TOWNSHIP OF HOPEWELL

MERCER COUNTY

201 Washington Crossing Pennington Road
Titusville, New Jersey 08560-1410
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November 24, 2015

Honorable Norman C. Bay, Chair
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Docket CP15-558-000
Previous Docket PF15-1-000
Proposed Gas Pipeline
PennEast Pipeline Company LLC
Hopewell Township, Mercer County

Dear Mr. Bay:

The attached documents were originally filed with FERC by Hopewell Township in response to the Pre-filing by PennEast (Docket PF15-1-000). The comments in these documents remain relevant to filing by PennEast under Docket CP-15-558-000. Hopewell Township is, therefore, refiling these documents under Docket CP15-558-000. For reader convenience, a table of contents identifying the documents included in this filing is provided.

Where used in this document, comments referring to the "Preferred Alternate Route" refer to the alignment within Hopewell Township as proposed by PennEast in its filing under CP15-558-000. Where used in this document, comments referring to the "Initial Proposed Route" refer to the initial alignment proposed by PennEast its filing under PF15-1-000 and those comments are NOT specific to CP15-558-000. Comments that have no specific alignment reference should be regarded as Hopewell Township comments that are applicable to all aspects of CP15-558-000.

Thank you.

Sincerely,

Raul E. Pogorzelski, P.E.
Township Administrator/Engineer

C: Hopewell Township Committee
Steven P. Goodell, Esquire
Governor Chris Christie
U.S. Senator Robert Menendez
U.S. Senator Cory Booker
Congresswoman Bonnie Watson Coleman
Mercer County Board of Chosen Freeholders

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TOWNSHIP OF HOPEWELL

MERCER COUNTY

201 Washington Crossing Pennington Road
Titusville, New Jersey 08560-1410
609.737.0605 Ext. 664
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February 25, 2015

Honorable Cheryl A. LaFleur, Chair
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Docket PF15-1-000
Proposed Gas Pipeline
PennEast Pipeline Company LLC
Hopewell Township, Mercer County

Dear Ms. LaFleur:

Hopewell Township respectfully submits the following scoping comments for its use in the development of an Environmental Impacts Statement (EIS) that clearly addresses the issues and potential issues related to the proposed PennEast pipeline:

1. **PROCESS**
   a. The public has been confused by the announcement of scoping meetings, the postponement of scoping meetings and the rescheduling scoping meetings to comport with the PennEast document production schedule. This has deprived the public of a clear process for public input.

   b. The original route proposed by PennEast as identified in the November 7, 2014 filing is dramatically different than the "**DRAFT**" Preferred Alternate Route identified by PennEast in its FERC filing on January 16, 2015. The two routes bisect different geographic locations within our 60 square mile community. Statements have been made by PennEast to the public that the original route has been abandoned; however, no reference to such abandonment is included in a FERC filing. Hopewell Township and its residents have, therefore, been unable to formulate material scoping comments on a specific proposal because a specific proposal has not been made clear.

c. Hopewell Township requests the following with regard to the scoping process:

1. FERC require PennEast to file documents which formally set forth the actual "Preferred Alternate Route" which it is proposing to construct.

2. If the original proposed route has been abandoned for consideration, PennEast should make this abandonment official in a filing with FERC.

3. FERC extend the close of the scoping period to a date which is 30 calendar days from the date that PennEast files the documents listed in #1 and #2 above with FERC.

4. FERC provide one additional scoping meeting 7 days prior to the close of the new scoping meeting date in #3 above for Hopewell Township.

2. NEED

a. There has not been a complete evaluation of the **NO ACTION** alternative. PennEast merely asserts that if they do not build someone else will build. There are 15 "other" similar actions of competing pipelines in New Jersey which serve the same stated purposes as this pipeline. FERC must, under NEPA, comprehensively consider impacts created by all other pipeline projects proposed in New Jersey and Pennsylvania. **FERC must evaluate the NO ACTION Alterative using a Programmatic Environmental Impact Statement.**

3. AFFORDABLE HOUSING IMPACTS

a. The **DRAFT** depiction of the Preferred Alternate Route will encumber land on a designated affordable housing tract known as Tax Block 85, Tax Lot 3. This encumbrance will impact Hopewell Township's ability to provide affordable housing on this tract. Providing affordable housing is a constitutional obligation which should not be pre-empted. **The EIS must address this impact.**

4. AGRICULTURE

Hopewell Township is ranked 1st in Mercer County and 16th in New Jersey for active agricultural land, including cropland and pastureland, based on 2014 Farmland Assessment data. Hopewell Township retains a major portion of its land area in agriculture. Prime farmland comprises approximately 44% of the Township's land area, soils of statewide importance 34%, and farmland of local importance 5%. In addition 93% of active agricultural areas practices take place on Prime, Statewide or locally important soils. The Township has a number of certified organic farms and farms

becoming certified: these farms supply the increasing market demand for organic specialty crops. This is a growing and important sector of our economy. The impacts of construction and maintenance of pipelines on active agricultural lands must be assessed scientifically and economically:

a. **The EIS must include an evaluation of all impacts associated with the pipeline crossing preserved and farm assessed land including the NO ACTION alternative.** These lands do not recover from construction.

b. **Both short term and long term economic impacts of construction and maintenance of a pipeline on the Township's productive agricultural soils must be assessed in the EIS.** The assessment must include a science based analysis of soil disturbance and impact upon soil structure and micro-organisms. The assessment must also weigh the importance of the growing market for organic specialty crops.

5. **BLASTING**

a. **The EIS must include an assessment of potential blasting damage for nearby residential dwellings, businesses, water wells, septic tank systems, and power lines, etc.**

b. **The EIS must be based upon preblast surveys for the structures listed in No. 1 and a determination of the qualifying survey distance from the blast zones.**

c. **The EIS must be based upon site specific borings to determine which areas in the community will require blasting.**

d. **The EIS must include an assessment of blasting impacts on the groundwater supply, groundwater quality and air quality.**

e. **The EIS must include site specific assessments of impacts on wildlife, birds (during breeding season), aquatic life (during spawning periods), endangered species and domesticated animals including horses.**

f. **The EIS must include an assessment of undetonated explosives on the groundwater quality and air quality.**

g. **The EIS must include a safety and health impact analysis of noxious fumes, Carbon Monoxide (CO), Hydrogen Sulfide (H2S), and Oxides of Nitrogen (NO, NO2, NO3), which could result from explosive performance problems, inadequate blast designs, and/or poor loading practices in wet holes.** Specifically, for inhabitants in nearby homes and businesses, and whether they are inside or outside their facilities.

h. **The EIS must include an assessment of pre-plan needs of emergency response units in Hopewell Township for additional training and/or equipment/apparatus to prepare for any unexpected mishaps related to noxious gasses, unplanned detonations, or say, a direct lightning strike on a blast or explosive truck.**

i. **The EIS must identify the security of explosives, primers and detonators handled on-site.**

j. **The EIS must identify ground vibration and airblast damage criteria will be used to eliminate the potential of structural damage to homes and businesses.**

k. **The EIS must identify ground vibration and airblast damage criteria to be used to minimize annoyance complaints in the community.**

l. **The EIS must include an assessment of the use of blasting mats and impacts of the same in proximity to power lines identified on the DRAFT depiction of the Preferred Alternate Route.**

m. **The EIS must include the procedure for identification of the blast zone, the safety radii for equipment and people when firing the blasts.**

n. **The EIS must include an assessment of impacts associated with If homeowners and/or businesses requiring evacuation during blasting.**

o. **The EIS must include an identification of the warning and countdown procedure leading up to firing a blast and the impacts of the same on the environs. The** expected frequency of blasting on a daily, weekly and monthly basis shall be included in this assessment.

p. **The EIS must include an evaluation and public disclosure of the disposal plans for all blast materials.**

6. <u>CLIMATE CHANGE</u>
   a. **The EIS must consider all climate change impacts related to the pipeline**. Climate Change not only includes how the project affects climate change but also how climate change affects the project.

   b. New Jersey is experiencing increased major rain events with increased rainfall intensity. Increased erosive forces are created during major rain events impacting steep slopes and creating scour in stream beds. **The EIS must consider the foreseeable risk of pipe exposure on slopes and in stream beds and alternatives which include best practices available directional boring technology for pipeline construction.**

7. <u>CONSTRUCTION</u>
   a. **The EIS must address quality of all imported soil.** All soil must be free of any contaminants and shall meet NJDEP residential site cleanup criteria.

   b. The majority of Hopewell Township roadways are comprised of years of oil and stone chips with a thickness of 3-5 inches. These roadways are not stable for heavy construction equipment and will fail. Repair of failures associated with this pipeline will be an unfair taxpayer burden; liability for repairs must be assessed on the pipeline. **The EIS must address this impact.**

8. <u>CUMULATIVE IMPACTS</u> *(In addition to references elsewhere in these comments)*
   a. PennEast has failed to recognize all potential land development in Hopewell Township as part of its cumulative impact assessments. For example, there is land development permitted in excess of 1,000,000 s.f. on Scotch Road in Hopewell Township. **The EIS must identify all cumulative impacts from all development.**

   b. **The EIS must include an evaluation of potential impacts related to "future" pipeline co-locations, connectors, and any other potential pipelines which FERC is aware of.**

   c. The cumulative impact assessment must include a study of all impacts from all existing pipelines and existing infrastructure, as well as foreseeable impacts upon the existing infrastructure. **The EIS must include a cumulative impact analysis, however, this cumulative impact analysis must not be done in a piecemeal manner.**

9. **ECONOMIC IMPACTS**
   a. The economic impact report addressed only alleged estimates of economic benefits and failed to discuss the economic impacts which are misleading. Actual impacts have not been detailed nor evaluated in this report. **The EIS should address this impact.**

   b. Preserved open space has been devalued by removal of development rights through the preservation process. **Acquisition of preserved/open space by PennEast using market values for the land in its present preserved state will not adequately compensate the public for and the EIS must address this impact as well as the following related impacts:**
      1. The taxpayers accrued debt service burden in every case where the preservation effort included bond issues and borrowing.
      2. The ecologic value of preserved land.
      3. The value of preserved land in stabilizing climate change.
      4. The economic loss of preserved lands for public recreation and tourism.
      5. Disruption and fragmentation of preserved lands; the creation of contiguous corridors of open space and preserved farmlands is a documented major public policy reason and goal when lands are selected for preservation. The pipeline causes fragmentation in conflict with this public policy. In addition, since 1964 a majority of New Jersey voters have supported public funding of open space, historic, and farmland preservation.
      6. The construction of a "greenfields" pipeline through preserved lands creates a significant chilling effect on stakeholders' interest preserving their lands; this impact must be assessed.
      7. Disruption of agricultural management plan.
      8. Disruption of public access routes.
      9. Impact on wildlife management plans.
      10. Disruption of preserved habitats.

   c. **The EIS must evaluate revenues generated by the project on the basis that many contractors used for the project will temporarily import specialized construction crews that are not residents of New Jersey.** The economic impact report failed to consider this fact.

   d. **The EIS must identify the actual intent of this project. The description in the Economic Report is inconsistent with the Monthly Progress Reports filed by PennEast with FERC.** The economic report states *"will create opportunities for customers to transport natural gas to where it is most needed and valued"*. The Monthly PennEast reports state *"The Project is designed to bring lower cost natural gas produced in the Marcellus Shale region in eastern Pennsylvania to homes and*

businesses in Pennsylvania and New Jersey." If the true intent of this project is *"to transport natural gas to where it is most needed and value"* then the stated local value of this project is affirmatively diminished.

e. **The EIS must reconcile the fact that the economic report does not address whether the construction materials for the project are coming from New Jersey or Pennsylvania.** There is a strong competitive construction material commodities market between New Jersey and Pennsylvania and the report simply assumes all materials purchased for the project will be purchased in the state in which construction is occurring. Unless PennEast is willing to guarantee that materials required in Pennsylvania WILL BE purchased in Pennsylvania and materials required for New Jersey construction WILL BE purchased in New Jersey then the predicted economic outcome will be dramatically different.

f. **The EIS must require the economic report be expanded to offer proof of the statement made in Section 4.1.2.** Otherwise all references to this statement in Section 4.1.2 and similar statements made throughout this report should be eliminated.

10. HISTORIC RESOURCES

Hopewell Township has a rich cultural heritage and an extensive historic legacy. The Township's historic resources include several hundred historic sites identified through historic site survey activities conducted over the past quarter century. Included among these are Washington Crossing State Park, a National Historic Landmark; 14 individual properties; three districts (Harbourton, Pleasant Valley and Titusville); and a segment of the Delaware and Raritan Canal Historic District, all of which are listed in the New Jersey and National Registers of Historic Places. Additionally 21 individual properties and one district (Mount Rose) have received an opinion from the New Jersey State Historic Preservation Officer that they meet the criteria of eligibility for listing in the New Jersey and National Registers of Historic Places:

a. **The EIS must evaluate the resources along the initial proposed route which includes The Poor Farm Historic District, Enos Titus House on Pennington-Rocky Hill Road, Historic Sites near Harbourton–Rocktown Road, Hoff/Hart House on Woosamonsa Road, Chamberlain Farmstead and 18th Century Mill Site on Old Mill Road and additional Historic sites on Blackwell and Federal City Roads**:

1. **Poor Farm Historic District (eligible for designation).** This district lies between and includes parts of Harbourton Ridge and Pennington Mountain, both wooded slopes that frame the valley floor that was the farmland of the Smith and Van Cleve families in the 18th Century. Resources include the 1740 Smith/Van Cleve

House, the 1850's Poor Farm residential building and its ancillary buildings, and the Poor Farm Cemetery. Construction of the Pipeline on this route would cut out a swath of forest on Harbourton Ridge and Pennington Mountain severely affecting the historic context of Poor Farm Valley. The path of the pipeline would leave a visible swath through the large meadow on the valley floor. On the southern edge of this proposed district is a mid-19th century farmhouse and barn. Another 19th century house is on the northern edge. Blocks and Lots in Rural Historic District: Block 31: Lots 17, 18, 19, 20, 38, 48, 48.01, 48.02, 48.03, 48.04, 79, 83, 84, 85, 87, and 88. Block 51: Lots 7.01, 7.02, 8 (partial), 8.02, 22 (partial), 32, 40, 41, 43 (partial), 46, and 54.

2. **Enos Titus House, Pennington-Rocky Hill Road (Hopewell Township designated landmark).** The proposed pipeline route passes about a hundred yards to the south of this property. The route must not overlap onto this property, which contains a late 18th century/early 19th century house, a mid-19th century barn, and a spring house. Block 45, Lot 1.

3. **Four Historic Sites near Harbourton –Rocktown Road (Two eligible for designation, two to be determined).** The proposed route cuts between four historic sites in a fairly tight group, making it probable that one or more of these sites will be negatively impacted. The first is a mid-18th century farmstead, known as Felice Habitat, which is accessed from Harbourton-Mt. Airy Road. The route would pass through a wooded area lying at the rear of this property, and turn eastward between two historic properties, separated by a modern property, all in the woods. The route flexibility here is minimal, and some negative impact is inevitable. Where the route emerges to cross Harbourton- Rocktown Road, there are historic stone walls on both sides of the road just a few hundred feet to the north of the proposed route. These walls are eligible for designation, and must not be harmed. Blocks 28, Lots: 2.03, 4.01, 20 and road frontage at the stone walls.

4. **Hoff/Hart House, Woosamonsa Road. (Eligible for designation).** This house has an 18th century kitchen ell, and an early 19th century (Federal period), main block, along with several outbuildings all clustered close to the road. It is eligible on the basis of architecture. The September 2014 route and the December variation of the route pass by this site either on the west, or east and too close in either case. The route must be kept out of this Block and Lot, so as not to devalue this historic site. Block 49, Lot 3.01.

5. **Chamberlain Farmstead and 18th Century Mill Site.** Two sites, on either side of Old Mill Road, are threatened by the proposed alignment, as modified in December of 2014. The historic farmstead on the east side of Old Mill Road is eligible in particular for its barn, one of the identifying and iconic structures of Hopewell Township. On the west side of Old Mill Road is a mid-18th century and 19th century grist and saw mill site, which almost certainly has archaeological significance that will be disturbed if the pipeline should pass here as shown. Both the farm and the archeological site merit designation and protection. Block 44, Lots 11.01, 29, 2, 3, 4, and 11.

6. **Three Additional Historic Sites, (not eligible for designation).** Other historic resources are along the proposed route. Avoidance of these is recommended. There is a circa 1800 four bay farmhouse, and a mid-19th century farmstead with woodlot, all lying north of Rt. 518. There is a 19th century farmhouse standing along Federal City Road, just north of Blackwell Road. Block 26, Lot 9 and Block 26, Lot 14.

b. **The EIS must evaluate resources along the DRAFT depiction of the Preferred Alternate Route which includes the following cultural/historic resources.** The following resources have been identified on the assumption that the pipeline will be located <u>within</u> the existing Jersey Central Power &Light Company (JCP&L) easement on the north side, or down the center of that easement. There are many additional resources that will need to be included in this evaluation should the foregoing assumption not be correct. Because there has been no effort by PennEast to more clearly identify a specific proposed Preferred Alternate Route rather than the "**DRAFT**" it has filed with FERC our ability to make constructive comments is constrained.

The JCP&L easement goes through the Pleasant Valley Rural Historic District. There are several concerns regarding archaeological sites that are contributing resources to the district which must be evaluated. **The following are resources identified based upon the above assumptions which must be considered in the EIS:**

1. **Intersection of Valley and Pleasant Valley Roads.** This intersection is key to the general appearance of the historic district. It is already visually damaged by the crossing of the power line, and therefore it is very important that no fenced yards with above ground apparatus appear here or anywhere within the historic district. Posts locating the crossing of a pipeline would also deteriorate the context of the District.

2. **Henry Phillips Mill Site.** This site lies near Pleasant Valley Road on a creek below a wooded ridge just 200 feet east of the intersection with Valley Road. The power line easement passes the site on the ridge above behind trees. It appears that the cleared boundary of the JCP&L easement is the northern side of its 285 feet, and therefore no tree clearing should be permitted for a pipeline. Any tree removal on the ridge for the installation of a pipeline would damage the context of the mill site, a contributing element of the historic district.

3. **Peter Phillips House Foundation.** Located up the north face of the mountain, the foundation with partial walls of a stone house is a contributing resource to the historic district. The JCP&L easement passes about 200' to the south of the foundation. It is a concern here that any blasting may dislodge the stone corners and foundation walls that date at least to 1810.

4. **Additional Archaeological Sites on Baldpate Mountain.** The JCP&L easement continues eastward across the William Burroughs/Elijah Chidester property which includes the knob of the mountain near the trail parking lot off Pleasant Valley Road. No archeology has been done on this property which was occupied as early as 1800. The Easement leaves the historic district behind the Atchley/Hunter farm, a designated Township Landmark, and extends eastward to the area along the abandoned Honey Hollow Road. It is known that there are many foundations in this area which demonstrate the presence of a community on the South side of the mountain. These foundations should be documented before any further disturbance is made.

5. **Phillips/Smith Property.** This 18th century site along Valley Road was occupied by Peter Phillips, Sr., and later John Smith. The property with house and barn are privately owned, and lie within the Pleasant Valley Historic District. The property is eligible for Hopewell Township Landmark status. The JCP&L easement passes through the western end of the lot. No visible evidence of the pipeline should occur here. No. 87 Valley Road - Block 59, Lot 7.

6. **Joseph Blackwell Farmhouse/London Ralph Hunt Archeological Site.** This property is at the eastern end of the proposed pipeline route. It is eligible for designation as a Hopewell Township Landmark for architecture and the importance of the family who lived there, and for whom the road was

named. The proposed pipeline route leaves its alignment in the edge of the Curlis Lake Woods behind and to the north of this site, travels along the western edge of the tract, then crosses behind the house to the eastern side of the property. This produces a potential value reduction to this historic property. This later 19th century house and farmstead were developed on the site of the 18th century pioneer settlement of location of a man called London Ralph Hunt. Any development on this site should require archaeological investigations on both sides of Blackwell Road where the proposed line would cross and connect to the existing Transco line. Blackwell Road - Block 72, Lot 9.

7. **Pleasant Valley Farm and the Hunt/Lanning Farmstead.** These properties are on either side of Valley Road near the intersection of Goat Hill Road. The JCP&L easement passes between them. The Pleasant Valley Farm is one of the five Stout Farms that resulted from the subdivision of Upper Bellmont Farm, circa 1800. It is potentially eligible for designation. The Ezekial Rose Farmstead is another 18th and 19th century farm complex that is part of the Pleasant Valley Historic District, and is privately owned. Nothing should be done to damage the context of either of these properties. Nos. 55-57 Valley Road - Block 59, Lot 4 and No. 62 Valley Road -Block 56 Lot 1.

8. **Additional Historic sites (not eligible for designation).** Two additional historic sites exist along the proposed route, and are affected by the route The John Primmer House on Reed Road appears to date from the late 18th or early 19th century. The William L. Titus House on Pennington-Lawrenceville Road appears to be an 18th century building. No. 1636 Reed Road and No. 24 Pennington-Lawrenceville Road.

11. <u>SAFETY</u>

a. The limits of the Potential Impacts Radius should be mapped in addition to textual descriptions to provide easily identifiable limits to potentially affected properties.

b. The EIS must include an Emergency Services Pre-Plan in order to fully understand potential impacts related to potential pipeline failures, accidents, explosions, leaks, and impacts to the hydrogeology and the groundwater table.

c. **The EIS must include a full analysis of potential effects on the power line evaluated which is part of the DRAFT depiction of the Preferred Alternate Route during construction and post construction.** These power lines are part of the "GRID" and all potential conditions and contingencies must be known and evaluated.

d. PennEast Pipeline Company Inc. LLC is a newly formed entity and, therefore, does not have an established safety record. **The EIS must include a demonstration of how PennEast Pipeline Company Inc. LLC will establish itself for safe construction and operation practices to insure all predicted outcomes will be realized.**

12. TRANSCONTINENTAL GAS PIPELINE CONNECTION

a. **The EIS must include ALL impacts related to the interconnection with the Transco pipeline in Hopewell Township.** Such impacts may include upgrades or changes to the Transco system which are reasonably foreseeable and directly or indirectly related to the PennEast connection, including but not limited to Transco compressor station improvements.

b. **The EIS must include an alternative evaluation for the Transco connection location.** A Transco connection opportunity exists 2 miles west of the proposed location and, if used, 2miles of overall pipeline length and related environmental impacts will be eliminated.

13. TRAFFIC

a. **The EIS must include impacts to N.J.S.H. Route 31 associated with the crossing shown in the DRAFT depiction of the Preferred Alternate Route.**

b. The EIS must include an assessment of all traffic impacts associated with roadway crossings. Hopewell Township has few roadways and as a result has few options for alternate traffic routes. Impacts include both direct and indirect to residential and businesses related to traffic diversions. Open cut road crossings and related diversions may affect the ability of farm equipment to transit to and from farming locations, road closures may impact farm businesses including organic CSA and organic specialty crop farms and wineries. **The EIS should evaluate using best available technology –directional boring – to cross all roadways along both the "greenfields" and the DRAFT depiction of the Preferred Alternate Route to minimize traffic impacts.**

14. WELLS, SEPTIC SYSTEMS AND GEOLOGY

The only source of drinking water for essentially all Hopewell Township residents is groundwater obtained from fractured bedrock aquifers beneath the municipality. Nearly all Township residents and businesses rely on groundwater obtained from on-lot wells and do not have other options for potable water. The following comments are made to insure adequate review is made to insure groundwater is adequately protected:

a. In 1988, the U.S. Environmental Protection Agency (USEPA) recognized the limited availability of water for residents of the Township when they included the Township within the Northwest New Jersey Sole Source Aquifer or the New Jersey Coastal Plain Aquifer. The USEPA and New Jersey Department of Environmental Protection (NJDEP) consider groundwater to be the single source of potable water to residents and businesses located within the boundaries of a sole-source aquifer. The USEPA and NJDEP recognize that groundwater is the only source of potable water for residents and businesses within the Township and by designating these resources as sole-source aquifers, recommended protection from potential damages. **The EIS must evaluate groundwater resources beneath Hopewell Township as resources worthy of special protection.**

b. Hopewell Township is located in one of the most populated sections of New Jersey. Groundwater resources are strained because of the demands imposed. Where stream flows historically were maintained by groundwater discharges, today, many streams in Hopewell Township are dry for months each year because groundwater levels beneath the municipality have dropped well below streambeds. **The EIS must address this issue.**

c. Both the original proposed route and **DRAFT** depiction of the Preferred Alternate Route cut through the northern half of the Township where groundwater resources are the most severely strained by the presence of igneous and metamorphic rocks. During drought, recharge to the diabase and Lockatong Formation is less than 2-inches per year, which is equivalent to 4.3 percent of annual precipitation to the municipality. These rocks receive very little replenishment. **Redirecting even a small percentage of infiltrating water away from a recharge area could have detrimental impacts to groundwater availability and therefore must be evaluated as part of the EIS.**

d. The hilly-nature and topography of the northern half of the Township divides water resources into a multitude of subwatersheds. Wells located in each sub watershed are dependent on incident precipitation within that same subwatershed to replenish water removed by a homeowner. **Trenching through this topography can redirect precipitation runoff away from one or more subwatersheds toward others and must be evaluated as part of the EIS.**

e. The pipeline trench itself, can serve as a preferred conduit for surface or subsurface runoff. The backfilled excavation will likely serve as a preferred pathway for throughflow that infiltrates through soils and fill materials but cannot penetrate the underlying poorly fractured bedrock. **The disturbance of soils and removal of vegetation to install the pipeline can create new surface conduits**

that transfer water rapidly downhill and away from existing recharge areas for wells or headwaters for streams and must be evaluated as part of the EIS.

f. The proposed pipeline pathways will cross the Hopewell Fault and related splays. While this fault has not been seismically active in very recent times, the increased fracture intensities along the fault planes indicate that the areas within a few hundred feet of the fault are likely the best groundwater resources for the Township. Groundwater recharge along the Hopewell Fault is significantly greater than in any other area of the Township. Runoff from the areas of higher elevation to the north infiltrates along the fault. **Trenching across the fault and thereby creating a new preferred pathway for water runoff may reduce recharge to these valuable long-term resources and must be evaluated as part of the EIS.**

g. Contaminants introduced during construction or from maintenance operations could irreparably damage a limited resource. In many areas of the Township, dilution is the only available method for reducing contaminant concentrations in groundwater. Because recharge to the Township's aquifers, especially those aquifers beneath the areas proposed for the Penn East pipeline, is limited except along the Hopewell Fault, the dilution process either involves considerable time or preservation of large recharge areas to ensure sufficient water infiltrates. **This potential impact must be evaluated as part of the EIS.**

h. Hopewell Township has expended considerable funds to preserve open spaces to ensure continued natural replenishment of its groundwater supplies through the preservation of recharge areas. Trenching through open spaces used for recharge may severely reduce the effectiveness of these efforts. Natural systems such as aquifers can require significant time to equilibrate to new changes. While the aquifer system might reach a new phase of equilibrium between withdrawals and natural replenishment, it is unlikely to re- equilibrate to current conditions. **The EIS must evaluate these potential impacts using site specific information.**

i. Hopewell Township, similar to USEPA and NJDEP, has long-recognized that its only available potable water resources have been strained and as a result, have taken measures to protect remaining resources from further depletion or damage. **The EIS must evaluate all potential impacts to Hopewell Township's water resources as stated above as well as include the following additional specific concerns:**

    1. The EIS must address impacts on individual on-site wells from excavation, blasting and drilling. Such impacts must be based upon detailed reviews of geologic strikes, dips, fractures and permeability.

2. The EIS must address potential impacts to the public community well serving Washington Crossing Park Estates and its wellhead protection area.

3. The EIS must assess data from groundwater and surface water testing. Protocol must be establishes for testing prior to construction, during construction and post construction. Permanent groundwater monitor wells shall be installed along the selected route to permit long term monitoring of effects.

4. The EIS must address impacts on individual onsite septic systems from excavation blasting and drilling. Such impacts must be based upon detailed reviews of geologic strikes, dips, fractures and permeability.

15. <u>WETLANDS AND FLOOD PLAIN IMPACTS</u>

a. PennEast must demonstrate full compliance with Section 404 (1)(b) guidelines of the Clean Water Act, the New Jersey Freshwater Wetlands Act and the New Jersey Flood Hazard Area Protection Act. **The EIS must evaluate potential non-compliance with permit criteria and conditions:**

1. The Memorandum of Understanding (MOU) between the U.S. Environmental Protection Agency and the New Jersey Department of Environmental Protection explicitly states in Section IV. Program Maintenance, A. Duty to Maintain Program compatibility - *"State Program will be conducted in conformance with applicable regulations and definitions found in 40 C.F.R. Parts 230 and 23.* PennEast must fully satisfy the requirements of the relevant portions of Section 404 of the Clean Water Act (CWA) including section 40CFR 230 and the requirements of the 404(b)(1) guidelines.

   Reference to 40CFR 230.10(c) also states the following; *"(c) Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States. Findings of significant degradation related to the proposed discharge shall be based upon appropriate factual determinations, evaluations, and tests required by subparts B and G, after consideration of subparts C through F, with special emphasis on the persistence and permanence of the effects outlined in those subparts. Under these Guidelines, effects contributing to significant degradation considered individual or collectively"*. **The EIS must evaluate the environmental consequence of proposed deviations from these requirements.**

2. Pursuant to the New Jersey Freshwater Wetlands Protection Act (FWPA) compliance with 40CFR 230.10(c) is mandated at N.J.A.C. 7:7A-7.2(b)9. This section of the FWPA states that a proposed regulated activity "*Will not cause or contribute to a significant degradation, as defined at 40CFR 230.10(c), of ground or surface waters*". PennEast must demonstrate compliance by testing ground and surface waters before construction along both the "greenfields" route and the co-located route. Once a route is finalized PennEast must continue to test ground and surface waters to be in compliance and document no degradation has occurred. **The EIS must evaluate the environmental consequence of all proposed deviations from these requirements.**

3. Other key sections of 404(b)(1) also apply. This section also specifically indicates that regulatory compliance should not be derived from rhetoric but based on <u>site specific factual determinations</u>. PennEast must provide site specific evaluations for all regulatory compliance under this Section. **The EIS must evaluate the environmental consequence of all proposed deviations from these requirements and address alternative technologies to avoid impacts.**

4. The 404(b)1 Guidelines include a section (40CFR 230.54) related to "Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves." Section (a) of this regulation states "*These preserves consist of areas designated under Federal and State laws or local ordinances to be managed for their aesthetic, educational, historical, recreational, or scientific value*". This section speaks to the possible loss of values the from the *"discharge of dredged or fill material into such areas may modify the aesthetic, educational, historical, recreational and/or scientific qualities thereby reducing or eliminating the uses for which such sites are set aside and managed".* The activities associated with the PennEast pipeline will impact antidegradation waters, endangered species habitat as well as numerous preserves set aside to protect these resources. **The EIS must evaluate the environmental consequence of all proposed deviations from these requirements.**

5. The New Jersey Flood Hazard Control Act has embraced the protection of antidegradation streams into its requirements, as have other regulations such as the Freshwater Wetlands Protection Act. The requirements for a utility crossing permit are designed to guide sound design as it relates to all streams, but the regulations place particular emphasis on the protection of antidegradation streams in order to comply with the requirements set forth in the Federal water quality standards. The Flood Hazard Control Act requires a buffer or riparian zone of 300 feet on both sides of all C-1 streams as well as all upstream tributaries situated in the same HUC 14 watershed. Compliance with New

Jersey's water quality standards form the foundation for compliance with Clean Water Act Section 401 water quality decisions. PennEast must demonstrate compliance with New Jersey's Surface Water Quality Standards at, N.J.A.C. 7:9B. **The EIS must evaluate the environmental consequence of all proposed deviations from these requirements.**

6. Both the New Jersey Flood Hazard Area Protection Act and the Freshwater Wetlands Protection Act have requirements that relate directly to New Jersey's water quality standards and the protection of antidegradation streams. The protection of antidegradation streams in New Jersey has, for example, been integrated into the above mentioned regulations through the establishment of riparian zones in accordance with the Flood Hazard Control Act. PennEast pipeline bisect and cross antidegradation streams, therefore, PennEast must fully comply with Section 404 of the Clean Water Act, the New Jersey Freshwater Wetlands Act and the New Jersey Flood Hazard Area Protection Act. **The EIS must evaluate the environmental consequence of all proposed deviations from these requirements.**

7. In accordance with N.J.A.C. 7:7A-7.2(b)5, a prerequisite for the NJDEP to issue an individual freshwater wetland permit or open water fill permit requires that the project demonstrate that it *"Will not cause or contribute to a violation of any applicable State water quality standard"*. The Surface Water Quality Standards at, N.J.A.C. 7:9B, establish the designated uses and antidegradation categories of the State's surface waters, classify surface waters based on those uses, and specify the water quality criteria and other policies and provisions necessary to attain those designated uses In accordance to N.J.A.C. 7:9B a "*Category one waters" means those waters designated in the tables in N.J.A.C. 7:9B-1.15(c) through (i), for purposes of implementing the antidegradation policies set forth at N.J.A.C. 7:9B-1.5(d), for protection from measurable changes in water quality based on exceptional ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource(s) to protect their aesthetic value (color, clarity, scenic setting) and ecological integrity (habitat, water quality and biological functions*). PennEast impacts to antidegradation streams contradict New Jersey's definition of an antidegradation stream in that the project WILL impact the aesthetic value (color, clarity and scenic setting) of various streams being crossed. In order to satisfy applicable water quality regulations, practicable alternatives such as HDD, Direct Pipe or other measures must be thoroughly assessed in order reduce or eliminate water quality related impacts. PennEast must demonstrate it has fully evaluated compliance with these regulations prior to obtaining a FWPA permit and to obtain a Clean Water Act 401 water quality certificate from the State of

New Jersey. **The EIS must evaluate the environmental consequence of all proposed deviations from these requirements.**

b. **Alternatives**

1. In accordance with 40 CFR 230.10(a) "*no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental Consequences.*" With regard to alternatives the FWPA similarly states at 7:7A-7.2(b) that "*The Department shall issue an individual freshwater wetlands or open water fill permit only if the regulated activity: (1) Has no practicable alternative which would meet the requirements at (b)1i and ii below; i. The alternative would have a less adverse impact on the aquatic ecosystem or would not involve a freshwater wetland; and ii. The alternative would not have significant adverse consequences, that is, it shall not merely substitute other significant environmental consequences for those attendant to the original proposal.*" Any applicant for a federal permit for an activity which will result in a discharge into waters of the United States, including PennEast, shall obtain a 401 water quality certification and comply with applicable water quality standards. In general, these regulatory requirements seek to restrict permitting approval to only the least ecologically damaging practicable alternative. **The EIS must evaluate the environmental consequence of all proposed deviations from these requirements and address alternative technologies to avoid impacts.**

2. The 404(b)(1) Guidelines require an alternatives analysis which addresses how impacts to waters and wetlands (waters of the United States) have been avoided and minimized. The alternatives analysis should address practicable alternatives to the discharge of dredged and fill material for each individual crossing of a wetland and/or waterbody. This approach was also recently indicated by the US Army Corps of Engineers in its January 28, 2015 letter to FERC The proposed method of crossing for such waterways should not be simply based on convenience but rather focus on the most ecologically sensitive alternatives in order to fully comply with New Jersey and federal regulations. Difficulty in the application of trenchless methods due to constraints such as lack of area or slope should not be used as the basis for an argument to use more invasive measures since these constraints should be viewed as self-induced since PennEast selected the route. PennEast must demonstrate full compliance with section 404 of the Clean Water Act and New Jersey antidegradation standards on all sensitive waterways that are associated with Category 1 waters and endangered species habitat especially where methods other than trenchless crossing methods are to be used. **The EIS must evaluate the environmental consequence of all**

proposed deviations from these requirements and address alternatives to avoid impacts.

c. **Secondary or Indirect Impacts**

1. CFR 230.11 also speaks to the need to address secondary impacts which is defined as "*effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material. Information about secondary effects on aquatic ecosystems shall be considered prior to the time final section 404 action is taken by permitting authorities*". There will be numerous changes to the landscape associated with the pipeline proposed by PennEast that will result in both short and long term impacts to hydrology as a result of changes in runoff patterns and runoff quantity. These changes will be exacerbated by soil compaction and the reduction of compacted soils' ability to absorb rainwater. Modifications to site hydrology related to soil compaction and loss of forest cover need to be evaluated as secondary impacts as these impacts can negatively affect the existing and designated uses of perennial streams. PennEast must provide a description of secondary impacts must be provided for compliance with New Jersey's individual wetland permit requirements. **The EIS must evaluate the cumulative impacts of all direct and secondary impacts.**

2. **404(b)1 Guidelines Subpart H—Actions To Minimize Adverse Effects states that "There are many actions which can be undertaken in response to § 203.10(d) to minimize the adverse effects of discharges of dredged or fill material" These include the following:**

   A. ***230.74 Actions related to technology.*** *Discharge technology should be adapted to the needs of each site. In determining whether the discharge operation sufficiently minimizes adverse environmental impacts, the applicant should consider.* This means that alternatives for each stream and wetland crossing needs to be assessed individually to minimize impacts. This approach is especially relevant to antidegradation streams, trout production waters and habitat for endangered and threatened species.

   B. ***230.75 Actions affecting plant and animal populations.*** *Minimization of adverse effects on populations of plants and animals can be achieved by: (a) Avoiding changes in water current and circulation patterns which would interfere with the movement of animals; (b) Selecting sites or managing discharges to prevent or avoid creating habitat conducive to the development of undesirable predators or species which have a competitive edge ecologically*

over indigenous plants or animals; (c) Avoiding sites having unique habitat or other value, including habitat of threatened or endangered species. Compliance with this section of the 404 (b)1 guidelines is extremely important with regard to the PennEast Pipeline since the route crosses preserved land with interior forest, endangered species habitat, trout streams and antidegradation streams. PennEast must demonstrate compliance with this section of the Clean Water Act as part of its need to obtain an Individual Freshwater Wetland Permit from the NJDEP. **The EIS must evaluate the environmental consequence of all proposed deviations from these requirements and address all alternatives to avoid impacts.**

The above comments attempt to identify local issues to be addressed during preparation of the EIS for this proposed gas pipeline. Hopewell Township is preparing supplemental documentation in support of the comments provided herein and will file those comments separately with FERC prior to the close of scoping.

Sincerely,

Harvey Lester

Harvey Lester, Mayor

C: Hopewell Township Committee
Steven P. Goodell, Esquire
Governor Chris Christie
U.S. Senator Robert Menendez
U.S. Senator Cory Booker
Congresswoman Bonnie Watson Coleman
Mercer County Board of Chosen Freeholders

TOWNSHIP OF HOPEWELL

MERCER COUNTY

201 Washington Crossing Pennington Road
Titusville, New Jersey 08560-1410
609.737.0605 Ext. 664
609.737.6839 Fax

February 27, 2015

Honorable Cheryl A. LaFleur, Chair
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Docket PF15-1-000
Proposed Gas Pipeline
PennEast Pipeline Company LLC
Hopewell Township, Mercer County

Dear Ms. LaFleur:

This letter is intended to supplement the Hopewell Township scoping comment letter submitted at the February 25, 2015 scoping meeting. Submitted herewith are record maps from the Hopewell Township Health Department of individual lots along the proposed initial route and the **DRAFT** Preferred Alternate Route for FERC's use in addressing Hopewell Township's scoping comments. These maps identify boundary, septic system and approximate well information. Also submitted are additional comments from the Hopewell Township Historic Preservation Commission.

Finally, Rutgers University and the New Jersey Geological Survey are presently studying the high prevalence of arsenic in well water throughout Hopewell Township. Hopewell Township has read with interest the report filed with FERC by Tullis Onstatt of Princeton University regarding arsenic. Hopewell Township requests that the aforementioned arsenic studies and the concerns presented in the Onstatt report be considered and evaluated as part of the FERC EIS.

Thank you.

Sincerely,

Paul E. Pogorzelski, P.E.
Township Administrator/Engineer

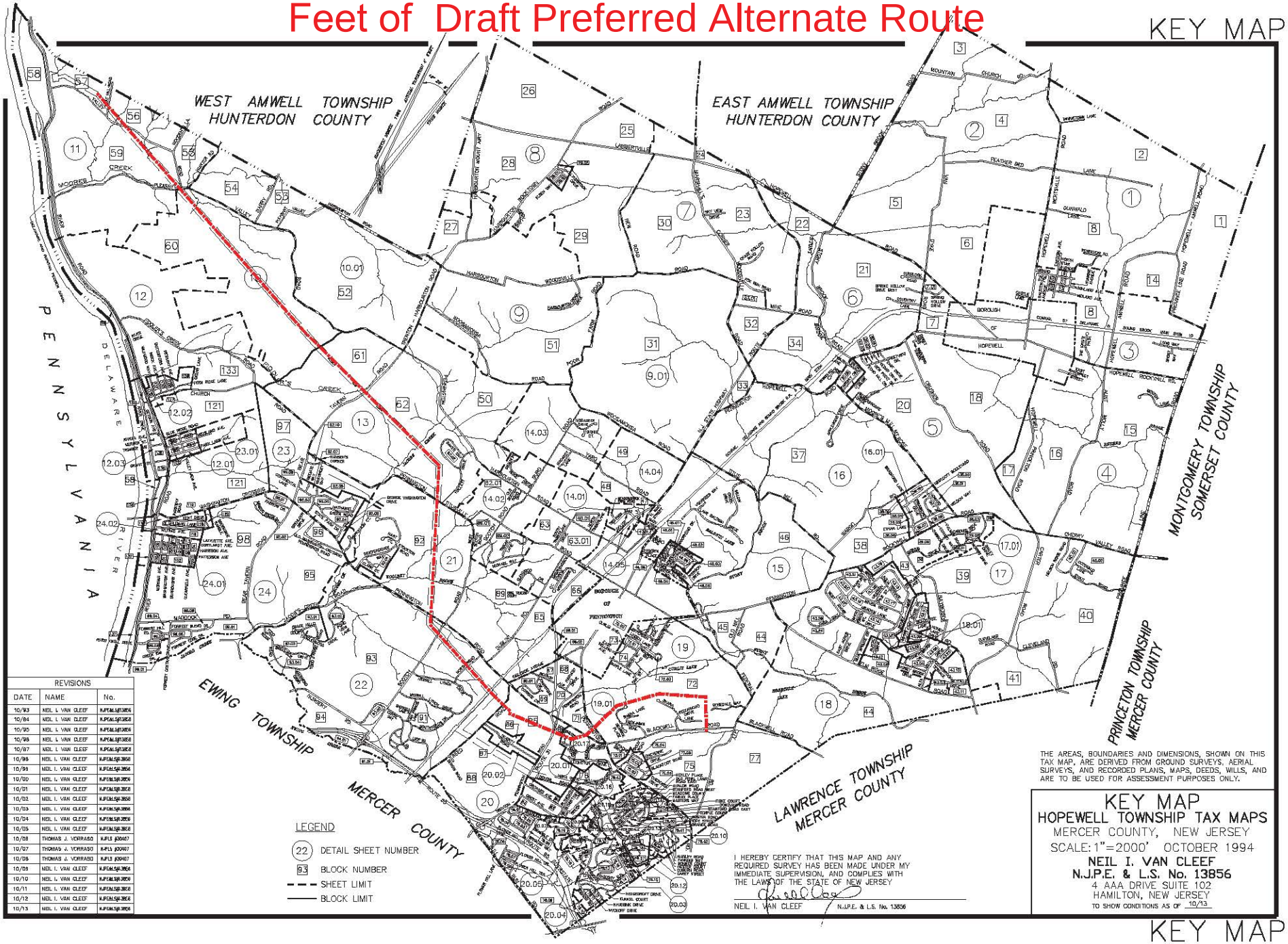
C: Hopewell Township Committee

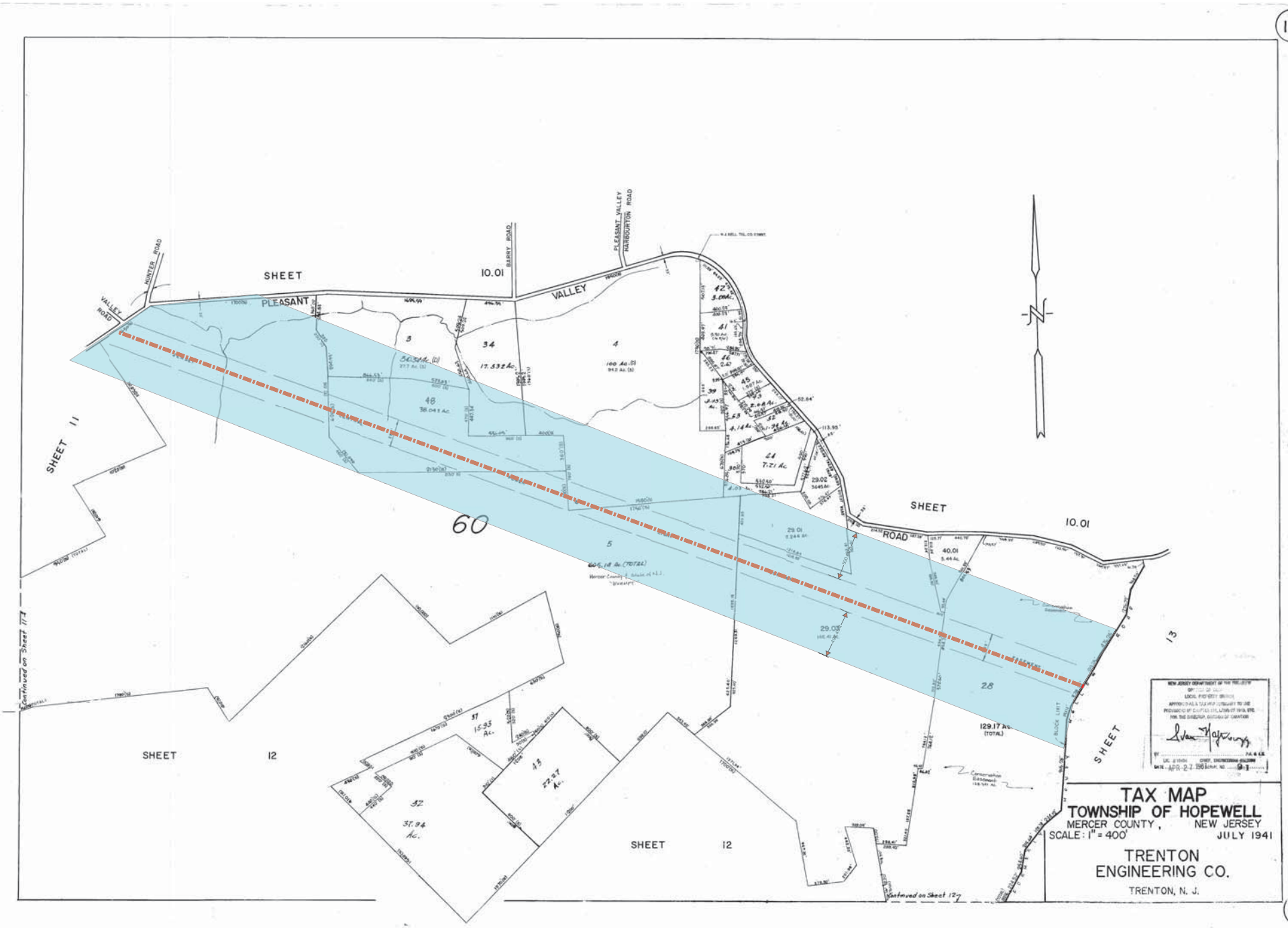
Hopewell Township Supplemental Scoping Comments

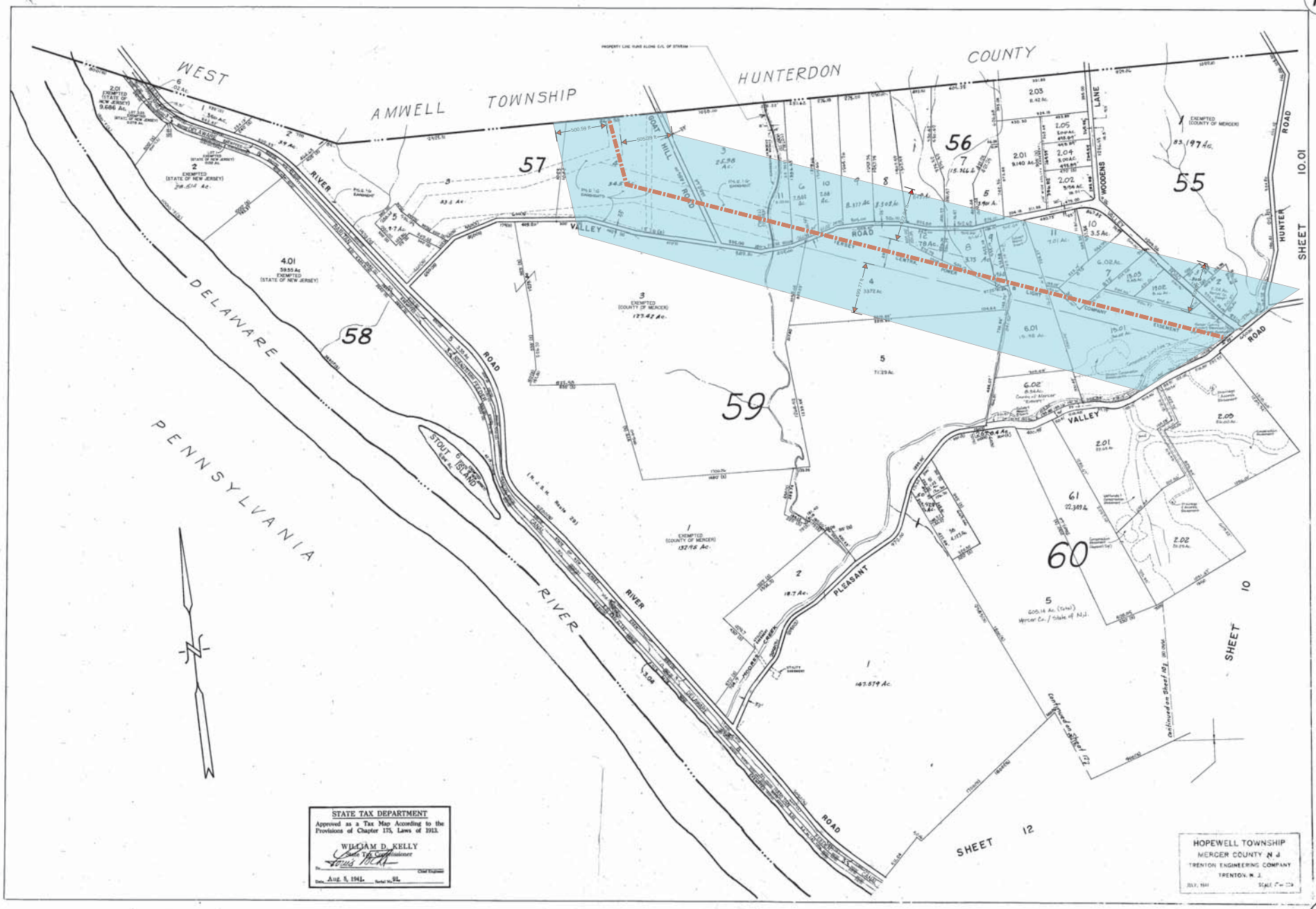
02.27.15

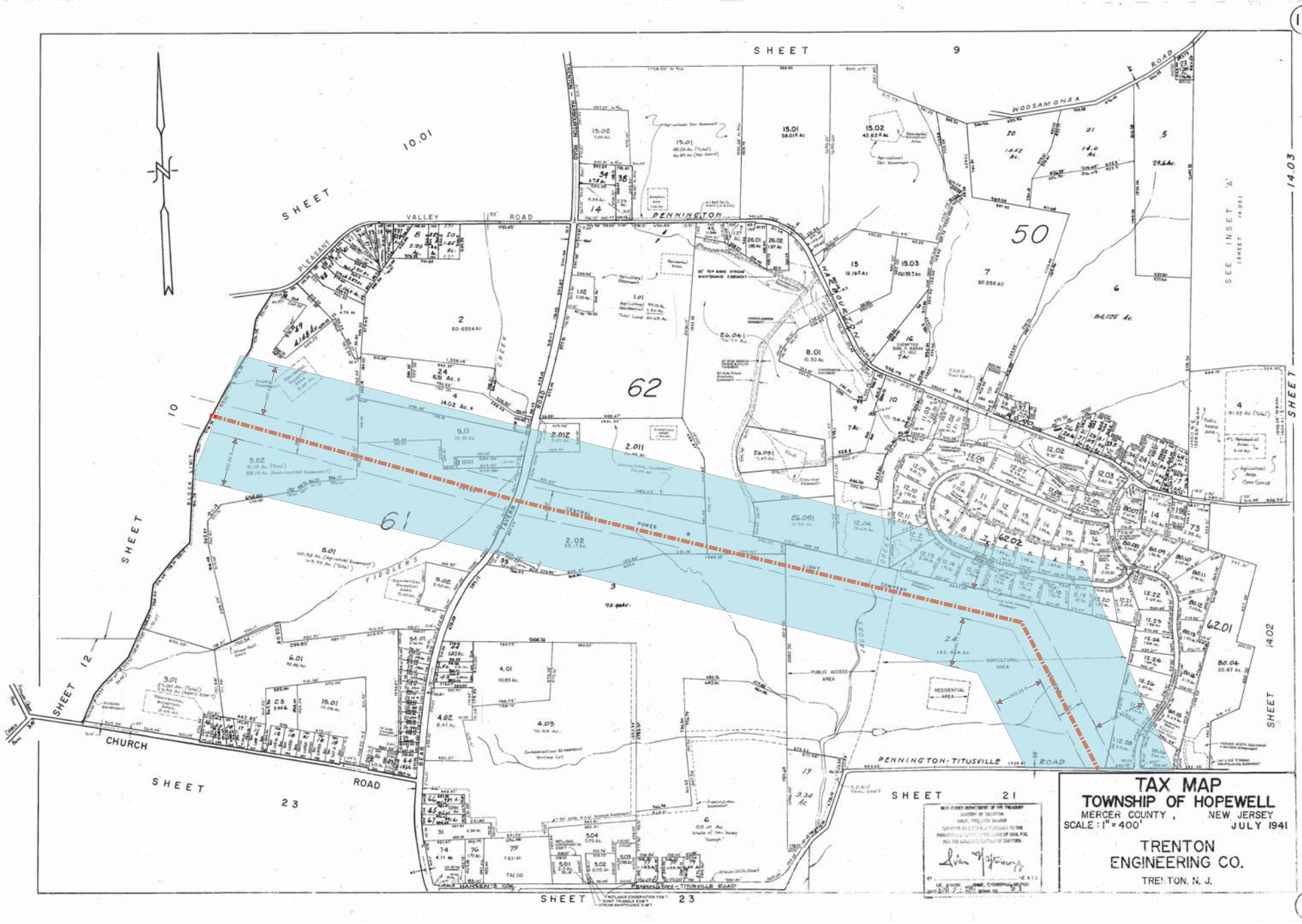
Record Maps from Hopewell Township Health Department
of
Individual Tax Lots along DRAFT Preferred Alternate Route

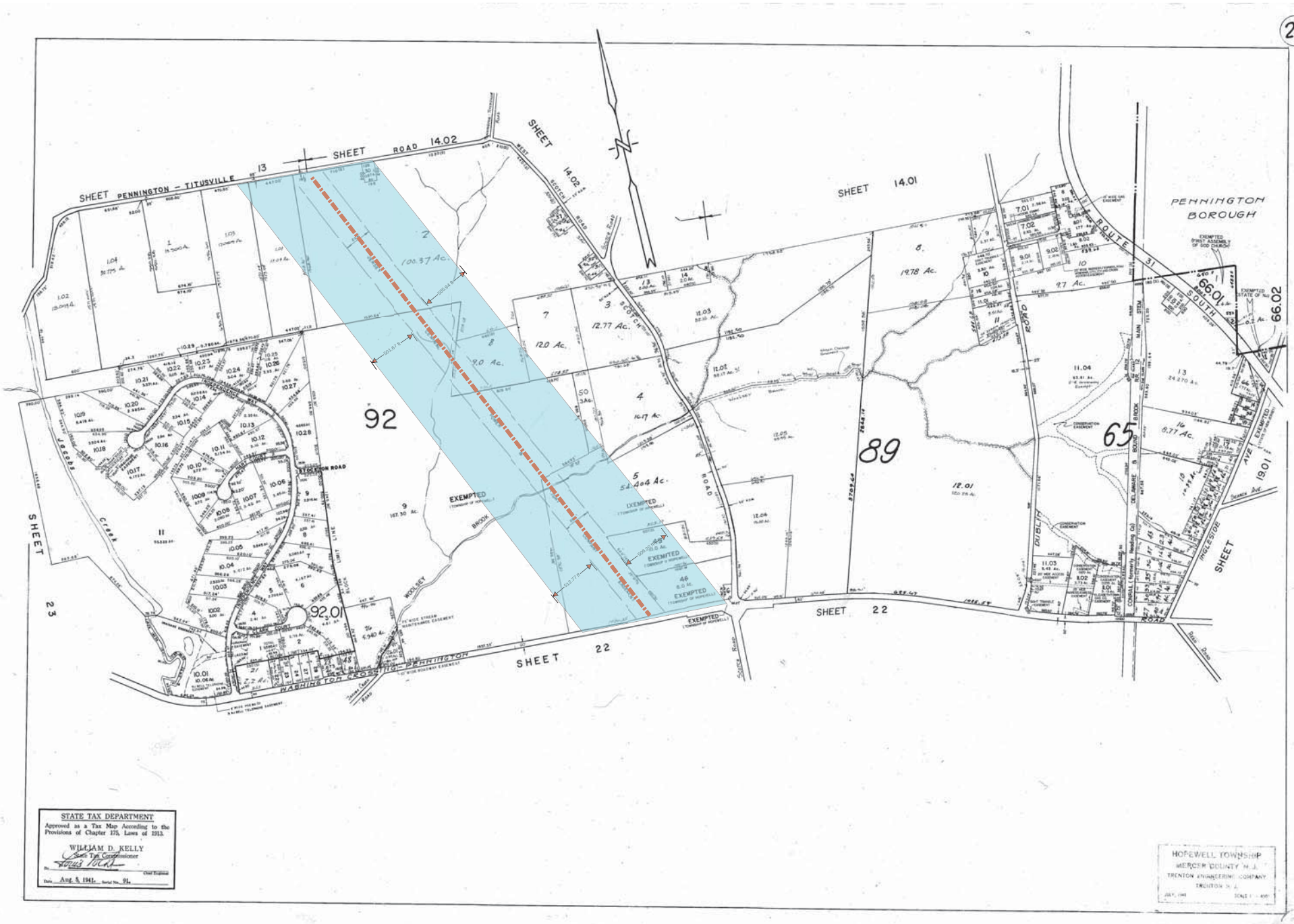
Maps Showing Information for Tax Lots Within 500 Feet of Draft Preferred Alternate Route

