVEY, INC. DATED MARCH 16, 2020, RECORDED IN PLAN BOOK 408, PAGE 4.
I. STATE OF MAINE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, STATE AID HIGHWAY 9, D.O.T. FILE NO. S-16-378, DATED APRIL 1974, RECORDED IN PLAN BOOK 69, PAGE 37.
J. STATE OF MAINE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, STATE AID HIGHWAY NO. 9, D.O.T. FILE NO. S-16-371, DATED JANUARY 1973, RECORDED IN PLAN BOOK 69, PAGE 35.
K. MAINE TURNPIKE AUTHORITY, MAINE TURNPIKE, PROPERTY AND RIGHT OF WAY PLAN, SECTION 1 - KITTERY TO PORTLAND STA 1513+00 TO 1605+00 (2 SHEETS) DATED FEBRUARY 2009.
L. MAINE TURNPIKE AUTHORITY, MAINE TURNPIKE, PROPERTY AND RIGHT OF WAY PLAN, SECTION 1 - KITTERY TO PORTLAND, SOUTH STREET RELOCATION, SUPPLEMENTAL 2, DATED FEBRUARY 2009.
M. MAINE TURNPIKE AUTHORITY, MAINE TURNPIKE, PROPERTY AND RIGHT OF WAY PLAN, SECTION 1 - KITTERY TO PORTLAND, MODERNIZATION & WIDENING PROJECT, SOUTH STREET UNDERPASS, SUPPLEMENTAL 101, DATED MARCH 2001.
N. "PLAN OF LAND OF MAINE WATER COMPANY, BIDDEFORD WATER TREATMENT FACILITY" BY JONES ASSOCIATES, INC. DATED FEBRUARY 13, 2018. UNRECORDED.
O. "WATER STORAGE COMPANY, WATER STORAGE TANK, BIDDEFORD SACO DIVISION, TANK SITE PLAN" BY WRIGHT-PIERCE, DATED APRIL 2015. UNRECORDED.



LOCATION MAP N.T.S.

SEAN P. PIERCE, PLS 2517

REV.:	BY:	DATE:	STATUS:
A	SPP	07/26/22	UPDATED WETLAND MAPPING

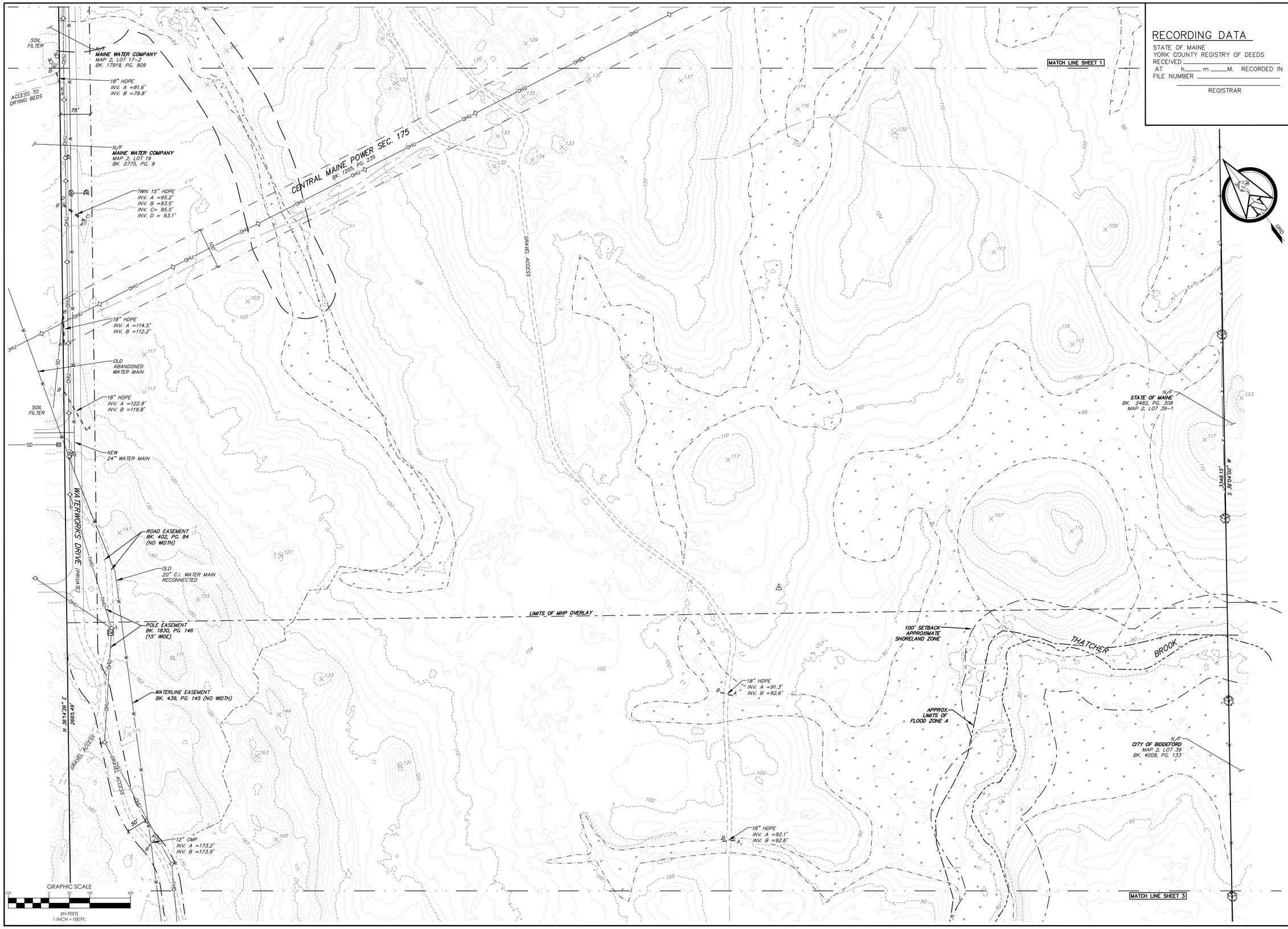
THIS PLAN SHALL NOT BE RECORDED WITHOUT WRITTEN PERMISSION AND ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK.

NORTHERN SURVEY ENGINEERING
207.440.3487
41 CHURCH ROAD, BRUNSWICK, MAINE 04011
WWW.NORTHERNSURVEYENGINEERING.COM

EXISTING CONDITIONS SURVEY
OF:
LAND OF SOUTH STREET VILLAGE, LLC
413 SOUTH STREET
BIDDEFORD, MAINE 04005
FOR:
SOUTH STREET VILLAGE, LLC
76 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DRAWN	CHECKED
SPP	PHB
PROJECT NO.	DATE
21006473A	06/23/22
SHEET SIZE	SCALE
24" X 36"	1" = 100'

SHEET 1 OF 3



RECORDING DATA

STATE OF MAINE
YORK COUNTY REGISTRY OF DEEDS
RECEIVED _____
AT h____ m____M. RECORDED IN
FILE NUMBER _____

REGISTRAR

SEAN P. PIERCE, PLS 2517

STATE OF MAINE
SEAN P. PIERCE
2517
PROFESSIONAL LAND SURVEYOR

REV.	BY:	DATE:	STATUS:
A	SPP	07/26/22	UPDATED WETLAND MAPPING

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION
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NORSE
NORTHERN SURVEY ENGINEERING
207.440.3487
41 CHURCH ROAD, BRUNSWICK, MAINE 04011
www.norseengineering.com

EXISTING CONDITIONS SURVEY

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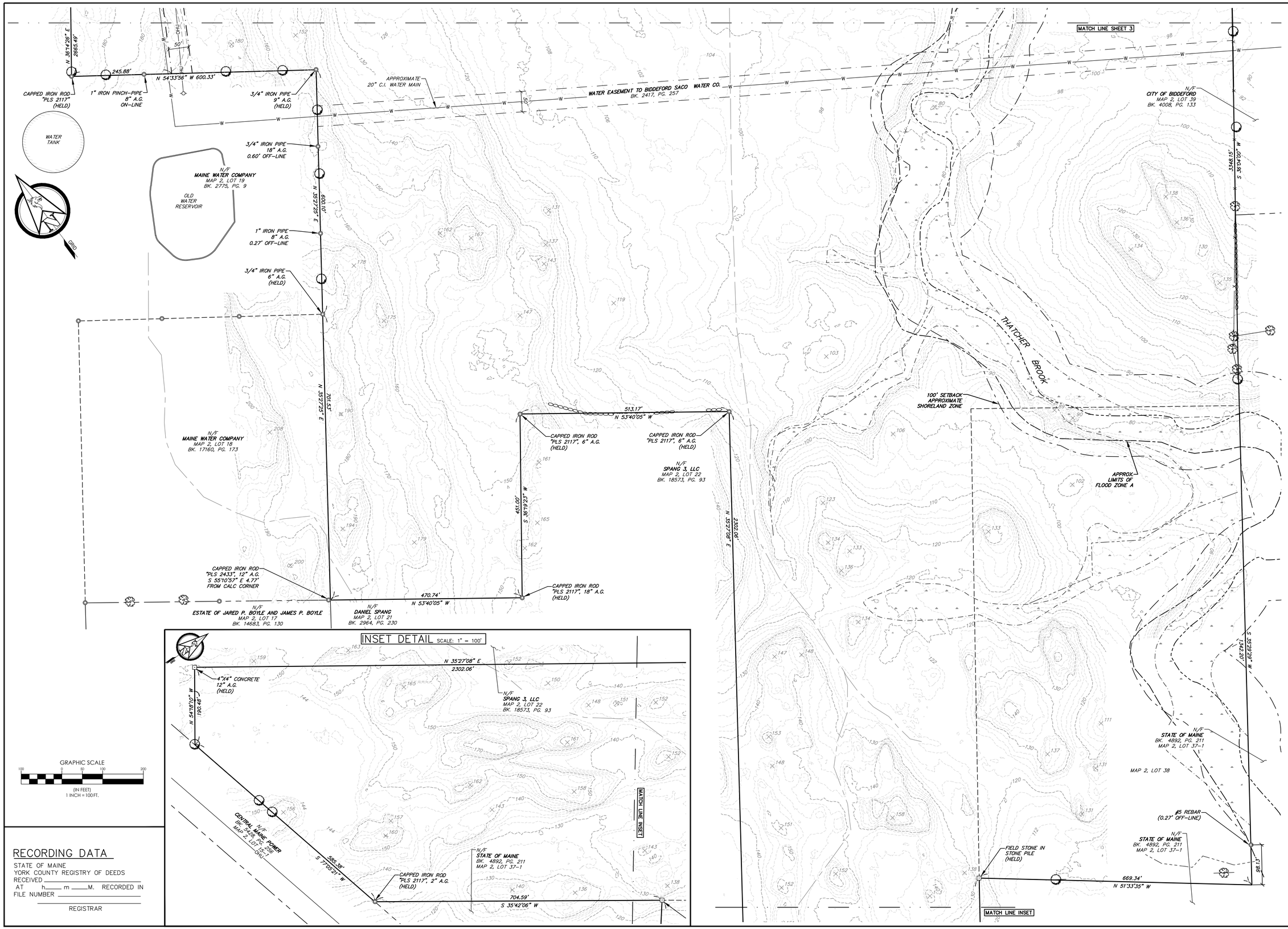
FOR:
SOUTH STREET VILLAGE, LLC
76 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DRAWN	CHECKED
SPP	PHB
PROJECT NO.	DATE
21006473A	06/23/22
SHEET SIZE	SCALE
24" X 36"	1" = 100'

SHEET 2 OF 3



RECORDING DATA

STATE OF MAINE
YORK COUNTY REGISTRY OF DEEDS
RECEIVED _____
AT h____ m ____M. RECORDED IN
FILE NUMBER _____

REGISTRAR

SEAN P. PIERCE, PLS 2517

STATE OF MAINE SEAN P. PIERCE 2517 PROFESSIONAL LAND SURVEYOR

REV.	BY:	DATE:	STATUS:
A	SPP	07/26/22	UPDATED WETLAND MAPPING

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41 CHURCH ROAD, BRUNSWICK, MAINE 04011
207.440.3487
www.northernsurveyengineering.com

EXISTING CONDITIONS SURVEY

OF:
LAND OF SOUTH STREET VILLAGE, LLC
413 SOUTH STREET
BIDDEFORD, MAINE 04005

FOR:
SOUTH STREET VILLAGE, LLC
78 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DRAWN	CHECKED
SPP	PHB
PROJECT NO.	DATE
21006473A	06/23/22
SHEET SIZE	SCALE
24" X 36"	1" = 100'

SHEET 3 OF 3

Pineland
Cumberland Hall
41 Campus Drive, Suite 301
New Gloucester, ME 04260

Portland
565 Congress Street, Suite 201
Portland, ME 04101

STORMWATER MANAGEMENT PLAN

Hidden Hills Manufactured Housing Park – An Age Restricted Community
Biddeford, Maine

The following Stormwater Management Plan has been prepared for the Hidden Hills Manufactured Housing Park to evaluate stormwater runoff and erosion control for the proposed 195 lot subdivision located at 413 South Street in Biddeford, Maine.

Site Calculations

Total Property Area	320 Ac (+/-)
Total Project Impervious Area	21.6 Ac
Total Developed Area	68.6 Ac

Existing Conditions

The development parcel is located on the southerly side of South Street, just west of the Maine Turnpike at 413 South Street. The property also has access to a private road along the northwestern edge of the property that serves the water district property. The parcel is shown as lot 8 on the City of Biddeford Tax Map 7. The 312.1-acre property is located within both the Suburban Residential (SR1) District and the Rural Farm (RF) District and also contains a Mobile Home Park (MHP) Overlay Zone. The portion of the property that is located within the MHP is approximately 160 acres. The allowable density for any park served by any subsurface wastewater disposal system is 1 unit per 20,000 SF. The net residential area calculation shows that the property can support approximately 348 manufactured homes within the MHP.

The property drains to three major study points:

Study Point 1 is located near the northeast property corner and represents the point where the unnamed stream that flows parallel to South Street crosses beneath the road. The stream flows to the north for a little less than 1,000' where it enters the Saco River.

Study Point 2 is located near the midpoint of the development on the eastern property line. This area drains to a Maine Turnpike ditch that eventually outfalls to the Saco River.

Study Point 3 handles the runoff from the portion of the development that drains to the south as well as all of the undeveloped remaining land. This area flows to Thatcher Brook. Thatcher Brook is an urban impaired stream. The study point represents the point where the brook leaves the property on the eastern property border.

Flooding

The development area is not located within an area of flood hazard according to the Federal Insurance Rate Maps 230145003B and 230145008B. See attached map. Portions of the overall property are located within a Zone-A flood plain however, these locations are outside of the development area of the project.

Modeling Assumptions

The onsite stormwater facilities were sized utilizing the USDA Soil Conservation Service (SCS) TR-20 Runoff Simulation Model, as contained in the HydroCAD computer software program (Version 9.0). Runoff curve numbers were determined for each direct watershed by measuring the area of each hydrologic soil group within each type of land cover. Weighted curve numbers were then calculated using curve numbers for various cover types and hydrologic soil groups, assuming "good" conditions as defined in U.S Soil Conservation Service (SCS) publications. Times of concentration and travel times were determined from site topographic maps in accordance with SCS procedures. A maximum length of 150 feet was used for sheet flow.

All of the watersheds' peak runoff rates were analyzed for the 2, 10, and 25-year frequency, 24-hour duration storm events. A Type III rainfall distribution was applied to these storms. The rainfall amounts for York County are as follows:

Storm Frequency	Precipitation (in./24 hr)
2-year	3.3
10-year	4.9
25-year	6.2

Onsite Soils

The soils were delineated by Mark Hampton of Mark Hampton Associates. His Class B High Intensity Soil Survey is attached to this submission. Offsite soils were determined from the NRCS Web Soil Mapper. See attached NRCS Soils Map.

Water Quantity (Flooding Standard)

The following table summarizes the results of stormwater calculations for the design storm events for the project areas. Calculations and computer modeling sheets are provided with this report.

Table 1 - Stormwater Runoff Summary Table
Pre-Development vs. Post-Development

Study Point #	2Yr/24Hr (cfs)		10Yr/24Hr (cfs)		25Yr/24Hr (cfs)	
	Pre	Post	Pre	Post	Pre	Post
1	30.5	28.4	70.6	69.0	107.8	105.1
2	68.2	66.4	145.9	141.0	215.0	207.2
3	15.3	12.6	34.1	32.8	51.0	50.9

As the above result table shows, the post-development flow rates for the 2, 10, 25 and 50-year/24 hour design storm events do not exceed the pre-development conditions.

Basic Standards

A site-specific Erosion & Sedimentation Control Plan has been developed for the project. Means and methods to control erosion and sedimentation during and after construction are detailed in the erosion control plan narrative and construction details, which are included directly on the project drawings for ease of reference during construction.

Requirements for inspection and maintenance of the stormwater management system are provided in the stormwater management system inspection and maintenance plan see attached.

Housekeeping requirements are included in the Erosion & Sediment Control Narrative located on the project drawings as well as in Attachment 6. Draft buffer deed restrictions are attached.

General Standards

The General Standard requires that a project's stormwater management system includes measures that will provide pollutant removal from runoff and mitigate for the increased frequency of channels erosive flows due to runoff from smaller storms and potential temperature impacts.

Best Management Practices (BMPs) will be implemented to reduce the impacts of site development on downstream water quality. BMP sizing calculations are attached to this report.

Water Quality (BMP Standard)

The water quality requirements will be met by a combination of gravel wetlands, roof drain filter strips and level spreader/forest & meadow buffers to treat the development.

Linear:

New Linear Impervious Area: The project will result in the creation of approximately 325,428 SF of linear impervious area. The proposed BMPs will result in the treatment of approximately 76.8% of the new impervious area.

Percentage of Treatment of the Impervious Area =76.8% (75% req'd)

Linear Project Developed Area: The project will result in the creation of approximately 602,700 SF of linear developed area. The proposed BMPs will result in the treatment of approximately 76.8% of the area.

Percentage of Treatment of the Developed Area = 76.8% (50% required)

Non-Linear:

New Linear Impervious Area: The project will result in the creation of approximately 616,900 SF of non-linear impervious area. The proposed BMPs will result in the treatment of approximately 95.46% of the new impervious area.

Percentage of Treatment of the Impervious Area =95.62% (95% req'd)

Non-Linear Project Developed Area: The project will result in the creation of approximately 2,238,400 SF of linear developed area. The proposed BMPs will result in the treatment of approximately 86.7% of the area.

Percentage of Treatment of the Developed Area = 86.71% (80% required)

Housekeeping and Maintenance & Inspection guidelines are attached to this report.

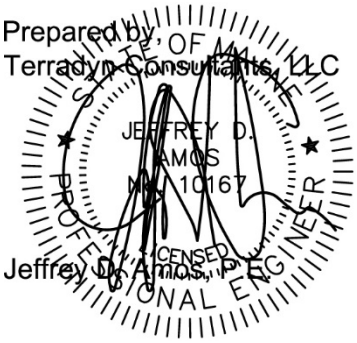
Urban Impaired Stream

Thatcher Brook is classified as an urban impaired stream. The portion of the project within the Thatcher Brook watershed will result in approximately 1.74 acres of roof, 1.92 acres of non-roof impervious area and 9.09 acres of landscaped area. According to our calculations, the applicant will be need to pay a compensation fee of $55,505.62. See attachment 4 for more information.

Summary

Based on the results of this evaluation, the proposed stormwater design is not expected to cause flooding, erosion or other significant adverse effects downstream of the site.

Prepared by,
Terradyn Consultants, LLC



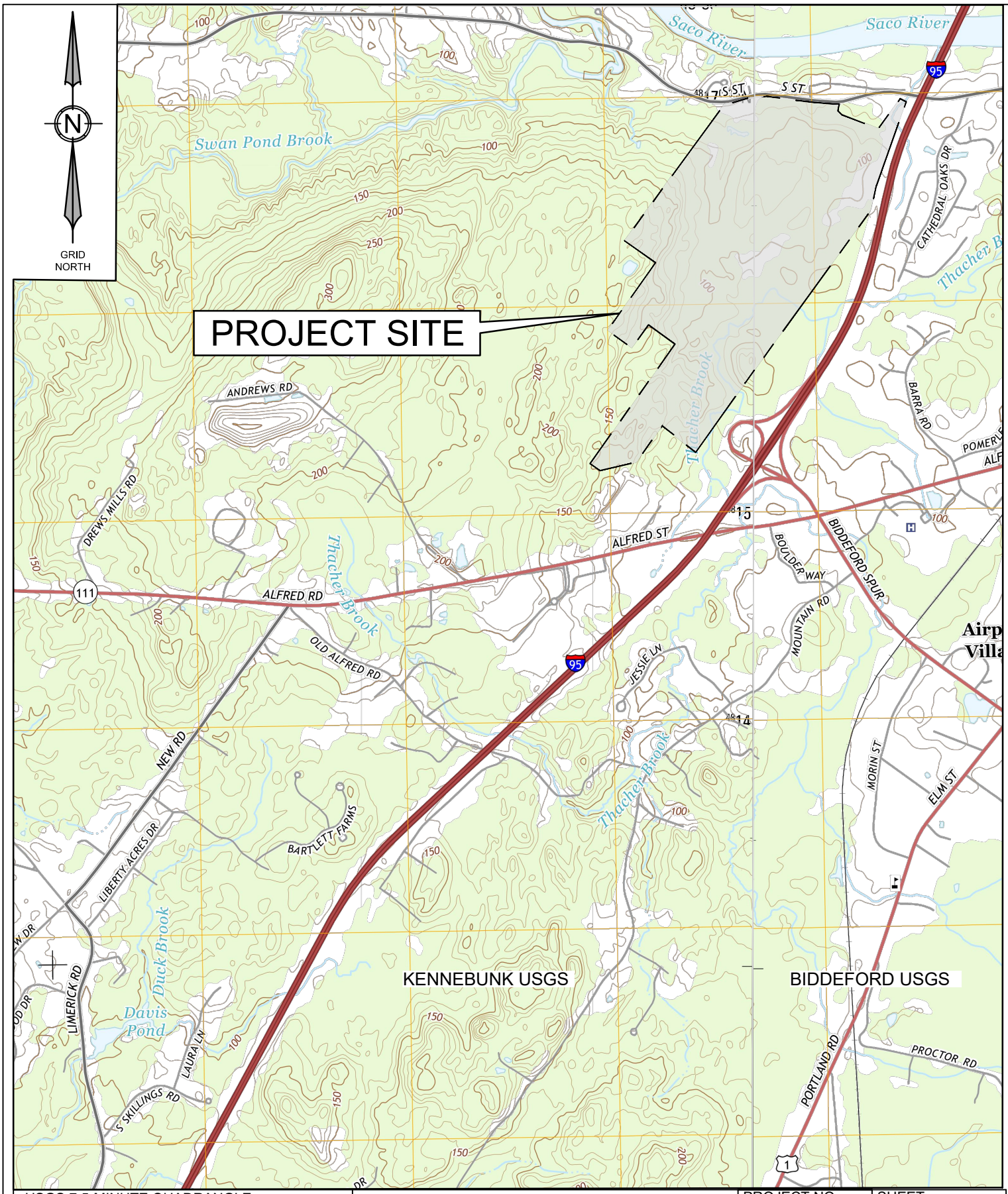
Jeffrey D. Amos, P.E.

Attachments:
Attachment 1- Site Figures:
- USGS Quadrangle Map
- Aerial Photo
- Medium Intensity Soil Map
- FEMA Floodmap

Attachment 2 – Water Quality Calculations
Attachment 3 – BMP Sizing Calculations
Attachment 4 – Urban Impaired Stream Compensation Fee Calculations
Attachment 5 - Pre Development Hydrocad Calculations
Attachment 6 - Post Development Hydrocad Calculations
Attachment 7 - Pond Spillway Checks – 25 & 100 Year
Attachment 8 - Maintenance & Inspection of Stormwater Facilities
Attachment 9 - Housekeeping Plan
Attachment 10 – Sample Buffer Restriction Language
Attachment 11 - Pond Test Pits
Attachment 12 – Pre & Post Development Watershed Maps

Attachment 1

Site Figures



USGS 7.5-MINUTE QUADRANGLE
BIDDEFORD & KENNEBUNK

PROJECT:
HIDDEN HILLS MANUFACTURED HOUSING PARK
413 SOUTH STREET, BIDDEFORD MAINE 04005

PREPARED FOR:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

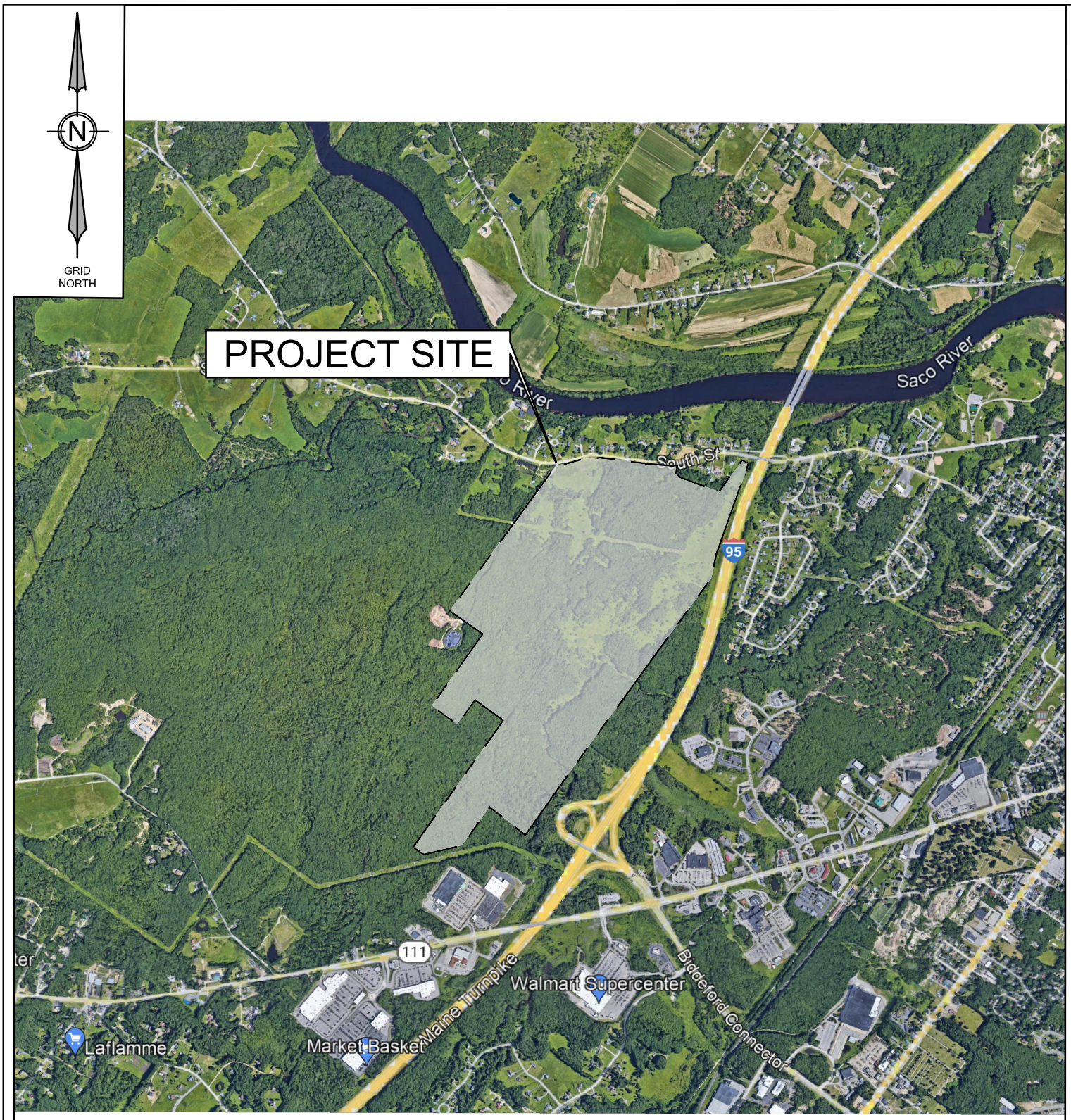
TERRADYN CONSULTANTS, LLC

PINELAND
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260

PORTLAND
565 CONGRESS STREET, SUITE 201
PORTLAND, ME 04101

207.926.5111 • info@terradynconsultants.com • www.terradynconsultants.com

PROJECT NO.	SHEET
21-13	1
DATE	OF
4/12/2022	5
SCALE	
1" = 2000'	



AERIAL MAP

PROJECT:
HIDDEN HILLS MANUFACTURED HOUSING PARK
413 SOUTH STREET, BIDDEFORD MAINE 04005

PREPARED FOR:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

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565 CONGRESS STREET, SUITE 201
PORTLAND, ME 04101

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PROJECT NO.	SHEET
21-13	2
DATE	OF
4/12/2022	5
SCALE	
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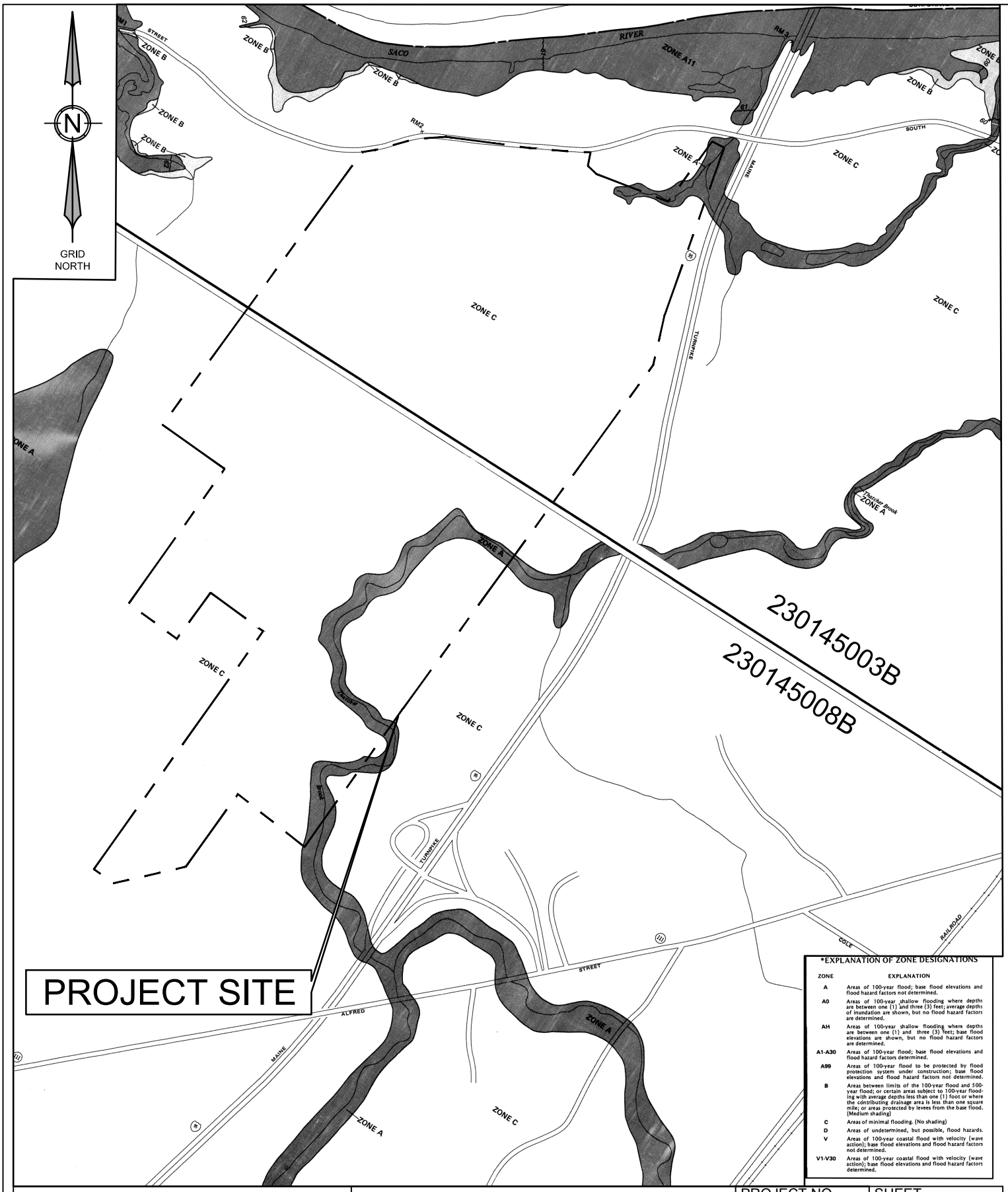

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

FLOOD INSURANCE RATE MAP

PROJECT:
HIDDEN HILLS MANUFACTURED HOUSING PARK
413 SOUTH STREET, BIDDEFORD MAINE 04005

PREPARED FOR:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

TERRADYN CONSULTANTS, LLC

PINELAND
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260

PORTLAND
565 CONGRESS STREET, SUITE 201
PORTLAND, ME 04101

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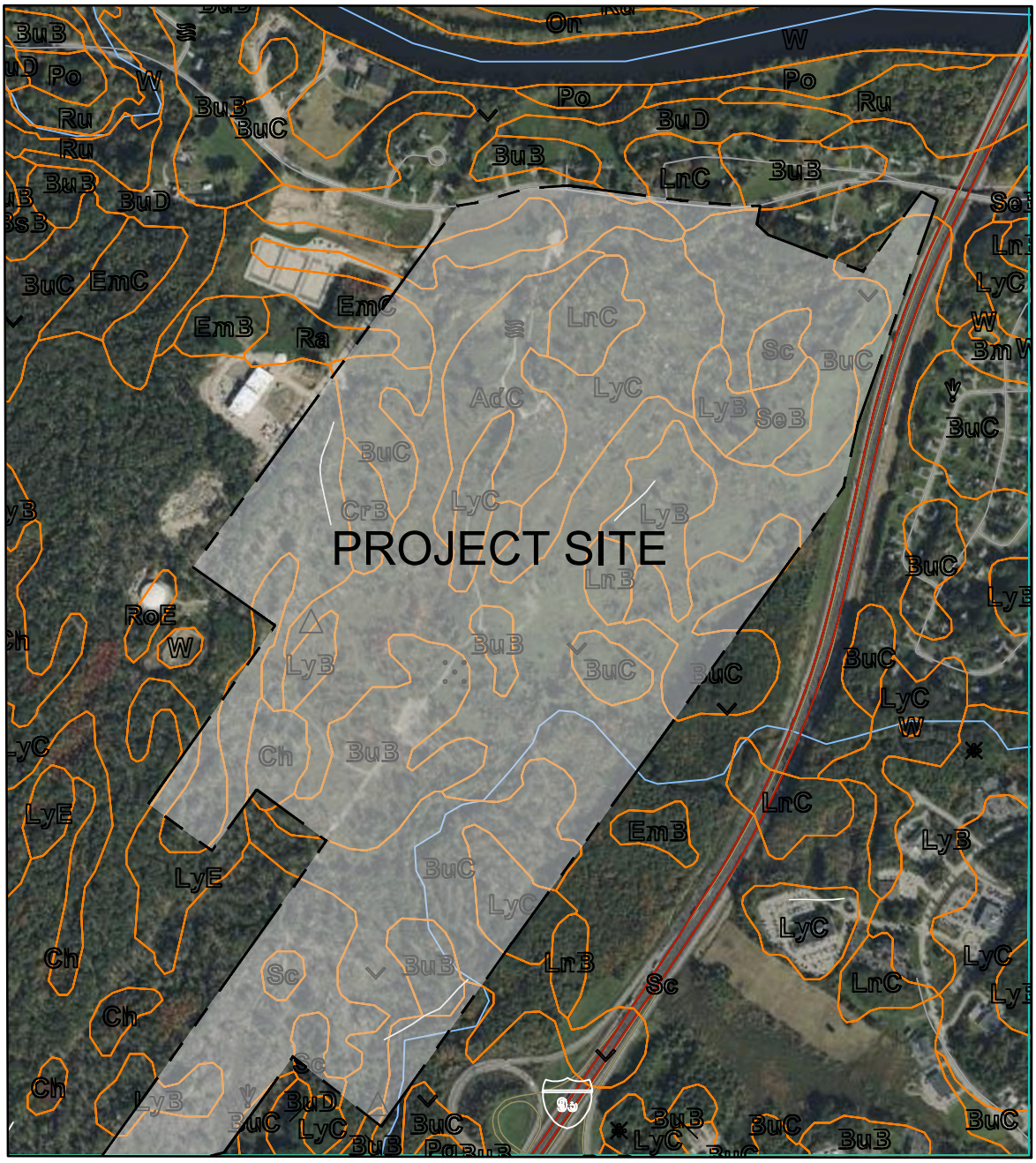
PROJECT NO.	SHEET
21-13	3
DATE	OF
4/12/2022	5
SCALE	
1" = 1000'	

GRID NORTH



SOIL SURVEY MAP	TERRADYN CONSULTANTS, LLC	PINELAND 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260 PORTLAND 565 CONGRESS STREET, SUITE 201 PORTLAND, ME 04101	PROJECT NO. 21-13	SHEET 4
PROJECT: HIDDEN HILLS MANUFACTURED HOUSING PARK 413 SOUTH STREET, BIDDEFORD MAINE 04005	207.926.5111 • info@terradynconsultants.com • www.terradynconsultants.com		DATE 4/12/2022	OF 5
PREPARED FOR: SOUTH STREET VILLAGE, LLC 762 MAIN STREET SOUTH PORTLAND, MAINE 04106			SCALE 1" = 1,000'	

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AdC	Adams loamy sand, 8 to 15 percent slopes	A	15.5	2.3%
Bm	Biddeford mucky peat, 0 to 3 percent slopes	D	4.2	0.6%
BuB	Buxton silt loam, 3 to 8 percent slopes	D	38.7	5.9%
BuC	Buxton silt loam, 8 to 15 percent slopes	C	119.6	18.1%
BuD	Buxton silt loam, 15 to 25 percent slopes	C	17.5	2.7%
Ch	Chocorua peat	A/D	4.1	0.6%
CrB	Croghan loamy fine sand, 0 to 8 percent slopes, wooded	A	3.7	0.6%
EmB	Elmwood fine sandy loam, 0 to 8 percent slopes	B	6.2	0.9%
EmC	Elmwood fine sandy loam, 8 to 15 percent slopes	B	19.0	2.9%
LnB	Lyman loam, 3 to 8 percent slopes, rocky	D	7.3	1.1%
LnC	Lyman loam, 8 to 15 percent slopes, rocky	D	18.3	2.8%
LyB	Lyman-Rock outcrop complex, 3 to 8 percent slopes	D	38.8	5.9%
LyC	Lyman-Rock outcrop complex, 8 to 15 percent slopes	D	129.0	19.5%
LyE	Lyman-Rock outcrop complex, 15 to 80 percent slopes	D	14.7	2.2%
Po	Podunk and Winooski soils	B	2.9	0.4%
Ra	Raynham silt loam	C/D	4.8	0.7%
RoE	Rock outcrop-Lyman complex, 15 to 80 percent slopes		1.2	0.2%
Ru	Rumney fine sandy loam, 0 to 3 percent slopes, frequently flooded	B/D	10.1	1.5%
Sc	Scantic silt loam, 0 to 3 percent slopes	D	194.2	29.4%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
SeB	Scio silt loam, 3 to 8 percent slopes	C	8.2	1.2%
W	Water bodies		2.8	0.4%
Totals for Area of Interest			660.9	100.0%

HYDROGRAPHIC SOIL GROUP

PROJECT:
HIDDEN HILLS MANUFACTURED HOUSING PARK
413 SOUTH STREET, BIDDEFORD MAINE 04005

PREPARED FOR:
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PROJECT NO. 21-13
DATE 4/12/2022
SCALE 1" = 1,000'
SHEET 5
OF 5

Attachment 2

Water Quality Calculations

Width of Road Impervious	27	Linear New Impervious Area (SF) =	325458
Width of Road Grass	23	Linear New Landscaped Area (SF)=	277242
		Linear Developed Area (SF) =	602700

Watershed	Beginning Station	End Station	Road Length (FT)	Impervious Area (SF)	Landscaped Area (SF)	Total Developed Area(SF)	Incremental Treatment % (Impervious)	Incremental Treatment % (Developed)	BMP	Urban Impaired Stream
Lozolite	0	0	0	0	0	0	0.00%	0.00%	LS-1	
Lozolite	0	600	600	16200	13800	30000	0.00%	0.00%	LS-2 (None)	
Lozolite	600	795	195	5265	4485	9750	1.62%	1.62%	LS-3	
Lozolite	795	1420	625	16875	14375	31250	0.00%	0.00%	None	
Lozolite	1420	1612	192	5184	4416	9600	0.00%	0.00%	None	
Lozolite	1612	2225	613	16551	14099	30650	5.09%	5.09%	LS-4	x
Lozolite	2225	2700	475	12825	10925	23750	0.00%	0.00%	LS-5	x
Lozolite	2700	2960	260	7020	5980	13000	2.16%	2.16%	GW-2	
Lozolite	2960	3112	152	4104	3496	7600	1.26%	1.26%	LS-6	
Lozolite	3112	3750	638	17226	14674	31900	5.29%	5.29%	LS-7	
Lozolite	3750	4160	410	11070	9430	20500	3.40%	3.40%	GW1	
Lozolite	0	0	0	0	0	0	0.00%	0.00%		
Topaz	0	225	225	6075	5175	11250	1.87%	1.87%	LS-13	
Topaz	225	380	155	4185	3565	7750	1.29%	1.29%	LS-12	
Topaz	380	550	170	4590	3910	8500	0.00%	0.00%	None	
Topaz	550	845	295	7965	6785	14750	2.45%	2.45%	LS-11	
Topaz	0	0	0	0	0	0	0.00%	0.00%		
Garnet	0	270	270	7290	6210	13500	0.00%	0.00%	None	
Garnet	270	570	300	8100	6900	15000	2.49%	2.49%	LS-8	
Garnet	570	700	130	3510	2990	6500	1.08%	1.08%	LS-9	
Garnet	700	940	240	6480	5520	12000	1.99%	1.99%	LS-10	
Garnet	940	1165	225	6075	5175	11250	1.87%	1.87%	LS-11	
Garnet	1165	1340	175	4725	4025	8750	1.45%	1.45%	LS-14	
Garnet	1340	1590	250	6750	5750	12500	2.07%	2.07%	LS-15	
Garnet	1590	1850	260	7020	5980	13000	0.00%	0.00%	None	
Garnet	1850	2265	415	11205	9545	20750	3.44%	3.44%	LS-16	
Garnet	2265	3180	915	24705	21045	45750	7.59%	7.59%	GW-1	
Garnet	0	0	0	0	0	0	0.00%	0.00%		
Griffinite	10	790	780	21060	17940	39000	6.47%	6.47%	GW-1	
Griffinite	790	1300	510	13770	11730	25500	4.23%	4.23%	GW-1	
Griffinite	1300	1630	330	8910	7590	16500	2.74%	2.74%	LS-17	
Griffinite	1630	1828	198	5346	4554	9900	1.64%	1.64%	LS-18	x
Griffinite	1828	2032	204	5508	4692	10200	0.00%	0.00%	None	x
Griffinite	0	0	0	0	0	0	0.00%	0.00%		
Ruby	10	345	335	4522.5	3852.5	8375	1.39%	1.39%	LS-9	
Ruby	10	345	335	4522.5	3852.5	8375	1.39%	1.39%	LS-10	
Ruby	345	590	245	6615	5635	12250	2.03%	2.03%	LS-19	x
Ruby	0	0	0	0	0	0	0.00%	0.00%		
Onyx	10	1277	1267	34209	29141	63350	10.51%	10.51%	GW-2	
	0	0	0	0	0	0	0.00%	0.00%		
	0	0	0	0	0	0	0.00%	0.00%		
	0	0	0	0	0	0	0.00%	0.00%		
	0	0	0	0	0	0	0.00%	0.00%		
	0	0	0	0	0	0	0.00%	0.00%		
	0	0	0	0	0	0	0.00%	0.00%		
	0	0	0	0	0	0	0.00%	0.00%		
	Subtotal			325458	277242	602700	76.80%	76.80%		

Non Linear New Impervious Area (SF) =	616900
Non Linear New Landscaped Area (SF)=	1767500
Non Linear Developed Area (SF) =	2384400

Watershed	Area/Lot #	Total Impervious Area (SF)	Total Landscaped Area (SF)	Total Developed Area (SF)	Incremental Treatment % (Impervious)	Incremental Treatment % (Developed)	BMP	Urban Impaired Stream
	Lot 1	3000	9000	12000	0.49%	0.50%	LS-13	
	Lot 2	3000	9000	12000	0.49%	0.50%	Lot Buffer 13	
	Lot 3	1500	4500	6000	0.24%	0.25%	Lot Buffer 13	
	Lot 3B	1500	4500	6000	0.24%	0.25%	LS-12	
	Lot 4	3000	9000	12000	0.49%	0.50%	LS-13	
	Lot 5	3000	9000	12000	0.49%	0.50%	LS-13	
	Lot 6	1000	5000	6000	0.16%	0.25%	Lot Buffer 12	
	Lot 6B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 6C	0	4000	4000	0.00%	0.17%	LS-12	
	Lot 7	3000	9000	12000	0.49%	0.50%	Lot Buffer 12	
	Lot 8	1000	4000	5000	0.16%	0.21%	LS-11	
	Lot 8 B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 8C	0	5000	5000	0.00%	0.00%	None	
	Lot 9	1000	4000	5000	0.16%	0.21%	LS-11	
	Lot 9 B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 9C	0	5000	5000	0.00%	0.00%	None	
	Lot 10	3000	9000	12000	0.49%	0.50%	LS-11	
	Lot 11	3000	9000	12000	0.49%	0.50%	Lot Buffer 14	
	Lot 12	3000	9000	12000	0.49%	0.50%	LS-14	
	Lot 13	3000	9000	12000	0.49%	0.50%	LS-11	
	Lot 14	3000	9000	12000	0.49%	0.50%	LS-14	
	Lot 15	3000	9000	12000	0.49%	0.50%	LS-14	
	Lot 16	3000	9000	12000	0.49%	0.50%	LS-15	
	Lot 17	1000	4000	5000	0.16%	0.21%	LS-15	
	Lot 17B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 17C	0	5000	5000	0.00%	0.00%	None	
	Lot 18	3000	9000	12000	0.49%	0.50%	Lot Buffer 14	
	Lot 19	3000	9000	12000	0.49%	0.50%	Lot Buffer 14	
	Lot 20	3000	9000	12000	0.49%	0.50%	Lot Buffer 14	
	Lot 21	3000	9000	12000	0.49%	0.50%	Lot Buffer 16	
	Lot 22	1000	9000	10000	0.00%	0.00%	None	

	Lot 22B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 23	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 23B	1000	4000	5000	0.16%	0.21%	LS-16	
	Lot 23C	0	5000	5000	0.00%	0.00%	None	
	Lot 24	1000	9000	10000	0.16%	0.42%	Lot Buffer 15	
	Lot 24B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 25	2000	5000	7000	0.32%	0.29%	LS-16	
	Lot 25B	1000	4000	5000	0.16%	0.21%	Roof Drain	
	Lot 25C	0	4000	4000	0.00%	0.00%	None	
	Lot 26	1000	5000	6000	0.16%	0.25%	LS-16	
	Lot 26B	0	4000	4000	0.00%	0.00%	None	
	Lot 26C	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 27	3000	9000	12000	0.49%	0.50%	LS-16	
	Lot 28	3000	9000	12000	0.49%	0.50%	LS-16	
	Lot 29	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 30	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 31	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 32	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 32B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 32C	0	8000	8000	0.00%	0.34%	Lot Buffer 17	
	Lot 33	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 33B	0	8000	8000	0.00%	0.34%	Lot Buffer	
	Lot 33C	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 34	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 34B	0	8000	8000	0.00%	0.34%	None	
	Lot 34C	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 35	1000	1000	2000	0.16%	0.08%	Lot Buffer 17	
	Lot 35B	0	8000	8000	0.00%	0.34%	None	
	Lot 35C	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 36	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 36B	0	8000	8000	0.00%	0.34%	None	
	Lot 36C	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 37	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 37B	0	8000	8000	0.00%	0.34%	None	
	Lot 37C	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 38	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 38B	2000	8000	10000	0.32%	0.42%	Lot Buffer 17	
	Lot 39	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 39B	2000	8000	10000	0.32%	0.42%	Lot Buffer 17	
	Lot 40	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 40B	2000	8000	10000	0.32%	0.42%	Lot Buffer 17	

	Lot 41	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 41B	2000	8000	10000	0.32%	0.42%	Lot Buffer 17	
	Lot 42	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 42B	2000	8000	10000	0.32%	0.42%	Lot Buffer 17	
	Lot 43	2000	4000	6000	0.32%	0.25%	GW-1	
	Lot 43B	1000	5000	6000	0.16%	0.25%	Lot Buffer 17	
	Lot 44	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 45	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 46	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 47	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 48	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 49	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 50	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 51	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 52	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 53	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 54	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 55	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 56	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 57	2000	4000	6000	0.32%	0.25%	GW-1	
	Lot 57B	1000	5000	6000	0.16%	0.25%	Lot Buffer 21	
	Lot 58	1000	4000	5000	0.16%	0.21%	GW-1	
	Lot 58B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 58C	0	5000	5000	0.00%	0.00%	None	
	Lot 59	2000	4000	6000	0.32%	0.25%	GW-1	
	Lot 59B	1000	5000	6000	0.16%	0.25%	Lot Buffer 21	
	Lot 60	3000	9000	12000	0.49%	0.50%	Lot Buffer 18	
	Lot 61	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 62	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 63	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 64	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 65	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 66	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 67	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 68	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 69	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 70	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 71	3000	9000	12000	0.49%	0.50%	GW-1	
	Lot 72	3000	9000	12000	0.49%	0.50%	Lot Buffer 9	
	Lot 73	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 73B	2000	8000	10000	0.32%	0.42%	Lot Buffer 9	

	Lot 74	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 74B	2000	8000	10000	0.32%	0.42%	Lot Buffer 9	
	Lot 75	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 75B	2000	8000	10000	0.32%	0.42%	Lot Buffer 9	
	Lot 76	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 76B	2000	8000	10000	0.32%	0.42%	Lot Buffer 9	
	Lot 77	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 77B	2000	8000	10000	0.32%	0.42%	Lot Buffer 9	
	Lot 78	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 78B	2000	8000	10000	0.32%	0.42%	Lot Buffer 9	
	Lot 79	1000	1000	2000	0.16%	0.08%	GW-1	
	Lot 79B	2000	8000	10000	0.32%	0.42%	Lot Buffer 9	
	Lot 80	3000	9000	12000	0.49%	0.50%	LS-1	
	Lot 81	3000	9000	12000	0.49%	0.50%	LS-1	
	Lot 82	3000	9000	12000	0.49%	0.50%	LS-1	
	Lot 83	3000	9000	12000	0.49%	0.50%	Lot Buffer 1	
	Lot 84	3000	9000	12000	0.49%	0.50%	Lot Buffer 1	
	Lot 85	3000	9000	12000	0.49%	0.50%	Lot Buffer 1	
	Lot 86	3000	9000	12000	0.49%	0.50%	Lot Buffer 1	
	Lot 87	3000	9000	12000	0.49%	0.50%	Lot Buffer 1	
	Lot 88	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 88B	1000	9000	10000	0.00%	0.00%	LS-2 (none)	
	Lot 89	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 89B	1000	9000	10000	0.16%	0.42%	LS-2 (none)	
	Lot 90	1000	9000	10000	0.00%	0.00%	LS-2 (none)	
	Lot 90B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 91	1000	9000	10000	0.00%	0.00%	LS-2 (none)	
	Lot 91B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 92	1000	9000	10000	0.00%	0.00%	LS-2 (none)	
	Lot 92B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 93	1000	9000	10000	0.00%	0.00%	LS-2 (none)	
	Lot 93B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 94	3000	9000	12000	0.49%	0.50%	LS-3	
	Lot 95	1000	4000	5000	0.16%	0.21%	LS-3	
	Lot 95B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 95C	0	5000	5000	0.00%	0.00%	None	
	Lot 96	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 96B	0	5000	5000	0.00%	0.21%	Lot Buffer 20	
	Lot 96C	1000	4000	5000	0.00%	0.00%	None	
	Lot 97	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 97B	0	5000	5000	0.00%	0.21%	Lot Buffer 2	

	Lot 97C	1000	4000	5000	0.00%	0.00%	None	
	Lot 98	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 98B	0	5000	5000	0.00%	0.21%	Lot Buffer 2	x
	Lot 98C	1000	4000	5000	0.00%	0.00%	None	
	Lot 99	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 99B	0	5000	5000	0.00%	0.21%	Lot Buffer 2	x
	Lot 99C	1000	4000	5000	0.00%	0.00%	None	
	Lot 100	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 100B	0	5000	5000	0.00%	0.21%	Lot Buffer 2	x
	Lot 100C	1000	4000	5000	0.00%	0.00%	None	
	Lot 101	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 101B	0	5000	5000	0.00%	0.21%	Lot Buffer 2	x
	Lot 101C	1000	4000	5000	0.00%	0.00%	None	
	Lot 102	3000	9000	12000	0.49%	0.50%	Lot Buffer 2	x
	Lot 103	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 103B	0	5000	5000	0.00%	0.21%	Lot Buffer 11	
	Lot 103C	1000	4000	5000	0.00%	0.00%	None	
	Lot 104	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 104B	1000	9000	10000	0.00%	0.00%	None	
	Lot 105	3000	9000	12000	0.49%	0.50%	Lot Buffer 11	
	Lot 106	3000	9000	12000	0.49%	0.50%	LS-8	
	Lot 107	1500	4500	6000	0.24%	0.25%	LS-8	
	Lot 107B	1500	4500	6000	0.24%	0.25%	Lot Buffer 11	
	Lot 108	1500	4500	6000	0.24%	0.25%	Lot Buffer 11	
	Lot 108B	1500	4500	6000	0.24%	0.25%	LS-9	
	Lot 109	3000	9000	12000	0.49%	0.50%	LS-9	
	Lot 109B	1500	4500	6000	0.24%	0.25%	Lot Buffer 11	
	Lot 110	3000	9000	12000	0.49%	0.50%	Lot Buffer 11	
	Lot 111	3000	9000	12000	0.49%	0.50%	LS-10	
	Lot 112	3000	9000	12000	0.49%	0.50%	Lot Buffer 11	
	Lot 113	3000	9000	12000	0.49%	0.50%	LS-10	
	Lot 114	3000	9000	12000	0.49%	0.50%	LS-10	
	Lot 115	1000	4000	5000	0.16%	0.21%	LS-10	
	Lot 115B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 115C	0	5000	5000	0.00%	0.00%	None	
	Lot 116	0	5000	5000	0.00%	0.00%	None	
	Lot 116B	1000	4000	5000	0.16%	0.21%	LS-10	
	Lot 116C	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 117	1000	4000	5000	0.00%	0.00%	LS-19	x
	Lot 117B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 117C	0	5000	5000	0.00%	0.00%	None	

	Lot 118	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 118B	1000	9000	10000	0.00%	0.00%	None	
	Lot 119	3000	9000	12000	0.49%	0.50%	LS-17	
	Lot 120	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 120B	1000	4000	5000	0.16%	0.21%	LS-19	x
	Lot 120C	0	5000	5000	0.00%	0.00%	None	x
	Lot 121	3000	9000	12000	0.49%	0.50%	LS-19	x
	Lot 122	3000	9000	12000	0.49%	0.50%	Lot Buffer 10	x
	Lot 123	3000	9000	12000	0.49%	0.50%	Lot Buffer 10	x
	Lot 124	3000	9000	12000	0.49%	0.50%	Lot Buffer 10	x
	Lot 125	3000	9000	12000	0.49%	0.50%	Lot Buffer 10	x
	Lot 126	3000	9000	12000	0.49%	0.50%	LS-9	
	Lot 127	3000	9000	12000	0.49%	0.50%	LS-8	
	Lot 128	2000	4000	6000	0.32%	0.25%	LS-8	
	Lot 128B	1000	5000	6000	0.16%	0.25%	Lot Buffer 10	x
	Lot 129	2000	4000	6000	0.32%	0.25%	LS-8	
	Lot 129B	1000	5000	6000	0.16%	0.25%	Lot Buffer 10	x
	Lot 130	2000	4000	6000	0.32%	0.25%	LS-8	
	Lot 130B	1000	5000	6000	0.16%	0.25%	Lot Buffer 10	x
	Lot 131	1000	4000	5000	0.00%	0.00%	None	
	Lot 131B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 131C	0	5000	5000	0.00%	0.21%	Lot Buffer 10	x
	Lot 132	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 132B	0	5000	5000	0.00%	0.21%	Lot Buffer 10	x
	Lot 132C	1000	4000	5000	0.00%	0.00%	None	
	Lot 133	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 133B	1000	9000	10000	0.00%	0.00%	None	
	Lot 134	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 134B	1000	9000	10000	0.00%	0.00%	None	x
	Lot 135	3000	9000	12000	0.49%	0.50%	Lot Buffer 3	x
	Lot 136	2000	4000	6000	0.32%	0.25%	LS-4	x
	Lot 136B	1000	5000	6000	0.16%	0.25%	Lot Buffer 3	x
	Lot 137	3000	9000	12000	0.49%	0.50%	Lot Buffer 3	x
	Lot 138	1000	4000	5000	0.16%	0.21%	LS-4	x
	Lot 138B	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 138C	0	5000	5000	0.00%	0.00%	None	x
	Lot 139	3000	9000	12000	0.49%	0.50%	LS-4	x
	Lot 140	1000	5000	6000	0.16%	0.25%	LS-4	x
	Lot 140B	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 140C	0	4000	4000	0.00%	0.17%	Lot Buffer 22	x
	Lot 141	0	4000	4000	0.00%	0.17%	LS-4	x

	Lot 141B	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 141C	1000	5000	6000	0.00%	0.00%	None	x
	Lot 142	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 143	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 144	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 145	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 146	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 147	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 148	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 149	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 150	3000	9000	12000	0.49%	0.50%	Lot Buffer 19	x
	Lot 151	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 151B	1000	9000	10000	0.00%	0.00%	None	x
	Lot 152	1000	4000	5000	0.16%	0.21%	LS-5	x
	Lot 152B	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 152C	0	5000	5000	0.00%	0.00%	None	x
	Lot 153	1000	4000	5000	0.16%	0.21%	LS-5	x
	Lot 153B	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 153C	0	5000	5000	0.00%	0.21%	Lot Buffer 7	x
	Lot 154	2000	4000	6000	0.32%	0.25%	LS-5	x
	Lot 154B	1000	5000	6000	0.16%	0.25%	Lot Buffer 7	x
	Lot 155	2000	4000	6000	0.32%	0.25%	LS-5	x
	Lot 155B	1000	5000	6000	0.16%	0.25%	Lot Buffer 7	x
	Lot 156	2000	4000	6000	0.32%	0.25%	LS-5	x
	Lot 156B	1000	5000	6000	0.16%	0.25%	Lot Buffer 7	x
	Lot 157	1000	4000	5000	0.16%	0.21%	GW-2	
	Lot 157B	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 157C	0	5000	5000	0.00%	0.00%	None	x
	Lot 158	1000	4000	5000	0.16%	0.21%	GW-2	
	Lot 158B	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 158C	0	5000	5000	0.00%	0.00%	None	x
	Lot 159	1000	4000	5000	0.16%	0.21%	GW-2	
	Lot 159B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 159C	0	5000	5000	0.00%	0.00%	None	
	Lot 160	1000	4000	5000	0.16%	0.21%	LS-6	
	Lot 160B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 160C	0	5000	5000	0.00%	0.00%	None	
	Lot 161	1000	4000	5000	0.16%	0.21%	LS-7	
	Lot 161B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 161C	0	5000	5000	0.00%	0.00%	None	
	Lot 162	1000	4000	5000	0.16%	0.21%	LS-7	

	Lot 162B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 162C	0	5000	5000	0.00%	0.00%	None	
	Lot 163	1000	4000	5000	0.16%	0.21%	LS-7	
	Lot 163B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 163C	0	5000	5000	0.00%	0.00%	none	
	Lot 164	3000	9000	12000	0.49%	0.50%	LS-7	
	Lot 165	2000	4000	6000	0.32%	0.25%	LS-7	
	Lot 165B	1000	5000	6000	0.16%	0.25%	Lot Buffer 8	
	Lot 166	1000	4000	5000	0.16%	0.21%	LS-7	
	Lot 166B	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 166C	0	3000	3000	0.00%	0.13%	Lot Buffer 8	
	Lot 166D	0	2000	2000	0.00%	0.00%	None	
	Lot 167	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 167B	0	4000	4000	0.00%	0.17%	Lot Buffer 8	
	Lot 167B	1000	5000	6000	0.00%	0.00%	None	
	Lot 168	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 168B	1000	9000	10000	0.00%	0.00%	None	
	Lot 169	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 169B	1000	9000	10000	0.00%	0.00%	None	
	Lot 170	3000	9000	12000	0.49%	0.50%	Lot Buffer 6	
	Lot 171	3000	9000	12000	0.49%	0.50%	Lot Buffer 6	
	Lot 172	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 173	3000	9000	12000	0.49%	0.50%	Lot Buffer 5	
	Lot 174	3000	9000	12000	0.49%	0.50%	Lot Buffer	
	Lot 175	3000	9000	12000	0.49%	0.50%	Lot Buffer 5	
	Lot 176	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 176B	1000	9000	10000	0.16%	0.42%	None	
	Lot 177	3000	9000	12000	0.49%	0.50%	Lot Buffer 5	
	Lot 178	3000	9000	12000	0.49%	0.50%	Lot Buffer 5	x
	Lot 179	2000	0	2000	0.32%	0.08%	Roof Drain	x
	Lot 179B	1000	9000	10000	0.00%	0.00%	None	x
	Lot 180	3000	9000	12000	0.49%	0.50%	Lot Buffer 4	x
	Lot 181	2000	0	2000	0.32%	0.08%	Roof Drain	
	Lot 181B	1000	9000	10000	0.00%	0.00%	None	
	Lot 182	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 183	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 184	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 185	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 186	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 187	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 188	3000	9000	12000	0.49%	0.50%	GW-2	

	Lot 189	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 190	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 191	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 192	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 193	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 194	3000	9000	12000	0.49%	0.50%	GW-2	
	Lot 195	3000	9000	12000	0.49%	0.50%	GW-2	
Club House	Building	1500	0	1500	0.24%	0.06%	Roof Drain	
	Parking & Access	12400	2000	14400	2.01%	0.60%	LS-11	
	BB Court	2500	0	2500	0.41%	0.10%	Lot Buffer 23	
Maintenance	Building	2000	0	2000	0.32%	0.08%	Roof Drain	
	Parking & Access	12000	2000	14000	1.95%	0.59%	LS-1	
	Subtotal	616900	1767500	2384400	95.62%	86.71%		

Attachment 3

BMP Sizing Calculations

STAGE STORAGE CALCULATIONS

GRAVEL WETLAND #1

WATERSHED IMPERVIOUS AREA=	175605	SF	1"
WATERSHED LANDSCAPED AREA=	336175	SF	0.4"
REQUIRED WQV=	25840	CF	
PROVIDED WQV=	26175	CF	
REQUIRED SA=	15504.0		
PROVIDED SA=	15700		

Forebay

STAGE (FT)	AREA (SF)	STORAGE (CF)
84.5	1100	0
85	1267	592
86	1600	2025

Cell #1

STAGE (FT)	AREA (SF)	STORAGE (CF)
83	7300	0
84	8300	7800
84.5	8800	12075

Cell #2

STAGE (FT)	AREA (SF)	STORAGE (CF)
83	7300	0
84	8300	7800
84.5	8800	12075

Total Pond

STAGE (FT)	AREA (SF)	STORAGE (CF)
83	14600	0
84	16600	16192
84.5	17600	26175
84.51	18000	26175
86	19500	54112
87	22500	74842

STAGE STORAGE CALCULATIONS

GRAVEL WETLAND #2

WATERSHED IMPERVIOUS AREA=	89229	SF	1"
WATERSHED LANDSCAPED AREA=	182121	SF	0.4"
REQUIRED WQV=	13506	CF	
PROVIDED WQV=	14401	CF	
REQUIRED SA=	8104.0		
PROVIDED SA=	8216		

Forebay

STAGE (FT)	AREA (SF)	STORAGE (CF)
86	120	0
87	334	227
87.5	463	426

Cell #1

STAGE (FT)	AREA (SF)	STORAGE (CF)
86	4108	0
87	4837	4473
87.5	5223	6988

Cell #2

STAGE (FT)	AREA (SF)	STORAGE (CF)
86	4108	0
87	4837	4473
87.5	5223	6988

Total Pond

STAGE (FT)	AREA (SF)	STORAGE (CF)
86	8336	0
87	10008	9172
87.5	10909	14401
87.51	10909	14401
88	12781	20205
89	14329	33509

LB-1
Single Family Residential Lot Buffer

Buffer Characteristics:

Soil Type:	C
Cover:	Forest
Slope:	8.00%
Length:	> 50 ft flowpath

Lots Treated:
Lot 78
Lot 79

LS-1

Vegetated Buffer & Level Lip Spreader

Road 1- Sta. 2+50 L

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	2.00
Length:	95

Tributary Area:	(sf)	(acre)	
Total:	56,000	1.29	
Impervious:	21,000	0.48	
Lawn:	35,000	0.80	6000 swale

Berm Length Calculations:

Required Lengths:

105 ft length / acre impervious

31 ft length / acre lawn

76 ft - Required Berm Length

80 ft - Berm Length Provided

LS-2
Vegetated Buffer & Level Lip Spreader
Road 1- Sta. 4+00 L

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	7.00
Length:	70

Tributary Area:	(sf)	(acre)
Total:	63,275	1.45
Impervious:	20,775	0.48
Lawn:	42,500	0.98

Berm Length Calculations:
Required Lengths:

131	ft length / acre impervious
36	ft length / acre lawn
98	**ft - Required Berm Length**
VOID	**ft - Berm Length Provided**

LS-3

Vegetated Buffer & Level Lip Spreader

Road 1- Sta. 8+00 L

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	7.00%
Length:	75

Tributary Area:	(sf)	(acre)
Total:	30,265	0.69
Impervious:	9,265	0.21
Lawn:	21,000	0.48

Berm Length Calculations:

Required Lengths:

125	ft length / acre impervious
35	ft length / acre lawn
43	**ft - Required Berm Length**
45	**ft - Berm Length Provided**

LS-4

Vegetated Buffer & Level Lip Spreader

Road 5- Sta. 9+75 R

Buffer Characteristics:

Soil Type:	C1
Cover:	Meadow
Slope:	5.00
Length:	150

Tributary Area:	(sf)	(acre)
Total:	49,650	1.14
Impervious:	23,551	0.54
Lawn:	26,099	0.60

Berm Length Calculations:

Required Lengths:

101	ft length / acre impervious
30	ft length / acre lawn
73	**ft - Required Berm Length**
80	**ft - Berm Length Provided**

LS-5

Vegetated Buffer & Level Lip Spreader

Road 2- Sta. 22+20 R

Buffer Characteristics:

Soil Type:	C1
Cover:	Meadow
Slope:	6.00
Length:	100

Tributary Area:	(sf)	(acre)
Total:	51,750	1.19
Impervious:	20,825	0.48
Lawn:	30,925	0.71

Berm Length Calculations:

Required Lengths:

125 ft length / acre impervious

35 ft length / acre lawn

85 ft - Required Berm Length

90 ft - Berm Length Provided

LS-6

Vegetated Buffer & Level Lip Spreader

Road 2- Sta. 33+50 R

Buffer Characteristics:

Soil Type:	C1
Cover:	meadow
Slope:	6.50
Length:	50

Tributary Area:	(sf)	(acre)
Total:	14,742	0.34
Impervious:	5,104	0.12
Lawn:	9,638	0.22

Berm Length Calculations:

Required Lengths:

183	ft length / acre impervious
60	ft length / acre lawn
35	**ft - Required Berm Length**
35	**ft - Berm Length Provided**

LS-7

Vegetated Buffer & Level Lip Spreader

Road 2- Sta. 33+50 R

Buffer Characteristics:

Soil Type:	C1
Cover:	forest
Slope:	7.00
Length:	150

Tributary Area:	(sf)	(acre)
Total:	69,900	1.60
Impervious:	26,226	0.60
Lawn:	43,674	1.00

Berm Length Calculations:

Required Lengths:

76 ft length / acre impervious

24 ft length / acre lawn

70 ft - Required Berm Length

70 ft - Berm Length Provided

LS-8

Vegetated Buffer & Level Lip Spreader

Road 3- Sta. 1+90 R

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	7.00
Length:	85

Tributary Area:	(sf)	(acre)
Total:	63,000	1.45
Impervious:	21,600	0.50
Lawn:	41,400	0.95

Berm Length Calculations:

Required Lengths:

114	ft length / acre impervious
33	ft length / acre lawn
88	**ft - Required Berm Length**
90	**ft - Berm Length Provided**

LS-9

Vegetated Buffer & Level Lip Spreader

Road 3- Sta. 5+50 R

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	7.50
Length:	100

Tributary Area:	(sf)	(acre)
Total:	56,874	1.31
Impervious:	18,532	0.43
Lawn:	38,342	0.88

Berm Length Calculations:

Required Lengths:

100	ft length / acre impervious
30	ft length / acre lawn
69	**ft - Required Berm Length**
70	**ft - Berm Length Provided**

LS-10

Vegetated Buffer & Level Lip Spreader

Road 3- Sta. 8+00 R

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	10.00
Length:	120

Tributary Area:	(sf)	(acre)
Total:	66,374	1.52
Impervious:	22,002	0.51
Lawn:	44,372	1.02

Berm Length Calculations:

Required Lengths:

103	ft length / acre impervious
33	ft length / acre lawn
86	**ft - Required Berm Length**
90	**ft - Berm Length Provided**

LS-11

Vegetated Buffer & Level Lip Spreader

Road 1- Sta. 5+50 L

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	6.00
Length:	150

Tributary Area:	(sf)	(acre)
Total:	74,400	1.71
Impervious:	34,440	0.79
Lawn:	39,960	0.92

Berm Length Calculations:

Required Lengths:

76 ft length / acre impervious

24 ft length / acre lawn

82 ft - Required Berm Length

82 ft - Berm Length Provided

LS-12

Vegetated Buffer & Level Lip Spreader

Road 1- Sta. 3+75 L

Buffer Characteristics:

Soil Type:	C1
Cover:	FOREST
Slope:	2.00
Length:	130

Tributary Area:	(sf)	(acre)
Total:	17,750	0.41
Impervious:	5,685	0.13
Lawn:	12,065	0.28

Berm Length Calculations:

Required Lengths:

82 ft length / acre impervious

26 ft length / acre lawn

18 ft - Required Berm Length

30 ft - Berm Length Provided

LS-13

Vegetated Buffer & Level Lip Spreader

Road 1- Sta. 10+50 R

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	1.00
Length:	150

Tributary Area:	(sf)	(acre)
Total:	47,250	1.08
Impervious:	15,075	0.35
Lawn:	32,175	0.74

Berm Length Calculations:

Required Lengths:

76 ft length / acre impervious

24 ft length / acre lawn

44 ft - Required Berm Length

45 ft - Berm Length Provided

LS-14

Vegetated Buffer & Level Lip Spreader

Road 3- Sta. 13+30 L

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	4.00
Length:	100

Tributary Area:	(sf)	(acre)
Total:	49,725	1.14
Impervious:	13,725	0.32
Lawn:	36,000	0.83

Berm Length Calculations:

Required Lengths:

100	ft length / acre impervious
30	ft length / acre lawn
56	**ft - Required Berm Length**
56	**ft - Berm Length Provided**

LS-15

Vegetated Buffer & Level Lip Spreader

Road 3- Sta. 15+90 L

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	4.00
Length:	100

Tributary Area:	(sf)	(acre)
Total:	34,750	0.80
Impervious:	10,750	0.25
Lawn:	24,000	0.55

Berm Length Calculations:

Required Lengths:

100	ft length / acre impervious
30	ft length / acre lawn
41	**ft - Required Berm Length**
42	**ft - Berm Length Provided**

LS-16

Vegetated Buffer & Level Lip Spreader

Road 3- Sta. 17+65 L

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	7.00
Length:	120

Tributary Area:	(sf)	(acre)
Total:	57,750	1.33
Impervious:	20,205	0.46
Lawn:	37,545	0.86

Berm Length Calculations:

Required Lengths:

86 ft length / acre impervious

27 ft length / acre lawn

63 ft - Required Berm Length

64 ft - Berm Length Provided

LS-17

Vegetated Buffer & Level Lip Spreader

Road 4- Sta. 12+90 L

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	7.50
Length:	90

Tributary Area:	(sf)	(acre)
Total:	16,500	0.38
Impervious:	8,910	0.20
Lawn:	7,590	0.17

Berm Length Calculations:

Required Lengths:

109	ft length / acre impervious
32	ft length / acre lawn
28	**ft - Required Berm Length**
30	**ft - Berm Length Provided**

LS-18

Vegetated Buffer & Level Lip Spreader

Road 5- Sta. 8+50 R

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	7.00
Length:	115

Tributary Area:	(sf)	(acre)
Total:	9,900	0.23
Impervious:	5,346	0.12
Lawn:	4,554	0.10

Berm Length Calculations:

Required Lengths:

89 ft length / acre impervious

27 ft length / acre lawn

14 ft - Required Berm Length

20 ft - Berm Length Provided

LS-19

Vegetated Buffer & Level Lip Spreader

Road 6- Sta. 3+30 R

Buffer Characteristics:

Soil Type:	C1
Cover:	Forest
Slope:	3.00
Length:	80

Tributary Area:	(sf)	(acre)
Total:	34,250	0.79
Impervious:	11,615	0.27
Lawn:	22,635	0.52

Berm Length Calculations:

Required Lengths:

120	ft length / acre impervious
34	ft length / acre lawn
50	**ft - Required Berm Length**
50	**ft - Berm Length Provided**

Attachment 4

Urban Impaired Stream Calculations

Watershed	Area/Lot #	Roof Impervious Area (SF)	Non-Roof Impervious Area (SF)	Landscaped Area (SF)
	Lot 98	2000	0	0
	Lot 98B	0	0	5000
	Lot 99	2000	0	0
	Lot 99B	0	0	5000
	Lot 100	2000	0	0
	Lot 100B	0	0	5000
	Lot 101	2000	0	0
	Lot 101B	0	0	5000
	Lot 102	2000	1000	9000
	Lot 117	0	1000	4000
	Lot 120B	0	1000	4000
	Lot 120C	0	0	5000
	Lot 121	2000	1000	9000
	Lot 122	2000	1000	9000
	Lot 123	2000	1000	9000
	Lot 124	2000	1000	9000
	Lot 125	2000	1000	9000
	Lot 128B	0	1000	5000
	Lot 129B	0	1000	5000
	Lot 130B	0	1000	5000
	Lot 131C	0	0	5000
	Lot 132B	0	0	5000
	Lot 134	2000	0	0
	Lot 134B	0	1000	9000
	Lot 135	2000	1000	9000
	Lot 136	2000	0	4000
	Lot 136B	0	1000	5000
	Lot 137	2000	1000	9000
	Lot 138	0	1000	4000
	Lot 138B	2000	0	0
	Lot 138C	0	0	5000
	Lot 139	2000	1000	9000
	Lot 140	0	1000	5000
	Lot 140B	2000	0	0
	Lot 140C	0	0	4000
	Lot 141	0	0	4000
	Lot 141B	2000	0	0
	Lot 141C	0	1000	5000
	Lot 142	2000	1000	9000
	Lot 143	2000	1000	9000
	Lot 144	2000	1000	9000
	Lot 145	2000	1000	9000
	Lot 146	2000	1000	9000
	Lot 147	2000	1000	9000
	Lot 148	2000	1000	9000
	Lot 149	2000	1000	9000
	Lot 150	2000	1000	9000
	Lot 151	2000	0	0
	Lot 151B	0	1000	9000
	Lot 152	0	1000	4000
	Lot 152B	2000	0	0
	Lot 152C	0	0	5000

	Lot 153	0	1000	4000
	Lot 153B	2000	0	0
	Lot 153C	0	0	5000
	Lot 154	2000	0	4000
	Lot 154B	0	1000	5000
	Lot 155	2000	0	4000
	Lot 155B	0	1000	5000
	Lot 156	2000	0	4000
	Lot 156B	0	1000	5000
	Lot 157B	2000	0	0
	Lot 157C	0	0	5000
	Lot 158B	2000	0	0
	Lot 158C	0	0	5000
	Lot 178	2000	1000	9000
	Lot 179	2000	0	0
	Lot 179B	0	1000	9000
	Lot 180	2000	1000	9000
	Subtotal	76000	37000	356000

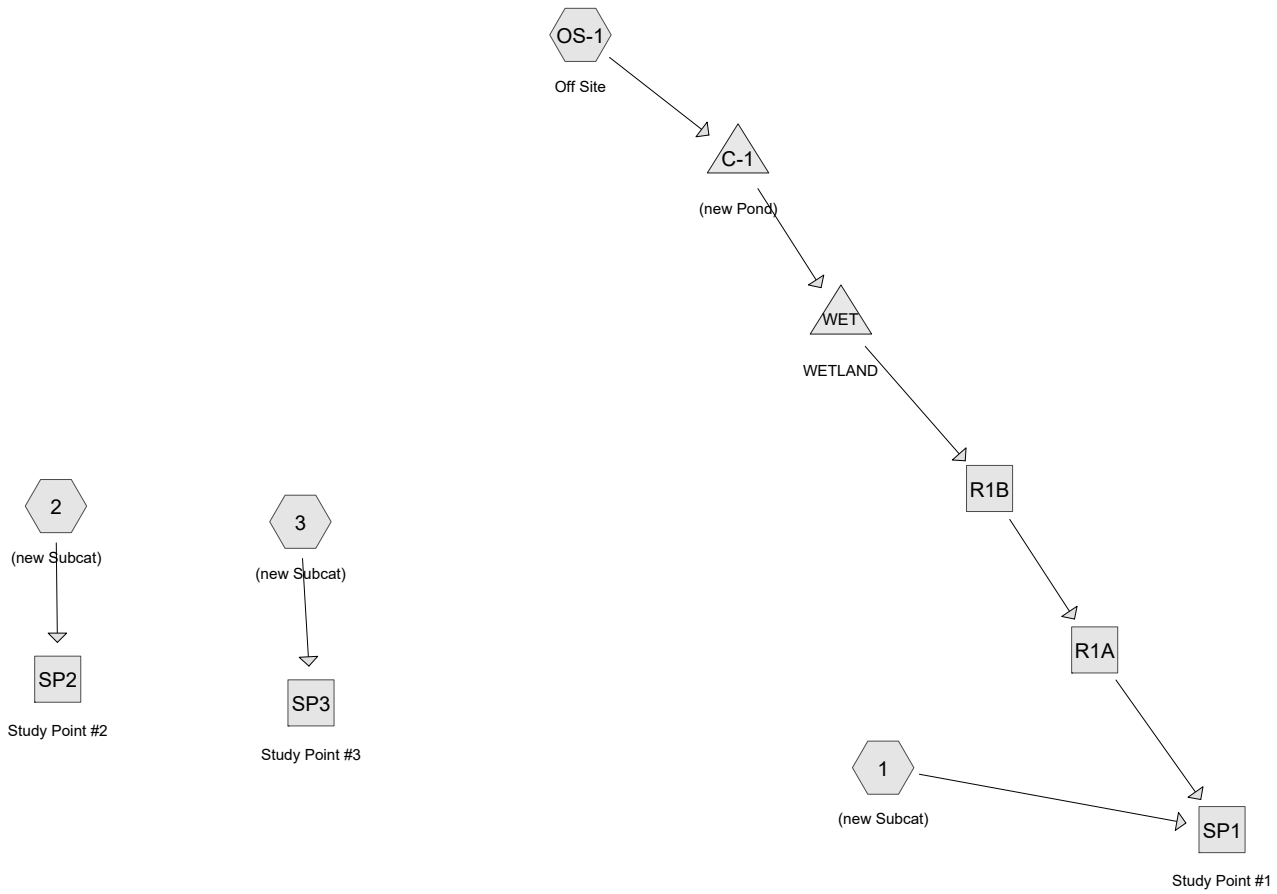
Road	Start Station	End Station	Non-Roof Impervious Area (SF)	Landscaped Area (SF)
Lozolite	1612	2225	16551	14099
Lozolite	2225	2700	12825	10925
Griffinite	1630	1828	5346	4554
Griffinite	1828	2032	5508	4692
Ruby	345	590	6615	5635
	Subtotal		46845	39905

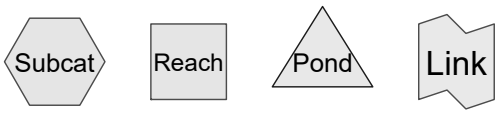
	Roof Impervious Area (SF)	Non-Roof Impervious Area (SF)	Landscaped Area (SF)
Total (SF)	76000	83845	395905
Total (Acres)	1.74	1.92	9.09
Compensation Fee (per acre)	$5,000.00	$12,500.00	$2,500.00
	$8,723.60	$24,060.20	$22,721.82

Total Fee	$55,505.62

Attachment 5

Pre-Development Hydrocad Calculations





Routing Diagram for 21-13 PRE
Prepared by {enter your company name here}, Printed 6/28/2022
HydroCAD® 10.00-26 s/n 10466 © 2020 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.01 hrs, 1501 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: (new Subcat) Runoff Area=122.290 ac 2.81% Impervious Runoff Depth>0.84"
Flow Length=5,317' Tc=139.2 min CN=72 Runoff=29.10 cfs 8.521 af

Subcatchment 2: (new Subcat) Runoff Area=273.370 ac 0.00% Impervious Runoff Depth>0.97"
Flow Length=5,272' Tc=172.1 min CN=75 Runoff=68.24 cfs 21.994 af

Subcatchment 3: (new Subcat) Runoff Area=41.222 ac 2.53% Impervious Runoff Depth>0.92"
Flow Length=840' Tc=80.9 min CN=73 Runoff=15.28 cfs 3.158 af

Subcatchment OS-1: Off Site Runoff Area=583,385 sf 5.16% Impervious Runoff Depth>0.88"
Flow Length=1,097' Tc=61.7 min CN=72 Runoff=5.56 cfs 0.979 af

Reach R1A: Avg. Flow Depth=0.22' Max Vel=1.32 fps Inflow=1.53 cfs 0.698 af
n=0.030 L=860.0' S=0.0058 '/' Capacity=230.46 cfs Outflow=1.53 cfs 0.683 af

Reach R1B: Avg. Flow Depth=0.26' Max Vel=1.77 fps Inflow=1.53 cfs 0.719 af
n=0.030 L=1,640.0' S=0.0090 '/' Capacity=51.80 cfs Outflow=1.53 cfs 0.698 af

