ENGINEERING REPORT
FLOOD HAZARD AREA CONTROL ACT RULES

RARITAN LOFTS

BLOCK 116.01, LOT 11.01
BOROUGH OF RARITAN
SOMERSET COUNTY, NEW JERSEY

Prepared for:
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February 28, 2023

ENGINEERING REPORT
FLOOD HAZARD AREA CONTROL ACT RULES

RARITAN LOFTS

BLOCK 116.01, LOT 11.06
BOROUGH OF RARITAN
SOMERSET COUNTY, NEW JERSEY

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining and preparing the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

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APPENDIX

I. INTRODUCTION

A. Purpose of Report and Accompanying Documents

This report has been prepared to support an application made to the New Jersey Department of Environmental Protection's Division of Land Resource Protection (NJDEP-DLRP) seeking a Verification and an Individual Permit pursuant to the Flood Hazard Area Control Act Rules (NJAC 7:13, et. seq., hereinafter "Flood Hazard Rules") for the redevelopment of an existing retail center, currently known as the Raritan Mall, in the Borough of Raritan (Somerset County). The project site is located west of NJ Route 206, north of Orlando Drive and east of Busky Lane in the Borough of Raritan upon property identified as Block 116.01, Lot 11.01 on the Borough's Tax Maps. As detailed in Section II of this report, the majority of the subject property lies within the flood fringe of the Raritan River.

Additional information pertaining to the location of the subject property and a description of the project site are provided in Subsection I-B below, while Subsection I-C of this report describes the proposed project. In general, the project primarily entails the demolition of an existing retail building and the construction of a new multi-use building within approximately the same footprint. The new building will include both residential and retail uses, as well as a parking garage.

To our knowledge, the property does not have any prior permitting history with the Department's Land Use Division. Refer to Subsection I-B of this report for a brief overview of the property's history.

This report satisfies the requirement(s) for an "Engineering Report" as set forth at Subpart 18.7 of the Flood Hazard Rules. Specifically, the cover sheet of this report has been signed and sealed by Eric L. Keller, PE, who is the firm's principal in responsible charge of the project. In addition to Mr. Keller, questions or comments concerning this report or any other aspect of the subject application may also be addressed to James R. Woods, PE, our Chief Engineer. Jim is very familiar with the project and application documents. Furthermore, the cover page of this report also displays the name, address, and telephone number for our firm, thereby satisfying the requirements at Items Numbered 1 and 2 of Paragraph (a) of Subpart 18.7.

This report should be reviewed and considered in conjunction with the following documents, which have also been prepared by Bowman Consulting and submitted to the Department in support of the subject application:

- Environmental Report, Flood Hazard Area Control Act Rules; Raritan Lofts; Block 116.01, Lot 1.01, Borough of Raritan, Somerset County, New Jersey; dated February 28, 2023.

- Set of plans entitled "Flood Hazard Verification and Permitting Plans for Raritan Lofts; Block 116.01, Lot 11.01, Borough of Raritan, Somerset County, New Jersey," consisting of 29 drawings per set, dated February 28, 2023.

B. Location and Description of Project Site

1. Location

As indicated above, the subject project site is located west of NJ Route 206, north of Orlando Drive and east of Busky Lane in the Borough of Raritan, Somerset County. Also as noted above, the site is currently known as the Raritan Mall. **Appendix A** of this report contains a copy of a portion of a Hagstrom Road Map that includes designation of the subject property as the Raritan Mall.

Appendix A of this report also contains a map illustrating the project site's location upon a portion of the Raritan and Bound Brook USGS Quadrangle. This map also indicates the proximity of the project site to the Raritan River. The State Plane coordinates for the approximate center of the site, which are also shown on the above referenced USGS map, are as follows:

- E(x) 457,000
- N(y) 631,500

A copy of the municipal tax map sheet is also provided in **Appendix A** of this report. It should be noted that while the tax map indicates the subject

property encompasses 12.2 acres, the survey performed for the parcel determined the area to be 10.8845 acres.

2. Project Site History

According to a report prepared by Partner Engineering and Science, Inc. entitled *Phase I Environmental Site Assessment Report,* the subject property was part of the Borough's landfill between 1959 and 1979. The current shopping mall was constructed upon the property circa 1985. The buildings and paved parking lots are a component of the landfill's cap. Accordingly, the proposed redevelopment of the property is subject to the review and approval of the Licensed Site Remediation Professional (LSRP) retained by the Owner. Our office has been coordinating the proposed redevelopment design with the LSRP

3. Description of Project Site

The project site, being Lot 11.01 of Block 116.01 in the Borough of Raritan (Somerset County) encompasses approximately 10.9 acres, with approximately 850 feet of frontage along Orlando Drive to the south and 540 feet of frontage along Busky Lane to the east. The western perimeter of the property includes 150 feet of frontage along NJ Route 206, as well as nearly 350 feet of frontage along the ramp connecting Route 206 to Orlando Drive. As noted above, the site has been previously utilized for the Borough's landfill and subsequently developed as a retail center. The property has been known as the site of the Raritan Mall since the mid-1980's.

There are currently two retail buildings existing on the site. Both buildings are one-story structures. The larger of the two existing buildings, measuring approximately 104,500 square feet, is an L-shaped structure situated in the western portion of the property. The smaller of the two existing buildings, having an approximate 11,000 square foot footprint, is located in the eastern portion of the property.

The vast majority of the remainder of the project site is currently comprised of paved drives and parking spaces. There are also concrete sidewalks adjacent to portions of both buildings. Consequently,

approximately 10.25 acres (nearly 95%) of the property is currently covered by impervious surfaces.

Topographically, the property generally slopes southward towards Orlando Drive, with grades typically ranging from extremely flat (less than one percent) to flat (generally less than two percent). Overall, the 10.9 acre property has only on the order of 7 feet of topographic relief, as on-site elevations predominately vary between elevation(s) 53.0 feet and 46.0 feet.

All of the elevations given in this report, as well as all the elevations provided on the above referenced accompanying plans, are based upon the North American Vertical Datum of 1988 (NAVD 1988). The equation for conversion to the National Geodetic Vertical Datum of 1929 (NGVD 1929) at the site is as follows:

NGVD 1929 = NAVD 1988 + 0.90 FEET

C. Description of Proposed Project

The project primarily involves the demolition of the existing L-shaped 104,500 square foot retail building and the construction of a new multi-story mixed-use building in approximately the same footprint. The new mixed use building will provide 276 residential units, including qualifying affordable housing units. In addition, the new building will provide for approximately 22,000 square feet of retail space and a parking garage accommodating 184 spaces. The existing one-story retail building on the eastern portion of the property will remain.

The on-site paved access drives and parking areas will be reconstructed and regraded as required to render the project compliant with Subpar 12.6 of the Flood Hazard Rules (refer to Section III-G of this report for specific detail). Curbing and additional drainage inlets and piping will be provided in conjunction with the reconstruction of the paved areas. Further, inasmuch as a portion of the project's required parking will be accommodated within the proposed parking garage, much of the paved parking areas existing in the southeastern portion of the property will no

longer be required and will be removed and replaced with vegetated soil pursuant to the direction of the LSRP. As a result, the project will result in an estimated 2.44 acre decrease in impervious cover (reducing the site's coverage from 95% to 72%).

The project also includes the acquisition of an access easement across adjacent property to the northeast (Lots 25, 26.01, 27 & 27.01 of Block 116.01, as well as Lot 3 of Block 112) because the existing roadways adjacent to the subject property are at an elevation that does not satisfy the requirements set forth at Subpart 12.6 of the subject Rules. The access easement provides for the required "high and dry" access extending from Somerset Street, as illustrated on the accompanying plans.

Refer to Section II of the accompanying Environmental Report for additional information pertaining to the project's design objectives and requirements, including information pertaining to the project site being designated as an area in need of redevelopment pursuant to the New Jersey Local Redevelopment and Housing Law (NJSA 40:12-A).

II. ENGINEERING INFORMATION FOR VERIFICATION APPLICATION

With respect to the application for a Verification pursuant to Subchapter 5 of the Flood Hazard Rules, this section of this report provides the required technical documentation relevant to establishing the following:

- The regulated flood elevation ("flood hazard area design flood elevation") at the project site is 51.95 feet, in the vertical datum of NAVD 1988.

- The limits of the regulated flood hazard area ("floodplain") on the subject property is as depicted upon the plans submitted with this application.

- The project site is not encumbered by a regulated floodway.

- The 10-year flood elevation at the project site is at elevation 46.2 feet in the NAVD 88 vertical datum.

It should be noted that the application for verification also includes verification of the limits of the on-site regulated riparian zone. However, technical documentation pertaining to the width of the riparian zone at the subject site is provided in the accompanying Environmental Report.

A. Determination of Flood Hazard Area Design Flood Elevation

Flood elevations and floodplain limits along the Raritan River in the vicinity of the subject property have been established by both the New Jersey Department of Environmental Protection (NJDEP) and the Federal Emergency Management Agency (FEMA). As detailed below, the State's delineation in the vicinity of the property pre-dates January 24, 2013. Therefore, pursuant to the requirements stipulated at Subparagraph (c)(1) of Subpart 3.2 of the Flood Hazard Rules, the regulated flood elevation ("flood hazard area design flood elevation") at the subject property has been determined based upon consideration of the State's delineation pursuant to Method 1 and FEMA's delineation(s) pursuant to Method 3, as detailed below. As stated at Subpart 3.2(c)(1) of the Rules, when available, the delineations by both the State and FEMA must be considered, with the regulated flood elevation being the delineation yielding the highest flood hazard area design flood elevation.

1. Method 1 (State Delineation)

The State delineation for the subject reach of the Raritan River is shown on a map prepared by the firm of Anderson-Nichola & Co. dated March 1972 and revised 1-2-86, identified as Plate R-10 and further identified as follows:

STATE OF NEW JERSEY
DEPARTMENT OF CONSERVATION & ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY AND SUPPLY
DELINEATION OF FLOODWAY
AND FLOOD HAZARD AREA
RARITAN RIVER
Sta. 1364+00 TO Sta. 1532+00
HILLSBOROUGH TOWNSHIP, SOMERVILLE BORO
RARITAN BORO, BRIDGEWATER TOWNSHIP
SOMERSET COUNTY, NEW JERSEY

A (reduced size) copy of the above referenced State delineation map is provided in **Appendix B** of this report. The location of the larger of the two on-site existing buildings is shown on the State delineation map and indicates that the upstream limit of the project site is located at approximate River Station 1420+00.

The State delineation map also includes a flood profile for the river. We created a pdf of the subject map and digitally determined the flood hazard area design flood elevation at Station 1420+00 to be at 52.85 feet (refer to copy of portion of pdf, also provided in Appendix B). However, it should be noted that the State's profile drawing provides the regulated flood elevations in the NGVD 1929 vertical datum. As explained above, the topography depicted on the accompanying plans has been complied based upon the vertical datum of NAVD 1988. Therefore, the regulated flood elevation must be adjusted pursuant to the datum equation given in Subsection I-B above, yielding a regulated flood elevation of 51.95 feet in the vertical datum of NAVD 1988.

2. Method 3 (FEMA Fluvial Method)

FEMA has also published flood elevations in the vicinity of the subject property. FEMA's delineation is shown on a "Flood Insurance Rate Map" (FIRM) dated September 28, 2007. The map is further identified as Panel 134 of 301 and Map Number 34035C0134E. A (reduced scale) copy of this map, which is currently the effective FIRM, is provided in **Appendix C** of this report.

In addition, FEMA has published a five-volume "Flood Insurance Study", (FIS) dated November 11, 2016, which includes flood profiles along the Raritan River. The flood profile for the subject reach of the Raritan River is illustrated on Plate 213P, contained in Volume 4 of the FIS. A (reduced scale) copy of the FEMA profile drawing is also provided in **Appendix C.** It must be noted that FEMA's horizontal stationing for the Raritan River differs from the stationing depicted on the above described State delineation map. The State profile indicates their stationing is *"in feet above mouth of Raritan River"*, while the FEMA profiles indicate their stationing to be *"stream distance in feet above confluence with Raritan Bay"*. In any case, the upstream limit of the subject project site is approximately 5,100 feet upstream of the river's crossing with Route 206. On the State profile, the Route 206 bridge is at approximate River Station 1369+00, while the Route 206 bridge is at approximate Station 1362+50 on the FEMA profile (a stationing difference of 650 feet). Accordingly, while the upstream limit of the project site is at River Station 1420+00 on the State profile, it is at River Station 1413+50 on the FEMA profile.

The FEMA profile does not include the NJ Flood Hazard Area Design Flood profile. Therefore, pursuant to the Method 3 criteria set forth in the Flood Hazard Rules, the flood hazard area design flood elevation is to be determined by adding one foot to the FEMA 100-year flood (1% annual chance flood) elevation. At River Station 1413+50 the FEMA profile for the 100-year flood is at elevation 50.2 feet, NAVD1988. Therefore, the regulated flood elevation at the project site as determined by Method 3 would be 51.2 feet, NAVD1988. Since this elevation is lower than the elevation determined by Method 1 above, the regulated flood elevation at the site, serving as the basis for the subject application is 51.95 feet, NAVD 1988.

Finally, it should also be noted that FEMA is in the process of updating their flood mapping for portions of Somerset County and has published a "Preliminary Flood Insurance Study" dated March 26, 2021. Subpart 3.2(a)(1) of the subject Rules requires FEMA preliminary studies to also be considered when determining the regulated flood elevation at a given site. However, in the case, the flood profile published in the Preliminary FIS for the subject reach of the Raritan River, which is also identified as Plate 213P, is identical to the above described flood profile published in the 2016 FIS. Therefore, the Preliminary FIS data does not alter the Method 3 assessment summarized above.

C. Limits of the Flood Hazard Area

Based upon the regulated flood elevation of 51.95 feet determined above, the limits of the regulated flood hazard area upon the subject property have been plotted and are illustrated on Sheet No. 2 of the accompanying plans. As shown on Sheet No. 2, virtually the entire site, with the exception of the existing buildings, is within the flood hazard area.

D. Floodway Limits

Similar to the requirements pertaining to determining the regulated flood elevation, Subpart 3.2(c)(1) of the Flood Hazard Rules requires the on-site limit of a floodway to be established using the widest published floodway in cases where both State delineations and FEMA FIRM's exist.

The above described State delineation map (Appendix B) indicates the floodway does not encroach onto the project site. Similarly, the above referenced FEMA FIRM (Appendix C) also indicates the regulated floodway does not encroach onto the project site. Therefore, the project site is not encumbered by a regulated floodway.

E. 10-Year Flood Elevation

The Flood Hazard Rules include certain requirements applicable to the 10-year floodplain, necessitating determination of the 10-year flood elevation on the property. The above described State delineation map does not provide any indication as to the 10-year flood profile/elevation. Review of the above described FEMA profile drawing (Appendix C) indicates the 10-year flood at the subject project site to be at elevation 46.2 feet, NAVD 1988. Therefore, the 10-year flood elevation at the project site has been considered to be elevation 46.2 feet, NAVD 1988.

III. ENGINEERING INFORMATION FOR INDIVIDUAL PERMIT APPLICATION

As indicated in the introductory section of this report, in addition to seeking a Verification pursuant to Subchapter 5 of the Flood Hazard Rules, the applicant has also applied for an Individual Permit to conduct regulated activities within regulated area(s). This section of this report addresses the engineering considerations relevant to the individual permit application.

Subchapter 11 of the Flood Hazard Rules sets forth "Area Specific Requirements For Individual Permits", while Subchapter 12 of the Flood Hazard Rules set forth "Activity Specific Requirements for Individual Permits". With respect to the applicability of the Subchapter 11 requirements to the subject project, engineering considerations are associated with the project activities proposed within regulated the flood fringe (Subpart 11.4). Our assessment of the project's compliance with the area specific requirements for the flood fringe is provided in Subsection A below.

With respect to the Subchapter 12 requirements, Subpart 12.1 sets forth general requirements that pertain to all regulated activities proposed in any regulated area. Subsection B of this section of this report addressees the project's compliance with those requirements. In addition, the following Subparts of Subchapter 12 are applicable to the project:

- Subpart 12.2: Requirements for Stormwater Management
- Subpart 12.3: Requirements for excavation, fill and grading activities.
- Subpart 12.4: Requirements for a structure
- Subpart 12.5: Requirements for a building
- Subpart 12.6: Requirements for a railroad, roadway and parking area

Subsections C through G of this section of this report addresses the project's compliance with the engineering considerations relevant to Subparts 12.2, through 12.6, respectively.

B. Activities within the Flood Fringe (Subpart 11.4)

Subpart 11.4 of the Flood Hazard Rules sets forth the requirements for activities within the regulated flood fringe. In general, compliance with Subpart 11.4 requires no loss of flood storage volume ("zero net fill"). More specifically, Subpart 11.4 requires no loss of flood storage volume between the existing ground surface and the 10-year flood elevation and no loss of flood storage volume between the 10-year and NJFHADF elevation.

The "average end area method" was used to estimate flood storage for both existing and proposed conditions. The accompanying set of plans illustrate cross-sections depicting the project's grades for both existing and proposed conditions. Specifically, for the existing conditions, 47 cross-sections were strategically located as illustrated on Sheet No. 9 of the accompanying plans. The cross-sections for existing conditions are provided on Sheet Nos. 10 through 17 of the plans. The available flood storage area at each cross-section is labelled below each section. In addition, the software computed food storage volume, accumulated from the initial section (0+00), is also provided below each section. Note that (due to software limitations) the storage areas and volumes for the NJ Flood Hazard Area Design Flood is taken to the existing ground surface, rather than to the 10-year flood elevation, necessitating an additional calculation as described below to demonstrate compliance with the subject Rules.

Similarly, for proposed conditions, Sheet No. 18 of the accompanying set of plans illustrate the location of 47 cross-sections strategically located to estimate flood storage on the site under proposed conditions. The cross-sections for proposed conditions are provided on Sheet Nos. 19 through 26 of the plans. Consistent with the methodology described above for existing conditions, the available flood storage area at each cross-section is labelled below each section and the software computed food storage volume, accumulated from the initial section (0+00), is also provided below each section. Again (due to software limitations) the storage areas and volumes for the NJ Flood Hazard Area Design Flood is taken to the existing ground surface, rather than to the 10-year flood elevation, necessitating an additional calculation as described below to demonstrate compliance with the subject Rules.

The above described flood storage assessment indicates that the available on-site flood storage for the 10-year flood (volume available between the respective existing or proposed ground surface and the 10-year flood elevation of 46.2 feet) will increase as a result of the project; specifically from approximately 55 cubic

yards to 69 cubic yards. The cross-sectional analyses also demonstrates that the on-site storage volume for the NJ Flood Hazard Area Design Flood (NJFHADF) will also be increased as a result of the project---from approximately 28,936 cubic yards to 29,099 cubic yards.

However, inasmuch as the Flood Hazard Rules regulate the volume between the 10-year flood and the NJFHADF (not between the ground surface and the NJFHADF), the storage volumes between the ground and 10-year flood elevation must be subtracted from the values given above pertaining to the volume between the ground and NJFHADF elevation. This adjustment renders 28,881 cubic yards (28,936-55) under existing conditions and 29,030 cubic yards (29,099-69) under proposed conditions.

All of the calculations described above demonstrate the project, as designed, complies with the requirements of Subpart 11.4 of the Flood Hazard Rules. On-site flood storage volume will not be reduced.

C. Requirements Applicable to All Regulated Activities (Subpart 12.1)

The requirements applicable to all regulated activities are set forth at Paragraphs (b) through (i) of Subpart 12.1. Each of the requirements stipulated at those Paragraphs is given *in italic type* below, immediately followed **in boldface type** by our assessment of the project's compliance with each specific requirement.

