

Borough of Bergenfield
Site Plan Committee Minutes
March 8, 2021

1. Call to Order

The meeting was called to order at 7:00 PM

2. Roll Call:

	<u>Robert Rivas</u>	<u>Robert Mader</u>	<u>Chris Naylis</u>
		<u>John Pampaloni</u>	<u>Michael Ravenda</u>
<u>Scott Jezequel</u>	<u>Joseph Scalora</u>		<u>Hernando Rivera</u>
<u>Perry Sulich</u>	<u>Lou Turso</u>		

3. Item 1.

Sixboro Holdings
40 Hickory Avenue
Bergenfield, NJ 07621

Site Address 40, 44,46,48Hickory Avenue
Seeks to build 18 unit Townhouse with 4 affordable rental units Seeking Use Change, and 5 bulk variances.

Attorney: Nylema Nabbie
Cleary-Giacobbe-Alfieri-Jacobs LLC
169 Ramapo Valley Road UL 105
Oakland, NJ 07436
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nnabbie@cgajlaw.com

Architect: Matthew B. Jarmel
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Engineer: Gerard P. Gesario PE
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42 Okner Parkway
Livingston, NJ 07039
973-994-9669 FAX 973-994-4069
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Open Meeting:

Joe Scalora opened the meeting at 7:00PM

Brian Chewcaskie:

Bruce presented the project and gave a brief yet detailed synopsis. He turned it over to Gerard Gesario from the Engineering firm

Gerard Gesario from Jarmel Kizel covered the following points:

- Description of lot size just under 39,000sqft
- Location of proposed building
- Storm water management system
- Fire Hydrant location, rear of driveway
- Underground utilities

Matthew Jarmel the architect for the project gave a description of the building:

- Approximately 1900 sqft per unit
- Above average finishes in and out
- Azak trim
- Cementous siding
- Price point is \$500,000

The meeting was opened up for comments from board members

Joe Scalora:

- Questions visitor parking spaces
- Height of building is well over limit
- Lot coverage was over limit

Matthew Jarmel:

- The height of the building on the plans is to the top of the ridge, if measured to the mean height of the roof it becomes very close to the 35 Limit for a R-M use.
- Overflow visitor parking will have to be on Hickory Avenue

John Pampaloni:

- Concerned about overwhelming the school system
- Townhomes do not fit into the area
- Any consideration given to single family homes
- Concerned about drastic changes to neighborhood and changing the character of the town.
- Questioned snow removal

- Questioned trash pick up, borough garbage trucks will not enter private property. They would need to put borough trash bins on the curb or have private garbage collection.

Edwin – Sixboro Holdings, LLC Applicant :

- When designing the building they were careful not to propose a large multi family building that would not be attractive.
- The new townhomes proposed are 2 bedroom and would not add a huge burden on the school system
- The new townhomes would add ratables
- They added the 4 affordable rental units to help Bergenfield residents
- They would have a HOA set up if the project went through.
- They have no formal plan for snow or sanitation, but are not opposed to private sanitation. If the snow needed to be removed, the maintenance contractor would handle it.

Perry Sulich:

- Questioned the door sizes and stairwell and hallway dimensions in regards to EMT bringing people in or out.
- Expressed concern and thought project is “over building” Bergenfield

Matthew Jarmel:

- Entry doors will be 36”
- Hallways and stairwells will be 42”

William Schmidt – Applicant:

- The townhome units will be sold, only the 4 affordable units will be rentals.
- The townhomes will provide entry level housing for professionals and perhaps current Bergenfield residents that want to own their own home.

Joe Scalora:

- Will the buildings have elevators?

Matthew Jarmel:

- The buildings are single family units and are not required to have an elevator.

Edwin – Applicant:

- With the price point in the \$ 500,000 range, it will be affordable to existing Bergenfield residents.

Chris Naylis:

- Questioned type of construction and construction materials
- Floor joists, roof trusses
- Will attics be separated?

- 150' maximum distance for fire truck without a turn around
- Fire hydrant at rear of property, should be closer to Hickory
- Consider flow requirements at hydrant
- Sprinkler system with a FDC at Hickory is what the FD would prefer
- Eliminate 2 rear units to accommodate turn around.

Matthew Jarmel:

- I will discuss all the recommendations with my client
- The attic spaces will be separated

Mike Ravenda Construction Official:

- The first variance needed is to change the zoning from R-5 to R-M,
- The zoning requirements for the R-M use are very different from those of an R-5, the front yard set back is 35', the side and rear setbacks are 25' and the lot coverage is 20%
- The density is 12 units per acre
- The applicant needs to look at Article VII in Chapter 186 which covers all the requirements for an R-M zone.

Brian Chewcaskie:

- He and his clients are aware of the variances needed

Robert Mader BPD:

- Concern over adequate lighting around all sides of the buildings
- Emphasized no overnight street parking
- Concerned over increased traffic close to existing intersections

Mike Ravanda:

- The lighting requirements are covered in Article VII in Chapter 186

Lou Turso:

- Fire hydrant connections are to 4" national standard
- Move hydrant to Hickory Avenue
- Hydrant must be red, not yellow

Richard Morf:

- Project is too large for area
- Opposed to granting use variance
- Project belongs in B-1 B-2 or R-M Zones
- Too many variances needed

Brian Chewcaskie:

- Brian thanked everyone for their time and input. Their team will address all the concerns and technical issues raised by the committee.

Summary:

- Overall, the members were opposed to the project based on density, size and the variances needed.
- The Fire Department had major issues with the travel distance for equipment, without a turn around.
- The Fire Department would like to see the buildings reduced in size and would like to see a sprinkler system installed, with a FDC at Hickory Avenue.
- The general consensus of the committee is that they encourage development, but development which is consistent with a R-5, R-6 Zone



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NJ State Board Of Architects Authorization No. T61
NJ State Board Of Engineers & Land Surveyors Authorization No. GA-278177

ISSUE			
NO.	DATE	DESCRIPTION	INT.
1	01.21.2021	INITIAL ZONING BOARD SUBMISSION	GG

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 IRWIN H. KIZEL, AIA, PP
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 JASMINE ALCAIDE, AIA
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 DAVID L. LESSEUR, RA
 KAROLINA FIOKAKOWICZ, AIA
 CHERYL SCHWEIDER, RA
 AMEET SINGH, RA
 MICHAEL J. VORLAND, AIA

Project Number: SIXBORO-S-20-214	Scale: AS NOTED
Drawn By: K.S.	Approved By: G.P.G.

Drawing Number:
C-002
2 OF 15

Initial Date: DECEMBER 7, 2020

ENGINEER OF RECORD

GERARD P. GESARIO, PE
NJ UC 24GE03825500 EXP. 4/30/22



SCALE: 1"=20'



REVISION			
NO.	DATE	DESCRIPTION	INT

EXISTING CONDITIONS
PLAN

C-100
3 OF 15

Initial Date: DECEMBER 7, 2021

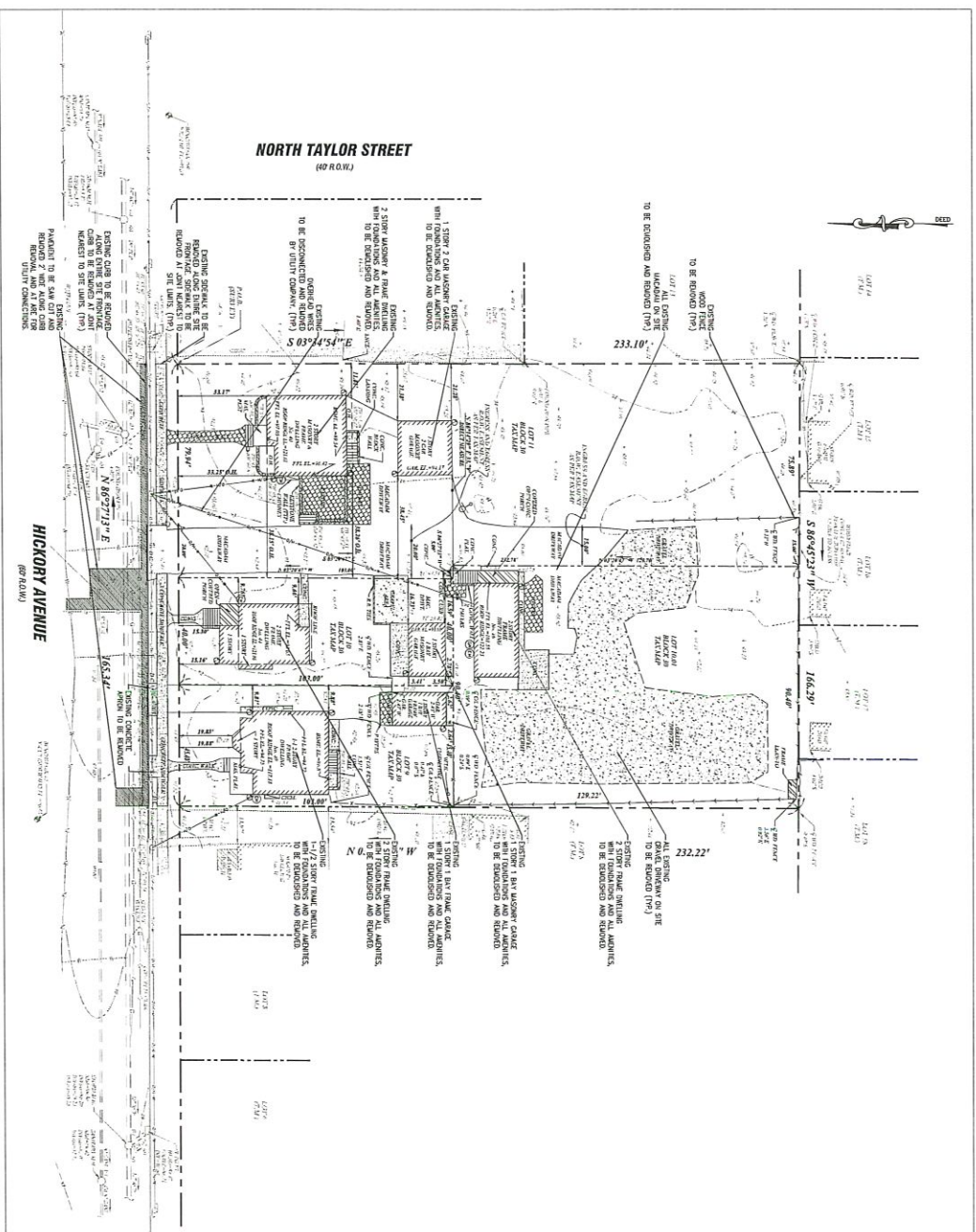
ENGINEER OF RECORD

GERARD P. GESARIO,
ALBINO J. CHENIERE, DVM
EPM 4/92

- REMARKS:**

DEVELOPMENT NOTES:

- [illegible]



DEMOLITION PLAN
SCALE: 1"=20'



ISSUE			
NO.	DATE	DESCRIPTION	INITIALS
1	01/21/2021	INITIAL ZONE BOARD DISTRIBUTION	CA

REVISION			
NO.	DATE	DESCRIPTION	INT.

Project: TOWNHOUSE DEVELOPMENT 40, 44, 46 & 48 HICKORY AVENUE BOROUGH OF BERGENFIELD BERGEN COUNTY, NEW JERSEY BLOCK 30, LOTS 8, 10, 10.01 & 11	
Project Number: SIXBORO-S-20-214	Scale: $1" = 20'$
Drawn By: A.P.P.	Approved By: G.P.G.
Drawing Name:	

DEMOLITION
PLAN

C-200

ENGINEER OF RECORD

GERARDO P. GESARIO
ALICIA HERRERA



Jarmel Kizel
ARCHITECTS AND ENGINEERS INC.

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Engineering
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Implementation Services

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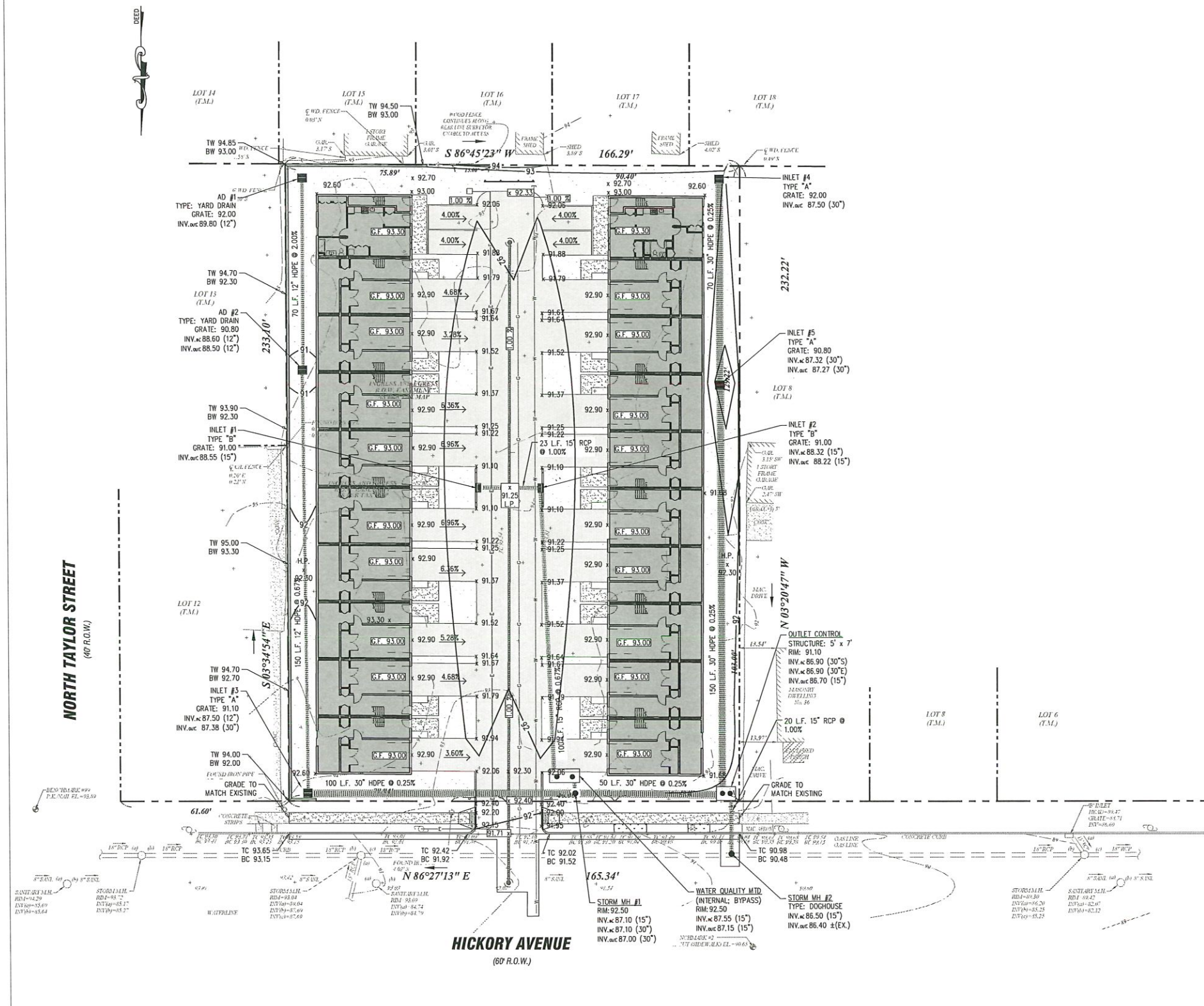
SURVEY REFERENCE:

- BOUNDARY & TOPOGRAPHY INFORMATION IS BASED ON A SURVEY TITLED "BOUNDARY AND TOPOGRAPHY OF TAX LOT 9, BLOCK 30, A.K.A. 40 HICKORY AVENUE, TAX LOT 10, BLOCK 30, A.K.A. 44 HICKORY AVENUE, TAX LOT 10.D1, BLOCK 30, A.K.A. 46 HICKORY AVENUE, TAX LOT 11, BLOCK 30, A.K.A. 48 HICKORY AVENUE, BOROUGH OF BERGENFIELD, BERGEN COUNTY, NEW JERSEY", BY DMC ASSOCIATES, INC., 211 MAIN STREET, BUTLER, NJ, DATED OCTOBER 05, 2020, WITH NO REVISION DATES.
- VERTICAL DATUM ARE BASED ON NAVD 88.

GRADING AND DRAINAGE PLAN NOTES

- THE GENERAL CONTRACTOR (G.C.) IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON SURVEY AND, WHERE POSSIBLE MEASUREMENTS SHOULD BE TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE G.C. MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE G.C. TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
- THE G.C. SHALL REFER TO ARCHITECTURAL & MEP PLANS AND SPECIFICATIONS FOR ACTUAL LOCATIONS OF ALL UTILITY ENTRANCES TO INCLUDE SANITARY SEWER LATERALS, DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRICAL, TELEPHONE AND GAS SERVICE. THE G.C. SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND TO ENSURE PROPER DEPTHS ARE ACHIEVED AS WELL AS COORDINATING WITH THE UTILITY COMPANIES AS TO LOCATION AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
- EXCAVATED MATERIAL CONTAINING ROCK OR STONE GREATER THAN SIX (6) INCHES IN LARGEST DIMENSION IS UNACCEPTABLE AS FILL TO WITHIN THE PROPOSED BUILDING AND PAVING AREA.
- ROCK OR STONE LESS THAN SIX (6) INCHES IN LARGEST DIMENSION IS ACCEPTABLE AS FILL TO WITHIN TWENTY-FOUR (24) INCHES OF SURFACE OF PROPOSED SURGED WHEN MIXED WITH SUITABLE MATERIAL AS PERMITTED BY THE OWNER'S GEOTECHNICAL ENGINEER.
- ROCK OR STONE LESS THAN TWO (2) INCHES IN LARGEST DIMENSION AND MIXED WITH SUITABLE MATERIAL IS ACCEPTABLE AS FILL WITHIN THE UPPER TWENTY-FOUR (24) INCH OF PROPOSED SUBGRADE AS PERMITTED BY THE OWNER'S GEOTECHNICAL ENGINEER.
- ALL SITEWORK AND EARTHWORK OPERATIONS CONDUCTED ON THE SITE TO BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT PREPARED BY THE OWNER'S GEOTECHNICAL ENGINEER AND DATED.
- COMPACTION CRITERIA FOR FILL PLACED IN THE FOLLOWING AREAS SHALL MEET OR EXCEED THE FOLLOWING MINIMUM PERCENTAGE OF MAXIMUM MODIFIED PROCTOR DRY DENSITY AS DETERMINED BY ASTM D-1557 USED ON REPRESENTATIVE SOIL SAMPLES, UNLESS MORE STRINGENT CRITERIA GIVEN ELSEWHERE:

FILL AREA	STANDARD PROCTOR DRY DENSITY
SIDEWALKS	95%
PAVEMENTS AND ROADWAYS	95%
LANDSCAPE AREAS	93%
TRENCH BACKFILL	SAME AS SURROUNDING AREA
- PROTECT SUBGRADE FROM EXCESSIVE WHEEL LOADING DURING CONSTRUCTION, INCLUDING TRUCKS AND DUMP TRUCKS.
- REMOVE AREAS OF FINISHED SUBGRADE FOUND TO HAVE INSUFFICIENT COMPACTION DENSITY TO DEPTH NECESSARY AND REPLACE IN A MANNER THAT WILL COMPLY WITH COMPACTION REQUIREMENTS BY USE OF MATERIAL EQUAL TO OR BETTER THAN BEST SUBGRADE MATERIAL ON SITE. SURFACE OF SUBGRADE AFTER COMPACTION SHALL BE HARD, UNIFORM, SMOOTH, STABLE, AND TRUE TO GRADE AND CROSS-SECTION.
- GRADE ALL AREAS WHERE FINISH GRADE ELEVATIONS OR CONTOURS ARE INDICATED ON DRAWINGS, OTHER THAN PAVED AREAS AND BUILDINGS, INCLUDING EXCAVATED AREAS, FILLED AND TRANSITION AREAS, AND LANDSCAPED AREAS. GRADED AREAS SHALL BE UNIFORM AND SMOOTH, FREE FROM ROCK, DEBRIS, OR IRREGULAR SURFACE CHANGES. FINISHED SUBGRADE SURFACE SHALL NOT BE MORE THAN 0.10 FEET ABOVE OR BELOW ESTABLISHED FINISHED SUBGRADE ELEVATION, AND ALL GROUND SURFACES SHALL VARY UNIFORMLY BETWEEN INDICATED ELEVATIONS. FINISH DITCHES SHALL BE GRADED TO ALLOW FOR PROPER DRAINAGE WITHOUT PONDING AND IN A MANNER THAT WILL MINIMIZE EROSION POTENTIAL.
- ALL CONCRETE, UNLESS OTHERWISE NOTED OR SPECIFIED BY REGULATORY AUTHORITIES, SHALL BE 4000 PSI.
- REPRESENTATIVES OF THE MUNICIPALITY SHALL HAVE THE RIGHT TO INSPECT THE DRAINAGE FACILITIES LOCATED ON THE PROPOSED LOT FROM TIME TO TIME AS DEEMED SCHEDULED.
- CATCH BASINS SHALL BE CLEANED OUT PERIODICALLY TO PREVENT THE BUILDUP OF SEDIMENT AND DEBRIS IN STRUCTURES.
- ROOF LEADER CLEANOUTS LOCATED IN GRASSED AREAS SHALL BE PLASTIC SCREW CAPS WHILE ROOF LEADER CLEANOUTS LOCATED WITHIN CONCRETE AREAS SHALL BE FLUSH BRASS CAPS.
- ALL ROOF DRAINS SHALL BE CONNECTED BELOW GRADE TO STORM SEWER SYSTEM.



GRADING AND DRAINAGE PLAN

SCALE: 1"=20'

**Jarmel Kizel**
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KAROLINA PODKONOWICZ, AIA
CHERYL SCHMIDTKE, AIA
ANNEET SINGH, RA
MICHAEL J. VORLAND, AIAProject: **TOWNHOUSE DEVELOPMENT**
40, 44, 46 & 48 HICKORY AVENUE
BOROUGH OF BERGENFIELD
BERGEN COUNTY, NEW JERSEY
BLOCK 30, LOTS 9, 10, 10.01 & 11Project Number: **SIXBORO-S-20-214** Scale: **1" = 20'**
Drawn By: **A.P.P.** Approved By: **G.P.G.**

Drawing Name:

GRADING AND DRAINAGE PLAN

Drawing Number:

C-400

8 OF 15

Initial Date: DECEMBER 7, 2020

ENGINEER OF RECORD

GERARD P. GESARIO, PE
NJ LIC 240803825500 EXP. 4/30/22

LANDSCAPING NOTES:

LANDSCAPING NOTES:

- ERIDON AND THE EVALUATION OF RUST.

- WATERBURY SHALL HAVE NORMAL RAIN OR C
DISEASES AND INSECT INFESTATION.

- ENGINEER AND OWNER IMMEDIATELY OF ANY

- © 2001 Blackwell Science Ltd *Journal of Internal Medicine* 250: 103–110

- ROOF SYSTEM, INSECTS, INJURES AND LATE
DEFECTIVE MATERIAL AT ANY TIME DURING THE

13. ALL FURNITURE, DRAPERY, ETC. IN THE HOUSE MUST BE IN GOOD CONDITION FOR A PERIOD OF TWO YEARS FROM THE DATE OF SALE.

17. PLANTING OPERATIONS SHALL BE PERFORMED

- #### 14. REFERENCES

SCALE: 1"=20'



NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN ACCOUNTS SHOWN IN THE FIRM AND THE FUND EODs, THE FUND OFFICIAL MUST SIGN

GERARD P. GESARIO, PE
NILES 766-0875 FAX 766-0876

Implementation Services

01212021	NIL	00
2021	2021	2021

NO.	DATE	DESCRIPTION
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Discussion

MONTAG VORLAGE A4

Project Number:	Scale:
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7 OF 15

ENGINEER OF RECORD

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BERGEN COUNTY SOIL CONSERVATION DISTRICT SOIL EROSION AND SEDIMENT CONTROL NOTES

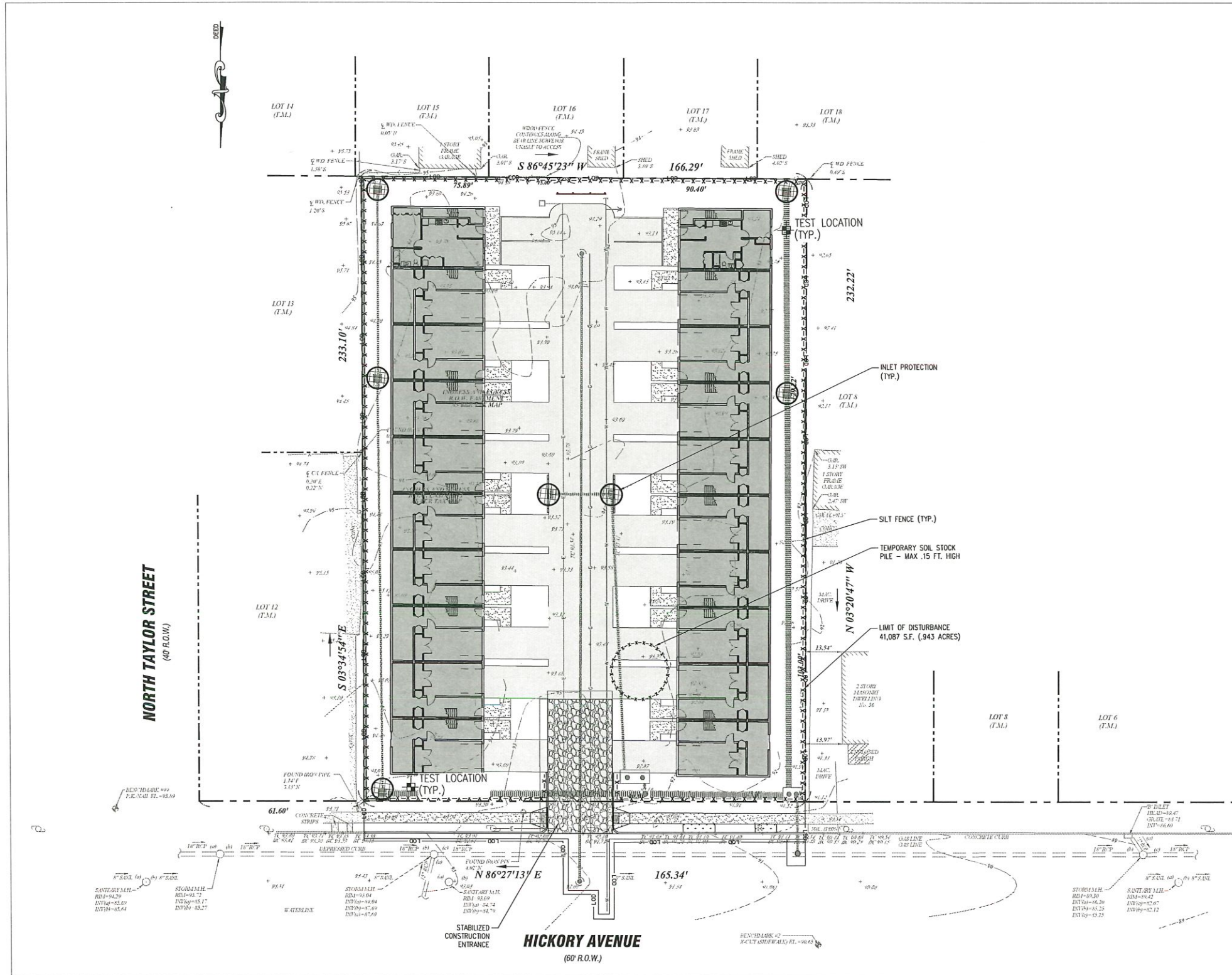
All soil erosion and sediment control practices will be installed in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey (NJ Standards), and will be installed in proper sequence and maintained until permanent stabilization is established.