Reach SP1: Study Point #1 Inflow=30.52 cfs 9.204 af
Outflow=30.52 cfs 9.204 af

Reach SP2: Study Point #2 Inflow=68.24 cfs 21.994 af
Outflow=68.24 cfs 21.994 af

Reach SP3: Study Point #3 Inflow=15.28 cfs 3.158 af
Outflow=15.28 cfs 3.158 af

Pond C-1: (new Pond) Peak Elev=75.83' Storage=200 cf Inflow=5.56 cfs 0.979 af
Outflow=5.55 cfs 0.979 af

Pond WET: WETLAND Peak Elev=74.18' Storage=19,361 cf Inflow=5.55 cfs 0.979 af
Outflow=1.53 cfs 0.719 af

Total Runoff Area = 450.275 ac Runoff Volume = 34.652 af Average Runoff Depth = 0.92"
98.85% Pervious = 445.099 ac 1.15% Impervious = 5.175 ac

Summary for Subcatchment 1: (new Subcat)

Runoff = 29.10 cfs @ 14.07 hrs, Volume= 8.521 af, Depth> 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.30"

Area (ac)	CN	Description
6.336	83	1/4 acre lots, 38% imp, HSG C
1.749	92	Paved roads w/open ditches, 50% imp, HSG C
0.315	92	Paved roads w/open ditches, 50% imp, HSG C
29.844	77	Woods, Good, HSG D
36.997	70	Woods, Good, HSG C
29.831	65	Brush, Good, HSG C
17.218	71	Meadow, non-grazed, HSG C
122.290	72	Weighted Average
118.850		97.19% Pervious Area
3.440		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
2.0	120	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
40.7	1,710	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
29.3	3,337	0.0070	1.90	401.77	**Trap/Vee/Rect Channel Flow,** Bot.W=100.00' D=2.00' Z= 3.0 '/' Top.W=112.00' n= 0.100 Very weedy reaches w/pools
139.2	5,317	Total			

Summary for Subcatchment 2: (new Subcat)

Runoff = 68.24 cfs @ 14.35 hrs, Volume= 21.994 af, Depth> 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.30"

Area (ac)	CN	Description
112.599	70	Woods, Good, HSG C
75.315	77	Woods, Good, HSG D
85.456	79	Woods/grass comb., Good, HSG D
273.370	75	Weighted Average
273.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.30"
69.2	1,799	0.0300	0.43		**Shallow Concentrated Flow, B-C** Forest w/Heavy Litter Kv= 2.5 fps
13.3	1,243	0.0300	1.56	20.63	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=25.00' D=0.50' Z= 3.0 '/' Top.W=28.00' n= 0.100 Very weedy reaches w/pools
22.4	2,080	0.0050	1.55	173.35	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=50.00' D=2.00' Z= 3.0 '/' Top.W=62.00' n= 0.100 Very weedy reaches w/pools
172.1	5,272	Total			

Summary for Subcatchment 3: (new Subcat)

Runoff = 15.28 cfs @ 13.21 hrs, Volume= 3.158 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.30"

Area (ac)	CN	Description
2.089	93	Paved roads w/open ditches, 50% imp, HSG D
7.346	71	Meadow, non-grazed, HSG C
4.388	77	Woods, Good, HSG D
10.331	70	Woods, Good, HSG C
7.196	78	Meadow, non-grazed, HSG D
5.051	65	Brush, Good, HSG C
4.821	73	Brush, Good, HSG D
41.222	73	Weighted Average
40.178		97.47% Pervious Area
1.044		2.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
13.7	690	0.0280	0.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
80.9	840	Total			

Summary for Subcatchment OS-1: Off Site

Runoff = 5.56 cfs @ 12.89 hrs, Volume= 0.979 af, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.30"

Area (sf)	CN	Description
16,250	92	Paved roads w/open ditches, 50% imp, HSG C
35,700	92	Paved roads w/open ditches, 50% imp, HSG C
10,890	75	1/4 acre lots, 38% imp, HSG B
107,975	74	>75% Grass cover, Good, HSG C
107,975	55	Woods, Good, HSG B
152,298	77	Woods, Good, HSG D
152,297	70	Woods, Good, HSG C
583,385	72	Weighted Average
553,272		94.84% Pervious Area
30,113		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.3	150	0.0300	0.06		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.30"
17.7	531	0.0400	0.50		**Shallow Concentrated Flow, B-C** Forest w/Heavy Litter Kv= 2.5 fps
0.4	218	0.0300	9.12	11.19	**Pipe Channel, C-D** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	198		9.83		**Lake or Reservoir, D-E** Mean Depth= 3.00'
61.7	1,097	Total			

Summary for Reach R1A:

[61] Hint: Exceeded Reach R1B outlet invert by 0.22' @ 14.79 hrs

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 0.63" for 2-yr event
Inflow = 1.53 cfs @ 14.66 hrs, Volume= 0.698 af
Outflow = 1.53 cfs @ 14.79 hrs, Volume= 0.683 af, Atten= 0%, Lag= 7.6 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.32 fps, Min. Travel Time= 10.9 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 13.1 min

Peak Storage= 995 cf @ 14.79 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 4.00' Flow Area= 36.0 sf, Capacity= 230.46 cfs

5.00' x 4.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 860.0' Slope= 0.0058 '/'
Inlet Invert= 59.00', Outlet Invert= 54.00'

Summary for Reach R1B:

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 0.64" for 2-yr event
Inflow = 1.53 cfs @ 14.48 hrs, Volume= 0.719 af
Outflow = 1.53 cfs @ 14.66 hrs, Volume= 0.698 af, Atten= 0%, Lag= 11.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.77 fps, Min. Travel Time= 15.4 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 18.9 min

Peak Storage= 1,418 cf @ 14.66 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 51.80 cfs

3.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 1,640.0' Slope= 0.0090 '/'
Inlet Invert= 73.80', Outlet Invert= 59.00'

Summary for Reach SP1: Study Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 135.683 ac, 3.04% Impervious, Inflow Depth > 0.81" for 2-yr event
Inflow = 30.52 cfs @ 14.07 hrs, Volume= 9.204 af
Outflow = 30.52 cfs @ 14.07 hrs, Volume= 9.204 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Reach SP2: Study Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 273.370 ac, 0.00% Impervious, Inflow Depth > 0.97" for 2-yr event
Inflow = 68.24 cfs @ 14.35 hrs, Volume= 21.994 af
Outflow = 68.24 cfs @ 14.35 hrs, Volume= 21.994 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Reach SP3: Study Point #3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 41.222 ac, 2.53% Impervious, Inflow Depth > 0.92" for 2-yr event
Inflow = 15.28 cfs @ 13.21 hrs, Volume= 3.158 af
Outflow = 15.28 cfs @ 13.21 hrs, Volume= 3.158 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Pond C-1: (new Pond)

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 0.88" for 2-yr event
Inflow = 5.56 cfs @ 12.89 hrs, Volume= 0.979 af
Outflow = 5.55 cfs @ 12.91 hrs, Volume= 0.979 af, Atten= 0%, Lag= 1.0 min
Primary = 5.55 cfs @ 12.91 hrs, Volume= 0.979 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 75.83' @ 12.91 hrs Surf.Area= 424 sf Storage= 200 cf

Plug-Flow detention time= 0.5 min calculated for 0.979 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (863.6 - 863.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	265,380 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.00	60	0	0
76.00	500	280	280
78.00	27,000	27,500	27,780
80.00	42,800	69,800	97,580
82.00	60,000	102,800	200,380
83.00	70,000	65,000	265,380

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	**36.0" W x 36.0" H Box Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.00' / 74.80' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.00 sf
#2	Primary	82.00'	**50.0' long x 20.0' 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=5.55 cfs @ 12.91 hrs HW=75.83' TW=74.02' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 5.55 cfs @ 2.99 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond WET: WETLAND

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 0.88" for 2-yr event
Inflow = 5.55 cfs @ 12.91 hrs, Volume= 0.979 af
Outflow = 1.53 cfs @ 14.48 hrs, Volume= 0.719 af, Atten= 72%, Lag= 94.0 min
Primary = 1.53 cfs @ 14.48 hrs, Volume= 0.719 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 74.18' @ 14.56 hrs Surf.Area= 66,800 sf Storage= 19,361 cf

Plug-Flow detention time= 159.7 min calculated for 0.719 af (73% of inflow)
Center-of-Mass det. time= 99.6 min (963.3 - 863.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.80'	787,500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.80	10,000	0	0
74.00	65,000	7,500	7,500
76.00	85,000	150,000	157,500
78.00	165,000	250,000	407,500
80.00	215,000	380,000	787,500

Device	Routing	Invert	Outlet Devices
#1	Primary	73.80'	**48.0" W x 48.0" H Box Culvert w/ 12.0" inside fill** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 72.80' / 72.50' S= 0.0043 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 12.00 sf
#2	Primary	79.00'	**50.0' long x 20.0' 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=1.53 cfs @ 14.48 hrs HW=74.18' TW=74.06' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.53 cfs @ 1.35 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=5.00-20.00 hrs, dt=0.01 hrs, 1501 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: (new Subcat) Runoff Area=122.290 ac 2.81% Impervious Runoff Depth>1.84"
Flow Length=5,317' Tc=139.2 min CN=72 Runoff=66.40 cfs 18.731 af

Subcatchment 2: (new Subcat) Runoff Area=273.370 ac 0.00% Impervious Runoff Depth>2.02"
Flow Length=5,272' Tc=172.1 min CN=75 Runoff=145.85 cfs 46.063 af

Subcatchment 3: (new Subcat) Runoff Area=41.222 ac 2.53% Impervious Runoff Depth>1.97"
Flow Length=840' Tc=80.9 min CN=73 Runoff=34.06 cfs 6.779 af

Subcatchment OS-1: Off Site Runoff Area=583,385 sf 5.16% Impervious Runoff Depth>1.91"
Flow Length=1,097' Tc=61.7 min CN=72 Runoff=12.66 cfs 2.135 af

Reach R1A: Avg. Flow Depth=0.41' Max Vel=1.92 fps Inflow=4.29 cfs 1.691 af
n=0.030 L=860.0' S=0.0058 '/' Capacity=230.46 cfs Outflow=4.29 cfs 1.669 af

Reach R1B: Avg. Flow Depth=0.49' Max Vel=2.51 fps Inflow=4.31 cfs 1.722 af
n=0.030 L=1,640.0' S=0.0090 '/' Capacity=51.80 cfs Outflow=4.29 cfs 1.691 af

Reach SP1: Study Point #1 Inflow=70.62 cfs 20.400 af
Outflow=70.62 cfs 20.400 af

Reach SP2: Study Point #2 Inflow=145.85 cfs 46.063 af
Outflow=145.85 cfs 46.063 af

Reach SP3: Study Point #3 Inflow=34.06 cfs 6.779 af
Outflow=34.06 cfs 6.779 af

Pond C-1: (new Pond) Peak Elev=76.44' Storage=1,813 cf Inflow=12.66 cfs 2.135 af
Outflow=12.26 cfs 2.135 af

Pond WET: WETLAND Peak Elev=74.49' Storage=40,849 cf Inflow=12.26 cfs 2.135 af
Outflow=4.31 cfs 1.722 af

Total Runoff Area = 450.275 ac Runoff Volume = 73.708 af Average Runoff Depth = 1.96"
98.85% Pervious = 445.099 ac 1.15% Impervious = 5.175 ac

Summary for Subcatchment 1: (new Subcat)

Runoff = 66.40 cfs @ 13.92 hrs, Volume= 18.731 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (ac)	CN	Description
6.336	83	1/4 acre lots, 38% imp, HSG C
1.749	92	Paved roads w/open ditches, 50% imp, HSG C
0.315	92	Paved roads w/open ditches, 50% imp, HSG C
29.844	77	Woods, Good, HSG D
36.997	70	Woods, Good, HSG C
29.831	65	Brush, Good, HSG C
17.218	71	Meadow, non-grazed, HSG C
122.290	72	Weighted Average
118.850		97.19% Pervious Area
3.440		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
2.0	120	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
40.7	1,710	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
29.3	3,337	0.0070	1.90	401.77	**Trap/Vee/Rect Channel Flow,** Bot.W=100.00' D=2.00' Z= 3.0 '/' Top.W=112.00' n= 0.100 Very weedy reaches w/pools
139.2	5,317	Total			

Summary for Subcatchment 2: (new Subcat)

Runoff = 145.85 cfs @ 14.34 hrs, Volume= 46.063 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (ac)	CN	Description
112.599	70	Woods, Good, HSG C
75.315	77	Woods, Good, HSG D
85.456	79	Woods/grass comb., Good, HSG D
273.370	75	Weighted Average
273.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.30"
69.2	1,799	0.0300	0.43		**Shallow Concentrated Flow, B-C** Forest w/Heavy Litter Kv= 2.5 fps
13.3	1,243	0.0300	1.56	20.63	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=25.00' D=0.50' Z= 3.0 '/' Top.W=28.00' n= 0.100 Very weedy reaches w/pools
22.4	2,080	0.0050	1.55	173.35	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=50.00' D=2.00' Z= 3.0 '/' Top.W=62.00' n= 0.100 Very weedy reaches w/pools
172.1	5,272	Total			

Summary for Subcatchment 3: (new Subcat)

Runoff = 34.06 cfs @ 13.12 hrs, Volume= 6.779 af, Depth> 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (ac)	CN	Description
2.089	93	Paved roads w/open ditches, 50% imp, HSG D
7.346	71	Meadow, non-grazed, HSG C
4.388	77	Woods, Good, HSG D
10.331	70	Woods, Good, HSG C
7.196	78	Meadow, non-grazed, HSG D
5.051	65	Brush, Good, HSG C
4.821	73	Brush, Good, HSG D
41.222	73	Weighted Average
40.178		97.47% Pervious Area
1.044		2.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
13.7	690	0.0280	0.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
80.9	840	Total			

Summary for Subcatchment OS-1: Off Site

Runoff = 12.66 cfs @ 12.83 hrs, Volume= 2.135 af, Depth> 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.90"

Area (sf)	CN	Description
16,250	92	Paved roads w/open ditches, 50% imp, HSG C
35,700	92	Paved roads w/open ditches, 50% imp, HSG C
10,890	75	1/4 acre lots, 38% imp, HSG B
107,975	74	>75% Grass cover, Good, HSG C
107,975	55	Woods, Good, HSG B
152,298	77	Woods, Good, HSG D
152,297	70	Woods, Good, HSG C
583,385	72	Weighted Average
553,272		94.84% Pervious Area
30,113		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.3	150	0.0300	0.06		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.30"
17.7	531	0.0400	0.50		**Shallow Concentrated Flow, B-C** Forest w/Heavy Litter Kv= 2.5 fps
0.4	218	0.0300	9.12	11.19	**Pipe Channel, C-D** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	198		9.83		**Lake or Reservoir, D-E** Mean Depth= 3.00'
61.7	1,097	Total			

Summary for Reach R1A:

[61] Hint: Exceeded Reach R1B outlet invert by 0.41' @ 14.18 hrs

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 1.52" for 10-yr event
Inflow = 4.29 cfs @ 14.09 hrs, Volume= 1.691 af
Outflow = 4.29 cfs @ 14.18 hrs, Volume= 1.669 af, Atten= 0%, Lag= 5.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.92 fps, Min. Travel Time= 7.5 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 10.6 min

Peak Storage= 1,920 cf @ 14.18 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 4.00' Flow Area= 36.0 sf, Capacity= 230.46 cfs

5.00' x 4.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 860.0' Slope= 0.0058 '/'
Inlet Invert= 59.00', Outlet Invert= 54.00'

Summary for Reach R1B:

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 1.54" for 10-yr event
Inflow = 4.31 cfs @ 13.95 hrs, Volume= 1.722 af
Outflow = 4.29 cfs @ 14.09 hrs, Volume= 1.691 af, Atten= 0%, Lag= 8.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.51 fps, Min. Travel Time= 10.9 min
Avg. Velocity = 1.75 fps, Avg. Travel Time= 15.6 min

Peak Storage= 2,804 cf @ 14.09 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 51.80 cfs

3.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 1,640.0' Slope= 0.0090 '/'
Inlet Invert= 73.80', Outlet Invert= 59.00'

Summary for Reach SP1: Study Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 135.683 ac, 3.04% Impervious, Inflow Depth > 1.80" for 10-yr event
Inflow = 70.62 cfs @ 13.92 hrs, Volume= 20.400 af
Outflow = 70.62 cfs @ 13.92 hrs, Volume= 20.400 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Reach SP2: Study Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 273.370 ac, 0.00% Impervious, Inflow Depth > 2.02" for 10-yr event
Inflow = 145.85 cfs @ 14.34 hrs, Volume= 46.063 af
Outflow = 145.85 cfs @ 14.34 hrs, Volume= 46.063 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Reach SP3: Study Point #3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 41.222 ac, 2.53% Impervious, Inflow Depth > 1.97" for 10-yr event
Inflow = 34.06 cfs @ 13.12 hrs, Volume= 6.779 af
Outflow = 34.06 cfs @ 13.12 hrs, Volume= 6.779 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Pond C-1: (new Pond)

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 1.91" for 10-yr event
Inflow = 12.66 cfs @ 12.83 hrs, Volume= 2.135 af
Outflow = 12.26 cfs @ 12.98 hrs, Volume= 2.135 af, Atten= 3%, Lag= 9.1 min
Primary = 12.26 cfs @ 12.98 hrs, Volume= 2.135 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 76.44' @ 12.98 hrs Surf.Area= 6,393 sf Storage= 1,813 cf

Plug-Flow detention time= 1.1 min calculated for 2.135 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (848.0 - 847.1)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	265,380 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.00	60	0	0
76.00	500	280	280
78.00	27,000	27,500	27,780
80.00	42,800	69,800	97,580
82.00	60,000	102,800	200,380
83.00	70,000	65,000	265,380

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	**36.0" W x 36.0" H Box Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.00' / 74.80' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.00 sf
#2	Primary	82.00'	**50.0' long x 20.0' 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=12.26 cfs @ 12.98 hrs HW=76.44' TW=74.27' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 12.26 cfs @ 3.77 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond WET: WETLAND

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 1.91" for 10-yr event
Inflow = 12.26 cfs @ 12.98 hrs, Volume= 2.135 af
Outflow = 4.31 cfs @ 13.95 hrs, Volume= 1.722 af, Atten= 65%, Lag= 57.9 min
Primary = 4.31 cfs @ 13.95 hrs, Volume= 1.722 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 74.49' @ 14.00 hrs Surf.Area= 69,943 sf Storage= 40,849 cf

Plug-Flow detention time= 140.3 min calculated for 1.721 af (81% of inflow)
Center-of-Mass det. time= 92.9 min (941.0 - 848.0)

Volume	Invert	Avail.Storage	Storage Description
#1	73.80'	787,500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.80	10,000	0	0
74.00	65,000	7,500	7,500
76.00	85,000	150,000	157,500
78.00	165,000	250,000	407,500
80.00	215,000	380,000	787,500

Device	Routing	Invert	Outlet Devices
#1	Primary	73.80'	**48.0" W x 48.0" H Box Culvert w/ 12.0" inside fill** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 72.80' / 72.50' S= 0.0043 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 12.00 sf
#2	Primary	79.00'	**50.0' long x 20.0' 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=4.31 cfs @ 13.95 hrs HW=74.49' TW=74.29' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.31 cfs @ 1.55 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=5.00-20.00 hrs, dt=0.01 hrs, 1501 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: (new Subcat) Runoff Area=122.290 ac 2.81% Impervious Runoff Depth>2.77"
Flow Length=5,317' Tc=139.2 min CN=72 Runoff=100.71 cfs 28.219 af

Subcatchment 2: (new Subcat) Runoff Area=273.370 ac 0.00% Impervious Runoff Depth>2.98"
Flow Length=5,272' Tc=172.1 min CN=75 Runoff=214.96 cfs 67.969 af

Subcatchment 3: (new Subcat) Runoff Area=41.222 ac 2.53% Impervious Runoff Depth>2.94"
Flow Length=840' Tc=80.9 min CN=73 Runoff=51.04 cfs 10.109 af

Subcatchment OS-1: Off Site Runoff Area=583,385 sf 5.16% Impervious Runoff Depth>2.87"
Flow Length=1,097' Tc=61.7 min CN=72 Runoff=19.16 cfs 3.206 af

Reach R1A: Avg. Flow Depth=0.57' Max Vel=2.31 fps Inflow=7.31 cfs 2.653 af
n=0.030 L=860.0' S=0.0058 '/' Capacity=230.46 cfs Outflow=7.29 cfs 2.626 af

Reach R1B: Avg. Flow Depth=0.67' Max Vel=2.97 fps Inflow=7.36 cfs 2.690 af
n=0.030 L=1,640.0' S=0.0090 '/' Capacity=51.80 cfs Outflow=7.31 cfs 2.653 af

Reach SP1: Study Point #1 Inflow=107.80 cfs 30.845 af
Outflow=107.80 cfs 30.845 af

Reach SP2: Study Point #2 Inflow=214.96 cfs 67.969 af
Outflow=214.96 cfs 67.969 af

Reach SP3: Study Point #3 Inflow=51.04 cfs 10.109 af
Outflow=51.04 cfs 10.109 af

Pond C-1: (new Pond) Peak Elev=76.87' Storage=5,764 cf Inflow=19.16 cfs 3.206 af
Outflow=17.73 cfs 3.205 af

Pond WET: WETLAND Peak Elev=74.78' Storage=60,896 cf Inflow=17.73 cfs 3.205 af
Outflow=7.36 cfs 2.690 af

Total Runoff Area = 450.275 ac Runoff Volume = 109.503 af Average Runoff Depth = 2.92"
98.85% Pervious = 445.099 ac 1.15% Impervious = 5.175 ac

Summary for Subcatchment 1: (new Subcat)

Runoff = 100.71 cfs @ 13.77 hrs, Volume= 28.219 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (ac)	CN	Description
6.336	83	1/4 acre lots, 38% imp, HSG C
1.749	92	Paved roads w/open ditches, 50% imp, HSG C
0.315	92	Paved roads w/open ditches, 50% imp, HSG C
29.844	77	Woods, Good, HSG D
36.997	70	Woods, Good, HSG C
29.831	65	Brush, Good, HSG C
17.218	71	Meadow, non-grazed, HSG C
122.290	72	Weighted Average
118.850		97.19% Pervious Area
3.440		2.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
2.0	120	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
40.7	1,710	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
29.3	3,337	0.0070	1.90	401.77	**Trap/Vee/Rect Channel Flow,** Bot.W=100.00' D=2.00' Z= 3.0 '/' Top.W=112.00' n= 0.100 Very weedy reaches w/pools
139.2	5,317	Total			

Summary for Subcatchment 2: (new Subcat)

Runoff = 214.96 cfs @ 14.34 hrs, Volume= 67.969 af, Depth> 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (ac)	CN	Description
112.599	70	Woods, Good, HSG C
75.315	77	Woods, Good, HSG D
85.456	79	Woods/grass comb., Good, HSG D
273.370	75	Weighted Average
273.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.30"
69.2	1,799	0.0300	0.43		**Shallow Concentrated Flow, B-C** Forest w/Heavy Litter Kv= 2.5 fps
13.3	1,243	0.0300	1.56	20.63	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=25.00' D=0.50' Z= 3.0 '/' Top.W=28.00' n= 0.100 Very weedy reaches w/pools
22.4	2,080	0.0050	1.55	173.35	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=50.00' D=2.00' Z= 3.0 '/' Top.W=62.00' n= 0.100 Very weedy reaches w/pools
172.1	5,272	Total			

Summary for Subcatchment 3: (new Subcat)

Runoff = 51.04 cfs @ 13.04 hrs, Volume= 10.109 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (ac)	CN	Description
2.089	93	Paved roads w/open ditches, 50% imp, HSG D
7.346	71	Meadow, non-grazed, HSG C
4.388	77	Woods, Good, HSG D
10.331	70	Woods, Good, HSG C
7.196	78	Meadow, non-grazed, HSG D
5.051	65	Brush, Good, HSG C
4.821	73	Brush, Good, HSG D
41.222	73	Weighted Average
40.178		97.47% Pervious Area
1.044		2.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
13.7	690	0.0280	0.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
80.9	840	Total			

Summary for Subcatchment OS-1: Off Site

Runoff = 19.16 cfs @ 12.82 hrs, Volume= 3.206 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
16,250	92	Paved roads w/open ditches, 50% imp, HSG C
35,700	92	Paved roads w/open ditches, 50% imp, HSG C
10,890	75	1/4 acre lots, 38% imp, HSG B
107,975	74	>75% Grass cover, Good, HSG C
107,975	55	Woods, Good, HSG B
152,298	77	Woods, Good, HSG D
152,297	70	Woods, Good, HSG C
583,385	72	Weighted Average
553,272		94.84% Pervious Area
30,113		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.3	150	0.0300	0.06		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.30"
17.7	531	0.0400	0.50		**Shallow Concentrated Flow, B-C** Forest w/Heavy Litter Kv= 2.5 fps
0.4	218	0.0300	9.12	11.19	**Pipe Channel, C-D** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	198		9.83		**Lake or Reservoir, D-E** Mean Depth= 3.00'
61.7	1,097	Total			

Summary for Reach R1A:

[61] Hint: Exceeded Reach R1B outlet invert by 0.57' @ 14.01 hrs

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 2.38" for 25-yr event
Inflow = 7.31 cfs @ 13.93 hrs, Volume= 2.653 af
Outflow = 7.29 cfs @ 14.01 hrs, Volume= 2.626 af, Atten= 0%, Lag= 4.9 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.31 fps, Min. Travel Time= 6.2 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 9.6 min

Peak Storage= 2,715 cf @ 14.01 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 4.00' Flow Area= 36.0 sf, Capacity= 230.46 cfs

5.00' x 4.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 860.0' Slope= 0.0058 '/'
Inlet Invert= 59.00', Outlet Invert= 54.00'

Summary for Reach R1B:

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 2.41" for 25-yr event
Inflow = 7.36 cfs @ 13.80 hrs, Volume= 2.690 af
Outflow = 7.31 cfs @ 13.93 hrs, Volume= 2.653 af, Atten= 1%, Lag= 7.7 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.97 fps, Min. Travel Time= 9.2 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 14.3 min

Peak Storage= 4,031 cf @ 13.93 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 51.80 cfs

3.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 1,640.0' Slope= 0.0090 '/'
Inlet Invert= 73.80', Outlet Invert= 59.00'

Summary for Reach SP1: Study Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 135.683 ac, 3.04% Impervious, Inflow Depth > 2.73" for 25-yr event
Inflow = 107.80 cfs @ 13.85 hrs, Volume= 30.845 af
Outflow = 107.80 cfs @ 13.85 hrs, Volume= 30.845 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Reach SP2: Study Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 273.370 ac, 0.00% Impervious, Inflow Depth > 2.98" for 25-yr event
Inflow = 214.96 cfs @ 14.34 hrs, Volume= 67.969 af
Outflow = 214.96 cfs @ 14.34 hrs, Volume= 67.969 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Reach SP3: Study Point #3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 41.222 ac, 2.53% Impervious, Inflow Depth > 2.94" for 25-yr event
Inflow = 51.04 cfs @ 13.04 hrs, Volume= 10.109 af
Outflow = 51.04 cfs @ 13.04 hrs, Volume= 10.109 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Pond C-1: (new Pond)

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 2.87" for 25-yr event
Inflow = 19.16 cfs @ 12.82 hrs, Volume= 3.206 af
Outflow = 17.73 cfs @ 13.03 hrs, Volume= 3.205 af, Atten= 7%, Lag= 12.5 min
Primary = 17.73 cfs @ 13.03 hrs, Volume= 3.205 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 76.87' @ 13.03 hrs Surf.Area= 12,066 sf Storage= 5,764 cf

Plug-Flow detention time= 2.2 min calculated for 3.205 af (100% of inflow)
Center-of-Mass det. time= 2.2 min (840.7 - 838.5)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	265,380 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.00	60	0	0
76.00	500	280	280
78.00	27,000	27,500	27,780
80.00	42,800	69,800	97,580
82.00	60,000	102,800	200,380
83.00	70,000	65,000	265,380

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	**36.0" W x 36.0" H Box Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.00' / 74.80' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.00 sf
#2	Primary	82.00'	**50.0' long x 20.0' 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=17.73 cfs @ 13.03 hrs HW=76.87' TW=74.49' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 17.73 cfs @ 4.21 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond WET: WETLAND

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth > 2.87" for 25-yr event
Inflow = 17.73 cfs @ 13.03 hrs, Volume= 3.205 af
Outflow = 7.36 cfs @ 13.80 hrs, Volume= 2.690 af, Atten= 58%, Lag= 45.9 min
Primary = 7.36 cfs @ 13.80 hrs, Volume= 2.690 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 74.78' @ 13.84 hrs Surf.Area= 72,752 sf Storage= 60,896 cf

Plug-Flow detention time= 130.9 min calculated for 2.689 af (84% of inflow)
Center-of-Mass det. time= 89.6 min (930.3 - 840.7)

Volume	Invert	Avail.Storage	Storage Description
#1	73.80'	787,500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

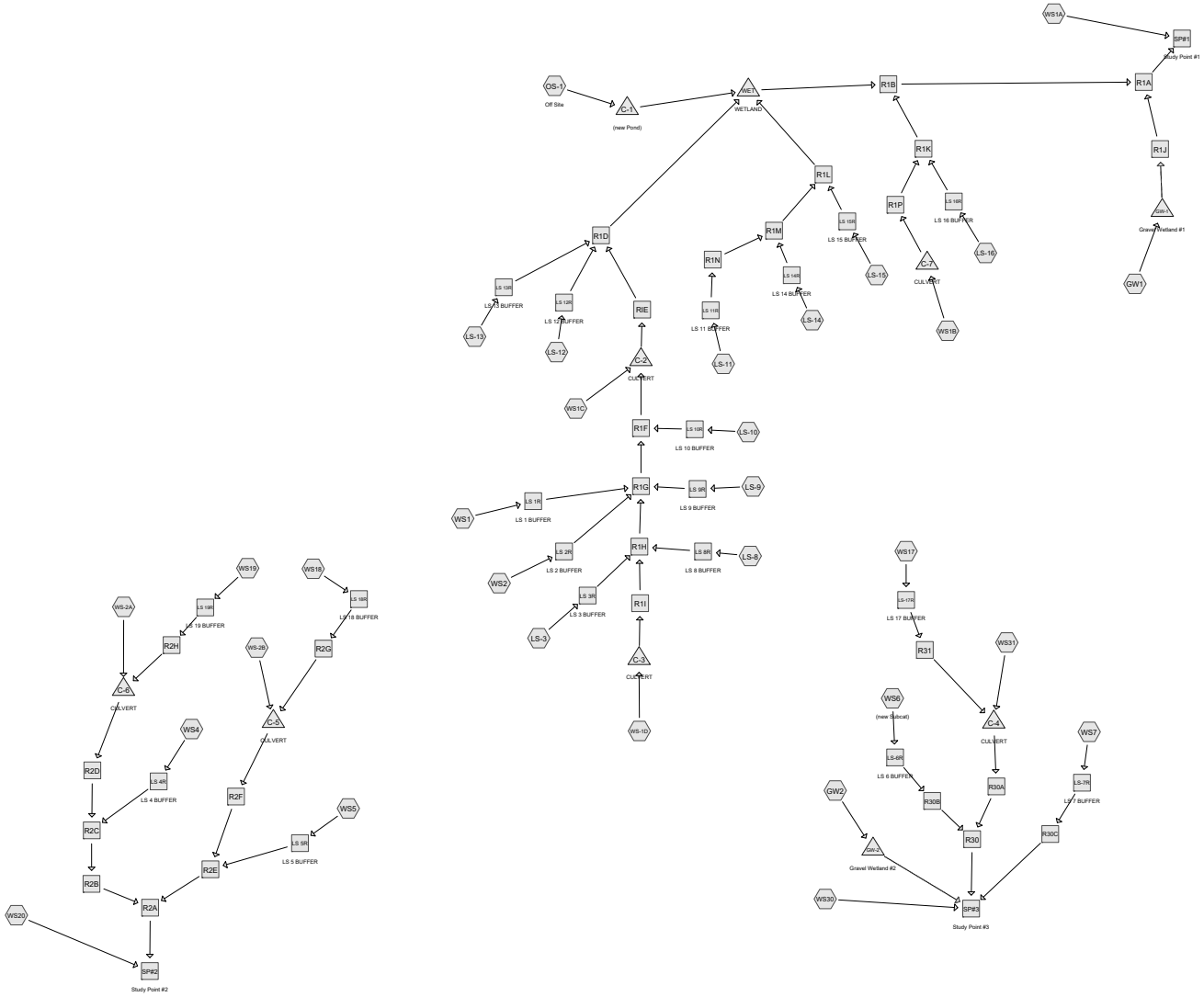
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.80	10,000	0	0
74.00	65,000	7,500	7,500
76.00	85,000	150,000	157,500
78.00	165,000	250,000	407,500
80.00	215,000	380,000	787,500

Device	Routing	Invert	Outlet Devices
#1	Primary	73.80'	**48.0" W x 48.0" H Box Culvert w/ 12.0" inside fill** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 72.80' / 72.50' S= 0.0043 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 12.00 sf
#2	Primary	79.00'	**50.0' long x 20.0' 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=7.36 cfs @ 13.80 hrs HW=74.77' TW=74.47' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 7.36 cfs @ 1.89 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Attachment 6

Post Development Hydrocad Calculations



Subcat Reach Pond Link

Routing Diagram for 21-13 POST
Prepared by {enter your company name here}, Printed 8/15/2022
HydroCAD® 10.00-26 s/n 10466 © 2020 HydroCAD Software Solutions LLC

Time span=5.00-40.00 hrs, dt=0.01 hrs, 3501 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment GW1: Runoff Area=552,670 sf 31.77% Impervious Runoff Depth=1.62"
Flow Length=1,090' Tc=42.0 min CN=82 Runoff=11.50 cfs 1.712 af

Subcatchment GW2: Runoff Area=312,270 sf 28.57% Impervious Runoff Depth=1.28"
Flow Length=560' Tc=11.7 min UI Adjusted CN=77 Runoff=8.69 cfs 0.767 af

Subcatchment LS-10: Runoff Area=81,466 sf 27.01% Impervious Runoff Depth=1.22"
Flow Length=440' Tc=8.9 min UI Adjusted CN=76 Runoff=2.35 cfs 0.190 af

Subcatchment LS-11: Runoff Area=90,223 sf 38.17% Impervious Runoff Depth=1.62"
Flow Length=700' Tc=32.2 min CN=82 Runoff=2.14 cfs 0.279 af

Subcatchment LS-12: Runoff Area=17,750 sf 32.03% Impervious Runoff Depth=1.62"
Flow Length=150' Slope=0.0800 '/' Tc=7.7 min CN=82 Runoff=0.73 cfs 0.055 af

Subcatchment LS-13: Runoff Area=69,679 sf 21.63% Impervious Runoff Depth=1.16"
Flow Length=650' Tc=46.2 min UI Adjusted CN=75 Runoff=0.95 cfs 0.155 af

Subcatchment LS-14: Runoff Area=49,725 sf 27.60% Impervious Runoff Depth=1.28"
Flow Length=370' Tc=7.5 min UI Adjusted CN=77 Runoff=1.59 cfs 0.122 af

Subcatchment LS-15: Runoff Area=34,750 sf 30.94% Impervious Runoff Depth=1.55"
Tc=7.5 min CN=81 Runoff=1.37 cfs 0.103 af

Subcatchment LS-16: Runoff Area=68,793 sf 29.37% Impervious Runoff Depth=1.28"
Flow Length=600' Tc=13.3 min UI Adjusted CN=77 Runoff=1.83 cfs 0.169 af

Subcatchment LS-3: Runoff Area=35,656 sf 25.98% Impervious Runoff Depth=1.22"
Flow Length=300' Tc=11.9 min UI Adjusted CN=76 Runoff=0.93 cfs 0.083 af

Subcatchment LS-8: Runoff Area=75,146 sf 28.74% Impervious Runoff Depth=1.28"
Flow Length=640' Tc=11.5 min UI Adjusted CN=77 Runoff=2.10 cfs 0.185 af

Subcatchment LS-9: Runoff Area=56,874 sf 32.58% Impervious Runoff Depth=1.62"
Flow Length=550' Tc=9.5 min CN=82 Runoff=2.19 cfs 0.176 af

Subcatchment OS-1: Off Site Runoff Area=583,385 sf 5.16% Impervious Runoff Depth=0.99"
Flow Length=1,097' Tc=61.7 min CN=72 Runoff=5.56 cfs 1.107 af

Subcatchment WS-1D: Runoff Area=638,889 sf 2.45% Impervious Runoff Depth=0.89"
Flow Length=1,500' Tc=74.2 min UI Adjusted CN=70 Runoff=4.69 cfs 1.084 af

Subcatchment WS-2A: Runoff Area=296,906 sf 6.09% Impervious Runoff Depth=1.10"
Flow Length=720' Tc=68.6 min UI Adjusted CN=74 Runoff=3.00 cfs 0.627 af

Subcatchment WS-2B: Runoff Area=8.619 ac 8.26% Impervious Runoff Depth=1.10"
Flow Length=1,000' Tc=113.5 min UI Adjusted CN=74 Runoff=2.70 cfs 0.793 af

Subcatchment WS1: Runoff Area=51,519 sf 4.08% Impervious Runoff Depth=1.05"
Flow Length=230' Tc=9.1 min UI Adjusted CN=73 Runoff=1.23 cfs 0.103 af

Subcatchment WS17: Runoff Area=26,816 sf 33.23% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=80 Runoff=1.06 cfs 0.076 af

Subcatchment WS18: Runoff Area=9,900 sf 54.00% Impervious Runoff Depth=2.00"
Tc=6.0 min CN=87 Runoff=0.53 cfs 0.038 af

Subcatchment WS19: Runoff Area=34,250 sf 33.91% Impervious Runoff Depth=1.62"
Flow Length=180' Tc=9.3 min CN=82 Runoff=1.33 cfs 0.106 af

Subcatchment WS1A: Runoff Area=2,700,581 sf 3.76% Impervious Runoff Depth=0.94"
Flow Length=3,337' Tc=135.7 min CN=71 Runoff=14.04 cfs 4.850 af

Subcatchment WS1B: Runoff Area=356,623 sf 4.37% Impervious Runoff Depth=0.99"
Flow Length=770' Tc=67.4 min UI Adjusted CN=72 Runoff=3.22 cfs 0.677 af

Subcatchment WS1C: Runoff Area=16.775 ac 8.55% Impervious Runoff Depth=1.05"
Flow Length=870' Tc=78.0 min UI Adjusted CN=73 Runoff=6.42 cfs 1.464 af

Subcatchment WS2: Runoff Area=230,676 sf 9.01% Impervious Runoff Depth=0.99"
Flow Length=726' Tc=41.6 min UI Adjusted CN=72 Runoff=2.77 cfs 0.438 af

Subcatchment WS20: Runoff Area=247.794 ac 0.22% Impervious Runoff Depth=1.16"
Flow Length=5,272' Tc=172.1 min CN=75 Runoff=61.85 cfs 23.999 af

Subcatchment WS30: Runoff Area=766,977 sf 4.69% Impervious Runoff Depth=0.99"
Flow Length=650' Tc=51.6 min UI Adjusted CN=72 Runoff=8.15 cfs 1.456 af

Subcatchment WS31: Runoff Area=8.074 ac 1.71% Impervious Runoff Depth=0.99"
Flow Length=707' Tc=80.3 min UI Adjusted CN=72 Runoff=2.83 cfs 0.668 af

Subcatchment WS4: Runoff Area=49,650 sf 47.43% Impervious Runoff Depth=1.84"
Tc=7.5 min CN=85 Runoff=2.34 cfs 0.175 af

Subcatchment WS5: Runoff Area=51,750 sf 40.24% Impervious Runoff Depth=1.77"
Tc=7.5 min CN=84 Runoff=2.34 cfs 0.175 af

Subcatchment WS6: (new Subcat) Runoff Area=14,742 sf 34.62% Impervious Runoff Depth=1.62"
Tc=6.0 min CN=82 Runoff=0.64 cfs 0.046 af

Subcatchment WS7: Runoff Area=104,548 sf 25.09% Impervious Runoff Depth=1.16"
Flow Length=580' Tc=37.4 min UI Adjusted CN=75 Runoff=1.60 cfs 0.232 af

Reach LS 10R: LS 10 BUFFER Avg. Flow Depth=0.12' Max Vel=0.16 fps Inflow=2.35 cfs 0.190 af
n=0.800 L=100.0' S=0.1200 '/' Capacity=63.30 cfs Outflow=1.75 cfs 0.190 af

Reach LS 11R: LS 11 BUFFER Avg. Flow Depth=0.22' Max Vel=0.10 fps Inflow=2.14 cfs 0.279 af
n=0.800 L=84.0' S=0.0238 '/' Capacity=25.94 cfs Outflow=1.89 cfs 0.279 af

Reach LS 12R: LS 12 BUFFER Avg. Flow Depth=0.17' Max Vel=0.04 fps Inflow=0.73 cfs 0.055 af
n=0.800 L=150.0' S=0.0067 '/' Capacity=6.06 cfs Outflow=0.24 cfs 0.055 af

Reach LS 13R: LS 13 BUFFER Avg. Flow Depth=0.20' Max Vel=0.07 fps Inflow=0.95 cfs 0.155 af
n=0.800 L=150.0' S=0.0120 '/' Capacity=11.06 cfs Outflow=0.65 cfs 0.155 af

Reach LS 14R: LS 14 BUFFER Avg. Flow Depth=0.15' Max Vel=0.12 fps Inflow=1.59 cfs 0.122 af
n=0.800 L=110.0' S=0.0545 '/' Capacity=28.21 cfs Outflow=0.99 cfs 0.122 af

Reach LS 15R: LS 15 BUFFER Avg. Flow Depth=0.16' Max Vel=0.12 fps Inflow=1.37 cfs 0.103 af
n=0.800 L=110.0' S=0.0545 '/' Capacity=21.48 cfs Outflow=0.89 cfs 0.103 af

Reach LS 16R: LS 16 BUFFER Avg. Flow Depth=0.14' Max Vel=0.14 fps Inflow=1.83 cfs 0.169 af
n=0.800 L=150.0' S=0.0800 '/' Capacity=38.26 cfs Outflow=1.23 cfs 0.169 af

Reach LS 18R: LS 18 BUFFER Avg. Flow Depth=0.11' Max Vel=0.12 fps Inflow=0.53 cfs 0.038 af
n=0.800 L=150.0' S=0.0867 '/' Capacity=16.68 cfs Outflow=0.29 cfs 0.038 af

Reach LS 19R: LS 19 BUFFER Avg. Flow Depth=0.13' Max Vel=0.08 fps Inflow=1.33 cfs 0.106 af
n=0.800 L=150.0' S=0.0333 '/' Capacity=23.37 cfs Outflow=0.66 cfs 0.106 af

Reach LS 1R: LS 1 BUFFER Avg. Flow Depth=0.09' Max Vel=0.08 fps Inflow=1.23 cfs 0.103 af
n=0.800 L=150.0' S=0.0533 '/' Capacity=37.98 cfs Outflow=0.58 cfs 0.103 af

Reach LS 2R: LS 2 BUFFER Avg. Flow Depth=0.47' Max Vel=0.18 fps Inflow=2.77 cfs 0.438 af
n=0.800 L=135.0' S=0.0370 '/' Capacity=10.91 cfs Outflow=2.51 cfs 0.438 af

Reach LS 3R: LS 3 BUFFER Avg. Flow Depth=0.13' Max Vel=0.12 fps Inflow=0.93 cfs 0.083 af
n=0.800 L=90.0' S=0.0667 '/' Capacity=26.06 cfs Outflow=0.69 cfs 0.083 af

Reach LS 4R: LS 4 BUFFER Avg. Flow Depth=0.16' Max Vel=0.13 fps Inflow=2.34 cfs 0.175 af
n=0.800 L=80.0' S=0.0625 '/' Capacity=41.11 cfs Outflow=1.77 cfs 0.175 af

Reach LS 5R: LS 5 BUFFER Avg. Flow Depth=0.16' Max Vel=0.13 fps Inflow=2.34 cfs 0.175 af
n=0.800 L=80.0' S=0.0625 '/' Capacity=41.11 cfs Outflow=1.76 cfs 0.175 af

Reach LS 8R: LS 8 BUFFER Avg. Flow Depth=0.13' Max Vel=0.13 fps Inflow=2.10 cfs 0.185 af
n=0.800 L=95.0' S=0.0842 '/' Capacity=53.03 cfs Outflow=1.60 cfs 0.185 af

Reach LS 9R: LS 9 BUFFER Avg. Flow Depth=0.15' Max Vel=0.13 fps Inflow=2.19 cfs 0.176 af
n=0.800 L=130.0' S=0.0654 '/' Capacity=37.38 cfs Outflow=1.44 cfs 0.176 af

Reach LS-17R: LS 17 BUFFER Avg. Flow Depth=0.15' Max Vel=0.11 fps Inflow=1.06 cfs 0.076 af
n=0.800 L=150.0' S=0.0533 '/' Capacity=17.13 cfs Outflow=0.55 cfs 0.076 af

Reach LS-6R: LS 6 BUFFER Avg. Flow Depth=0.10' Max Vel=0.08 fps Inflow=0.64 cfs 0.046 af
n=0.800 L=150.0' S=0.0467 '/' Capacity=17.94 cfs Outflow=0.28 cfs 0.046 af

Reach LS-7R: LS 7 BUFFER Avg. Flow Depth=0.15' Max Vel=0.11 fps Inflow=1.60 cfs 0.232 af
n=0.800 L=150.0' S=0.0467 '/' Capacity=31.58 cfs Outflow=1.27 cfs 0.232 af

Reach R1A: Avg. Flow Depth=0.85' Max Vel=2.90 fps Inflow=14.41 cfs 7.541 af
n=0.030 L=860.0' S=0.0058 '/' Capacity=230.46 cfs Outflow=14.41 cfs 7.537 af

Reach R1B: Avg. Flow Depth=0.89' Max Vel=3.44 fps Inflow=11.88 cfs 6.349 af
n=0.030 L=1,640.0' S=0.0090 '/' Capacity=51.80 cfs Outflow=11.86 cfs 6.345 af

Reach R1D: Avg. Flow Depth=0.55' Max Vel=0.79 fps Inflow=15.36 cfs 3.916 af
n=0.100 L=260.0' S=0.0077 '/' Capacity=371.57 cfs Outflow=15.29 cfs 3.916 af

Reach R1F: Avg. Flow Depth=0.74' Max Vel=4.14 fps Inflow=8.38 cfs 2.260 af
n=0.030 L=280.0' S=0.0179 '/' Capacity=30.96 cfs Outflow=8.38 cfs 2.260 af

Reach R1G: Avg. Flow Depth=1.20' Max Vel=1.96 fps Inflow=7.95 cfs 2.069 af
n=0.070 L=220.0' S=0.0136 '/' Capacity=52.87 cfs Outflow=7.94 cfs 2.069 af

Reach R1H: Avg. Flow Depth=1.03' Max Vel=1.62 fps Inflow=5.19 cfs 1.352 af
n=0.070 L=180.0' S=0.0111 '/' Capacity=47.72 cfs Outflow=5.18 cfs 1.352 af

Reach R1I: Avg. Flow Depth=1.23' Max Vel=1.10 fps Inflow=4.68 cfs 1.084 af
n=0.070 L=240.0' S=0.0042 '/' Capacity=29.22 cfs Outflow=4.66 cfs 1.084 af

Reach R1J: Avg. Flow Depth=0.85' Max Vel=3.21 fps Inflow=7.08 cfs 1.197 af
n=0.070 L=300.0' S=0.0567 '/' Capacity=42.31 cfs Outflow=7.06 cfs 1.196 af

Reach R1K: Avg. Flow Depth=0.49' Max Vel=3.22 fps Inflow=3.70 cfs 0.846 af
n=0.070 L=110.0' S=0.1091 '/' Capacity=16.76 cfs Outflow=3.70 cfs 0.846 af

Reach R1L: Avg. Flow Depth=1.07' Max Vel=0.82 fps Inflow=2.87 cfs 0.504 af
n=0.070 L=370.0' S=0.0027 '/' Capacity=23.54 cfs Outflow=2.80 cfs 0.504 af

Reach R1M: Avg. Flow Depth=1.18' Max Vel=0.70 fps Inflow=2.47 cfs 0.402 af
n=0.070 L=270.0' S=0.0019 '/' Capacity=16.43 cfs Outflow=2.41 cfs 0.402 af

Reach R1N: Avg. Flow Depth=0.97' Max Vel=0.85 fps Inflow=1.89 cfs 0.279 af
n=0.070 L=140.0' S=0.0036 '/' Capacity=18.62 cfs Outflow=1.88 cfs 0.279 af

Reach R1P: Avg. Flow Depth=0.75' Max Vel=2.08 fps Inflow=3.22 cfs 0.677 af
n=0.070 L=420.0' S=0.0286 '/' Capacity=23.92 cfs Outflow=3.20 cfs 0.677 af

Reach R2A: Avg. Flow Depth=0.39' Max Vel=0.75 fps Inflow=6.23 cfs 1.914 af
n=0.030 L=600.0' S=0.0008 '/' Capacity=498.29 cfs Outflow=6.12 cfs 1.914 af

Reach R2B: Avg. Flow Depth=0.26' Max Vel=0.66 fps Inflow=3.49 cfs 0.908 af
n=0.030 L=360.0' S=0.0011 '/' Capacity=575.38 cfs Outflow=3.45 cfs 0.908 af

Reach R2C: Avg. Flow Depth=0.92' Max Vel=1.39 fps Inflow=3.51 cfs 0.908 af
n=0.100 L=440.0' S=0.0195 '/' Capacity=17.39 cfs Outflow=3.49 cfs 0.908 af

Reach R2D: Avg. Flow Depth=0.95' Max Vel=1.48 fps Inflow=3.30 cfs 0.733 af
n=0.100 L=770.0' S=0.0227 '/' Capacity=14.93 cfs Outflow=3.24 cfs 0.733 af

Reach R2E: Avg. Flow Depth=0.82' Max Vel=1.42 fps Inflow=2.97 cfs 1.006 af
n=0.100 L=550.0' S=0.0236 '/' Capacity=19.13 cfs Outflow=2.96 cfs 1.006 af

Reach R2F: Avg. Flow Depth=0.82' Max Vel=1.31 fps Inflow=2.76 cfs 0.831 af
n=0.100 L=200.0' S=0.0200 '/' Capacity=17.60 cfs Outflow=2.76 cfs 0.831 af

Reach R2G: Avg. Flow Depth=0.25' Max Vel=0.75 fps Inflow=0.29 cfs 0.038 af
n=0.100 L=550.0' S=0.0291 '/' Capacity=4.71 cfs Outflow=0.25 cfs 0.038 af

Reach R2H: Avg. Flow Depth=0.41' Max Vel=0.87 fps Inflow=0.66 cfs 0.106 af
n=0.100 L=570.0' S=0.0211 '/' Capacity=4.00 cfs Outflow=0.61 cfs 0.106 af

Reach R30: Avg. Flow Depth=0.81' Max Vel=1.53 fps Inflow=3.15 cfs 0.789 af
n=0.100 L=360.0' S=0.0278 '/' Capacity=20.74 cfs Outflow=3.13 cfs 0.789 af

Reach R30A: Avg. Flow Depth=0.84' Max Vel=1.40 fps Inflow=3.04 cfs 0.744 af
n=0.100 L=180.0' S=0.0222 '/' Capacity=18.55 cfs Outflow=3.03 cfs 0.744 af

Reach R30B: Avg. Flow Depth=0.25' Max Vel=0.87 fps Inflow=0.28 cfs 0.046 af
n=0.100 L=100.0' S=0.0400 '/' Capacity=5.52 cfs Outflow=0.28 cfs 0.046 af

Reach R30C: Avg. Flow Depth=0.11' Max Vel=0.52 fps Inflow=1.27 cfs 0.232 af
n=0.100 L=110.0' S=0.0273 '/' Capacity=74.87 cfs Outflow=1.26 cfs 0.232 af

Reach R31: Avg. Flow Depth=0.34' Max Vel=0.94 fps Inflow=0.55 cfs 0.076 af
n=0.100 L=540.0' S=0.0315 '/' Capacity=4.89 cfs Outflow=0.50 cfs 0.076 af

Reach RIE: Avg. Flow Depth=0.95' Max Vel=2.57 fps Inflow=14.59 cfs 3.706 af
n=0.030 L=370.0' S=0.0041 '/' Capacity=192.45 cfs Outflow=14.57 cfs 3.706 af

Reach SP#1: Study Point #1 Inflow=28.37 cfs 12.387 af
Outflow=28.37 cfs 12.387 af

Reach SP#2: Study Point #2 Inflow=66.44 cfs 25.913 af
Outflow=66.44 cfs 25.913 af

Reach SP#3: Study Point #3 Inflow=12.60 cfs 2.949 af
Outflow=12.60 cfs 2.949 af

Pond C-1: (new Pond) Peak Elev=75.83' Storage=200 cf Inflow=5.56 cfs 1.107 af
Outflow=5.55 cfs 1.107 af

Pond C-2: CULVERT Peak Elev=85.31' Storage=4,337 cf Inflow=14.67 cfs 3.724 af
Outflow=14.59 cfs 3.706 af

Pond C-3: CULVERT Peak Elev=96.63' Storage=502 cf Inflow=4.69 cfs 1.084 af
Outflow=4.68 cfs 1.084 af

Pond C-4: CULVERT Peak Elev=96.55' Storage=117 cf Inflow=3.04 cfs 0.744 af
Outflow=3.04 cfs 0.744 af

Pond C-5: CULVERT Peak Elev=96.52' Storage=59 cf Inflow=2.76 cfs 0.831 af
Outflow=2.76 cfs 0.831 af

Pond C-6: CULVERT Peak Elev=106.08' Storage=1,390 cf Inflow=3.41 cfs 0.733 af
Outflow=3.30 cfs 0.733 af

Pond C-7: CULVERT Peak Elev=93.57' Storage=37 cf Inflow=3.22 cfs 0.677 af
Outflow=3.22 cfs 0.677 af

Pond GW-1: Gravel Wetland #1 Peak Elev=84.76' Storage=28,910 cf Inflow=11.50 cfs 1.712 af
Primary=0.04 cfs 0.086 af Secondary=7.04 cfs 1.111 af Outflow=7.08 cfs 1.197 af

Pond GW-2: Gravel Wetland #2 Peak Elev=87.72' Storage=17,069 cf Inflow=8.69 cfs 0.767 af
Primary=1.04 cfs 0.472 af Secondary=0.00 cfs 0.000 af Outflow=1.04 cfs 0.472 af

Pond WET: WETLAND Peak Elev=75.05' Storage=81,350 cf Inflow=22.33 cfs 5.528 af
Outflow=10.38 cfs 5.503 af

Total Runoff Area = 450.275 ac Runoff Volume = 42.111 af Average Runoff Depth = 1.12"
95.41% Pervious = 429.589 ac 4.59% Impervious = 20.686 ac

Time span=5.00-40.00 hrs, dt=0.01 hrs, 3501 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment GW1: Runoff Area=552,670 sf 31.77% Impervious Runoff Depth=2.99"
Flow Length=1,090' Tc=42.0 min CN=82 Runoff=21.36 cfs 3.161 af

Subcatchment GW2: Runoff Area=312,270 sf 28.57% Impervious Runoff Depth=2.54"
Flow Length=560' Tc=11.7 min UI Adjusted CN=77 Runoff=17.67 cfs 1.517 af

Subcatchment LS-10: Runoff Area=81,466 sf 27.01% Impervious Runoff Depth=2.45"
Flow Length=440' Tc=8.9 min UI Adjusted CN=76 Runoff=4.86 cfs 0.382 af

Subcatchment LS-11: Runoff Area=90,223 sf 38.17% Impervious Runoff Depth=2.99"
Flow Length=700' Tc=32.2 min CN=82 Runoff=3.97 cfs 0.516 af

Subcatchment LS-12: Runoff Area=17,750 sf 32.03% Impervious Runoff Depth=2.99"
Flow Length=150' Slope=0.0800 '/' Tc=7.7 min CN=82 Runoff=1.34 cfs 0.102 af

Subcatchment LS-13: Runoff Area=69,679 sf 21.63% Impervious Runoff Depth=2.37"
Flow Length=650' Tc=46.2 min UI Adjusted CN=75 Runoff=2.01 cfs 0.316 af

Subcatchment LS-14: Runoff Area=49,725 sf 27.60% Impervious Runoff Depth=2.54"
Flow Length=370' Tc=7.5 min UI Adjusted CN=77 Runoff=3.22 cfs 0.242 af

Subcatchment LS-15: Runoff Area=34,750 sf 30.94% Impervious Runoff Depth=2.90"
Tc=7.5 min CN=81 Runoff=2.57 cfs 0.193 af

Subcatchment LS-16: Runoff Area=68,793 sf 29.37% Impervious Runoff Depth=2.54"
Flow Length=600' Tc=13.3 min UI Adjusted CN=77 Runoff=3.72 cfs 0.334 af

Subcatchment LS-3: Runoff Area=35,656 sf 25.98% Impervious Runoff Depth=2.45"
Flow Length=300' Tc=11.9 min UI Adjusted CN=76 Runoff=1.93 cfs 0.167 af

Subcatchment LS-8: Runoff Area=75,146 sf 28.74% Impervious Runoff Depth=2.54"
Flow Length=640' Tc=11.5 min UI Adjusted CN=77 Runoff=4.28 cfs 0.365 af

Subcatchment LS-9: Runoff Area=56,874 sf 32.58% Impervious Runoff Depth=2.99"
Flow Length=550' Tc=9.5 min CN=82 Runoff=4.06 cfs 0.325 af

Subcatchment OS-1: Off Site Runoff Area=583,385 sf 5.16% Impervious Runoff Depth=2.12"
Flow Length=1,097' Tc=61.7 min CN=72 Runoff=12.66 cfs 2.367 af

Subcatchment WS-1D: Runoff Area=638,889 sf 2.45% Impervious Runoff Depth=1.96"
Flow Length=1,500' Tc=74.2 min UI Adjusted CN=70 Runoff=11.27 cfs 2.399 af

Subcatchment WS-2A: Runoff Area=296,906 sf 6.09% Impervious Runoff Depth=2.28"
Flow Length=720' Tc=68.6 min UI Adjusted CN=74 Runoff=6.53 cfs 1.298 af

Subcatchment WS-2B: Runoff Area=8.619 ac 8.26% Impervious Runoff Depth=2.28"
Flow Length=1,000' Tc=113.5 min UI Adjusted CN=74 Runoff=5.92 cfs 1.641 af

Subcatchment WS1: Runoff Area=51,519 sf 4.08% Impervious Runoff Depth=2.20"
Flow Length=230' Tc=9.1 min UI Adjusted CN=73 Runoff=2.72 cfs 0.217 af

Subcatchment WS17: Runoff Area=26,816 sf 33.23% Impervious Runoff Depth=2.81"
Tc=6.0 min CN=80 Runoff=2.03 cfs 0.144 af

Subcatchment WS18: Runoff Area=9,900 sf 54.00% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=87 Runoff=0.91 cfs 0.066 af

Subcatchment WS19: Runoff Area=34,250 sf 33.91% Impervious Runoff Depth=2.99"
Flow Length=180' Tc=9.3 min CN=82 Runoff=2.46 cfs 0.196 af

Subcatchment WS1A: Runoff Area=2,700,581 sf 3.76% Impervious Runoff Depth=2.04"
Flow Length=3,337' Tc=135.7 min CN=71 Runoff=32.82 cfs 10.546 af

Subcatchment WS1B: Runoff Area=356,623 sf 4.37% Impervious Runoff Depth=2.12"
Flow Length=770' Tc=67.4 min UI Adjusted CN=72 Runoff=7.35 cfs 1.447 af

Subcatchment WS1C: Runoff Area=16.775 ac 8.55% Impervious Runoff Depth=2.20"
Flow Length=870' Tc=78.0 min UI Adjusted CN=73 Runoff=14.31 cfs 3.079 af

Subcatchment WS2: Runoff Area=230,676 sf 9.01% Impervious Runoff Depth=2.12"
Flow Length=726' Tc=41.6 min UI Adjusted CN=72 Runoff=6.26 cfs 0.936 af

Subcatchment WS20: Runoff Area=247.794 ac 0.22% Impervious Runoff Depth=2.37"
Flow Length=5,272' Tc=172.1 min CN=75 Runoff=132.20 cfs 48.907 af

Subcatchment WS30: Runoff Area=766,977 sf 4.69% Impervious Runoff Depth=2.12"
Flow Length=650' Tc=51.6 min UI Adjusted CN=72 Runoff=18.49 cfs 3.112 af

Subcatchment WS31: Runoff Area=8.074 ac 1.71% Impervious Runoff Depth=2.12"
Flow Length=707' Tc=80.3 min UI Adjusted CN=72 Runoff=6.48 cfs 1.427 af

Subcatchment WS4: Runoff Area=49,650 sf 47.43% Impervious Runoff Depth=3.28"
Tc=7.5 min CN=85 Runoff=4.12 cfs 0.311 af

Subcatchment WS5: Runoff Area=51,750 sf 40.24% Impervious Runoff Depth=3.18"
Tc=7.5 min CN=84 Runoff=4.18 cfs 0.315 af

Subcatchment WS6: (new Subcat) Runoff Area=14,742 sf 34.62% Impervious Runoff Depth=2.99"
Tc=6.0 min CN=82 Runoff=1.18 cfs 0.084 af

Subcatchment WS7: Runoff Area=104,548 sf 25.09% Impervious Runoff Depth=2.37"
Flow Length=580' Tc=37.4 min UI Adjusted CN=75 Runoff=3.38 cfs 0.474 af

Reach LS 10R: LS 10 BUFFER Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=4.86 cfs 0.382 af
n=0.800 L=100.0' S=0.1200 '/' Capacity=63.30 cfs Outflow=4.00 cfs 0.382 af

Reach LS 11R: LS 11 BUFFER Avg. Flow Depth=0.32' Max Vel=0.13 fps Inflow=3.97 cfs 0.516 af
n=0.800 L=84.0' S=0.0238 '/' Capacity=25.94 cfs Outflow=3.66 cfs 0.516 af

Reach LS 12R: LS 12 BUFFER Avg. Flow Depth=0.26' Max Vel=0.06 fps Inflow=1.34 cfs 0.102 af
n=0.800 L=150.0' S=0.0067 '/' Capacity=6.06 cfs Outflow=0.53 cfs 0.101 af

Reach LS 13R: LS 13 BUFFER Avg. Flow Depth=0.34' Max Vel=0.09 fps Inflow=2.01 cfs 0.316 af
n=0.800 L=150.0' S=0.0120 '/' Capacity=11.06 cfs Outflow=1.58 cfs 0.316 af

Reach LS 14R: LS 14 BUFFER Avg. Flow Depth=0.24' Max Vel=0.16 fps Inflow=3.22 cfs 0.242 af
n=0.800 L=110.0' S=0.0545 '/' Capacity=28.21 cfs Outflow=2.31 cfs 0.242 af

Reach LS 15R: LS 15 BUFFER Avg. Flow Depth=0.25' Max Vel=0.16 fps Inflow=2.57 cfs 0.193 af
n=0.800 L=110.0' S=0.0545 '/' Capacity=21.48 cfs Outflow=1.86 cfs 0.193 af

Reach LS 16R: LS 16 BUFFER Avg. Flow Depth=0.22' Max Vel=0.18 fps Inflow=3.72 cfs 0.334 af
n=0.800 L=150.0' S=0.0800 '/' Capacity=38.26 cfs Outflow=2.81 cfs 0.334 af

Reach LS 18R: LS 18 BUFFER Avg. Flow Depth=0.16' Max Vel=0.15 fps Inflow=0.91 cfs 0.066 af
n=0.800 L=150.0' S=0.0867 '/' Capacity=16.68 cfs Outflow=0.55 cfs 0.066 af

Reach LS 19R: LS 19 BUFFER Avg. Flow Depth=0.20' Max Vel=0.11 fps Inflow=2.46 cfs 0.196 af
n=0.800 L=150.0' S=0.0333 '/' Capacity=23.37 cfs Outflow=1.43 cfs 0.196 af

Reach LS 1R: LS 1 BUFFER Avg. Flow Depth=0.16' Max Vel=0.12 fps Inflow=2.72 cfs 0.217 af
n=0.800 L=150.0' S=0.0533 '/' Capacity=37.98 cfs Outflow=1.61 cfs 0.217 af

Reach LS 2R: LS 2 BUFFER Avg. Flow Depth=0.74' Max Vel=0.23 fps Inflow=6.26 cfs 0.936 af
n=0.800 L=135.0' S=0.0370 '/' Capacity=10.91 cfs Outflow=5.90 cfs 0.936 af

Reach LS 3R: LS 3 BUFFER Avg. Flow Depth=0.20' Max Vel=0.16 fps Inflow=1.93 cfs 0.167 af
n=0.800 L=90.0' S=0.0667 '/' Capacity=26.06 cfs Outflow=1.58 cfs 0.167 af

Reach LS 4R: LS 4 BUFFER Avg. Flow Depth=0.23' Max Vel=0.17 fps Inflow=4.12 cfs 0.311 af
n=0.800 L=80.0' S=0.0625 '/' Capacity=41.11 cfs Outflow=3.34 cfs 0.311 af

Reach LS 5R: LS 5 BUFFER Avg. Flow Depth=0.23' Max Vel=0.17 fps Inflow=4.18 cfs 0.315 af
n=0.800 L=80.0' S=0.0625 '/' Capacity=41.11 cfs Outflow=3.39 cfs 0.315 af

Reach LS 8R: LS 8 BUFFER Avg. Flow Depth=0.21' Max Vel=0.18 fps Inflow=4.28 cfs 0.365 af
n=0.800 L=95.0' S=0.0842 '/' Capacity=53.03 cfs Outflow=3.56 cfs 0.365 af

Reach LS 9R: LS 9 BUFFER Avg. Flow Depth=0.23' Max Vel=0.17 fps Inflow=4.06 cfs 0.325 af
n=0.800 L=130.0' S=0.0654 '/' Capacity=37.38 cfs Outflow=2.96 cfs 0.325 af

Reach LS-17R: LS 17 BUFFER Avg. Flow Depth=0.23' Max Vel=0.15 fps Inflow=2.03 cfs 0.144 af
n=0.800 L=150.0' S=0.0533 '/' Capacity=17.13 cfs Outflow=1.21 cfs 0.144 af

Reach LS-6R: LS 6 BUFFER Avg. Flow Depth=0.15' Max Vel=0.11 fps Inflow=1.18 cfs 0.084 af
n=0.800 L=150.0' S=0.0467 '/' Capacity=17.94 cfs Outflow=0.62 cfs 0.084 af

Reach LS-7R: LS 7 BUFFER Avg. Flow Depth=0.25' Max Vel=0.15 fps Inflow=3.38 cfs 0.474 af
n=0.800 L=150.0' S=0.0467 '/' Capacity=31.58 cfs Outflow=2.95 cfs 0.474 af

Reach R1A: Avg. Flow Depth=1.46' Max Vel=3.87 fps Inflow=36.62 cfs 15.980 af
n=0.030 L=860.0' S=0.0058 '/' Capacity=230.46 cfs Outflow=36.61 cfs 15.975 af

Reach R1B: Avg. Flow Depth=1.52' Max Vel=4.52 fps Inflow=31.00 cfs 13.339 af
n=0.030 L=1,640.0' S=0.0090 '/' Capacity=51.80 cfs Outflow=30.94 cfs 13.334 af

Reach R1D: Avg. Flow Depth=0.86' Max Vel=1.03 fps Inflow=34.35 cfs 8.270 af
n=0.100 L=260.0' S=0.0077 '/' Capacity=371.57 cfs Outflow=34.26 cfs 8.270 af

Reach R1F: Avg. Flow Depth=1.16' Max Vel=5.19 fps Inflow=19.00 cfs 4.792 af
n=0.030 L=280.0' S=0.0179 '/' Capacity=30.96 cfs Outflow=19.00 cfs 4.792 af

Reach R1G: Avg. Flow Depth=1.78' Max Vel=2.48 fps Inflow=18.17 cfs 4.409 af
n=0.070 L=220.0' S=0.0136 '/' Capacity=52.87 cfs Outflow=18.16 cfs 4.409 af

Reach R1H: Avg. Flow Depth=1.54' Max Vel=2.06 fps Inflow=12.17 cfs 2.931 af
n=0.070 L=180.0' S=0.0111 '/' Capacity=47.72 cfs Outflow=12.16 cfs 2.931 af

Reach R1I: Avg. Flow Depth=1.88' Max Vel=1.41 fps Inflow=11.23 cfs 2.399 af
n=0.070 L=240.0' S=0.0042 '/' Capacity=29.22 cfs Outflow=11.21 cfs 2.399 af

Reach R1J: Avg. Flow Depth=1.40' Max Vel=4.32 fps Inflow=20.16 cfs 2.646 af
n=0.070 L=300.0' S=0.0567 '/' Capacity=42.31 cfs Outflow=20.14 cfs 2.645 af

Reach R1K: Avg. Flow Depth=0.71' Max Vel=4.08 fps Inflow=8.20 cfs 1.781 af
n=0.070 L=110.0' S=0.1091 '/' Capacity=16.76 cfs Outflow=8.20 cfs 1.781 af

Reach R1L: Avg. Flow Depth=1.50' Max Vel=1.00 fps Inflow=5.71 cfs 0.950 af
n=0.070 L=370.0' S=0.0027 '/' Capacity=23.54 cfs Outflow=5.63 cfs 0.950 af

Reach R1M: Avg. Flow Depth=1.63' Max Vel=0.85 fps Inflow=4.84 cfs 0.758 af
n=0.070 L=270.0' S=0.0019 '/' Capacity=16.43 cfs Outflow=4.76 cfs 0.758 af

Reach R1N: Avg. Flow Depth=1.34' Max Vel=1.02 fps Inflow=3.66 cfs 0.516 af
n=0.070 L=140.0' S=0.0036 '/' Capacity=18.62 cfs Outflow=3.64 cfs 0.516 af

Reach R1P: Avg. Flow Depth=1.12' Max Vel=2.61 fps Inflow=7.35 cfs 1.447 af
n=0.070 L=420.0' S=0.0286 '/' Capacity=23.92 cfs Outflow=7.32 cfs 1.447 af

Reach R2A: Avg. Flow Depth=0.62' Max Vel=0.99 fps Inflow=13.17 cfs 3.826 af
n=0.030 L=600.0' S=0.0008 '/' Capacity=498.29 cfs Outflow=13.02 cfs 3.826 af

Reach R2B: Avg. Flow Depth=0.40' Max Vel=0.87 fps Inflow=7.34 cfs 1.805 af
n=0.030 L=360.0' S=0.0011 '/' Capacity=575.38 cfs Outflow=7.28 cfs 1.805 af

Reach R2C: Avg. Flow Depth=1.32' Max Vel=1.72 fps Inflow=7.36 cfs 1.805 af
n=0.100 L=440.0' S=0.0195 '/' Capacity=17.39 cfs Outflow=7.34 cfs 1.805 af

Reach R2D: Avg. Flow Depth=1.37' Max Vel=1.83 fps Inflow=7.00 cfs 1.494 af
n=0.100 L=770.0' S=0.0227 '/' Capacity=14.93 cfs Outflow=6.92 cfs 1.494 af

Reach R2E: Avg. Flow Depth=1.17' Max Vel=1.76 fps Inflow=6.35 cfs 2.022 af
n=0.100 L=550.0' S=0.0236 '/' Capacity=19.13 cfs Outflow=6.33 cfs 2.022 af

Reach R2F: Avg. Flow Depth=1.19' Max Vel=1.64 fps Inflow=6.01 cfs 1.707 af
n=0.100 L=200.0' S=0.0200 '/' Capacity=17.60 cfs Outflow=6.00 cfs 1.707 af

Reach R2G: Avg. Flow Depth=0.34' Max Vel=0.91 fps Inflow=0.55 cfs 0.066 af
n=0.100 L=550.0' S=0.0291 '/' Capacity=4.71 cfs Outflow=0.48 cfs 0.066 af

Reach R2H: Avg. Flow Depth=0.59' Max Vel=1.09 fps Inflow=1.43 cfs 0.196 af
n=0.100 L=570.0' S=0.0211 '/' Capacity=4.00 cfs Outflow=1.32 cfs 0.196 af

Reach R30: Avg. Flow Depth=1.18' Max Vel=1.92 fps Inflow=6.99 cfs 1.655 af
n=0.100 L=360.0' S=0.0278 '/' Capacity=20.74 cfs Outflow=6.98 cfs 1.655 af

Reach R30A: Avg. Flow Depth=1.23' Max Vel=1.76 fps Inflow=6.81 cfs 1.571 af
n=0.100 L=180.0' S=0.0222 '/' Capacity=18.55 cfs Outflow=6.80 cfs 1.571 af

Reach R30B: Avg. Flow Depth=0.35' Max Vel=1.10 fps Inflow=0.62 cfs 0.084 af
n=0.100 L=100.0' S=0.0400 '/' Capacity=5.52 cfs Outflow=0.62 cfs 0.084 af

Reach R30C: Avg. Flow Depth=0.18' Max Vel=0.70 fps Inflow=2.95 cfs 0.474 af
n=0.100 L=110.0' S=0.0273 '/' Capacity=74.87 cfs Outflow=2.94 cfs 0.474 af

Reach R31: Avg. Flow Depth=0.49' Max Vel=1.19 fps Inflow=1.21 cfs 0.144 af
n=0.100 L=540.0' S=0.0315 '/' Capacity=4.89 cfs Outflow=1.10 cfs 0.144 af

Reach RIE: Avg. Flow Depth=1.52' Max Vel=3.29 fps Inflow=32.59 cfs 7.853 af
n=0.030 L=370.0' S=0.0041 '/' Capacity=192.45 cfs Outflow=32.57 cfs 7.853 af

Reach SP#1: Study Point #1 Inflow=68.97 cfs 26.521 af
Outflow=68.97 cfs 26.521 af

Reach SP#2: Study Point #2 Inflow=140.97 cfs 52.733 af
Outflow=140.97 cfs 52.733 af

Reach SP#3: Study Point #3 Inflow=32.80 cfs 6.462 af
Outflow=32.80 cfs 6.462 af

Pond C-1: (new Pond) Peak Elev=76.44' Storage=1,813 cf Inflow=12.66 cfs 2.367 af
Outflow=12.26 cfs 2.367 af

Pond C-2: CULVERT Peak Elev=86.25' Storage=9,056 cf Inflow=32.85 cfs 7.871 af
Outflow=32.59 cfs 7.853 af

Pond C-3: CULVERT Peak Elev=97.11' Storage=1,389 cf Inflow=11.27 cfs 2.399 af
Outflow=11.23 cfs 2.399 af

Pond C-4: CULVERT Peak Elev=96.94' Storage=225 cf Inflow=6.82 cfs 1.571 af
Outflow=6.81 cfs 1.571 af

Pond C-5: CULVERT Peak Elev=96.86' Storage=137 cf Inflow=6.02 cfs 1.707 af
Outflow=6.01 cfs 1.707 af

Pond C-6: CULVERT Peak Elev=106.46' Storage=3,297 cf Inflow=7.27 cfs 1.494 af
Outflow=7.00 cfs 1.494 af

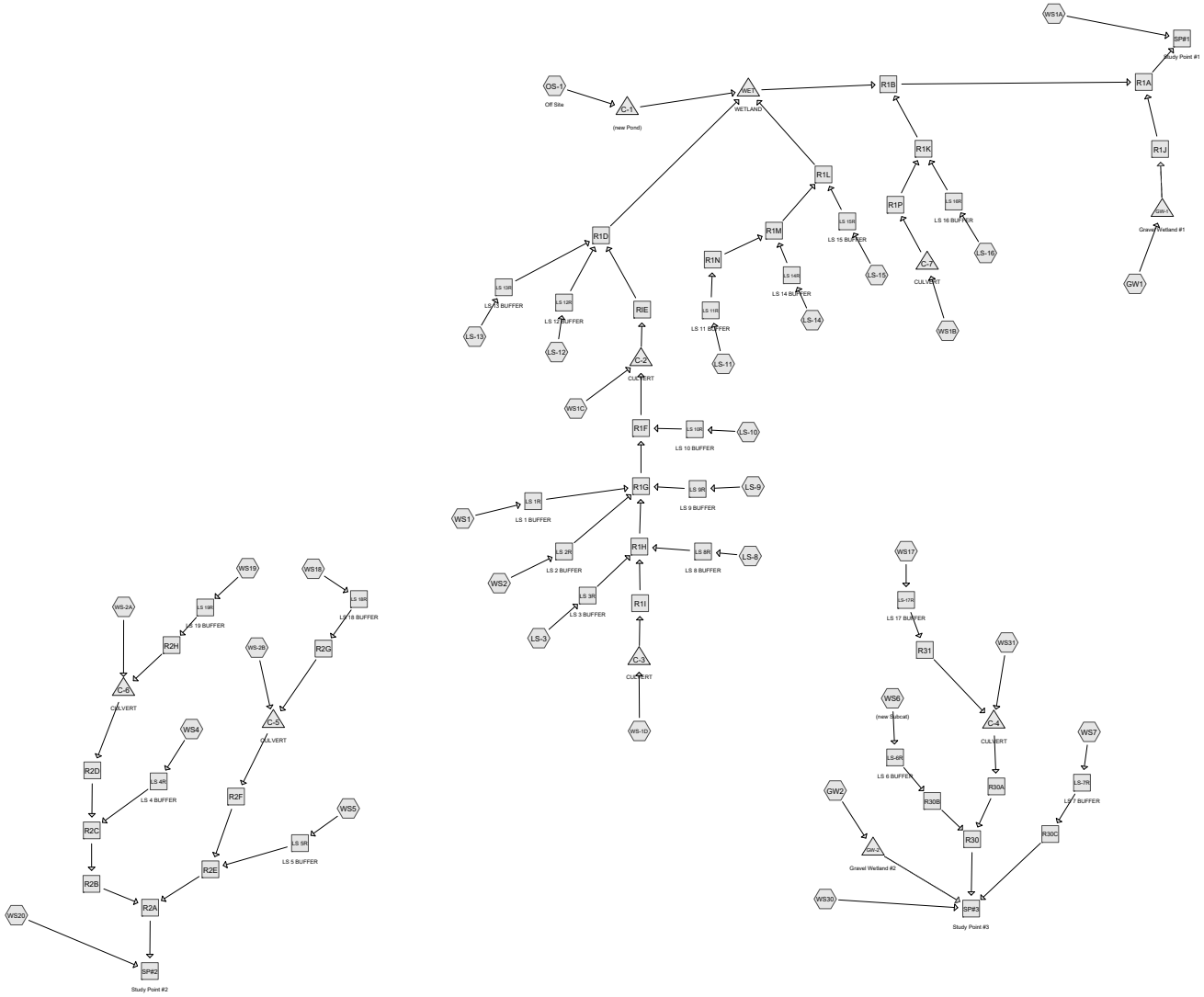
Pond C-7: CULVERT Peak Elev=93.99' Storage=74 cf Inflow=7.35 cfs 1.447 af
Outflow=7.35 cfs 1.447 af

Pond GW-1: Gravel Wetland #1 Peak Elev=85.02' Storage=33,655 cf Inflow=21.36 cfs 3.161 af
Primary=0.04 cfs 0.090 af Secondary=20.12 cfs 2.556 af Outflow=20.16 cfs 2.646 af

Pond GW-2: Gravel Wetland #2 Peak Elev=88.34' Storage=25,042 cf Inflow=17.67 cfs 1.517 af
Primary=7.65 cfs 1.221 af Secondary=0.00 cfs 0.000 af Outflow=7.65 cfs 1.221 af

Pond WET: WETLAND Peak Elev=76.09' Storage=165,059 cf Inflow=49.74 cfs 11.588 af
Outflow=27.12 cfs 11.557 af

Total Runoff Area = 450.275 ac Runoff Volume = 86.585 af Average Runoff Depth = 2.31"
95.41% Pervious = 429.589 ac 4.59% Impervious = 20.686 ac



Routing Diagram for 21-13 POST
Prepared by {enter your company name here}, Printed 8/15/2022
HydroCAD® 10.00-26 s/n 10466 © 2020 HydroCAD Software Solutions LLC

Time span=5.00-40.00 hrs, dt=0.01 hrs, 3501 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment GW1: Runoff Area=552,670 sf 31.77% Impervious Runoff Depth=4.17"
Flow Length=1,090' Tc=42.0 min CN=82 Runoff=29.66 cfs 4.411 af

Subcatchment GW2: Runoff Area=312,270 sf 28.57% Impervious Runoff Depth=3.65"
Flow Length=560' Tc=11.7 min UI Adjusted CN=77 Runoff=25.46 cfs 2.183 af

Subcatchment LS-10: Runoff Area=81,466 sf 27.01% Impervious Runoff Depth=3.55"
Flow Length=440' Tc=8.9 min UI Adjusted CN=76 Runoff=7.05 cfs 0.554 af

Subcatchment LS-11: Runoff Area=90,223 sf 38.17% Impervious Runoff Depth=4.17"
Flow Length=700' Tc=32.2 min CN=82 Runoff=5.51 cfs 0.720 af

Subcatchment LS-12: Runoff Area=17,750 sf 32.03% Impervious Runoff Depth=4.17"
Flow Length=150' Slope=0.0800 '/' Tc=7.7 min CN=82 Runoff=1.86 cfs 0.142 af

Subcatchment LS-13: Runoff Area=69,679 sf 21.63% Impervious Runoff Depth=3.45"
Flow Length=650' Tc=46.2 min UI Adjusted CN=75 Runoff=2.95 cfs 0.460 af

Subcatchment LS-14: Runoff Area=49,725 sf 27.60% Impervious Runoff Depth=3.65"
Flow Length=370' Tc=7.5 min UI Adjusted CN=77 Runoff=4.64 cfs 0.348 af

Subcatchment LS-15: Runoff Area=34,750 sf 30.94% Impervious Runoff Depth=4.07"
Tc=7.5 min CN=81 Runoff=3.59 cfs 0.270 af

Subcatchment LS-16: Runoff Area=68,793 sf 29.37% Impervious Runoff Depth=3.65"
Flow Length=600' Tc=13.3 min UI Adjusted CN=77 Runoff=5.36 cfs 0.481 af

Subcatchment LS-3: Runoff Area=35,656 sf 25.98% Impervious Runoff Depth=3.55"
Flow Length=300' Tc=11.9 min UI Adjusted CN=76 Runoff=2.81 cfs 0.242 af

Subcatchment LS-8: Runoff Area=75,146 sf 28.74% Impervious Runoff Depth=3.65"
Flow Length=640' Tc=11.5 min UI Adjusted CN=77 Runoff=6.16 cfs 0.525 af

Subcatchment LS-9: Runoff Area=56,874 sf 32.58% Impervious Runoff Depth=4.17"
Flow Length=550' Tc=9.5 min CN=82 Runoff=5.62 cfs 0.454 af