(b) The Department shall issue an individual permit for a regulated activity only if it determines that the regulated activity is not likely to cause significant and adverse effects on the following:

1. *Water quality*
2. *Aquatic biota*
3. *Water supply*
4. *Flooding*
5. *Drainage*
6. *Channel stability*
7. *Threatened and endangered species or their current or documented historic habitats*
8. *Navigation*
9. *Energy production; and*

10. Fishery resources.

The application documents demonstrate that the regulated activities required for the project are not likely to cause significant and adverse impacts upon the above listed resources and/or considerations.

(c) A permittee shall obtain all necessary approvals from the local Soil Conservation District prior to commencing any activity approved in an individual permit issued under this chapter.

The applicant is cognizant that approval is required from the Somerset-Union Soil Conservation District prior to any land disturbance and will file an application with the District for said approval.

(d) A permittee shall obtain all necessary approvals from the USDA Natural Resource Conservation Service prior to commencing any activity designed or overseen by the NRCS, which is approved in an individual permit issued under this chapter.

The project does not include any activities to be designed or overseen by the NRCS.

(e) If neither the Soil Conservation District nor the USDA Natural Resource Conservation Service has jurisdiction over an activity approved in an individual permit issued under this chapter, the permittee shall commence the activity only if the following requirements are met:

1. Sediment control measures shall be installed around the proposed construction sufficient to prevent sediment from entering any riparian zone or channel outside the construction area;

2. If construction is proposed in a channel, sediment control measures, such as coffer dams, shall be installed around the activity sufficient to prevent flowing water from coming in contact with construction for the duration of the project where feasible;

3. *All slopes shall be graded and stabilized to prevent post-construction erosion; and*

4. *Permanent, native, non-invasive plant species shall be established on all exposed soils immediately following construction. The applicant shall monitor and maintain all such vegetation for at least three growing seasons to ensure proper establishment and survival.*

Since the project is subject to the approval of the Somerset-Union Soil Conservation District, this condition is not applicable.

(f) *The Department shall issue an individual permit for a regulated activity that adversely impacts a property not owned by an applicant as set forth in (g) below, only if the applicant demonstrates that one or more of the following requirements are satisfied for each adversely impacted property:*

1. *The applicant is a public entity that intends to appropriate the adversely impacted property through its power of eminent domain;*

2. *The applicant has entered into a contract to purchase the adversely impacted property;*

3. *The applicant has obtained an easement that encompasses the entire area that will be adversely impacted by the proposed activity, which specifically allows the applicant to undertake the proposed activity; or*

4. *The applicant has obtained written permission from the owners of the adversely impacted property. Written permission shall include the following:*

    i. *An explanation of the nature and purpose of the project;*
    ii. *An estimate of the length of time regulated activities will occur;*

iii. *An estimate of the extent to which the adversely impacted property will be affected by flooding or stormwater discharges and the frequency at which these impacts are expected to occur; and*

iv. *The notarized signature of all owners of the adversely impacted property.*

The project does not propose any activities that will cause an adverse impact upon any land not owned by the applicant.

(g) The Department shall consider a regulated activity to adversely impact a property not owned by an applicant if the activity meets one or more of the following. For the purpose of determining compliance with (g)4 and 5 below, calculations shall be rounded to the nearest 0.1 feet:

1. *The regulated activity is situated, in whole or in part, on property that is not owned by the applicant;*

2. *A stormwater discharge is directed overland onto property that is not owned by the applicant and the Department determines that the discharge will significantly increase or concentrate overland flow and/or cause erosion or increased flooding on the property not owned by the applicant;*

3. *The applicant relocates a regulated water or otherwise alters its top of bank such that the limit of the riparian zone encroaches further onto an offsite property;*

4. *The applicant proposes to undertake one or more of the following regulated activities:*

   i. *The construction of a new bridge or culvert, which does not meet the offsite flood requirements of N.J.A.C. 7:13-12.7(e);*

   ii. *The reconstruction of an existing bridge or culvert, which does not meet the offsite flood requirements of N.J.A.C. 7:13-12.7(f); or*

iii. *The restoration of a regulated water to a natural condition, which does not meet the offsite flood requirements of N.J.A.C. 7:13-12.14(d);*

5. *The applicant proposes to undertake a regulated activity not listed in (g)4 above, and the regulated activity will result in one or more of the following offsite impacts during any flood event described in (i) below:*

   i. *The regulated activity subjects any offsite habitable building, railroad, roadway, or parking area to increased depth or frequency of flooding;*
   ii. *The regulated activity increases offsite flood depths by more than 0.2 feet, in cases where the applicant owns or has development rights on both sides of a regulated water; or*
   iii. *The regulated activity increases offsite flood depths by more than 0.1 feet, in cases where the applicant owns or has development rights on only one side of a regulated water.*

The project does not propose any activities that will cause an adverse impact upon any land not owned by the applicant.

(h) *If a project results in a significant change in the cross-sectional area and/or hydraulic capacity of a channel or floodway, the Department shall presume that the project has the potential to adversely impact a property not owned by the applicant, as described at (g) above. In such a case, the Department shall require the applicant to provide hydrologic and/or hydraulic calculations that identify the properties that would be adversely impacted, or which demonstrate that such impacts will not in fact occur. Examples of projects that may require such an analysis include a channel modification, flood control project, the construction or removal of a water control structure, and the placement of a significant volume of fill in a floodway.*

The project does not propose any activities within a channel or floodway.

(i) *Where this chapter requires consideration of potential offsite flooding impacts, the following flood events shall be analyzed:*

1. *The flood hazard area design flood;*
2. *The 100-year flood;*
3. *The 50-year flood;*
4. *The 25-year flood;*
5. *The 10-year flood; and*
6. *The two-year flood.*

The project does not introduce off-site flooding potential.

D. Requirements for Stormwater Management (Subpart 12.2)

In general, Subpart 12.2 of the Flood Hazard Rules requires all projects that constitute "major development" comply with the State's Stormwater Management Rules (NJAC 7:8). Since the proposed Raritan Lofts project will disturb more than one acre of land, it is classified as "major development" with respect to determining the applicability of the Stormwater Management Rules.

The Stormwater Management Rules establish performance standards relevant to the management of stormwater runoff. Performance standards are established relevant to groundwater recharge, water quality and "quantity control". Each performance standard is discussed below with respect to its applicability to the Raritan Lofts project and/or the project's compliance with the standard.

With respect to groundwater recharge, the project attains compliance via the non-structural strategy of reducing impervious coverage. As detailed on the plans, impervious coverage will be reduced by approximately 2.42 acres (from an estimated 10.25 acres under existing conditions to an estimated 7.83 acres under proposed conditions). Consequently, the project will not create a deficit with respect to annual average groundwater recharge. As a result, the project complies with the performance standard relevant to recharge.

With respect to water quality management, the Stormwater Management Rules apply the performance standard(s) for water quality only to projects that will increase the quantity of regulated motor vehicle surface by 0.25 acres or more. The Drainage Area Maps provided at the end of **Appendix D** of this report

quantify the amount of regulated motor vehicle surface (pavement) on the subject property under both existing and proposed conditions and indicates that the project will result in an approximate 1.8 acre reduction (form 6.7 acres to 4.9 acres) of regulated motor vehicle surface on the project site. Therefore, the project is not subject to the water quality requirements.

With respect to "quantity control", the above described reduction of impervious cover(non-structural stormwater management) results in a reduction in both the peak rate and total volume of stormwater runoff from the site such that the design meets the requirement for quantity control set forth at Subparagraph (b)(1) of Subpart 5.6 of the Stormwater Management Rules. Specifically, the calculations provided in **Appendix D** of this report demonstrate that the runoff hydrographs for proposed conditions do not exceed, at any point in time, the runoff hydrographs for existing conditions for each regulated storm event (2, 10 and 100-year storms).

E. Requirements for Excavation, Fill and Grading (Subpart 12.3)

Excavation, fill, and grading is required to construct the project. These activities will take place in the regulated flood fringe and, therefore, are subject to the Subpart 12.3 requirements.

Paragraph (b) of Subpart 12.3 of the Flood Hazard Rules sets forth design and construction standards that apply to any excavation, fill or grading proposed in any regulated area. Each of the requirements stipulated at Paragraph (b) of Subpart 12.3 is given *in italic type* verbatim below, immediately followed **in boldface type** by our assessment of the project's compliance with each specific requirement.

The Department shall issue an individual permit for excavation, fill and/or grading only if the following requirements are satisfied:

1. *The overland flow of stormwater is not impeded and floodwaters can freely enter and exit the disturbed area, unless the area is graded to impound water for a stormwater management structure that meets the requirements of the Stormwater Management rules at N.J.A.C. 7:8;* **The project's proposed grading will not impede overland runoff.**

2. *Any slope of greater than 50 percent (a ratio of two horizontal to one vertical) is stabilized using soil bioengineering, retaining walls, riprap or other appropriate slope protection;* **The project does not propose any slopes steeper than a ratio of two horizontal to one vertical. Refer to the accompanying plans.**

3. *The excavation, fill and/or grading does not endanger the integrity of any existing structure;* **The proposed grading for the project does not endanger the integrity of any existing structures.**

4. *All excavated material is disposed of lawfully.* **Any excess excavated material will be legally disposed, as referenced on the accompanying Construction Plans.**

F. Requirements for Structures (Subpart 12.4)

The proposed building is a structure as defined in the Flood Hazard Rules. Subpart 12.4 of the subject Rules sets forth general requirements for structures. Specifically, pursuant to Subpart 12.4, all structures must be designed and constructed to:

- Resist impact from water and debris during the flood hazard area design flood
- Resist uplift, floatation, collapse and displacement due to hydrostatic and hydrodynamic forces resulting from the flood hazard area design flood
- Resist overturning and sliding pressure, as well as pressure from the freeze/thaw cycle of the soil

The proposed building will be structurally designed by a State-licensed professional (engineer and/or architect) considering all of the above stated requirements. Further, all structural designs are subject to review and approval pursuant to the State's Building Code, providing further assurance the above stated requirements are met.

G. Requirements for Buildings (Subpart 12.5)

The project proposes the construction of one new mixed use building. The small retail building existing in the eastern portion of the project site will remain. Accordingly, the assessment provided below relevant to Subpart 12.5 of the Flood Hazard Rules pertains solely to the new proposed building. As indicated in Subsection I-C of this report, the proposed new building will provide for 276 residential units, approximately 22,000 square feet of retail space and a parking garage accommodating 184 spaces.

Paragraph (b) of Subpart 12.5 sets forth the requirements that pertain to any building to be constructed in a flood hazard area. Each of the requirements at Paragraph (b) are provided *in italic type* below, immediately followed by our assessment of the project's compliance in **boldface type.**

(b) The Department shall issue an individual permit to construct, elevate, enlarge or reconstruct a building of any kind, only if the following requirements are met:

1. The building is designed to resist hydrostatic and hydrodynamic loads and effects of buoyancy resulting from flooding to at least one foot above the flood hazard area design flood elevation; **This requirement is similar to the Subpart 12.4 requirements for structures. Refer to Subsection III-D of this report for our response.**

2. *All applicable requirements set forth in (c) through (t) below are satisfied.* **The requirements at Subparagraphs (c) through (t) of Subpart 12.5 are individually addressed below, as applicable.**

Paragraph (c) of Subpart 12.5 sets forth the requirements that pertain to any building to be constructed in a flood hazard area. Each of the requirements at Paragraph (c) are provided *in italic type* below, immediately followed by our assessment of the project's compliance in **boldface type.**

(c) The Department shall issue an individual permit to construct, elevate, enlarge, or reconstruct a building only

if the following setbacks are satisfied, unless the building lies adjacent to a lawfully existing bulkhead, retaining wall, or revetment along a tidal water, in which case the following setbacks do not apply:

1. *Any new building is located at least 25 feet from any top of bank;*
2. *If an existing building is to be enlarged, such as through the construction of an addition, the enlarged portion of the building is located at least 25 feet from the top of bank, unless the applicant meets the requirements of (d) below; and*
3. *If an existing building located less than 25 feet from the top of bank is to be elevated or reconstructed, the building shall be relocated so that it is situated at least 25 feet from the top of bank, unless the applicant meets the requirements of (d) below.*

The project entails the construction of a new building that will be located more than 25 feet from the top of the bank of the regulated water. Therefore, the project complies with Paragraph (c) of Subpart 12.5.

Paragraph (d) of Subpart 12.5 pertains to cases where compliance with the certain requirements of Paragraph (c) is not feasible. Therefore, the Paragraph (d) is not applicable to the Raritan Lofts project. Similarly, the requirements at Paragraph (e) through Paragraph (h) are not applicable to the Raritan Lofts project because those Paragraphs pertain to buildings proposed or located in a floodway. As indicated in Section II of this report, the project site is not encumbered by a regulated floodway.

Paragraph (i) of Subpart 12.5 pertains to all buildings and is therefore applicable to the subject project. Each of the requirements at Paragraph (i) are provided *in italic type* below, immediately followed by our assessment of the project's compliance in **boldface type.**

(i) The Department shall issue an individual permit to construct a new habitable building only if the following requirements regarding the lowest floor of the building are satisfied:

1. *The lowest floor of a single-family home or duplex is set at least one foot above the flood hazard area design flood elevation and no lower than the elevation required under the Uniform Construction Code, N.J.A.C. 5:23;* **This requirement does not apply to the Raritan Lofts project as the proposed building is not a single family home or duplex.**

2. *The lowest floor of a critical building is set at least one foot above the flood hazard area design flood elevation and no lower than the elevation required under the Uniform Construction Code, N.J.A.C. 5:23;* **This requirement does not apply to the Raritan Lofts project as the proposed building is not a critical building.**

3. *The lowest floor of a multi-residence building is set at least one foot above the flood hazard area design flood elevation and no lower than the elevation required under the Uniform Construction Code, N.J.A.C. 5:23, unless all of the following are satisfied:*
   i. *The building is used for both residential and non-residential purposes;*
   ii. *The lowest floor of any residential portion of the building, including any common area, such as a lobby or other portion of the building that is used for both residential and non-residential purposes, is set at least one foot above the flood hazard area design flood elevation; iii. The applicant demonstrates that it is not feasible to set the lowest floor of any or all of the non-residential portions of the building at least one foot above the flood hazard area design flood elevation;*

iii. *The lowest floor of the non-residential portions of the building identified in (i)3iii above is set as close as feasible to one foot above the flood hazard area design flood elevation. In no case shall the lowest floor of the building be set below grade along all adjoining exterior walls;*

iv. *An architect or engineer certifies that the non-residential portions of the building identified in (i)3iii above will be constructed in accordance with the flood-proofing requirements at (q) below;*

v. *No portion of the building is located within a V zone; and vii. No portion of the building is located within a coastal A zone, unless an architect or engineer certifies that the building's foundation is designed in accordance with the Uniform Construction Code, N.J.A.C. 5:23; and*

The project, as proposed, complies with the requirements of Subparagraph 3 of Paragraph (i) of Subpart 12.5. All of the lowest floors of the proposed building will be constructed at elevation 53.0 feet, being 1.05 feet above the regulated flood elevation. Uses proposed on the lowest floors include retail uses, the residential lobby area and the parking garage.

Subparagraph (4) of Paragraph (i) of Subpart 12.5 pertains to the lowest floor of any building not identified in Subparagraphs (1) through (3). Therefore Subparagraph (4) does not apply to the Raritan Lofts project. Similarly, Paragraphs (j) through (n) of Subpart 12.5 do not apply to the subject project as these Paragraphs pertain to the reconstruction or use conversion of existing buildings.

Paragraph (o) of Subpart 12.5 pertains to critical and multi-residence buildings and is therefore applicable to the Raritan Lofts project. Each of the requirements at Paragraph (o) are provided *in italic type* below, immediately followed by our assessment of the project's compliance in **boldface type.**

(o) The Department shall issue an individual permit to construct a critical building or multi-residence building, or to convert an existing building to one of these uses, only if the applicant demonstrates that the building is served by at least one existing or proposed roadway, the travel surface of which is constructed at least one foot above the flood hazard area design flood elevation, which is of adequate size and capacity to serve the building, unless:

1. *The building is located in a tidal flood hazard area or is a multi-residence building that is part of a redevelopment project; and*
2. *The applicant demonstrates that such access is not feasible in accordance with N.J.A.C. 7:13-12.6(e).*

Access as described in Subparagraph (o) of Subpart 12.5 is not feasible. Refer to Section III-G of this report for our assessment and demonstration relevant to Subpart 12.6 below.

Finally, Subpart 12.5 also includes additional requirements at Paragraphs (p) through (u). However, these Paragraphs do not apply to the proposed building, as the requirements pertain constructing an enclosure below the lowest habitable floor elevating and/or for flood-proofing portions of building below the regulated flood elevation. The Raritan Lofts project does not propose any enclosure below the lowest habitable floors (elevation 53.0 feet).

H. Requirements for Roadways & Parking Areas (Subpart 12.6)

Subpart 12.6 of the Flood Hazard Rules sets forth the requirements for railroads, roadways and parking areas in a flood hazard area. The requirements applicable to public roadways and railroads are given at Paragraph (b) of Subpart 12.6 and do not pertain to the subject project. Similarly, the requirement at Paragraph (c) of Subpart 12.6 are also not applicable to the Raritan Lofts project. Specifically, Paragraph (c) sets forth the requirements for the construction or reconstruction of private roadways in a fluvial flood hazard area serving critical buildings and/or multi-residence buildings that are part of a redevelopment project. As detailed in Section II of the accompanying Environmental Report, the project site has been

designated as an area in need of redevelopment by the Borough of Raritan pursuant to NJSA 40;12-A.

Paragraph (d) of Subpart 12.6 sets forth the requirements for the construction or reconstruction of private driveways and parking areas that are not subject to the Paragraph (c) requirements. Therefore, the requirements given at Paragraph (d) of Subpart 12.6 are applicable to the Raritan Lofts project. Each of the requirements stipulated at Paragraph (d) of Subpart 12.6 are given *in italic type* verbatim below, immediately followed **in boldface type** by our assessment of the project's compliance with each specific requirement.

(d) The Department shall issue an individual permit to construct or reconstruct a private roadway or parking area not covered by (c) above, only if one of the following requirements is satisfied:

1. *The travel surface of each private roadway or parking area is constructed at least one foot above the flood hazard area design flood elevation; or*

2. *The applicant demonstrates that each building or group of buildings is already served by one or more roadways and/or parking areas having a travel surface at least one foot above the flood hazard area design flood elevation, which is of adequate size and capacity to serve the building or group of buildings, or that it is not feasible to construct the travel surface of each private roadway or parking area at least one foot above the flood hazard area design flood elevation pursuant to (e) below, and instead constructs the travel surface of each private roadway and parking area as close to this elevation as feasible.*

It is not feasible to construct the travel surface serving the proposed mixed use building at least one foot above the flood hazard area design flood elevation. The travel surface and parking areas have been designed to be as close to the required elevation as feasible. For example, the following is noted:

- **All 184 parking spaces provided in the proposed garage will be at an elevation of 53.0 feet or higher, compliant with the Subpart 12.6 requirements.**

- **A total of 404 parking spaces are proposed at or above elevation 51.0 feet, thereby being subject to less than one foot of inundation by the regulated flood elevation. The vast majority of the above described 404 spaces are in close proximity to the new proposed mixed use building.**
- **The drive immediately in front of the proposed mixed-use building will be at or above elevation 51.0 (less than a foot below the regulated flood elevation at its lowest point). for its entire length.**
- **A route subject to less than one foot of inundation by the regulated flood elevation is provided on-site to the proposed off-site access easement acquired by the owner across the neighboring property to the northeast of the Raritan Lofts site. The access easement will provide access to Somerset Street compliant with the Subpart 12.6 requirements. Refer to Sheet No. 8 of the accompanying plans.**

Paragraph (e) of Subpart 12.6 sets forth specific requirements for demonstrating infeasibility relevant to the Paragraph(d) requirements. Each of the requirements stipulated at Paragraph (e) of Subpart 12.6 are given *in italic type* verbatim below, immediately followed **in boldface type** by our assessment of the project's compliance with each specific requirement.