- Any disturbed area that will be left exposed for more than thirty (30) days and not subject to construction traffic shall immediately receive a temporary seeding and mulching. If the season prohibits temporary seeding, the disturbed area will be mulched with unraveled straw at a rate of 2 tons per acre anchored by approved methods (i.e. peg and twine, mulch netting, or liquid mulch binder).
- Immediately following initial disturbance or rough grading, all critical areas subject to erosion will receive a temporary seeding in combination with straw mulch or a suitable equivalent, at a rate of 2 tons per acre, according to the NJ Standards.
- Stabilization Specifications:**
 - Temporary Seeding and Mulching:**
 - Ground Limestone - Applied uniformly according to soil test recommendations.
 - Fertilizer - Apply 11lbs. /1,000 sf of 10-20-10 or equivalent with 50% water insoluble nitrogen (unless a soil test indicates otherwise) worked into the soil to a minimum of 4".
 - Seed - perennial ryegrass 100 lbs. /acre (2.3 lbs. /1,000 sf) or other approved seed; plant between March 1 and May 15 or between August 15 and October 1.
 - Mulch - Unraveled straw or hay at a rate of 70 to 90 lbs. /1,000 sf applied to achieve 95% soil surface coverage. Mulch shall be anchored by approved methods (i.e. peg and twine, mulch netting, or liquid mulch binder).
 - Permanent Seeding and Mulching:**
 - Topsoil - A uniform application to an average depth of 5", minimum of 4" firmed in place is required.
 - Ground Limestone - Applied uniformly according to soil test recommendations.
 - Fertilizer - Apply 11 lbs. /1,000 sf of 10-20-10 or equivalent with 50% water insoluble nitrogen (unless a soil test indicates otherwise) worked into the soil to a minimum of 4".
 - Seed - Turf type tall fescue (blend of 3 cultivars) 350 lbs. /acre (8 lbs. /1,000 sf) or other approved seed; plant between March 1 and October 1 (summer seeding requires irrigation).
 - Mulch - Unraveled straw or hay at a rate of 70 to 90 lbs. /1,000 sf applied to achieve 95% soil surface coverage. Mulch shall be anchored by approved methods (i.e. peg and twine, mulch netting, or liquid mulch binder).
- The site shall at all times be graded and maintained such that all stormwater runoff is diverted to soil erosion and sediment control facilities.
- Soil erosion and sediment control measures will be inspected and maintained on a regular basis, including after every storm event.
- Stockpiles are not to be located within 50' of a floodplain, slope, roadway or drainage facility. The base of all stockpiles shall be contained by a haybale sediment barrier or silt fence.
- A crushed stone, vehicle wheel-cleaning blanket will be installed wherever a construction access road intersects any paved roadway. Said blanket will be composed of 1" - 2 1/2" crushed stone, 6" thick, will be at least 30' x 100' and should be underlain with a suitable synthetic sediment filter fabric and maintained.
- Maximum side slopes of all exposed surfaces shall not exceed 3:1 unless otherwise approved by the District.
- Driveways must be stabilized with 1" - 2 1/2" crushed stone or subbase prior to individual lot construction.
- All soil washed, dropped, spilled or tracked outside the limit of disturbance or onto public right-of-ways, will be removed immediately. Paved roadways must be kept clean at all times.
- Catch basin inlets will be protected with an inlet filter designed in accordance with Section 28-1 of the NJ Standards.
- Storm drainage outlets will be stabilized, as required, before the discharge points become operational.
- Dewatering operations must discharge directly into a sediment control bog or other approved filter in accordance with Section 14-1 of the NJ Standards.
- Dust shall be controlled via the application of water, calcium chloride or other approved method in accordance with Section 16-1 of the NJ Standards.
- Trees to remain after construction are to be protected with a suitable fence installed at the drip line or beyond in accordance with Section 9-1 of the NJ Standards.
- The project owner shall be responsible for any erosion or sedimentation that may occur below stormwater outfalls or off-site as a result of construction of the project.
- Any revision to the certified Soil Erosion and Sediment Control Plan must be submitted to the District for review and approval prior to implementation in the field.
- A copy of the certified Soil Erosion and Sediment Control Plan must be available at the project site throughout construction.
- The Bergen County Soil Conservation District must be notified, in writing, at least 48 hours prior to any land disturbance: Bergen County SCD, 700 Kinderhook Road, Suite 106, Oradell, NJ 07649; Tel: 201-261-4407; Fax: 201-261-7573.
- The Bergen County Soil Conservation District may request additional measures to minimize on or off-site erosion problems during construction.
- The owner must obtain a District issued report of compliance prior to the issuance of any certificate of occupancy. The District requires at least one week's notice to facilitate the scheduling of all report of compliance inspections. All site work must be completed, including temporary/permanent stabilization of all exposed areas, prior to the issuance of a report of compliance by the District.

Revised 12/7/17

SEQUENCE OF CONSTRUCTION:

ITEM	DURATION
1. INSTALL SOIL EROSION MEASURES	2
2. DEMO SITE	14
3. ROUGH GRADE SITE FOR BUILDINGS AND PAVEMENT	7
4. CONSTRUCT UTILITY MAIN EXTENSIONS AND SERVICES	20
5. CONSTRUCT STORM SYSTEM	10
6. CONSTRUCT BUILDINGS	270
7. INSTALL NEW CURB & POUR NEW WALKWAYS (PUBLIC R.O.W.)	10
8. CONSTRUCT ASPHALT BASE PAVEMENT & DRIVEWAYS	2
9. CONDUCT SOIL COMPACTION TESTING AND REMEDIATE SUBSOIL (SCARIFICATION/TILLAGE MIN. 6") AS NECESSARY	1
10. UNIFORMLY APPLY TOP SOIL (DEPTH: 5" AVERAGE, 4" MINIMUM, FIRMED IN PLACE)	1
11. PLANT NEW VEGETATION	2
12. CONSTRUCT FINAL PAVEMENT AND LINE STRIPING	2
13. INSTALL MUTCD SIGNAGE AND GUIDE	1
14. REMOVE SOIL EROSION MEASURES	1
TOTAL:	343 DAYS



SOIL EROSION AND SEDIMENT CONTROL PLAN

SCALE: 1"=20'



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NJ State Board of Architects Registration No. 161
NJ State Board of Engineers & Land Surveyors Registration No. GA 2783177

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Project:
TOWNHOUSE DEVELOPMENT
40, 44, 46 & 48 HICKORY AVENUE
BOROUGH OF BERGENFIELD
BERGEN COUNTY, NEW JERSEY
BLOCK 30, LOTS 9, 10, 10.01 & 11

Project Number:
SIXBORO-S-20-214
Scale:
1" = 20'
Drawn By:
A.P.P.
Approved By:
G.P.G.

Drawing Name:
**SOIL EROSION
AND
SEDIMENT CONTROL
PLAN**

Drawing Number:

C-800
9 OF 15

Initial Date: DECEMBER 7, 2020

ENGINEER OF RECORD

GERARD P. GESARIO, PE
NJ LIC 24002/025500 EXP. 4/30/22

Soil De-compaction and Testing Requirements

Soil Compaction Testing Requirements

- Subgrade soils prior to the application of topsoil (see permanent seeding and stabilization notes for topsoil requirements) shall be free of excessive compaction to a depth of 6.0 inches to enhance the establishment of permanent vegetative cover.
- Areas of the site which are subject to compaction testing and/or mitigation are graphically denoted on the certified soil erosion control plan.
- Compaction testing locations are denoted on the plan. A copy of the plan or portion of the plan shall be used to mark locations of tests, and attached to the compaction remediation form, available from the local soil conservation district. This form must be filled out and submitted prior to receiving a certificate of compliance from the district.
- In the event that testing indicates compaction in excess of the maximum thresholds indicated for the simplified testing methods (see details below), the contractor/owner shall have the option to perform either (1) compaction mitigation over the entire mitigation area denoted on the plan (excluding exempt areas), or (2) perform additional, more detailed testing to establish the limits of excessive compaction whereupon only the excessively compacted areas would require compaction mitigation. Additional detailed testing shall be performed by a trained, licensed professional.

Compaction Testing Methods

- Probing Wire Test (see detail)
- Hand-held Penetrometer Test (see detail)
- Tube Bulk Density Test (licensed professional engineer required)
- Nuclear Density Test (licensed professional engineer required)

Note: Additional testing methods which conform to ASTM standards and specifications, and which produce a dry weight, soil bulk density measurement may be allowed subject to District approval.

Soil compaction testing is not required if/when subsoil compaction remediation (scarification/tillage (6" minimum depth) or similar) is proposed as part of the sequence of construction.

Procedures for Soil Compaction Mitigation

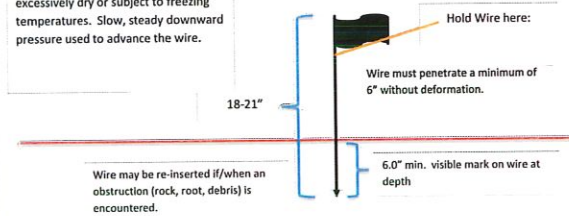
Procedures shall be used to mitigate excessive soil compaction prior to placement of topsoil and establishment of permanent vegetative cover.

Restoration of compacted soils shall be through deep scarification/tillage (6" minimum depth) where there is no danger to underground utilities (cables, irrigation systems, etc.). In the alternative, another method as specified by a New Jersey Licensed Professional Engineer may be substituted subject to District Approval.

Simplified Testing Methods

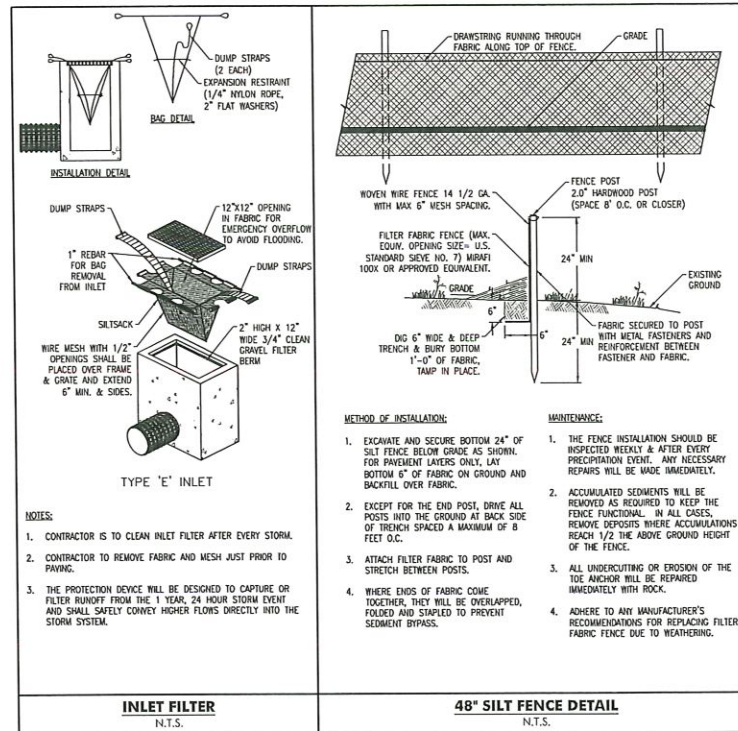
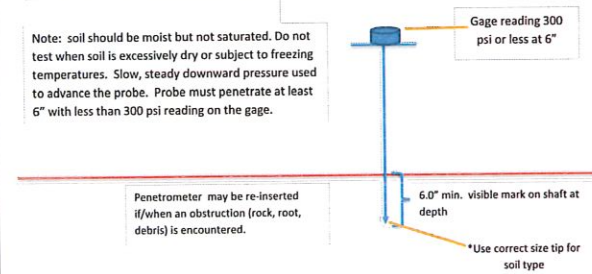
Probing Wire Test- 15.5 ga steel wire (survey flag)

Note: soil should be moist but not saturated. Do not test when soil is excessively dry or subject to freezing temperatures. Slow, steady downward pressure used to advance the wire.



Handheld Soil Penetrometer Test

Note: soil should be moist but not saturated. Do not test when soil is excessively dry or subject to freezing temperatures. Slow, steady downward pressure used to advance the probe. Probe must penetrate at least 6" with less than 300 psi reading on the gage.



Dust Control Notes

The following methods should be considered for controlling dust:

Mulches - See Standard for Stabilization with Mulches Only (pg. 5-1)

Vegetative Cover - See Standard for Temporary Vegetative Cover (pg. 7-1), Permanent Vegetative Cover for Soil Stabilization (pg. 4-1), and Permanent Stabilization with Sod (pg. 6-1)

Spray-On Adhesives - On mineral soils (not effective on muck soils). Keep traffic off these areas.

Table 16-1: Dust Control Materials

MATERIAL	WATER DILUTION	TYPE OF NOZZLE	APPLY GALLONS/ACRE
Anionic asphalt emulsion	7:1	Coarse Spray	1200
Latex emulsion	12.5:1	Fine Spray	235
Rcsln in water	4:1	Fine Spray	300
Polyacrylamide (PAM) - spray on	Apply according to manufacturer's instructions.		
Polyacrylamide (PAM) - dry spray	May also be used as an additive to sediment basins to flocculate and precipitate suspended colloids. See Sediment Basin standard (pg. 26-1)		
Acidulated Soy Bean Soap Stick	None	Coarse Spray	1200

Tillage - To roughen surface and bring clods to the surface. This is a temporary emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, and spring-toothed harrows are examples of equipment which may produce the desired effect.

Sprinkling - Site is sprinkled until the surface is wet.

Barriers - Solid board fences, snow fences, burlap fences, crate walls, bales of hay, and similar material can be used to control air currents and soil blowing.

Calcium Chloride - Shall be in the form of loose, dry granulates or flakes fine enough to feed through commonly used spreaders at a rate that will keep surface moist but not cause pollution or plant damage. If used on steeper slopes, then use other practices to prevent washing into streams, or accumulation around plants.

Stone - Cover surface with crushed stone or coarse gravel.

Standards for SE&SC in NJ

16-1.2

July 1999



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Project:
TOWNHOUSE DEVELOPMENT
40, 44, 46 & 48 HICKORY AVENUE
BOROUGH OF BERGENFIELD
BERGEN COUNTY, NEW JERSEY
BLOCK 30, LOTS 9, 10, 10.01 & 11

Project Number: **SIXBORO-S-20-214** Scale: **AS NOTED**

Drawn By: **A.P.P.** Approved By: **G.P.G.**

Drawing Name:
**SOIL EROSION
AND
SEDIMENT CONTROL
DETAILS**

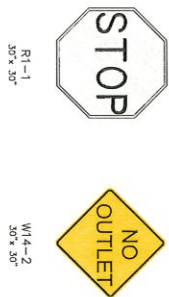
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C-810

10 OF 15

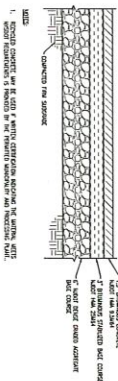
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ENGINEER OF RECORD

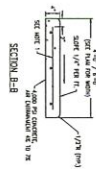
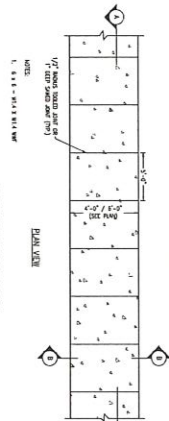
GERARD P. GESARIO, PE
NJ LIC 24503035500 DP 4/30/22



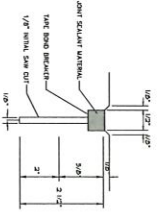
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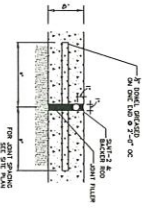
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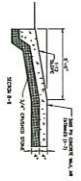
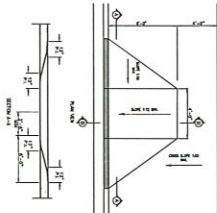
CONSTRUCTION JOINT
(MAX 20'-0\"/>



EXPANSION JOINT @ MAX 20'-0\"/>



HANDICAP CURB AT SIDEWALK
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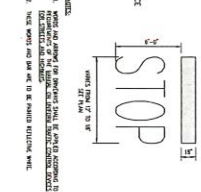
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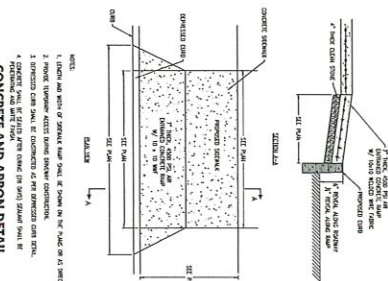
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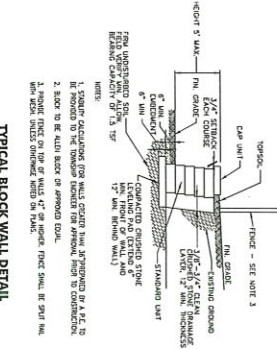
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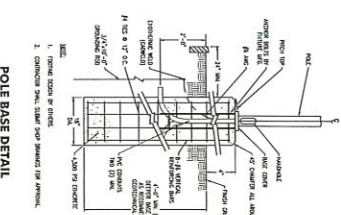
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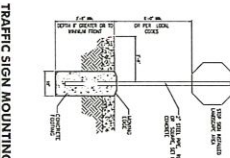
TYPICAL BLOCK WALL DETAIL
N.T.S.



POLE BASE DETAIL
N.T.S.



TRAFFIC SIGN MOUNTING
DETAIL
N.T.S.



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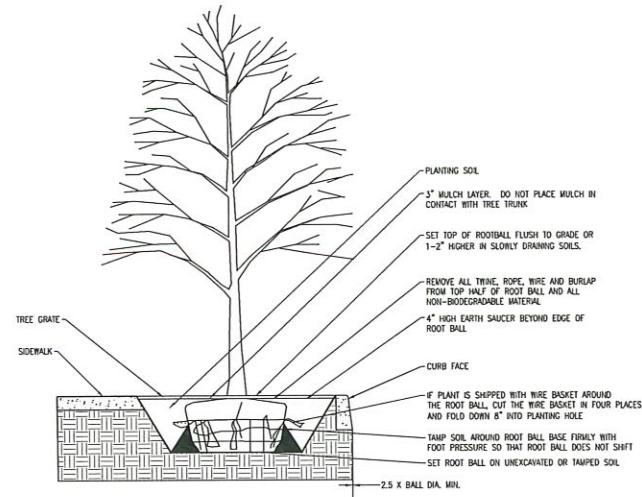
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1	10/12/2020

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NO.	DATE
1	10/12/2020

PROJECT
TOWNHOUSE DEVELOPMENT
40, 44, 46 & 48 HICKORY AVENUE
BERGEN COUNTY, NEW JERSEY
BLOCK 30, LOTS 1 & 10, 101 & 11
SYNOPSIS S-20-214
AS NOTED
Approved By: [Signature]
Checked By: [Signature]
Drawing Number: C-900

DETAIL SHEET
C-900
11 OF 16
ISSUED: DECEMBER 1, 2020

DESIGNED BY: JARMEL KIZEL
DATE: 10/12/2020



DECIDUOUS TREE PLANTING
N.T.S.

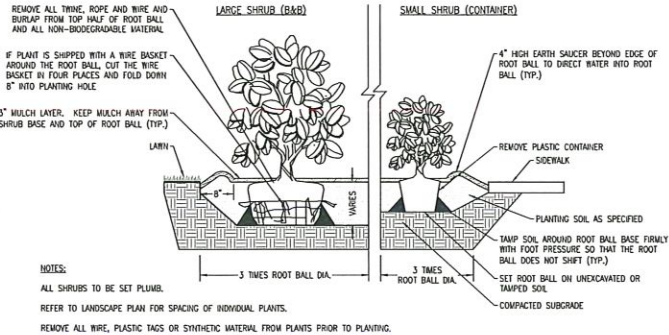
NOTES:

1. WIRE OR CABLE SIZE SHALL BE AS FOLLOWS:
TREES UP TO 2.5 IN. CALIPER - 14 GAUGE
TREES 2.5 IN. TO 3 IN. CALIPER - 12 GAUGE
2. TIGHTEN WIRE OR CABLE ENOUGH TO KEEP TREE FROM SLIPPING. ALLOW FOR SOME TREMOR MOVEMENT. PLASTIC HOSE SHALL BE LONG ENOUGH TO ACCOMMODATE 1.5 IN. OF GROWTH AND BUTTER ALL BRANCHES FROM THE WIRE.
3. TUCK ANY LOOSE ENDS OF THE WIRE OR CABLE INTO THE WIRE WINDUP SO THAT NO SHARP WIRE ENDS ARE EXPOSED.
4. INSTALL THREE GUY WIRES PER TREE, SPACED EVENLY AROUND THE TRUNK.
5. STAKE TREES ONLY UPON THE APPROVAL OF THE LANDSCAPE ARCHITECT.

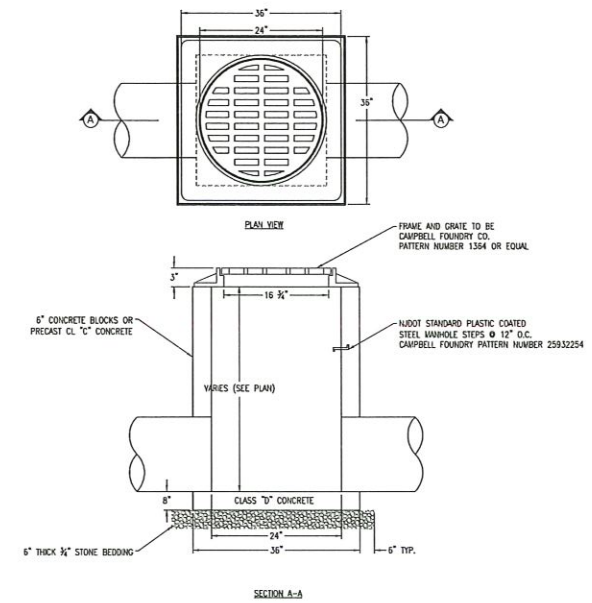
GENERAL NOTES:

ALL STAKES SHALL BE DRIVEN OUTSIDE THE EDGE OF THE ROOT BALL.
ASSURE THAT THE BEARING SURFACE OF THE PROTECTIVE COVERING OF THE WIRE OR CABLE AGAINST THE TREE TRUNK IS A MINIMUM OF 0.5 IN.
REMOVE ALL STAKING AS SOON AS THE TREE HAS GROWN SUFFICIENT ROOTS TO OVERCOME THE PROBLEM THAT REQUIRED THE TREE TO BE STAKED.
STAKES SHALL BE REMOVED NO LATER THAN THE END OF THE FIRST GROWING SEASON AFTER PLANTING.
TREES NORMALLY DO NOT NEED TO BE STAKED AND STAKING CAN BE HARMFUL TO THE TREE. STAKING SHOULD BE DONE ONLY WITH THE APPROVAL OF THE LANDSCAPE ARCHITECT IF IT IS EXPECTED THAT THE TREE WILL NOT BE ABLE TO SUPPORT ITSELF.
THE FOLLOWING REASONS WHY TREES DO NOT REMAIN STRAIGHT:
- TREES WITH POOR-QUALITY ROOT BALLS OR ROOT BALLS THAT HAVE BEEN CRACKED OR DAMAGED. REJECT RATHER THAN STAKE.
- TREES THAT HAVE GROWN TOO CLOSE TOGETHER IN THE NURSERY, RESULTING IN WEAK TRUNKS. REJECT RATHER THAN STAKE.
- PLANTING PROCEDURES THAT DO NOT ACCURATELY TAMP SOILS AROUND THE ROOT BALL. CORRECT THE PLANTING PROCEDURE.
- ROOT BALLS PLACED ON SOFT SOIL. TAMP SOILS UNDER ROOT BALL PRIOR TO PLANTING.
- ROOT BALLS WITH VERY SANDY SOIL OR VERY HEAVY CLAY SOIL. STAKING ADVISABLE.
- TREES LOCATED IN A PLACE OF EXTREMELY WINDY CONDITIONS. STAKING ADVISABLE.

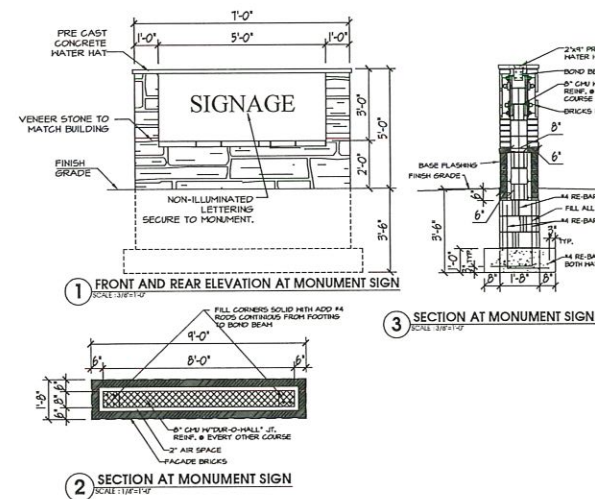
TREE STAKING DETAIL - TREES 3 INCH CALIPER OR LARGER
N.T.S.



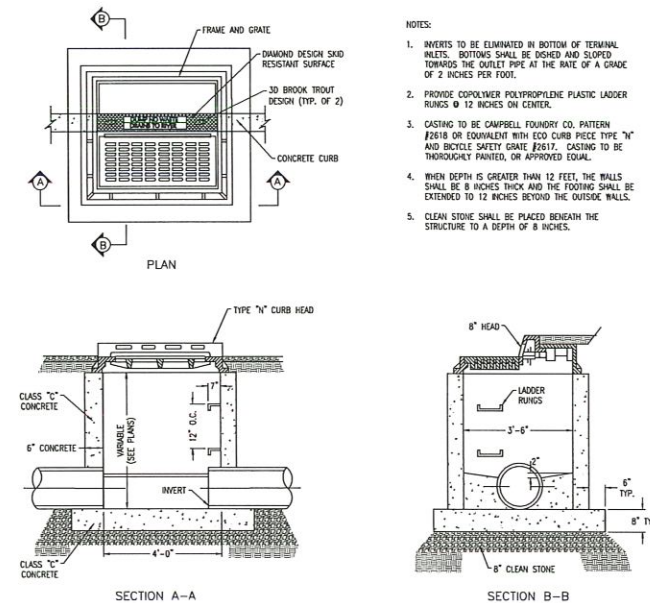
SHRUB PLANTING
N.T.S.



YARD DRAIN
N.T.S.

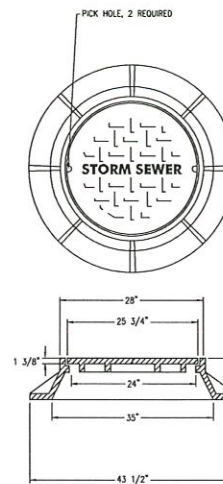


SIGNAGE DETAIL
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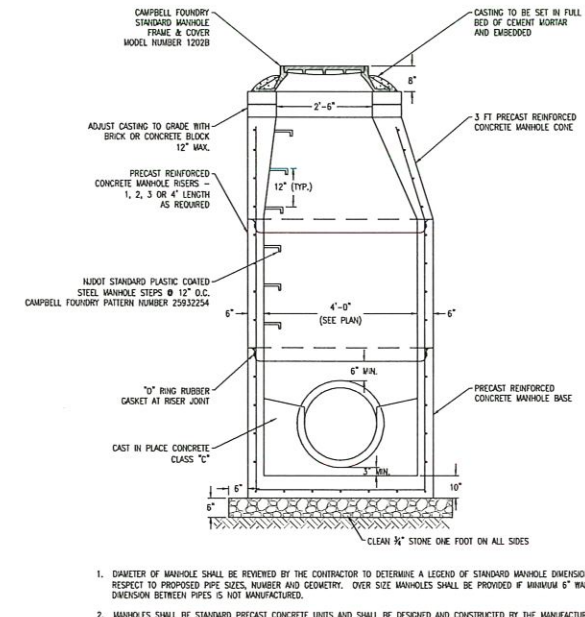


TYPE "B" INLET
N.T.S.

INLET TYPE 'A' DETAIL
N.T.S.



MANHOLE FRAME AND COVER
N.T.S.



STORM MANHOLE
N.T.S.



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Project:
TOWNHOUSE DEVELOPMENT
40, 44, 46 & 48 HICKORY AVENUE
BOROUGH OF BERGENFIELD
BERGEN COUNTY, NEW JERSEY
BLOCK 30, LOTS 9, 10, 10.01 & 11

Project Number:
SIXBORO-S-20-214
Scale:
AS NOTED
Drawn By:
A.P.P.
Approved By:
G.P.G.
Drawing Name:

DETAIL SHEET

Drawing Number:

C-901

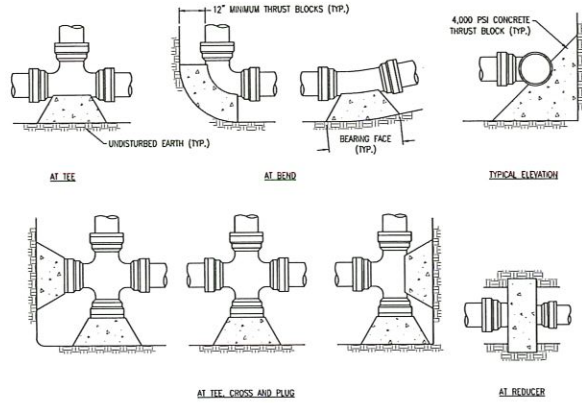
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Initial Date: DECEMBER 7, 2020

ENGINEER OF RECORD

GERARD P. GESARIO, PE
NJ LIC 24082005500 EIT: 438122

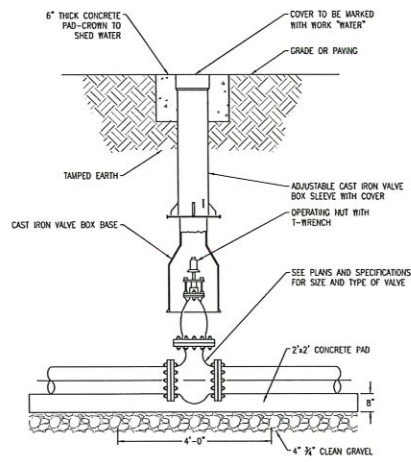
PIPE SIZE	AREA OF BEARING FACE OF THRUST BLOCK IN SQUARE FEET (AREA BASED ON INTERNAL PRESSURE OF 150 PSIG AND SOIL BEARING PRESSURE OF 2000 PSF) (SEE NOTE 1)					REDUCER
	90°	45°	22-1/2°	11-1/4°	PLUG	
4" - 6"	4	2.5	1.5	1	3	6" x 4"
8"	7	4	2	1	5	8" x 6"
12"	14.5	8	4	2	10.5	12" x 8"



- NOTES:
- SPECIAL DESIGN IS REQUIRED FOR FITTINGS ON DOMESTIC WATER MAIN PIPE LARGER THAN 12 INCHES.
 - THRUST BLOCK IS TO BE POURED AGAINST UNDISTURBED EARTH. WIDTH OF THRUST BLOCK SHOULD BE APPROXIMATELY TWICE HEIGHT.
 - THRUST BLOCK IS TO BE INSTALLED AT ALL BENDS, PLUGS, TEES, AND TAPPING SLEEVE AND VALVE CONNECTIONS.
 - FACTORY CAST OFFSETS ARE TO BE TREATED AS (2) 45 DEGREE BENDS.
 - FOR REDUCERS, THRUST BLOCK IS TO BE KEPT INTO WALLS AND BOTTOM OF TRENCH.
 - MECHANICAL RESTRAINT IS REQUIRED IN ADDITION TO THRUST BLOCK.
 - WOOD BLOCKING IS NOT PERMITTED.