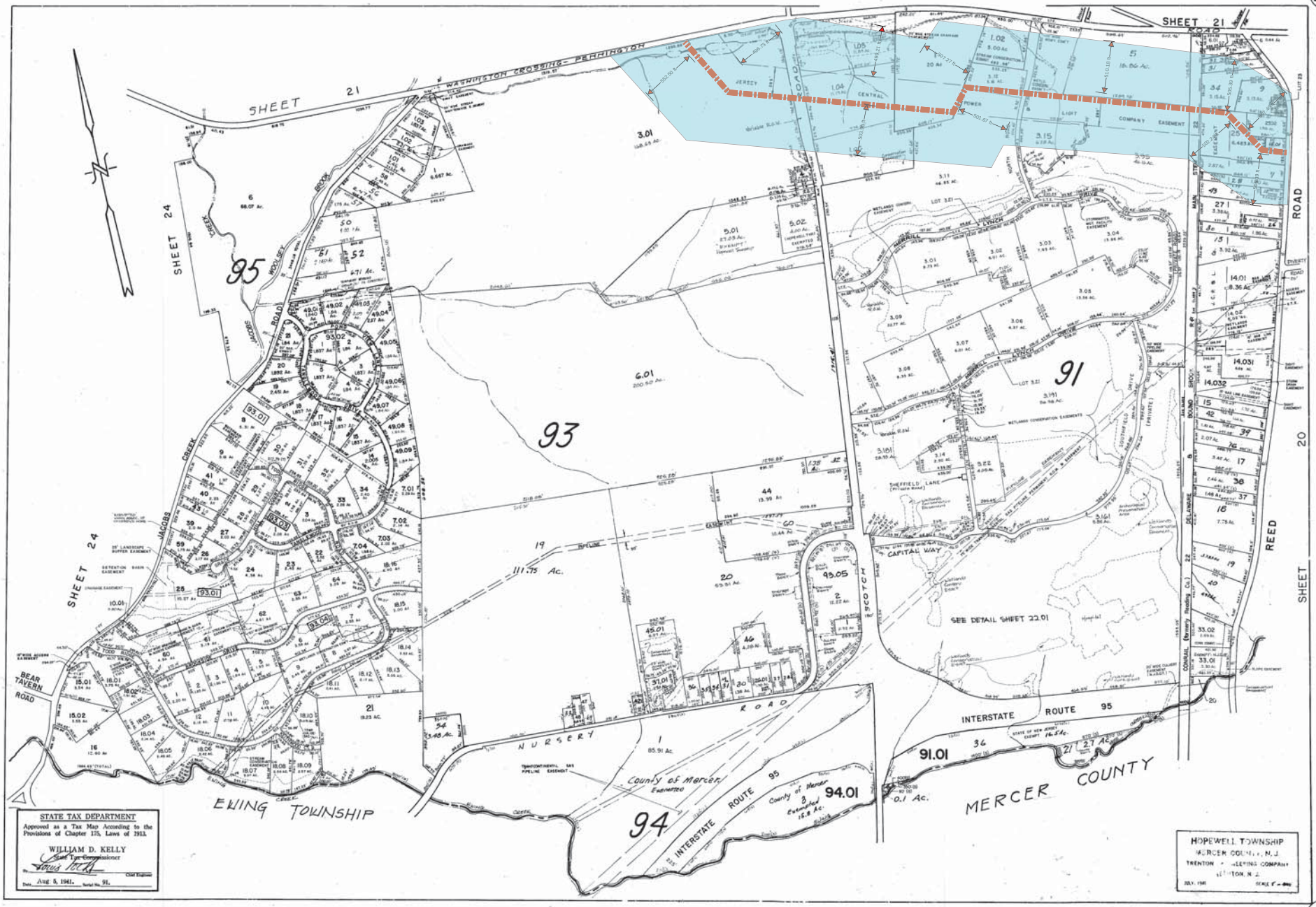


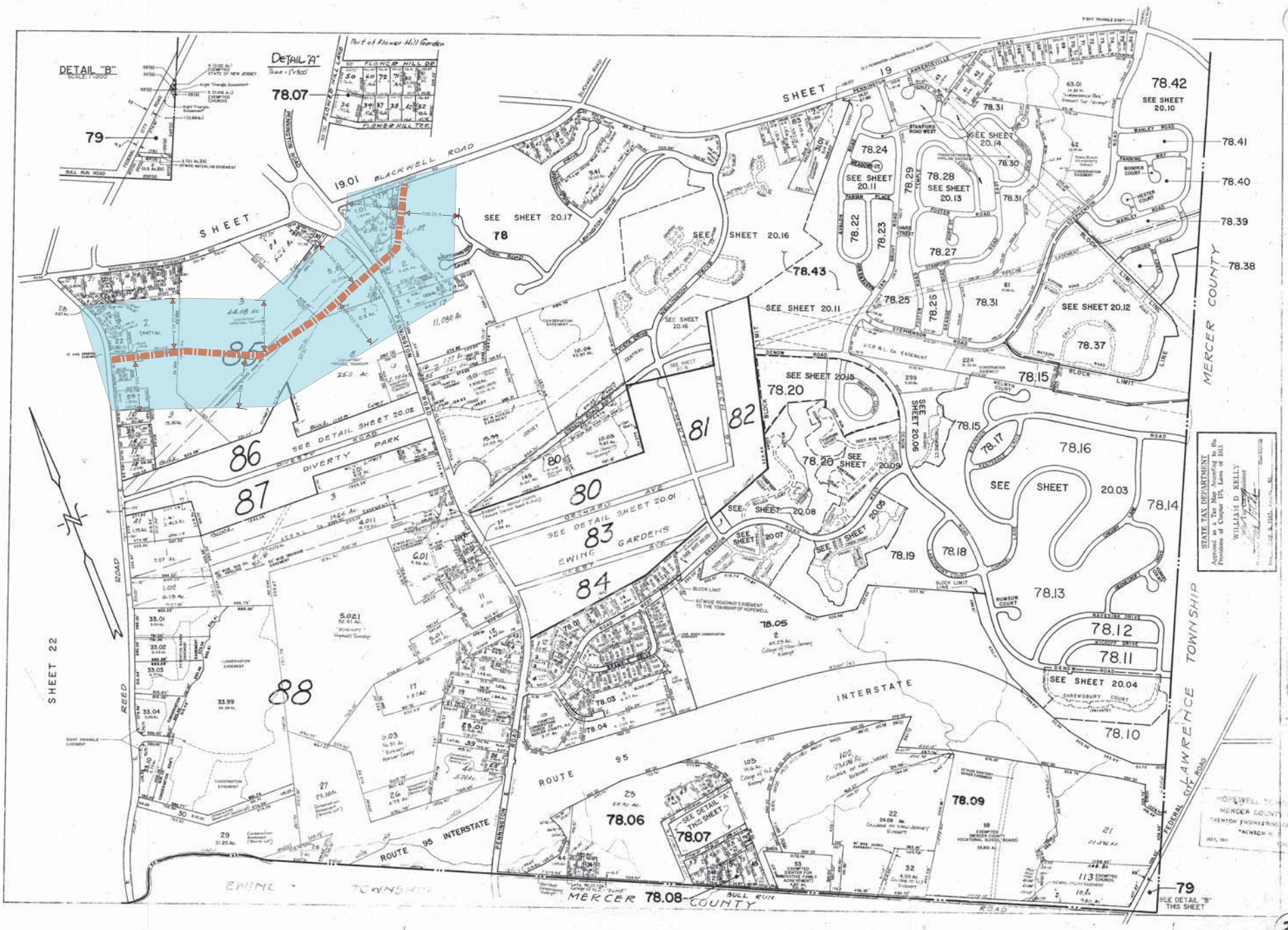

10
SHEET 10.01
PLEASANT VALLEY ROAD
VALLEY ROAD
HUNTER ROAD
BARNY ROAD
PLEASANT VALLEY HARBOURTON ROAD
SHEET 11
SHEET 12
SHEET 13
60
Continued on Sheet 11
Continued on Sheet 12
129.17 Ac. (TOTAL)
TAX MAP
TOWNSHIP OF HOPEWELL
MERCER COUNTY, NEW JERSEY
SCALE: 1" = 400'
JULY 1941
TRENTON ENGINEERING CO.
TRENTON, N. J.
10

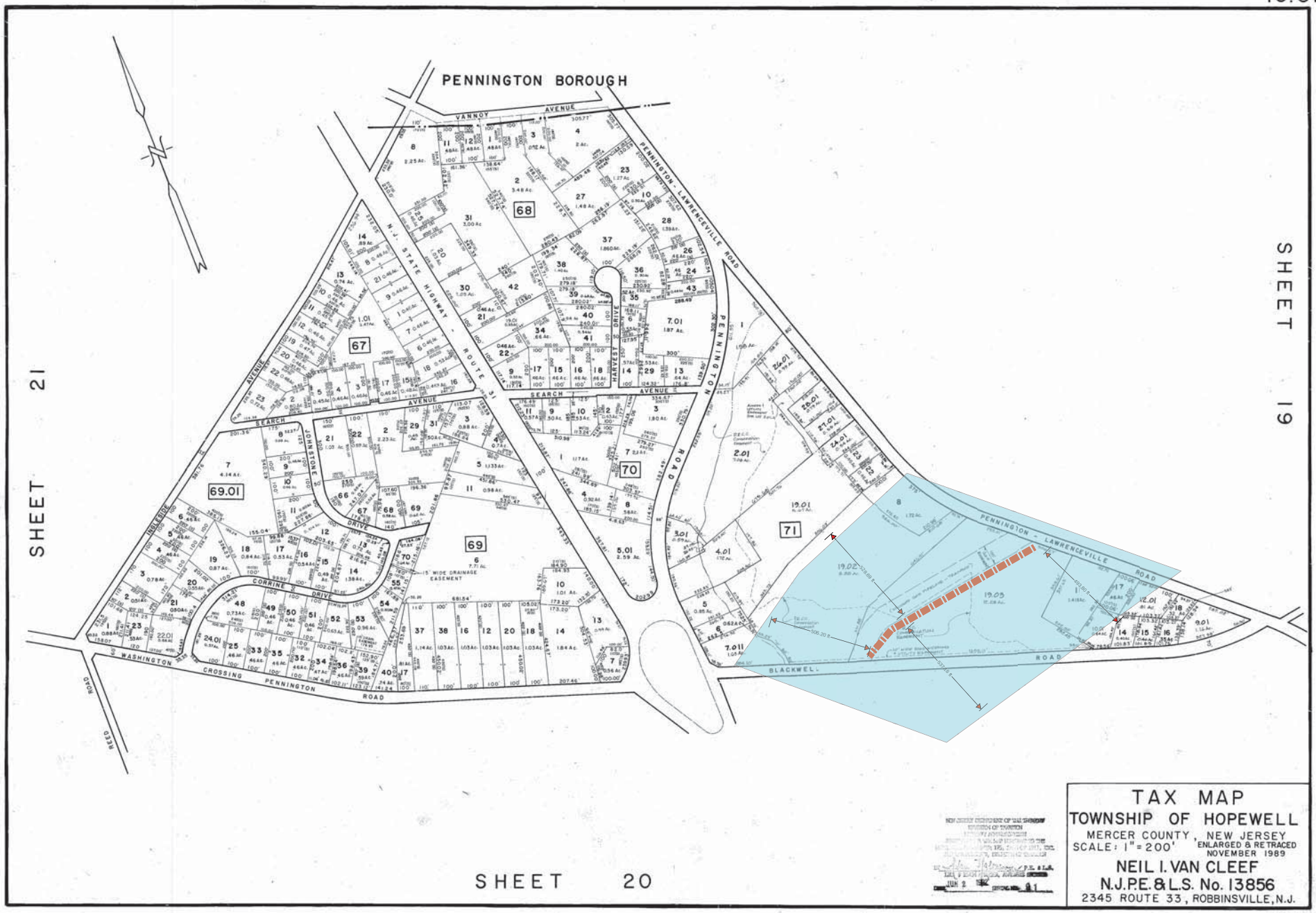

WEST AMWELL TOWNSHIP
HUNTERDON COUNTY
DELAWARE RIVER
PENNSYLVANIA
STOUT ISLAND
GOAT HILL ROAD
VALLEY ROAD
WOODENS LANE
HUNTER ROAD
PLEASANT VALLEY ROAD
SHEET 10.01
SHEET 10
SHEET 12
57
58
59
60
55
56
STATE TAX DEPARTMENT
Approved as a Tax Map According to the Provisions of Chapter 175, Laws of 1913.
WILLIAM D. KELLY
State Tax Commissioner
Chief Engineer
Date Aug. 5, 1941
HOPEWELL TOWNSHIP
MERCER COUNTY N.J.
TRENTON ENGINEERING COMPANY
TRENTON, N. J.


13
SHEET 9
SHEET 10
SHEET 12
SHEET 23
SHEET 21
SHEET 14.03
SHEET 14.02
WOOSAMONSA ROAD
PLEASANT VALLEY ROAD
PENNINGTON
HARBOURTON
TRENTON - HARBOURTON ROAD
TAVERN ROAD
FIDDLER'S CREEK
CHURCH ROAD
PENNINGTON-TITUSVILLE ROAD
CENTRAL POWER & LIGHT COMPANY
JACOBS CREEK
PUBLIC ACCESS AREA
AGRICULTURAL AREA
RESIDENTIAL AREA
SEE INSET 'A'
62
61
50
62.01
62.02
TAX MAP
TOWNSHIP OF HOPEWELL
MERCER COUNTY, NEW JERSEY
SCALE: 1" = 400'
JULY 1941
TRENTON ENGINEERING CO.
TRENTON, N. J.
13


21
SHEET 13
SHEET 14.02
SHEET 14.01
SHEET 22
SHEET 23
SHEET 19.01
SHEET PENNINGTON - TITUSVILLE ROAD
PENNINGTON BOROUGH
ROUTE 31
SOUTH
DUBLIN
CROSS ROAD
BROOK
DELAWARE & RARITAN CANAL
CONRAIL (formerly Reading Co.)
MAIN STEM
INGLESIDE
AVE.
WOOLSEY
BROOK
JACOBS
CREEK
HOPEWELL - PENNINGTON ROAD
92
92.01
89
65
66.01
66.02
100.37 Ac.
EXEMPTED
STATE TAX DEPARTMENT
Approved as a Tax Map According to the Provisions of Chapter 175, Laws of 1913.
WILLIAM D. KELLY
State Tax Commissioner
Date Aug. 5, 1941
HOPEWELL TOWNSHIP
MERCER COUNTY N.J.
TRENTON ENGINEERING COMPANY
TRENTON N.J.

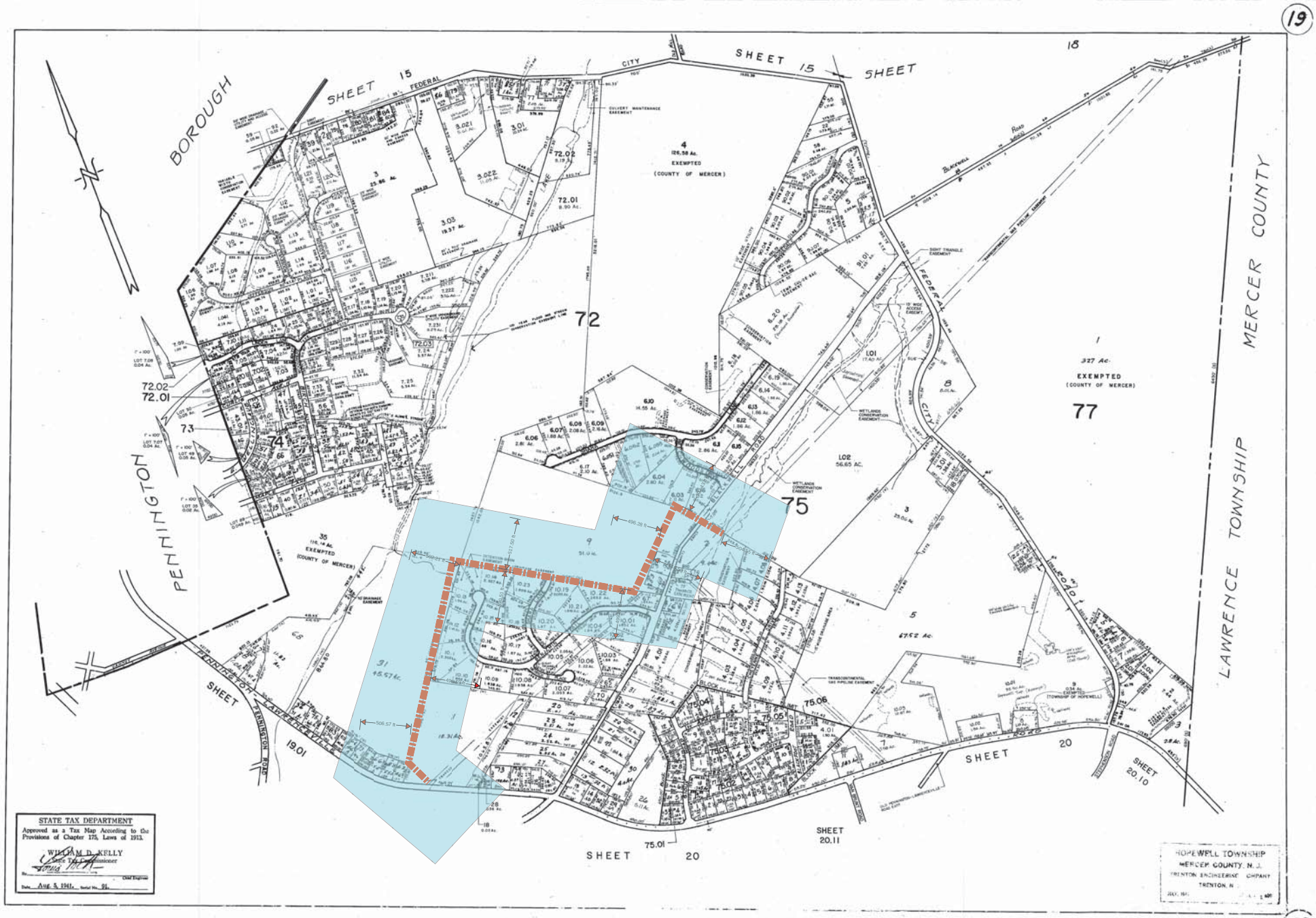

22
SHEET 21
SHEET 21
WASHINGTON CROSSING - PENNINGTON
ROAD
JERSEY CENTRAL POWER & LIGHT COMPANY EASEMENT
SHEET 24
SHEET 24
95
93
91
94
6.01
3.01
111.75 Ac.
JACOBS CREEK
WOOLSEY BROOK
ROAD
SCOTCH ROAD
NURSERY ROAD
CAPITAL WAY
SHEFFIELD LANE
BEAR TAVERN ROAD
REED ROAD
SHEET 20
SEE DETAIL SHEET 22.01
INTERSTATE ROUTE 95
91.01
94.01
County of Mercer Exempted
County of Mercer 8 Exempted 16.8 Ac.
EWING TOWNSHIP
MERCER COUNTY
STATE TAX DEPARTMENT
Approved as a Tax Map According to the Provisions of Chapter 175, Laws of 1913.
WILLIAM D. KELLY
State Tax Commissioner
Aug. 5, 1941.
HOPEWELL TOWNSHIP
MERCER COUNTY, N.J.
TRENTON ENGINEERING COMPANY
22


DETAIL "B"
SCALE: 1"=200'
DETAIL "A"
Scale: 1"=100'
Part of Flower Hill Garden
FLOWER HILL DR
FLOWER HILL TRE
78.07
79
BULL RUN ROAD
PENNINGTON ROAD
BLACKWELL ROAD
SHEET 19
SHEET 22
SEE SHEET 20.17
78
SEE SHEET 20.16
78.43
SEE SHEET 20.11
SEE SHEET 20.12
SEE SHEET 20.15
SEE SHEET 20.06
SEE SHEET 20.09
SEE SHEET 20.08
SEE SHEET 20.07
SEE SHEET 20.03
SEE SHEET 20.04
SEE SHEET 20.10
SEE SHEET 20.14
SEE SHEET 20.13
78.42
78.41
78.40
78.39
78.38
78.37
78.31
78.30
78.29
78.28
78.27
78.26
78.25
78.24
78.23
78.22
78.20
78.19
78.18
78.17
78.16
78.15
78.14
78.13
78.12
78.11
78.10
78.09
78.08
78.06
78.05
78.03
78.04
85
86
87
88
80
81
82
83
84
DIVERTY PARK
SEE DETAIL SHEET 20.02
SEE DETAIL SHEET 20.01
ORCHARD AVE
EWING GARDENS
EWING AVE
REED ROAD
INTERSTATE ROUTE 95
MERCER COUNTY
LAWRENCE TOWNSHIP
FEDERAL CITY ROAD
EWING TOWNSHIP
SEE DETAIL "A" THIS SHEET
SEE DETAIL "B" THIS SHEET
STATE TAX DEPARTMENT
WILLIAM D KELLY
HOPEWELL TOWNSHIP
MERCER COUNTY N.J.
TRENTON ENGINEERING CORP.
TRENTON N.J.



TAX MAP
TOWNSHIP OF HOPEWELL
MERCER COUNTY, NEW JERSEY
SCALE: 1" = 200'
ENLARGED & RETRACED NOVEMBER 1989

NEIL I. VAN CLEEF
N.J.P.E. & L.S. No. 13856
2345 ROUTE 33, ROBBINSVILLE, N.J.


19
BOROUGH
PENNINGTON
SHEET 15
SHEET 15
SHEET 15
CITY
FEDERAL
18
MERCER COUNTY
LAWRENCE TOWNSHIP
4
126.58 Ac.
EXEMPTED
(COUNTY OF MERCER)
72
72.01
72.02
73
74
75
75.01
75.04
75.05
75.06
77
1
327 Ac.
EXEMPTED
(COUNTY OF MERCER)
35
116.14 Ac.
EXEMPTED
(COUNTY OF MERCER)
31
45.57 Ac.
L01
L02
56.65 AC.
67.52 Ac.
SHEET 19.01
SHEET 20
SHEET 20.11
SHEET 20.10
STATE TAX DEPARTMENT
Approved as a Tax Map According to the Provisions of Chapter 175, Laws of 1913.
WILLIAM D. KELLY
Tax Commissioner
Chief Engineer
Date Aug. 5, 1941. Serial No. 91.
HOPEWELL TOWNSHIP
MERCER COUNTY, N. J.
TRENTON ENGINEERING COMPANY
TRENTON, N. J.
19

PennEast Pipeline DRAFT Preferred Alternate Route

Block	Lot	File	Scanned	Comments
55	1	x	x	scan
56	3	x		no plan
56	5	x		no plan
56	6	x	x	scan
56	7			no folder
56	8			no folder
56	9	x	x	scan
56	10	x	x	scan
56	11	x	x	scan
57	4	x		no plans
59	3	x		no plans
59	4	x	x	scan
59	5			same as 59/4
59	6.01	x	x	scan
59	6.02	x		no plans
59	7	x	x	scan
59	8	x	x	scan
59	9	x	x	scan
59	10	x		no plans
59	11	x		no plans
59	12			no folder
59	13.01	x		no plans
59	13.02	x	x	scan
59	13.03	x		no plans
60	3	x		no plans
60	4	x		no plans
60	5	x		no plans
60	29.01	x	x	scan
60	29.02	x	x	scan
60	30	x	x	scan
60	34	x		no plans
60	40.01	x		no plans
60	48			no folder
61	3.02			no folder-open space
61	4	x	x	scan
61	5.01	x		no plans
61	9.01	x	x	scan
61	10.01	x	x	scan
62	2.012	x	x	scan
62	2.011			no folder
62	2.02	x		no plans-subdivision plan
62	3	x	x	scan
62	12.04			no folder

PennEast Pipeline DRAFT Preferred Alternate Route

Block	Lot	File	Scanned	Comments
62	12.11	x	x	scan
62	12.12	x	x	scan
62	12.13	x	x	scan
62	12.14	x	x	scan
62	12.15	x	x	scan
62	12.16	x	x	scan
62	12.17	x	x	scan
62	12.18	x	x	scan
62	12.19	x	x	scan
62	12.2	x	x	scan
62	12.26	x		no plans
62	12.27	x	x	scan
62	12.28	x	x	scan
62	24	x		no plans
62	26.031	x	x	scan
62	26.041	x		no plans
62.01	80.15	x		no plans
62.01	80.16	x	x	scan
62.02	3	x	x	scan
62.02	4	x	x	scan
62.02	5	x	x	scan
62.02	6	x	x	scan
62.02	7	x	x	scan
62.02	8	x	x	scan
62.02	9	x	x	scan
71	7.011	x	x	scan
71	8	x	x	scan
71	10.01	x	x	scan
71	11			no folder
71	12.01			no folder
71	17			no folder
71	19.02	x		no plans
71	19.03	x		no plans
72	6.03	x	x	scan
72	6.04	x	x	scan
72	6.051	x	x	scan
72	6.052	x	x	scan
72	6.053	x	x	scan
72	6.1	x	x	scan
72	6.11	x	x	scan
72	6.15	x	x	scan
72	6.16	x	x	scan
72	9	x		no plans
72	10.01	x	x	scan
72	10.02	x	x	scan
72	10.04	x	x	scan
72	10.1	x	x	scan

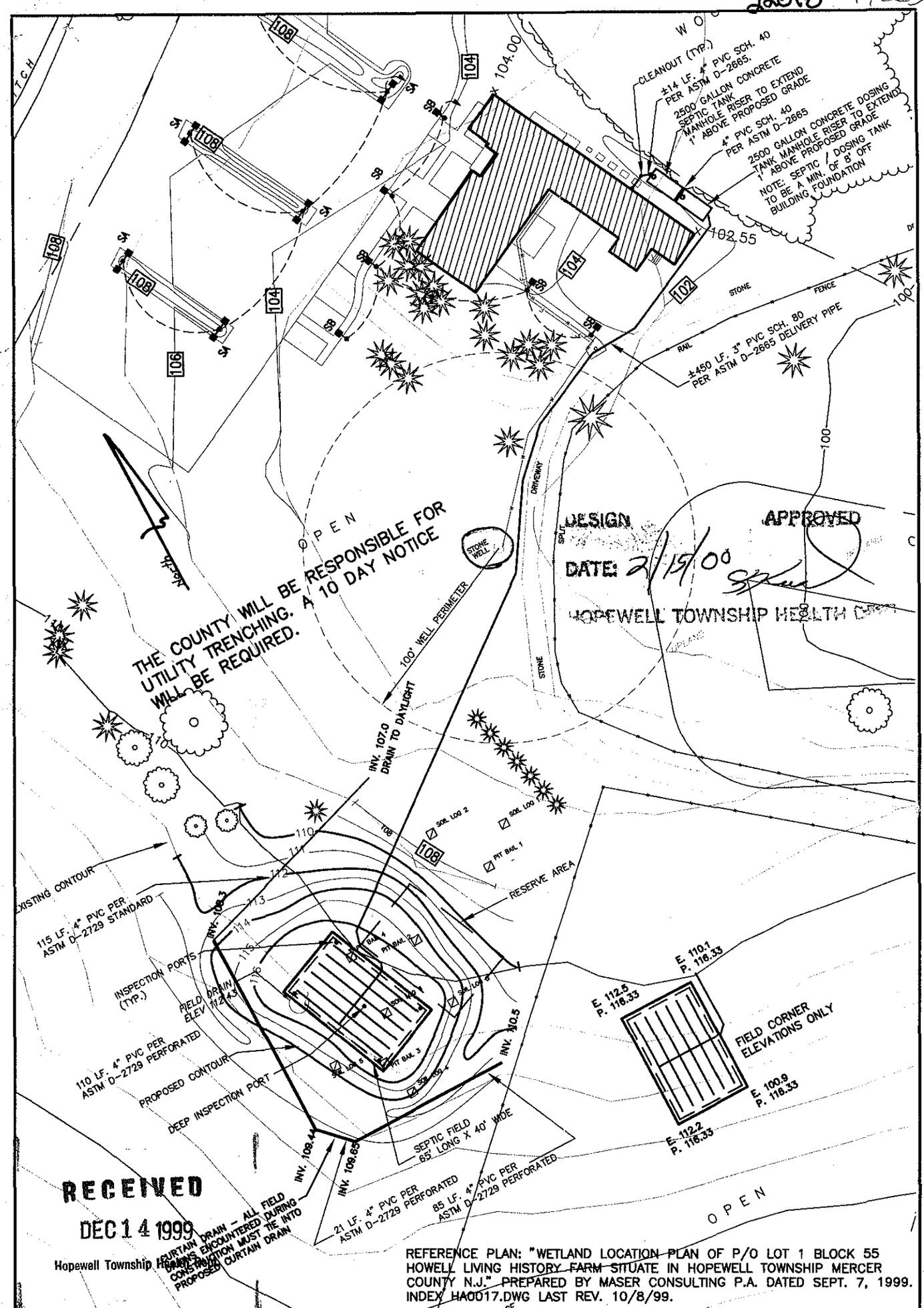
PennEast Pipeline DRAFT Preferred Alternate Route

Block	Lot	File	Scanned	Comments
72	10.11	x	x	scan
72	10.12	x	x	scan
72	10.13	x	x	scan
72	10.14	x	x	scan
72	10.15	x	x	scan
72	10.16	x	x	scan
72	10.18	x	x	scan
72	10.19	x	x	scan
72	10.2	x	x	scan
72	10.21	x	x	scan
72	10.22	x	x	scan
72	10.23	x	x	scan
72	11	x		no plans
72	31			no folder
72	52	x	x	scan
72	53	x		no plans
72	67	x		pipeline
75	1.02			no plans
75	2			no folder
75	4.01	x	x	scan
75	4.02	x	x	scan
75	4.06	x	x	scan
75	4.07	x	x	scan
75	4.08	x	x	scan
75	16	x	x	scan
75	27	x		no plans
78	1.01	x		no septic
78	2	x		no plans
78	3	x		no plans
78	4	x	x	scan
78	5	x		no plans
78	6	x		no plans
78	17	x		no plans
78	30	x		no plans
78	65	x		no plans
78	97	x		no plans
85	2	x		no plans
85	3	x		no plans
85	5.01	x	x	scan - shop rite
85	8	x		no plans
85	9.01			no folder
85	10	x		no plans
85	15	x	x	scan
85	22	x	x	scan
85	23	x	x	scan
85	26	x	x	scan
85	28	x	x	scan

PennEast Pipeline DRAFT Preferred Alternate Route

Block	Lot	File	Scanned	Comments
91	1	x	x	scan
91	1.02	x	x	scan
91	1.03	x		no plans
91	1.04	x		no plans
91	1.05	x		no plans
91	3.15			no folder
91	5	x		no plans
91	9	x	x	scan
91	11	x		no plans
91	12	x		no plans
91	25	x	x	scan
91	25.01	x	x	scan
91	25.02	x	x	scan
91	28	x		no plans
91	31	x		no plans
91	32			no folder
91	34	x		no plans
91	43	x	x	scan
92	1.03	x		no folder
92	1.05	x		no folder
92	2	x	x	scan
92	5			township building
92	7			no folder
92	8			no folder
92	9			township building
92	46			township building
92	49			no folder
92	50			ballfield
93	3.01	x	x	scan

22018 49223



REFERENCE PLAN: "WETLAND LOCATION PLAN OF P/O LOT 1 BLOCK 55 HOWELL LIVING HISTORY FARM SITUATE IN HOPEWELL TOWNSHIP MERCER COUNTY N.J." PREPARED BY MASER CONSULTING P.A. DATED SEPT. 7, 1999. INDEX HA0017.DWG LAST REV. 10/8/99.

van note–harvey associates, p.c

consulting engineers, planners & land surveyors

vnh

777 ALEXANDER ROAD
PRINCETON, NEW JERSEY
08540

Robert A. Hough 12/13/99

DATE OF SIGN

ROBERT A. HOUGH
NEW JERSEY PROFESSIONAL ENGINEER
LIC. No. 33444

SEPTIC SYSTEM DESIGN OF HOWELL LIVING HISTORY FARM P/O LOT 1 BLOCK 55

PREPARED FOR

MERCER COUNTY PARKS COMMISSION

SITUATED IN

HOPEWELL TWP. MERCER CO., N.J.
SCALE: 1" = 60' DECEMBER 1999.

DRAWN BY: BJF	FIELD BK	ORDER No. 02.22. 33757 -32	FILE No.	SHEET No.
CHECKED BY: RAH	PAGE		TWP. BLK.	1 OF 8

SEPTIC FIELD CROSS – SECTION

MOUNDED SOIL REPLACEMENT

NOT TO SCALE

REQUIRED DISPOSAL AREA

DESIGNED FOR A PROPOSED VISITOR CENTER

20 EMPLOYEES @ 15 GPD = 300 GPD PLUS
270 VISITORS @ 5GPD = 1350 GPD
DAILY FLOW RATE = 1650 GPD.

DESIGNED PERM. = 6 – 20 IN/HR.

REQUIRED BOTTOM BED AREA – (MIN.)
1650 GPM X 1.33 SF/DAY = 2194.5 SF.

DESIGNED BOTTOM BED AREA –
61' LONG 36' WIDE = 2196.0 SQ. FT.

EXCAVATION LIMITS –
65' LONG X 40' WIDE = 2600.0 SQ. FT.

PRESURE DISTRIBUTION SYSTEM

12 DISTRIBUTION LATERALS 27.5' LONG.

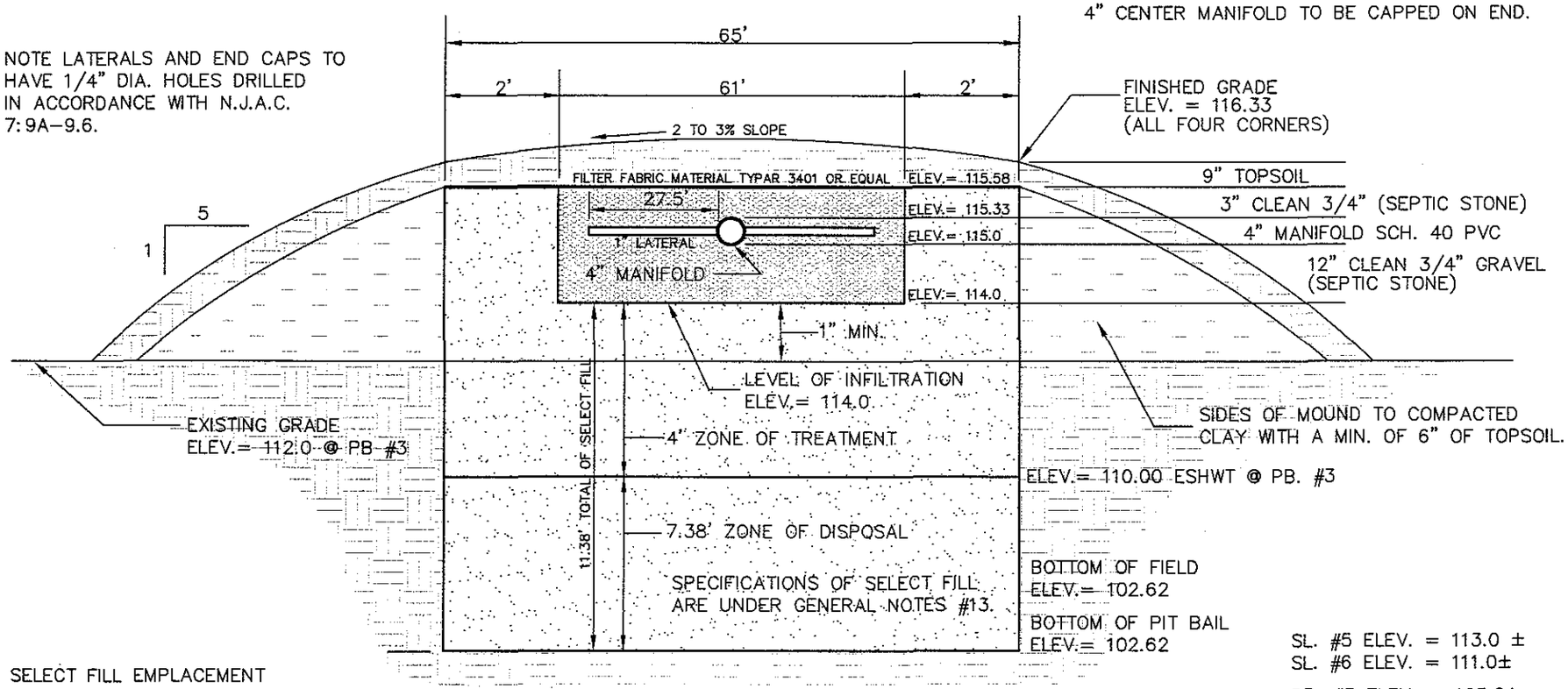
LATERALS SPACED 6' OFF CENTER.

INDIVIDUAL LATERALS TO HAVE 5 HOLES 1/4" IN DIAMETER AT 30" APART.

END LATERALS TO BE SPACED 3' FROM EDGE OF BED.

4" CENTER MANIFOLD TO BE CAPPED ON END.

NOTE LATERALS AND END CAPS TO HAVE 1/4" DIA. HOLES DRILLED IN ACCORDANCE WITH N.J.A.C. 7:9A–9.6.



SL. #5 ELEV. = 113.0 ±
SL. #6 ELEV. = 111.0±

PB. #3 ELEV. = 103.8±
PB. # 4 ELEV. = 102.62±

SELECT FILL EMPLACEMENT

FILL MATERIAL TO BE SPREAD AND COMPACTED IN ONE FOOT LAYERS. COMPACTION IS TO BE DONE BY SHEEPSFOOT ROLLER OR THE USE OF A RUBBER TIRED OR TRACKED MACHINE DRIVEN OVER THE AREA IN A CONTROLLED PATTERN.

AFTER EMPLACEMENT OF THE SELECT FILL AND BEFORE PLACEMENT OF THE STONE. THE ENGINEER MUST PERFORM PERCOLATION TESTS IN THE EMPLACED SELECT FILL.

van note–harvey associates, p.c
consulting engineers, planners & land surveyors
777 ALEXANDER ROAD
PRINCETON, NEW JERSEY
08540

ROBERT A. HOUGH
NEW JERSEY PROFESSIONAL ENGINEER
LIC. No. 33444

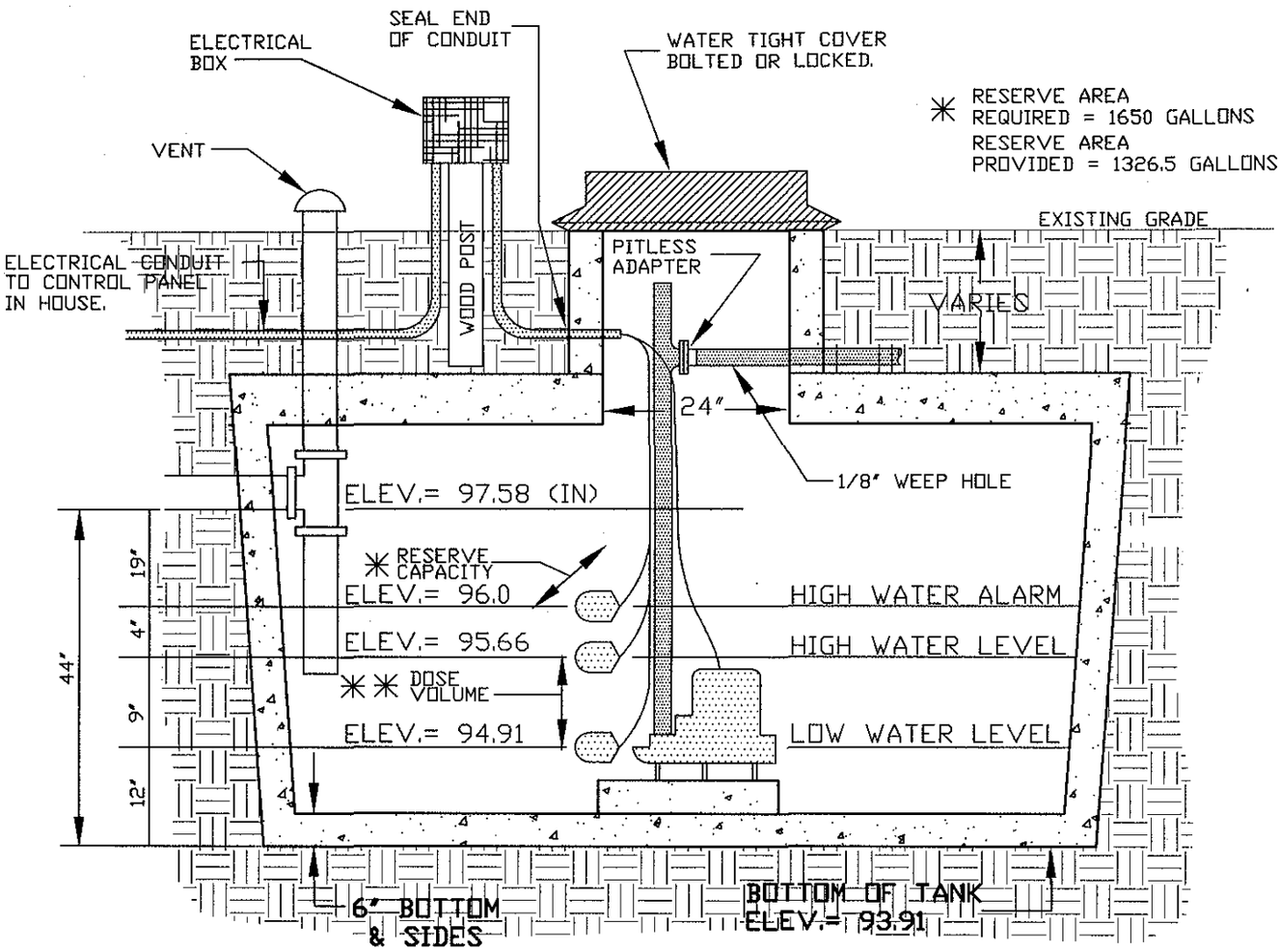
DATE OF SIGN 12/17/99

SEPTIC SYSTEM DESIGN
OF
HOWELL LIVING HISTORY FARM
P/O LOT 1 BLOCK 55
PREPARED FOR
MERCER COUNTY PARKS COMMISSION
SITUATED IN
HOPEWELL TWP.
MERCER CO., N.J.
DECEMBER 1999.

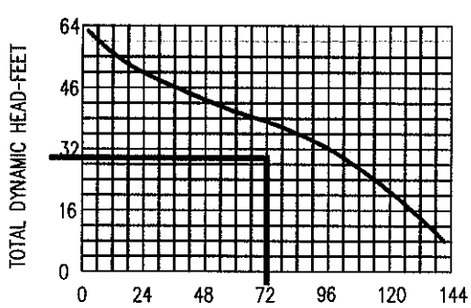
DRAWN BY: BJF	CHECKED BY: RAH	SCALE: AS SHOWN	FIELD BK	PAGE	ORDER No. 02.22.33757-32	FILE No.	TWP. BLK.	SHEET No. 2 OF 8

2500 GALLON DOSING TANK WITH PUMP

NOT TO SCALE



MIN. TANK INSIDE DIMENSIONS L=192" X W=84" X D=38".



CAPACITY-U.S. G.P.M.

29.09 TDH @ 71.0 GPM

HYDROMATIC PUMP MODEL SPD100H OR APPROVED EQUAL.

✳✳ DOSE 412.5 GALLONS PLUS TOTAL VOLUME OF PIPING 202.1 GALLONS.

DOSE VOLUME REQUIRED = 614.6 GALLONS
DOSE VOLUME PROVIDED = 634.9 GALLONS

QUICK-DISCONNECT COUPLINGS SHALL BE USED TO FACILITATE REMOVAL OF THE PUMP FOR SERVICING.

FLOATS TO BE USED HYDROMATIC 3900 MERCURY SWITCH LEVEL CONTROL OR EQUAL.

PUMP TO BE USED HYDROMATIC SPD100H OR APPROVED EQUAL.

AUDIO AND VISUAL ALARMS TO BE INSTALLED INSIDE OF DWELLING.

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DRAWN BY: BJF	FIELD BK	ORDER No. 02.22.33757-32	FILE No.	SHEET No.
CHECKED BY: RAH	PAGE		TWP. BLK.	3 OF 8

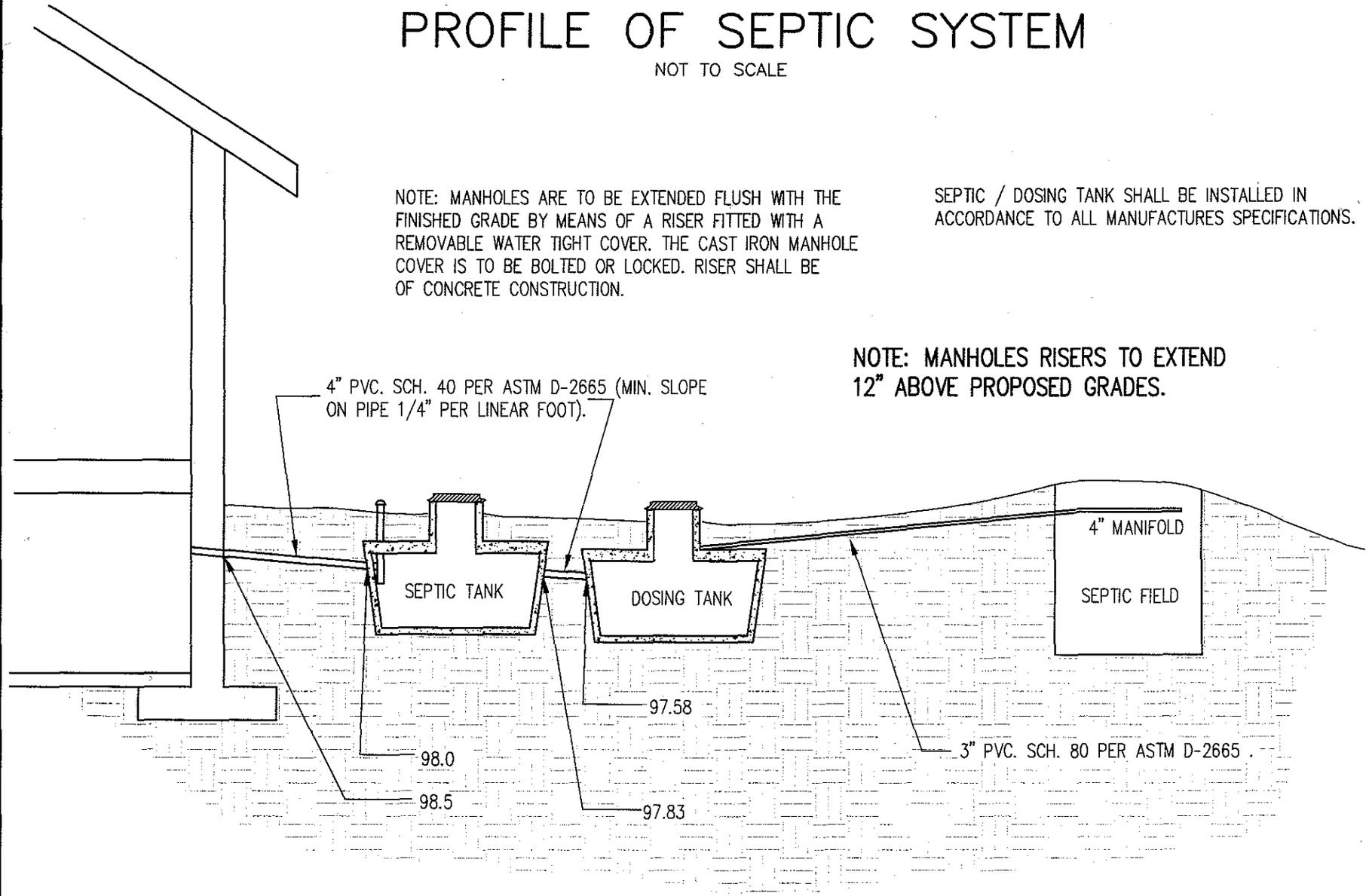
PROFILE OF SEPTIC SYSTEM

NOT TO SCALE

NOTE: MANHOLES ARE TO BE EXTENDED FLUSH WITH THE FINISHED GRADE BY MEANS OF A RISER FITTED WITH A REMOVABLE WATER TIGHT COVER. THE CAST IRON MANHOLE COVER IS TO BE BOLTED OR LOCKED. RISER SHALL BE OF CONCRETE CONSTRUCTION.

SEPTIC / DOSING TANK SHALL BE INSTALLED IN ACCORDANCE TO ALL MANUFACTURES SPECIFICATIONS.

NOTE: MANHOLES RISERS TO EXTEND 12" ABOVE PROPOSED GRADES.



FOR INVERT ELEVATIONS PURPOSES ONLY.

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P/O LOT 1 BLOCK 55
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CHECKED BY: RAH	PAGE		TWP. BLK. 4	OF 8

SCALE: AS SHOWN

GENERAL NOTES

1. REMOVE TREES IN THE VICINITY OF DISPOSAL FIELD AS DIRECTED BY HEALTH OFFICER.
2. EXCAVATION CARRIED BELOW REQUIRED DEPTH TO BE FILLED WITH FILLER MATERIAL.
3. NO GRADING EQUIPMENT SHALL PASS OVER SEPTIC FIELD.
4. TWO PIECE PRECAST REINFORCED CONCRETE SEPTIC TANK SHALL BE WATER TESTED BY THE ADMINISTRATIVE AUTHORITY
5. LOT GRADING TO BE CONTROLLED TO DIRECT SURFACE WATER AWAY FROM AND TO AVOID PONDING WITHIN WASTE DISPOSAL AREA.
6. PROVIDE ACCESS COVER PERMANENT MARKER AT FINISHED GRADE FOR SEPTIC TANK, DOSING TANK AND DISTRIBUTION BOX.
7. THE PERFORMANCE OF SUBSURFACE DISPOSAL SYSTEMS DEPENDS UPON CONSTRUCTION IN STRICT ACCORDANCE WITH STATE AND LOCAL STANDARDS, PRESCRIBED USE AS DESIGNED, AND PERIODIC MAINTENANCE BY THE OWNER.
8. THERE ARE NO EXISTING WELLS, WATER COURSES OR SEPTIC SYSTEMS WITHIN 100 FEET OF THE PROPOSED SEPTIC SYSTEM OR WELL EXCEPT THOSE SPECIFIED ON THE PLAN.
9. CONTRACTOR TO VERIFY ALL ELEVATIONS PRIOR TO CONSTRUCTION.
10. CONTRACTOR SHALL NOTIFY ENGINEER IF SUBSOIL CONDITIONS ARE FOUND TO DIFFER SUBSTANTIALLY FROM THOSE SHOWN ON DRAWINGS.
11. NO GARBAGE GRINDER UNITS TO BE ATTACHED TO SEPTIC SYSTEM.
12. CONTRACTOR TO NOTIFY ENGINEER OF PROGRESS SO THAT ENGINEER MAY MAKE PERIODIC INSPECTIONS FOR PREPARATION OF AS-BUILT PLAN AND CERTIFICATE. INSPECTIONS TO INCLUDE BUT NOT BE LIMITED TO: OPEN EXCAVATION, REPLACEMENT, D-BOX, BACKFILL AND FINAL GRADE. NO CERTIFICATION CAN BE PROVIDED IF NOT WITNESSED BY VNHA.
13. SELECT FILL SHALL MEET THE FOLLOWING CRITERIA:
    A. CONTENT OF COURSE FRAGMENT (PARTICLES GREATER THAN 2MM IN SMALLEST DIMENSION) SHALL BE LESS THAN 15% BY VOLUME OR 25% BY WEIGHT.
    B. TEXTURAL ANALYSIS (COMPOSITION, BY WEIGHT, OF SIZE PASSING THE 2MM SIEVE): 85-95% SAND, 5-15% SILT AND CLAY, MINIMUM 5% CLAY. SAND SILT AND CLAY ARE THE PARTICLE SIZE FRACTIONS OR "SOIL SEPARATES" AS DEFINED BY THE U.S.D.A. SYSTEM OF SOIL CLASSIFICATION.
    C. PERMEABILITY: 2-6 IN./HR. OR PERCOLATION RATE 15-20 MIN./IN.
14. ALL ELECTRICAL INSTALLATIONS PER NATIONAL ELECTRICAL CODE.
15. SOIL TESTS AND SOIL LOGS: THE SOIL LOGS AND PERMEABILITY TESTS MAKE NO REPRESENTATIONS OR WARRANTIES EITHER AS TO THE PRESENCE OR ABSENCE OF OBSTRUCTIONS OR SOIL CONDITIONS OTHER THAN THOSE ACTUALLY PENETRATED OR AS TO THEIR NATURE OR EXTENT. SUBSURFACE CONDITIONS OTHER THAN THOSE ACTUALLY PENETRATED MAY VARY WITH REGARD TO ELEVATION, COMPOSITION, TEXTURE, STRUCTURE, SOUNDNESS, AND OTHER CHARACTERISTICS FROM THE DESCRIPTIONS GIVEN IN THE SOIL LOGS AND THE RESULTS FROM THE PERCOLATION TESTS. SUBSURFACE CONDITIONS DIFFERING FROM THOSE OBSERVED AT TEST LOCATIONS MAY REQUIRE REVISIONS TO THE DESIGN OR CONSTRUCTION OF THE ON-SITE SEWAGE DISPOSAL SYSTEM AT THE OWNER'S EXPENSE.
16. SEPTIC TANK TO BE CONSTRUCTED AND PLACED ACCORDING TO N.J.A.C. 7:9A-8.2.
17. SOIL TESTS ARE CARRIED OUT UNDER THE DIRECT SUPERVISION OF A LICENSED ENGINEER.
18. FILL MATERIAL COMPACTION TO BE INSPECTED BY THE ENGINEER.
19. DOSING TANK TO BE CONSTRUCTED AND PLACED ACCORDING TO N.J.A.C. 7:9A-8.2.
20. SEPTIC/DOSING TANK TO BE MANUFACTURED BY R&E MERSHON CONCRETE PRODUCTS, INC.

van note-harvey associates, p.c
consulting engineers, planners & land surveyors
vnh
777 ALEXANDER ROAD
PRINCETON, NEW JERSEY
08540

Robert A. Hough 12/13/99
DATE OF SIGN

ROBERT A. HOUGH
NEW JERSEY PROFESSIONAL ENGINEER
LIC. No. 33444

SEPTIC SYSTEM DESIGN
OF
HOWELL LIVING HISTORY FARM
P/O LOT 1 BLOCK 55
PREPARED FOR
MERCER COUNTY PARKS COMMISSION
SITUATED IN
HOPEWELL TWP. MERCER CO., N.J.
SCALE: AS SHOWN DECEMBER 1999.

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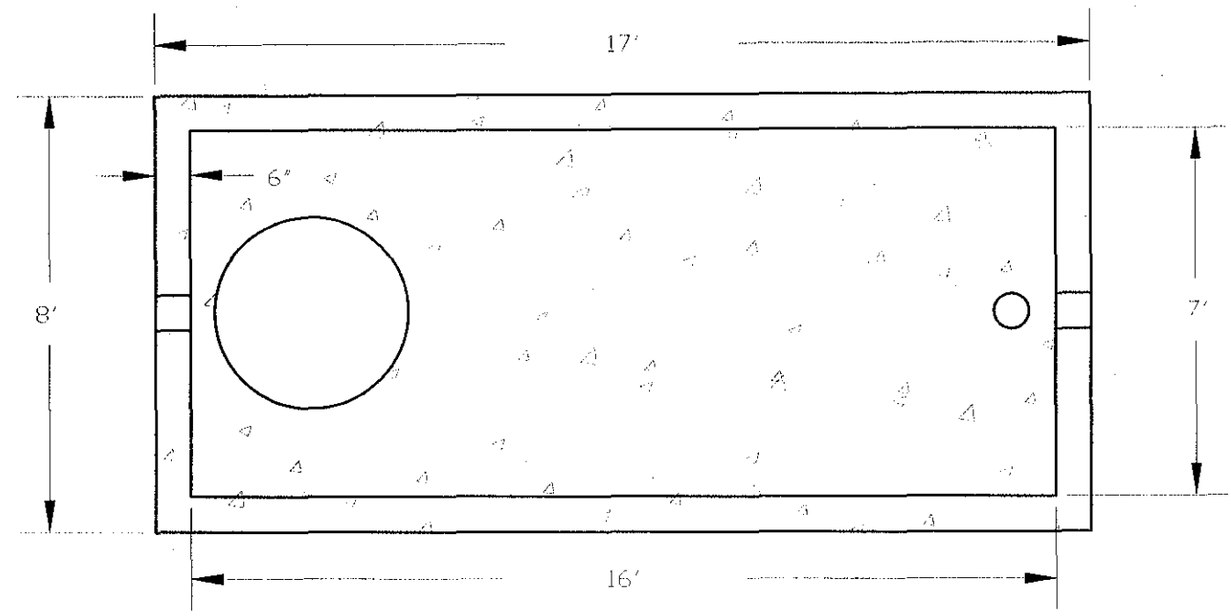

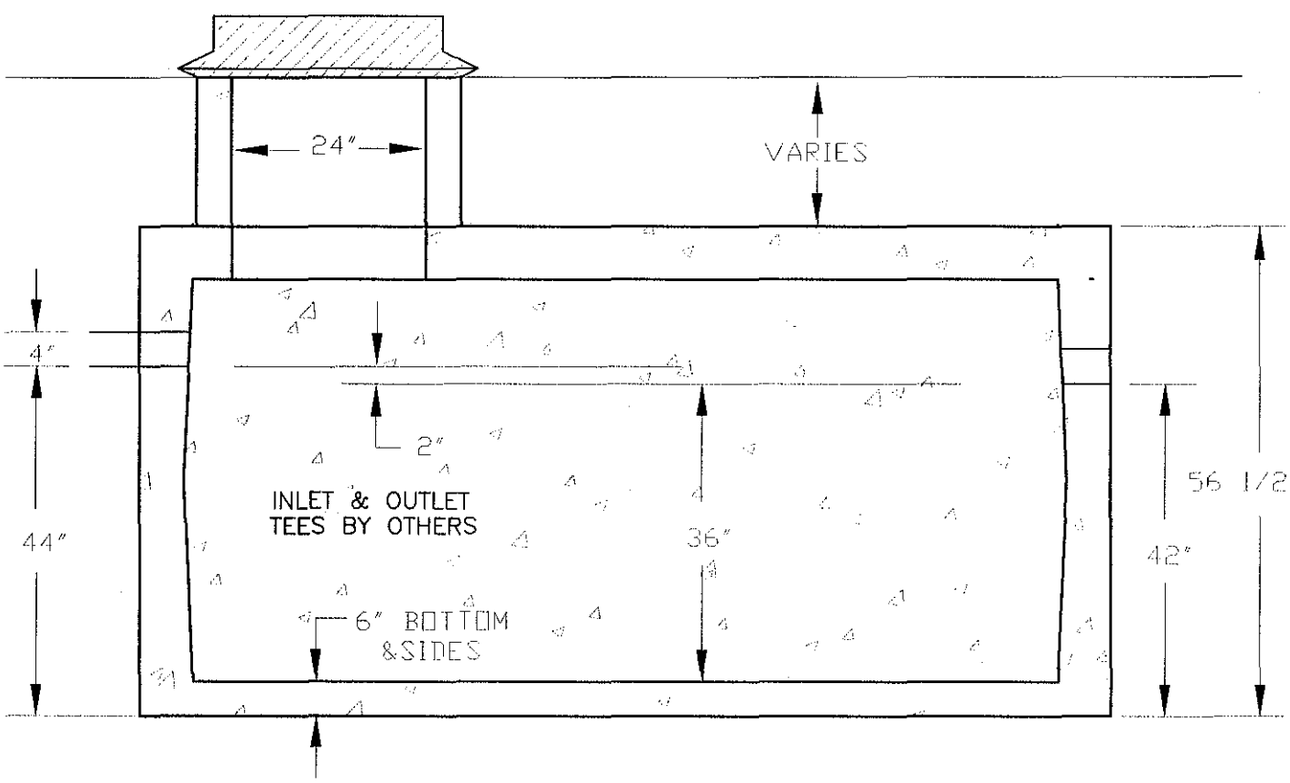

R & E MERSHON CONCRETE PRODUCTS INC.

2500 GALLON TANK – TWO PIECE

TANK IS 4000 PSI CONCRETE – STEEL REINFORCED
CONCRETE TO CONFORMS TO ACI 318-16-4.5.1
AND ACI 318-16-4.5.2

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vnh
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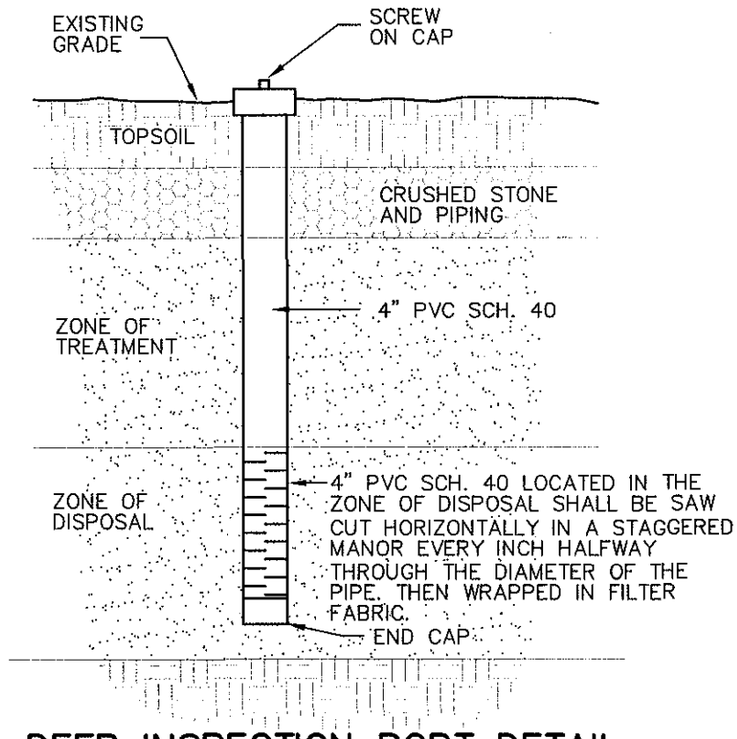
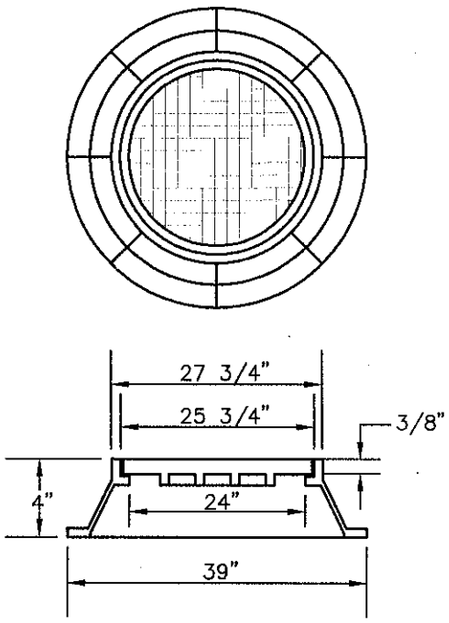
DRAWN BY: BJF	FIELD BK	ORDER No.	FILE No.	SHEET No.
CHECKED BY: RAH	PAGE	02.22. 33757 -32	TWP. BLK.	6 OF 8



DEEP INSPECTION PORT DETAIL

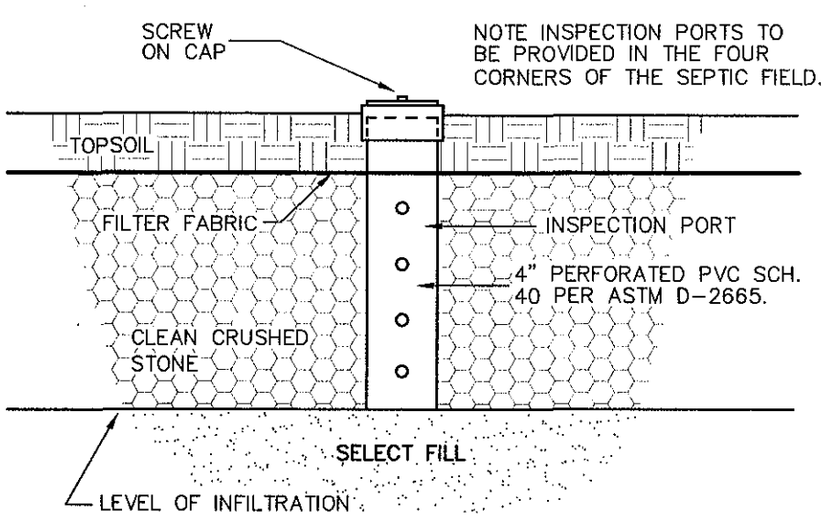
NOT TO SCALE



MANHOLE FRAME AND COVER AS MANUFACTURED BY CAMPBELL FOUNDRY, TYPE 1203B OR APPROVED EQUAL.