Subcatchment OS-1: Off Site Runoff Area=583,385 sf 5.16% Impervious Runoff Depth=3.16"
Flow Length=1,097' Tc=61.7 min CN=72 Runoff=19.16 cfs 3.524 af

Subcatchment WS-1D: Runoff Area=638,889 sf 2.45% Impervious Runoff Depth=2.96"
Flow Length=1,500' Tc=74.2 min UI Adjusted CN=70 Runoff=17.37 cfs 3.624 af

Subcatchment WS-2A: Runoff Area=296,906 sf 6.09% Impervious Runoff Depth=3.35"
Flow Length=720' Tc=68.6 min UI Adjusted CN=74 Runoff=9.69 cfs 1.905 af

Subcatchment WS-2B: Runoff Area=8.619 ac 8.26% Impervious Runoff Depth=3.35"
Flow Length=1,000' Tc=113.5 min UI Adjusted CN=74 Runoff=8.80 cfs 2.409 af

Subcatchment WS1: Runoff Area=51,519 sf 4.08% Impervious Runoff Depth=3.26"
Flow Length=230' Tc=9.1 min UI Adjusted CN=73 Runoff=4.06 cfs 0.321 af

Subcatchment WS17: Runoff Area=26,816 sf 33.23% Impervious Runoff Depth=3.96"
Tc=6.0 min CN=80 Runoff=2.85 cfs 0.203 af

Subcatchment WS18: Runoff Area=9,900 sf 54.00% Impervious Runoff Depth>4.71"
Tc=6.0 min CN=87 Runoff=1.22 cfs 0.089 af

Subcatchment WS19: Runoff Area=34,250 sf 33.91% Impervious Runoff Depth=4.17"
Flow Length=180' Tc=9.3 min CN=82 Runoff=3.40 cfs 0.273 af

Subcatchment WS1A: Runoff Area=2,700,581 sf 3.76% Impervious Runoff Depth=3.06"
Flow Length=3,337' Tc=135.7 min CN=71 Runoff=50.21 cfs 15.813 af

Subcatchment WS1B: Runoff Area=356,623 sf 4.37% Impervious Runoff Depth=3.16"
Flow Length=770' Tc=67.4 min UI Adjusted CN=72 Runoff=11.07 cfs 2.154 af

Subcatchment WS1C: Runoff Area=16.775 ac 8.55% Impervious Runoff Depth=3.26"
Flow Length=870' Tc=78.0 min UI Adjusted CN=73 Runoff=21.40 cfs 4.551 af

Subcatchment WS2: Runoff Area=230,676 sf 9.01% Impervious Runoff Depth=3.16"
Flow Length=726' Tc=41.6 min UI Adjusted CN=72 Runoff=9.42 cfs 1.393 af

Subcatchment WS20: Runoff Area=247.794 ac 0.22% Impervious Runoff Depth=3.45"
Flow Length=5,272' Tc=172.1 min CN=75 Runoff=194.85 cfs 71.305 af

Subcatchment WS30: Runoff Area=766,977 sf 4.69% Impervious Runoff Depth=3.16"
Flow Length=650' Tc=51.6 min UI Adjusted CN=72 Runoff=27.87 cfs 4.633 af

Subcatchment WS31: Runoff Area=8.074 ac 1.71% Impervious Runoff Depth=3.16"
Flow Length=707' Tc=80.3 min UI Adjusted CN=72 Runoff=9.79 cfs 2.125 af

Subcatchment WS4: Runoff Area=49,650 sf 47.43% Impervious Runoff Depth=4.49"
Tc=7.5 min CN=85 Runoff=5.58 cfs 0.427 af

Subcatchment WS5: Runoff Area=51,750 sf 40.24% Impervious Runoff Depth=4.38"
Tc=7.5 min CN=84 Runoff=5.70 cfs 0.434 af

Subcatchment WS6: (new Subcat) Runoff Area=14,742 sf 34.62% Impervious Runoff Depth=4.17"
Tc=6.0 min CN=82 Runoff=1.64 cfs 0.118 af

Subcatchment WS7: Runoff Area=104,548 sf 25.09% Impervious Runoff Depth=3.45"
Flow Length=580' Tc=37.4 min UI Adjusted CN=75 Runoff=4.96 cfs 0.691 af

Reach LS 10R: LS 10 BUFFER Avg. Flow Depth=0.25' Max Vel=0.25 fps Inflow=7.05 cfs 0.554 af
n=0.800 L=100.0' S=0.1200 '/' Capacity=63.30 cfs Outflow=6.02 cfs 0.554 af

Reach LS 11R: LS 11 BUFFER Avg. Flow Depth=0.39' Max Vel=0.15 fps Inflow=5.51 cfs 0.720 af
n=0.800 L=84.0' S=0.0238 '/' Capacity=25.94 cfs Outflow=5.15 cfs 0.720 af

Reach LS 12R: LS 12 BUFFER Avg. Flow Depth=0.33' Max Vel=0.07 fps Inflow=1.86 cfs 0.142 af
n=0.800 L=150.0' S=0.0067 '/' Capacity=6.06 cfs Outflow=0.80 cfs 0.141 af

Reach LS 13R: LS 13 BUFFER Avg. Flow Depth=0.43' Max Vel=0.11 fps Inflow=2.95 cfs 0.460 af
n=0.800 L=150.0' S=0.0120 '/' Capacity=11.06 cfs Outflow=2.43 cfs 0.460 af

Reach LS 14R: LS 14 BUFFER Avg. Flow Depth=0.30' Max Vel=0.18 fps Inflow=4.64 cfs 0.348 af
n=0.800 L=110.0' S=0.0545 '/' Capacity=28.21 cfs Outflow=3.50 cfs 0.348 af

Reach LS 15R: LS 15 BUFFER Avg. Flow Depth=0.32' Max Vel=0.18 fps Inflow=3.59 cfs 0.270 af
n=0.800 L=110.0' S=0.0545 '/' Capacity=21.48 cfs Outflow=2.71 cfs 0.270 af

Reach LS 16R: LS 16 BUFFER Avg. Flow Depth=0.28' Max Vel=0.22 fps Inflow=5.36 cfs 0.481 af
n=0.800 L=150.0' S=0.0800 '/' Capacity=38.26 cfs Outflow=4.25 cfs 0.481 af

Reach LS 18R: LS 18 BUFFER Avg. Flow Depth=0.20' Max Vel=0.17 fps Inflow=1.22 cfs 0.089 af
n=0.800 L=150.0' S=0.0867 '/' Capacity=16.68 cfs Outflow=0.78 cfs 0.089 af

Reach LS 19R: LS 19 BUFFER Avg. Flow Depth=0.25' Max Vel=0.13 fps Inflow=3.40 cfs 0.273 af
n=0.800 L=150.0' S=0.0333 '/' Capacity=23.37 cfs Outflow=2.12 cfs 0.273 af

Reach LS 1R: LS 1 BUFFER Avg. Flow Depth=0.21' Max Vel=0.15 fps Inflow=4.06 cfs 0.321 af
n=0.800 L=150.0' S=0.0533 '/' Capacity=37.98 cfs Outflow=2.62 cfs 0.321 af

Reach LS 2R: LS 2 BUFFER Avg. Flow Depth=0.91' Max Vel=0.26 fps Inflow=9.42 cfs 1.393 af
n=0.800 L=135.0' S=0.0370 '/' Capacity=10.91 cfs Outflow=8.98 cfs 1.393 af

Reach LS 3R: LS 3 BUFFER Avg. Flow Depth=0.26' Max Vel=0.18 fps Inflow=2.81 cfs 0.242 af
n=0.800 L=90.0' S=0.0667 '/' Capacity=26.06 cfs Outflow=2.37 cfs 0.242 af

Reach LS 4R: LS 4 BUFFER Avg. Flow Depth=0.28' Max Vel=0.19 fps Inflow=5.58 cfs 0.427 af
n=0.800 L=80.0' S=0.0625 '/' Capacity=41.11 cfs Outflow=4.67 cfs 0.427 af

Reach LS 5R: LS 5 BUFFER Avg. Flow Depth=0.29' Max Vel=0.19 fps Inflow=5.70 cfs 0.434 af
n=0.800 L=80.0' S=0.0625 '/' Capacity=41.11 cfs Outflow=4.77 cfs 0.434 af

Reach LS 8R: LS 8 BUFFER Avg. Flow Depth=0.26' Max Vel=0.21 fps Inflow=6.16 cfs 0.525 af
n=0.800 L=95.0' S=0.0842 '/' Capacity=53.03 cfs Outflow=5.31 cfs 0.525 af

Reach LS 9R: LS 9 BUFFER Avg. Flow Depth=0.29' Max Vel=0.20 fps Inflow=5.62 cfs 0.454 af
n=0.800 L=130.0' S=0.0654 '/' Capacity=37.38 cfs Outflow=4.29 cfs 0.454 af

Reach LS-17R: LS 17 BUFFER Avg. Flow Depth=0.29' Max Vel=0.17 fps Inflow=2.85 cfs 0.203 af
n=0.800 L=150.0' S=0.0533 '/' Capacity=17.13 cfs Outflow=1.82 cfs 0.203 af

Reach LS-6R: LS 6 BUFFER Avg. Flow Depth=0.19' Max Vel=0.12 fps Inflow=1.64 cfs 0.118 af
n=0.800 L=150.0' S=0.0467 '/' Capacity=17.94 cfs Outflow=0.92 cfs 0.118 af

Reach LS-7R: LS 7 BUFFER Avg. Flow Depth=0.32' Max Vel=0.18 fps Inflow=4.96 cfs 0.691 af
n=0.800 L=150.0' S=0.0467 '/' Capacity=31.58 cfs Outflow=4.46 cfs 0.691 af

Reach R1A: Avg. Flow Depth=1.88' Max Vel=4.39 fps Inflow=56.55 cfs 23.602 af
n=0.030 L=860.0' S=0.0058 '/' Capacity=230.46 cfs Outflow=56.53 cfs 23.597 af

Reach R1B: Avg. Flow Depth=1.91' Max Vel=5.07 fps Inflow=47.62 cfs 19.712 af
n=0.030 L=1,640.0' S=0.0090 '/' Capacity=51.80 cfs Outflow=47.55 cfs 19.707 af

Reach R1D: Avg. Flow Depth=1.07' Max Vel=1.17 fps Inflow=50.89 cfs 12.248 af
n=0.100 L=260.0' S=0.0077 '/' Capacity=371.57 cfs Outflow=50.80 cfs 12.248 af

Reach R1F: Avg. Flow Depth=1.44' Max Vel=5.77 fps Inflow=28.53 cfs 7.113 af
n=0.030 L=280.0' S=0.0179 '/' Capacity=30.96 cfs Outflow=28.52 cfs 7.113 af

Reach R1G: Avg. Flow Depth=2.17' Max Vel=2.77 fps Inflow=27.36 cfs 6.559 af
n=0.070 L=220.0' S=0.0136 '/' Capacity=52.87 cfs Outflow=27.35 cfs 6.559 af

Reach R1H: Avg. Flow Depth=1.89' Max Vel=2.31 fps Inflow=18.55 cfs 4.391 af
n=0.070 L=180.0' S=0.0111 '/' Capacity=47.72 cfs Outflow=18.55 cfs 4.391 af

Reach R1I: Avg. Flow Depth=2.32' Max Vel=1.59 fps Inflow=17.27 cfs 3.624 af
n=0.070 L=240.0' S=0.0042 '/' Capacity=29.22 cfs Outflow=17.25 cfs 3.624 af

Reach R1J: Avg. Flow Depth=1.66' Max Vel=4.76 fps Inflow=28.75 cfs 3.895 af
n=0.070 L=300.0' S=0.0567 '/' Capacity=42.31 cfs Outflow=28.73 cfs 3.894 af

Reach R1K: Avg. Flow Depth=0.86' Max Vel=4.59 fps Inflow=12.25 cfs 2.635 af
n=0.070 L=110.0' S=0.1091 '/' Capacity=16.76 cfs Outflow=12.25 cfs 2.635 af

Reach R1L: Avg. Flow Depth=1.78' Max Vel=1.10 fps Inflow=8.13 cfs 1.338 af
n=0.070 L=370.0' S=0.0027 '/' Capacity=23.54 cfs Outflow=8.06 cfs 1.338 af

Reach R1M: Avg. Flow Depth=1.94' Max Vel=0.93 fps Inflow=6.85 cfs 1.068 af
n=0.070 L=270.0' S=0.0019 '/' Capacity=16.43 cfs Outflow=6.76 cfs 1.068 af

Reach R1N: Avg. Flow Depth=1.59' Max Vel=1.11 fps Inflow=5.15 cfs 0.720 af
n=0.070 L=140.0' S=0.0036 '/' Capacity=18.62 cfs Outflow=5.13 cfs 0.720 af

Reach R1P: Avg. Flow Depth=1.37' Max Vel=2.92 fps Inflow=11.07 cfs 2.154 af
n=0.070 L=420.0' S=0.0286 '/' Capacity=23.92 cfs Outflow=11.05 cfs 2.154 af

Reach R2A: Avg. Flow Depth=0.78' Max Vel=1.14 fps Inflow=19.31 cfs 5.537 af
n=0.030 L=600.0' S=0.0008 '/' Capacity=498.29 cfs Outflow=19.14 cfs 5.537 af

Reach R2B: Avg. Flow Depth=0.50' Max Vel=1.01 fps Inflow=10.69 cfs 2.605 af
n=0.030 L=360.0' S=0.0011 '/' Capacity=575.38 cfs Outflow=10.63 cfs 2.605 af

Reach R2C: Avg. Flow Depth=1.58' Max Vel=1.90 fps Inflow=10.72 cfs 2.605 af
n=0.100 L=440.0' S=0.0195 '/' Capacity=17.39 cfs Outflow=10.69 cfs 2.605 af

Reach R2D: Avg. Flow Depth=1.65' Max Vel=2.02 fps Inflow=10.23 cfs 2.178 af
n=0.100 L=770.0' S=0.0227 '/' Capacity=14.93 cfs Outflow=10.13 cfs 2.178 af

Reach R2E: Avg. Flow Depth=1.41' Max Vel=1.96 fps Inflow=9.37 cfs 2.932 af
n=0.100 L=550.0' S=0.0236 '/' Capacity=19.13 cfs Outflow=9.33 cfs 2.932 af

Reach R2F: Avg. Flow Depth=1.44' Max Vel=1.83 fps Inflow=8.92 cfs 2.498 af
n=0.100 L=200.0' S=0.0200 '/' Capacity=17.60 cfs Outflow=8.91 cfs 2.498 af

Reach R2G: Avg. Flow Depth=0.40' Max Vel=1.00 fps Inflow=0.78 cfs 0.089 af
n=0.100 L=550.0' S=0.0291 '/' Capacity=4.71 cfs Outflow=0.67 cfs 0.089 af

Reach R2H: Avg. Flow Depth=0.71' Max Vel=1.22 fps Inflow=2.12 cfs 0.273 af
n=0.100 L=570.0' S=0.0211 '/' Capacity=4.00 cfs Outflow=1.96 cfs 0.273 af

Reach R30: Avg. Flow Depth=1.43' Max Vel=2.15 fps Inflow=10.44 cfs 2.445 af
n=0.100 L=360.0' S=0.0278 '/' Capacity=20.74 cfs Outflow=10.43 cfs 2.445 af

Reach R30A: Avg. Flow Depth=1.50' Max Vel=1.97 fps Inflow=10.21 cfs 2.328 af
n=0.100 L=180.0' S=0.0222 '/' Capacity=18.55 cfs Outflow=10.21 cfs 2.328 af

Reach R30B: Avg. Flow Depth=0.43' Max Vel=1.23 fps Inflow=0.92 cfs 0.118 af
n=0.100 L=100.0' S=0.0400 '/' Capacity=5.52 cfs Outflow=0.92 cfs 0.118 af

Reach R30C: Avg. Flow Depth=0.22' Max Vel=0.81 fps Inflow=4.46 cfs 0.691 af
n=0.100 L=110.0' S=0.0273 '/' Capacity=74.87 cfs Outflow=4.44 cfs 0.691 af

Reach R31: Avg. Flow Depth=0.60' Max Vel=1.34 fps Inflow=1.82 cfs 0.203 af
n=0.100 L=540.0' S=0.0315 '/' Capacity=4.89 cfs Outflow=1.65 cfs 0.203 af

Reach RIE: Avg. Flow Depth=1.90' Max Vel=3.69 fps Inflow=48.34 cfs 11.647 af
n=0.030 L=370.0' S=0.0041 '/' Capacity=192.45 cfs Outflow=48.32 cfs 11.647 af

Reach SP#1: Study Point #1 Inflow=105.12 cfs 39.410 af
Outflow=105.12 cfs 39.410 af

Reach SP#2: Study Point #2 Inflow=207.15 cfs 76.842 af
Outflow=207.15 cfs 76.842 af

Reach SP#3: Study Point #3 Inflow=50.90 cfs 9.655 af
Outflow=50.90 cfs 9.655 af

Pond C-1: (new Pond) Peak Elev=76.95' Storage=6,799 cf Inflow=19.16 cfs 3.524 af
Outflow=16.77 cfs 3.524 af

Pond C-2: CULVERT Peak Elev=87.04' Storage=15,041 cf Inflow=49.15 cfs 11.664 af
Outflow=48.34 cfs 11.647 af

Pond C-3: CULVERT Peak Elev=97.48' Storage=2,389 cf Inflow=17.37 cfs 3.624 af
Outflow=17.27 cfs 3.624 af

Pond C-4: CULVERT Peak Elev=97.24' Storage=322 cf Inflow=10.22 cfs 2.328 af
Outflow=10.21 cfs 2.328 af

Pond C-5: CULVERT Peak Elev=97.13' Storage=215 cf Inflow=8.93 cfs 2.498 af
Outflow=8.92 cfs 2.498 af

Pond C-6: CULVERT Peak Elev=106.74' Storage=5,095 cf Inflow=10.67 cfs 2.178 af
Outflow=10.23 cfs 2.178 af

Pond C-7: CULVERT Peak Elev=94.31' Storage=115 cf Inflow=11.07 cfs 2.154 af
Outflow=11.07 cfs 2.154 af

Pond GW-1: Gravel Wetland #1 Peak Elev=85.16' Storage=36,206 cf Inflow=29.66 cfs 4.411 af
Primary=0.04 cfs 0.093 af Secondary=28.71 cfs 3.802 af Outflow=28.75 cfs 3.895 af

Pond GW-2: Gravel Wetland #2 Peak Elev=88.84' Storage=31,781 cf Inflow=25.46 cfs 2.183 af
Primary=13.22 cfs 1.886 af Secondary=0.00 cfs 0.000 af Outflow=13.22 cfs 1.886 af

Pond WET: WETLAND Peak Elev=76.79' Storage=237,521 cf Inflow=71.48 cfs 17.110 af
Outflow=41.69 cfs 17.077 af

Total Runoff Area = 450.275 ac Runoff Volume = 126.781 af Average Runoff Depth = 3.38"
95.41% Pervious = 429.589 ac 4.59% Impervious = 20.686 ac

Summary for Subcatchment GW1:

Runoff = 29.66 cfs @ 12.56 hrs, Volume= 4.411 af, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (sf)	CN	Description
	175,605	98	Unconnected pavement, HSG C
	336,145	74	>75% Grass cover, Good, HSG C
	12,920	70	Woods, Good, HSG C
*	28,000	74	Stormwater Pond
	552,670	82	Weighted Average
	377,065		68.23% Pervious Area
	175,605		31.77% Impervious Area
	175,605		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.5	150	0.0530	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
3.9	140	0.0140	0.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.6	800	0.0050	3.72	4.57	**Pipe Channel, D-E** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
42.0	1,090	Total			

Summary for Subcatchment GW2:

Runoff = 25.46 cfs @ 12.16 hrs, Volume= 2.183 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (sf)	CN	Adj	Description
	89,229	98		Unconnected pavement, HSG C
	182,121	74		>75% Grass cover, Good, HSG C
	12,920	70		Woods, Good, HSG C
*	28,000	74		Stormwater Pond
	312,270	81	77	Weighted Average, UI Adjusted
	223,041			71.43% Pervious Area
	89,229			28.57% Impervious Area
	89,229			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	150	0.0460	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.9	135	0.0270	2.46		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.2	275	0.0050	3.72	4.57	**Pipe Channel, D-E** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
11.7	560	Total			

Summary for Subcatchment LS-10:

Runoff = 7.05 cfs @ 12.13 hrs, Volume= 0.554 af, Depth= 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
22,002	98		Unconnected pavement, HSG C
44,372	74		>75% Grass cover, Good, HSG C
15,092	70		Woods, Good, HSG C
81,466	80	76	Weighted Average, UI Adjusted
59,464			72.99% Pervious Area
22,002			27.01% Impervious Area
22,002			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	150	0.0860	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.3	30	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	90	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	170	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
8.9	440	Total			

Summary for Subcatchment LS-11:

Runoff = 5.51 cfs @ 12.42 hrs, Volume= 0.720 af, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
34,440	98	Unconnected pavement, HSG C
39,960	74	>75% Grass cover, Good, HSG C
15,823	70	Woods, Good, HSG C
90,223	82	Weighted Average
55,783		61.83% Pervious Area
34,440		38.17% Impervious Area
34,440		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.9	150	0.0700	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
0.7	120	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	430	0.0500	12.75	15.65	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
32.2	700	Total			

Summary for Subcatchment LS-12:

Runoff = 1.86 cfs @ 12.11 hrs, Volume= 0.142 af, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
5,685	98	Unconnected pavement, HSG C
12,065	74	>75% Grass cover, Good, HSG C
17,750	82	Weighted Average
12,065		67.97% Pervious Area
5,685		32.03% Impervious Area
5,685		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	150	0.0800	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"

Summary for Subcatchment LS-13:

Runoff = 2.95 cfs @ 12.63 hrs, Volume= 0.460 af, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
15,075	98		Unconnected pavement, HSG C
32,175	74		>75% Grass cover, Good, HSG C
22,429	70		Woods, Good, HSG C
69,679	78	75	Weighted Average, UI Adjusted
54,604			78.37% Pervious Area
15,075			21.63% Impervious Area
15,075			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.3	150	0.0300	0.06		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
1.6	150	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	140	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	60	0.0500	12.75	15.65	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.4	150	0.0500	6.76	33.79	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.035
46.2	650	Total			

Summary for Subcatchment LS-14:

Runoff = 4.64 cfs @ 12.11 hrs, Volume= 0.348 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
13,725	98		Unconnected pavement, HSG C
36,000	74		>75% Grass cover, Good, HSG C
49,725	81	77	Weighted Average, UI Adjusted
36,000			72.40% Pervious Area
13,725			27.60% Impervious Area
13,725			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	150	0.1000	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.3	60	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	160	0.0500	12.75	15.65	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
7.5	370	Total			

Summary for Subcatchment LS-15:

Runoff = 3.59 cfs @ 12.11 hrs, Volume= 0.270 af, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
10,750	98	Unconnected pavement, HSG C
24,000	74	>75% Grass cover, Good, HSG C
34,750	81	Weighted Average
24,000		69.06% Pervious Area
10,750		30.94% Impervious Area
10,750		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5					**Direct Entry, Same as LS-14**

Summary for Subcatchment LS-16:

Runoff = 5.36 cfs @ 12.18 hrs, Volume= 0.481 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
20,205	98		Unconnected pavement, HSG C
37,545	74		>75% Grass cover, Good, HSG C
11,043	70		Woods, Good, HSG C
68,793	80	77	Weighted Average, UI Adjusted
48,588			70.63% Pervious Area
20,205			29.37% Impervious Area
20,205			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	150	0.0300	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.1	130	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	320	0.0100	5.70	7.00	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
13.3	600	Total			

Summary for Subcatchment LS-3:

Runoff = 2.81 cfs @ 12.16 hrs, Volume= 0.242 af, Depth= 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
9,265	98		Unconnected pavement, HSG C
21,000	74		>75% Grass cover, Good, HSG C
5,391	70		Woods, Good, HSG C
35,656	80	76	Weighted Average, UI Adjusted
26,391			74.02% Pervious Area
9,265			25.98% Impervious Area
9,265			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	150	0.0300	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	110	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	40	0.0100	5.70	7.00	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
11.9	300	Total			

Summary for Subcatchment LS-8:

Runoff = 6.16 cfs @ 12.16 hrs, Volume= 0.525 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
21,600	98		Unconnected pavement, HSG C
41,400	74		>75% Grass cover, Good, HSG C
12,146	70		Woods, Good, HSG C
75,146	80	77	Weighted Average, UI Adjusted
53,546			71.26% Pervious Area
21,600			28.74% Impervious Area
21,600			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	150	0.0530	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.3	230	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	160	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.5	100	0.0050	3.18	50.94	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.035
11.5	640	Total			

Summary for Subcatchment LS-9:

Runoff = 5.62 cfs @ 12.13 hrs, Volume= 0.454 af, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
18,532	98	Unconnected pavement, HSG C
38,342	74	>75% Grass cover, Good, HSG C
56,874	82	Weighted Average
38,342		67.42% Pervious Area
18,532		32.58% Impervious Area
18,532		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	120	0.0530	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	110	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	320	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
9.5	550	Total			

Summary for Subcatchment OS-1: Off Site

Runoff = 19.16 cfs @ 12.82 hrs, Volume= 3.524 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
16,250	92	Paved roads w/open ditches, 50% imp, HSG C
35,700	92	Paved roads w/open ditches, 50% imp, HSG C
10,890	75	1/4 acre lots, 38% imp, HSG B
107,975	74	>75% Grass cover, Good, HSG C
107,975	55	Woods, Good, HSG B
152,298	77	Woods, Good, HSG D
152,297	70	Woods, Good, HSG C
583,385	72	Weighted Average
553,272		94.84% Pervious Area
30,113		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.3	150	0.0300	0.06		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.30"
17.7	531	0.0400	0.50		**Shallow Concentrated Flow, B-C** Forest w/Heavy Litter Kv= 2.5 fps
0.4	218	0.0300	9.12	11.19	**Pipe Channel, C-D** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.3	198		9.83		**Lake or Reservoir, D-E** Mean Depth= 3.00'
61.7	1,097	Total			

Summary for Subcatchment WS-1D:

Runoff = 17.37 cfs @ 13.02 hrs, Volume= 3.624 af, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (sf)	CN	Adj	Description
*	15,640	98		Unconnected Impervious
	24,490	74		>75% Grass cover, Good, HSG C
	598,759	70		Woods, Good, HSG C
	638,889	71	70	Weighted Average, UI Adjusted
	623,249			97.55% Pervious Area
	15,640			2.45% Impervious Area
	15,640			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.8	150	0.0650	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
42.4	1,350	0.0450	0.53		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
74.2	1,500	Total			

Summary for Subcatchment WS-2A:

Runoff = 9.69 cfs @ 12.89 hrs, Volume= 1.905 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (sf)	CN	Adj	Description
*	18,090	98		Unconnected Impervious
	73,660	74		>75% Grass cover, Good, HSG C
	102,578	70		Woods, Good, HSG C
	102,578	77		Woods, Good, HSG D
	296,906	75	74	Weighted Average, UI Adjusted
	278,816			93.91% Pervious Area
	18,090			6.09% Impervious Area
	18,090			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.7	150	0.0330	0.06		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
26.9	570	0.0200	0.35		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
68.6	720	Total			

Summary for Subcatchment WS-2B:

Runoff = 8.80 cfs @ 13.50 hrs, Volume= 2.409 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (ac)	CN	Adj	Description
*	0.712	98		Unconnected Impervious
	2.893	74		>75% Grass cover, Good, HSG C
	3.176	70		Woods, Good, HSG C
	1.838	77		Woods, Good, HSG D
	8.619	75	74	Weighted Average, UI Adjusted
	7.907			91.74% Pervious Area
	0.712			8.26% Impervious Area
	0.712			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
46.3	850	0.0150	0.31		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
113.5	1,000	Total			

Summary for Subcatchment WS1:

Runoff = 4.06 cfs @ 12.13 hrs, Volume= 0.321 af, Depth= 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
2,100	98		Unconnected pavement, HSG C
36,000	74		>75% Grass cover, Good, HSG C
13,419	70		Woods, Good, HSG C
51,519	74	73	Weighted Average, UI Adjusted
49,419			95.92% Pervious Area
2,100			4.08% Impervious Area
2,100			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.9	80	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.1	230	Total			

Summary for Subcatchment WS17:

Runoff = 2.85 cfs @ 12.09 hrs, Volume= 0.203 af, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
8,910	98	Unconnected pavement, HSG C
7,590	74	>75% Grass cover, Good, HSG C
10,316	70	Woods, Good, HSG C
26,816	80	Weighted Average
17,906		66.77% Pervious Area
8,910		33.23% Impervious Area
8,910		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment WS18:

Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.089 af, Depth> 4.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
5,346	98	Unconnected pavement, HSG C
4,554	74	>75% Grass cover, Good, HSG C
9,900	87	Weighted Average
4,554		46.00% Pervious Area
5,346		54.00% Impervious Area
5,346		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min Tc**

Summary for Subcatchment WS19:

Runoff = 3.40 cfs @ 12.13 hrs, Volume= 0.273 af, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
11,615	98	Unconnected pavement, HSG C
22,635	74	>75% Grass cover, Good, HSG C
34,250	82	Weighted Average
22,635		66.09% Pervious Area
11,615		33.91% Impervious Area
11,615		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	150	0.0530	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.3	30	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.3	180	Total			

Summary for Subcatchment WS1A:

Runoff = 50.21 cfs @ 13.73 hrs, Volume= 15.813 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (sf)	CN	Description
*	56,640	98	Unconnected Impervious Area
	198,740	74	>75% Grass cover, Good, HSG C
	76,175	92	Paved roads w/open ditches, 50% imp, HSG C
	13,700	92	Paved roads w/open ditches, 50% imp, HSG C
	521,925	77	Woods, Good, HSG D
	949,205	70	Woods, Good, HSG C
	884,196	65	Brush, Good, HSG C
	2,700,581	71	Weighted Average
	2,599,004		96.24% Pervious Area
	101,578		3.76% Impervious Area
	56,640		55.76% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
96.9	150	0.0040	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
38.8	3,187	0.0070	1.37	13.69	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=3.00' D=2.00' Z= 1.0 '/' Top.W=7.00' n= 0.100 Very weedy reaches w/pools
135.7	3,337	Total			

Summary for Subcatchment WS1B:

Runoff = 11.07 cfs @ 12.95 hrs, Volume= 2.154 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (sf)	CN	Adj	Description
*	15,600	98		Unconnected Impervious
	53,840	74		>75% Grass cover, Good, HSG C
	240,183	70		Woods, Good, HSG C
	47,000	77		Woods, Good, HSG D
	356,623	73	72	Weighted Average, UI Adjusted
	341,023			95.63% Pervious Area
	15,600			4.37% Impervious Area
	15,600			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
45.2	150	0.0270	0.06		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
14.1	300	0.0200	0.35		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
8.1	320	0.0700	0.66		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
67.4	770	Total			

Summary for Subcatchment WS1C:

Runoff = 21.40 cfs @ 13.08 hrs, Volume= 4.551 af, Depth= 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (ac)	CN	Adj	Description
*	1.434	98		Unconnected Impervious
	3.343	74		>75% Grass cover, Good, HSG C
	10.222	70		Woods, Good, HSG C
	1.776	77		Woods, Good, HSG D
	16.775	74	73	Weighted Average, UI Adjusted
	15.341			91.45% Pervious Area
	1.434			8.55% Impervious Area
	1.434			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.9	150	0.0480	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
42.1	720	0.0130	0.29		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
78.0	870	Total			

Summary for Subcatchment WS2:

Runoff = 9.42 cfs @ 12.58 hrs, Volume= 1.393 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
20,775	98		Unconnected pavement, HSG C
42,500	74		>75% Grass cover, Good, HSG C
167,401	70		Woods, Good, HSG C
230,676	73	72	Weighted Average, UI Adjusted
209,901			90.99% Pervious Area
20,775			9.01% Impervious Area
20,775			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	150	0.0500	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
4.7	400	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	176	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
41.6	726	Total			

Summary for Subcatchment WS20:

Runoff = 194.85 cfs @ 14.34 hrs, Volume= 71.305 af, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

	Area (ac)	CN	Description
*	0.552	98	Lot Impervious
	1.600	74	>75% Grass cover, Good, HSG C
	98.933	70	Woods, Good, HSG C
	61.253	77	Woods, Good, HSG D
	85.456	79	Woods/grass comb., Good, HSG D
	247.794	75	Weighted Average
	247.242		99.78% Pervious Area
	0.552		0.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.30"
69.2	1,799	0.0300	0.43		**Shallow Concentrated Flow, B-C** Forest w/Heavy Litter Kv= 2.5 fps
13.3	1,243	0.0300	1.56	20.63	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=25.00' D=0.50' Z= 3.0 '/' Top.W=28.00' n= 0.100 Very weedy reaches w/pools
22.4	2,080	0.0050	1.55	173.35	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=50.00' D=2.00' Z= 3.0 '/' Top.W=62.00' n= 0.100 Very weedy reaches w/pools
172.1	5,272	Total			

Summary for Subcatchment WS30:

Runoff = 27.87 cfs @ 12.72 hrs, Volume= 4.633 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
35,981	98		Unconnected pavement, HSG C
107,985	74		>75% Grass cover, Good, HSG C
513,208	70		Woods, Good, HSG C
109,803	77		Woods, Good, HSG D
766,977	73	72	Weighted Average, UI Adjusted
730,996			95.31% Pervious Area
35,981			4.69% Impervious Area
35,981			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.3	150	0.0300	0.06		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
51.6	650	Total			

Summary for Subcatchment WS31:

Runoff = 9.79 cfs @ 13.11 hrs, Volume= 2.125 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (ac)	CN	Adj	Description
0.138	98		Unconnected pavement, HSG C
0.781	74		>75% Grass cover, Good, HSG C
5.153	70		Woods, Good, HSG C
2.002	77		Woods, Good, HSG D
8.074	73	72	Weighted Average, UI Adjusted
7.936			98.29% Pervious Area
0.138			1.71% Impervious Area
0.138			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
13.1	557	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
80.3	707	Total			

Summary for Subcatchment WS4:

Runoff = 5.58 cfs @ 12.11 hrs, Volume= 0.427 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
23,551	98	Unconnected pavement, HSG C
26,099	74	>75% Grass cover, Good, HSG C
49,650	85	Weighted Average
26,099		52.57% Pervious Area
23,551		47.43% Impervious Area
23,551		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5					**Direct Entry, Assumed Tc**

Summary for Subcatchment WS5:

Runoff = 5.70 cfs @ 12.11 hrs, Volume= 0.434 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
20,825	98	Unconnected pavement, HSG C
30,925	74	>75% Grass cover, Good, HSG C
51,750	84	Weighted Average
30,925		59.76% Pervious Area
20,825		40.24% Impervious Area
20,825		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5					**Direct Entry, Assumed Tc**

Summary for Subcatchment WS6: (new Subcat)

Runoff = 1.64 cfs @ 12.09 hrs, Volume= 0.118 af, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Description
5,104	98	Unconnected pavement, HSG C
9,638	74	>75% Grass cover, Good, HSG C
14,742	82	Weighted Average
9,638		65.38% Pervious Area
5,104		34.62% Impervious Area
5,104		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Assumed Tc**

Summary for Subcatchment WS7:

Runoff = 4.96 cfs @ 12.51 hrs, Volume= 0.691 af, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.20"

Area (sf)	CN	Adj	Description
26,226	98		Unconnected pavement, HSG C
43,674	74		>75% Grass cover, Good, HSG C
34,648	70		Woods, Good, HSG C
104,548	79	75	Weighted Average, UI Adjusted
78,322			74.91% Pervious Area
26,226			25.09% Impervious Area
26,226			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.5	150	0.0530	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
1.6	110	0.0550	1.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	320	0.0050	4.03	4.95	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
37.4	580	Total			

Summary for Reach LS 10R: LS 10 BUFFER

Inflow Area = 1.870 ac, 27.01% Impervious, Inflow Depth = 3.55" for 25-yr event
Inflow = 7.05 cfs @ 12.13 hrs, Volume= 0.554 af
Outflow = 6.02 cfs @ 12.19 hrs, Volume= 0.554 af, Atten= 15%, Lag= 3.6 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.25 fps, Min. Travel Time= 6.7 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 29.0 min

Peak Storage= 2,415 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.00' Flow Area= 110.0 sf, Capacity= 63.30 cfs

90.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 130.00'
Length= 100.0' Slope= 0.1200 '/'
Inlet Invert= 101.00', Outlet Invert= 89.00'

‡

Summary for Reach LS 11R: LS 11 BUFFER

Inflow Area = 2.071 ac, 38.17% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 5.51 cfs @ 12.42 hrs, Volume= 0.720 af
Outflow = 5.15 cfs @ 12.55 hrs, Volume= 0.720 af, Atten= 6%, Lag= 7.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.15 fps, Min. Travel Time= 9.6 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 43.5 min

Peak Storage= 2,973 cf @ 12.55 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 102.0 sf, Capacity= 25.94 cfs

82.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 122.00'
Length= 84.0' Slope= 0.0238 '/'
Inlet Invert= 84.00', Outlet Invert= 82.00'

‡

Summary for Reach LS 12R: LS 12 BUFFER

Inflow Area = 0.407 ac, 32.03% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 1.86 cfs @ 12.11 hrs, Volume= 0.142 af
Outflow = 0.80 cfs @ 12.35 hrs, Volume= 0.141 af, Atten= 57%, Lag= 14.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.07 fps, Min. Travel Time= 38.3 min
Avg. Velocity = 0.02 fps, Avg. Travel Time= 147.1 min

Peak Storage= 1,834 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.00' Flow Area= 50.0 sf, Capacity= 6.06 cfs

30.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 70.00'
Length= 150.0' Slope= 0.0067 '/'
Inlet Invert= 83.00', Outlet Invert= 82.00'

‡

Summary for Reach LS 13R: LS 13 BUFFER

Inflow Area = 1.600 ac, 21.63% Impervious, Inflow Depth = 3.45" for 25-yr event
Inflow = 2.95 cfs @ 12.63 hrs, Volume= 0.460 af
Outflow = 2.43 cfs @ 12.89 hrs, Volume= 0.460 af, Atten= 18%, Lag= 15.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.11 fps, Min. Travel Time= 23.8 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 91.5 min

Peak Storage= 3,464 cf @ 12.89 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.00' Flow Area= 65.0 sf, Capacity= 11.06 cfs

45.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 85.00'
Length= 150.0' Slope= 0.0120 '/'
Inlet Invert= 83.80', Outlet Invert= 82.00'

‡

Summary for Reach LS 14R: LS 14 BUFFER

Inflow Area = 1.142 ac, 27.60% Impervious, Inflow Depth = 3.65" for 25-yr event
Inflow = 4.64 cfs @ 12.11 hrs, Volume= 0.348 af
Outflow = 3.50 cfs @ 12.19 hrs, Volume= 0.348 af, Atten= 25%, Lag= 4.7 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.18 fps, Min. Travel Time= 9.9 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 46.2 min

Peak Storage= 2,083 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 76.0 sf, Capacity= 28.21 cfs

56.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 96.00'
Length= 110.0' Slope= 0.0545 '/'
Inlet Invert= 86.00', Outlet Invert= 80.00'

‡

Summary for Reach LS 15R: LS 15 BUFFER

Inflow Area = 0.798 ac, 30.94% Impervious, Inflow Depth = 4.07" for 25-yr event
Inflow = 3.59 cfs @ 12.11 hrs, Volume= 0.270 af
Outflow = 2.71 cfs @ 12.18 hrs, Volume= 0.270 af, Atten= 25%, Lag= 4.6 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.18 fps, Min. Travel Time= 9.9 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 45.4 min

Peak Storage= 1,610 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 21.48 cfs

40.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 80.00'
Length= 110.0' Slope= 0.0545 '/'
Inlet Invert= 86.00', Outlet Invert= 80.00'

‡

Summary for Reach LS 16R: LS 16 BUFFER

Inflow Area = 1.579 ac, 29.37% Impervious, Inflow Depth = 3.65" for 25-yr event
Inflow = 5.36 cfs @ 12.18 hrs, Volume= 0.481 af
Outflow = 4.25 cfs @ 12.29 hrs, Volume= 0.481 af, Atten= 21%, Lag= 6.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.22 fps, Min. Travel Time= 11.6 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 53.1 min

Peak Storage= 2,961 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 84.0 sf, Capacity= 38.26 cfs

64.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 104.00'
Length= 150.0' Slope= 0.0800 '/'
Inlet Invert= 90.00', Outlet Invert= 78.00'

‡

Summary for Reach LS 18R: LS 18 BUFFER

Inflow Area = 0.227 ac, 54.00% Impervious, Inflow Depth > 4.71" for 25-yr event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.089 af
Outflow = 0.78 cfs @ 12.18 hrs, Volume= 0.089 af, Atten= 36%, Lag= 5.7 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.17 fps, Min. Travel Time= 15.0 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 60.1 min

Peak Storage= 700 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 40.0 sf, Capacity= 16.68 cfs

20.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 60.00'
Length= 150.0' Slope= 0.0867 '/'
Inlet Invert= 124.00', Outlet Invert= 111.00'

‡

Summary for Reach LS 19R: LS 19 BUFFER

Inflow Area = 0.786 ac, 33.91% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 3.40 cfs @ 12.13 hrs, Volume= 0.273 af
Outflow = 2.12 cfs @ 12.27 hrs, Volume= 0.273 af, Atten= 38%, Lag= 8.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.13 fps, Min. Travel Time= 19.4 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 84.7 min

Peak Storage= 2,467 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.00' Flow Area= 80.0 sf, Capacity= 23.37 cfs

60.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 100.00'
Length= 150.0' Slope= 0.0333 '/'
Inlet Invert= 122.00', Outlet Invert= 117.00'

‡

Summary for Reach LS 1R: LS 1 BUFFER

Inflow Area = 1.183 ac, 4.08% Impervious, Inflow Depth = 3.26" for 25-yr event
Inflow = 4.06 cfs @ 12.13 hrs, Volume= 0.321 af
Outflow = 2.62 cfs @ 12.26 hrs, Volume= 0.321 af, Atten= 35%, Lag= 8.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.15 fps, Min. Travel Time= 17.0 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 72.3 min

Peak Storage= 2,667 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 100.0 sf, Capacity= 37.98 cfs

80.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 120.00'
Length= 150.0' Slope= 0.0533 '/'
Inlet Invert= 99.00', Outlet Invert= 91.00'

‡

Summary for Reach LS 2R: LS 2 BUFFER

Inflow Area = 5.296 ac, 9.01% Impervious, Inflow Depth = 3.16" for 25-yr event
Inflow = 9.42 cfs @ 12.58 hrs, Volume= 1.393 af
Outflow = 8.98 cfs @ 12.69 hrs, Volume= 1.393 af, Atten= 5%, Lag= 6.9 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.26 fps, Min. Travel Time= 8.7 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 33.2 min

Peak Storage= 4,688 cf @ 12.69 hrs
Average Depth at Peak Storage= 0.91'
Bank-Full Depth= 1.00' Flow Area= 40.0 sf, Capacity= 10.91 cfs

20.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 60.00'
Length= 135.0' Slope= 0.0370 '/'
Inlet Invert= 96.00', Outlet Invert= 91.00'

‡

Summary for Reach LS 3R: LS 3 BUFFER

Inflow Area = 0.819 ac, 25.98% Impervious, Inflow Depth = 3.55" for 25-yr event
Inflow = 2.81 cfs @ 12.16 hrs, Volume= 0.242 af
Outflow = 2.37 cfs @ 12.24 hrs, Volume= 0.242 af, Atten= 16%, Lag= 4.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.18 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 34.3 min

Peak Storage= 1,170 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 1.00' Flow Area= 65.0 sf, Capacity= 26.06 cfs

45.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 85.00'
Length= 90.0' Slope= 0.0667 '/'
Inlet Invert= 101.00', Outlet Invert= 95.00'

‡

Summary for Reach LS 4R: LS 4 BUFFER

Inflow Area = 1.140 ac, 47.43% Impervious, Inflow Depth = 4.49" for 25-yr event
Inflow = 5.58 cfs @ 12.11 hrs, Volume= 0.427 af
Outflow = 4.67 cfs @ 12.16 hrs, Volume= 0.427 af, Atten= 16%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.19 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 31.9 min

Peak Storage= 1,944 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 100.0 sf, Capacity= 41.11 cfs

80.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 120.00'
Length= 80.0' Slope= 0.0625 '/'
Inlet Invert= 93.00', Outlet Invert= 88.00'

‡

Summary for Reach LS 5R: LS 5 BUFFER

Inflow Area = 1.188 ac, 40.24% Impervious, Inflow Depth = 4.38" for 25-yr event
Inflow = 5.70 cfs @ 12.11 hrs, Volume= 0.434 af
Outflow = 4.77 cfs @ 12.16 hrs, Volume= 0.434 af, Atten= 16%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.19 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 31.6 min

Peak Storage= 1,971 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 100.0 sf, Capacity= 41.11 cfs

80.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 120.00'
Length= 80.0' Slope= 0.0625 '/'
Inlet Invert= 93.00', Outlet Invert= 88.00'

‡

Summary for Reach LS 8R: LS 8 BUFFER

Inflow Area = 1.725 ac, 28.74% Impervious, Inflow Depth = 3.65" for 25-yr event
Inflow = 6.16 cfs @ 12.16 hrs, Volume= 0.525 af
Outflow = 5.31 cfs @ 12.23 hrs, Volume= 0.525 af, Atten= 14%, Lag= 4.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.21 fps, Min. Travel Time= 7.4 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 32.5 min

Peak Storage= 2,370 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 1.00' Flow Area= 110.0 sf, Capacity= 53.03 cfs

90.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 130.00'
Length= 95.0' Slope= 0.0842 '/'
Inlet Invert= 101.00', Outlet Invert= 93.00'

‡

Summary for Reach LS 9R: LS 9 BUFFER

Inflow Area = 1.306 ac, 32.58% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 5.62 cfs @ 12.13 hrs, Volume= 0.454 af
Outflow = 4.29 cfs @ 12.22 hrs, Volume= 0.454 af, Atten= 24%, Lag= 5.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.20 fps, Min. Travel Time= 11.0 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 52.1 min

Peak Storage= 2,830 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 90.0 sf, Capacity= 37.38 cfs

70.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 110.00'
Length= 130.0' Slope= 0.0654 '/'
Inlet Invert= 101.00', Outlet Invert= 92.50'

‡

Summary for Reach LS-17R: LS 17 BUFFER

Inflow Area = 0.616 ac, 33.23% Impervious, Inflow Depth = 3.96" for 25-yr event
Inflow = 2.85 cfs @ 12.09 hrs, Volume= 0.203 af
Outflow = 1.82 cfs @ 12.18 hrs, Volume= 0.203 af, Atten= 36%, Lag= 5.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.17 fps, Min. Travel Time= 14.6 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 64.7 min

Peak Storage= 1,586 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 50.0 sf, Capacity= 17.13 cfs

30.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 70.00'
Length= 150.0' Slope= 0.0533 '/'
Inlet Invert= 121.00', Outlet Invert= 113.00'

‡

Summary for Reach LS-6R: LS 6 BUFFER

Inflow Area = 0.338 ac, 34.62% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 1.64 cfs @ 12.09 hrs, Volume= 0.118 af
Outflow = 0.92 cfs @ 12.21 hrs, Volume= 0.118 af, Atten= 44%, Lag= 7.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.12 fps, Min. Travel Time= 20.0 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 82.2 min

Peak Storage= 1,110 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 55.0 sf, Capacity= 17.94 cfs

35.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 75.00'
Length= 150.0' Slope= 0.0467 '/'
Inlet Invert= 101.00', Outlet Invert= 94.00'

‡

Summary for Reach LS-7R: LS 7 BUFFER

Inflow Area = 2.400 ac, 25.09% Impervious, Inflow Depth = 3.45" for 25-yr event
Inflow = 4.96 cfs @ 12.51 hrs, Volume= 0.691 af
Outflow = 4.46 cfs @ 12.68 hrs, Volume= 0.691 af, Atten= 10%, Lag= 9.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.18 fps, Min. Travel Time= 13.9 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 58.3 min

Peak Storage= 3,724 cf @ 12.68 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 1.00' Flow Area= 90.0 sf, Capacity= 31.58 cfs

70.00' x 1.00' deep channel, n= 0.800
Side Slope Z-value= 20.0 '/' Top Width= 110.00'
Length= 150.0' Slope= 0.0467 '/'
Inlet Invert= 90.00', Outlet Invert= 83.00'

‡

Summary for Reach R1A:

[62] Hint: Exceeded Reach R1B OUTLET depth by 0.48' @ 12.61 hrs
[62] Hint: Exceeded Reach R1J OUTLET depth by 1.05' @ 14.14 hrs

Inflow Area = 85.504 ac, 13.25% Impervious, Inflow Depth > 3.31" for 25-yr event
Inflow = 56.55 cfs @ 13.20 hrs, Volume= 23.602 af
Outflow = 56.53 cfs @ 13.24 hrs, Volume= 23.597 af, Atten= 0%, Lag= 2.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.39 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.69 fps, Avg. Travel Time= 8.5 min

Peak Storage= 11,086 cf @ 13.24 hrs
Average Depth at Peak Storage= 1.88'
Bank-Full Depth= 4.00' Flow Area= 36.0 sf, Capacity= 230.46 cfs

5.00' x 4.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 860.0' Slope= 0.0058 '/'
Inlet Invert= 59.00', Outlet Invert= 54.00'

Summary for Reach R1B:

[62] Hint: Exceeded Reach R1K OUTLET depth by 0.15' @ 14.17 hrs

Inflow Area = 72.816 ac, 10.02% Impervious, Inflow Depth > 3.25" for 25-yr event
Inflow = 47.62 cfs @ 13.67 hrs, Volume= 19.712 af
Outflow = 47.55 cfs @ 13.74 hrs, Volume= 19.707 af, Atten= 0%, Lag= 4.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.07 fps, Min. Travel Time= 5.4 min
Avg. Velocity = 2.13 fps, Avg. Travel Time= 12.9 min

Peak Storage= 15,397 cf @ 13.74 hrs
Average Depth at Peak Storage= 1.91'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 51.80 cfs

3.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 1,640.0' Slope= 0.0090 '/'
Inlet Invert= 73.80', Outlet Invert= 59.00'

Summary for Reach R1D:

[61] Hint: Exceeded Reach RIE outlet invert by 1.07' @ 13.14 hrs

Inflow Area = 45.647 ac, 9.71% Impervious, Inflow Depth = 3.22" for 25-yr event
Inflow = 50.89 cfs @ 13.10 hrs, Volume= 12.248 af
Outflow = 50.80 cfs @ 13.14 hrs, Volume= 12.248 af, Atten= 0%, Lag= 2.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.17 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 12.9 min

Peak Storage= 11,330 cf @ 13.14 hrs
Average Depth at Peak Storage= 1.07'
Bank-Full Depth= 3.00' Flow Area= 180.0 sf, Capacity= 371.57 cfs

30.00' x 3.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 260.0' Slope= 0.0077 '/'
Inlet Invert= 80.00', Outlet Invert= 78.00'

‡

Summary for Reach R1F:

[62] Hint: Exceeded Reach LS 10R OUTLET depth by 0.34' @ 12.90 hrs
[61] Hint: Exceeded Reach R1G outlet invert by 1.44' @ 12.84 hrs

Inflow Area = 26.865 ac, 9.39% Impervious, Inflow Depth = 3.18" for 25-yr event
Inflow = 28.53 cfs @ 12.83 hrs, Volume= 7.113 af
Outflow = 28.52 cfs @ 12.84 hrs, Volume= 7.113 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.77 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 2.7 min

Peak Storage= 1,383 cf @ 12.84 hrs
Average Depth at Peak Storage= 1.44'
Bank-Full Depth= 1.50' Flow Area= 5.3 sf, Capacity= 30.96 cfs

2.00' x 1.50' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 5.00'
Length= 280.0' Slope= 0.0179 '/'
Inlet Invert= 88.00', Outlet Invert= 83.00'

Summary for Reach R1G:

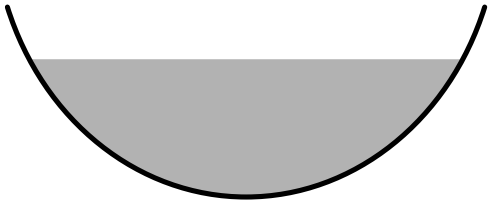
[62] Hint: Exceeded Reach LS 1R OUTLET depth by 2.06' @ 12.91 hrs
[62] Hint: Exceeded Reach LS 2R OUTLET depth by 1.39' @ 13.18 hrs
[62] Hint: Exceeded Reach LS 9R OUTLET depth by 0.55' @ 12.92 hrs
[62] Hint: Exceeded Reach R1H OUTLET depth by 0.50' @ 12.50 hrs

Inflow Area = 24.994 ac, 8.07% Impervious, Inflow Depth = 3.15" for 25-yr event
Inflow = 27.36 cfs @ 12.85 hrs, Volume= 6.559 af
Outflow = 27.35 cfs @ 12.86 hrs, Volume= 6.559 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.77 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 4.3 min

Peak Storage= 2,173 cf @ 12.86 hrs
Average Depth at Peak Storage= 2.17'
Bank-Full Depth= 3.00' Flow Area= 16.0 sf, Capacity= 52.87 cfs

8.00' x 3.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 220.0' Slope= 0.0136 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Summary for Reach R1H:

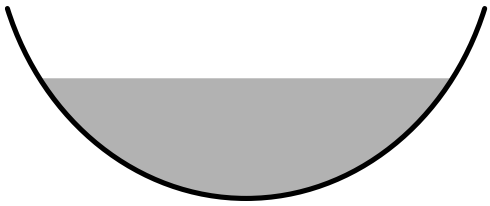
[62] Hint: Exceeded Reach LS 8R OUTLET depth by 1.80' @ 13.11 hrs
[62] Hint: Exceeded Reach R1I OUTLET depth by 0.40' @ 12.22 hrs

Inflow Area = 17.211 ac, 6.20% Impervious, Inflow Depth = 3.06" for 25-yr event
Inflow = 18.55 cfs @ 13.06 hrs, Volume= 4.391 af
Outflow = 18.55 cfs @ 13.08 hrs, Volume= 4.391 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.31 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 3.5 min

Peak Storage= 1,444 cf @ 13.08 hrs
Average Depth at Peak Storage= 1.89'
Bank-Full Depth= 3.00' Flow Area= 16.0 sf, Capacity= 47.72 cfs

8.00' x 3.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 180.0' Slope= 0.0111 '/'
Inlet Invert= 93.00', Outlet Invert= 91.00'



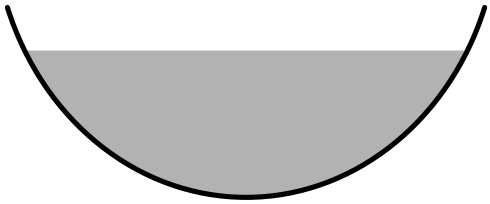
Summary for Reach R1I:

Inflow Area = 14.667 ac, 2.45% Impervious, Inflow Depth = 2.96" for 25-yr event
Inflow = 17.27 cfs @ 13.06 hrs, Volume= 3.624 af
Outflow = 17.25 cfs @ 13.10 hrs, Volume= 3.624 af, Atten= 0%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.59 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 6.4 min

Peak Storage= 2,609 cf @ 13.10 hrs
Average Depth at Peak Storage= 2.32'
Bank-Full Depth= 3.00' Flow Area= 16.0 sf, Capacity= 29.22 cfs

8.00' x 3.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 240.0' Slope= 0.0042 '/'
Inlet Invert= 94.00', Outlet Invert= 93.00'



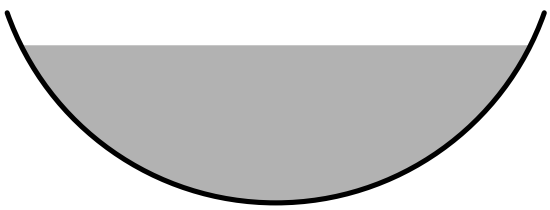
Summary for Reach R1J:

Inflow Area = 12.688 ac, 31.77% Impervious, Inflow Depth > 3.68" for 25-yr event
Inflow = 28.75 cfs @ 12.66 hrs, Volume= 3.895 af
Outflow = 28.73 cfs @ 12.67 hrs, Volume= 3.894 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.76 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 4.0 min

Peak Storage= 1,811 cf @ 12.67 hrs
Average Depth at Peak Storage= 1.66'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 42.31 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 300.0' Slope= 0.0567 '/'
Inlet Invert= 76.00', Outlet Invert= 59.00'



Summary for Reach R1K:

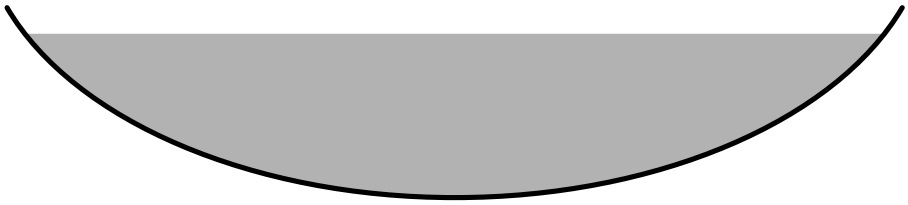
[62] Hint: Exceeded Reach LS 16R OUTLET depth by 9.73' @ 12.99 hrs
[62] Hint: Exceeded Reach R1P OUTLET depth by 9.03' @ 8.87 hrs

Inflow Area = 9.766 ac, 8.42% Impervious, Inflow Depth = 3.24" for 25-yr event
Inflow = 12.25 cfs @ 12.90 hrs, Volume= 2.635 af
Outflow = 12.25 cfs @ 12.91 hrs, Volume= 2.635 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.59 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 1.3 min

Peak Storage= 294 cf @ 12.91 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 1.00' Flow Area= 3.3 sf, Capacity= 16.76 cfs

5.00' x 1.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 110.0' Slope= 0.1091 '/'
Inlet Invert= 87.00', Outlet Invert= 75.00'



Summary for Reach R1L:

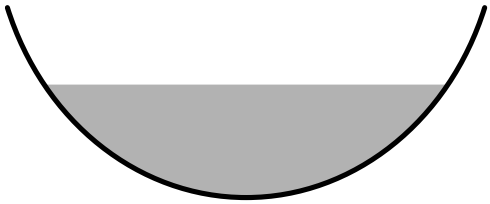
[62] Hint: Exceeded Reach LS 15R OUTLET depth by 0.59' @ 12.60 hrs
[62] Hint: Exceeded Reach R1M OUTLET depth by 0.01' @ 26.16 hrs

Inflow Area = 4.011 ac, 33.72% Impervious, Inflow Depth = 4.00" for 25-yr event
Inflow = 8.13 cfs @ 12.48 hrs, Volume= 1.338 af
Outflow = 8.06 cfs @ 12.53 hrs, Volume= 1.338 af, Atten= 1%, Lag= 3.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.10 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 19.6 min

Peak Storage= 2,707 cf @ 12.53 hrs
Average Depth at Peak Storage= 1.78'
Bank-Full Depth= 3.00' Flow Area= 16.0 sf, Capacity= 23.54 cfs

8.00' x 3.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 370.0' Slope= 0.0027 '/'
Inlet Invert= 79.00', Outlet Invert= 78.00'



Summary for Reach R1M:

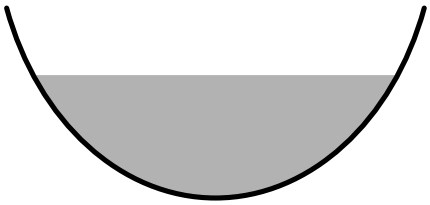
[62] Hint: Exceeded Reach LS 14R OUTLET depth by 1.25' @ 12.59 hrs
[63] Warning: Exceeded Reach R1N INLET depth by 0.10' @ 12.21 hrs

Inflow Area = 3.213 ac, 34.42% Impervious, Inflow Depth = 3.99" for 25-yr event
Inflow = 6.85 cfs @ 12.50 hrs, Volume= 1.068 af
Outflow = 6.76 cfs @ 12.55 hrs, Volume= 1.068 af, Atten= 1%, Lag= 3.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.93 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.26 fps, Avg. Travel Time= 17.0 min

Peak Storage= 1,964 cf @ 12.55 hrs
Average Depth at Peak Storage= 1.94'
Bank-Full Depth= 3.00' Flow Area= 14.0 sf, Capacity= 16.43 cfs

7.00' x 3.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 270.0' Slope= 0.0019 '/'
Inlet Invert= 79.50', Outlet Invert= 79.00'



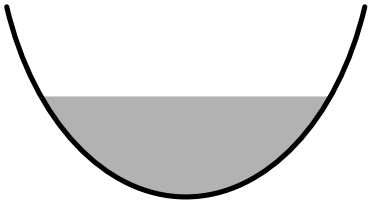
Summary for Reach R1N:

Inflow Area = 2.071 ac, 38.17% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 5.15 cfs @ 12.55 hrs, Volume= 0.720 af
Outflow = 5.13 cfs @ 12.57 hrs, Volume= 0.720 af, Atten= 0%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.11 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.32 fps, Avg. Travel Time= 7.3 min

Peak Storage= 645 cf @ 12.57 hrs
Average Depth at Peak Storage= 1.59'
Bank-Full Depth= 3.00' Flow Area= 12.0 sf, Capacity= 18.62 cfs

6.00' x 3.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 140.0' Slope= 0.0036 '/'
Inlet Invert= 80.00', Outlet Invert= 79.50'



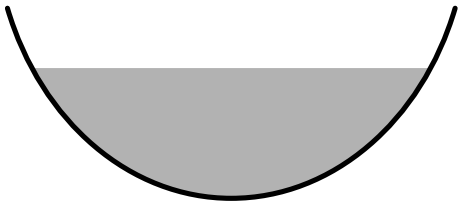
Summary for Reach R1P:

Inflow Area = 8.187 ac, 4.37% Impervious, Inflow Depth = 3.16" for 25-yr event
Inflow = 11.07 cfs @ 12.95 hrs, Volume= 2.154 af
Outflow = 11.05 cfs @ 12.97 hrs, Volume= 2.154 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.92 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 5.9 min

Peak Storage= 1,588 cf @ 12.97 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 2.00' Flow Area= 6.7 sf, Capacity= 23.92 cfs

5.00' x 2.00' deep Parabolic Channel, n= 0.070 Sluggish weedy reaches w/pools
Length= 420.0' Slope= 0.0286 '/'
Inlet Invert= 90.00', Outlet Invert= 78.00'



Summary for Reach R2A:

[62] Hint: Exceeded Reach R2B OUTLET depth by 0.33' @ 13.84 hrs
[61] Hint: Exceeded Reach R2E outlet invert by 0.78' @ 13.44 hrs

Inflow Area = 18.776 ac, 13.50% Impervious, Inflow Depth = 3.54" for 25-yr event
Inflow = 19.31 cfs @ 13.34 hrs, Volume= 5.537 af
Outflow = 19.14 cfs @ 13.44 hrs, Volume= 5.537 af, Atten= 1%, Lag= 6.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.14 fps, Min. Travel Time= 8.8 min
Avg. Velocity = 0.37 fps, Avg. Travel Time= 27.3 min

Peak Storage= 10,053 cf @ 13.44 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 5.00' Flow Area= 150.0 sf, Capacity= 498.29 cfs

20.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 40.00'
Length= 600.0' Slope= 0.0008 '/'
Inlet Invert= 77.00', Outlet Invert= 76.50'

‡

Summary for Reach R2B:

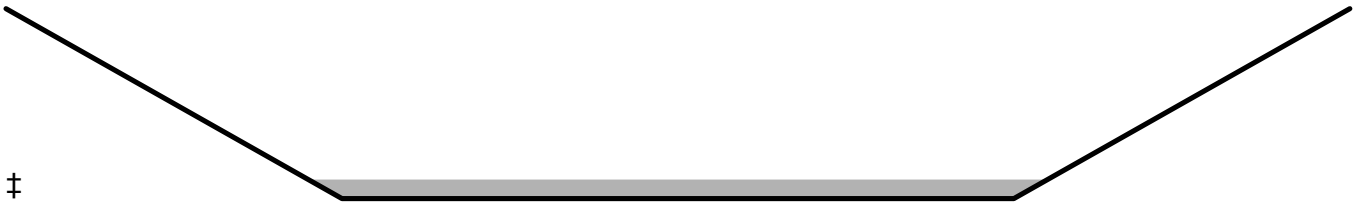
[61] Hint: Exceeded Reach R2C outlet invert by 0.50' @ 13.21 hrs

Inflow Area = 8.742 ac, 13.99% Impervious, Inflow Depth = 3.58" for 25-yr event
Inflow = 10.69 cfs @ 13.15 hrs, Volume= 2.605 af
Outflow = 10.63 cfs @ 13.21 hrs, Volume= 2.605 af, Atten= 1%, Lag= 3.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.01 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 18.1 min

Peak Storage= 3,805 cf @ 13.21 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 5.00' Flow Area= 150.0 sf, Capacity= 575.38 cfs

20.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 2.0 '/' Top Width= 40.00'
Length= 360.0' Slope= 0.0011 '/'
Inlet Invert= 77.40', Outlet Invert= 77.00'



‡

Summary for Reach R2C:

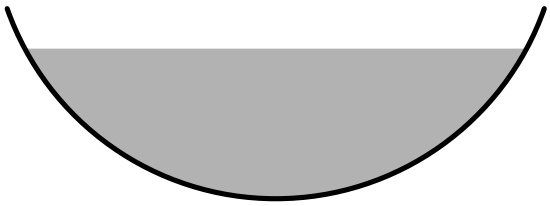
[62] Hint: Exceeded Reach R2D OUTLET depth by 0.44' @ 12.19 hrs

Inflow Area = 8.742 ac, 13.99% Impervious, Inflow Depth = 3.58" for 25-yr event
Inflow = 10.72 cfs @ 13.10 hrs, Volume= 2.605 af
Outflow = 10.69 cfs @ 13.15 hrs, Volume= 2.605 af, Atten= 0%, Lag= 2.9 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.90 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 12.4 min

Peak Storage= 2,469 cf @ 13.15 hrs
Average Depth at Peak Storage= 1.58'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 17.39 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 440.0' Slope= 0.0195 '/'
Inlet Invert= 86.00', Outlet Invert= 77.40'



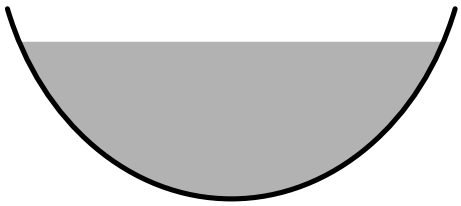
Summary for Reach R2D:

Inflow Area = 7.602 ac, 8.97% Impervious, Inflow Depth = 3.44" for 25-yr event
Inflow = 10.23 cfs @ 13.04 hrs, Volume= 2.178 af
Outflow = 10.13 cfs @ 13.12 hrs, Volume= 2.178 af, Atten= 1%, Lag= 4.6 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.02 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 20.8 min

Peak Storage= 3,858 cf @ 13.12 hrs
Average Depth at Peak Storage= 1.65'
Bank-Full Depth= 2.00' Flow Area= 6.7 sf, Capacity= 14.93 cfs

5.00' x 2.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 770.0' Slope= 0.0227 '/'
Inlet Invert= 103.50', Outlet Invert= 86.00'



Summary for Reach R2E:

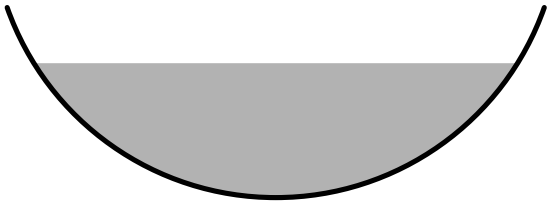
[62] Hint: Exceeded Reach LS 5R OUTLET depth by 3.34' @ 13.58 hrs
[62] Hint: Exceeded Reach R2F OUTLET depth by 0.45' @ 12.20 hrs

Inflow Area = 10.034 ac, 13.08% Impervious, Inflow Depth = 3.51" for 25-yr event
Inflow = 9.37 cfs @ 13.52 hrs, Volume= 2.932 af
Outflow = 9.33 cfs @ 13.57 hrs, Volume= 2.932 af, Atten= 0%, Lag= 3.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.96 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 13.8 min

Peak Storage= 2,613 cf @ 13.57 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 19.13 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 550.0' Slope= 0.0236 '/'
Inlet Invert= 90.00', Outlet Invert= 77.00'



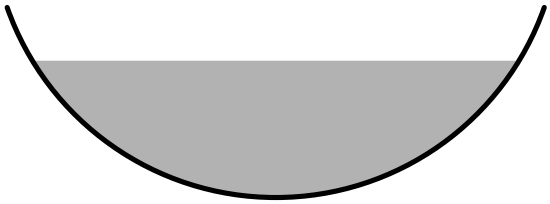
Summary for Reach R2F:

Inflow Area = 8.846 ac, 9.44% Impervious, Inflow Depth = 3.39" for 25-yr event
Inflow = 8.92 cfs @ 13.50 hrs, Volume= 2.498 af
Outflow = 8.91 cfs @ 13.52 hrs, Volume= 2.498 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.83 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 5.6 min

Peak Storage= 976 cf @ 13.52 hrs
Average Depth at Peak Storage= 1.44'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 17.60 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 200.0' Slope= 0.0200 '/'
Inlet Invert= 94.00', Outlet Invert= 90.00'



Summary for Reach R2G:

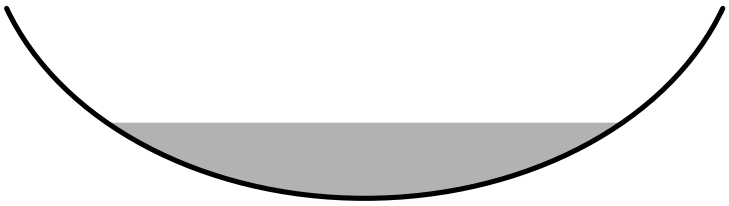
[62] Hint: Exceeded Reach LS 18R OUTLET depth by 0.22' @ 12.40 hrs

Inflow Area = 0.227 ac, 54.00% Impervious, Inflow Depth = 4.71" for 25-yr event
Inflow = 0.78 cfs @ 12.18 hrs, Volume= 0.089 af
Outflow = 0.67 cfs @ 12.31 hrs, Volume= 0.089 af, Atten= 13%, Lag= 7.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.00 fps, Min. Travel Time= 9.1 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 33.1 min

Peak Storage= 368 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.00' Flow Area= 2.7 sf, Capacity= 4.71 cfs

4.00' x 1.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 550.0' Slope= 0.0291 '/'
Inlet Invert= 111.00', Outlet Invert= 95.00'



Summary for Reach R2H:

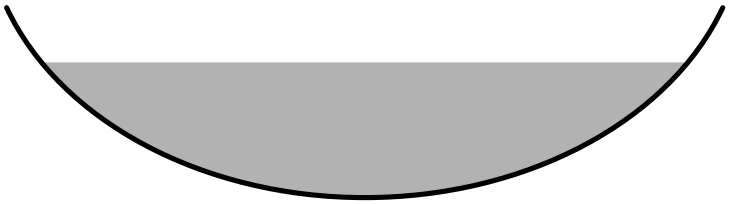
[62] Hint: Exceeded Reach LS 19R OUTLET depth by 0.47' @ 12.44 hrs

Inflow Area = 0.786 ac, 33.91% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 2.12 cfs @ 12.27 hrs, Volume= 0.273 af
Outflow = 1.96 cfs @ 12.39 hrs, Volume= 0.273 af, Atten= 8%, Lag= 7.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.22 fps, Min. Travel Time= 7.8 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 28.3 min

Peak Storage= 911 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.71'
Bank-Full Depth= 1.00' Flow Area= 2.7 sf, Capacity= 4.00 cfs

4.00' x 1.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 570.0' Slope= 0.0211 '/'
Inlet Invert= 117.00', Outlet Invert= 105.00'



Summary for Reach R30:

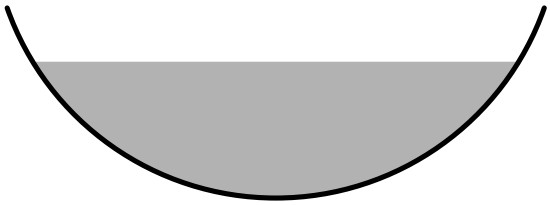
[62] Hint: Exceeded Reach R30A OUTLET depth by 0.02' @ 7.85 hrs
[62] Hint: Exceeded Reach R30B OUTLET depth by 1.21' @ 13.18 hrs

Inflow Area = 9.028 ac, 5.09% Impervious, Inflow Depth = 3.25" for 25-yr event
Inflow = 10.44 cfs @ 13.12 hrs, Volume= 2.445 af
Outflow = 10.43 cfs @ 13.14 hrs, Volume= 2.445 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.15 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 9.2 min

Peak Storage= 1,748 cf @ 13.14 hrs
Average Depth at Peak Storage= 1.43'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 20.74 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 360.0' Slope= 0.0278 '/'
Inlet Invert= 90.00', Outlet Invert= 80.00'



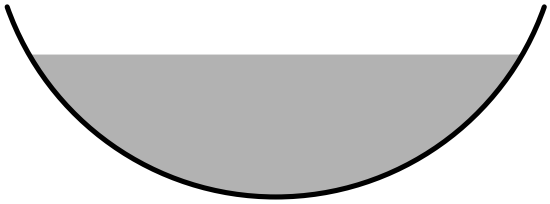
Summary for Reach R30A:

Inflow Area = 8.690 ac, 3.94% Impervious, Inflow Depth = 3.21" for 25-yr event
Inflow = 10.21 cfs @ 13.11 hrs, Volume= 2.328 af
Outflow = 10.21 cfs @ 13.12 hrs, Volume= 2.328 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.97 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 5.0 min

Peak Storage= 933 cf @ 13.12 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 18.55 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 180.0' Slope= 0.0222 '/'
Inlet Invert= 94.00', Outlet Invert= 90.00'



Summary for Reach R30B:

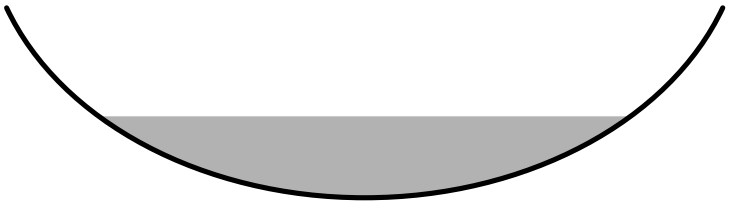
[62] Hint: Exceeded Reach LS-6R OUTLET depth by 0.24' @ 12.24 hrs

Inflow Area = 0.338 ac, 34.62% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 0.92 cfs @ 12.21 hrs, Volume= 0.118 af
Outflow = 0.92 cfs @ 12.22 hrs, Volume= 0.118 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.23 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 5.1 min

Peak Storage= 75 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.00' Flow Area= 2.7 sf, Capacity= 5.52 cfs

4.00' x 1.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 100.0' Slope= 0.0400 '/'
Inlet Invert= 94.00', Outlet Invert= 90.00'



Summary for Reach R30C:

[61] Hint: Exceeded Reach LS-7R outlet invert by 0.22' @ 12.70 hrs

Inflow Area = 2.400 ac, 25.09% Impervious, Inflow Depth = 3.45" for 25-yr event
Inflow = 4.46 cfs @ 12.68 hrs, Volume= 0.691 af
Outflow = 4.44 cfs @ 12.70 hrs, Volume= 0.691 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.81 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.22 fps, Avg. Travel Time= 8.5 min

Peak Storage= 604 cf @ 12.70 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 40.0 sf, Capacity= 74.87 cfs

20.00' x 1.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 20.0 '/' Top Width= 60.00'
Length= 110.0' Slope= 0.0273 '/'
Inlet Invert= 83.00', Outlet Invert= 80.00'

‡

Summary for Reach R31:

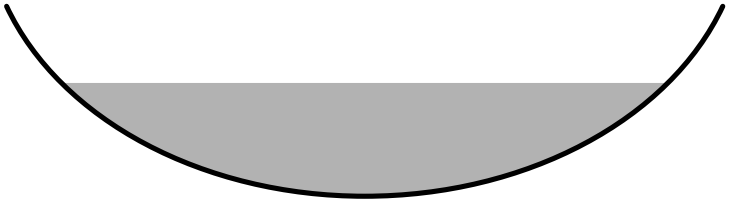
[62] Hint: Exceeded Reach LS-17R OUTLET depth by 0.32' @ 12.36 hrs

Inflow Area = 0.616 ac, 33.23% Impervious, Inflow Depth = 3.96" for 25-yr event
Inflow = 1.82 cfs @ 12.18 hrs, Volume= 0.203 af
Outflow = 1.65 cfs @ 12.28 hrs, Volume= 0.203 af, Atten= 9%, Lag= 6.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.34 fps, Min. Travel Time= 6.7 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 25.8 min

Peak Storage= 662 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.60'
Bank-Full Depth= 1.00' Flow Area= 2.7 sf, Capacity= 4.89 cfs

4.00' x 1.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 540.0' Slope= 0.0315 '/'
Inlet Invert= 113.00', Outlet Invert= 96.00'



Summary for Reach RIE:

Inflow Area = 43.640 ac, 9.07% Impervious, Inflow Depth = 3.20" for 25-yr event
Inflow = 48.34 cfs @ 13.10 hrs, Volume= 11.647 af
Outflow = 48.32 cfs @ 13.12 hrs, Volume= 11.647 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.69 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 5.3 min

Peak Storage= 4,850 cf @ 13.12 hrs
Average Depth at Peak Storage= 1.90'
Bank-Full Depth= 4.00' Flow Area= 36.0 sf, Capacity= 192.45 cfs

5.00' x 4.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 370.0' Slope= 0.0041 '/'
Inlet Invert= 81.50', Outlet Invert= 80.00'

Summary for Reach SP#1: Study Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 147.501 ac, 9.26% Impervious, Inflow Depth > 3.21" for 25-yr event
Inflow = 105.12 cfs @ 13.72 hrs, Volume= 39.410 af
Outflow = 105.12 cfs @ 13.72 hrs, Volume= 39.410 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2

Summary for Reach SP#2: Study Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 266.570 ac, 1.16% Impervious, Inflow Depth = 3.46" for 25-yr event
Inflow = 207.15 cfs @ 14.34 hrs, Volume= 76.842 af
Outflow = 207.15 cfs @ 14.34 hrs, Volume= 76.842 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2

Summary for Reach SP#3: Study Point #3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 36.204 ac, 10.87% Impervious, Inflow Depth > 3.20" for 25-yr event
Inflow = 50.90 cfs @ 12.67 hrs, Volume= 9.655 af
Outflow = 50.90 cfs @ 12.67 hrs, Volume= 9.655 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2

Summary for Pond C-1: (new Pond)

Inflow Area = 13.393 ac, 5.16% Impervious, Inflow Depth = 3.16" for 25-yr event
Inflow = 19.16 cfs @ 12.82 hrs, Volume= 3.524 af
Outflow = 16.77 cfs @ 12.90 hrs, Volume= 3.524 af, Atten= 12%, Lag= 4.3 min
Primary = 16.77 cfs @ 12.90 hrs, Volume= 3.524 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 76.95' @ 13.27 hrs Surf.Area= 13,153 sf Storage= 6,799 cf

Plug-Flow detention time= 5.5 min calculated for 3.524 af (100% of inflow)
Center-of-Mass det. time= 5.4 min (889.0 - 883.6)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	265,380 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.00	60	0	0
76.00	500	280	280
78.00	27,000	27,500	27,780
80.00	42,800	69,800	97,580
82.00	60,000	102,800	200,380
83.00	70,000	65,000	265,380

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	**36.0" W x 36.0" H Box Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.00' / 74.80' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.00 sf
#2	Primary	82.00'	**50.0' long x 20.0' 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=16.77 cfs @ 12.90 hrs HW=76.84' TW=75.92' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 16.77 cfs @ 3.04 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond C-2: CULVERT

[62] Hint: Exceeded Reach R1F OUTLET depth by 2.65' @ 13.16 hrs

Inflow Area = 43.640 ac, 9.07% Impervious, Inflow Depth = 3.21" for 25-yr event
Inflow = 49.15 cfs @ 12.99 hrs, Volume= 11.664 af
Outflow = 48.34 cfs @ 13.10 hrs, Volume= 11.647 af, Atten= 2%, Lag= 6.6 min
Primary = 48.34 cfs @ 13.10 hrs, Volume= 11.647 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 87.04' @ 13.10 hrs Surf.Area= 8,857 sf Storage= 15,041 cf

Plug-Flow detention time= 6.2 min calculated for 11.647 af (100% of inflow)
Center-of-Mass det. time= 5.0 min (895.5 - 890.5)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	235,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	100	0	0
84.00	1,400	750	750
86.00	5,450	6,850	7,600
88.00	12,000	17,450	25,050
90.00	26,000	38,000	63,050
92.00	64,000	90,000	153,050
93.00	100,000	82,000	235,050

Device	Routing	Invert	Outlet Devices
#1	Primary	84.00'	**48.0" Round Culvert w/ 12.0" inside fill** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 83.00' / 81.50' S= 0.0214 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 10.11 sf
#2	Primary	92.00'	**50.0' long x 20.0' 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=48.34 cfs @ 13.10 hrs HW=87.04' TW=83.40' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 48.34 cfs @ 4.78 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond C-3: CULVERT

Inflow Area = 14.667 ac, 2.45% Impervious, Inflow Depth = 2.96" for 25-yr event
Inflow = 17.37 cfs @ 13.02 hrs, Volume= 3.624 af
Outflow = 17.27 cfs @ 13.06 hrs, Volume= 3.624 af, Atten= 1%, Lag= 2.5 min
Primary = 17.27 cfs @ 13.06 hrs, Volume= 3.624 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.48' @ 13.07 hrs Surf.Area= 3,020 sf Storage= 2,389 cf

Plug-Flow detention time= 2.0 min calculated for 3.624 af (100% of inflow)
Center-of-Mass det. time= 1.9 min (901.7 - 899.8)

Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	57,200 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.00	200	0	0
98.00	4,000	4,200	4,200
100.00	12,000	16,000	20,200
102.00	25,000	37,000	57,200

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**48.0" Round Culvert w/ 12.0" inside fill** L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.00' / 94.00' S= 0.0182 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 10.11 sf

#2	Primary	101.52'	**50.0' long x 20.0' 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=17.27 cfs @ 13.06 hrs HW=97.48' TW=96.32' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 17.27 cfs @ 3.01 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond C-4: CULVERT