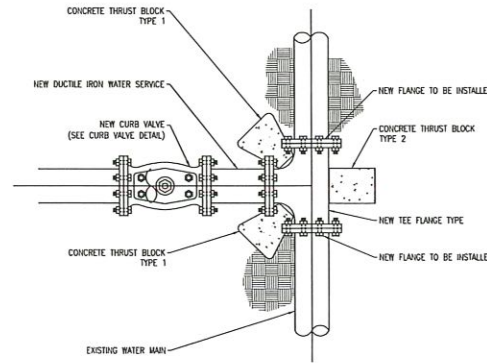
THRUST BLOCK DETAILS

N.T.S.



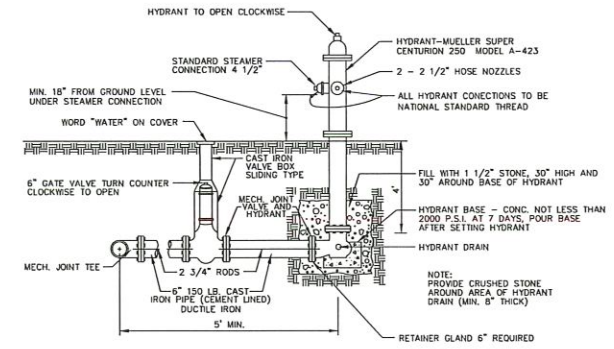
CURB VALVE DETAIL

N.T.S.



WATER MAIN CONNECTION DETAIL

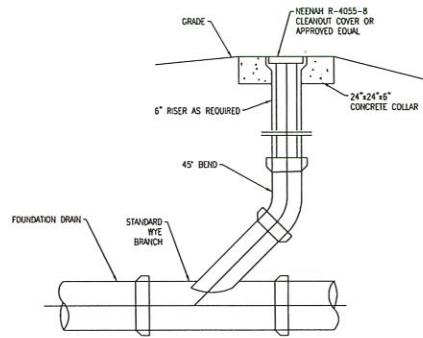
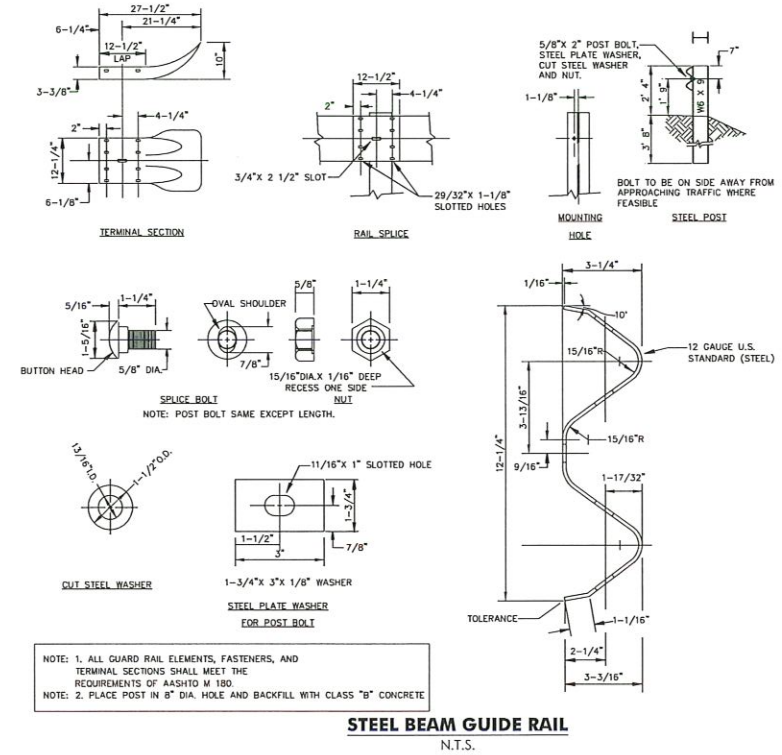
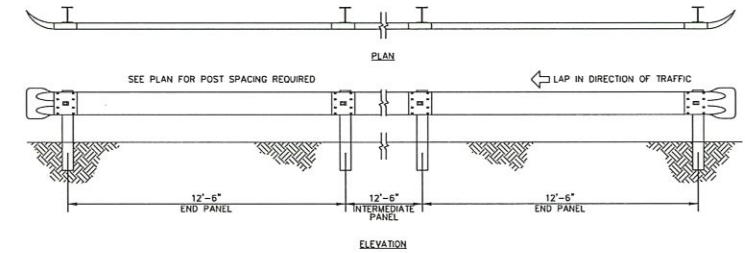
N.T.S.



- NOTE:
- UNLESS OTHERWISE SPECIFIED - WATER MAIN SHALL BE OF CAST IRON PIPE TYPE "T" CLASS 150 CEMENT LINED.
 - GATE VALVES SHALL BE MUELLER OR EQUAL.
 - HYDRANTS SHALL BE MUELLER.
 - VALVE BOX SHALL BE SLIDING.
 - HYDRANT SHALL HAVE APPROVED ROADWAY REFLECTIVE MARKING SYSTEM.
 - HYDRANT SHALL BE EQUIPPED WITH AN APPROVED HYDRANT MARKING FLAG.
 - MUELLER HYDRANT SHALL BE EQUIPPED WITH "STONZ" PUMPER NOZZLE ADAPTER.
 - THE HYDRANT COLOR CODE SHALL BE MUELLER YELLOW BARREL WITH WHITE CAPS AND BONNET.

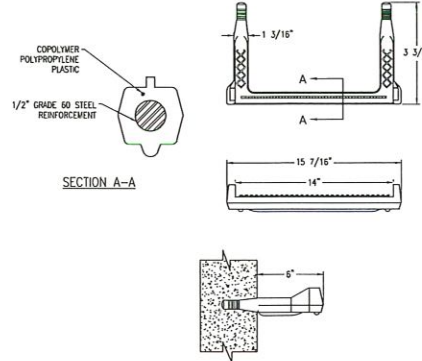
TYPICAL HYDRANT INSTALLATION WITH C.I. PIPE

N.T.S.



STORM CLEANOUT

N.T.S.



PLASTIC LADDER RUNG

N.T.S.

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BERGEN COUNTY, NEW JERSEY
BLOCK 30, LOTS 9, 10, 10.01 & 11

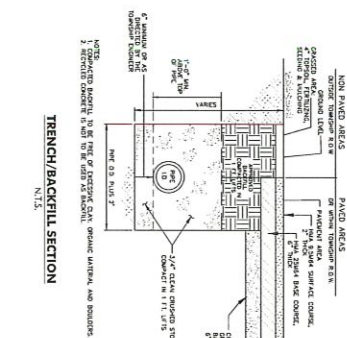
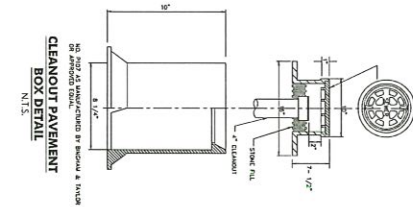
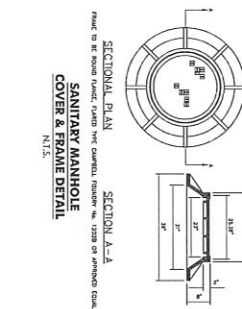
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SIXBORO-S-20-214
Scale:
AS NOTED
Drawn By:
A.P.P.
Approved By:
G.P.G.

Drawing Name:
DETAIL SHEET

Drawing Number:
C-902
13 OF 15
Initial Date: DECEMBER 7, 2020

ENGINEER OF RECORD

GERARD P. GESARIO, PE
NJ LIC. 4400302559 EXP. 4/30/22



TRENCH/BACKFILL SECTION
N.T.S.

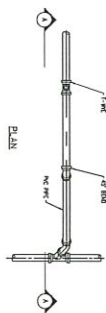
15.1.3

MANHOLE PRECAST (SANITARY)

N.1.5.

INLET & MANHOLE NOTES

- [illegible]

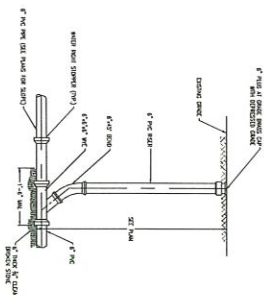


SECTION A-A

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SANITARY SEWER BUILDING CONNECTION

1991



SANITARY CLEANOUT
NTS

1000

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Project: TOWNHOUSE DEVELOPMENT 40, 44, 46 & 48 HICKORY AVENUE BOROUGH OF BERGENFIELD BERGEN COUNTY, NEW JERSEY BLOCK 30, LOTS 9, 10, 10.01 & 11	
Project Number: SIXBORO-S-20-214	Scale: AS NOTED
Drawn by: A.P.P.	Approved by: G.P.G.

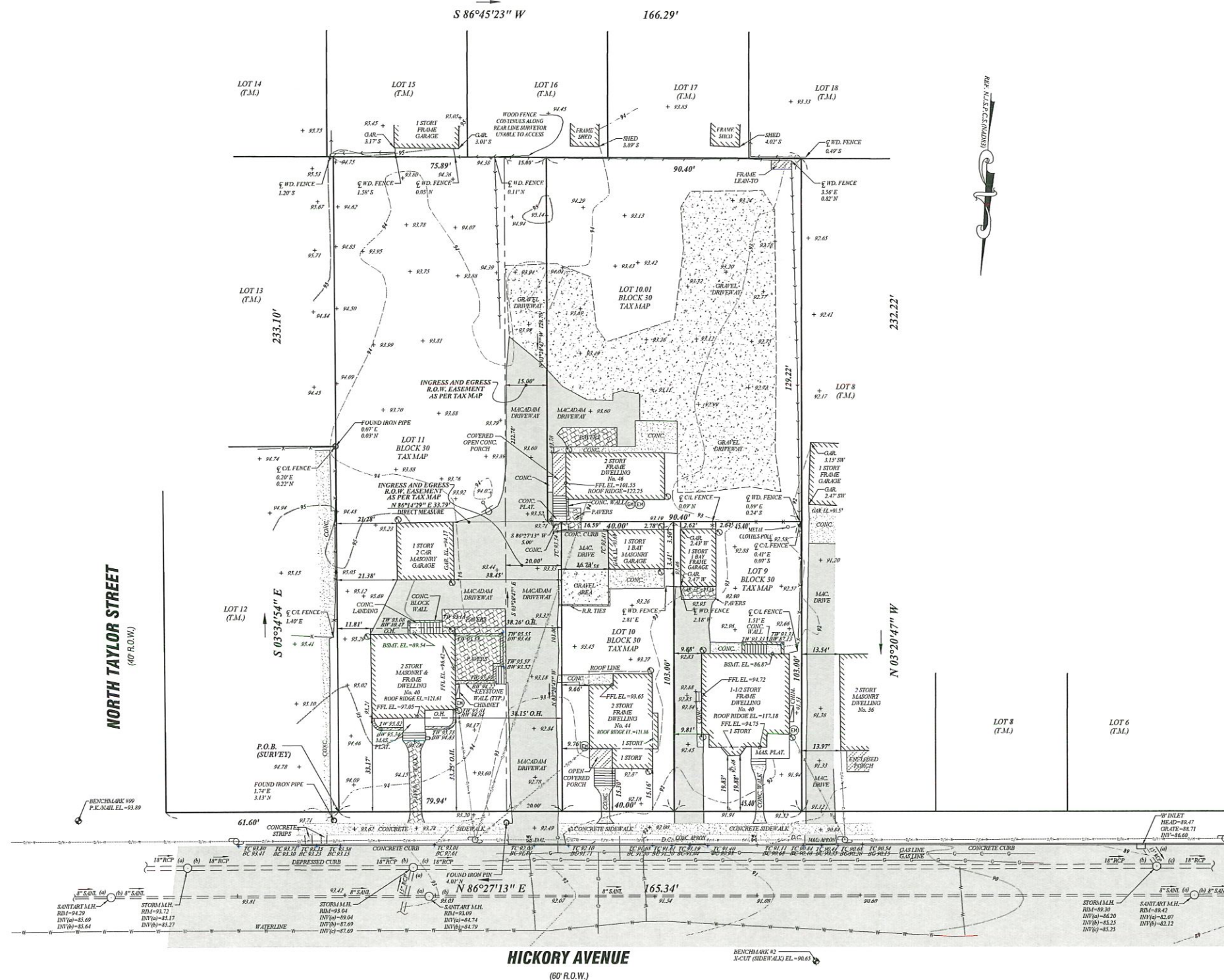
Ordering Number:
C-903

ENGINEER OF RECORD

GERARD P. CESARIO, PE
N.J.C. 241000023000 Exp. 6/2012GERARD P. CESARIO, PE
N.J.C. 241000023000 Exp. 6/2012

Jarmel Kize
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42 OKNER PARKWAY
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TEL: 973-991-9669
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www.jarmelkize.com

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- SURVEYORS NOTES:**
- A written waiver and direction not to set corner markers has been obtained from the ultimate user pursuant to "P.L. 2003, C.14 (N.J.S.A. 45:8-36.3) and N.J.A.C. 13:40-5.2(D)."
 - The utilities shown have been located from evidence observed on the surface only. The surveyor makes no guarantees that the utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. The surveyor has not physically located the underground utilities.
 - Location of sub-surface improvements are not part of this survey. Example: oil tanks, sanitary-septic and cess pool systems, wells, gas lines, sewer laterals, water mains, etc.
 - Riparian claims, riparian rights and conveyance map were not reviewed or considered part of this survey.
 - Except as specifically stated or shown on this plat, this survey does not purport to reflect any of the following which may be applicable to the subject real estate easements, other than possible easements that were visible or on record at the time of the making of this survey; building setback lines; restrictive covenants; subdivision restrictions; zoning or other land use regulations and any other facts that an accurate and current title search may disclose.
 - Declaration is made to original purchaser of the survey. It is not transferable to additional institutions or subsequent owners.
 - Survey is valid only if print has original seal and signature of surveyor.
 - Subsurface and environmental conditions were not examined or considered as a part of this survey.
 - Subject to any and all easements or restrictions either recorded or unrecorded.
 - This survey does not purport to represent or determine Flood Hazard Areas, Riparian Zones, Wetlands Location or Buffer Zones, etc. as established by the Federal Emergency Management Agency and/or the New Jersey Department of Environmental Protection and are not considered part of contractual obligations under this survey. Ultimate user shall secure the services of a certified Ecologist or Engineer.
 - Flood plain maps were not reviewed or considered part of this survey.
 - The retracement of the boundary depicted herein by the surveyor is based upon the evidence found and recorded and the opinion of the surveyor as to the validity of such evidence, any representation herein is not to publish disparagement of title of the subject property or adjoining land owners. The ultimate users of this survey shall have acknowledged that this survey could be made public and that the surveyor and company have no fiduciary duty or confidentiality obligation to the client or users.
 - This survey represents a positional location of recorded deed lines and not to represent or determine ownership to ultimate users of this survey.
 - Lot Area
Tax Lot 9= 4,676± sq. ft.
Tax Lot 10= 4,120± sq. ft.
Tax Lot 10.01= 11,703± sq. ft.
Tax Lot 11= 18,099± sq. ft.
Combined Lot Area = 38,578± sq. ft.
 - Vertical Datum is NAVD83 utilizing dual freq. diff. GPS. Benchmarks are NGS Cor stations:
L.A.M.T. ellip. ht.= 90.181m, N12, ellip. ht.= 17.917m, N12MT, ellip. ht.= 101.119m,
NUSC, ellip. ht.= 172.957m, NYMD, ellip. ht.= 128.21m.
All elevations are shown in US survey feet.
 - Contour Interval is 1.0 Foot.

MAP REFERENCE:

A Map Entitled "Map of Property Belonging to Mrs John Esser, Bergenfield, New Jersey" and dated September 22, 1920. Said map being filed in the Bergen County Register's Office on October 23, 1920 as Map No. 1697.

LEGEND	
BASKETBALL-HOOP	⦿
MAILBOX	□
UTILITY POLE	⦿
WATER VALVE	⦿
GAS METER	⦿
ELECTRIC METER	⦿
ROOF LEADER	⦿
WATER LINE (UG)	—
GAS LINE (UG)	—
WIRES (OVERHEAD)	—
WOOD STOCKADE FENCE	—
CHAIN LINK FENCE	—
KEYSTONE WALL	—
CONC. WALL	—
BENCHMARK	⦿

REVISION	DESCRIPTION	BY
DATE		

BOUNDARY AND TOPOGRAPHY SURVEY OF

TAX LOT 9, BLOCK 30, A.K.A. 40 HICKORY AVENUE
TAX LOT 10, BLOCK 30, A.K.A. 44 HICKORY AVENUE
TAX LOT 10.01, BLOCK 30, A.K.A. 46 HICKORY AVENUE
TAX LOT 11, BLOCK 30, A.K.A. 48 HICKORY AVENUE
BOROUGH OF BERGENFIELD, BERGEN COUNTY, NEW JERSEY

DMC ASSOCIATES, INC.
PROFESSIONAL LAND SURVEYORS
211 MAIN STREET, BUTLER, NJ 07405
TEL: (973) 838-9187 FAX: (973) 838-4389 INFO@DMCSURVETNG.COM

PRELIMINARY

ROBERT L. CIGOL, N.J.P.L.S. No. 24GS04026100
CERTIFICATE OF AUTHORIZATION No. 24GA27919000

DRAWN BY: JAD	SCALE: 1" = 20'	DATE: 10/05/2020	SHEET NO.: 1 OF 1	DMC NO.: 2009080
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BUILDING A FRONT ELEVATION RENDERING



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No. 1006 State of New Jersey Architects Registration No. 101
No. 1006 State of New Jersey Engineers & Land Surveyors Registration No. 101

ISSUED

NO.	DATE	DESCRIPTION	INT.
1	01/21/2021	INITIAL ZONING BOARD MEETING SUBMISSION	

REVISIONS

NO.	DATE	DESCRIPTION	INT.

PRINCIPALS

MATTHEW B. JARMEL, AIA, AIA
RICHARD J. KIZEL, P.E.

ARCHITECTS & ENGINEERS

JANINE ALCAIDE, AIA
JANIS A. BRONKHORST, P.E.
JEFFREY L. CROOK, P.E.
JENNIFER L. CROOK, P.E.
JENNIFER L. CROOK, P.E.
JENNIFER L. CROOK, P.E.
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Project: SIXBORO TOWNHOUSE DEVELOPMENT
40, 44, 48, 48 HICKORY AVENUE
BLOCK 30 LOT 6, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY

Project Number: SIXBORO20-214-18
Scale: AS NOTED
Drawn By: KP
Approved By: MBJ

Drawing Name:

BUILDING EXTERIOR RENDERING

Drawing Number:

SD-001

Initial Date: 10/29/2020

DESIGN PROFESSIONAL OF RECORD


MATTHEW B. JARMEL, AIA, MBA



BOROUGH OF BERGENFIELD

198 NORTH WASHINGTON AVENUE
BERGENFIELD, NEW JERSEY 07621

CONSTRUCTION CODE DEPT.

(201) 387-4055 EXT. 1-4092

FAX: (201) 385-7376

March 22, 2021

Sixboro Holdings
40, 44, 46 and 48 Hickory Ave
Bergenfield, NJ 07621

RE: 18 unit townhouse development and garden apartments

Dear Mr/Mrs Petrillo

Your application for the 18 unit townhouse development and 4 garden apartments has been denied for the following reason:

- | | |
|---|--|
| 1) Change of use from R-5 & R-6 to Multifamily | |
| 2) Max lot coverage of 20%, 6,967 ft | Proposed lot coverage 42%, 14,700ft |
| 3) Max improved lot coverage of 65%, 22,642.75 ft | Proposed improved lot coverage of 85.6%, 29,820 ft |
| 4) Required front yard setback is 35 ft | Proposed is 13 ft 1 ¼ in |
| 5) Required side yard coverage is 25 ft | Proposed is 12 ft 11in. |
| 6) Required side yard coverage is 25 ft | Proposed is 10 ft. |
| 7) Required total side yard is 50 ft | Proposed total is 22 ft 11 in |
| 8) Required rear yard is 25 ft | Proposed is 9 ft 1 ½ in |
| 9) Maximum Building height 40 ft | Proposed building ht is 42 ft, 4 & 1/16 in |

You have the right to appeal my decision to the zoning board of adjustment. You must contact the Building Department to obtain the proper applications.

If you have any question on the above matter, please contact our office. You can call the Building Department at 201-387-4055 Ext. 4

Sincerely,

Michael Ravenda
Zoning Officer

tbz



BUILDING A FRONT ELEVATION RENDERING



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NJ State Board Of Architects Authorization No. 161
NJ State Board Of Engineers & Land Surveyors Authorization No. GA-278177

ISSUED

NO.	DATE	DESCRIPTION	INT
1.	01.21.2021	INITIAL ZONING BOARD SUBMISSION	MBJ

REVISIONS

NO.	DATE	DESCRIPTION	INT

PRINCIPALS

MATTHEW B. JARMEL, AIA, MBA
RICHARD JARMEL, PE
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ARCHITECTS & ENGINEERS

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AUSTIN SIKEN, AIA
MICHAEL J. YORLAND, AIA

Project: SIXBORO TOWNHOUSE DEVELOPMENT
40, 44, 46, 48 HICKORY AVENUE
BLOCK 30 LOT 6, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY

Project Number: SIXBORO20-214-18 Scale: AS NOTED

Drawn By: KP Approved By: MBJ

Drawing Name:

BUILDING EXTERIOR RENDERING

Drawing Number:

SD-001

OF

Initial Date: 10.29.2020

DESIGN PROFESSIONAL OF RECORD

MATTHEW B. JARMEL, AIA, MBA
NJ State Board Of Architects Authorization No. 161
NJ State Board Of Engineers & Land Surveyors Authorization No. GA-278177



BUILDING A FRONT ELEVATION RENDERING



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REVISIONS

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KAROLINA PODANOWICZ, AIA
DAVID L. LESCHKE, RA
CHERYL SCHIFFNER, RA
AMEET SINGH, RA
MICHAEL J. VORLAND, AIA

Project: SIXBORO TOWNHOUSE
DEVELOPMENT
40, 44, 46, 48 HICKORY AVENUE
BLOCK 30 LOT 6, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY

Project Number: SIXBORO20-214-18

Scale: AS NOTED

Drawn By: KP

Approved By: MBJ

Drawing Name:

BUILDING EXTERIOR RENDERING

Drawing Number:

SD-002

OF

Initial Date: 10.29.2020

DESIGN PROFESSIONAL OF RECORD

MATTHEW B. JARMEL, AIA, MBA



UNIT SQUARE FOOTAGE		
UNIT COUNT	UNIT TYPE	AREA
18	UNIT A TYPICAL	1943 SQ. FT.
	LEVEL 1	421 SQ. FT.
	LEVEL 2	761 SQ. FT.
	LEVEL 3	761 SQ. FT.
1	AFFORDABLE 1 BR	642 SQ. FT.
1	AFFORDABLE 2 BR - TYPE 1	642 SQ. FT.
1	AFFORDABLE 2 BR - TYPE 2	1377 SQ. FT.
	LEVEL 1	111 SQ. FT.
	LEVEL 2	755 SQ. FT.
	LEVEL 3	511 SQ. FT.
1	AFFORDABLE 3 BR	1377 SQ. FT.
	LEVEL 1	111 SQ. FT.
	LEVEL 2	755 SQ. FT.
	LEVEL 3	511 SQ. FT.

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ISSUED			
NO.	DATE	DESCRIPTION	INT
1.	01.21.2021	INITIAL ZONING BOARD MBJ SUBMISSION	

REVISIONS			
NO.	DATE	DESCRIPTION	INT

PRINCIPALS
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DAVID L. LESSENE, AIA
CHERYL SCHWENKER, AIA
AMIEE SISKIN, PA
MICHAEL J. VORLAND, AIA

Project: SIXBORO TOWNHOUSE DEVELOPMENT
40, 44, 46, 48 HICKORY AVENUE
BLOCK 30 LOT 6, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY

Project Number: SIXBORO20-214-18
Scale: AS NOTED

Drawn By: KP
Approved By: MBJ

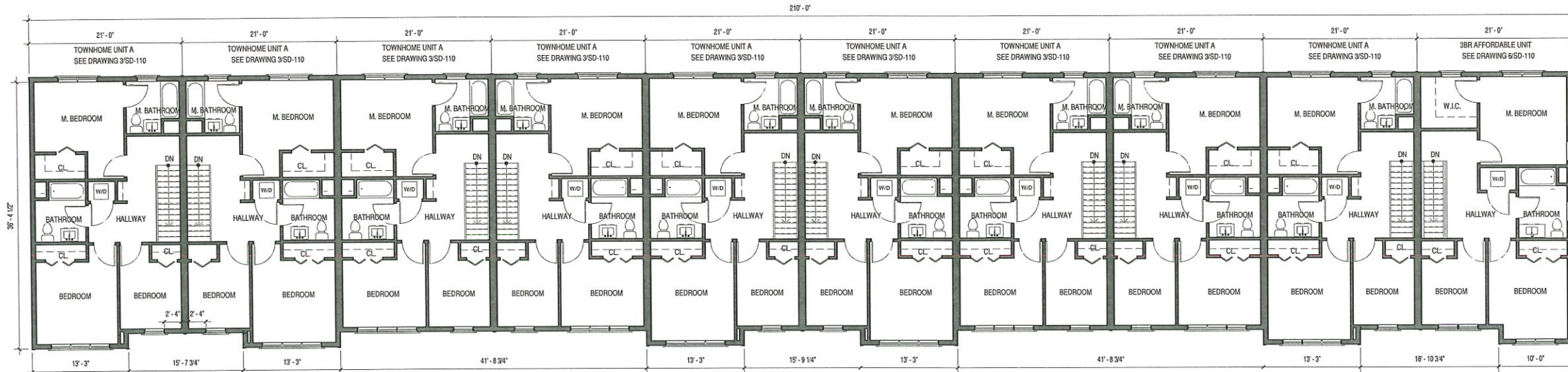
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Drawing Number: SD-100

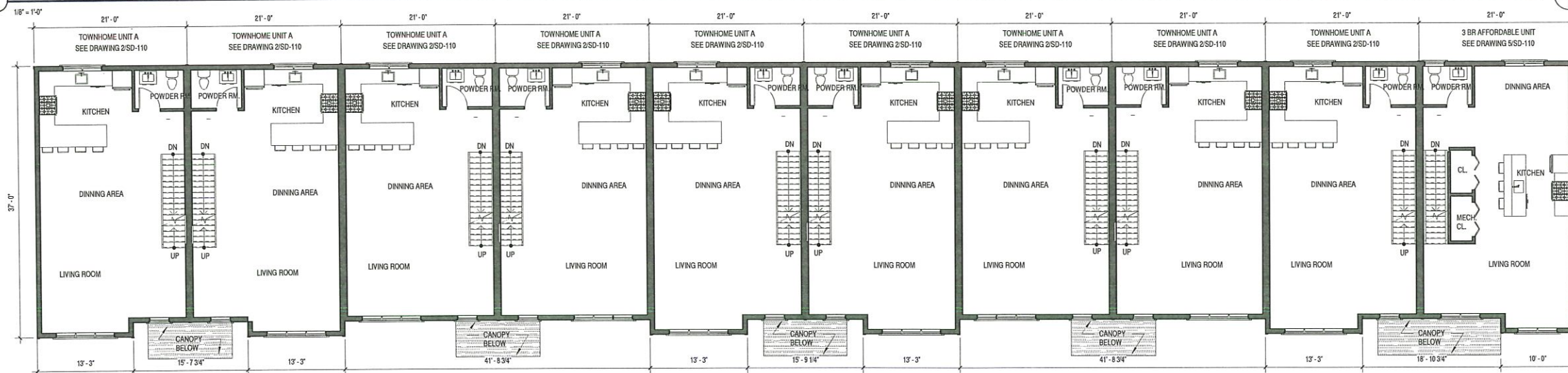
OF
Initial Date: 10.29.2020

DESIGN PROFESSIONAL OF RECORD

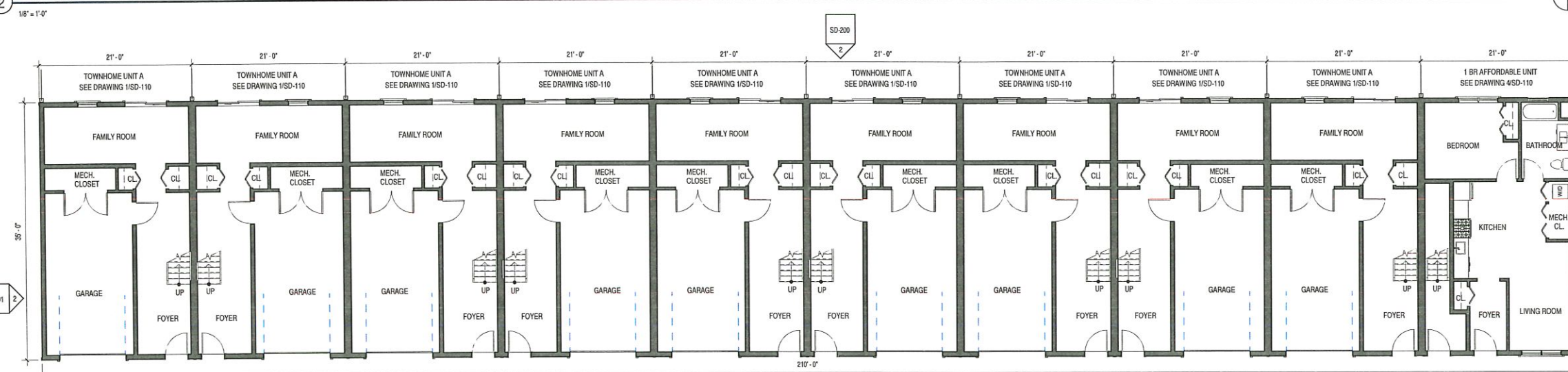
MATTHEW B. JARMEL, AIA, MBA
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NJ State Board of Engineers & Land Surveyors Authorization No. GA-275177