STANDARD MANHOLE FRAME AND COVER DETAIL

NOT TO SCALE



INSPECTION PORT DETAIL

NOT TO SCALE

van note-harvey associates, p.c

consulting engineers, planners & land surveyors

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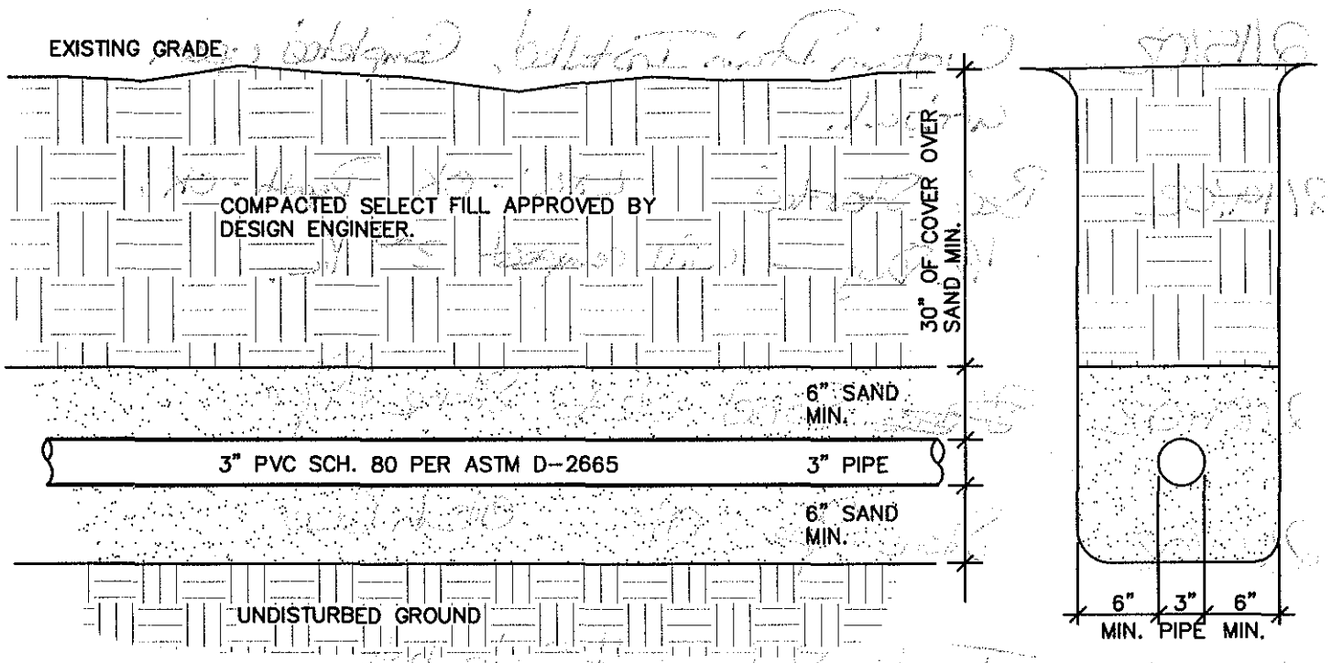
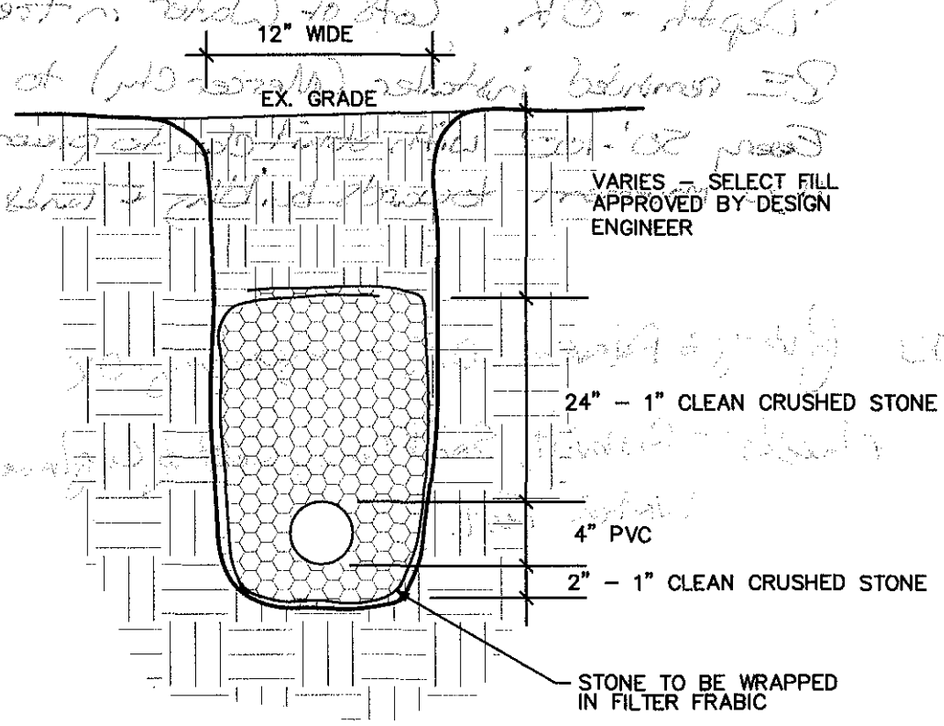
CHECKED BY: RAH	PAGE		TWP. BLK.	7 OF 8



DELIVERY PIPE BEDDING DETAIL

NOT TO SCALE



CURTAIN DRAIN DETAIL

NOT TO SCALE

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consulting engineers, planners & land surveyors

777 ALEXANDER ROAD
PRINCETON, NEW JERSEY
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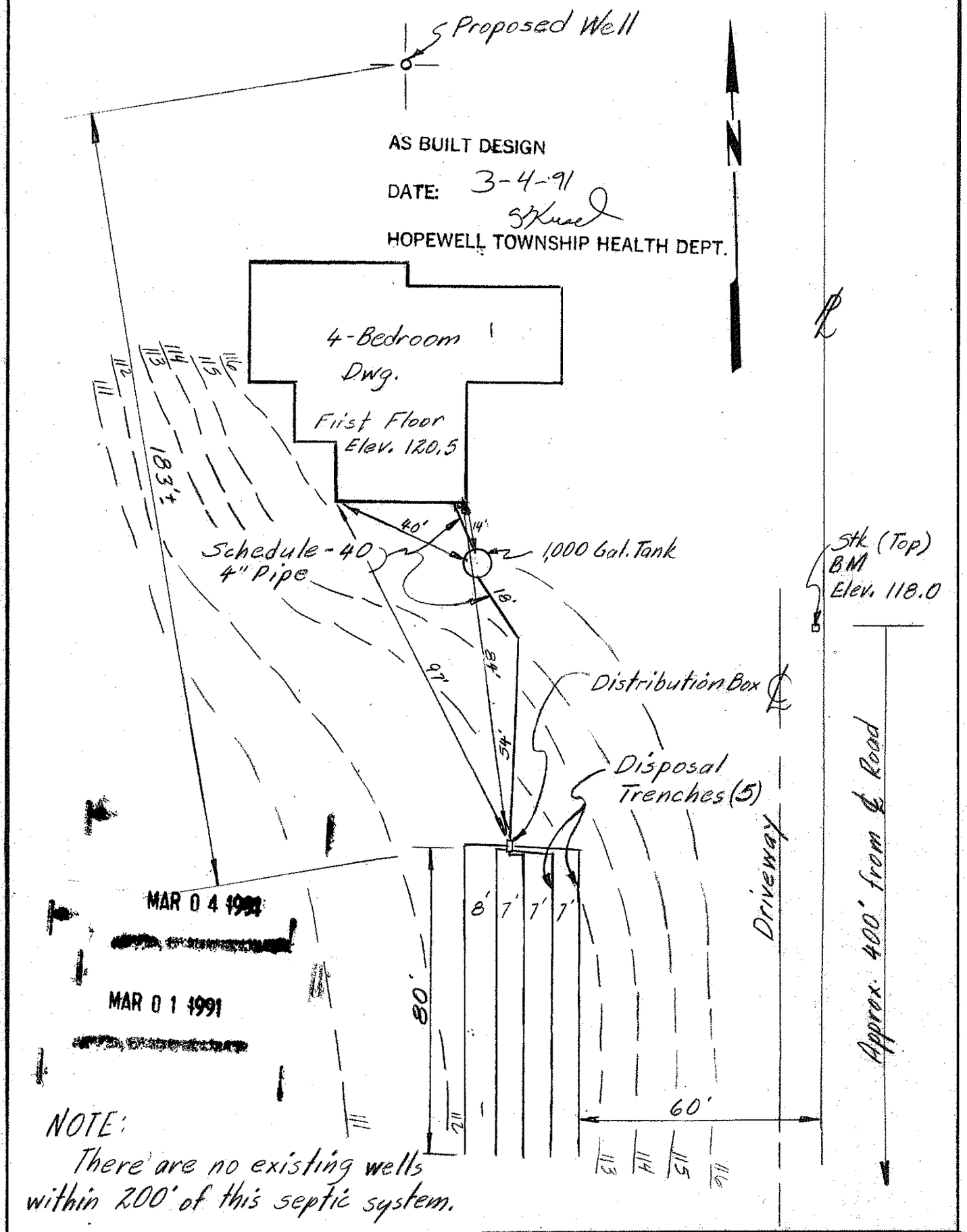


NOTE:
There are no existing wells within 200' of this septic system.

"AS BUILT"

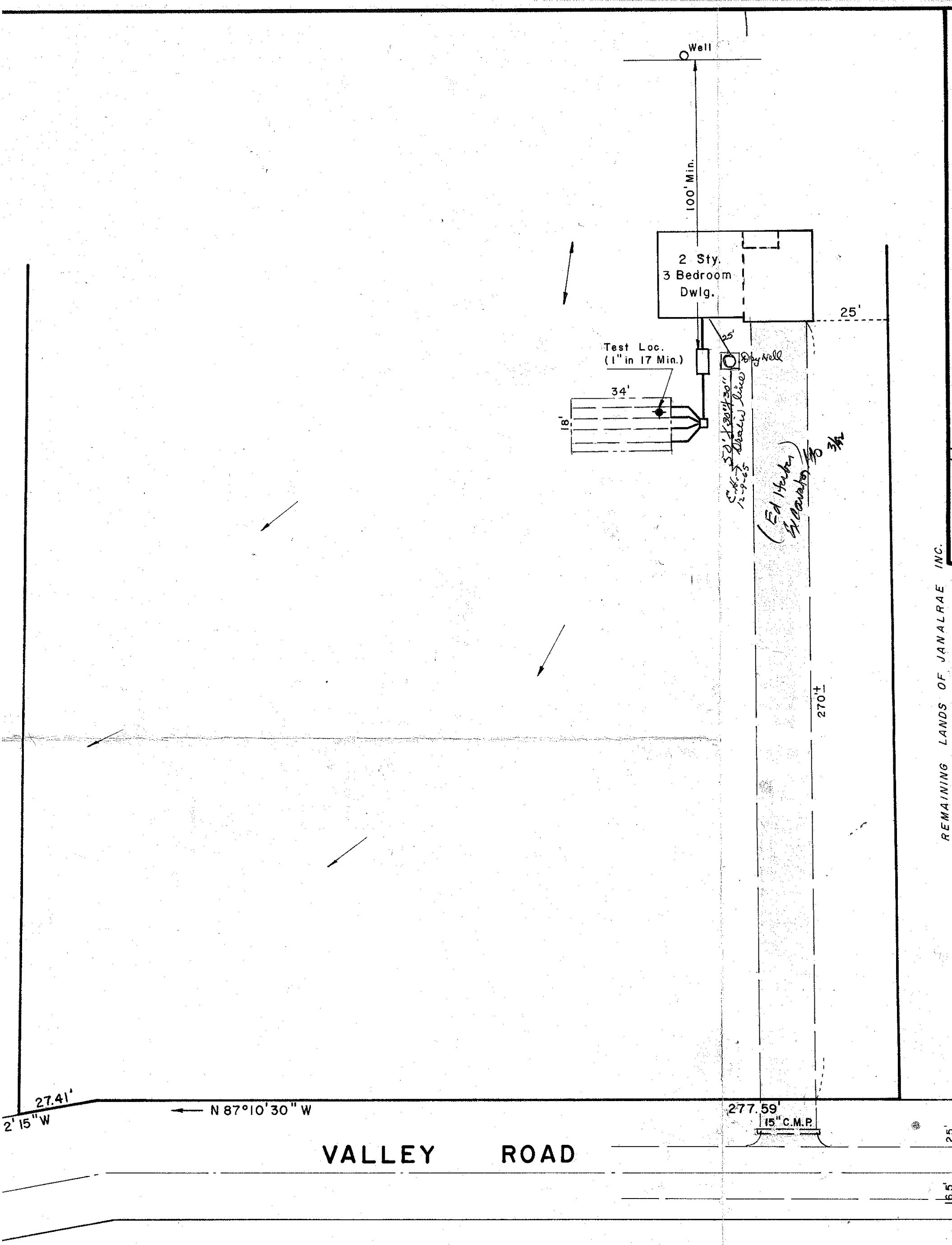
DURASTANTI

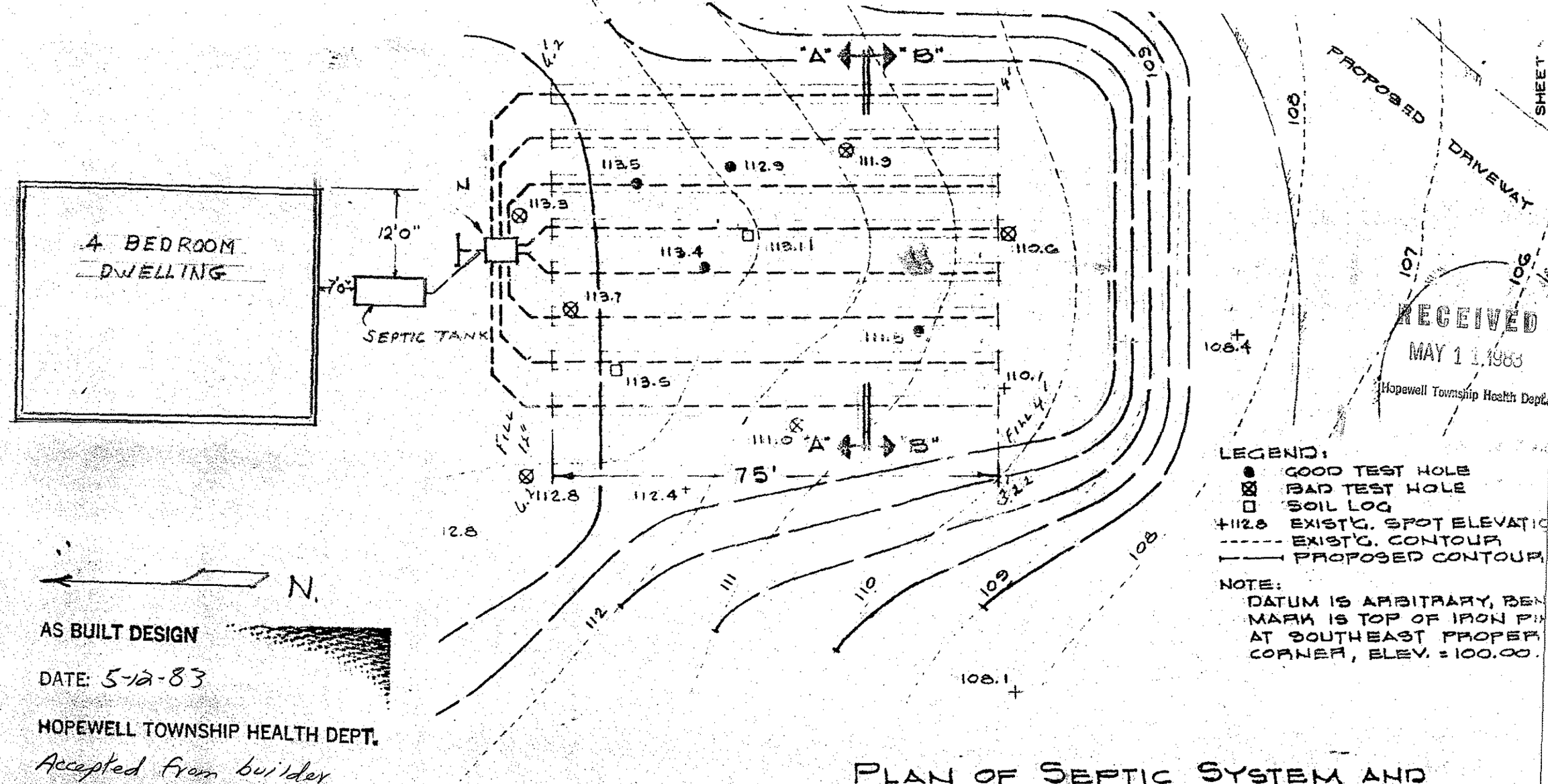
Hopewell Township - Mercer County
New Jersey

JOHN WALDNER, P.E. #15525
Licensed New Jersey Professional Engineer
John M. Waldner 3/3/91
61 Upper Ferry Rd., Trenton, N.J., 08628

SEPTIC SYSTEM DESIGN

Block No. 56 Lot No. 6
Date: Oct. 1988 Scale: 1" = 30'
Feb. 1991


Well
100' Min.
2 Sty.
3 Bedroom
Dwlg.
25'
Test Loc.
(1" in 17 Min.)
34'
18'
25'
Dry well
50' x 30" x 30"
Drain line
C.M.P.
12-9-65
(Ed Hartman
Excavator)
270'±
REMAINING LANDS OF JANALRAE INC.
27.41'
2' 15" W
N 87°10'30" W
277.59'
15" C.M.P.
25'
VALLEY ROAD
16.5'



AS BUILT DESIGN

DATE: 5-12-83

HOPEWELL TOWNSHIP HEALTH DEPT.

Accepted from builder due to untimely death of engineer.

H.O.

DAVID B. CHRISTIAN

NJ PE & LS NO 20131 6/8/81

DATE SIGNED

PLAN OF SEPTIC SYSTEM AND PROPOSED GRADING FOR SYSTEM.

DAVID B. CHRISTIAN & ASSOCIATES, INC.

ENGINEERS • SURVEYORS

241 WEST MAPLE AVENUE, LANGHORNE, PA. 19047

481 MANTOLOKING ROAD, BRICKTOWN, N.J. 08723

(215) 757 7802 (201) 899 1826

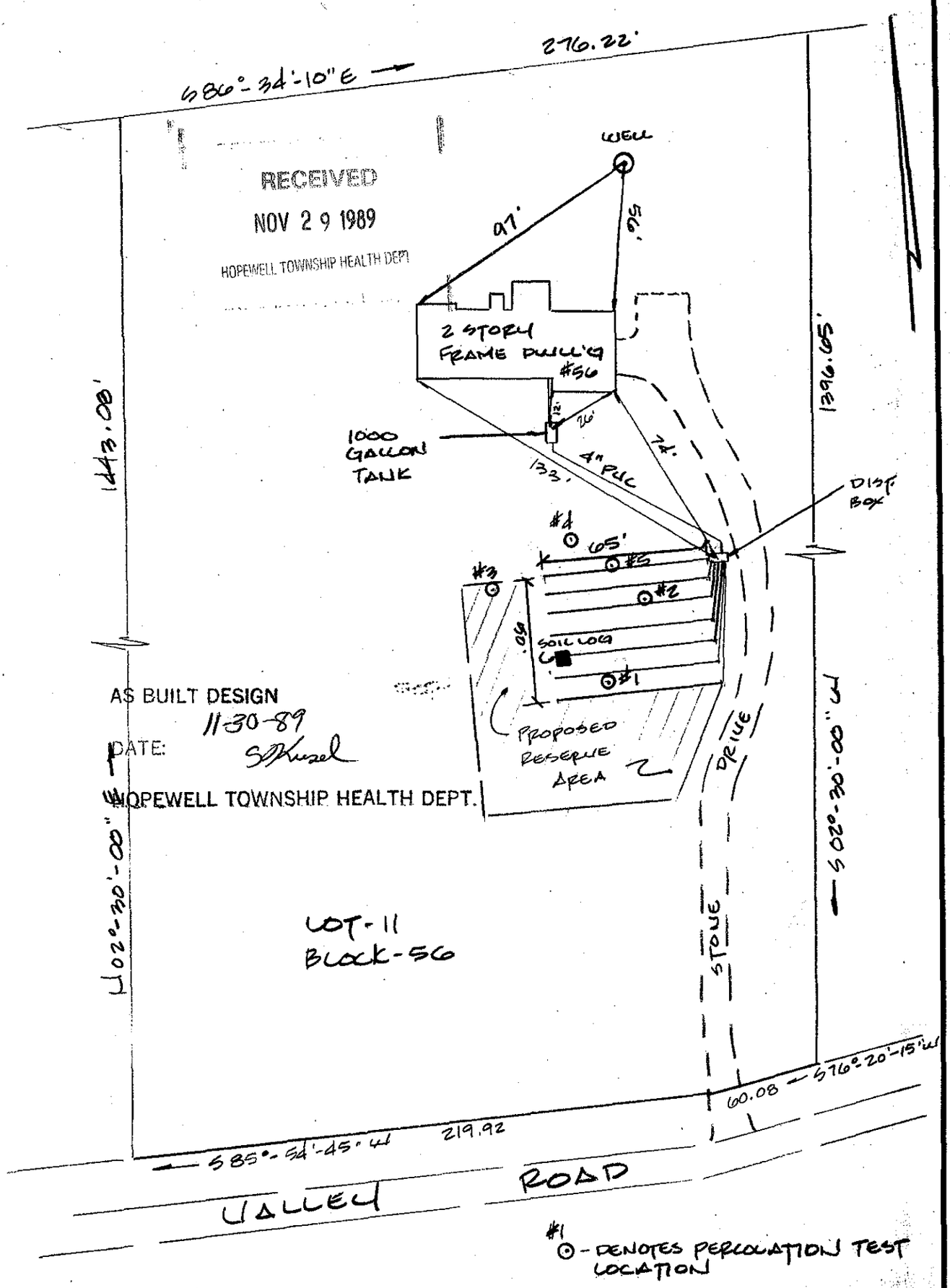
SCALE: 1" = 2

DATE: 5 JUN

DRAWN BY: J.E.

REF. NO.: A92

PLAN NO.: S-7



BRUCE M. RITTENHOUSE PROFESSIONAL ENGINEER & LAND SURVEYOR #13453	SHEET	BLOCK	LOT
	11	56	11

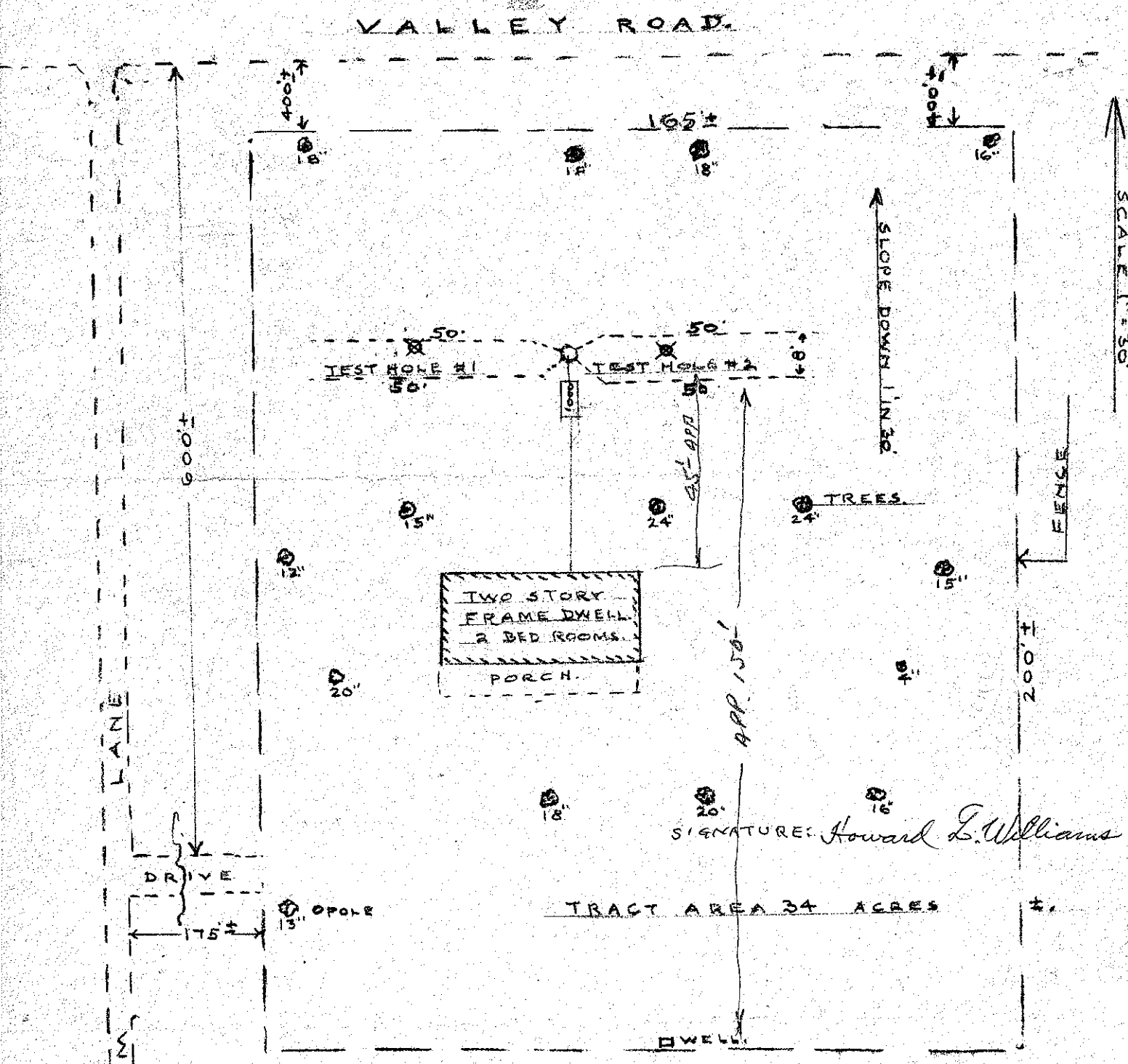
PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-11, BLOCK-56 FOR
SINJAK, INC.
HOPEWELL TWP. MERCER CO. - N.J.

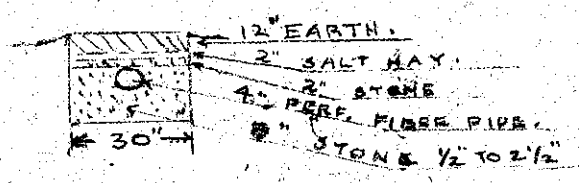
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
FRANK J. FALCONE	P.L.S.	NO. 32112

Bryce M. Rittenhouse 11/27/89
DATE

DRAWN	DATE	CERTIFIED AS CORRECT TO:
FJF	11/27/89	
CHECK	SCALE	
BR	1"=50'	
REV.		



TEST HOLE #1 AND #2
10"x28" - SOIL WET.
5" TOP SOIL - 23" BROKEN SHALE.
#1 PERCOLATION 1 IN. - 30 MIN
#2 " 1 IN. - 25 MIN.
AVERAGE PERCOLATION - 1 IN - 27½ MIN.



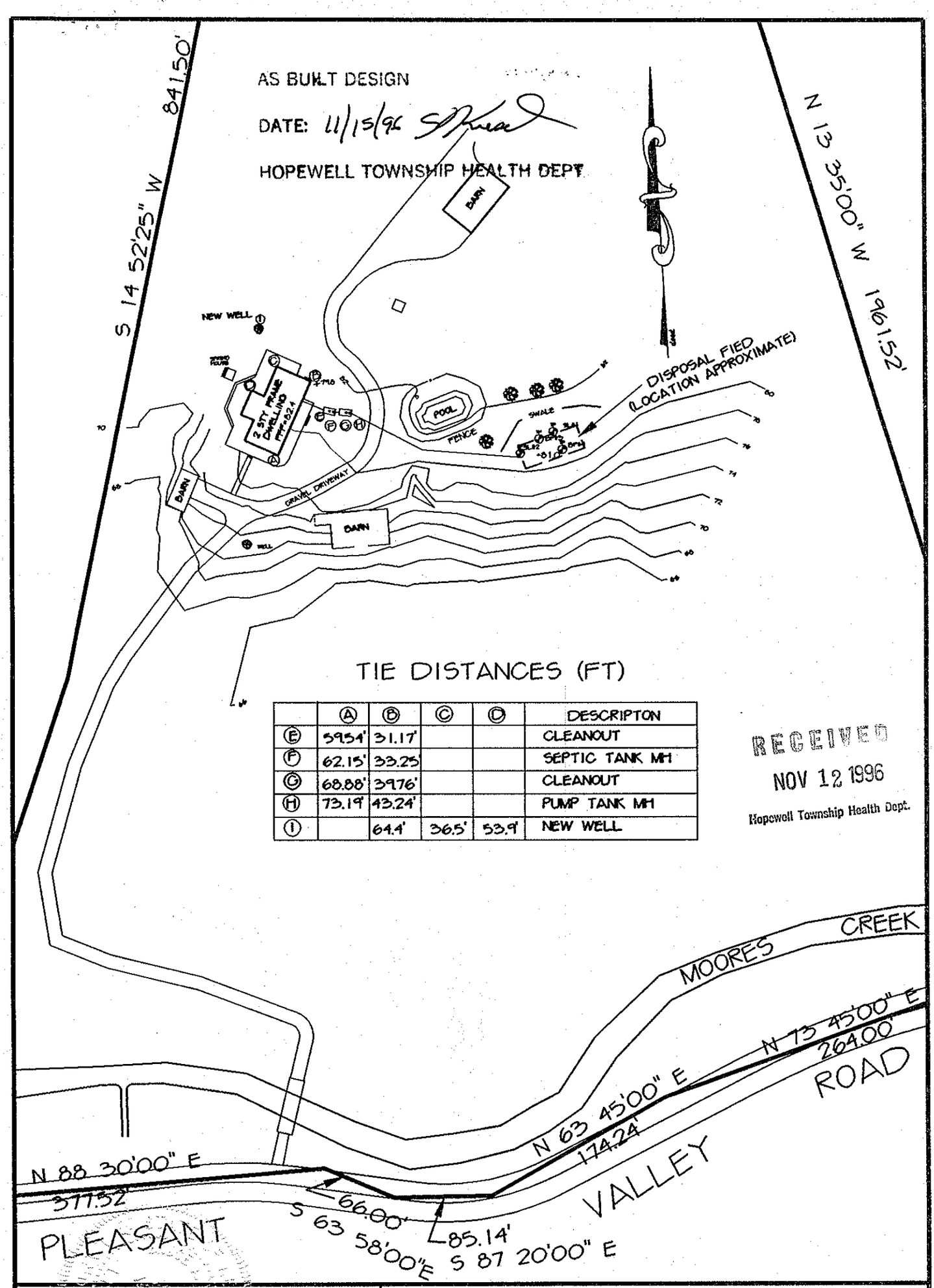
LINE SLOPE 4' PER 100'.

PERCOLATION TEST
AND SEPTIC SYSTEM FOR
MR. WM. A. PATTY
HOPEWELL TOWNSHIP
MERCER CO. - N.J
SECTION 39 - LOT # 4.
SCALE 1" = 30' OCT. 21, 1966.
BY HOWARD L. WILLIAMS
N.J. PROF. ENG. LIC. # 147.

AS BUILT DESIGN

DATE: 11/15/96

HOPEWELL TOWNSHIP HEALTH DEPT



TIE DISTANCES (FT)

	Ⓐ	Ⓑ	Ⓒ	Ⓓ	DESCRIPTON
Ⓔ	59.54'	31.17'			CLEANOUT
Ⓕ	62.15'	33.25'			SEPTIC TANK MH
Ⓖ	68.88'	39.76'			CLEANOUT
Ⓗ	73.19'	43.24'			PUMP TANK MH
Ⓘ		64.4'	36.5'	53.9'	NEW WELL

RECEIVED
NOV 12 1996
Hopewell Township Health Dept.

Bruce A. Kruegel 11/7/96

BRUCE A. KRUEGEL N.J.P.L.S. #19018
NEW JERSEY PROFESSIONAL LAND SURVEYOR

K. E. Baill

KENNETH E. BAILL P.E. 30111, P.P. 04122
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL PLANNER

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

SEPTIC SYSTEM AS-BUILT

PREPARED FOR

BLOCK 59, LOT 6

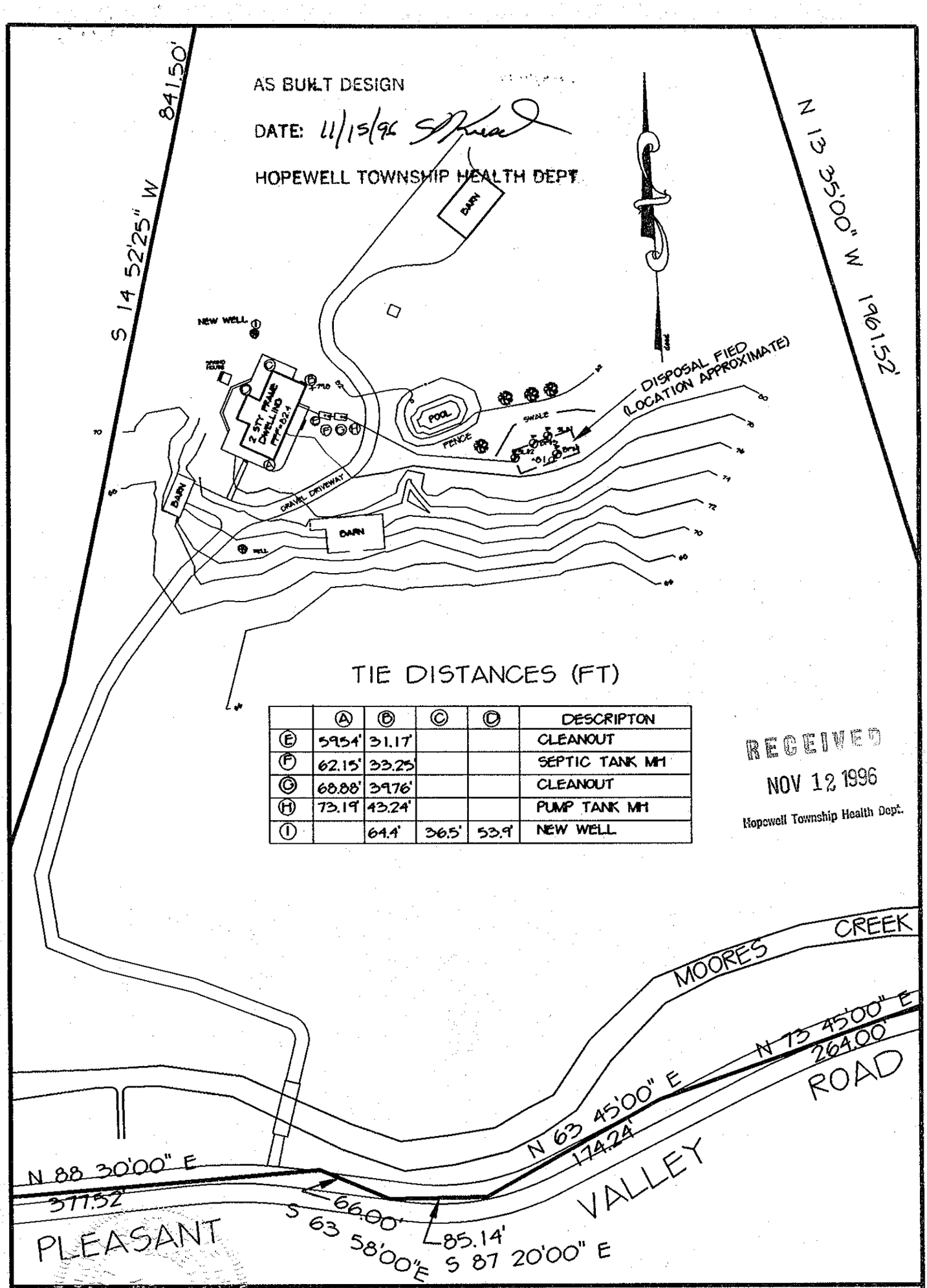
HOPWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: BK	CHECKED BY: TU	SCALE: 1=100'	DATE: 11/06/96	PROJ. NO. 91-125
FILE: H:\91-125\ASBUILT				

AS BUILT DESIGN

DATE: 11/15/96

HOPEWELL TOWNSHIP HEALTH DEPT



TIE DISTANCES (FT)

	Ⓐ	Ⓑ	Ⓒ	Ⓓ	DESCRIPTON
Ⓔ	59.54'	31.17'			CLEANOUT
Ⓕ	62.15'	33.25'			SEPTIC TANK MH
Ⓖ	68.88'	39.76'			CLEANOUT
Ⓗ	73.19'	43.24'			PUMP TANK MH
Ⓘ		64.4'	36.5'	53.9'	NEW WELL

RECEIVED
NOV 12 1996
Hopewell Township Health Dept.

11/7/96

BRUCE A. KRUEGEL N.J.P.L.S. #19018
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TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

SEPTIC SYSTEM AS-BUILT

PREPARED FOR

BLOCK 59, LOT 6

HOPWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: BK	CHECKED BY: TU	SCALE: 1=100'	DATE: 11/06/96	PROJ. NO: 91-125
FILE: H:\91-125\ASBUILT				

TEST DATA.

HOLE 9" X 24"

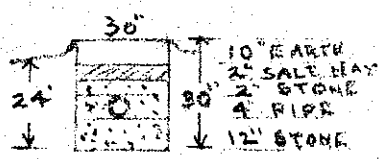
SOIL DAMP

4" TOP SOIL - 12" CLAY-LOAM

8" BROKEN SHALE

PERCOLATION RATE

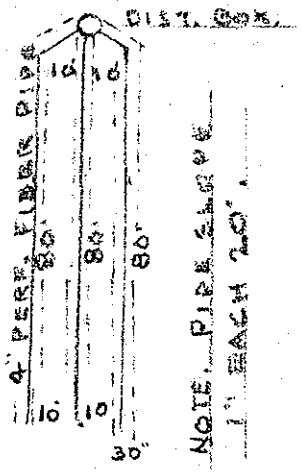
1 INCH IN 30 MIN.



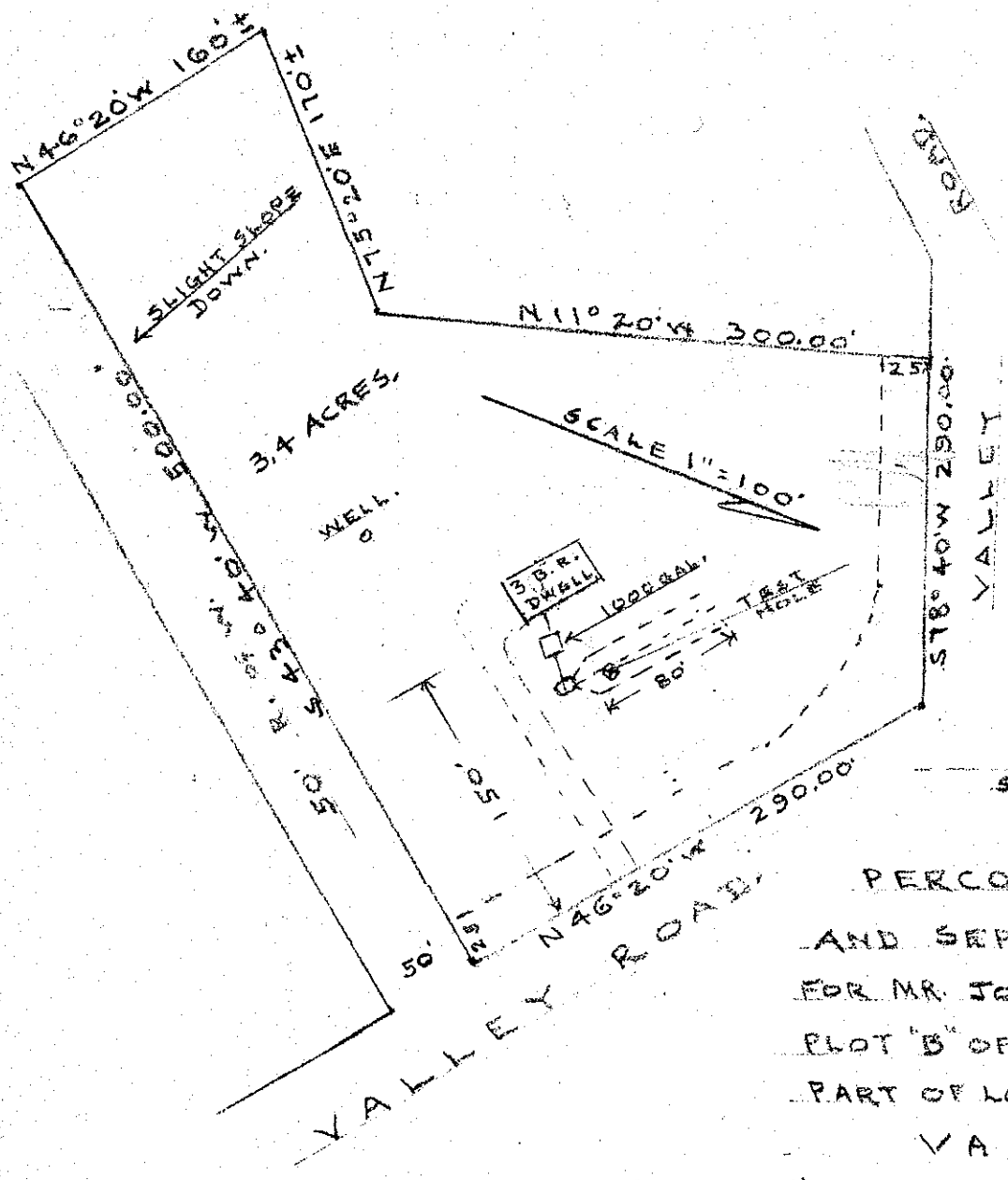
TRENCH DETAIL.
NO SCALE.

BOTTOM AREA 600 SQ. FT.

THE RIGHT IS RESERVED TO CHANGE IF EXCAVATION WARRANTS CHANGE.



TRENCH DETAIL
1" = 40'



SIGNATURE.

PERCOLATION TEST

AND SEPTIC SYSTEM

FOR MR. JOHN SIMSON - ET. UX.

PLOT "B" OF MINOR SUB-DIV.

PART OF LOT 47 - SEC. 59 - SHEET 11

VALLEY ROAD

HOPEWELL TWP. - MERCER CO. - N.J.

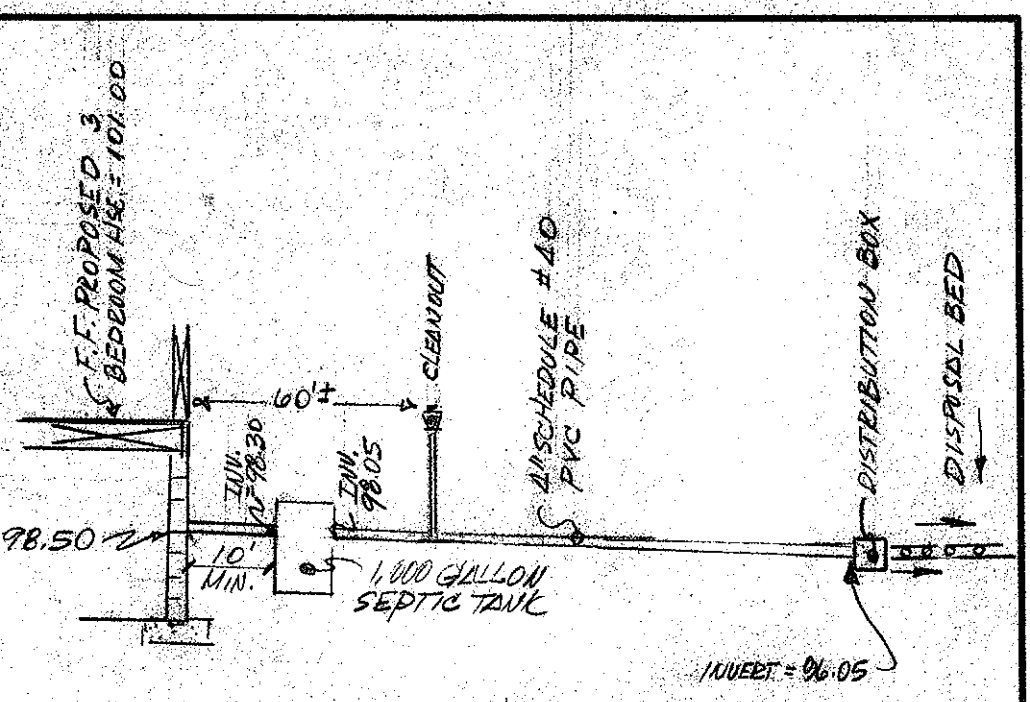
SCALE 1" = 100' SEPT. 15, 1967.

BY HOWARD L. WILLIAMS

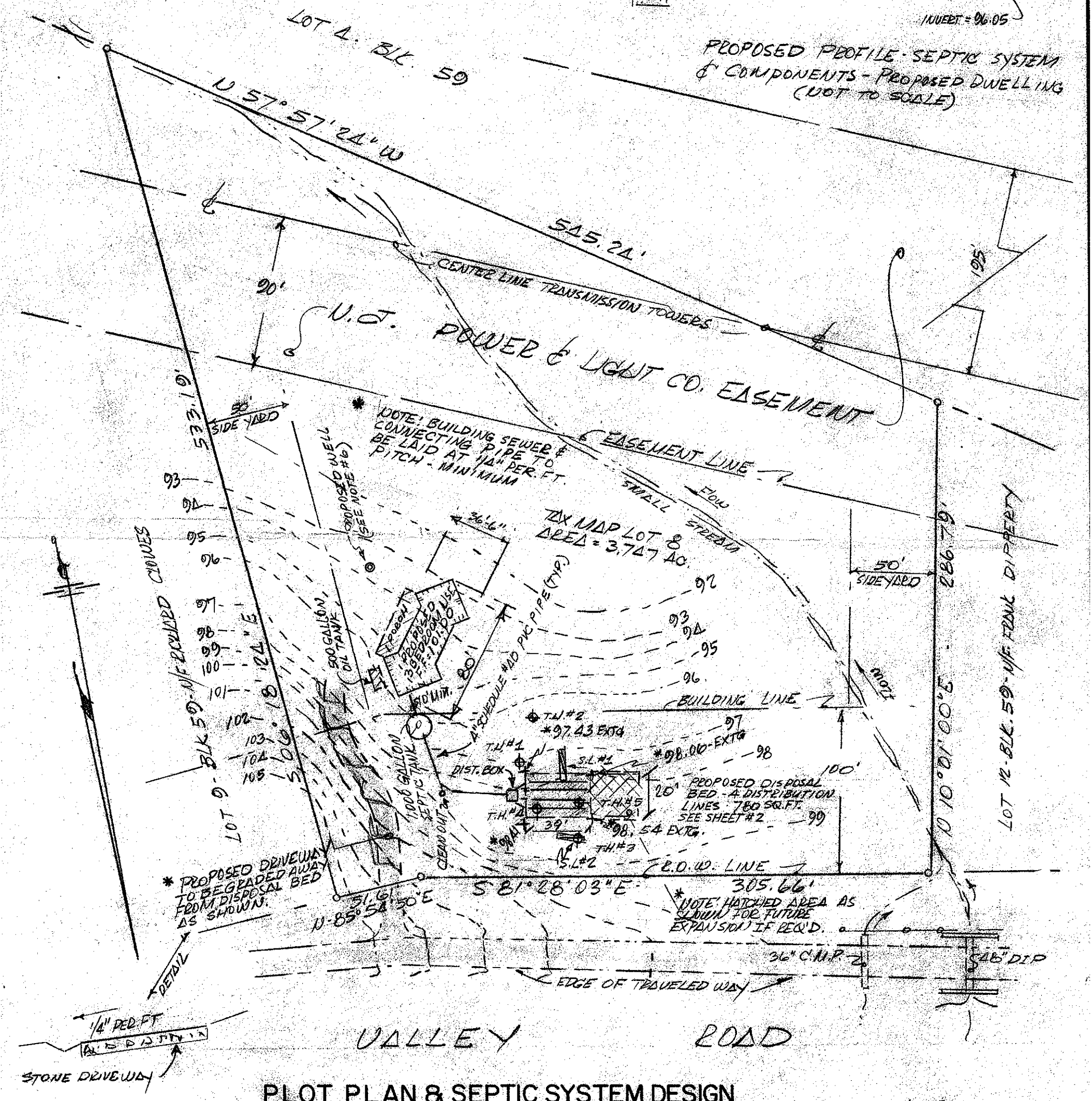
N.J. PROF. ENG. LIC. # 147.

SOIL LOG RESULTS: DATED 4-23-82 - WITNESSED BY MR. GARY GUARINO - HOPEWELL TOWNSHIP HEALTH INSPECTOR. SOIL LOG #1 - 0"-4" TOP SOIL - 4"-34" DENSE LOAM & SHALE - 34"-48" DENSE LAYER OF CLAY - 48"-74" HEAVY LAYER OF CLAY LOAM 74"-124" CLAY LOAM & SHALE FRAGMENTS - TOTAL DEPTH - 10'-4" - SEEPAGE AT 97" & 124"
SOIL LOG #2 - 0"-4" TOP SOIL - 4"-25" DENSE LOAM & SHALE 25"-33" DENSE LAYER OF CLAY - 33"-55" HEAVY LAYER OF CLAY LOAM - 55"-136" CLAY LOAM & SHALE FRAGMENTS TOTAL DEPTH - 11'-4" SEEPAGE AT 82"
PERCOLATION TEST RESULTS
TEST HOLE # 4 - DEPTH TO BOTTOM OF HOLE - 27" RATE 3 MIN/IN.
TEST HOLE # 5 - DEPTH TO BOTTOM OF HOLE - 30" RATE 0.83 MIN/IN.

NOTE: BOUNDARY LINES AS SHOWN HEREON BY DAVID GOLDENBAUM, INC.



PROPOSED PROFILE - SEPTIC SYSTEM & COMPONENTS - PROPOSED DWELLING (NOT TO SCALE)



PLOT PLAN & SEPTIC SYSTEM DESIGN

FOR

PAUL TOCCO

LOT 8 - BLOCK 59 - HOPEWELL TWP., MERCER CO., N.J.

JULY - 1986

SCALE - 1" = 60'

REVISED: 8-28-86 AS PER TWP. CORRESPONDENCE OF 8-26-86.
REVISED - 9-8-86

LEGEND

- DENOTES PERCOLATION TEST
- DENOTES SOIL LOG
- 100 - - - DENOTES EXISTING CONTOUR
- 100 —— DENOTES FINAL CONTOUR
- + DENOTES EXTG SPOT ELEV.

SPECIAL NOTE*
A PERMANENT B.M. WILL BE SET WHEN PROPOSED DWELLING IS

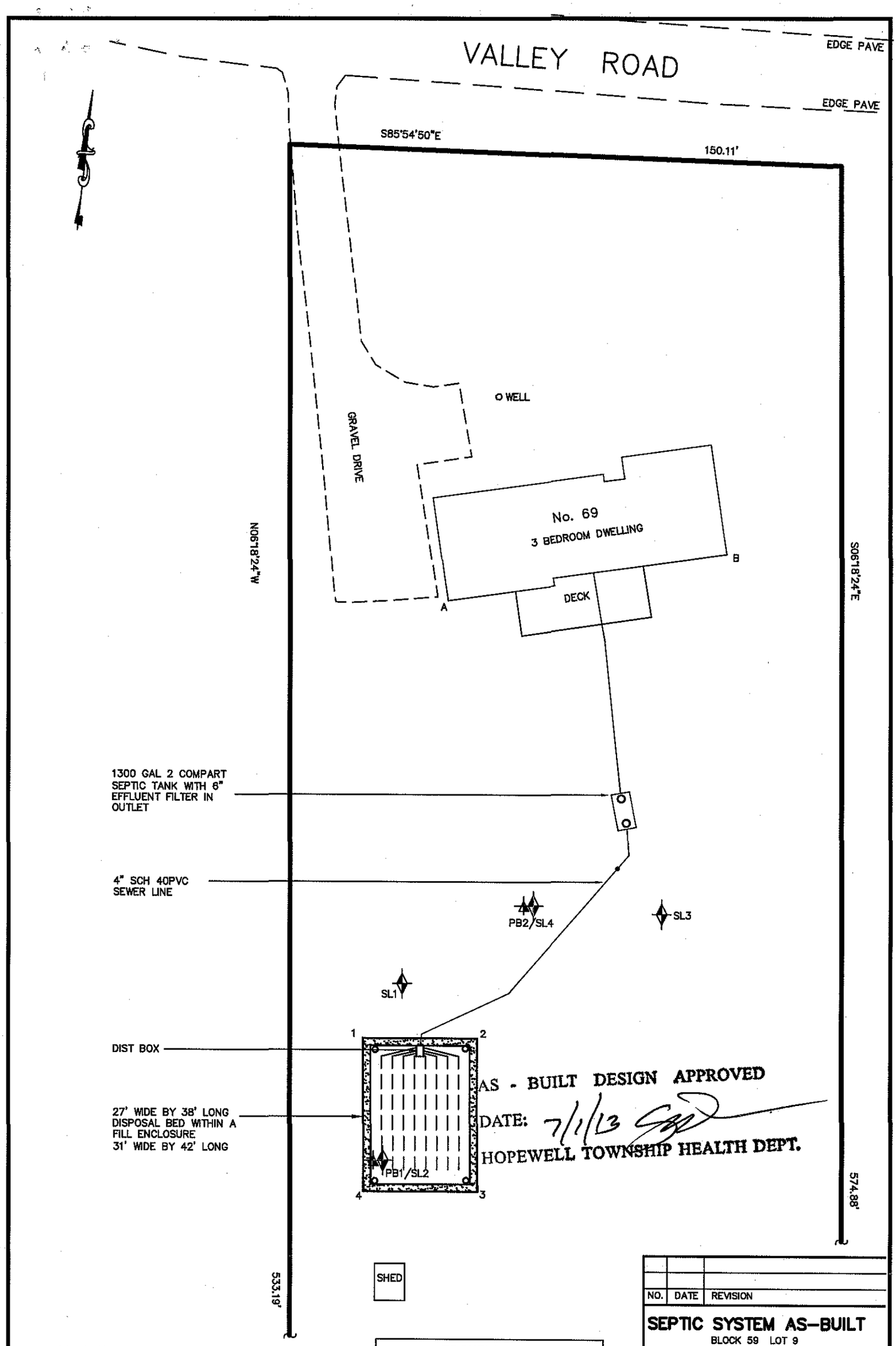
M.W. HEINRICI, L.M. TAYLOR
SURVEYORS, ENGINEERS, PLANNERS
122-124 MAIN STREET, FLEMINGTON, NEW JERSEY 08822

DESIGN

DATE: 9-13-86

APPROVED

HOPEWELL TOWNSHIP HEALTH DEPT.



LEGEND

- SOIL LOG
- CLEANOUT
- INSPECTION PORT
- PIT BAIL TEST

TIE DISTANCES

	HOUSE CORNER A	HOUSE CORNER B
SEPTIC TANK	74.5	76.0
BED CORNER 1	122.0	166.2
BED CORNER 2	120.0	149.0
BED CORNER 3	162.5	187.5
BED CORNER 4	163.5	201.0

NO.	DATE	REVISION

SEPTIC SYSTEM AS-BUILT

BLOCK 59 LOT 9
TOWNSHIP OF HOPEWELL
MERCER COUNTY, NEW JERSEY

Erica Busch
ERICA L. BUSCH
NEW JERSEY PROFESSIONAL ENGINEER LIC. NO. 32145
PO BOX 486, HAMPTON, NEW JERSEY 08827
(908) 202-4477

DATE	SCALE	SHEET
6/17/13	AS SHOWN	1 OF 1

Permit #2012082 file copy

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 59 **Lot** 9

Form 1

Location of Project 69 Valley Road Lambertville NJ 08530
(street / development)

Applicant Ruth Clowes Telephone (day) 609-737-0050

Current Mailing Address 69 Valley Road
Lambertville NJ 08530

Type of Permit (Check ALL applicable categories):

___ New Construction ___ Alteration / No Expansion or Change in Use

___ Deviation from Standards ___ Alteration / Expansion or Change in Use

___ Alteration / Real Estate Transaction X Alteration / Malfunctioning System

Type of Facility:

X Residential – Number of Bedrooms 3 Expansion Attic: ___ Yes X No

___ Commercial / Institutional – Specify Type of Establishment ___

Type of Wastes to be Discharged:

X Sanitary Sewage ___ Industrial Waste ___ Other (specify) ___

Other Approvals / Certifications / Waivers / Exemptions (Attach to Application):

___ U.S. Army Corps of Engineers ___ N.J.D.E.P. – Bureau of Flood Plain Management

___ N.J.D.E.P. – Bureau of Inland Regulation

___ N.J. D.E.P. – Bureau of Nonpoint Pollution Control

Engineer Erica Busch Telephone: 908 202 4477

Address PO Box 486 Hampton NJ 08827

I hereby certify that the information furnished on Form 1 of this application is true. I am aware that false swearing is a crime in this State and subject to prosecution.

Richard B. Clowes 6-7-12
Applicant's Signature Date

___ Application Denied – Reason for Denial / Citation of Rules Violated: ___

X Application Approved ___ Application Approved Subject to Approval by N.J.D.E.P.