(e) An applicant seeking to demonstrate that it is not feasible to construct the travel surface of a railroad, roadway, or parking area at least one foot above the flood hazard area design flood elevation, as is required for various activities in this section, shall:

1. Demonstrate that strict compliance with the elevation requirements of this section would result in one or more of the following:

i. Prohibitively high construction costs;

ii. Construction costs that are disproportionately high compared with any benefit that would be obtained by strict compliance;

iii. A design that necessitates excessive volumes of fill that exceed the flood storage displacement limits at N.J.A.C. 7:13-11.4, for which flood

storage cannot feasibly be created in compensation either onsite or offsite; or

iv. *A design that causes unavoidable and adverse impacts to the environment (such as to the channel, riparian zone, or fishery resources), or which would cause unavoidable and significant increases in flooding;*

Strict compliance with the elevation requirements of this section would result in construction costs that are disproportionately high compared to the benefit that would be obtained by strict compliance. Specifically, as detailed above, the proposed project provides for vehicular ingress and egress, as well as nearly 1.5 parking spaces per residential unit subject to less than a foot of inundation by the regulated flood elevation. In consideration of the extremely rare occasion(s) regional flooding will attain the regulated flood elevation, the benefit of further elevating the parking areas and drives is minimal. The cost of further elevation will not only entail the cost of additional soil material but may also entail additional costs associated with disruption of the former landfill materials and/or capping system.

Moreover, since excavation depths on the site are restricted by the former landfill, further elevating the drives and parking areas may render a design for which flood storage cannot feasibly be created pursuant to the Subpart 11.4 requirements.

2. *Demonstrate that every reasonable effort has been taken to situate portions of each proposed railroad, roadway or parking area at least one foot above the flood hazard area design flood elevation so that vehicles can move to higher ground during a flood;*

The proposed design demonstrates every reasonable effort has been taken to situate the private drives and parking as close to the required elevation as feasible. Refer to our response to Paragraph (d) above.

3. *Demonstrate that no extraordinary risk is posed to any person using each proposed railroad, roadway or*

parking area that is constructed at an elevation less than one foot above the flood hazard area design flood elevation. This demonstration shall include:

i. *An analysis of the depth and frequency of floodwaters that will inundate the railroad, roadway, or parking area. In no case shall the travel surface of a private roadway or parking area that serves a multi-residence building in a fluvial flood hazard area be situated greater than 12 inches below the flood hazard area design flood elevation;*

ii. *The number of people that will be adversely impacted when the railroad, roadway, or parking area is inundated; and*

iii. *Measures being proposed to ameliorate the anticipated adverse impacts described in (e)3i and ii above, such as the establishment of evacuation plans for individuals that would be trapped during a flood, provisions for emergency electrical service during an outage, and flood-proofing measures; and*

As detailed above, the proposed design does not introduce an extraordinary risk to any person using the private drive or parking areas. The travel surface serving the proposed mixed use building, being the drive immediately in front of the proposed building extending to and along the off-site access easement acquired by the owner, is less than one foot below the regulated flood elevation in its entirety.

4. *Provide an adequate number of permanent signs are posted in prominent locations indicating which proposed roadways and parking areas are subject to flooding in the following cases:*

   i. *The roadway and/or parking area serves a critical building, a multi-residence building or a residential subdivision of two or more single-family home or duplexes; or*

   ii. *The parking area has 10 spaces or more.*

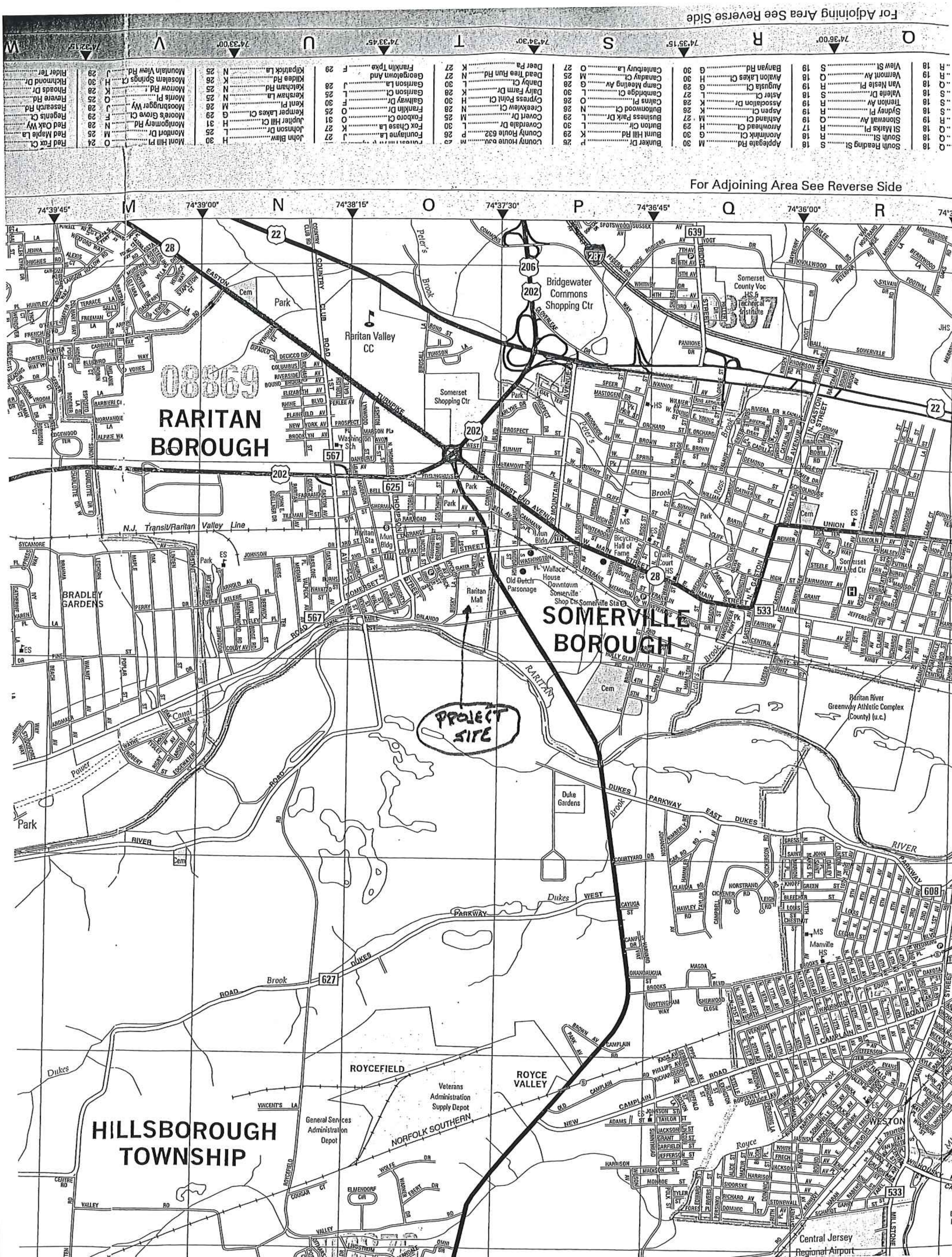
Refer to the accompanying plans for the proposed location of flood warning signs, as well as a detail of the proposed signs.

Finally, in addition to the requirements set forth in Paragraph (e) of Subpart 12.6, Paragraph (f) of Subpart 12.6 sets forth requirements for deed restriction(s) applicable to projects where a private roadway or parking area is proposed less than one foot above the flood hazard area design flood elevation. The applicant will comply with any deed restrictions relevant to Subpart 12.6 requirement stipulated in the Individual Permit issued for the project.

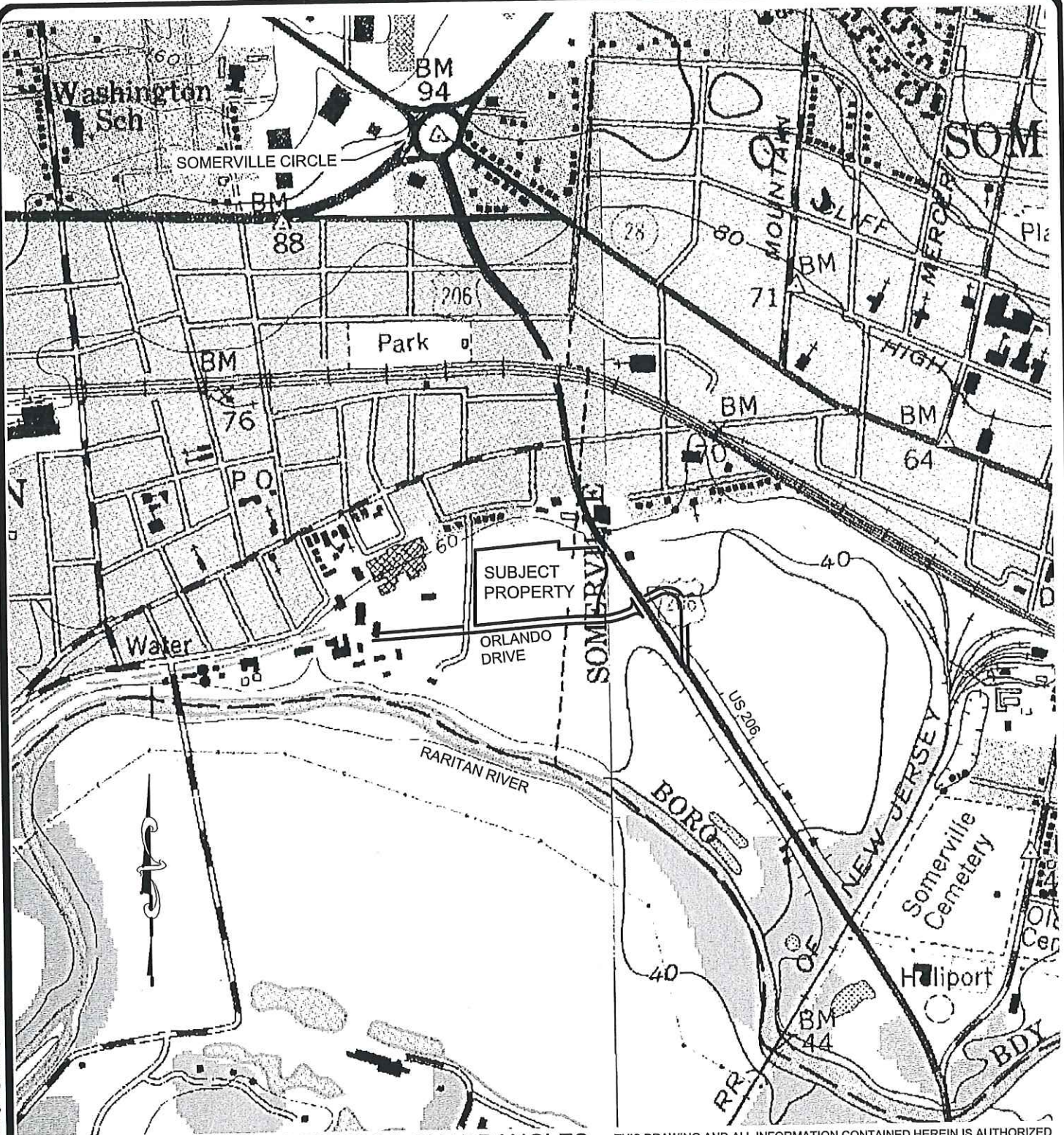
APPENDIX A

LOCATION MAPS

- Hagstrom Road Map
- USGS
- TAX MAP



For Adjoining Area See Reverse Side
74°39'45"
M
74°39'00"
N
74°38'15"
O
74°37'30"
P
74°36'45"
Q
74°36'00"
R
RARITAN
BOROUGH
08869
SOMERVILLE
BOROUGH
08876
HILLSBOROUGH
TOWNSHIP
BRADLEY
GARDENS
Bridgewater
Commons
Shopping Ctr
Raritan Valley
CC
Somerset
Shopping Ctr
Somerset
County Voc
HS &
Technical
Institute
Raritan
Mall
Old Dutch
Parsonage
Wallace
House
Downtown
Somerville
Shop Ctr
Somerville Sta
Duke
Gardens
Raritan River
Greenway Athletic Complex
(County) (u.c.)
ROYCEFIELD
ROYCE
VALLEY
Veterans
Administration
Supply Depot
General Services
Administration
Depot
NORFOLK SOUTHERN
N.J. Transit/Raritan Valley Line
DUKES PARKWAY
RIVER
Manville
HS
WESTON
Central Jersey
Regional Airport
PROJECT
SITE



RARITAN & BOUND BROOK USGS QUADRANGLES

SCALE: 1"=1000'

0 1000 2000

CENTER OF SITE:
E: 457,000 FT
N: 631,500 FT

Bowman Consulting Group Ltd
54 Horsehill Road, Suite 100
Cedar Knolls, New Jersey 07927
bowman.com
E-mail: NJ@Bowman.com
Phone: 973-359-8400
FAX: 973-359-8455
NJ Certificate of Authorization
No. 24GA28222600

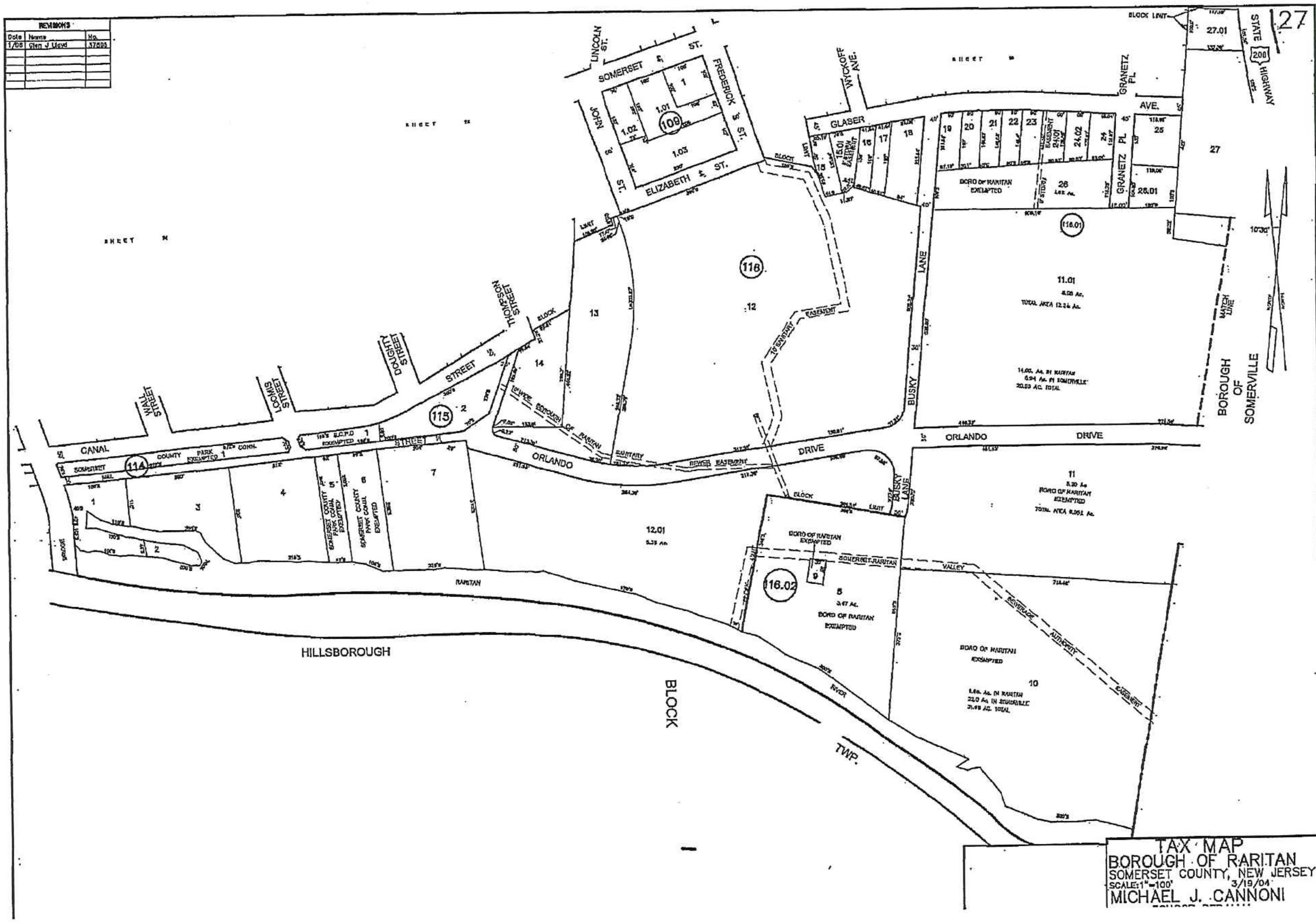
DATE: 02-17-2023 SCALE: 1"=1000' CHKD.:

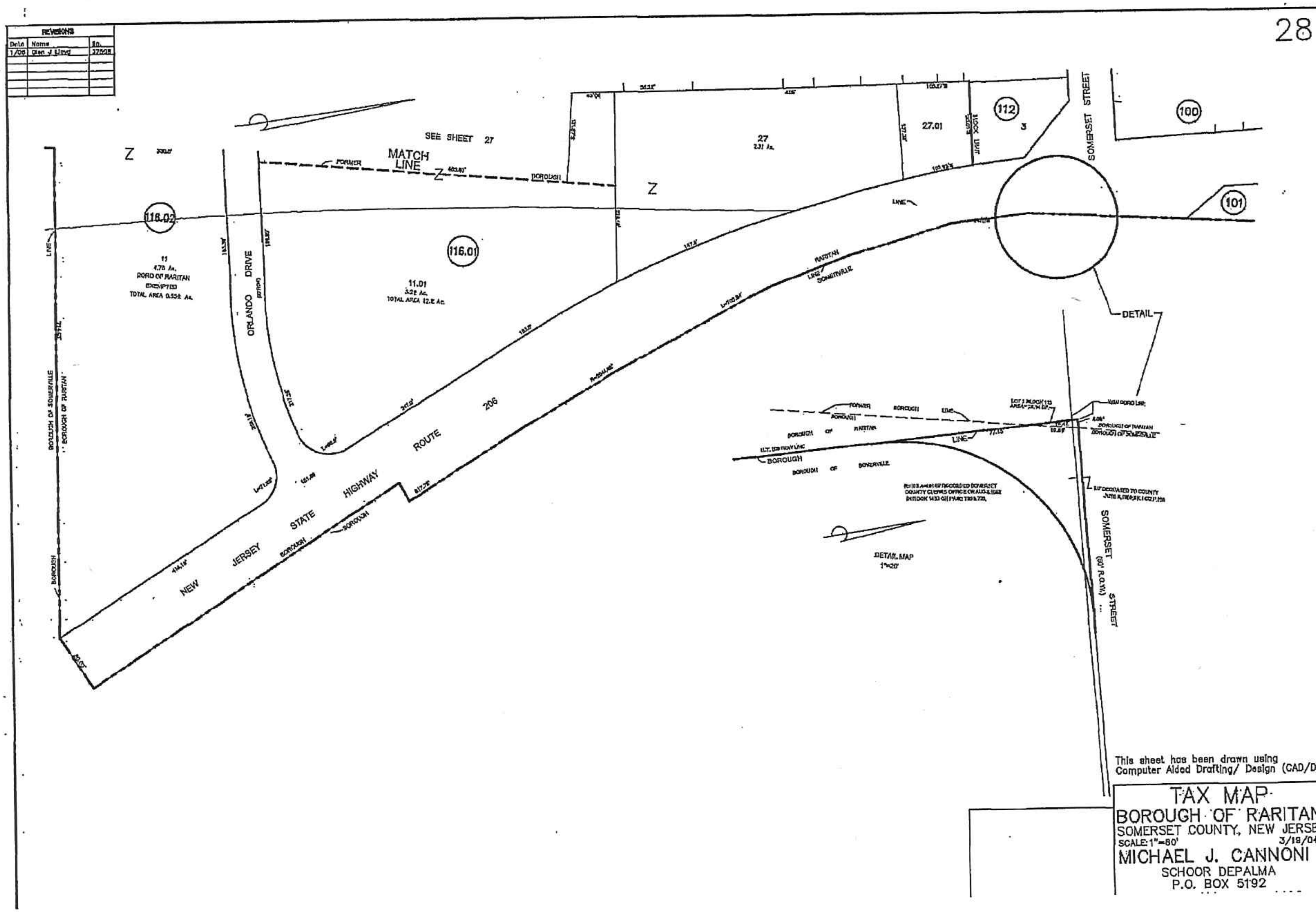
PROJ.: 081289-01-001

Bowman

RARITAN LOFTS
LOCATION MAP
BLOCK 116.01, LOT 11.01
BOROUGH OF RARITAN, SOMERSET COUNTY, NEW JERSEY

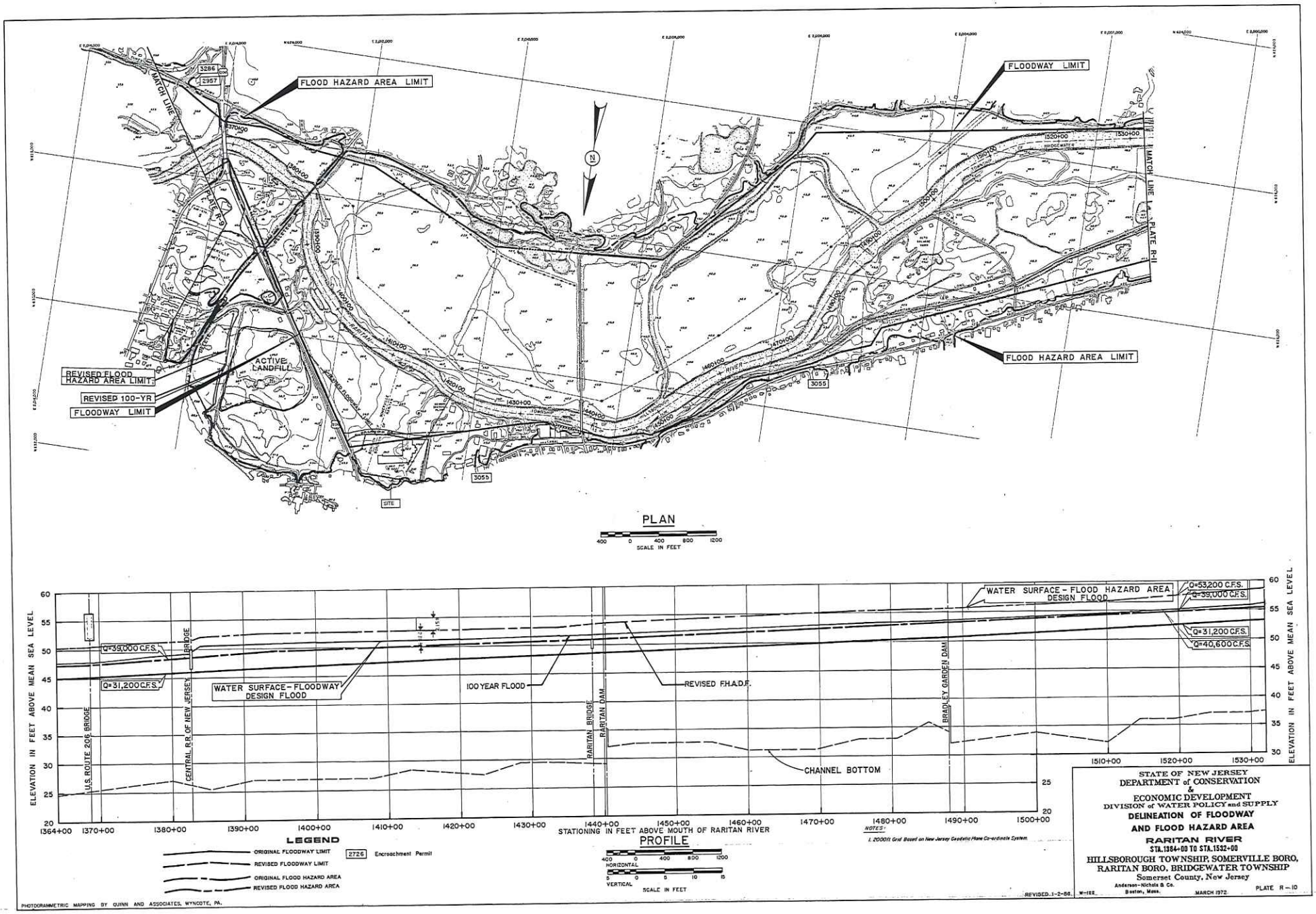
P:\081289 - Dimentman Raritan\081289-01-001 (ENG)\Engineering\Engineering Plans\03-Misc Plans\081289-MP-USGS.dwg 02/17/23 10:13:22AM, bwoods, LAYOUT:LETTER NO SIG


127
TAX MAP
BOROUGH OF RARITAN
SOMERSET COUNTY, NEW JERSEY
SCALE: 1"=100' 3/19/04
MICHAEL J. CANNONI
REVISIONS
Date | Name | No.
1/06 | Glen J Lloyd | 37005
STATE 206 HIGHWAY
BOROUGH OF SOMERVILLE
MATCH LINE
BLOCK LIMIT
ORLANDO DRIVE
BUSKY LANE
GLASER ST.
WYCKOFF AVE.
GRANETZ PL.
GRANETZ PL AVE.
SOMERSET ST.
FREDERICK ST.
ELIZABETH ST.
JOHN ST.
LINCOLN ST.
THOMPSON STREET
DOUGHTY STREET
LOOMIS STREET
WALL STREET
CANAL STREET
SOMERSET COUNTY PARK EXEMPTED
SOMERSET COUNTY PARK COMM. EXEMPTED
BORO OF RARITAN EXEMPTED
SOMERSET-RARITAN VALLEY SEWERAGE AUTHORITY EASEMENT
SANITARY SEWER EASEMENT
BOROUGH OF RARITAN
RARITAN RIVER
HILLSBOROUGH TWP.
BLOCK
109
114
115
116
116.01
116.02
11.01
11
12
12.01
10
27
27.01
25
26
26.01
24.02
15.01
13
14


28
REVISIONS
Date
Name
No.
SEE SHEET 27
MATCH LINE
FORMER
BOROUGH
27
27.01
112
100
101
116.02
116.01
11
BORO OF RARITAN
EXEMPTED
11.01
ORLANDO DRIVE
NEW JERSEY STATE HIGHWAY ROUTE 206
SOMERSET STREET
DETAIL
BOROUGH OF SOMERVILLE
BOROUGH OF RARITAN
BOROUGH OF RARITAN
BOROUGH OF SOMERVILLE
DETAIL MAP
1"=20'
This sheet has been drawn using Computer Aided Drafting/ Design (CAD/D)
TAX MAP
BOROUGH OF RARITAN
SOMERSET COUNTY, NEW JERSEY
SCALE: 1"=80'
3/19/04
MICHAEL J. CANNONI
SCHOOR DEPALMA
P.O. BOX 5192

APPENDIX B

STATE DELINEATION MAP



STATE OF NEW JERSEY
DEPARTMENT of CONSERVATION
&
ECONOMIC DEVELOPMENT
DIVISION of WATER POLICY and SUPPLY

DELINEATION OF FLOODWAY AND FLOOD HAZARD AREA

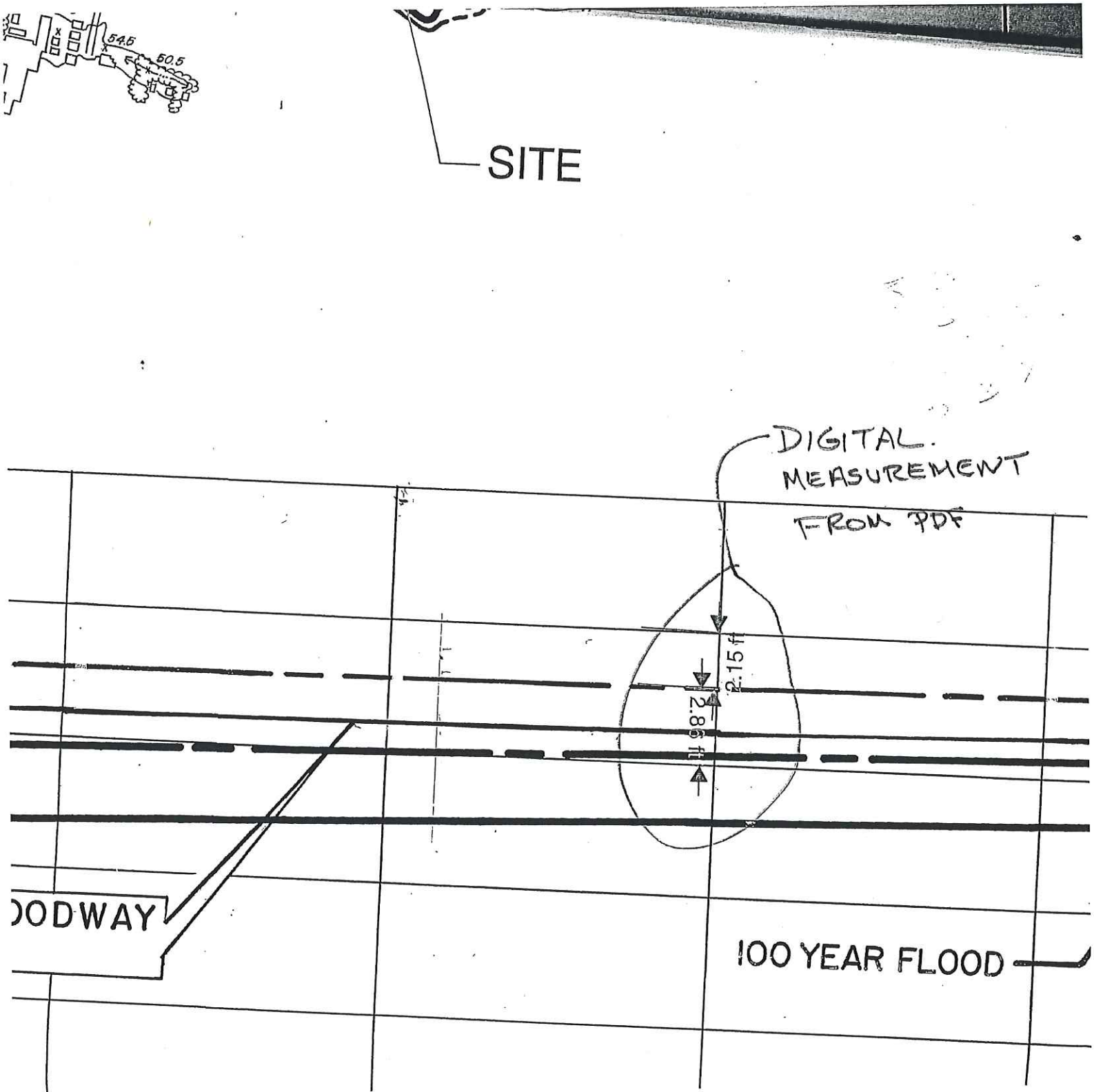
RARITAN RIVER

STA. 1364+00 TO STA. 1532+00

HILLSBOROUGH TOWNSHIP, SOMERVILLE BORO, RARITAN BORO, BRIDGEWATER TOWNSHIP
Somerset County, New Jersey

Anderson-Nichols & Co.
Boston, Mass.

REVISED 1-2-86 W-122 MARCH 1972 PLATE R-10


54.6
50.5
SITE
DIGITAL.
MEASUREMENT
FROM PDF
2.15 ft
2.86 ft
OODWAY
100 YEAR FLOOD

APPENDIX C

FEMA FIRM AND FIS PROFILE

NOTES TO USERS

map is for use in administering the National Flood Insurance Program. It
not necessarily identify all areas subject to flooding, particularly from local
nage sources of small size. The community map repository should be
sulted for possible updated or additional flood hazard information.

obtain more detailed information in areas where **Base Flood Elevations**
s) and/or **floodways** have been determined, users are encouraged to consult
Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables
ained within the Flood Insurance Study (FIS) report that accompanies this
A. Users should be aware that BFEs shown on the FIRM represent
ded whole-foot elevations. These BFEs are intended for flood insurance
g purposes only and should not be used as the sole source of flood
ation information. Accordingly, flood elevation data presented in the FIS
rt should be utilized in conjunction with the FIRM for purposes of
struction and/or floodplain management.

stal Base Flood Elevations shown on this map apply only landward
1.0' North American Vertical Datum of 1988 (NAVD 88). Users of this
A should be aware that coastal flood elevations are also provided in the
mary of Stillwater Elevations table in the Flood Insurance Study report
his jurisdiction. Elevations shown in the Summary of Stillwater Elevations
should be used for construction and/or floodplain management purposes
n they are higher than the elevations shown on this FIRM.

ndaries of the **floodways** were computed at cross sections and interpolated
veen cross sections. The floodways were based on hydraulic considerations
regard to requirements of the National Flood Insurance Program. Floodway
hs and other pertinent floodway data are provided in the Flood Insurance
ly report for this jurisdiction.

ain areas not in Special Flood Hazard Areas may be protected by **flood**
tral structures. Refer to Section 2.4 "Flood Protection Measures" of
Flood Insurance Study report for information on flood control structures
nis jurisdiction.

projection used in the preparation of this map was New Jersey State
ne, FIPSZONE 2900. The **horizontal datum** was NAD 83, GRS80
roid. Differences in datum, spheroid, projection or State Plane zones used
he production of FIRMs for adjacent jurisdictions may result in slight positional
rences in map features across jurisdiction boundaries. These differences
not affect the accuracy of this FIRM.

d elevations on this map are referenced to the North American Vertical
im of 1988. These flood elevations must be compared to structure and
nd elevations referenced to the same **vertical datum**. For information
rding conversion between the National Geodetic Vertical Datum of 1929
the North American Vertical Datum of 1988, visit the National Geodetic
ey website at www.ngs.noaa.gov or contact the National Geodetic Survey
he following address:

: Information Services
A, N/NGS12
onal Geodetic Survey
IC-3, #9202
East-West Highway
r Spring, Maryland 20910-3282
-713-3242

obtain current elevation, description, and/or location information for **bench marks**
wn on this map, please contact the Information Services Branch of the
onal Geodetic Survey at **(301) 713-3242**, or visit their website at
v.ngs.noaa.gov.

e map information shown on this FIRM was derived from digital ortho-
ography provided by the Somerset County GIS Department. This information was
uced at a scale of 1:2,400 from aerial photography dated March 2000.

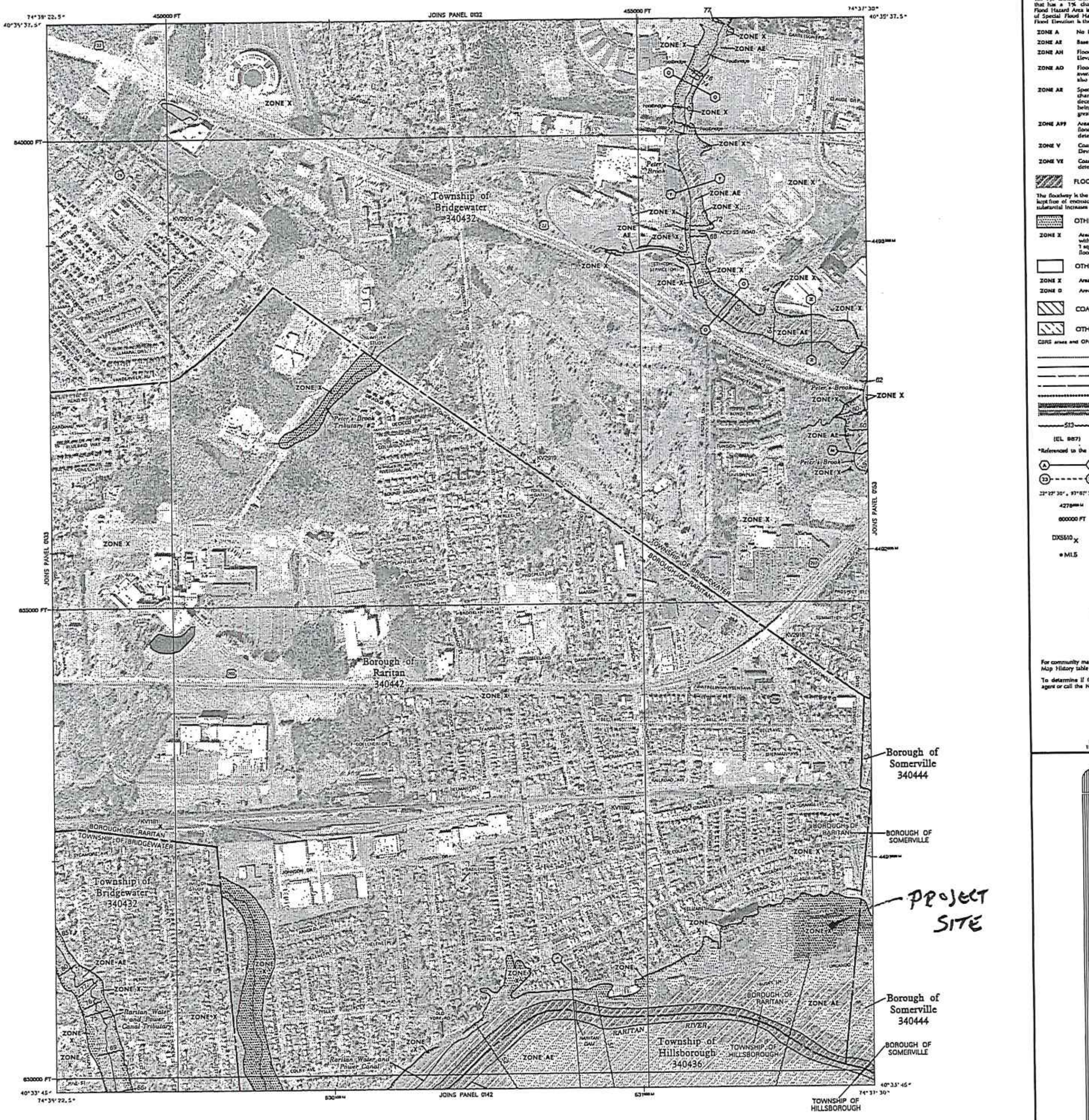
d on updated topographic information, this map reflects more detailed and up-
ate **stream channel configurations and floodplain delineations**
those shown on the previous FIRM for this jurisdiction. As a result, the
d Profiles and Floodway Data tables in the Flood Insurance Study
rt (which contains authoritative hydraulic data) may reflect stream
nnel distances that differ from what is shown on this map. Also, the
to floodplain relationships for unrevised streams may differ from what is
wn on previous maps.