1 BUILDING A 3RD FLOOR PLAN



2 BUILDING A 2ND FLOOR PLAN



3 BUILDING A FIRST FLOOR PLAN



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NO.	DATE	DESCRIPTION	INT.
1.	01.21.2021	INITIAL ZONING BOARD/MBJ SUBMISSION	

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ANNEET SINGH, RA

MICHAEL J. VORLAND, AIA

Project: **SIXBORO TOWNHOUSE DEVELOPMENT**
40, 44, 46, 48 HICKORY AVENUE
BLOCK 30 LOT 6, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY

Project Number: **SIXBORO20-214-18** Scale: **AS NOTED**

Drawn By: **Author** Approved By: **MBJ**

Drawing Name:

BUILDING A FLOOR PLANS

Drawing Number:

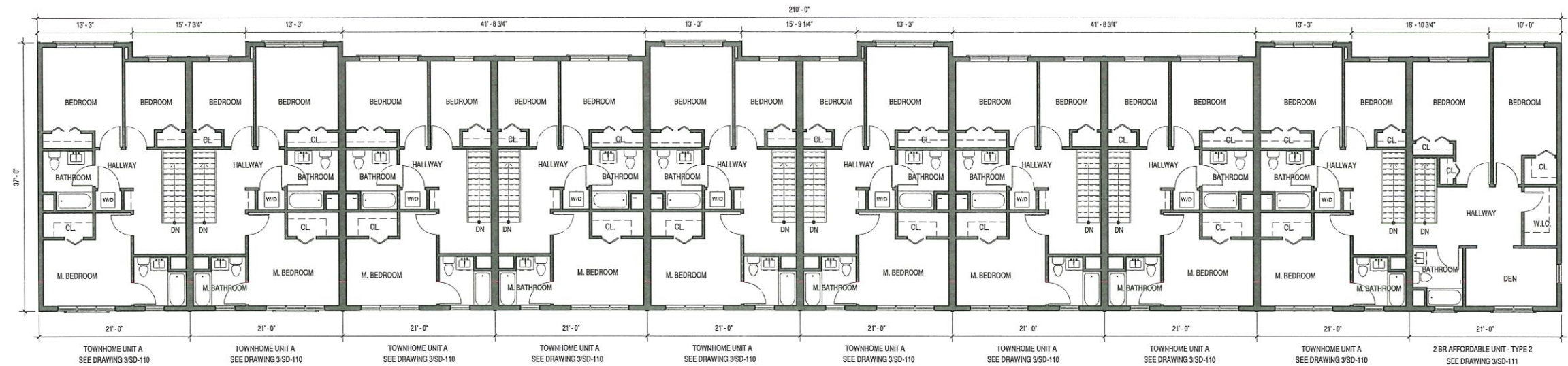
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OF

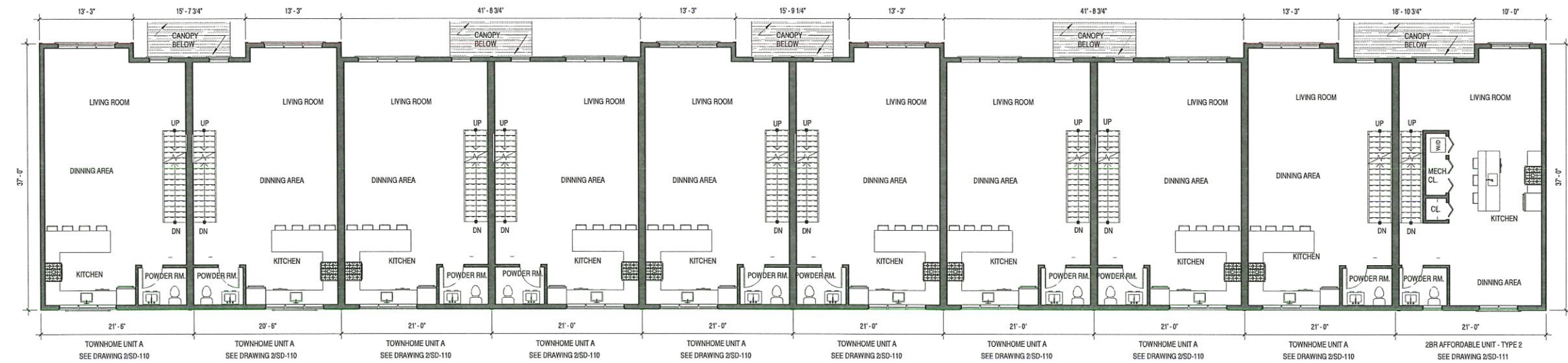
Initial Date: 10.29.2020

DESIGN PROFESSIONAL OF RECORD

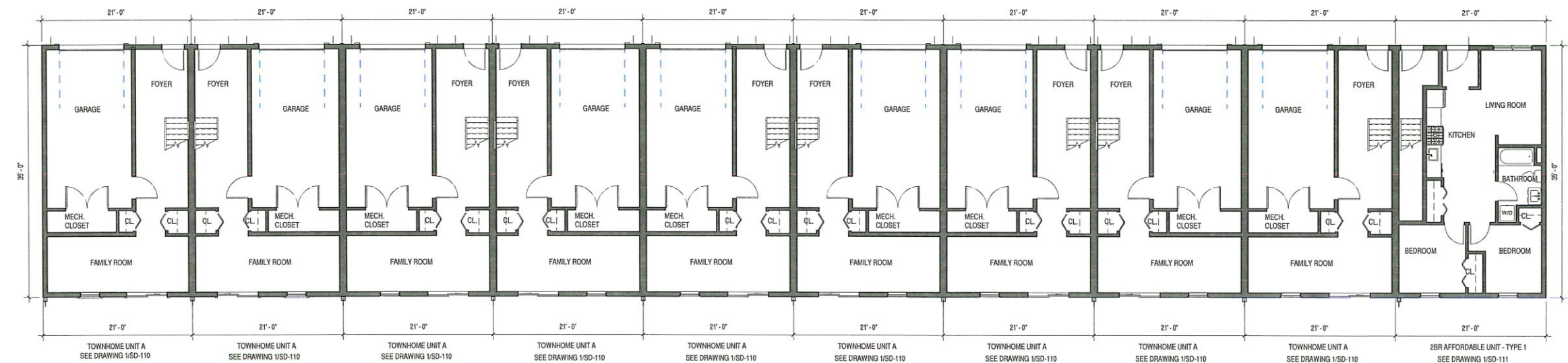
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NJ State Board of Architects Authorization No. 151
NJ State Board of Engineers & Land Surveyors Authorization No. GA-278177



1 BUILDING B 3RD FLOOR PLAN
1/8" = 1'-0"



2 BUILDING B 2ND FLOOR PLAN
1/8" = 1'-0"



3 BUILDING B FIRST FLOOR PLAN
1/8" = 1'-0"



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NO.	DATE	DESCRIPTION	INT.
1.	01.21.2021	INITIAL ZONING BOARD SUBMISSION	MBJ

REVISIONS

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CHERYL SCHWENKER, AIA
AMERT SINGH, FA
MICHAEL J. VORLAND, AIA

Project: **SIXBORO TOWNHOUSE DEVELOPMENT**
40, 44, 46, 48 HICKORY AVENUE
BLOCK 30 LOT 6, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY

Project Number: **SIXBORO20-214-18** Scale: **AS NOTED**

Drawn By: **Author** Approved By: **MBJ**

Drawing Name: **BUILDING B FLOOR PLANS**

Drawing Number: **SD-102**

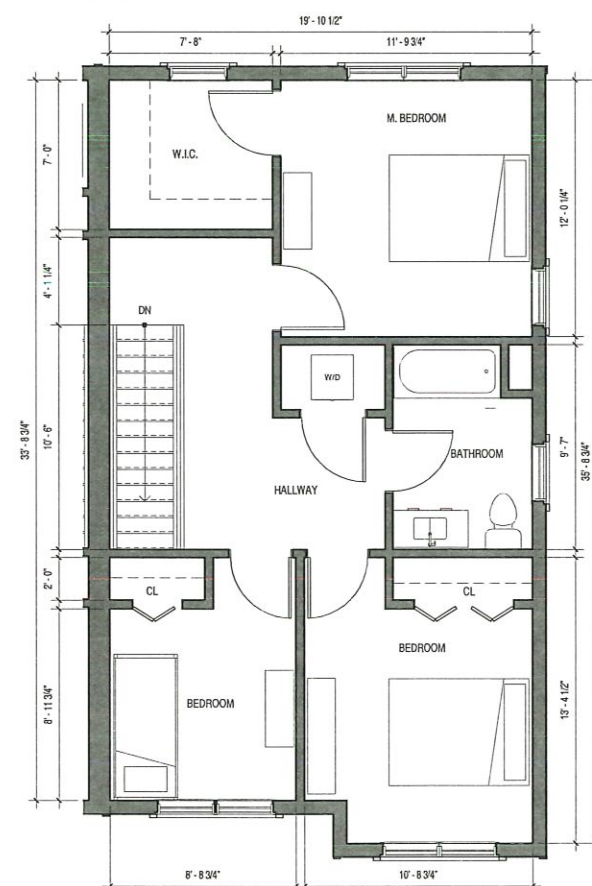
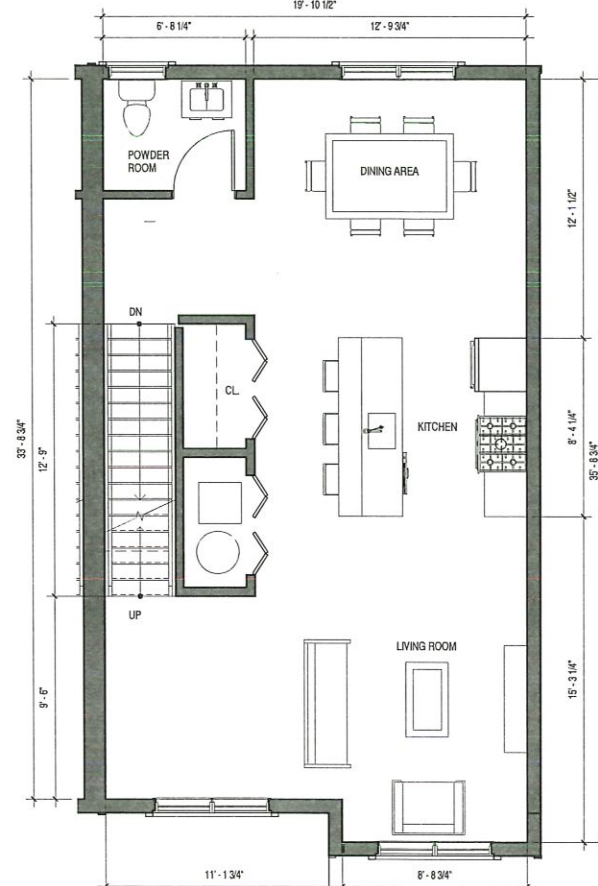
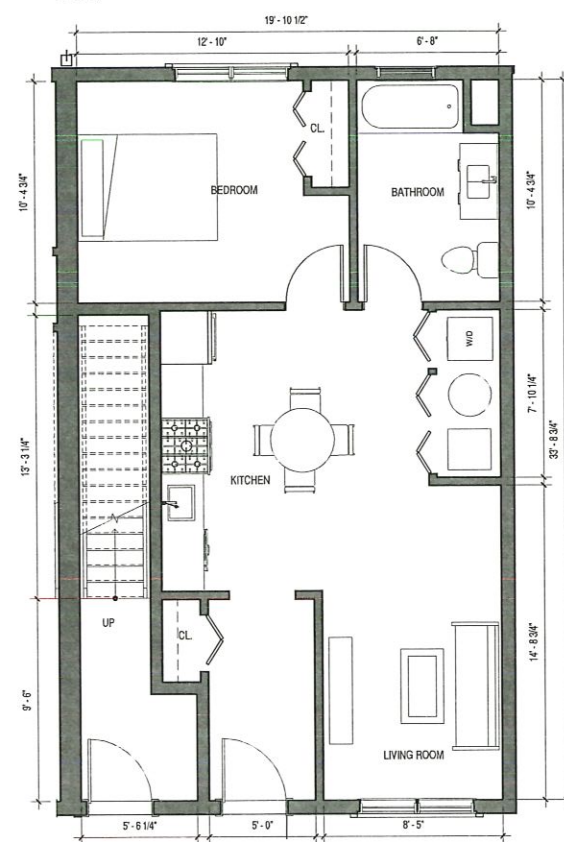
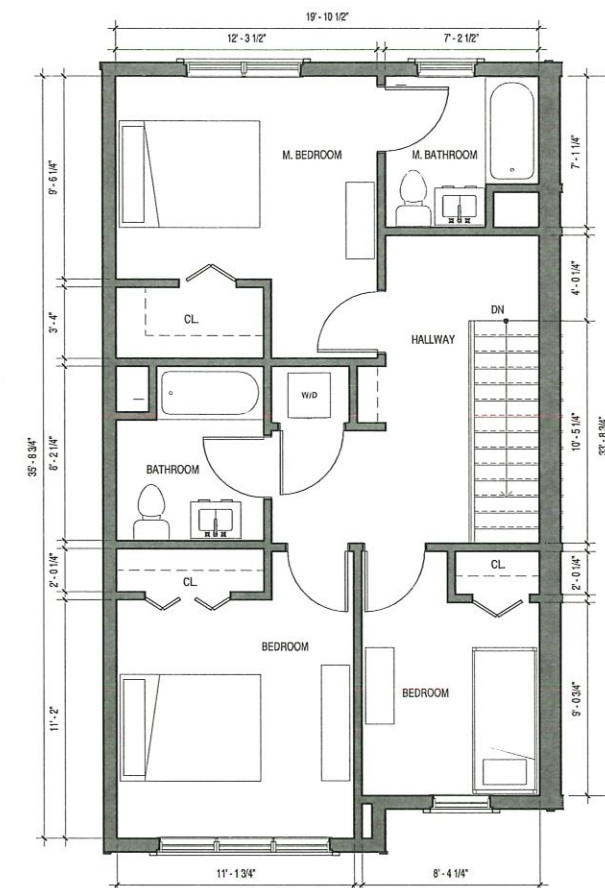
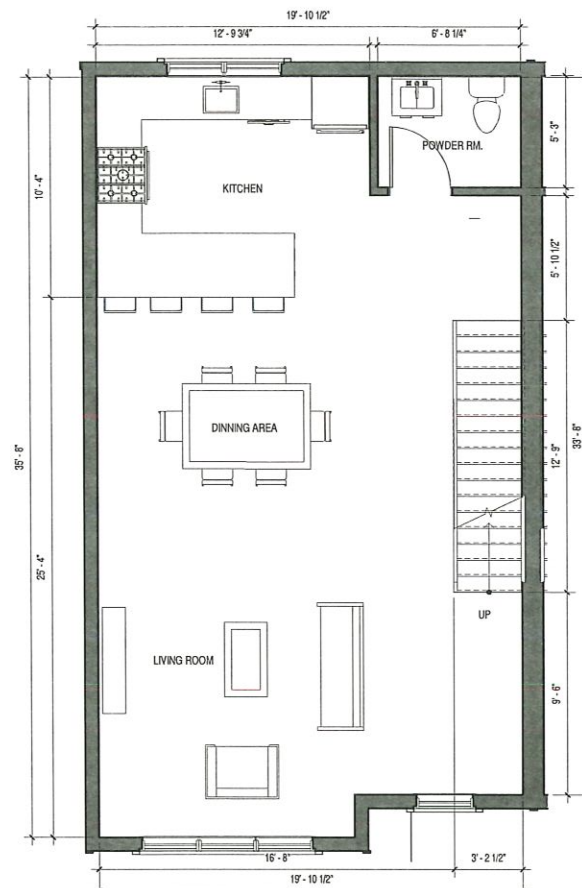
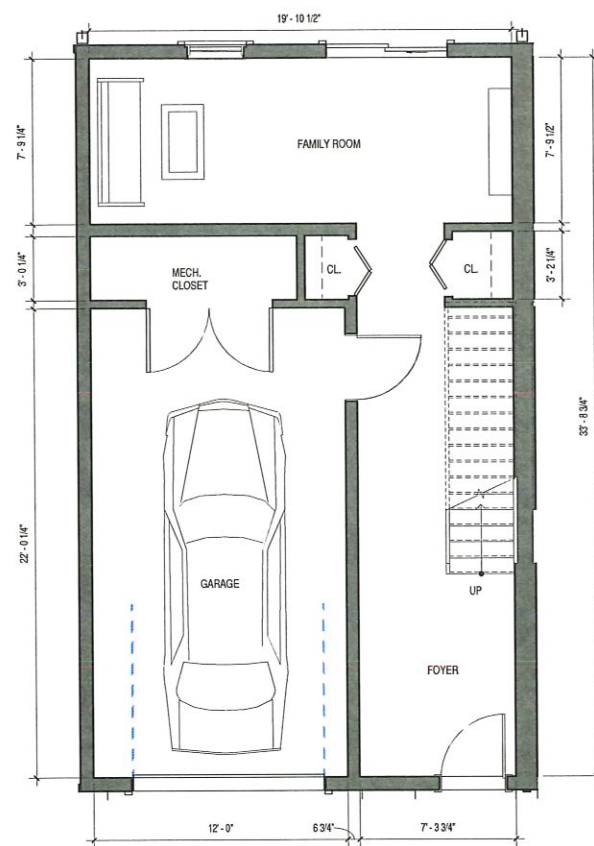
OF

Initial Date: **10.29.2020**

DESIGN PROFESSIONAL OF RECORD

MATTHEW B. JARMEL, AIA, MBA

NJ State Board of Architects
EXP. 12.31.21



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NJ State Board Of Engineers & Land Surveyors Authorization No. GA-278177

ISSUED

[illegible]

REVISIONS

[illegible]

PRINCIPALS

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MATTHEW B. JARMEL, AIA, MBA
RICHARD JARMEL, PE
IRWIN H. KIZEL, AIA, PP
ARCHITECTS & ENGINEERS

CONTRACTORS & ENGINEERS

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RONALD A. BROOKSHIRE, PE
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Project: **SIXBORO TOWNHOUSE
DEVELOPMENT**
**40, 44, 46, 48 HICKORY AVENUE
BLOCK 30 LOT 6, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY**

Project Number:		Scale:
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SIXBORO20-214-18	AS NOTED
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Drawn By: KR	Approved By: MR
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RP	MBJ
Drawing Name:	

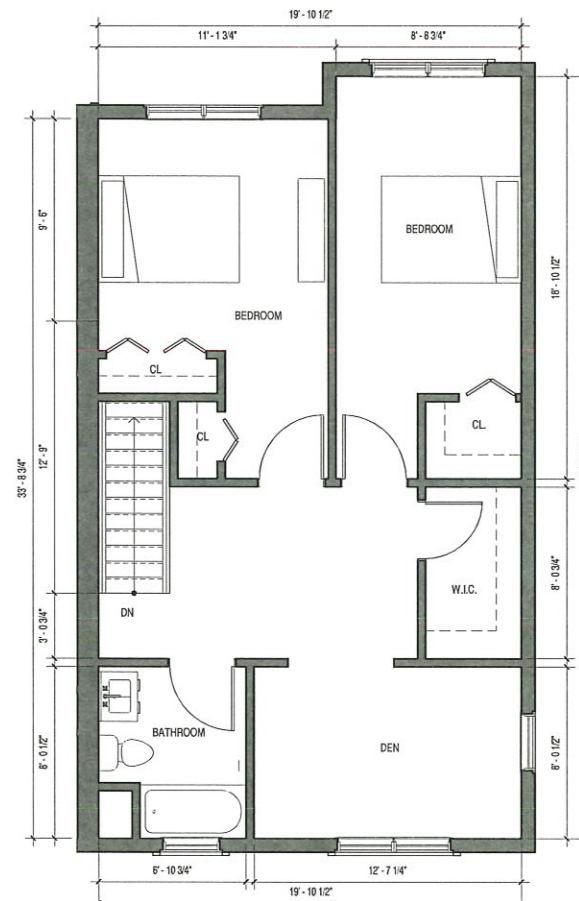
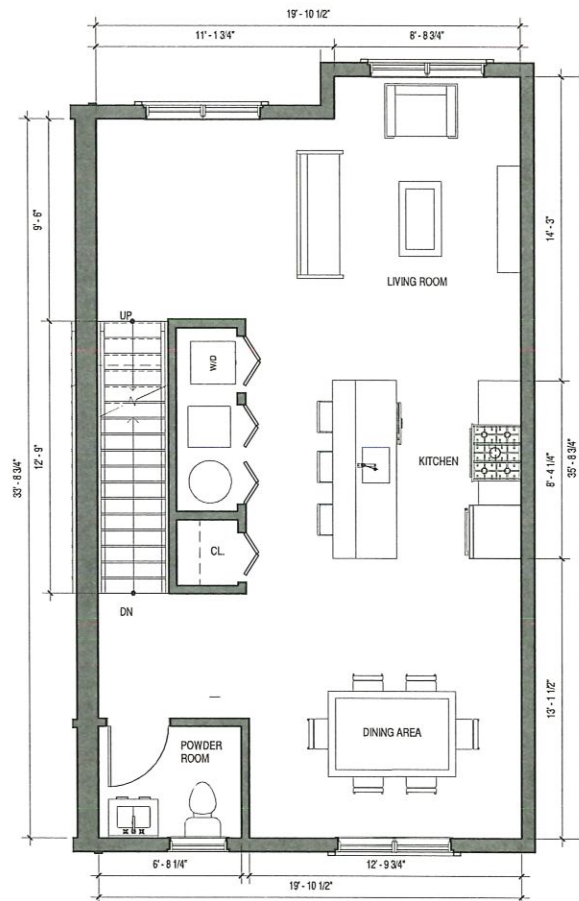
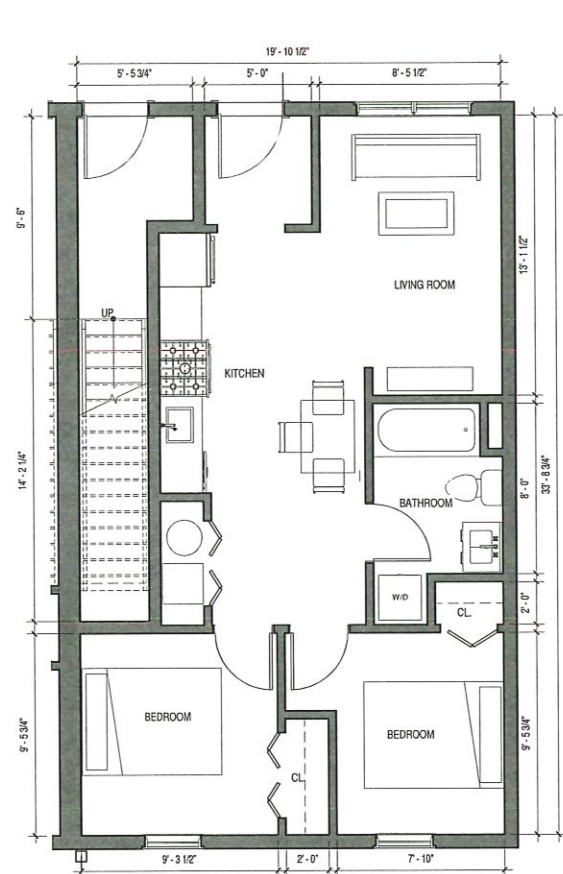
Drawing Name:

CONCLUSIONS

UNIT FLOOR PLANS

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Drawing Number:



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ISSUED

NO.	DATE	DESCRIPTION	INT
1.	01.21.2021	INITIAL ZONING BOARD/MBJ SUBMISSION	

REVISIONS

NO.	DATE	DESCRIPTION	INT

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Project: SIXBORO TOWNHOUSE DEVELOPMENT
40, 44, 46, 48 HICKORY AVENUE
BLOCK 30 LOT 8, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY

Project Number: SIXBORO20-214-18
Scale: AS NOTED
Drawn By: Author
Approved By: MBJ

Drawing Name:

UNIT FLOOR PLANS

Drawing Number:

SD-111
OF

Initial Date: 10.29.2020

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RO	MES
Drawing Name:	

BUILDING ELEVATIONS - 1 OF 2

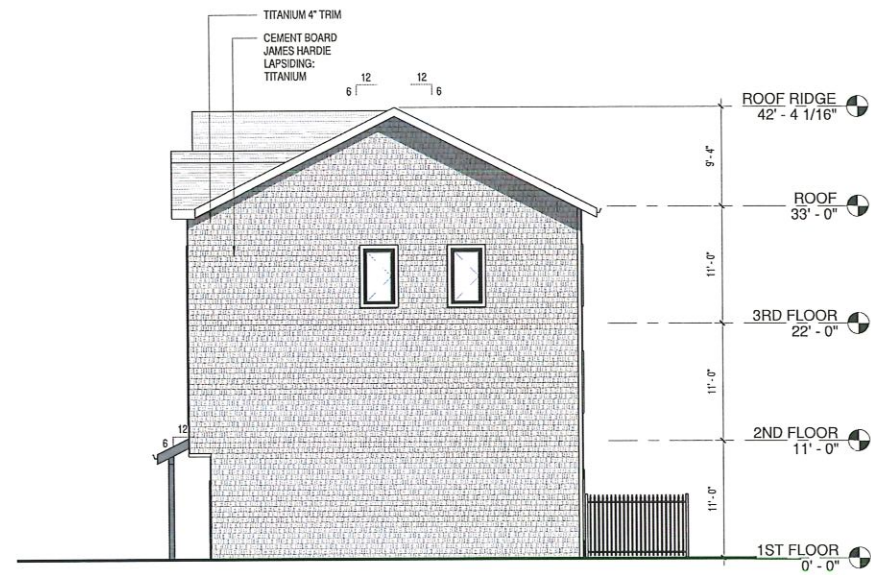
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Initial Date: 10.29.2020

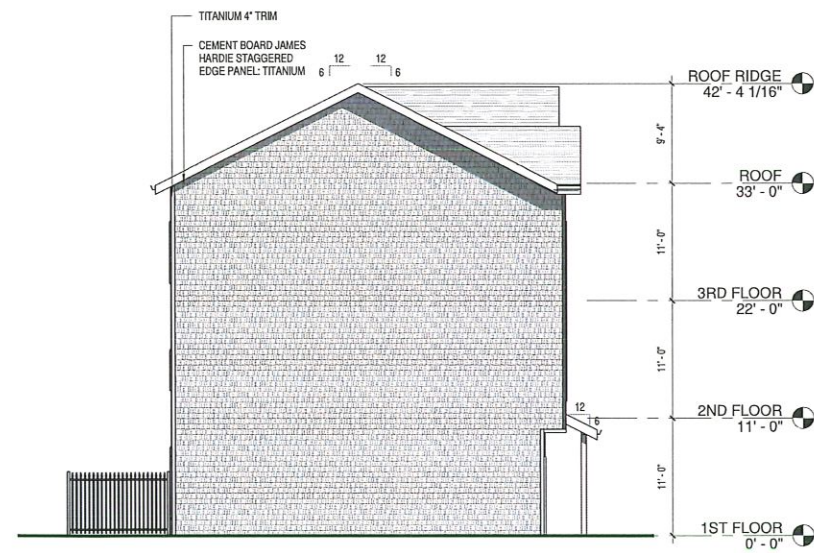
DESIGN PROFESSIONAL OF RECORD

MATTHEW B. JARMEL, AIA, MBA

 $1/8" = 1'-0"$  $\frac{1}{8}'' = 1'$



1 SIDE ELEVATION (SOUTH)
1/8" = 1'-0"



2 STREET ADJACENT ELEVATION (NORTH)
1/8" = 1'-0"



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ISSUED

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1.	01.21.2021	INITIAL ZONING BOARD SUBMISSION	MBJ

REVISIONS

NO.	DATE	DESCRIPTION	INT

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Project: **SIXBORO TOWNHOUSE DEVELOPMENT**
40, 44, 46, 48 HICKORY AVENUE
BLOCK 30 LOT 6, 9, 10, 11
BERGENFIELD, NEW JERSEY
BERGEN COUNTY

Project Number: **SIXBORO20-214-18** Scale: **AS NOTED**

Drawn By: **KS** Approved By: **MBJ**

Drawing Name:

BUILDING ELEVATIONS - 2 OF 2

Drawing Number:

SD-201
OF

Initial Date: 10.29.2020

DESIGN PROFESSIONAL OF RECORD

MATTHEW B. JARMEL, AIA, MBA
NJ State Board Of Architects Authorization No. 151



STORMWATER MANAGEMENT REPORT

FOR

HICKORY AVENUE TOWNHOMES


40 Hickory Sixboro, LLC

**40-48 Hickory Avenue
Block 30, Lots 9, 10, 10.01, and 11
Borough of Bergenfield
Bergen County, New Jersey**

**Report Prepared by
Jarmel Kizel Architects & Engineers, Inc.**

**Jarmel Kizel Project No. SIXBORO-S-20-214
February 10, 2021**

Gerard P. Gesario, PE
Professional Engineer
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1. Figure 1 – Site Location Map

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- A. Drainage System Calculations Spreadsheet
- B. Existing Peak Flow Hydrographs for 2-YR, 10-YR, 100-YR Storm Events
- C. Proposed Peak Flow Hydrographs for 2-YR, 10-YR, 100-YR Storm Events
- D. Routed Basin Hydrographs for 2-YR, 10-YR, 100-YR Storm Events
- E. Annual Groundwater Recharge Calculations
- F. NRCS Soil Mapping Information
- G. Maps
 - a. Map of Survey
 - b. Grading & Drainage Plan
 - c. Existing Drainage Area Plan
 - d. Proposed Drainage Area Plan

INTRODUCTION

This report has been prepared on behalf of the applicant, 40 Hickory Sixboro, LLC, in support of their application for the construction of a 22-unit townhome style development to be located at 40-48 Hickory Avenue, Bergen County, New Jersey. *See Figure 1, Site Location Map.* The 22-unit development will be contained in two (2) separate buildings with each building containing nine (9) 3-bedroom townhomes. One building will also contain two (2) 2-bedroom apartment units and the other building will also contain one (1) 1-bedroom apartment unit and one (1) 3-bedroom apartment unit.