Name and Title of Authorized Agent ___

Date of Action 6/21/12 Signature of Authorized Agent ___

HOPEWELL TOWNSHIP
JUN 19 2012
ADMINISTRATION

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 2a – General Site Evaluation Data Evaluation Date 5/22/12

1. Name of Site Evaluator (print): E. Busch
   Address of Site Evaluator: PO Box 486 Hampton NJ 08827
   Telephone Number: 908 202 4477
2. Special Site Limitations Identified (Check ALL applicable categories):
   ___ Flood Plains ___ Bedrock Outcrops ___ Disturbed Ground ___ Steep Slopes
   ___ Wetlands ___ Excessively Stony ___ Sink Holes ___ Sand Dunes
   ___ Other (specify) _____
3. Soil Logs – Enter on form 2b – **Use one form for each soil log**
4. Considerations Relating to Disturbed Ground:
   Type of Disturbance:
   ___ Filled Area ___ Excavated Area ___ Re-graded Area ___ Subsurface Drains
   ___ Other (specify) _____
   Pre-existing Natural Ground Surface:
   Elevation Relative to Existing Ground Surface _____
   Method of Identification _____
   Suitability of Disturbed Ground:
   ___ Unsuitable: Objects subject to disintegration or change in volume
   ___ Excessively Coarse
   ___ Proctor Test Performed - % Standard Proctor Density _____
5. Hydraulic Head Test:
   Hydraulically restrictive horizon depth top to bottom _____
   Piezometer A depth to bottom _____ Depth of water level (24 hrs.) _____
   Piezometer B depth to bottom _____ Depth of water level (24 hrs.) _____
   Witnessed by _____ Signature _____ Date _____
6. Attachments (Check items included):
   X Site Plan
   X Key map showing location of site on a U.S.G.S. quadrangle or other accurate map
   X Key map showing location of site on a U.S.D.A. soil survey map
   X Other (specify) Survey

I hereby certify that the information furnished on Form 2a of this application (and the attachments thereto) is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator Eric Busch Date 5/31/12

Signature and Seal of Professional Engineer Eric Busch

License # 32145 Date 5/31/12

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 2b – Soil Log and Interpretation

1. Soil Log # 1 Date of Soil Log 5/22/12 Method: ☒ Profile Pit ☐ Boring
2. Log:

Depth (inches)	Munsell Color Name and Symbol; Estimated Textural Class; Estimated Volume % Coarse Fragments; Structure; Consistence; Mottling Abundance, Size and Contrast

Soil Log 1 (5/22/12)

0-12" Topsoil
12-74" Brown (7.5YR4/3) friable weak angular blocky clay loam with 10-15% gravel. Tight in place.
74-132" Dark gray (2.5YRN4) and brown (7.5YR4/3) friable subangular blocky clay loam with 25% gravel becoming looser with depth

Mottles 12-32" Many prominent coarse (perched)
74-132" Few fine faint (regional)
Seepage 100" slow
Pooled at 124" after 2 hours

3. Ground Water Observations:
   - X Seepage observed – Depth (inches) 100"
   - X Pit flooded – Depth (inches) 124" after 2 hours of observation
4. Soil Limiting Zones (check ALL applicable categories):
   - X Fractured Rock Substratum – Depth to Top 74"
   - ___ Massive Rock Substratum – Depth to Top ___
   - ___ Excessively Coarse Horizon – Depth Top to Bottom ___
   - ___ Excessively Coarse Substratum – Depth to Top ___
   - X Hydraulically Restrictive Horizon – Depth Top to Bottom 12-74"
   - ___ Hydraulically Restrictive Substratum – Depth to Top ___
   - X Perched Zone of Saturation – Depth Top to Bottom 12-32"
   - X Regional Zone of Saturation – Depth to Top 74
5. Soil Suitability Classification III Wp Hr
6. I hereby certify that the information furnished on form 2b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator Eric Busch Date 5/31/12
Signature and Seal of Professional Engineer Eric Busch
License # 32145 Date 5/31/12

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 2b – Soil Log and Interpretation

1. Soil Log # 2 Date of Soil Log 5/22/12 Method: ☒ Profile Pit ☐ Boring
2. Log:

Depth (inches)	Munsell Color Name and Symbol; Estimated Textural Class; Estimated Volume % Coarse Fragments; Structure; Consistence; Mottling Abundance, Size and Contrast

Soil Log 2 (5/22/12)

0-12" Topsoil
12-44" Brown (7.5YR4/3) friable weak angular blocky clay loam with 10% gravel.
44-121" Strong brown (7.5YR4/6) fractured shale 50-60% with clay loam fines

Mottles 41" Few fine faint (regional)
Seepage 60" slow
Pooled at 61" after 24 hours

3. Ground Water Observations:
   X Seepage observed – Depth (inches) 60"
   X Pit flooded – Depth (inches) 61" after 24 hours of observation
4. Soil Limiting Zones (check ALL applicable categories):
   ___ Fractured Rock Substratum – Depth to Top ___
   ___ Massive Rock Substratum – Depth to Top ___
   ___ Excessively Coarse Horizon – Depth Top to Bottom ___
   ___ Excessively Coarse Substratum – Depth to Top ___
   ___ Hydraulically Restrictive Horizon – Depth Top to Bottom ___
   ___ Hydraulically Restrictive Substratum – Depth to Top ___
   ___ Perched Zone of Saturation – Depth Top to Bottom ___
   X Regional Zone of Saturation – Depth to Top 41"
5. Soil Suitability Classification II Wr
6. I hereby certify that the information furnished on form 2b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator Eric Brach Date 5/31/12
Signature and Seal of Professional Engineer Eric Brach
License # 32145 Date 5/31/12

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 2b – Soil Log and Interpretation

1. Soil Log # 3 Date of Soil Log 5/22/12 Method: ☒ Profile Pit ☐ Boring
2. Log:

Depth (inches)	Munsell Color Name and Symbol; Estimated Textural Class; Estimated Volume % Coarse Fragments; Structure; Consistence; Mottling Abundance, Size and Contrast

Soil Log 3 (5/22/12)

0-12" Topsoil
12-36" Brown (7.5YR4/3) friable weak angular blocky clay loam with 10% gravel.
36-120" Dark gray (2.5YRN4) and brown (10YR5/3) friable subangular blocky clay loam with 30-40% gravel and cobbles shale and grit

Mottles 48" Many prominent medium (regional)
Seepage 48-120" slow in pockets
Pooled at 112" after 2 hours

3. Ground Water Observations:
   - X Seepage observed – Depth (inches) 48
   - X Pit flooded – Depth (inches) 112 after 2 hours of observation
4. Soil Limiting Zones (check ALL applicable categories):
   - ___ Fractured Rock Substratum – Depth to Top ___
   - ___ Massive Rock Substratum – Depth to Top ___
   - ___ Excessively Coarse Horizon – Depth Top to Bottom ___
   - ___ Excessively Coarse Substratum – Depth to Top ___
   - ___ Hydraulically Restrictive Horizon – Depth Top to Bottom ___
   - ___ Hydraulically Restrictive Substratum – Depth to Top ___
   - ___ Perched Zone of Saturation – Depth Top to Bottom ___
   - X Regional Zone of Saturation – Depth to Top 48"
5. Soil Suitability Classification IIWr
6. I hereby certify that the information furnished on form 2b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator Eric Bush Date 5/31/12
Signature and Seal of Professional Engineer Eric Bush
License # 32145 Date 5/31/12

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 2b – Soil Log and Interpretation

1. Soil Log # 4 Date of Soil Log 5/22/12 Method: ☒ Profile Pit ☐ Boring
2. Log:

Depth (inches)	Munsell Color Name and Symbol; Estimated Textural Class; Estimated Volume % Coarse Fragments; Structure; Consistence; Mottling Abundance, Size and Contrast

Soil Log 4 (5/22/12)

0-12" Topsoil
12-37" Brown (7.5YR4/3) friable weak angular blocky clay loam with 10% gravel.
37-112" Dark brown (7.5YR4/3) loose granular coarse gravelly loam with pockets of dark gray clay loam with pockets of dark gray clay loam

Mottles 36-112" Many prominent coarse (regional)
Seepage 56-112" moderate
Pooled at 61" after 24 hours

3. Ground Water Observations:
   X Seepage observed – Depth (inches) 56
   X Pit flooded – Depth (inches) 61 after 24 hours of observation
4. Soil Limiting Zones (check ALL applicable categories):
   ___ Fractured Rock Substratum – Depth to Top ___
   ___ Massive Rock Substratum – Depth to Top ___
   ___ Excessively Coarse Horizon – Depth Top to Bottom ___
   ___ Excessively Coarse Substratum – Depth to Top ___
   ___ Hydraulically Restrictive Horizon – Depth Top to Bottom ___
   ___ Hydraulically Restrictive Substratum – Depth to Top ___
   ___ Perched Zone of Saturation – Depth Top to Bottom ___
   X Regional Zone of Saturation – Depth to Top 36"
5. Soil Suitability Classification IIWr
6. I hereby certify that the information furnished on form 2b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator Eric Busch Date 5/31/12
Signature and Seal of Professional Engineer Eric Busch
License # 32145 Date 5/31/12

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 3a – Soil Permeability Data
Assign a number for each test and a letter for each test replicate. Show test data and calculations on Form 3b, 3c, 3d, 3e, 3f, or 3g. Use one sheet for each separate test or test replicate.

1. Data Summary – Use one line for each test replicate

Type of Test	Test #	Replicate (letter)	Depth (inches)	Result*
Pitbail	1A	–	104"	0.4
	2A	-	85"	1.0

*For tube permeameter, pit-bailing and piezometer tests, report results in inches per hour. For soil permeability class rating give soil permeability class number. For percolation test, report result in minutes per inch. For basin flooding test, report result as positive if basin drains completely within 24 hours after second filling, negative otherwise.

2. Design Permeability / Percolation Rate:
   X Select Fill 6-20 in / hr or _____ min / in
   ___Test # _____
   ___ Average of Test Replicates ___ Single Replicate ___ Slowest of Replicates
3. Type of limiting zone identified during permeability testing:
   ___ None ___ Specify Type _____ Test Number _____
   ___ Specify Type _____ Test Number _____
4. Attachments:
   ___ Form 3b – Tube Permeameter Test Data – Number of Sheets _____
   ___ Form 3c – Soil Permeability Class Rating Test Data – Number of Sheets _____
   ___ Form 3d – Percolation Test Data – Number of Sheets _____
   X Form 3e – Pit-Bailing Test Data – Number of Sheets 4
   ___ Form 3f – Piezometer Test Data – Number of Sheets _____
   ___ Form 3g – Basin Flooding Test Data – Number of Sheets _____
5. I hereby certify that the information furnished on Form 3a of this application (and the attachments thereto) is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A.58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator Eric Busch Date 5/31/12
Signature and Seal of Professional Engineer Eric Busch
License # 32145 Date 5/31/12

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 3f – Pit-Bailing Test Data (2 pages)

1. Test # 1A Reference Soil Log 2 Date Tested 5/22/12
2. Using the reference level established, measure and record the following:
   Depth to bottom of pit (ft), D_{pit} 8.67
   Depth to water level after 2 hr. stabilization period (ft), D_{water} 7.5
   Depth to impermeable stratum (ft), $D_{stratum}$ 10.08 (If depth is unknown assume it to be 1.5 times the depth of the pit.)
   Height of water level above impermeable stratum (ft), $H = D_{stratum} - D_{water}$ = 2.58
   Length of time interval (minutes), T 30
3. At the interval chosen, record the following data in the table below:
   Time of measurement (minutes), t_n
   Depth of water level below reference level (inches), d_n
   Water surface dimensions (feet), l,w
4. Calculate the following values and enter in the table below:
   Water surface area (ft²), A_n
   Water level rise, h_{rise} (Subtract current value of d_n from previous value)
   Average water surface area (ft²), A_{av} (Take average of A_n and previous A_n)
   Average height of water level above impermeable stratum (feet), h (Take average of d_n and previous value of d_n, convert to feet, and subtract from $D_{stratum}$)
   Calculate permeability (in / hr), $K_a = [\, h_{rise} / T \,] \times [\, A_{av} / 2.27\,(H^2 - h^2)\,] \times 60$ min / hr

t_n	d_n (in)	l,w (ft)	A_n (ft²)	h_{rise} (in)	A_{av} (ft²)	h (ft)	K_a
t0 12:00	102	0.5, 0.5	0.3	—	—	—	—
t1 12:30	97.5	2.0, 2.5	5.0	4.5	2.6	1.8	2.9
t2 1:00	94	3.17, 2.5	7.9	3.5	6.5	2.1	8.9
t3 1:30	91	3.5, 2.5	8.8	3.0	8.3	2.4	21.4
t4 2:00	90	3.67, 2.5	9.2	1.0	9.0	2.5	37.0
t0				—	—	—	—
t1							
t2							
t3							
t4							
t0				—	—	—	—
t1							
t2							
t3							
t4							—

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 3f – Pit-Bailing Test Data (2 pages) - Continued

5. Record the following data:

   Final depth of pit (ft), D_{pit} 8.67

   Depth to impermeable stratum (ft), $D_{stratum}$ 10.08 (If no impermeable stratum is encountered assume $D_{stratum} = D_{pit}$)

   Height of standpipe above reference level (ft) h_{pipe} _____

   Depth to water level after 24 hour stabilization period (ft), D_{water} 5.08 (Take measurement from top of standpipe. Subtract h_{pipe})

   Height of static water level above impermeable stratum (ft), H 5.0 ($H = D_{stratum} - D_{water}$)

   Average height of water level above impermeable stratum (ft), h 2.5 (Take average of d_n from beginning and end of last time interval recorded in section 4, convert this to feet, subtract from $d_{stratum}$)

6. Re-calculation of K using data from section 5 above and from final time interval of section 4:

   $K = [\, h_{rise} / t \,] \times [\, A_{av} / 2.27\, (H^2 - h^2) \,] \times 60$ min / hr

   $= [\, 1.0 / 30 \,] \times [\, 9.2 / 2.27\, (5^2 - 2.5^2) \,] \times 60$ min / hr = 0.4

7. I hereby certify that the information furnished on Form 3f of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator Eric Bush Date 5/31/12

Signature and Seal of Professional Engineer Eric Bush

License # 32145 Date 5/31/12

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 3f – Pit-Bailing Test Data (2 pages)

1. Test # 2A Reference Soil Log 4 Date Tested 5/22/12
2. Using the reference level established, measure and record the following:
   Depth to bottom of pit (ft), D_{pit} 7.08
   Depth to water level after 2 hr. stabilization period (ft), D_{water} 5.58
   Depth to impermeable stratum (ft), $D_{stratum}$ 9.33 (If depth is unknown assume it to be 1.5 times the depth of the pit.)
   Height of water level above impermeable stratum (ft), $H = D_{stratum} - D_{water}$ = 3.75
   Length of time interval (minutes), T 10, 30, 40
3. At the interval chosen, record the following data in the table below:
   Time of measurement (minutes), t_n
   Depth of water level below reference level (inches), d_n
   Water surface dimensions (feet), l,w
4. Calculate the following values and enter in the table below:
   Water surface area (ft²), A_n
   Water level rise, h_{rise} (Subtract current value of d_n from previous value)
   Average water surface area (ft²), A_{av} (Take average of A_n and previous A_n)
   Average height of water level above impermeable stratum (feet), h (Take average of d_n and previous value of d_n, convert to feet, and subtract from $D_{stratum}$)
   Calculate permeability (in / hr), $K_a = [\, h_{rise} / T \,] \times [\, A_{av} / 2.27\,(H^2 - h^2)\,] \times 60$ min / hr

t_n	d_n (in)	l,w (ft)	A_n (ft²)	h_{rise} (in)	A_{av} (ft²)	h (ft)	K_a
t0 2:20	80	3.0, 2.5	7.5	—	—	—	—
t1 2:30	78	3.17, 2.5	7.9	2.0	7.7	2.7	6.3
t2 2:40	77	3.33, 2.5	8.3	1.0	8.1	2.9	3.7
t3 3:10	73	4.0, 2.5	10.0	4.0	9.2	3.1	7.1
t4 3:40	70	4.3, 2.5	10.8	3.0	10.4	3.4	10.2
4:20	67	4.58, 2.5	11.5	3.0	11.1	3.6	23.3
t0				—	—	—	—
t1							
t2							
t3							
t4							
t0				—	—	—	—
t1							
t2							
t3							
t4							—

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 3f – Pit-Bailing Test Data (2 pages) - Continued

5. Record the following data:

   Final depth of pit (ft), D_{pit} 7.08

   Depth to impermeable stratum (ft), $D_{stratum}$ 9.33 (If no impermeable stratum is encountered assume $D_{stratum} = D_{pit}$)

   Height of standpipe above reference level (ft) h_{pipe} _____

   Depth to water level after 24 hour stabilization period (ft), D_{water} 3.41 (Take measurement from top of standpipe. Subtract h_{pipe})

   Height of static water level above impermeable stratum (ft), H 5.92 ($H = D_{stratum} - D_{water}$)

   Average height of water level above impermeable stratum (ft), h 3.6 (Take average of d_n from beginning and end of last time interval recorded in section 4, convert this to feet, subtract from $d_{stratum}$)

6. Re-calculation of K using data from section 5 above and from final time interval of section 4:

   $K = [\, h_{rise} / t \,] \times [\, A_{av} / 2.27\, (H^2 - h^2) \,] \times 60$ min / hr

   $= [\, 3.0 / 40 \,] \times [\, 11.5 / 2.27\, (5.92^2 - 3.6^2) \,] \times 60$ min / hr = 1.0

7. I hereby certify that the information furnished on Form 3f of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator Eric Bush Date 5/31/12

Signature and Seal of Professional Engineer Eric Bush

License # 32145 Date 5/31/12

APPLICATION FOR PERMIT TO CONSTRUCT / ALTER AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Municipality Hopewell **Block** 69 **Lot** 9

Form 4 – General Design Data

1. Volume of Sanitary Sewage (gallons) 500
   X Residential – Number of Dwelling Units 1 Total Number of Bedrooms 3
   ___ Commercial / Institutional – Indicate type of establishment ___
   Show method of calculation ___
   If estimate is based on water meter data:
   Indicate source of data ___
   Frequency of readings ___ Average daily flow ___ Maximum daily flow ___

2. Alterations:
   Reason for alteration (check ALL applicable categories):
   ___ Expansion or change in use ___ Upgrade existing facilities ___ Real estate transaction
   X Correct malfunctioning system ___ Other (specify) ___
   Describe nature of alteration (scope of work) Replace existing S. tank & disposal bed w/ new 2 comp. S. Tank & MSR.

3. System Components:

   Grease trap: ___ New ___ Existing Total capacity (gallons) ___
   Show calculation ___

   Septic Tank: X New ___ Existing Total capacity (gallons) 1300
   1st compartment 867 2nd compartment 433 3rd compartment ___

   Effluent distribution: X gravity flow ___ gravity dosing ___ pressure dosing
   Dosing device: ___ pump ___ siphon
   Dosing tank: ___ New ___ Existing Total capacity (gallons) ___
   Dose volume ___ Reserve capacity ___

   Laterals: number 8 total length (ft) 248 diameter (in) 4 spacing (ft) 3

   Connecting pipe (from septic tank): diameter (in) 4 length (ft) 85

   Distribution: X D-box ___ Manifold: diameter (in) ___ length (ft) ___

   Disposal field: Type of installation (i.e. C, SRB, SRE, M, MSR) MSR
   Design Permeability / Percolation Rate 6-20 IN/HR
   ___ Disposal Bed: Dimensions (ft) ___ Total disposal area (ft²) 1026 w/in 1302
   ___ Disposal Trenches: Total Length (ft) ___ Width (ft) ___

   Seepage Pits: Design percolation rate (min / in) ___ Number of Pits ___
   Total percolating area provided (ft²) ___

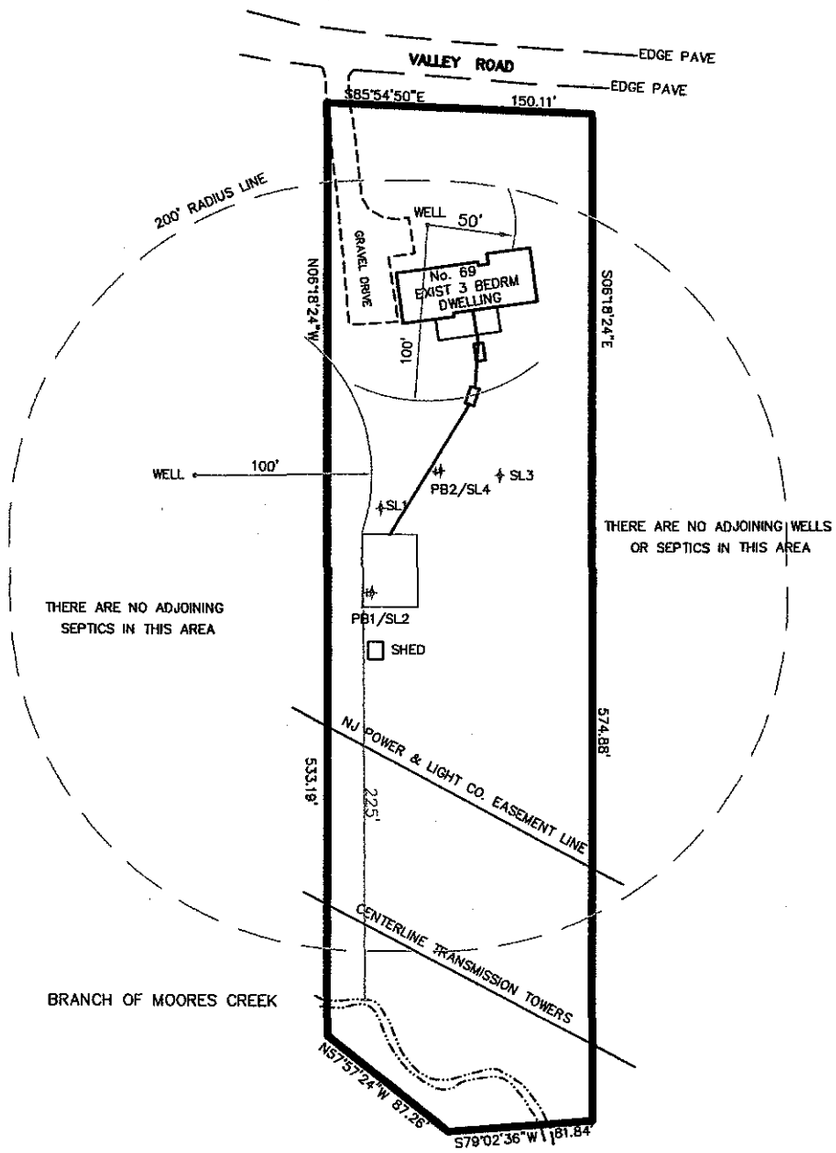
4. Attachments:
   X General plan of system showing location of all system components
   X Cross-sections of each system component
   ___ Pump performance curve
   ___ Other (specify) ___

5. I hereby certify that the information furnished on Form 4 of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator Eric Busch Date 5/31/12

Signature and Seal of Professional Engineer Eric Busch

License # 32145 Date 5/31/12



GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

NO.	DATE	REVISION
1	6/7/12	PER HOPEWELL HEALTH DEPARTMENT

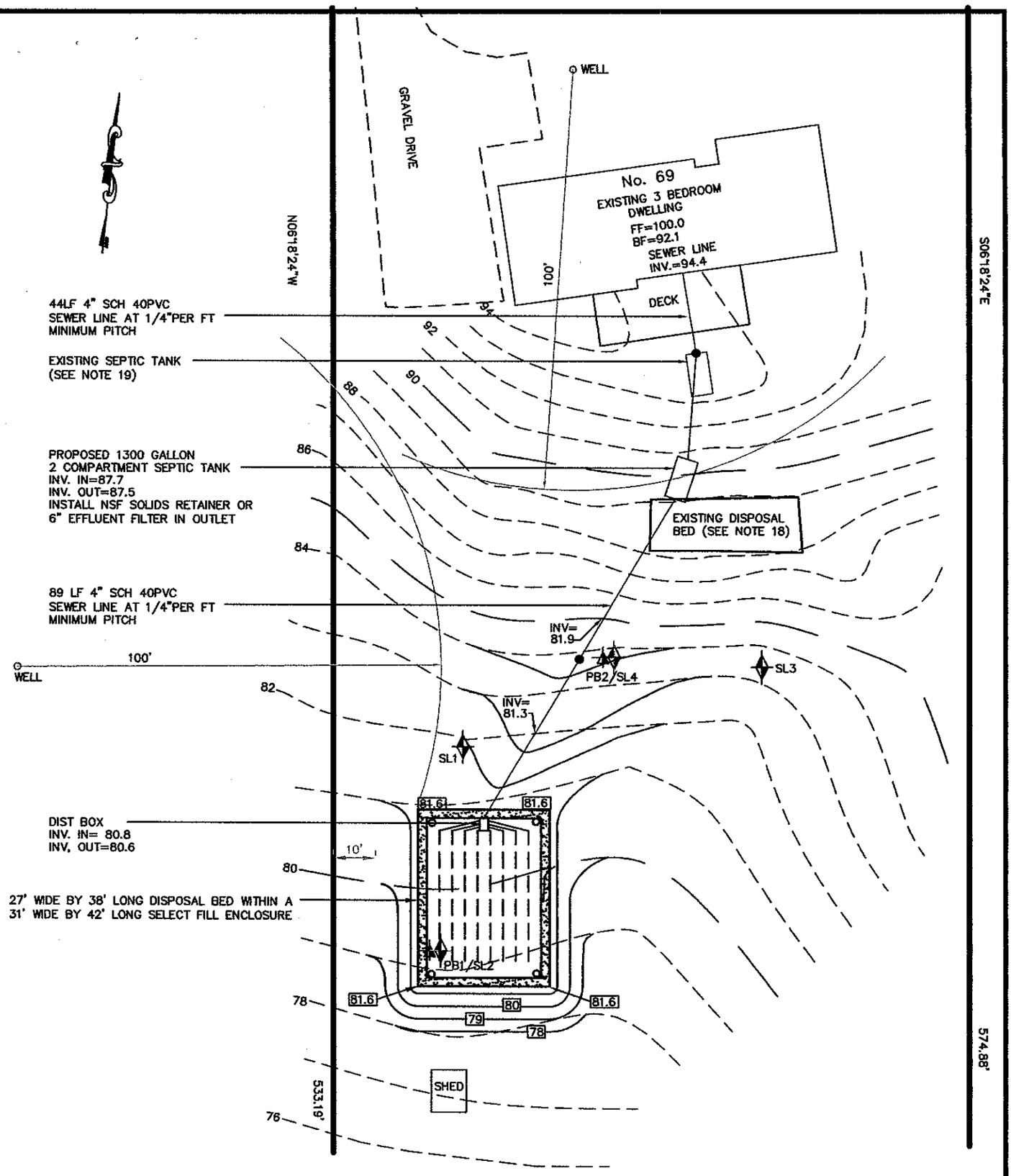
SEPTIC SYSTEM ALTERATION

BLOCK 59 LOT 9
TOWNSHIP OF HOPEWELL
MERCER COUNTY, NEW JERSEY

DESIGN APPROVED
DATE: 6/21/12
HOPEWELL TOWNSHIP HEALTH DEPT.

Erica Busch
ERICA L. BUSCH
NEW JERSEY PROFESSIONAL ENGINEER LIC. NO. 32145
PO BOX 486, HAMPTON, NEW JERSEY 08827
(908) 202-4477

DATE	SCALE	SHEET
5/25/12	AS SHOWN	1 OF 6



PLAN

(IN FEET)

30 0 15 30 60

GRAPHIC SCALE
1 INCH = 30 ft.

LEGEND

- SOIL LOG
- CLEANOUT
- INSPECTION PORT
- PIT BAIL TEST

THIS PLAN IS TO BE USED FOR THE CONSTRUCTION OF THE SEPTIC SYSTEM ONLY. IT IS NOT INTENDED TO BE USED AS A SURVEY FOR THE PURPOSE OF TITLE TRANSFER OR PLOT PLAN FOR THE CONSTRUCTION OF ANY IMPROVEMENTS SUCH AS HOUSE ADDITIONS, DRIVEWAYS, POOLS, BARNS OR SHEDS.

TOPOGRAPHY ONLY IS HEREBY ACCURATE AS SHOWN. BOUNDARY AND LOCATION INFORMATION, INCLUDING BUT NOT LIMITED TO METES AND BOUNDS, PHYSICAL FEATURES, DRAINAGE, WATERWAYS, UTILITY LOCATIONS AND EASEMENTS ARE BASED ON A SURVEY AS PREPARED BY OTHERS.

Wayne R. Jarvis

WAYNE R. JARVIS
NEW JERSEY LAND SURVEYOR LIC. NO. 34007

NO.	DATE	REVISION
1	6/7/12	PER HOPEWELL HEALTH DEPARTMENT

SEPTIC SYSTEM ALTERATION

BLOCK 59 LOT 9

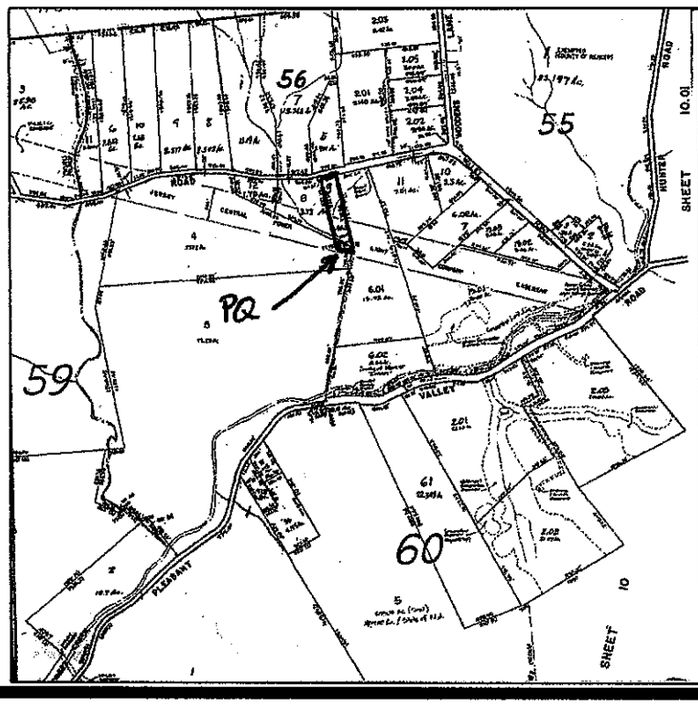
TOWNSHIP OF HOPEWELL

MERCER COUNTY, NEW JERSEY

Erica Busch

ERICA L. BUSCH
NEW JERSEY PROFESSIONAL ENGINEER LIC. NO. 32145
PO BOX 486, HAMPTON, NEW JERSEY 08827
(908) 202-4477

DATE	SCALE	SHEET
5/25/12	AS SHOWN	2 OF 6



TOWNSHIP OF EAST AMWELL TAX MAP (SHEET 11)

MERCER COUNTY SOIL SURVEY MAP
SOILS MAPPED AS REFC2: READINGTON AND ABBOTSTOWN SILT LOAMS
6–12% SLOPES

GENERAL NOTES

1. SURVEY BOUNDARY INFORMATION HAS BEEN OBTAINED FROM SURVEY PLAN PREPARED BY DAVID E. GOLDENBAUM, NJLS NJ No. 20805, DATED 4/16/82
2. TOPOGRAPHIC INFORMATION OBTAINED FROM FIELD MEASUREMENTS TAKEN BY THIS FIRM ON 5/22/12.
3. THERE ARE NO WETLANDS WITHIN THE AREA OF THE PROPOSED DISPOSAL BED.
4. PROPOSED DISPOSAL BED IS 50 FEET (MIN.) FROM STREAMS, AND STORM SEWERS, AND 100 FT. FROM THIS AND ADJACENT WELLS.
5. THIS PLAN IS TO BE USED FOR THE CONSTRUCTION OF THE SEPTIC SYSTEM ONLY. IT IS NOT INTENDED TO BE USED AS A PLOT PLAN FOR THE CONSTRUCTION OF ANY IMPROVEMENTS.
6. THE LOCATION OF ALL UTILITIES IN THE VICINITY OF THE PROJECT SITE ARE NOT GUARANTEED FOR ACCURACY AND/OR COMPLETENESS. CONTRACTOR IS TO VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION. (1–800–272–1000)
7. THE CONTRACTOR IS RESPONSIBLE TO BE FAMILIAR WITH ALL LOCAL AND STATE HEALTH CODES.
8. ANY CONDITION DIFFERENT THAN SHOWN MUST BE REPORTED TO THE DESIGN ENGINEER IMMEDIATLY.
9. THE CONTRACTOR IS RESPONSIBLE TO PERFORM THE WORK IN A SAFE MANNER AND TAKE ALL NECESSARY PRECAUTIONS TO INSURE A SAFE WORK ENVIRONMENT. THE DESIGN ENGINEER IS NOT RESPONSIBLE FOR THE CONTRACTORS OPERATIONS OR SAFETY MEASURES.
10. ALL WORK SHALL BE IN CONFORMANCE WITH N.J.A.C. 7:9A "STANDARDS FOR INDIVIDUAL SUBSURFACE SEWAGE
11. DESIGN ENGINEER AND HEALTH DEPARTMENT SHALL RECEIVE 72 HOURS NOTICE PRIOR TO CONSTRUCTION.
12. PRIOR TO ANY CONSTRUCTION, THE DESIGN ENGINEER SHALL:
    - SET A BENCHMARK IN THE IMMEDIATE DISPOSAL AREA.
    - STAKEOUT THE PROPOSED DISPOSAL BED.
    - VERIFY THAT THE ELEVATIONS SHOWN ON THE APPROVED DESIGN ARE CONSISTENT WITH ACTUAL FIELD CONDITIONS.
13. DURING CONSTRUCTION THE DESIGN ENGINEER IS TO INSPECT THE FOLLOWING:
    - OPEN EXCAVATION
    - PERMEABILITY TESTS ARE TO BE CONDUCTED IN SELECT FILL MATERIAL DURING CONSTRUCTION
    - FILL BEFORE PLACEMENT OF STONE – TANKS, STONE AND PIPING PRIOR TO BACKFILLING
    - FINAL GRADING, INCLUDING SEEDING AND MULCHING OF DISTURBED GROUND
    - PUMP PERFORMANCE AND FLOAT SETTINGS IF APPLICABLE.
14. SYSTEM WAS NOT DESIGNED TO ACCOMMODATE A GARBAGE DISPOSAL SYSTEM. INSTALLATION OF A GARBAGE DISPOSAL SYSTEM IS PROHIBITED.
15. WATER SOFTENER BACKWASH WATER SHALL NOT BE DISCHARGED INTO THIS SYSTEM.
16. BUILDING SEWER TO BE 4" SCHEDULE 40 PVC PIPE WITH A MINIMUM PITCH 1/4"PER FOOT IF APPLICABLE
17. THIS LOT IS ARE SERVED BY PRIVATE WELL.
18. THE EXISTING LATERALS SHALL BE ABANDONED IN PLACE
19. THE EXISTING SEPTIC TANK SHALL BE PUMPED BY A LICENSED SEWAGE HAULER, CRUSHED AND BACKFILLED WITH NATIVE SOIL.

SEPTIC SYSTEM DESIGN:

DESIGNED FOR A 3 BEDROOM HOUSE
TOTAL DAILY SEWAGE VOLUME = 500 GPD
DESIGN PERMEABILITY RATE = 6–20 IN./HR.
REQUIRED BOTTOM AREA/DAY = 1.61 S.F./GPD
500 GAL./DAY X 1.61 S.F./GAL./DAY = 805 S.F.
HOPEWELL TOWNSHIP ORDINANCE INCREASE BED SIZE BY 25%
805 S.F. X 1.25 = 1006.25 S.F.
CONSTRUCT AN 27' WIDE BY 38' LONG DISPOSAL
BED WITHIN A 31' WIDE X 42' LONG SELECT FILL ENCLOSURE

NO.	DATE	REVISION
1	6/7/12	PER HOPEWELL HEALTH DEPARTMENT

SEPTIC SYSTEM ALTERATION

BLOCK 59 LOT 9

TOWNSHIP OF HOPEWELL

MERCER COUNTY, NEW JERSEY

Erica Busch
ERICA L. BUSCH
NEW JERSEY PROFESSIONAL ENGINEER LIC. NO. 32145
PO BOX 486, HAMPTON, NEW JERSEY 08827
(908) 202–4477

DATE	SCALE	SHEET
5/25/12	AS SHOWN	3 OF 6

DISPOSAL BED

GENERAL NOTES:

1. LOCATION OF DISPOSAL SYSTEM AND COMPONENTS SHALL BE STAKED OUT BY DESIGN ENGINEER
2. EXCAVATION PRIOR TO THE PLACEMENT OF FILL MATERIAL SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF N.J.A.C. 7:9–10.3(c)
   - A. CONSTRUCTION SHALL NOT TAKE PLACE WHEN THE SOIL MOISTURE CONTENT IS ABOVE THE LOWER PLASTIC LIMIT.
   - B. IF HEAVY EXCAVATING EQUIPMENT IS OPERATED WITHIN THE DISPOSAL BED THE EQUIPMENT SHALL NOT BE DRIVEN DIRECTLY ON THE INFILTRATIVE SURFACE OF THE EXCAVATION. A MINIMUM OF ONE FOOT OF FILL MATERIAL SHALL BE MAINTAINED BELOW THE VEHICLE TRACKS AT ALL TIMES.
   - C. ALL SIDEWALL AND BOTTOM AREAS SHALL BE SCARIFIED BEFORE PLACEMENT OF FILTER MATERIAL
   - D. ALL SIDEWALL AND BOTTOM AREAS SHALL BE CLEANED OF SILT DEPOSITED WITHIN THE EXCAVAION DUE TO RAIN OR SNOW.
3. AN EXCAVATION SHALL BE MADE TO THE REQUIRED DEPTH EXTENDING THROUGHOUT THE ENTIRE AREA TO BE OCCUPIED BY THE DISPOSAL FIELD AND BEYOND THE PERIMETER OF THE DISPOSAL FIELD A MINIMUM OF TWO FEET IN ALL DIRECTIONS.
4. THE EXCAVATION SHALL BE FILLED WITH SUITABLE FILL MATERIAL AND THE FILL MATERIAL MOUNDED UP OVER THE EXCAVATION A MINIMUM OF TWO FEET BEYOND THE PARAMETER OF THE DISPOSAL FIELD.
5. FILL MATERIAL USED IN THE ZONE OF DISPOSAL AND ZONE OF TREATMENT SHALL MEET THE REQUIREMENTS OF NJDEP NJAC 7:9A–10.1(f)4 AND 5 RESPECTIVELY
   - A. TEXTURAL ANALYSIS (COMPOSITION BY WEIGHT OF SIZE FRACTION PASSING EACH SIEVE)

⅜" SIEVE	100%
#8 SIEVE	80–100%
#16 SIEVE	50–85%
#30 SIEVE	25–60%
#50 SIEVE	10–30%
#100 SIEVE	2–10%

	ZONE OF TREATMENT	ZONE OF DISPOSAL
B. COARSE FRAGMENT CONTENT (MATERIAL RETAINED ON #8 SIEVE)	<15% BY VOL OR <20% BY WEIGHT	<15% BY VOL OR <25% BY WEIGHT
C. PERMEABILITY	6–20 IN/HR OR 3–15 MIN/IN	>2 IN.HR OR >30 MIN.IN

6. PLACEMENT AND COMPACTION OF FILL MATERIAL SHALL MEET THE REQUIREMENTS AS SPECIFIED BY NJAC 7:9A–10.4(f).
   - A. INSTALL FILTER MATERIAL IN 8" – 12" LIFTS AND COMPACT LIGHTLY WITH A TRACKED VEHICLE. RUBBER TIRE EQUIPMENT SHALL NOT BE USED TO COMPACT THE FILL
   - B. THE FILL MATERIAL IS TO BE SAMPLED AND TESTED BY THE ENGINEER TO INSURE COMPLIANCE WITH NJDEP SPECIFICATIONS. A COMPOSITE SAMPLE SHALL BE OBTAINED BY SAMPLING AN ON–SITE STOCKPILE PRIOR TO INSTALLATION. THE TESTING SHALL INCLUDE A MECHANICAL ANALYSIS TEST INCLUDING SIEVE AND HYDROMETER TESTING.
   - C. PLACEMENT AND COMPACTION OF APPROVED FILL MATERIAL SHALL BE UNDER THE OBSERVATION AND APPROVAL OF THE DESIGN ENGINEER. COMPACTION OF THE FILL SHALL BE SUFFICIENT TO ADEQUATELY PREVENT FAILURE OF ANY COMPONENT OF THE SYSTEM DUE TO EXCESSIVE SETTLEMENT OR DIFFERENTAL SETTLEMENT. THE ENGINEER SHALL PERFORM PERCOLATION TESTS IN THE FILTER MATERIAL AS IT IS BEING INSTALLED.
7. A PROFESSIONAL ENGINEER SHALL CERTIFY BY SIGNATURE AND SEAL THE TEXTURAL ANALYSIS AND AND COMPACTION OF THE FILL.
8. THE FILTER MATERIAL SHALL BE WASHED GRAVEL OR CRUSHED STONE FREE OF FINES, DUST, ASHES, OR CLAY. FILTER MATERIAL SHALL CONFORM IN SIZE AND GRADATION TO NJDOT NUMBERS 3,4, OR 24 STONE
9. SLOPE OF PIPE IN THE DISPOSAL BED IS TO BE 0' – 2"/ 100 FEET. HOLES SHALL BE 1/4" DIAMETER, 36" ON CENTER AND OFFSET FROM THER ADJOINING LATERALS. INSTALL ENDCAPS.
10. INSTALL 4" SCH. 40 PVC (PERFORATED) INSPECTION PORTS AT ALL CORNERS OF THE DISPOSAL BED.
11. THE MANIFOLD PIPE/S MUST BE SOLID PIPE.
12. FILTER MATERIAL SHALL BE COVERED WITH FILTER FABRIC. (MIRAFI # 140 OR EQUIV.) EDGES OF ADJACENT SHEETS OF FILTER FABRIC SHALL OVERLAP 6 INCHES.
13. THE SIDE SLOPES OF THE DISPOSAL BED SHALL BE CONSTRUCTED WITH SLOPES OF THREE TO ONE OR LESS
14. FIILL BERM MATERIAL SHALL BE SILTY CLAY, CLAY SOILS, FREE OF STONES, AND DEBRIS COMPACTED TO A PERMEABILITY OF <0.2 IN/HR
15. BACKFILL MATERIAL SHALL BE TOPSOIL FREE OF LARGE STONES, STUMPS, AND OTHER WASTE MATERIAL.
16. PROVIDE GRADING OF THE DISPOSAL BED AND SURROUNDING AREA TO DIVERT SURFACE WATER AWAY FROM THE DISPOSAL AREA.
20. THE CONSTRUCTION OF THE DISPOSAL BED SHALL BE SO THAT THERE WILL BE NO DETRIMENTAL DRAINAGE EFFECTS ON THE ADJOINING PROPERTIES.
21. PROPERTY LINE SHALL BE STAKED OUT AND THE ENGINEER SHALL INSPECT THE GRADE AND CERTIFY ALL WORK WAS WITHIN THE PROPERTY LINES. ENGINEER SHALL CERTIFY AND INSPECT THAT THE FINAL GRADING HAS NOT LED TO ANY OFF SITE WATER RUNOFF PROBLEMS.

NO.	DATE	REVISION
1	6/7/12	PER HOPEWELL HEALTH DEPARTMENT

SEPTIC SYSTEM ALTERATION

BLOCK 59 LOT 9

TOWNSHIP OF HOPEWELL

MERCER COUNTY, NEW JERSEY

Erica Busch

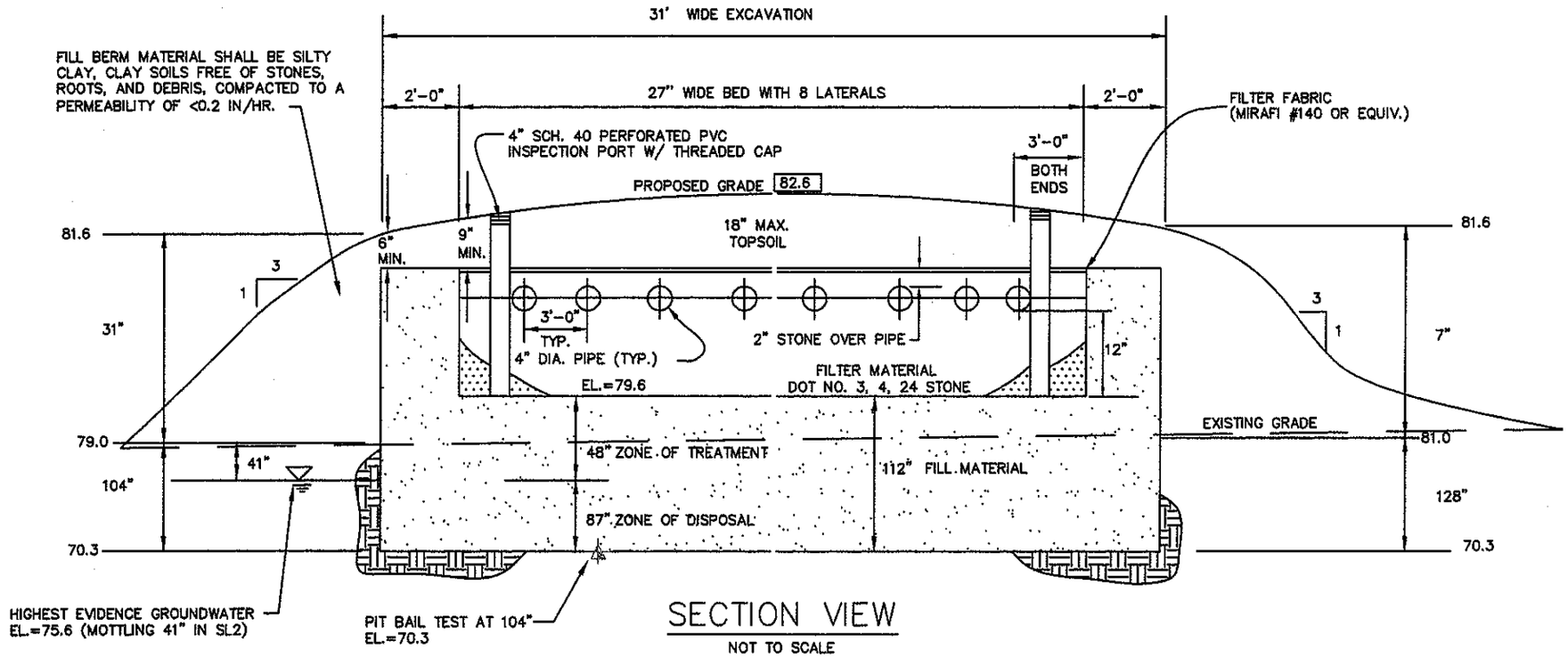
ERICA L. BUSCH

NEW JERSEY PROFESSIONAL ENGINEER LIC. NO. 32145

PO BOX 486, HAMPTON, NEW JERSEY 08827

(908) 202–4477

DATE	SCALE	SHEET
5/25/12	AS SHOWN	4 OF 6



SECTION VIEW

NOT TO SCALE

NO.	DATE	REVISION
1	6/7/12	PER HOPEWELL HEALTH DEPARTMENT

SEPTIC SYSTEM ALTERATION

BLOCK 59 LOT 9

TOWNSHIP OF HOPEWELL

MERCER COUNTY, NEW JERSEY

ERICA L. BUSCH

NEW JERSEY PROFESSIONAL ENGINEER LIC. NO. 32145

PO BOX 486, HAMPTON, NEW JERSEY 08827

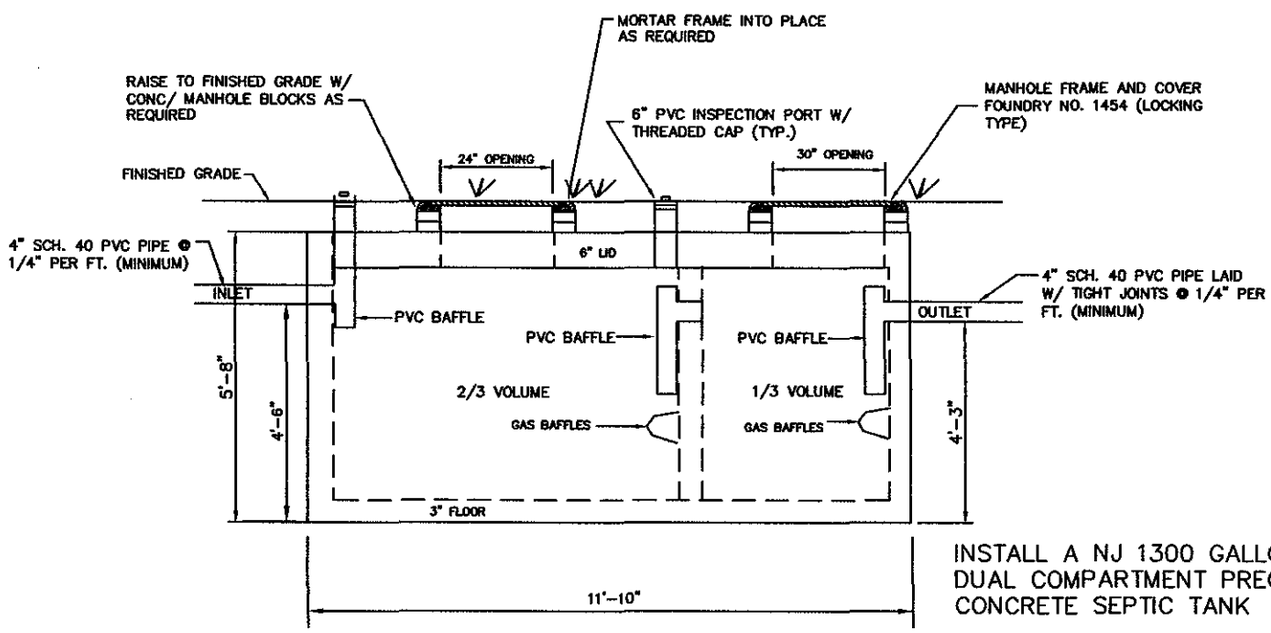
(908) 202-4477

DATE	SCALE	SHEET
5/25/12	AS SHOWN	5 OF 6

TANK/PUMP PIT

GENERAL NOTES:

1. ALL INSIDE SURFACES OF TANKS SHALL BE SEALED WITH TWO COATINGS OF AN APPROPRIATE INERT COATING TO MINIMIZE CORROSION. COATING OF PRECAST TANKS SHALL BE APPLIED
2. SEPTIC TANKS SHALL BE PLACED UPON A FIRM AND STABLE FOUNDATION SO THAT THE POTENTIAL FOR UNEVEN SETTLEMENT OR SHIFTING IS MINIMIZED. TANKS ARE TO BE INSTALLED DIRECTLY ON UNDISTURBED NATURAL SOIL. IF THE EXCAVATION IS DUG TOO DEEP, IT SHALL BE BACKFILLED TO THE PROPER ELEVATION WITH COMPACTED SAND. COMPACTED SAND IS TO BE OBSERVED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION OF TANK.
3. OUTLET BAFFLES OR TEES SHALL BE PROVIDED WITH GAS DEFLECTION BAFFLE.
4. ALL MANHOLES SHALL BE EXTENDED FLUSH WITH FINISHED GRADE BY MEANS OF A RISER FITTED WITH A REMOVABLE WATER TIGHT COVER. COVERS SHALL BE BOLTED OR LOCKED.
5. AN INSPECTION PORT EXTENDING TO FINISHED GRADE SHALL BE PROVIDED OVER EACH TANK OR COMPERTMENT INLET OR OUTLET WHICH IS NOT DIRECTLY BELOW A MANHOLE. INSPECTION PORTS SHALL EXTEND TO FINISHED GRADE AND SHALL BE CONSTRUCTED OF 4" CAST IRON OR PVC PIPE WITH BOLTED CAP.
6. THE INSTALLATION OF ALL TANKS SHALL PREVENT FLOTATION.
7. ALL SEPTIC TANK CONNECTIONS AND ALL RISERS, SHALL BE SEALED WITH AN EXPANDING WATERPROOF CEMENT. IN ADDITION, TAR GASKETS ARE REQUIRED UNDER ALL CAST IRON MANHOLE COVERS
8. MAXIMUM OF 4' COVER OVER THE SEPTIC TANK.
9. PROPOSED SEPTIC TANK SHALL HAVE INSTALLED AN NSF CERTIFIED SEPTIC SOLID RETAINER OR SEPTIC EFFLUENT FILTER IN ACCORDANCE WITH NJAC 7:9A-8.2(j)3
10. SEPTIC TANK, RISER AND INSPECTION PORT SHALL BE TESTED FOR WATER TIGHTNESS AFTER INSTALLATION AND BEFORE BACKFILLING USING HYDROSTATIC OR VACUUM TEST.
11. A PERMANENT, NON-CORROSIVE MARKER, MINIMUM OF 6 SQIN SHALL BE ATTACHED TO THE MANHOLE COVER OR RISER IMMEDIATLY BELOW THE COVER WITH THE FOLLOWING INFORMATION:
    1. ADMINISTRATIVE AUTHORITY NAME AND PERMIT NUMBER
    2. DATE OF INSTALLATION
    3. TYPE OF SYSTEM
    4. TOTAL DESIGN CRITERIA IN GALLONS PER DAY



INSTALL A NJ 1300 GALLON DUAL COMPARTMENT PRECAST CONCRETE SEPTIC TANK

NOTE: GROUND COVER ABOVE THE TANK SHALL NOT EXCEED 4'-0".

SEPTIC TANK DETAIL
NOT TO SCALE

INSTALL NSF SOLIDS RETAINER OR 6" EFFLUENT FILTER IN OUTLET IN OUTLET

NO.	DATE	REVISION
1	6/7/12	PER HOPEWELL HEALTH DEPARTMENT

SEPTIC SYSTEM ALTERATION

BLOCK 59 LOT 9

TOWNSHIP OF HOPEWELL

MERCER COUNTY, NEW JERSEY

Erica Busch

ERICA L. BUSCH
NEW JERSEY PROFESSIONAL ENGINEER LIC. NO. 32145
PO BOX 486, HAMPTON, NEW JERSEY 08827
(908) 202-4477

DATE	SCALE	SHEET
5/25/12	AS SHOWN	6 OF 6

George Kiesel

From: Paul Pogorzelski [paulpogo@hopewelltwp.org]
Sent: Wednesday, June 20, 2012 7:30 AM
To: George Kiesel
Subject: septic design grading review Blk 59 Lot 8

Approved

Paul E. Pogorzelski, P.E.
Hopewell Township Administrator/Engineer
201 Washington Crossing-Pennington Road
Titusville, NJ 08560
609-737-0605 ext 664
609-737-6839 (fax)

Please consider the environment before printing this e-mail
"This message may contain confidential and/or proprietary information and is intended for the person/entity to whom it was originally addressed.

TOWNSHIP of HOPEWELL

MERCER COUNTY

DEPARTMENT OF HEALTH

Serving Hopewell Borough & Pennington Borough

201 Washington Crossing Pennington Road Titusville, New Jersey 08560-1410

Phone: 609.737.0120 Fax: 609-737-6836

Richard and Ruth Clowes
69 Valley Rd
Lambertville NJ 08530

June 21, 2012

RE: Block 59 Lot 9

To Whom It May Concern:

Your application for an alteration to an onsite subsurface sewage disposal system has been approved with the following conditions:

SEWAGE DISPOSAL PERMITS ARE VALID FOR TWO YEARS FROM DATE OF ISSUE.

1. A copy of this letter must be forwarded to your construction contractor and sewage disposal installer prior to installation of said system.

2. The sewage disposal system must be located and staked prior to installation by a licensed surveyor or professional engineer to guarantee the proper alignment of the system in the area of the soil tests, and to insure it will conform to all site restrictions as represented on the attached design.

3. An acceptable grading plan has been included and must be constructed accordingly and can only be changed with township and design engineer approval.

4. The required elevation of the sewage disposal system should be verified by the licensed professional engineer or surveyor, the builder and the plumbing contractor as it relates to the foundation height, the point where the sewer line exits the dwelling and the height of the septic tank. If this is a gravity system and the minimum height of the sewer line is not maintained, an ejector system will be required after the septic tank.

5. An onsite conference is required with your installer and a representative from this office prior to installation of any part of this system. This should avoid any problem during the installation which can be costly to all parties concerned.

6. The design engineer must be notified at the beginning of the installation. Field measures must be made for the required as-built design, and grading plan certifications. The as-built must show soil test location, distances to the tank and D-box as measured from two fixed points, also, any changes caused by site conditions, construction changes and installation problems. If this is a raised system, the as-built grading

plan must be certified by the engineer that it is as designed, showing all inverts and contour lines. The as-built will provide a detailed location of the installed system so it can be located once it is covered.

7. No excavating machinery shall be permitted in the excavation during construction. A track-hoe or back-hoe must be used to dig the excavation. Sand must be available at the start of construction to cover the bottom and to protect open fractures etc.

8. All trees within 10 feet of a conventional disposal system or within the area of the extended clay fill and sloped area of a raised disposal/mound system must be removed.

9. All phases of construction of the disposal system must be inspected by the Health Department. It is your responsibility (or your contractors) to notify the Health Department by no later than 9:00 a.m. on every day that construction is underway so inspections can be scheduled. Systems will be dug up if not inspected by this office!

10. A certificate of compliance will not be issued if the system is not completed and the grades certified. Raised systems must be stabilized. All systems must be seeded or sodded and have established vegetative growth.

11. All septic tanks must comply with new tank requirements and also be provided with locking manhole access lids to final grade as well as effluent filters as required by NJDEP 7: 9A.

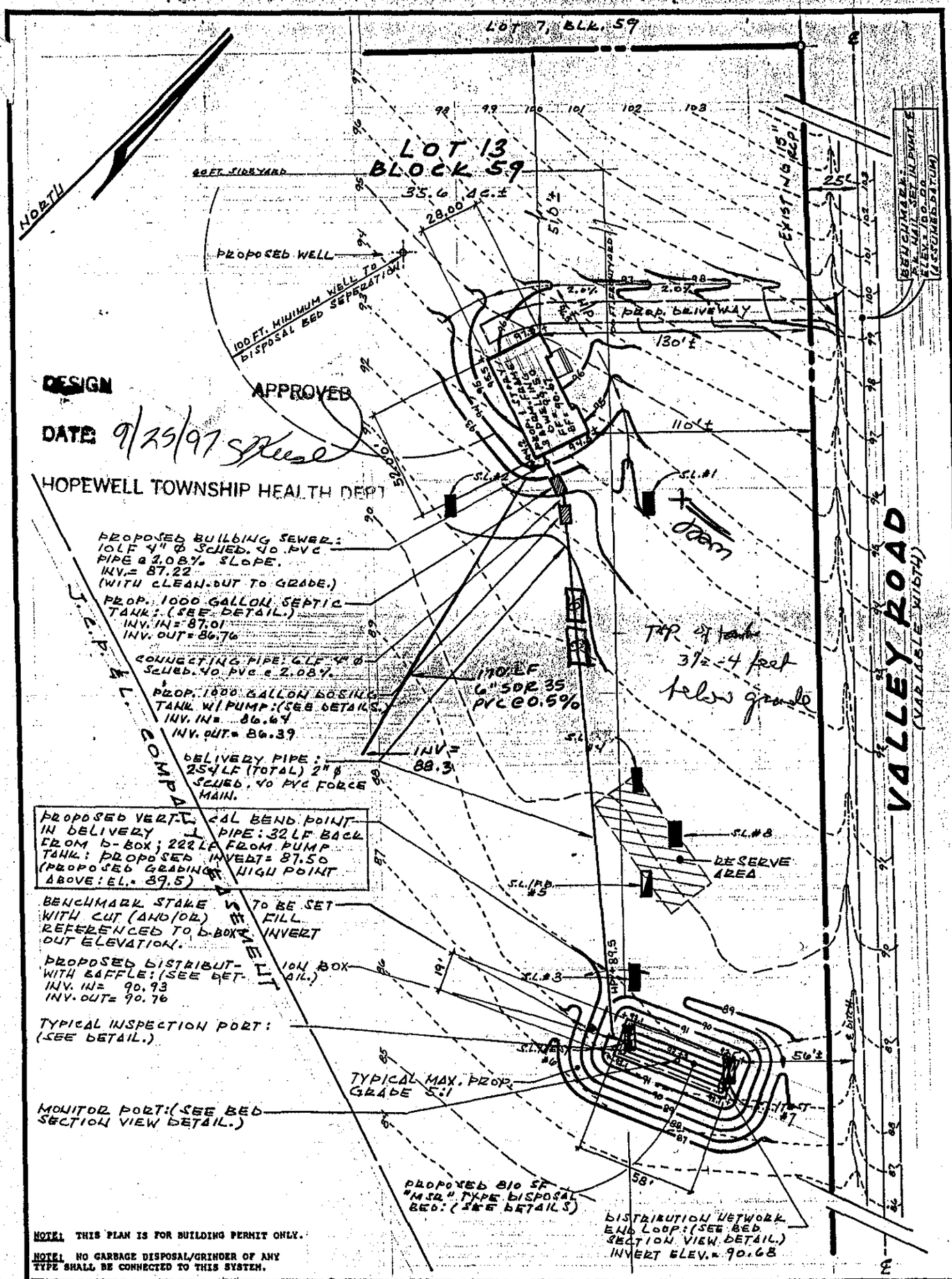
12. All sand and clay fill must be stock piled on site and certified by a licensed laboratory or by the design engineer once in place using a perc test.

13. Hopewell Township requires a 50% larger, two compartment septic tank whenever a sewer ejector is utilized in a dwelling.

Effective January 1, 1990 the New Jersey Department of Environmental Protection enacted a law requiring all Existing septic tank must be fitted with concrete risers and cast-iron manhole covers to grade.

Very truly yours,

George K. Kiesel
Environmental Health Coordinator



FRANK J. FALCONE
PROFESSIONAL LAND SURVEYOR #32112 PROF. PLANNER #3760

SHEET	BLOCK	LOT
11	59	13

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

PLOT PLAN & DISPOSAL SYSTEM DESIGN DETAIL OF LOT 13, BLOCK 59, FOR:
JOSEPH TESAURO
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
FRANK J. FALCONE	P.L.S.	NO.	32112

9/3/97
FRANK J. FALCONE: P.L.S. #32112 P.P. #3760 DATE

DRAWN	DATE
J.M.	9/3/97
CHECK FF GB	SCALE 1"=60'
REV.	

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR #24327

9/4/97
D. GEOFFREY BROWN: P.E. & L.S. #24327

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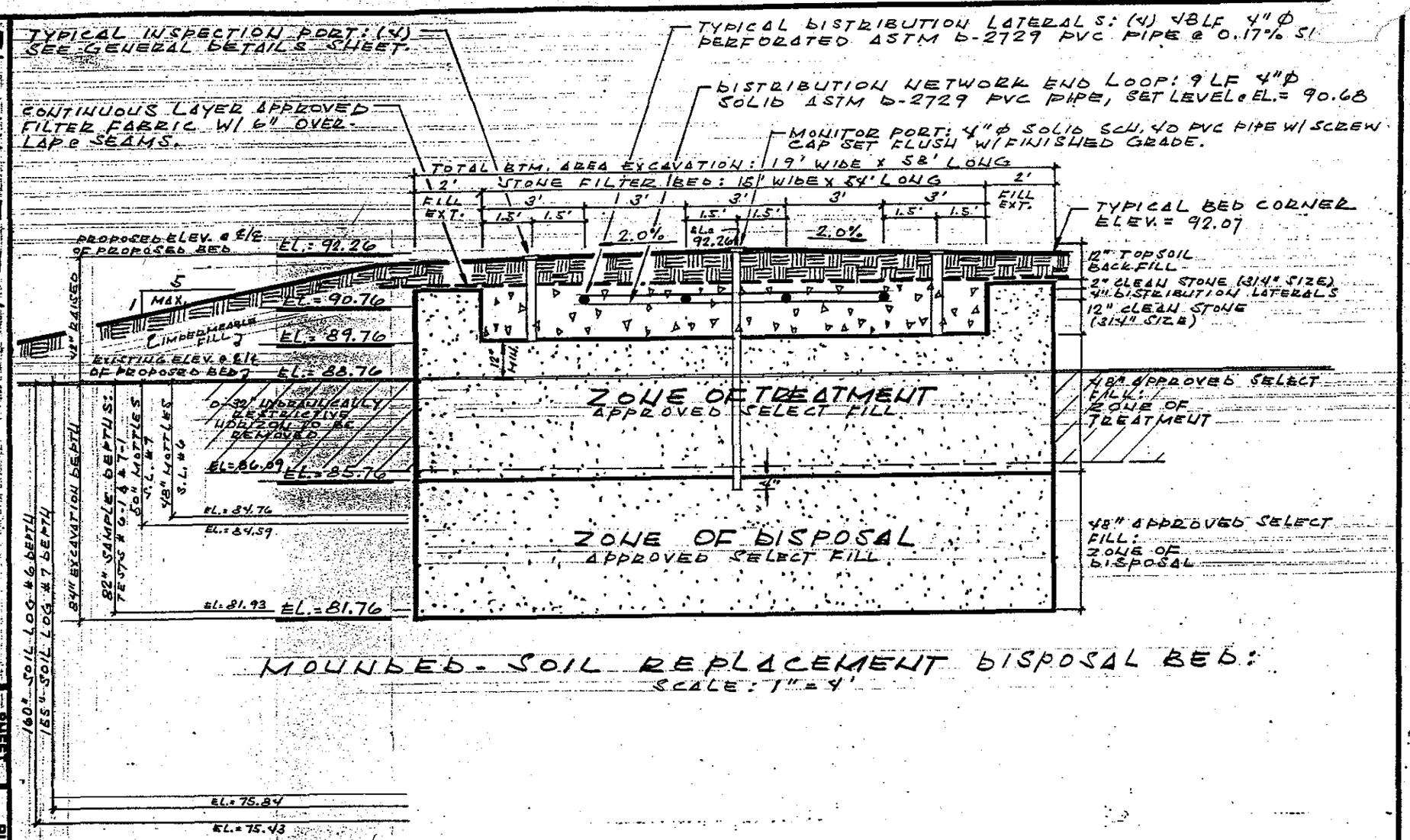


- NOTE: The Hopewell Township Health Dept. requires a Soil Permeability Class Rating Test on the Stockpiled Select Fill. The contractor shall notify the design engineer 24 hrs. in advance of the said stockpiling in order to obtain samples of the fill for testing.
- The select fill shall not be emplaced until a passing soil analysis has been obtained.
- The distribution network shall not be constructed until a passing percolation test has been performed on the emplaced select fill, to insure proper compaction. The contractor shall notify the design engineer 24 hrs. in advance in order to perform said test.