porate limits shown on this map are based on the best data available
e time of publication. Because changes due to annexations or de-annexations
have occurred after this map was published, map users should contact
opriate community officials to verify current corporate limit locations.

se refer to the separately printed **Map Index** for an overview map of the
ity showing the layout of map panels; community map repository addresses;
a Listing of Communities table containing National Flood Insurance Program
s for each community as well as a listing of the panels on which each
munity is located.

tact the **FEMA Map Service Center** at 1-800-358-9616 for information on
able products associated with this FIRM. Available products may include
iously issued Letters of Map Change, a Flood Insurance Study report,
/or digital versions of this map. The FEMA Map Service Center may also be
hed by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

u have **questions about this map** or questions concerning the National
d Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627)
sit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the that has a 1% chance of being equaled or exceeded in any given year. The S Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping te average depths determined. For areas of alluvial fan flooding, vel also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% a chance flood by a flood control system that was subseq decertified. Zone AR indicates that the former flood control syst being restored to provide protection from the 1% annual chan greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a F flood protection system under construction; no Base Flood Elev determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Ele determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that m kept free of encroachment so that the 1% annual chance flood can be carried w substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance with average depths of less than 1 foot or with drainage areas les 1 square mile; and areas protected by levees from 1% annual c flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zone boundary dividing Special Flood Hazard Areas of dif Base Flood Elevations, flood depths or flood velociti

~~513~~ Base Flood Elevation line and value; elevation in fee

(EL 987) Base Flood Elevation value where uniform within elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A)——(A) Cross section line

(23)- - - -(23) Transect line

23°27'30", 97°07'30" Geographic coordinates referenced to the North Am Datum 1983 (NAD 83), Western Hemisphere

4278 M 1000-meter Universal Transverse Mercator grid ticks, zon

600000 FT 5000-foot grid values: New Jersey State Plane coor system, FIPSZONE 2900, Transverse Mercator project

DX5510 X Bench mark (see explanation in Notes to Users secti this FIRM panel)

• M1.5 River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 28, 2007

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Com Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your ins agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0134E

FIRM
FLOOD INSURANCE RATE
SOMERSET COUNTY,
NEW JERSEY
(ALL JURISDICTIONS)

PANEL 134 OF 301

(SEE MAP INDEX FOR FIRM PANEL LA

CONTAINS:

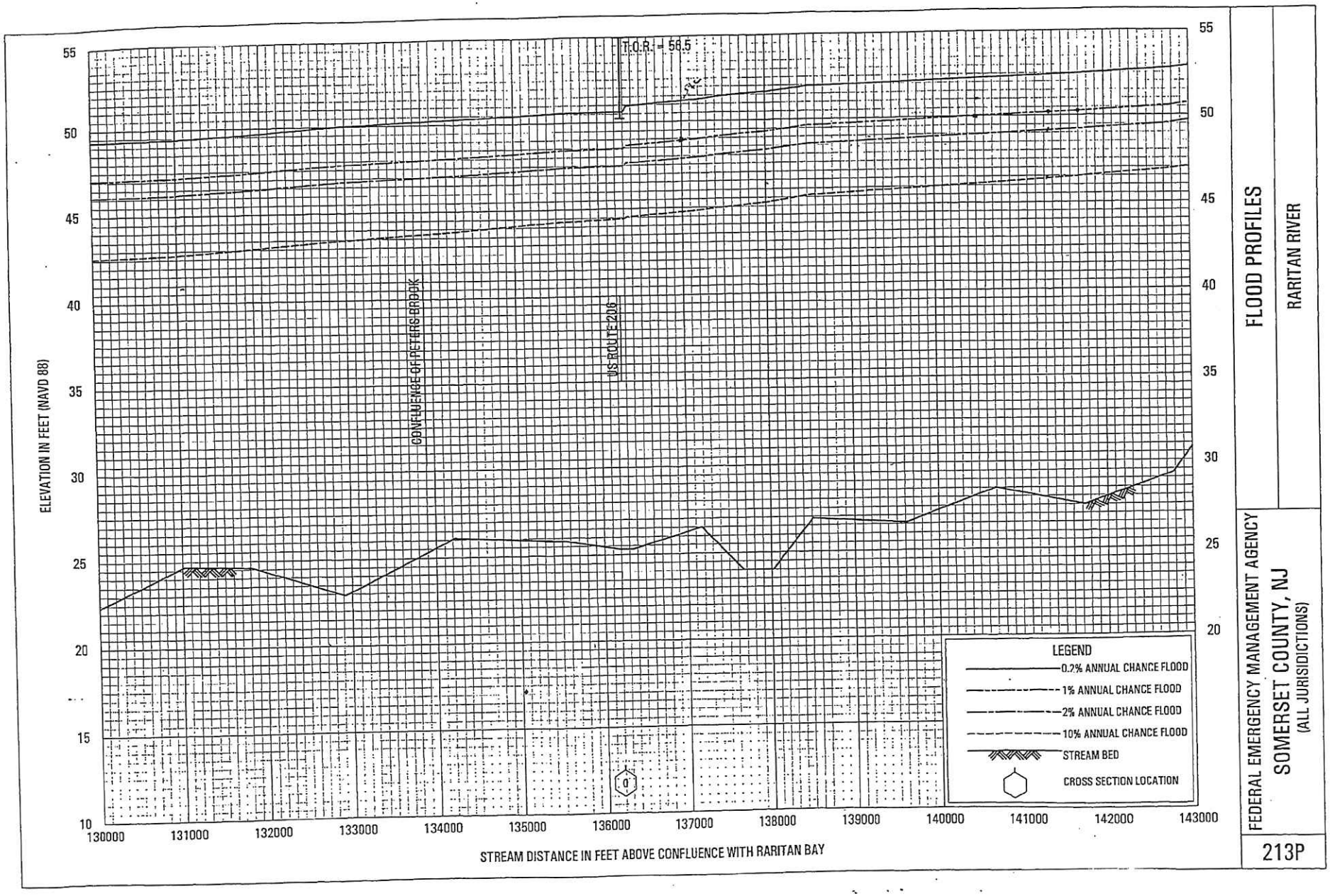
COMMUNITY	NUMBER	PANEL
BRIDGEWATER, TOWNSHIP OF	340432	0134
HILLSBOROUGH, TOWNSHIP OF	340436	0134
RARITAN, BOROUGH OF	340442	0134
SOMERVILLE, BOROUGH OF	340444	0134

Notice to User: The Map Number shown below should when placing map orders; the Community Number above should be used on insurance applications for the community.

MAP NU
34035C

EFFECTIVE
SEPTEMBER 28,

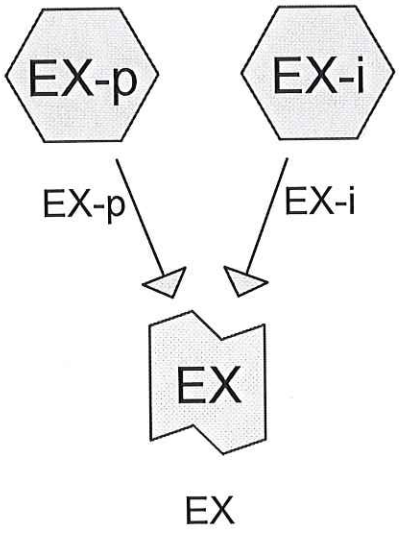
Federal Emergency Management A

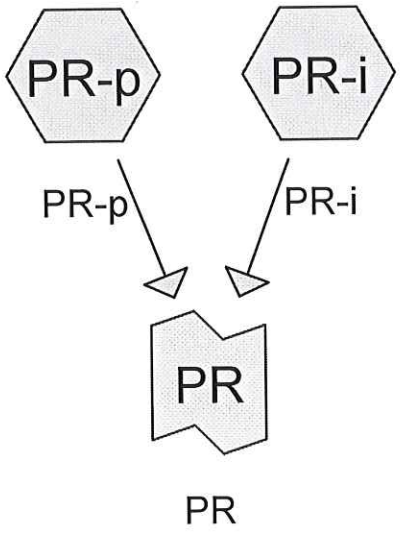

T.O.R. = 56.5
CONFLUENCE OF PETERS BROOK
US ROUTE 206
ELEVATION IN FEET (NAVD 88)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH RARITAN BAY
55
50
45
40
35
30
25
20
15
10
130000
131000
132000
133000
134000
135000
136000
137000
138000
139000
140000
141000
142000
143000
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
RARITAN RIVER
FEDERAL EMERGENCY MANAGEMENT AGENCY
SOMERSET COUNTY, NJ
(ALL JURISIDICTIONS)
213P

APPENDIX D

STORMWATER MANAGEMENT CALCULATIONS

AND DOCUMENTATION





Subcat Reach Pond Link

Routing Diagram for 081289
Prepared by Bowman Consulting, Printed 2/24/2023

Time span=1.00-27.00 hrs, dt=0.05 hrs, 521 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-i: EX-i Runoff Area=10.414 ac 100.00% Impervious Runoff Depth=3.11"
Flow Length=605' Tc=4.0 min CN=98 Runoff=38.41 cfs 2.696 af

Subcatchment EX-p: EX-p Runoff Area=0.785 ac 0.00% Impervious Runoff Depth=1.51"
Tc=4.0 min CN=80 Runoff=1.63 cfs 0.099 af

Subcatchment PR-i: PR-i Runoff Area=7.985 ac 100.00% Impervious Runoff Depth=3.11"
Flow Length=520' Tc=3.9 min CN=98 Runoff=29.56 cfs 2.067 af

Subcatchment PR-p: PR-p Runoff Area=3.214 ac 0.00% Impervious Runoff Depth=1.51"
Tc=3.9 min CN=80 Runoff=6.71 cfs 0.405 af

Link EX: EX Inflow=40.03 cfs 2.795 af
Primary=40.03 cfs 2.795 af

Link PR: PR Inflow=36.25 cfs 2.472 af
Primary=36.25 cfs 2.472 af

Total Runoff Area = 22.398 ac Runoff Volume = 5.267 af Average Runoff Depth = 2.82"
17.85% Pervious = 3.999 ac 82.15% Impervious = 18.399 ac

Summary for Subcatchment EX-i: EX-i

Runoff = 38.41 cfs @ 12.10 hrs, Volume= 2.696 af, Depth= 3.11"
Routed to Link EX : EX

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
*	3.145	98	Roof
*	6.802	98	Vehicle Pavement
*	0.467	98	Other Impervious
	10.414	98	Weighted Average
	10.414		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.34"
1.1	170	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	100	0.0050	3.72	16.75	**Channel Flow,** Area= 4.5 sf Perim= 18.5' r= 0.24' n= 0.011
0.9	235	0.0050	4.55	8.05	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
4.0	605	Total			

Summary for Subcatchment EX-p: EX-p

Runoff = 1.63 cfs @ 12.10 hrs, Volume= 0.099 af, Depth= 1.51"
Routed to Link EX : EX

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
*	0.785	80	Open Space
	0.785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0					**Direct Entry,**

Summary for Subcatchment PR-i: PR-i

Runoff = 29.56 cfs @ 12.10 hrs, Volume= 2.067 af, Depth= 3.11"
Routed to Link PR : PR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
*	2.434	98	Roof
*	4.981	98	Vehicle Pavement
*	0.570	98	Other Impervious
	7.985	98	Weighted Average
	7.985		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.34"
1.3	115	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	305	0.0075	4.94	6.06	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
3.9	520	Total			

Summary for Subcatchment PR-p: PR-p

Runoff = 6.71 cfs @ 12.10 hrs, Volume= 0.405 af, Depth= 1.51"
Routed to Link PR : PR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

	Area (ac)	CN	Description
*	3.214	80	Open Space
	3.214		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9					**Direct Entry,**

Summary for Link EX: EX

Inflow Area = 11.199 ac, 92.99% Impervious, Inflow Depth = 3.00" for 2-Year event
Inflow = 40.03 cfs @ 12.10 hrs, Volume= 2.795 af
Primary = 40.03 cfs @ 12.10 hrs, Volume= 2.795 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs

Summary for Link PR: PR

Inflow Area = 11.199 ac, 71.30% Impervious, Inflow Depth = 2.65" for 2-Year event
Inflow = 36.25 cfs @ 12.10 hrs, Volume= 2.472 af
Primary = 36.25 cfs @ 12.10 hrs, Volume= 2.472 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs

Time span=1.00-27.00 hrs, dt=0.05 hrs, 521 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-i: EX-i Runoff Area=10.414 ac 100.00% Impervious Runoff Depth>4.77"
Flow Length=605' Tc=4.0 min CN=98 Runoff=57.96 cfs 4.142 af

Subcatchment EX-p: EX-p Runoff Area=0.785 ac 0.00% Impervious Runoff Depth=2.90"
Tc=4.0 min CN=80 Runoff=3.11 cfs 0.190 af

Subcatchment PR-i: PR-i Runoff Area=7.985 ac 100.00% Impervious Runoff Depth>4.77"
Flow Length=520' Tc=3.9 min CN=98 Runoff=44.61 cfs 3.176 af

Subcatchment PR-p: PR-p Runoff Area=3.214 ac 0.00% Impervious Runoff Depth=2.90"
Tc=3.9 min CN=80 Runoff=12.79 cfs 0.777 af

Link EX: EX Inflow=61.07 cfs 4.332 af
Primary=61.07 cfs 4.332 af

Link PR: PR Inflow=57.39 cfs 3.953 af
Primary=57.39 cfs 3.953 af

Total Runoff Area = 22.398 ac Runoff Volume = 8.285 af Average Runoff Depth = 4.44"
17.85% Pervious = 3.999 ac 82.15% Impervious = 18.399 ac

Summary for Subcatchment EX-i: EX-i

Runoff = 57.96 cfs @ 12.10 hrs, Volume= 4.142 af, Depth> 4.77"
Routed to Link EX : EX

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

	Area (ac)	CN	Description
*	3.145	98	Roof
*	6.802	98	Vehicle Pavement
*	0.467	98	Other Impervious
	10.414	98	Weighted Average
	10.414		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.34"
1.1	170	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	100	0.0050	3.72	16.75	**Channel Flow,** Area= 4.5 sf Perim= 18.5' r= 0.24' n= 0.011
0.9	235	0.0050	4.55	8.05	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
4.0	605	Total			

Summary for Subcatchment EX-p: EX-p

Runoff = 3.11 cfs @ 12.10 hrs, Volume= 0.190 af, Depth= 2.90"
Routed to Link EX : EX

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

	Area (ac)	CN	Description
*	0.785	80	Open Space
	0.785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0					**Direct Entry,**

Summary for Subcatchment PR-i: PR-i

Runoff = 44.61 cfs @ 12.10 hrs, Volume= 3.176 af, Depth> 4.77"
Routed to Link PR : PR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

	Area (ac)	CN	Description
*	2.434	98	Roof
*	4.981	98	Vehicle Pavement
*	0.570	98	Other Impervious
	7.985	98	Weighted Average
	7.985		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.34"
1.3	115	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	305	0.0075	4.94	6.06	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
3.9	520	Total			

Summary for Subcatchment PR-p: PR-p

Runoff = 12.79 cfs @ 12.10 hrs, Volume= 0.777 af, Depth= 2.90"
Routed to Link PR : PR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

	Area (ac)	CN	Description
*	3.214	80	Open Space
	3.214		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9					**Direct Entry,**

Summary for Link EX: EX

Inflow Area = 11.199 ac, 92.99% Impervious, Inflow Depth > 4.64" for 10-Year event
Inflow = 61.07 cfs @ 12.10 hrs, Volume= 4.332 af
Primary = 61.07 cfs @ 12.10 hrs, Volume= 4.332 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs

Summary for Link PR: PR

Inflow Area = 11.199 ac, 71.30% Impervious, Inflow Depth > 4.24" for 10-Year event
Inflow = 57.39 cfs @ 12.10 hrs, Volume= 3.953 af
Primary = 57.39 cfs @ 12.10 hrs, Volume= 3.953 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs

Time span=1.00-27.00 hrs, dt=0.05 hrs, 521 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-i: EX-i Runoff Area=10.414 ac 100.00% Impervious Runoff Depth>7.96"
Flow Length=605' Tc=4.0 min CN=98 Runoff=95.30 cfs 6.911 af

Subcatchment EX-p: EX-p Runoff Area=0.785 ac 0.00% Impervious Runoff Depth=5.82"
Tc=4.0 min CN=80 Runoff=6.06 cfs 0.381 af

Subcatchment PR-i: PR-i Runoff Area=7.985 ac 100.00% Impervious Runoff Depth>7.96"
Flow Length=520' Tc=3.9 min CN=98 Runoff=73.35 cfs 5.299 af

Subcatchment PR-p: PR-p Runoff Area=3.214 ac 0.00% Impervious Runoff Depth=5.82"
Tc=3.9 min CN=80 Runoff=24.93 cfs 1.559 af

Link EX: EX Inflow=101.36 cfs 7.292 af
Primary=101.36 cfs 7.292 af

Link PR: PR Inflow=98.28 cfs 6.858 af
Primary=98.28 cfs 6.858 af

Total Runoff Area = 22.398 ac Runoff Volume = 14.150 af Average Runoff Depth = 7.58"
17.85% Pervious = 3.999 ac 82.15% Impervious = 18.399 ac

Summary for Subcatchment EX-i: EX-i

Runoff = 95.30 cfs @ 12.10 hrs, Volume= 6.911 af, Depth> 7.96"
Routed to Link EX : EX

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

	Area (ac)	CN	Description
*	3.145	98	Roof
*	6.802	98	Vehicle Pavement
*	0.467	98	Other Impervious
	10.414	98	Weighted Average
	10.414		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.34"
1.1	170	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	100	0.0050	3.72	16.75	**Channel Flow,** Area= 4.5 sf Perim= 18.5' r= 0.24' n= 0.011
0.9	235	0.0050	4.55	8.05	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
4.0	605	Total			

Summary for Subcatchment EX-p: EX-p

Runoff = 6.06 cfs @ 12.10 hrs, Volume= 0.381 af, Depth= 5.82"
Routed to Link EX : EX

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

	Area (ac)	CN	Description
*	0.785	80	Open Space
	0.785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0					**Direct Entry,**

Summary for Subcatchment PR-i: PR-i

Runoff = 73.35 cfs @ 12.10 hrs, Volume= 5.299 af, Depth> 7.96"
Routed to Link PR : PR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

	Area (ac)	CN	Description
*	2.434	98	Roof
*	4.981	98	Vehicle Pavement
*	0.570	98	Other Impervious
	7.985	98	Weighted Average
	7.985		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.34"
1.3	115	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	305	0.0075	4.94	6.06	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
3.9	520	Total			

Summary for Subcatchment PR-p: PR-p

Runoff = 24.93 cfs @ 12.10 hrs, Volume= 1.559 af, Depth= 5.82"
Routed to Link PR : PR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

	Area (ac)	CN	Description
*	3.214	80	Open Space
	3.214		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9					**Direct Entry,**

Summary for Link EX: EX

Inflow Area = 11.199 ac, 92.99% Impervious, Inflow Depth > 7.81" for 100-Year event
Inflow = 101.36 cfs @ 12.10 hrs, Volume= 7.292 af
Primary = 101.36 cfs @ 12.10 hrs, Volume= 7.292 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs

Summary for Link PR: PR

Inflow Area = 11.199 ac, 71.30% Impervious, Inflow Depth > 7.35" for 100-Year event
Inflow = 98.28 cfs @ 12.10 hrs, Volume= 6.858 af
Primary = 98.28 cfs @ 12.10 hrs, Volume= 6.858 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-27.00 hrs, dt= 0.05 hrs