The project site consists of four (4) parcels identified on Borough Tax Maps as Lots 9, 10, 10.01, and 11 within Block 30. The purpose of this report is to present the stormwater runoff calculations performed for this development to demonstrate compliance with the Borough of Bergenfield Code Chapter 268 Stormwater Management. This report is intended to address requirements specifically with regard to the four (4) components of a major development: stormwater quantity, stormwater quality, groundwater recharge, and erosion control.

PROJECT DESCRIPTION

The four (4) parcels that make up the development site total 38,578 square feet or 0.886 acres. The properties are currently developed with four (4) single-family detached houses and three (3) detached garage structures. The existing structures are accessed via asphalt drives, grave drives, and miscellaneous concrete and paver walkways. *See Appendix H, Map of Survey*

The combined parcels have a rectangular shape with an overall width of 165.3 feet and a depth of 233.6 feet. The development fronts on the south side of Hickory Avenue between Washington Avenue and 1st Street. The development site is located within the Borough's R-5 Zone and is surrounded by single-family detached residential homes on all four (4) sides.

Each of the two (2) proposed townhouse buildings will be three (3) stories. Each unit will have an asphalt driveway that will be accessed from a proposed 24-foot wide private road off of Hickory Avenue. The site slopes mildly from south to north having roughly 4 feet of grade change across the development property. No significant grade changes are proposed and the existing slope pattern will be maintained. *See Appendix I, Grading and Drainage Plan.*

The proposed development will increase the amount of impervious surface lot coverage when compared to the existing conditions thus increasing the peak stormwater runoff rates generated from the site. The development is considered a *major development* as defined by

the New Jersey Department of Environmental Protection (NJDEP) Best Management Practices (BMP) manual for stormwater. NJDEP defines a major development as any new development that will ultimately result in the disturbance of one or more acres of land, or increase impervious surfaces by one-quarter acre (10,890 square feet) or more. A major development must comply with three (3) components of stormwater management: Stormwater quantity, stormwater quality, and groundwater recharge. To meet the requirement, a sub-surface detention and infiltration system is proposed in conjunction with an outlet control structure designed to mitigate the increase in peak stormwater runoff rates such that the developed peak flow rates for the 2, 10, and 100-year storm events leaving the site are reduced to 50%, 75%, and 80%, respectively of the predeveloped peak flow rates generated by the site. A sub-surface infiltration system is also proposed and designed to store the NJDEP one-year water quality design storm and infiltrate through a layer of clean stone. The detention and infiltration system will work in conjunction with a single proprietary Manufactured Treatment Device (MTD) to address water quality.

ENVIRONMENTAL SITE ANALYSIS

As described in the Project Description, the properties are currently developed with four (4) single-family detached houses and three (3) detached garage structures. The existing structures are accessed via asphalt drives, grave drives, and miscellaneous concrete and paver walkways. There are no trees of note within the development parcels. The underlying soils are listed as Dunellen-Urban Land Complex (DuUB), 3 to 8 percent slopes. *See Appendix F, NRCS Soil Mapping Information.*

There are no wetlands, waterways, or other environmental critical areas that would create any constraints on development of these parcels.

PROPOSED STORMWATER MANAGEMENT

Existing Site Conditions

Under existing conditions there is one (1) single watershed as the entire development area drains from south to north onto Hickory Avenue. This one (1) watershed was broken up into two (20 sub-watersheds to separate out estimated off-site area that drains onto and through the development property. These sub-watershed areas are identified as Point of Analysis (POA) 1 and POA 2. See *Appendix J Existing Drainage Area Plan*. All runoff currently drains via sheet flow directly to Hickory Avenue and into the existing 18-inch storm sewer within Hickory Avenue.

The Rational Method was used to calculate the existing peak runoff rates. Runoff Coefficients (C) values used were as follows:

- Buildings, Concrete, Asphalt: 0.95
- Gravel Drives: 0.65
- Paver Patios, Paver walkways: 0.65

Because the development site is small (less than 1 acre) and fully developed, a minimum Time of Concentration, T_c , of 10 minutes was assumed and used in the calculations.

A summary of the existing peak flow rates for the 2, 10, and 100-year storm events are provided in Table 1 below.

Table 1: Existing Condition Peak Flows

Storm Event	Existing Peak Flow (cfs)		
	Site Area to Hickory Avenue	Off-Site Area passing thru Development to Hickory Avenue	Total Existing Peak Runoff to Hickory Avenue
2-YR	2.12	0.35	2.47
10-YR	2.80	0.46	3.26
100-YR	3.84	0.63	4.47

See *Appendix B for Existing Hydrograph calculations*

Proposed Site Conditions

Under proposed conditions, the same watershed area as described under the existing conditions was examined for comparison of pre-developed to developed peak flows. In doing so, the developed watershed area site was divided into two (2) sub-watershed areas. These areas are identified as: 1) Developed area collected and conveyed via pipe to detention; 2) Developed area that bypass detention and drain directly onto Hickory Avenue. *See Appendix K Proposed Drainage Area Plan.* All roof drainage will be collected and piped to the detention system.

The Rational Method was used to calculate the proposed peak runoff rates. Runoff Coefficients (C) values used were as follows:

- Buildings, Concrete, Asphalt: 0.95
- Landscape/Lawn Areas: 0.35

Because the development site is small (less than 1 acre), a minimum Time of Concentration, T_c , of 10 minutes was assumed and used in the calculations.

A summary of the proposed peak flow rates for the 2, 10, and 100-year storm events are provided in Table 2 below.

Table 2: Proposed Condition Peak Flows

Storm Event	Proposed Peak Flow (cfs)		
	Runoff Collected and Conveyed to Detention	Runoff Bypassing Detention	Total Proposed Peak Runoff
2-YR	2.80	0.08	2.88
10-YR	3.69	0.10	3.79
100-YR	5.07	0.14	5.21

See Appendix C for Proposed Condition Hydrograph calculations

Detention Basin Design

The proposed detention system will consist of 370 L.F. of 30-inch HDPE pipe. The 30-inch pipe will convey runoff from two (2) directions into a 5-foot x 7-foot concrete outlet structure. Within the outlet structure will be a weir wall used to mitigate the inflow to meet the outflow design criteria. The weir wall proposed will utilize a 6-inch low flow orifice at elevation 86.80, a secondary 12-inch orifice at elevation 88.60, and a 12-inch rectangular weir set at elevation 89.40.

The outflow design criteria requires that the developed peak flow rates for the 2, 10, and 100-year storm events leaving the site are reduced to 50%, 75%, and 80%, respectively of the predeveloped peak flow rates generated by the site. The reduction factors are applied to the peak flow results presented in Column 2 of Table 1 above. Reduction factors do not get applied to the off-site runoff as that flow is allowed to be collected and pass through the detention system.

The hydrographs used for the basin model routing are computed using the Modified Rational Method. The Modified Rational Method was developed to provide a more accurate portrayal of the peak flow and volume entering into a storage facility. This method reduces the peak flow obtained via the Rational Method by approximately one-third and extends the time duration of the peak flow for 3 times the Time of Concentration used in the analysis.

Outflow from the basin will be conveyed from the proposed outlet structure with a 15-inch RCP to a new doghouse manhole structure on the existing 18-inch storm sewer within Hickory Avenue. Tables 3 and 4 below provide an overall summary relative to calculating the total allowable peak flow from the site and the actual total site peak flows, respectively.

Table 3: Summary of Peak Discharges and Allowable Site Runoff (cfs)

Storm Event	Pre-Developed Peak Flow from Project Site (Table 1, Column 2)	Applicable Reduction Factor	Adjusted Existing Peak Flow	Offsite Peak Flow to Basin (Table 1, Column 3)	Total Allowable Peak Flow (Column 4 + Column 5)
2-YR	2.12	50 %	1.06	0.35	1.41
10-YR	2.80	75 %	2.10	0.46	2.56
100-YR	3.84	80 %	3.07	0.63	3.70

Table 4: Summary of Proposed Peak Flows (cfs)

Storm Event	Total Allowable Peak Flow from Site (Table 3, Column 6)	Developed Peak Flow Bypassing Detention (Table 2, Column 3)	Allowable Detention System Routed Outflow (Column 2 – Column 3)	Actual Detention System Routed Outflow	Confirm
2-YR	1.41	0.08	1.33	1.24	✓
10-YR	2.56	0.10	2.46	2.24	✓
100-YR	3.70	0.14	3.56	3.50	✓

See Appendix D for Basin Routing Hydrographs

Water Quality Design

Runoff from all paved areas will be collected by two (2) storm inlets. The water quality storm flow collected will be piped to a proprietary Manufactured Treatment Device (MTD) sized only for the runoff from the water quality storm. Larger storm flow will bypass the MTD and be piped directly to the detention system. The NJDEP water quality design storm is defined as 1.25-inches of rainfall over a 2-hour time period. The proposed MTD will be NJDEP certified to meet the required 80% total suspended solids (TSS) removal rate.

Groundwater Recharge

Groundwater recharge calculations were prepared using the NJDEP spreadsheets for calculating recharge deficits due to development of land. *See Appendix E for Recharge Spreadsheets* The spreadsheets use the underlying soil with a comparison of pre and post-developed land cover to determine the annual post development recharge deficit. The post development annual recharge deficit for this development is 18,778 cubic feet. In order to address this deficit, a 110 linear feet portion of the 30-inch pipe detention system is designed as perforated pipe over a 24-inch bedding of clean stone. This system will provide for an annual recharge volume of 21,488 cubic feet. The proposed recharge volume of 21,488 cubic feet exceeds the calculated annual recharge deficit of 18,778 cubic feet thus satisfying the groundwater recharge requirement for a major development.

Nonstructural Stormwater Management Strategies (Low Impact Design)

The NJDEP list nine (9) nonstructural stormwater management strategies that a major development should strive to address. Not all strategies need to be incorporated into the development design. The development design should incorporate these strategies to the extent feasible based on the existing site conditions as well as the proposed development. In this particular case, the developer is re-purposing previously developed parcels of land that requires no clearing of vegetation, contains no environmentally sensitive areas, and no significant earthwork. By these facts alone, the proposed development is "low impact". Nonetheless, below are listed the nine (9) nonstructural strategies and a brief comment relative to same.

1. Protect areas that provide water quality benefits or are particularly susceptible to erosion. No portion of the development area falls within this low impact design strategy. The project parcels are developed with residential housing, paved drives, gravel drives and other site hardscape coverage. The site also has a mild slope of less than 2 percent across the land.
2. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces. Impervious surface was limited to the minimum width for an access drive and driveways to each unit. There are landscape areas that separate most of the driveways helping to break up the impervious surface.
3. Maximize the protection of natural drainage features and vegetation. The existing site does not contain any natural drainage features or substantive vegetation.
4. Minimize the decrease in the time of concentration from pre-construction to post-construction. The relatively small size of the development (< 1 acre) suggests that the time of concentration difference pre-development to post-development will be de minimis. Under both conditions, the calculated time of concentration was less than the minimal suggested 10-minute minimum time to use in design computations.
5. Minimize land disturbance including clearing and grading. No clearing of vegetation is required on this site. Proposed grades are designed relatively close to existing grades to minimize need for large quantities of soil moving.
6. Minimize soil compaction. The proposed lawn and landscaped areas will be required to be prepared with hand tools and/or low impact machines.
7. Provide low maintenance landscaping that encourages the retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides. No vegetation or landscaping of note exists on the current site. The proposed development will incorporate several small areas of plantings, small street trees plus an evergreen screen along the perimeter with minimal open lawn areas.
8. Provide vegetated open channel conveyance systems discharging into and through stable vegetated areas. The small nature of the site and the existing conditions in and

around the site plus the proposed development do not lend itself to this strategy. Small shallow grassed channels are incorporated in the rear of each proposed building.

9. Provide for other source controls to prevent or minimize the release of pollutants into stormwater runoff. The proposed development being residential no harmful or toxic pollutants are anticipated. Being residential, trash and recyclables will be collected regularly. In addition, the proposed storm inlets will utilize the current "Eco" castings.

EROSION CONTROL

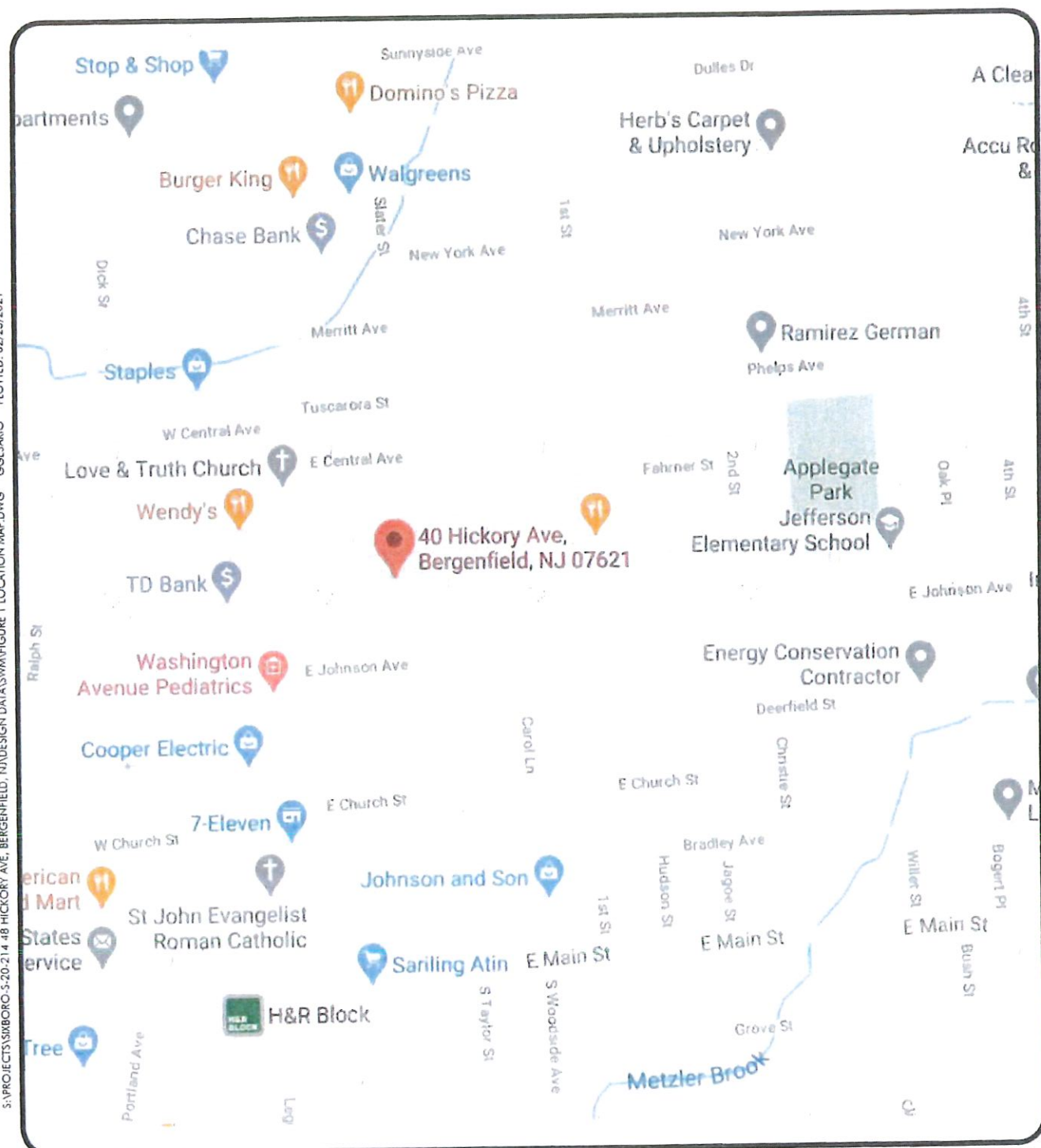
The minimum design and performance standards for erosion control are established by the State of New Jersey under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and the latest edition of The Standards for Soil Erosion and Sediment Control in New Jersey. The proposed development incorporates such measures as inlet protection filters, silt fencing, and a stabilized construction entrance. In addition, the proposed development will seek and require approval from the Bergen County Soil Conservation District.

CONCLUSION

As stated in the Introduction section of this report, the purpose of this report is to present the stormwater runoff calculations performed for this development and to demonstrate compliance with the Borough of Bergenfield Code Chapter 268 Stormwater Management. This report is intended to address requirements specifically with regard to the four (4) components of a major development: stormwater quantity, stormwater quality, groundwater recharge, and erosion control. The design provided herein and as shown on the Preliminary\Final Site Plan drawings submitted as part of this application and which should be referenced when reading this report are intended to prevent or limit the impact of the proposed development on the site and the surrounding areas with respect to stormwater and erosion control.

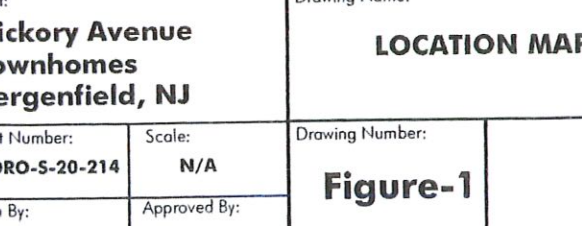
It is our opinion, the provided narrative, summary tables, and attachments demonstrate compliance with the both the Borough of Bergenfield Code on stormwater management and NJDEP rules and regulations for a major development. Specifically, based on the results achieved through the detention basin routings and peak flow analysis, the development of this site is in compliance with the 50, 75, 80% reductions in the pre-developed peak flow rates for the 2, 10, and 100-year storm events, respectively, as well as compliance with the groundwater recharge standards demonstrated in Appendix E to this report, and compliance with the water quality standards through the use of a proprietary manufactured treatment device certified by the NJDEP.

FIGURE 1
SITE LOCATION MAP



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[illegible]

Project: Hickory Avenue Townhomes Bergenfield, NJ		Drawing Name: LOCATION MAP	
Project Number: SIXBORO-S-20-214	Scale: N/A	Drawing Number: Figure-1	
Drawn By: GPG	Approved By:	Initial Date: 2/10/2021	

APPENDIX A

DRAINAGE SYSTEM CALCULATIONS SPREADSHEET

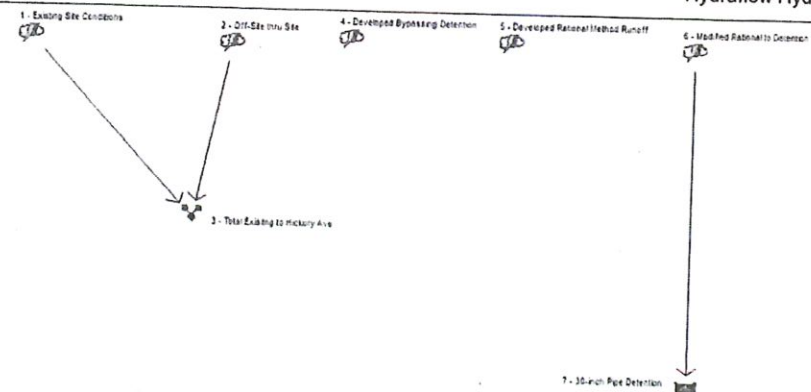
MADE BY: <u>GPG</u> DATE: <u>02/10/21</u>												RAINFALL CURVE -												"n" VALUE 0.013 RCP "n" VALUE 0.024 CMP "n" VALUE 0.010 DIP "n" VALUE 0.012 SPP "n" VALUE 0.020 CPP												SHEET <u>1</u> OF <u>1</u> PROJECT: <u>HICKORY AVENUE TOWNHOMES</u> PROJ. NO: <u>SIXBORO-S-20-214</u>											
CHKD BY: <u>GPG</u> DATE: <u>02/10/21</u>												DRAINAGE SYSTEM																																			
SUBAREA DATA												DESIGN DATA												DESIGN FLOW												PIPE DATA											
LOCATION FROM	TO	AREA	"C"	Cx	SUM Cx	TC	SUM TC	DES STM	"I"	INLET Qi	FLOW Qa	PIPE TYPE	SIZE IN	SLOPE %	CAP Qf	VEL Vf	%FULL Qa/Qf	VEL Va	DPTH INCH	FLOW TIME	LGTH I-I	TOP GRATE	INVERTS		COVER																						
																							UPPER	LOWER																							
AD-1	AD-2	0.136	0.57	0.08	0.08	6	6.0	25	7.50	0.58	0.58	SPP	12	2.00	5.46	6.95	11	4.5	2.6	0.3	70	92.00	90.00	88.60	1.00																						
AD-2	AD-3	0.194	0.71	0.14	0.22	6	6.3	25	7.50	1.03	1.61	SPP	12	0.67	3.15	4.01	51	4.0	6.1	0.6	150	90.80	88.50	87.50	1.30																						
AD-3	SMH-1	0.022	0.35	0.01	0.22	6	6.9	25	7.22	0.06	1.61	SPP	30	0.25	22.22	4.53	7	2.5	5.1	0.7	100	91.10	87.35	87.10	1.25																						
INLET-1	INLET-2	0.218	0.9	0.20	0.20	6	6.0	25	7.50	1.47	1.47	RCP	15	1.00	6.46	5.26	23	4.2	4.8	0.1	23	91.00	88.55	88.32	1.20																						
INLET-2	WQ-MTD	0.218	0.9	0.20	0.39	6	6.1	25	7.50	1.47	2.94	RCP	15	0.67	5.29	4.31	56	4.4	8.0	0.4	100	91.00	88.22	87.55	1.53																						
SMH-1	OCS	0	0	0.00	0.62	6	7.5	25	7.08	0.00	4.36	SPP	30	0.25	22.22	4.53	20	3.5	9.0	0.2	50	92.50	87.03	86.90	2.97																						
INLET-4	INLET-5	0.098	0.68	0.07	0.07	6	6.0	25	7.50	0.50	0.50	SPP	30	0.25	22.22	4.53	2	1.8	3.0	0.6	70	92.00	87.50	87.32	2.01																						
INLET-5	OCS	0.155	0.8	0.12	0.19	6	6.6	25	7.22	0.90	1.38	SPP	30	0.25	22.22	4.53	6	2.4	4.7	1.0	150	90.80	87.27	86.90	1.03																						

APPENDIX B

**EXISTING PEAK FLOW HYDROGRAPHS
2, 10, AND 100-YEAR STORM EVENTS**

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.1



Legend

Hyd. Origin	Description
1 Rational	Existing Site Conditions
2 Rational	Off-Site thru Site
3 Combine	Total Existing to Hickory Ave
4 Rational	Developed Bypassing Detention
5 Rational	Developed Rational Method Runoff
6 Mod. Rational	Modified Rational to Detention
7 Reservoir	30-inch Pipe Detention

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	2.125	1	10	1,275	---	----	----	Existing Site Conditions
2	Rational	0.348	1	10	209	---	----	----	Off-Site thru Site
3	Combine	2.474	1	10	1,484	1, 2	----	----	Total Existing to Hickory Ave
4	Rational	0.078	1	10	47	---	----	----	Developed Bypassing Detention
5	Rational	2.804	1	10	1,682	---	----	----	Developed Rational Method Runoff
6	Mod. Rational	1.944	1	10	2,566	---	----	----	Modified Rational to Detention
7	Reservoir	1.244	1	26	2,565	6	88.75	1,113	30-inch Pipe Detention
2021-01-22 GPG Model.gpw				Return Period: 2 Year			Tuesday, Feb 23, 2021		

Hydrograph Report

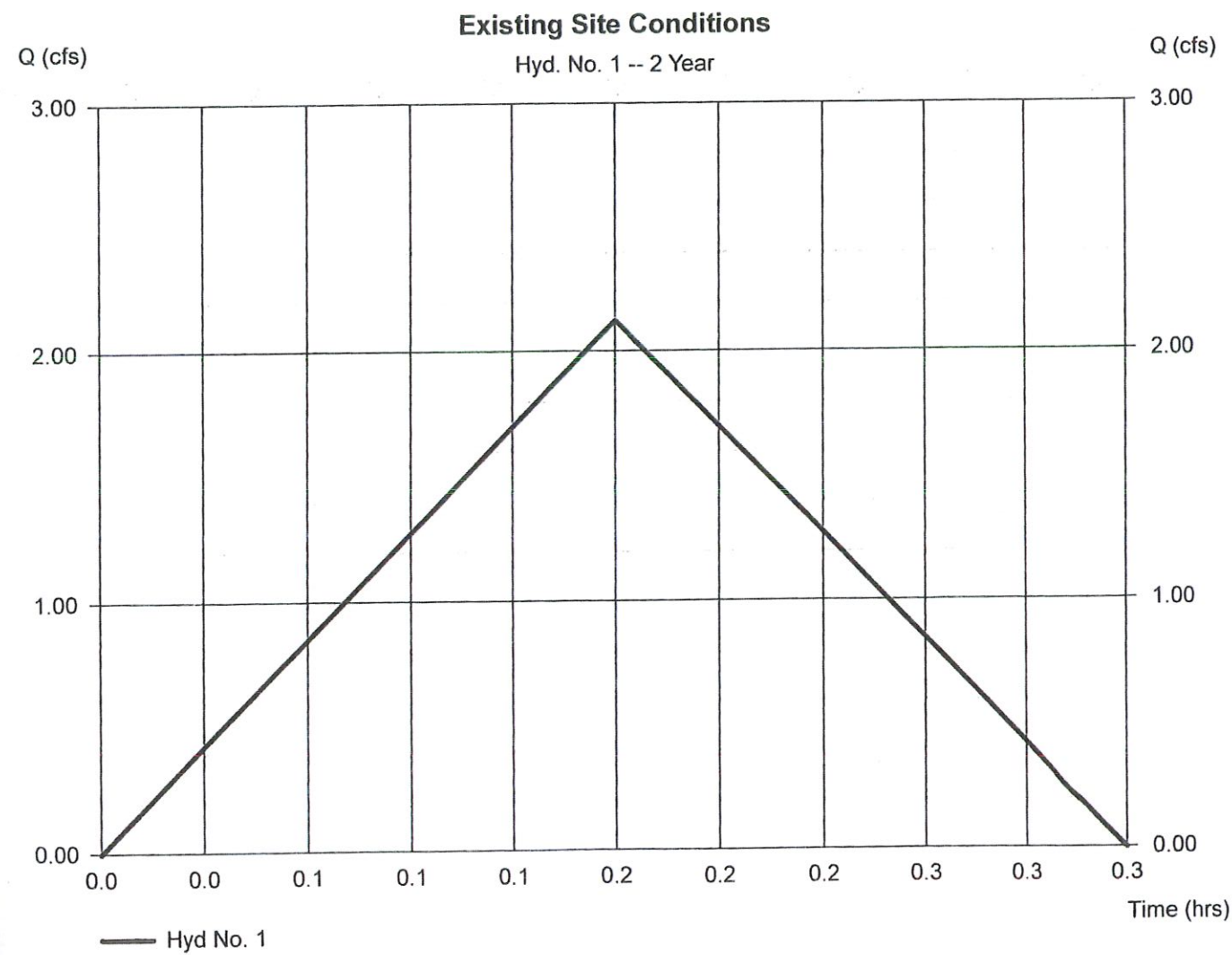
Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Hyd. No. 1

Existing Site Conditions

Hydrograph type	= Rational	Peak discharge	= 2.125 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 1,275 cuft
Drainage area	= 0.886 ac	Runoff coeff.	= 0.57
Intensity	= 4.208 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1