[62] Hint: Exceeded Reach R31 OUTLET depth by 0.92' @ 13.13 hrs

Inflow Area = 8.690 ac, 3.94% Impervious, Inflow Depth = 3.21" for 25-yr event
Inflow = 10.22 cfs @ 13.11 hrs, Volume= 2.328 af
Outflow = 10.21 cfs @ 13.11 hrs, Volume= 2.328 af, Atten= 0%, Lag= 0.3 min
Primary = 10.21 cfs @ 13.11 hrs, Volume= 2.328 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.24' @ 13.11 hrs Surf.Area= 345 sf Storage= 322 cf

Plug-Flow detention time= 0.7 min calculated for 2.328 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (897.7 - 897.0)

Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	6,100 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.00	175	0	0
98.00	450	625	625
100.00	850	1,300	1,925
102.00	3,325	4,175	6,100

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.00' / 94.00' S= 0.0182 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf
#2	Primary	101.87'	**50.0' long x 20.0' 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=10.21 cfs @ 13.11 hrs HW=97.24' TW=95.50' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 10.21 cfs @ 2.84 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond C-5: CULVERT

[62] Hint: Exceeded Reach R2G OUTLET depth by 1.95' @ 13.51 hrs

Inflow Area =	8.846 ac,	9.44% Impervious,	Inflow Depth =	3.39"	for 25-yr event
Inflow =	8.93 cfs @	13.49 hrs,	Volume=	2.498 af	
Outflow =	8.92 cfs @	13.50 hrs,	Volume=	2.498 af,	Atten= 0%, Lag= 0.5 min
Primary =	8.92 cfs @	13.50 hrs,	Volume=	2.498 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.13' @ 13.50 hrs Surf.Area= 332 sf Storage= 215 cf

Plug-Flow detention time= 0.4 min calculated for 2.498 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (924.3 - 923.9)

Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	48,150 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.00	50	0	0
98.00	550	600	600
100.00	11,000	11,550	12,150
102.00	25,000	36,000	48,150

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.00' / 93.00' S= 0.0364 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf
#2	Primary	99.97'	**50.0' long x 20.0' 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=8.92 cfs @ 13.50 hrs HW=97.13' TW=95.44' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.92 cfs @ 2.71 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond C-6: CULVERT

[62] Hint: Exceeded Reach R2H OUTLET depth by 1.30' @ 13.15 hrs

Inflow Area =	7.602 ac,	8.97% Impervious,	Inflow Depth =	3.44"	for 25-yr event
Inflow =	10.67 cfs @	12.88 hrs,	Volume=	2.178 af	
Outflow =	10.23 cfs @	13.04 hrs,	Volume=	2.178 af,	Atten= 4%, Lag= 9.6 min
Primary =	10.23 cfs @	13.04 hrs,	Volume=	2.178 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 106.74' @ 13.04 hrs Surf.Area= 6,954 sf Storage= 5,095 cf

Plug-Flow detention time= 6.8 min calculated for 2.178 af (100% of inflow)

Center-of-Mass det. time= 6.8 min (889.7 - 882.9)

Volume	Invert	Avail.Storage	Storage Description
#1	105.50'	54,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.50	200	0	0
106.00	4,000	1,050	1,050
108.00	12,000	16,000	17,050
110.00	25,000	37,000	54,050

Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	**36.0" Round Culvert w/ 12.0" inside fill** L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 104.50' / 103.50' S= 0.0182 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf
#2	Primary	109.29'	**50.0' long x 20.0' 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=10.23 cfs @ 13.04 hrs HW=106.74' TW=105.15' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 10.23 cfs @ 2.85 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond C-7: CULVERT

Inflow Area = 8.187 ac, 4.37% Impervious, Inflow Depth = 3.16" for 25-yr event
Inflow = 11.07 cfs @ 12.95 hrs, Volume= 2.154 af
Outflow = 11.07 cfs @ 12.95 hrs, Volume= 2.154 af, Atten= 0%, Lag= 0.2 min
Primary = 11.07 cfs @ 12.95 hrs, Volume= 2.154 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 94.31' @ 12.95 hrs Surf.Area= 162 sf Storage= 115 cf

Plug-Flow detention time= 0.3 min calculated for 2.154 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (889.2 - 889.0)

Volume	Invert	Avail.Storage	Storage Description
#1	93.00'	10,575 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
93.00	50	0	0
94.00	100	75	75
96.00	500	600	675
98.00	2,200	2,700	3,375
100.00	5,000	7,200	10,575

Device	Routing	Invert	Outlet Devices
#1	Primary	93.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 92.00' / 90.00' S= 0.0286 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf
#2	Primary	97.40'	**50.0' long x 20.0' 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=11.07 cfs @ 12.95 hrs HW=94.31' TW=91.37' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.07 cfs @ 2.93 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW-1: Gravel Wetland #1

Inflow Area = 12.688 ac, 31.77% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 29.66 cfs @ 12.56 hrs, Volume= 4.411 af
Outflow = 28.75 cfs @ 12.66 hrs, Volume= 3.895 af, Atten= 3%, Lag= 5.9 min
Primary = 0.04 cfs @ 12.66 hrs, Volume= 0.093 af
Secondary = 28.71 cfs @ 12.66 hrs, Volume= 3.802 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 85.16' @ 12.66 hrs Surf.Area= 18,653 sf Storage= 36,206 cf

Plug-Flow detention time= 104.8 min calculated for 3.895 af (88% of inflow)
Center-of-Mass det. time= 50.4 min (891.4 - 841.0)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	73,266 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	14,600	0	0
84.00	16,600	15,600	15,600
84.50	17,600	8,550	24,150
84.51	18,000	178	24,328
86.00	19,500	27,937	52,266
87.00	22,500	21,000	73,266

Device	Routing	Invert	Outlet Devices
#1	Primary	82.67'	**12.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.67' / 79.50' S= 0.0634 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	80.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	80.75'	**4.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 80.75' / 80.00' S= 0.0469 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#4	Device 3	83.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 82.67'

#5	Secondary	84.50'	**20.0' long x 13.0' 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) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.04 cfs @ 12.66 hrs HW=85.16' TW=77.66' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.04 cfs of 5.33 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.60 fps)
└─**3=Culvert** (Passes 0.04 cfs of 0.52 cfs potential flow)
└─**4=Exfiltration** (Passes 0.04 cfs of 6.65 cfs potential flow)

Secondary OutFlow Max=28.71 cfs @ 12.66 hrs HW=85.16' TW=77.66' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Weir Controls 28.71 cfs @ 2.18 fps)

Summary for Pond GW-2: Gravel Wetland #2

Inflow Area = 7.169 ac, 28.57% Impervious, Inflow Depth = 3.65" for 25-yr event
Inflow = 25.46 cfs @ 12.16 hrs, Volume= 2.183 af
Outflow = 13.22 cfs @ 12.40 hrs, Volume= 1.886 af, Atten= 48%, Lag= 14.5 min
Primary = 13.22 cfs @ 12.40 hrs, Volume= 1.886 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 88.84' @ 12.40 hrs Surf.Area= 14,074 sf Storage= 31,781 cf

Plug-Flow detention time= 142.3 min calculated for 1.886 af (86% of inflow)
Center-of-Mass det. time= 81.7 min (907.2 - 825.5)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	54,485 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	8,336	0	0
87.00	10,008	9,172	9,172
88.00	12,781	11,395	20,567
89.00	14,329	13,555	34,122
90.30	17,000	20,364	54,485

Device	Routing	Invert	Outlet Devices
#1	Primary	85.67'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.67' / 82.50' S= 0.0634 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	87.50'	**3.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	86.50'	**24.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.50' / 86.30' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#4	Device 1	83.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	83.75'	**4.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900

			Inlet / Outlet Invert= 83.75' / 83.00' S= 0.0094 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.09 sf
#6	Device 5	86.00'	**2.400 in/hr Exfiltration over Surface area**
			Conductivity to Groundwater Elevation = 85.67'
#7	Secondary	88.85'	**20.0' long x 13.0' 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) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=13.22 cfs @ 12.40 hrs HW=88.84' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 13.22 cfs @ 7.48 fps)
  - **2=Sharp-Crested Vee/Trap Weir** (Passes < 15.16 cfs potential flow)
    - **3=Culvert** (Passes < 13.80 cfs potential flow)
  - **4=Orifice/Grate** (Passes < 0.05 cfs potential flow)
    - **5=Culvert** (Passes < 0.37 cfs potential flow)
      - **6=Exfiltration** (Passes < 5.19 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=86.00' TW=0.00' (Dynamic Tailwater)
- **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond WET: WETLAND

Inflow Area =	63.050 ac, 10.27% Impervious, Inflow Depth = 3.26" for 25-yr event			
Inflow =	71.48 cfs @ 13.00 hrs, Volume=	17.110 af		
Outflow =	41.69 cfs @ 13.87 hrs, Volume=	17.077 af, Atten= 42%, Lag= 52.0 min		
Primary =	41.69 cfs @ 13.87 hrs, Volume=	17.077 af		

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 76.79' @ 13.84 hrs Surf.Area= 116,733 sf Storage= 237,521 cf

Plug-Flow detention time= 119.2 min calculated for 17.077 af (100% of inflow)
Center-of-Mass det. time= 117.6 min (1,015.2 - 897.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.80'	787,500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.80	10,000	0	0
74.00	65,000	7,500	7,500
76.00	85,000	150,000	157,500
78.00	165,000	250,000	407,500
80.00	215,000	380,000	787,500

Device	Routing	Invert	Outlet Devices
#1	Primary	73.80'	**48.0" W x 48.0" H Box Culvert w/ 12.0" inside fill**
			L= 70.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 72.80' / 72.50' S= 0.0043 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 12.00 sf
#2	Primary	79.00'	**50.0' long x 20.0' 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=41.69 cfs @ 13.87 hrs HW=76.79' TW=75.71' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 41.69 cfs @ 3.48 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Attachment 7

Pond Spillway Checks – 25 & 100 Year

Routing Diagram for 21-13 POST
Prepared by {enter your company name here}, Printed 8/15/2022
HydroCAD® 10.00-26 s/n 10466 © 2020 HydroCAD Software Solutions LLC

Time span=5.00-40.00 hrs, dt=0.01 hrs, 3501 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond GW-1: Gravel Wetland #1 Peak Elev=85.16' Storage=36,219 cf Inflow=29.66 cfs 4.411 af
Primary=0.00 cfs 0.000 af Secondary=28.75 cfs 3.856 af Outflow=28.75 cfs 3.856 af

Pond GW-2: Gravel Wetland #2 Peak Elev=89.27' Storage=37,993 cf Inflow=25.46 cfs 2.183 af
Primary=0.00 cfs 0.000 af Secondary=14.15 cfs 1.449 af Outflow=14.15 cfs 1.449 af

Summary for Pond GW-1: Gravel Wetland #1

Inflow Area =	12.688 ac, 31.77% Impervious, Inflow Depth = 4.17" for 25-yr event				
Inflow =	29.66 cfs @	12.56 hrs,	Volume=	4.411 af	
Outflow =	28.75 cfs @	12.66 hrs,	Volume=	3.856 af,	Atten= 3%, Lag= 5.9 min
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	
Secondary =	28.75 cfs @	12.66 hrs,	Volume=	3.856 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 85.16' @ 12.66 hrs Surf.Area= 18,653 sf Storage= 36,219 cf

Plug-Flow detention time= 96.9 min calculated for 3.855 af (87% of inflow)
Center-of-Mass det. time= 39.9 min (880.9 - 841.0)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	73,266 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	14,600	0	0
84.00	16,600	15,600	15,600
84.50	17,600	8,550	24,150
84.51	18,000	178	24,328
86.00	19,500	27,937	52,266
87.00	22,500	21,000	73,266

Device	Routing	Invert	Outlet Devices
#1	Primary	82.67'	**12.0" Round Culvert X 0.00** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.67' / 79.50' S= 0.0634 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	80.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	80.75'	**4.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 80.75' / 80.00' S= 0.0469 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#4	Device 3	83.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 82.67'
#5	Secondary	84.50'	**20.0' long x 13.0' 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) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=83.00' TW=76.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Passes 0.00 cfs of 0.02 cfs potential flow)
    └─**3=Culvert** (Passes 0.00 cfs of 0.19 cfs potential flow)
      └─**4=Exfiltration** (Passes 0.00 cfs of 0.81 cfs potential flow)

Secondary OutFlow Max=28.75 cfs @ 12.66 hrs HW=85.16' TW=77.66' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Weir Controls 28.75 cfs @ 2.18 fps)

Summary for Pond GW-2: Gravel Wetland #2

Inflow Area = 7.169 ac, 28.57% Impervious, Inflow Depth = 3.65" for 25-yr event
Inflow = 25.46 cfs @ 12.16 hrs, Volume= 2.183 af
Outflow = 14.15 cfs @ 12.38 hrs, Volume= 1.449 af, Atten= 44%, Lag= 13.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Secondary = 14.15 cfs @ 12.38 hrs, Volume= 1.449 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 89.27' @ 12.38 hrs Surf.Area= 14,874 sf Storage= 37,993 cf

Plug-Flow detention time= 178.8 min calculated for 1.449 af (66% of inflow)
Center-of-Mass det. time= 78.5 min (903.9 - 825.5)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	54,485 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	8,336	0	0
87.00	10,008	9,172	9,172
88.00	12,781	11,395	20,567
89.00	14,329	13,555	34,122
90.30	17,000	20,364	54,485

Device	Routing	Invert	Outlet Devices
#1	Primary	85.67'	**18.0" Round Culvert X 0.00** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.67' / 82.50' S= 0.0634 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	87.50'	**3.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	86.50'	**24.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.50' / 86.30' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#4	Device 1	83.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	83.75'	**4.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 83.75' / 83.00' S= 0.0094 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#6	Device 5	86.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 85.67'
#7	Secondary	88.85'	**20.0' long x 13.0' 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) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=86.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
  - **2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
    - **3=Culvert** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Passes 0.00 cfs of 0.02 cfs potential flow)
    - **5=Culvert** (Passes 0.00 cfs of 0.12 cfs potential flow)
      - **6=Exfiltration** (Passes 0.00 cfs of 0.46 cfs potential flow)

Secondary OutFlow Max=14.14 cfs @ 12.38 hrs HW=89.27' TW=0.00' (Dynamic Tailwater)
- **7=Broad-Crested Rectangular Weir** (Weir Controls 14.14 cfs @ 1.70 fps)

Routing Diagram for 21-13 POST
Prepared by {enter your company name here}, Printed 8/15/2022
HydroCAD® 10.00-26 s/n 10466 © 2020 HydroCAD Software Solutions LLC

Time span=5.00-40.00 hrs, dt=0.01 hrs, 3501 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond GW-1: Gravel Wetland #1 Peak Elev=85.39' Storage=40,570 cf Inflow=45.78 cfs 6.901 af
Primary=0.00 cfs 0.000 af Secondary=44.64 cfs 6.346 af Outflow=44.64 cfs 6.346 af

Pond GW-2: Gravel Wetland #2 Peak Elev=89.62' Storage=43,418 cf Inflow=40.89 cfs 3.537 af
Primary=0.00 cfs 0.000 af Secondary=36.10 cfs 2.802 af Outflow=36.10 cfs 2.802 af

Summary for Pond GW-1: Gravel Wetland #1

Inflow Area =	12.688 ac,	31.77% Impervious,	Inflow Depth >	6.53"	for 100-yr event
Inflow =	45.78 cfs @	12.55 hrs,	Volume=	6.901 af	
Outflow =	44.64 cfs @	12.64 hrs,	Volume=	6.346 af,	Atten= 2%, Lag= 4.9 min
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	
Secondary =	44.64 cfs @	12.64 hrs,	Volume=	6.346 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 85.39' @ 12.64 hrs Surf.Area= 18,887 sf Storage= 40,570 cf

Plug-Flow detention time= 74.1 min calculated for 6.344 af (92% of inflow)
Center-of-Mass det. time= 32.9 min (861.4 - 828.5)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	73,266 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	14,600	0	0
84.00	16,600	15,600	15,600
84.50	17,600	8,550	24,150
84.51	18,000	178	24,328
86.00	19,500	27,937	52,266
87.00	22,500	21,000	73,266

Device	Routing	Invert	Outlet Devices
#1	Primary	82.67'	**12.0" Round Culvert X 0.00** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.67' / 79.50' S= 0.0634 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	80.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	80.75'	**4.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 80.75' / 80.00' S= 0.0469 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#4	Device 3	83.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 82.67'
#5	Secondary	84.50'	**20.0' long x 13.0' 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) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=83.00' TW=76.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Passes 0.00 cfs of 0.02 cfs potential flow)
    └─**3=Culvert** (Passes 0.00 cfs of 0.19 cfs potential flow)
      └─**4=Exfiltration** (Passes 0.00 cfs of 0.81 cfs potential flow)

Secondary OutFlow Max=44.64 cfs @ 12.64 hrs HW=85.39' TW=78.05' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Weir Controls 44.64 cfs @ 2.51 fps)

Summary for Pond GW-2: Gravel Wetland #2

Inflow Area =	7.169 ac, 28.57% Impervious, Inflow Depth = 5.92" for 100-yr event				
Inflow =	40.89 cfs @	12.16 hrs,	Volume=	3.537 af	
Outflow =	36.10 cfs @	12.22 hrs,	Volume=	2.802 af,	Atten= 12%, Lag= 3.9 min
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	
Secondary =	36.10 cfs @	12.22 hrs,	Volume=	2.802 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 89.62' @ 12.22 hrs Surf.Area= 15,605 sf Storage= 43,418 cf

Plug-Flow detention time= 129.4 min calculated for 2.802 af (79% of inflow)
Center-of-Mass det. time= 51.6 min (863.3 - 811.8)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	54,485 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	8,336	0	0
87.00	10,008	9,172	9,172
88.00	12,781	11,395	20,567
89.00	14,329	13,555	34,122
90.30	17,000	20,364	54,485

Device	Routing	Invert	Outlet Devices
#1	Primary	85.67'	**18.0" Round Culvert X 0.00** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.67' / 82.50' S= 0.0634 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	87.50'	**3.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 2	86.50'	**24.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.50' / 86.30' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#4	Device 1	83.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	83.75'	**4.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 83.75' / 83.00' S= 0.0094 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#6	Device 5	86.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 85.67'
#7	Secondary	88.85'	**20.0' long x 13.0' 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) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=86.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
  - **2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
    - **3=Culvert** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Passes 0.00 cfs of 0.02 cfs potential flow)
    - **5=Culvert** (Passes 0.00 cfs of 0.12 cfs potential flow)
      - **6=Exfiltration** (Passes 0.00 cfs of 0.46 cfs potential flow)

Secondary OutFlow Max=36.08 cfs @ 12.22 hrs HW=89.62' TW=0.00' (Dynamic Tailwater)
- **7=Broad-Crested Rectangular Weir** (Weir Controls 36.08 cfs @ 2.34 fps)

Attachment 8

Maintenance & Inspection of Stormwater Facilities

Pineland
Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland
565 Congress Street, Suite 201
Portland, ME 04101

HIDDEN HILLS MHP
BIDDEFORD, MAINE
STORMWATER MANAGEMENT SYSTEM INSEPCTION & MAINTENANCE PLAN

Project Owner/Developer: South Street Village, LLC
762 Main Street
South Portland, ME 04106

Responsible Party: Homeowners Association or General Contractor
TBD

Prepared By: Jeffery Amos, P.E.
Terradyn Consultants, LLC
41 Campus Drive, Suite 101
New Gloucester, Maine 04260
(207) 926-5111

INTRODUCTION:

Regular inspection and maintenance of the entire stormwater management system is crucial to the long-term effectiveness of the system. The responsible party must provide regular inspection and maintenance of all permanent erosion control measures and stormwater management structures, establish any contract services required to implement the program, and keep records and a maintenance log book of inspection and maintenance activities. At a minimum, the inspection and maintenance activities outlined herein should be performed at the recommended intervals.

All measures must be maintained in effective operating condition. A person with knowledge of erosion and sedimentation practices, stormwater management, and the standards and conditions of all local, state and federal permits for the project shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected.

INSPECTION TASKS

1. Inspect **vegetated areas**, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

2. Inspect **ditches, swales and other open stormwater channels** in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.

3. Inspect **culverts** in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

4. Inspect **Roof Drain Filter Strip** semi-annually and following major storm events. Debris and sediment buildup shall be removed as needed. Area should be weeded as necessary.

5. Inspect **grassed underdrained soil filter** semi-annually and following major storm events. Debris and sediment buildup shall be removed from the forebay and basin as needed. Mowing of grassed basin can occur semi-annually to a height of no less than 6-inches. Any bare area or erosion rills shall be repaired with new filter media or sandy loam then seeded and mulched. Maintaining good grass cover will minimize clogging with fine sediments and if ponding exceeds 48 hours, the top of the filter bed must be rototilled to reestablish the soil's filtration capacity.

6. Inspect and clean out **catch basins**. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).

7. Inspect **resource and treatment buffers** once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader or turnout lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.

Recertification requirement:

Within three months of the expiration of each five-year interval from the date of issuance of the permit, the permittee shall certify the following to the Department.

(a) All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.

(b) All aspects of the stormwater control system are operating as approved, have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system, as necessary.

(c) The stormwater maintenance plan for the site is being implemented as approved by the Department, and the maintenance log is being maintained.

(d) All proprietary systems have been maintained according to the manufacturer's recommendations. Where required by the Department, the permittee shall execute a 5-year maintenance contract with a qualified professional for the coming 5-year interval. The maintenance contract must include provisions for routine inspections, cleaning and general maintenance.

(e) The Department may waive some or all of these recertification requirements on a case-by-case basis for permittees subject to the Department's Multi-Sector General Permit ("MSGP") and/or Maine Pollutant Discharge Elimination System ("MEPDES") programs where it is demonstrated that these programs are providing stormwater control that is at least as effective as required pursuant to this Chapter.

Conveyance & Distribution Systems: (Stormwater Channels & Culverts, etc.)

1. Inspection schedule:

a. Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains (one inch of rain in 24 hours) to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side-slopes.

b. Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

c. Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

2. Mowing: Grass should not be trimmed extremely short, as this will reduce the filtering effect of the swale (MPCA, 1989). The cut vegetation should be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale. The mowed height of the grass should be 2-4 inches taller than the maximum flow depth of the design water quality storm. A minimum mow height of 6 inches is generally recommended (Galli, 1993).

3. Erosion: It is important to install erosion and sediment control measures to stabilize this area as soon as possible and to retain any organic matter in the bottom of the trench.

4. Fertilization: Routine fertilization and/or use of pesticides is strongly discouraged. If complete re-seeding is necessary, half the original recommended rate of fertilizer should be applied with a full rate of seed.

5. Sediment Removal: The level of sediment deposition in the channel should be monitored regularly, and removed from grassed channels before permanent damage is done to the grassed vegetation, or if infiltration times are longer than 12 hours. Sediment should be removed from riprap channels when it reduces the capacity of the channel.

Roadway Surfaces:

Paved surfaces shall be swept or vacuumed at least once annually in the Spring to remove all Winter sand, and periodically during the year on an as-needed basis to minimize transportation of sediment during rainfall events.

Catch Basin Systems:

Catch basins are designed with a deep sump to trap larger sediment. Catch basins shall be inspected for sediment depth in the spring and fall, and accumulated sediment shall be removed and disposed of lawfully when it reaches 50% of the design capacity of the sump.

Vegetated Swales:

Mowing: Grass should not be trimmed extremely short, as this will reduce the filtering effect of the swale (MPCA, 1989). The cut vegetation should be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale. The mowed height of the grass should be 2-4 inches taller than the maximum flow depth of the design water quality storm. A minimum mow height of 6 inches is generally recommended (Galli, 1993).

Routine Maintenance and Inspection: The area should be inspected for failures following heavy rainfall (one inch of rain in 24 hours) and repaired as necessary for newly formed channels or gullies, reseeding/sodding of bare spots, removal of trash, leaves and/or accumulated sediments, the control of woody or other undesirable vegetation and to check the condition and integrity of the check dams.

Aeration: The buffer strip may require periodic mechanical aeration to restore infiltration capacity. This aeration must be done during a time when the area can be reseeded and mulched prior to any significant rainfall.

Erosion: It is important to install erosion and sediment control measures to stabilize this area as soon as possible and to retain any organic matter in the bottom of the trench.

Fertilization: Routine fertilization and/or use of pesticides is strongly discouraged. If complete re-seeding is necessary, half the original recommended rate of fertilizer should be applied with a full rate of seed.

Sediment Removal: The level of sediment deposition in the channel should be monitored regularly, and removed from grassed channels before permanent damage is done to the grassed vegetation, or if infiltration times are longer than 12 hours. Sediment should be removed from riprap channels when it reduces the capacity of the channel.

Level Lip Spreader:

Long term maintenance of the level spreader is essential to ensure its effectiveness. Spreaders constructed of wood, asphalt, stone or concrete curbing also require inspection and maintenance.

1. **Inspections:** At least once a year and following major storms (one inch of rain in 24 hours), the level spreader pools should be inspected for sand accumulation and debris that may reduce its capacity.
2. **Sediment Removal:** Sediment build-up should be removed when it has accumulated to approximately 25% of design volume or channel capacity. Dispose of the sediments appropriately.
3. **Debris:** Remove debris such as leaf litter, branches and tree growth.
4. **Mowing:** Vegetated spreaders may require mowing.
5. **Snow Storage:** Do not store snow within the area of the level spreaders.
6. **Level Spreader Replacement:** The reconstruction of the level spreader may be necessary when sheet flow from the spreader channelize into the buffer.

Vegetated Buffers:

1. **Mowing:** Meadow buffers may be mown no more than twice per year. They may not be maintained as a lawn.

2. **Inspection Frequency:** Buffers should be inspected annually for evidence of erosion or concentrated flows through or around the buffer. All eroded areas should be repaired, seeded

and mulched. A shallow stone trench should be installed and maintained as a level spreader to distribute flows evenly in any area showing concentrated flows.

3. **Access and Use:** Buffers should not be traversed by all-terrain vehicles or other vehicles. Activities within buffers should be conducted so as not to damage vegetation, disturb any organic duff layer, and expose soil.

4. **Snow Storage:** Do not store snow within the buffer area.

5. **Model Maintenance Plan:** The following techniques should be followed to maintain the integrity of buffers from initial planning through post-construction (Schueler, 1994):

a. Planning Stage:
i. Require buffer limits to be present on all clearing/grading and erosion control plans

ii. Record all buffer boundaries on official maps and site plans.

iii. Clearly establish acceptable and unacceptable uses for the buffer, and include in deed restrictions and conservation easements.

iv. Establish clear vegetation targets and management rules for the buffer.

v. Provide incentives for owners protect buffers through perpetual conservation easements rather than deed restrictions.

b. Construction Stage:
i. Pre-construction stakeout of buffers to define the Limit of Disturbance (LOD). ii. Set LOD based on drip-line of the forested buffer.

iii. Conduct pre-construction meeting to familiarize contractors and foremen with LOD and buffer limit.

iv. Mark the LOD with silt fence barrier, signs or other methods to exclude construction equipment.

c. Post-Development Stage:
i. Mark buffer boundaries with permanent signs (or fences) describing allowable uses.

ii. Educate property owners/homeowner associations on the purpose, limits and allowable uses of the buffer.

iii. Conduct periodic "buffer walks" to inspect the condition of the buffer network (using volunteers, where possible).

iv. Replant unused meadow buffers with trees and shrubs, if possible.

6. **Tree Removal**: Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

   (i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25-foot by 50-foot rectangle (1,250 square feet) area, as determined by the rating scheme in Table 11:

Table 11.

Point System for Determining an Evenly

Distributed Stand of Trees

Diameter of tree at 4½ feet above ground level	**Points**
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

   (ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

DOCUMENTATION

Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. The log must be made accessible to Department of Environmental Protection staff and a copy provided to the Department upon request. The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.

The log attached at the end of this plan is from the *Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual for Designers and Engineers (May 2016)*. The log may be used or adapted for this project.

ATTACHMENTS:
Stormwater Management Facilities Inspection & Maintenance Log

Stormwater Management Facilities
Inspection & Maintenance Log
Hidden Hills MHP

General Information:

Inspected by:	Date:	Weather:

Reason for Inspection: (Regular Inspection) (Major Rain Event)

BMP	Conditions Observed	Repairs Needed?
1. Vegetated Areas		
2. Ditches, Swales, Open Channels		
3. Culverts		
4. Roof Drain Filter Strip		
5. Gravel Wetland		
6. Catch Basin		
7. Vegetated Buffers		
8. Level Lip Spreader		

Detailed Repair Notes:

BMP Type	Date	Description of Repairs & Sediment Disposal

Notes:
If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. A copy of this log shall be retained for a period of at least five years from the completion of permanent stabilization. The log must be made accessible to Department of Environmental Protection staff and a copy provided to the Department upon request.

Attachment 9

Housekeeping Plan

HIDDEN HILLS MHP
BIDDEFORD, MAINE
HOUSEKEEPING PLAN

Project Owner/Developer: South Street Village, LLC
762 Main Street
South Portland, ME 04106

Responsible Party: Homeowners Association or General Contractor
TBD

Prepared By: Jeffery Amos, P.E.
Terradyn Consultants, LLC
41 Campus Drive, Suite 101
New Gloucester, Maine 04260
(207) 926-5111

Introduction:
The contractor shall be responsible for maintaining proper housekeeping standards throughout the construction phase of the project. After the construction phase has been completed, the owner or operator of the project will be responsible.

Standards:
In accordance with the housekeeping performance standards required by MDEP chapter 500 stormwater regulations, the following standards shall be met:

1. **Spill prevention.** Controls must be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

2. **Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

3. **Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

Operations during wet months that experience tracking of mud off the site onto public roads should provide for sweeping of road areas at least once a week and prior to significant storm events. Where chronic mud tracking occurs, a stabilized construction entrance should be provided. Operations during dry months, that experience fugitive dust problems, should wet down the access roads once a week or more frequently as needed.

4. **Debris and other materials.** Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

   To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. **Trench or foundation de-watering.** Trench de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the department.

6. **Authorized Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:

(a) Discharges from firefighting activity;

(b) Fire hydrant flushings;

(c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);

(d) Dust control runoff in accordance with permit conditions and Appendix (C)(3);

(e) Routine external building washdown, not including surface paint removal, that does not involve detergents;

(f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;

(g) Uncontaminated air conditioning or compressor condensate;

(h) Uncontaminated groundwater or spring water;

(i) Foundation or footer drain-water where flows are not contaminated;

(j) Uncontaminated excavation dewatering (see requirements in Appendix C(5));

(k) Potable water sources including waterline flushings; and

(l) Landscape irrigation.

7. **Unauthorized non-stormwater discharges .** The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:

(a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;

(b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;

(c) Soaps, solvents, or detergents used in vehicle and equipment washing; and

(d) Toxic or hazardous substances from a spill or other release.

Attachment 10

Sample Buffer Restriction Language

Forms H1-3 SUGGESTED TEMPLATES FOR STORMWATER BUFFER DEED RESTRICTIONS. With some minor revisions the H-1 (Forested buffer, no disturbance) template may be used to protect undisturbed stream buffers.

Forested buffer, No disturbance FORM H-1 04/06

DECLARATION OF RESTRICTIONS (Forested Buffer, No Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____ , 20___,
by _____, _____ ,
(Name) (Street Address)
_____, _____County, Maine, _____ , (herein referred to as the
(City or Town) (County) (Zip Code)
"Declarant", pursuant to a permit received from the Maine Department of Environmental Protection under the Site Location of Development Act, to preserve a buffer area on a parcel of land near
_____, _____ .
(Road Name) (Known Feature and/or Town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(Town)
described in a deed from _____to _____, dated
(Name) (Name of Declarant)
_____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Site Location of Development Act, 38 M.R.S.A. §§ 481-490, and Department Rules for stormwater management, Chapter 500, promulgated by the Maine Board of Environmental Protection, Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties

having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Site Location of Development Act and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor shall the topography of the area be altered or manipulated in any way;

b. No trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

c. No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

d. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

e. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

f. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

_____

(Name)

STATE OF MAINE, _____County, dated _____, 20__.
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

_____
Notary Public

1. Forested buffer, limited disturbance

DECLARATION OF RESTRICTIONS (Forested Buffer, Limited Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____, 20___, by _____ , _____,
(Name) (Street Address)
_____, _____County, Maine, _____, (herein referred to as the
(City or Town) (County) (Zip Code)
"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Site Location of Development Act to preserve a buffer area on a parcel of land near _____,_____ .
(Road Name) (Known Feature and/or Town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(Town)
described in a deed from_____ to _____dated
(Name) (Name of Declarant)
_____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer area location here)

WHEREAS, pursuant to the Site Location of Development Act, 38 M.R.S.A. §§ 481-490, and Department Rules for stormwater management, Chapter 500, promulgated by the Maine Board of Environmental Protection, Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and

absorb stormwater, and to maintain compliance with the Site Location of Development Act and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;

b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

(i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees " is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot square (2500 square feet) area, as determined by the following rating scheme:

Diameter of tree at 4½ feet above ground level	**Points**
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

(ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(Name)

_____

STATE OF MAINE
_____ County, _____, 20__.
(County) (Date)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

_____

Notary Public

_____

DECLARATION OF RESTRICTIONS (Non-Wooded Meadow Buffer)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____, 20___, by
_____, _____
(Name) (Street Address)
_____, _____County, Maine,_____, (herein referred to as the
(City or Town) (County) (Zip Code)
"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Site Location of Development Act, to preserve a buffer area on a parcel of land near
_____, _____ .
(Road Name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(Town)
described in a deed from_____to _____, dated
(Name) (Name of Declarant)
_____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Site Location of Development Act, 38 M.R.S.A. §§ 481-490 and Department Rules for stormwater management (Chapter 500) promulgated by the Maine Board of Environmental Protection, Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Site Location of Development Act and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;

b. A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Restricted Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than two times per year.

c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area, except for vehicles used in mowing;

e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

_____
(NAME)

STATE OF MAINE, _____, County, dated _____, 20__ .
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

_____

Notary Public

_____

Attachment 11

Pond Test Pit Logs

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

5365

July 21, 2022

Mr. Mark Lazoraitis
Terradyn Consultants, LLC
41 Campus Drive Suite 301
New Gloucester, ME 04260

Re: Soil Test Pit Evaluation, Stormwater Management, South Street Village Biddeford , ME

Dear Mark,

I have completed the evaluation of two hand dug test pits for the proposed stormwater treatment program for the South Street Village Project located on South Street Biddeford, ME. The soil evaluation was conducted in accordance with Section 7.D.4 of the Stormwater Management Rules. Both test pits were dug in the proposed stormwater treatment areas.

The soils evaluated were well drained glacial till over ledge. The limiting factor was 39 inches and 42 inches respectively. The soil test pit log descriptions are attached. The hydrological soil group for all the test pits is noted on the log descriptions. No groundwater was observed in either of the test pits.

If you have any questions or require additional information, please contact me.

Sincerely,

Mark J. Hampton L.S.E., C.S.S.
Licensed Site Evaluator #263
Certified Soil Scientist #216

Enc.

P.O. BOX 1931 • PORTLAND, ME 04104-1931 • 207-756-2900 • mhampto1@maine.rr.com

Quality services that meet your deadline

5365

PAGE ____ OF ____

FORM F (SS1) Rev. 7/21

SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
South Street Villages	South Street Villages LLC	Biddeford

Exploration Symbol # STW-1 ☒ Test Pit ☐ Boring ☐ Probe

0 " Organic horizon thickness Ground surface elev. ____

____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches): 0, 10, 20, 30, 40, 50, 60

Horizon	Color	Texture	Structure	Consistence	Redox
AE	Dark Brown	Sandy Loam	Fine Grand	Very Friable	
Bhs	Dusky Red	Sandy Loam	Fine Grand	Friable	
Bs1	Brown	Sandy Loam	Fine Grand	Friable	None Noted
R		LEDGE			

Soil Details

Soil Series/Phase Name:	Limiting Factor	Drainage Class	Slope	Hydric Soil	Hydrologic Soil Group
Lyman-Tunbridge	39 " Depth; ☐ Groundwater ☐ Restrictive Layer ☒ Bedrock	☐ ED ☐ SED ☒ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD	10 Percent	☒ No ☐ Yes	C

Exploration Symbol # STW-2 ☒ Test Pit ☐ Boring ☐ Probe

____ " Organic horizon thickness Ground surface elev. ____

____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches): 0, 10, 20, 30, 40, 50, 60

Horizon	Color	Texture	Structure	Consistence	Redox
AE	Dark Brown	Sandy Loam	Fine Grand	Very Friable	
Bhs	Dusky Red	Sandy Loam	Grand	Friable	
Bs1	Tan	Sandy Loam	Fine Grand	Friable	None Noted
R		LEDGE			

Soil Details

Soil Series/Phase Name:	Limiting Factor	Drainage Class	Slope	Hydric Soil	Hydrologic Soil Group
Lyman-Tunbridge	42 " Depth; ☐ Groundwater ☐ Restrictive Layer ☒ Bedrock	☐ ED ☐ SED ☒ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD	8 Percent	☒ No ☐ Yes	C

Exploration Symbol # STW-1C ☒ Test Pit ☐ Boring ☐ Probe

____ " Organic horizon thickness Ground surface elev. ____

____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches): 0, 10, 20, 30, 40, 50, 60

Horizon	Color	Texture	Structure	Consistence	Redox

Soil Details

Soil Series/Phase Name:	Limiting Factor	Drainage Class	Slope	Hydric Soil	Hydrologic Soil Group
	" Depth; ☐ Groundwater ☐ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD	Percent	☐ No ☐ Yes	

Exploration Symbol # ____ ☐ Test Pit ☐ Boring ☐ Probe

____ " Organic horizon thickness Ground surface elev. ____

____ " Depth: ☐ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches): 0, 10, 20, 30, 40, 50, 60

Horizon	Color	Texture	Structure	Consistence	Redox

Soil Details

Soil Series/Phase Name:	Limiting Factor	Drainage Class	Slope	Hydric Soil	Hydrologic Soil Group
	" Depth; ☐ Groundwater ☐ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD	Percent	☐ No ☐ Yes	

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature

Mark J. Hampton
Name Printed

7/21/2022
Date

216
SS License No.

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

affix professional seal

Attachment 12

Pre & Post Development Watershed Maps

LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION
- REACH
- PRE — WATERSHED LABEL
- 1 — REACH
- CB — CATCH BASIN/POND
- Na — MEDIUM INTENSITY SOIL NAME
- ADAMS — HIGH INTENSITY SOIL NAME
- MEDIUM INTENSITY SOIL BOUNDARY
- HIGH INTENSITY SOIL BOUNDARY
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- PROPOSED PROPERTY LINE
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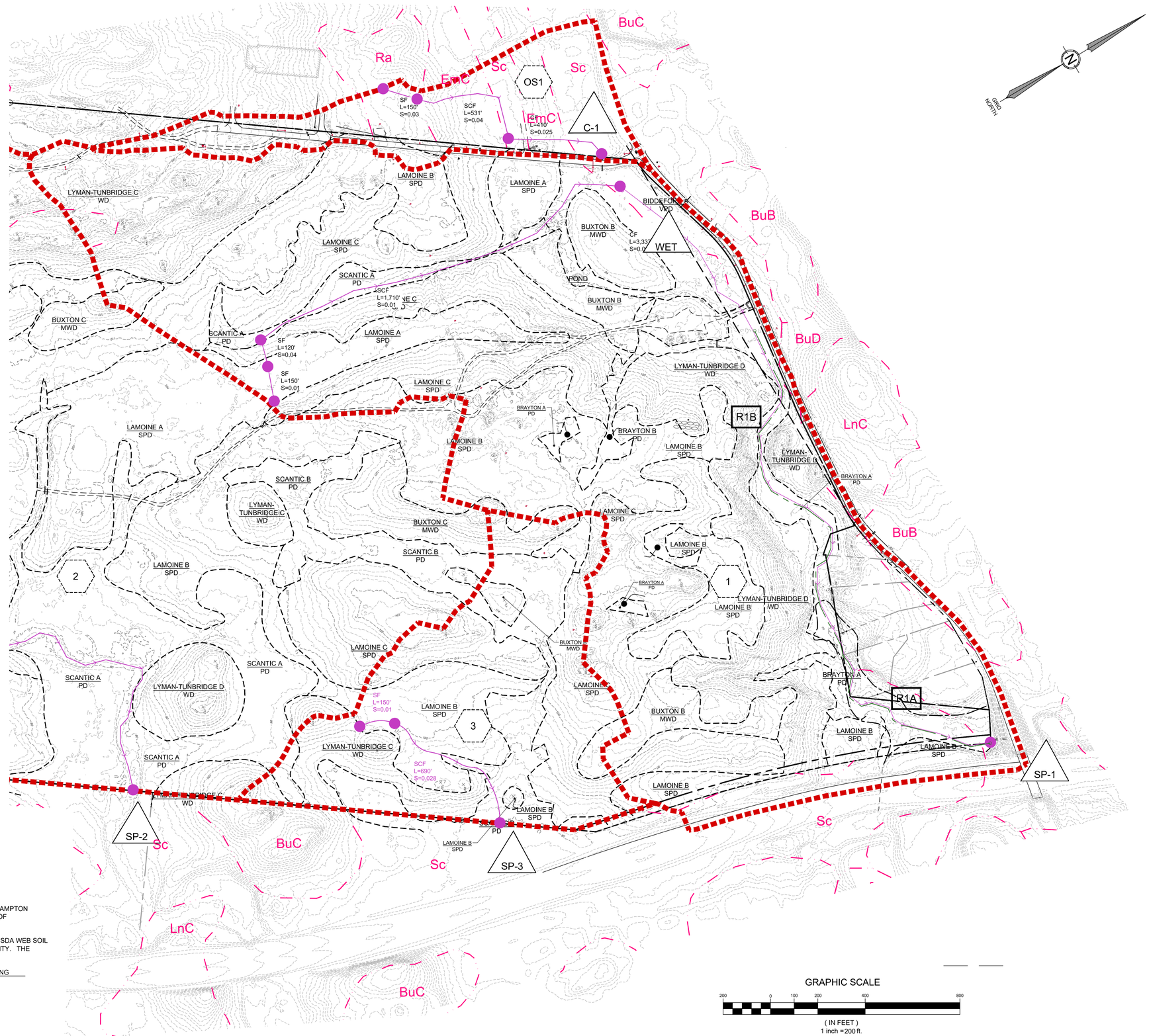
- 124 — MAJOR CONTOURS
- 124 — PROPOSED CONTOURS
- WETLAND BOUNDARY



SOILS NOTES:

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BuB	BUXTON SILT LOAM	D
BuC, BuD	BUXTON SILT LOAM	C
Ch	CHOCORUA PEAT	A/D
EmC	ELMWOOD FINE SAND	B
LnB, LnC, LnD	LYMAN LOAM	D
LyB, LyC, LyE	LYMAN ROCK OUTCROP	D
Ra	RAYNHAM SILT LOAM	C/D
Sn	SCANTIC SILT LOAM	D

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

STATE OF MAINE JEFFREY D. AMOS 10167 LICENSED PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
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565 CONGRESS STREET SUITE 201 PORTLAND, ME 04102
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www.terradynconsultants.com
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PRE-DEVELOPMENT WATERSHED MAP

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 200'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	WS-1.0

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- 124 — MAJOR CONTOURS
- 124 — PROPOSED CONTOURS
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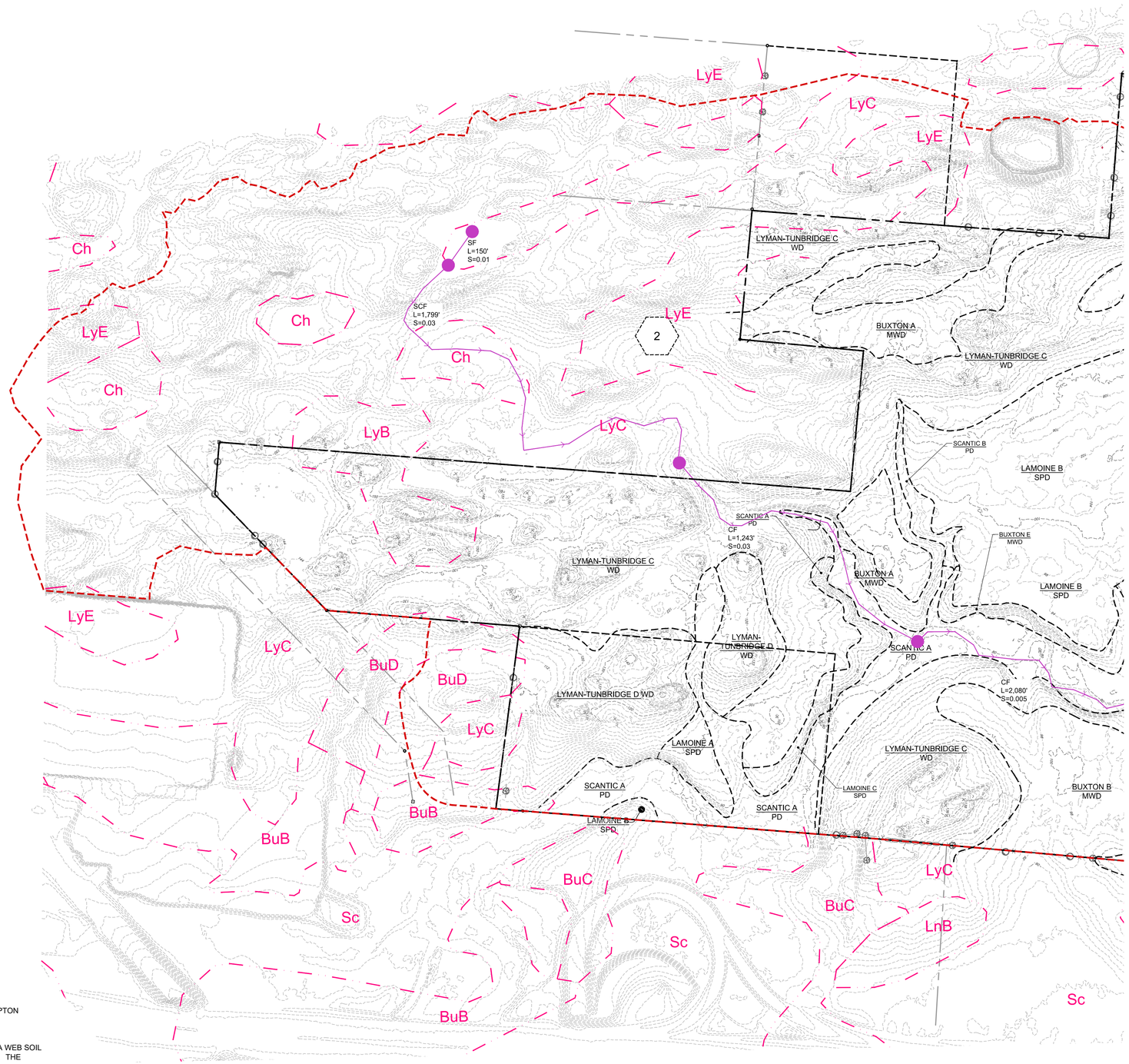

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LyB, LyC, LyE	LYMAN ROCK OUTCROP	D
Ra	RAYNHAM SILT LOAM	C/D
Sn	SCANTIC SILT LOAM	D

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

STATE OF MAINE — JEFFREY D. AMOS — No. 10167 — LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PRE-DEVELOPMENT WATERSHED MAP

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 200'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	WS-1.1

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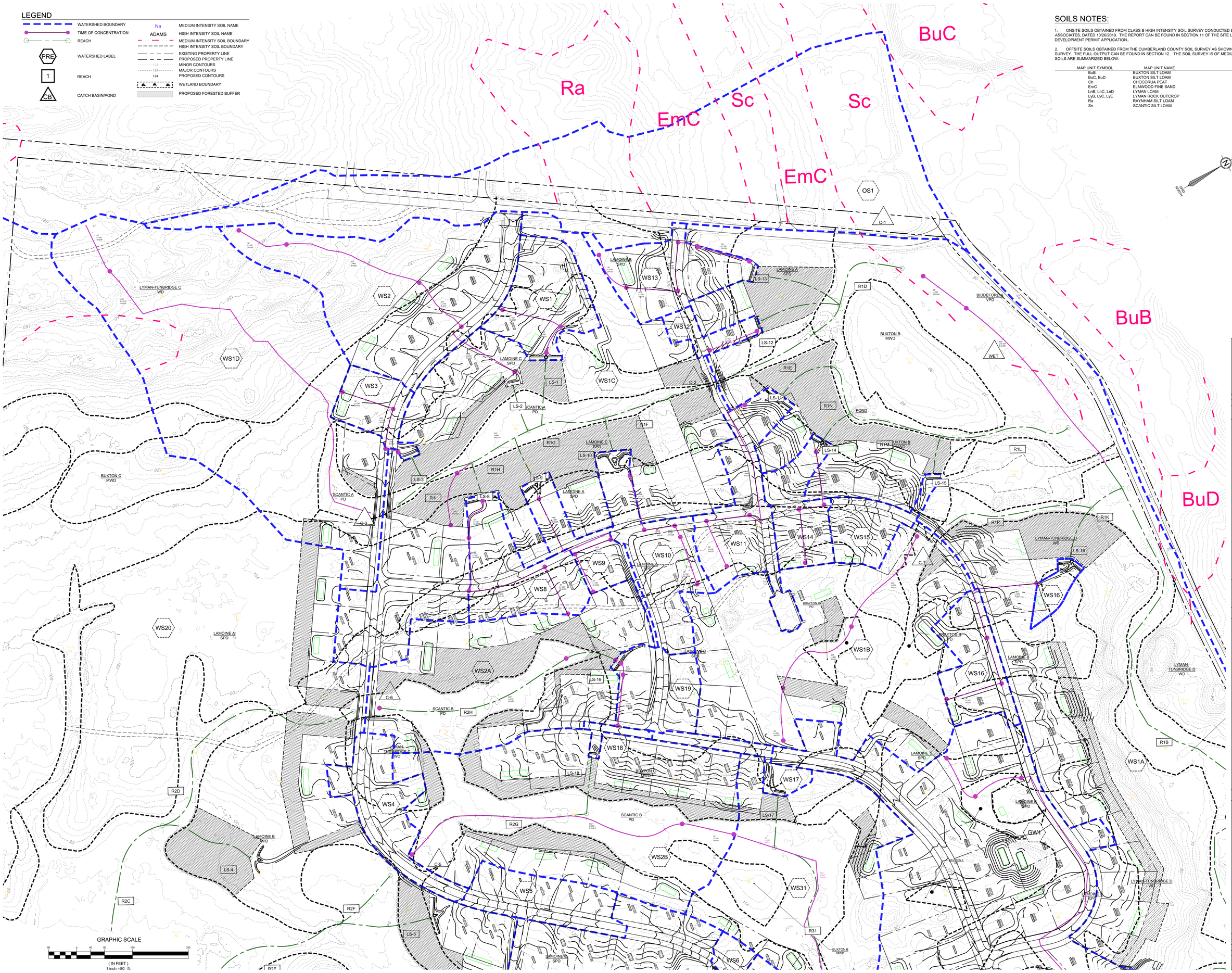

NO.	DATE	REVISION	DATE	BY

REVISIONS

DATE: DATE
P.E.: P.E.

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NEW GLOUCESTER, ME 04260
565 CONGRESS STREET
SUITE 200
PORTLAND, ME 04102
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NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
POST-DEVELOPMENT WATERSHED MAP

CLIENT:
SOUTH STREET VILLAGE, LLC
782 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1"=80'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.0

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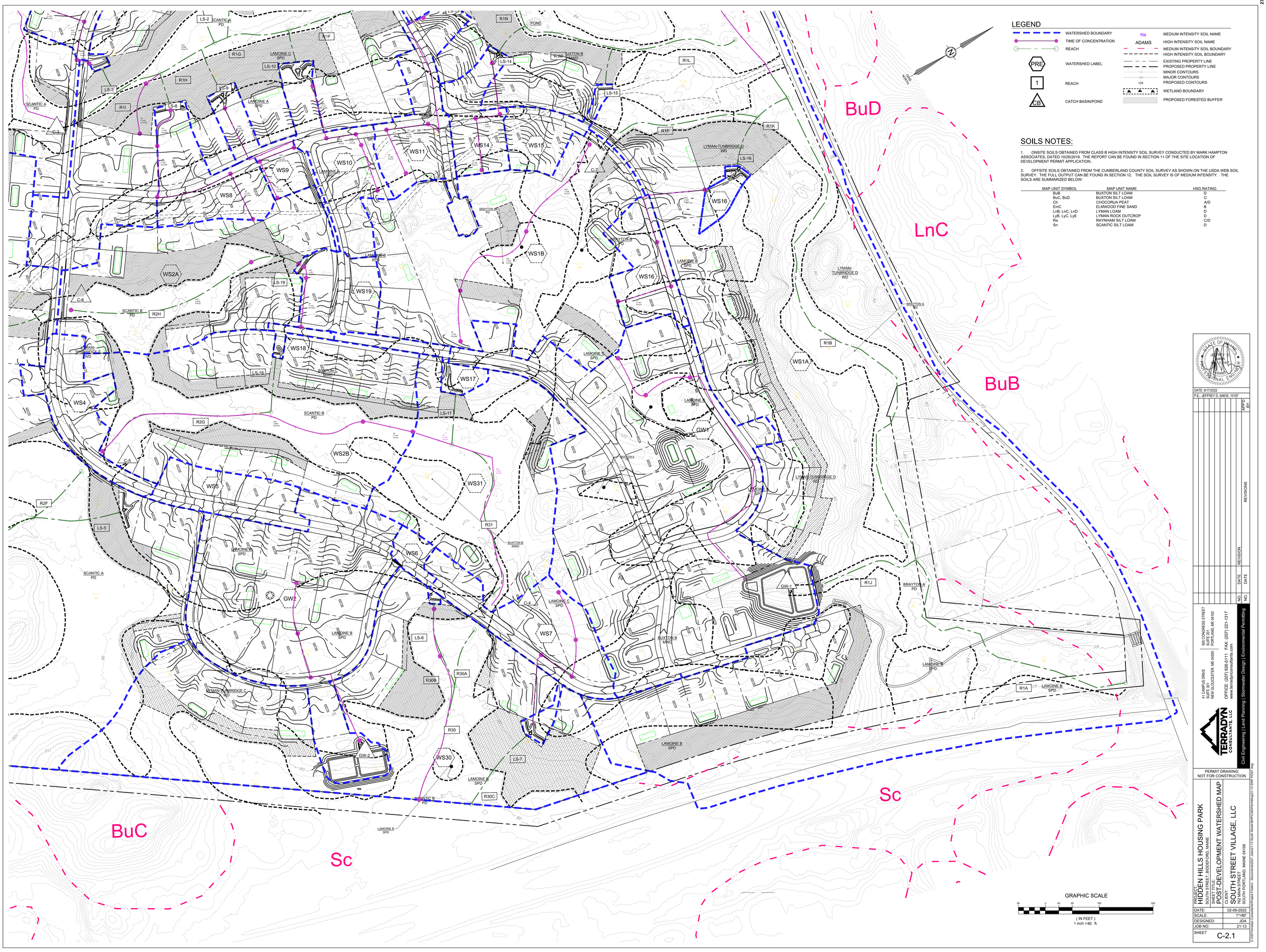

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LyB, LyC, LyE	LYMAN ROCK OUTCROP	D
Ra	RAYNHAM SILT LOAM	C/D
Sn	SCANTIC SILT LOAM	D

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 8/17/2022
P.E.: JEFFREY D. AMOS, 10167

NO.	DATE	REVISION	BY

REVISIONS

41 CAMPUS DRIVE
SUITE 203
NEW GLOUCESTER, ME 04260

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SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
POST-DEVELOPMENT WATERSHED MAP

CLIENT:
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762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

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SHEET	C-2.1

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Pineland
Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland
565 Congress Street, Suite 310
Portland, ME 04101

21-13

August 17, 2022

Hannah Bonine
Assistant City Planner
Biddeford City Hall
P.O. Box 586
Biddeford, ME 04005

3rd Party Engineering Comment Response
Hidden Hills Manufactured Housing Park
413 South Street, Biddeford

Hannah,

Below are our responses to comments that were provided by Tom Saucier, P,E. of Site Design for the Hidden Hills Manufactured Housing Park on May 4, 2022. Our responses to his comments are shown in *italics.*

1. It is our understanding that Waterworks Drive is currently a "private way", and that Maine Water plans to offer it to the city for acceptance. Article VI, Section 45. Div 2.E.5.c.i. seems to require two entrances onto a "public street" if it is expected to generate 200 or more trips per day.

Response: Comment acknowledged.

2. Has a standard boundary survey of the parcel been submitted?

Response: A stamped boundary survey can be found in Attachment 3.

3. As we previously indicated to you, we recommend that the traffic generation analysis be peer reviewed by a traffic engineer.

Response: Comment acknowledged.

4. It appears a portion of the site is located in the Thatcher Brook watershed, however there is no mention of the Urban Impaired Stream standard in the stormwater management report. If the project is located in the direct watershed of Thatcher Brook, it is our understanding the city requires a compensation fee which would be paid to a Compensation Fee Utilization Fund administered by the city for Thatcher Brook.

Response: A portion of the project is located withing the Thatcher Brook watershed. This is further discussed in the attached updated Stormwater Report that can be found in Attachment 4. We calculate that the compensation fee will be approximately $55,000.

5. We expect detailed plans of the left turn lane in South Street with the final submission.

Response: The applicant no longer believes that a left turn lane is necessary . See the traffic study in Attachment 1.

6. Saw cuts and butt joints should be shown at the Waterworks Drive intersections.

Response: The saw cut and butt joints are now shown on the site plans, as requested.

7. The applicant should review Section 51 and chapter 62, Table A for dimensional requirements. It appears the private road would be classified as an urban section, major residential road. Pavement radii at intersections must be 25 ft or 30 ft minimum and drives are prohibited off turnarounds. Are waivers of these standards permitted?

Response: Intersection now feature pavement radii of 30'.

8. The plans reflect the opening of Waterworks Drive at Lozolite to install a water main connection. The detail for the repair should be discussed with the city engineer, assuming it will be a public street under moratorium when the water main is installed.

Response: Comment acknowledged.

9. Culverts and riprap aprons will be required at the intersections of Topaz and Lozolite with Waterworks.

Response: A culvert and the necessary riprap protection were added beneath the intersection of Lozolite Lane. There is an existing culvert that passes beneath Waterworks Drive immediately upgradient of the Topaz intersection. We detailed the ditch grading to ensure all runoff upstream of the Topaz intersection drains to the existing culvert. See Sheet C-3.1.

10. The street section should include 4" of crushed gravel, as opposed to the 3" depth shown on the typical section.

Response: The section has been modified as requested. See Sheet C-6.5.

11. We recommend that the radii at the private road intersections with Waterworks Drive be Type I granite.

Response: We have modified the Waterworks intersection curbing as you requested.

12. Just a reminder to the applicant that emergency spillways should be designed to independently convey the 25 year storm with a minimum of one foot of freeboard.

Response: Comment acknowledged. I believe they are modeled correctly. It should be noted that we've modified Gravel Wetland 1 to use the spillway as the primary outlet control structure. When this is the case, MDEP does not require a separate emergency spillway.

13. There are conflicting embankment widths shown in the details.

Response: The pond details have been updated accordingly.

14. A note on drawing C-6.5 refers to acceptance of the stormwater facilities by the city. Our recommendation is that the city does not accept private stormwater facilities.

Response: Comment acknowledged. All stormwater facilities will remain privately owned and maintained.

15. Per section 51.D.1., monumentation should be provided in accordance with section 62-87. It may be that a waiver could be granted by the planning board for alternative monumentation materials.

Response: Monumentation will be provided per ordinance requirements on the Waterworks Drive right of way. No waiver is necessary.

16. The note required by section 51.D.4. should be added to the final subdivision plan.

Response: The requested note has been added to the subdivision plan. See Note 10 on C-1.0.

17. It appears additional cross culverts will be required under the private road system.

Response: We've detailed the lot grading. The intent is for all front yards will flow into the street drainage system. I believe that all remaining low points are connected to the stormwater system via cross culverts.

18. The stormwater Inspection and Maintenance plans during construction should be included on the drawings, with the post-construction plan being a written stand-alone document.

Response: Post construction plan is part of the updated stormwater report. The required maintenance for each BMP is included in each detail, but we will formalize the construction phase inspection and maintenance and will send you that plan directly in the coming days.

19. Chapter 62 Table 6A requires the tangent length between curves of reverse alignment to be 100 ft minimum. There are a couple locations that do not meet this requirement.

Response: Comment acknowledged. We updated our plans to correct any instance of less than 100'.

If you have additional questions or require additional information, please feel free to reach out to me at jeff@terradynconsultants.com.

Sincerely,

Jeffrey D. Amos, P.E.

HIDDEN HILLS HOUSING PARK

AN AGE RESTRICTED COMMUNITY
SOUTH STREET, BIDDEFORD, MAINE

SHEET INDEX

SHT. NO.	SHEET TITLE
C-0.0	COVER SHEET & LOCATION MAP
C-1.0	OVERALL SUBDIVISION PLAN
C-1.1	SUBDIVISION PLAN - 1
C-1.2	SUBDIVISION PLAN - 2
C-1.3	SUBDIVISION PLAN - 3
C-1.4	SUBDIVISION PLAN - 4
C-2.0	OVERALL SITE PLAN
C-2.1	SITE PLAN - 1
C-2.2	SITE PLAN - 2
C-2.3	SITE PLAN - 3
C-2.4	SITE PLAN - 4
C-2.5	SITE PLAN - 5
C-2.6	SITE PLAN - 6
C-2.7	SITE PLAN - 7
C-2.8	SITE PLAN - 8
C-3.0	OVERALL GRADING & DRAINAGE PLAN
C-3.1	GRADING AND DRAINAGE PLAN - 1
C-3.2	GRADING AND DRAINAGE PLAN - 2
C-3.3	GRADING AND DRAINAGE PLAN - 3
C-3.4	GRADING AND DRAINAGE PLAN - 4
C-3.5	GRADING AND DRAINAGE PLAN - 5
C-3.6	GRADING AND DRAINAGE PLAN - 6
C-3.7	GRADING AND DRAINAGE PLAN - 7
C-3.8	GRADING AND DRAINAGE PLAN - 8
C-3.9	GRAVEL WETLAND - 1 PLAN
C-3.10	GRAVEL WETLAND - 2 PLAN
C-4.0	OVERALL UTILITY PLAN
C-4.1	UTILITY PLAN - 1
C-4.2	UTILITY PLAN - 2
C-4.3	UTILITY PLAN - 3
C-4.4	UTILITY PLAN - 4
C-4.5	UTILITY PLAN - 5
C-4.6	UTILITY PLAN - 6
C-4.7	UTILITY PLAN - 7
C-4.8	UTILITY PLAN - 8
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C-5.2	PROFILE - LOZOLITE LANE
C-5.3	PROFILE - LOZOLITE LANE
C-5.4	PROFILE - LOZOLITE LANE
C-5.5	PROFILE - LOZOLITE LANE
C-5.6	PROFILE - GARNET DRIVE
C-5.7	PROFILE - GARNET DRIVE
C-5.8	PROFILE - GARNET DRIVE
C-5.9	PROFILE - GRIFFINITE WAY
C-5.10	PROFILE - GRIFFINITE WAY
C-5.11	PROFILE - ONYX CIRCLE
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C-5.13	PROFILE - RUBY ROAD
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C-6.2	SITE DETAILS - 2
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L-7.2	LANDCSAPE PLAN - 2
L-7.3	LANDSCAPE PLAN - 3
L-7.4	LANDSCAPE PLAN - 4
L-7.5	LANDSCAPE PLAN - 5
L-7.6	LANDSCAPE PLAN - 6
L-7.7	LANDSCAPE PLAN - 7
L-7.8	LANDSCAPE PLAN - 8
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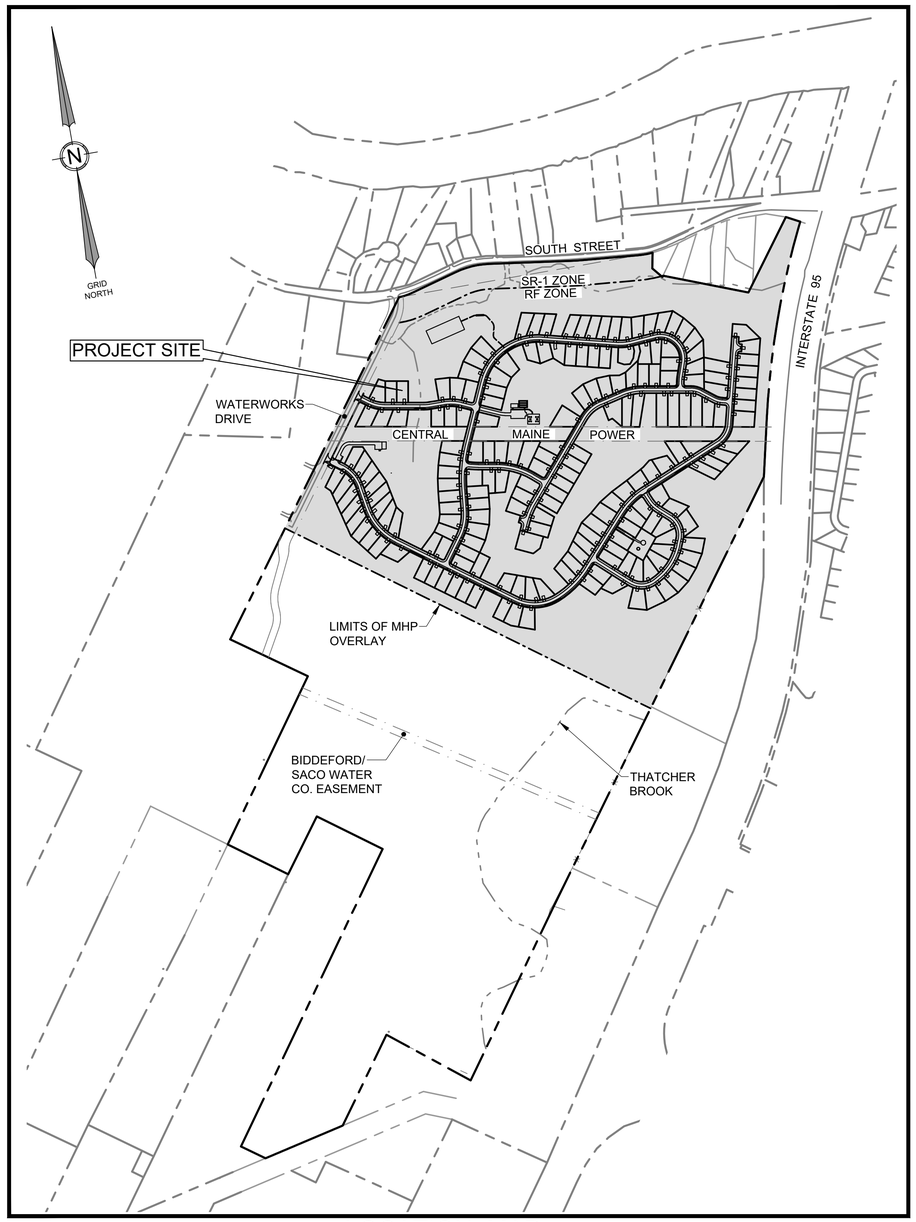
P-1.2	PHOTOMETRIC PLAN - 2
P-1.3	PHOTOMETRIC PLAN - 3
P-1.4	PHOTOMETRIC PLAN - 4
P-1.5	PHOTOMETRIC PLAN - 5
P-1.6	PHOTOMETRIC PLAN - 6
P-1.7	PHOTOMETRIC PLAN - 7
P-1.8	PHOTOMETRIC PLAN - 8



LOCATION MAP
SCALE: 1" = 500'

APPLICANT/OWNER:
SOUTH STREET VILLAGE LLC.
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

PROJECT PARCEL SITE
CITY OF BIDDEFORD TAX ASSESSOR'S MAP & LOT NUMBERS

MAP	LOT
2	7-8

PREPARED BY:

CIVIL ENGINEER:
TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, MAINE 04260
(207) 926-5111

SURVEYOR:
NORSE
NORTHERN SURVEY ENGINEERING
41 CHURCH ROAD
BRUNSWICK, MAINE 04011
MAIN: (207) 481-7080
DIRECT: (207) 481-7068
MOBILE: (978) 729-7110

WETLAND DELINEATION:
MARK HAMPTON ASSOCIATES
P.O. BOX 1931
PORTLAND, ME 04104-1931
(207) 756-2900

LEGEND

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- PROPOSED SETBACK LINE
- EXISTING SETBACK LINE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- ROAD CENTERLINE
- 124 EXISTING MINOR CONTOUR
- 124 EXISTING MAJOR CONTOUR
- 124 PROPOSED CONTOUR
- SD EXISTING STORMDRAIN
- SD PROPOSED STORMDRAIN
- W EXISTING WATER LINE
- W PROPOSED WATER LINE
- UD PROPOSED UNDERDRAIN
- OHE EXISTING OVERHEAD ELECTRIC & TELEPHONE
- OHE PROPOSED OVERHEAD ELECTRIC & TELEPHONE
- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- EXISTING EDGE OF GRAVEL
- PROPOSED EDGE OF GRAVEL
- EXISTING CURB
- PROPOSED CURB
- EDGE OF WATER
- EXISTING TREE LINE
- PROPOSED TREE LINE
- EXISTING GUARDRAIL
- PROPOSED GUARDRAIL
- MB EROSION CONTROL MULCH BERM
- TP-A TEST PIT
- EXISTING VALVE
- PROPOSED VALVE
- EXISTING HYDRANT
- PROPOSED HYDRANT
- EXISTING TRANSFORMER
- EXISTING LIGHT POLE
- PROPOSED LIGHT POLE
- EXISTING UTILITY POLE
- PROPOSED UTILITY POLE
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- PROPOSED DRAINAGE MANHOLE
- EXISTING SEWER MANHOLE
- EXISTING SIGN
- PROPOSED SIGN
- EXISTING BUILDING
- PROPOSED BUILDING
- WETLAND AREA
- PROPOSED PAVEMENT
- RIPRAP
- PROPOSED BUFFER
- PROPOSED WETLAND ALTERATION

APPROVED: CITY OF BIDDEFORD
PLANNING BOARD

DATE

STATE OF MAINE JEFFREY D. AMOS 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

41 CAMPUS DRIVE
SUITE 301
NEW GLOUCESTER, ME 04260

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

TERRADYN CONSULTANTS, LLC
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

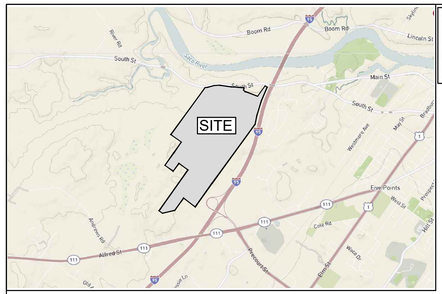
SHEET TITLE:
COVER SHEET & LOCATION MAP

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 120'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-0.0

C:\OD\Terradyn Consultants\Project Folders - Documents\2021 Jobs\21-13 South Street MHP\CAD\Permitting\21-13 C.dwg

SEE SHEETS C-1.1 THRU C-1.4 FOR MORE INFORMATION, INCLUDING PARCEL SIZES AND DEFINITIONS, AND ROADWAY DEFINIITIONS.

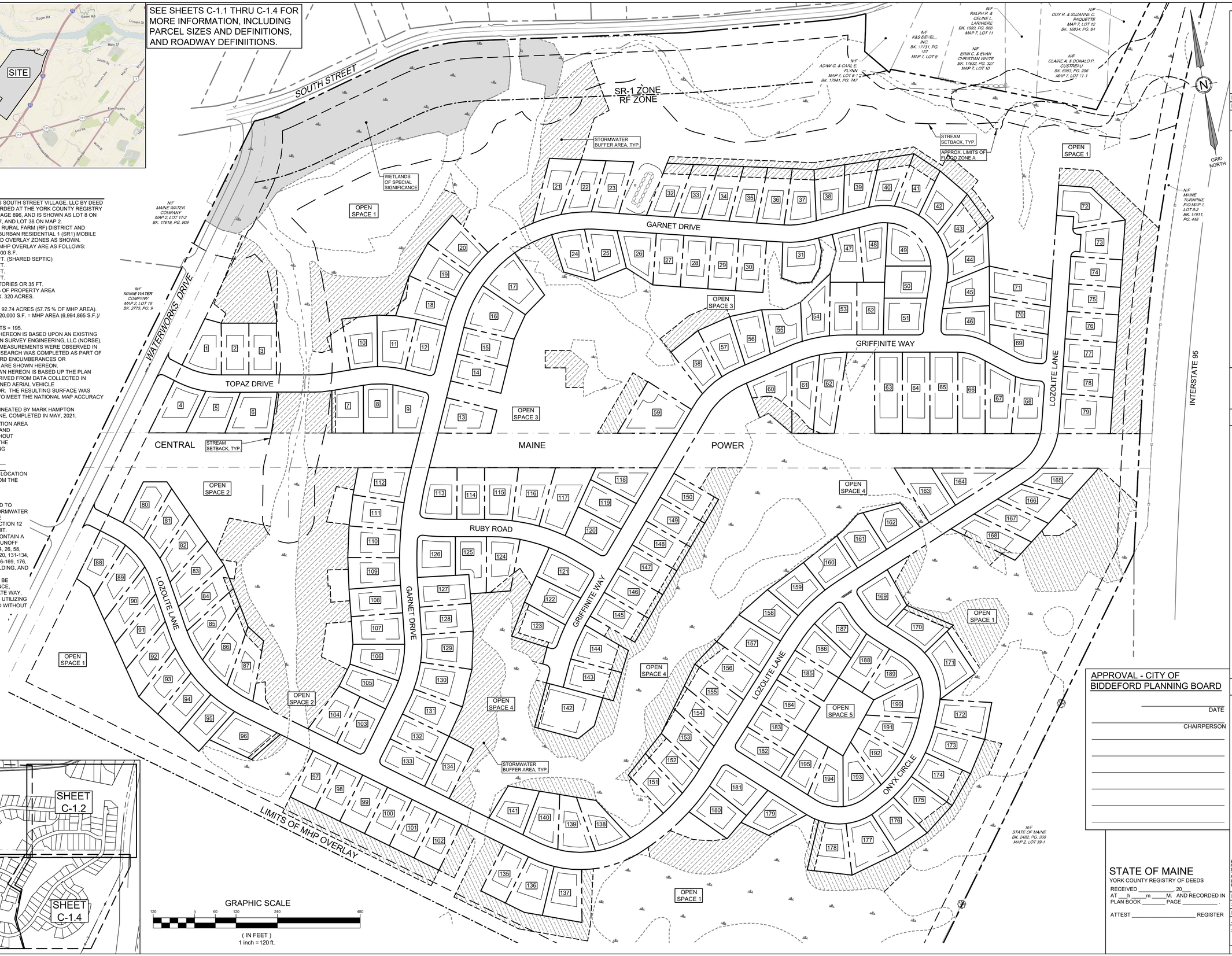


LOCATION MAP

NOT TO SCALE

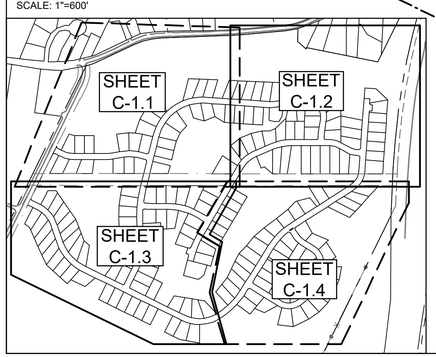
GENERAL NOTES

1. RECORD OWNER OF THE PARCEL IS SOUTH STREET VILLAGE, LLC BY DEED DATED AUGUST 15, 2017 AND RECORDED AT THE YORK COUNTY REGISTRY OF DEEDS (YCRD) IN BOOK 17541, PAGE 896, AND IS SHOWN AS LOT 8 ON THE CITY OF BIDDEFORD TAX MAP 7, AND LOT 38 ON MAP 2.
2. THE PROPERTY IS LOCATED IN THE RURAL FARM (RF) DISTRICT AND PARTIALLY SHOWN WITHIN THE SUBURBAN RESIDENTIAL 1 (SR1) MOBILE HOME PARK (MHP), AND SHORELAND OVERLAY ZONES AS SHOWN. LAND USE REGULATIONS FOR THE MHP OVERLAY ARE AS FOLLOWS:
   MIN. LOT SIZE: 12,000 S.F.
   MIN. LOT WIDTH: 75 FT. (SHARED SEPTIC)
   MIN. FRONT SETBACK: 15 FT.
   MIN. SIDE SETBACK: 15 FT.
   MIN. REAR SETBACK: 15 FT.
   MAX. BUILDING HEIGHT: 3 STORIES OR 35 FT.
   MIN. OPEN SPACE: 10% OF PROPERTY AREA
3. TOTAL AREA OF PARCEL IS APPROX. 320 ACRES.
   AREA OF MHP = 160.58 ACRES.
   AREA OF OPEN SPACE PROVIDED = 92.74 ACRES (57.75 % OF MHP AREA).
   TOTAL ALLOWABLE UNITS = 1 UNIT/20,000 S.F. = MHP AREA (6,994,865 S.F.)/ 20,000 S.F. PER UNIT = 349.7 UNITS.
   TOTAL NUMBER OF PROPOSED UNITS = 195.
4. BOUNDARY INFORMATION SHOWN HEREON IS BASED UPON AN EXISTING CONDITIONS SURVEY BY NORTHERN SURVEY ENGINEERING, LLC (NORSE), DATED DECEMBER 21, 2021. FIELD MEASUREMENTS WERE OBSERVED IN NOVEMBER, 2021, AND A RECORDS SEARCH WAS COMPLETED AS PART OF THE SURVEY TO DEFINE ANY RECORD ENCUMBERANCES OR CONVEYANCES, AND ALL FINDINGS ARE SHOWN HEREON.
5. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UP THE PLAN REFERENCED IN NOTE 4 AND IS DERIVED FROM DATA COLLECTED IN NOVEMBER, 2021 USING AN UNMANNED AERIAL VEHICLE (UAV)SURVEY-GRADE LIDAR SENSOR. THE RESULTING SURFACE WAS GROUND-TRUTHED AND VERIFIED TO MEET THE NATIONAL MAP ACCURACY STANDARDS FOR 1-FT. CONTOURS.
6. THE WETLANDS SHOWN WERE DELINEATED BY MARK HAMPTON ASSOCIATES, INC., PORTLAND, MAINE, COMPLETED IN MAY, 2021.
7. TOTAL PROJECT WETLAND ALTERATION AREA = 14,280 S.F. NO ADDITIONAL WETLAND ALTERNATION IS PERMISSIBLE WITHOUT FURTHER WETLAND PERMITTING. THE PROJECT RECEIVED THE FOLLOWING PERMITS:
   NRPA PERMIT # _____
   ACOA PERMIT # _____
8. THIS PROJECT IS BOUND BY A SITE LOCATION OF DEVELOPMENT ACT PERMIT FROM THE MAINE DEP PERMIT #
9. PROJECT STORMWATER NOTES:
   A. THE OWNER SHALL BE REQUIRED TO INSPECT AND MAINTAIN THE STORMWATER MANAGEMENT SYSTEM, PER THE GUIDELINES AS OUTLINED IN SECTION 12 OF THE APPROVED SLODA PERMIT.
   B. THE FOLLOWING UNITS SHALL CONTAIN A FILTER STRIP TO CATCH ROOF RUNOFF WITHIN REASON: 6, 8, 9, 17, 22-24, 26, 58, 88-93, 95-101, 103, 104, 115-118, 120, 131-134, 138, 140, 141, 151-153, 157-163, 166-169, 176, 179, 181, THE MAINTENANCE BUILDING, AND THE CLUBHOUSE.
10. THE CITY OF BIDDEFORD WILL NOT BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR OR PLOWING OF THE PRIVATE WAY, AND THAT FURTHER LOT DIVISIONS UTILIZING THE PRIVATE WAY ARE PROHIBITED WITHOUT PRIOR APPROVAL OF THE BOARD.



SITE KEY

SCALE: 1"=600'



GRAPHIC SCALE

120 0 60 120 240 480

(IN FEET)
1 inch = 120 ft.

APPROVAL - CITY OF BIDDEFORD PLANNING BOARD

_____ DATE

_____ CHAIRPERSON

STATE OF MAINE

YORK COUNTY REGISTRY OF DEEDS

RECEIVED _____, 20___
AT ___h ____m ____M. AND RECORDED IN
PLAN BOOK _____ PAGE _____ .