PROPOSED 3 BEDROOM DWLG.= 500 G.P.D. "Q"
ASSUME IN-PLACE SELECT FILL @ 3-15 M.P.I.
1.61 SF/GPD REQ. X 500 GPD = 805 SF MINIMUM
805 SF ÷ 15' (PROP. BED WIDTH) = 53.67' (REQ. LENGTH/USE 54')

"MSR" TYPE DISP. BED REQUIRES 2' FILL EXTENSION

EXCAVATE BTM. AREA BED: 19' W. X 58' L. (= 1102 SQ. FT.)
CONSTRUCT STONE FILTER BED: 15' W. X 54' L. (= 810 SQ. FT.)

FRANK J. FALCONE
PROFESSIONAL LAND SURVEYOR N32112 PROF. PLANNER #3760

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

BRYCE M. RITTENHOUSE P.E. & P.L.S. NO. 13453
ARNOLD RYDEN, JR. P.E. P.L.S. NO. 21223
D. GEOFFREY BROWN P.E. P.L.S. NO. 24327
WESLEY J. LANE P.L.S. NO. 30747
FRANK J. FALCONE P.L.S. NO. 32112

FRANK J. FALCONE P.L.S. N 32112 P.P. N 3760 DATE 9/4/97

DRAWN	CHECKED	DATE	SCALE
J.T.M.	GB	7/31/97	1" = 4'

REV.

SHEET 11 | BLOCK 59 | LOT 13

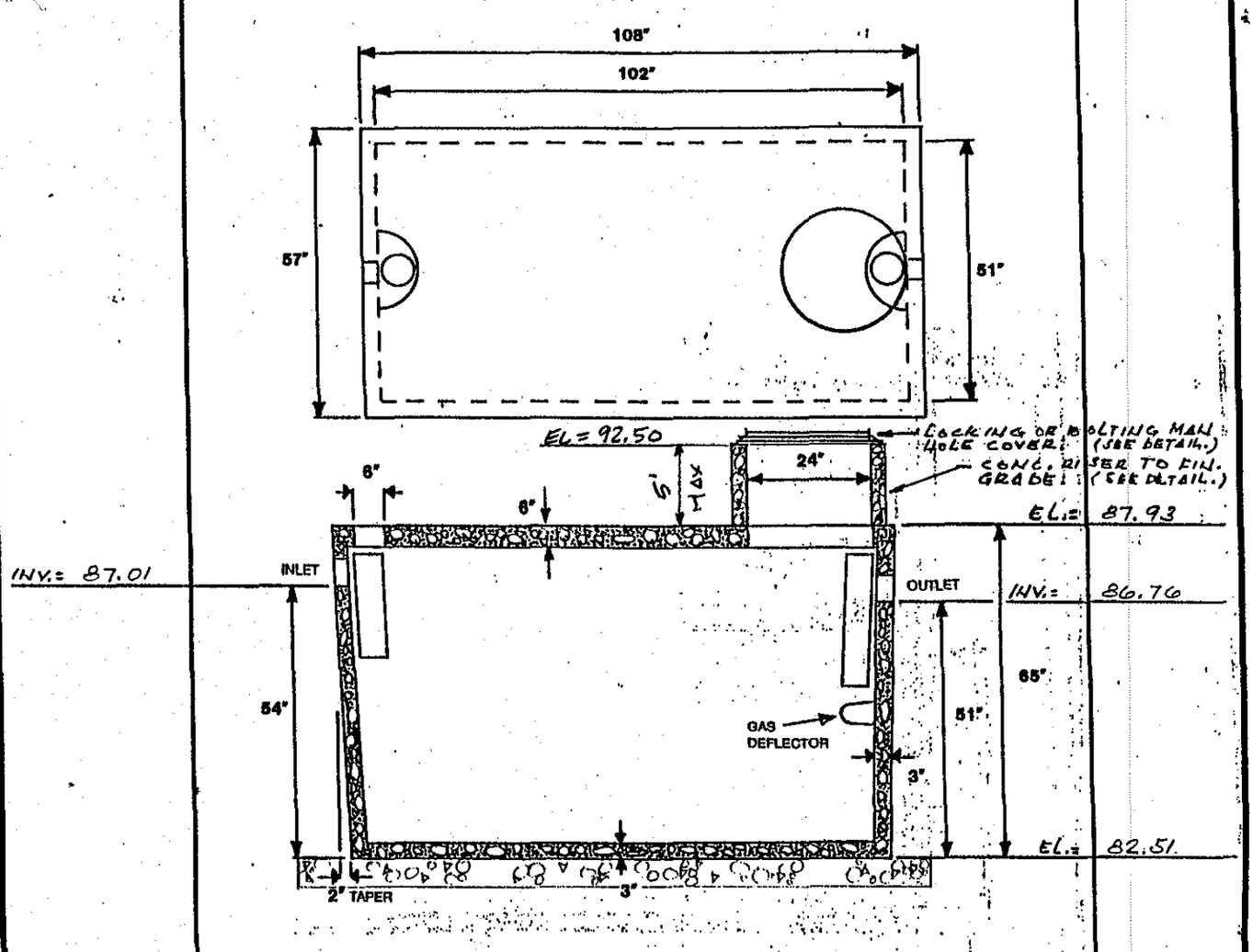
DISPOSAL BED SECTION
VIEW DETAIL
OF LOT 13, BLOCK 59, FOR:
JOSEPH TESAURO
HOPEWELL TWP., MERCER CO., NEW JERSEY.

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR #24327

D. GEOFFREY BROWN P.E. & L.S. # 24327 9/4/97

2/8

NEW JERSEY 1000 GALLON MONOLITHIC SEPTIC TANK



SPECIFICATIONS

- **Minimum Concrete Strength** — 3,500 P.S.I. @ approx. 28 Days
- **Steel Reinforcement** — #4 Rebar in lid, #3 in sides
  6" x 6" x 10" — gauge wire mesh in bottom
- **Joint** — Sealed with a synthetic resin sealant or equivalent
- **Design** — Septic Tank shall be as manufactured by MODERN CONCRETE SEPTIC TANK COMPANY

• NOTE: THE SEPTIC TANK SHALL BE PLACED ON A FIRM & STABLE FOUNDATION OF 3/4" SIZE CLEAN STONE, 6" THICK.

FRANK J. FALCONE
NEW JERSEY LICENSED LAND SURVEYOR #32112

SHEET	BLOCK	LOT
11	59	13

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

1,000 GALLON SEPTIC TANK DETAIL
FOR LOT 13, BLOCK 59,
JOSEPH TESAURO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
FRANK J. FALCONE	P.L.S.	NO. 32112

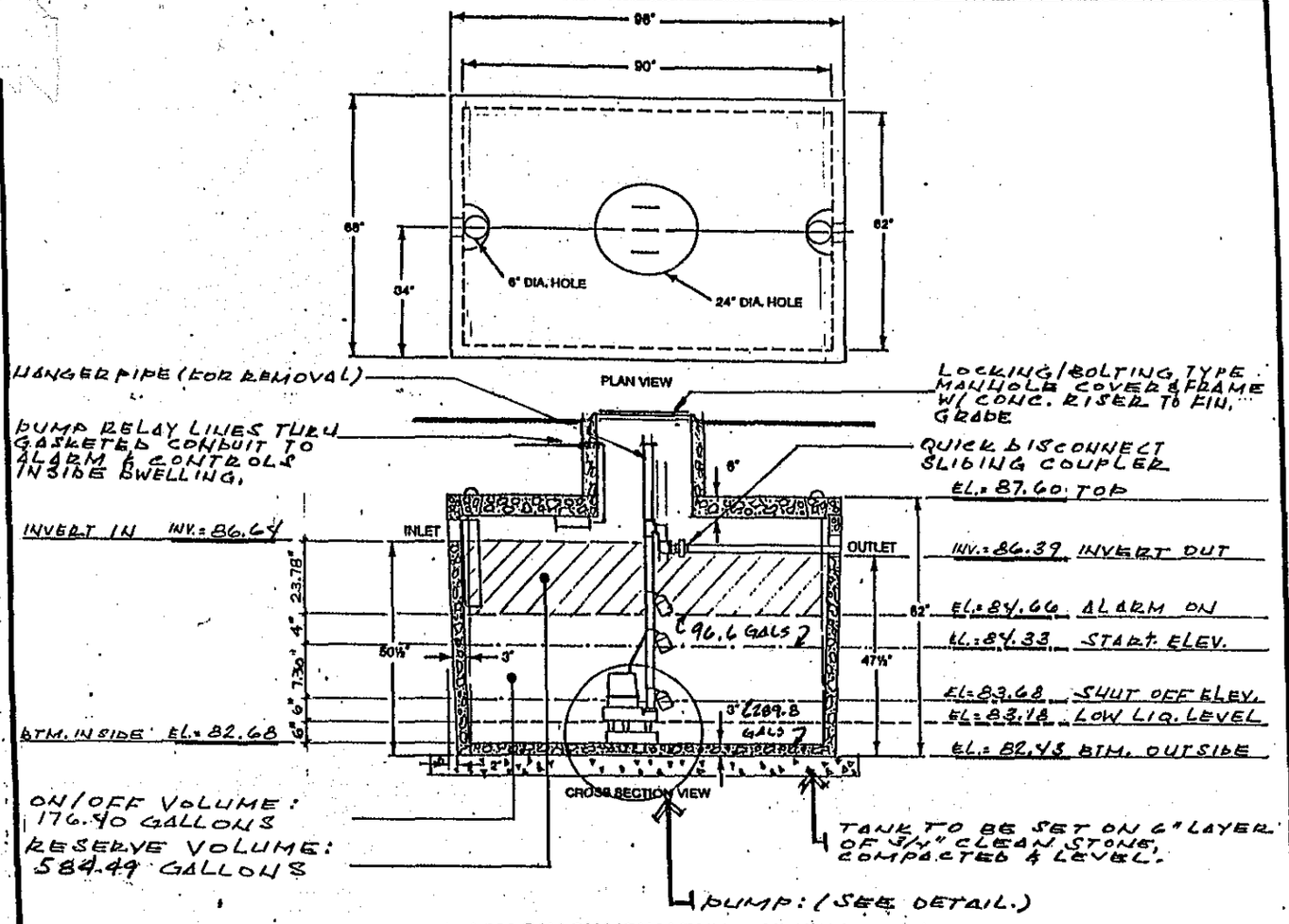
9/3/97
FRANK J. FALCONE: N.J.L.L.S. #32112 DATE

DRAWN	DATE
J.M.	9/3/97
CHECK	SCALE
93	NONE
REV.	

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR #24327

9/3/97
D. GEOFFREY BROWN: P.E. & L.S. #24327

B
3



1,000 GALLON MONOLITHIC PUMP TANK

THE PROPOSED DOSING TANK USING A PUMP HAS SUFFICIENT CAPACITY TO DISTRIBUTE EFFLUENT EQUALLY TO ALL PARTS OF DISPOSAL FIELD DURING EACH DOSE CYCLE.

THE PROPOSED DOSING TANK PROVIDES ADEQUATE RESERVE AREA IN THE EVENT OF A PUMP MALFUNCTION.

THE PROPOSED DOSING TANK PROVIDES A TOTAL LIQUID CAPACITY TO ACCOMODATE THE MINIMUM DOSE VOLUME AND Tcp & Tpd.

THE PROPOSED, SPECIFIED PUMP OR AN APPROVED EQUAL SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLAN. IF THE CONTRACTOR SELECTS A PUMP THAT IS DIFFERENT THAN THE APPROVED SHOWN IN THE APPROVED DESIGN, THE PUMP MODEL AND ITS SPECIFICATIONS SHALL BE GIVEN TO THE DESIGN ENGINEER FOR APPROVAL PRIOR TO ITS INSTALLATION.

THE PUMP SHALL BE SET ON A PEDESTAL AND THE INTAKE SHALL BE SET A MINIMUM OF 3 INCHES ABOVE THE BOTTOM OF THE DOSING TANK.

THE PUMP ON AND OFF SETTINGS SHALL PROVIDE THE MINIMUM DOSE VOLUME.

THE HIGH WATER ALARM SHALL BE INSTALLED 4 INCHES ABOVE THE "PUMP ON" SWITCH AND SHALL ACTIVE BOTH A VISUAL AND AUDIBLE ALARM.

THE PUMP AND THE ALARM SHALL UTILIZE SEPARATE ELECTRICAL CIRCUITS.

THE DOSING TANK SHALL BE CONSTRUCTED OF THE SAME MATERIAL AS THOSE ALLOWED FOR SEPTIC TANK CONSTRUCTION.

THE DOSING TANK SHALL BE BACKFILLED UTILIZING THE SAME REQUIREMENTS FOR BACKFILLING THE SEPTIC TANK.

ALL ELECTRICAL LINES FROM THE BUILDING TO THE PUMP CONTROL PANEL SHALL BE PROTECTED BY A CONDUIT.

A GAS TIGHT SEAL SHALL BE PROVIDED WHERE ELECTRICAL CONDUITS ENTER THE DOSING TANK.

WHEN THE DELIVERY PIPE IS SUBJECT TO FROST PENETRATION, THE DELIVERY PIPE WILL DRAIN BACK TO THE DOSING TANK AFTER EACH DOSE CYCLE.

WHEN THE LOW WATER LEVEL IN THE DOSING TANK IS LOWER THAN THE INVERT OF THE DISTRIBUTION NETWORK, THE DELIVERY PIPE SHALL SLOPE BACK TO THE DOSING TANK.

THERE IS NO CHECK VALVE AT THE PUMP AND THE DELIVERY PIPE DRAINS BACK TO THE DOSING TANK.

A 1/8" WEEP HOLE IS PROVIDED AT THE INVERT OF THE PUMP DISCHARGE PIPE, ABOVE THE HIGH WATER LEVEL IN THE DOSING TANK.

A 1/8" WEEP HOLE SHALL BE PROVIDED IN THE DELIVERY PIPE AT THE HIGHEST POINT IN THE DOSING TANK WHERE THE LOW WATER LEVEL IS HIGHER THAN THE DISTRIBUTION BOX OR DISTRIBUTION LATERAL.

- DOSE VOLUME: 125 GALLONS (25% Q)
- ON/OFF VOLUME: 176.40 GALLONS
- DISTANCE BETWEEN ON SWITCH & OFF SWITCH: 7.72"
- REQ'D. RESERVE VOLUME: 500 GALLONS
- RESERVE VOLUME PROVIDED: 543.51 GALLONS
- NOTE: NO SUBSTITUTION OF THE SPECIFIED TANK, IT'S ELEVATIONS, SWITCH SETTINGS, OR PROPOSED LOCATION SHALL BE MADE WITHOUT THE NOTIFICATION, REVIEW, AND APPROVAL OF THE DESIGN ENGINEER.

SPECIFICATIONS

- Minimum Concrete Strength — 3,500 P.S.I. @ approx. 28 Days
- Steel Reinforcement — #4 Rebar in lid, #3 in sides
  6" x 6" x 10 gauge wire mesh in bottom
- Joint — Sealed with a synthetic resin sealant or equivalent
- Design — Pump Tank shall be as manufactured by
  MODERN CONCRETE SEPTIC TANK COMPANY

FRANK J. FALCONE
PROFESSIONAL LAND SURVEYOR #32112 PROF. PLANNER #3760

SHEET	BLOCK	LOT
11	59	13

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DOSING TANK DETAIL
1,000 GALLON MONOLITHIC PUMP TANK
FOR LOT 13, BLOCK 59, FOR:
JOSEPH TESAURO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
FRANK J. FALCONE	P.L.S.	NO.	32112

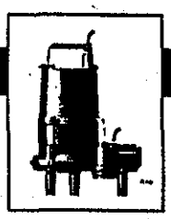
FRANK J. FALCONE: P.L.S. #32112 PP #3760 DATE 9/3/97

DRAWN J.M.
DATE 9/3/97
CHECK FJF/GB
SCALE NONE
REV.

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR #24327

9/3/97
D. GEOFFREY BROWN: PE&LS #24327

B



ENGINEERING DETAILS - SPD 100H

Pump Characteristics

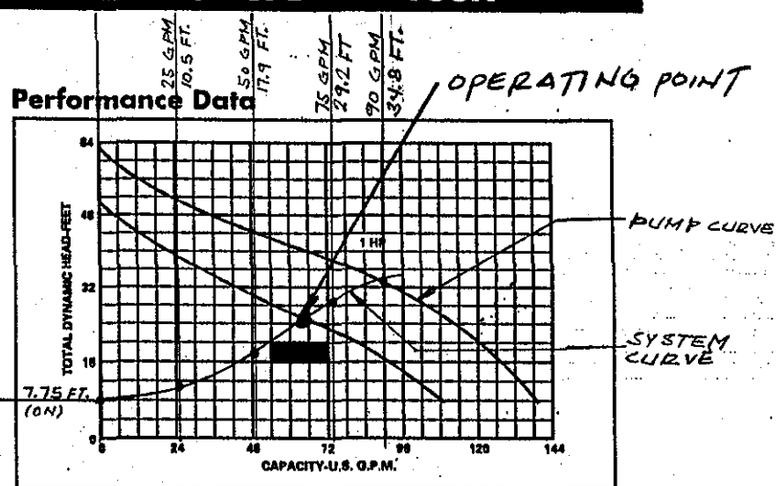
Pump/Motor Unit	Submersible				
[redacted]					
Manual Model (100)	MH2	MH6	MH3	MH4	MH5
Automatic Models	AH2	–	–	–	–
Horsepower	1				
Full Load Amps	9.5	4.5	4.0	1.7	1.5
Motor Type	Cap.	Three-Phase			
R.P.M.	3450				
Phase Ø	1	3			
Voltage	230	200	230	460	575
Hertz	60				
Operation	Intermittent				
Temperature	140°F Ambient				
NEMA Design	B				
Insulation	Class B				
Discharge Size	2" NPT (3" opt.)				
Solids Handling	3/4"				
Unit Weight	73 lbs.				

Power Cord: SPD50M 14/3, STW-A, 1a, 115V = 10' std. (20' opt.)–14/4, STW-A, 1a, 115V = 10' std. (20' opt.)–16/3, STW-A, 1a, 230V = 20' std.–16/4, STW-A, 1a, 230V = 20' std. SPD100M 16/3, STW-A, 1a, 230V = 20' std.–16/4, STW-A, 1a, 230V = 20' std.–18/5, STW-A, 3a, 200V, 230V, 460V or 575V = 20' std.

Materials of Construction

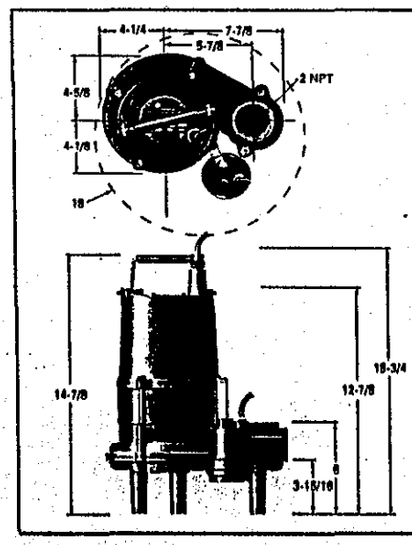
Handle	Steel
Lubricating Oil	Dielectric Oil
Motor Housing	Cast Iron
Seal Housing	Cast Iron
Pump Casing	Cast Iron
Shaft	Stainless Steel
Mechanical Shaft Seal	Seal Faces: Carbon/Ceramic Seal Body: Brass Springs: Stainless Steel Bellows: Buna-N
Impeller	Cast Iron
Upper Bearing	Single Row Ball Bearing
Lower Bearing	Single Row Ball Bearing
Base	Cast Iron
Fasteners	Stainless Steel

Performance Data



Total Head (feet)		10	20	30	40	50	60
GPM	[redacted]						
	1 HP	137	120	96	67	31	0

Dimensional Data



1. All dimensions in inches
2. Component dimensions may vary ± 1/8 inch
3. Not for construction purposes unless certified
4. dimensions and weights are approximate
5. We reserve the right to make revisions to our products and their specifications without notice

NOTE: Model SPD100AH2 utilizes wide-angle piggyback float switch for automatic operation.

AURORA/HYDROMATIC Pumps, Inc.
1840 Barney Road, Ashland, Ohio 44805
(419) 289-3042

- OR DESIGN ENGINEER APPROVED EQUAL.
- AN AUDIO & VISUAL PUMP FAILURE ALARM IS REQUIRED.
- THE ALARM SHALL BE PLACED IN A NOTICEABLE AND APPROPRIATE LOCATION INSIDE THE PROPOSED DWELLING.
- SEPARATE ELECTRICAL CIRCUITS SHALL BE PROVIDED FOR THE PUMP SYSTEM AND THE ALARM SYSTEM.

FRANK J. FALCONE
PROFESSIONAL LAND SURVEYOR # 32112 PROF. PLANNER # 3760

SHEET	BLOCK	LOT
11	59	13

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

PUMP DETAIL
FOR LOT 18, BLOCK 59, FOR:
JOSEPH TESAURO
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE P.E. & P.L.S. NO. 13453
ARNOLD RYDEN, JR. P.L.S. NO. 21223
D. GEOFFREY BROWN P.E. NO. 24327
WESLEY J. LANE P.L.S. NO. 30747
FRANK J. FALCONE P.L.S. NO. 32112

FRANK J. FALCONE P.L.S. # 32112 PP # 3760 DATE 9/3/97

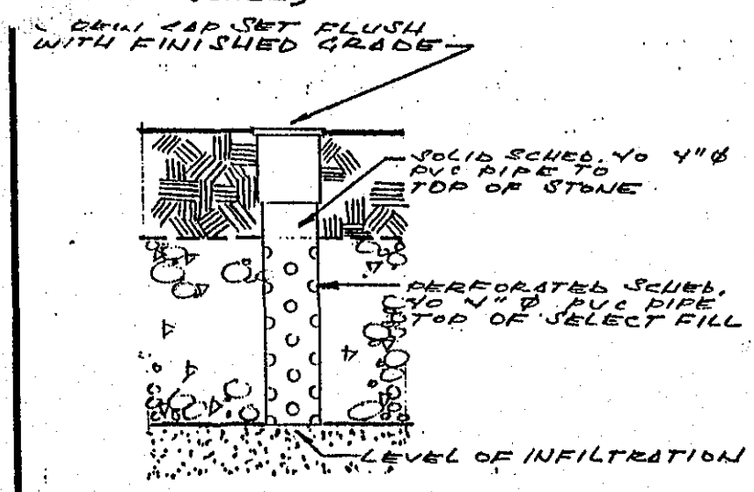
DRAWN J.M. DATE 9/3/97
CHECK FJF GB
REV.
SCALE NONE

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327

D. GEOFFREY BROWN P.E. & L.S. # 24327 9/3/97

8
5

INSPECTION PORT DETAIL:
(NOT TO SCALE)

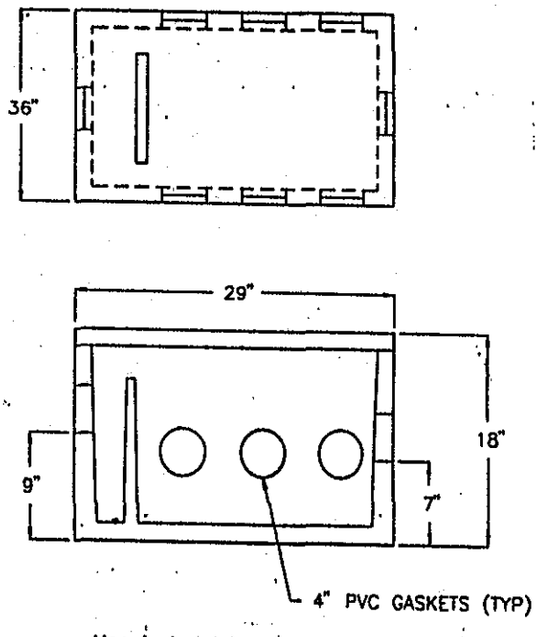


FILTER FABRIC SPECIFICATIONS

TERRATEX SD OR EQUAL	
GRAB TENSILE STRENGTH	125 LBS.
MULLEN BURST STRENGTH	275 LBS./SQ.IN.
ELONGATION	80%
WATER PERMEABILITY COEFFICIENT	~2 CM/SEC.

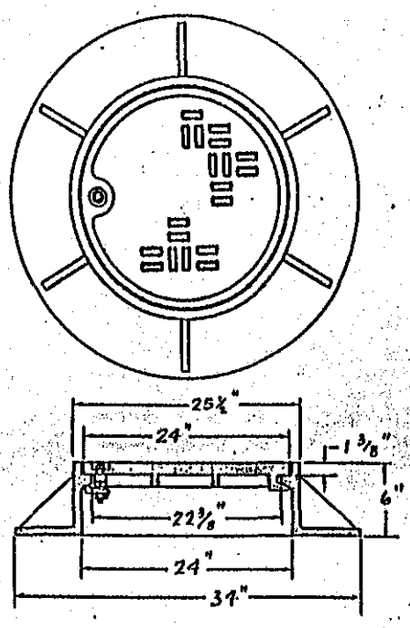
THE FABRIC IS TO BE LAPPED OVER THE TOP OF STONE A MIN. OF 6"

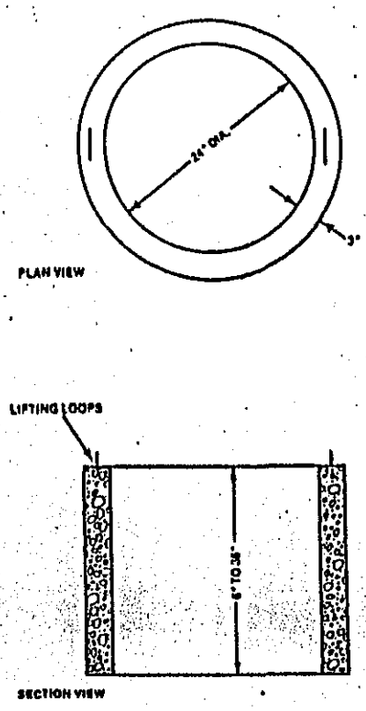
7 OUTLET DISTRIBUTION BOX WITH BAFFLE



Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant

STANDARD TYPE FRAME
CAMPBELL No. 1452C





SPECIFICATIONS

- Concrete Minimum Strength — 3,500 P.S.I. @ 28 Days
- Steel Reinforcement — 6" x 6" x 10 ga. wire mesh in sides

MANHOLE DETAIL
N.T.S.

CONCRETE EXTENSION DETAIL
N.T.S.

FRANK J. FALCONE P.P. # 3760
NEW JERSEY LICENSED LAND SURVEYOR # 32112

SHEET	BLOCK	LOT
11	59	13

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

GENERAL DISPOSAL SYSTEM DETAILS
FOR LOT 13, BLOCK 59,
JOSEPH TESAURO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

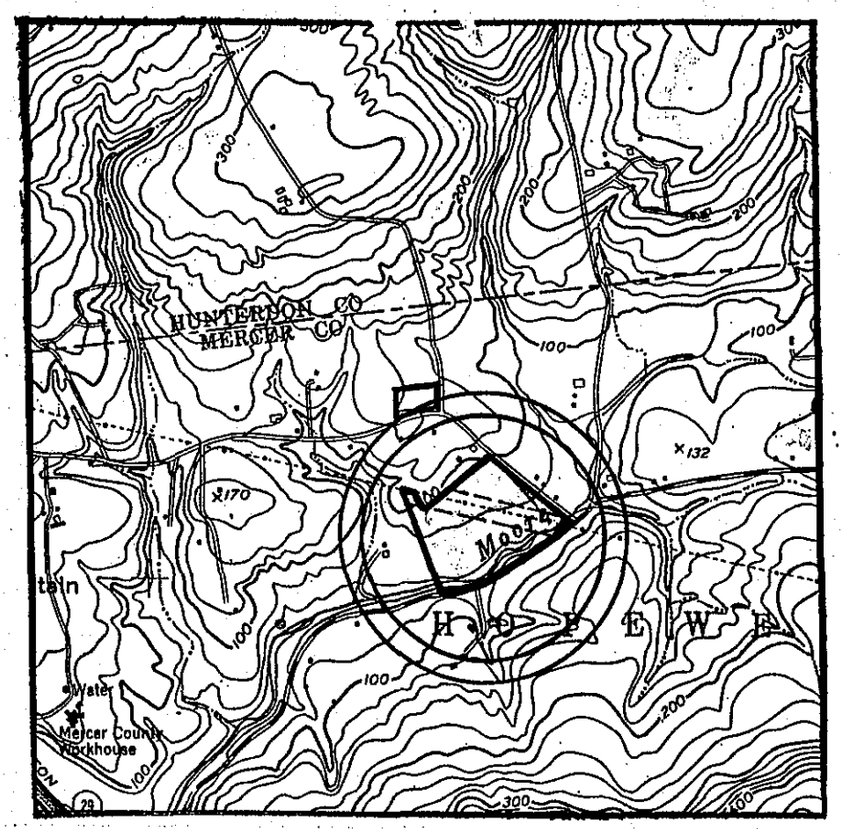
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
FRANK J. FALCONE	P.L.S.	NO. 32112

9/3/97
FRANK J. FALCONE: N.J.L.L.S. # 32112 DATE

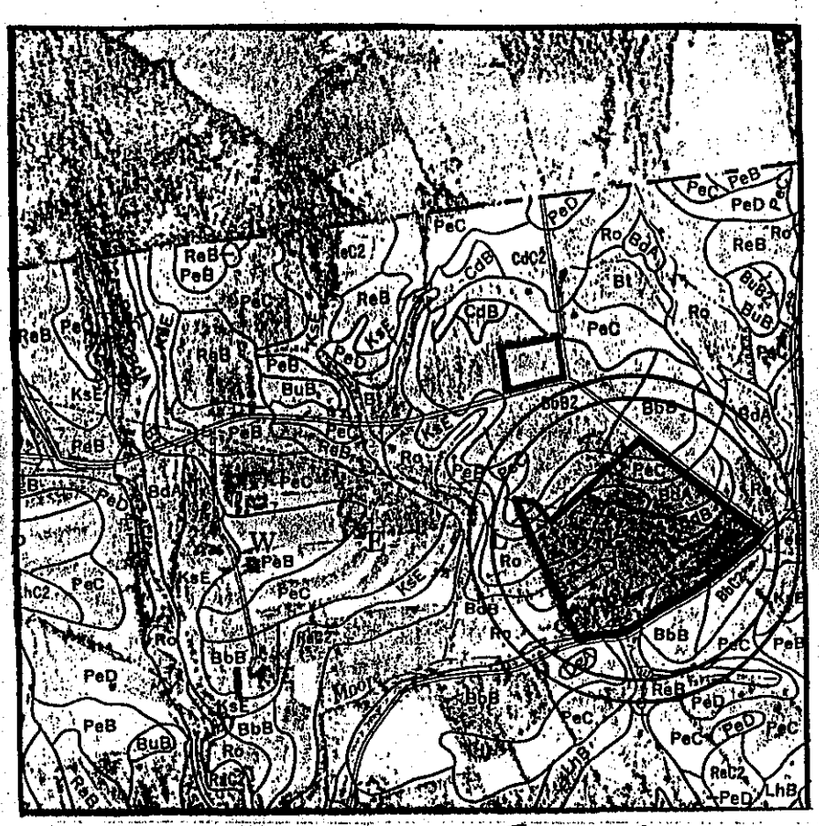
DRAWN J.M. | DATE 9/3/97 | CHECK FK GB | SCALE NONE | REV.

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327
9/3/97
D. GEOFFREY BROWN: P.E. & L.S. # 24327

B 6



U.S.G.S. QUADRANGLE MAP:
SCALE: 1" = 2000



MERCER COUNTY SOIL SURVEY:
SCALE: 1" = 1320'

FRANK J. FALCONE
PROFESSIONAL LAND SURVEYOR #32112 PROF. PLANNER #3760

SHEET	BLOCK	LOT
11	59	13

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

KEY MAPS
OF LOT 13, BLOCK 59, FOR:
JOSEPH TESAURO
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE P.E. & P.L.S. NO. 13453
ARNOLD RYDEN, JR. P.L.S. NO. 21223
D. GEOFFREY BROWN P.E. NO. 24327
WESLEY J. LANE P.L.S. NO. 30747
FRANK J. FALCONE P.L.S. NO. 32112

9/3/97
FRANK J. FALCONE: P.L.S. #32112 P.P. #3760 DATE

DRAWN	DATE
J.M.	9/3/97
CHECK FF GB	SCALE AS SHOWN
REV.	

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR #24327

9/3/97
D. GEOFFREY BROWN: P.E. & L.S. # 24327

8

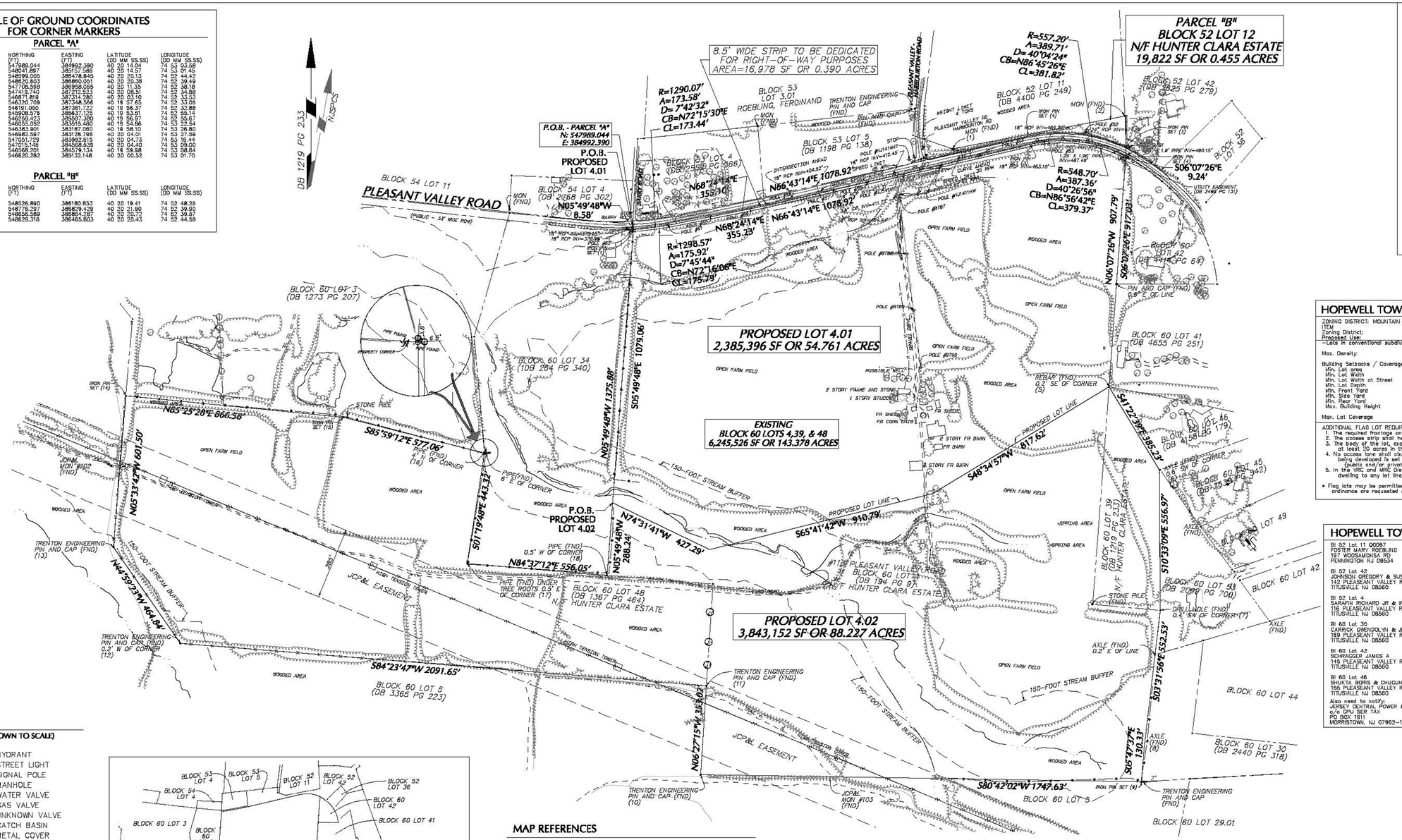
TABLE OF GROUND COORDINATES FOR CORNER MARKERS

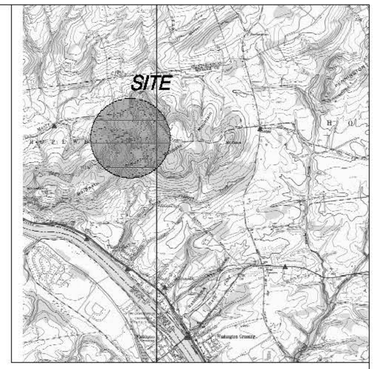
PARCEL "A"

CORNER NUMBER	CORNER TYPE	NORTHING (FT)	EASTING (FT)	LATITUDE (DD MM SS.SS)	LONGITUDE (DD MM SS.SS)
1	IRON PIN	547989.044	384992.390	40 20 14.04	74 53 03.58
2	IRON PIN	548041.897	385157.566	40 20 14.57	74 53 01.45
3	IRON PIN	548199.005	385478.845	40 20 20.13	74 52 44.42
4	IRON PIN	548520.903	385860.051	40 20 30.38	74 52 19.49
5	REBAR	547706.598	386958.055	40 20 11.35	74 52 38.18
6	AXLE	547419.740	387212.923	40 20 08.51	74 52 34.88
7	DRILL HOLE	546871.819	387314.280	40 20 03.10	74 52 33.53
8	AXLE	546330.709	387348.556	40 19 57.65	74 52 33.06
9	IRON PIN	546191.060	387361.722	40 19 56.37	74 52 32.88
10	PIN AND CAP	545908.578	386937.105	40 19 53.91	74 52 55.14
11	PIN AND CAP	546259.423	385597.380	40 19 56.97	74 52 55.67
12	PIN AND CAP	546055.092	385515.460	40 19 54.96	74 53 22.54
13	PIN AND CAP	546383.901	383187.060	40 19 58.10	74 53 26.80
14	IRON PIN	546982.587	383128.798	40 20 04.01	74 53 27.59
15	IRON PIN	547051.729	383992.815	40 20 04.73	74 53 16.44
16	IRON PIN	547015.148	384568.539	40 20 04.40	74 53 09.00
17	IRON PIN	546968.201	384579.134	40 19 59.98	74 53 08.84
18	PIPE	546620.282	385132.148	40 20 00.52	74 53 01.70

PARCEL "B"

CORNER NUMBER	CORNER TYPE	NORTHING (FT)	EASTING (FT)	LATITUDE (DD MM SS.SS)	LONGITUDE (DD MM SS.SS)
1					
2	CONC MON	548526.890	386180.853	40 20 19.41	74 52 48.26
3	CONC MON	548776.797	386829.429	40 20 21.90	74 52 39.90
4	IRON PIN	548656.589	386864.087	40 20 20.72	74 52 39.37
5	IRON PIN	548629.318	386465.803	40 20 20.43	74 52 44.59





LOCATION MAP

SOURCE:
USGS 7.5 MINUTE QUADRANGLE – LAMBERTVILLE, 1973
USGS 7.5 MINUTE QUADRANGLE – PENNINGTON, 1981

HOPEWELL TOWNSHIP ZONING DATA TABLE

ZONING DISTRICT: MOUNTAIN RESOURCE CONSERVATION
ITEM — CONVENTIONAL SUBDIVISION
Zoning District:
Proposed Use:
–Lots in conventional subdivisions shall front on local streets. [.17–180L2(1), (g), (h) and (1)]

Max. Density:	0.075 DU/AC
Building Setbacks / Coverage:	
Min. Lot area	14 acres
Min. Lot Width	400 FT
Min. Lot Width at Street	50 FT
Min. Lot Depth	500 FT
Min. Front Yard	150 FT
Min. Side Yard	75 FT
Min. Rear Yard	75 FT
Max. Building Height	35 FT
Max. Lot Coverage	6 %

ADDITIONAL FLAG LOT REQUIREMENTS*
1. The required frontage on an improved street may be reduced to not less than 50 FT
2. The access strip shall have a width at all points of at least 50 FT.
3. The body of the lot, exclusive of the access strip shall have an area of at least 20 acres in the MRC District
4. No access lane shall abut another access lane, except that where at least 50% of the tract being developed is set aside in wetlands, wetland buffers, or other permanent open space (public and/or private), no more than two access lanes may abut one another.
5. In the VRC and MRC Districts, there shall be a 100 FT setback from the proposed dwelling to any lot line, and a 200 FT setback from the proposed dwelling to any existing residence.

* Flag lots may be permitted in residential zones only so long as variance relief from bulk standards of the ordinance are requested and granted in order to accommodate unique site conditions.

HOPEWELL TOWNSHIP LIST OF OWNERS WITHIN 200 FEET

Bl 52 Lot 11 Q0067
FOSTER MARY ROEBLING
197 WOOSAMONSA RD
PENNINGTON NJ 08534

Bl 52 Lot 12 Q0088
HUNTER CLARA ESTATE
PO BOX 195
TITUSVILLE NJ 08560

Bl 52 Lot 36
WHEATLEY CLEORA C
144 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Bl 52 Lot 42
JOHNSON GREGORY & SUSANNE
142 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Bl 53 Lot 4
WASHBURN WILLIAM & DORTOHY K
120 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Bl 53 Lot 5 Q0067
FOSTER MARY ROEBLING
197 WOOSAMONSA RD
PENNINGTON NJ 08534

Bl 54 Lot 4
SARAFIN RICHARD JR & IRMA G
116 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Bl 60 Lot 3
BURD D & M EST c/o NICKOLAUS/H
212 NORTH QUEEN ST
LANCASTER PA 17603

Bl 60 Lot 4
BURD THOMAS J
233 GOAT HILL RD
LAMBERTVILLE NJ 08530

Bl 60 Lot 5
COUNTY OF MERCER/STATE OF NJ
640 S BROAD ST/PO BOX 8068
TRENTON NJ 08650

Bl 60 Lot 30
CARRICK GWENDOLYN & JEFFREY
189 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Bl 60 Lot 34
BURD THOMAS J
233 GOAT HILL RD
LAMBERTVILLE NJ 08530

Bl 60 Lot 41
SUCKEWER ADA
10 MADLEAN CIRCLE
PRINCETON NJ 08540

Bl 60 Lot 42
SCHRAGGER JAMES A
145 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Bl 60 Lot 44
PLEASANT VALLEY PROPERTY INC
175 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Bl 60 Lot 45
YAZIJIAN ARMEN D TRUSTEE ESTAT
914 N PENNSYLVANIA AVE
MORRISVILLE PA 19067

Bl 60 Lot 46
SHUKTA BORIS & CHUGUNOVA ELENA
155 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Bl 60 Lot 49
GARDIE RAFI & DAUKSHTA EUGENIA
161 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

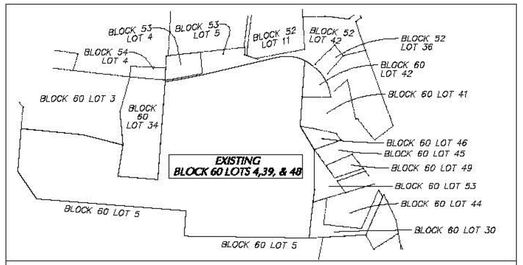
Bl 60 Lot 53
ETCHELLS ALLISON & FRANCINE
163 PLEASANT VALLEY RD
TITUSVILLE NJ 08560

Also need to notify:
JERSEY CENTRAL POWER & LIGHT
c/o GPU SER TAX
PO BOX 1911
MORRISTOWN, NJ 07962–1911

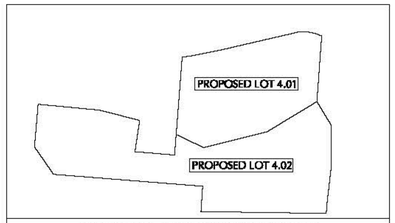
LEGEND

(SYMBOLS NOT SHOWN TO SCALE)

- HYDRANT
- STREET LIGHT
- SIGNAL POLE
- MANHOLE
- WATER VALVE
- GAS VALVE
- UNKNOWN VALVE
- CATCH BASIN
- METAL COVER
- ELECTRIC BOX
- DOOR
- DOUBLE DOOR
- GARAGE DOOR
- PARKING METER
- SPOT ELEVATION
- CLEAN OUT
- TREE
- BENCH MARK
- SIGN
- POLE
- ANCHOR POLE
- BOLLARD
- STORM DRAIN
- SANITARY
- COMBINED SEWER
- CABLE TV TONE OUT
- GAS TONE OUT
- WATER TONE OUT
- ELECTRIC TONE OUT
- TELEPHONE TONE OUT
- STEAM TONE OUT
- UNKNOWN UTILITY TONE OUT
- FENCE (TYPE AS NOTED)
- OVERHEAD WIRE
- GUIDE RAIL (TYPE AS NOTED)
- TREE LINE
- PROPERTY/RIGHT-OF-WAY LINE
- REFERENCED UTILITY LINE (TYPE AS NOTED)–PLOTTED FROM EXISTING MAPPING



EXISTING LOT CONFIGURATION
SCALE: 1"=1000'



PROPOSED LOT CONFIGURATION
SCALE: 1"=1000'

MAP REFERENCES

1. A PLAN ENTITLED "PLAN OF LANDS, DAVID L. STOUT", BY JOHN USMIANI, DATED DECEMBER, 1966 AND REVISED NOVEMBER 1974.
2. A PLAN ENTITLED "MINOR SUBDIVISION, PREPARED FOR G. PATRICK & MARY ANN HIGHAM", DATED JUNE 5, 1987 AND REVISED JULY 16, 87.
3. A PLAN ENTITLED "PLAN OF SURVEY, FOR MERCER COUNTY ACQUISITION OF TRAP ROCK INDUSTRIES PROPERTIES AT BALDPATE MOUNTAIN", BY TRENTON ENGINEERING CO. INC., DATED 3–20–98 AND REVISED 4–1–98.
4. PLANS ENTITLED "PLANS OF PROPOSED CONSTRUCTION, SECTION 5, MOORE'S STATION–ACKOR'S CORNER ROAD".
5. A PLAN ENTITLED "PLAN OF LANDS OF DONALD BURD" BY TRENTON ENGINEERING COMPANY.
6. A PLAN ENTITLED " MINOR SUBDIVISION OF LOTS 1 AND 3 BLOCK 53, FOR FERDINAND W. ROEBLING III AND CHARLES GILBERT", BY TRENTON ENGINEERING CO. INC., DATED 1–30–02 AND REVISED 9–4–02.
7. TAX MAPS OF HOPEWELL TOWNSHIP.
8. HOPEWELL TOWNSHIP STREAM CENTERLINES AND 150–FOOT BUFFER PLAN.

GENERAL NOTES

1. THIS PLAN IS NOT VALID UNLESS EMBOSSED WITH THE SEAL OF THE UNDERSIGNED PROFESSIONAL(S).
2. BOUNDARY INFORMATION AS SHOWN HEREON IS BASED UPON BEST AVAILABLE MAPPING AND DEED THEORY AND A FIELD SURVEY CONDUCTED BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES IN APRIL 2012.
3. THIS PLAN WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE SEARCH. THEREFORE THIS PROPERTY MAY BE SUBJECT TO ADDITIONAL EASEMENTS, RIGHT OF WAYS, COVENANTS, ETC. AS MAY BE DISCLOSED IN A CURRENT, COMPREHENSIVE TITLE SEARCH.
4. THIS MAP REFLECTS SITE CONDITIONS AS THE RESULT OF A FIELD SURVEY PERFORMED BY LANGAN ENGINEERING & ENVIRONMENTAL SERVICES IN APRIL 2012.
5. THE TOPOGRAPHIC INFORMATION SHOWN HEREON WAS COMPILED BY PROMAPS BASED ON A FLIGHT DATED MARCH 23, 2009. LANGAN PERFORMED AERIAL SURVEY CONTROL.
6. NO CERTIFICATION IS MADE BY THE UNDERSIGNED AS TO THE ACTUAL UNDERGROUND POSITION OF ANY UTILITIES OR TO THE COMPLETENESS AND/OR ACCURACY OF UTILITY INFORMATION PROVIDED BY OTHERS.
7. IT IS IMPERATIVE THAT UTILITY COMPANIES BE NOTIFIED PRIOR TO ANY EXCAVATION AND/OR CONSTRUCTION. CALL 1–800–272–1000 TO ORDER UTILITY MARKOUTS.
8. HORIZONTAL REFERENCE DATUM BASED ON DEED BOOK 1219 PAGE 233.
9. VERTICAL REFERENCE DATUM BASED ON NAVD 88 DERIVED BY GPS METHODS.

GRAPHIC SCALE 1"=200'
0 200 400 600

I CERTIFY THAT THIS SUBDIVISION PLAN HAS BEEN APPROVED BY THE MERCER COUNTY PLANNING BOARD.

DIRECTOR DATE

MAP NUMBER

I CERTIFY THAT THIS MAP IS IN ACCORDANCE WITH THE FREE CONSENT AND EXPRESS DESIRES OF THE OWNER AND THAT WE ALSO CONSENT TO THE FILING THEREOF.

AGENT FOR OWNER DATE

RECORD OWNER

BLOCK 60 LOT 4– CLARA HUNTER ESTATE
BLOCK 60 LOT 39 – CLARA HUNTER ESTATE (DB 1219 PG 233)
BLOCK 60 LOT 48 – CLARA HUNTER ESTATE (DB 1367 PG 484)

I HAVE CAREFULLY EXAMINED THIS MAP AND TO THE BEST OF MY KNOWLEDGE AND BELIEF FIND IT CONFORMS WITH THE PROVISIONS OF "THE MAP FILING LAW" RESOLUTION OF APPROVAL AND THE MUNICIPAL ORDINANCES AND REQUIREMENTS APPLICABLE THERETO.

PLANNING BOARD ENGINEER DATE

TO:
SURETY TITLE CORPORATION AND
THE COUNTY OF MERCER;

I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP AND LAND SURVEY MEETS THE MINIMUM SURVEY DETAIL REQUIREMENTS, AS PROMULGATED BY THE STATE BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS AND HAS BEEN MADE UNDER MY SUPERVISION, AND COMPLIES WITH THE PROVISIONS OF "THE MAP FILING LAW" AND THAT THE CORNER MARKERS AS SHOWN HAVE BEEN SET.

JOSEPH E. ROMANO, PROFESSIONAL LAND SURVEYOR DATE
N.J. LICENSE NO. 36273

Date	Description	No.
	Revisions	

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
River Drive Center 1
619 River Drive
Elmwood Park, NJ 07407
P: 201.794.6900 F: 201.794.0366
www.langan.com
NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA VIRGINIA CALIFORNIA NEVADA
NJ Certificate of Authorization No: 24GA27996400

Project
HUNTER FARM
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

Drawing Title
MINOR SUBDIVISION PLAN
BLOCK 60, LOTS 4,39 & 48

Project No. 3649902	Drawing No. VS-101-0101
Date 15 OCTOBER 2012	
Scale 1"=200'	
Drn. By AB	
Checked By JER/SFH	1 OF 1

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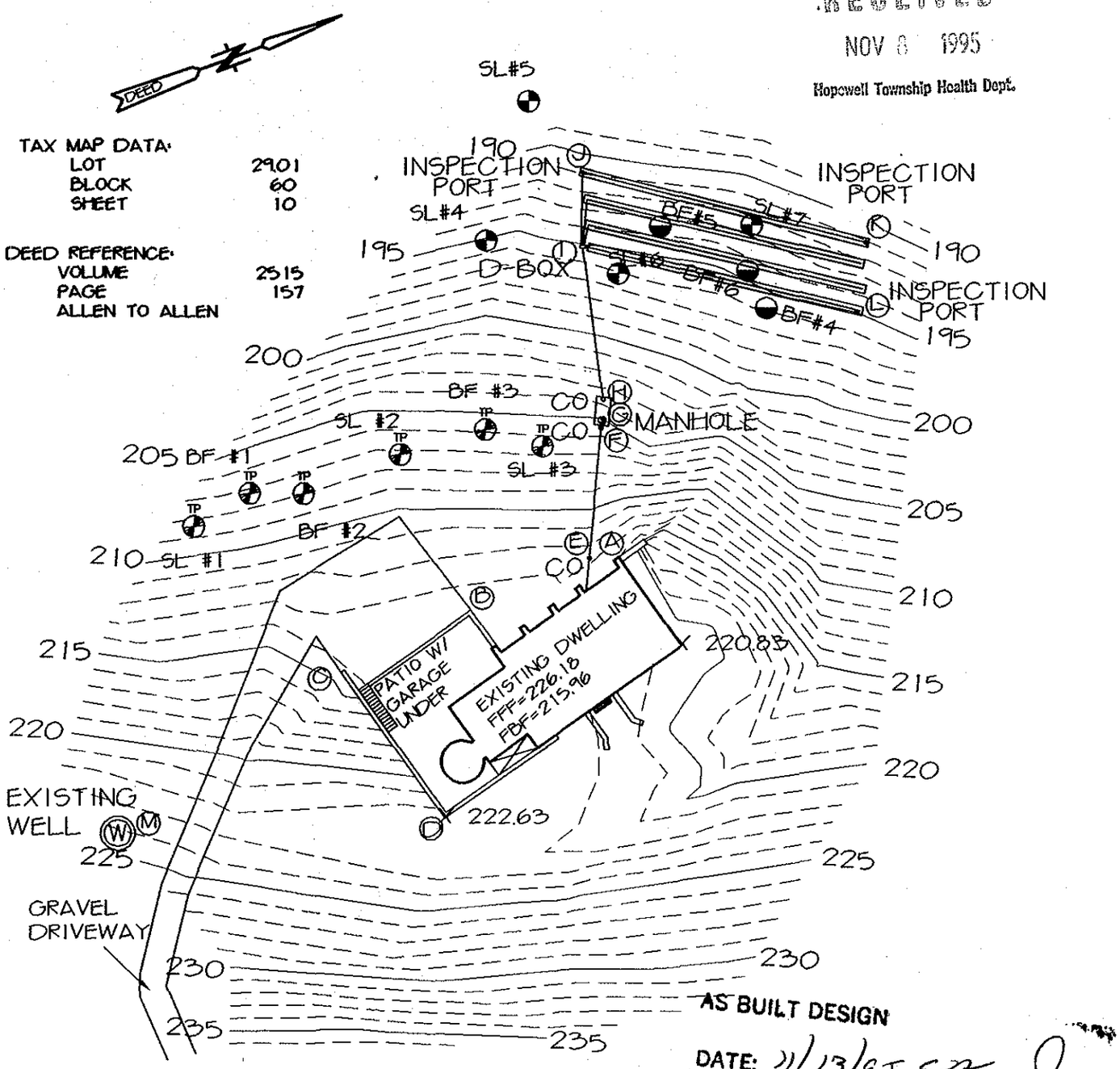
\\langan.com\data\DT\data9\003649902\Survey Data – 003649902\Terramodel\Existing\36499 Subdivision Final.pro Feb 1,2013

RECEIVED
NOV 8 1995
Hopewell Township Health Dept.



HOPEWELL TOWNSHIP HEALTH DEPT

NOTES:
- SUBJECT TO THE FINDINGS OF A TITLE SEARCH
- WAIVER OF SETTING CORNER MARKERS HAS BEEN OBTAINED FROM THE ULTIMATE USER PURSUANT TO THE BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS REGULATION, N.J.A.C. 13:40-5.1(D).
- WETLANDS DELINEATED BY TERRA TECHNOLOGY ON APRIL 11, 1990 AND FIELD LOCATED BY GOLDENBAUM BAILL ASSOCIATES INC., ON APRIL 27, 1990.