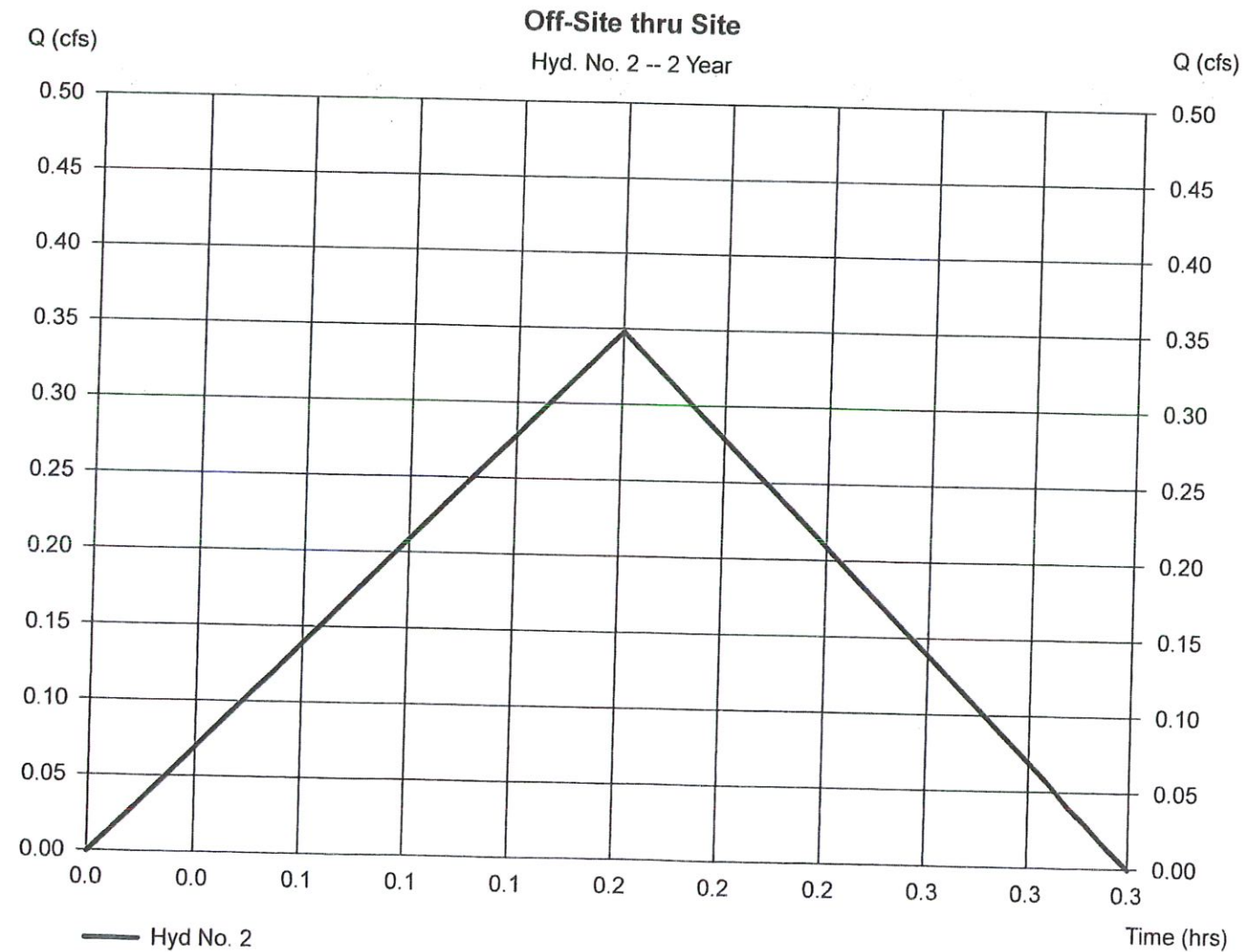


Hydrograph Report

Hyd. No. 2

Off-Site thru Site

Hydrograph type	= Rational	Peak discharge	= 0.348 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 209 cuft
Drainage area	= 0.202 ac	Runoff coeff.	= 0.41
Intensity	= 4.208 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

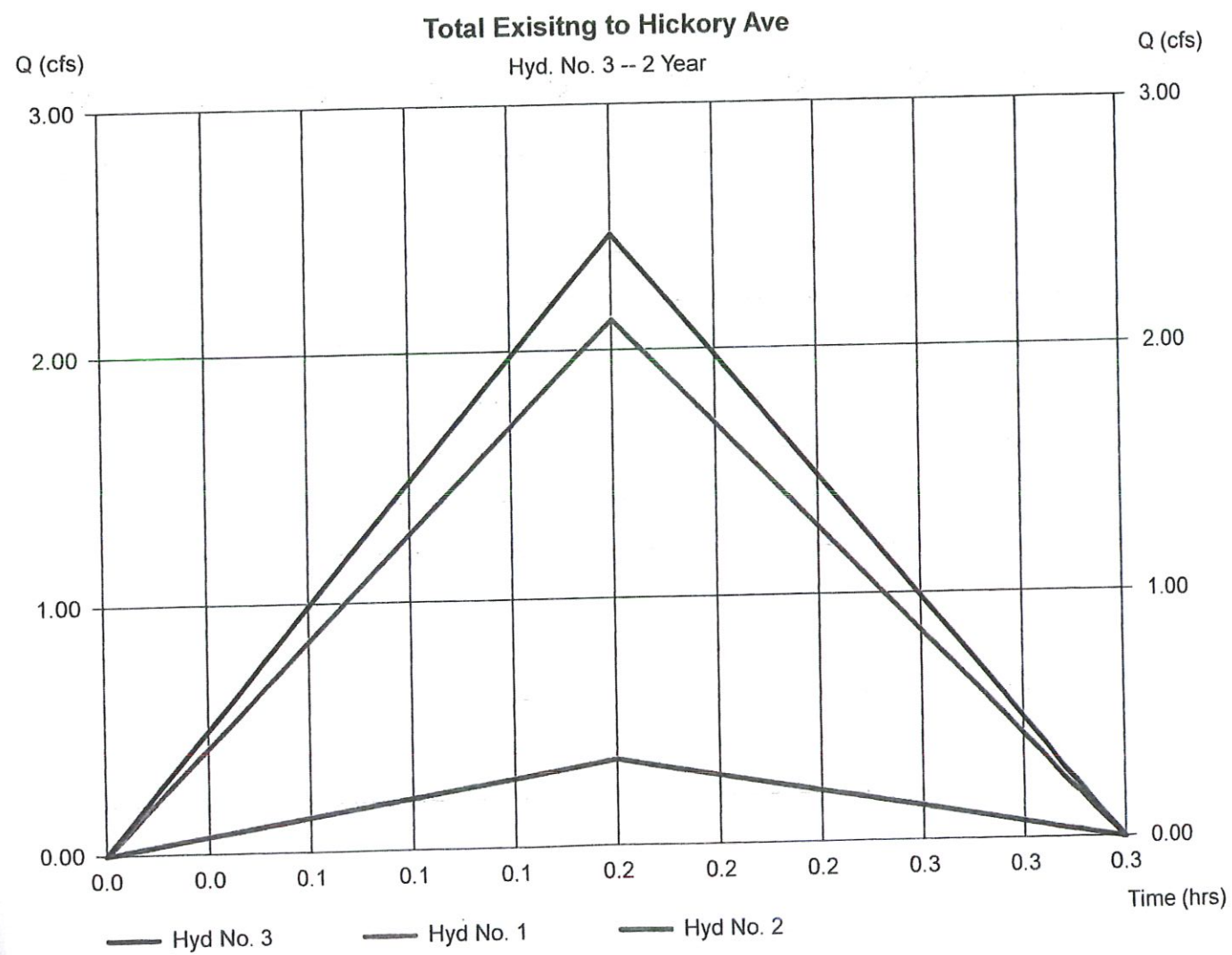
Tuesday, Feb 23, 2021

Hyd. No. 3

Total Exisitng to Hickory Ave

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 2.474 cfs
Time to peak = 0.17 hrs
Hyd. volume = 1,484 cuft
Contrib. drain. area= 1.088 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	2.796	1	10	1,678	---	----	-----	Existing Site Conditions
2	Rational	0.459	1	10	275	---	----	-----	Off-Site thru Site
3	Combine	3.254	1	10	1,953	1, 2	----	-----	Total Exisitng to Hickory Ave
4	Rational	0.103	1	10	62	---	----	-----	Developed Bypassing Detention
5	Rational	3.689	1	10	2,214	---	----	-----	Developed Rational Method Runoff
6	Mod. Rational	2.916	1	10	3,149	---	----	-----	Modified Rational to Detention
7	Reservoir	2.242	1	20	3,149	6	89.11	1,416	30-inch Pipe Detention
2021-01-22 GPG Model.gpw					Return Period: 10 Year			Tuesday, Feb 23, 2021	

Hydrograph Report

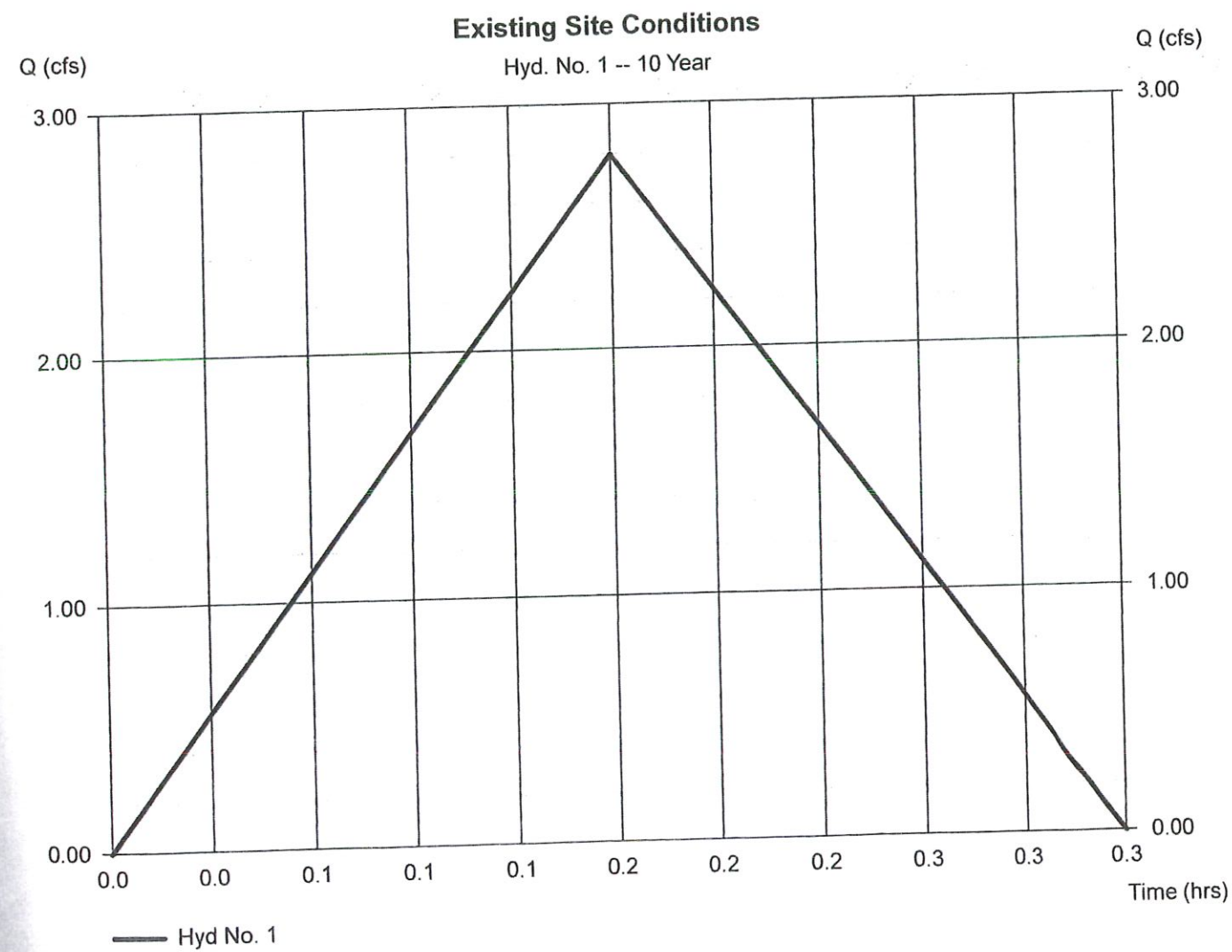
Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Hyd. No. 1

Existing Site Conditions

Hydrograph type	= Rational	Peak discharge	= 2.796 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 1,678 cuft
Drainage area	= 0.886 ac	Runoff coeff.	= 0.57
Intensity	= 5.536 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1

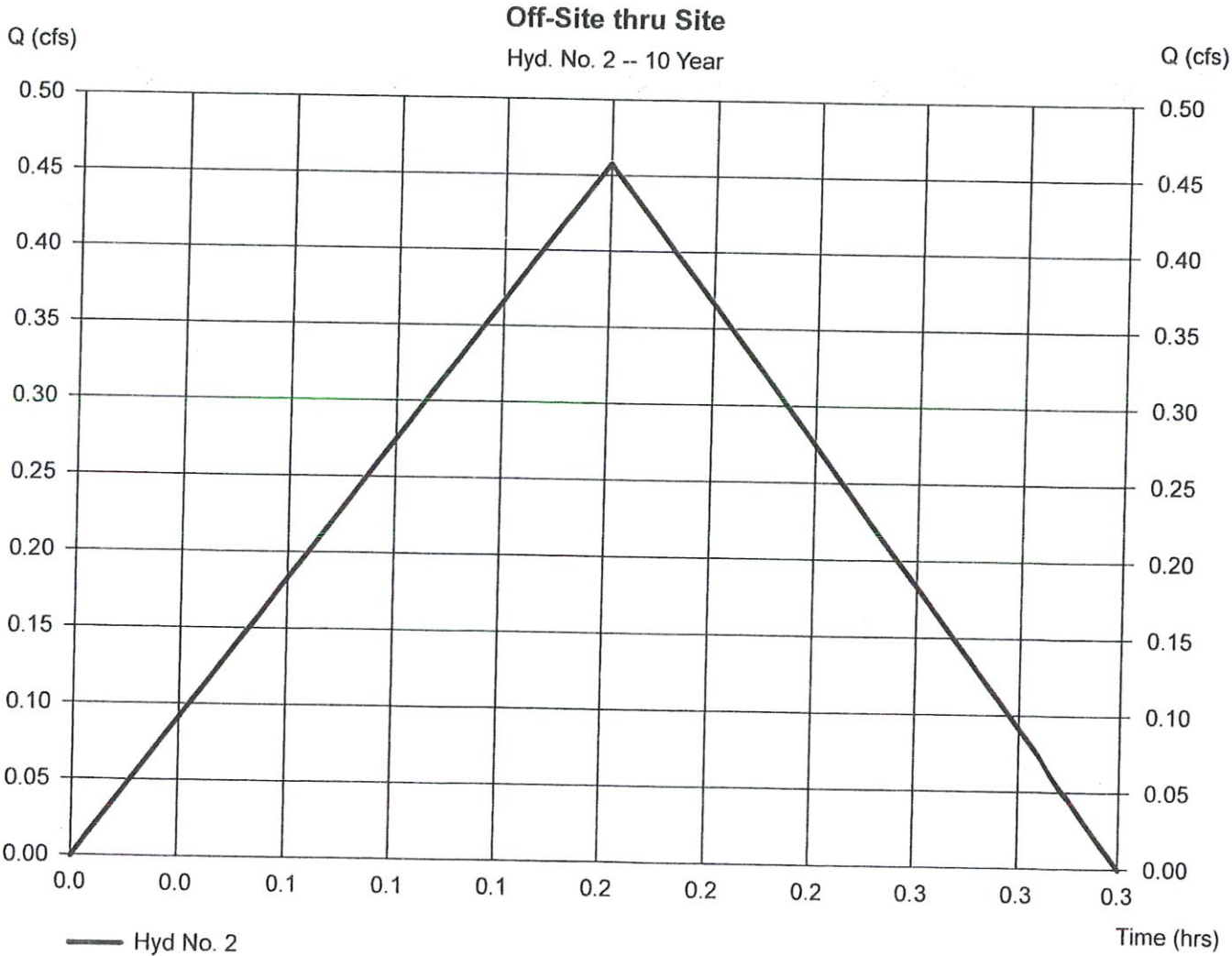


Hydrograph Report

Hyd. No. 2

Off-Site thru Site

Hydrograph type	= Rational	Peak discharge	= 0.459 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 275 cuft
Drainage area	= 0.202 ac	Runoff coeff.	= 0.41
Intensity	= 5.536 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

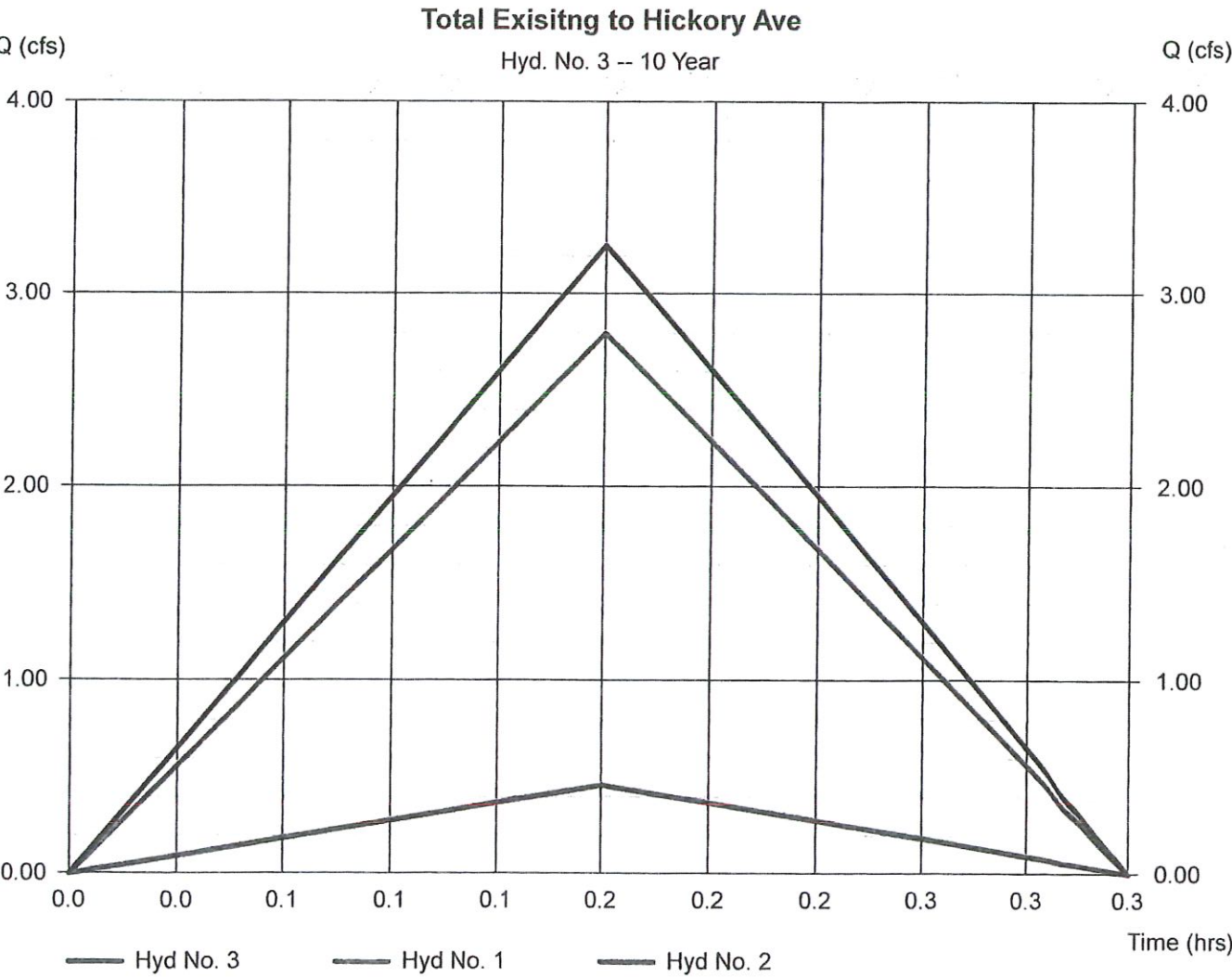
Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Hyd. No. 3

Total Exisitng to Hickory Ave

Hydrograph type	= Combine	Peak discharge	= 3.254 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 1,953 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 1.088 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

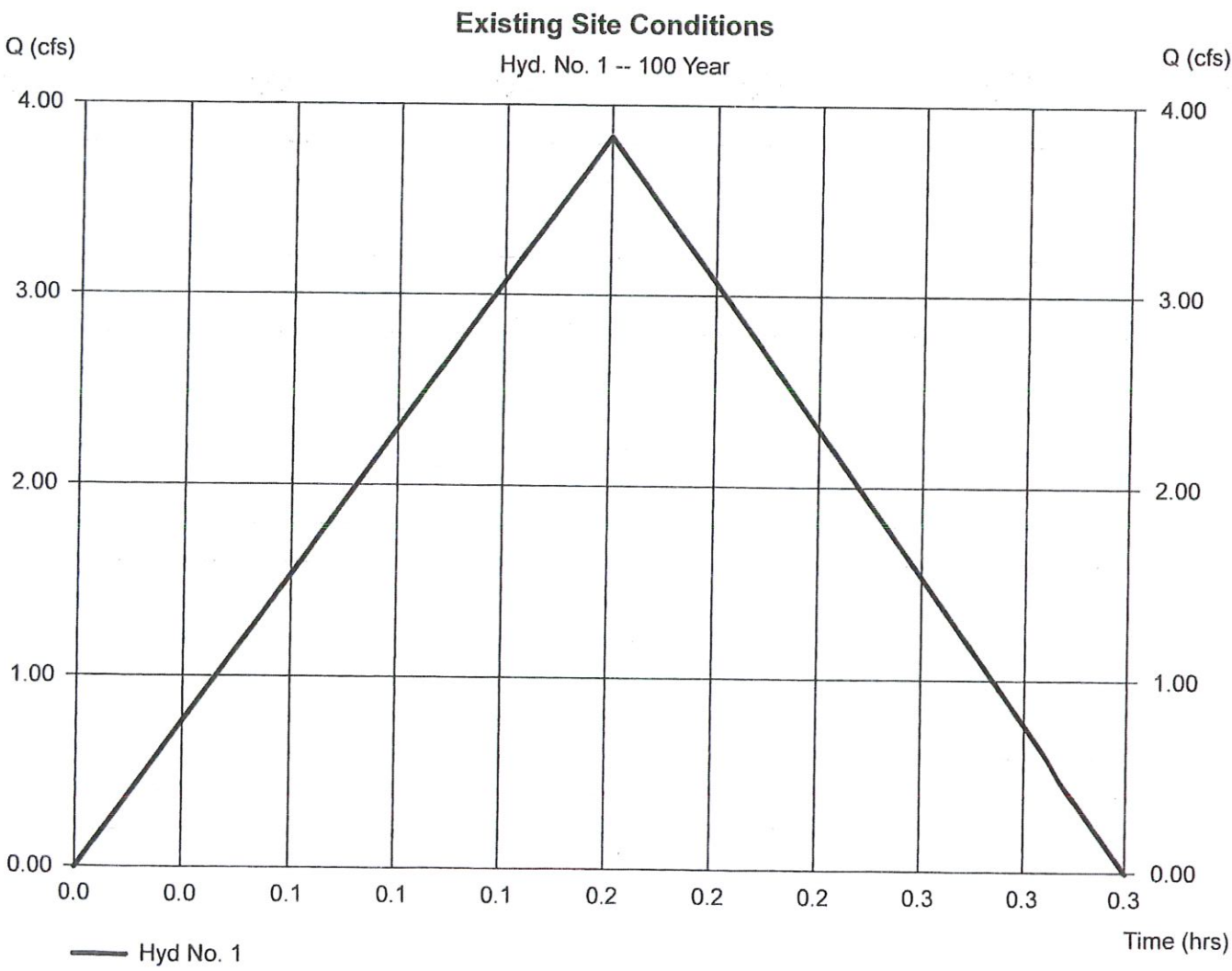
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	3.839	1	10	2,304	---	----	-----	Existing Site Conditions
2	Rational	0.630	1	10	378	---	----	-----	Off-Site thru Site
3	Combine	4.469	1	10	2,681	1, 2	----	-----	Total Exisitng to Hickory Ave
4	Rational	0.141	1	10	85	---	----	-----	Developed Bypassing Detention
5	Rational	5.066	1	10	3,040	---	----	-----	Developed Rational Method Runoff
6	Mod. Rational	3.726	1	10	4,694	---	----	-----	Modified Rational to Detention
7	Reservoir	3.498	1	22	4,694	6	89.54	1,692	30-inch Pipe Detention
2021-01-22 GPG Model.gpw					Return Period: 100 Year			Tuesday, Feb 23, 2021	

Hydrograph Report

Hyd. No. 1

Existing Site Conditions

Hydrograph type	= Rational	Peak discharge	= 3.839 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 2,304 cuft
Drainage area	= 0.886 ac	Runoff coeff.	= 0.57
Intensity	= 7.603 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

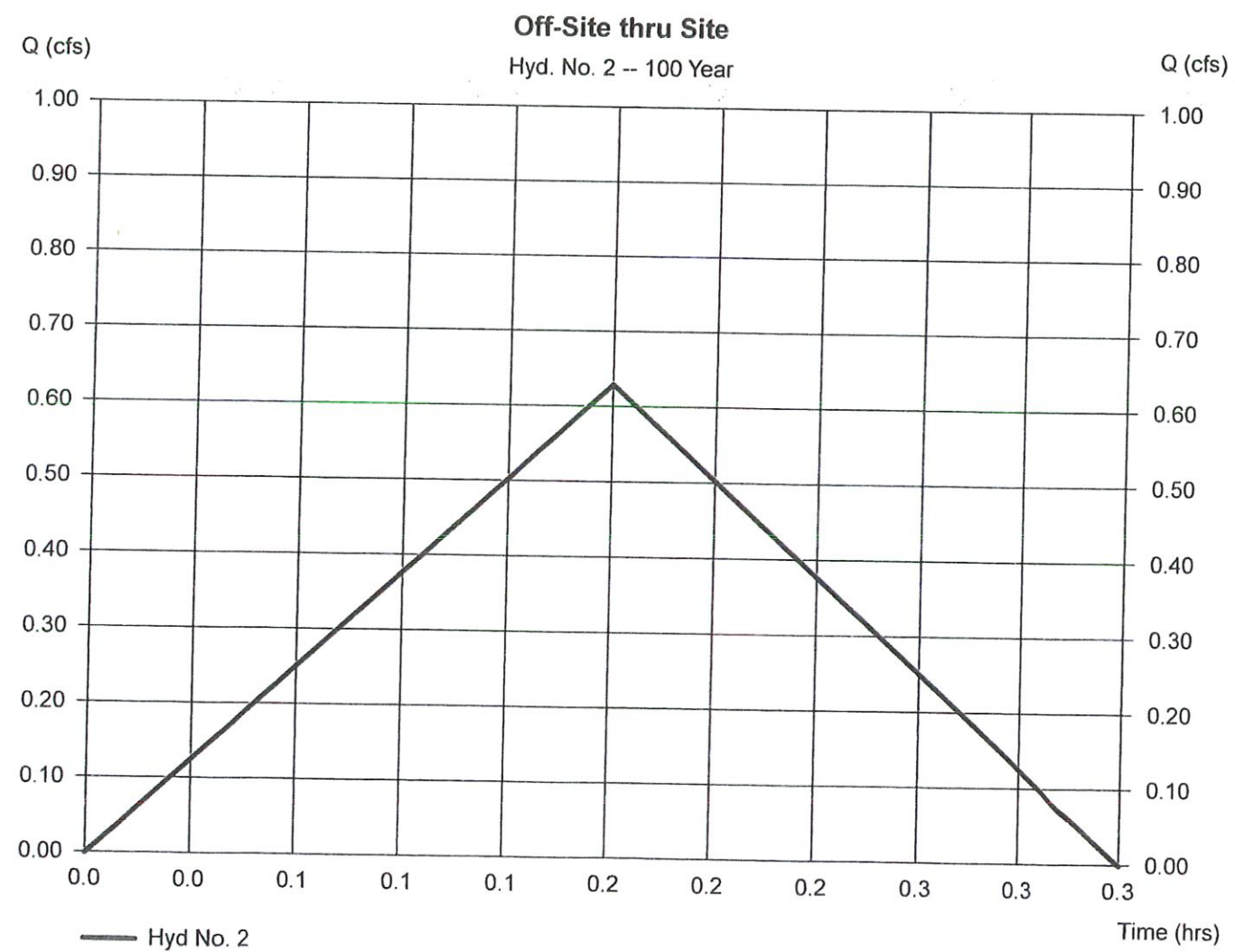
Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Hyd. No. 2

Off-Site thru Site

Hydrograph type	= Rational	Peak discharge	= 0.630 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 378 cuft
Drainage area	= 0.202 ac	Runoff coeff.	= 0.41
Intensity	= 7.603 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