ATTEST _____ REGISTER

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE
SUITE 207
NEW GLOUCESTER, ME 04260
565 CONGRESS STREET
SUITE 301
PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
OVERALL SUBDIVISION PLAN

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 120'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-1.0

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CENTERLINE CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C3	111.67'	240.00'	S 66°42'03" E	110.66'
C4	39.42'	240.00'	S 84°44'10" E	39.38'
C5	122.08'	300.00'	N 77°47'01" W	121.24'
C6	558.97'	400.00'	S 63°54'28" W	514.59'

PROPERTY CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C29	23.46'	15.00'	S 8°33'56" E	21.14'
C30	23.66'	15.00'	S 81°26'04" W	21.28'
C31	100.04'	215.00'	S 66°42'03" E	99.14'
C32	84.47'	265.00'	S 62°30'09" E	84.11'
C33	38.84'	265.00'	S 75°49'55" E	38.80'
C34	35.32'	215.00'	S 84°44'10" E	35.28'
C35	43.53'	265.00'	S 84°44'10" E	43.48'
C36	48.22'	325.00'	N 85°11'28" W	48.18'
C37	80.04'	325.00'	N 73°53'06" W	79.84'
C38	83.94'	275.00'	N 80°41'51" W	83.61'
C39	27.97'	275.00'	N 69°02'20" W	27.96'
C40	23.56'	15.00'	N 21°07'32" W	21.21'
C41	23.56'	15.00'	N 68°52'28" E	21.21'
C42	80.12'	425.00'	S 29°16'32" W	80.00'
C43	80.00'	425.00'	S 40°04'08" W	79.88'
C44	133.82'	375.00'	S 34°05'52" W	133.11'
C45	80.00'	425.00'	S 50°51'14" W	79.88'
C46	133.33'	375.00'	S 54°30'26" W	132.63'
C47	156.29'	425.00'	S 66°46'53" W	155.41'
C48	119.98'	375.00'	S 73°51'32" W	119.47'
C49	85.14'	425.00'	S 83°03'19" W	85.00'
C50	88.51'	425.00'	N 85°14'22" W	88.35'
C51	104.07'	375.00'	N 89°01'31" W	103.73'
C52	23.84'	425.00'	N 77°39'58" W	23.84'
C53	32.83'	375.00'	N 78°34'01" W	32.82'
C187	4.01'	325.00'	N 66°28'33" W	4.01'

PROPERTY LINE TABLE

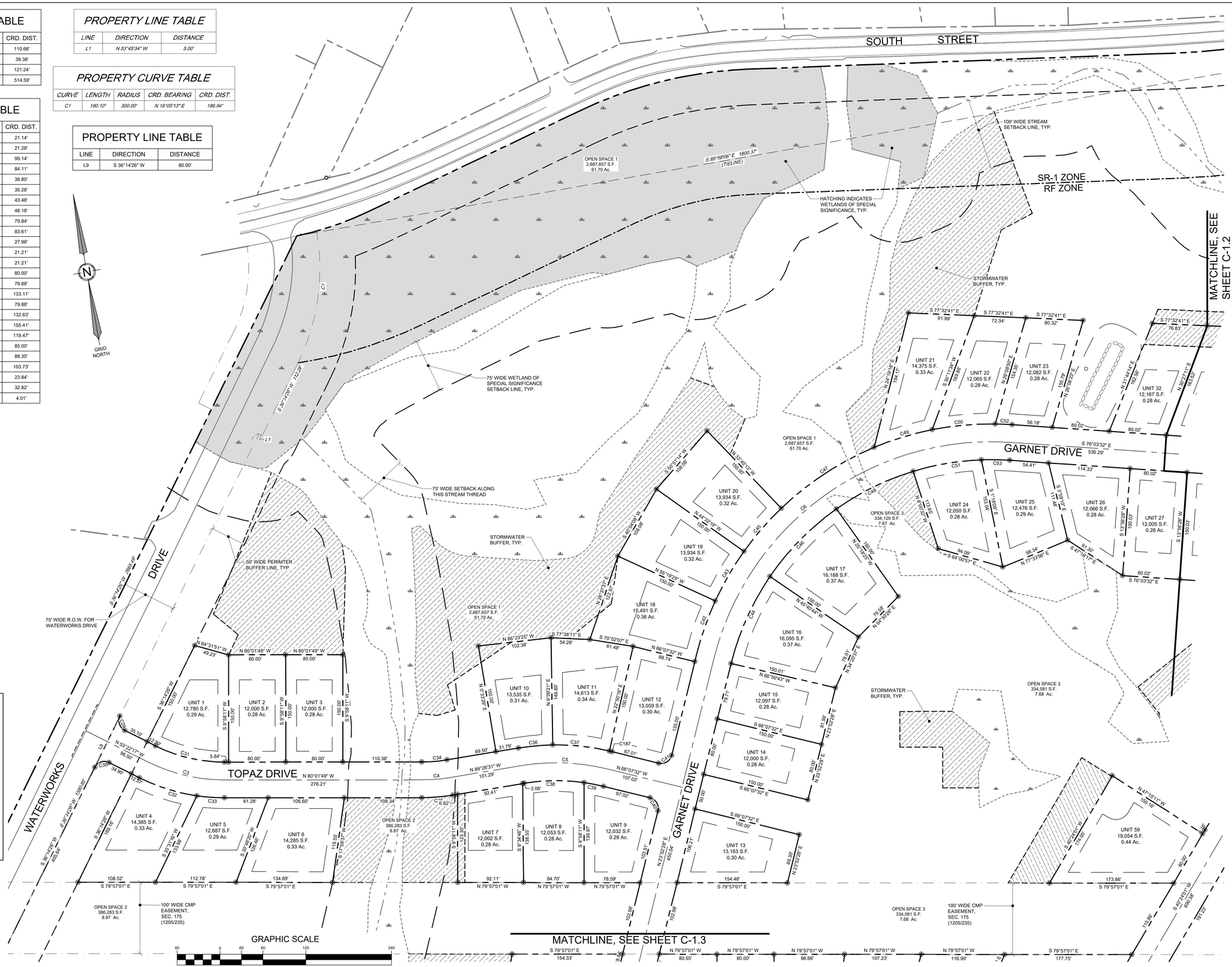
LINE	DIRECTION	DISTANCE
L1	N 53°45'34" W	5.00'

PROPERTY CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C1	190.10'	300.00'	N 18°05'13" E	186.94'

PROPERTY LINE TABLE

LINE	DIRECTION	DISTANCE
L9	S 36°14'26" W	80.00'



SEE SHEET C-1.0 FOR GENERAL NOTES.

APPROVAL - CITY OF BIDDEFORD PLANNING BOARD

DATE

CHAIRPERSON

STATE OF MAINE
YORK COUNTY REGISTRY OF DEEDS
RECEIVED _____, 20___
AT ___h ____m ____M. AND RECORDED IN
PLAN BOOK _____ PAGE _____ .
ATTEST _____ REGISTER

STATE OF MAINE JEFFREY D. AMOS 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE, SUITE 201, NEW GLOUCESTER, ME 04260
565 CONGRESS STREET, SUITE 201, PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE: SUBDIVISION PLAN - 1

CLIENT: SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 60'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-1.1

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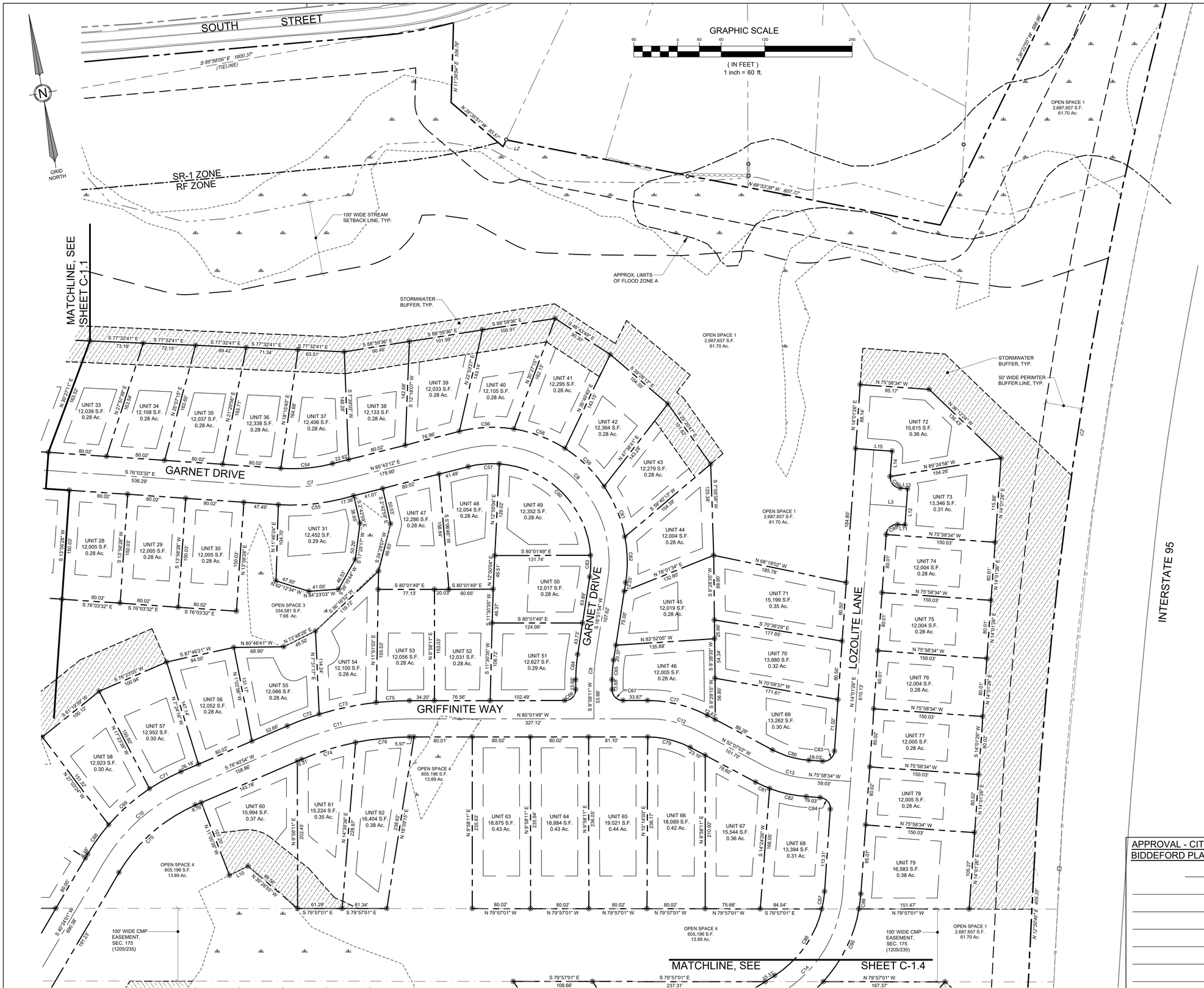

PROPERTY LINE TABLE

LINE	DIRECTION	DISTANCE
L2	S 35°17'22" W	10.33'

PROPERTY CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C2	1354.05'	5914.65'	S 19°24'16" W	1351.10'

PROPERTY LINE TABLE

LINE	DIRECTION	DISTANCE
L10	S 73°31'13" W	28.51'
L11	S 75°58'34" E	10.00'
L12	N 14°01'26" E	50.01'
L13	N 75°58'34" W	10.00'
L14	N 14°01'26" E	35.00'
L15	N 75°58'34" W	50.00'

CENTERLINE CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C7	79.50'	250.00'	S 85°10'10" E	79.17'
C8	315.96'	160.00'	N 37°42'27" W	267.07'
C9	31.05'	200.00'	S 14°25'02" W	31.02'
C10	158.31'	250.00'	S 58°32'28" W	155.68'
C11	162.58'	400.00'	S 88°19'33" W	161.46'
C12	73.08'	150.00'	N 66°04'26" W	72.36'
C13	62.46'	150.00'	S 64°02'48" E	62.01'
C14	162.71'	175.00'	N 40°39'38" E	156.92'

PROPERTY CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C54	71.55'	225.00'	S 85°10'10" E	71.25'
C55	87.46'	275.00'	S 85°10'10" E	87.09'
C56	75.50'	185.00'	N 82°35'21" W	74.97'
C57	42.86'	135.00'	N 85°11'08" W	42.68'
C58	75.54'	185.00'	N 59°12'03" W	75.02'
C59	75.54'	185.00'	N 35°48'19" W	75.02'
C60	193.96'	135.00'	N 34°55'56" W	177.70'
C61	75.54'	185.00'	N 12°24'33" W	75.02'
C62	63.21'	185.00'	N 9°04'37" E	62.90'
C63	29.78'	135.00'	N 12°32'44" E	29.72'
C64	34.93'	225.00'	S 14°25'02" W	34.90'
C65	27.17'	175.00'	S 14°25'02" W	27.14'
C66	23.56'	15.00'	N 54°58'11" E	21.21'
C67	23.56'	15.00'	S 35°01'49" E	21.21'
C68	49.73'	275.00'	S 45°34'52" W	49.66'
C69	75.25'	275.00'	S 58°36'04" W	75.01'
C70	142.48'	225.00'	S 58°32'28" W	140.11'
C71	49.16'	275.00'	S 71°33'39" W	49.09'
C72	46.74'	425.00'	S 79°49'56" W	46.72'
C73	80.13'	425.00'	S 88°23'05" W	80.02'
C74	77.89'	375.00'	S 82°37'55" W	77.75'
C75	45.87'	425.00'	N 83°07'19" W	45.85'
C76	74.53'	375.00'	N 85°43'27" W	74.41'
C77	85.25'	175.00'	N 66°04'26" W	84.41'
C79	60.90'	125.00'	N 66°04'24" W	60.30'
C80	52.05'	125.00'	S 84°02'48" E	51.68'
C81	20.95'	175.00'	S 55°32'46" E	20.93'
C82	51.93'	175.00'	S 67°28'32" E	51.74'
C83	23.56'	15.00'	N 59°01'26" E	21.21'
C84	23.56'	15.00'	N 30°58'34" W	21.21'
C85	23.56'	15.00'	S 59°01'26" W	21.21'
C86	23.56'	15.00'	S 30°58'34" E	21.21'
C87	24.34'	150.00'	N 18°40'20" E	24.31'
C88	115.13'	150.00'	N 45°18'31" E	112.33'
C89	20.73'	200.00'	N 16°59'37" E	20.72'
C90	112.82'	200.00'	N 36°07'25" E	111.33'

APPROVAL - CITY OF BIDDEFORD PLANNING BOARD

DATE

CHAIRPERSON

SEE SHEET C-1.0 FOR GENERAL NOTES.

STATE OF MAINE
YORK COUNTY REGISTRY OF DEEDS
RECEIVED _____, 20___
AT ___h ____m ____M. AND RECORDED IN
PLAN BOOK _____ PAGE _____.
ATTEST _____ REGISTER

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
A.	04-13-2022	PRELIMINARY SUBMISSION	JDA
B.	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	

TERRADYN CONSULTANTS, LLC
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NEW GLOUCESTER, ME 04260
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565 CONGRESS STREET
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PORTLAND, ME 04101
FAX: (207) 221-1317
www.terradynconsultants.com
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SUBDIVISION PLAN - 2

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 60'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-1.2

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PROPERTY LINE TABLE

LINE	DIRECTION	DISTANCE
L16	S 36°14'26" W	80.00'
L17	N 65°01'56" W	11.48'
L18	S 24°58'04" W	50.00'
L19	S 65°01'56" E	10.00'
L20	S 24°58'04" W	35.00'
L21	S 65°01'56" E	50.00'
L22	N 74°27'01" W	15.06'
L23	N 74°27'01" W	15.06'

PROPERTY CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C91	23.46'	15.00'	S 8°33'56" E	21.14'
C92	23.66'	15.00'	S 81°26'04" W	21.28'
C93	7.62'	275.00'	N 52°34'39" W	7.62'
C94	75.25'	275.00'	N 43°56'41" W	75.01'
C95	44.06'	225.00'	N 47°45'39" W	43.99'
C96	84.52'	225.00'	N 31°23'19" W	84.03'
C97	75.25'	275.00'	N 28°16'00" W	75.01'
C98	54.52'	275.00'	N 14°44'52" W	54.43'
C99	45.39'	225.00'	N 14°50'50" W	45.31'
C100	13.10'	375.00'	S 10°04'07" E	13.10'
C101	50.59'	425.00'	S 12°28'42" E	50.56'
C102	95.73'	375.00'	S 18°22'58" E	95.47'
C103	84.52'	425.00'	S 21°35'10" E	84.38'
C104	103.47'	375.00'	S 33°36'03" E	103.15'
C105	84.52'	425.00'	S 32°58'52" E	84.38'
C106	80.13'	375.00'	S 47°37'39" E	79.98'
C107	84.52'	425.00'	S 44°22'34" E	84.38'
C108	27.27'	425.00'	S 51°54'42" E	27.26'
C109	23.59'	15.00'	N 81°11'25" E	21.24'
C110	23.53'	15.00'	S 8°48'35" E	21.19'
C111	59.07'	275.00'	S 59°54'12" E	58.96'
C112	71.57'	325.00'	S 60°03'29" E	71.43'
C113	109.89'	275.00'	S 77°30'16" E	109.16'
C114	80.00'	325.00'	S 73°25'08" E	79.80'
C115	177.97'	325.00'	N 83°50'30" E	175.76'
C116	109.89'	275.00'	N 79°36'04" E	109.16'
C117	39.73'	325.00'	N 32°37'39" E	39.71'
C118	38.35'	375.00'	N 33°12'00" E	38.33'
C119	108.17'	325.00'	N 19°35'25" E	107.67'
C120	80.00'	375.00'	N 24°09'32" E	79.85'

PROPERTY CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C121	80.83'	375.00'	N 11°52'20" E	80.67'
C122	24.72'	325.00'	N 7°52'35" E	24.71'
C123	18.71'	975.00'	S 6°14'50" W	18.71'
C124	79.66'	1025.00'	S 7°55'26" W	79.64'
C125	108.31'	975.00'	S 9°58'46" W	108.26'
C126	80.00'	1025.00'	S 12°23'10" W	79.98'
C127	80.00'	1025.00'	S 16°51'29" W	79.98'
C128	85.52'	1025.00'	S 21°29'03" W	85.50'
C129	101.03'	975.00'	S 20°54'22" W	100.98'
C130	24.19'	15.00'	S 28°15'22" E	21.65'
C131	24.19'	15.00'	S 59°21'21" W	21.65'
C132	45.60'	475.00'	S 77°12'01" E	45.58'
C133	50.40'	525.00'	S 77°12'01" E	50.38'
C134	63.86'	525.00'	N 76°27'56" W	63.82'
C135	87.68'	475.00'	N 74°39'45" W	87.55'
C136	80.00'	525.00'	N 68°36'56" W	79.92'
C137	80.00'	525.00'	N 59°53'05" W	79.92'
C138	87.48'	475.00'	N 64°05'54" W	87.36'
C139	54.24'	525.00'	N 52°33'34" W	54.22'
C140	76.46'	475.00'	N 54°12'39" W	76.38'
C141	23.56'	15.00'	N 85°24'01" E	21.21'
C142	23.56'	15.00'	N 4°35'59" W	21.21'
C143	39.19'	525.00'	S 38°15'43" W	39.18'
C144	63.29'	525.00'	S 32°40'10" W	63.25'
C145	10.89'	475.00'	S 39°44'37" W	10.89'
C146	107.05'	475.00'	S 32°37'50" W	106.82'
C147	10.00'	475.00'	S 25°34'16" W	10.00'
C148	22.45'	15.00'	N 72°05'31" E	20.41'
C149	23.56'	15.00'	N 20°01'56" W	21.21'

CENTERLINE CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C15	193.31'	250.00'	N 31°13'11" W	188.53'
C16	311.93'	400.00'	S 31°24'31" E	304.09'
C17	304.19'	300.00'	S 82°47'52" E	291.33'
C18	185.90'	350.00'	N 20°54'49" E	183.72'
C19	317.25'	1000.00'	S 14°47'10" W	315.92'
C20	48.00'	500.00'	S 77°12'01" E	47.98'
C21	264.86'	500.00'	N 64°46'30" W	261.77'
C22	134.67'	500.00'	S 32°41'03" W	134.27'

GRAPHIC SCALE

60 0 60 60 120 240

(IN FEET)
1 inch = 60 ft.

APPROVAL - CITY OF BIDDEFORD PLANNING BOARD

DATE

CHAIRPERSON

SEE SHEET C-1.0 FOR GENERAL NOTES.

STATE OF MAINE
YORK COUNTY REGISTRY OF DEEDS
RECEIVED _____, 20___
AT ___h ___m ____M. AND RECORDED IN
PLAN BOOK _____ PAGE _____ .
ATTEST _____ REGISTER

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE
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NEW GLOUCESTER, ME 04260
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com
565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SUBDIVISION PLAN - 3

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 60'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-1.3

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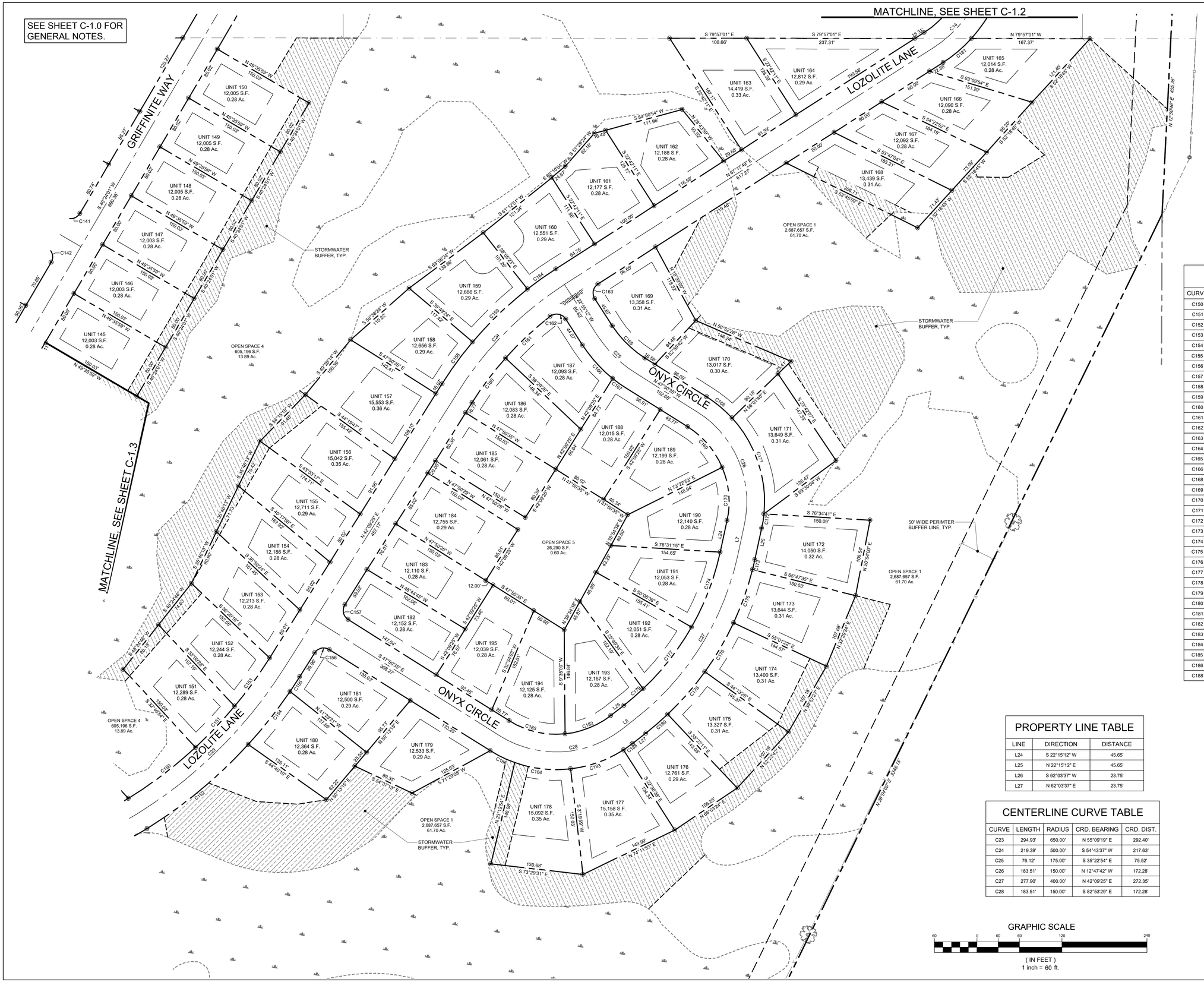
SEE SHEET C-1.0 FOR GENERAL NOTES.



PROPERTY CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C150	119.25'	625.00'	N 62°41'15" E	119.07'
C151	80.07'	625.00'	N 53°33'04" E	80.02'
C152	186.41'	675.00'	N 60°14'32" E	185.82'
C153	84.26'	625.00'	N 46°01'08" E	84.19'
C154	95.29'	675.00'	N 48°17'11" E	95.21'
C155	24.57'	675.00'	N 43°11'58" E	24.57'
C156	23.56'	15.00'	S 87°09'25" W	21.21'
C157	23.56'	15.00'	S 2°50'35" E	21.21'
C158	73.49'	525.00'	S 46°10'00" W	73.43'
C159	107.52'	525.00'	S 56°02'37" W	107.33'
C160	79.04'	475.00'	S 46°55'26" W	78.95'
C161	86.25'	475.00'	S 56°53'33" W	86.13'
C162	24.87'	15.00'	N 70°24'47" W	22.12'
C163	23.62'	15.00'	S 22°11'19" W	21.25'
C164	49.36'	525.00'	S 64°36'13" W	49.34'
C165	65.25'	150.00'	S 35°22'54" E	64.74'
C166	63.84'	200.00'	S 32°03'52" E	63.57'
C168	47.08'	175.00'	N 40°08'12" W	46.94'
C169	76.46'	125.00'	N 30°19'09" W	75.28'
C170	76.46'	125.00'	N 4°43'45" E	75.28'
C171	146.73'	175.00'	N 8°24'35" W	142.47'
C172	20.29'	175.00'	N 18°55'55" E	20.28'
C173	14.47'	425.00'	N 23°13'42" E	14.47'
C174	113.82'	375.00'	N 30°56'56" E	113.39'
C175	80.02'	425.00'	N 29°35'50" E	79.90'
C176	80.02'	425.00'	N 40°23'04" E	79.90'
C177	111.12'	375.00'	N 48°08'00" E	110.71'
C178	80.02'	425.00'	N 51°10'17" E	79.90'
C179	35.59'	375.00'	N 59°20'28" E	35.58'
C180	40.76'	425.00'	N 59°18'46" E	40.75'
C181	52.41'	200.00'	N 59°47'26" E	52.26'
C182	70.36'	125.00'	N 78°11'10" E	69.44'
C183	80.02'	175.00'	N 80°14'01" E	79.32'
C184	80.02'	175.00'	S 73°34'08" E	79.32'
C185	82.56'	125.00'	S 66°45'56" E	81.07'
C186	38.57'	175.00'	S 54°09'24" E	38.49'
C188	15.50'	175.00'	N 64°35'51" E	15.49'

PROPERTY LINE TABLE

LINE	DIRECTION	DISTANCE
L24	S 22°15'12" W	45.65'
L25	N 22°15'12" E	45.65'
L26	S 62°03'37" W	23.75'
L27	N 62°03'37" E	23.75'

CENTERLINE CURVE TABLE

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C23	294.93'	650.00'	N 55°09'19" E	292.40'
C24	219.39'	500.00'	S 54°43'37" W	217.63'
C25	76.12'	175.00'	S 35°22'54" E	75.52'
C26	183.51'	150.00'	N 12°47'42" W	172.28'
C27	277.90'	400.00'	N 42°09'25" E	272.35'
C28	183.51'	150.00'	S 82°53'29" E	172.28'

GRAPHIC SCALE

60 0 60 120 240

(IN FEET)
1 inch = 60 ft.

APPROVAL - CITY OF BIDDEFORD PLANNING BOARD

_____ DATE

_____ CHAIRPERSON

STATE OF MAINE
YORK COUNTY REGISTRY OF DEEDS
RECEIVED _____, 20___
AT ___h ____m ____M. AND RECORDED IN PLAN BOOK _____ PAGE _____ .
ATTEST _____ REGISTER

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B.	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A.	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting
41 CAMPUS DRIVE SUITE 203 NEW GLOUCESTER, ME 04260
555 CONGRESS STREET SUITE 201 PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE: SUBDIVISION PLAN - 4

CLIENT: SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 60'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-1.4

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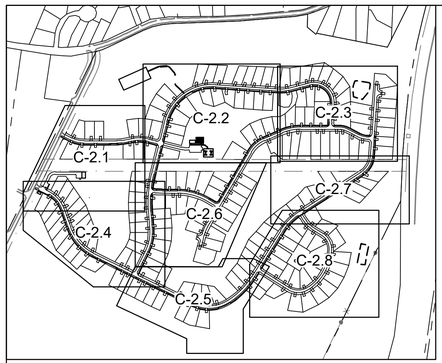
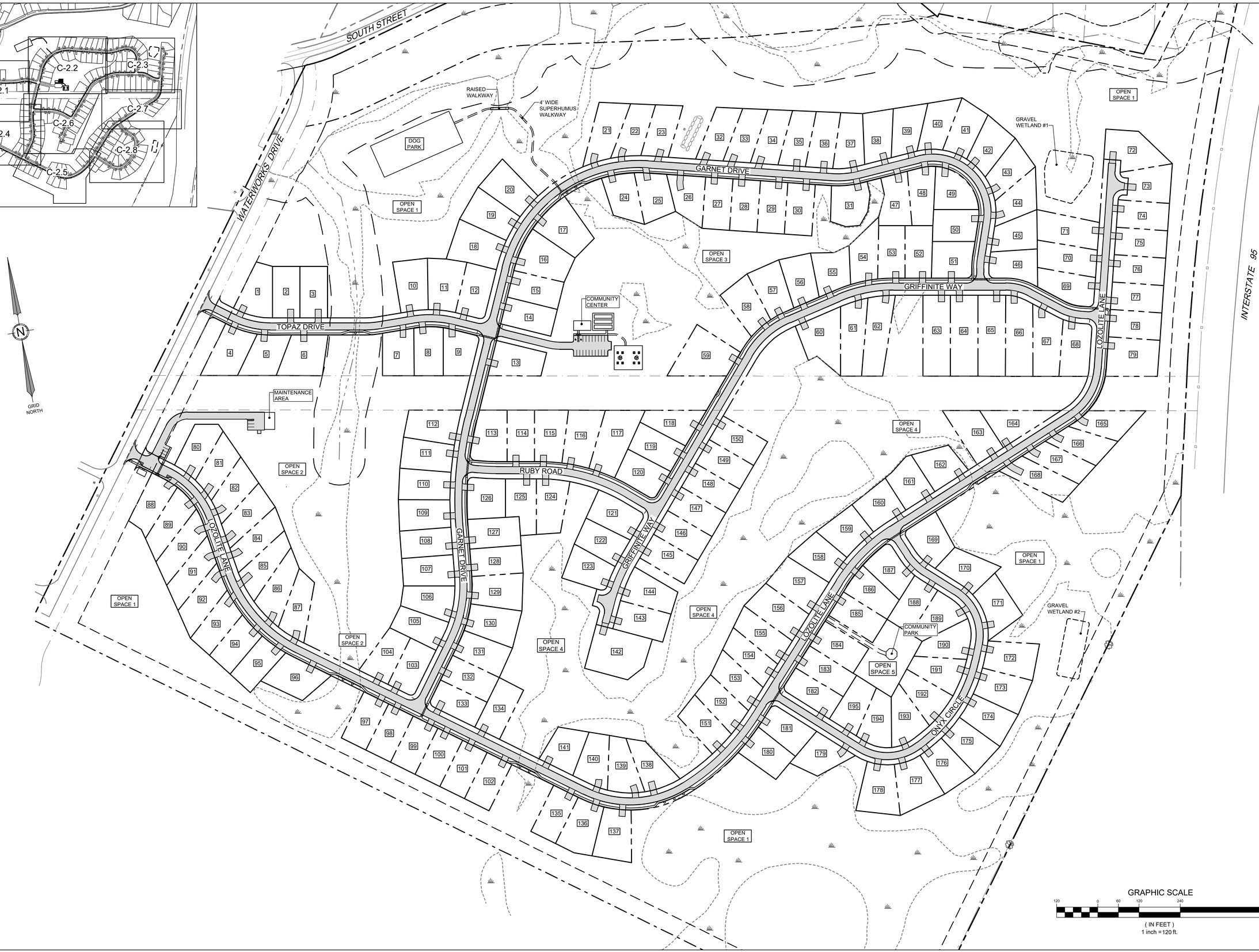


SITE KEY
SCALE: 1"=600'



STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
OVERALL SITE PLAN

CLIENT:
SOUTH STREET VILLAGE, LLC
782 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 120'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.0

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CONSTRUCTION NOTES

1. ALL WORK SHALL CONFORM TO THE APPLICABLE CODES AND ORDINANCES.

2. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIM OR HERSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIM OR HERSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.

3. CONTRACTOR SHALL NOTIFY ENGINEER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND IN THE FIELD.

4. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND OWNER'S REQUIREMENTS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

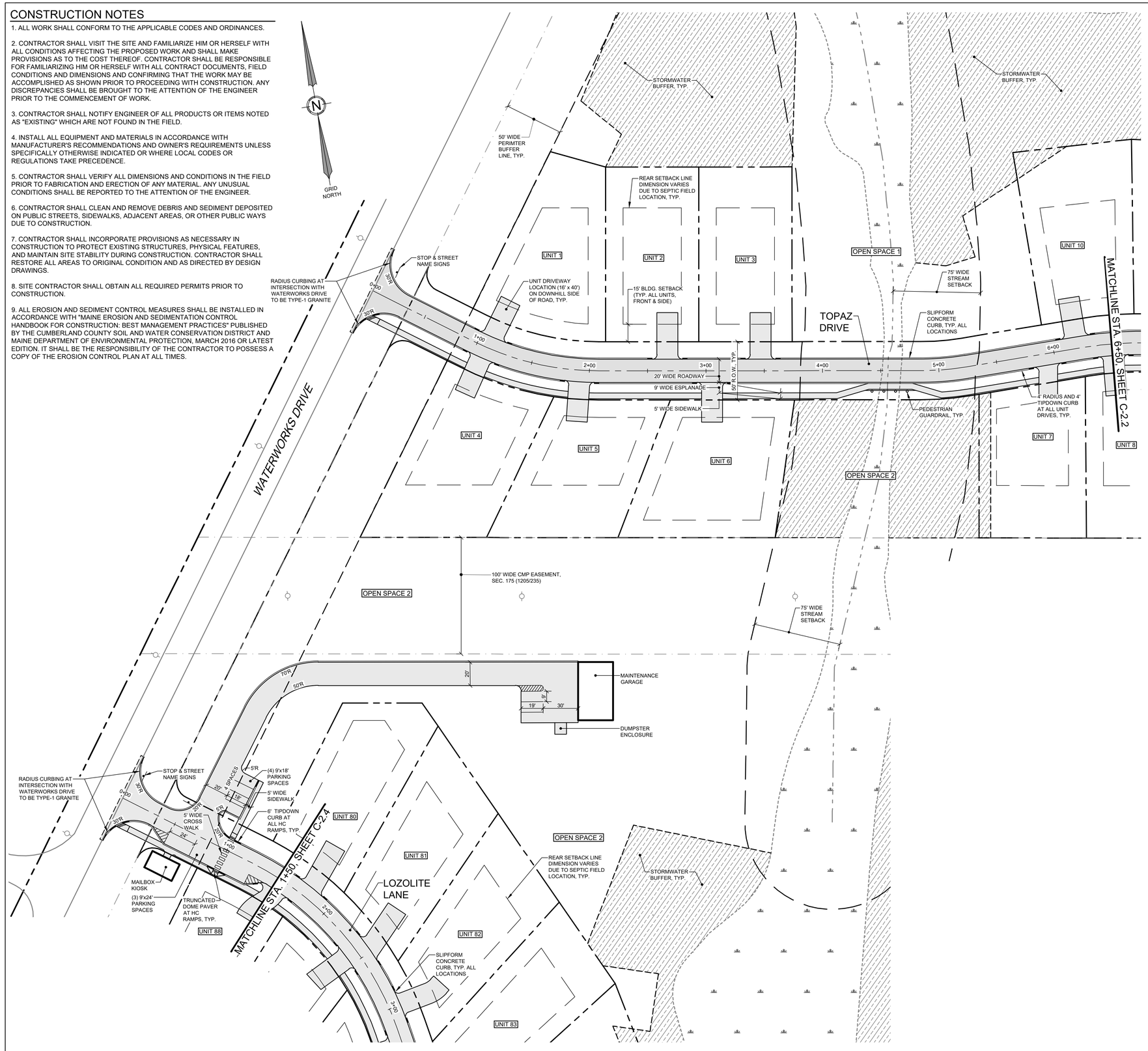
5. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.

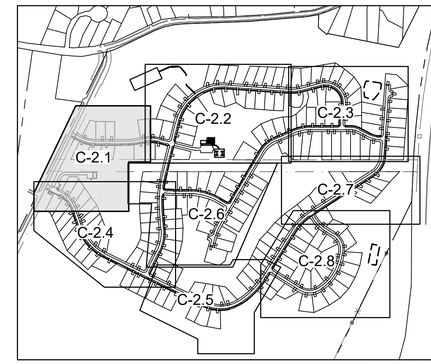
6. CONTRACTOR SHALL CLEAN AND REMOVE DEBRIS AND SEDIMENT DEPOSITED ON PUBLIC STREETS, SIDEWALKS, ADJACENT AREAS, OR OTHER PUBLIC WAYS DUE TO CONSTRUCTION.

7. CONTRACTOR SHALL INCORPORATE PROVISIONS AS NECESSARY IN CONSTRUCTION TO PROTECT EXISTING STRUCTURES, PHYSICAL FEATURES, AND MAINTAIN SITE STABILITY DURING CONSTRUCTION. CONTRACTOR SHALL RESTORE ALL AREAS TO ORIGINAL CONDITION AND AS DIRECTED BY DESIGN DRAWINGS.

8. SITE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.

9. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH "MAINE EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES" PUBLISHED BY THE CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, MARCH 2016 OR LATEST EDITION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO POSSESS A COPY OF THE EROSION CONTROL PLAN AT ALL TIMES.





SITE KEY
SCALE: 1"=600'

CONSTRUCTION NOTES

10. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY INFORMATION PROVIDED BY UTILITY COMPANIES. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT DIG SAFE (1-888-DIGSAFE) AT LEAST THREE (3) BUT NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.

11. CONTRACTOR SHALL BE AWARE THAT DIG SAFE ONLY NOTIFIES ITS "MEMBER" UTILITIES ABOUT THE DIG. WHEN NOTIFIED, DIG SAFE WILL ADVISE CONTRACTOR OF MEMBER UTILITIES IN THE AREA. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND CONTACTING NON-MEMBER UTILITIES DIRECTLY. NON-MEMBER UTILITIES MAY INCLUDE TOWN OR CITY WATER AND SEWER DISTRICTS AND SMALL LOCAL UTILITIES, AS WELL AS USG PUBLIC WORKS SYSTEMS.

12. CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE REQUIREMENTS OF 23 MRSA 3360-A. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE APPROPRIATE UTILITIES TO OBTAIN AUTHORIZATION PRIOR TO RELOCATION OF ANY EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS. IF A UTILITY CONFLICT ARISES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER, THE MUNICIPALITY AND APPROPRIATE UTILITY COMPANY PRIOR TO PROCEEDING WITH ANY RELOCATION.

13. ALL PAVEMENT MARKINGS AND DIRECTIONAL SIGNAGE SHOWN ON THE PLAN SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS.

14. ALL PAVEMENT JOINTS SHALL BE SAWCUT PRIOR TO PAVING TO PROVIDE A DURABLE AND UNIFORM JOINT.

15. NO HOLES, TRENCHES OR STRUCTURES SHALL BE LEFT OPEN OVERNIGHT IN ANY EXCAVATION ACCESSIBLE TO THE PUBLIC OR IN PUBLIC RIGHTS-OF-WAY.

16. ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL REQUIRE A M.D.O.T. PERMIT AS WELL AS PERMITS FROM THE TOWN AS APPLICABLE.

17. THE PROPOSED LIMITS OF CLEARING SHOWN HEREON ARE APPROXIMATE BASED UPON THE PROPOSED LIMITS OF SITE GRADING. THE APPLICANT RESERVES THE RIGHT TO PERFORM NORMAL FOREST MANAGEMENT ACTIVITIES OUTSIDE OF THE CLEARING LIMIT AS SHOWN. TREE REMOVAL OUTSIDE OF THE LIMITS OF CLEARING MAY BE NECESSARY TO REMOVE DEAD OR DYING TREES OR TREE LIMBS. THIS REMOVAL IS DUE TO POTENTIAL SAFETY HAZARDS AND TO PROMOTE PROPER FOREST GROWTH.

18. IMMEDIATELY UPON COMPLETION OF CUTS/FILLS, THE CONTRACTOR SHALL STABILIZE DISTURBED AREAS IN ACCORDANCE WITH EROSION CONTROL NOTES AND AS SPECIFIED ON PLANS.

19. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR THE REMOVAL, REPLACEMENT AND RECTIFICATION OF ALL DAMAGED AND DEFECTIVE MATERIAL AND WORKMANSHIP IN CONNECTION WITH THE CONTRACT WORK. THE CONTRACTOR SHALL REPLACE OR REPAIR AS DIRECTED BY THE OWNER ALL SUCH DAMAGED OR DEFECTIVE MATERIALS WHICH APPEAR WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.

20. ALL WORK PERFORMED BY THE GENERAL CONTRACTOR AND/OR TRADE SUBCONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF LOCAL, STATE OR FEDERAL LAWS, AS WELL AS ANY OTHER GOVERNING REQUIREMENTS, WHETHER OR NOT SPECIFIED ON THE DRAWINGS.

21. WHERE THE TERMS "APPROVED EQUAL", "OTHER APPROVED", "EQUAL TO", "ACCEPTABLE" OR OTHER GENERAL QUALIFYING TERMS ARE USED IN THESE NOTES, IT SHALL BE UNDERSTOOD THAT REFERENCE IS MADE TO THE RULING AND JUDGMENT OF TERRADYN CONSULTANTS, LLC.

22. THE GENERAL CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FOR THE WORK UNTIL TURNED OVER TO THE OWNER.

23. THE GENERAL CONTRACTOR SHALL MAINTAIN A CURRENT AND COMPLETE SET OF CONSTRUCTION DRAWINGS ON SITE DURING ALL PHASES OF CONSTRUCTION FOR USE OF ALL TRADES.

24. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY CHANGES AND DEVIATION OF APPROVED PLANS NOT AUTHORIZED BY THE ARCHITECT/ENGINEER AND/OR CLIENT/OWNER.

25. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. ANY MODIFICATION TO SUIT FIELD DIMENSION AND CONDITION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ANY WORK.

26. BEFORE THE FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT AND MATERIALS, REPAIR OR REPLACE PRIVATE OR PUBLIC PROPERTY WHICH MAY HAVE BEEN DAMAGED OR DESTROYED DURING CONSTRUCTION, CLEAN THE AREAS WITHIN AND ADJACENT TO THE PROJECT WHICH HAVE BEEN OBSTRUCTED BY HIS/HER OPERATIONS, AND LEAVE THE PROJECT AREA NEAT AND PRESENTABLE.

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

STATE OF MAINE JEFFREY D. AMOS No. 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
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Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE PLAN - 1

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.1

C:\OD\Terradyn Consultants\Project Folders - Documents\2021 Jobs\21-13 South Street MHP\CAD\Permitting\21-13 SITE.dwg

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

STATE OF MAINE
JEFFREY D. AMOS
No. 10167
LICENSED
PROFESSIONAL ENGINEER

DATE.	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE
SUITE 301
NEW GLOUCESTER, ME 04260
565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE PLAN - 2

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.2

C:\OD\Terradyn Consultants\Project Folders - Documents\2021 Jobs\21-13 South Street MHP\CAD\Permitting\21-13 SITE.dwg

SITE KEY
SCALE: 1"=600'

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

NO.	DATE	REVISIONS	APP'D BY
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A	04-13-2022	PRELIMINARY SUBMISSION	

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

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41 CAMPUS DRIVE SUITE 201 NEW GLOUCESTER, ME 04260
565 CONGRESS STREET SUITE 201 PORTLAND, ME 04102
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PROJECT: HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE: SITE PLAN - 3

CLIENT: SOUTH STREET VILLAGE, LLC
792 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.3

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DATE.	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

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565 CONGRESS STREET
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PORTLAND, ME 04102
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE PLAN - 4

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.4

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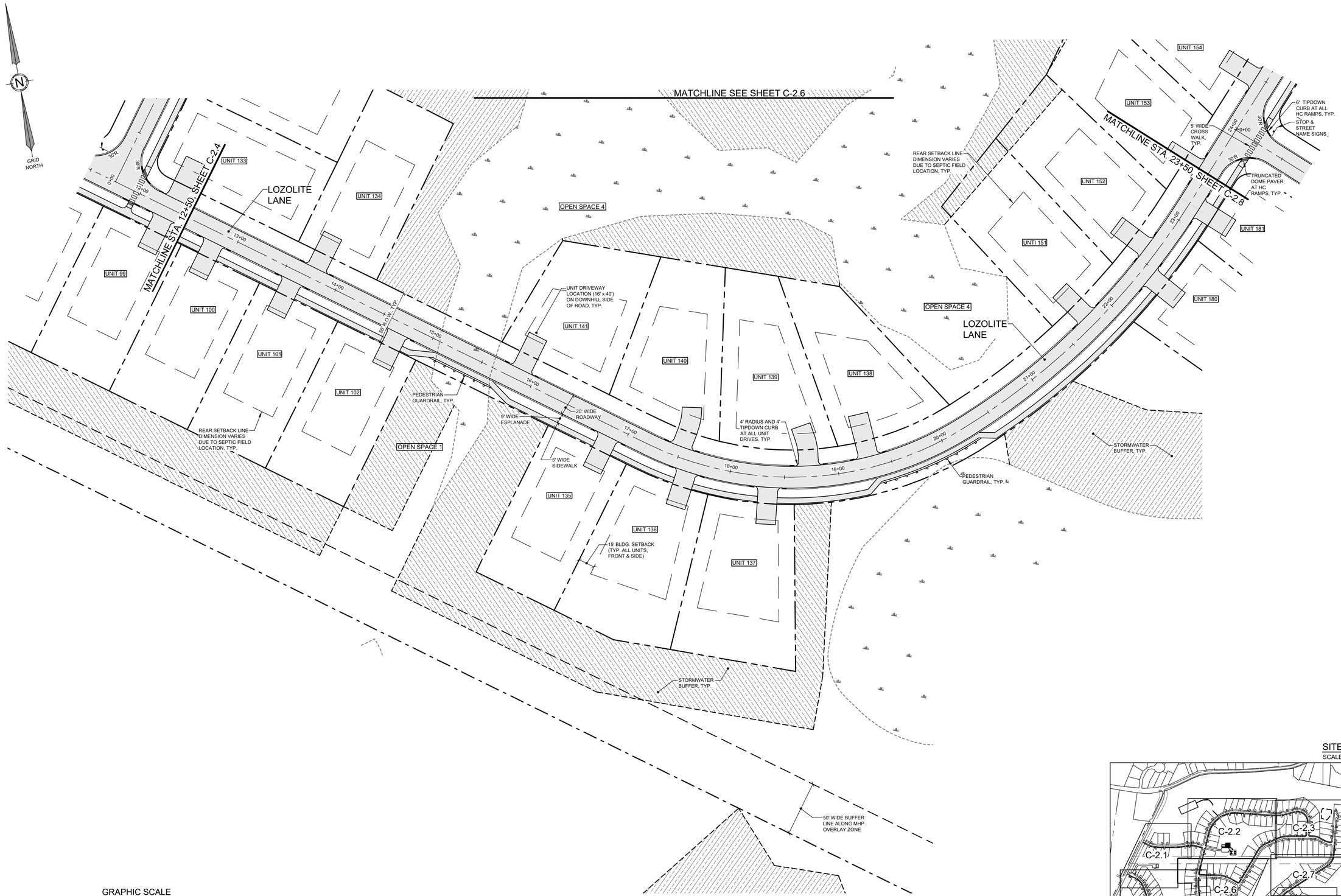
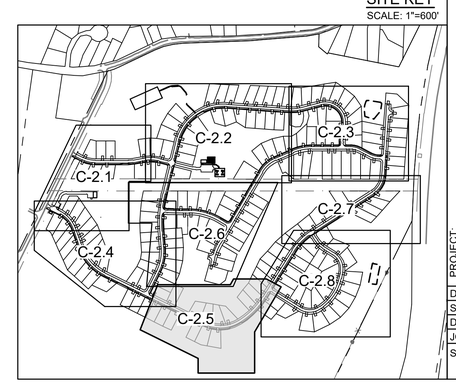


GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

SITE KEY
SCALE: 1"=600'



STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

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565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

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NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE PLAN - 5

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.5

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MATCHLINE, SEE SHEET C-2.2

MATCHLINE, SEE SHEET C-2.2

OPEN SPACE 2

OPEN SPACE 3

OPEN SPACE 3

MATCHLINE STA. 8+00, SHEET C-2.4

MATCHLINE STA. 1+00, SHEET C-2.4

SEE SHEET C-2.4

MATCHLINE SHEET C-2.5

GARNET DRIVE

GARNET DRIVE

RUBY ROAD

GRIFFINITE WAY

COMMUNITY GARDENS

OPEN SPACE 4

OPEN SPACE 4

UNIT 104
UNIT 105
UNIT 106
UNIT 107
UNIT 108
UNIT 109
UNIT 110
UNIT 111
UNIT 112
UNIT 113
UNIT 114
UNIT 115
UNIT 116
UNIT 117
UNIT 118
UNIT 119
UNIT 120
UNIT 121
UNIT 122
UNIT 123
UNIT 124
UNIT 125
UNIT 126
UNIT 127
UNIT 128
UNIT 129
UNIT 130
UNIT 131
UNIT 132
UNIT 142
UNIT 143
UNIT 144
UNIT 145
UNIT 146
UNIT 147
UNIT 148
UNIT 149
UNIT 150

6' TIPDOWN CURB AT ALL HC RAMPS, TYP.

STOP & STREET NAME SIGNS

5' WIDE CROSS WALK, TYP.

TRUNCATED DOME PAVER AT HC RAMPS, TYP.

15' BLDG. SETBACK (TYP. ALL UNITS, FRONT & SIDE)

REAR SETBACK LINE DIMENSION VARIES DUE TO SEPTIC FIELD LOCATION, TYP.

UNIT DRIVEWAY LOCATION (16' x 40') ON DOWNHILL SIDE OF ROAD, TYP.

SLIPFORM CONCRETE CURB, TYP. ALL LOCATIONS

9' WIDE ESPLANADE

5' WIDE SIDEWALK

20' WIDE ROADWAY

STOP & STREET NAME SIGNS

4' RADIUS AND 4' TIPDOWN CURB AT ALL UNIT DRIVES, TYP.

50' R.O.W. TYP.

STORMWATER BUFFER, TYP.

STORMWATER BUFFER, TYP.

GRID NORTH

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

SITE KEY
SCALE: 1"=600'

C-2.1
C-2.2
C-2.3
C-2.4
C-2.5
C-2.6
C-2.7
C-2.8

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

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TERRADYN CONSULTANTS, LLC

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NEW GLOUCESTER, ME 04260

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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE PLAN - 6

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.6

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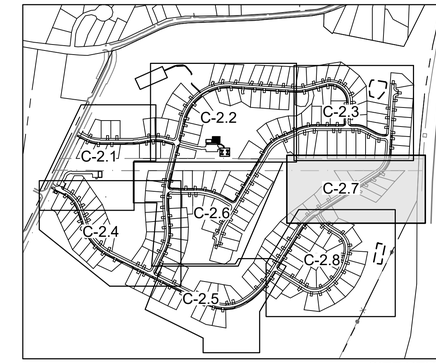

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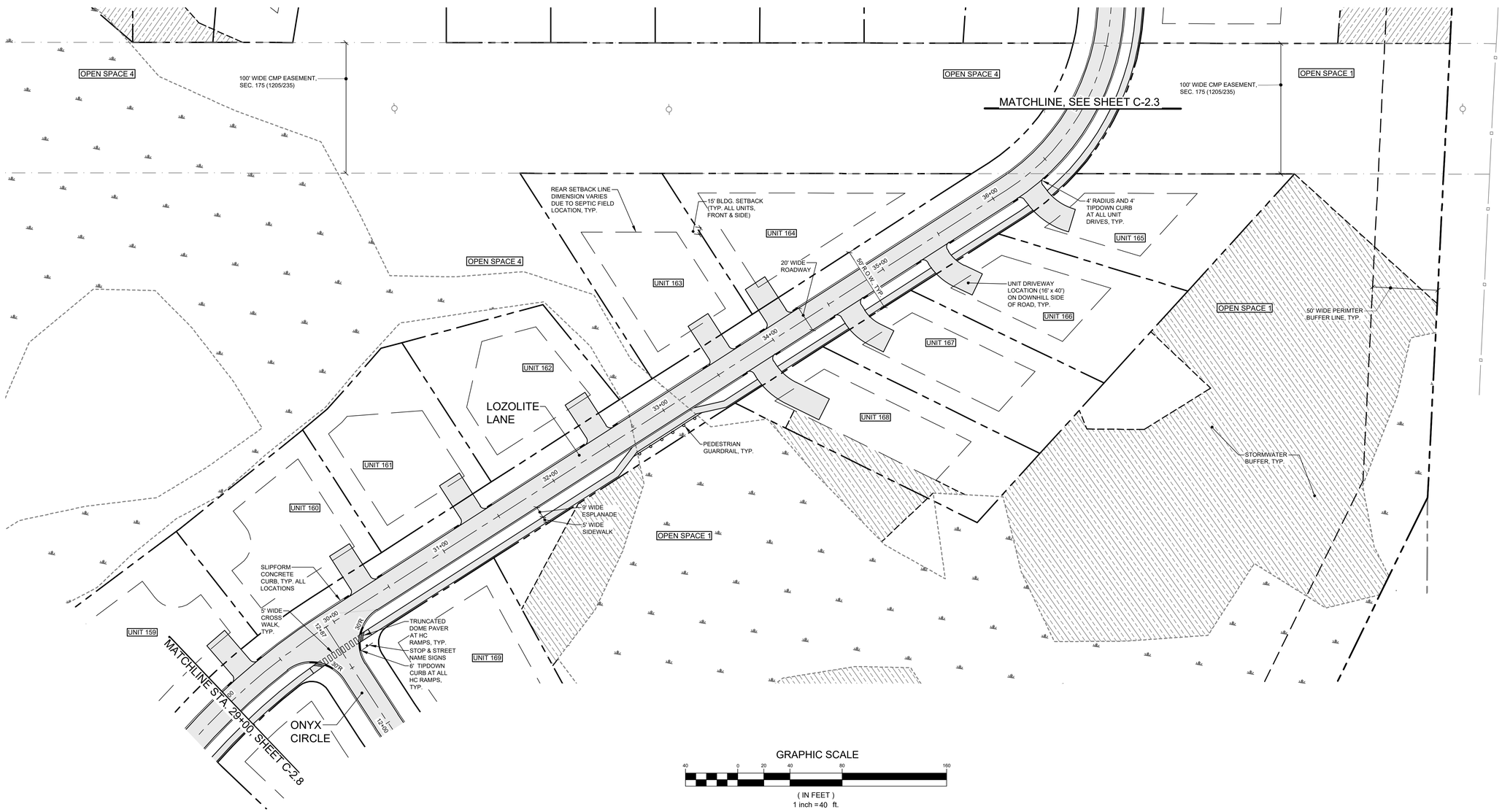

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

STATE OF MAINE
JEFFREY D. AMOS
10167
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DATE.	08-17-2022
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE PLAN - 7

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.7

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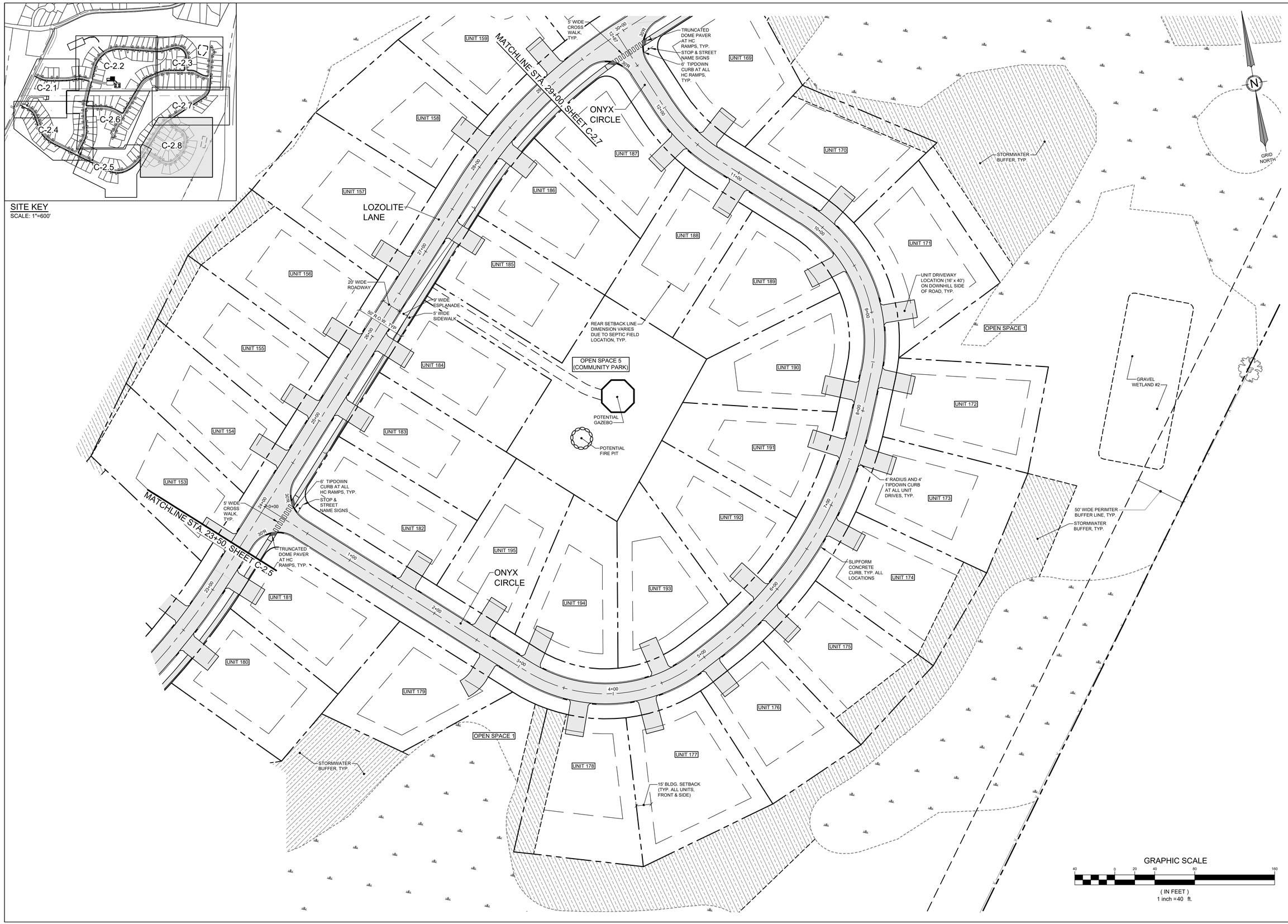

STATE OF MAINE
JEFFREY D. AMOS
No. 10167
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565 CONGRESS STREET
SUITE 200
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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE PLAN - 8

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-2.8

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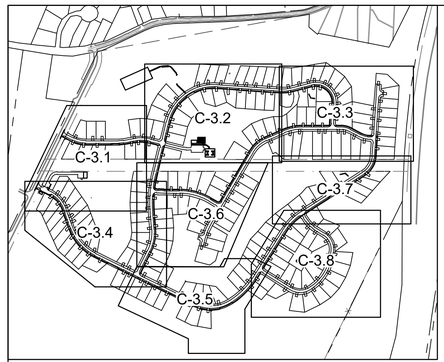
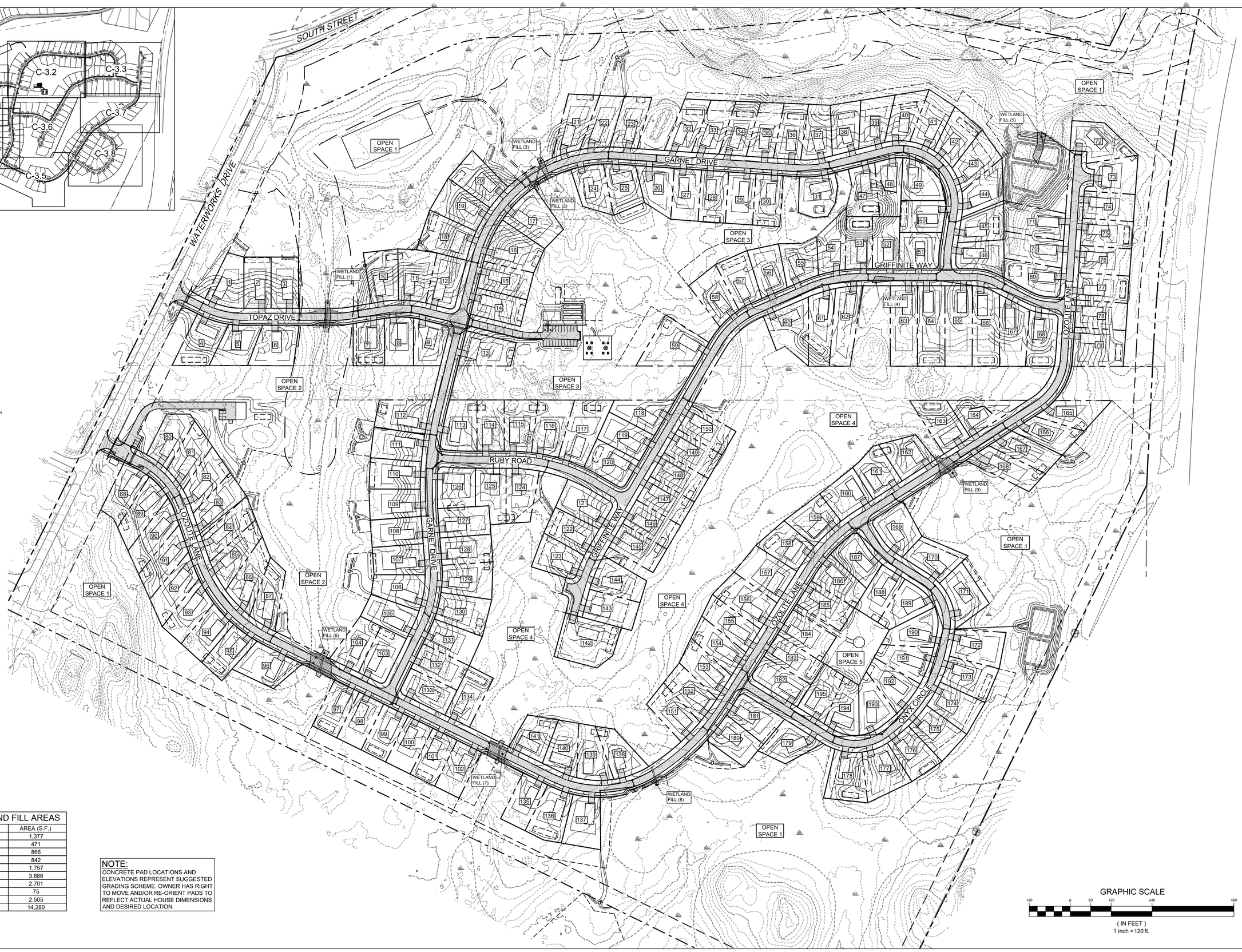


SITE KEY
SCALE: 1"=600'



WETLAND FILL AREAS	
FILL NO.	AREA (S.F.)
1	1,377
2	471
3	866
4	842
5	1,757
6	3,686
7	2,701
8	75
9	2,505
TOTAL	14,280

NOTE:
CONCRETE PAD LOCATIONS AND ELEVATIONS REPRESENT SUGGESTED GRADING SCHEME. OWNER HAS RIGHT TO MOVE AND/OR RE-ORIENT PADS TO REFLECT ACTUAL HOUSE DIMENSIONS AND DESIRED LOCATION.

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
OVERALL GRADING & DRAINAGE PLAN

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 120'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.0

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HOUSEKEEPING NOTES

1. SPILL PREVENTION. CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS ON SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.

2. GROUNDWATER PROTECTION. DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL. DIKES, BERMS, SUMPS, AND OTHER FORMS OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.

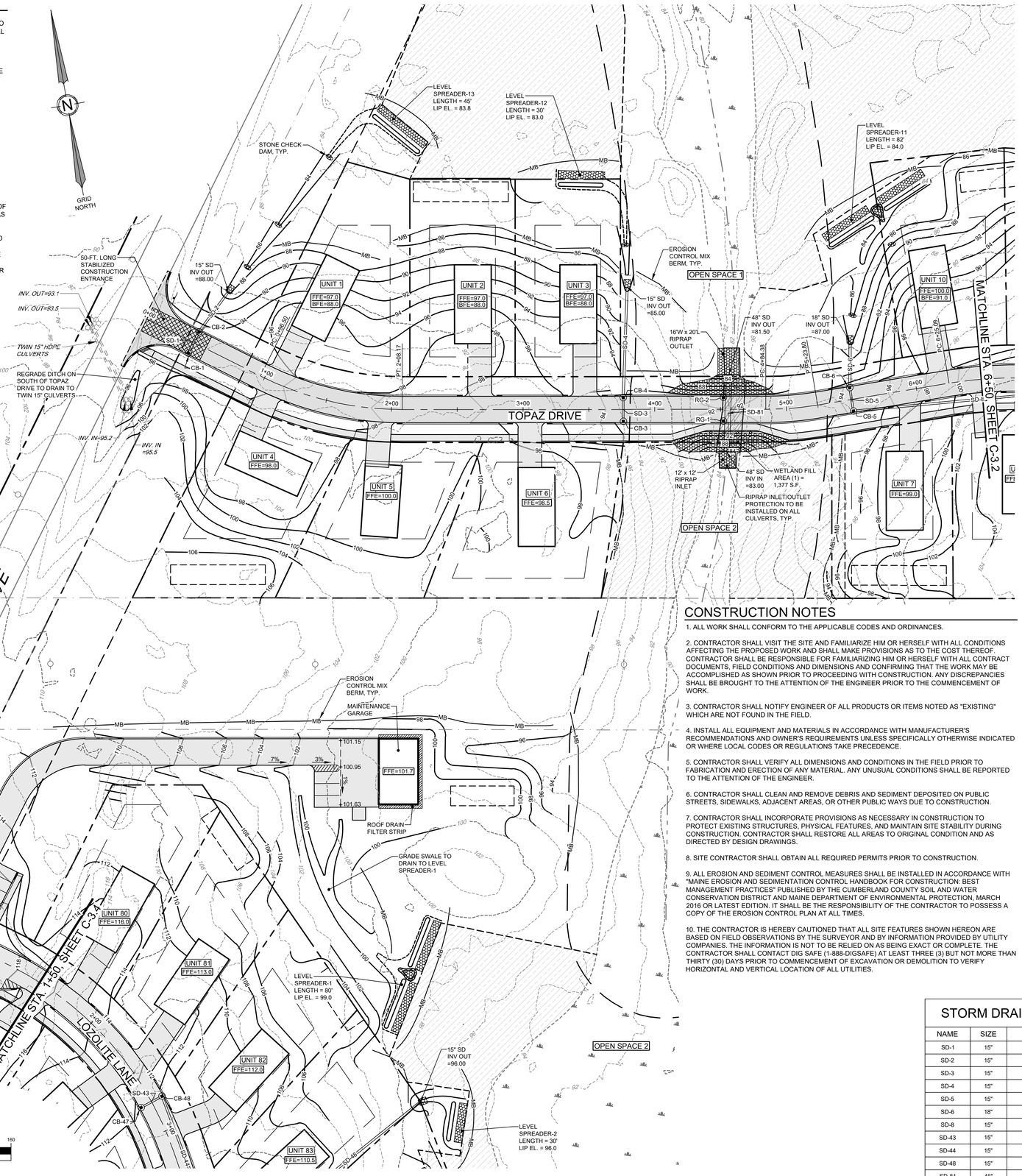
3. FUGITIVE SEDIMENT AND DUST. ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MAY NOT BE USED FOR DUST CONTROL.

4. DEBRIS AND OTHER MATERIALS. LITTER, CONSTRUCTION DEBRIS, AND CHEMICALS EXPOSED TO STORMWATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

5. TRENCH OR FOUNDATION DE-WATERING. TRENCH DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER MUST BE REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, AND MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM SEDIMENTATION BASIN. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.

6. NON-STORMWATER DISCHARGES. IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES.

7. ADDITIONAL REQUIREMENTS. ADDITIONAL REQUIREMENTS MAY BE APPLIED ON A SITE-SPECIFIC BASIS.



SITE KEY
SCALE: 1"=600'

CONSTRUCTION NOTES

1. ALL WORK SHALL CONFORM TO THE APPLICABLE CODES AND ORDINANCES.

2. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIM OR HERSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIM OR HERSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.

3. CONTRACTOR SHALL NOTIFY ENGINEER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND IN THE FIELD.

4. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND OWNER'S REQUIREMENTS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

5. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.

6. CONTRACTOR SHALL CLEAN AND REMOVE DEBRIS AND SEDIMENT DEPOSITED ON PUBLIC STREETS, SIDEWALKS, ADJACENT AREAS, OR OTHER PUBLIC WAYS DUE TO CONSTRUCTION.

7. CONTRACTOR SHALL INCORPORATE PROVISIONS AS NECESSARY IN CONSTRUCTION TO PROTECT EXISTING STRUCTURES, PHYSICAL FEATURES, AND MAINTAIN SITE STABILITY DURING CONSTRUCTION. CONTRACTOR SHALL RESTORE ALL AREAS TO ORIGINAL CONDITION AND AS DIRECTED BY DESIGN DRAWINGS.

8. SITE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.

9. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH "MAINE EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES" PUBLISHED BY THE CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, MARCH 2016 OR LATEST EDITION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO POSSESS A COPY OF THE EROSION CONTROL PLAN AT ALL TIMES.

10. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY INFORMATION PROVIDED BY UTILITY COMPANIES. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT DIG SAFE (1-888-DIGSAFE) AT LEAST THREE (3) BUT NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.

CONSTRUCTION NOTES

11. CONTRACTOR SHALL BE AWARE THAT DIG SAFE ONLY NOTIFIES ITS "MEMBER" UTILITIES ABOUT THE DIG. WHEN NOTIFIED, DIG SAFE WILL ADVISE CONTRACTOR OF MEMBER UTILITIES IN THE AREA. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND CONTACTING NON-MEMBER UTILITIES DIRECTLY. NON-MEMBER UTILITIES MAY INCLUDE TOWN OR CITY WATER AND SEWER DISTRICTS AND SMALL LOCAL UTILITIES, AS WELL AS USG PUBLIC WORKS SYSTEMS.

12. CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE REQUIREMENTS OF 23 MRSA 3360-A. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE APPROPRIATE UTILITIES TO OBTAIN AUTHORIZATION PRIOR TO RELOCATION OF ANY EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS. IF A UTILITY CONFLICT ARISES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER, THE MUNICIPALITY AND APPROPRIATE UTILITY COMPANY PRIOR TO PROCEEDING WITH ANY RELOCATION.

13. ALL PAVEMENT MARKINGS AND DIRECTIONAL SIGNAGE SHOWN ON THE PLAN SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS.

14. ALL PAVEMENT JOINTS SHALL BE SAWCUT PRIOR TO PAVING TO PROVIDE A DURABLE AND UNIFORM JOINT.

15. NO HOLES, TRENCHES OR STRUCTURES SHALL BE LEFT OPEN OVERNIGHT IN ANY EXCAVATION ACCESSIBLE TO THE PUBLIC OR IN PUBLIC RIGHTS-OF-WAY.

16. ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL REQUIRE A M.D.O.T. PERMIT AS WELL AS PERMITS FROM THE TOWN AS APPLICABLE.

17. THE PROPOSED LIMITS OF CLEARING SHOWN HEREON ARE APPROXIMATE BASED UPON THE PROPOSED LIMITS OF SITE GRADING. THE APPLICANT RESERVES THE RIGHT TO PERFORM NORMAL FOREST MANAGEMENT ACTIVITIES OUTSIDE OF THE CLEARING LIMIT AS SHOWN. TREE REMOVAL OUTSIDE OF THE LIMITS OF CLEARING MAY BE NECESSARY TO REMOVE DEAD OR DYING TREES OR TREE LIMBS. THIS REMOVAL IS DUE TO POTENTIAL SAFETY HAZARDS AND TO PROMOTE PROPER FOREST GROWTH.

18. IMMEDIATELY UPON COMPLETION OF CUTS/FILLS, THE CONTRACTOR SHALL STABILIZE DISTURBED AREAS IN ACCORDANCE WITH EROSION CONTROL NOTES AND AS SPECIFIED ON PLANS.

19. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR THE REMOVAL, REPLACEMENT AND RECTIFICATION OF ALL DAMAGED AND DEFECTIVE MATERIAL AND WORKMANSHIP IN CONNECTION WITH THE CONTRACT WORK. THE CONTRACTOR SHALL REPLACE OR REPAIR AS DIRECTED BY THE OWNER ALL SUCH DAMAGED OR DEFECTIVE MATERIALS WHICH APPEAR WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.

20. ALL WORK PERFORMED BY THE GENERAL CONTRACTOR AND/OR TRADE SUBCONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF LOCAL, STATE OR FEDERAL LAWS, AS WELL AS ANY OTHER GOVERNING REQUIREMENTS, WHETHER OR NOT SPECIFIED ON THE DRAWINGS.

21. WHERE THE TERMS "APPROVED EQUAL", "OTHER APPROVED", "EQUAL TO", "ACCEPTABLE" OR OTHER GENERAL QUALIFYING TERMS ARE USED IN THESE NOTES, IT SHALL BE UNDERSTOOD THAT REFERENCE IS MADE TO THE RULING AND JUDGMENT OF TERRADYN CONSULTANTS, LLC.

22. THE GENERAL CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FOR THE WORK UNTIL TURNED OVER TO THE OWNER.

23. THE GENERAL CONTRACTOR SHALL MAINTAIN A CURRENT AND COMPLETE SET OF CONSTRUCTION DRAWINGS ON SITE DURING ALL PHASES OF CONSTRUCTION FOR USE OF ALL TRADES.

24. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY CHANGES AND DEVIATION OF APPROVED PLANS NOT AUTHORIZED BY THE ARCHITECT/ENGINEER AND/OR CLIENT/OWNER.

25. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. ANY MODIFICATION TO SUIT FIELD DIMENSION AND CONDITION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ANY WORK.

26. BEFORE THE FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT AND MATERIALS, REPAIR OR REPLACE PRIVATE OR PUBLIC PROPERTY WHICH MAY HAVE BEEN DAMAGED OR DESTROYED DURING CONSTRUCTION, CLEAN THE AREAS WITHIN AND ADJACENT TO THE PROJECT WHICH HAVE BEEN OBSTRUCTED BY HIS/HER OPERATIONS, AND LEAVE THE PROJECT AREA NEAT AND PRESENTABLE.

STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-1	15"	14'	1.43%
SD-2	15"	36'	1.72%
SD-3	15"	14'	1.43%
SD-4	15"	82'	3.33%
SD-5	15"	14'	1.43%
SD-6	18"	32'	4.60%
SD-8	15"	150'	7.09%
SD-43	15"	14'	1.43%
SD-44	15"	129'	1.47%
SD-48	15"	190'	4.20%
SD-81	48"	59'	2.53%
SD-109	15"	60'	3.32%

STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-1	94.07		88.82 (SD-1)	48"
CB-2	94.07	88.62 (SD-1)	88.62 (SD-2)	48"
CB-3	93.18		87.93 (SD-3)	48"
CB-4	93.18	87.73 (SD-3)	87.73 (SD-4)	48"
CB-5	94.09	88.88 (SD-8)	88.68 (SD-5)	48"
CB-6	94.19	88.48 (SD-5)	88.48 (SD-6)	48"
CB-47	111.31		106.06 (SD-43)	48"
CB-48	111.31	105.86 (SD-43)	105.86 (SD-44)	48"
RG-1	91.72			48"
RG-2	91.72			48"

STATE OF MAINE JEFFREY D. AMOS No. 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE SUITE 201 NEW GLOUCESTER, ME 04260
565 CONGRESS STREET SUITE 201 PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
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Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE: GRADING AND DRAINAGE PLAN - 1

CLIENT: SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.1

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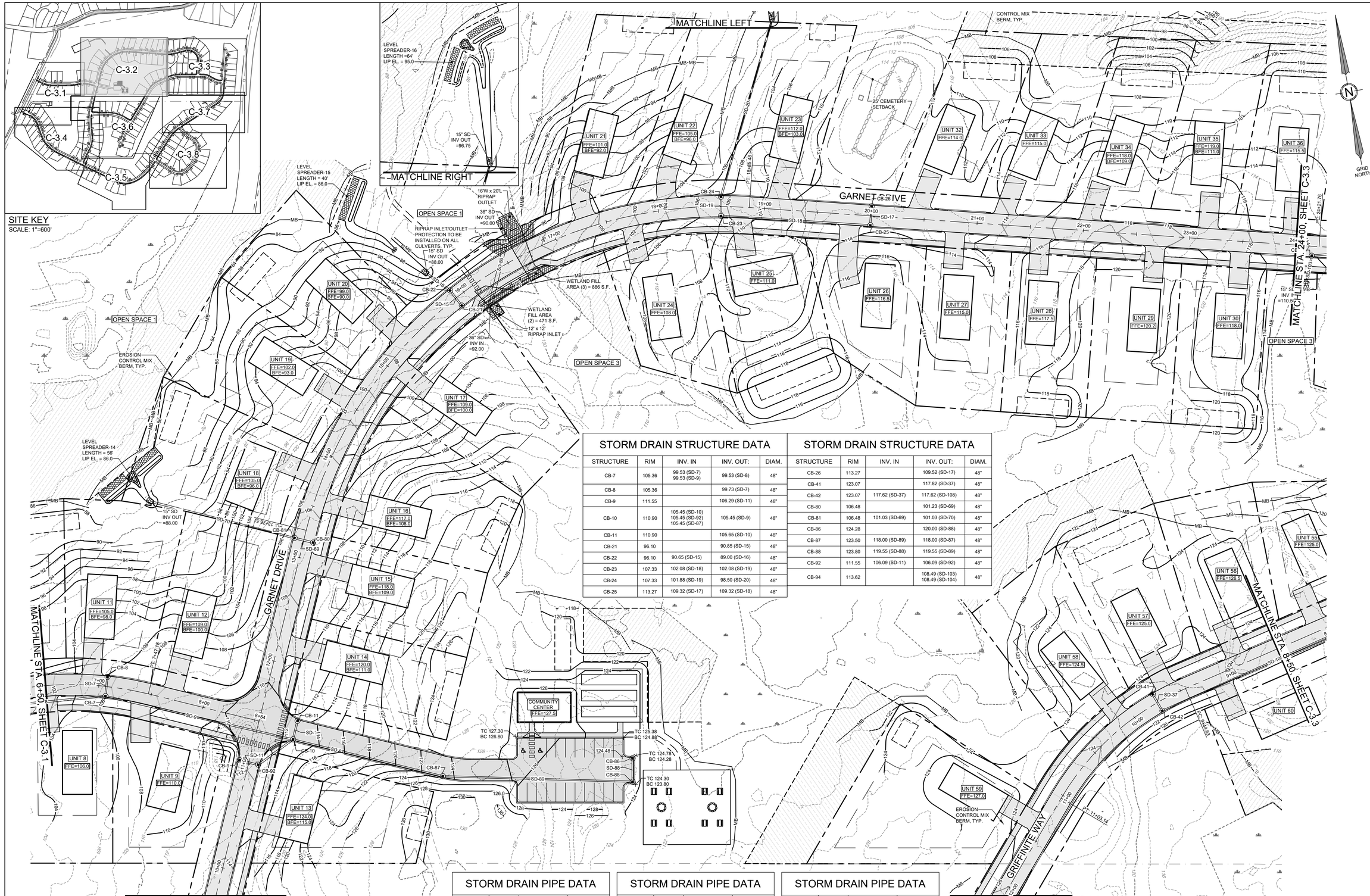

STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-7	105.36	99.53 (SD-7) 99.53 (SD-9)	99.53 (SD-8)	48"
CB-8	105.36		99.73 (SD-7)	48"
CB-9	111.55		106.29 (SD-11)	48"
CB-10	110.90	105.45 (SD-10) 105.45 (SD-92) 105.45 (SD-87)	105.45 (SD-9)	48"
CB-11	110.90		105.65 (SD-10)	48"
CB-21	96.10		90.85 (SD-15)	48"
CB-22	96.10	90.65 (SD-15)	89.00 (SD-16)	48"
CB-23	107.33	102.08 (SD-18)	102.08 (SD-19)	48"
CB-24	107.33	101.88 (SD-19)	98.50 (SD-20)	48"
CB-25	113.27	109.32 (SD-17)	109.32 (SD-18)	48"

STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-26	113.27		109.52 (SD-17)	48"
CB-41	123.07		117.82 (SD-37)	48"
CB-42	123.07	117.62 (SD-37)	117.62 (SD-108)	48"
CB-80	106.48		101.23 (SD-69)	48"
CB-81	106.48	101.03 (SD-69)	101.03 (SD-70)	48"
CB-86	124.28		120.00 (SD-88)	48"
CB-87	123.50	118.00 (SD-89)	118.00 (SD-87)	48"
CB-88	123.80	119.55 (SD-88)	119.55 (SD-89)	48"
CB-92	111.55	106.09 (SD-11)	106.09 (SD-92)	48"
CB-94	113.62		108.49 (SD-103) 108.49 (SD-104)	48"

STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-7	15"	14'	1.43%
SD-8	15"	150'	7.09%
SD-9	15"	177'	3.35%
SD-10	15"	14'	1.43%
SD-11	15"	14'	1.43%
SD-15	15"	14'	1.42%
SD-16	15"	25'	4.06%

STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-17	15"	14'	1.43%
SD-18	15"	136'	5.31%
SD-19	15"	14'	1.43%
SD-20	15"	173'	1.01%
SD-37	15"	14'	1.43%
SD-69	15"	14'	1.43%
SD-70	15"	136'	9.60%

STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-86	36"	77'	2.59%
SD-87	15"	141'	8.91%
SD-88	15"	18'	2.50%
SD-89	15"	174'	0.89%
SD-92	15"	36'	1.75%
SD-103	15"	25'	8.15%

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

STATE OF MAINE
JEFFREY D. AMOS
PE 10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

41 CAMPUS DRIVE
SUITE 201
NEW GLOUCESTER, ME 04260

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
GRADING AND DRAINAGE PLAN - 2

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.2

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STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-27	111.97	108.02 (SD-21) 108.02 (SD-104) 108.02 (SD-105)	108.02 (SD-22)	48"
CB-28	111.97		108.22 (SD-21)	48"
CB-29	111.22	106.92 (SD-22) 107.27 (SD-23)	106.92 (SD-24)	48"
CB-30	111.22		107.47 (SD-23)	48"
CB-31	107.63	103.68 (SD-24) 103.68 (SD-25)	103.68 (SD-26)	48"
CB-32	107.63		103.88 (SD-25)	48"
CB-33	104.68	99.43 (SD-26)	99.18 (SD-27)	48"
CB-34	104.68	98.98 (SD-27)	99.13 (SD-90)	48"
CB-35	99.13	93.91 (SD-32) 93.91 (SD-66)	93.66 (SD-33)	48"
CB-36	99.13	93.46 (SD-33)	93.46 (SD-34)	48"
CB-37	109.18	102.89 (SD-31) 102.89 (SD-36)	102.89 (SD-32)	48"
CB-38	109.18		103.09 (SD-31)	48"
CB-39	118.92	113.14 (SD-35) 113.34 (SD-107)	113.14 (SD-36)	48"
CB-40	118.92		113.34 (SD-35)	48"
CB-71	102.18	95.04 (SD-68) 95.00 (SD-99)	95.04 (SD-66)	48"
CB-72	101.00	95.55 (SD-67)	95.55 (SD-68)	48"
CB-73	101.00		95.75 (SD-67)	48"
CB-89	102.18		95.20 (SD-99)	48"
CB-94	113.62		108.49 (SD-103) 108.49 (SD-104)	48"
CB-96	93.86		88.61 (SD-46)	48"
CB-97	93.86	88.41 (SD-46)	88.41 (SD-47)	48"
DMH-5	124.58	115.24 (SD-108)	115.24 (SD-107)	48"

STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-21	15"	14'	1.43%
SD-22	15"	215'	0.51%
SD-23	15"	14'	1.43%
SD-24	15"	110'	2.93%
SD-25	15"	14'	1.43%
SD-26	15"	151'	2.81%
SD-27	18"	14'	1.43%
SD-31	15"	14'	1.43%
SD-32	15"	190'	4.73%
SD-33	18"	14'	1.43%
SD-34	18"	47'	0.97%
SD-35	15"	14'	1.43%
SD-36	15"	196'	5.23%
SD-46	15"	14'	1.43%
SD-47	15"	117'	10.58%
SD-66	15"	194'	0.58%
SD-67	15"	14'	1.43%
SD-68	15"	98'	0.52%
SD-90	18"	169'	7.78%
SD-99	15"	14'	1.43%
SD-103	15"	25'	8.15%
SD-104	15"	92'	0.51%
SD-105	15"	27'	15.76%
SD-107	15"	131'	1.45%
SD-108	15"	228'	1.04%

STATE OF MAINE
JEFFREY D. AMOS
No. 10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

41 CAMPUS DRIVE
SUITE 201
NEW GLOUCESTER, ME 04260

565 CONGRESS STREET
SUITE 200
PORTLAND, ME 04102

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

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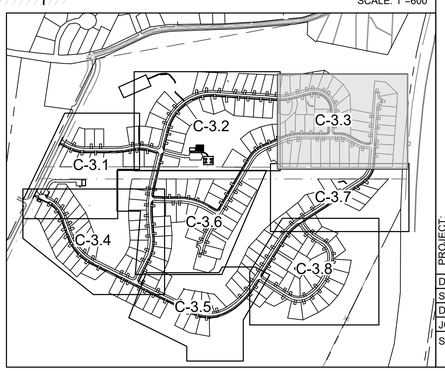
SITE KEY
SCALE: 1"=600'



PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
GRADING AND DRAINAGE PLAN - 3

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.3

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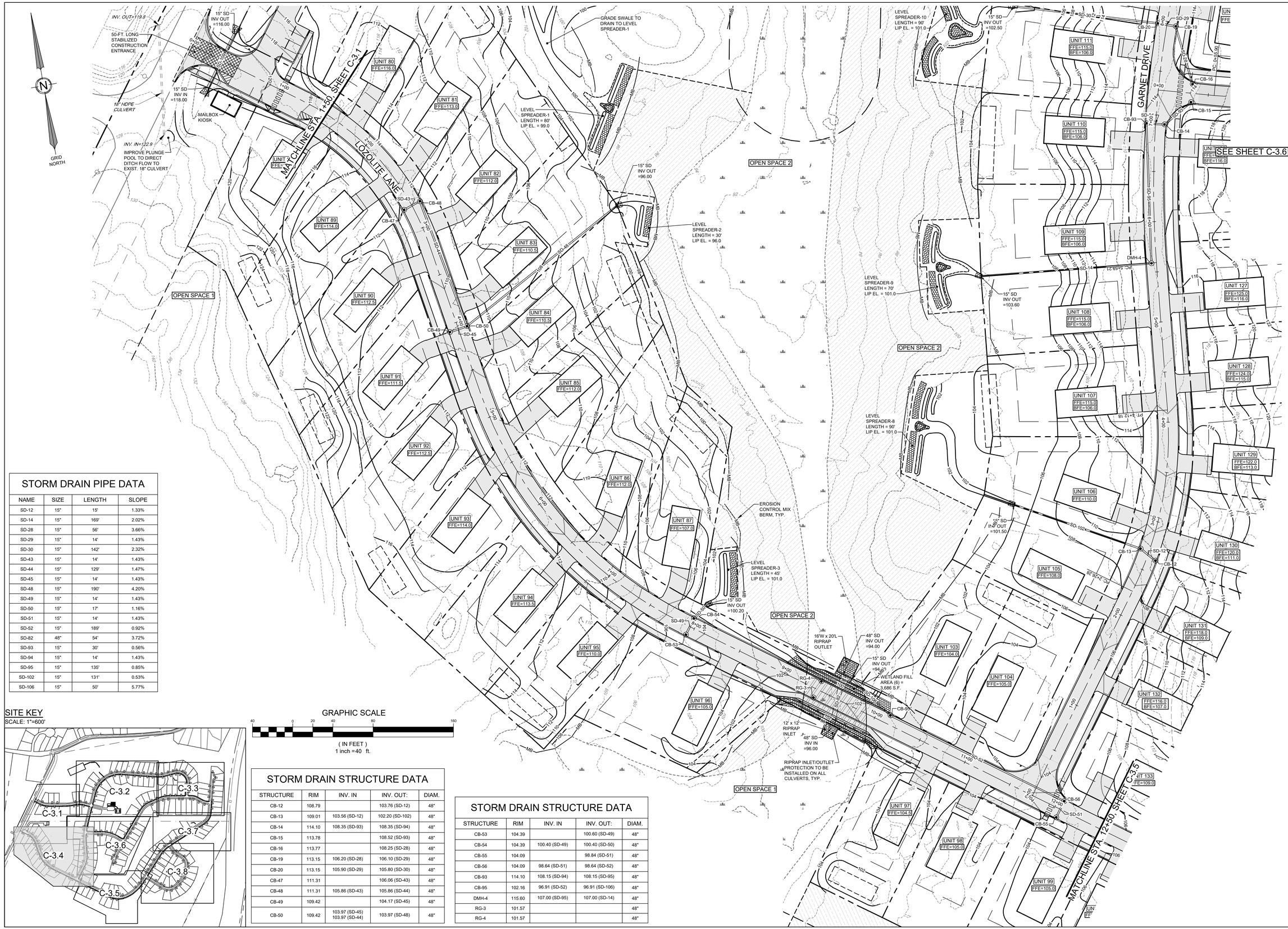

STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-12	15"	15'	1.33%
SD-14	15"	169'	2.02%
SD-28	15"	56'	3.66%
SD-29	15"	14'	1.43%
SD-30	15"	142'	2.32%
SD-43	15"	14'	1.43%
SD-44	15"	129'	1.47%
SD-45	15"	14'	1.43%
SD-48	15"	190'	4.20%
SD-49	15"	14'	1.43%
SD-50	15"	17'	1.16%
SD-51	15"	14'	1.43%
SD-52	15"	189'	0.92%
SD-82	48"	54'	3.72%
SD-93	15"	30'	0.56%
SD-94	15"	14'	1.43%
SD-95	15"	135'	0.85%
SD-102	15"	131'	0.53%
SD-106	15"	50'	5.77%

SITE KEY
SCALE: 1"=600'

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-12	108.79		103.76 (SD-12)	48"
CB-13	109.01	103.56 (SD-12)	102.20 (SD-102)	48"
CB-14	114.10	108.35 (SD-93)	108.35 (SD-94)	48"
CB-15	113.78		108.52 (SD-93)	48"
CB-16	113.77		108.25 (SD-28)	48"
CB-19	113.15	106.20 (SD-28)	106.10 (SD-29)	48"
CB-20	113.15	105.90 (SD-29)	105.80 (SD-30)	48"
CB-47	111.31		106.06 (SD-43)	48"
CB-48	111.31	105.86 (SD-43)	105.86 (SD-44)	48"
CB-49	109.42		104.17 (SD-45)	48"
CB-50	109.42	103.97 (SD-45) 103.97 (SD-44)	103.97 (SD-48)	48"

STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-53	104.39		100.60 (SD-49)	48"
CB-54	104.39	100.40 (SD-49)	100.40 (SD-50)	48"
CB-55	104.09		98.84 (SD-51)	48"
CB-56	104.09	98.64 (SD-51)	98.64 (SD-52)	48"
CB-93	114.10	108.15 (SD-94)	108.15 (SD-95)	48"
CB-95	102.16	96.91 (SD-52)	96.91 (SD-106)	48"
DMH-4	115.60	107.00 (SD-95)	107.00 (SD-14)	48"
RG-3	101.57			48"
RG-4	101.57			48"

STATE OF MAINE
JEFFREY D. AMOS
No. 10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE
SUITE 301
NEW GLOUCESTER, ME 04260
565 CONGRESS STREET
SUITE 200
PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

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NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
GRADING AND DRAINAGE PLAN - 4

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.4

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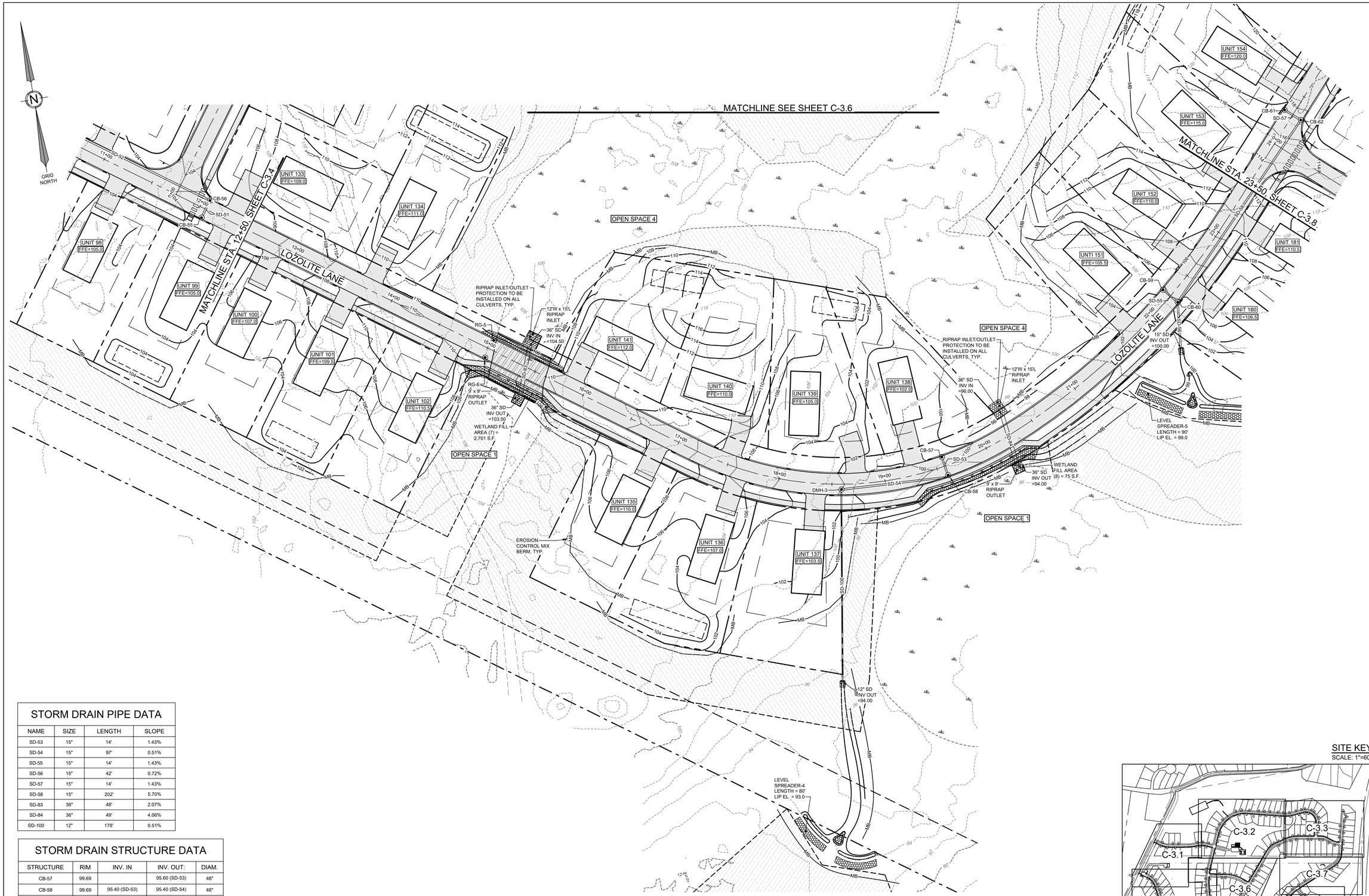


STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-53	15"	14'	1.43%
SD-54	15"	97'	0.51%
SD-55	15"	14'	1.43%
SD-56	15"	42'	0.72%
SD-57	15"	14'	1.43%
SD-58	15"	202'	5.70%
SD-83	36"	48'	2.07%
SD-84	36"	49'	4.06%
SD-100	12"	178'	0.51%

STORM DRAIN STRUCTURE DATA

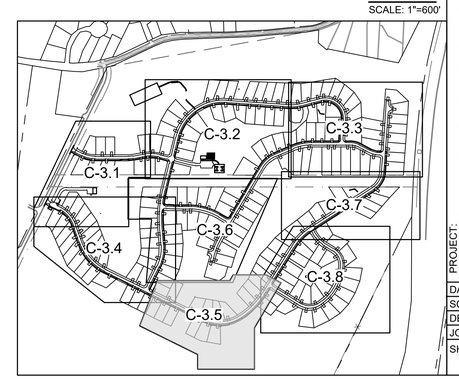
STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-57	99.69		95.60 (SD-53)	48"
CB-58	99.69	95.40 (SD-53)	95.40 (SD-54)	48"
CB-59	103.75		100.50 (SD-55)	48"
CB-60	103.75	100.30 (SD-55) 100.30 (SD-58)	100.30 (SD-56)	48"
CB-61	117.27		112.02 (SD-57)	48"
CB-62	117.27	111.82 (SD-57)	111.82 (SD-58)	48"
DMH-3	102.00	94.90 (SD-54)	94.90 (SD-100)	48"
RG-5	109.01			48"
RG-6	109.01			48"

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

SITE KEY
SCALE: 1"=600'



STATE OF MAINE
JEFFREY D. AMOS
No. 10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
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TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE
SUITE 201
NEW GLOUCESTER, ME 04260

555 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
GRADING AND DRAINAGE PLAN - 5

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.5

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STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-12	15"	15'	1.33%
SD-14	15"	169'	2.02%
SD-28	15"	56'	3.66%
SD-29	15"	14'	1.43%
SD-30	15"	142'	2.32%
SD-39	15"	14'	1.43%
SD-40	15"	23'	0.88%
SD-41	15"	14'	1.43%
SD-42	15"	35'	0.86%
SD-91	15"	14'	1.43%

STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-12	108.79		103.76 (SD-12)	48"
CB-13	109.01	103.56 (SD-12)	102.20 (SD-102)	48"
CB-14	114.10	108.35 (SD-93)	108.35 (SD-94)	48"
CB-15	113.78		108.52 (SD-93)	48"
CB-16	113.77		108.25 (SD-28)	48"
CB-19	113.15	106.20 (SD-28)	106.10 (SD-29)	48"
CB-20	113.15	105.90 (SD-29)	105.80 (SD-30)	48"
CB-43	128.42		124.40 (SD-39)	48"
CB-44	128.42	124.20 (SD-39)	124.20 (SD-40)	48"
CB-45	125.39		122.00 (SD-41)	48"
CB-46	125.39	121.80 (SD-41)	121.80 (SD-42)	48"
CB-90	128.76	124.81 (SD-91)	124.81 (SD-101)	48"
CB-91	128.76		125.01 (SD-91)	48"
CB-93	114.10	108.15 (SD-94)	108.15 (SD-95)	48"
DMH-4	115.60	107.00 (SD-95)	107.00 (SD-14)	48"

SITE KEY
SCALE: 1"=600'

STATE OF MAINE
JEFFREY D. AMOS
No. 10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE SUITE 301 NEW GLOUCESTER, ME 04260
565 CONGRESS STREET SUITE 201 PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
GRADING AND DRAINAGE PLAN - 6

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.6

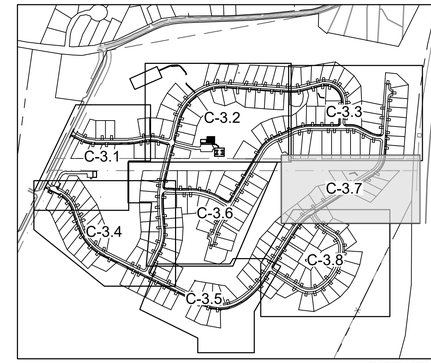
C:\GD\Terradyn Consultants\Project Folders - Documents\2021 Jobs\21-13 South Street MHP\CAD\Permitting\21-13 GD.dwg

STORM DRAIN STRUCTURE DATA

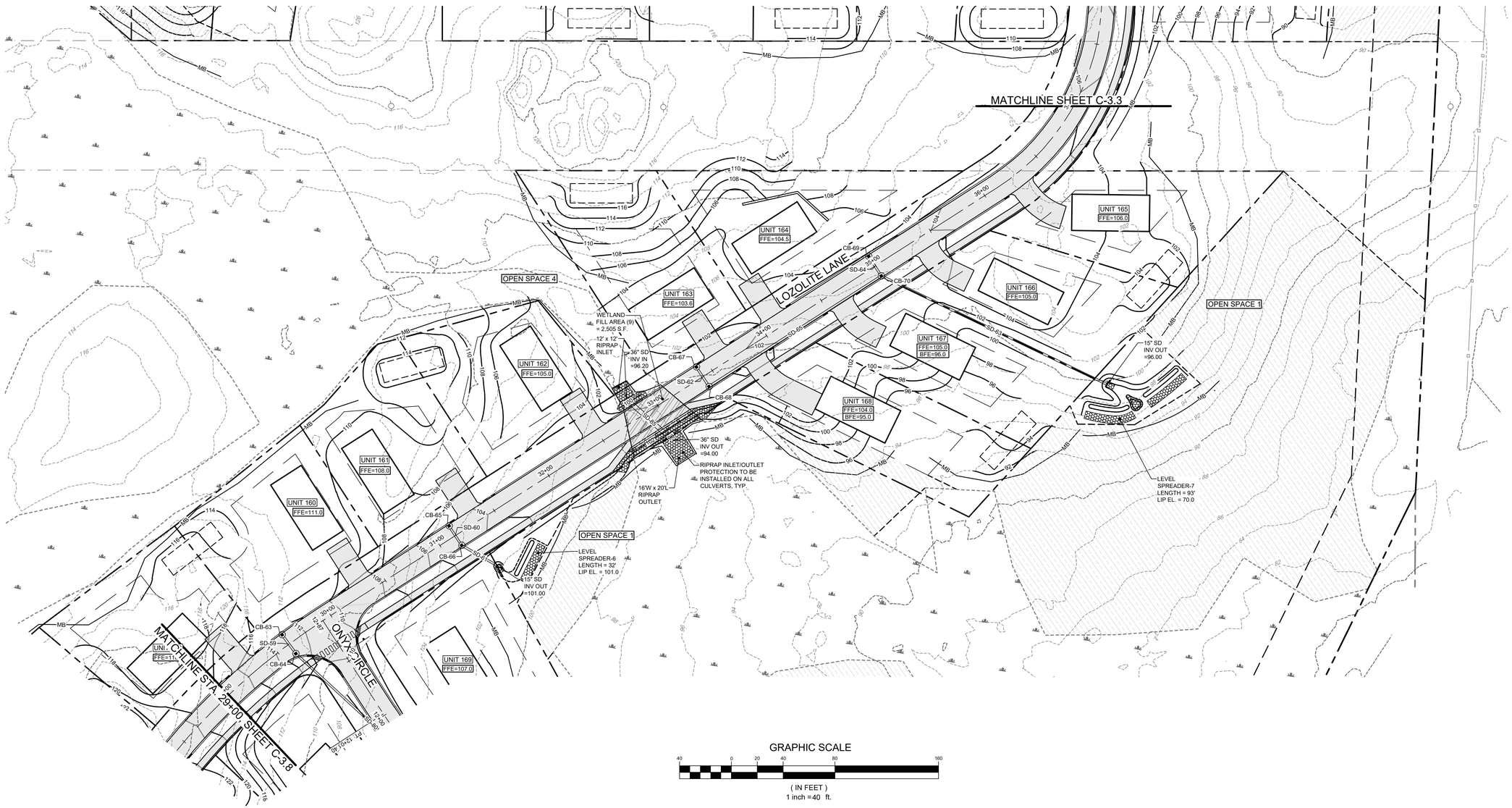
STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-63	112.92		107.67 (SD-59)	48"
CB-64	112.92	107.47 (SD-59)	107.47 (SD-80)	48"
CB-65	104.67		101.40 (SD-60)	48"
CB-66	104.66	101.20 (SD-60)	101.20 (SD-61)	48"
CB-67	101.59		97.96 (SD-62)	48"
CB-68	101.59	97.76 (SD-62)	97.76 (SD-65)	48"
CB-69	103.08		97.17 (SD-64)	48"
CB-70	103.08	96.97 (SD-64) 96.97 (SD-65)	96.97 (SD-63)	48"

STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-59	15"	14'	1.43%
SD-60	15"	14'	1.44%
SD-61	15"	30'	0.66%
SD-62	15"	14'	1.43%
SD-63	15"	192'	0.51%
SD-64	15"	14'	1.43%
SD-65	15"	154'	0.51%
SD-80	15"	154'	5.30%
SD-85	36"	48'	4.63%



SITE KEY
SCALE: 1"=600'



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

STATE OF MAINE
JEFFREY D. AMOS
No. 10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
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Permitting

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE SUITE 301 NEW GLOUCESTER, ME 04260
565 CONGRESS STREET SUITE 201 PORTLAND, ME 04102
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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
GRADING AND DRAINAGE PLAN - 7

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.7

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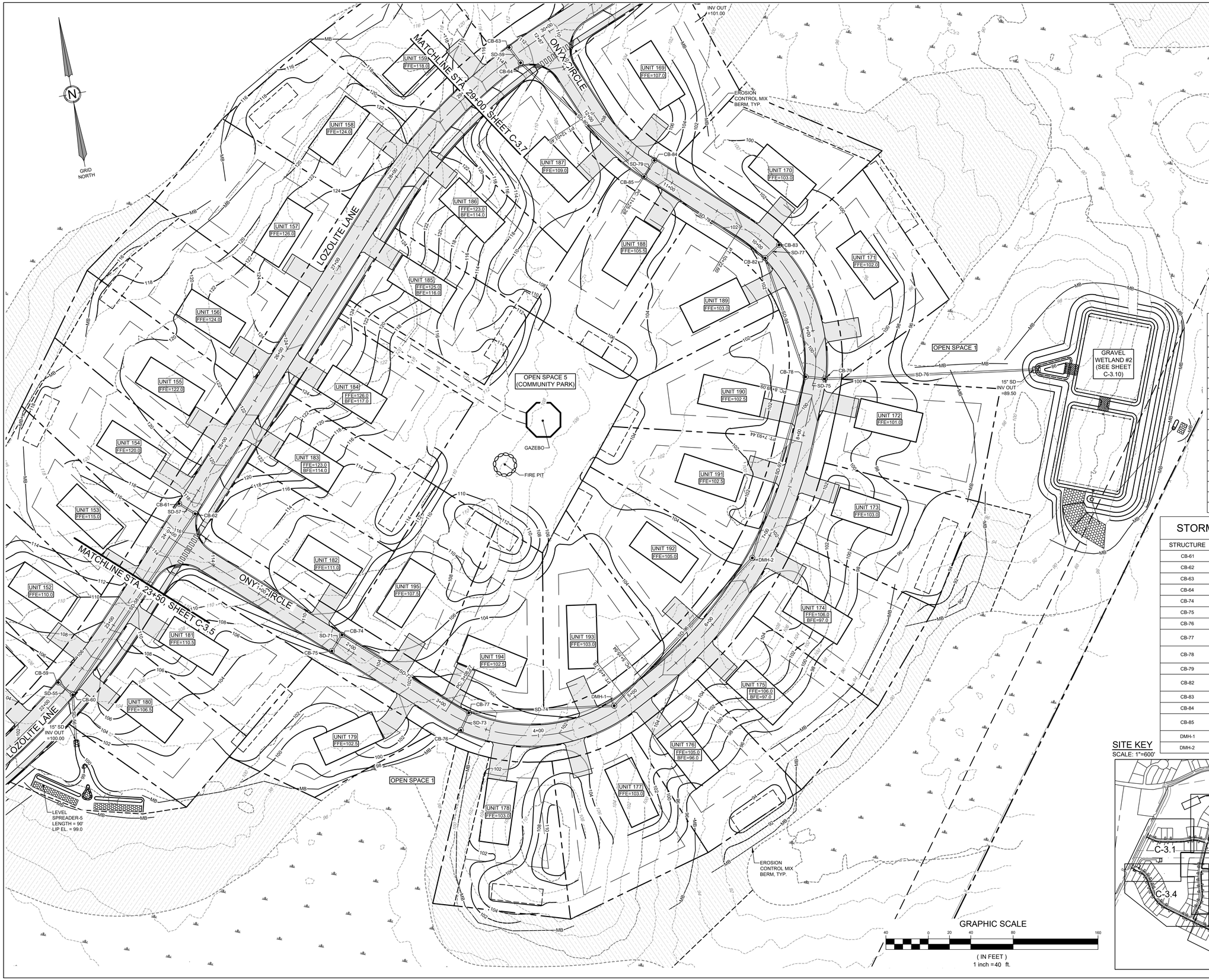


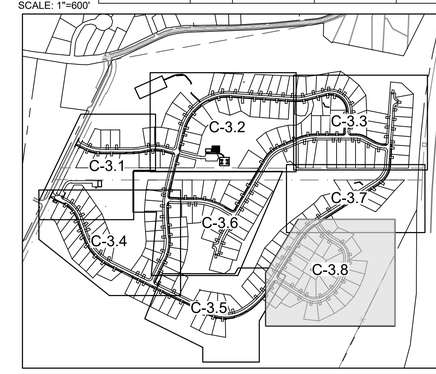
STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SD-57	15"	14'	1.43%
SD-58	15"	202'	5.70%
SD-59	15"	14'	1.43%
SD-71	15"	14'	1.43%
SD-72	15"	136'	4.98%
SD-73	15"	14'	1.43%
SD-74	15"	133'	0.66%
SD-75	15"	14'	1.43%
SD-76	15"	195'	1.02%
SD-77	15"	14'	1.43%
SD-78	15"	134'	2.64%
SD-79	15"	14'	1.43%
SD-80	15"	154'	5.30%
SD-96	15"	187'	0.54%
SD-97	15"	174'	0.75%
SD-98	15"	114'	3.55%

STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-61	117.27		112.02 (SD-57)	48"
CB-62	117.27	111.82 (SD-57)	111.82 (SD-58)	48"
CB-63	112.92		107.67 (SD-59)	48"
CB-64	112.92	107.47 (SD-59)	107.47 (SD-80)	48"
CB-74	107.12	101.67 (SD-71)	101.67 (SD-72)	48"
CB-75	107.12		101.87 (SD-71)	48"
CB-76	100.34		95.08 (SD-73)	48"
CB-77	100.44	94.88 (SD-73) 94.88 (SD-72)	94.88 (SD-74)	48"
CB-78	99.75	91.70 (SD-97) 91.70 (SD-98)	91.70 (SD-75)	48"
CB-79	99.75	91.50 (SD-75)	91.50 (SD-76)	48"
CB-82	101.31	95.76 (SD-77) 95.76 (SD-78)	95.76 (SD-98)	48"
CB-83	101.21		95.96 (SD-77)	48"
CB-84	104.73		99.48 (SD-79)	48"
CB-85	104.73	99.28 (SD-79) 99.28 (SD-80)	99.28 (SD-78)	48"
DMH-1	102.94	94.00 (SD-74)	94.00 (SD-96)	48"
DMH-2	103.12	93.00 (SD-96)	93.00 (SD-97)	48"

SITE KEY
SCALE: 1"=600'



STATE OF MAINE JEFFREY D. AMOS No. 10167 LICENSED PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
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PERMIT DRAWING
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
GRADING AND DRAINAGE PLAN - 8

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

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DESIGNED:	JDA
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SHEET	C-3.8

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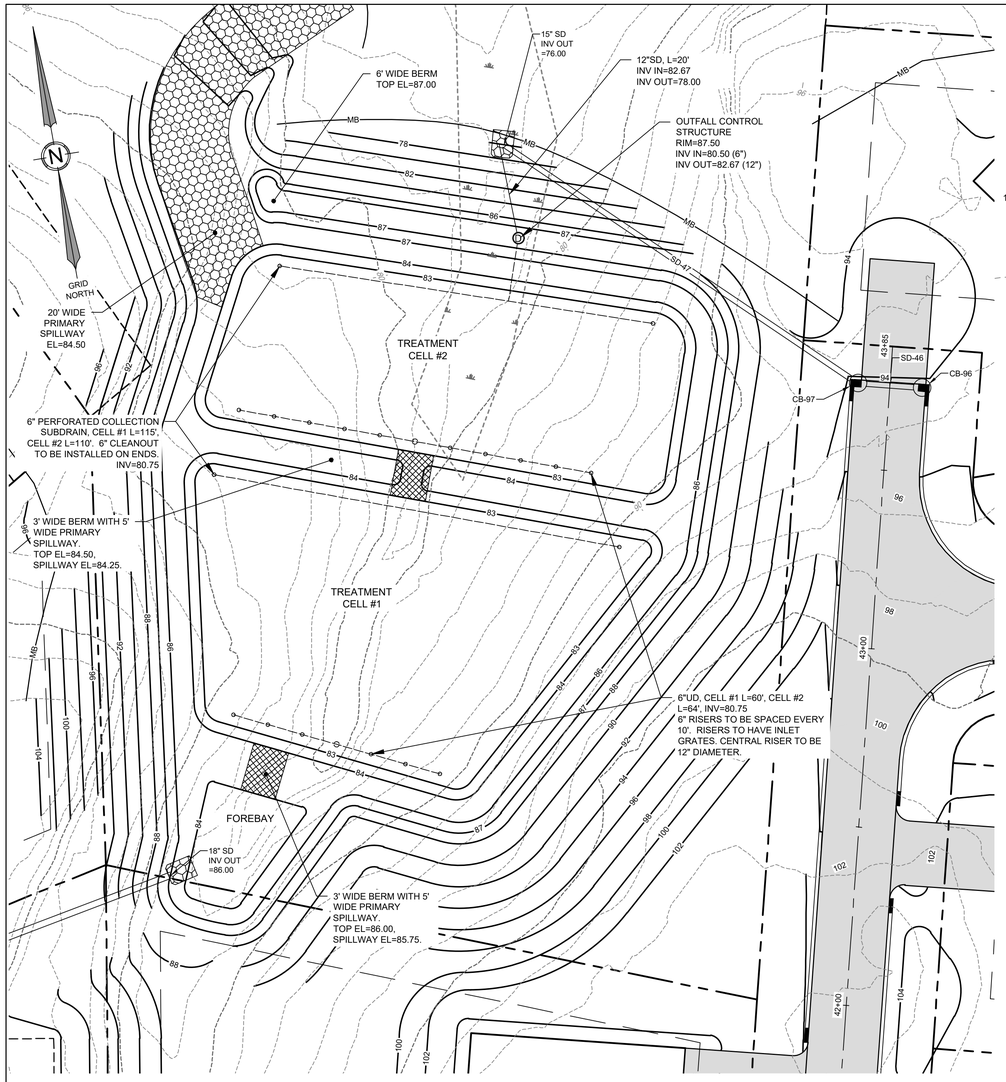
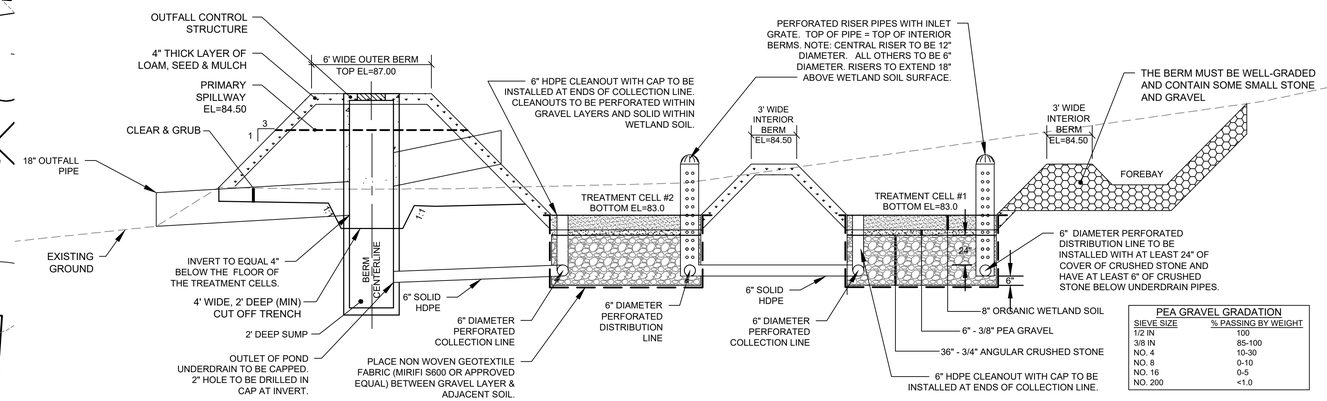


GRAPHIC SCALE

20 0 10 20 40 80

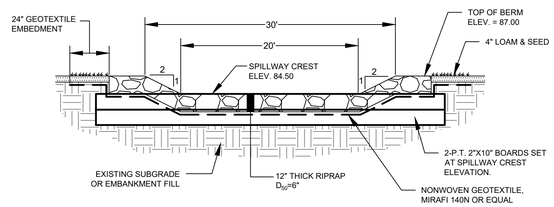
(IN FEET)
1 inch =20 ft.



CROSS SECTION VIEW - GRAVEL WETLAND

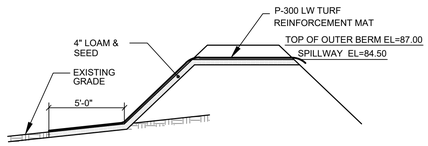
NOT TO SCALE

PEA GRAVEL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
1/2 IN	100
3/8 IN	85-100
NO. 4	10-30
NO. 8	0-10
NO. 16	0-5
NO. 200	<1.0



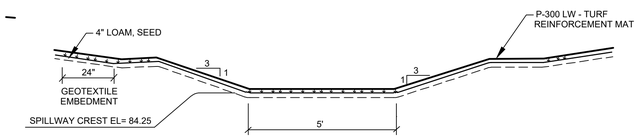
PRIMARY SPILLWAY CROSS SECTION

NOT TO SCALE



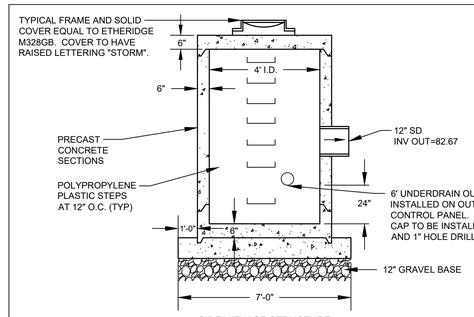
SPILLWAY EMBANKMENT SECTION

NOT TO SCALE

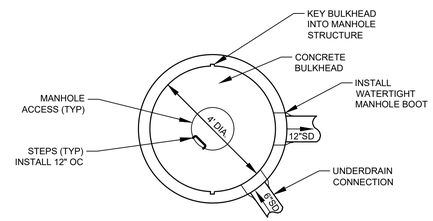


INTERNAL BERM SPILLWAY CROSS-SECTIONS

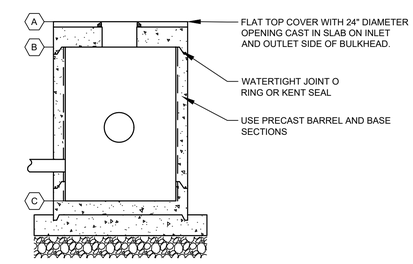
NOT TO SCALE



SIDE VIEW OF STRUCTURE



TOP VIEW OF STRUCTURE



SIDE VIEW

NOTES:
1. SUBMIT SHOP DRAWINGS FOR OWNER/ ENGINEER APPROVAL.
2. STRUCTURE SHALL BE DESIGNED FOR H-20 LOADING.
3. CASTINGS SHALL PROVIDE FOR A 24" CLEAR OPENING.

SCHEDULE A
OUTLET CONTROL STRUCTURE

ITEM DESCRIPTION	DIMENSION / ELEVATION
A. TOP OF STRUCTURE	87.50
B. UNDERSIDE OF SLAB	87.00
C. BOTTOM OF STRUCTURE	78.50

OUTLET CONTROL STRUCTURE (OCS)

NOT TO SCALE

GRAVEL WETLAND INSTALLATION NOTES:

1. THE MINIMUM SPACING BETWEEN THE SUBSURFACE PERFORATED DISTRIBUTION LINE AND THE SUBSURFACE PERFORATED COLLECTION DRAIN AT EITHER END OF THE GRAVEL IN EACH TREATMENT CELL IS 15 FT.

2. THERE SHOULD BE A MINIMUM HORIZONTAL TRAVEL DISTANCE OF 15 FT WITHIN THE GRAVEL LAYER IN EACH CELL.

3. VERTICAL PERFORATED OR SLOTTED RISER PIPES DELIVER WATER FROM THE SURFACE DOWN TO THE SUBSURFACE, PERFORATED OR SLOTTED DISTRIBUTION LINES. THESE RISERS SHALL HAVE A MAXIMUM SPACING OF 10 FEET.

4. SLOTTED VERTICAL RISERS SHALL HAVE A MINIMUM DIAMETER OF 12" FOR THE CENTRAL RISER AND 6" FOR END RISERS. THE VERTICAL RISERS SHALL NOT BE CAPPED, BUT RATHER COVERED WITH AN INLET GRATE.

5. VERTICAL CLEANOUTS CONNECTED TO THE DISTRIBUTION AND COLLECTION SUBDRAINS, AT EACH END, SHALL BE PERFORATED OR SLOTTED ONLY WITHIN THE GRAVEL LAYER, AND SOLID WITHIN THE WETLAND SOIL AND STORAGE AREA ABOVE.

6. TREATMENT CELL FLOOR TO BE GRADED FLAT.

7. BERMS AND WEIRS SEPARATING THE FOREBAY AND TREATMENT CELLS SHOULD BE CONSTRUCTED WITH CLAY, OR NON-CONDUCTIVE SOILS, AND/OR A FINE GEOTEXTILE, OR SOME COMBINATION THEREOF, TO AVOID WATER SEEPAGE AND SOIL PIPING THROUGH THESE EARTHEN DIVIDERS.

8. THE SYSTEM SHOULD BE PLANTED TO ACHIEVE A RIGOROUS ROOT MAT WITH GRASSES, FORBS, AND SHRUBS WITH OBLIGATE AND FACULTATIVE WETLAND SPECIES.

9. THE SUBAREA DRAINING TO A CREATED WETLAND MUST BE COMPLETELY STABLE BEFORE RUNOFF IS DIRECTED TO THE BASIN TO PREVENT SEDIMENTATION OF THE DRAINAGE LAYER; OR ALL RUNOFF SHOULD BE RE-DIRECTED UNTIL CONSTRUCTION IS FINALIZED. THE VEGETATION WITHIN THE STRUCTURE IS EQUALLY IMPORTANT AND MUST BE WELL ESTABLISHED BEFORE IT CAN ACCEPT ANY RUNOFF.

10. GRAVEL WETLAND STORMWATER AREA TO BE SEEDED WITH "NEW ENGLAND WETMIX" AS DISTRIBUTED BY NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, PHONE 413-548-8000, EMAIL INFO@NEWP.COM, OR APPROVED EQUIVALENT. APPLY AT A RATE OF 1 LB/2,500 SF.

11. THE SEEDS WILL NOT GERMINATE UNDER INUNDATED CONDITIONS. IF PLANTED DURING THE FALL MONTHS THE SEED MIX WILL GERMINATE THE FOLLOWING SPRING. DURING THE FIRST SEASON OF GROWTH SEVERAL SPECIES WILL PRODUCE SEEDS WHILE OTHER SPECIES WILL PRODUCE SEEDS AFTER THE SECOND GROWING SEASON. NOT ALL SPECIES WILL GROW IN ALL WETLAND SITUATIONS. THIS MIX IS COMPRISED OF THE WETLAND SPECIES MOST LIKELY TO GROW IN CREATED/RESTORED WETLANDS AND SHOULD PRODUCE MORE THAN 75% GROUND COVER IN TWO FULL GROWING SEASONS.

12. THE WETLAND SEEDS IN THIS MIX CAN BE SOWN BY HAND, WITH A HAND-HELD SPREADER, OR HYDRO-SEEDED ON LARGE OR HARD TO REACH SITES. LIGHTLY RAKE TO ENSURE GOOD SEED-TO-SOIL CONTACT. SEEDING CAN TAKE PLACE ON FROZEN SOIL, AS THE FREEZING AND THAWING WEATHER OF LATE FALL AND LATE WINTER WILL WORK THE SEED INTO THE SOIL. IF SPRING CONDITIONS ARE DRIER THAN USUAL, WATERING MAY BE REQUIRED. IF SOWING DURING THE SUMMER MONTHS, SUPPLEMENTAL WATERING WILL LIKELY BE REQUIRED UNTIL GERMINATION. A LIGHT MULCH OF CLEAN, WEED FREE STRAW IS RECOMMENDED.

13. THE POND CONSTRUCTION SHOULD BE ONLY CONSTRUCTED UNDER THE SUPERVISION OF THE DESIGN ENGINEER.

POND CONSTRUCTION NOTES:
1. CONTRACTOR SHALL REMOVE ALL TOPSOIL AND ORGANIC MATERIAL FROM EMBANKMENT AND POND CONSTRUCTION AREA.
2. SCARIFY SUBGRADE TO ESTABLISH INTERFACE FOR ALL FILLS.
3. CONSTRUCTION MATERIAL SHALL MEET M.D.O.T. SPEC 703.18
4. COMPACT IN 12" LIFTS TO 92% OF MAXIMUM DRY DENSITY.
5. INSTALL RIPRAP AND EROSION CONTROL MESH WHERE SPECIFIED.
6. LOAM, SEED & STABILIZE IN ACCORDANCE WITH SEDIMENTATION AND EROSION CONTROL PLAN & NOTES.

CONSTRUCTION INSPECTION NOTES:
INSPECTION BY A PROFESSIONAL ENGINEER WILL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT THE INSTALLATION OF EACH POND'S EMBANKMENT CONSTRUCTION, STORMWATER INLET, UNDERDRAINS, FILTER MATERIAL MAKEUP AND PLACEMENT, OUTLET CONTROL STRUCTURE, CLAY LINER (IF APPLICABLE), AND EMERGENCY SPILLWAY CONSTRUCTION FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE POND. AN INSPECTION OF THE UNDERDRAINED GRAVEL OUTLET SHALL ALSO BE PERFORMED ONE YEAR AFTER THE FINAL STABILIZATION OF THE POND.

ORGANIC WETLAND SOIL MIXTURE:
THE WETLAND SOIL SHOULD HAVE A LOW HYDRAULIC CONDUCTIVITY (0.1-0.01 FT/DAY). THIS SOIL CAN BE MANUFACTURED USING COMPOST, SAND AND FINE SOILS, INTO A BLEND WITH MORE THATN 15% ORGANIC MATTER. IT SHOULD CONTAIN MORE THAN 15% SILT (PASSING THE #200 SIEVE); BUT WITH A CLAY SIZE PORTION THAT IS LESS THAN 15%. DO NOT USE GEOTEXTILES BETWEEN THE HORIZONTAL LAYERS OF THIS SYSTEM AS THEY WILL CLOG DUE TO FINES AND MAY RESTRICT ROOT GROWTH.

WETLAND SOIL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
1/2 IN	100
NO. 10	75-90
NO. 100	40-50
NO. 200	25-50

EMBANKMENT CONSTRUCTION:
1. CONSTRUCTION OF COMMON BORROW MATERIAL MEETING M.D.O.T. SPECIFICATION 703.
2. PLACE BORROW MATERIAL IN 12" LIFTS COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
3. INSTALL RIPRAP AND EROSION CONTROL MESH WHERE SPECIFIED ON PLANS
4. LOAM, SEED, AND STABILIZE IN ACCORDANCE WITH SEDIMENTATION AND EROSION CONTROL PLAN.

STATE OF MAINE
JEFFREY D. AMOS
NO. 10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

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565 CONGRESS STREET
SUITE 200
PORTLAND, ME 04102

PERMIT DRAWING
NOT FOR CONSTRUCTION

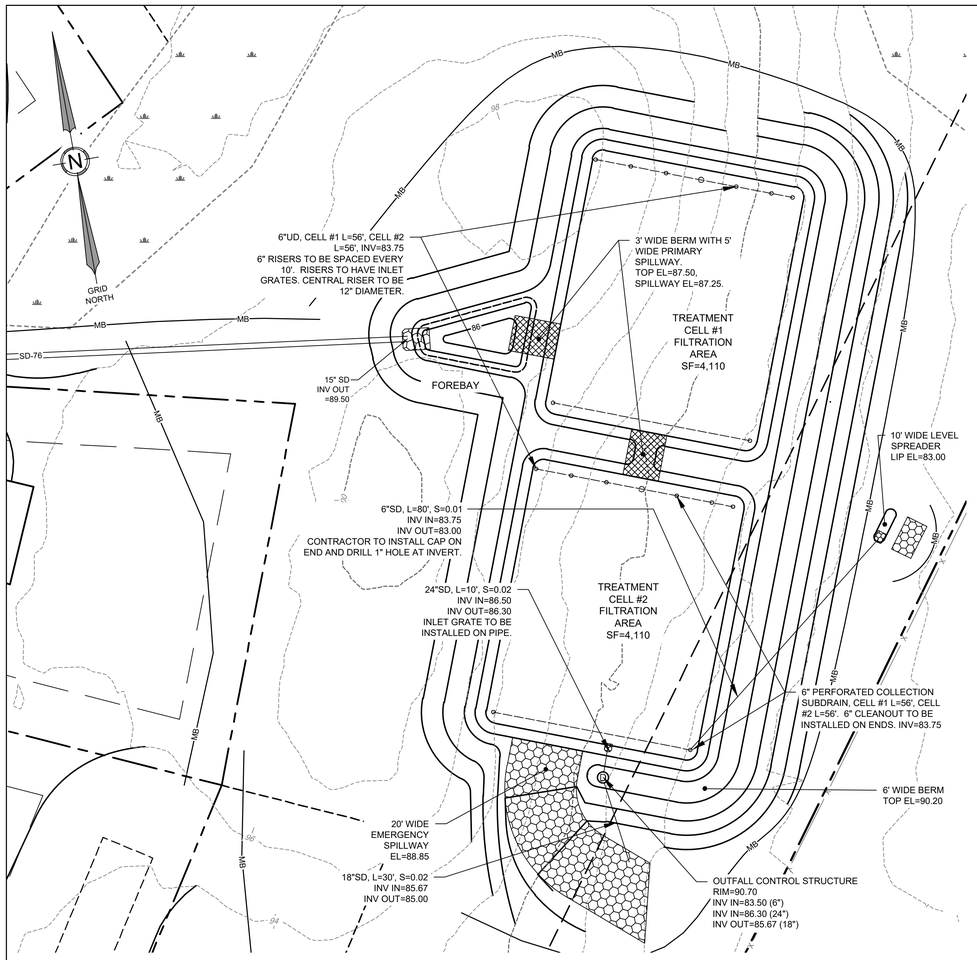
PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
GRAVEL WETLAND - 1 PLAN

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.9

C:\OD\Terradyn Consultants\Project Folders - Documents\2021 Jobs\21-13 South Street MHP\CAD\Permitting\21-13 GD.dwg



GRAPHIC SCALE

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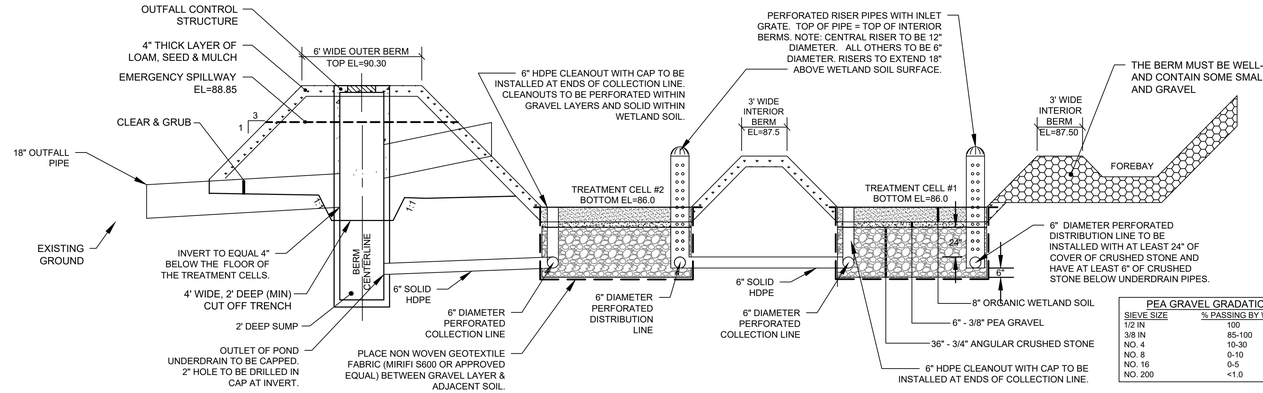
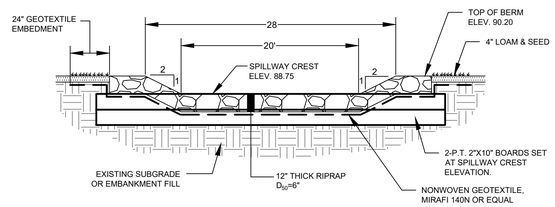
(IN FEET)
1 inch = 20 ft.



CROSS SECTION VIEW - GRAVEL WETLAND

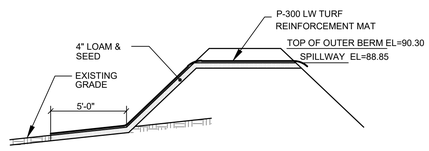
NOT TO SCALE

PEA GRAVEL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
1/2 IN	100
3/8 IN	85-100
NO. 4	10-30
NO. 8	0-10
NO. 16	0-5
NO. 200	<1.0



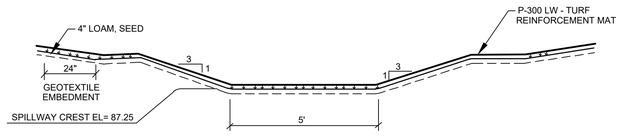
EMERGENCY SPILLWAY CROSS SECTION

NOT TO SCALE



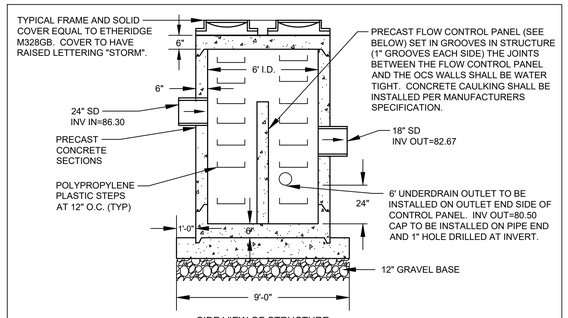
SPILLWAY EMBANKMENT SECTION

NOT TO SCALE

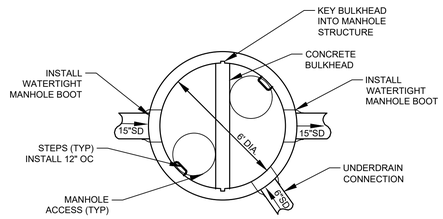


INTERNAL BERM SPILLWAY CROSS-SECTIONS

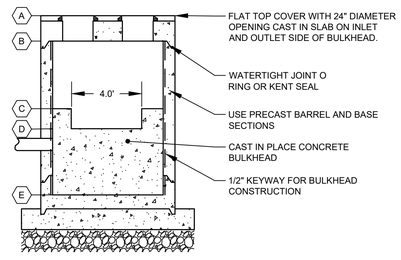
NOT TO SCALE



SIDE VIEW OF STRUCTURE



TOP VIEW OF STRUCTURE



SIDE VIEW & WEIR WALL

NOTES:
1. SUBMIT SHOP DRAWINGS FOR OWNER/ ENGINEER APPROVAL.
2. STRUCTURE SHALL BE DESIGNED FOR H-20 LOADING.
3. CASTINGS SHALL PROVIDE FOR A 24" CLEAR OPENING.

SCHEDULE A OUTLET CONTROL STRUCTURE	
ITEM DESCRIPTION	DIMENSION / ELEVATION
A. TOP OF STRUCTURE	90.70
B. UNDERSIDE OF SLAB	90.20
C. TOP OF CONCRETE BULKHEAD	88.75
D. BOTTOM OF WEIR SLOT	87.50
E. BOTTOM OF STRUCTURE	81.50

OUTLET CONTROL STRUCTURE (OCS)

NOT TO SCALE

GRAVEL WETLAND INSTALLATION NOTES:

1. THE MINIMUM SPACING BETWEEN THE SUBSURFACE PERFORATED DISTRIBUTION LINE AND THE SUBSURFACE PERFORATED COLLECTION DRAIN AT EITHER END OF THE GRAVEL IN EACH TREATMENT CELL IS 15 FT.

2. THERE SHOULD BE A MINIMUM HORIZONTAL TRAVEL DISTANCE OF 15 FT WITHIN THE GRAVEL LAYER IN EACH CELL.

3. VERTICAL PERFORATED OR SLOTTED RISER PIPES DELIVER WATER FROM THE SURFACE DOWN TO THE SUBSURFACE, PERFORATED OR SLOTTED DISTRIBUTION LINES. THESE RISERS SHALL HAVE A MAXIMUM SPACING OF 10 FEET.

4. SLOTTED VERTICAL RISERS SHALL HAVE A MINIMUM DIAMETER OF 12" FOR THE CENTRAL RISER AND 6" FOR END RISERS. THE VERTICAL RISERS SHALL NOT BE CAPPED, BUT RATHER COVERED WITH AN INLET GRATE.

5. VERTICAL CLEANOUTS CONNECTED TO THE DISTRIBUTION AND COLLECTION SUBDRAINS, AT EACH END, SHALL BE PERFORATED OR SLOTTED ONLY WITHIN THE GRAVEL LAYER, AND SOLID WITHIN THE WETLAND SOIL AND STORAGE AREA ABOVE.

6. TREATMENT CELL FLOOR TO BE GRADED FLAT.

7. BERMS AND WEIRS SEPARATING THE FOREBAY AND TREATMENT CELLS SHOULD BE CONSTRUCTED WITH CLAY, OR NON-CONDUCTIVE SOILS, AND/OR A FINE GEOTEXTILE, OR SOME COMBINATION THEREOF, TO AVOID WATER SEEPAGE AND SOIL PIPING THROUGH THESE EARTHEN DIVIDERS.

8. THE SYSTEM SHOULD BE PLANTED TO ACHIEVE A RIGOROUS ROOT MAT WITH GRASSES, FORBS, AND SHRUBS WITH OBLIGATE AND FACULTATIVE WETLAND SPECIES.

9. THE SUBAREA DRAINING TO A CREATED WETLAND MUST BE COMPLETELY STABLE BEFORE RUNOFF IS DIRECTED TO THE BASIN TO PREVENT SEDIMENTATION OF THE DRAINAGE LAYER; OR ALL RUNOFF SHOULD BE RE-DIRECTED UNTIL CONSTRUCTION IS FINALIZED. THE VEGETATION WITHIN THE STRUCTURE IS EQUALLY IMPORTANT AND MUST BE WELL ESTABLISHED BEFORE IT CAN ACCEPT ANY RUNOFF.

10. GRAVEL WETLAND STORMWATER AREA TO BE SEEDED WITH "NEW ENGLAND WETMIX" AS DISTRIBUTED BY NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, PHONE 413-548-8000, EMAIL INFO@NEWP.COM, OR APPROVED EQUIVALENT. APPLY AT A RATE OF 1 LB/2,500 SF.

11. THE SEEDS WILL NOT GERMINATE UNDER INUNDATED CONDITIONS. IF PLANTED DURING THE FALL MONTHS THE SEED MIX WILL GERMINATE THE FOLLOWING SPRING. DURING THE FIRST SEASON OF GROWTH SEVERAL SPECIES WILL PRODUCE SEEDS WHILE OTHER SPECIES WILL PRODUCE SEEDS AFTER THE SECOND GROWING SEASON. NOT ALL SPECIES WILL GROW IN ALL WETLAND SITUATIONS. THIS MIX IS COMPRISED OF THE WETLAND SPECIES MOST LIKELY TO GROW IN CREATED/RESTORED WETLANDS AND SHOULD PRODUCE MORE THAN 75% GROUND COVER IN TWO FULL GROWING SEASONS.

12. THE WETLAND SEEDS IN THIS MIX CAN BE SOWN BY HAND, WITH A HAND-HELD SPREADER, OR HYDRO-SEEDED ON LARGE OR HARD TO REACH SITES. LIGHTLY RAKE TO ENSURE GOOD SEED-TO-SOIL CONTACT. SEEDING CAN TAKE PLACE ON FROZEN SOIL, AS THE FREEZING AND THAWING WEATHER OF LATE FALL AND LATE WINTER WILL WORK THE SEED INTO THE SOIL. IF SPRING CONDITIONS ARE DRIER THAN USUAL, WATERING MAY BE REQUIRED. IF SOWING DURING THE SUMMER MONTHS, SUPPLEMENTAL WATERING WILL LIKELY BE REQUIRED UNTIL GERMINATION. A LIGHT MULCH OF CLEAN, WEED FREE STRAW IS RECOMMENDED.

13. THE POND CONSTRUCTION SHOULD BE ONLY CONSTRUCTED UNDER THE SUPERVISION OF THE DESIGN ENGINEER.

POND CONSTRUCTION NOTES:
1. CONTRACTOR SHALL REMOVE ALL TOPSOIL AND ORGANIC MATERIAL FROM EMBANKMENT AND POND CONSTRUCTION AREA.
2. SCARIFY SUBGRADE TO ESTABLISH INTERFACE FOR ALL FILLS.
3. CONSTRUCTION MATERIAL SHALL MEET M.D.O.T. SPEC 703.18
4. COMPACT IN 12" LIFTS TO 92% OF MAXIMUM DRY DENSITY.
5. INSTALL RIPRAP AND EROSION CONTROL MESH WHERE SPECIFIED.
6. LOAM, SEED & STABILIZE IN ACCORDANCE WITH SEDIMENTATION AND EROSION CONTROL PLAN & NOTES.

CONSTRUCTION INSPECTION NOTES:
INSPECTION BY A PROFESSIONAL ENGINEER WILL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT THE INSTALLATION OF EACH POND'S EMBANKMENT CONSTRUCTION, STORMWATER INLET, UNDERDRAINS, FILTER MATERIAL MAKEUP AND PLACEMENT, OUTLET CONTROL STRUCTURE, CLAY LINER (IF APPLICABLE), AND EMERGENCY SPILLWAY CONSTRUCTION FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE POND. AN INSPECTION OF THE UNDERDRAINED GRAVEL OUTLET SHALL ALSO BE PERFORMED ONE YEAR AFTER THE FINAL STABILIZATION OF THE POND.

ORGANIC WETLAND SOIL MIXTURE:
THE WETLAND SOIL SHOULD HAVE A LOW HYDRAULIC CONDUCTIVITY (0.1-0.01 FT/DAY). THIS SOIL CAN BE MANUFACTURED USING COMPOST, SAND AND FINE SOILS, INTO A BLEND WITH MORE THATN 15% ORGANIC MATTER. IT SHOULD CONTAIN MORE THAN 15% SILT (PASSING THE #200 SIEVE); BUT WITH A CLAY SIZE PORTION THAT IS LESS THAN 15%. DO NOT USE GEOTEXTILES BETWEEN THE HORIZONTAL LAYERS OF THIS SYSTEM AS THEY WILL CLOG DUE TO FINES AND MAY RESTRICT ROOT GROWTH.

WETLAND SOIL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
1/2 IN	100
NO. 10	75-90
NO. 100	40-50
NO. 200	25-50

EMBANKMENT CONSTRUCTION:
1. CONSTRUCTION OF COMMON BORROW MATERIAL MEETING M.D.O.T. SPECIFICATION 703.
2. PLACE BORROW MATERIAL IN 12" LIFTS COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
3. INSTALL RIPRAP AND EROSION CONTROL MESH WHERE SPECIFIED ON PLANS
4. LOAM, SEED, AND STABILIZE IN ACCORDANCE WITH SEDIMENTATION AND EROSION CONTROL PLAN.

STATE OF MAINE JEFFREY D. AMOS 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE SUITE 201 NEW GLOUCESTER, ME 04260
565 CONGRESS STREET SUITE 201 PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE: GRAVEL WETLAND - 2 PLAN

CLIENT: SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-3.10

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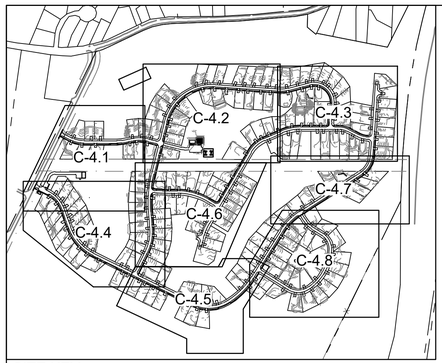

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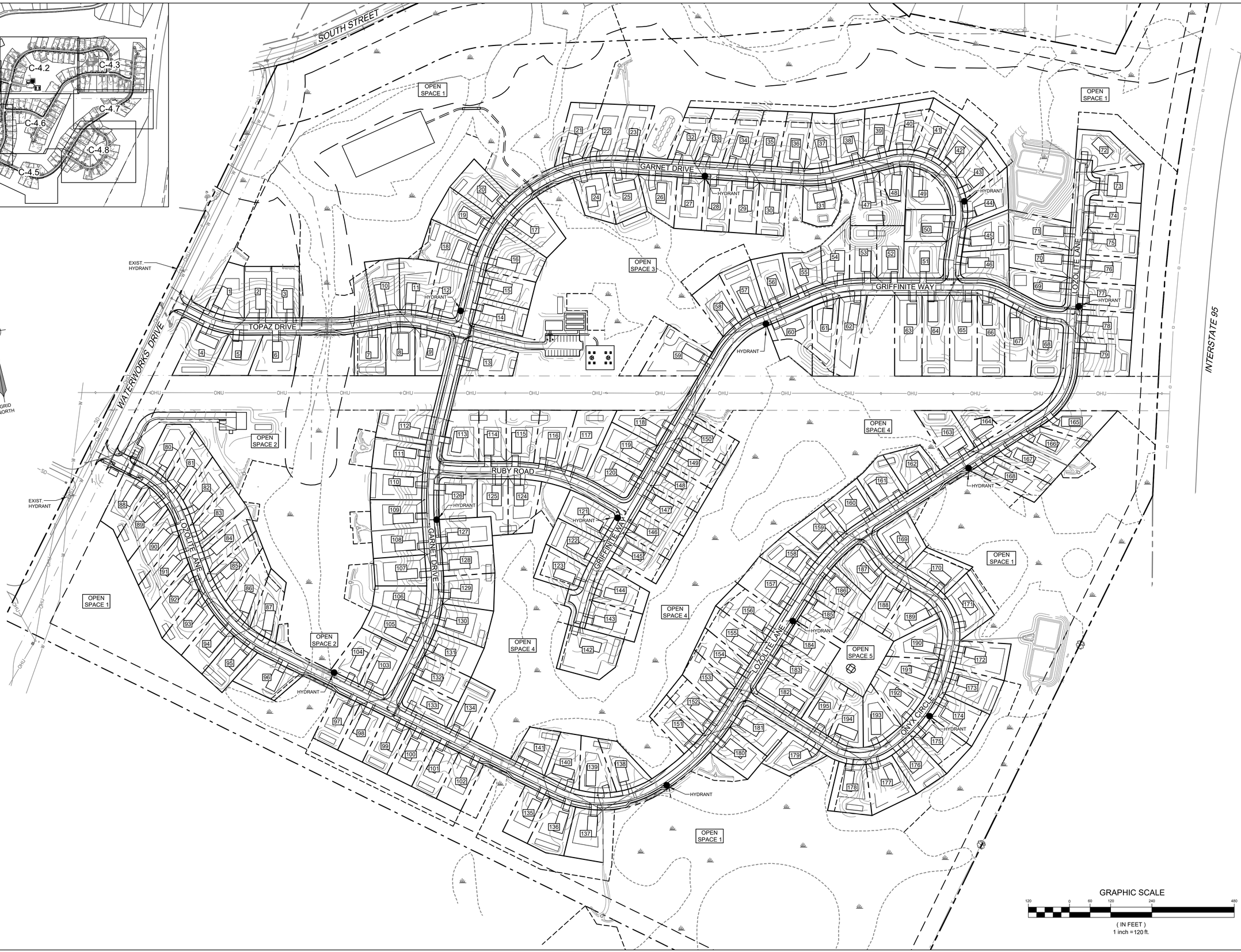
SCALE: 1"=600'



STATE OF MAINE
JEFFREY D. AMOS
No. 10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

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PORTLAND, ME 04102
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
OVERALL UTILITY PLAN

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 120'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.0

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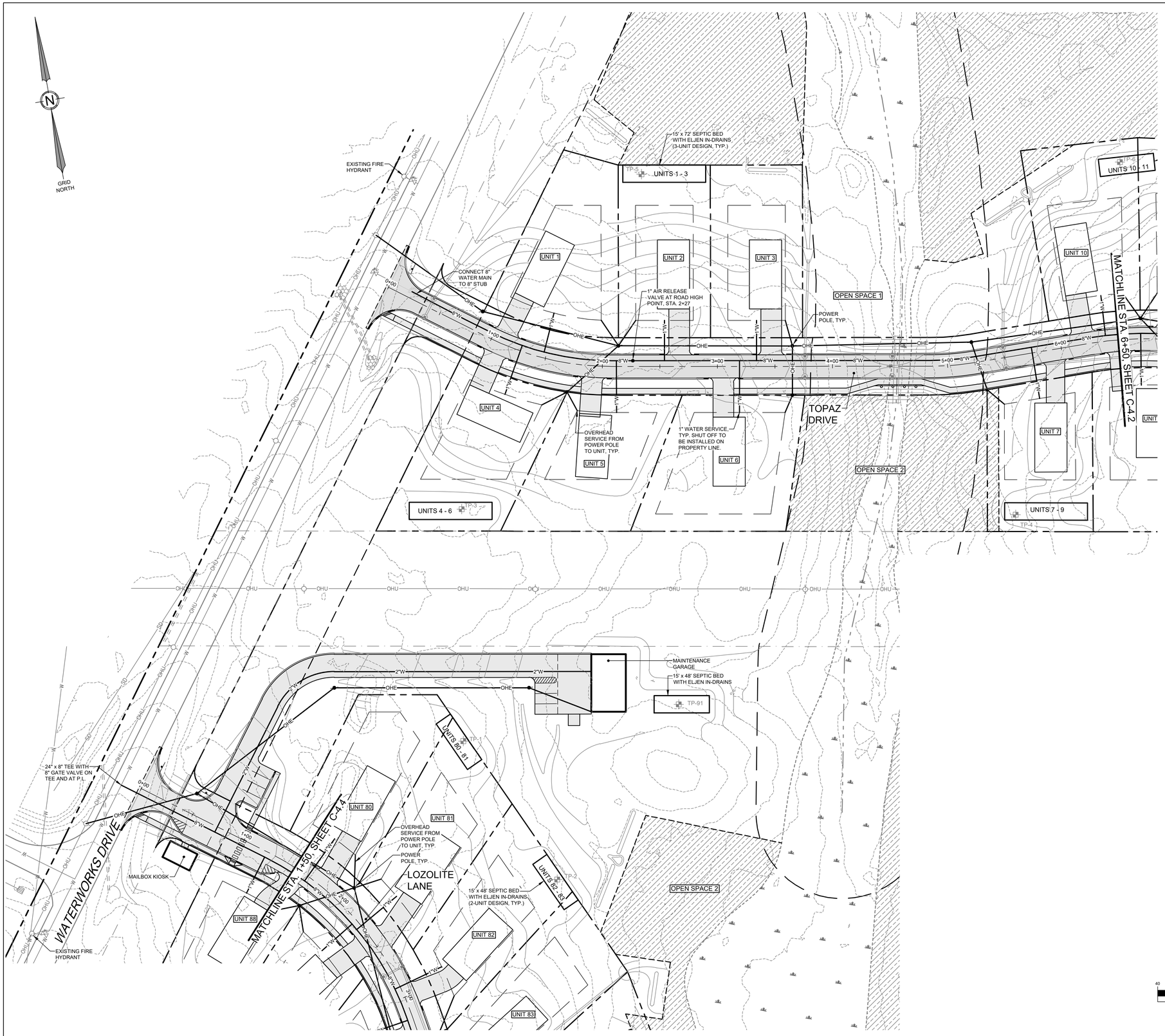

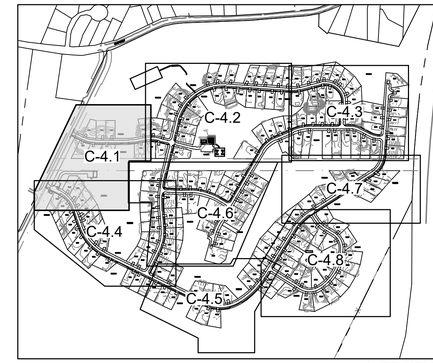

SITE KEY
SCALE: 1"=600'

WATER MAIN CONSTRUCTION NOTES:

1. 8" WATER MAIN TO BE INSTALLED 5-FT. FROM ROADWAY CENTERLINE.
2. MAINTAIN 10-FT. SEPARATION BETWEEN 8" WATER MAIN AND ALL OTHER UNDERGROUND UTILITIES, AND 12" MIN. VERTICAL SEPARATION AT ALL CROSSINGS. INSTALL 2" RIGID FOAM INSULATION ABOVE WATER MAIN, TYP.
3. INSTALL TWO LAYERS OF RIGID INSULATION BETWEEN 1" WATER SERVICES AND CULVERTS, TYP. AT ALL CROSSINGS.
4. CURB STOPS LOCATED WITHIN PAVED AREAS SHALL BE IN A VALVE BOX TO SECTION.
5. 5.5-FT. OF COVER ON ALL WATER MAINS AND SERVICES, TYP.
6. TESTABLE DCVA ON ALL FIRE SERVICES BEFORE RISER PIPE, TYP.

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

STATE OF MAINE JEFFREY D. AMOS 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

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OFFICE: (207) 926-5111 FAX: (207) 221-1317
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565 CONGRESS STREET SUITE 201 PORTLAND, ME 04102

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
UTILITY PLAN - 1

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.1

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WATER MAIN CONSTRUCTION NOTES:

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2. MAINTAIN 10-FT. SEPARATION BETWEEN 8" WATER MAIN AND ALL OTHER UNDERGROUND UTILITIES, AND 12" MIN. VERTICAL SEPARATION AT ALL CROSSINGS. INSTALL 2" RIGID FOAM INSULATION ABOVE WATER MAIN, TYP.
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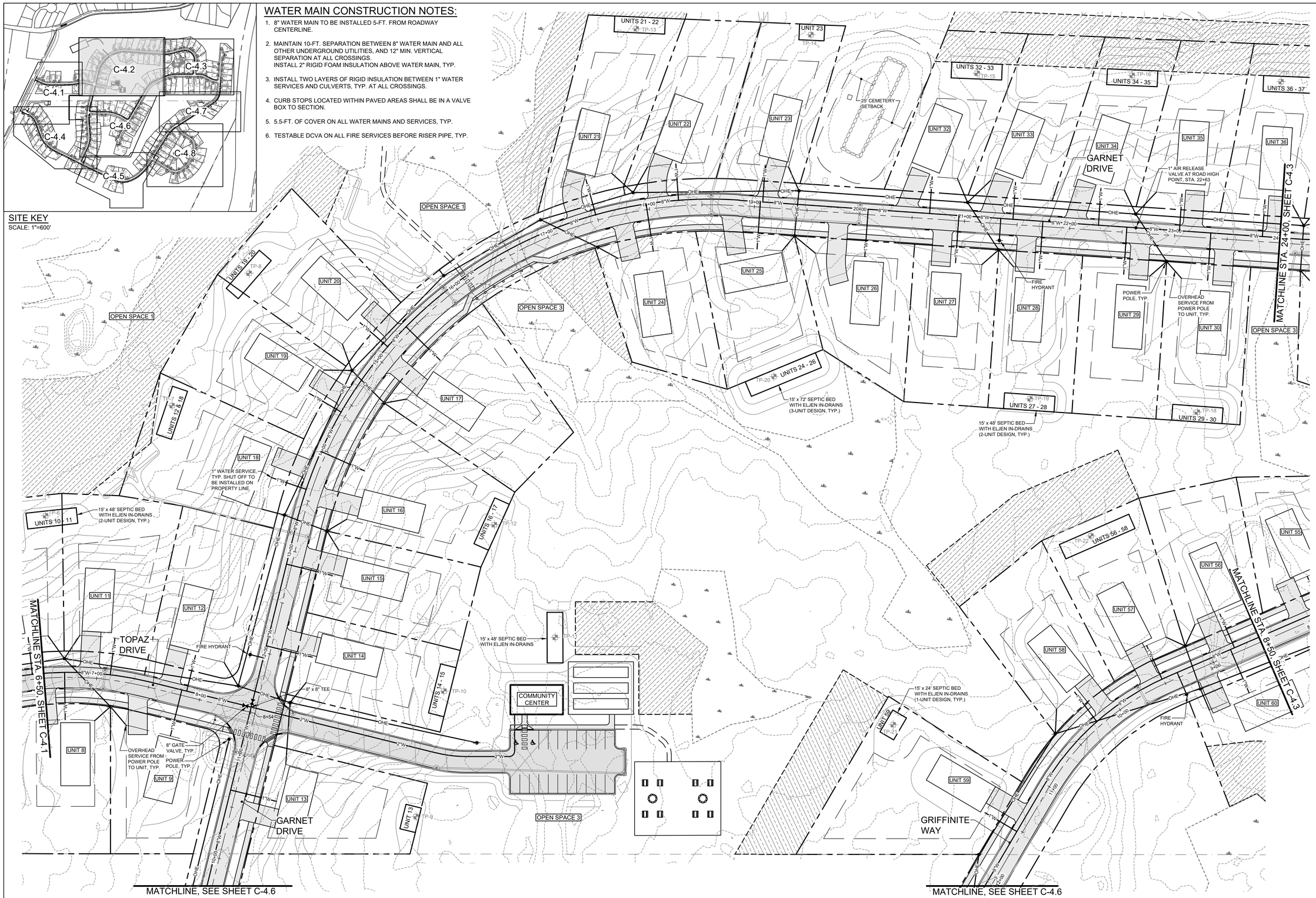

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch =40 ft.

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE.	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
UTILITY PLAN - 2

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.2

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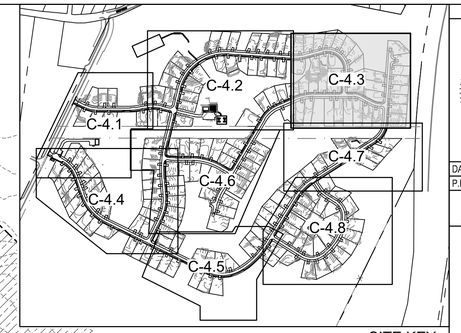

SITE KEY
SCALE: 1"=600'

WATER MAIN CONSTRUCTION NOTES:

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2. MAINTAIN 10-FT. SEPARATION BETWEEN 8" WATER MAIN AND ALL OTHER UNDERGROUND UTILITIES, AND 12" MIN. VERTICAL SEPARATION AT ALL CROSSINGS. INSTALL 2" RIGID FOAM INSULATION ABOVE WATER MAIN, TYP.
3. INSTALL TWO LAYERS OF RIGID INSULATION BETWEEN 1" WATER SERVICES AND CULVERTS, TYP. AT ALL CROSSINGS.
4. CURB STOPS LOCATED WITHIN PAVED AREAS SHALL BE IN A VALVE BOX TO SECTION.
5. 5.5-FT. OF COVER ON ALL WATER MAINS AND SERVICES, TYP.
6. TESTABLE DCVA ON ALL FIRE SERVICES BEFORE RISER PIPE, TYP.

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

STATE OF MAINE JEFFREY D. AMOS 10167 LICENSED PROFESSIONAL ENGINEER

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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
UTILITY PLAN - 3

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.3

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WATER MAIN CONSTRUCTION NOTES:

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2. MAINTAIN 10-FT. SEPARATION BETWEEN 8" WATER MAIN AND ALL OTHER UNDERGROUND UTILITIES, AND 12" MIN. VERTICAL SEPARATION AT ALL CROSSINGS. INSTALL 2" RIGID FOAM INSULATION ABOVE WATER MAIN, TYP.
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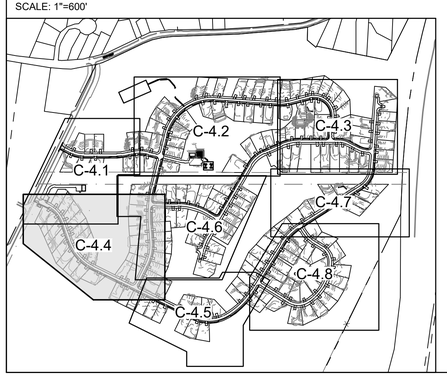
5. 5.5-FT. OF COVER ON ALL WATER MAINS AND SERVICES, TYP.
6. TESTABLE DCVA ON ALL FIRE SERVICES BEFORE RISER PIPE, TYP.

SITE KEY

SCALE: 1"=600'



STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

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565 CONGRESS STREET, SUITE 201, PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
UTILITY PLAN - 4

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.4

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WATER MAIN CONSTRUCTION NOTES:

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2. MAINTAIN 10-FT. SEPARATION BETWEEN 8" WATER MAIN AND ALL OTHER UNDERGROUND UTILITIES, AND 12" MIN. VERTICAL SEPARATION AT ALL CROSSINGS.
   INSTALL 2" RIGID FOAM INSULATION ABOVE WATER MAIN, TYP.
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GRAPHIC SCALE

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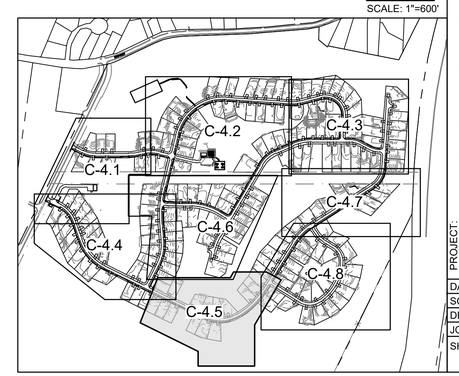
(IN FEET)
1 inch =40 ft.

SITE KEY
SCALE: 1"=600'



STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
UTILITY PLAN - 5

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.5

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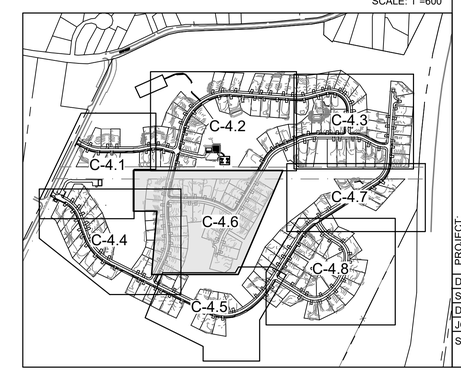
WATER MAIN CONSTRUCTION NOTES:

1. 8" WATER MAIN TO BE INSTALLED 5-FT. FROM ROADWAY CENTERLINE.
2. MAINTAIN 10-FT. SEPARATION BETWEEN 8" WATER MAIN AND ALL OTHER UNDERGROUND UTILITIES, AND 12" MIN. VERTICAL SEPARATION AT ALL CROSSINGS. INSTALL 2" RIGID FOAM INSULATION ABOVE WATER MAIN, TYP.
3. INSTALL TWO LAYERS OF RIGID INSULATION BETWEEN 1" WATER SERVICES AND CULVERTS, TYP. AT ALL CROSSINGS.
4. CURB STOPS LOCATED WITHIN PAVED AREAS SHALL BE IN A VALVE BOX TO SECTION.
5. 5.5-FT. OF COVER ON ALL WATER MAINS AND SERVICES, TYP.
6. TESTABLE DCVA ON ALL FIRE SERVICES BEFORE RISER PIPE, TYP.

SITE KEY
SCALE: 1"=600'



STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE SUITE 203 NEW GLOUCESTER, ME 04260
565 CONGRESS STREET SUITE 301 PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
UTILITY PLAN - 6

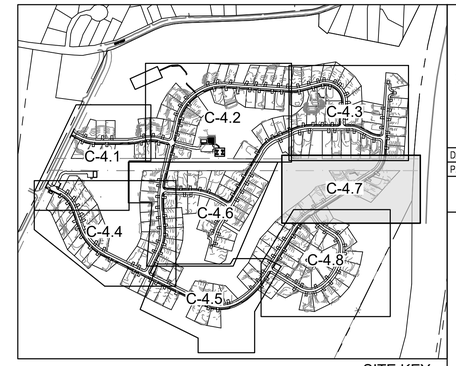
CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.6

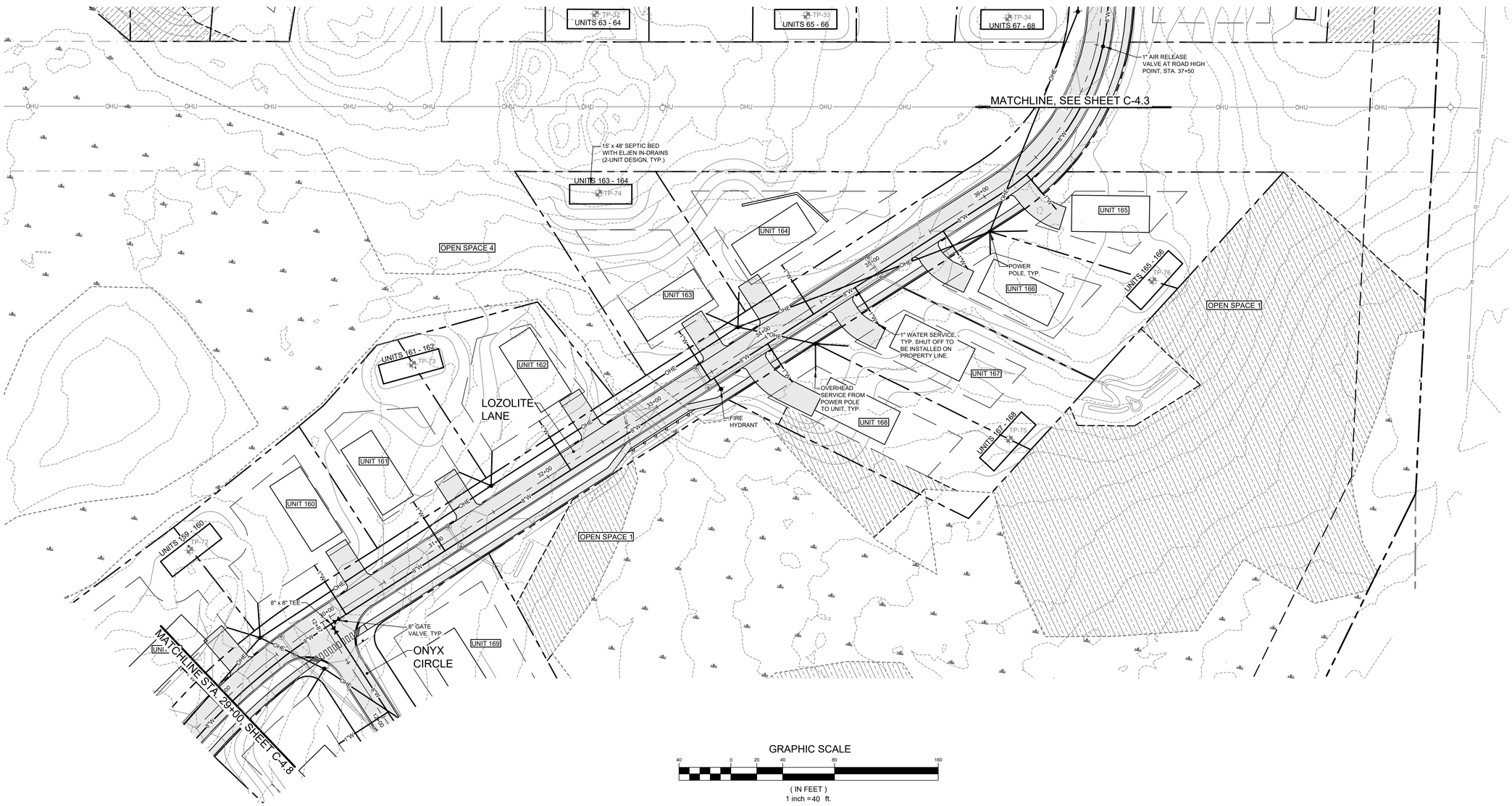
C:\OD\Terradyn Consultants\Project Folders - Documents\2021 Jobs\21-13 South Street MHP\CAD\Permitting\21-13 UTIL.dwg

WATER MAIN CONSTRUCTION NOTES:

1. 8" WATER MAIN TO BE INSTALLED 5-FT. FROM ROADWAY CENTERLINE.
2. MAINTAIN 10-FT. SEPARATION BETWEEN 8" WATER MAIN AND ALL OTHER UNDERGROUND UTILITIES, AND 12" MIN. VERTICAL SEPARATION AT ALL CROSSINGS.
   INSTALL 2" RIGID FOAM INSULATION ABOVE WATER MAIN, TYP.
3. INSTALL TWO LAYERS OF RIGID INSULATION BETWEEN 1" WATER SERVICES AND CULVERTS, TYP. AT ALL CROSSINGS.
4. CURB STOPS LOCATED WITHIN PAVED AREAS SHALL BE IN A VALVE BOX TO SECTION.
5. 5.5-FT. OF COVER ON ALL WATER MAINS AND SERVICES, TYP.
6. TESTABLE DCVA ON ALL FIRE SERVICES BEFORE RISER PIPE, TYP.