EXISTING WELL (W)(N)

	STRUCTURE	DISTANCE A	B	C	D
E	CLEANOUT	10.1	45.3		
F	CLEANOUT	45.5	78.3		
G	MANHOLE	48.2	80.7		
H	CLEANOUT	55.6	87.2		
I	D-BOX	109.6	133.5		
J	INSP. PORT	136.3	159.2		
K	INSP. PORT	141.0	189.6		
L	INSP. PORT	120.1	171.1		
M	WELL			96.7	171.1
N	WELL			236.2	180.1

11/6/95 REVISED SHEET SIZE CHK'D: KEB DRW'N: TFU

KENNETH E. BAILL P.E. 30111, P.P. 04122
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL PLANNER

CLAY E. STANDISH N.J.P.L.S. #36280
NEW JERSEY PROFESSIONAL LAND SURVEYOR

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

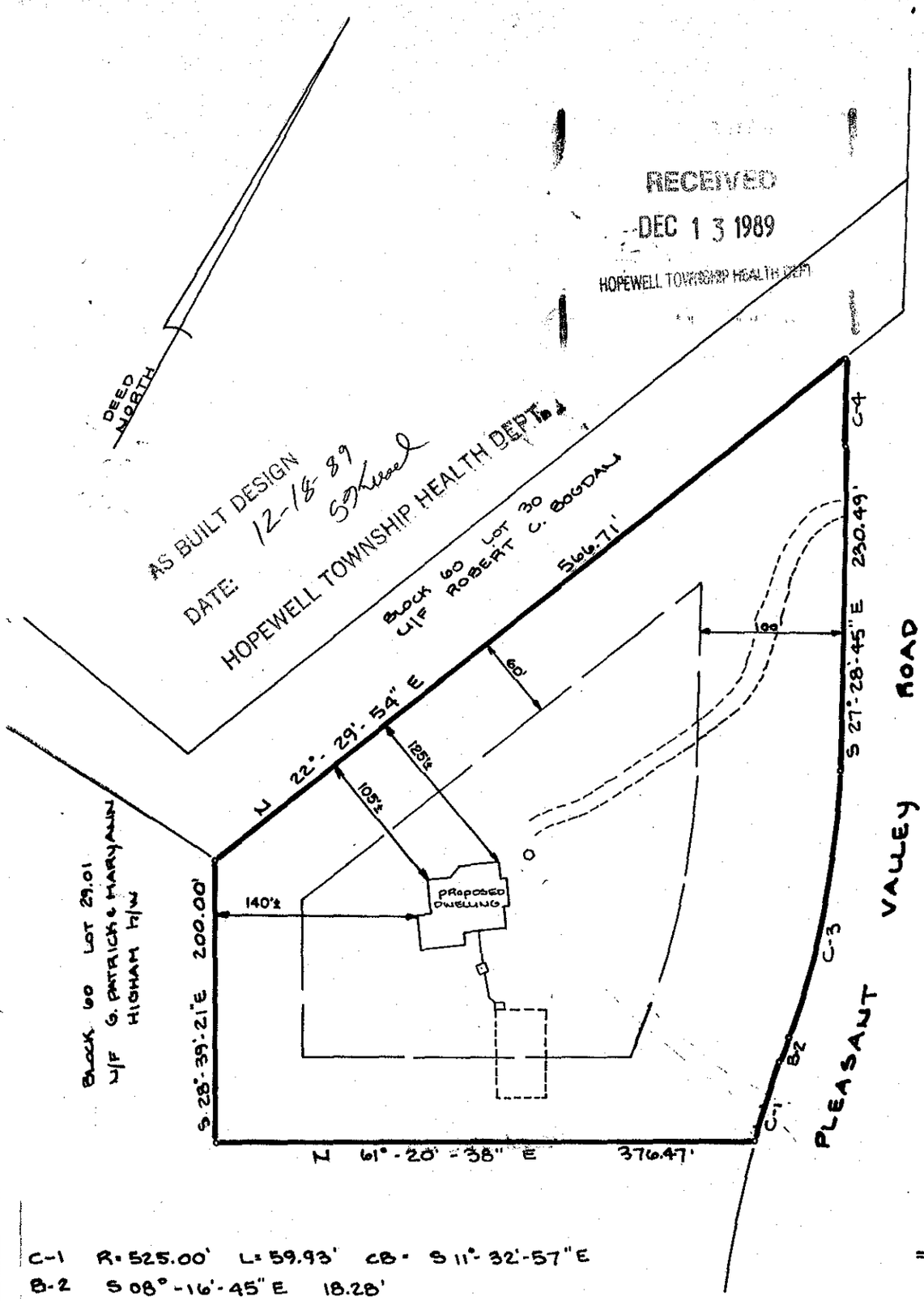
SEPTIC AND GRADING AS-BUILT

PREPARED FOR

BLOCK 60, LOT 29.01

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: JPM	CHECKED BY: KEB/CES	SCALE: 1"=50'	DATE: 3/15/95	PROJ. NO: 83-505-5
FILE: H:\83-505\SEPASDL1				



C-1 R = 525.00' L = 59.93' CB = S 11°-32'-57" E
B-2 S 08°-16'-45" E 18.28'
C-3 R = 575.00' L = 192.69' CB = S 17°-52'-45" E
C-4 R = 2045.00' L = 62.24' CB = S 28°-21'-05" E

TAX MAP DATA
BLOCK 60
LOT 29.02
SHEET 10

CONTAINING:
3.645 AC

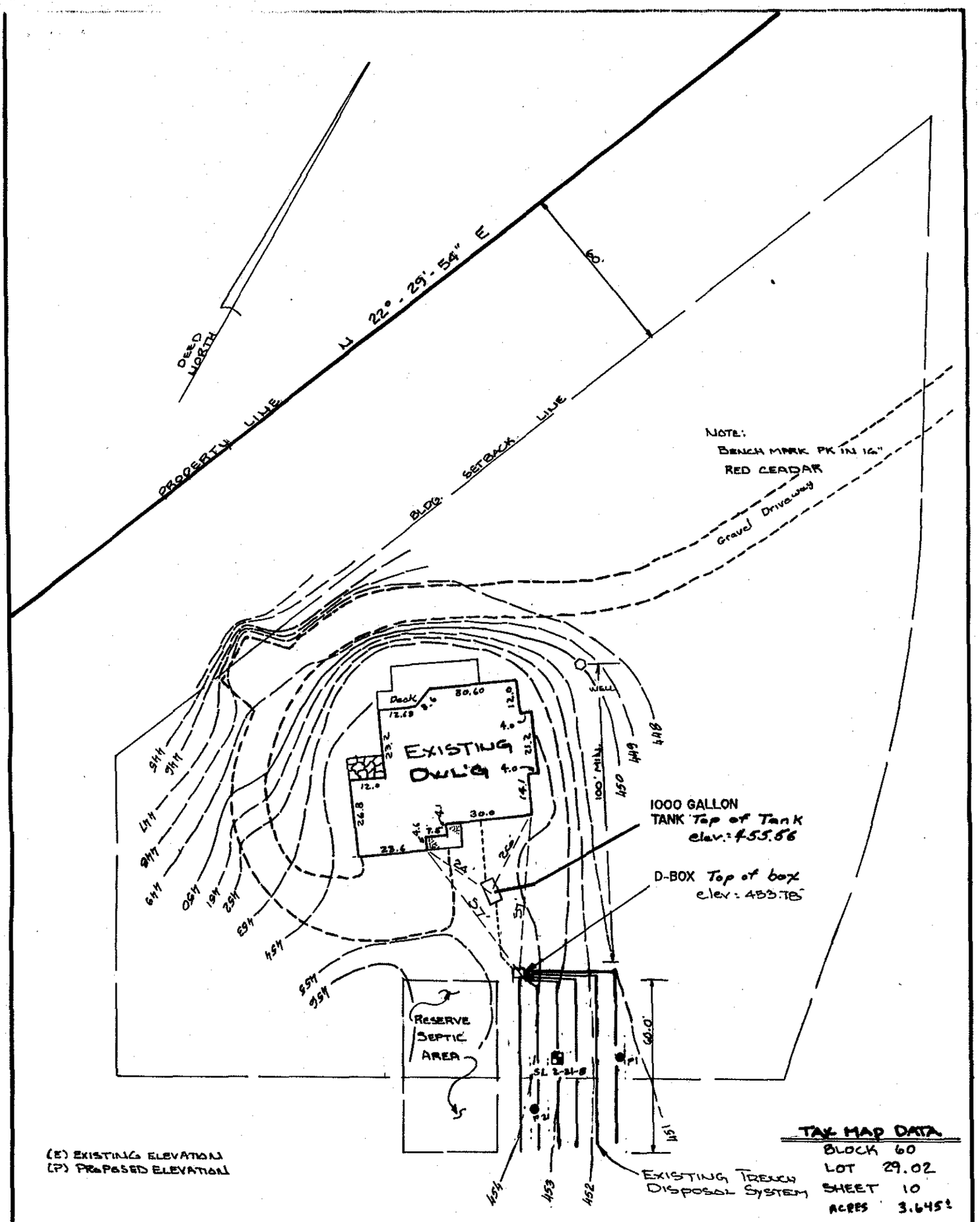
REV.NO.	DATE	REVISION	DRAWN BY	CHK'D BY
2	12/12/89	As built septic system	JL	
1	5/23/89	REV. PER TOWNSHIP HEALTH DEPT LETTER 5/18/89	PAH	

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING · LAND SURVEYING · PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N.J. 08530
Telephone: (609) 397-1505 Fax: (609) 397-1739

SEWAGE DISPOSAL SYSTEM FOR
BLOCK 60 , LOT 29.02
HOPEWELL TOWNSHIP, MERCER CO., NEW JERSEY

Kenneth E. Baill
KENNETH E. BAILL NJPE 30111

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:	SHEET #
AHM	KEB	1" = 100'	5/5/89	83-505-3	1/3



REV.NO.	DATE	REVISION	DRAWN BY	CHK'D BY
2	12/12/89	As built septic system and elevations	JL	
1	5/23/89	Rev per Township Health Dept. Letter 5/18/89	PAH	

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING · LAND SURVEYING · PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N.J. 08530
Telephone: (609) 397-1505 Fax: (609) 397-1739

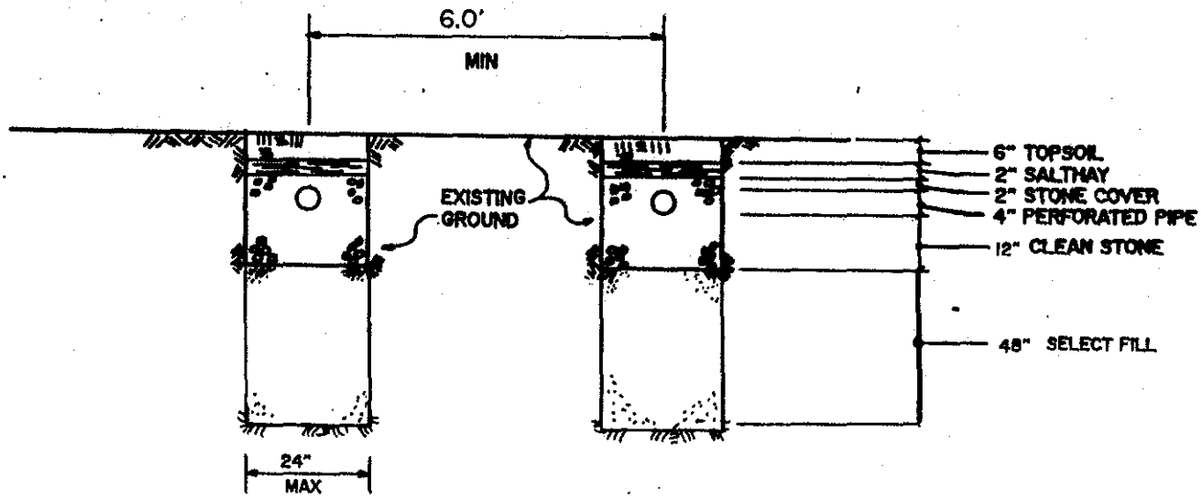
SEWAGE DISPOSAL SYSTEM FOR

BLOCK 60 , LOT 29.02

HOPEWELL TOWNSHIP, MERCER CO., NEW JERSEY

KENNETH E. BAILL NJPE 30111

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:	SHEET #
AHM	KEB	1" = 40'	5/5/89	83-505-3	2/3



TYP. TRENCH SECTION

N.T.S.

GENERAL NOTES

1. PERCOLATION TESTS AND DISPOSAL DESIGN ARE IN ACCORDANCE WITH LOCAL ORDINANCE AND N.J. CHAPTER 199.
2. ALL FIELD PIPE EXCLUDING DISPOSAL FIELD SHALL BE 4" SCH. 40 PVC.
3. MINIMUM SLOPE OF PIPE SHALL BE 1/8" PER. FOOT FOR FIELD PIPE.
4. DISPOSAL SYSTEM SHALL CONSIST OF (6) 4" DIA. PVC PERFORATED PIPES IN DISPOSAL TRENCHES @ 2' X 60'
5. ELEVATIONS ARE BASED ON N.J.G.C.S. MON. # 7661, ELEV. = 240.863
6. THERE ARE NO POTABLE WATERWELLS WITHIN 100' OF PROPOSED DISPOSAL AREA
7. THIS SEPTIC SYSTEM DESIGN IS BASED ON A 4 BEDROOM DWELLING.
8. ALL TREES SHALL BE REMOVED WITHIN 10' OF THE SYSTEM.
9. A CLEANOUT SHALL BE INSTALLED EVERY 50'.

THE ENGINEERS LIABILITY FOR THIS DESIGN TERMINATES AT ACCEPTANCE OR CERTIFICATION BY THE ADMINISTRATIVE AUTHORITY UNLESS THE ENGINEER IS RETAINED TO INSPECT THE INSTALLATION OF THE SYSTEM.

Soil Logs and Percolation Tests were performed on February 21, 1987 and witnessed by Gary Guarino

SOIL LOG - 2-21-B

0 - 8" Topsoil
8" - 30" Sandy clay loam
30" - 76" Sandy clay with rocks 2"-5" in diameter
No water encountered

PERCOLATION TESTS No.1 19" depth 5 min/inch
No.2 24" depth 5 min/inch

REV.NO.	DATE	REVISION	DRAWN BY	CHK'D BY
1	5/23/89	REV PER TOWNSHIP HEALTH DEPT. LETTER 5/12/89	PAH	

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING · LAND SURVEYING · PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N.J. 08530
Telephone: (609) 397-1505 Fax: (609) 397-1739

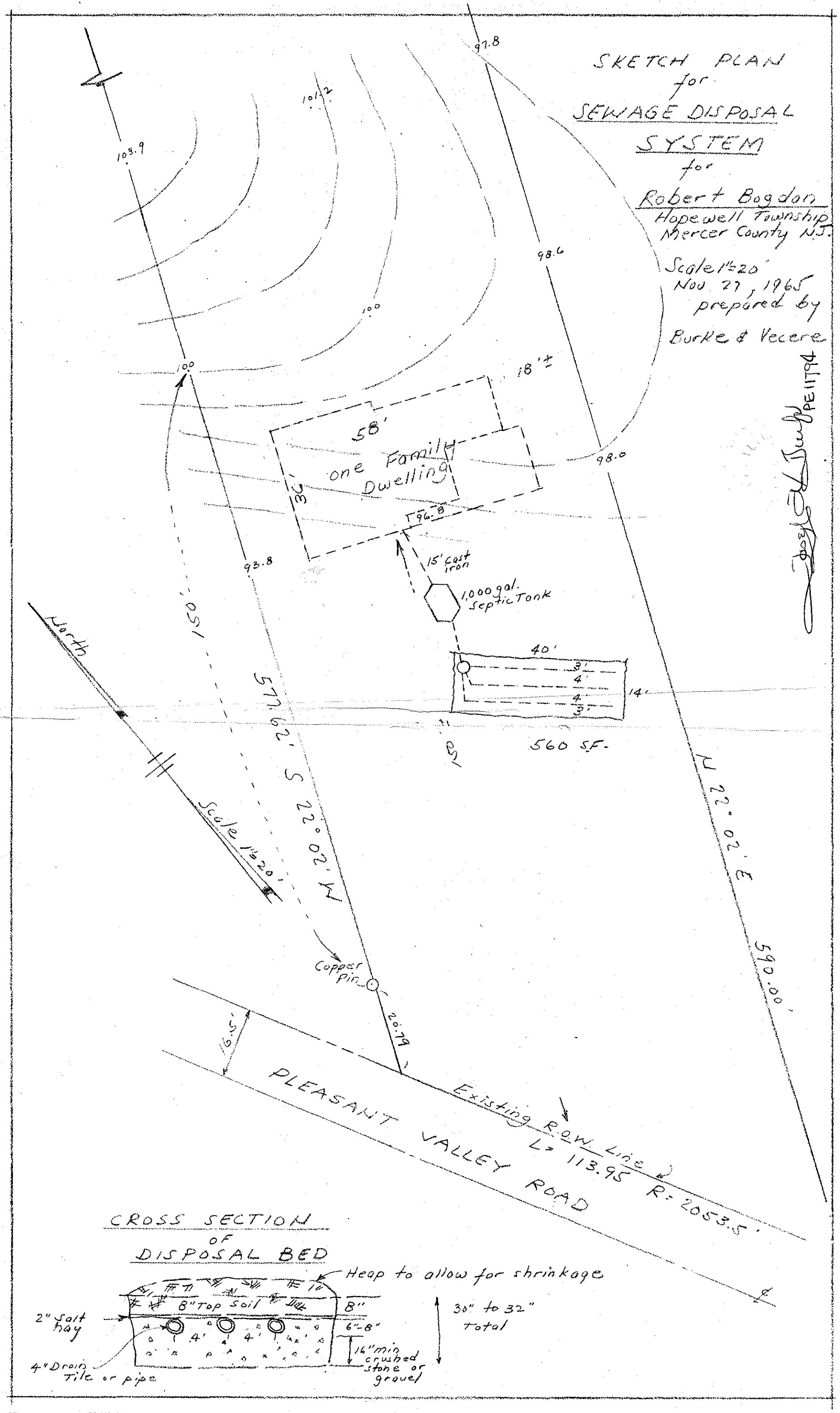
SEWAGE DISPOSAL SYSTEM FOR

BLOCK 60 , LOT 29.02

HOPEWELL TOWNSHIP, MERCER CO., NEW JERSEY

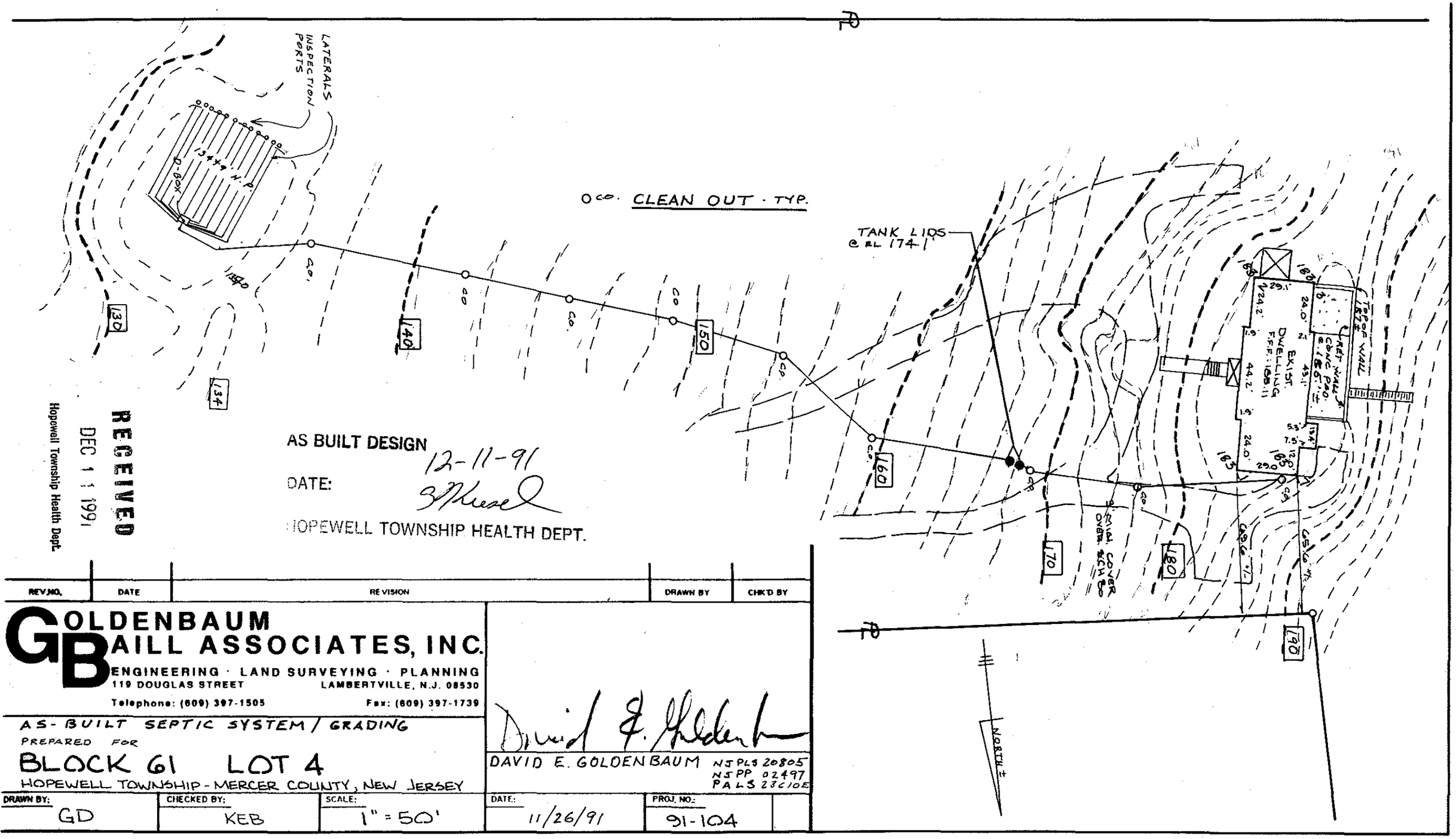
KENNETH E. BAILL NJPE 30111

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:	SHEET #
AHM	KEB	NONE	5/5/89	83-505-3	3/3



BY _____ DATE _____ SUBJECT _____ SHEET NO. _____ OF _____

CHKD. BY _____ DATE _____ JOB NO. _____



AS BUILT DESIGN

DATE: 12-11-91

HOPEWELL TOWNSHIP HEALTH DEPT.

RECEIVED
DEC 11 1991
Hopewell Township Health Dept.

REV. NO.	DATE	REVISION	DRAWN BY	CHK'D BY

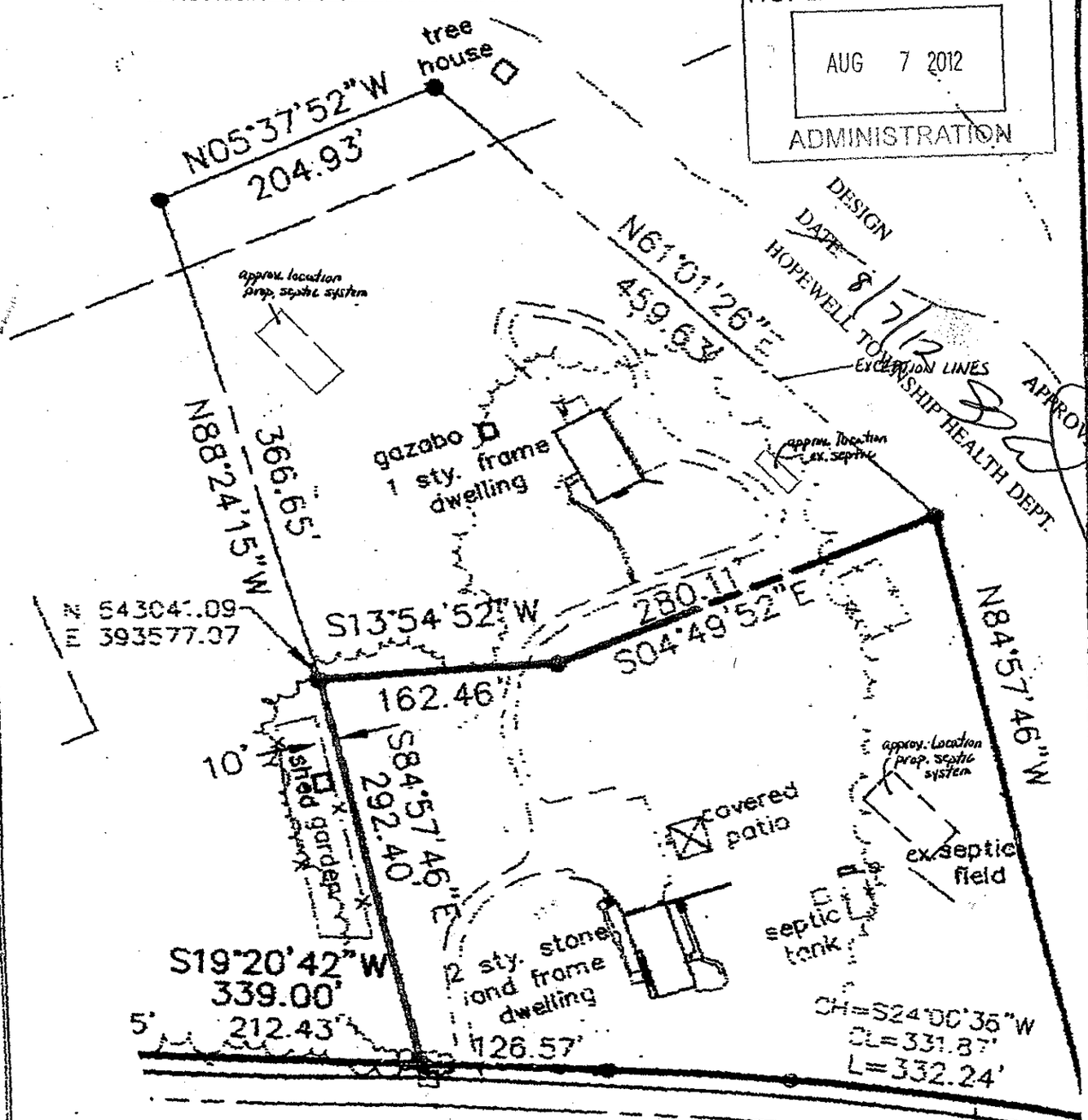
GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING · LAND SURVEYING · PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N.J. 08530
Telephone: (609) 397-1505 Fax: (609) 397-1739

AS-BUILT SEPTIC SYSTEM / GRADING
PREPARED FOR
BLOCK 61 LOT 4
HOPEWELL TOWNSHIP - MERCER COUNTY, NEW JERSEY

DAVID E. GOLDENBAUM NJ PLS 20805 NJ PP 02497 PA LS 23C10E

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:
GD	KEB	1" = 50'	11/26/91	91-104

HOPEWELL TOWNSHIP
AUG 7 2012
ADMINISTRATION



DESIGN
DATE 8/7/12
HOPEWELL TOWNSHIP HEALTH DEPT.
EXCEPTION LINES
APPROVED

General Notes:

1. The property lines, metes and bounds, structures and driveway locations were taken from a plan entitled "Final Survey Plan for Tax Lots 3.01, 3.02, 5.01, 5.02 and 34.01, block 61 situated in Hopewell Township Mercer County, New Jersey" by Site Works Consultants Inc. dated Aug 28, 08.
2. Topography taken from field notes. Topography was shot based on a benchmark set on the first floor of the existing dwelling as shown on page 2. The benchmark was set at an assumed elevation of 97.24.
3. The existing septic tank is to be pumped dry, crushed and backfilled with clean fill.
4. If any part of the existing septic system is excavated, the material must be buried on site.
5. There are no existing wells or septic systems within 100' of the proposed septic system unless otherwise noted.
6. The new septic tank is to be installed and tested for water tightness as per N.J.A.C. 7:9A-8.2
7. This is an alteration to an existing septic system as per N.J.A.C. 7:14A-3.3(d)(e).

REV.	DESCRIPTION	DATE	BY

16 JUL 12

DONALD P. SCHLACHTER DATE
New Jersey Professional Engineer No. 23805

SEPTICS BY PATTERSON, INC.
SOIL TESTING, SEPTIC DESIGN, INSPECTIONS
887 NEW RD. CHURCHVILLE, PA 18966 215-942-9017

SEPTIC SYSTEM DESIGN

PREPARED FOR

BLOCK 61 LOT 5.02

SITUATED IN
HOPEWELL TOWNSHIP MERCER COUNTY

SCALE: —	DRAWN BY:	
DATE: 7/16/12	CHECKED BY:	PAGE: 1 OF 8

N047888

AS - BUILT DESIGN APPROVED
DATE: 2/8/13
HOPEWELL TOWNSHIP HEALTH DEPT.

General Notes:

1. The property line, metes and bounds, and house and structures locations were taken from a plan entitled "Location Survey for Bear Tavern Road Assocaites, L.L.C. Lot 10.01 Block 61 situated in Hopewell Township, Mercer County, New Jersey" by Newton – Land Surveyor, Dated Mar., 2006
2. The existing septic tank or seepage pit is to be pumped out, crushed in place, and backfilled with clean fill.
3. The new septic tank is to be installed and tested for watertightness as per N.J.A.C.7:9A-8.2
4. A benchmark of 100.00 is set on top of the first step leading to the front door as marked.
5. There are no existing wells within 100' of the proposed septic system unless otherwise noted. There are no existing septic systems within 50' of the proposed septic system unless otherwise noted.

REV.	DESCRIPTION	DATE	BY
1	Rev. tank Locations, notes	8/2/12	CAP
2	As-built Dimensions	10/22/12	CAP

DEC 11 2006

DONALD P. SCHLACHTER DATE
New Jersey Professional Engineer No. 23805

SEPTICS BY PATTERSON, INC.
SOIL TESTING, SEPTIC DESIGN, INSPECTIONS
837 NEW RD. CHERCHVILLE, PA 18966 215-968-0017

SEPTIC SYSTEM DESIGN

PREPARED FOR

BLOCK 61 LOT 10.01

SITUATED IN

HOPEWELL TOWNSHIP MERCER COUNTY

SCALE: 1"=50' | DRAWN BY:
DATE: 12/11/06 | CHECKED BY:
PAGE: 2 OF 8

File Copy

RECEIVED

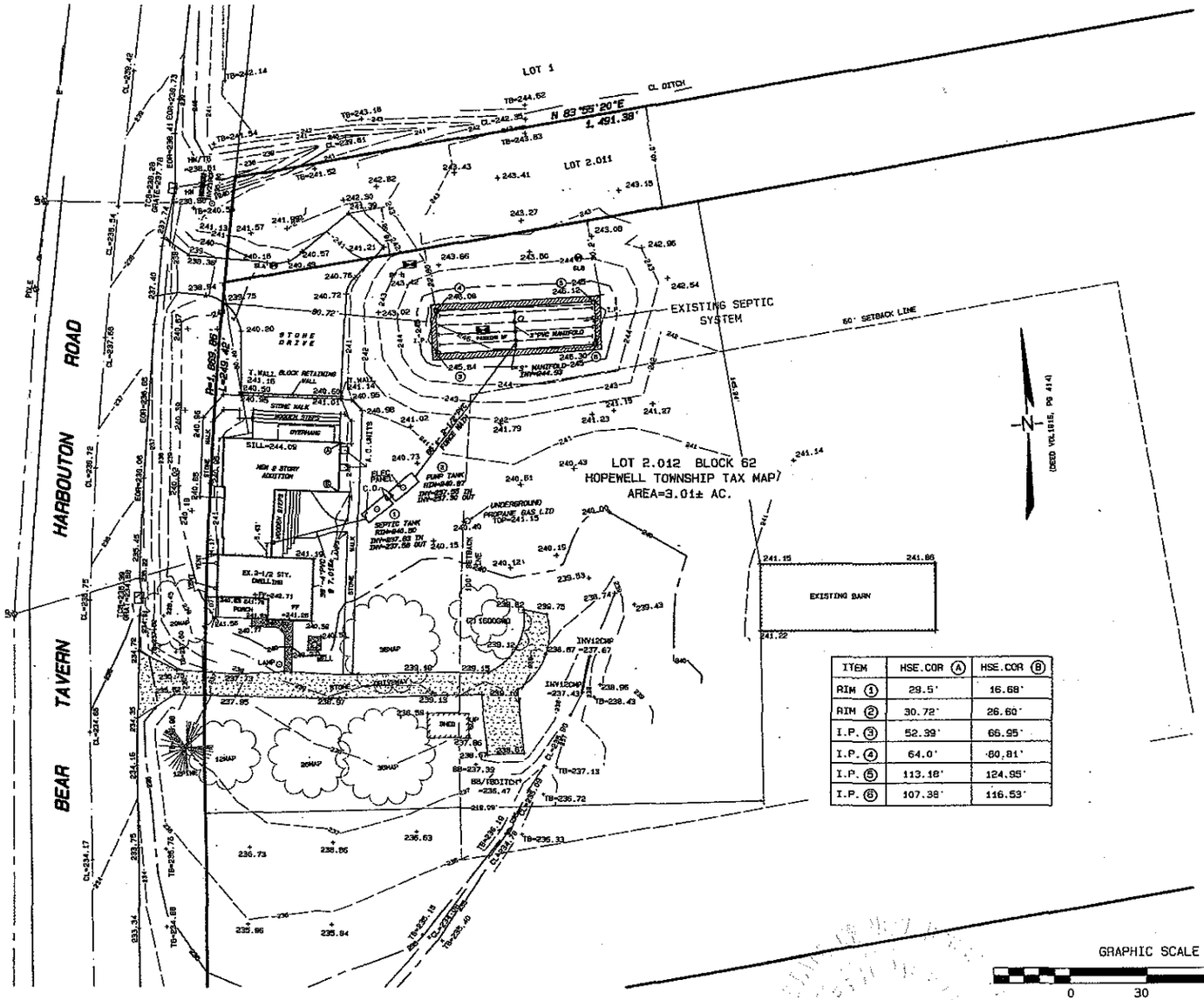
JUL 1 8 2008

HOPEWELL TOWNSHIP HEALTH DEPT.

AS - BUILT DESIGN APPROVED

DATE: 8/7/08

HOPEWELL TOWNSHIP HEALTH DEPT.



ITEM	HSE.COR (A)	HSE.COR (B)
RIM (1)	29.5'	16.68'
RIM (2)	30.72'	26.60'
I.P. (3)	52.39'	66.95'
I.P. (4)	64.0'	80.81'
I.P. (5)	113.18'	124.95'
I.P. (6)	107.38'	116.53'

No.	Date	Description

REVISIONS

TRENTON ENGINEERING CO., INC.
PROFESSIONAL ENGINEERS, PLANNERS AND LAND SURVEYORS
ESTABLISHED 1907
2193 SPRUCE STREET TRENTON, N.J. 08638
TEL. NO. 609-882-0616
FAX. NO. 609-882-8004

D.F. STRATTON L.S. N.J.-27823 P.P.N.J.-6521

JOSEPH MESTER
N.J. PROFESSIONAL ENGINEER AND
PROFESSIONAL LAND SURVEYOR No. 19462

7/10/08 Joseph Mester
DATE

AS-BUILT SEPTIC SYSTEM

(P/O LOT 2.012 BLOCK 62)

for

GARY PATRICELLI

in

HOPEWELL TOWNSHIP
MERCER CO., NEW JERSEY

CERTIFICATE OF AUTHORIZATION NO. 24GA28075300

TAX MAP DATA		
LOT	BLOCK	PAGE
2.012	62	13

DATE 7-09-08

INV. 42440

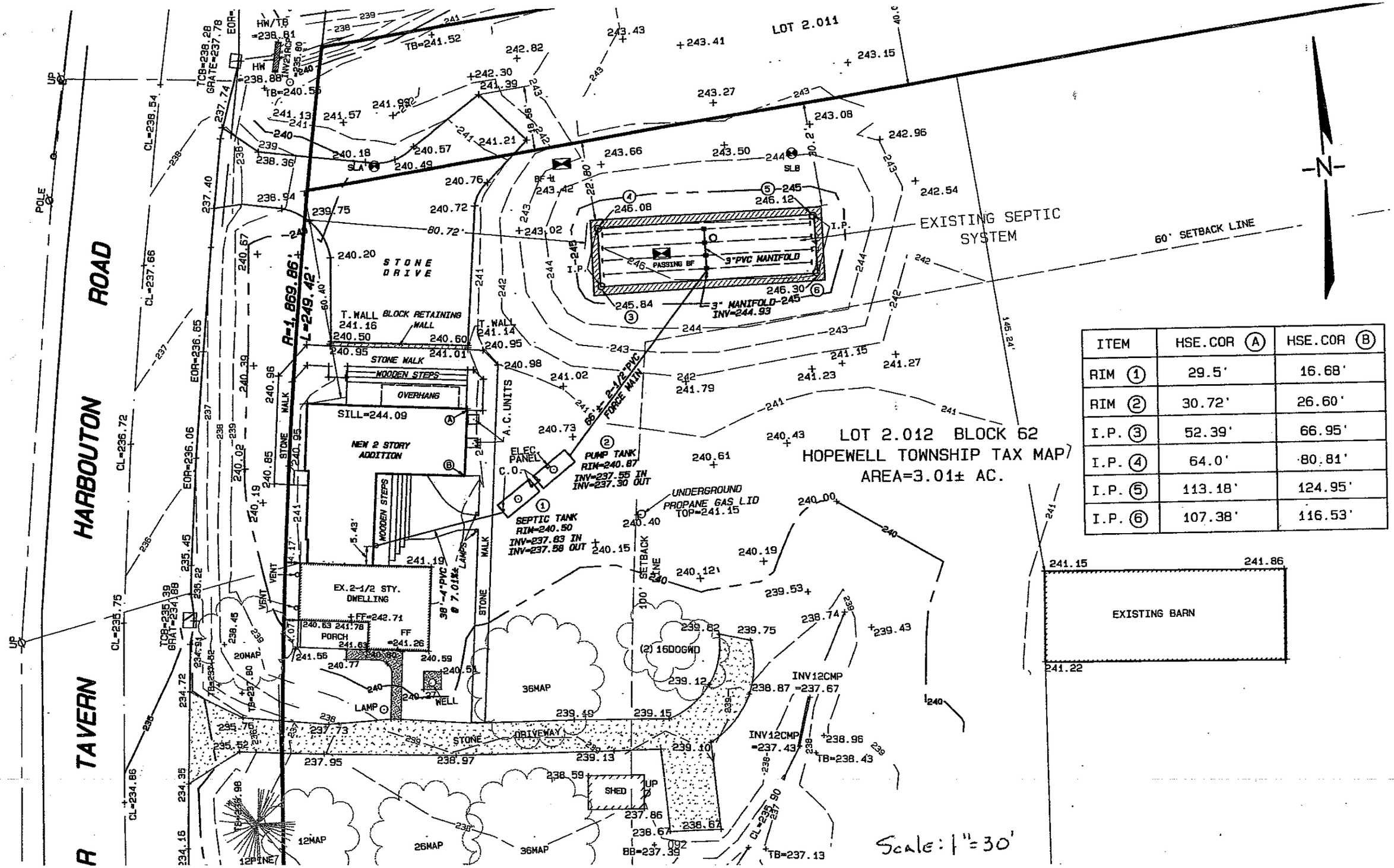
DRAWN BY: DS

SCALE 1"=30'

FB. PG.

FILE 94-61B

C:\wjobs\EXIST\PATRICELLI SEPTIC DES -AS BUILT.pro



ITEM	HSE.COR (A)	HSE.COR (B)
RIM (1)	29.5'	16.68'
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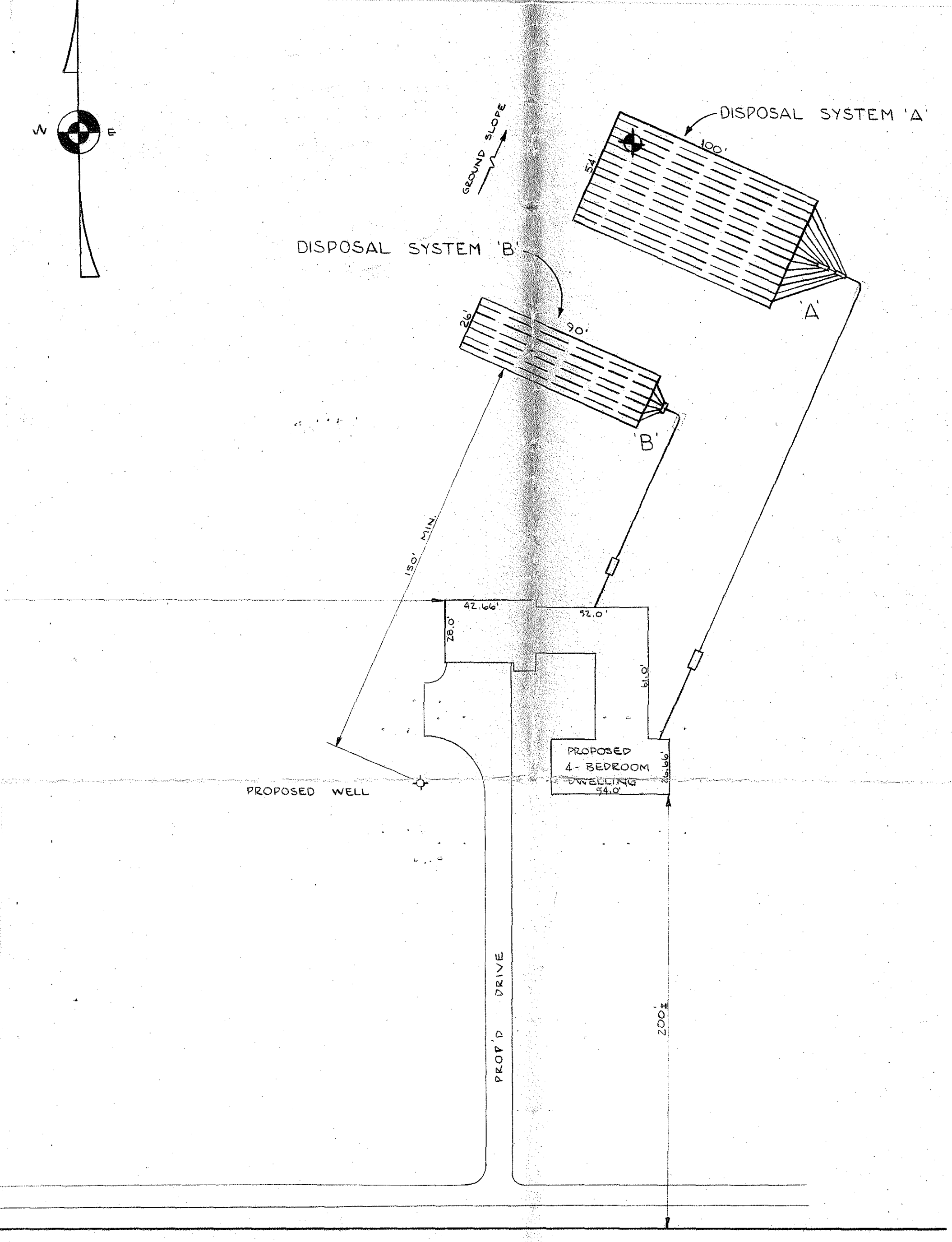
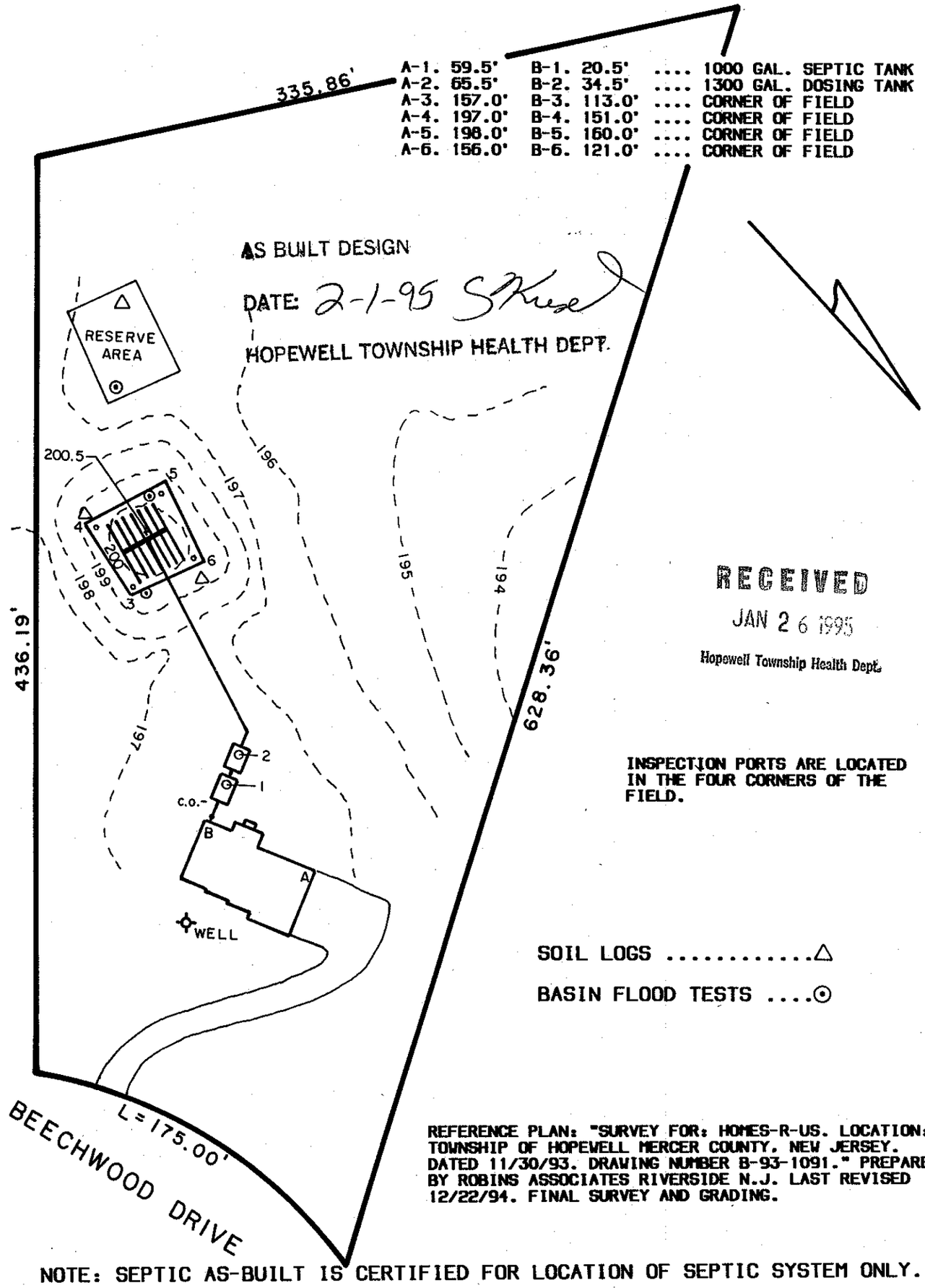
I.P. (4)	64.0'	80.81'
I.P. (5)	113.18'	124.95'
I.P. (6)	107.38'	116.53'


N
E
GROUND SLOPE
DISPOSAL SYSTEM 'A'
100'
54'
'A'
DISPOSAL SYSTEM 'B'
26'
90'
'B'
150' MIN.
42.66'
52.0'
28.0'
61.0'
PROPOSED
4- BEDROOM
DWELLING
54.0'
26.66'
PROPOSED WELL
PROP'D DRIVE
200'±

A-1. 59.5'	B-1. 20.5'	....	1000 GAL. SEPTIC TANK
A-2. 65.5'	B-2. 34.5'	....	1300 GAL. DOSING TANK
A-3. 157.0'	B-3. 113.0'	....	CORNER OF FIELD
A-4. 197.0'	B-4. 151.0'	....	CORNER OF FIELD
A-5. 198.0'	B-5. 160.0'	....	CORNER OF FIELD
A-6. 156.0'	B-6. 121.0'	....	CORNER OF FIELD



REFERENCE PLAN: "SURVEY FOR: HOMES-R-US. LOCATION: TOWNSHIP OF HOPEWELL MERCER COUNTY, NEW JERSEY. DATED 11/30/93. DRAWING NUMBER B-93-1091." PREPARED BY ROBINS ASSOCIATES RIVERSIDE N.J. LAST REVISED 12/22/94. FINAL SURVEY AND GRADING.

NOTE: SEPTIC AS-BUILT IS CERTIFIED FOR LOCATION OF SEPTIC SYSTEM ONLY.

van note-harvey associates
consulting engineers, planners & land surveyors
777 Alexander Road Princeton, N.J. 08540
223 North Main Street Cape May Court House, N.J. 08210

Robert A. Hough 1/26/95
DATE OF SIGNATURE

ROBERT A. HOUGH
N.J. P.E. No. 33444

SEPTIC AS-BUILT PLAN

FOR

HOMES R US INC.

LOT 6.04 BLOCK 72

HOPEWELL TOWNSHIP MERCER CO., N.J.

SCALE 1" = 60' JANUARY 1995.

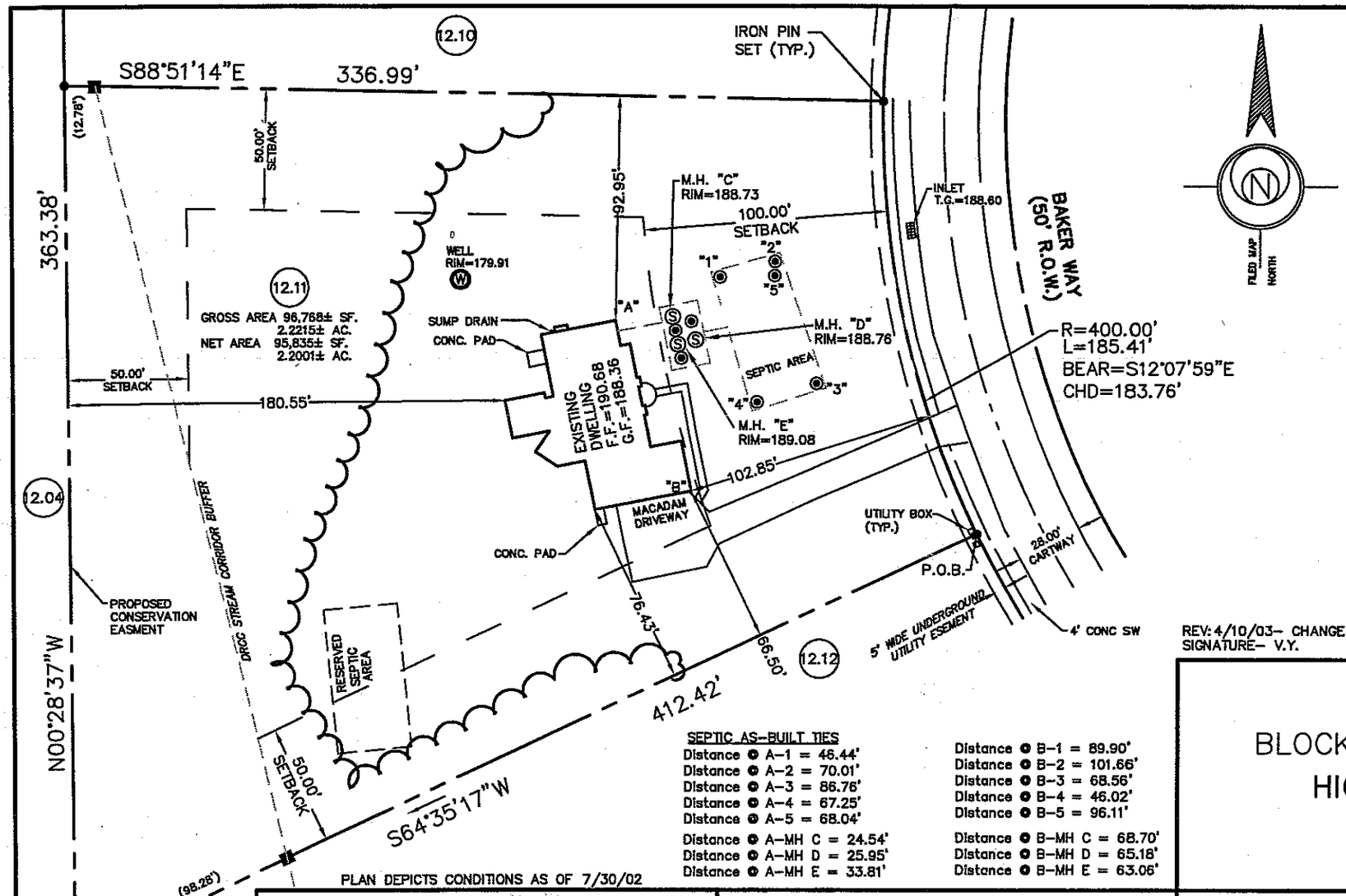
DRAWN BY	FIELD BK	ORDER No.	FILE No.	SHEET No.
BJF	PAGE	2.22. 31537-33		1 OF 1
CHECKED BY				

8.5 x 14 VNH TITLE BLOCK MYLAR - 927[0.37]PF: SEPTIC 150 20-Jan-95 09:59 AM / 4.11.00010-94

AS - BUILT DESIGN APPROVED

DATE: 5/7/03

HOPEWELL TOWNSHIP HEALTH DEPT.



I HEREBY CERTIFY THAT THIS SURVEY WAS ACTUALLY MADE ON THE GROUND AS PER RECORD DESCRIPTION AND IS CORRECT AND THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES EXCEPT AS SHOWN.

THIS CERTIFICATION IS MADE ONLY TO THE ABOVE NAMED PARTIES FOR PURCHASE AND/ OR MORTGAGE FOR HEREIN DELINEATED PROPERTY BY BELOW NAMED PURCHASER. NO RESPONSIBILITY OR LIABILITY IS ASSUMED BY SURVEYOR FOR USE OF SURVEY FOR ANY OTHER PURPOSE INCLUDING, BUT NOT LIMITED TO USE OF SURVEY FOR SURVEY AFFIDAVIT, RESALE OF PROPERTY, OR TO ANY OTHER PERSON NOT LISTED IN CERTIFICATION, EITHER DIRECTLY OR INDIRECTLY.

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.11 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITTLED: "FINAL PLAT –SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 1/13/99, PREPARED BY: HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00 AS MAP NO. 3759

REV: 4/10/03– CHANGE TITLBLOCK PER HEALTH DEPARTMENT, ADD ENGINEER SIGNATURE– V.Y.

SEPTIC AS-BUILT TIES

Distance @ A-1 = 46.44'	Distance @ B-1 = 89.90'
Distance @ A-2 = 70.01'	Distance @ B-2 = 101.66'
Distance @ A-3 = 86.76'	Distance @ B-3 = 68.56'
Distance @ A-4 = 67.25'	Distance @ B-4 = 46.02'
Distance @ A-5 = 68.04'	Distance @ B-5 = 96.11'
Distance @ A-MH C = 24.54'	Distance @ B-MH C = 68.70'
Distance @ A-MH D = 25.95'	Distance @ B-MH D = 65.18'
Distance @ A-MH E = 33.81'	Distance @ B-MH E = 63.06'

PLAN DEPICTS CONDITIONS AS OF 7/30/02

MAP OF
"SEPTIC AS-BUILT"

BLOCK 62 LOT 12.11

HIGH POINTE AT HOPEWELL

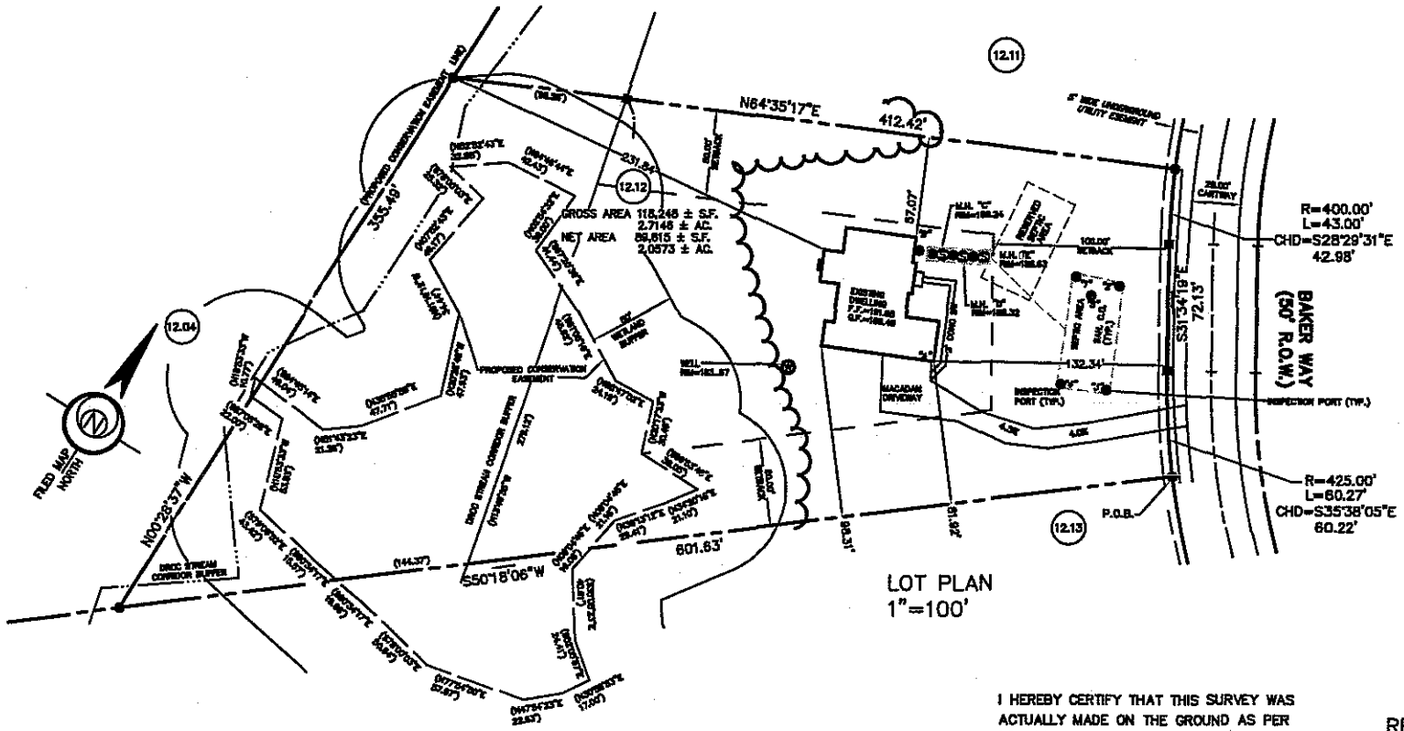
HOPWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 4/10/03
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE – 40873

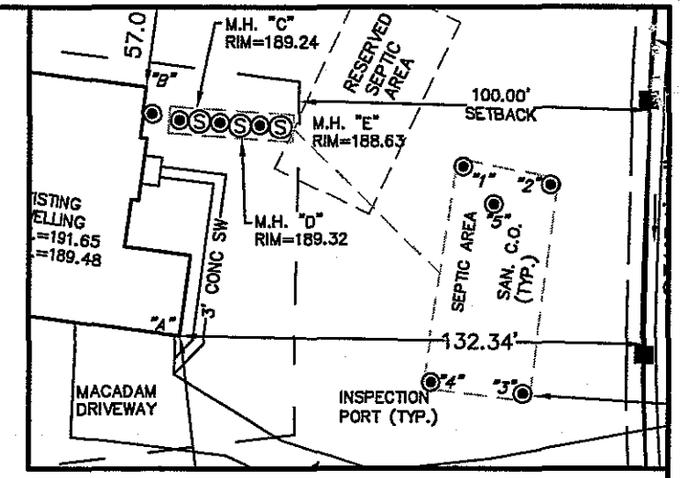
DATE 4/10/03
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC., PA.
2747 PHILMONT AVENUE
HUNTINGDON VALLEY, PA. 19006
215/914–2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION No. GA277044

DESIGNED:	DRAWN: VY	CHECKED: WCB
SCALE: 1"=60'	DATE: 8/02/02	DWG. NO.: TBI #03SEPAB



LOT PLAN
1"=100'



SEPTIC AS-BUILT DETAIL
1"=50'

SEPTIC AS-BUILT TIES

Distance @ A-1 = 93.71'	*Distance @ B-1 = 93.10'*
Distance @ A-2 = 113.70'	*Distance @ B-2 = 118.45'*
Distance @ A-3 = 98.95'	*Distance @ B-3 = 138.11'*
Distance @ A-4 = 72.69'	*Distance @ B-4 = 116.64'*
Distance @ A-5 = 96.71'	*Distance @ B-5 = 104.41'*
Distance @ A-MH C = 61.37'	*Distance @ B-MH C = 22.66'*
Distance @ A-MH D = 62.13'	*Distance @ B-MH D = 26.23'*
Distance @ A-MH E = 64.93'	*Distance @ B-MH E = 38.22'*

I HEREBY CERTIFY THAT THIS SURVEY WAS ACTUALLY MADE ON THE GROUND AS PER RECORD DESCRIPTION AND IS CORRECT AND THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES EXCEPT AS SHOWN.

THIS CERTIFICATION IS MADE ONLY TO THE ABOVE NAMED PARTIES FOR PURCHASE AND/OR MORTGAGE FOR HEREIN DELINEATED PROPERTY BY BELOW NAMED PURCHASER. NO RESPONSIBILITY OR LIABILITY IS ASSUMED BY SURVEYOR FOR USE OF SURVEY FOR ANY OTHER PURPOSE INCLUDING, BUT NOT LIMITED TO USE OF SURVEY FOR SURVEY AFFIDAVIT, RESALE OF PROPERTY, OR TO ANY OTHER PERSON NOT LISTED IN CERTIFICATION, EITHER DIRECTLY OR INDIRECTLY.

REV: 4/09/03-- CHANGE TITLEBLOCK PER HEALTH DEPARTMENT, ADD ENGINEER SIGNATURE- V.Y.

AS - BUILT DESIGN APPROVED
DATE: 5/7/03
HOPEWELL TOWNSHIP HEALTH DEPT.

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.12 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITTLED: "FINAL PLAT -SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL"
DATED 9/18/00,
PREPARED BY: HOPEWELL VALLEY ENGINEERING, P.C.
AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00
AS MAP NO. 3759

MAP OF
"SEPTIC AS-BUILT"
BLOCK 62 LOT 12.12
HIGH POINTE AT HOPEWELL

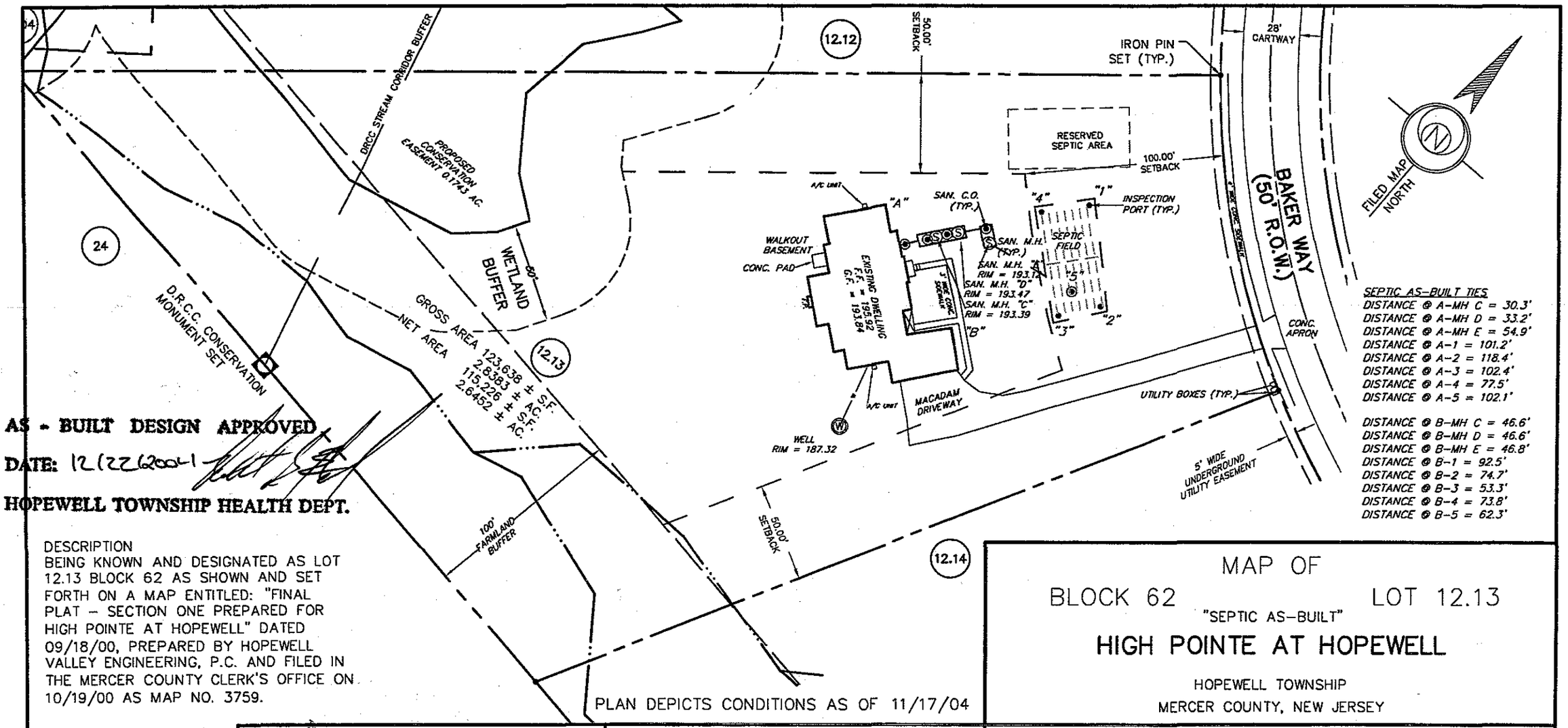
HOPWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 4/10/03
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE - 40873

DATE 4/10/03
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC., PA.
2747 PHILMONT AVENUE
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION No. GA277044

DESIGNED:	DRAWN: VY	CHECKED: WCB
SCALE: AS-NOTED	DATE: 1/25/03	DWG. NO.: TBI #4-SEPAB



SEPTIC AS-BUILT TIES
DISTANCE @ A-MH C = 30.3'
DISTANCE @ A-MH D = 33.2'
DISTANCE @ A-MH E = 54.9'
DISTANCE @ A-1 = 101.2'
DISTANCE @ A-2 = 118.4'
DISTANCE @ A-3 = 102.4'
DISTANCE @ A-4 = 77.5'
DISTANCE @ A-5 = 102.1'

DISTANCE @ B-MH C = 46.6'
DISTANCE @ B-MH D = 46.6'
DISTANCE @ B-MH E = 46.8'
DISTANCE @ B-1 = 92.5'
DISTANCE @ B-2 = 74.7'
DISTANCE @ B-3 = 53.3'
DISTANCE @ B-4 = 73.8'
DISTANCE @ B-5 = 62.3'

AS - BUILT DESIGN APPROVED

DATE: 12/22/2004

HOPEWELL TOWNSHIP HEALTH DEPT.

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.13 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT – SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 09/18/00, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 10/19/00 AS MAP NO. 3759.