Primary Comparison

Time (hours)	Link EX (cfs)	Link PR (cfs)
0.00	0.00	0.00
0.05	0.00	0.00
0.10	0.00	0.00
0.15	0.00	0.00
0.20	0.00	0.00
0.25	0.00	0.00
0.30	0.00	0.00
0.35	0.00	0.00
0.40	0.00	0.00
0.45	0.00	0.00
0.50	0.00	0.00
0.55	0.00	0.00
0.60	0.00	0.00
0.65	0.00	0.00
0.70	0.00	0.00
0.75	0.00	0.00
0.80	0.00	0.00
0.85	0.00	0.00
0.90	0.00	0.00
0.95	0.00	0.00
1.00	0.00	0.00
1.05	0.00	0.00
1.10	0.00	0.00
1.15	0.00	0.00
1.20	0.00	0.00
1.25	0.01	0.01
1.30	0.02	0.01
1.35	0.02	0.02
1.40	0.03	0.02
1.45	0.04	0.03
1.50	0.05	0.04
1.55	0.05	0.04
1.60	0.06	0.04
1.65	0.06	0.05
1.70	0.07	0.05
1.75	0.08	0.06
1.80	0.08	0.06
1.85	0.09	0.07
1.90	0.10	0.07
1.95	0.10	0.08
2.00	0.11	0.08
2.05	0.11	0.09
2.10	0.12	0.09
2.15	0.12	0.10
2.20	0.13	0.10
2.25	0.14	0.10
2.30	0.14	0.11
2.35	0.15	0.11
2.40	0.15	0.12
2.45	0.16	0.12
2.50	0.16	0.13
2.55	0.17	0.13
2.60	0.17	0.13
2.65	0.18	0.14
2.70	0.18	0.14
2.75	0.19	0.14
2.80	0.19	0.15
2.85	0.20	0.15
2.90	0.20	0.16
2.95	0.21	0.16
3.00	0.21	0.16
3.05	0.22	0.17
3.10	0.22	0.17
3.15	0.23	0.17
3.20	0.23	0.18
3.25	0.24	0.18
3.30	0.24	0.18
3.35	0.24	0.19
3.40	0.25	0.19
3.45	0.25	0.19
3.50	0.26	0.20
3.55	0.26	0.20
3.60	0.27	0.20
3.65	0.27	0.21
3.70	0.27	0.21
3.75	0.28	0.21
3.80	0.28	0.22
3.85	0.29	0.22
3.90	0.29	0.22
3.95	0.29	0.23
4.00	0.30	0.23
4.05	0.30	0.23
4.10	0.31	0.23
4.15	0.31	0.24
4.20	0.31	0.24
4.25	0.32	0.24
4.30	0.32	0.25
4.35	0.33	0.25
4.40	0.33	0.25
4.45	0.33	0.25
4.50	0.34	0.26
4.55	0.34	0.26
4.60	0.34	0.26
4.65	0.35	0.27
4.70	0.35	0.27
4.75	0.35	0.27
4.80	0.36	0.27
4.85	0.36	0.28
4.90	0.36	0.28
4.95	0.37	0.28
5.00	0.37	0.28
5.05	0.37	0.29
5.10	0.38	0.29
5.15	0.38	0.29
5.20	0.38	0.29
5.25	0.39	0.30
5.30	0.39	0.30
5.35	0.39	0.30
5.40	0.40	0.30
5.45	0.40	0.31
5.50	0.40	0.31
5.55	0.41	0.31
5.60	0.41	0.31
5.65	0.41	0.32
5.70	0.42	0.32
5.75	0.42	0.32
5.80	0.42	0.32
5.85	0.42	0.33
5.90	0.43	0.33
5.95	0.43	0.33
6.00	0.43	0.33
6.05	0.44	0.34
6.10	0.45	0.34
6.15	0.45	0.35
6.20	0.46	0.35
6.25	0.47	0.36
6.30	0.48	0.36
6.35	0.48	0.37
6.40	0.49	0.38
6.45	0.50	0.38
6.50	0.50	0.39
6.55	0.51	0.39
6.60	0.52	0.40
6.65	0.53	0.40
6.70	0.53	0.41
6.75	0.54	0.41
6.80	0.55	0.42
6.85	0.55	0.43
6.90	0.56	0.43
6.95	0.57	0.44
7.00	0.58	0.44
7.05	0.59	0.45
7.10	0.59	0.46
7.15	0.60	0.46
7.20	0.61	0.47
7.25	0.62	0.47
7.30	0.62	0.48
7.35	0.63	0.48
7.40	0.64	0.49
7.45	0.65	0.50
7.50	0.65	0.50
7.55	0.66	0.51
7.60	0.67	0.51
7.65	0.68	0.52
7.70	0.68	0.53
7.75	0.69	0.53

Primary Comparison (continued)

Time (hours)	Link EX (cfs)	Link PR (cfs)
7.80	0.70	0.54
7.85	0.71	0.54
7.90	0.72	0.55
7.95	0.72	0.55
8.00	0.73	0.56
8.05	0.74	0.57
8.10	0.74	0.57
8.15	0.75	0.58
8.20	0.76	0.58
8.25	0.77	0.59
8.30	0.77	0.59
8.35	0.78	0.60
8.40	0.79	0.61
8.45	0.80	0.61
8.50	0.81	0.62
8.55	0.81	0.62
8.60	0.82	0.63
8.65	0.83	0.64
8.70	0.84	0.64
8.75	0.85	0.65
8.80	0.85	0.65
8.85	0.86	0.66
8.90	0.87	0.66
8.95	0.88	0.67
9.00	0.89	0.68
9.05	0.91	0.69
9.10	0.93	0.71
9.15	0.95	0.73
9.20	0.98	0.75
9.25	1.01	0.77
9.30	1.03	0.80
9.35	1.06	0.82
9.40	1.08	0.84
9.45	1.11	0.86
9.50	1.14	0.88
9.55	1.16	0.90
9.60	1.19	0.93
9.65	1.22	0.95
9.70	1.24	0.97
9.75	1.27	0.99
9.80	1.30	1.01
9.85	1.32	1.04
9.90	1.35	1.06
9.95	1.38	1.08
10.00	1.40	1.11
10.05	1.43	1.13
10.10	1.46	1.15
10.15	1.49	1.18
10.20	1.52	1.20
10.25	1.54	1.22
10.30	1.57	1.25
10.35	1.59	1.27
10.40	1.62	1.30
10.45	1.65	1.32
10.50	1.68	1.35
10.55	1.76	1.42
10.60	1.86	1.50
10.65	1.96	1.58
10.70	2.06	1.66
10.75	2.16	1.75
10.80	2.26	1.84
10.85	2.36	1.92
10.90	2.47	2.01
10.95	2.57	2.09
11.00	2.67	2.19
11.05	2.84	2.33
11.10	3.03	2.49
11.15	3.21	2.65
11.20	3.41	2.82
11.25	3.60	2.98
11.30	3.79	3.15
11.35	3.98	3.32
11.40	4.18	3.49
11.45	4.34	3.64
11.50	4.51	3.79
11.55	5.51	4.68
11.60	6.76	5.74
11.65	7.17	6.10
11.70	7.43	6.34
11.75	8.56	7.38
11.80	9.98	8.62
11.85	11.84	10.32
11.90	13.96	12.19
11.95	18.47	16.38
12.00	23.87	21.23
12.05	31.56	28.49
12.10	**40.03**	**36.25**
12.15	31.17	27.93
12.20	17.91	16.12
12.25	13.63	12.38
12.30	11.16	10.22
12.35	9.60	8.79
12.40	8.12	7.47
12.45	7.68	7.09
12.50	7.43	6.88
12.55	6.38	5.87
12.60	5.08	4.70
12.65	4.71	4.36
12.70	4.52	4.20
12.75	4.33	4.02
12.80	4.13	3.84
12.85	3.94	3.67
12.90	3.74	3.48
12.95	3.55	3.30
13.00	3.35	3.12
13.05	3.16	2.94
13.10	2.96	2.76
13.15	2.84	2.64
13.20	2.72	2.54
13.25	2.62	2.45
13.30	2.51	2.35
13.35	2.41	2.25
13.40	2.30	2.15
13.45	2.20	2.06
13.50	2.09	1.96
13.55	1.99	1.86
13.60	1.89	1.76
13.65	1.84	1.72
13.70	1.81	1.70
13.75	1.78	1.67
13.80	1.75	1.64
13.85	1.73	1.62
13.90	1.70	1.60
13.95	1.67	1.57
14.00	1.64	1.54
14.05	1.62	1.52
14.10	1.59	1.49
14.15	1.56	1.47
14.20	1.54	1.44
14.25	1.51	1.42
14.30	1.48	1.39
14.35	1.45	1.36
14.40	1.42	1.34
14.45	1.40	1.31
14.50	1.37	1.29
14.55	1.34	1.26
14.60	1.31	1.24
14.65	1.29	1.21
14.70	1.26	1.18
14.75	1.23	1.16
14.80	1.21	1.14
14.85	1.18	1.11
14.90	1.15	1.08
14.95	1.12	1.06
15.00	1.09	1.03
15.05	1.07	1.01
15.10	1.04	0.98
15.15	1.03	0.97
15.20	1.02	0.96
15.25	1.01	0.95
15.30	1.00	0.95
15.35	1.00	0.94
15.40	0.99	0.94
15.45	0.98	0.93
15.50	0.98	0.92
15.55	0.97	0.91

Primary Comparison (continued)

Time (hours)	Link EX (cfs)	Link PR (cfs)
15.60	0.96	0.91
15.65	0.96	0.90
15.70	0.95	0.89
15.75	0.94	0.89
15.80	0.93	0.88
15.85	0.93	0.87
15.90	0.92	0.87
15.95	0.91	0.86
16.00	0.90	0.85
16.05	0.90	0.85
16.10	0.89	0.84
16.15	0.88	0.83
16.20	0.88	0.83
16.25	0.87	0.82
16.30	0.86	0.81
16.35	0.85	0.80
16.40	0.85	0.80
16.45	0.84	0.79
16.50	0.83	0.78
16.55	0.82	0.78
16.60	0.82	0.77
16.65	0.81	0.77
16.70	0.80	0.76
16.75	0.79	0.75
16.80	0.78	0.74
16.85	0.78	0.74
16.90	0.77	0.73
16.95	0.77	0.72
17.00	0.76	0.72
17.05	0.75	0.71
17.10	0.74	0.70
17.15	0.74	0.70
17.20	0.73	0.69
17.25	0.72	0.68
17.30	0.71	0.67
17.35	0.70	0.67
17.40	0.70	0.66
17.45	0.69	0.65
17.50	0.68	0.65
17.55	0.68	0.64
17.60	0.67	0.63
17.65	0.66	0.63
17.70	0.66	0.62
17.75	0.65	0.61
17.80	0.64	0.61
17.85	0.63	0.60
17.90	0.63	0.59
17.95	0.62	0.59
18.00	0.61	0.58
18.05	0.60	0.57
18.10	0.60	0.56
18.15	0.59	0.56
18.20	0.59	0.56
18.25	0.59	0.56
18.30	0.59	0.56
18.35	0.59	0.56
18.40	0.58	0.55
18.45	0.58	0.55
18.50	0.58	0.55
18.55	0.58	0.55
18.60	0.58	0.55
18.65	0.57	0.54
18.70	0.57	0.54
18.75	0.57	0.54
18.80	0.57	0.54
18.85	0.57	0.54
18.90	0.57	0.54
18.95	0.56	0.53
19.00	0.56	0.53
19.05	0.56	0.53
19.10	0.56	0.53
19.15	0.56	0.53
19.20	0.55	0.53
19.25	0.55	0.52
19.30	0.55	0.52
19.35	0.55	0.52
19.40	0.55	0.52
19.45	0.55	0.52
19.50	0.54	0.52
19.55	0.54	0.51
19.60	0.54	0.51
19.65	0.54	0.51
19.70	0.54	0.51
19.75	0.54	0.51
19.80	0.54	0.51
19.85	0.53	0.51
19.90	0.53	0.50
19.95	0.53	0.50
20.00	0.53	0.50
20.05	0.52	0.50
20.10	0.52	0.50
20.15	0.52	0.49
20.20	0.52	0.49
20.25	0.52	0.49
20.30	0.51	0.49
20.35	0.51	0.49
20.40	0.51	0.48
20.45	0.51	0.48
20.50	0.51	0.48
20.55	0.51	0.48
20.60	0.51	0.48
20.65	0.50	0.48
20.70	0.50	0.47
20.75	0.50	0.47
20.80	0.50	0.47
20.85	0.49	0.47
20.90	0.49	0.47
20.95	0.49	0.47
21.00	0.49	0.46
21.05	0.49	0.46
21.10	0.48	0.46
21.15	0.48	0.46
21.20	0.48	0.46
21.25	0.48	0.46
21.30	0.48	0.46
21.35	0.48	0.45
21.40	0.47	0.45
21.45	0.47	0.45
21.50	0.47	0.45
21.55	0.47	0.45
21.60	0.47	0.44
21.65	0.46	0.44
21.70	0.46	0.44
21.75	0.46	0.44
21.80	0.46	0.44
21.85	0.46	0.44
21.90	0.46	0.43
21.95	0.45	0.43
22.00	0.45	0.43
22.05	0.45	0.43
22.10	0.45	0.43
22.15	0.45	0.43
22.20	0.45	0.43
22.25	0.44	0.42
22.30	0.44	0.42
22.35	0.44	0.42
22.40	0.44	0.42
22.45	0.44	0.41
22.50	0.43	0.41
22.55	0.43	0.41
22.60	0.43	0.41
22.65	0.43	0.41
22.70	0.43	0.41
22.75	0.42	0.40
22.80	0.42	0.40
22.85	0.42	0.40
22.90	0.42	0.40
22.95	0.42	0.40
23.00	0.42	0.40
23.05	0.42	0.40
23.10	0.41	0.39
23.15	0.41	0.39
23.20	0.41	0.39
23.25	0.41	0.39
23.30	0.40	0.38
23.35	0.40	0.38

Primary Comparison (continued)

Time (hours)	Link EX (cfs)	Link PR (cfs)
23.40	0.40	0.38
23.45	0.40	0.38
23.50	0.40	0.38
23.55	0.39	0.38
23.60	0.39	0.37
23.65	0.39	0.37
23.70	0.39	0.37
23.75	0.39	0.37
23.80	0.39	0.37
23.85	0.38	0.37
23.90	0.38	0.36
23.95	0.42	0.40
24.00	0.46	0.44
24.05	0.29	0.26
24.10	0.05	0.05
24.15	0.01	0.01
24.20	0.00	0.00
24.25	0.00	0.00
24.30	0.00	0.00
24.35	0.00	0.00
24.40	0.00	0.00
24.45	0.00	0.00
24.50	0.00	0.00
24.55	0.00	0.00
24.60	0.00	0.00
24.65	0.00	0.00
24.70	0.00	0.00
24.75	0.00	0.00
24.80	0.00	0.00
24.85	0.00	0.00
24.90	0.00	0.00
24.95	0.00	0.00
25.00	0.00	0.00
25.05	0.00	0.00
25.10	0.00	0.00
25.15	0.00	0.00
25.20	0.00	0.00
25.25	0.00	0.00
25.30	0.00	0.00
25.35	0.00	0.00
25.40	0.00	0.00
25.45	0.00	0.00
25.50	0.00	0.00
25.55	0.00	0.00
25.60	0.00	0.00
25.65	0.00	0.00
25.70	0.00	0.00
25.75	0.00	0.00
25.80	0.00	0.00
25.85	0.00	0.00
25.90	0.00	0.00
25.95	0.00	0.00
26.00	0.00	0.00
26.05	0.00	0.00
26.10	0.00	0.00
26.15	0.00	0.00
26.20	0.00	0.00
26.25	0.00	0.00
26.30	0.00	0.00
26.35	0.00	0.00
26.40	0.00	0.00
26.45	0.00	0.00
26.50	0.00	0.00
26.55	0.00	0.00
26.60	0.00	0.00
26.65	0.00	0.00
26.70	0.00	0.00
26.75	0.00	0.00
26.80	0.00	0.00
26.85	0.00	0.00
26.90	0.00	0.00
26.95	0.00	0.00
27.00	0.00	0.00

Primary Comparison

Time (hours)	Link EX (cfs)	Link PR (cfs)	Time (hours)	Link EX (cfs)	Link PR (cfs)	Time (hours)	Link EX (cfs)	Link PR (cfs)
0.00	0.00	0.00	2.60	0.38	0.29	5.20	0.67	0.51
0.05	0.00	0.00	2.65	0.39	0.30	5.25	0.67	0.51
0.10	0.00	0.00	2.70	0.39	0.30	5.30	0.67	0.52
0.15	0.00	0.00	2.75	0.40	0.31	5.35	0.68	0.52
0.20	0.00	0.00	2.80	0.41	0.31	5.40	0.68	0.52
0.25	0.00	0.00	2.85	0.42	0.32	5.45	0.69	0.53
0.30	0.00	0.00	2.90	0.42	0.32	5.50	0.69	0.53
0.35	0.00	0.00	2.95	0.43	0.33	5.55	0.70	0.53
0.40	0.00	0.00	3.00	0.43	0.33	5.60	0.70	0.54
0.45	0.00	0.00	3.05	0.44	0.34	5.65	0.70	0.54
0.50	0.00	0.00	3.10	0.45	0.34	5.70	0.71	0.54
0.55	0.00	0.00	3.15	0.45	0.35	5.75	0.71	0.55
0.60	0.00	0.00	3.20	0.46	0.35	5.80	0.72	0.55
0.65	0.00	0.00	3.25	0.47	0.36	5.85	0.72	0.55
0.70	0.00	0.00	3.30	0.47	0.36	5.90	0.72	0.56
0.75	0.00	0.00	3.35	0.48	0.37	5.95	0.73	0.56
0.80	0.00	0.00	3.40	0.48	0.37	6.00	0.73	0.56
0.85	0.01	0.01	3.45	0.49	0.38	6.05	0.74	0.57
0.90	0.03	0.02	3.50	0.50	0.38	6.10	0.75	0.58
0.95	0.04	0.03	3.55	0.50	0.39	6.15	0.76	0.59
1.00	0.06	0.04	3.60	0.51	0.39	6.20	0.77	0.59
1.05	0.07	0.05	3.65	0.51	0.39	6.25	0.78	0.60
1.10	0.08	0.06	3.70	0.52	0.40	6.30	0.80	0.61
1.15	0.10	0.07	3.75	0.53	0.40	6.35	0.81	0.62
1.20	0.11	0.08	3.80	0.53	0.41	6.40	0.82	0.63
1.25	0.12	0.09	3.85	0.54	0.41	6.45	0.83	0.64
1.30	0.13	0.10	3.90	0.54	0.42	6.50	0.84	0.64
1.35	0.15	0.11	3.95	0.55	0.42	6.55	0.85	0.65
1.40	0.16	0.12	4.00	0.55	0.42	6.60	0.86	0.66
1.45	0.17	0.13	4.05	0.56	0.43	6.65	0.87	0.67
1.50	0.18	0.14	4.10	0.56	0.43	6.70	0.88	0.68
1.55	0.19	0.15	4.15	0.57	0.44	6.75	0.89	0.68
1.60	0.20	0.15	4.20	0.57	0.44	6.80	0.90	0.69
1.65	0.21	0.16	4.25	0.58	0.44	6.85	0.91	0.70
1.70	0.22	0.17	4.30	0.59	0.45	6.90	0.93	0.71
1.75	0.23	0.18	4.35	0.59	0.45	6.95	0.94	0.72
1.80	0.24	0.19	4.40	0.59	0.45	7.00	0.95	0.73
1.85	0.25	0.19	4.45	0.60	0.46	7.05	0.96	0.74
1.90	0.26	0.20	4.50	0.60	0.46	7.10	0.97	0.75
1.95	0.27	0.21	4.55	0.61	0.47	7.15	0.98	0.75
2.00	0.28	0.22	4.60	0.61	0.47	7.20	0.99	0.76
2.05	0.29	0.22	4.65	0.62	0.47	7.25	1.00	0.77
2.10	0.30	0.23	4.70	0.62	0.48	7.30	1.01	0.78
2.15	0.31	0.24	4.75	0.63	0.48	7.35	1.03	0.79
2.20	0.31	0.24	4.80	0.63	0.48	7.40	1.04	0.80
2.25	0.32	0.25	4.85	0.64	0.49	7.45	1.05	0.81
2.30	0.33	0.26	4.90	0.64	0.49	7.50	1.06	0.82
2.35	0.34	0.26	4.95	0.64	0.49	7.55	1.07	0.83
2.40	0.35	0.27	5.00	0.65	0.50	7.60	1.08	0.84
2.45	0.36	0.27	5.05	0.65	0.50	7.65	1.10	0.85
2.50	0.36	0.28	5.10	0.66	0.50	7.70	1.11	0.86
2.55	0.37	0.28	5.15	0.66	0.51	7.75	1.12	0.87