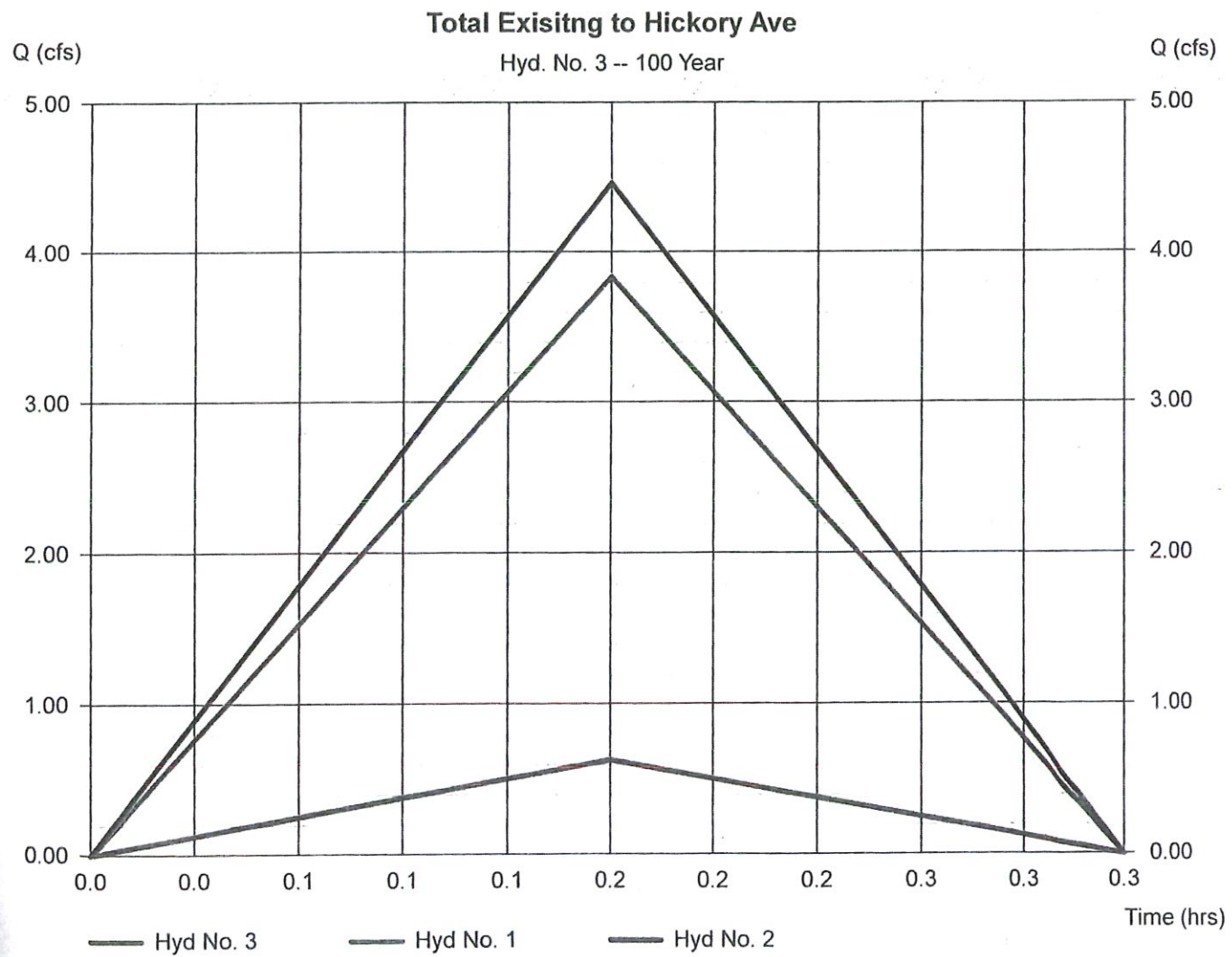
Tuesday, Feb 23, 2021

Hyd. No. 3

Total Exisitng to Hickory Ave

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 4.469 cfs
Time to peak = 0.17 hrs
Hyd. volume = 2,681 cuft
Contrib. drain. area= 1.088 ac



APPENDIX C

**PROPOSED PEAK FLOW HYDROGRAPHS
2, 10, AND 100-YEAR STORM EVENTS**

Hydrograph Report

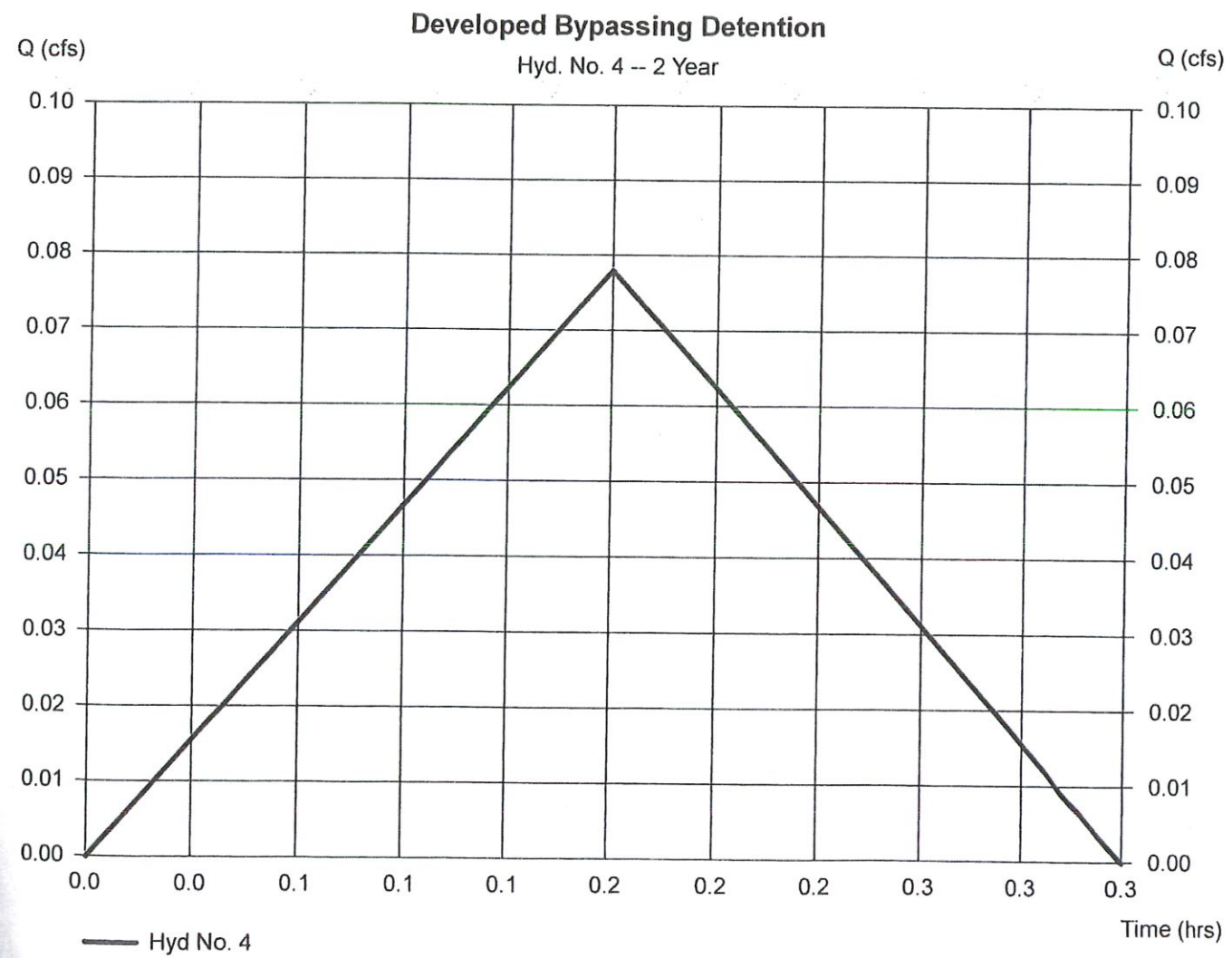
Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Hyd. No. 4

Developed Bypassing Detention

Hydrograph type	= Rational	Peak discharge	= 0.078 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 47 cuft
Drainage area	= 0.053 ac	Runoff coeff.	= 0.35
Intensity	= 4.208 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

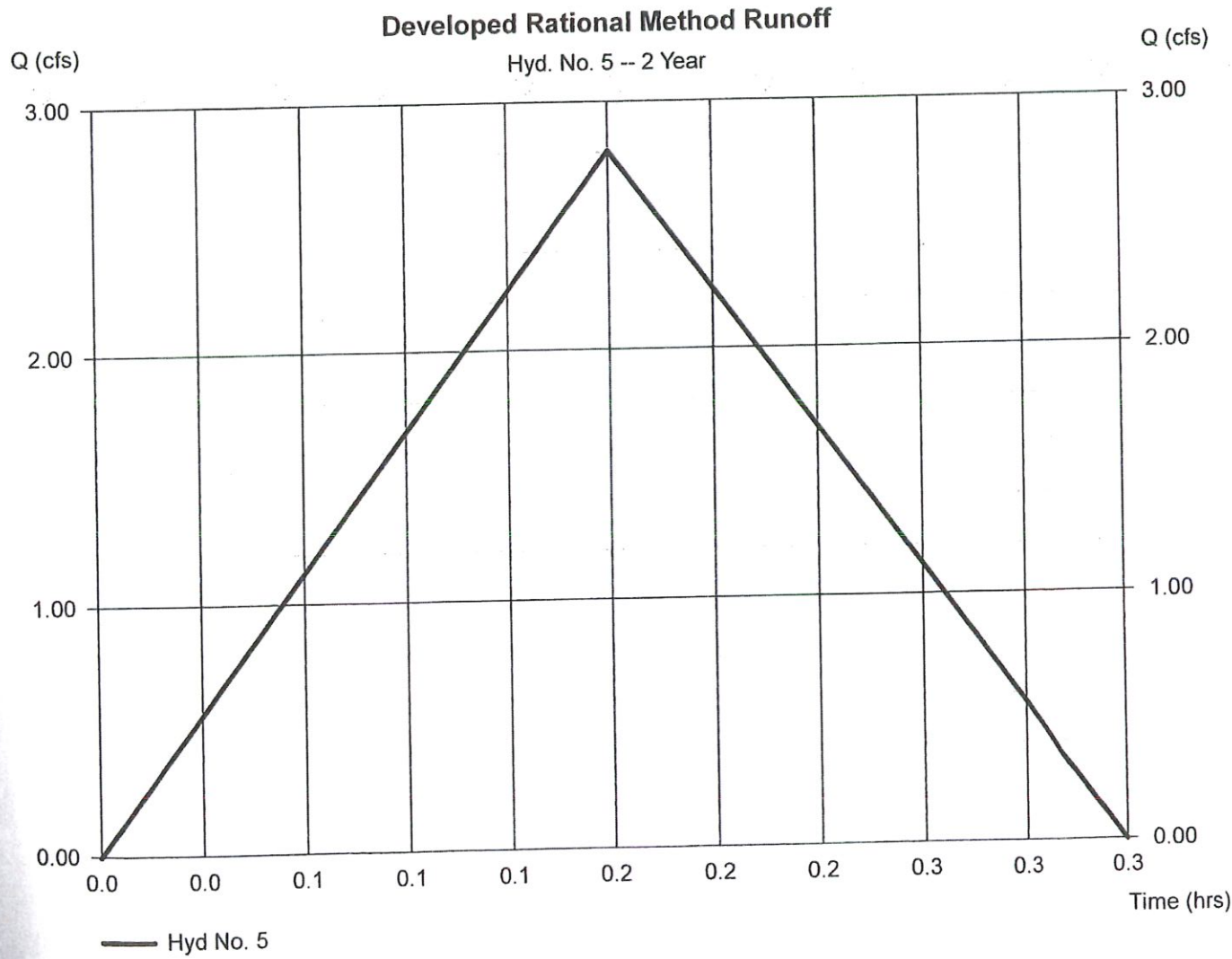
Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Hyd. No. 5

Developed Rational Method Runoff

Hydrograph type	= Rational	Peak discharge	= 2.804 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 1,682 cuft
Drainage area	= 0.833 ac	Runoff coeff.	= 0.8
Intensity	= 4.208 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1

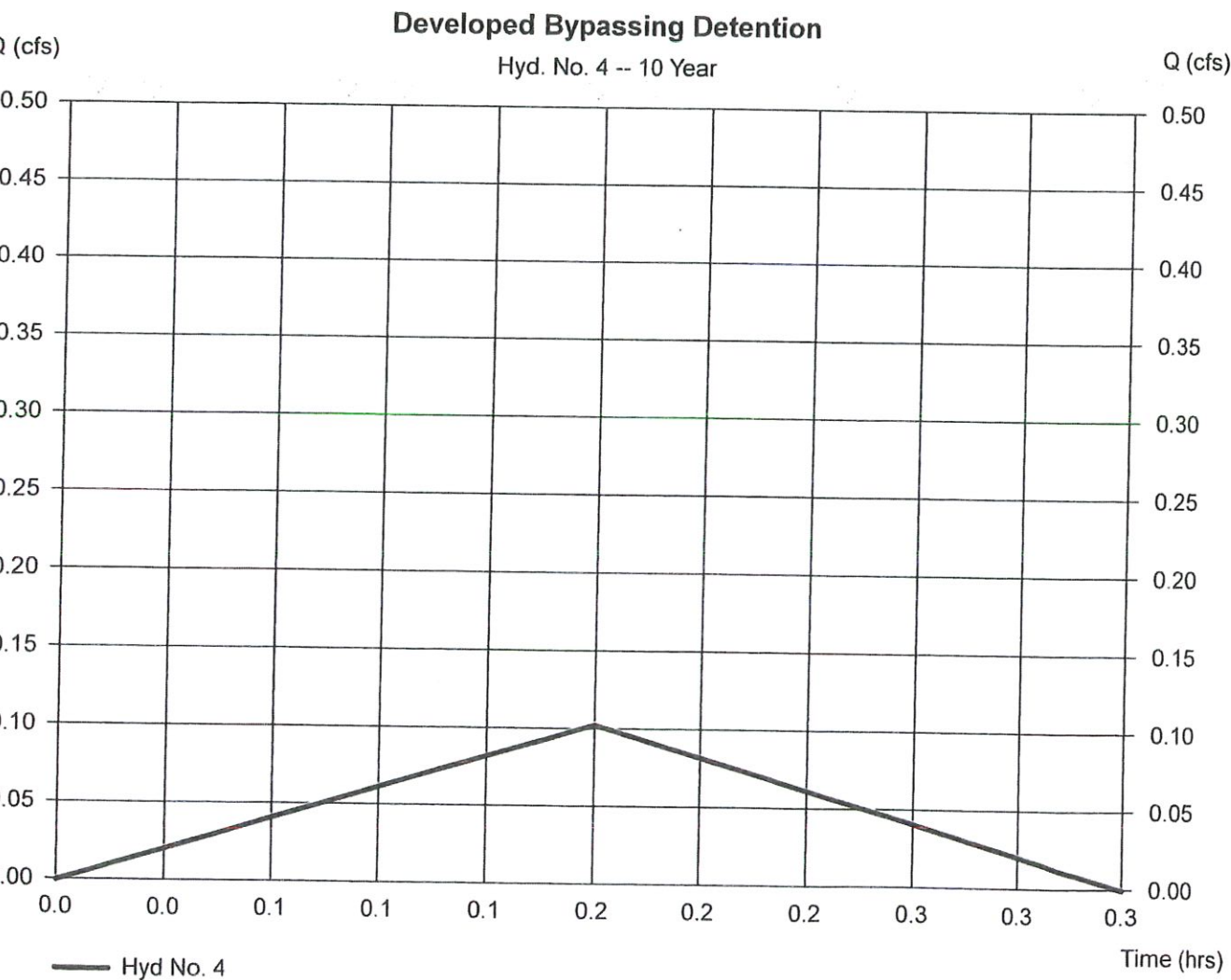


Hydrograph Report

Hyd. No. 4

Developed Bypassing Detention

Hydrograph type	= Rational	Peak discharge	= 0.103 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 62 cuft
Drainage area	= 0.053 ac	Runoff coeff.	= 0.35
Intensity	= 5.536 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

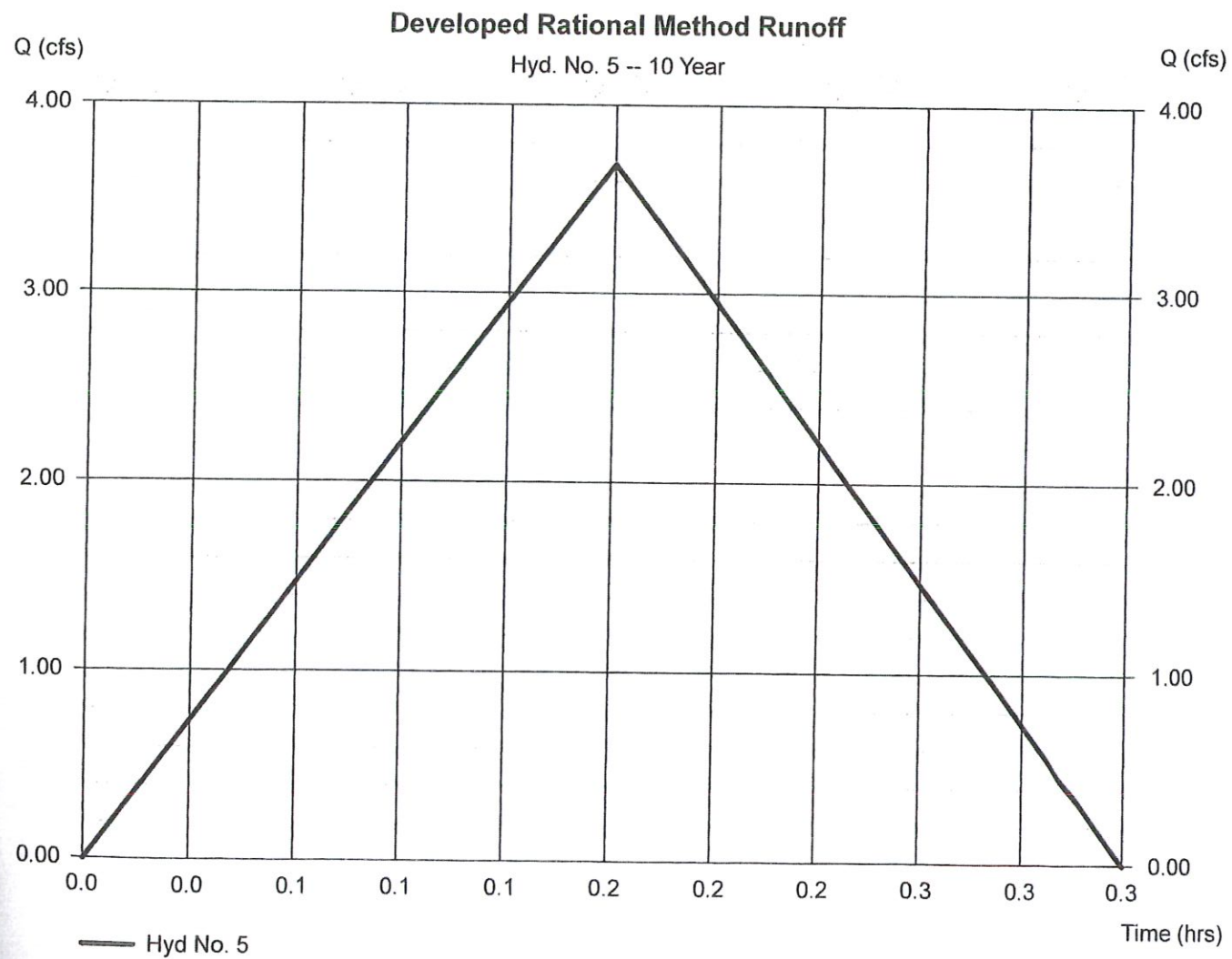
Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Hyd. No. 5

Developed Rational Method Runoff

Hydrograph type	= Rational	Peak discharge	= 3.689 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 2,214 cuft
Drainage area	= 0.833 ac	Runoff coeff.	= 0.8
Intensity	= 5.536 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

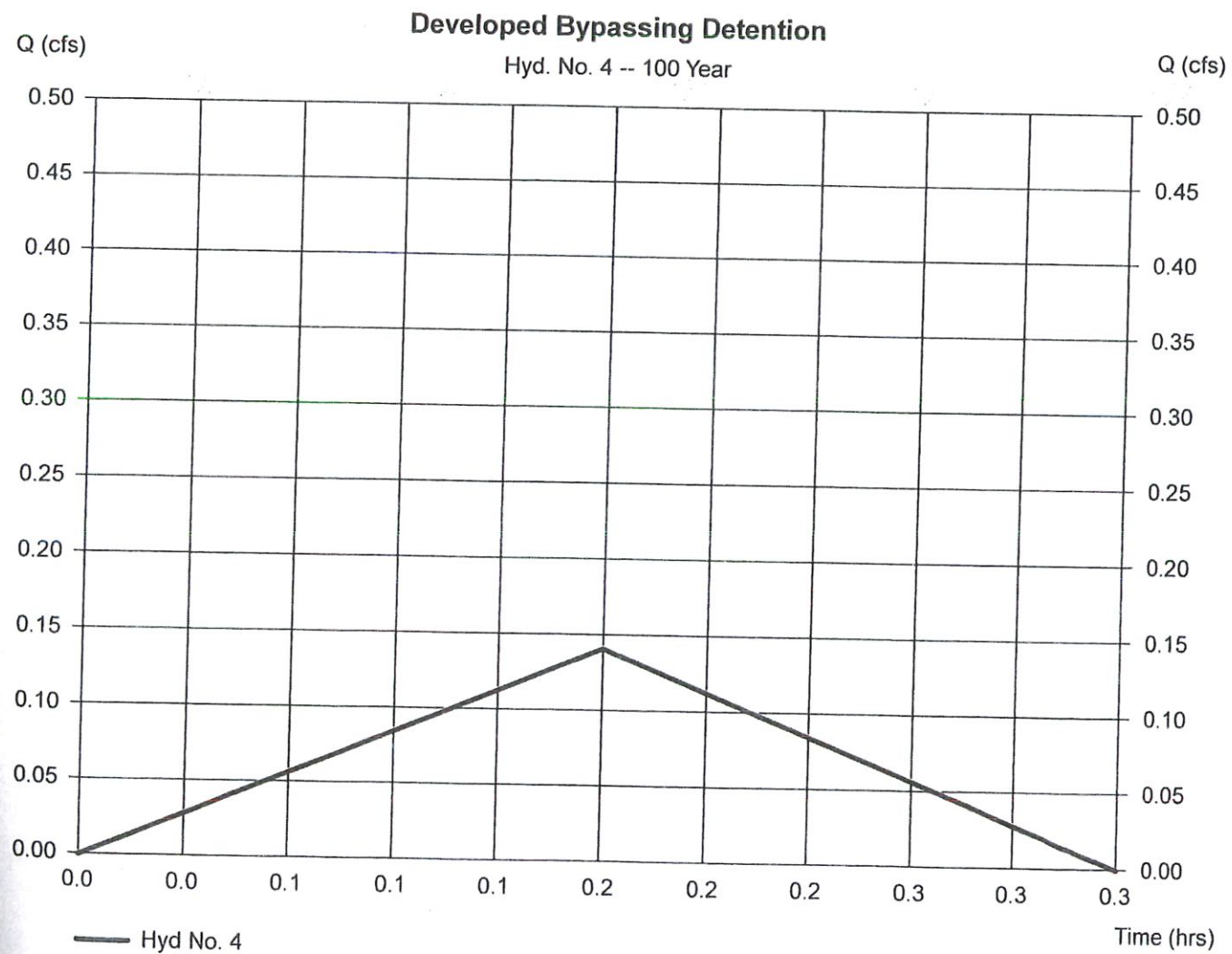
Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Hyd. No. 4

Developed Bypassing Detention

Hydrograph type	= Rational	Peak discharge	= 0.141 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 85 cuft
Drainage area	= 0.053 ac	Runoff coeff.	= 0.35
Intensity	= 7.603 in/hr	Tc by User	= 10.00 min
IDF Curve	= Trenton, New Jersey.idf	Asc/Rec limb fact	= 1/1



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

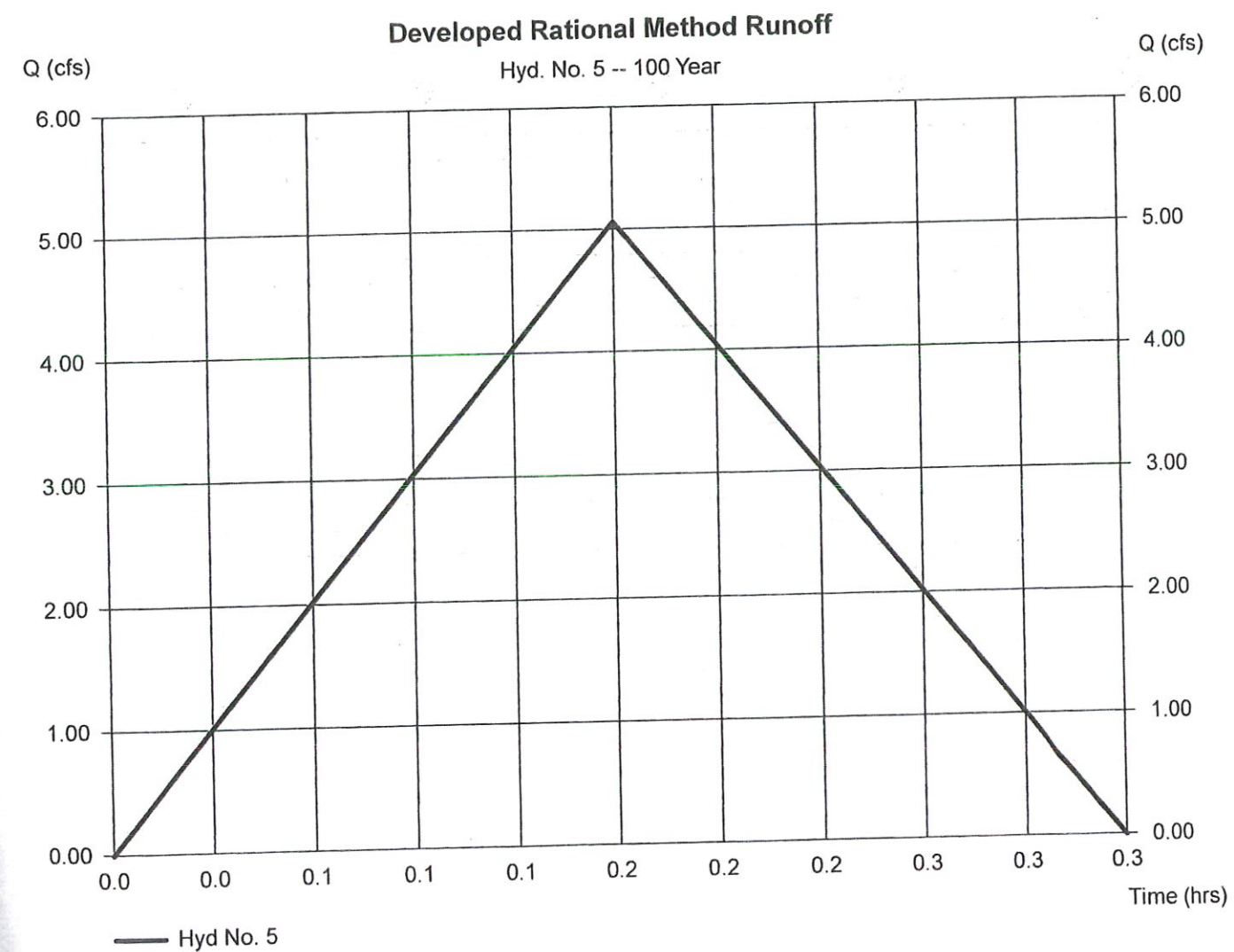
Tuesday, Feb 23, 2021

Hyd. No. 5

Developed Rational Method Runoff

Hydrograph type = Rational
Storm frequency = 100 yrs
Time interval = 1 min
Drainage area = 0.833 ac
Intensity = 7.603 in/hr
IDF Curve = Trenton, New Jersey.idf

Peak discharge = 5.066 cfs
Time to peak = 0.17 hrs
Hyd. volume = 3,040 cuft
Runoff coeff. = 0.8
Tc by User = 10.00 min
Asc/Rec limb fact = 1/1



APPENDIX D

ROUTED BASIN HYDROGRAPHS
2, 10, AND 100-YEAR STORM EVENTS

Pond Report

Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

Pond No. 1 - 30-INCH PIPE DETENTION

Pond Data

UG Chambers - Invert elev. = 86.80 ft, Rise x Span = 2.50 x 2.50 ft, Barrel Len = 370.00 ft, No. Barrels = 1, Slope = 0.25%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	86.80	n/a	0	0
0.34	87.14	n/a	25	25
0.69	87.49	n/a	96	120
1.03	87.83	n/a	206	327
1.37	88.17	n/a	277	604
1.71	88.51	n/a	305	908
2.06	88.86	n/a	305	1,214
2.40	89.20	n/a	277	1,490
2.74	89.54	n/a	206	1,696
3.08	89.88	n/a	95	1,792
3.43	90.23	n/a	25	1,817

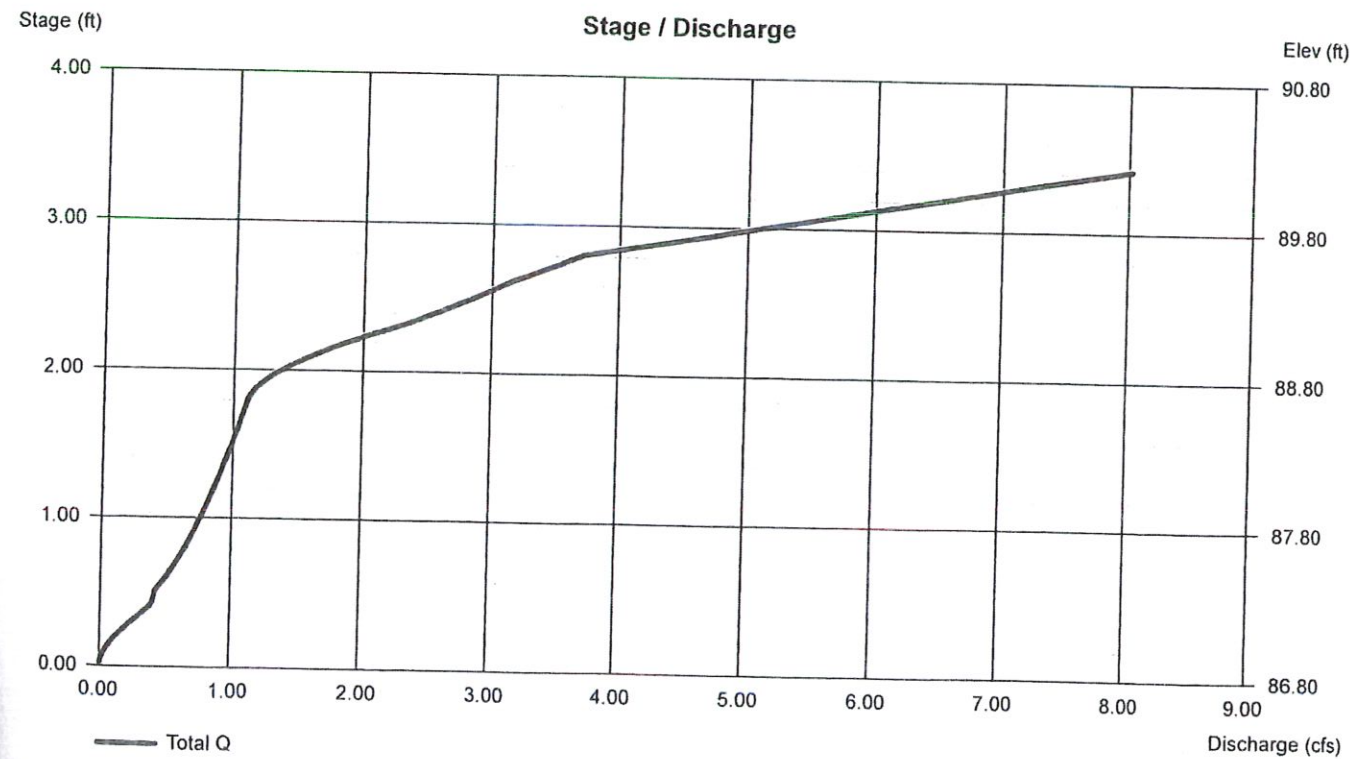
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	6.00	12.00	0.00
Span (in)	= 0.00	6.00	12.00	0.00
No. Barrels	= 0	1	1	0
Invert El. (ft)	= 0.00	86.80	88.60	0.00
Length (ft)	= 0.00	20.00	20.00	0.00
Slope (%)	= 0.00	1.00	1.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 89.40	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s)