SITE KEY
SCALE: 1"=600'



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

NO.	DATE	REVISIONS
B.	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW
A.	04-13-2022	PRELIMINARY SUBMISSION

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167
JDA APP'D BY

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE SUITE 201 NEW GLOUCESTER, ME 04260
565 CONGRESS STREET SUITE 200 PORTLAND, ME 04102
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PERMIT DRAWING
NOT FOR CONSTRUCTION

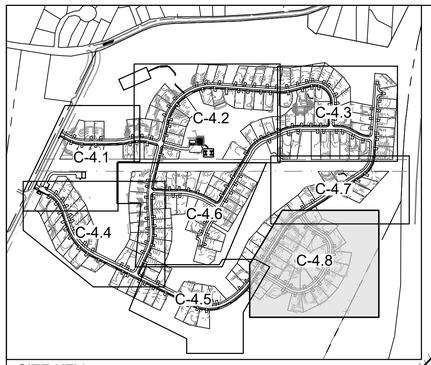
PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
UTILITY PLAN - 7

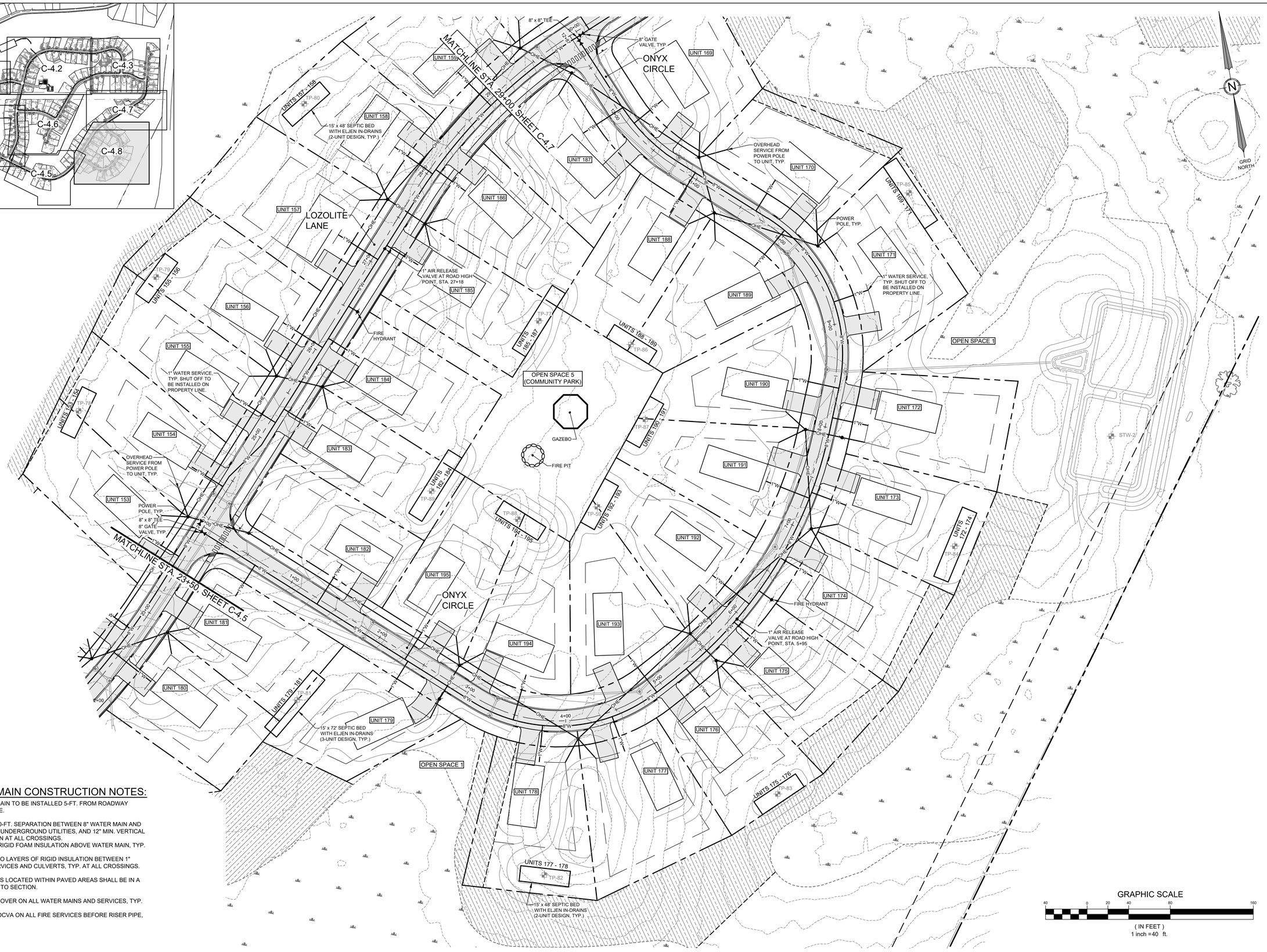
CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.7

C:\OD\Terradyn Consultants\Project Folders - Documents\2021 Jobs\21-13 South Street MHP\CAD\Permitting\21-13 UTIL.dwg



SITE KEY
SCALE: 1"=600'



WATER MAIN CONSTRUCTION NOTES:

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

STATE OF MAINE JEFFREY D. AMOS No. 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

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TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE SUITE 201 NEW GLOUCESTER, ME 04260
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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE: UTILITY PLAN - 8

CLIENT: SOUTH STREET VILLAGE, LLC
782 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-4.8

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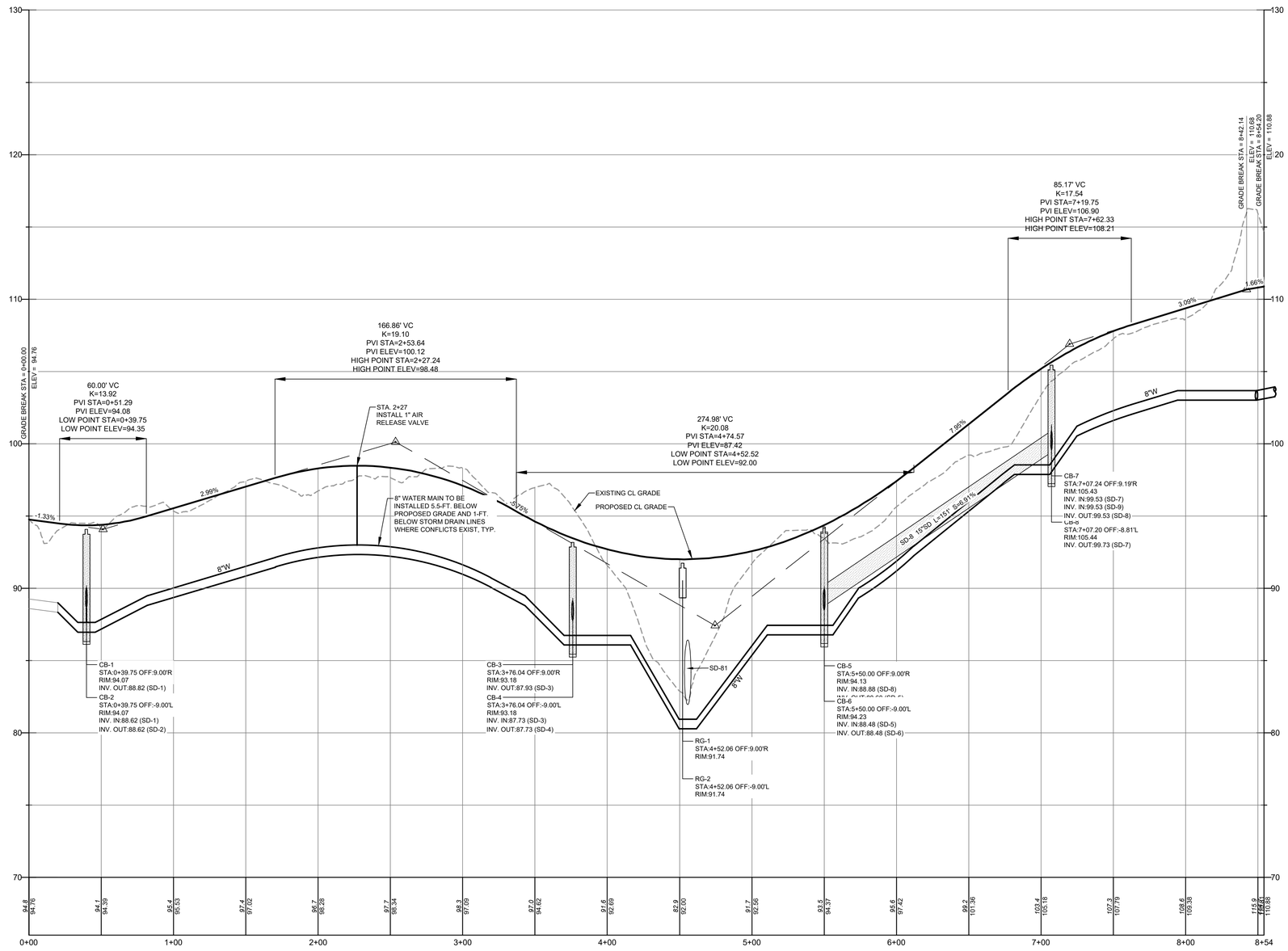

TOPAZ DRIVE

STA. 0+00 TO STA. 8+26
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
10167
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PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

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SUITE 103
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PORTLAND, ME 04102
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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PROFILE - TOPAZ DRIVE

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.1

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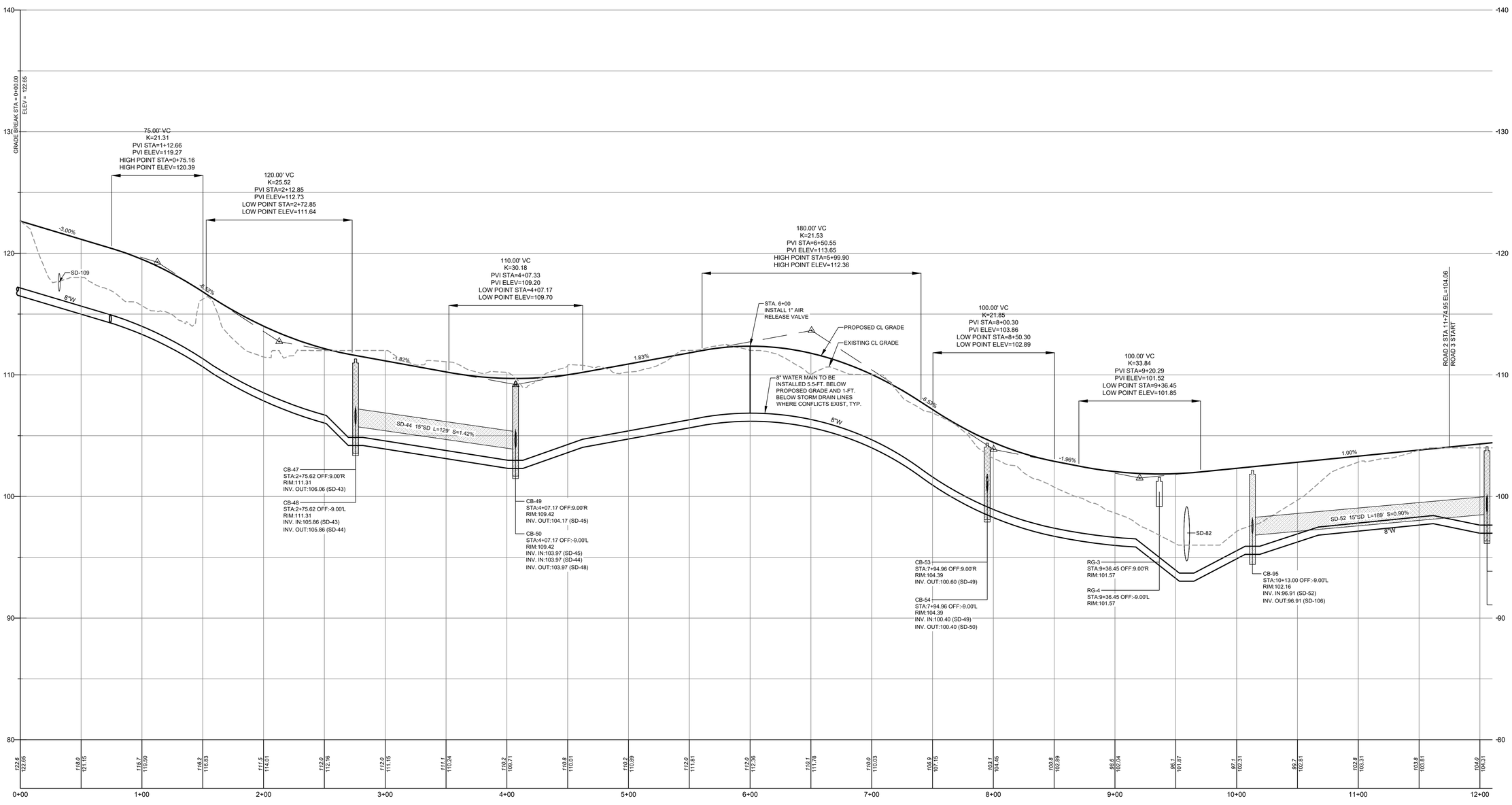

LOZOLITE LANE

STA. 0+00 TO STA. 12+00
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
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Permitting

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE
SUITE 301
NEW GLOUCESTER, ME 04260
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PROFILE - LOZOLITE LANE

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.2

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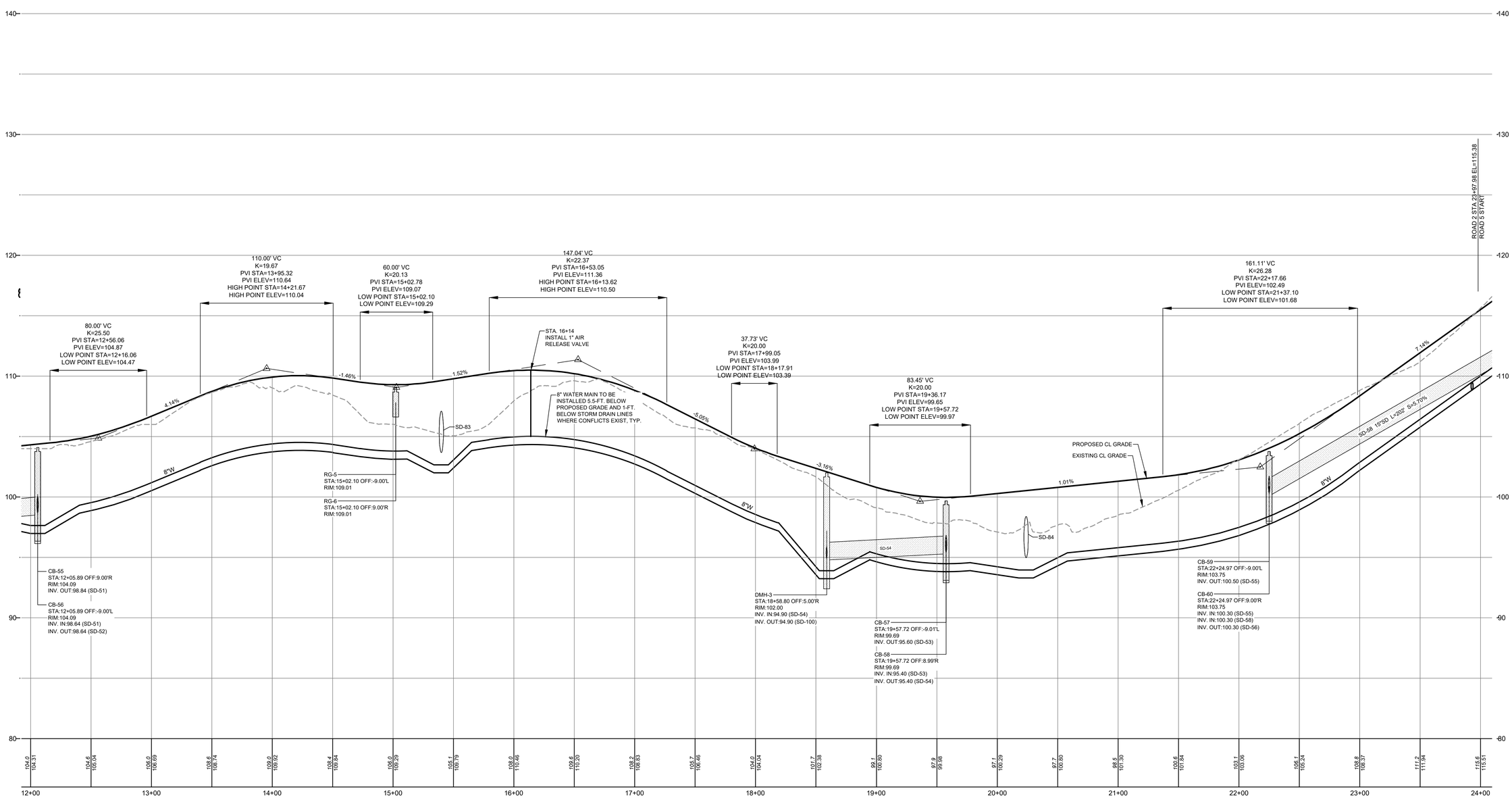

LOZOLITE LANE

STA. 12+00 TO STA. 24+00
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
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DATE: 08-17-2022
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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PROFILE - LOZOLITE LANE

CLIENT:
SOUTH STREET VILLAGE, LLC
792 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.3

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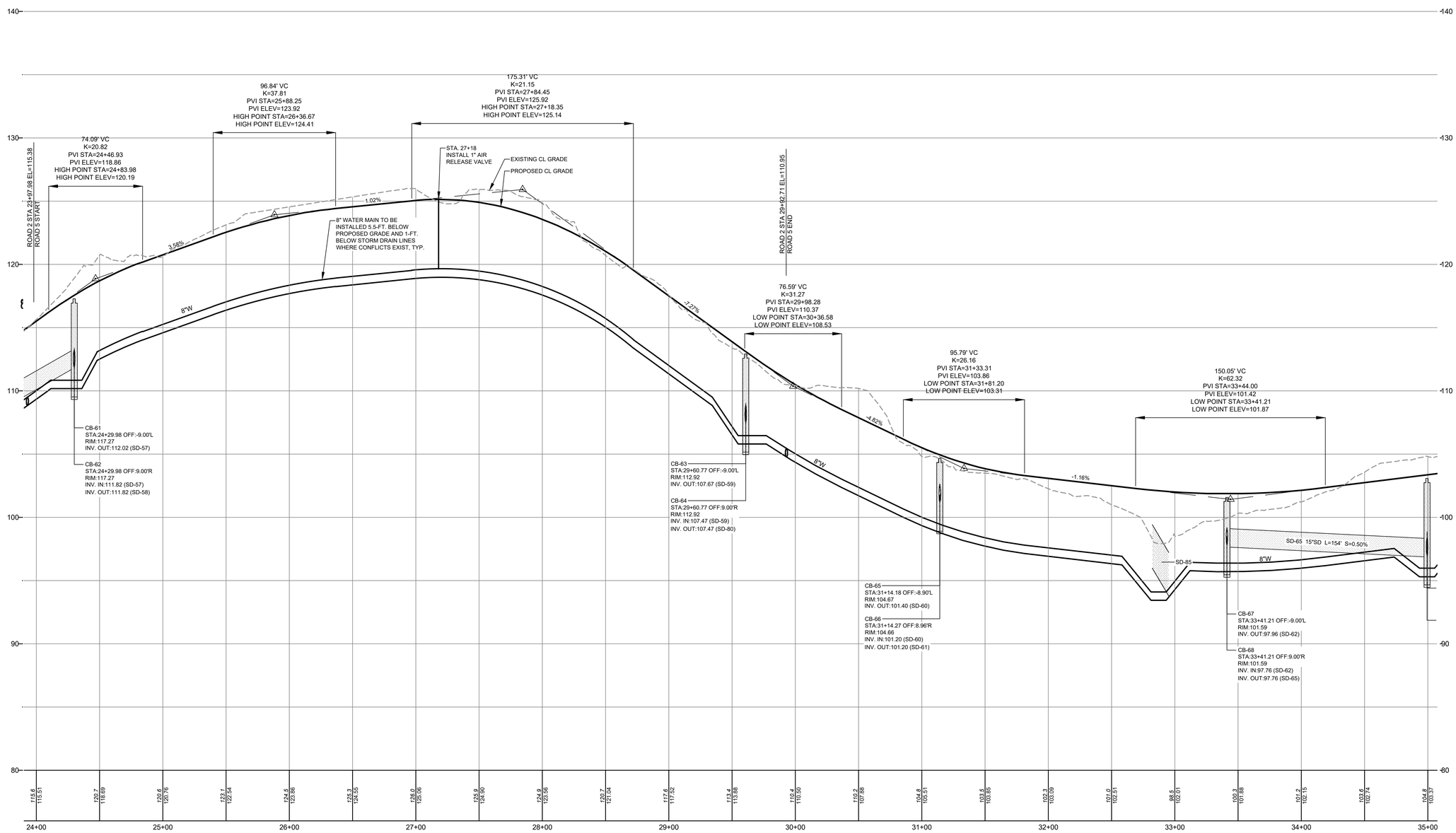

LOZOLITE LANE

STA. 24+00 TO STA. 35+00
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE.	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
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41 CAMPUS DRIVE
SUITE 201
NEW GLOUCESTER, ME 04260

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

OFFICE: (207) 926-5111 FAX: (207) 221-1317
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Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PROFILE - LOZOLITE LANE

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.4

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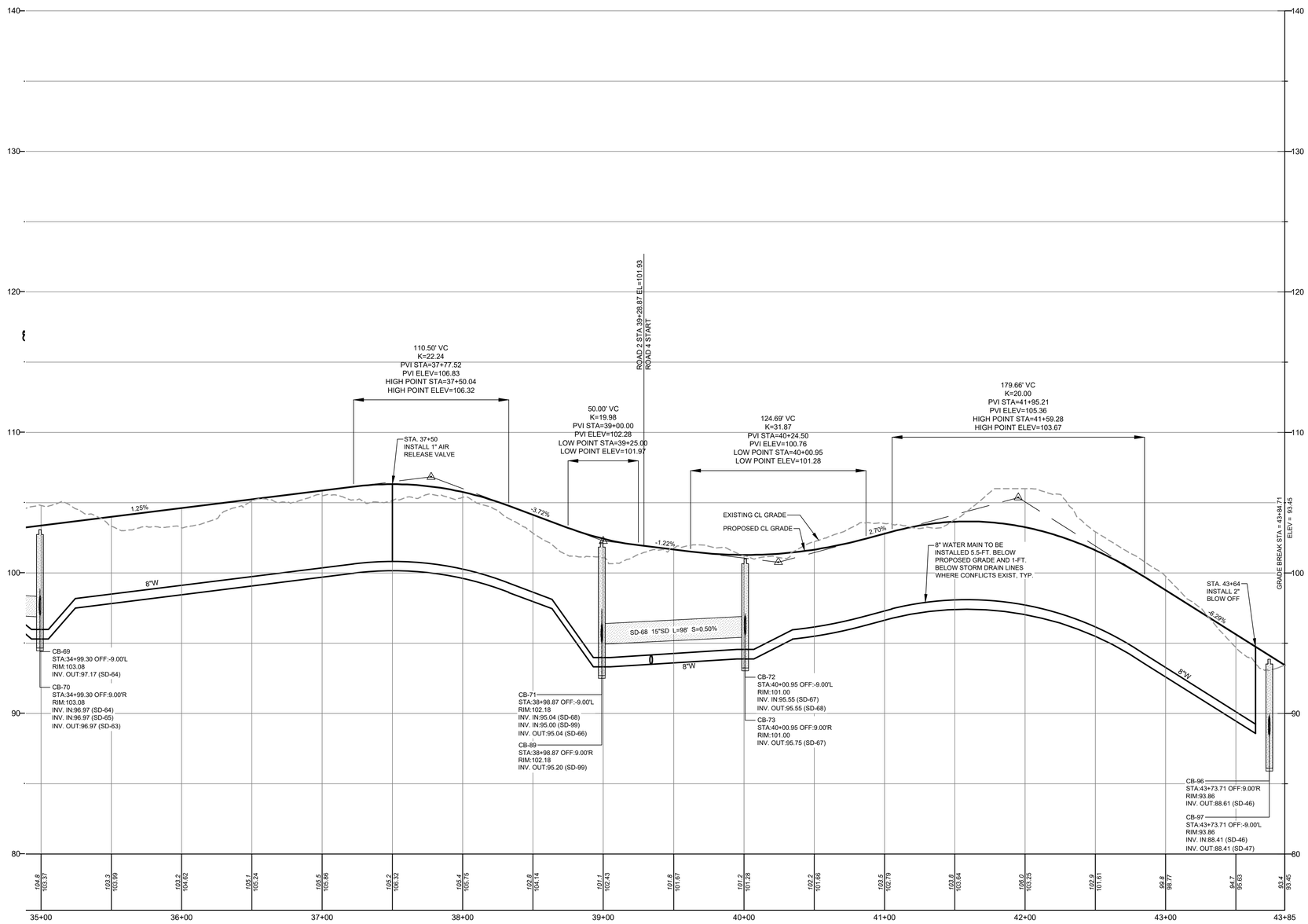

LOZOLITE LANE

STA. 35+00 TO STA. 43+85
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
10167
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PROFESSIONAL ENGINEER

DATE.	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

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SUITE 201
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PERMIT DRAWING
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PROFILE - LOZOLITE LANE

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.5

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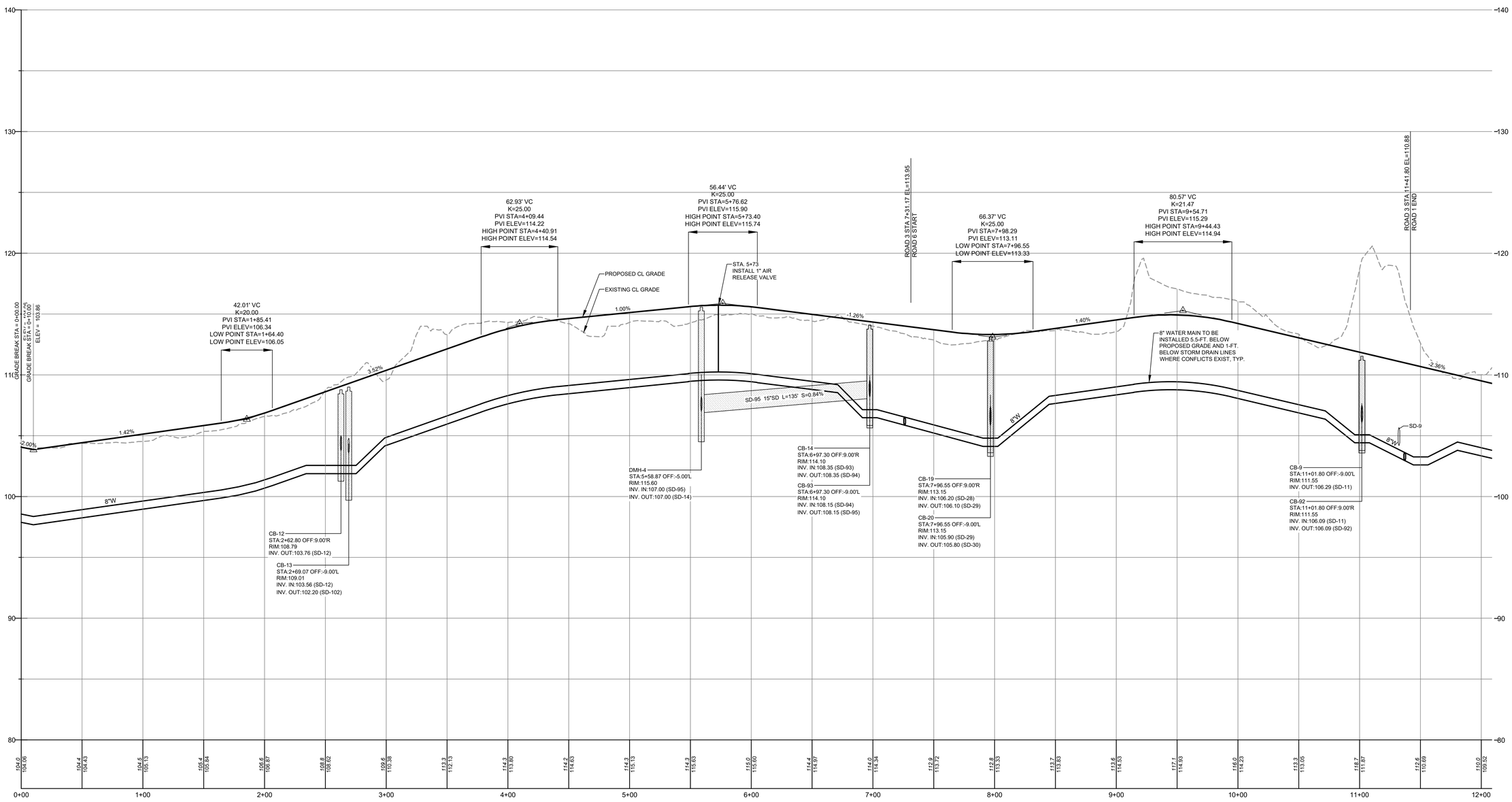

GARNET DRIVE

STA. 0+00 TO STA. 12+00
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
10167
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PROFESSIONAL ENGINEER

DATE: 08-17-2022
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE
PROFILE - GARNET DRIVE

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.6

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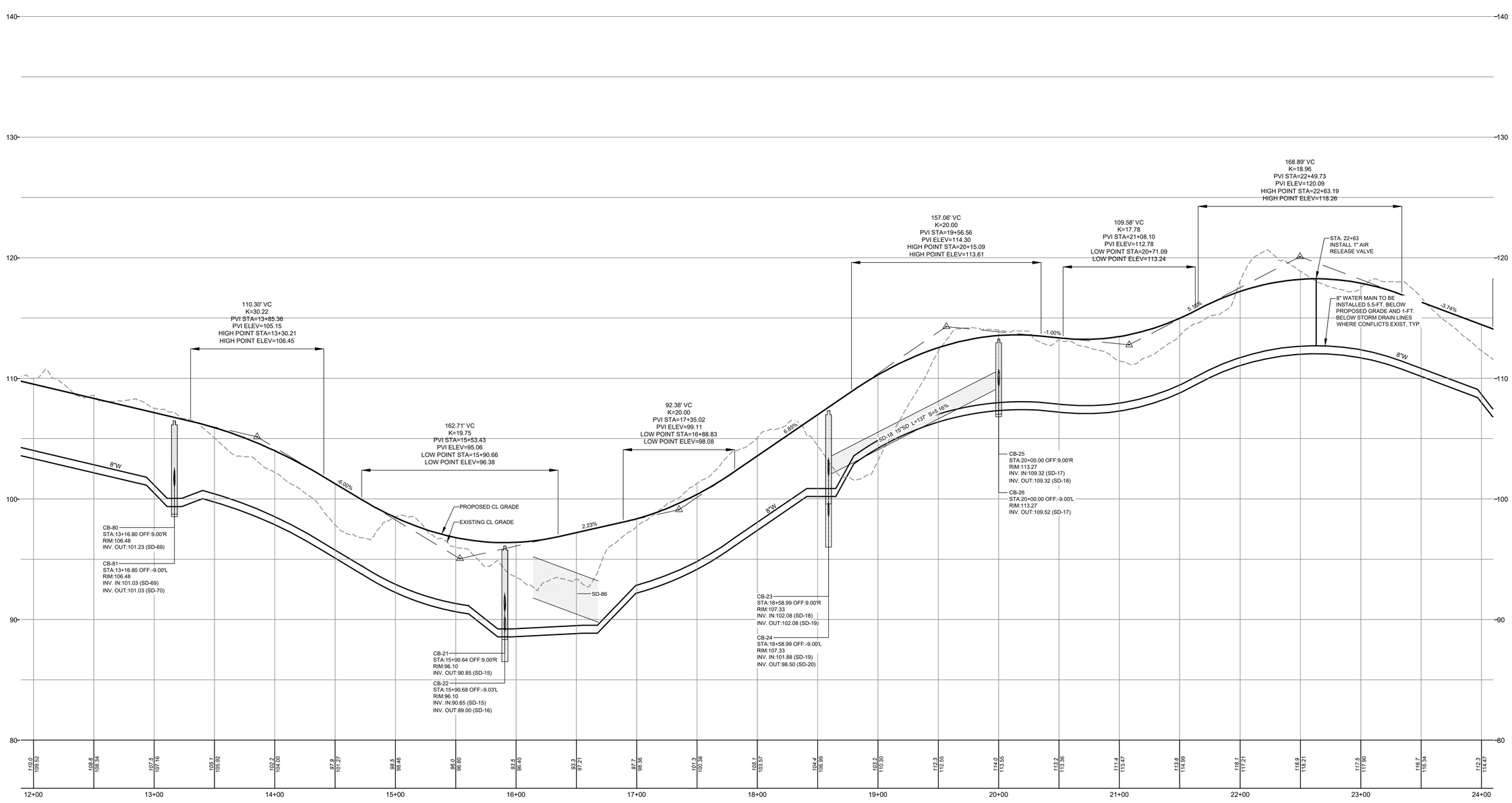

GARNET DRIVE

STA. 12+00 TO STA. 24+00
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE.	08-17-2022
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NEW GLOUCESTER, ME 04260

565 CONGRESS STREET
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PORTLAND, ME 04102

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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PROFILE - GARNET DRIVE

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.7

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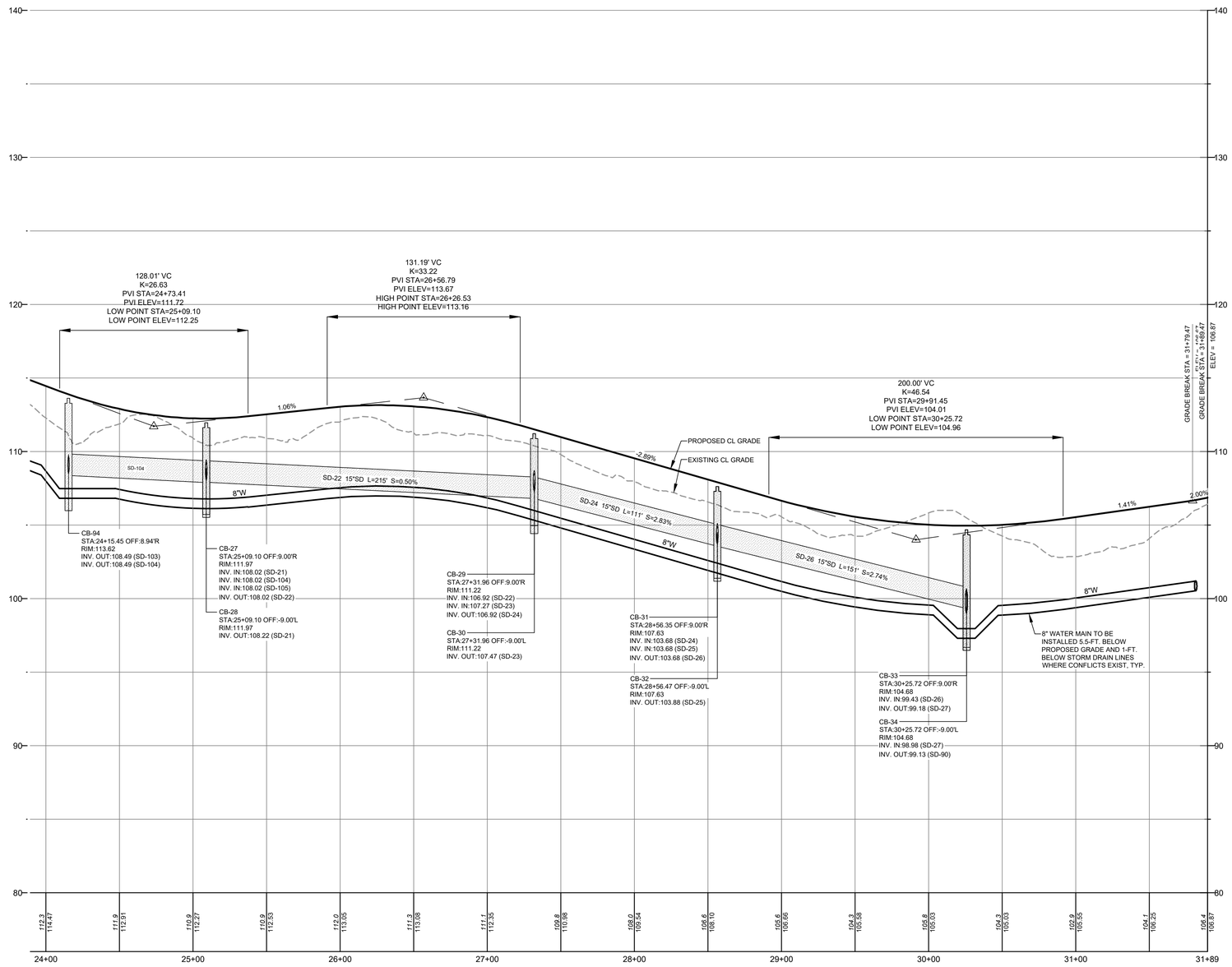

GARNET DRIVE

STA. 24+00 TO STA. 31+89
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
10167
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PROFESSIONAL ENGINEER

DATE:	08-17-2022
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NEW GLOUCESTER, ME 04260
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www.terradynconsultants.com
555 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
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PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PROFILE - GARNET DRIVE

CLIENT:
SOUTH STREET VILLAGE, LLC
782 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.8

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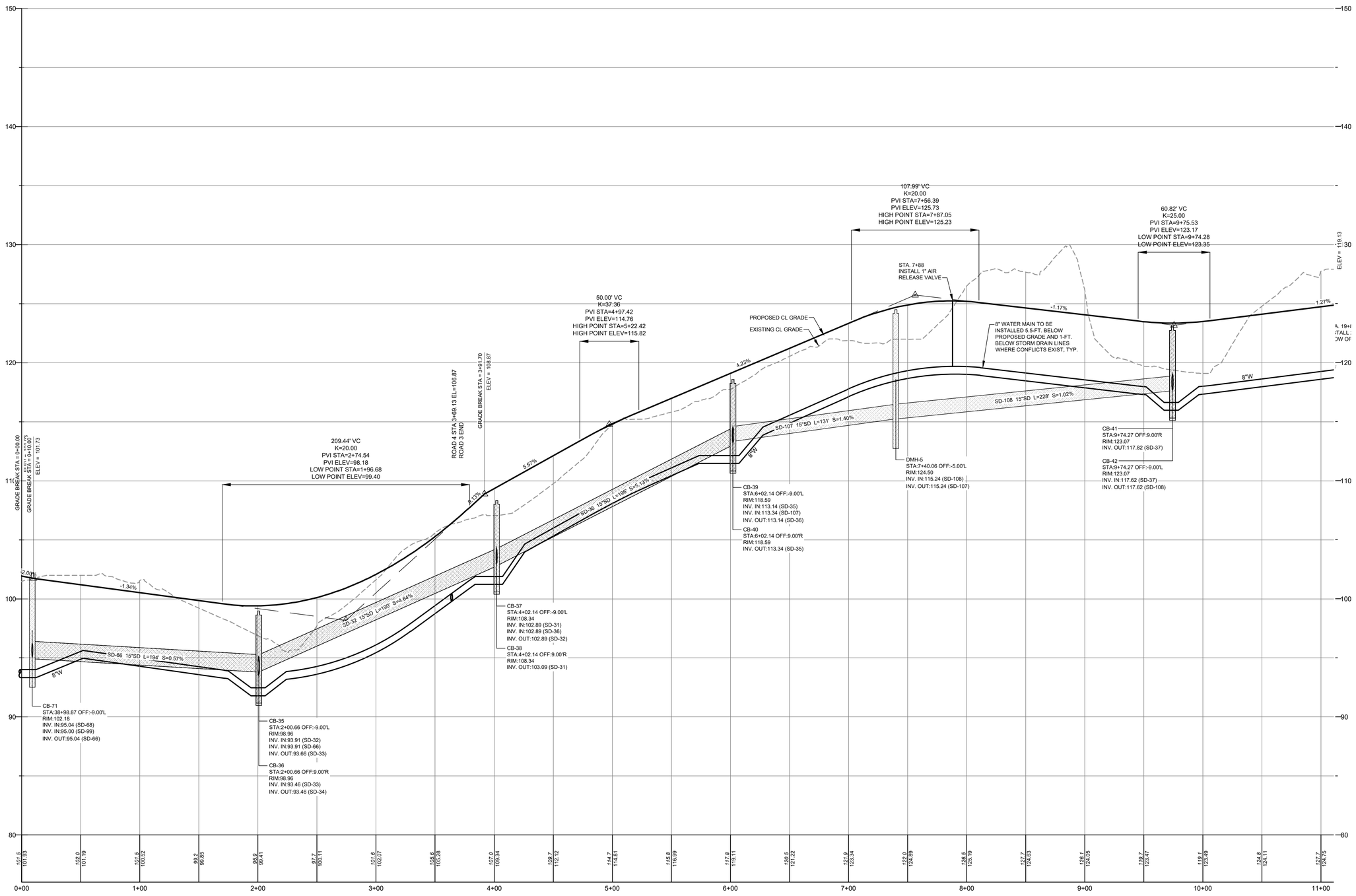

GRIFFINITE WAY

STA. 0+00 TO STA. 11+00
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
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SUITE 201
PORTLAND, ME 04102

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
PROFILE - GRIFFINITE WAY

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-5.9

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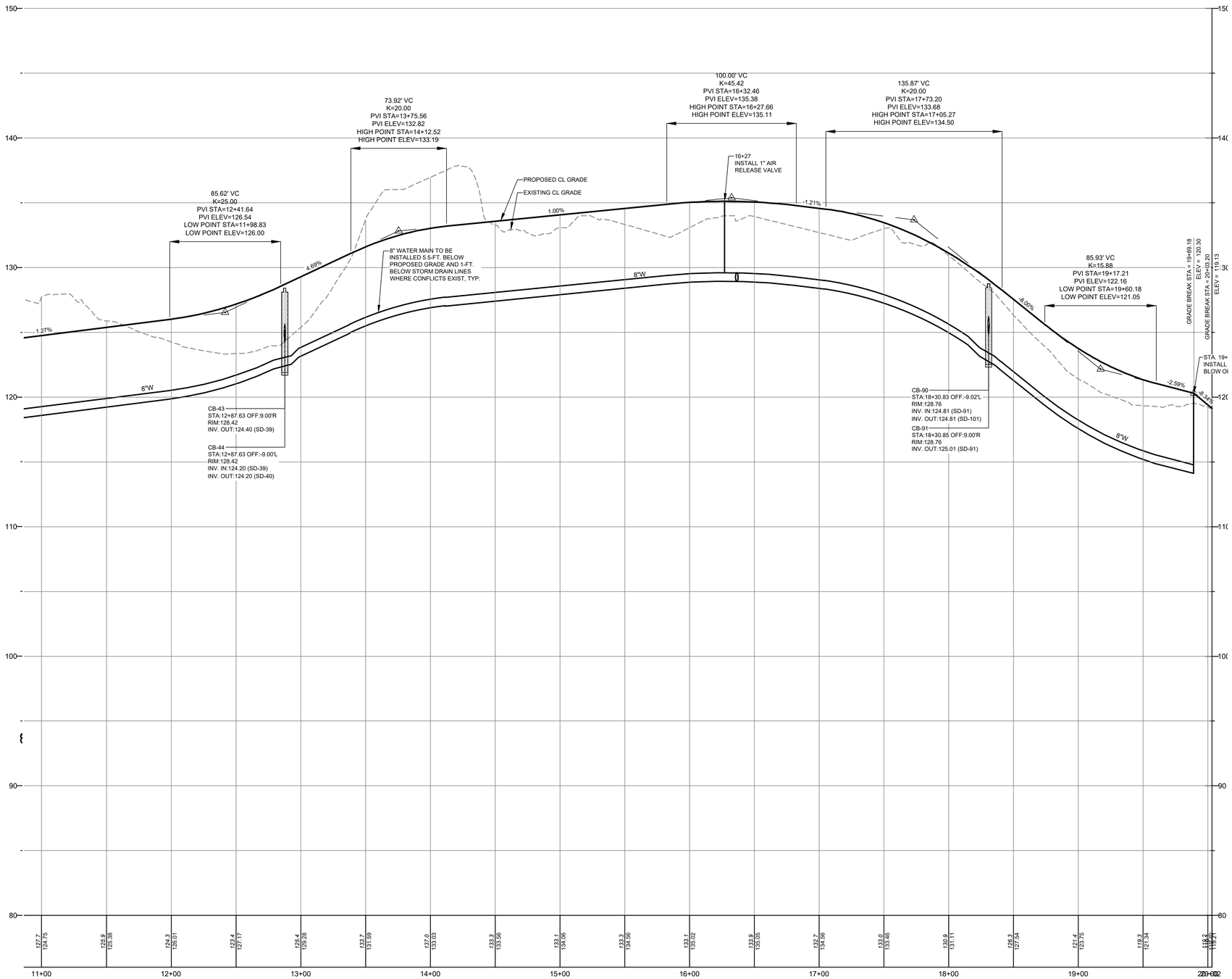

GRIFFINITE WAY

STA.11+00 TO STA. 20+02
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B.	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A.	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
41 CAMPUS DRIVE
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565 CONGRESS STREET
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OFFICE: (207) 926-5111 FAX: (207) 221-1317
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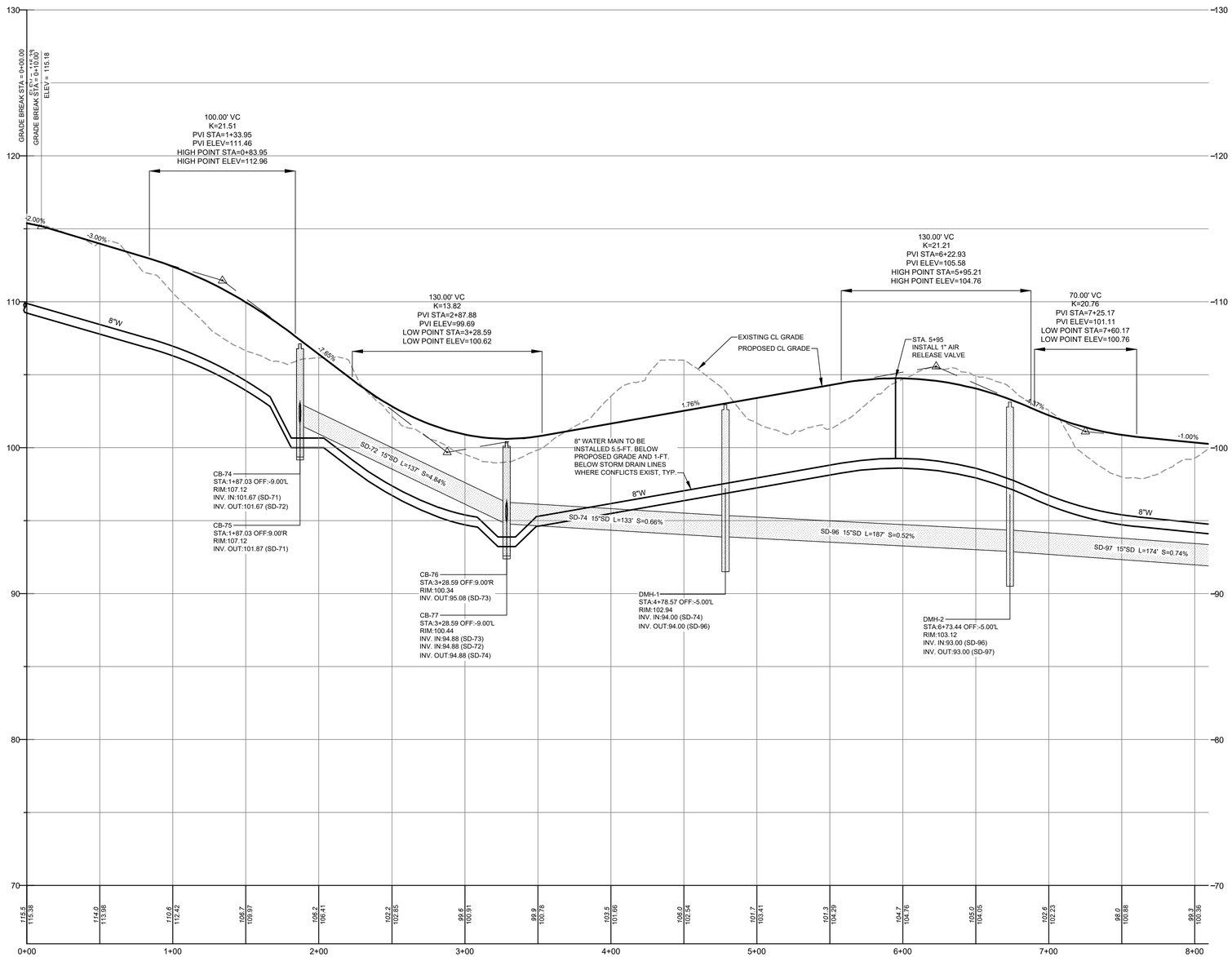

ONYX CIRCLE

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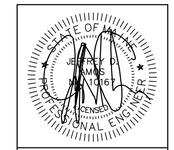

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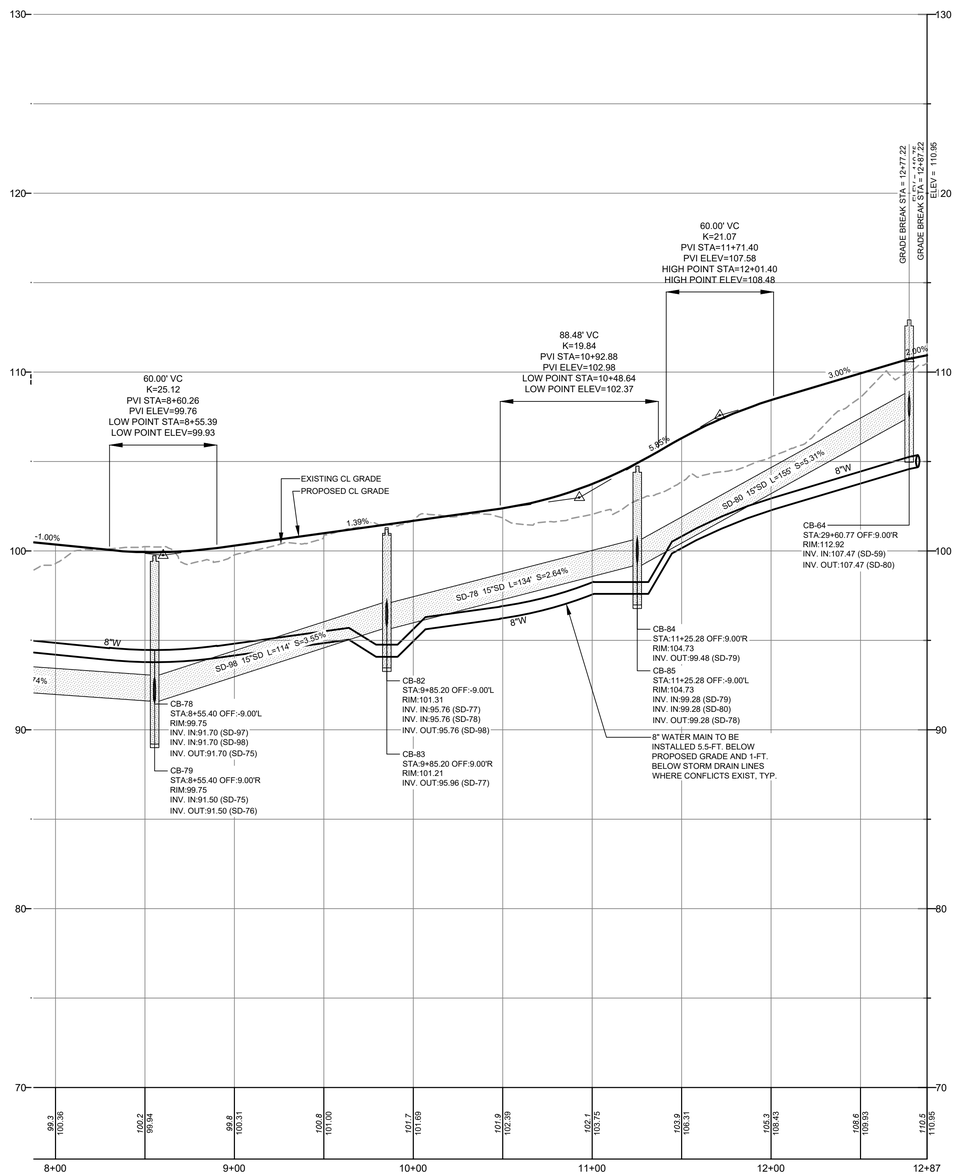

ONYX CIRCLE

STA. 8+00 TO STA. 12+87
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1" = 4' VERT

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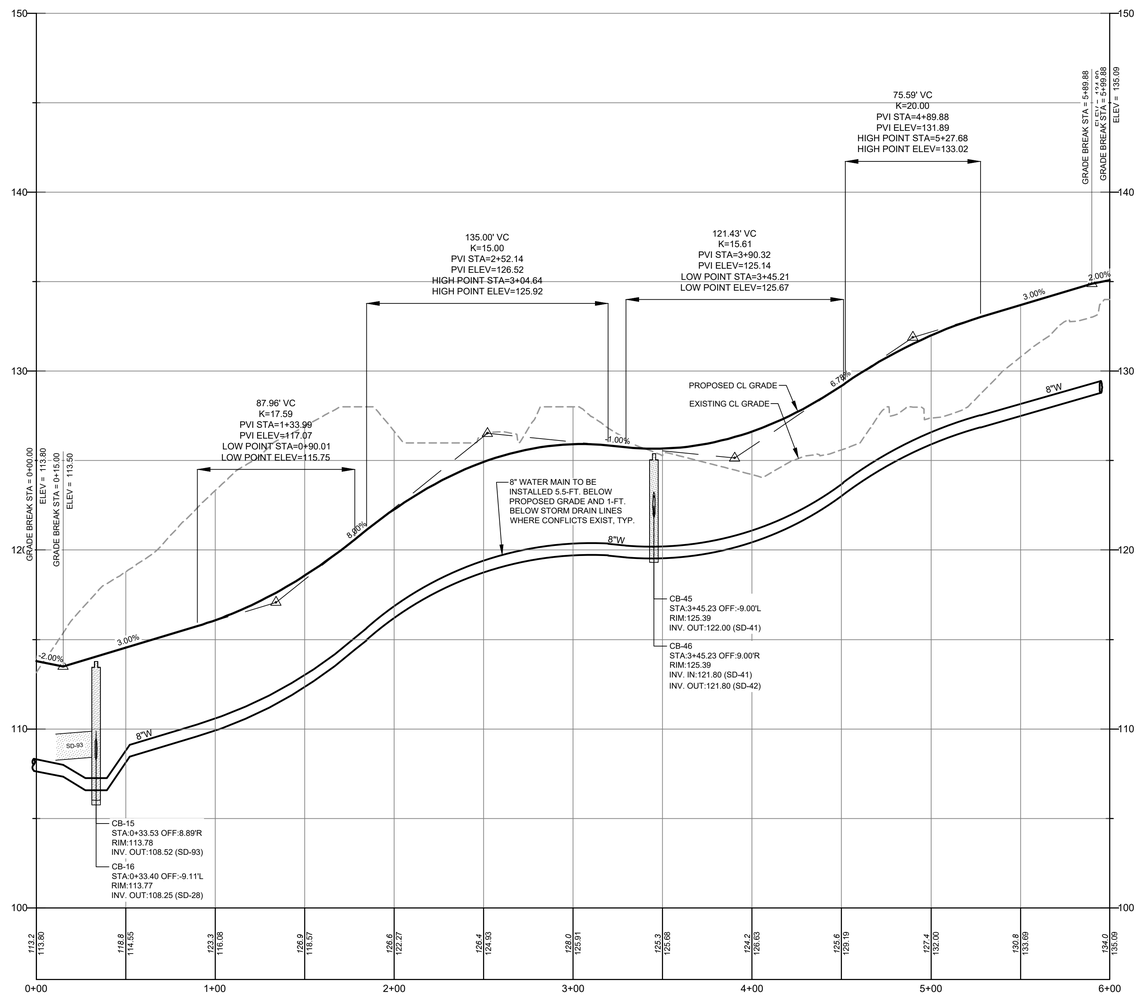

RUBY ROAD

STA. 0+00 TO STA. 6+00
SCALE: 1" = 40' HORIZ.
1" = 4' VERT

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EROSION AND SEDIMENT CONTROL PLAN

PRE-CONSTRUCTION PHASE
A PERSON WHO CONDUCTS, OR CAUSES TO BE CONDUCTED, AN ACTIVITY THAT INVOLVES FILLING, DISPLACING OR EXPOSING SOIL OR OTHER EARTHEN MATERIALS SHALL TAKE MEASURES TO PREVENT UNREASONABLE EROSION OF SOIL OR SEDIMENT BEYOND THE PROJECT SITE OR INTO A PROTECTED NATURAL RESOURCE AS DEFINED IN 38 MRSA § 480-B. EROSION CONTROL MEASURES MUST BE IN PLACE BEFORE THE ACTIVITY BEGINS. MEASURES MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL THE SITE IS PERMANENTLY STABILIZED. ADEQUATE AND TIMELY TEMPORARY AND PERMANENT STABILIZATION MEASURES MUST BE TAKEN. THE SITE MUST BE MAINTAINED TO PREVENT UNREASONABLE EROSION AND SEDIMENTATION. MINIMIZE DISTURBED AREAS AND PROTECT NATURAL DOWNGRADIENT BUFFER AREAS TO THE EXTENT PRACTICABLE.

BMP CONSTRUCTION PHASE
A. SEDIMENT BARRIERS. PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, PROPERLY INSTALL SEDIMENT BARRIERS AT THE EDGE OF ANY DOWNGRADIENT DISTURBED AREA AND ADJACENT TO ANY DRAINAGE CHANNELS WITHIN THE PROPOSED DISTURBED AREA. MAINTAIN THE SEDIMENT BARRIERS UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.

B. CONSTRUCTION ENTRANCE: PRIOR TO ANY CLEARING OR GRUBBING, A CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT THE INTERSECTION WITH THE PROPOSED ACCESS DRIVE AND THE EXISTING ROADWAY TO AVOID TRACKING OF MUD, DUST AND DEBRIS FROM THE SITE.

C. RIPRAP: SINCE RIPRAP IS USED WHERE EROSION POTENTIAL IS HIGH, CONSTRUCTION MUST BE SEQUENCED SO THAT THE RIPRAP IS PUT IN PLACE WITH THE MINIMUM DELAY. DISTURBANCE OF AREAS WHERE RIPRAP IS TO BE PLACED SHOULD BE UNDERTAKEN ONLY WHEN FINAL PREPARATION AND PLACEMENT OF THE RIPRAP CAN FOLLOW IMMEDIATELY BEHIND THE INITIAL DISTURBANCE. WHERE RIPRAP IS USED FOR OUTLET PROTECTION, THE RIPRAP SHOULD BE PLACED BEFORE OR IN CONJUNCTION WITH THE CONSTRUCTION OF THE PIPE OR CHANNEL SO THAT IT IS IN PLACE WHEN THE PIPE OR CHANNEL BEGINS TO OPERATE. MAINTAIN TEMPORARY RIPRAP, SUCH AS TEMPORARY CHECK DAMS UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.

D. TEMPORARY STABILIZATION. STABILIZE WITH TEMPORARY SEEDING, MULCH, OR OTHER NON-ERODABLE COVER ANY EXPOSED SOILS THAT WILL REMAIN UNWORKED FOR MORE THAN 14 DAYS EXCEPT, STABILIZE AREAS WITHIN 100 FEET OF A WETLAND OR WATERBODY WITHIN 7 DAYS OR PRIOR TO A PREDICTED STORM EVENT, WHICHEVER COMES FIRST. IF HAY OR STRAW MULCH IS USED, THE APPLICATION RATE MUST BE 2 BALES (70-90 POUNDS) PER 1000 SF OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE. HAY MULCH MUST BE KEPT MOIST OR ANCHORED TO PREVENT WIND BLOWING. AN EROSION CONTROL BLANKET OR MAT SHALL BE USED AT THE BASE OF GRASSED WATERWAYS, STEEP SLOPES (15% OR GREATER) AND ON ANY DISTURBED SOIL WITHIN 100 FEET OF LAKES, STREAMS AND WETLANDS. GRADING SHALL BE PLANNED SO AS TO MINIMIZE THE LENGTH OF TIME BETWEEN INITIAL SOIL EXPOSURE AND FINAL GRADING. ON LARGE PROJECTS THIS SHOULD BE ACCOMPLISHED BY PHASING THE OPERATION AND COMPLETING THE FIRST PHASE UP TO FINAL GRADING AND SEEDING BEFORE STARTING THE SECOND PHASE, AND SO ON.

E. VEGETATED WATERWAY. UPON FINAL GRADING, THE DISTURBED AREAS SHALL BE IMMEDIATELY SEEDED TO PERMANENT VEGETATION AND MULCHED AND WILL NOT BE USED AS OUTLETS UNTIL A DENSE, VIGOROUS VEGETATIVE COVER HAS BEEN OBTAINED. ONCE SOIL IS EXPOSED FOR WATERWAY CONSTRUCTION, IT SHOULD BE IMMEDIATELY SHAPED, GRADED AND STABILIZED. VEGETATED WATERWAYS NEED TO BE STABILIZED EARLY DURING THE GROWING SEASON (PRIOR TO SEPTEMBER 15). IF FINAL SEEDING OF WATERWAYS IS DELAYED PAST SEPTEMBER 15, EMERGENCY PROVISIONS SUCH AS SOD OR RIPRAP MAY BE REQUIRED TO STABILIZE THE CHANNEL. WATERWAYS SHOULD BE FULLY STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.

PERMANENT STABILIZATION DEFINED
A. SEEDED AREAS. FOR SEEDED AREAS, PERMANENT STABILIZATION MEANS AN 90% COVER OF THE DISTURBED AREA WITH MATURE, HEALTHY PLANTS WITH NO EVIDENCE OF WASHING OR RILLING OF THE TOPSOIL.

B. SODDED AREAS. FOR SODDED AREAS, PERMANENT STABILIZATION MEANS THE COMPLETE BINDING OF THE SOD ROOTS INTO THE UNDERLYING SOIL WITH NO SLUMPING OF THE SOD OR DIE-OFF.

C. PERMANENT MULCH. FOR MULCHED AREAS, PERMANENT MULCHING MEANS TOTAL COVERAGE OF THE EXPOSED AREA WITH AN APPROVED MULCH MATERIAL. EROSION CONTROL MIX MAY BE USED AS MULCH FOR PERMANENT STABILIZATION ACCORDING TO THE APPROVED APPLICATION RATES AND LIMITATIONS.

D. RIPRAP. FOR AREAS STABILIZED WITH RIPRAP, PERMANENT STABILIZATION MEANS THAT SLOPES STABILIZED WITH RIPRAP HAVE AN APPROPRIATE BACKING OF A WELL-GRADED GRAVEL OR APPROVED GEOTEXTILE TO PREVENT SOIL MOVEMENT FROM BEHIND THE RIPRAP. STONE MUST BE SIZED APPROPRIATELY. IT IS RECOMMENDED THAT ANGULAR STONE BE USED.

E. AGRICULTURAL USE. FOR CONSTRUCTION PROJECTS ON LAND USED FOR AGRICULTURAL PURPOSES (E.G., PIPELINES ACROSS CROP LAND), PERMANENT STABILIZATION MAY BE ACCOMPLISHED BY RETURNING THE DISTURBED LAND TO AGRICULTURAL USE.

F. PAVED AREAS. FOR PAVED AREAS, PERMANENT STABILIZATION MEANS THE PLACEMENT OF THE COMPACTED GRAVEL SUBBASE IS COMPLETED.

G. DITCHES, CHANNELS, AND SWALES. FOR OPEN CHANNELS, PERMANENT STABILIZATION MEANS THE CHANNEL IS STABILIZED WITH MATURE VEGETATION AT LEAST THREE INCHES IN HEIGHT, WITH WELL-GRADED RIPRAP, OR WITH ANOTHER NON-ERODSIVE LINING CAPABLE OF WITHSTANDING THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHOUT RELIANCE ON CHECK DAMS TO SLOW FLOW. THERE MUST BE NO EVIDENCE OF SLUMPING OF THE LINING, UNDERCUTTING OF THE BANKS, OR DOWN-CUTTING OF THE CHANNEL.

GENERAL CONSTRUCTION PHASE
THE FOLLOWING EROSION CONTROL MEASURES SHALL BE FOLLOWED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION OF THIS PROJECT:

A. ALL TOPSOIL SHALL BE COLLECTED, STOCKPILED, SEEDED WITH RYE AT 3 POUNDS/1,000 SF AND MULCHED, AND REUSED AS REQUIRED. SILT FENCING SHALL BE PLACED DOWN GRADIENT FROM THE STOCKPILED LOAM. STOCKPILE TO BE LOCATED BY DESIGNATION OF THE OWNER AND INSPECTING ENGINEER.

B. THE INSPECTING ENGINEER AT HIS/HER DISCRETION, MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES AND/OR SUPPLEMENTAL VEGETATIVE PROVISIONS TO MAINTAIN STABILITY OF EARTHWORKS AND FINISH GRADED AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ANY SUPPLEMENTAL MEASURES AS DIRECTED BY THE INSPECTING ENGINEER. FAILURE TO COMPLY WITH THE ENGINEER'S DIRECTIONS WILL RESULT IN DISCONTINUATION OF CONSTRUCTION ACTIVITIES.

C. EROSION CONTROL MESH SHALL BE APPLIED IN ACCORDANCE WITH THE PLANS OVER ALL FINISH SEEDED AREAS AS SPECIFIED ON THE DESIGN PLANS.

D. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN UNTIL THEY ARE ADEQUATELY STABILIZED.

E. ALL EROSION, AND SEDIMENT CONTROL PRACTICES AND MEASURES SHALL BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.

F. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIALS.

G. AREAS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 INCHES PRIOR TO PLACEMENT OF TOPSOIL.

H. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC., SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

I. ALL FILLS SHALL BE PLACED AND COMPACTED IN LAYERS NOT TO EXCEED 8 INCHES IN THICKNESS.

J. EXCEPT FOR APPROVED LANDFILLS OR NON-STRUCTURAL FILLS, FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, ROCKS, LOGS, STUMPS, BUILDING DEBRIS AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY LIFTS.

K. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILL SLOPES OR STRUCTURAL FILLS.

L. FILL SHALL NOT BE PLACED ON A FROZEN FOUNDATION.

M. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED APPROPRIATELY.

N. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.

O. REMOVE ANY TEMPORARY CONTROL MEASURES, SUCH AS SILT FENCE, WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED. REMOVE ANY ACCUMULATED SEDIMENTS AND STABILIZE.

PERMANENT VEGETATION
PERMANENT VEGETATIVE COVER SHOULD BE ESTABLISHED ON DISTURBED AREAS WHERE PERMANENT, LONG LIVED VEGETATIVE COVER IS NEEDED TO STABILIZE THE SOIL, TO REDUCE DAMAGES FROM SEDIMENT AND RUNOFF, AND TO ENHANCE THE ENVIRONMENT.

SEEDBED PREPARATION
A. GRADE AS FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION AND ANCHORING, AND MAINTENANCE.

B. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TESTS SUCH AS THOSE OFFERED BY THE UNIVERSITY OF MAINE SOIL TESTING LABORATORY. SOIL SAMPLE MAILERS ARE AVAILABLE FROM THE LOCAL COOPERATIVE EXTENSION SERVICE OFFICE. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 POUNDS PER ACRE OR 18.4 POUNDS PER 1,000 SQUARE FEET USING 10-20-20 (N-P2O5-K2O) OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT
A RATE OF 3 TONS PER ACRE (138 LB. PER 1,000 SQ. FT).

C. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.D. REMOVE FROM THE SURFACE ALL STONES 2 INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE, CLODS, LUMPS OR OTHER UNSUITABLE MATERIAL.

E. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.

F. PERMANENT SEEDING SHOULD BE MADE 45 DAYS PRIOR TO THE FIRST KILLING FROST OR AS A DORMANT SEEDING WITH MULCH AFTER THE FIRST KILLING FROST AND BEFORE SNOWFALL. WHEN CROWN VETCH IS SEEDED IN LATER SUMMER, AT LEAST 35% OF THE SEED SHOULD BE HARD SEED (UNSCARIFIED). IF SEEDING CANNOT BE DONE WITHIN THE SEEDING DATES, MULCH ACCORDING TO THE TEMPORARY MULCHING BMP AND OVERWINTER STABILIZATION AND CONSTRUCTION TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.

G. FOLLOWING SEED BED PREPARTATION, SWALE AREAS, FILL AREAS AND BACK SLOPES SHALL BE SEEDED AT A RATE OF 3 LBS./1,000 S.F. WITH A MIXTURE OF 35% CREEPING RED FESCUE, 6% RED TOP, 24% KENTUCKY BLUEGRASS, 10% PERENNIAL RYEGRASS, 20% ANNUAL RYEGRASS AND 5% WHITE DUTCH CLOVER.

I. AREAS WHICH HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHALL BE MULCHED IMMEDIATELY FOLLOWING SEEDING.

J. AREAS WHICH CANNOT BE SEEDED WITHIN THE GROWING SEASON SHALL BE MULCHED FOR OVER-WINTER PROTECTION AND THE AREA SHOULD BE SEEDED AT THE BEGINNING OF THE GROWING SEASON.

WINTER CONSTRUCTION PHASE
IF AN AREA IS NOT STABILIZED WITH TEMPORARY OR PERMANENT MEASURES BY NOVEMBER 15, THEN THE SITE MUST BE PROTECTED WITH ADDITIONAL STABILIZATION MEASURES.

A. PERMANENT STABILIZATION CONSISTS OF AT LEAST 90% VEGETATION, PAVEMENT/GRAVEL BASE OR RIPRAP.

B. DO NOT EXPOSE SLOPES OR LEAVE SLOPES EXPOSED OVER THE WINTER OR FOR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS FULLY PROTECTED WITH MULCH.

C. APPLY HAY MULCH AT TWICE THE STANDARD RATE (150 LBS. PER 1,000 SF). THE MULCH MUST BE THICK ENOUGH SUCH THAT THE GROUND SURFACE WILL NOT BE VISIBLE AND MUST BE ANCHORED.

D. USE MULCH AND MULCH NETTING OR AN EROSION CONTROL MULCH BLANKET OR ALL SLOPES GREATER THAN 8 % OR OTHER AREAS EXPOSED TO DIRECT WIND.

E. INSTALL AN EROSION CONTROL BLANKET IN ALL DRAINAGEWAYS (BOTTOM AND SIDES) WITH A SLOPE GREATER THAN 3 %.

F. SEE THE VEGETATION MEASURES FOR MORE INFORMATION ON SEEDING DATES AND TYPES.

G. WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SO THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.

H. AN AREA WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIER.

I. TEMPORARY MULCH MUST BE APPLIED WITHIN 7 DAYS OF SOIL EXPOSURE OR PRIOR TO ANY STORM EVENT, BUT AFTER EVERY WORKDAY IN AREAS WITHIN 100 FEET FROM A PROTECTED NATURAL RESOURCE.

J. AREAS THAT HAVE BEEN BROUGHT TO FINAL GRADE MUST BE PERMANENTLY MULCHED THAT SAME DAY.

K. IF SNOWFALL IS GREATER THAN 1 INCH (FRESH OR CUMULATIVE), THE SNOW SHALL BE REMOVED FROM THE AREAS DUE TO BE SEEDED AND MULCHED.

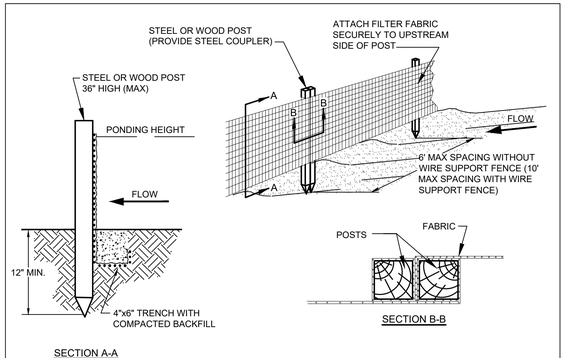
L. LOAM SHALL BE FREE OF FROZEN CLUMPS BEFORE IT IS APPLIED.

M. ALL VEGETATED DITCH LINES THAT HAVE NOT BEEN STABILIZED BY NOVEMBER 1, OR WILL BE WORKED DURING THE WINTER CONSTRUCTION PERIOD, MUST BE STABILIZED WITH AN APPROPRIATE STONE LINING BACKED BY AN APPROPRIATE GRAVEL BED OR GEOTEXTILE UNLESS SPECIFICALLY RELEASED FROM THIS STANDARD BY THE DEPARTMENT.

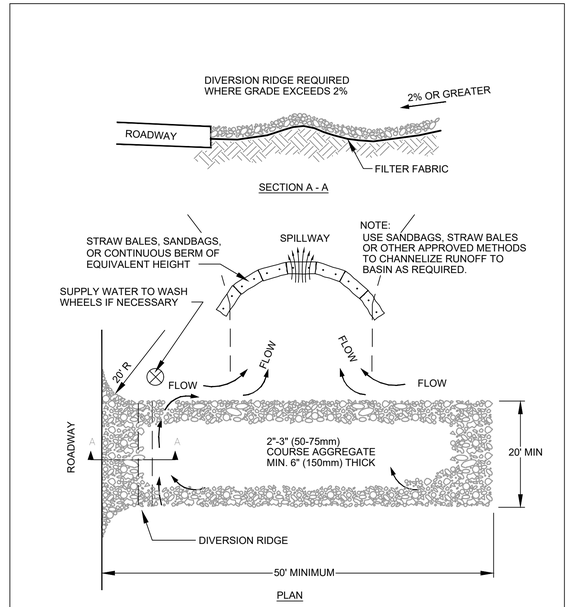
MAINTENANCE AND INSPECTION PHASE
A. MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE APPLICANT WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED. HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION, ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. A CONSTRUCTION LOG MUST BE MAINTAINED FOR THE EROSION AND SEDIMENTATION CONTROL INSPECTIONS AND MAINTENANCE

B. A LOG (REPORT) MUST BE KEPT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF THE PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, AND MAJOR OBSERVATIONS RELATING TO OPERATION OF EROSION AND SEDIMENTATION CONTROLS AND POLLUTION PREVENTION MEASURES. MAJOR OBSERVATIONS MUST INCLUDE: BMPS THAT NEED TO BE MAINTAINED; LOCATION(S) OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION; AND LOCATION(S) WHERE ADDITIONAL BMPS ARE NEEDED THAT DID NOT EXIST AT THE TIME OF INSPECTION. FOLLOW-UP TO CORRECT DEFICIENCIES OR ENHANCE CONTROLS MUST ALSO BE INDICATED IN THE LOG AND DATED, INCLUDING WHAT ACTION WAS TAKEN AND WHEN.

DEWATERING
A DEWATERING PLAN IS NEEDED TO ADDRESS EXCAVATION DE-WATERING FOLLOWING HEAVY RAINFALL EVENTS OR WHERE THE EXCAVATION MAY INTERCEPT THE GROUNDWATER TABLE DURING CONSTRUCTION. THE COLLECTED WATER NEEDS TREATMENT AND A DISCHARGE POINT THAT WILL NOT CAUSE DOWNGRADIENT EROSION AND OFFSITE SEDIMENTATION OR WITHIN A RESOURCE.



SILT FENCE
NOT TO SCALE

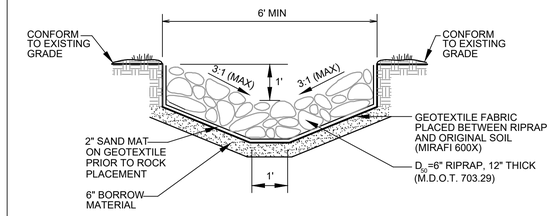


NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.

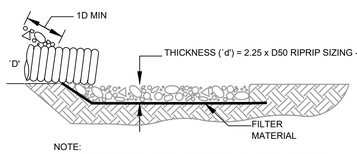
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



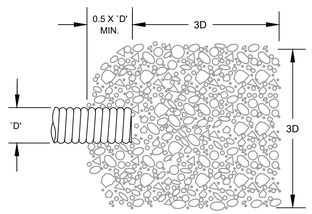
RIPRAP SWALE
NOT TO SCALE



NOTE:
1. GEOTEXTILE FILTER FABRIC BENEATH STONE BASED ON UNDISTURBED SOILS, OR 6" OF 4" MINUS BAN RUN GRAVEL FREE OF FINES, CLAYS, SILTS.

2. GEOTEXTILE TO BE MIRAFI 600X OR APPROVED EQUAL.

SECTION



HARD ANGULAR ROCK
D50 SELECTION PER
CHART

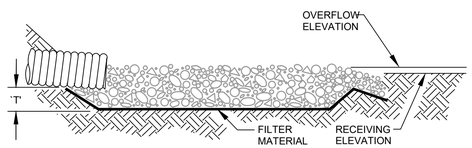
PLAN

PIPE INLET PROTECTION SIZING TABLE

PIPE SIZE (IN)	RIRAP SIZING (D50)	LENGTH (FT)	WIDTH (FT)
6	3	2.0	1.5
12	5	3.5	3.0
15	6	4.5	3.75
18	8	5.25	4.5
24	10	7.0	6.0
30	12	8.75	7.5
36	14	10.5	9.0

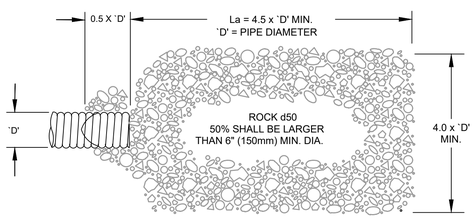
NOTES:
1. IN DEFINED CHANNELS, APRON SHALL EXTEND FULL WIDTH OF BOTTOM AND ONE FOOT ABOVE MAX. HEADWATER OR UP TO BANK FULL, WHICHEVER IS LESS.

PIPE INLET PROTECTION



THICKNESS ('T') = 2.25 x D50 RIPRAP SIZING - 6" (150mm) MIN.

SECTION



PLAN

PIPE OUTLET PROTECTION SIZING TABLE

PIPE SIZE (IN)	RIP RAP SIZING (D50)	LENGTH (FT)	WIDTH (FT)
6	3	2.5	2.0
12	5	5.0	4.0
15	6	6.25	5.0
18	8	7.5	6.0
24	10	10.0	8.0
30	12	13.0	10.0
36	14	15.0	12.0

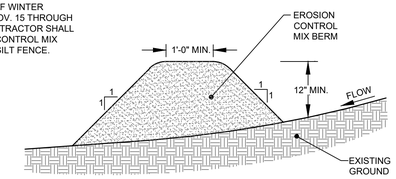
NOTES:
1. 'La' = LENGTH OF APRON. DISTANCE 'La' SHALL BE OF SUFFICIENT LENGTH TO DISSIPATE ENERGY.

2. APRON SHALL BE SET AT A ZERO GRADE AND ALIGNED STRAIGHT.

3. FILTER MATERIAL SHALL BE FILTER FABRIC (MIRAFI 600X OR APPROVED EQUAL) OR 6" (150mm) THICK MINIMUM GRADED GRAVEL LAYER.

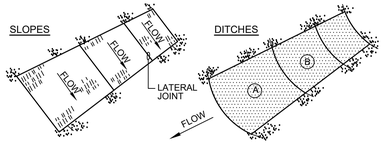
PIPE OUTLET PROTECTION
NOT TO SCALE

NOTE:
DURING PERIODS OF WINTER
CONSTRUCTION (NOV. 15 THROUGH
APRIL 15), THE CONTRACTOR SHALL
INSTALL EROSION CONTROL MIX
BERMS IN LIEU OF SILT FENCE.



EROSION CONTROL MIX:
EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES & MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS:
- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80% - 100% DRY WEIGHT BASIS
- PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN AND A MINIMUM OF 70%, MAXIMUM OF 85% PASSING A 0.75" SCREEN
- THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED
- LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
- SOLUBLE SALTS CONTENT SHALL BE < 4.0 mmhos/cm.
- ph SHALL FALL BETWEEN 5.0 - 8.0.