PLAN DEPICTS CONDITIONS AS OF 11/17/04

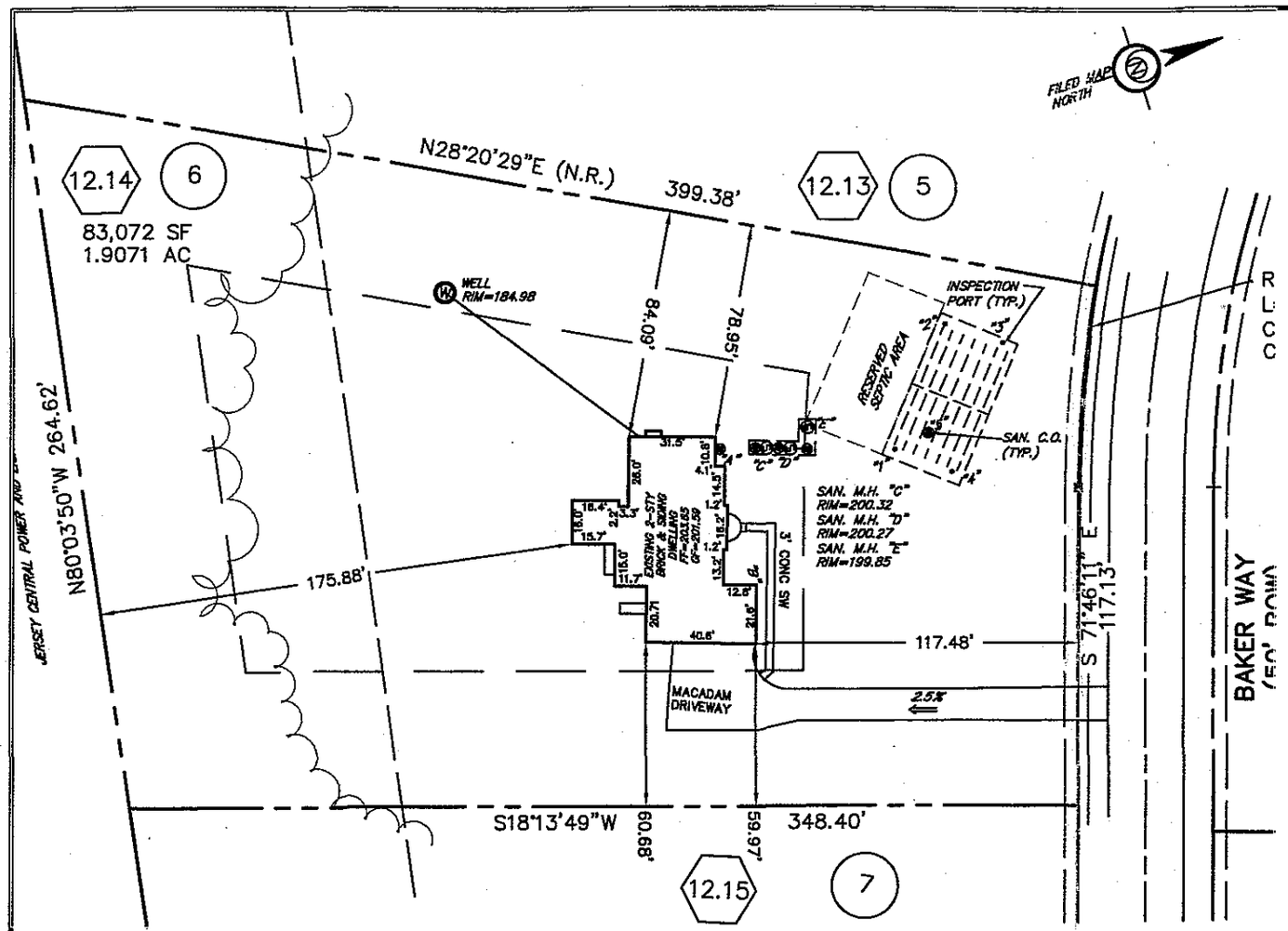
MAP OF
BLOCK 62 LOT 12.13
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 11/24/04
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE – 40873

Byron W. Rimmer 11/24/04
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2050
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: 1" = 60'	DATE: 11/24/04	FILE: LOT005AB



SEPTIC AS-BUILT TIES

DISTANCE @ A-1=62.6'	DISTANCE @ B-1=70.7'
DISTANCE @ A-2=95.8'	DISTANCE @ B-2=117.1'
DISTANCE @ A-3=111.0'	DISTANCE @ B-3=126.1'
DISTANCE @ A-4=83.0'	DISTANCE @ B-4=82.1'
DISTANCE @ A-5=88.9'	DISTANCE @ B-5=96.0'
DISTANCE @ A-MH C=21.5'	DISTANCE @ B-MH C=50.9'
DISTANCE @ A-MH D=25.2'	DISTANCE @ B-MH D=51.7'
DISTANCE @ A-MH E=33.6'	DISTANCE @ B-MH E=60.9'

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.14 BLOCK 62
AS SHOWN AND SET FORTH ON A MAP ENTITTLED:
"FINAL PLAT-SECTION ONE PREPARED FOR
HIGH POINTE AT HOPEWELL"
DATED 9/18/00,
PREPARED BY: HOPEWELL VALLEY ENGINEERING, P.C.
AND FILED IN THE MERCER COUNTY CLERK'S OFFICE
ON 12/19/00
AS MAP NO. 3759

AS - BUILT DESIGN APPROVED
DATE: 8/10/04
HOPEWELL TOWNSHIP HEALTH DEPT.

RECEIVED
OCT 01 2003
Hopewell Township Health Dept.

MAP OF
BLOCK 62 "SEPTIC AS-BUILT" LOT 12.14
HIGH POINTE AT HOPEWELL

HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 9/29/03
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE - 40873

DATE 9/29/03
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: DANT	CHECKED: V.Y.
SCALE: 1"=60'	DATE: 9/24/03	DWG. NO.: TBI #06

AS - BUILT DESIGN APPROVED

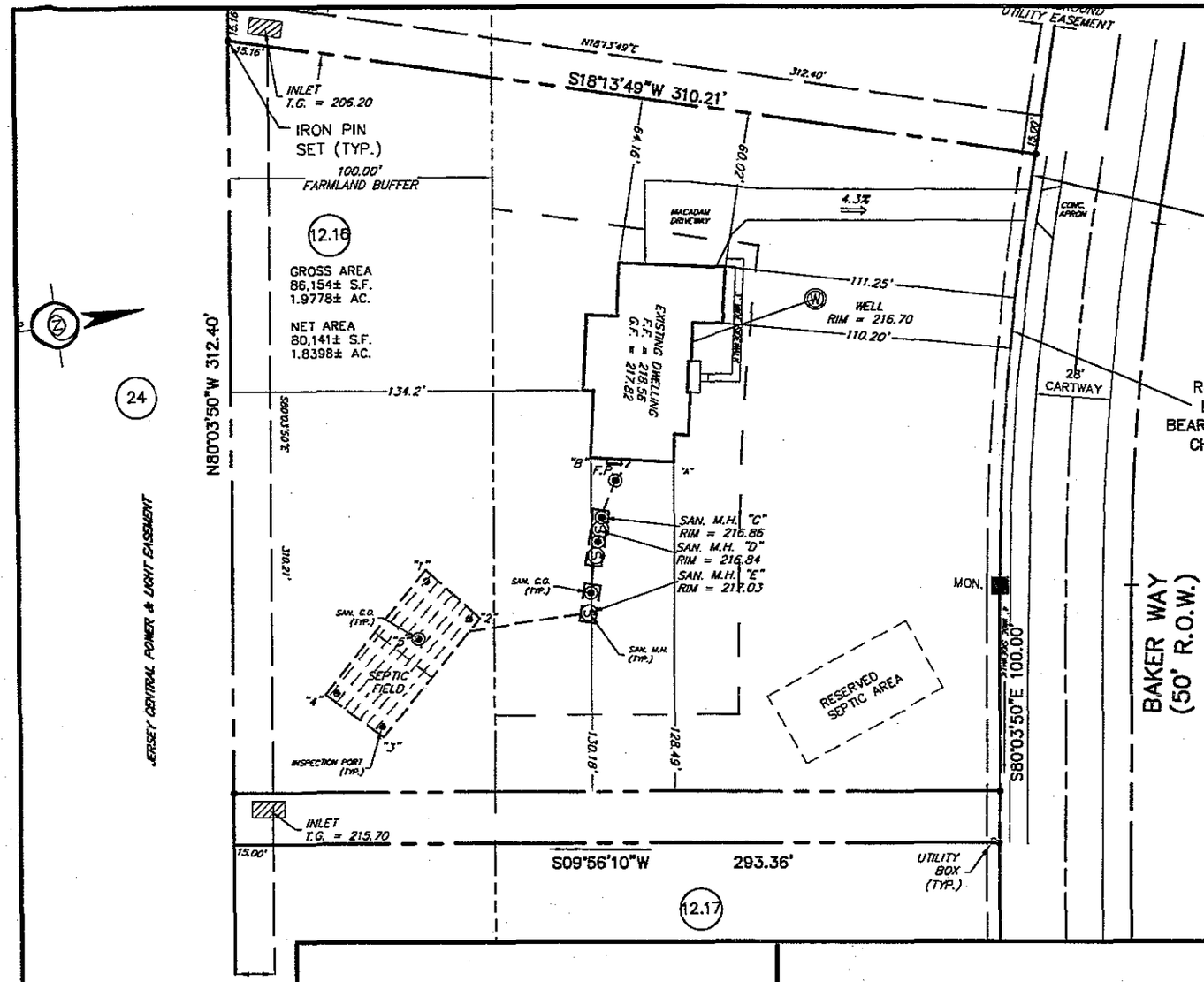
DATE: 10/20/04

HOPEWELL TOWNSHIP HEALTH DEPT.

RECEIVED

OCT 20 2004

Hopewell Township Health Dept.



SEPTIC AS-BUILT TIES

DISTANCE @ A-MH C = 37.4'
DISTANCE @ A-MH D = 39.9'
DISTANCE @ A-MH E = 67.2'
DISTANCE @ A-1 = 105.5'
DISTANCE @ A-2 = 99.4'
DISTANCE @ A-3 = 151.9'
DISTANCE @ A-4 = 157.3'
DISTANCE @ A-5 = 119.6'

DISTANCE @ B-MH C = 24.8'
DISTANCE @ B-MH D = 28.2'
DISTANCE @ B-MH E = 60.5'
DISTANCE @ B-1 = 79.3'
DISTANCE @ B-2 = 78.2'
DISTANCE @ B-3 = 131.6'
DISTANCE @ B-4 = 133.7'
DISTANCE @ B-5 = 96.6'

PLAN DEPICTS CONDITIONS AS OF 09/15/04

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.16 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT – SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 09/18/00, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00 AS MAP NO. 3759.

MAP OF

BLOCK 62 LOT 12.16

"SEPTIC AS-BUILT"

HIGH POINTE AT HOPEWELL

HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 9/21/04

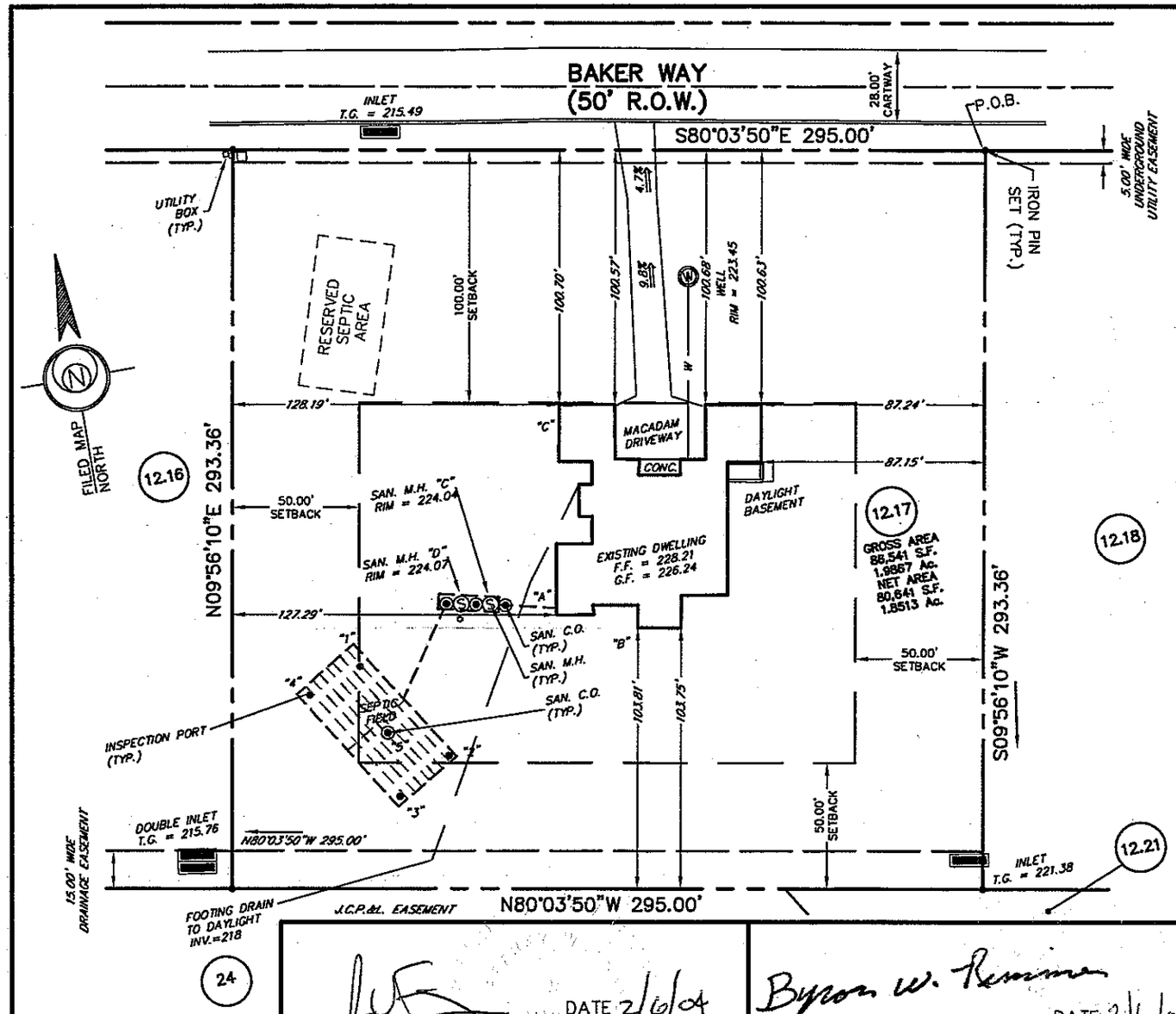
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE – 40873

DATE 9/21/04

BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: 1"=60'	DATE: 09/17/04	FILE: LOT008AB



DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.17 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITTLED: "FINAL PLAT-SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL"
DATED 9/18/00,
PREPARED BY: HOPEWELL VALLEY ENGINEERING, P.C.
AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00
AS MAP NO. 3759

PLAN DEPICTS CONDITIONS AS OF 01/21/04

SEPTIC AS-BUILT TIES
DISTANCE @ A-1 = 79.55'
DISTANCE @ A-2 = 70.24'
DISTANCE @ A-3 = 94.70'
DISTANCE @ A-4 = 101.82'
DISTANCE @ A-5 = 80.93'
DISTANCE @ A-MH C = 26.49'
DISTANCE @ A-MH D = 30.13'

DISTANCE @ B-1 = 93.88'
DISTANCE @ B-2 = 90.21'
DISTANCE @ B-3 = 104.85'
DISTANCE @ B-4 = 115.92'
DISTANCE @ B-5 = 93.66'

DISTANCE @ C-MH C = 84.00'
DISTANCE @ C-MH D = 85.51'

AS - BUILT DESIGN APPROVED
DATE: 2/23/04
HOPEWELL TOWNSHIP HEALTH DEPT.

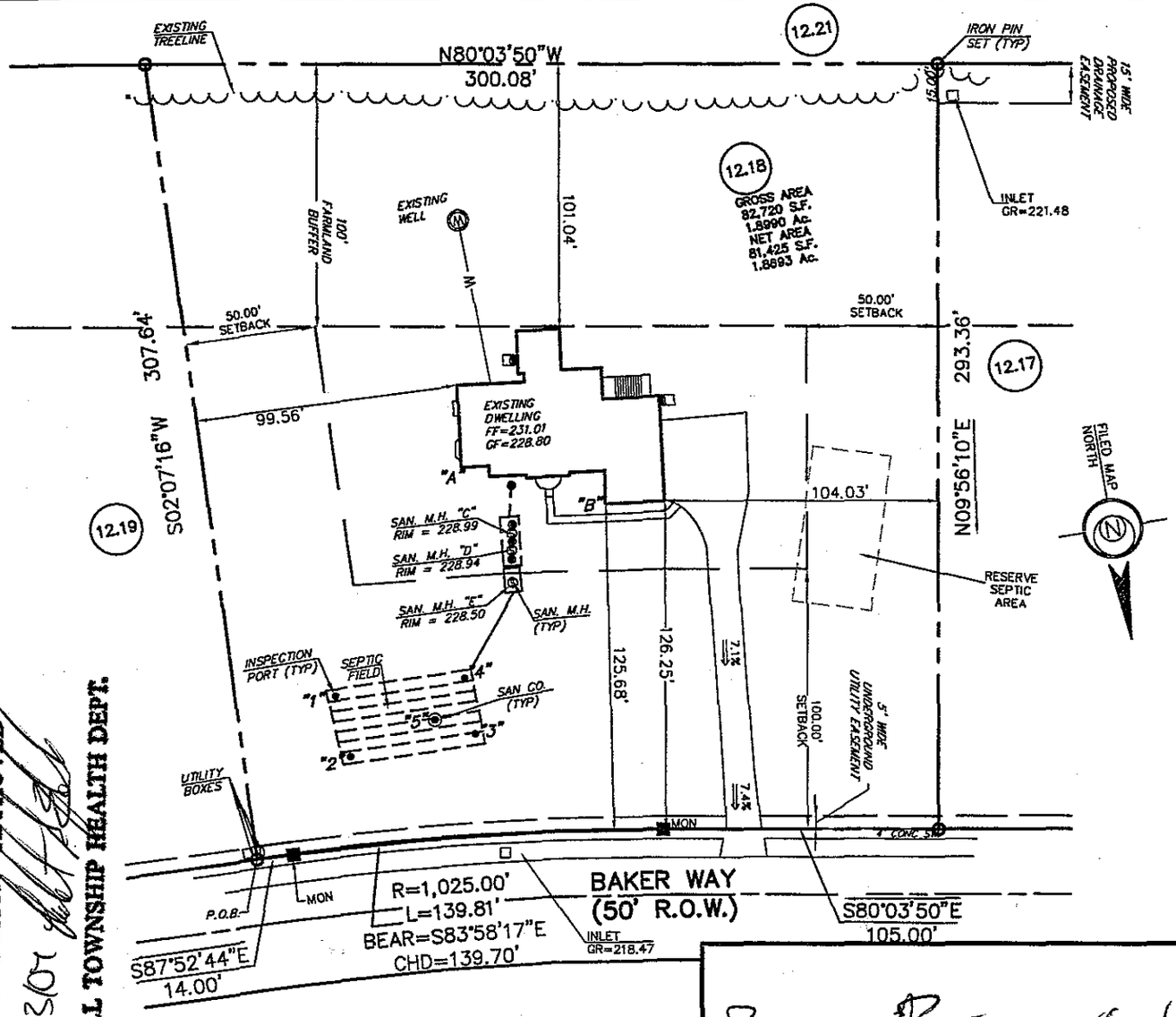
MAP OF
BLOCK 62 LOT 12.17
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 2/6/04
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE - 40873

DATE 2/6/04
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: V.Y.
SCALE: 1"=60'	DATE: 01/22/04	FILE: LOT009AB



DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.18 BLOCK 62
AS SHOWN AND SET FORTH ON A MAP ENTITLED:
"FINAL PLAT-SECTION ONE PREPARED FOR
HIGH POINTE AT HOPEWELL"
DATED 9/18/00,
PREPARED BY: HOPEWELL VALLEY ENGINEERING, P.C.
AND FILED IN THE MERCER COUNTY CLERK'S OFFICE
ON 12/19/00
AS MAP NO. 3759

SEPTIC AS-BUILT TIES
DISTANCE @ A-1 = 99.7'
DISTANCE @ A-2 = 118.9'
DISTANCE @ A-3 = 102.5'
DISTANCE @ A-4 = 80.9'
DISTANCE @ A-5 = 97.4'
DISTANCE @ A-MH C = 33.1'
DISTANCE @ A-MH D = 36.1'
DISTANCE @ A-MH E = 47.5'

DISTANCE @ B-1 = 126.4'
DISTANCE @ B-2 = 137.7'
DISTANCE @ B-3 = 101.7'
DISTANCE @ B-4 = 86.1'
DISTANCE @ B-5 = 105.8'
DISTANCE @ B-MH C = 37.8'
DISTANCE @ B-MH D = 38.9'
DISTANCE @ B-MH E = 46.0'

PLAN DEPICTS CONDITIONS AS OF 8-21-2004

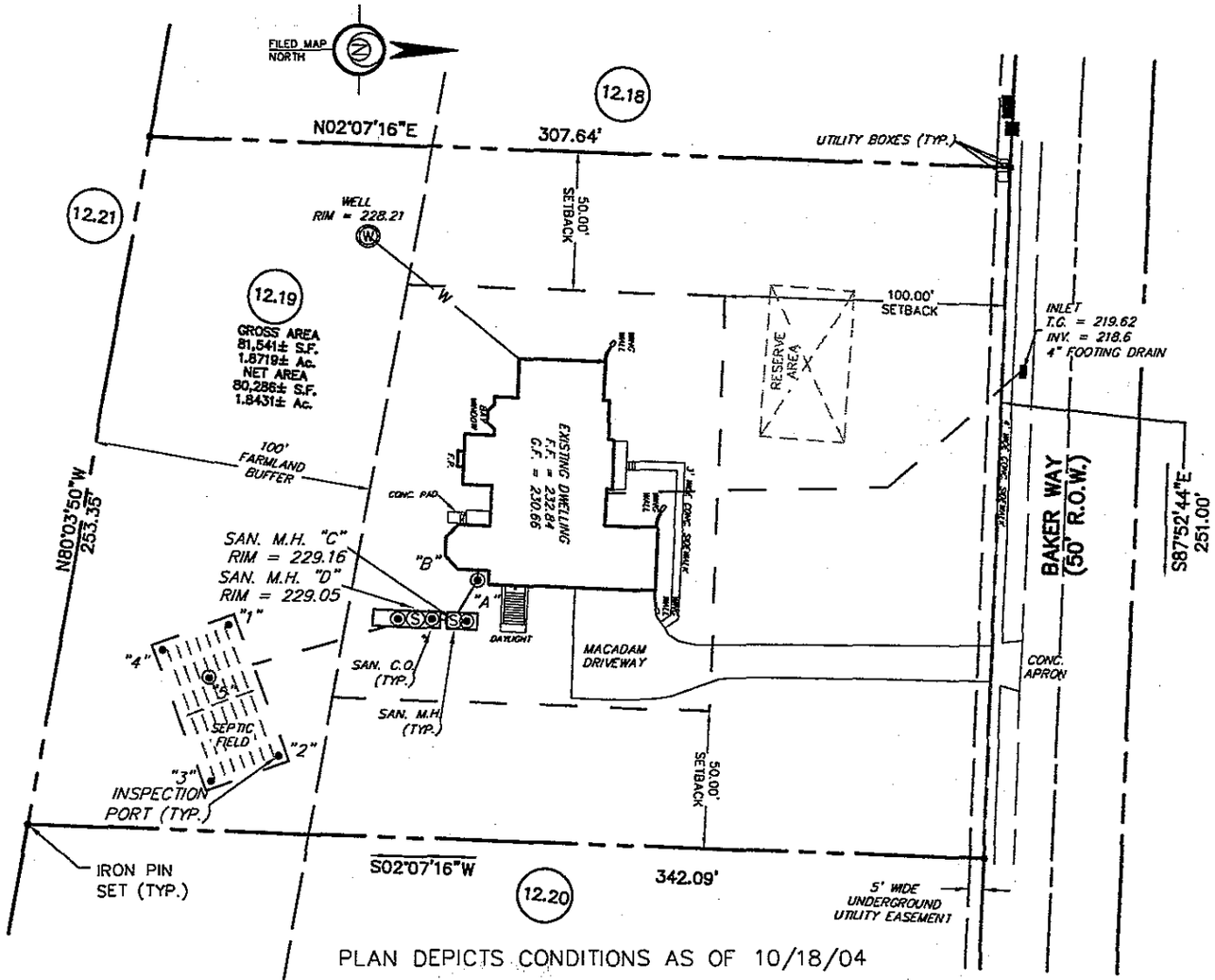
AS - BUILT DESIGN APPROVED
DATE: 9/13/05
HOPEWELL TOWNSHIP HEALTH DEPT.

MAP OF
BLOCK 62 LOT 12.18
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 8/24/05
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: D.M.P.	CHECKED: R.F.B.
SCALE: 1"=60'	DATE: 8-23-2004	FILE: 1207-LOT010AB



PLAN DEPICTS CONDITIONS AS OF 10/18/04

RECEIVED
OCT 25 2004
Hopewell Township Health Dept.

AS - BUILT INSPECTION APPROVED
DATE 10/27/04
HOPEWELL TOWNSHIP HEALTH DEPT.

SEPTIC AS-BUILT TIES
DISTANCE @ A-MH C = 18.2'
DISTANCE @ A-MH D = 20.9'
DISTANCE @ A-1 = 93.8'
DISTANCE @ A-2 = 97.6'
DISTANCE @ A-3 = 122'
DISTANCE @ A-4 = 119'
DISTANCE @ A-5 = 105.6'

DISTANCE @ B-MH C = 23.7'
DISTANCE @ B-MH D = 23.6'
DISTANCE @ B-1 = 80.9'
DISTANCE @ B-2 = 93.8'
DISTANCE @ B-3 = 117'
DISTANCE @ B-4 = 107'
DISTANCE @ B-5 = 95.2'

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.19 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT – SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 09/18/00, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 10/19/00 AS MAP NO. 3759.

MAP OF
BLOCK 62 LOT 12.19
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 10/21/04
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE – 40873

DATE 10/21/04
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

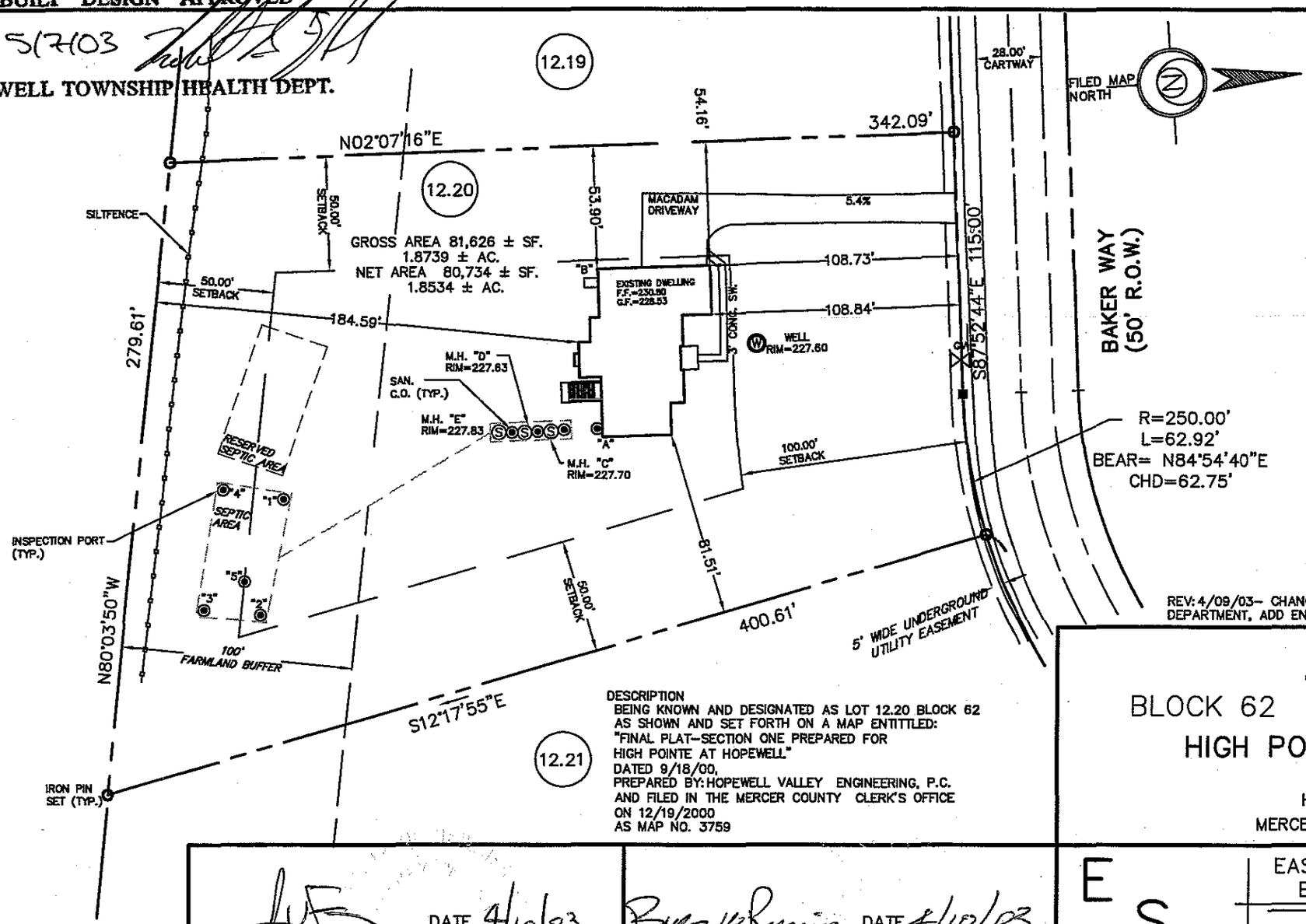
ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2050
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: 1" = 60'	DATE: 10/20/04	FILE: LOT011AB

AS - BUILT DESIGN APPROVED

DATE: 5/7/03

HOPEWELL TOWNSHIP HEALTH DEPT.



SEPTIC AS-BUILT TIES

Distance ⊙ A-1 = 141.67'	Distance ⊙ B-1 = 170.02'
Distance ⊙ A-2 = 168.32'	Distance ⊙ B-2 = 211.39'
Distance ⊙ A-3 = 189.60'	Distance ⊙ B-3 = 227.67'
Distance ⊙ A-4 = 167.12'	Distance ⊙ B-4 = 189.81'
Distance ⊙ A-5 = 168.50'	Distance ⊙ B-5 = 206.22'
Distance ⊙ A-MH C = 27.70'	Distance ⊙ B-MH C = 75.80'
Distance ⊙ A-MH D = 31.27'	Distance ⊙ B-MH D = 77.21'
Distance ⊙ A-MH E = 45.17'	Distance ⊙ B-MH E = 83.47'

I HEREBY CERTIFY THAT THIS SURVEY WAS ACTUALLY MADE ON THE GROUND AS PER RECORD DESCRIPTION AND IS CORRECT AND THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES EXCEPT AS SHOWN.

THIS CERTIFICATION IS MADE ONLY TO THE ABOVE NAMED PARTIES FOR PURCHASE AND/ OR MORTGAGE FOR HEREIN DELINEATED PROPERTY BY BELOW NAMED PURCHASER. NO RESPONSIBILITY OR LIABILITY IS ASSUMED BY SURVEYOR FOR USE OF SURVEY FOR ANY OTHER PURPOSE INCLUDING, BUT NOT LIMITED TO USE OF SURVEY FOR SURVEY AFFIDAVIT, RESALE OF PROPERTY, OR TO ANY OTHER PERSON NOT LISTED IN CERTIFICATION, EITHER DIRECTLY OR INDIRECTLY.

TO ALL PERSONS AND PARTIES OF INTEREST: THIS PLAN WAS PREPARED FOR A FEE FOR THE PERSONS AND PURPOSES INDICATED HEREON. ANY OTHER USE OF THIS PLAN OR A COPY OR ALTERATION OF IT NOT IMPRESSED WITH THE SEAL OF THE LICENSED ENGINEER OR SURVEYOR WHO PREPARED THIS PLAN IS NOT THE RESPONSIBILITY OF THE UNDERSIGNED.

REV: 4/09/03- CHANGE TITLEBLOCK PER HEALTH DEPARTMENT, ADD ENGINEER SIGNATURE- V.Y.

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.20 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITTLED: "FINAL PLAT-SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 9/18/00, PREPARED BY: HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/2000 AS MAP NO. 3759

MAP OF
"SEPTIC AS-BUILT"

BLOCK 62 LOT 12.20

HIGH POINTE AT HOPEWELL

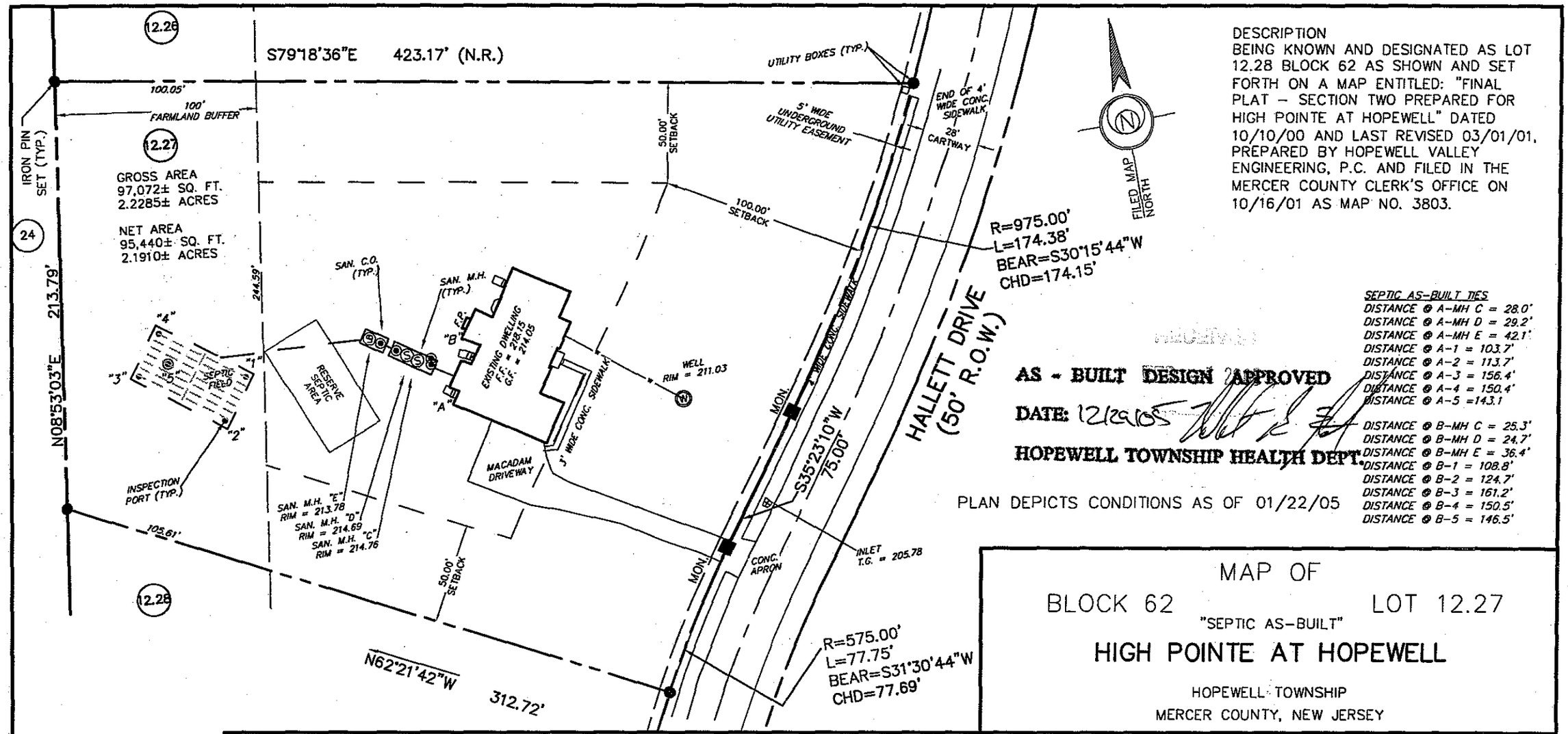
HOPWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 4/10/03
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE - 40873

DATE 4/10/03
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC., PA.
2747 PHILMONT AVENUE
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION No. GA277044

DESIGNED:	DRAWN: VY	CHECKED: WCB
SCALE: AS-NOTED	DATE: 1/25/03	DWG. NO.: TBI #12SEPAB



DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.28 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT – SECTION TWO PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 10/10/00 AND LAST REVISED 03/01/01, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 10/16/01 AS MAP NO. 3803.

AS - BUILT DESIGN APPROVED

DATE: 12/29/05

HOPEWELL TOWNSHIP HEALTH DEPT.

PLAN DEPICTS CONDITIONS AS OF 01/22/05

SEPTIC AS-BUILT TIES

DISTANCE @ A-MH C = 28.0'
DISTANCE @ A-MH D = 29.2'
DISTANCE @ A-MH E = 42.1'
DISTANCE @ A-1 = 103.7'
DISTANCE @ A-2 = 113.7'
DISTANCE @ A-3 = 156.4'
DISTANCE @ A-4 = 150.4'
DISTANCE @ A-5 =143.1

DISTANCE @ B-MH C = 25.3'
DISTANCE @ B-MH D = 24.7'
DISTANCE @ B-MH E = 36.4'
DISTANCE @ B-1 = 108.8'
DISTANCE @ B-2 = 124.7'
DISTANCE @ B-3 = 161.2'
DISTANCE @ B-4 = 150.5'
DISTANCE @ B-5 = 146.5'

MAP OF

BLOCK 62 LOT 12.27

"SEPTIC AS-BUILT"

HIGH POINTE AT HOPEWELL

HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

Neil E. Sander DATE 1/27/05

NEIL E. SANDER
PROFESSIONAL ENGINEER
N.J. LICENSE # GE-043805

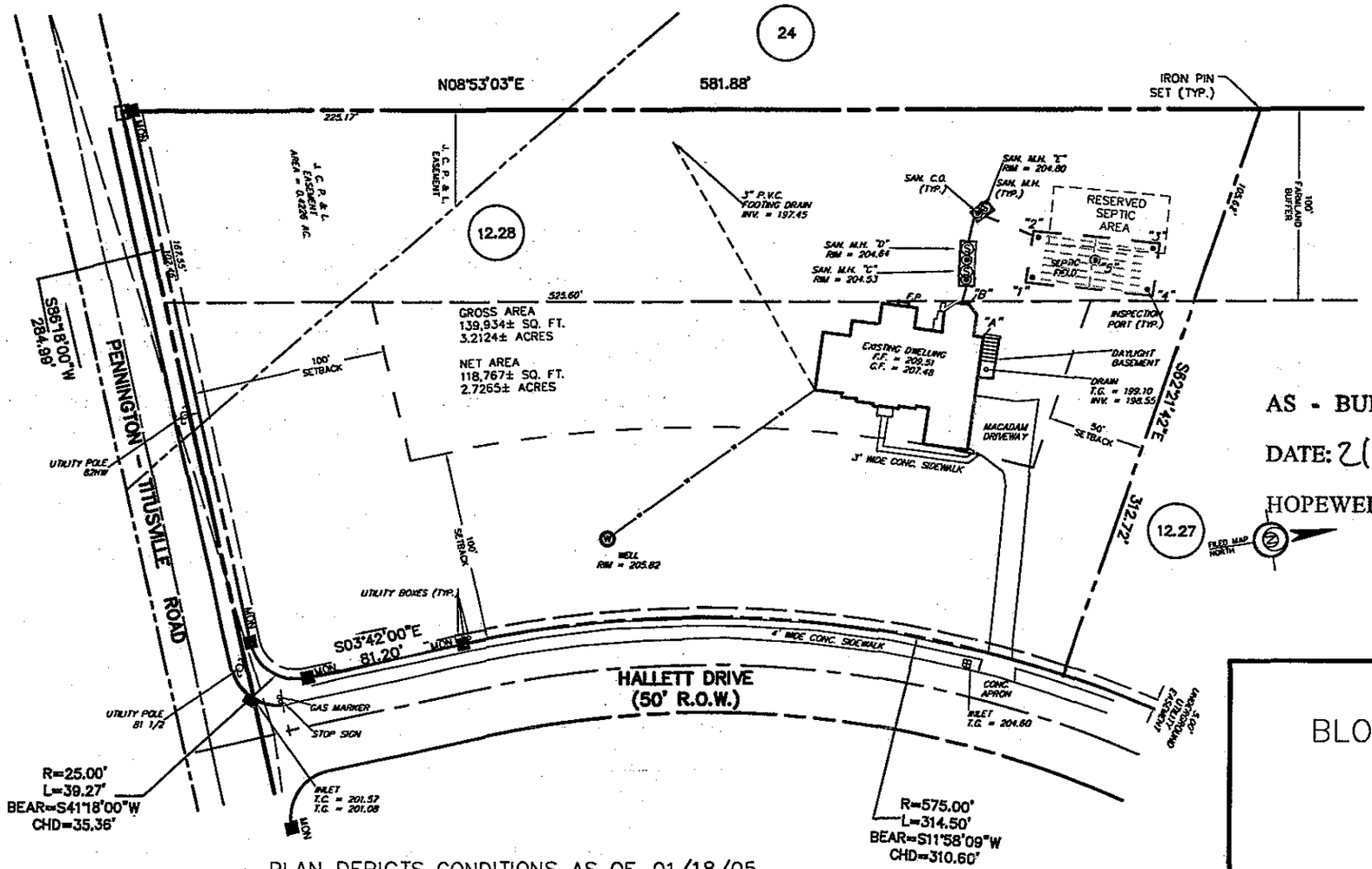
Byron W. Rimmer DATE 1/27/05

BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # GS-020369

ESE

EASTERN STATES ENGINEERING, INC.
250 GIBRALTAR ROAD
HORSHAM, PA 19044
215 / 914-2050
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: 1" = 60'	DATE: 01/26/05	FILE: LOT038AB



DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 12.28 BLOCK 62 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT – SECTION TWO PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 10/10/00 AND LAST REVISED 03/01/01, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 10/16/01 AS MAP NO. 3803.

AS - BUILT DESIGN APPROVED
DATE: 2/2/05 JAN 20 2005
HOPEWELL TOWNSHIP HEALTH DEPT.

SEPTIC AS-BUILT TIES
DISTANCE @ A-MH C = 35.5'
DISTANCE @ A-MH D = 37.2'
DISTANCE @ A-MH E = 67.9'
DISTANCE @ A-1 = 40.2'
DISTANCE @ A-2 = 59.5'
DISTANCE @ A-3 = 98.9'
DISTANCE @ A-4 = 87.9'
DISTANCE @ A-5 = 70.2'
DISTANCE @ B-MH C = 17.1'
DISTANCE @ B-MH D = 18.8'
DISTANCE @ B-MH E = 51.3'
DISTANCE @ B-1 = 35.6'
DISTANCE @ B-2 = 50.2'
DISTANCE @ B-3 = 99.3'
DISTANCE @ B-4 = 92.3'
DISTANCE @ B-5 = 69.2'

PLAN DEPICTS CONDITIONS AS OF 01/18/05

MAP OF
BLOCK 62 LOT 12.28
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

Neil E. Sander DATE 1/20/05
NEIL E. SANDER
PROFESSIONAL ENGINEER
N.J. LICENSE # GE-043805

Byron W. Rimmer DATE 1/20/05
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # GS-020369

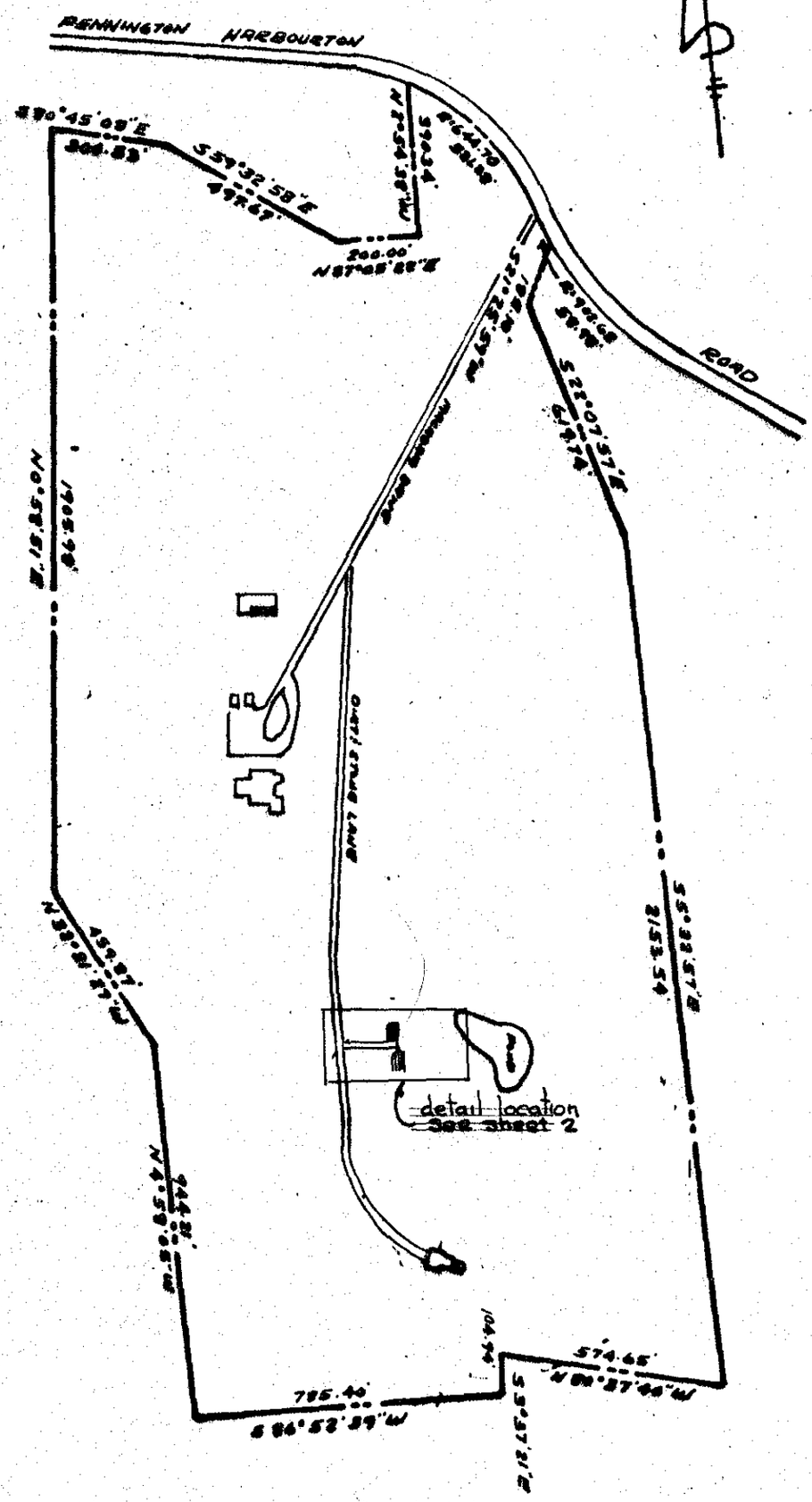
ESE
EASTERN STATES ENGINEERING, INC.
250 GIBRALTAR ROAD
HORSHAM, PA 19044
215 / 914-2050
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: 1" = 80'	DATE: 01/19/05	FILE: LOT037AB

MR. & MRS. JOHN LOVERO SR.

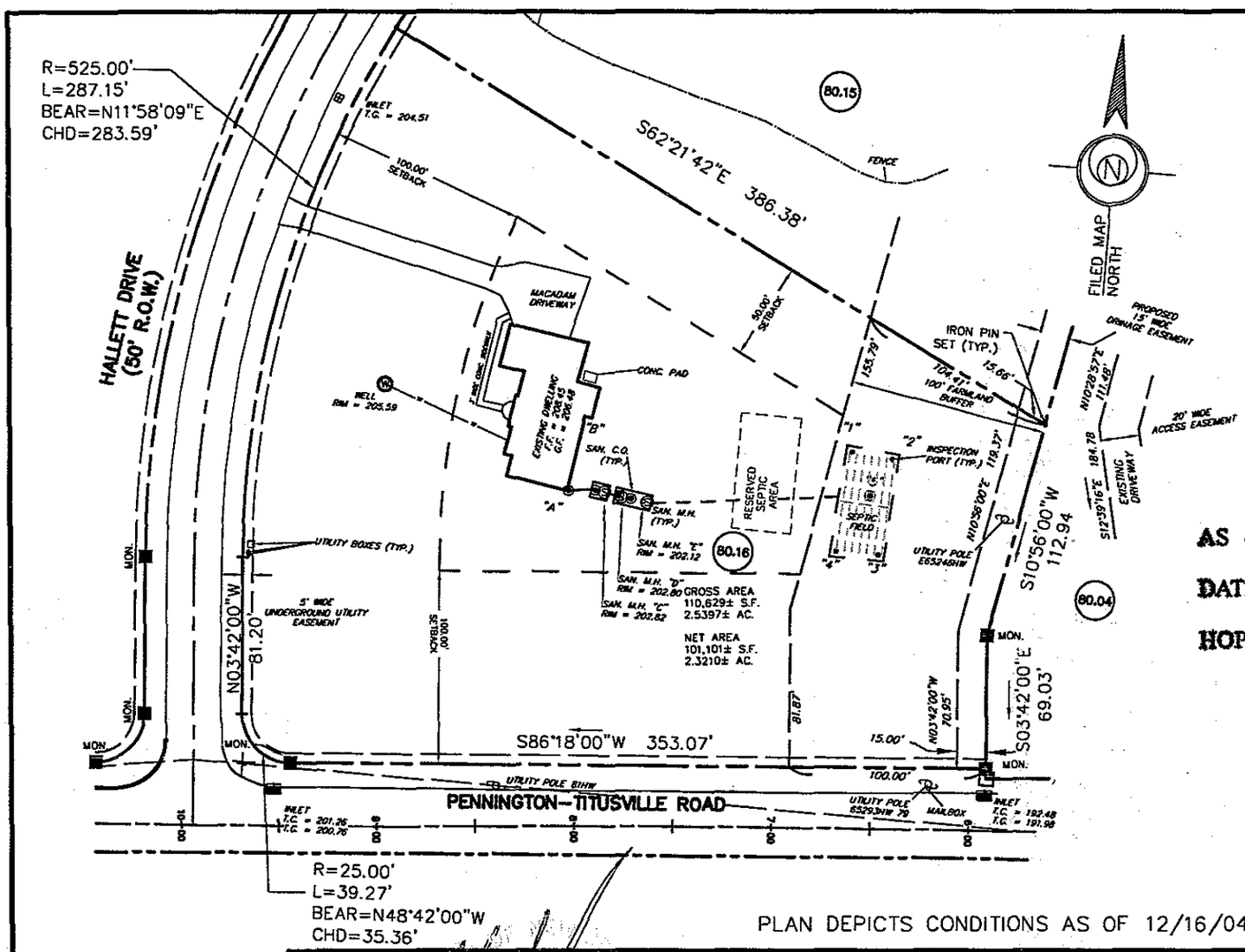
PENNINGTON HARBOURTON ROAD

HOPEWELL TOWNSHIP MERCER COUNTY, N.J.



LOCATION PLAN
1"=400'

1/6



DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 80.16 BLOCK 62.01 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT – SECTION TWO PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 10/10/00 AND LAST REVISED 03/01/01, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 10/16/00 AS MAP NO. 3803.

RECEIVED
DEC 23 2004
AS - BUILT DESIGN APPROVED
DATE: 12/28/04
HOPEWELL TOWNSHIP HEALTH DEPT.

SEPTIC AS-BUILT TIES
DISTANCE @ A-MH C = 24.6'
DISTANCE @ A-MH D = 27.9'
DISTANCE @ A-MH E = 41.2'
DISTANCE @ A-1 = 145.7'
DISTANCE @ A-2 = 165.4'
DISTANCE @ A-3 = 160.8'
DISTANCE @ A-4 = 139.7'
DISTANCE @ A-5 = 153.5'

DISTANCE @ B-MH C = 41.5'
DISTANCE @ B-MH D = 43.5'
DISTANCE @ B-MH E = 51.8'
DISTANCE @ B-1 = 132.5'
DISTANCE @ B-2 = 153.2'
DISTANCE @ B-3 = 160.8'
DISTANCE @ B-4 = 141.2'
DISTANCE @ B-5 = 146.2'

PLAN DEPICTS CONDITIONS AS OF 12/16/04

MAP OF
BLOCK 62.01 LOT 80.16
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

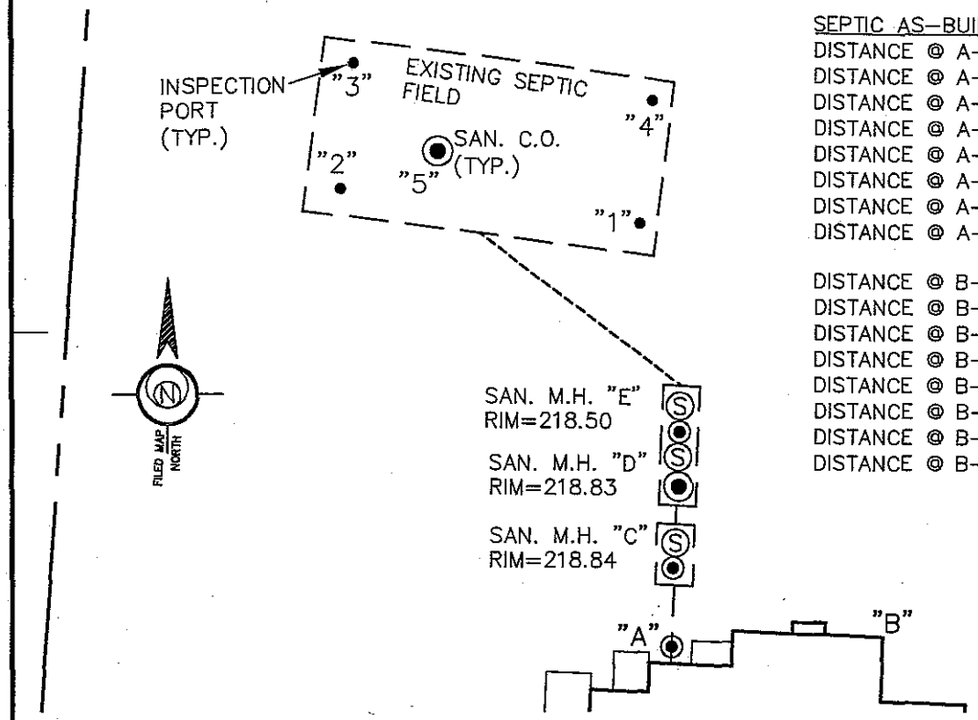
DATE 11-22-04
MICHAEL J. SOSINSKI
PROFESSIONAL ENGINEER
N.J. LICENSE # GE-29929

DATE 12/22/04
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # GS-020369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2050
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: 1" = 80'	DATE: 12/22/04	FILE: LOT036AB

SEPTIC AS-BUILT SCALE: 1" = 30'

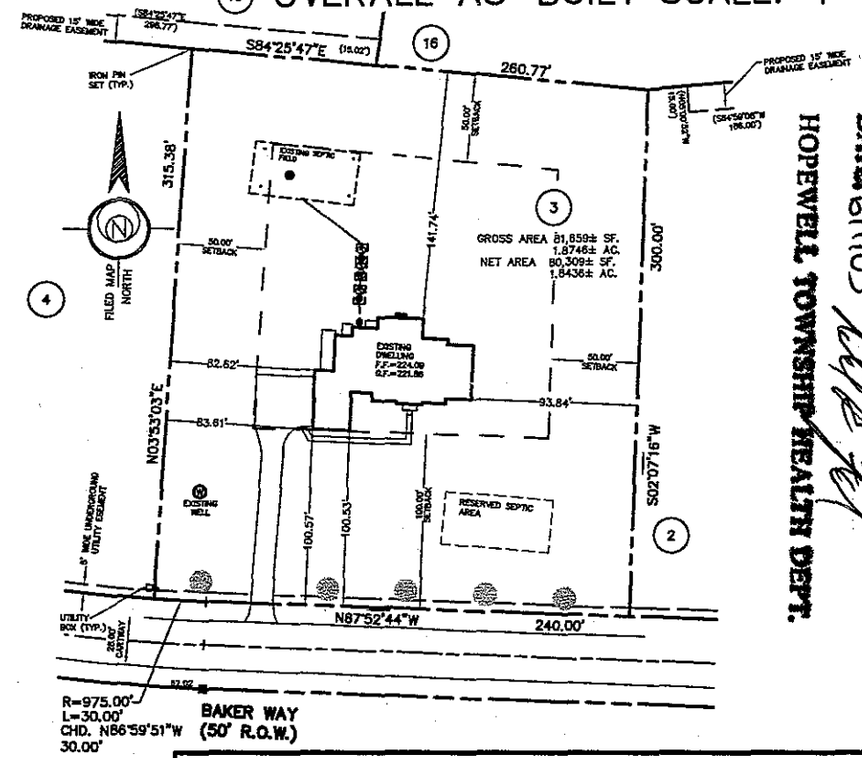


SEPTIC AS-BUILT TIES

DISTANCE @ A-1=75.1'
DISTANCE @ A-2=96.4'
DISTANCE @ A-3=114.0'
DISTANCE @ A-4=96.1'
DISTANCE @ A-5=94.4'
DISTANCE @ A-MH C=21.7'
DISTANCE @ A-MH D=25.4'
DISTANCE @ A-MH E=37.4'

DISTANCE @ B-1=82.2'
DISTANCE @ B-2=120.1'
DISTANCE @ B-3=133.4'
DISTANCE @ B-4=99.9'
DISTANCE @ B-5=112.7'
DISTANCE @ B-MH C=39.8'
DISTANCE @ B-MH D=41.2'
DISTANCE @ B-MH E=48.1'

(15) OVERALL AS-BUILT SCALE: 1" = 100'



AS - BUILT DESIGN APPROVED
DATE: 6/1/05
HOPEWELL TOWNSHIP HEALTH DEPT.

I HEREBY CERTIFY THAT THIS SURVEY WAS ACTUALLY MADE ON THE GROUND AS PER RECORD DESCRIPTION AND IS CORRECT AND THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES EXCEPT AS SHOWN.

TO ALL PERSONS AND PARTIES OF INTEREST: THIS PLAN WAS PREPARED FOR A FEE FOR THE PERSONS AND PURPOSES INDICATED HEREON. ANY OTHER USE OF THIS PLAN OR A COPY OR ALTERATION OF IT NOT IMPRESSED WITH THE SEAL OF THE LICENSED ENGINEER OR SURVEYOR WHO PREPARED THIS PLAN IS NOT THE RESPONSIBILITY OF THE UNDERSIGNED.

PLAN DEPICTS CONDITIONS AS OF 08/09/04

MAP OF
BLOCK 62.02 LOT 3
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

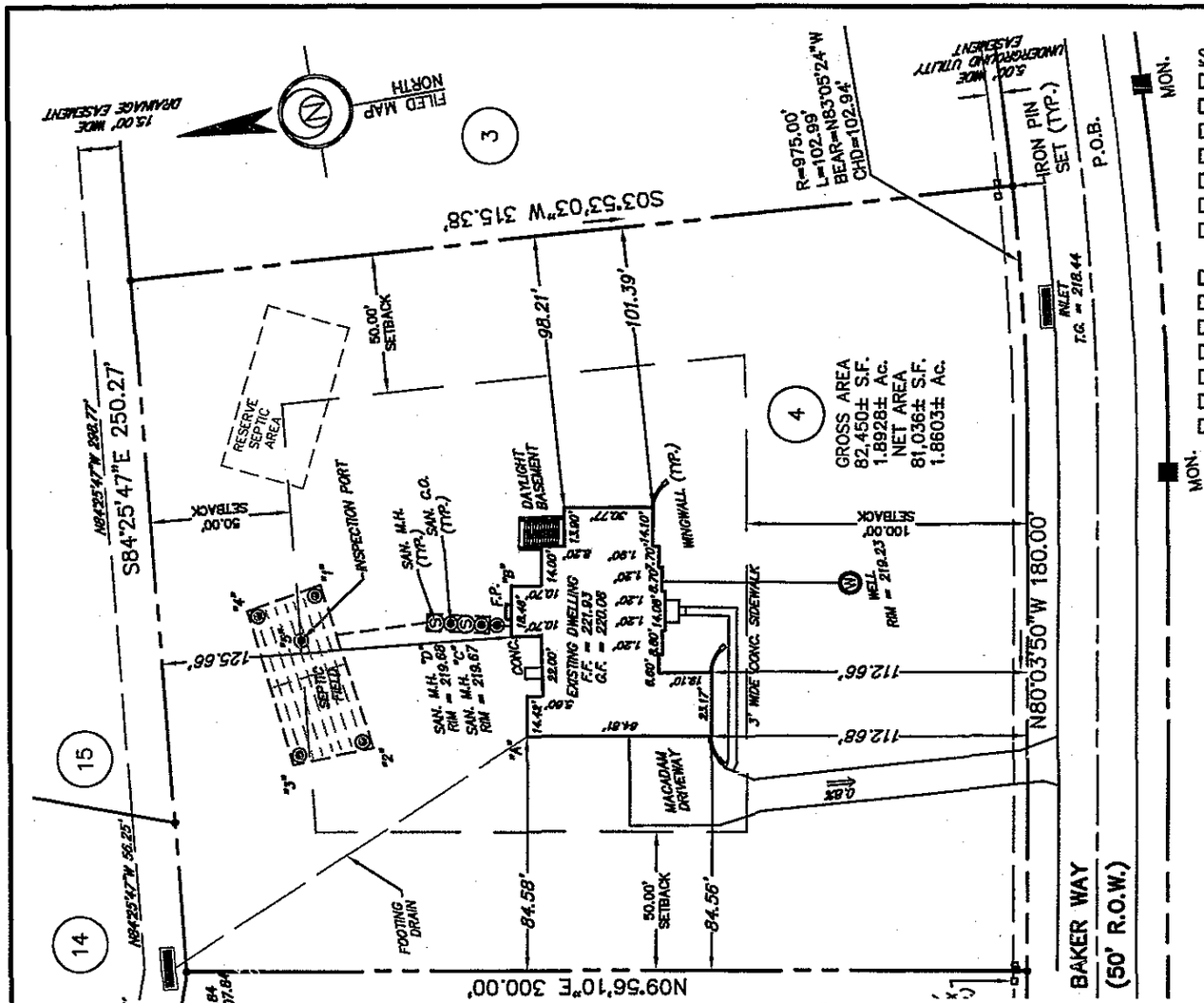
DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 3 BLOCK 62.02 AS SHOWN AND SET FORTH ON A MAP ENTITLED "FINAL PLAT-SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 9/18/00, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00 AS MAP NO. 3759

Neil E. Sander DATE 3/11/05
NEIL E. SANDER
PROFESSIONAL ENGINEER
N.J. LICENSE # GE-043805

Byron W. Rimmer DATE 3/11/05
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # GS-020369

ESE
EASTERN STATES ENGINEERING, INC.
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044
250 GIBRALTAR ROAD, SUITE 2E
HORSHAM, PA 19044
215 / 914-2050

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: AS NOTED	DATE: 03/10/05	FILE: LOT015 SEPTIC AB



SEPTIC AS-BUILT TIES

DISTANCE @ A-1 = 92.00'
DISTANCE @ A-2 = 59.55'
DISTANCE @ A-3 = 82.19'
DISTANCE @ A-4 = 106.12'
DISTANCE @ A-5 = 88.57'
DISTANCE @ A-MH C = 45.67'
DISTANCE @ A-MH D = 47.63'

DISTANCE @ B-1 = 70.85'
DISTANCE @ B-2 = 77.98'
DISTANCE @ B-3 = 97.66'
DISTANCE @ B-4 = 91.69'
DISTANCE @ B-5 = 78.18'
DISTANCE @ B-MH C = 20.49'
DISTANCE @ B-MH D = 23.31'

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 4 BLOCK 62.02 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT-SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 9/18/00, PREPARED BY: HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00 AS MAP NO. 3759

CERTIFY TO THE FOLLOWING:
NAVID B. KHAN AND SHAFQAT KHAN, H/W
WESTMINSTER TITLE AGENCY / WESTMINSTER ABSTRACT CO.
GREENPOINT MORTGAGE FUNDING, INC. ITS SUCCESSORS AND/OR ASSIGNS
HIGH POINTE AT HOPEWELL, LLC / TOLL BROTHERS, INC.
MILAN PATEL, ESQ.