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

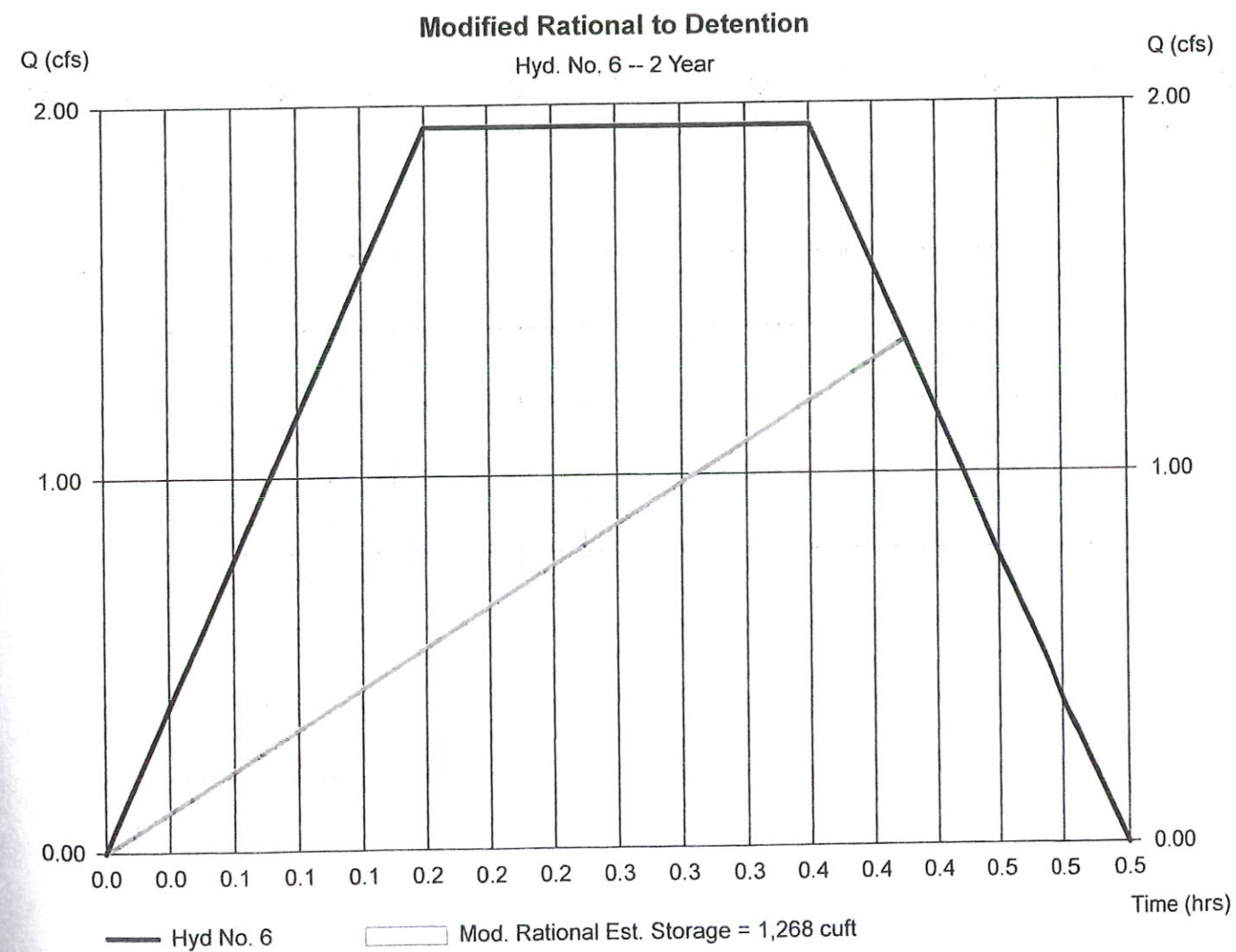
Tuesday, Feb 23, 2021

Hyd. No. 6

Modified Rational to Detention

Hydrograph type = Mod. Rational
Storm frequency = 2 yrs
Time interval = 1 min
Drainage area = 0.833 ac
Intensity = 2.917 in/hr
IDF Curve = Trenton, New Jersey.idf
Target Q = 1.300 cfs

Peak discharge = 1.944 cfs
Time to peak = 0.17 hrs
Hyd. volume = 2,566 cuft
Runoff coeff. = 0.8
Tc by User = 10.00 min
Storm duration = 2.2 x Tc
Est. Req'd Storage = 1,268 cuft



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Tuesday, Feb 23, 2021

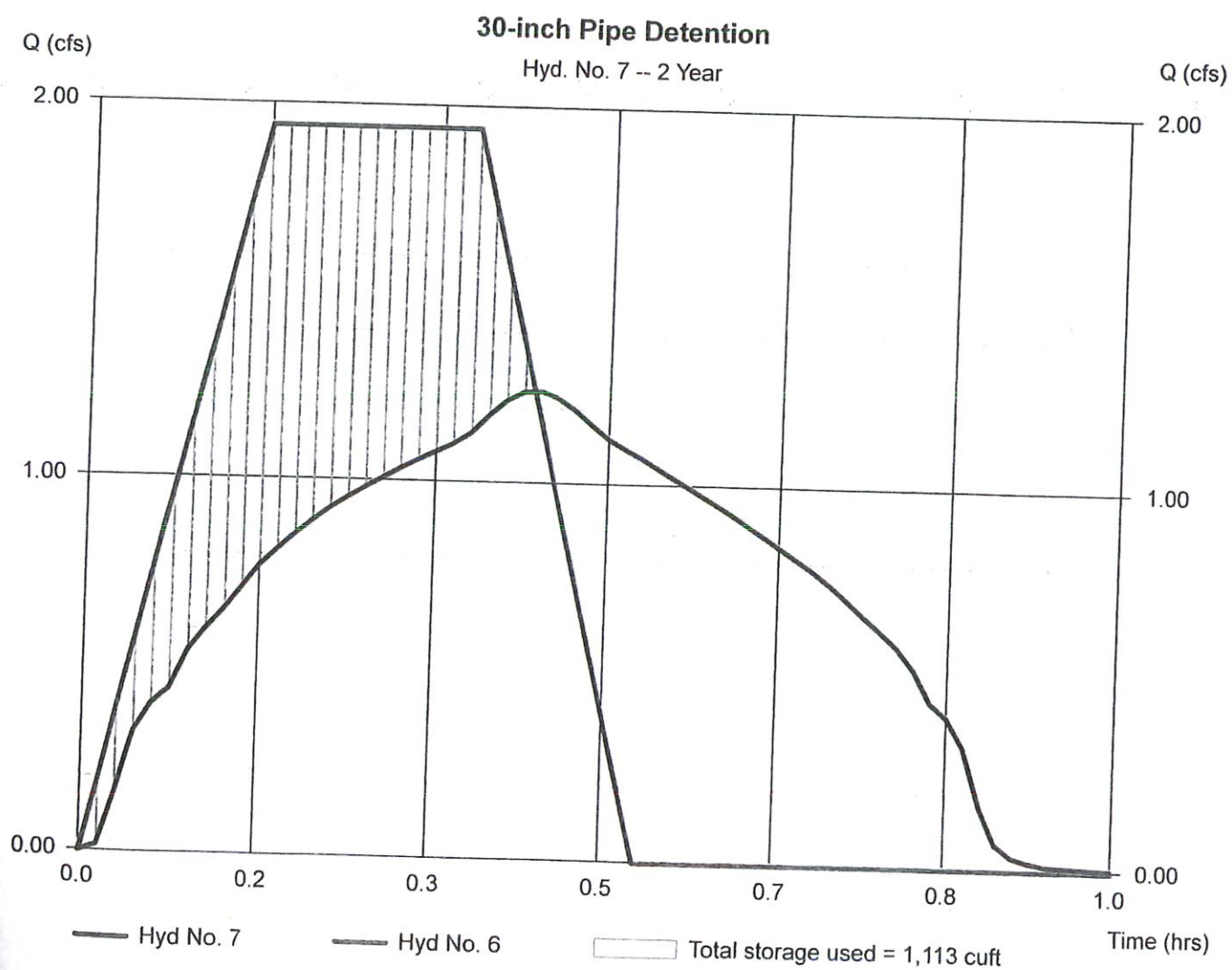
Hyd. No. 7

30-inch Pipe Detention

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyd. No. = 6 - Modified Rational to Detention
Reservoir name = 30-INCH PIPE DETENTION

Peak discharge = 1.244 cfs
Time to peak = 0.43 hrs
Hyd. volume = 2,565 cuft
Max. Elevation = 88.75 ft
Max. Storage = 1,113 cuft

Storage Indication method used.

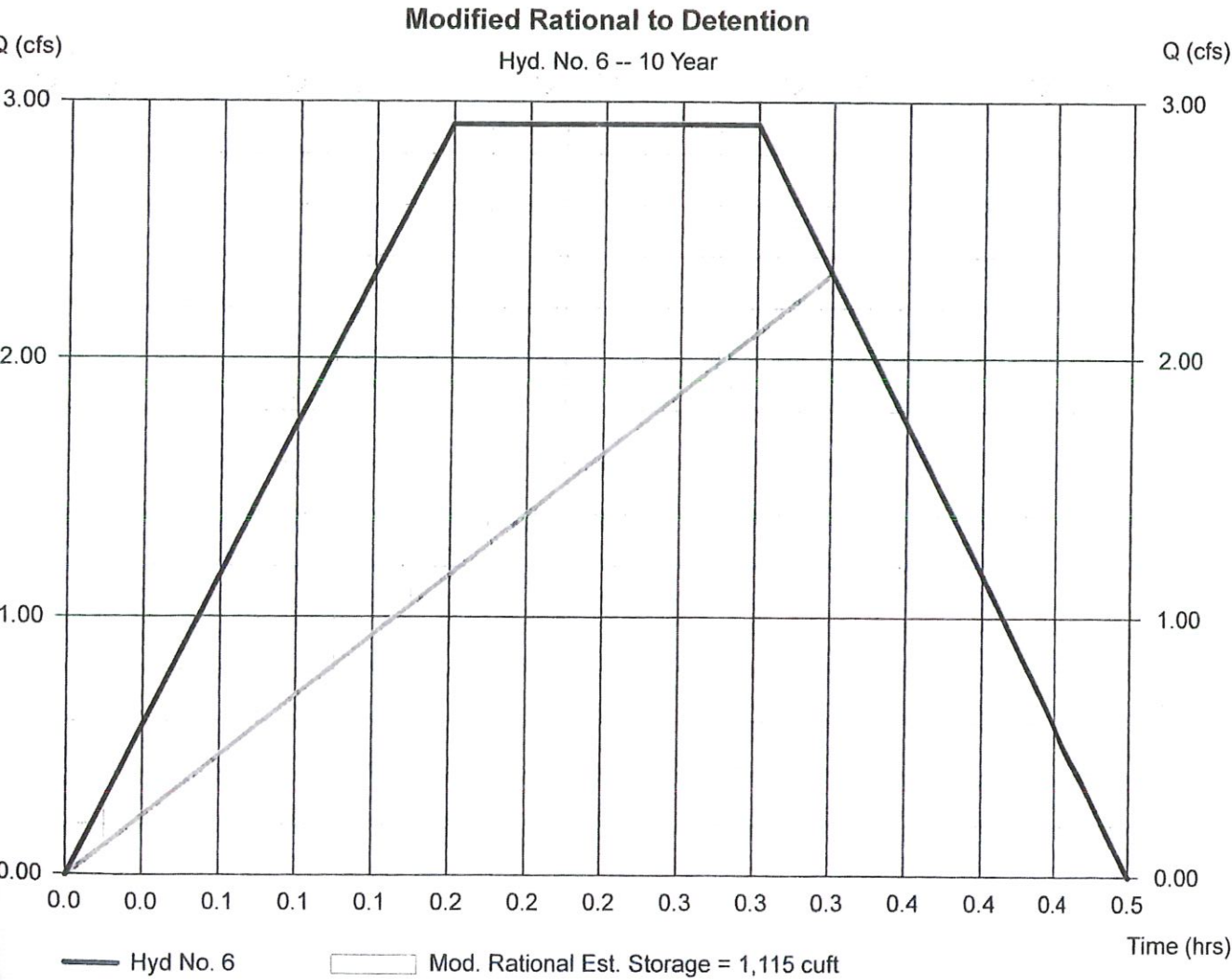


Hydrograph Report

Hyd. No. 6

Modified Rational to Detention

Hydrograph type	=	Mod. Rational	Peak discharge	=	2.916 cfs
Storm frequency	=	10 yrs	Time to peak	=	0.17 hrs
Time interval	=	1 min	Hyd. volume	=	3,149 cuft
Drainage area	=	0.833 ac	Runoff coeff.	=	0.8
Intensity	=	4.376 in/hr	Tc by User	=	10.00 min
IDF Curve	=	Trenton, New Jersey.idf	Storm duration	=	1.8 x Tc
Target Q	=	2.400 cfs	Est. Req'd Storage	=	1,115 cuft



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

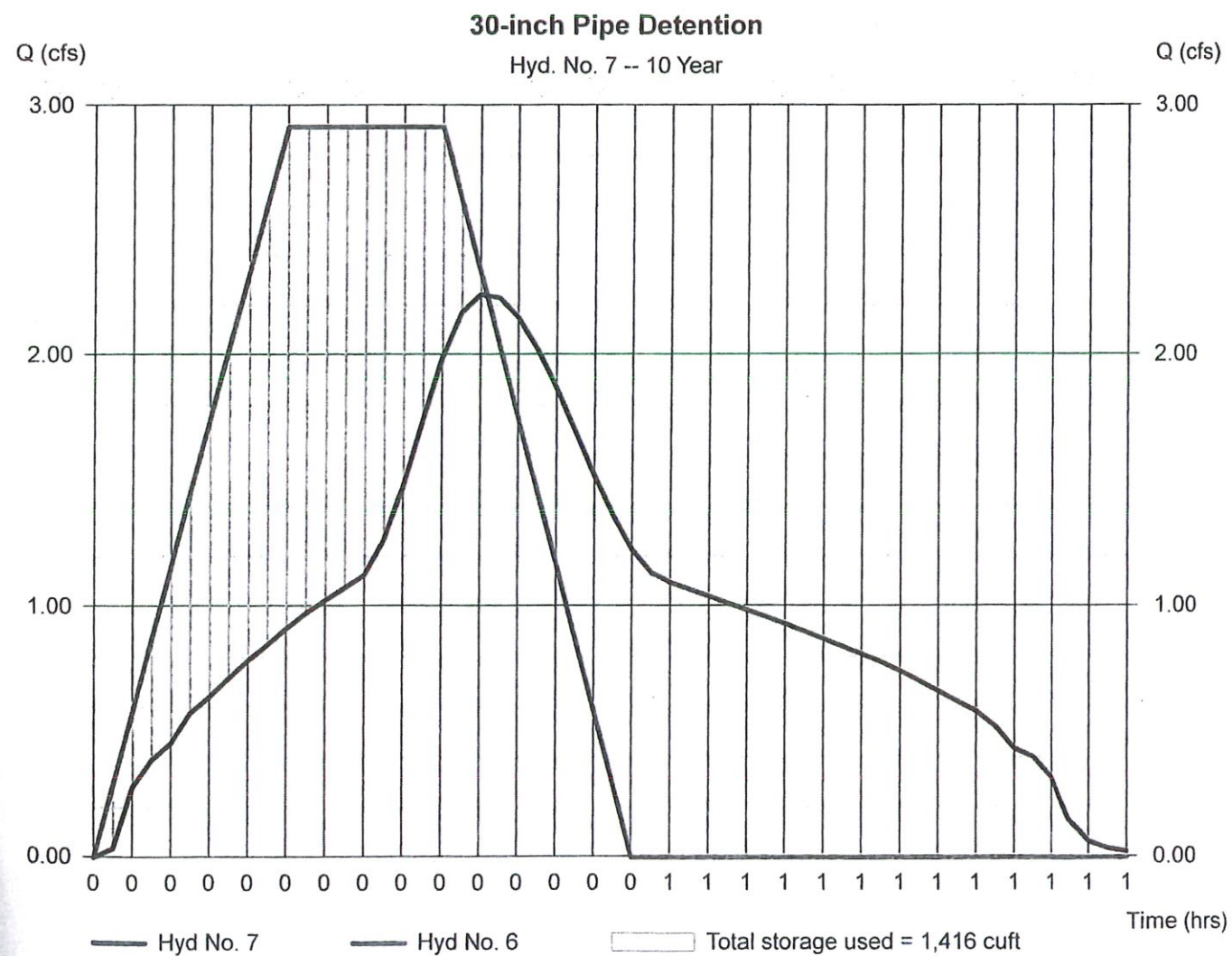
Tuesday, Feb 23, 2021

Hyd. No. 7

30-inch Pipe Detention

Hydrograph type	= Reservoir	Peak discharge	= 2.242 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.33 hrs
Time interval	= 1 min	Hyd. volume	= 3,149 cuft
Inflow hyd. No.	= 6 - Modified Rational to Detention	Max. Elevation	= 89.11 ft
Reservoir name	= 30-INCH PIPE DETENTION	Max. Storage	= 1,416 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

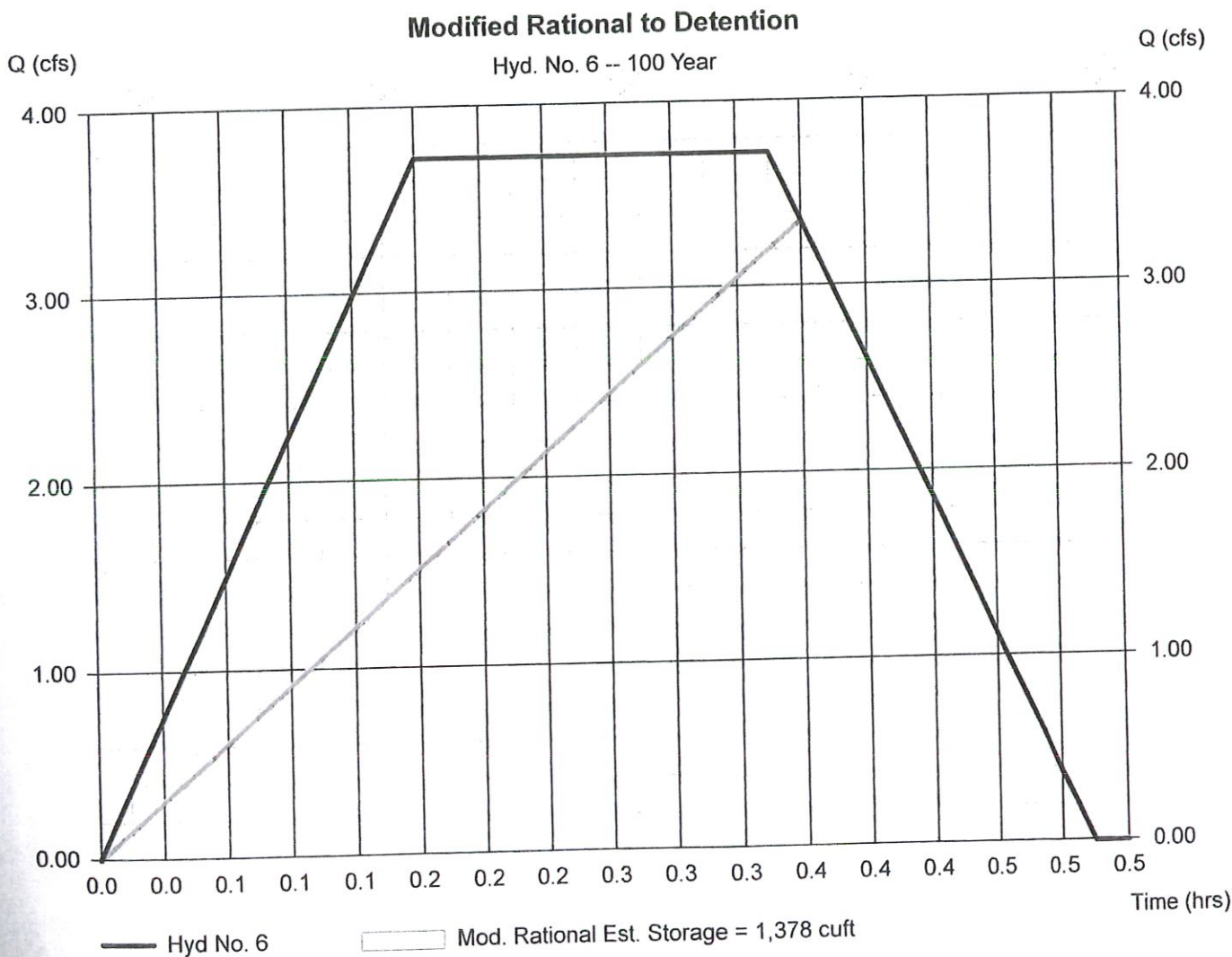
Tuesday, Feb 23, 2021

Hyd. No. 6

Modified Rational to Detention

Hydrograph type = Mod. Rational
Storm frequency = 100 yrs
Time interval = 1 min
Drainage area = 0.833 ac
Intensity = 5.591 in/hr
IDF Curve = Trenton, New Jersey.idf
Target Q = 3.500 cfs

Peak discharge = 3.726 cfs
Time to peak = 0.17 hrs
Hyd. volume = 4,694 cuft
Runoff coeff. = 0.8
Tc by User = 10.00 min
Storm duration = 2.1 x Tc
Est. Req'd Storage = 1,378 cuft



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

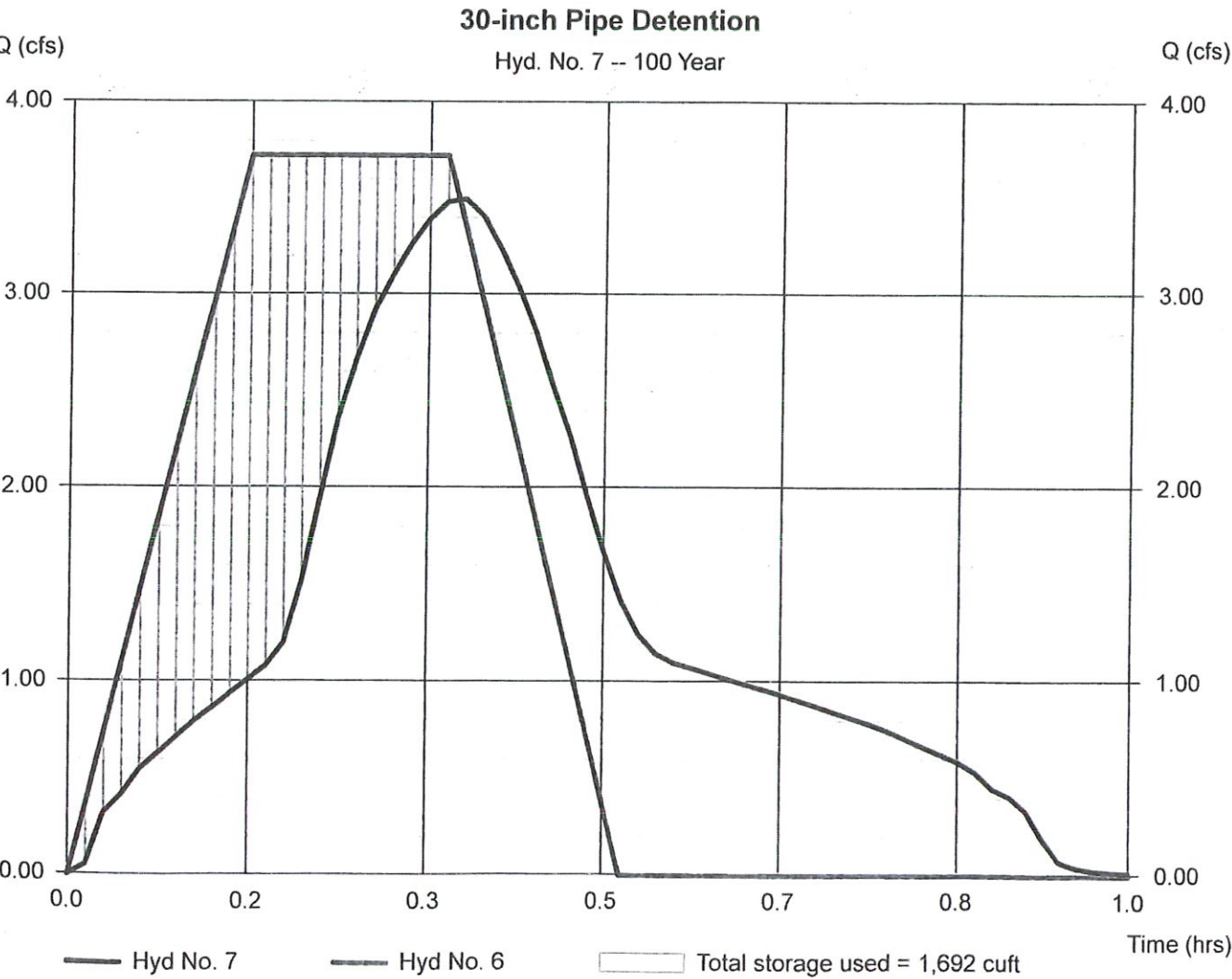
Tuesday, Feb 23, 2021

Hyd. No. 7

30-inch Pipe Detention

Hydrograph type	= Reservoir	Peak discharge	= 3.498 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.37 hrs
Time interval	= 1 min	Hyd. volume	= 4,694 cuft
Inflow hyd. No.	= 6 - Modified Rational to Detention	Max. Elevation	= 89.54 ft
Reservoir name	= 30-INCH PIPE DETENTION	Max. Storage	= 1,692 cuft

Storage Indication method used.



APPENDIX E

ANNUAL GROUNDWATER RECHARGE CALCULATIONS

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
BERGEN CO., BERGENFIELD BORO	48.3	1.58

BERGEN CO., BERGENFIELD BORO		48.3		1.58	
Pre-Developed Conditions					
Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.248	Impervious areas	Dunellen	0.0	
2	0.153	Gravel, dirt	Dunellen	10.2	5,665
3	0.485	Open space	Dunellen	18.2	28,518
4	0				
5	0				
6	0				
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	0.9			Total Annual Recharge	Total Annual Recharge

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

GSR-32)

Project Name:		Hickory Ave Townhomes			
Description:		Recharge Analysis			
Analysis Date:		01/22/21			
Post-Developed Conditions					
Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.624	Impervious areas	Dunellen	0.0	-
2	0				
3	0.262	Open space	Dunellen	18.2	15,408
4	0				
5	0				
6	0				
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =		0.9		Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				4.8	15,408
Annual Recharge Requirements Calculation ↓					
% of Pre-Developed Annual Recharge to Preserve =				100%	
Post-Development Annual Recharge Deficit=				18,778	(cubic feet)
Recharge Efficiency Parameters Calculations (area averages)					
RWC=	3.63	(in)		DRWC=	0.00
ERWC =	0.76	(in)		EDRWC=	0.00

APPENDIX F
NRCS SOIL MAPPING INFORMATION



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

1/22/2021
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)	Soil Area
Area of Interest (AOI)	Stony Spot
Soils	Very Stony Spot
Soil Map Unit Polygons	Wet Spot
Soil Map Unit Lines	Other
Soil Map Unit Points	Special Line Features
Special Point Features	Water Features
Blowout	Streams and Canals
Borrow Pit	Transportation
Clay Spot	Rails
Closed Depression	Interstate Highways
Gravel Pit	US Routes
Gravelly Spot	Major Roads
Landfill	Local Roads
Lava Flow	Background
Marsh or swamp	Aerial Photography
Mine or Quarry	
Miscellaneous Water	
Perennial Water	
Rock Outcrop	
Saline Spot	
Sandy Spot	
Severely Eroded Spot	
Sinkhole	
Slide or Slip	
Sodic Spot	

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Bergen County, New Jersey
Survey Area Data: Version 17, Jun 1, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 23, 2014—Aug 15, 2014

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DuuB	Dunellen-Urban land complex, 3 to 8 percent slopes	0.9	100.0%
Totals for Area of Interest		0.9	100.0%

**APPENDIX G
MAPS**

**MAP OF SURVEY
GRADING & DRAINAGE PLAN
EXISTING DRAINAGE AREA PLAN
PROPOSED DRAINAGE AREA PLAN**