EROSION CONTROL MIX BERM
NOT TO SCALE



NOTES:
1. BURY THE TOP END OF THE MESH MATERIAL IN A 6" TRENCH AND BACKFILL AND TAMP TRENCHING SECURE END WITH STAPLES AT 6" SPACING, 4" DOWN FROM EXPOSED END.

2. FLOW DIRECTION JOINTS TO HAVE UPPER END OF LOWER STRIP BURIED WITH UPPER LAYERS OVERLAPPED 4" AND STAPLED. OVERLAP B OVER A.

3. LATERAL JOINTS TO HAVE 4" OVERLAP OF STRIPS. STAPLE 18" ON CENTER.

4. STAPLE OUTSIDE LATERAL EDGE 2' ON CENTER.

5. WIRE STAPLES TO BE MIN. OF #11 WIRE, 6" LONG & 1-1/2" WIDE.

6. USE NORTH AMERICAN GREEN DS 150 (OR APPROVED EQUAL) ON SLOPES BETWEEN 4:1-2:1. USE NORTH AMERICAN GREEN VMAX SC250 PERMANENT TURF REINFORCEMENT MAT (OR APPROVED EQUAL) ON SLOPES 2:1 AND STEEPER..

EROSION CONTROL BLANKET
NOT TO SCALE

STATE OF MAINE
JEFFREY
AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE:	08-17-2022
P.E.:	JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
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NEW GLOUCESTER, ME 04260
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www.terradynconsultants.com
565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE DETAILS -1

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-6.1

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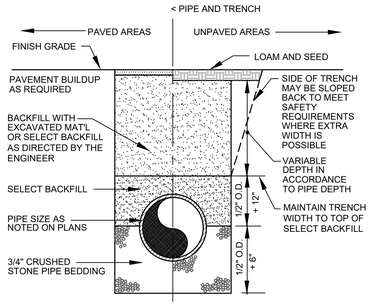
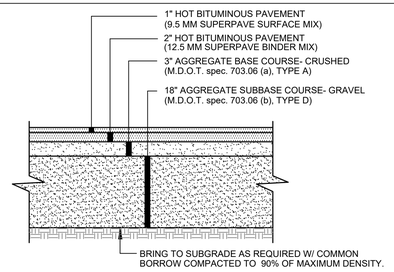


TYPICAL TRENCH SECTION

NOT TO SCALE

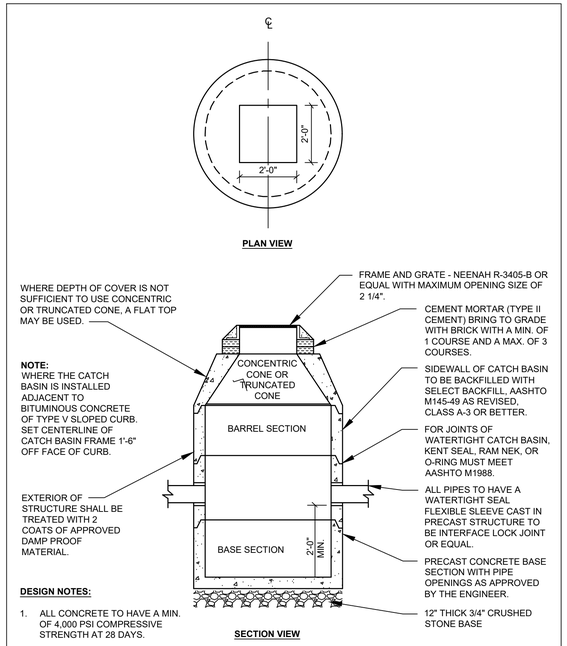


NOTES:

1. COMPACT GRAVEL SUBBASE COURSE TO 92% OF MAXIMUM DENSITY USING HEAVY ROLLER COMPACTION.
2. CONTRACTOR SHALL SET GRADE STAKES MARKING SUBBASE AND FINISH GRADE ELEVATIONS FOR CONSTRUCTION REFERENCE.

PARKING AREA PAVEMENT SECTION

NOT TO SCALE



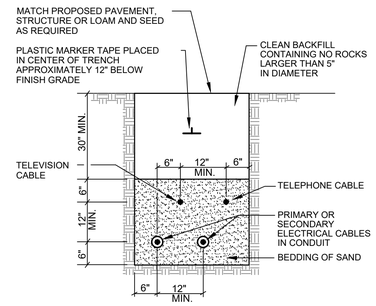
DESIGN NOTES:

1. ALL CONCRETE TO HAVE A MIN. OF 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
2. DESIGN LOAD FOR H-20 WHEEL LOAD.
3. CATCH BASIN TO CONFORM TO ASTM-C478 SPECIFICATIONS.
4. REINFORCE TO 0.12 IN SQ./LF..

NOTE:
CASCADE GRATES SHALL BE INSTALLED ON GRADIENT OF GUTTER IF PROFILE GRADE EXCEEDS 5% GRATES SHALL BE DEPRESSED 2" BELOW NORMAL GUTTER GRADE UNLESS THIS DEPRESSION INTERFERES WITH TRAFFIC. PARALLEL BAR GRATES SHALL BE INSTALLED ON A LEVEL GRADIENT.

TYPICAL CATCH BASIN

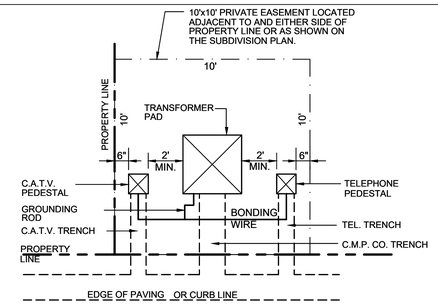
NOT TO SCALE



CABLES TO BE ENCASED IN SCHEDULE 40 PVC CONDUIT WHEN RUN BENEATH PAVED AREAS.

TYPICAL UNDERGROUND CABLE INSTALLATION

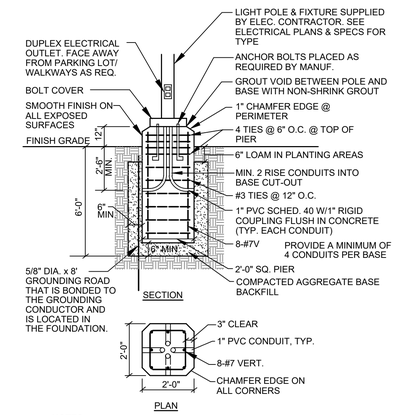
NOT TO SCALE



NOTE:
TRANSFORMER PAD AND COVER TO BE FIBERGLASS MEETING CENTRAL MAINE POWER SPECIFICATIONS.

TRANSFORMER DETAIL

NOT TO SCALE

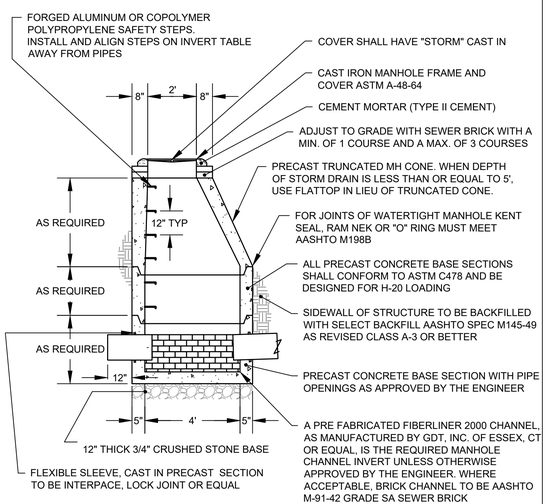


NOTES:

1. CONCRETE f'c=4000 psi.
2. REINF. STEEL GRADE 60 NEW BARS.
3. CONCRETE 3/4" AGG., 6 +/- 1% ENTRAINED AIR.
4. PROVIDE 2 COATS BITUMINOUS DAMPROOFING FOR ALL CONCRETE BELOW GRADE.
5. INSTALL BASE 3'-0" ABOVE FINISH GRADE IN LOCATIONS WHERE POLES ARE IN PARKING LOT PAVEMENT.
6. BID ALT - CONTRACTOR MAY SUBSTITUTE PRECAST CONCRETE LIGHT POLE BASE EQUAL TO ABOVE SPEC.

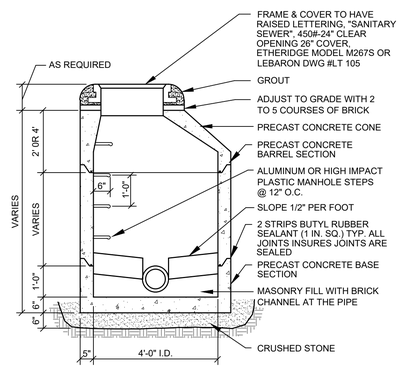
LIGHT POLE BASE

NOT TO SCALE



4' DIAMETER PRECAST STORM DRAIN MANHOLE

NOT TO SCALE



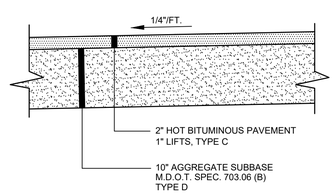
NOTE: PIPE CONNECTIONS SHALL BE WATERTIGHT FLEXIBLE BOOT CONNECTORS PROVIDES LEAKPROOF CONNECTION

PRECAST SEWER MANHOLE

NOT TO SCALE

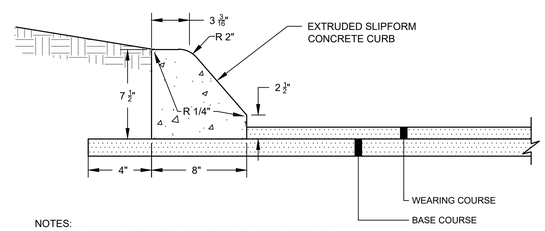
TYPICAL PAVEMENT JOINT

NOT TO SCALE



BITUMINOUS SIDEWALK

NOT TO SCALE

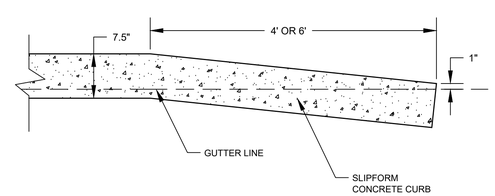


NOTES:

1. APPLY EPOXY BETWEEN BINDER PAVEMENT AND CURB
2. 1" TO 2" SLUMP
3. 5% TO 7% AIR ENTRAINMENT
4. 4,000 PSI CONCRETE WITH FIBER REINFORCEMENT

SLOPED SLIPFORM CONCRETE CURB DETAIL

NOT TO SCALE



SLIPFORM CURB TIPDOWN DETAIL

NOT TO SCALE

STATE OF MAINE JEFFREY D. AMOS 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE DETAILS - 2

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-6.2

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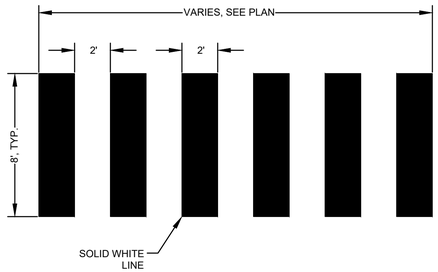
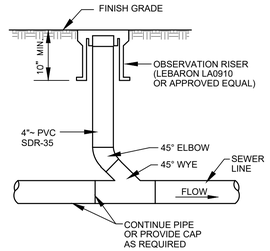


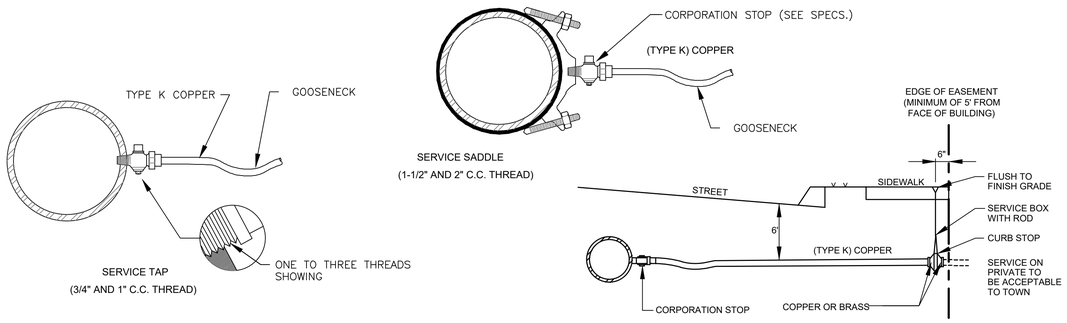
CROSSWALK STRIPING DETAIL

NOT TO SCALE



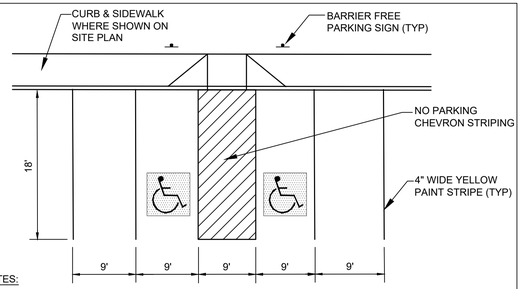
SEWER CLEANOUT

NOT TO SCALE



TYPICAL WATER SERVICE CONNECTION

NOT TO SCALE

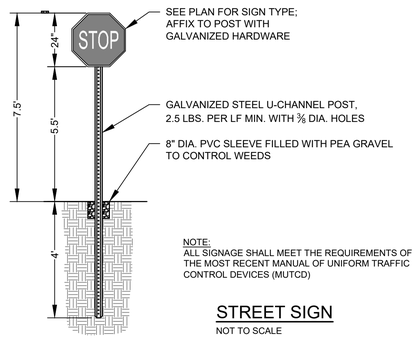


NOTES:

1. SEE SITE PLAN FOR NUMBER AND LOCATION OF BARRIER FREE PARKING SPACES.
2. BARRIER FREE GRAPHIC SYMBOL (PAINTED WHITE) TO BE CENTERED IN PARKING STALL. SYMBOL TO BE PAINTED ON BLUE NON-SKID BACKGROUND.

TYPICAL PARKING STALL DIMENSIONS

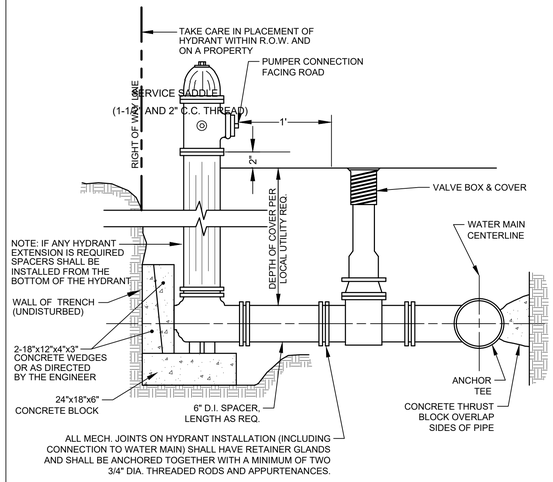
NOT TO SCALE



NOTE:
ALL SIGNAGE SHALL MEET THE REQUIREMENTS OF THE MOST RECENT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

STREET SIGN

NOT TO SCALE

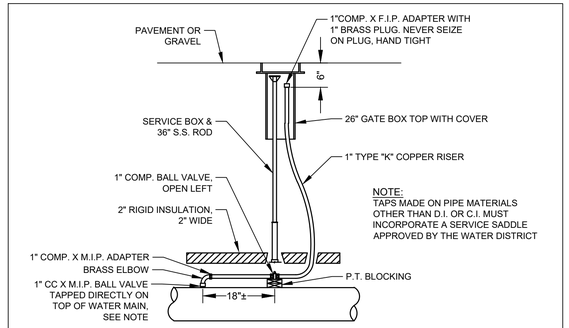


NOTES:

1. ALL MATERIALS SHALL CONFORM TO THE KENNEBUNK, KENNEBUNKPORT & WELLS WATER DISTRICT REQUIREMENTS
2. HYDRANT SHALL BE OPEN RIGHT
3. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE

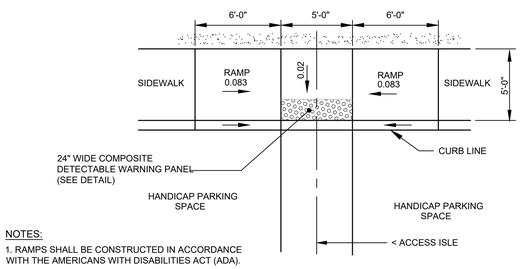
TYP. HYDRANT INSTALLATION

NOT TO SCALE



AIR RELEASE DETAIL

NOT TO SCALE

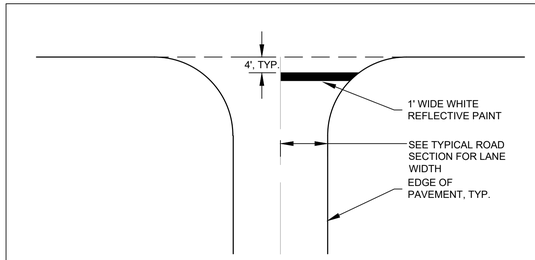


NOTES:

1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA).
2. ALL RAMPS SHALL HAVE DETECTABLE WARNINGS THE FULL DEPTH AND WIDTH OF THE RAMP PER SECTION 4.29 OF THE ADA.
3. A TACTILE WARNING STRIP IS REQUIRED WHERE RAMP ABUTS AN AREA USED BY VEHICLES.

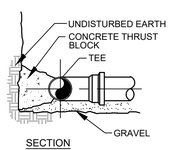
HANDICAP RAMP

NOT TO SCALE



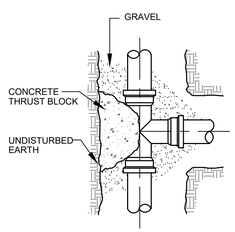
STOP BAR DETAIL

NOT TO SCALE

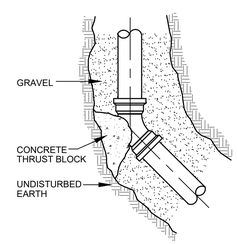


SECTION

CONCRETE THRUST BLOCK SIZE REQUIREMENTS				
		SQ. FT. OF BEARING ON UNDISTURBED SOIL		
FITTINGS		90° BENDS	45° BENDS	TEES AND PLUGS
PIPE SIZE	6"	4.0	2.0	3.0
	8"	8.0	4.0	6.0
	12"	15	10	10



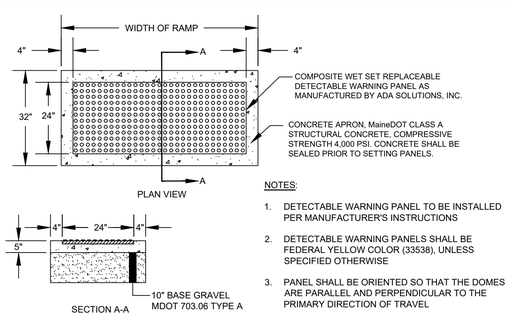
PLAN



45° BEND

TEE & BEND DETAIL

NOT TO SCALE

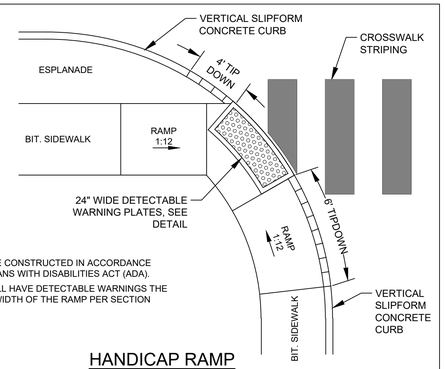


NOTES:

1. DETECTABLE WARNING PANEL TO BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS
2. DETECTABLE WARNING PANELS SHALL BE FEDERAL YELLOW COLOR (33538), UNLESS SPECIFIED OTHERWISE
3. PANEL SHALL BE ORIENTED SO THAT THE DOMES ARE PARALLEL AND PERPENDICULAR TO THE PRIMARY DIRECTION OF TRAVEL

COMPOSITE DETECTABLE WARNING PANEL DETAIL

NOT TO SCALE

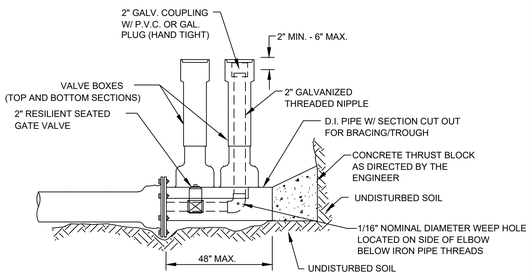


NOTES:

1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA).
2. ALL RAMPS SHALL HAVE DETECTABLE WARNINGS THE FULL DEPTH AND WIDTH OF THE RAMP PER SECTION 4.29 OF THE ADA.

HANDICAP RAMP

NOT TO SCALE



STANDARD 2" BLOW OFF

NOT TO SCALE

TERRADYN CONSULTANTS, LLC
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting
41 CAMPUS DRIVE SUITE 201 NEW GLOUCESTER, ME 04260
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com
555 CONGRESS STREET SUITE 201 PORTLAND, ME 04102

STATE OF MAINE JEFFREY D. AMOS 10167 LICENSED PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE DETAILS - 3

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-6.3

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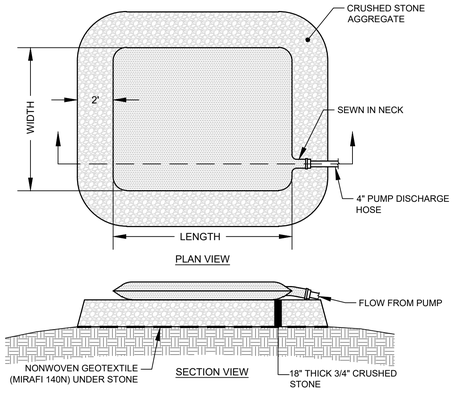
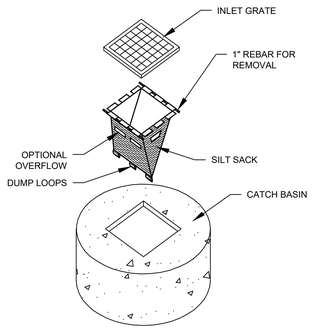


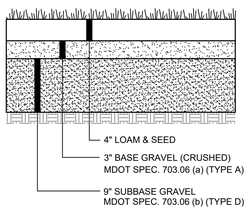
NOTES:
1. DIRTBAG BY ACF ENVIRONMENTAL
2. SEAMS MUST BE HIGH STRENGTH DOUBLE STITCHED "J" SEAMS.
3. CONSTRUCTION DEWATERING OF TURBID WATER SHALL BE PUMPED THROUGH A DIRTBAG AND RELEASED THROUGH A VEGETATED BUFFER AT LEAST 50' UPSTREAM OF WETLAND AREAS.
4. THE LOCATION OF THE DIRTBAG SHALL BE DETERMINED BY THE CONTRACTOR, BUT SHALL IT SHALL NOT BE SITED IN CRITICAL AREAS, SUCH AS WETLANDS.

DIRTBAG DETAIL
NOT TO SCALE

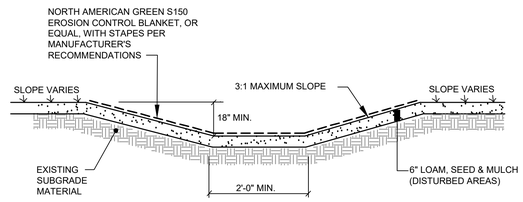


NOTES:
1. SILT SACKS TO BE INSTALLED IN ALL CATCH BASINS RECEIVING RUNOFF FROM DISTURBED AREA
2. SILT SACK TO BE MAINTAINED UNTIL TRIBUTARY ARE IS FULLY STABILIZED

SILT SACK DETAIL
NOT TO SCALE

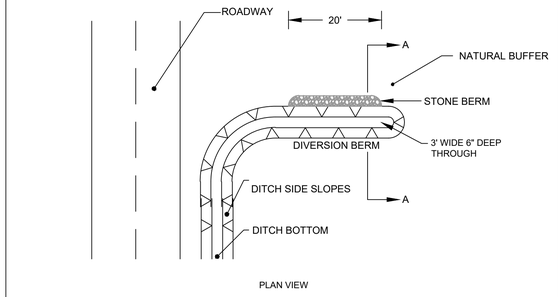


TYPICAL STORMWATER CONTROL AREA ACCESS CROSS-SECTION
NOT TO SCALE

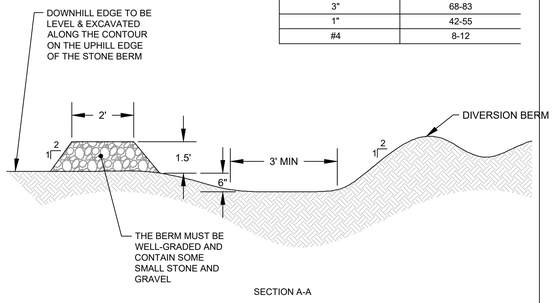


NOTE: REFER TO GRADING PLAN FOR DITCH WIDTH AND SIDE SLOPES

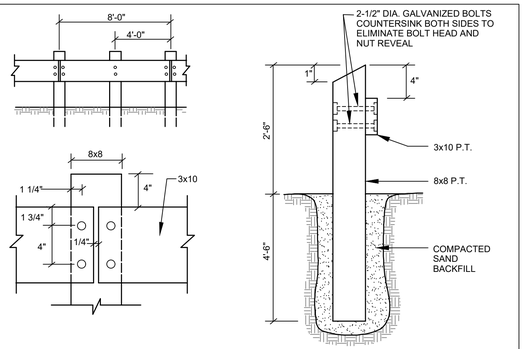
GRASSED SWALE
NOT TO SCALE



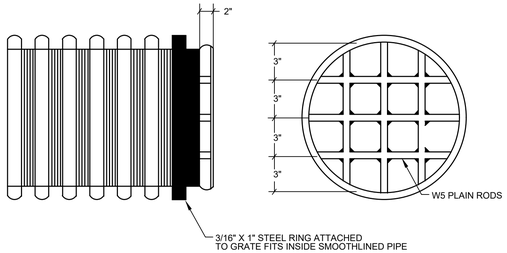
BERM STONE SIZE	
SIEVE DESIGNATION	% BY WEIGHT PASSING SQUARE MESH SIEVES
12"	100
6"	84-100
3"	68-83
1"	42-55
#4	8-12



TYPICAL LEVEL LIP SPREADER
NOT TO SCALE

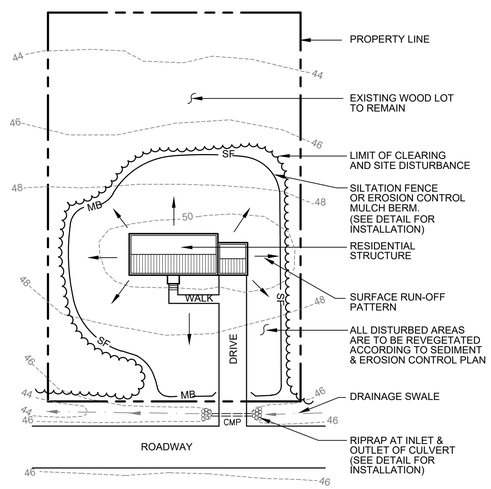


PRESSURE TREATED WOODEN GUARDRAIL
NOT TO SCALE



NOTES:
1. RODS CONFORM TO SECTION 709.1
2. GRATE TO HAVE ONE SHOP COAT OF ALUMINUM PAINT.
3. 3/8" GRADE 304 STAINLESS STEEL BOLT AND NUT (4 EA.)

INLET GRATE DETAIL
NOT TO SCALE



Inspection Notes for Lot Grading and Driveway location
Inspections by a professional engineer shall consist of a visit to the site prior to construction to consult with the earthwork contractor and a post construction meeting to confirm grading on lots and for all driveways to ensure runoff is directed according to plans and to oversee the re-stabilization of the lot into a vegetated cover.

TYPICAL EROSION CONTROL MEASURES FOR DWELLING UNITS
NOT TO SCALE

CONSTRUCTION NOTES

1. ALL WORK SHALL CONFORM TO THE APPLICABLE CODES AND ORDINANCES.

2. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIM OR HERSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIM OR HERSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.

3. CONTRACTOR SHALL NOTIFY ENGINEER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND IN THE FIELD.

4. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND OWNER'S REQUIREMENTS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

5. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.

6. CONTRACTOR SHALL CLEAN AND REMOVE DEBRIS AND SEDIMENT DEPOSITED ON PUBLIC STREETS, SIDEWALKS, ADJACENT AREAS, OR OTHER PUBLIC WAYS DUE TO CONSTRUCTION.

7. CONTRACTOR SHALL INCORPORATE PROVISIONS AS NECESSARY IN CONSTRUCTION TO PROTECT EXISTING STRUCTURES, PHYSICAL FEATURES, AND MAINTAIN SITE STABILITY DURING CONSTRUCTION. CONTRACTOR SHALL RESTORE ALL AREAS TO ORIGINAL CONDITION AND AS DIRECTED BY DESIGN DRAWINGS.

8. SITE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.

9. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH "MAINE EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES" PUBLISHED BY THE CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, MARCH 2016 OR LATEST EDITION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO POSSESS A COPY OF THE EROSION CONTROL PLAN AT ALL TIMES.

10. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY INFORMATION PROVIDED BY UTILITY COMPANIES. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT DIG SAFE (1-888-DIGSAFE) AT LEAST THREE (3) BUT NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.

11. CONTRACTOR SHALL BE AWARE THAT DIG SAFE ONLY NOTIFIES ITS "MEMBER" UTILITIES ABOUT THE DIG. WHEN NOTIFIED, DIG SAFE WILL ADVISE CONTRACTOR OF MEMBER UTILITIES IN THE AREA. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND CONTACTING NON-MEMBER UTILITIES DIRECTLY. NON-MEMBER UTILITIES MAY INCLUDE TOWN OR CITY WATER AND SEWER DISTRICTS AND SMALL LOCAL UTILITIES, AS WELL AS USG PUBLIC WORKS SYSTEMS.

12. CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE REQUIREMENTS OF 23 MRSA 3360-A. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE APPROPRIATE UTILITIES TO OBTAIN AUTHORIZATION PRIOR TO RELOCATION OF ANY EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS. IF A UTILITY CONFLICT ARISES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER, THE MUNICIPALITY AND APPROPRIATE UTILITY COMPANY PRIOR TO PROCEEDING WITH ANY RELOCATION.

13. ALL PAVEMENT MARKINGS AND DIRECTIONAL SIGNAGE SHOWN ON THE PLAN SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS.

14. ALL PAVEMENT JOINTS SHALL BE SAWCUT PRIOR TO PAVING TO PROVIDE A DURABLE AND UNIFORM JOINT.

15. NO HOLES, TRENCHES OR STRUCTURES SHALL BE LEFT OPEN OVERNIGHT IN ANY EXCAVATION ACCESSIBLE TO THE PUBLIC OR IN PUBLIC RIGHTS-OF-WAY.

16. ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL REQUIRE A M.D.O.T. PERMIT AS WELL AS PERMITS FROM THE TOWN AS APPLICABLE.

17. THE PROPOSED LIMITS OF CLEARING SHOWN HEREON ARE APPROXIMATE BASED UPON THE PROPOSED LIMITS OF SITE GRADING. THE APPLICANT RESERVES THE RIGHT TO PERFORM NORMAL FOREST MANAGEMENT ACTIVITIES OUTSIDE OF THE CLEARING LIMIT AS SHOWN. TREE REMOVAL OUTSIDE OF THE LIMITS OF CLEARING MAY BE NECESSARY TO REMOVE DEAD OR DYING TREES OR TREE LIMBS. THIS REMOVAL IS DUE TO POTENTIAL SAFETY HAZARDS AND TO PROMOTE PROPER FOREST GROWTH.

18. IMMEDIATELY UPON COMPLETION OF CUTS/FILLS, THE CONTRACTOR SHALL STABILIZE DISTURBED AREAS IN ACCORDANCE WITH EROSION CONTROL NOTES AND AS SPECIFIED ON PLANS.

19. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR THE REMOVAL, REPLACEMENT AND RECTIFICATION OF ALL DAMAGED AND DEFECTIVE MATERIAL AND WORKMANSHIP IN CONNECTION WITH THE CONTRACT WORK. THE CONTRACTOR SHALL REPLACE OR REPAIR AS DIRECTED BY THE OWNER ALL SUCH DAMAGED OR DEFECTIVE MATERIALS WHICH APPEAR WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.

20. ALL WORK PERFORMED BY THE GENERAL CONTRACTOR AND/OR TRADE SUBCONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF LOCAL, STATE OR FEDERAL LAWS, AS WELL AS ANY OTHER GOVERNING REQUIREMENTS, WHETHER OR NOT SPECIFIED ON THE DRAWINGS.

21. WHERE THE TERMS "APPROVED EQUAL", "OTHER APPROVED", "EQUAL TO", "ACCEPTABLE" OR OTHER GENERAL QUALIFYING TERMS ARE USED IN THESE NOTES, IT SHALL BE UNDERSTOOD THAT REFERENCE IS MADE TO THE RULING AND JUDGMENT OF TERRADYN CONSULTANTS, LLC.

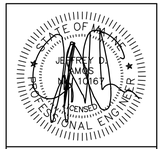
22. THE GENERAL CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FOR THE WORK UNTIL TURNED OVER TO THE OWNER.

23. THE GENERAL CONTRACTOR SHALL MAINTAIN A CURRENT AND COMPLETE SET OF CONSTRUCTION DRAWINGS ON SITE DURING ALL PHASES OF CONSTRUCTION FOR USE OF ALL TRADES.

24. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY CHANGES AND DEVIATION OF APPROVED PLANS NOT AUTHORIZED BY THE ARCHITECT/ENGINEER AND/OR CLIENT/OWNER.

25. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. ANY MODIFICATION TO SUIT FIELD DIMENSION AND CONDITION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ANY WORK.

26. BEFORE THE FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT AND MATERIALS, REPAIR OR REPLACE PRIVATE OR PUBLIC PROPERTY WHICH MAY HAVE BEEN DAMAGED OR DESTROYED DURING CONSTRUCTION, CLEAN THE AREAS WITHIN AND ADJACENT TO THE PROJECT WHICH HAVE BEEN OBSTRUCTED BY HIS/HER OPERATIONS, AND LEAVE THE PROJECT AREA NEAT AND PRESENTABLE.



DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

41 CAMPUS DRIVE
SUITE 201
NEW GLOUCESTER, ME 04260

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

TERRADYN CONSULTANTS, LLC
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE DETAILS - 4

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-6.4

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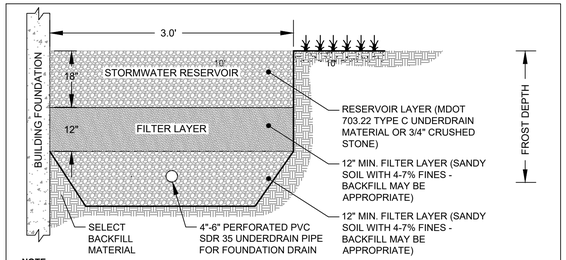
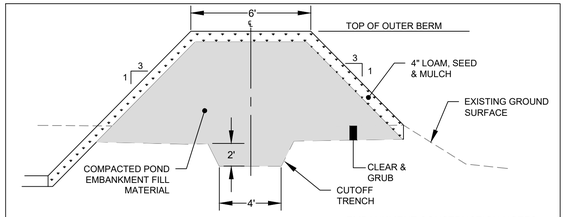


NOTE:
FILTER BED TO BE INSTALLED WITH A LOW POINT THAT ALLOWS OVERFLOW RUNOFF TO LEAVE FILTER BED VIA SHEET FLOW. LOWEST TOP ELEVATION TO BE HELD CONSTANT FOR AT LEAST 5' SO IT MAY FUNCTION SIMILARLY TO A LEVEL SPREADER.

CONSTRUCTION INSPECTION NOTES:
INSPECTIONS BY A PROFESSIONAL ENGINEER SHALL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT EACH THE ROOF DRIP EDGE FILTER'S UNDERDRAIN CONSTRUCTION, FILTER MATERIAL PLACEMENT, AND OVERFLOW FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE FILTER.

ROOF DRIPLINE FILTER BED

NOT TO SCALE

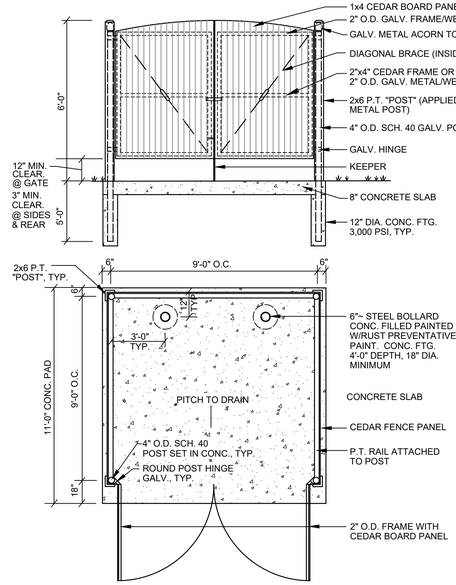


EMBANKMENT FILL MATERIAL:
FILL MUST BE FREE OF FROZEN SOIL, ROCKS OVER SIX INCHES, AND SOD, BRUSH, STUMPS, TREE ROOTS, WOOD, OR OTHER PERISHABLE MATERIALS. EMBANKMENT FILLS LESS THAN 10 FEET IN FILL HEIGHT MUST BE COMPACTED USING COMPACTION METHODS THAT WOULD GUARANTEE A FILL DENSITY OF 90% OF THE MAXIMUM DENSITY AS DETERMINED BY STANDARD PROCTOR (ASTM-698). ALL EMBANKMENT FILLS MORE THAN 10 FEET IN FILL HEIGHT MUST BE COMPACTED TO 90% OF THE MAXIMUM DENSITY AND MUST HAVE THEIR DENSITY VERIFIED BY FIELD DENSITY TESTING.

EMBANKMENT CONSTRUCTION NOTES:
1. CONTRACTOR SHALL REMOVE ALL TOPSOIL AND ORGANIC MATERIAL FROM EMBANKMENT AND POND CONSTRUCTION AREA.
2. SCARIFY SUBGRADE TO ESTABLISH INTERFACE FOR ALL FILLS.
3. COMPACT IN 12" LIFTS TO 92% OF MAXIMUM DRY DENSITY.
4. INSTALL RIPRAP AND EROSION CONTROL MESH WHERE SPECIFIED.
5. LOAM, SEED & STABILIZE IN ACCORDANCE WITH SEDIMENTATION AND EROSION CONTROL PLAN & NOTES.

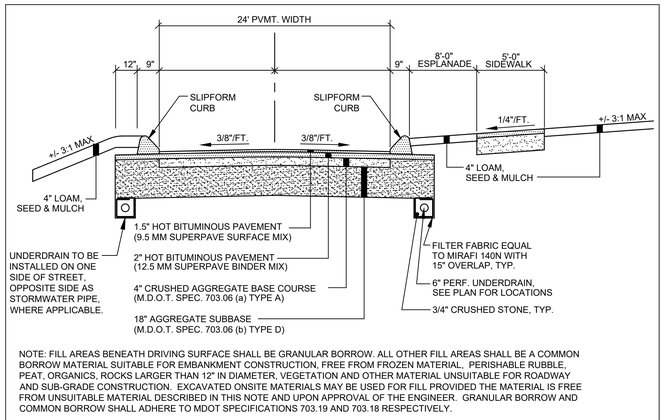
POND EMBANKMENT DETAIL

NOT TO SCALE



TYPICAL DUMPSTER ENCLOSURE

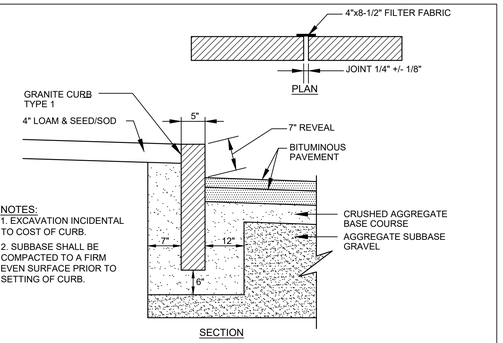
NOT TO SCALE



NOTE: FILL AREAS BENEATH DRIVING SURFACE SHALL BE GRANULAR BORROW. ALL OTHER FILL AREAS SHALL BE A COMMON BORROW MATERIAL SUITABLE FOR EMBANKMENT CONSTRUCTION, FREE FROM FROZEN MATERIAL, PERISHABLE RUBBLE, PEAT, ORGANICS, ROCKS LARGER THAN 12" IN DIAMETER, VEGETATION AND OTHER MATERIAL UNSUITABLE FOR ROADWAY AND SUB-GRADE CONSTRUCTION. EXCAVATED ONSITE MATERIALS MAY BE USED FOR FILL PROVIDED THE MATERIAL IS FREE FROM UNSUITABLE MATERIAL DESCRIBED IN THIS NOTE AND UPON APPROVAL OF THE ENGINEER. GRANULAR BORROW AND COMMON BORROW SHALL ADHERE TO MDOT SPECIFICATIONS 703.19 AND 703.18 RESPECTIVELY.

TYPICAL MINOR LOCAL STREET SECTION

NOT TO SCALE



NOTES:
1. EXCAVATION INCIDENTAL TO COST OF CURB.
2. SUBBASE SHALL BE COMPACTED TO A FIRM EVEN SURFACE PRIOR TO SETTING OF CURB.

VERTICAL GRANITE CURB

NOT TO SCALE

CONSTRUCTION INSPECTION NOTES:

1. THE DESIGN ENGINEER SHALL INSPECT THE CONSTRUCTION AND STABILIZATION OF THE GRAVEL WETLAND. INSPECTIONS SHALL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT THE CONSTRUCTION (FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE POND) OF THE POND'S EMBANKMENT, STORMWATER INLET, GRAVEL AND FILTER MATERIAL MAKEUP AND PLACEMENT, OUTLET CONTROL STRUCTURE, LINER INSTALLATION, AND EMERGENCY SPILLWAY. IF NECESSARY, THE INSPECTING ENGINEER SHALL INTERPRET THE POND'S CONSTRUCTION PLAN FOR THE CONTRACTOR. ONCE THE POND IS CONSTRUCTED AND STABILIZED, THE INSPECTING ENGINEER WILL NOTIFY THE CITY WITHIN 14 DAYS TO STATE THE POND HAS BEEN COMPLETED. ACCOMPANYING THE ENGINEER'S NOTIFICATION SHALL BE A LOG OF THE ENGINEER'S INSPECTIONS GIVING THE DATE OF EACH INSPECTION, THE TIME OF EACH INSPECTION, AND THE ITEMS INSPECTED ON EACH VISIT, AND INCLUDE ANY TESTING DATA OR SIEVE ANALYSIS DATA OF THE MATERIALS USED. AN INSPECTION OF THE UNDERDRAINED GRAVEL OUTLET SHALL ALSO BE PERFORMED BY A PROFESSIONAL ENGINEER ONE YEAR AFTER THE FINAL STABILIZATION OF THE POND. THE ENGINEER SHALL NOTIFY THE CITY AS TO THE OUTLET'S EFFECTIVENESS AND DETERMINE ANY MAINTENANCE ITEMS THAT ARE NEEDED.

2. THE APPLICANT SHALL BE REQUIRED TO PERFORM ROUTINE INSPECTION AND MAINTENANCE OF THE STORMWATER FACILITIES AS OUTLINED IN THE OPERATIONS AND MAINTENANCE MANUAL DEVELOPMENT SPECIFICALLY FOR THE SITE. A COPY OF THE ANNUAL INSPECTION AND MAINTENANCE REPORT INCLUDING INSPECTION LOG(S) SHALL BE SUBMITTED ANNUALLY (BY JULY 15TH OF EACH YEAR) TO THE CITY PUBLIC WORKS DEPARTMENT.

GRAVEL WETLAND INSTALLATION NOTES:

1. THE MINIMUM SPACING BETWEEN THE SUBSURFACE PERFORATED DISTRIBUTION LINE AND THE SUBSURFACE PERFORATED COLLECTION DRAIN AT EITHER END OF THE GRAVEL IN EACH TREATMENT CELL IS 15 FT.

2. THERE SHOULD BE A MINIMUM HORIZONTAL TRAVEL DISTANCE OF 15 FT WITHIN THE GRAVEL LAYER IN EACH CELL.

3. VERTICAL PERFORATED OR SLOTTED RISER PIPES DELIVER WATER FROM THE SURFACE DOWN TO THE SUBSURFACE, PERFORATED OR SLOTTED DISTRIBUTION LINES. THESE RISERS SHALL HAVE A MAXIMUM SPACING OF 10 FEET.

4. SLOTTED VERTICAL RISERS SHALL HAVE A MINIMUM DIAMETER OF 12" FOR THE CENTRAL RISER AND 6" FOR END RISERS. THE VERTICAL RISERS SHALL NOT BE CAPPED, BUT RATHER COVERED WITH AN INLET GRATE.

5. VERTICAL CLEANOUTS CONNECTED TO THE DISTRIBUTION AND COLLECTION SUBDRAINS, AT EACH END, SHALL BE PERFORATED OR SLOTTED ONLY WITHIN THE GRAVEL LAYER, AND SOLID WITHIN THE WETLAND SOIL AND STORAGE AREA ABOVE.

6. TREATMENT CELL FLOOR TO BE GRADED FLAT.

7. BERMS AND WEIRS SEPARATING THE FOREBAY AND TREATMENT CELLS SHOULD BE CONSTRUCTED WITH CLAY, OR NON-CONDUCTIVE SOILS, AND/OR A FINE GEOTEXTILE, OR SOME COMBINATION THEREOF, TO AVOID WATER SEEPAGE AND SOIL PIPING THROUGH THESE EARTHEN DIVIDERS.

8. THE SYSTEM SHOULD BE PLANTED TO ACHIEVE A RIGOROUS ROOT MAT WITH GRASSES, FORBS, AND SHRUBS WITH OBLIGATE AND FACULTATIVE WETLAND SPECIES.

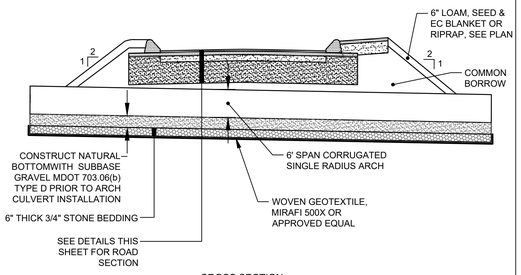
9. THE SUBAREA DRAINING TO A CREATED WETLAND MUST BE COMPLETELY STABLE BEFORE RUNOFF IS DIRECTED TO THE BASIN TO PREVENT SEDIMENTATION OF THE DRAINAGE LAYER; OR ALL RUNOFF SHOULD BE RE-DIRECTED UNTIL CONSTRUCTION IS FINALIZED. THE VEGETATION WITHIN THE STRUCTURE IS EQUALLY IMPORTANT AND MUST BE WELL ESTABLISHED BEFORE IT CAN ACCEPT ANY RUNOFF.

10. GRAVEL WETLAND STORMWATER AREA TO BE SEEDED WITH "NEW ENGLAND WETMIX" AS DISTRIBUTED BY NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, PHONE 413-548-8000, EMAIL INFO@NEWP.COM, OR APPROVED EQUIVALENT. APPLY AT A RATE OF 1 LB/2,500 SF.

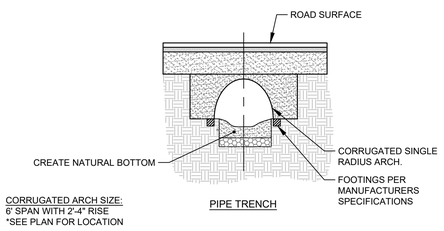
11. THE SEEDS WILL NOT GERMINATE UNDER INUNDATED CONDITIONS. IF PLANTED DURING THE FALL MONTHS THE SEED MIX WILL GERMINATE THE FOLLOWING SPRING. DURING THE FIRST SEASON OF GROWTH SEVERAL SPECIES WILL PRODUCE SEEDS WHILE OTHER SPECIES WILL PRODUCE SEEDS AFTER THE SECOND GROWING SEASON. NOT ALL SPECIES WILL GROW IN ALL WETLAND SITUATIONS. THIS MIX IS COMPRISED OF THE WETLAND SPECIES MOST LIKELY TO GROW IN CREATED/RESTORED WETLANDS AND SHOULD PRODUCE MORE THAN 75% GROUND COVER IN TWO FULL GROWING SEASONS.

12. THE WETLAND SEEDS IN THIS MIX CAN BE SOWN BY HAND, WITH A HAND-HELD SPREADER, OR HYDRO-SEEDED ON LARGE OR HARD TO REACH SITES. LIGHTLY RAKE TO ENSURE GOOD SEED-TO-SOIL CONTACT. SEEDING CAN TAKE PLACE ON FROZEN SOIL, AS THE FREEZING AND THAWING WEATHER OF LATE FALL AND LATE WINTER WILL WORK THE SEED INTO THE SOIL. IF SPRING CONDITIONS ARE DRIER THAN USUAL, WATERING MAY BE REQUIRED. IF SOWING DURING THE SUMMER MONTHS, SUPPLEMENTAL WATERING WILL LIKELY BE REQUIRED UNTIL GERMINATION. A LIGHT MULCH OF CLEAN, WEED FREE STRAW IS RECOMMENDED.

13. THE POND CONSTRUCTION SHOULD BE ONLY CONSTRUCTED UNDER THE SUPERVISION OF THE DESIGN ENGINEER.



CROSS SECTION



CORRUGATED ARCH SIZE:
6' SPAN WITH 2'-4" RISE
*SEE PLAN FOR LOCATION

PIPE TRENCH

NOTES:
1. SEE TYPICAL TRENCH DETAIL FOR BACKFILL REQUIREMENTS

STREAM CROSSING DETAIL

NOT TO SCALE

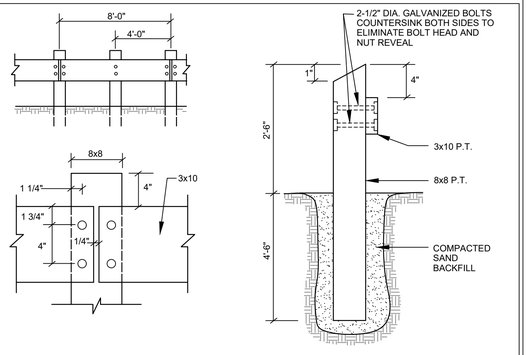
ORGANIC WETLAND SOIL MIXTURE:

1. THE WETLAND SOIL SHOULD HAVE A LOW HYDRAULIC CONDUCTIVITY (0.1-0.01 FT/DAY). THIS SOIL CAN BE MANUFACTURED USING COMPOST, SAND AND FINE SOILS, INTO A BLEND WITH MORE THAN 15% ORGANIC MATTER. IT SHOULD CONTAIN MORE THAN 15% SILT (PASSING THE #200 SIEVE); BUT WITH A CLAY SIZE PORTION THAT IS LESS THAN 2%. DO NOT USE GEOTEXTILES BETWEEN THE HORIZONTAL LAYERS OF THIS SYSTEM AS THEY WILL CLOG DUE TO FINES AND MAY RESTRICT ROOT GROWTH.

POND DEWATERING NOTES:

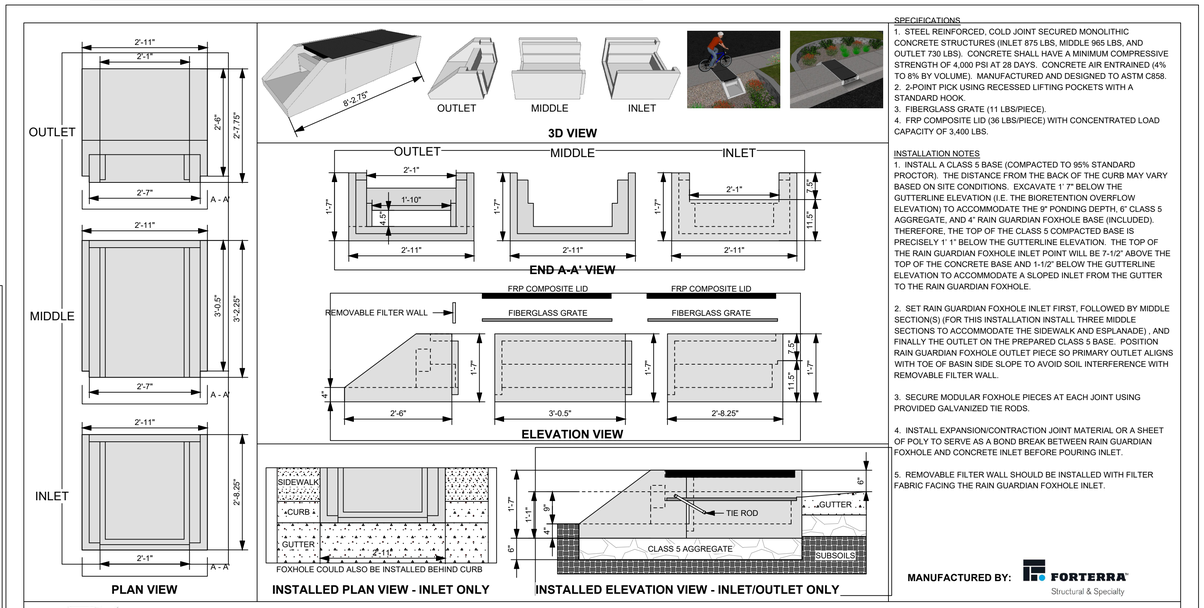
1. DEWATERING OF THE FOREBAY AND TREATMENT CELLS OF THE POND SHALL BE CONDUCTED SUCH THAT THE POND WILL NOT FILL WITH WATER UNTIL THE FOREBAY & TREATMENT CELL FLOORS ARE COMPLETED.

2. DEWATERING PROCEDURES SHALL BE CONDUCTED USING MDEP APPROVED TECHNIQUES AND SHALL INCLUDE THE USE OF A DIRT BAG SYSTEM. THE DIRT BAG SHALL BE USED ACCORDING TO MANUFACTURER INSTRUCTIONS.



PEDESTRIAN GUARDRAIL

NOT TO SCALE



SPECIFICATIONS
1. STEEL REINFORCED, COLD JOINT SECURED MONOLITHIC CONCRETE STRUCTURES (INLET 875 LBS, MIDDLE 965 LBS, AND OUTLET 730 LBS). CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS. CONCRETE AIR ENTRAINED (4% TO 8% BY VOLUME). MANUFACTURED AND DESIGNED TO ASTM C858.
2. 2-POINT PICK USING RECESSED LIFTING POCKETS WITH A STANDARD HOOK.
3. FIBERGLASS GRATE (11 LBS/PIECE).
4. FRP COMPOSITE LID (36 LBS/PIECE) WITH CONCENTRATED LOAD CAPACITY OF 3,400 LBS.

INSTALLATION NOTES
1. INSTALL A CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR). THE DISTANCE FROM THE BACK OF THE CURB MAY VARY BASED ON SITE CONDITIONS. EXCAVATE 1' 7" BELOW THE GUTTERLINE ELEVATION (I.E. THE BIORETENTION OVERFLOW ELEVATION) TO ACCOMMODATE THE 9" PONDING DEPTH, 6" CLASS 5 AGGREGATE, AND 4" RAIN GUARDIAN FOXHOLE BASE (INCLUDED). THEREFORE, THE TOP OF THE CLASS 5 COMPACTED BASE IS PRECISELY 1' 1" BELOW THE GUTTERLINE ELEVATION. THE TOP OF THE RAIN GUARDIAN FOXHOLE INLET POINT WILL BE 7-1/2" ABOVE THE TOP OF THE CONCRETE BASE AND 1-1/2" BELOW THE GUTTERLINE ELEVATION TO ACCOMMODATE A SLOPED INLET FROM THE GUTTER TO THE RAIN GUARDIAN FOXHOLE.

2. SET RAIN GUARDIAN FOXHOLE INLET FIRST, FOLLOWED BY MIDDLE SECTION(S) (FOR THIS INSTALLATION INSTALL THREE MIDDLE SECTIONS TO ACCOMMODATE THE SIDEWALK AND ESPLANADE) , AND FINALLY THE OUTLET ON THE PREPARED CLASS 5 BASE. POSITION RAIN GUARDIAN FOXHOLE OUTLET PIECE SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE TO AVOID SOIL INTERFERENCE WITH REMOVABLE FILTER WALL.

3. SECURE MODULAR FOXHOLE PIECES AT EACH JOINT USING PROVIDED GALVANIZED TIE RODS.

4. INSTALL EXPANSION/CONTRACTION JOINT MATERIAL OR A SHEET OF POLY TO SERVE AS A BOND BREAK BETWEEN RAIN GUARDIAN FOXHOLE AND CONCRETE INLET BEFORE POURING INLET.

5. REMOVABLE FILTER WALL SHOULD BE INSTALLED WITH FILTER FABRIC FACING THE RAIN GUARDIAN FOXHOLE INLET.

MANUFACTURED BY: FORTERRA Structural & Specialty

RAIN GUARDIAN
PRETREATMENT FOR BIORETENTION
Rain Gardens • Swales • Filtration Basins • Infiltration Basins

RAIN GUARDIAN FOXHOLE

NOT TO SCALE

STATE OF MAINE
JEFFREY D. AMOS
10167
LICENSED
PROFESSIONAL ENGINEER

DATE: 08-17-2022
P.E.: JEFFREY D. AMOS, PE 10167

NO.	DATE	REVISIONS	APP'D BY
B	08-17-2022	ADDITIONAL INFORMATION AND PEER REVIEW	JDA
A	04-13-2022	PRELIMINARY SUBMISSION	

TERRADYN CONSULTANTS, LLC
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting
www.terradynconsultants.com
OFFICE: (207) 926-5111 FAX: (207) 221-1317
41 CAMPUS DRIVE SUITE 101 NEW GLOUCESTER, ME 04260
565 CONGRESS STREET SUITE 201 PORTLAND, ME 04102

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
HIDDEN HILLS HOUSING PARK
SOUTH STREET, BIDDEFORD, MAINE

SHEET TITLE:
SITE DETAILS - 5

CLIENT:
SOUTH STREET VILLAGE, LLC
762 MAIN STREET
SOUTH PORTLAND, MAINE 04106

DATE:	02-09-2022
SCALE:	1" = 40'
DESIGNED:	JDA
JOB NO:	21-13
SHEET	C-6.5

C:\OD\Terradyn Consultants\Project Folders - Documents\2021 Jobs\21-13 South Street MHP\CAD\Permitting\21-13 D.dwg

To the Attention of:

Chairman Southwick and all Members of the Biddeford Planning Board; President Belanger and all Members of Biddeford City Council; Gregory Mitchell, Hannah Bonine, City Planners; City Manager James A. Bennett; Brad Favreau, Economic Development Coordinator; Nan Whitten, Administrative Assistant

From: The Undersigned Concerned Community Members
RE: Proposed Hidden Hills Development, South Street, Biddeford, ME

We the residents of the South Street area submit this letter of concern to the administrators of the City of Biddeford.

The Saco River is our primary source of drinking water and the source of fresh water to our coastal estuary. We are concerned about the impact of dense human water and waste production on the aquifer and the increase in vehicular and pedestrian traffic in this area of the city. The developers of the proposed Hidden Hills Development on South Street in Biddeford have not made clear the issues of land ownership, maintenance, and long-term commitment to this property.

We are in favor of a site law review. The developers also acknowledged the need for this review at the last Planning Board meeting.

Additionally, we request that the city address the following points:

1. The former Clair parcel proposed for development on South Street has a long history of arable land use, and according to current NRCS mapping surveys consists of soil strata that lead any precipitation or runoff directly to the aquifer and to the Saco River. Improper management of the proposed development may result in loss of open spaces and preclude future uses for this rural land.

2. The density of the subdivision and the types of septic plans proposed make toxic runoff flowing into the aquifer a distinct possibility. The developers have not made clear who would be responsible for the maintenance of these multiple family septic systems. Proper care is essential, and we know that all man-made systems can fail. Unless the developers can be held financially liable for the cleanup of pollution in the event of a leak, this responsibility would fall to the city and citizens of Biddeford.

3. The developers have already clear-cut the land without the required permits from the Forestry department. This demonstrates a lack of commitment on the part of the developers to follow regulations for future permitting requirements. These regulations must be enforced.

4. The developer has not provided clear answers on future development beyond Hidden Hills. Their most recent proposal to the city Planning Board omits information about plans for the adjacent acreage.

5. The city is evaluating traffic congestion in the downtown area, as evidenced by a recent study commissioned in partnership with the Maine Department of Transportation and the Maine Turnpike Authority. There are approximately 1000 new housing units proposed across Biddeford including Thatcher Brook, the Mill units, and Hidden Hills. If these projects are completed, the influx of vehicles will increase demand on the city's existing infrastructure, and may further burden taxpayers with the cost of road maintenance and expansion.

6. On June 22nd, the Maine Turnpike Authority will present to the Biddeford City Council their proposal for a new turnpike interchange and South Street connector. South Street would serve as the main thoroughfare for the proposed development, which if completed will put additional strain on an already stressed section of two-lane road without sidewalks or other pedestrian safety measures.

7. Given the infrastructure requirements of the proposed developments across the city, taxpayers deserve transparency regarding the tax revenue share proportions with the state, and the impact on the mill rate.

The addressal of these concerns, and the results of the site law review, must be shared with the people of Biddeford in a public forum.

We appreciate the efforts of the Planning Board to proceed carefully with the permitting process on Hidden Hills to ensure the best possible development is considered. We believe the current density and the systems proposed do not serve the rural nature of this part of the City. Less capacity in a more clustered architectural plan could better serve housing needs and preserve the abutting natural resources.

Thank you for your attention to our concerns.

Linda S. Brown 420 South St.
Linda S. Brown brown.linda14@gmail.com

additional signatures attached:

To Biddeford Planning Board RE: South Street "Hidden Hills"

Name	Address	Email
* NICHOLAS DARGIE	26 OLD HOLLIS RD	NICHOLAS.DARGIE@GMAIL.COM
* Peter York	18 Old Hollis Rd	Peteryork25@icloud.com
Bob McDowell	14 Old Hollis Rd.	bobmcdowell@email.com *
Nick Baldwin	12 Old Hollis Rd	nickbaldwin2@yahoo.com *
Stephen Gray	6 OLD Hollis Rd	skiffman39@yahoo.com
[illegible]	383 So 5th St,	
Mark Hazen	398 So Str.	markEHazen@GMail.com
Michael P. Bald	14 Hayfield Rd.	mbald@maine.rr.com
Ginette Bourgault	14 Hayfield Rd	lanny.ginette@yahoo.com
Elaine Gosselin	5 Hayfield Rd	e_gosselin@hotmail.com
Richard J. Olson	6 Hayfield Rd	rickolson2015@gmail.com
Anna Marie Olson	6 Hayfield Rd	AnnOlson96@GMAIL.COM
* Marcia V. Lord	1 Hayfield Rd	mvlord@aol.com
JIM WHEATER	1 Hayfield Rd	JRWHEATER@AOL.COM
LOUIS DITOMASSO	424 SOUTH ST	lditomasso34@yahoo.com
JULIANNA DITOMASSO	424 South St.	juliannaditomasso@gmail.com
Max Davis	416 South St.	williammaxdavis@gmail.com
Shiloh Parker	416 South St.	shiloh.e.parker@gmail.co
Anthony M. Chicco	3 Fox Hollow Dr.	RMchicco76@gmail.com
Christine Aldrich	2 Fox Hollow Dr.	queenx-tinc@hotmail.com

To Biddeford Planning Board RE: South Street "Hidden Hills"

Name	Address	Email
Barbara Hague	1 Fox Hollow Dr.	Biddeford 04005
[illegible]	475 south st	Alexlawrencewhite@gmail.com
[illegible]	475 south st	camille.k.white@gmail.com
Karen M. Soulière	20 Hayfield Rd	karen-souliere@idexx.com
Wayne D. Soulière	20 HAYFIELD Rd	wsouliere@icloud.com
Wendy Phillips	2 Glenview Dr. / 11 Fox Hollow Dr.	wjphillips93@gmail.com
Roger P Dacheux	436 south st	bberger@maine.rr.com
Rita Parsons	1 Merrill Dr	rcparsons@maine.rr.com
Claudette Levesque	5 Old Hollis Rd	cmel74540@gmail.com
Lorraine Dugas	339 ELM ST	—
[illegible]	2 Glenview Dr	
[illegible]	400 South St.	joel reverse@hotmail.com

Matthew Chamberlain

Tue, Jul 12, 5:48 AM (2 days ago). to me

Yes I'm one of the developers

Matthew

Matthew Chamberlain

Jul 12, 2022, 5:48 AM (2 days ago)

to me

I'm willing and happy to meet you and say 4-6 more people and you can pick the location. **I'm not a fan of zoom as I like to see and look at** [Color, bold type added by L.B.] face to face whom ever is talking with me.

Look for to hearing back from you.

Matthew

LINDA BROWN

6:38 AM (2 minutes ago)

to Matthew

Hello Matthew . I will not be available for the next 2 weeks nor am I abke [able] to meet people in person because of the health issues of my husband. If you are willing to meet on Zoom I will make an effort to present you with some times that other concerned residents can also commit to in August. I do have a Zoom account that allows for group meetings so can offer that to help facilitate. Thank you.

Linda S. Brown
Licensed Clinical Social Worker
420 South Street
Biddeford, ME 04005
Phone (207) 841-9069
207-494-7747 [FAX]

July 12, 2022

Members of the Planning Board
Biddeford, ME

Copy to the group of concerned citizens that initiated the June 3, 2022 letter

Dear Chairperson and Members of the Biddeford Planning Board:

I submitted a letter of concern Re: Hidden Hills from many concerned citizens to the East and West of the proposed Hidden Hills Development several weeks ago. I have heard nothing in response from the Planning Board BUT I did receive this via email from the developer yesterday:

Linda, would you be open to meeting me to discuss your concerns you sent to the city?

450-7653

Matthew Chamberlain

I understand the developers have the right to receive any public comments and concerns but it strikes me as highly inappropriate for this gentleman who does not identify himself properly to contact me, an individual, when all the questions and concerns should properly be met by him in person at public hearings.

I initially thought he had a position with the City, but then my memory took me back to him attending as developer the first meeting re: South Street LLC I attended a few years ago. I withdrew my initial response to meet with him alone and informed him he could address any comments he wants to make to me at the next Board meeting that convenes to discuss this.

Meanwhile, I am very curious if the City has followed through and requested a Site Law Review for this proposed development, and if not, why not? It meets ALL the criteria for initiating that review. It feels like we are being led through motions of "being heard' [I work with addicts and have a good idea when smoke is being blown in my direction!!!] but not responded to.

Many meetings ago the developers agreed to allow the Biddeford Conservation Commission the opportunity of doing a site walk. Has this been done? If not, why not?

We would greatly appreciate information and notification regarding the Board's decision making process.

On behalf of the "South Street Neighbor's" group,

Linda S. Brown

Whitten, Nan

From: LINDA BROWN <brown.linda14@gmail.com>
Sent: Thursday, July 14, 2022 6:54 AM
To: Whitten, Nan
Cc: Grooms, Matthew
Subject: Hidden Hills, concerned residents
Attachments: 7.14.22 Emails w M C Hidden Hills.pages

Hi Nan, I am attaching a part of an email thread between me and Mr. Chamberlain. My past contact with him in 2019 was adversarial and I am in no way willing to meet with him alone and in person. Also, I do avoid in-person gatherings due to Covid and as evidence, closed my own office in 2020 and work strictly via telehealth now. I offer the emails to you as evidence that I am working to meet with him, but am not willing to limit it to "4-6" people if more wish to participate. Please disseminate as you see appropriate. Thanks so much, Linda

--

Whitten, Nan

From: LINDA BROWN <brown.linda14@gmail.com>
Sent: Friday, August 12, 2022 11:57 AM
To: Whitten, Nan
Subject: South Street Development

Hi Nan, just an update if you would be so kind to let the members of the planning board know:
I have been trying to coordinate a Zoom meeting between Matthew Chamberlain, about 4 other residents of the area and myself without success. I am not sure where the Hidden Hills Development application is at this point, but I feel I have made a good faith effort to do as much as I can and I do not have the time to devote to this now. I think our thoughts and concerns were made clear to the board and hope they will take those into consideration as they ponder approval. I think we have a sense that our concerns don't carry much weight in the decision process. I did not hear back from the developer from my last email.
Thanks and apologies for the disjointed message. Linda Brown
--

Whitten, Nan

From: Whitten, Nan
Sent: Tuesday, July 12, 2022 10:54 AM
To: 'LINDA BROWN'
Subject: RE: letter to Biddeford City Planning Board

Hi Linda:

I completely get what you are saying and do not blame you at all especially in this day and age.

Legally, the Planning Board Members can only address you at the Board meetings. They can't reach out and talk to you one on one about a project as that would be considered ex-parte so that is why they never got back to you.

Thank you for clarifying. It looks like it's nice out. I hope you enjoy this beautiful day.

Nan.

From: LINDA BROWN <brown.linda14@gmail.com>
Sent: Tuesday, July 12, 2022 10:42 AM
To: Whitten, Nan <Nan.Whitten@Biddefordmaine.org>
Subject: Re: letter to Biddeford City Planning Board

Hi Nan,
As I tried to make clear in the most recent letter I am not surprised that the letter was shared with the developers, only that one of the developers would only contact me and not all the signers of the letter we submitted to the Board, and also, did not indicate who he was. That seems very disingenuous and inappropriate when he had every opportunity to be at meetings and hasn't shown up.
I have informed our neighborhood group by sending them a copy of the most recent exchange as I indicated on the letter you received today! Thank you again for your timely attention and responses. Linda

On Tue, Jul 12, 2022 at 9:08 AM Whitten, Nan <Nan.Whitten@biddefordmaine.org> wrote:

> ***Good Morning Linda:***
>
> ***Thank you for reaching out. I will forward your letter onto those you have addressed it to. Sorry you were surprised by Mr. Chamberlain contacting you. Everything in City Hall is public and we do send these letters of concern onto the developers so that they hopefully can be addressed.***
>
> ***Please let us know if we can be of further assistance.***
>
> ***Respectfully***
>
> ***Nan Whitten***
>
> ***Office Manager***
>
> ***City of Biddeford***
>
> ***Planning & Development***
>
> ***207-284-9115***
>
> ***NOTE: Starting the week of June 27, 2022, new City Hall business hours will be:***
>
> ***Monday & Tuesday – 7:00 a.m. to 5:00 p.m.***
>
> ***Wednesday & Thursday – 8:00 a.m. to 4:00 p.m.***
>
> ***Closed on Fridays***
>
> **From:** LINDA BROWN <brown.linda14@gmail.com>
> **Sent:** Tuesday, July 12, 2022 8:57 AM

To: Whitten, Nan <Nan.Whitten@Biddefordmaine.org>
Subject: letter to Biddeford City Planning Board

Dear Nan, I would appreciate you forwarding this letter to the planning Board and any other City Official you deem appropriate.

Thanks so much, Linda Brown

--

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--

Whitten, Nan

From: LINDA BROWN <brown.linda14@gmail.com>
Sent: Thursday, July 14, 2022 12:36 PM
To: Whitten, Nan
Subject: Re: Hidden Hills
Attachments: 7.14.22 Emails w M C Hidden Hills 2.pdf

Hin Nan, Yes, I am a direct abutter as I own property at 418 South Street and live at 420 South Street, directly across from the proposed development. I have been receiving the mailed notifications but was asking time froame for the next Planning Board meeting in order to convene a representation of the group to meet with Mr. Chamberlain. I am attaching the .pdf version of the email exchange I am having so far w. Mr. Chamberlain regarding a meeting. I too am off next week and the week after if hosting 2 different family groups is a vacation 😁🚐 then that is what I am doing!! Hope yours is relaxing and refreshing, and I'm glad the City was open to you all getting 4 day work weeks. It is much more human to have some time to have balance in life, and research shows we are actually much more productive that way! Linda

On Thu, Jul 14, 2022 at 8:08 AM Whitten, Nan <Nan.Whitten@biddefordmaine.org> wrote:

> ***Good Morning Linda:***
>
> ***Hidden Hills will not be on the August 3rd agenda. They have not applied for final approval yet. Do you know if you are within 250 feet of the planned subdivision or have you been getting our notices for when they appear? If not, I am happy to add you to the abutter list. If you wouldn't mind sending your mailing address, I will add you that way you can know when they are appearing.***
>
> ***Enjoy your day!***
>
> ***Nan.***
>
> ***Ps, we are closed tomorrow and I am on vacation next week so it may be best to send your information today so that I can add you to the list if necessary. (I may forget when I come back from vacation)***
>
> **From:** LINDA BROWN <brown.linda14@gmail.com>
> **Sent:** Thursday, July 14, 2022 7:06 AM
> **To:** Whitten, Nan <Nan.Whitten@Biddefordmaine.org>
> **Subject:** Hidden Hills
>
> Hi again Nan, I see that the next Planning Board public meeting is scheduled for August 3, 2022 but could not locate an agenda. Is Hidden Hills development scheduled for additional discussion this date? If not, could you let me know when the next time you have the proposed development scheduled for discussion? I'm concerned we will not be able to get a meeting scheduled with the developer and our group prior if it is to be discussed on 8.3.22. Thanks again, and I do appreciate your willingness to help educate me on proper procedure, your support, and your timely and friendly assistance! Linda
>
> --
>
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--

Whitten, Nan

From: mgchamberlain48@gmail.com
Sent: Monday, August 15, 2022 4:13 PM
To: Whitten, Nan; 'Richard Potvin'; Alexa Plotkin; Larry Patoine; Michael Cantara; Roch Angers; Sean Tarpey; Susan Deschambault; William Southwick
Cc: Grooms, Matthew
Subject: RE: South Street Development
Attachments: 2022_08_15_15_56_44.pdf

For the record, Linda and I emailed each other 4 times in about 1 hour on August 9th in the morning , plus many times prior, and my last email to her on that day was (How does August 15th at 7pm work?) Please see the attached email to verify. I will be happy to provide the entire email chain if anyone would like to see it. I was the one to initiate a conversation about the concerns of the neighbors and made several attempts to connect but Linda's schedule didn't allow it. I had also suggested including the new Matt and Greg to be part of it as well.

Matthew Chamberlain
DB/OWNER/BROKER
Regency Realty Group
762 Main Street
South Portland, ME 04106
CELL 207-450-7653
OFF 207-253-1500 X 202

From: Whitten, Nan <Nan.Whitten@Biddefordmaine.org>
Sent: Monday, August 15, 2022 11:57 AM
To: Matthew Chamberlain <mgchamberlain48@gmail.com>; pvose1@gmail.com; Richard Potvin <apotvin@maine.rr.com>; Alexa Plotkin <Alexa.Plotkin@biddefordmaine.org>; Larry Patoine <Larry.Patoine@biddefordmaine.org>; Michael Cantara <Michael.Cantara@biddefordmaine.org>; Roch Angers <Roch.Angers@biddefordmaine.org>; Sean Tarpey <Sean.Tarpey@biddefordmaine.org>; Susan Deschambault <Susan.Deschambault@biddefordmaine.org>; William Southwick <William.Southwick@biddefordmaine.org>
Cc: Grooms, Matthew <Matthew.Grooms@biddefordmaine.org>
Subject: FW: South Street Development
Importance: High

Good Morning:

We received this over the weekend and wanted to make sure to get it out to each of you. Please let us know if you have any questions.

Thank you
Nan.

From: LINDA BROWN <brown.linda14@gmail.com>
Sent: Friday, August 12, 2022 11:57 AM
To: Whitten, Nan <Nan.Whitten@Biddefordmaine.org>
Subject: South Street Development

Hi Nan, just an update if you would be so kind to let the members of the planning board know:
I have been trying to coordinate a Zoom meeting between Matthew Chamberlain, about 4 other residents of the area and myself without success. I am not sure where the Hidden Hills Development application is at this point, but I feel I have made a good faith effort to do as much as I can and I do not have the time to devote to this now. I think our thoughts and concerns were made clear to the board and hope they will take those into consideration as they ponder approval. I think we have a sense that our concerns don't carry much weight in the decision process. I did not hear back from the developer from my last email.
Thanks and apologies for the disjointed message. Linda Brown
--

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Under Maine law, documents - including e-mails - in the possession of public officials or city employees about government business may be classified as public records. There are very few exceptions. As a result, please be advised that what is written in an e-mail could be released to the public and/or the media if requested.

Whitten, Nan

From: Bill Southwick <southwick@maine.rr.com>
Sent: Monday, May 16, 2022 11:51 AM
To: Roch Angers; Bruce Benway; Alexa Plotkin; Sean Tarpey; Michael Cantara; Larry J. Patoine
Cc: Bonine, Hannah; Whitten, Nan
Subject: Fwd: Question from a May Street Resident - Sandie and Tony Curro

Please see the email below I just received regarding the South Street project we will be reviewing Wednesday night at our meeting.

Hannah/Nan,
Can you make sure this is included in the packet and that all appropriate parties are notified?

Thanks,
Bill

Sent from my iPhone!

Begin forwarded message:

> **From:** skibum@gwi.net
> **Date:** May 16, 2022 at 8:54:39 AM EDT
> **To:** southwick@maine.rr.com
> **Subject: Question from a May Street Resident - Sandie and Tony Curro**

Good morning Bill, my wife Sandie is friend's with your wife and obtained your e mail for me. I apologize for reaching out to you directly. Sandie and I have owned our home on May street since 1983 and as you might imagine there have been many changes. Who could have imagined that Biddeford would become "the" place to live.

Among the many changes have been a great increase in traffic volume and associated noise and safety issues. I have been communicating with Liam LaFountain about my thoughts and concerns and have met with him once; we'll meet again this Friday. I just learned from Liam that the proposed South street modular/manufactured home development will come before the planning board this Wednesday. I'm working at the York Hospital walk in clinic in Sanford until 6 PM that day so I'm not sure if I'll call in or try to get back in time to participate in the meeting. I had two thoughts I wanted to share with you in regard to this proposal.

First I have seen a traffic study provided by Liam, that study was done last summer, and that study showed an average of over 3000 vehicles per day use May street. A big number and one that is likely to grow significantly with the proposed development.

What steps is the developer, or the city, prepared to take so this development does not significantly increase the 3000 cars per day that are using May street now? Would we consider restricting the number of vehicles in this development or altering traffic patterns so the new daily commuting traffic does not using May street primarily?

I have been communicating with Carol Morris since January and have been trying to get from her an estimate by the traffic engineers as to the expected number of vehicles that would come with a south street development. Back in January I was asking when the proposed South street development was for a larger number of units. I have not yet been able to get an answer but have asked her again in the hope we might have an answer by the time of the meeting.

My second question involves how the modular/manufactured homes will get to their new location. The route 111 end of May street is posted, no vehicles above 5 tons. That posting has been there for many years and unfortunately gets ignored. About one week ago a tractor trailer shook our house as it went by, it was hauling what appeared to be a modular home segment. Five minutes later two more tractor trailers went by and were back to back - both had what appeared to be modular home sections. As a good size SUV these days is 3 tons these modular home segments are almost certainly above 5 tons. If the development on South street is approved how will we prevent a string of tractor trailers transporting modular segments down May street?

Again, thank you for considering my thoughts. I hope to see you on Wednesday.

Tony Curro

182 May St

Cell 602 9463

mgchamberlain48@gmail.com

From: Matthew Chamberlain <mgchamberlain48@gmail.com>
Sent: Tuesday, August 9, 2022 8:29 AM
To: LINDA BROWN
Subject: Re: Hidden Hills Biddeford

How does August 15 at 7 PM work?

Matthew Chamberlain
Broker/Owner/DB
Regency Realty Group
762 Main Street
South Portland, ME 04106
Office 207-253-1500
Cell 207-450-7653
Fax 207-253-1616
ME Lic # DB903090

On Aug 9, 2022, at 8:17 AM, LINDA BROWN <brown.linda14@gmail.com> wrote:

Ps. My iPad is kind of messed up so please forgive the messed up writing and it's that causing my frustration not you

On Tue, Aug 9, 2022 at 8:12 AM LINDA BROWN <brown.linda14@gmail.com> wrote:
W

On Tue, Aug 9, 2022 at 8:04 AM Matthew Chamberlain <mgchamberlain48@gmail.com> wrote:
Linda, just a thought, if you want to include Matt and Greg it should be more during business hours.

Matthew Chamberlainas we all work for a living too that won't fly.
Broker/Owner/DB
Regency Realty Group
762 Main Streetell
South Portland, ME 04106
Office 207-253-1500
Cell 207-450-7653
Fax 207-253-1616
ME Lic # DB903090

On Aug 9, 2022, at 7:42 AM, LINDA BROWN <brown.linda14@gmail.com> wrote:

Hello, I suggested a couple of days and times and so far have had a couple of affirmatives for Tuesday August 16 at 7 pm on Zoom which I can set up. Will that work for you?

Whitten, Nan

From: William Southwick
Sent: Tuesday, July 12, 2022 9:59 AM
To: Whitten, Nan; Grooms, Matthew; Mitchell, Gregory; Contact all Councilors; Alexa Plotkin; Larry Patoine; Michael Cantara; Roch Angers; Sean Tarpey; Susan Deschambault
Cc: 'LINDA BROWN'
Subject: Re: letter to Biddeford City Planning Board

A reminder to all board members that we cannot respond to these communications outside of a public meeting on the subject application. That said, perhaps the city planner can respond to the letter and explain that the board is unable to engage outside of a public meeting. Furthermore, we should encourage them to meet with the developer in an effort to have some of their concerns responded to.
Matt, please copy the board on any response you provide this person.
Thanks,
Bill

From: Whitten, Nan <Nan.Whitten@Biddefordmaine.org>
Sent: Tuesday, July 12, 2022 9:10 AM
To: Grooms, Matthew <Matthew.Grooms@biddefordmaine.org>; Mitchell, Gregory <gregory.mitchell@biddefordmaine.org>; Contact all Councilors <ContactallCouncilors@Biddefordmaine.org>; Alexa Plotkin <Alexa.Plotkin@biddefordmaine.org>; Larry Patoine <Larry.Patoine@biddefordmaine.org>; Michael Cantara <Michael.Cantara@biddefordmaine.org>; Roch Angers <Roch.Angers@biddefordmaine.org>; Sean Tarpey <Sean.Tarpey@biddefordmaine.org>; Susan Deschambault <Susan.Deschambault@biddefordmaine.org>; William Southwick <William.Southwick@biddefordmaine.org>
Cc: 'LINDA BROWN' <brown.linda14@gmail.com>
Subject: FW: letter to Biddeford City Planning Board

From: LINDA BROWN <brown.linda14@gmail.com>
Sent: Tuesday, July 12, 2022 8:57 AM
To: Whitten, Nan <Nan.Whitten@Biddefordmaine.org>
Subject: letter to Biddeford City Planning Board

Dear Nan, I would appreciate you forwarding this letter to the planning Board and any other City Official you deem appropriate.

Thanks so much, Linda Brown

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