Primary Comparison (continued)

Time (hours)	Link EX (cfs)	Link PR (cfs)
7.80	1.13	0.88
7.85	1.14	0.89
7.90	1.16	0.91
7.95	1.17	0.92
8.00	1.18	0.93
8.05	1.19	0.94
8.10	1.20	0.95
8.15	1.21	0.96
8.20	1.23	0.97
8.25	1.24	0.98
8.30	1.25	0.99
8.35	1.26	1.00
8.40	1.27	1.01
8.45	1.28	1.02
8.50	1.30	1.03
8.55	1.31	1.04
8.60	1.32	1.05
8.65	1.33	1.06
8.70	1.34	1.08
8.75	1.35	1.09
8.80	1.36	1.10
8.85	1.37	1.11
8.90	1.39	1.12
8.95	1.40	1.13
9.00	1.41	1.14
9.05	1.45	1.17
9.10	1.48	1.20
9.15	1.52	1.24
9.20	1.56	1.27
9.25	1.60	1.31
9.30	1.65	1.34
9.35	1.69	1.38
9.40	1.72	1.41
9.45	1.76	1.44
9.50	1.80	1.48
9.55	1.85	1.52
9.60	1.89	1.55
9.65	1.93	1.59
9.70	1.97	1.62
9.75	2.01	1.66
9.80	2.05	1.70
9.85	2.09	1.73
9.90	2.14	1.77
9.95	2.17	1.81
10.00	2.21	1.84
10.05	2.25	1.88
10.10	2.30	1.92
10.15	2.34	1.96
10.20	2.38	2.00
10.25	2.42	2.04
10.30	2.46	2.07
10.35	2.50	2.11
10.40	2.55	2.15
10.45	2.59	2.19
10.50	2.64	2.23
10.55	2.76	2.35
10.60	2.92	2.48
10.65	3.07	2.61
10.70	3.22	2.75
10.75	3.37	2.88
10.80	3.53	3.03
10.85	3.69	3.16
10.90	3.85	3.30
10.95	4.00	3.44
11.00	4.16	3.59
11.05	4.42	3.83
11.10	4.71	4.08
11.15	5.00	4.34
11.20	5.30	4.61
11.25	5.58	4.88
11.30	5.88	5.15
11.35	6.17	5.42
11.40	6.47	5.69
11.45	6.71	5.92
11.50	6.97	6.16
11.55	8.51	7.60
11.60	10.43	9.31
11.65	11.05	9.88
11.70	11.45	10.25
11.75	13.18	11.91
11.80	15.36	13.90
11.85	18.20	16.60
11.90	21.44	19.57
11.95	28.32	26.22
12.00	36.54	33.88
12.05	48.23	45.28
12.10	**61.07**	**57.39**
12.15	47.49	44.08
12.20	27.26	25.38
12.25	20.73	19.46
12.30	16.97	16.04
12.35	14.59	13.79
12.40	12.34	11.71
12.45	11.67	11.11
12.50	11.29	10.77
12.55	9.68	9.18
12.60	7.72	7.34
12.65	7.15	6.82
12.70	6.86	6.56
12.75	6.58	6.29
12.80	6.27	6.00
12.85	5.98	5.72
12.90	5.68	5.44
12.95	5.39	5.15
13.00	5.08	4.87
13.05	4.79	4.58
13.10	4.49	4.30
13.15	4.30	4.12
13.20	4.13	3.97
13.25	3.98	3.81
13.30	3.81	3.66
13.35	3.66	3.51
13.40	3.49	3.35
13.45	3.34	3.20
13.50	3.17	3.05
13.55	3.02	2.90
13.60	2.86	2.75
13.65	2.79	2.68
13.70	2.74	2.64
13.75	2.70	2.60
13.80	2.66	2.56
13.85	2.62	2.52
13.90	2.58	2.48
13.95	2.54	2.44
14.00	2.49	2.40
14.05	2.45	2.36
14.10	2.41	2.32
14.15	2.37	2.28
14.20	2.33	2.24
14.25	2.29	2.20
14.30	2.24	2.16
14.35	2.20	2.12
14.40	2.16	2.08
14.45	2.12	2.04
14.50	2.08	2.00
14.55	2.04	1.96
14.60	1.99	1.92
14.65	1.95	1.88
14.70	1.91	1.84
14.75	1.87	1.80
14.80	1.83	1.76
14.85	1.79	1.72
14.90	1.74	1.68
14.95	1.70	1.64
15.00	1.66	1.60
15.05	1.62	1.56
15.10	1.58	1.52
15.15	1.56	1.51
15.20	1.54	1.49
15.25	1.53	1.48
15.30	1.52	1.47
15.35	1.51	1.46
15.40	1.50	1.45
15.45	1.49	1.44
15.50	1.48	1.43
15.55	1.47	1.42

Primary Comparison (continued)

Time (hours)	Link EX (cfs)	Link PR (cfs)
15.60	1.46	1.41
15.65	1.45	1.40
15.70	1.43	1.38
15.75	1.42	1.37
15.80	1.41	1.36
15.85	1.40	1.35
15.90	1.39	1.35
15.95	1.38	1.33
16.00	1.37	1.32
16.05	1.36	1.31
16.10	1.35	1.30
16.15	1.34	1.29
16.20	1.33	1.28
16.25	1.31	1.27
16.30	1.30	1.26
16.35	1.29	1.25
16.40	1.28	1.24
16.45	1.27	1.23
16.50	1.25	1.21
16.55	1.25	1.20
16.60	1.24	1.20
16.65	1.23	1.19
16.70	1.22	1.18
16.75	1.20	1.16
16.80	1.19	1.15
16.85	1.18	1.14
16.90	1.17	1.13
16.95	1.16	1.12
17.00	1.15	1.11
17.05	1.14	1.10
17.10	1.13	1.09
17.15	1.12	1.08
17.20	1.10	1.07
17.25	1.09	1.06
17.30	1.08	1.04
17.35	1.07	1.03
17.40	1.06	1.02
17.45	1.05	1.01
17.50	1.04	1.00
17.55	1.03	0.99
17.60	1.01	0.98
17.65	1.00	0.97
17.70	0.99	0.96
17.75	0.98	0.95
17.80	0.97	0.94
17.85	0.96	0.93
17.90	0.95	0.92
17.95	0.94	0.91
18.00	0.93	0.90
18.05	0.91	0.89
18.10	0.90	0.87
18.15	0.90	0.87
18.20	0.90	0.87
18.25	0.89	0.86
18.30	0.89	0.86
18.35	0.89	0.86
18.40	0.88	0.86
18.45	0.88	0.85
18.50	0.88	0.85
18.55	0.88	0.85
18.60	0.87	0.85
18.65	0.87	0.84
18.70	0.87	0.84
18.75	0.86	0.84
18.80	0.86	0.84
18.85	0.86	0.83
18.90	0.86	0.83
18.95	0.85	0.83
19.00	0.85	0.82
19.05	0.85	0.82
19.10	0.85	0.82
19.15	0.84	0.82
19.20	0.84	0.81
19.25	0.84	0.81
19.30	0.83	0.81
19.35	0.83	0.81
19.40	0.83	0.80
19.45	0.83	0.80
19.50	0.82	0.80
19.55	0.82	0.80
19.60	0.82	0.79
19.65	0.81	0.79
19.70	0.81	0.79
19.75	0.81	0.79
19.80	0.81	0.79
19.85	0.81	0.78
19.90	0.80	0.78
19.95	0.80	0.77
20.00	0.80	0.77
20.05	0.79	0.77
20.10	0.79	0.77
20.15	0.79	0.76
20.20	0.78	0.76
20.25	0.78	0.76
20.30	0.78	0.76
20.35	0.78	0.75
20.40	0.77	0.75
20.45	0.77	0.75
20.50	0.77	0.74
20.55	0.77	0.74
20.60	0.77	0.74
20.65	0.76	0.74
20.70	0.76	0.73
20.75	0.75	0.73
20.80	0.75	0.73
20.85	0.75	0.73
20.90	0.74	0.72
20.95	0.74	0.72
21.00	0.74	0.72
21.05	0.74	0.72
21.10	0.73	0.71
21.15	0.73	0.71
21.20	0.73	0.71
21.25	0.73	0.71
21.30	0.73	0.71
21.35	0.72	0.70
21.40	0.72	0.70
21.45	0.71	0.69
21.50	0.71	0.69
21.55	0.71	0.69
21.60	0.71	0.69
21.65	0.70	0.68
21.70	0.70	0.68
21.75	0.70	0.68
21.80	0.70	0.68
21.85	0.70	0.68
21.90	0.69	0.67
21.95	0.69	0.67
22.00	0.68	0.66
22.05	0.68	0.66
22.10	0.68	0.66
22.15	0.68	0.66
22.20	0.68	0.66
22.25	0.67	0.65
22.30	0.67	0.65
22.35	0.66	0.65
22.40	0.66	0.64
22.45	0.66	0.64
22.50	0.66	0.64
22.55	0.66	0.64
22.60	0.65	0.64
22.65	0.65	0.63
22.70	0.64	0.63
22.75	0.64	0.62
22.80	0.64	0.62
22.85	0.64	0.62
22.90	0.63	0.62
22.95	0.63	0.61
23.00	0.63	0.61
23.05	0.63	0.61
23.10	0.62	0.61
23.15	0.62	0.60
23.20	0.62	0.60
23.25	0.61	0.60
23.30	0.61	0.59
23.35	0.61	0.59

Primary Comparison (continued)

Time (hours)	Link EX (cfs)	Link PR (cfs)
23.40	0.61	0.59
23.45	0.61	0.59
23.50	0.60	0.58
23.55	0.60	0.58
23.60	0.59	0.58
23.65	0.59	0.58
23.70	0.59	0.58
23.75	0.59	0.57
23.80	0.58	0.57
23.85	0.58	0.56
23.90	0.58	0.56
23.95	0.63	0.62
24.00	0.70	0.68
24.05	0.43	0.41
24.10	0.08	0.07
24.15	0.01	0.01
24.20	0.00	0.00
24.25	0.00	0.00
24.30	0.00	0.00
24.35	0.00	0.00
24.40	0.00	0.00
24.45	0.00	0.00
24.50	0.00	0.00
24.55	0.00	0.00
24.60	0.00	0.00
24.65	0.00	0.00
24.70	0.00	0.00
24.75	0.00	0.00
24.80	0.00	0.00
24.85	0.00	0.00
24.90	0.00	0.00
24.95	0.00	0.00
25.00	0.00	0.00
25.05	0.00	0.00
25.10	0.00	0.00
25.15	0.00	0.00
25.20	0.00	0.00
25.25	0.00	0.00
25.30	0.00	0.00
25.35	0.00	0.00
25.40	0.00	0.00
25.45	0.00	0.00
25.50	0.00	0.00
25.55	0.00	0.00
25.60	0.00	0.00
25.65	0.00	0.00
25.70	0.00	0.00
25.75	0.00	0.00
25.80	0.00	0.00
25.85	0.00	0.00
25.90	0.00	0.00
25.95	0.00	0.00
26.00	0.00	0.00
26.05	0.00	0.00
26.10	0.00	0.00
26.15	0.00	0.00
26.20	0.00	0.00
26.25	0.00	0.00
26.30	0.00	0.00
26.35	0.00	0.00
26.40	0.00	0.00
26.45	0.00	0.00
26.50	0.00	0.00
26.55	0.00	0.00
26.60	0.00	0.00
26.65	0.00	0.00
26.70	0.00	0.00
26.75	0.00	0.00
26.80	0.00	0.00
26.85	0.00	0.00
26.90	0.00	0.00
26.95	0.00	0.00
27.00	0.00	0.00

Primary Comparison

Time (hours)	Link EX (cfs)	Link PR (cfs)	Time (hours)	Link EX (cfs)	Link PR (cfs)	Time (hours)	Link EX (cfs)	Link PR (cfs)
0.00	0.00	0.00	2.60	0.81	0.62	5.20	1.21	0.94
0.05	0.00	0.00	2.65	0.82	0.63	5.25	1.22	0.94
0.10	0.00	0.00	2.70	0.84	0.64	5.30	1.22	0.95
0.15	0.00	0.00	2.75	0.85	0.65	5.35	1.23	0.96
0.20	0.00	0.00	2.80	0.86	0.66	5.40	1.24	0.96
0.25	0.00	0.00	2.85	0.87	0.67	5.45	1.24	0.97
0.30	0.00	0.00	2.90	0.87	0.67	5.50	1.25	0.98
0.35	0.00	0.00	2.95	0.88	0.68	5.55	1.25	0.98
0.40	0.00	0.00	3.00	0.89	0.68	5.60	1.26	0.99
0.45	0.00	0.00	3.05	0.90	0.69	5.65	1.27	1.00
0.50	0.00	0.00	3.10	0.91	0.70	5.70	1.27	1.00
0.55	0.03	0.02	3.15	0.92	0.70	5.75	1.28	1.01
0.60	0.06	0.05	3.20	0.93	0.71	5.80	1.28	1.02
0.65	0.10	0.08	3.25	0.94	0.72	5.85	1.29	1.02
0.70	0.13	0.10	3.30	0.94	0.72	5.90	1.30	1.03
0.75	0.17	0.13	3.35	0.95	0.73	5:95	1.30	1.03
0.80	0.20	0.15	3.40	0.96	0.74	6.00	1.31	1.04
0.85	0.22	0.17	3.45	0.97	0.75	6.05	1.32	1.05
0.90	0.25	0.19	3.50	0.98	0.75	6.10	1.34	1.07
0.95	0.28	0.21	3.55	0.99	0.76	6.15	1.36	1.09
1.00	0.31	0.23	3.60	0.99	0.76	6.20	1.38	1.10
1.05	0.33	0.25	3.65	1.00	0.77	6.25	1.40	1.12
1.10	0.36	0.27	3.70	1.01	0.77	6.30	1.42	1.14
1.15	0.38	0.29	3.75	1.02	0.78	6.35	1.43	1.15
1.20	0.40	0.31	3.80	1.02	0.78	6.40	1.45	1.17
1.25	0.42	0.32	3.85	1.03	0.79	6.45	1.47	1.18
1.30	0.44	0.34	3.90	1.04	0.80	6.50	1.49	1.20
1.35	0.46	0.35	3.95	1.04	0.80	6.55	1.51	1.22
1.40	0.48	0.37	4.00	1.05	0.81	6.60	1.53	1.23
1.45	0.50	0.38	4.05	1.06	0.81	6.65	1.54	1.25
1.50	0.52	0.40	4.10	1.07	0.82	6.70	1.56	1.27
1.55	0.54	0.41	4.15	1.07	0.82	6.75	1.58	1.28
1.60	0.55	0.42	4.20	1.08	0.83	6.80	1.59	1.30
1.65	0.57	0.44	4.25	1.09	0.84	6.85	1.61	1.32
1.70	0.58	0.45	4.30	1.10	0.84	6.90	1.64	1.34
1.75	0.60	0.46	4.35	1.10	0.85	6.95	1.66	1.35
1.80	0.62	0.47	4.40	1.11	0.85	7.00	1.68	1.37
1.85	0.63	0.49	4.45	1.11	0.85	7.05	1.69	1.39
1.90	0.65	0.50	4.50	1.12	0.86	7.10	1.71	1.41
1.95	0.66	0.51	4.55	1.13	0.86	7.15	1.73	1.42
2.00	0.67	0.52	4.60	1.13	0.87	7.20	1.75	1.44
2.05	0.69	0.53	4.65	1.14	0.87	7.25	1.77	1.45
2.10	0.70	0.54	4.70	1.15	0.88	7.30	1.78	1.47
2.15	0.71	0.55	4.75	1.15	0.88	7.35	1.80	1.49
2.20	0.72	0.56	4.80	1.16	0.89	7.40	1.82	1.51
2.25	0.74	0.57	4.85	1.16	0.89	7.45	1.84	1.53
2.30	0.75	0.58	4.90	1.17	0.90	7.50	1.86	1.55
2.35	0.76	0.59	4.95	1.18	0.91	7.55	1.88	1.56
2.40	0.77	0.59	5.00	1.18	0.91	7.60	1.89	1.58
2.45	0.78	0.60	5.05	1.19	0.92	7.65	1.91	1.60
2.50	0.79	0.61	5.10	1.20	0.92	7.70	1.94	1.62
2.55	0.80	0.62	5.15	1.20	0.93	7.75	1.95	1.63

Primary Comparison (continued)

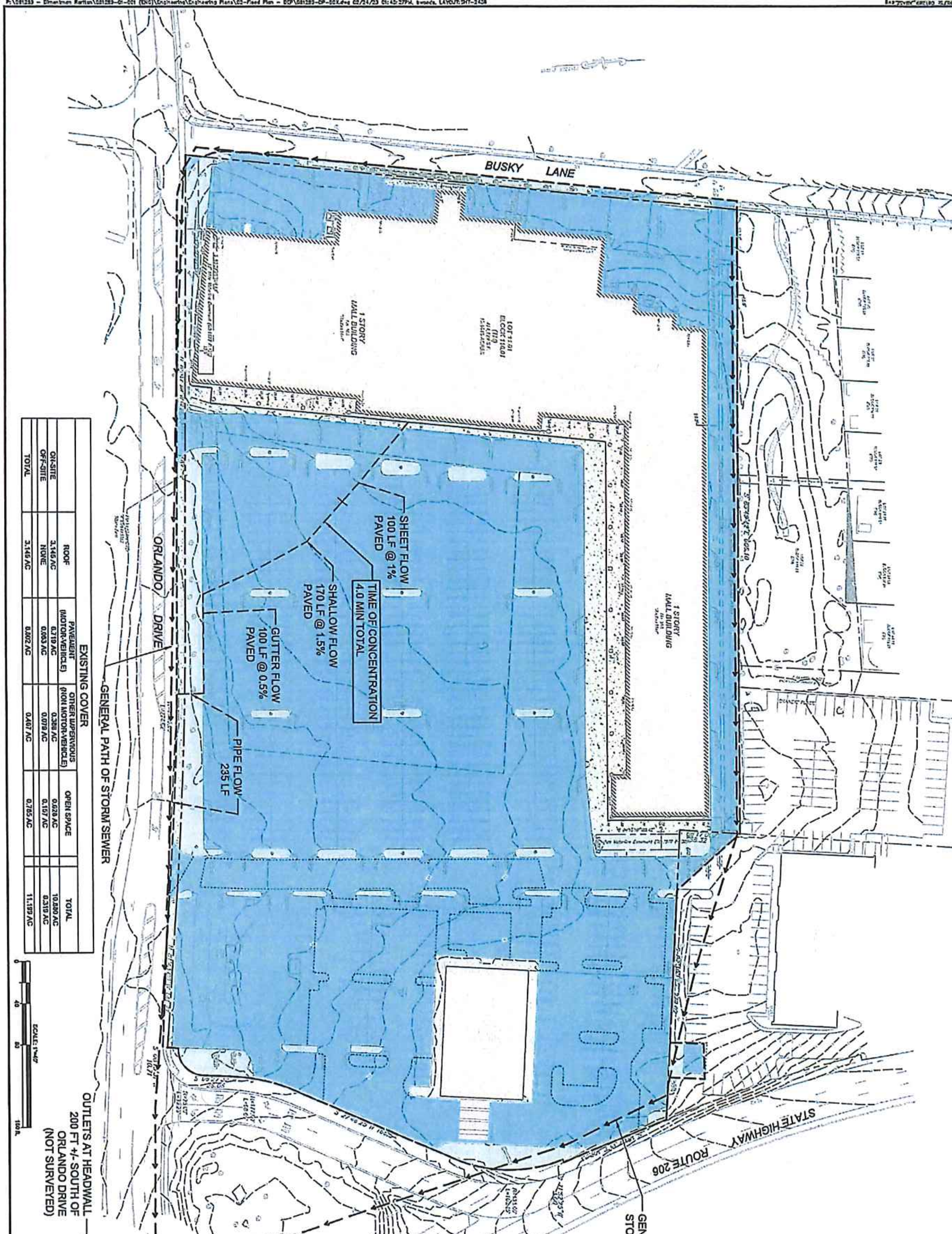
Time (hours)	Link EX (cfs)	Link PR (cfs)	Time (hours)	Link EX (cfs)	Link PR (cfs)	Time (hours)	Link EX (cfs)	Link PR (cfs)
7.80	1.97	1.65	10.40	4.32	3.87	13.00	8.39	8.21
7.85	1.99	1.67	10.45	4.39	3.94	13.05	7.91	7.74
7.90	2.01	1.69	10.50	4.47	4.01	13.10	7.41	7.25
7.95	2.03	1.71	10.55	4.68	4.22	13.15	7.11	6.95
8.00	2.05	1.73	10.60	4.94	4.45	13.20	6.83	6.69
8.05	2.07	1.74	10.65	5.19	4.69	13.25	6.57	6.43
8.10	2.08	1.76	10.70	5.45	4.93	13.30	6.30	6.17
8.15	2.10	1.78	10.75	5.71	5.17	13.35	6.04	5.91
8.20	2.13	1.80	10.80	5.98	5.41	13.40	5.77	5.65
8.25	2.14	1.81	10.85	6.23	5.66	13.45	5.51	5.40
8.30	2.16	1.83	10.90	6.49	5.90	13.50	5.24	5.14
8.35	2.18	1.85	10.95	6.75	6.15	13.55	4.99	4.88
8.40	2.20	1.87	11.00	7.02	6.40	13.60	4.72	4.63
8.45	2.22	1.89	11.05	7.45	6.82	13.65	4.61	4.52
8.50	2.24	1.91	11.10	7.94	7.27	13.70	4.53	4.44
8.55	2.26	1.93	11.15	8.42	7.72	13.75	4.46	4.38
8.60	2.27	1.94	11.20	8.92	8.19	13.80	4.39	4.31
8.65	2.29	1.96	11.25	9.39	8.65	13.85	4.33	4.25
8.70	2.32	1.98	11.30	9.90	9.12	13.90	4.26	4.18
8.75	2.33	2.00	11.35	10.38	9.59	13.95	4.19	4.11
8.80	2.35	2.02	11.40	10.88	10.07	14.00	4.12	4.04
8.85	2.37	2.03	11.45	11.27	10.46	14.05	4.05	3.97
8.90	2.39	2.05	11.50	11.70	10.87	14.10	3.98	3.90
8.95	2.41	2.08	11.55	14.28	13.39	14.15	3.91	3.84
9.00	2.43	2.10	11.60	17.49	16.37	14.20	3.85	3.78
9.05	2.49	2.15	11.65	18.52	17.34	14.25	3.78	3.71
9.10	2.55	2.20	11.70	19.16	17.96	14.30	3.70	3.64
9.15	2.61	2.26	11.75	22.05	20.84	14.35	3.63	3.57
9.20	2.68	2.33	11.80	25.67	24.27	14.40	3.56	3.50
9.25	2.75	2.39	11.85	30.39	28.92	14.45	3.50	3.44
9.30	2.82	2.46	11.90	35.76	34.02	14.50	3.43	3.37
9.35	2.89	2.51	11.95	47.19	45.43	14.55	3.36	3.30
9.40	2.95	2.57	12.00	60.82	58.51	14.60	3.29	3.23
9.45	3.02	2.63	12.05	80.16	77.86	14.65	3.22	3.16
9.50	3.09	2.70	12.10	**101.36**	**98.26**	14.70	3.15	3.09
9.55	3.16	2.76	12.15	78.73	75.22	14.75	3.08	3.03
9.60	3.23	2.83	12.20	45.17	43.21	14.80	3.02	2.97
9.65	3.29	2.89	12.25	34.33	33.07	14.85	2.95	2.90
9.70	3.36	2.95	12.30	28.09	27.24	14.90	2.87	2.82
9.75	3.43	3.01	12.35	24.14	23.39	14.95	2.80	2.75
9.80	3.50	3.08	12.40	20.41	19.85	15.00	2.73	2.69
9.85	3.57	3.15	12.45	19.30	18.82	15.05	2.67	2.62
9.90	3.64	3.22	12.50	18.67	18.22	15.10	2.60	2.56
9.95	3.70	3.28	12.55	16.01	15.54	15.15	2.57	2.53
10.00	3.77	3.34	12.60	12.76	12.42	15.20	2.55	2.51
10.05	3.84	3.40	12.65	11.82	11.53	15.25	2.53	2.49
10.10	3.91	3.47	12.70	11.34	11.09	15.30	2.51	2.47
10.15	3.98	3.54	12.75	10.87	10.62	15.35	2.50	2.45
10.20	4.05	3.61	12.80	10.37	10.14	15.40	2.48	2.44
10.25	4.12	3.67	12.85	9.89	9.66	15.45	2.46	2.42
10.30	4.18	3.74	12.90	9.38	9.18	15.50	2.44	2.40
10.35	4.25	3.80	12.95	8.90	8.70	15.55	2.42	2.38

Primary Comparison (continued)

Time (hours)	Link EX (cfs)	Link PR (cfs)	Time (hours)	Link EX (cfs)	Link PR (cfs)	Time (hours)	Link EX (cfs)	Link PR (cfs)
15.60	2.41	2.37	18.20	1.48	1.45	20.80	1.24	1.22
15.65	2.39	2.35	18.25	1.47	1.45	20.85	1.23	1.22
15.70	2.36	2.33	18.30	1.47	1.45	20.90	1.23	1.21
15.75	2.35	2.31	18.35	1.46	1.44	20.95	1.22	1.21
15.80	2.33	2.29	18.40	1.46	1.44	21.00	1.22	1.20
15.85	2.31	2.27	18.45	1.45	1.43	21.05	1.21	1.20
15.90	2.30	2.26	18.50	1.45	1.43	21.10	1.21	1.19
15.95	2.28	2.24	18.55	1.44	1.42	21.15	1.20	1.19
16.00	2.25	2.22	18.60	1.44	1.42	21.20	1.20	1.18
16.05	2.24	2.20	18.65	1.44	1.41	21.25	1.20	1.18
16.10	2.22	2.19	18.70	1.43	1.41	21.30	1.20	1.18
16.15	2.21	2.17	18.75	1.43	1.40	21.35	1.19	1.18
16.20	2.19	2.15	18.80	1.42	1.40	21.40	1.18	1.17
16.25	2.17	2.13	18.85	1.42	1.40	21.45	1.18	1.16
16.30	2.14	2.11	18.90	1.41	1.39	21.50	1.17	1.16
16.35	2.13	2.09	18.95	1.41	1.39	21.55	1.17	1.15
16.40	2.11	2.08	19.00	1.40	1.38	21.60	1.16	1.15
16.45	2.09	2.06	19.05	1.40	1.38	21.65	1.16	1.14
16.50	2.07	2.04	19.10	1.39	1.37	21.70	1.15	1.14
16.55	2.05	2.02	19.15	1.39	1.37	21.75	1.15	1.14
16.60	2.04	2.01	19.20	1.38	1.36	21.80	1.15	1.14
16.65	2.02	1.99	19.25	1.38	1.36	21.85	1.15	1.13
16.70	2.00	1.97	19.30	1.38	1.36	21.90	1.14	1.12
16.75	1.98	1.95	19.35	1.37	1.35	21.95	1.13	1.12
16.80	1.96	1.93	19.40	1.37	1.35	22.00	1.13	1.11
16.85	1.94	1.91	19.45	1.36	1.34	22.05	1.12	1.11
16.90	1.93	1.90	19.50	1.36	1.34	22.10	1.12	1.10
16.95	1.91	1.88	19.55	1.35	1.33	22.15	1.12	1.10
17.00	1.89	1.86	19.60	1.35	1.33	22.20	1.12	1.10
17.05	1.88	1.85	19.65	1.34	1.32	22.25	1.11	1.09
17.10	1.86	1.83	19.70	1.34	1.32	22.30	1.10	1.09
17.15	1.84	1.81	19.75	1.34	1.32	22.35	1.09	1.08
17.20	1.82	1.79	19.80	1.34	1.32	22.40	1.09	1.08
17.25	1.80	1.77	19.85	1.33	1.31	22.45	1.09	1.07
17.30	1.78	1.75	19.90	1.32	1.30	22.50	1.08	1.07
17.35	1.76	1.73	19.95	1.32	1.30	22.55	1.08	1.07
17.40	1.75	1.72	20.00	1.31	1.29	22.60	1.08	1.06
17.45	1.73	1.70	20.05	1.31	1.29	22.65	1.07	1.06
17.50	1.71	1.68	20.10	1.30	1.28	22.70	1.06	1.05
17.55	1.69	1.67	20.15	1.30	1.28	22.75	1.06	1.04
17.60	1.67	1.65	20.20	1.29	1.27	22.80	1.05	1.04
17.65	1.65	1.63	20.25	1.29	1.27	22.85	1.05	1.03
17.70	1.64	1.61	20.30	1.28	1.27	22.90	1.04	1.03
17.75	1.62	1.59	20.35	1.28	1.26	22.95	1.04	1.03
17.80	1.60	1.58	20.40	1.27	1.26	23.00	1.04	1.03
17.85	1.58	1.56	20.45	1.27	1.25	23.05	1.04	1.02
17.90	1.56	1.54	20.50	1.26	1.25	23.10	1.03	1.01
17.95	1.54	1.52	20.55	1.26	1.25	23.15	1.02	1.01
18.00	1.53	1.50	20.60	1.26	1.25	23.20	1.02	1.00
18.05	1.51	1.48	20.65	1.26	1.24	23.25	1.01	1.00
18.10	1.49	1.47	20.70	1.25	1.23	23.30	1.01	0.99
18.15	1.48	1.46	20.75	1.24	1.22	23.35	1.01	0.99

Primary Comparison (continued)

Time (hours)	Link EX (cfs)	Link PR (cfs)
23.40	1.01	0.99
23.45	1.00	0.99
23.50	0.99	0.98
23.55	0.98	0.97
23.60	0.98	0.97
23.65	0.98	0.97
23.70	0.98	0.97
23.75	0.97	0.96
23.80	0.96	0.95
23.85	0.96	0.94
23.90	0.95	0.94
23.95	1.04	1.03
24.00	1.15	1.13
24.05	0.71	0.68
24.10	0.14	0.12
24.15	0.02	0.02
24.20	0.00	0.00
24.25	0.00	0.00
24.30	0.00	0.00
24.35	0.00	0.00
24.40	0.00	0.00
24.45	0.00	0.00
24.50	0.00	0.00
24.55	0.00	0.00
24.60	0.00	0.00
24.65	0.00	0.00
24.70	0.00	0.00
24.75	0.00	0.00
24.80	0.00	0.00
24.85	0.00	0.00
24.90	0.00	0.00
24.95	0.00	0.00
25.00	0.00	0.00
25.05	0.00	0.00
25.10	0.00	0.00
25.15	0.00	0.00
25.20	0.00	0.00
25.25	0.00	0.00
25.30	0.00	0.00
25.35	0.00	0.00
25.40	0.00	0.00
25.45	0.00	0.00
25.50	0.00	0.00
25.55	0.00	0.00
25.60	0.00	0.00
25.65	0.00	0.00
25.70	0.00	0.00
25.75	0.00	0.00
25.80	0.00	0.00
25.85	0.00	0.00
25.90	0.00	0.00
25.95	0.00	0.00
26.00	0.00	0.00
26.05	0.00	0.00
26.10	0.00	0.00
26.15	0.00	0.00
26.20	0.00	0.00
26.25	0.00	0.00
26.30	0.00	0.00
26.35	0.00	0.00
26.40	0.00	0.00
26.45	0.00	0.00
26.50	0.00	0.00
26.55	0.00	0.00
26.60	0.00	0.00
26.65	0.00	0.00
26.70	0.00	0.00
26.75	0.00	0.00
26.80	0.00	0.00
26.85	0.00	0.00
26.90	0.00	0.00
26.95	0.00	0.00
27.00	0.00	0.00



EXISTING COVER

	ROOF	PAVEMENT (MOTOR-VEHICLE)	OTHER IMPERVIOUS (NON MOTOR-VEHICLE)	OPEN SPACE	TOTAL
ON-SITE	3.146 AC	0.719 AC	0.388 AC	0.628 AC	10.880 AC
OFF-SITE	NONE	0.083 AC	0.079 AC	0.157 AC	0.319 AC
TOTAL	3.146 AC	0.802 AC	0.467 AC	0.785 AC	11.199 AC

FLOOD HAZARD VERIFICATION AND PERMITTING PLANS

RARITAN LOFTS EXISTING DRAINAGE AREA MAP

BLOCK 116.01, LOT 11.01

BOROUGH OF RARITAN, SOMERSET COUNTY, NEW JERSEY

SHEET No. 1 OF 2

Bowman Consulting Group Ltd

ERIC L. KELLER, N.J. Professional Engineer, Lic. 24GE03205400

Bowman

PROJ.: 081289-01-001
DATE: 2-22-23

	REVISION	DATE	CHKD
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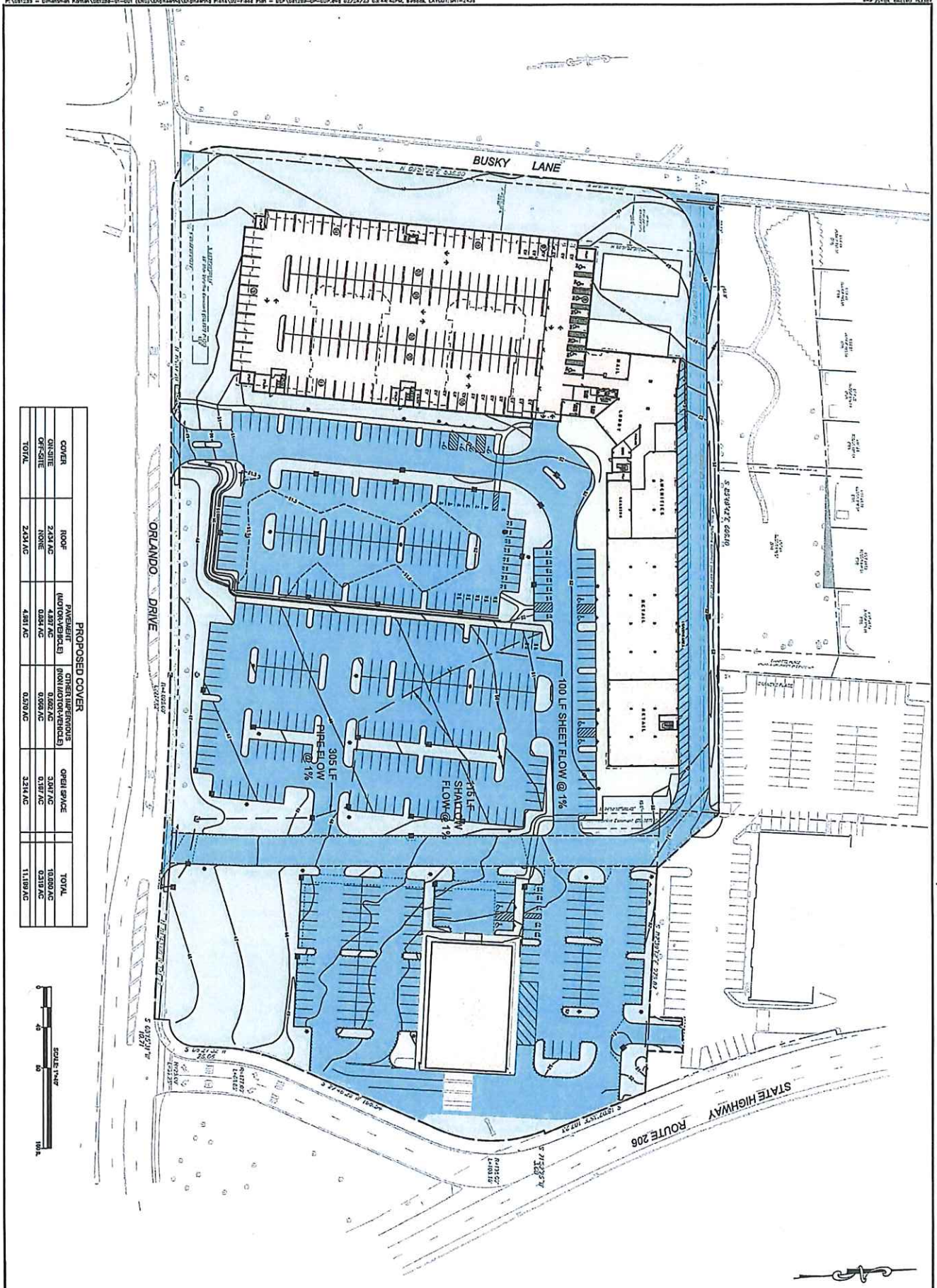

PROPOSED COVER

COVER	ROOF	PAVEMENT (MOTOR-VEHICLE)	OTHER IMPERVIOUS (NON MOTOR-VEHICLE)	OPEN SPACE	TOTAL
ON-SITE	2.434 AC	4.897 AC	0.662 AC	3.047 AC	10.000 AC
OFF-SITE	NONE	0.084 AC	0.008 AC	0.197 AC	0.319 AC
TOTAL	2.434 AC	4.981 AC	0.670 AC	3.244 AC	11.189 AC

FLOOD HAZARD VERIFICATION AND PERMITTING PLANS

RARITAN LOFTS
PROPOSED DRAINAGE AREA MAP

BLOCK 116.01, LOT 11.01

BOROUGH OF RARITAN, SOMERSET COUNTY, NEW JERSEY

SHEET No. 2 OF 2

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ERIC L. KELLER, N.J. Professional Engineer, Lic. 24GE03205400

Bowman

PROJ.: 081289-01-001
DATE: 2-23-23
DWG.

NO.	REVISION	DATE	DWG
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