AS - BUILT DESIGN APPROVED

DATE: 3/11/04

HOPEWELL TOWNSHIP HEALTH DEPT.

PLAN DEPICTS CONDITIONS AS OF 10/28/03

MAP OF
BLOCK 62.02 LOT 4
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 11/6/03
CHOONG Y. YIM
PROFESSIONAL ENGINEER
N.J. LICENSE # GE - 34835

DATE 11/06/03
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: V.Y.
SCALE: 1"=60'	DATE: 11/04/03	FILE: LOT016AB

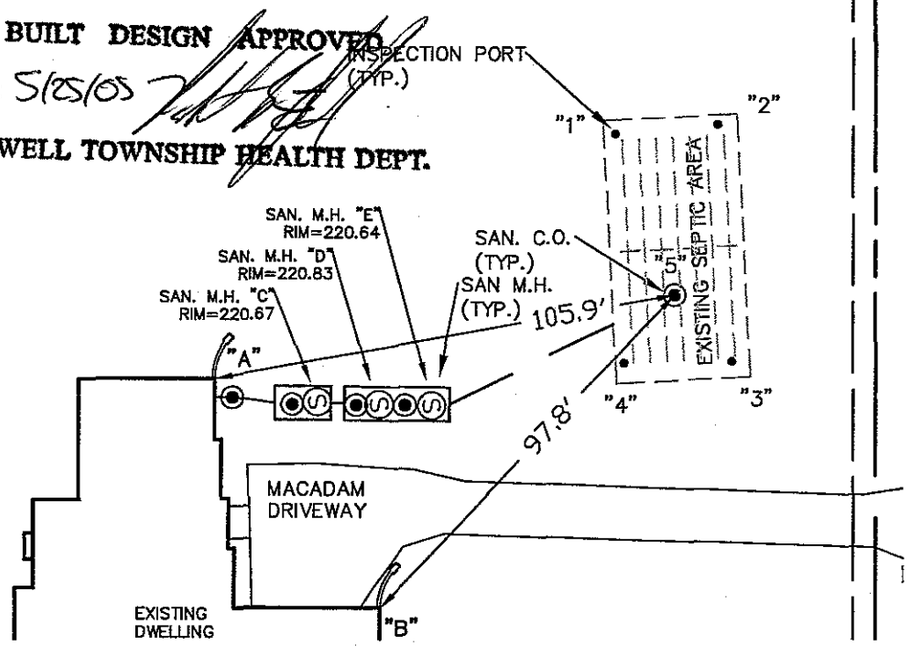
N:\Survdept\1207\finals\LOT016AB.dwg, 11/06/2003 03:25:59 PM, rbarrett

SEPTIC AS-BUILT SCALE: 1" = 40'

5

GROSS AREA
82,132 S.F.
1.8855 Ac.
NET AREA
80,857 S.F.
1.8562 Ac.

AS - BUILT DESIGN APPROVED
DATE: 5/25/05
HOPEWELL TOWNSHIP HEALTH DEPT.

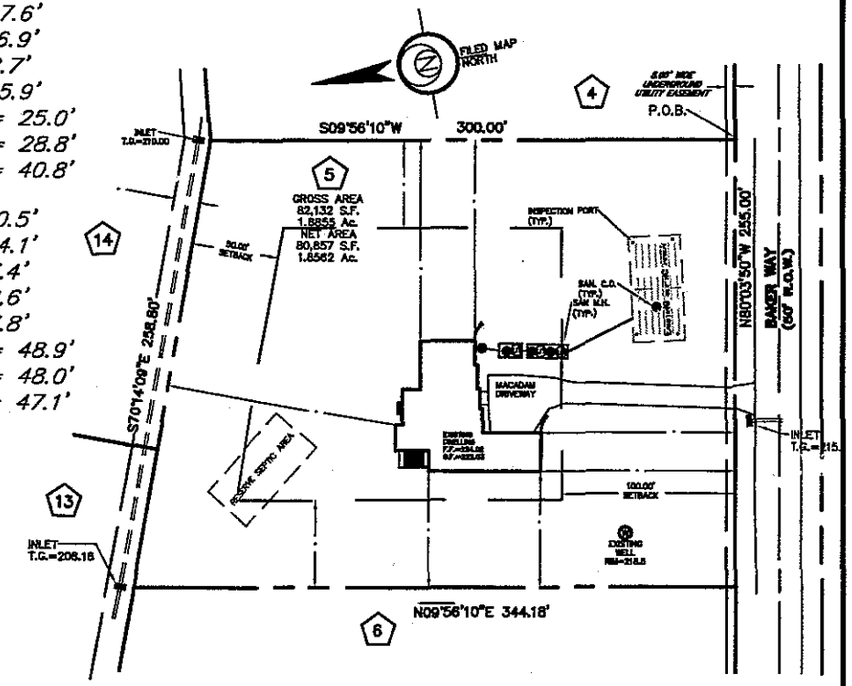


SEPTIC AS-BUILT TIES

Distance @ A-1 = 106.5'
Distance @ A-2 = 127.6'
Distance @ A-3 = 116.9'
Distance @ A-4 = 92.7'
Distance @ A-5 = 105.9'
Distance @ A-MH C = 25.0'
Distance @ A-MH D = 28.8'
Distance @ A-MH E = 40.8'

Distance @ B-1 = 120.5'
Distance @ B-2 = 134.1'
Distance @ B-3 = 97.4'
Distance @ B-4 = 78.6'
Distance @ B-5 = 97.8'
Distance @ B-MH C = 48.9'
Distance @ B-MH D = 48.0'
Distance @ B-MH E = 47.1'

OVERALL AS-BUILT SCALE: 1" = 100'



I HEREBY CERTIFY THAT THIS SURVEY WAS ACTUALLY MADE ON THE GROUND AS PER RECORD DESCRIPTION AND IS CORRECT AND THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES EXCEPT AS SHOWN.

TO ALL PERSONS AND PARTIES OF INTEREST: THIS PLAN WAS PREPARED FOR A FEE FOR THE PERSONS AND PURPOSES INDICATED HEREON. ANY OTHER USE OF THIS PLAN OR A COPY OR ALTERATION OF IT NOT IMPRESSED WITH THE SEAL OF THE LICENSED ENGINEER OR SURVEYOR WHO PREPARED THIS PLAN IS NOT THE RESPONSIBILITY OF THE UNDERSIGNED.

PLAN DEPICTS CONDITIONS AS OF 08/03/04

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 5 BLOCK 62.02 AS SHOWN AND SET FORTH ON A MAP ENTITLED "FINAL PLAT--SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 9/18/00, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00 AS MAP NO. 3759

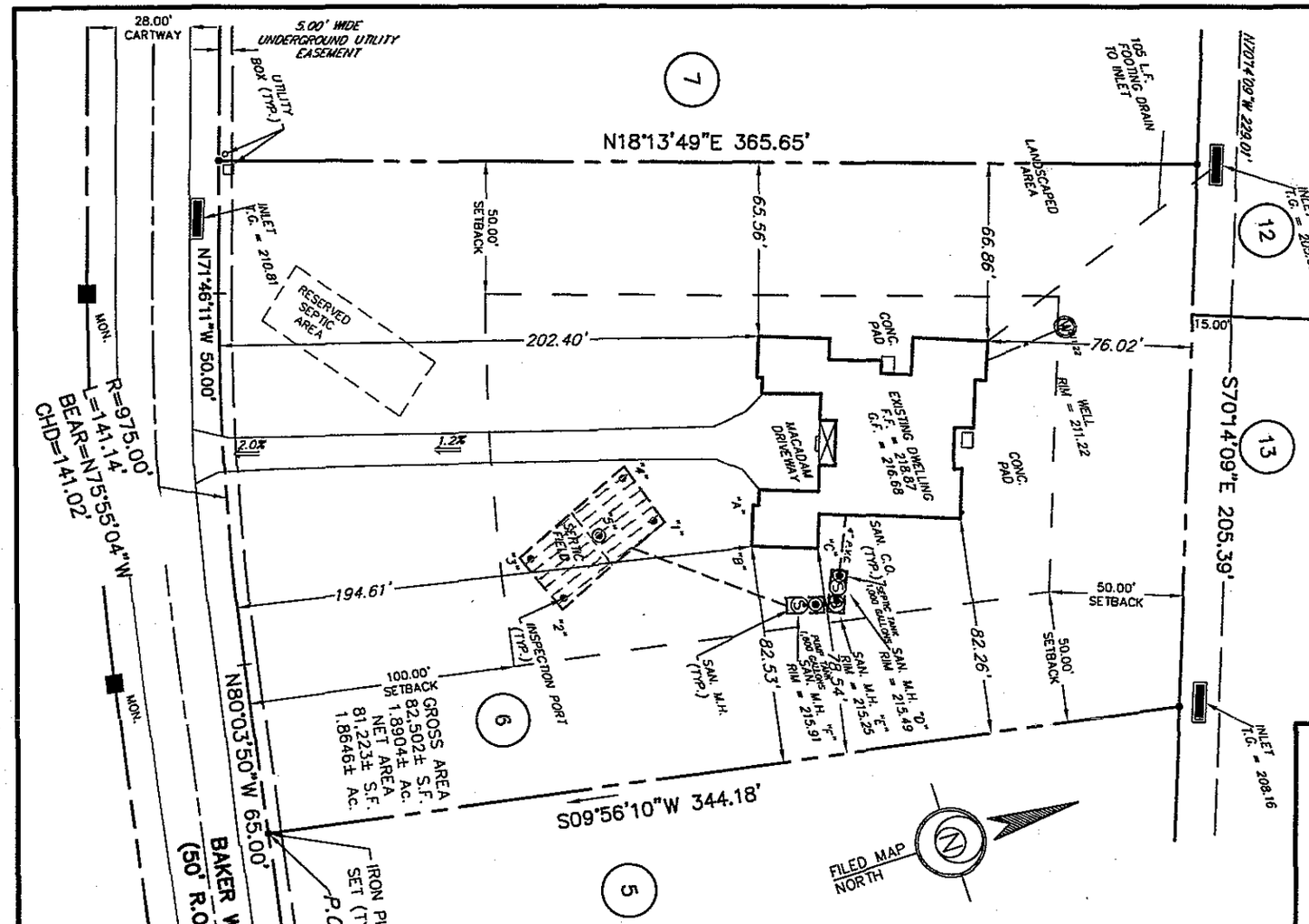
Neil E. Sander DATE 4/5/05
NEIL E. SANDER
PROFESSIONAL ENGINEER
N.J. LICENSE # GE-043805

Byron W. Rimmer DATE 4/6/05
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # GS-020369

MAP OF
BLOCK 62.02 LOT 5
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

ESE
EASTERN STATES ENGINEERING, INC.
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044
250 GIBRALTAR ROAD, SUITE 2E
HORSHAM, PENNSYLVANIA 19044
215 / 914-2050

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: AS NOTED	DATE: 03/28/05	FILE: LOT017-SEPTIC-AB



PLAN DEPICTS CONDITIONS AS OF 05/10/04

AS - BUILT DESIGN APPROVED

DATE: 11/16/04

HOPEWELL TOWNSHIP HEALTH DEPT.

SEPTIC AS-BUILT TIES
DISTANCE @ A-1 = 37.9'
DISTANCE @ A-2 = 79.2'
DISTANCE @ A-3 = 85.8'
DISTANCE @ A-4 = 49.9'
DISTANCE @ A-5 = 58.7'

DISTANCE @ B-MH D = 36.3'
DISTANCE @ B-MH E = 37.9'
DISTANCE @ B-MH F = 28.2'
DISTANCE @ B-1 = 38.3'
DISTANCE @ B-2 = 73.3'
DISTANCE @ B-3 = 83.1'
DISTANCE @ B-4 = 54.9'
DISTANCE @ B-5 = 57.4'

DISTANCE @ C-MH D = 18.9'
DISTANCE @ C-MH E = 22.1'
DISTANCE @ C-MH F = 22.6'

SEPTIC DESIGNED BY SEPTICS BY PATTERSON, INC. FROM PLAN ENTITLED, "SEPTIC SYSTEM DESIGN PREPARED FOR BLOCK 62.02 LOT 6" DATED 01/27/03 AND LAST REVISED 02/14/03, BEING PAGE 1 OF 7.

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 6 BLOCK 62.02 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT – SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 09/18/00, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00 AS MAP NO. 3759.

REV. #1 – 05/11/04 – REVISE BEARING – R.F.B.

MAP OF
BLOCK 62.02 LOT 6
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 5/11/04
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE – 40873

DATE 5/11/04
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

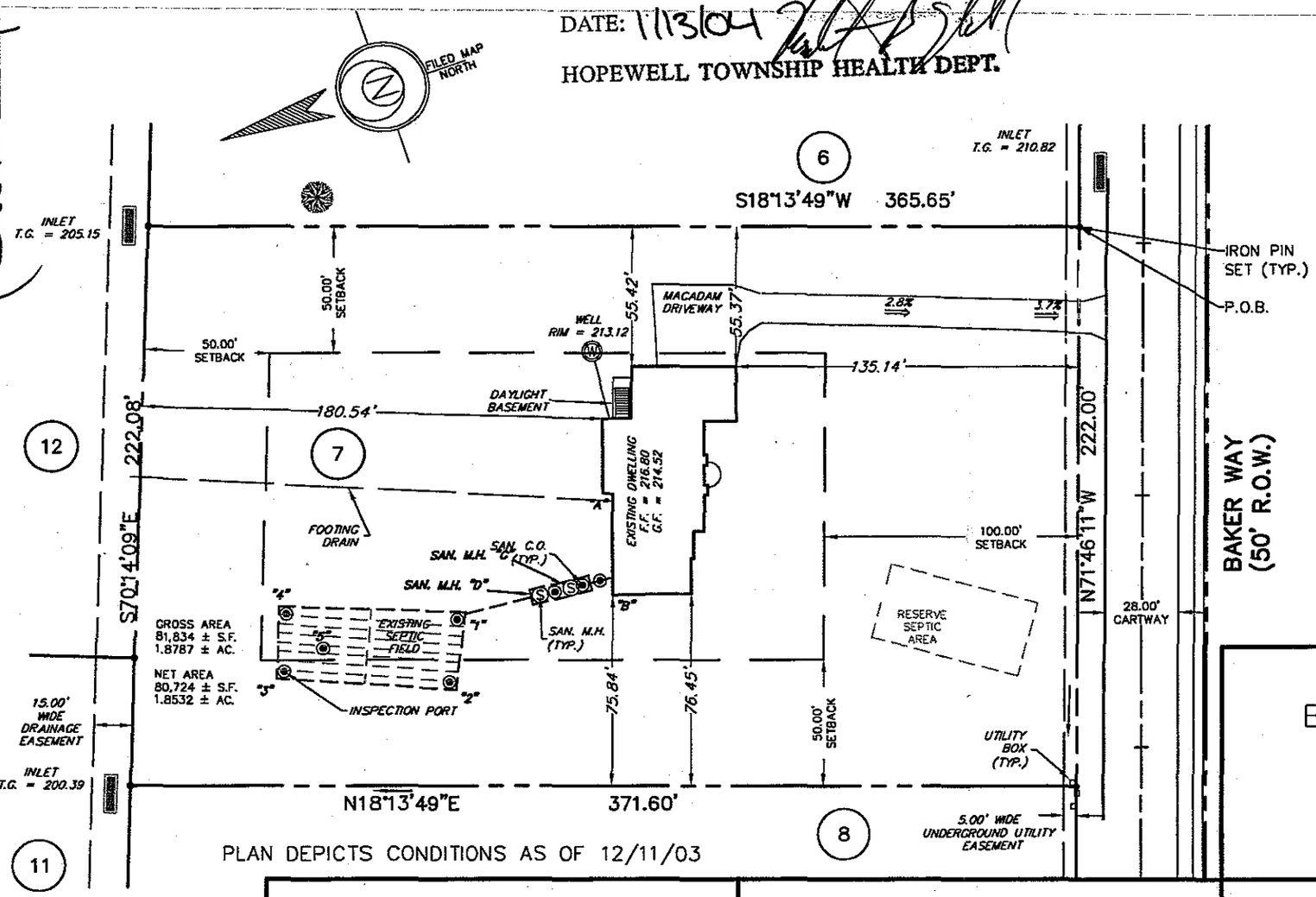
DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: 1"=60'	DATE: 05/11/04	FILE: LOT018AB

AS - BUILT DESIGN APPROVED

DATE: 1/13/04

HOPEWELL TOWNSHIP HEALTH DEPT.

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 7 BLOCK 62.02
AS SHOWN AND SET FORTH ON A MAP ENTITLED:
"FINAL PLAT–SECTION ONE PREPARED FOR
HIGH POINTE AT HOPEWELL"
DATED 9/18/00,
PREPARED BY: HOPEWELL VALLEY ENGINEERING, P.C.
AND FILED IN THE MERCER COUNTY CLERK'S OFFICE
ON 12/19/00
AS MAP NO. 3759



PLAN DEPICTS CONDITIONS AS OF 12/11/03

SEPTIC AS–BUILT TIES

DISTANCE @ A–1 = 76.47'
DISTANCE @ A–2 = 96.32'
DISTANCE @ A–3 = 142.24'
DISTANCE @ A–4 = 131.93'
DISTANCE @ A–5 = 124.52'
DISTANCE @ A–MH C = 39.71'
DISTANCE @ A–MH D = 41.69'

DISTANCE @ B–1 = 62.46'
DISTANCE @ B–2 = 73.12'
DISTANCE @ B–3 = 131.04'
DISTANCE @ B–4 = 127.17'
DISTANCE @ B–5 = 114.27'
DISTANCE @ B–MH C = 16.85'
DISTANCE @ B–MH D = 20.11'

MAP OF

BLOCK 62.02 LOT 7

"SEPTIC AS–BUILT"

HIGH POINTE AT HOPEWELL

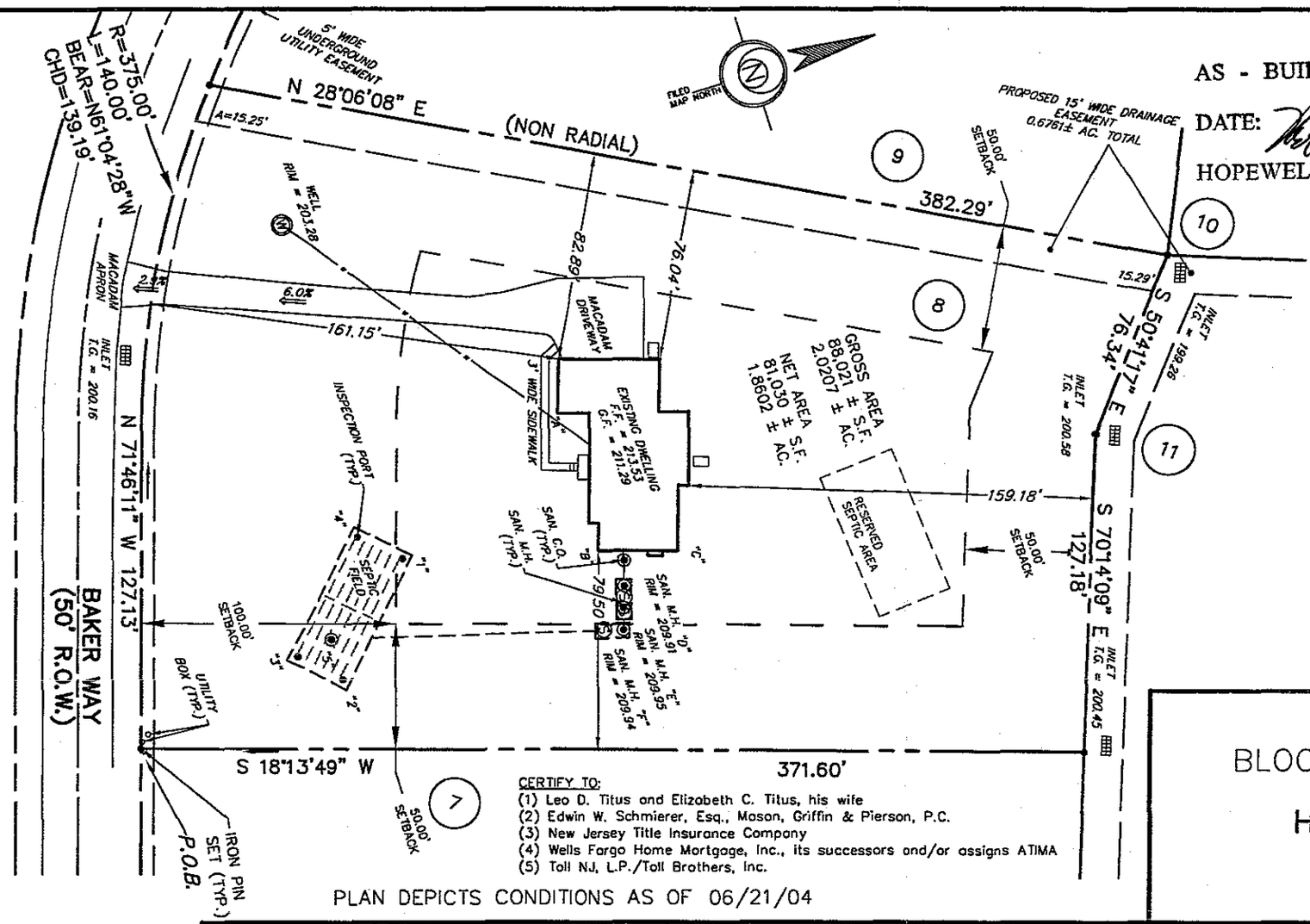
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

DATE 12/19/03
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE – 40873

DATE 12-19-03
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914–2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: V.Y.
SCALE: 1"=60'	DATE: 12/12/03	FILE: LOT019AB



AS - BUILT DESIGN APPROVED

DATE: 11/16/04

HOPEWELL TOWNSHIP HEALTH DEPT.

SEPTIC AS-BUILT TIES

DISTANCE @ A-1 = 83.8'
DISTANCE @ A-2 = 135.4'
DISTANCE @ A-3 = 140.7'
DISTANCE @ A-4 = 92.7'
DISTANCE @ A-5 = 140.7'

DISTANCE @ B-MH D = 23.3'
DISTANCE @ B-MH E = 26.6'
DISTANCE @ B-MH F = 31.6'
DISTANCE @ B-1 = 77.1'
DISTANCE @ B-2 = 113.0'
DISTANCE @ B-3 = 125.7'
DISTANCE @ B-4 = 95.1'
DISTANCE @ B-5 = 111.1'

DISTANCE @ C-MH D = 30.1'
DISTANCE @ C-MH E = 32.6'
DISTANCE @ C-MH F = 43.0'

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 8 BLOCK 62.02 AS SHOWN AND SET FORTH ON A MAP ENTITLED: "FINAL PLAT – SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 09/18/00, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00 AS MAP NO. 3759.

CERTIFY TO:
(1) Leo D. Titus and Elizabeth C. Titus, his wife
(2) Edwin W. Schmierer, Esq., Mason, Griffin & Pierson, P.C.
(3) New Jersey Title Insurance Company
(4) Wells Fargo Home Mortgage, Inc., its successors and/or assigns ATIMA
(5) Toll NJ, L.P./Toll Brothers, Inc.

PLAN DEPICTS CONDITIONS AS OF 06/21/04

MAP OF
BLOCK 62.02 LOT 8
"SEPTIC AS-BUILT"
HIGH POINTE AT HOPEWELL
HOPEWELL TOWNSHIP
MERCER COUNTY, NEW JERSEY

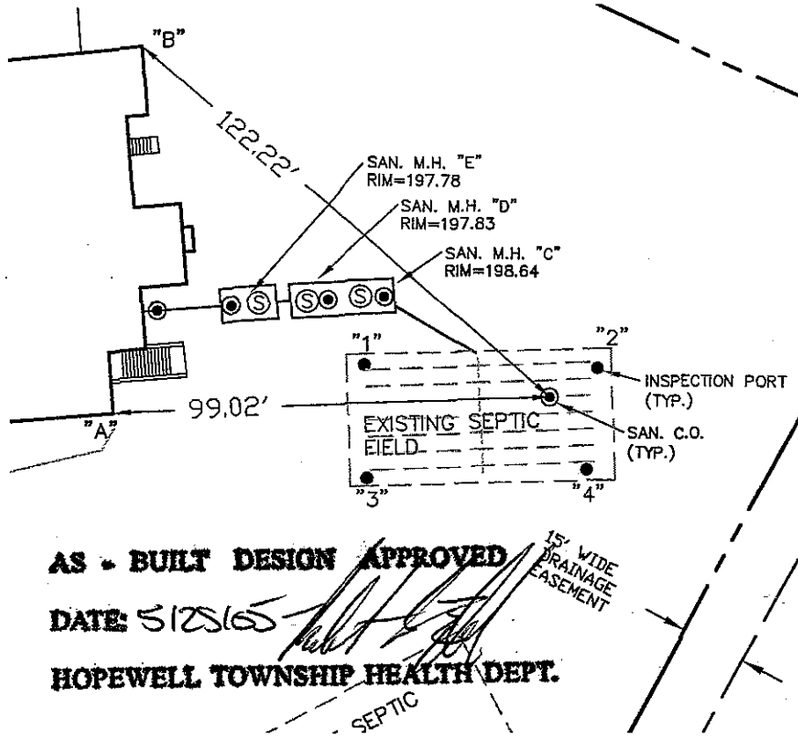
DATE 6/23/04
JEFFREY W. FRANZ
PROFESSIONAL ENGINEER
N.J. LICENSE # GE – 40873

DATE 6/23/04
BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # 20369

ESE
EASTERN STATES ENGINEERING, INC.
2747 PHILMONT AVENUE, P.O. BOX 38
HUNTINGDON VALLEY, PA. 19006
215/914-2036
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: 1"=60'	DATE: 06/10/04	FILE: LOT020AB

SEPTIC AS-BUILT SCALE: 1" = 40'



AS - BUILT DESIGN APPROVED

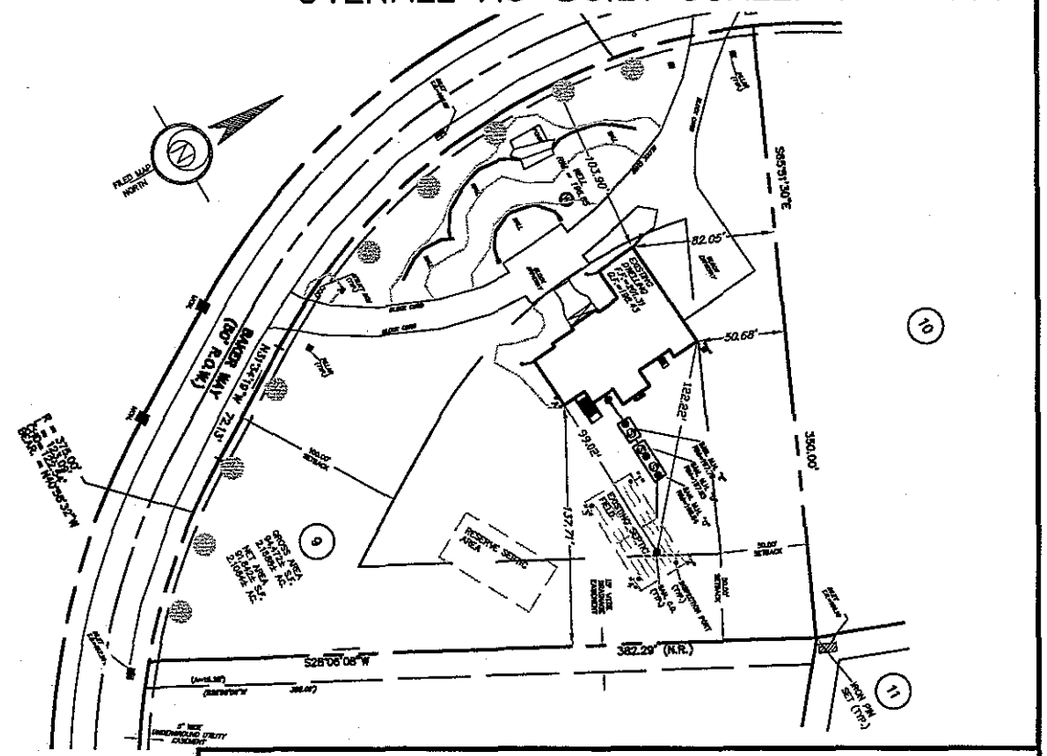
DATE: 5/23/05

HOPEWELL TOWNSHIP HEALTH DEPT.

SEPTIC AS-BUILT TIES

Distance @ A-1 = 58.0'
Distance @ A-2 = 110.3'
Distance @ A-3 = 59.4'
Distance @ A-4 = 108.1'
Distance @ A-MH C = 40.2'
Distance @ A-MH D = 43.6'
Distance @ A-MH E = 55.5'
Distance @ B-1 = 88.7'
Distance @ B-2 = 126.6'
Distance @ B-3 = 111.2'
Distance @ B-4 = 139.6'
Distance @ B-MH C = 71.8'
Distance @ B-MH D = 65.4'
Distance @ B-MH E = 64.5'

OVERALL AS-BUILT SCALE: 1" = 100'



I HEREBY CERTIFY THAT THIS SURVEY WAS ACTUALLY MADE ON THE GROUND AS PER RECORD DESCRIPTION AND IS CORRECT AND THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES EXCEPT AS SHOWN.

TO ALL PERSONS AND PARTIES OF INTEREST: THIS PLAN WAS PREPARED FOR A FEE FOR THE PERSONS AND PURPOSES INDICATED HEREON. ANY OTHER USE OF THIS PLAN OR A COPY OR ALTERATION OF IT NOT IMPRESSED WITH THE SEAL OF THE LICENSED ENGINEER OR SURVEYOR WHO PREPARED THIS PLAN IS NOT THE RESPONSIBILITY OF THE UNDERSIGNED.

PLAN DEPICTS CONDITIONS AS OF 02/22/05

MAP OF

BLOCK 62.02 LOT 9

"SEPTIC AS-BUILT"

HIGH POINTE AT HOPEWELL

HOPEWELL TOWNSHIP

MERCER COUNTY, NEW JERSEY

DESCRIPTION
BEING KNOWN AND DESIGNATED AS LOT 9 BLOCK 62.02 AS SHOWN AND SET FORTH ON A MAP ENTITLED "FINAL PLAT-SECTION ONE PREPARED FOR HIGH POINTE AT HOPEWELL" DATED 9/18/00, PREPARED BY HOPEWELL VALLEY ENGINEERING, P.C. AND FILED IN THE MERCER COUNTY CLERK'S OFFICE ON 12/19/00 AS MAP NO. 3759

Neil E. Sander DATE 3/11/05

NEIL E. SANDER
PROFESSIONAL ENGINEER
N.J. LICENSE # GE-043805

Byron W. Rimmer DATE 3/11/05

BYRON W. RIMMER
PROFESSIONAL LAND SURVEYOR
N.J. LICENSE # GS-020369

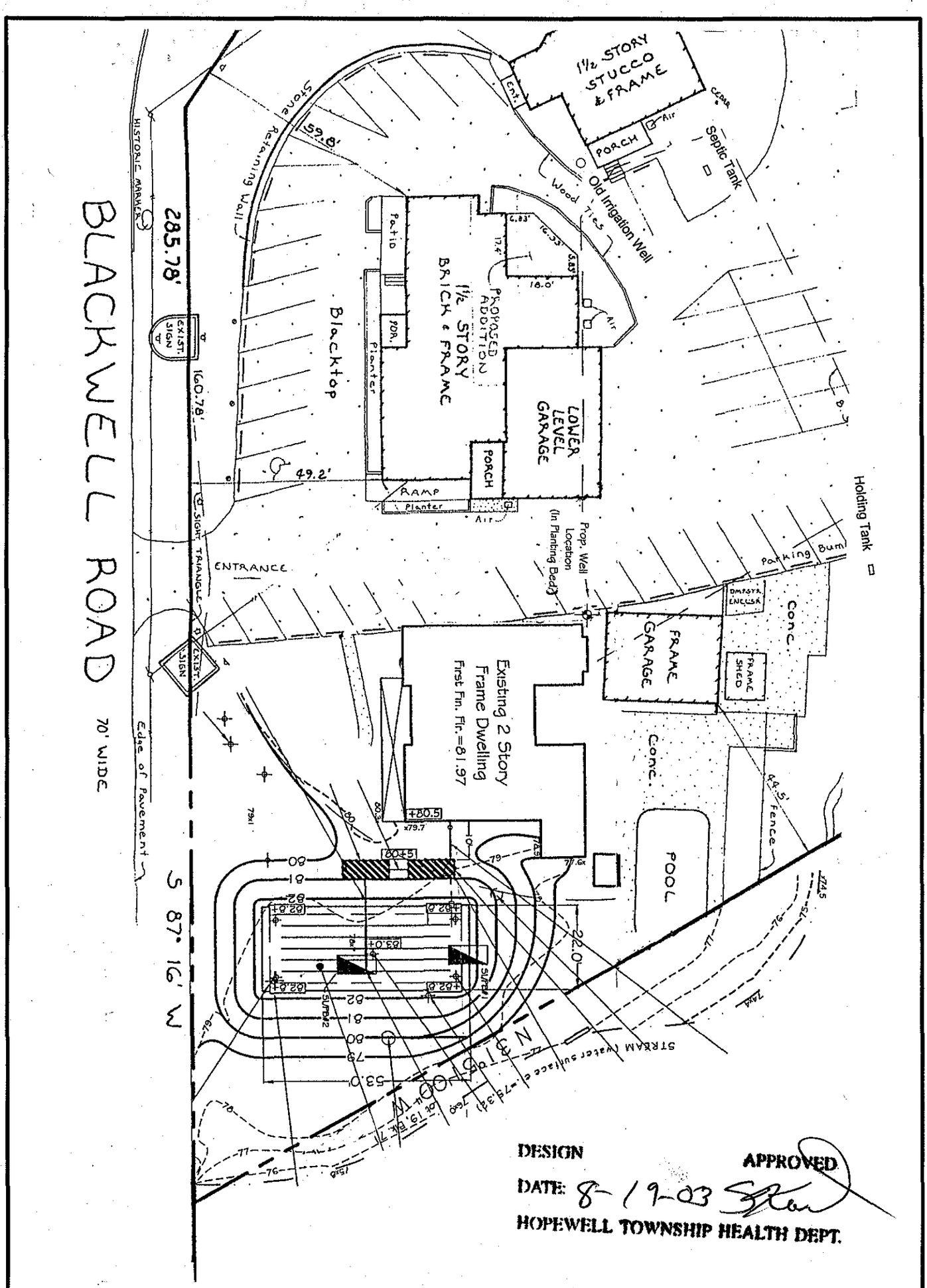
E S E

EASTERN STATES ENGINEERING, INC.

NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. GA277044

250 GIBRALTAR ROAD, SUITE 2E
HORSHAM, PA 19044
215 / 914-2050

DESIGNED:	DRAWN: R.F.B.	CHECKED: T.B.H.
SCALE: AS NOTED	DATE: 03/10/05	FILE: LOT021 SEPTIC AB



Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Overall Plan

of Lot-20, Block-71 for

Robert Wilson

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

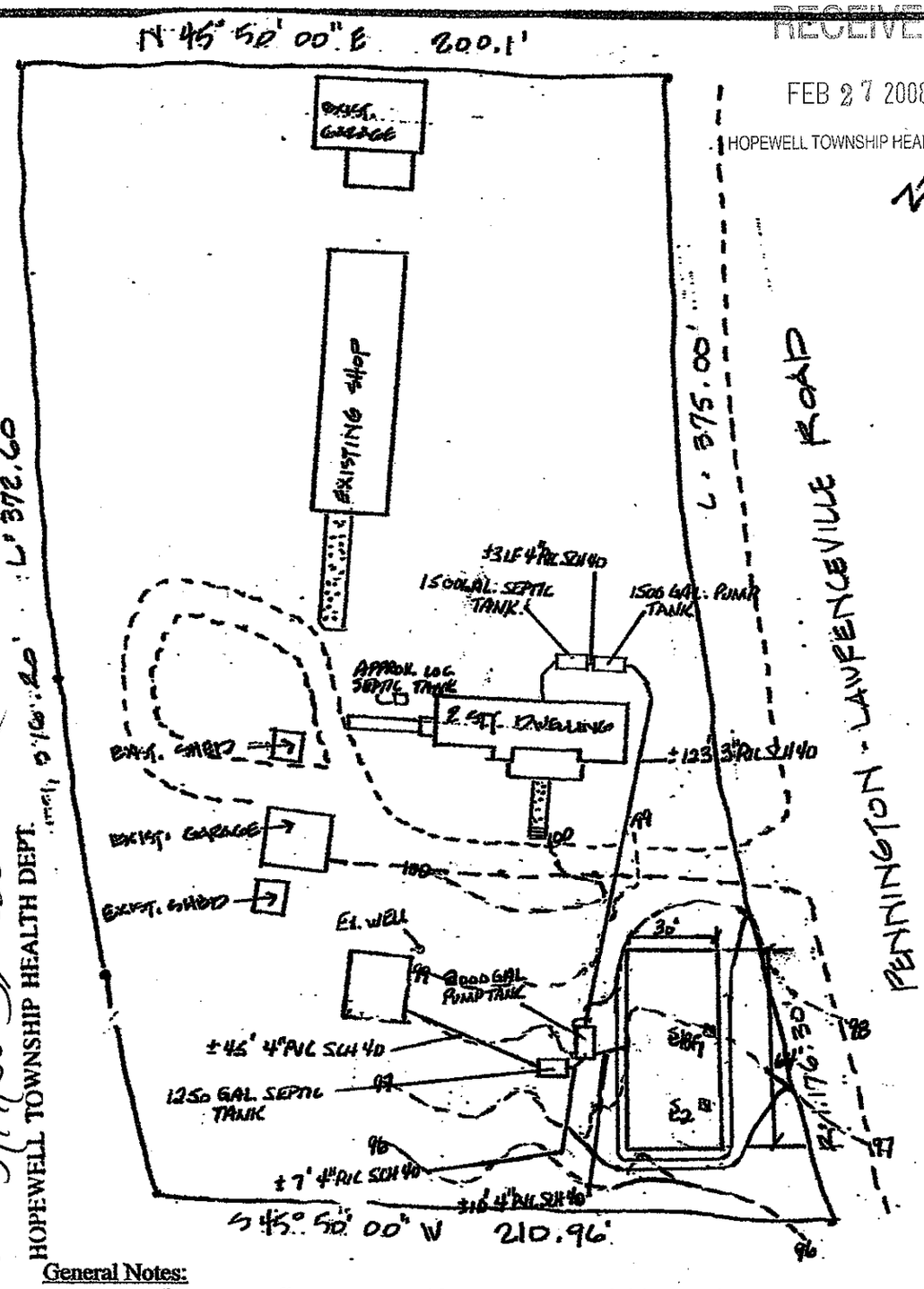
Bryce M. Rittenhouse 08/08/03
Bryce M. Rittenhouse: PE & LS #13453 Date

Date: 08/08/03
Scale: 1"=30'
Drawn: JRM
Check: BMR

Revisions:

Job#:R021010
Dwg:120671_sep.dwg
View:Plan
Layout:SEP_RP

RECEIVED
FEB 27 2008
HOPEWELL TOWNSHIP HEALTH DEPT.



APPROVED
DESIGN
DATE: 3/17/08
HOPEWELL TOWNSHIP HEALTH DEPT.

General Notes:

1. The property lines, metes and bounds, house and driveway location was taken from a plan entitled "Pearse – Drance Barn 24 Pennington – Lawrenceville Rd. Pennington, NJ 08534"by Jennifer A. Stark, R.A., AIA
2. A benchmark of 100.00 was set on the first corner step leading from the driveway to the front porch. Topography taken from field notes.
3. The existing septic tank is to be pumped clean, crushed, and backfilled in place with clean fill.
4. There are no existing wells or septic systems within 200' of the proposed septic system unless otherwise noted.
5. This is an alteration to an existing septic system as per N.J.A.C. 7:14A-3.3(d)(e).

REV.	DESCRIPTION	DATE	BY
1	REV. GRADING	2/22/08	CAP

SEPTICS BY PATTERSON, INC.
SOIL TESTING, SEPTIC DESIGN, INSPECTIONS
887 NEW RD. CHURCHVILLE, PA 18966 215-942-9017

SEPTIC SYSTEM DESIGN

PREPARED FOR

BLOCK 71 LOT 8

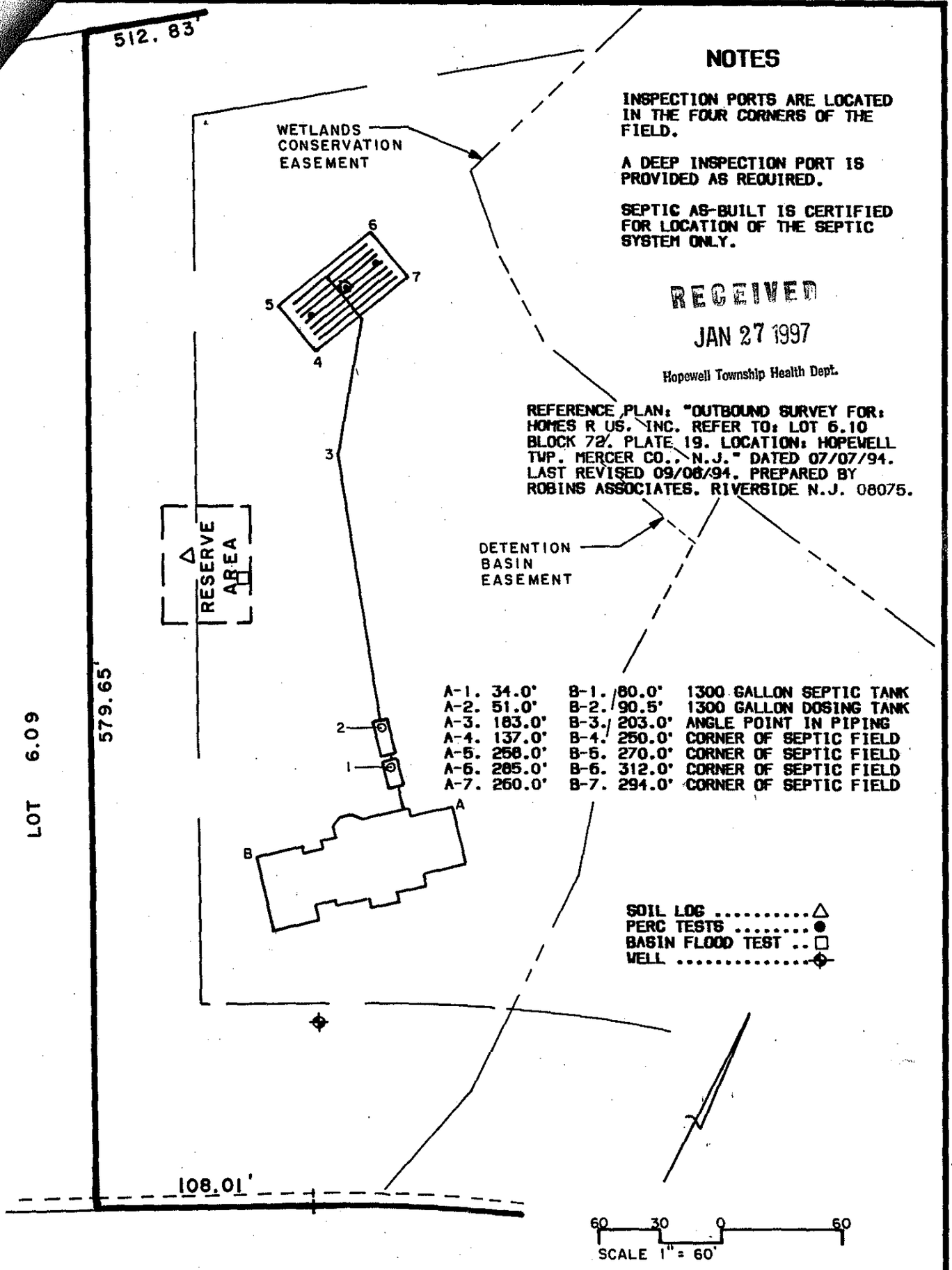
SITUATED IN HOPEWELL TOWNSHIP MERCER COUNTY

25 JAN 08

DONALD P. SCHLACHTER DATE
New Jersey Professional Engineer No. 23805

SCALE: 1" = 50'	DRAWN BY:	
DATE: 1/25/08	CHECKED BY:	PAGE: 1 OF 10

NOVEMBER



NOTES

INSPECTION PORTS ARE LOCATED IN THE FOUR CORNERS OF THE FIELD.

A DEEP INSPECTION PORT IS PROVIDED AS REQUIRED.

SEPTIC AS-BUILT IS CERTIFIED FOR LOCATION OF THE SEPTIC SYSTEM ONLY.

RECEIVED
JAN 27 1997
Hopewell Township Health Dept.

REFERENCE PLAN: "OUTBOUND SURVEY FOR: HOMES R US, INC. REFER TO: LOT 6.10 BLOCK 72. PLATE 19. LOCATION: HOPEWELL TWP. MERCER CO., N.J." DATED 07/07/94. LAST REVISED 09/08/94. PREPARED BY ROBINS ASSOCIATES. RIVERSIDE N.J. 08075.

A-1. 34.0'	B-1. 80.0'	1300 GALLON SEPTIC TANK
A-2. 51.0'	B-2. 90.5'	1300 GALLON DOSING TANK
A-3. 183.0'	B-3. 203.0'	ANGLE POINT IN PIPING
A-4. 137.0'	B-4. 250.0'	CORNER OF SEPTIC FIELD
A-5. 258.0'	B-5. 270.0'	CORNER OF SEPTIC FIELD
A-6. 285.0'	B-6. 312.0'	CORNER OF SEPTIC FIELD
A-7. 260.0'	B-7. 294.0'	CORNER OF SEPTIC FIELD

SOIL LOG .....△
PERC TESTS .....●
BASIN FLOOD TEST ..□
WELL .....⊕

van note-harvey associates
consulting engineers, planners & land surveyors
777 Alexander Road Princeton, N.J. 08540
223 North Main Street Cape May Court House, N.J. 08210

Robert A. Hough 2/29/96
DATE OF SIGNATURE

ROBERT A. HOUGH
N.J. P.E. No. 33444

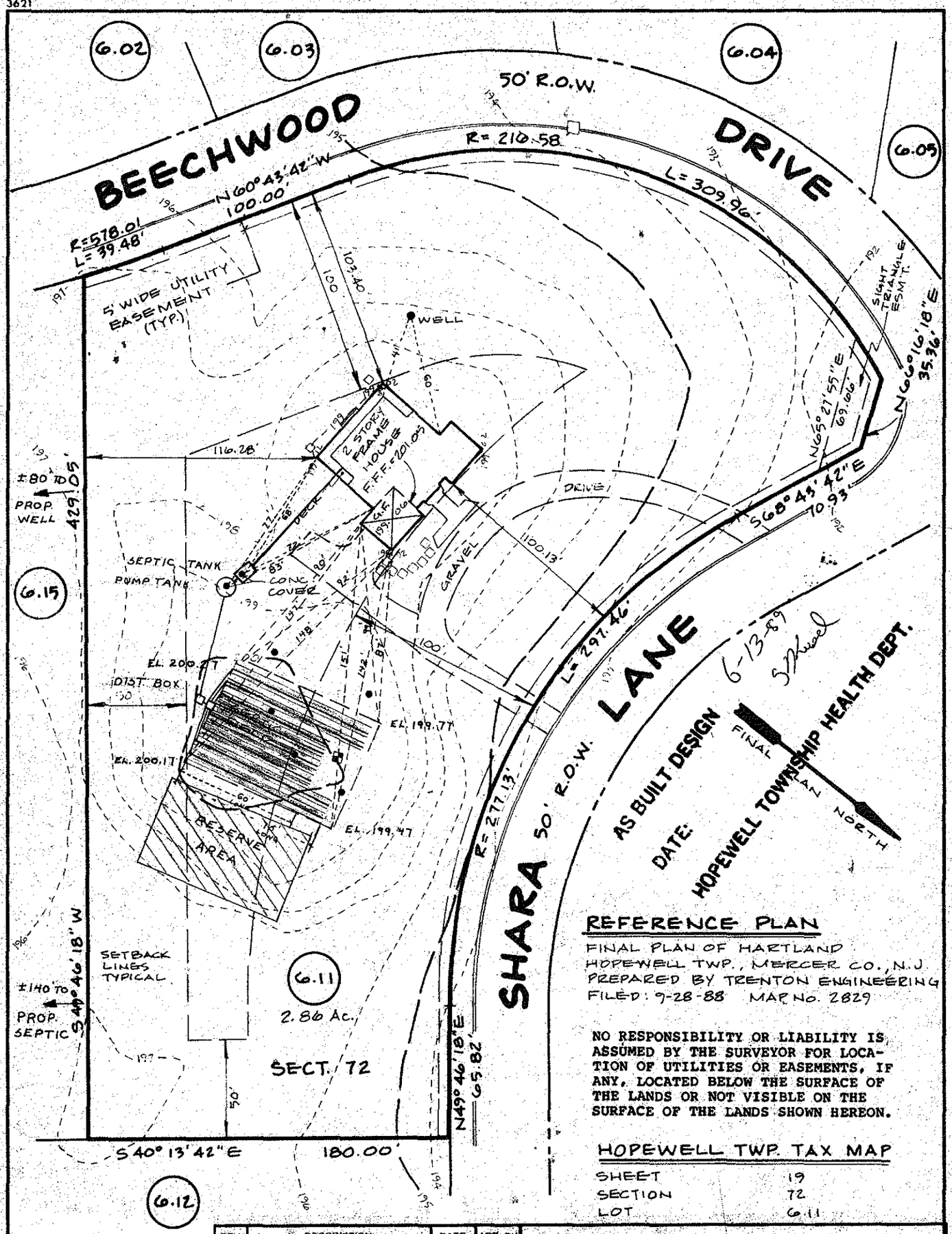
SEPTIC AS-BUILT PLAN
FOR
LOT 6.10 BLOCK 72

HOPEWELL TWP. MERCER CO., N.J.
SCALE 1" = 60' MARCH 1996

DRAWN BY	FIELD BK	ORDER No.	FILE No.	SHEET No.
BJF	PAGE	02.22. 32320-33		1 OF 1
CHECKED BY RAH				

S AS-BUILT 6.10 - 927[0,37]PF: BRIAN 20184 28-Feb-96 04:32 PM / 4.11.00010-95

3621



REFERENCE PLAN

FINAL PLAN OF HARTLAND
HOPEWELL TWP., MERCER CO., N.J.
PREPARED BY TRENTON ENGINEERING
FILED: 9-28-88 MAP No. 2829

NO RESPONSIBILITY OR LIABILITY IS ASSUMED BY THE SURVEYOR FOR LOCATION OF UTILITIES OR EASEMENTS, IF ANY, LOCATED BELOW THE SURFACE OF THE LANDS OR NOT VISIBLE ON THE SURFACE OF THE LANDS SHOWN HEREON.

HOPEWELL TWP. TAX MAP

SHEET	19
SECTION	72
LOT	6.11

NOTE:
SEPTIC AS-BUILT IS CERTIFIED FOR LOCATIONS AND ELEVATIONS OF HOUSE WELL AND SEPTIC SYSTEM.

REV.	DESCRIPTION	DATE	APP. BY

RECEIVED
JUN 8 1989
HOPEWELL TOWNSHIP HEALTH DEPT.

Kenneth F. Najjar 6/9/89
DATE
KENNETH F. NAJJAR
N.J. P.E. No. 28517

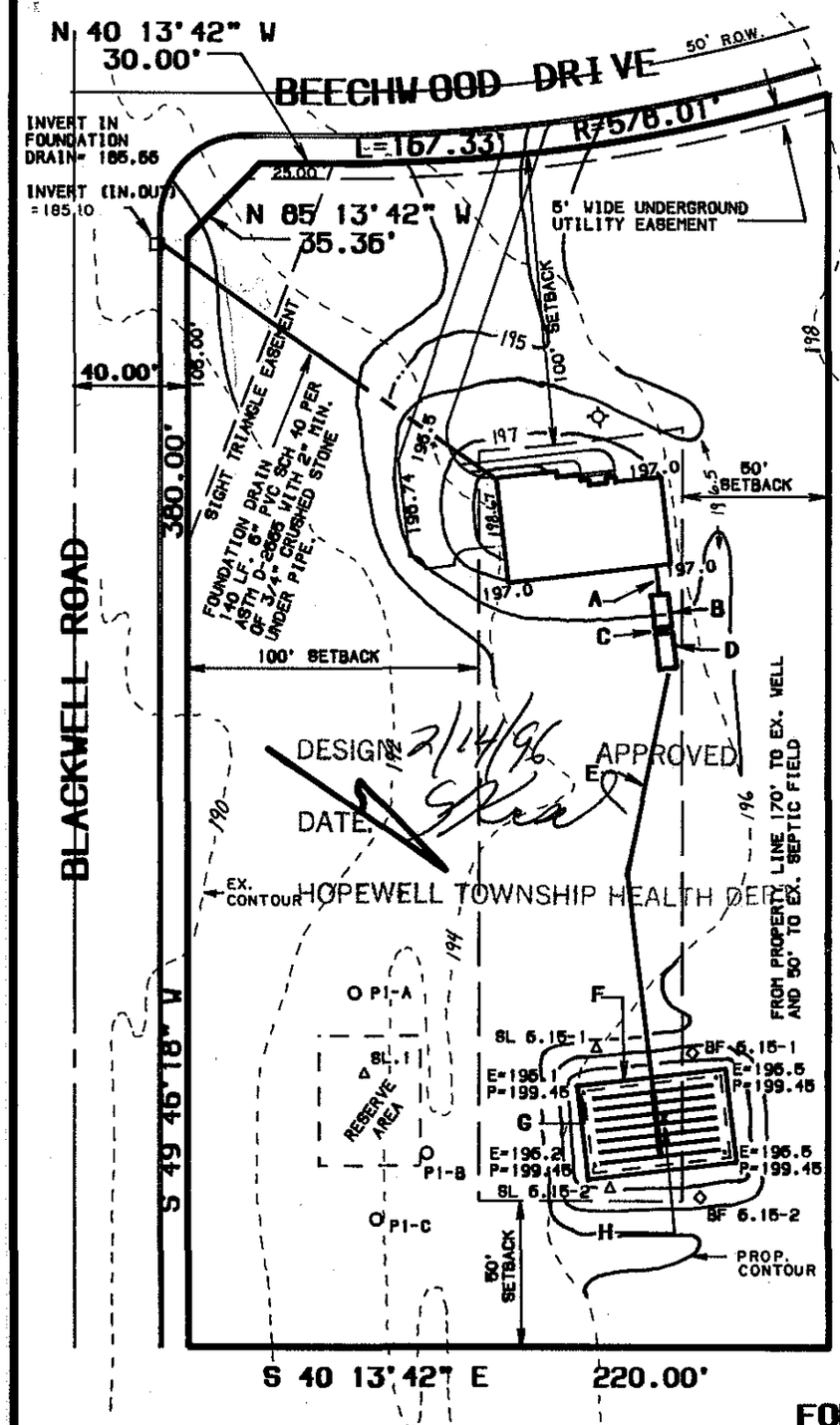
van note-harvey associates
consulting engineers, planners & land surveyors

777	Alexander Road	•	Princeton, N.J. 08540
785	Delsea Drive	•	Deptford, N.J. 08096
1147	North New Road	•	Absecon, N.J. 08201
59	East Mill Rd. (Rt 24)	•	Long Valley, N.J. 07853
223	North Main Street	•	Cape May Court House, N.J. 08210

vnh

FINAL PLAN OF
SEPTIC SYSTEM FOR
BLACKWELL FARMS
BLOCK: 72 LOT: 6.11
HOPEWELL TWP. MERCER CO. N.J.
SCALE: 1" = 60' JUNE 1989

DRAWN BY	FIELD BOOK	ORDER NO	FILE NO	SHEET NO
DCP	PAGE	27430		1 OF 2
CHECKED BY				



FROM PROP. SEPTIC FIELD TO EX. WELL 230' AND 230' TO EX. SEPTIC FIELD.

A. 10 LF. (MIN.) 4" PVC. SCH. 40 PER ASTM D-2665 (MIN. SLOPE ON PIPE 1/4" PER LF.)

B. 1000 GALLON CONCRETE SEPTIC TANK

C. 4" PVC. SCH. 40 PER ASTM D-2665 (MIN. SLOPE ON PIPE 1/4" PER LF.)

D. 1300 GALLON CONCRETE DOSING TANK

E. 146 LF. 3" PVC. SCH. 40 PER ASTM D-2665 DELIVERY PIPE

F. SEPTIC FIELD SEE SHEET 2 OF 6

G. INSPECTION PORTS TYP. (INSPECTION PORTS TO BE PROVIDED IN THE FOUR CORNER OF THE SEPTIC FIELD SEE SHEET 7 OF 7)

H. DEEP INSPECTION PORT (SEE SHEET 7 OF 7)

PROPOSED 4 BEDROOM DWELLING
F.F.F. = 200.33
F.G.F. = 199.00
FOUNDATION DRAIN
ELEV.= 190.00
CATCH BASIN
INVERT = 185.10
CATCH BASIN INVERT IN FROM FOUNDATION DRAIN = 185.66

LOT 6.15, BLOCK 72

LOT AREA :

ACRES 2.068
SQ. FT. 90.097

LEGEND

BASIN FLOOD .....◇
PERC TEST ..... ○
SOIL LOG .....△
PIT BAIL ..... N/A
WELL LOCATION .....☼

HOPEWELL TOWNSHIP TAX MAP

SHEET NO. 19
SECTION NO. 72
LOT No. 6.15

SEPTIC TANK AND DOSING TANK TO BE MANUFACTURED BY MODERN CONCRETE CO. OR APPROVED EQUAL.

FOR BUILDING PERMIT ONLY

LOT 6.12

DESCRIPTION : BEING KNOWN AND DESIGNATED AS LOT 6.17 SECTION 72 AS SHOWN AND SET FORTH ON A CERTAIN MAP ENTITLED: "PREMLIMINARY & FINAL SUBDIVISION FOR BLACKWELL FARMS ASSOCIATES, HOPEWELL TOWNSHIP MERCER COUNTY, NEW JERSEY," SCALE 1" = 100', PREPARED BY TRENTON ENGINEERING COMPANY, INC. ON JANUARY 5, 1989. FILED IN THE MERCER COUNTY CLERK'S OFFICE ON JUNE 2, 1989 AS MAP No. 2979. FILE No. 17047.

ELEVATIONS ALONG CURBLINE TAKEN FROM THE PLAN ENTITLED "FINAL GRADING PLAN OF HART FARM SUBDIVISION IN HOPEWELL TWP., MERCER COUNTY N.J." DATED 12/14/87 LAST REVISED 5/20/88; PREPARED BY TRENTON ENGINEERING COMPANY, INC. CONSTRACTOR TO VERIFY ELEVATIONS PRIOR TO CONSTRUCTION.

NASSAU SURVEYING
DIVISION OF VAN NOTE - HARVEY ASSOCIATES, P.C.
LAND SURVEYORS
777 ALEXANDER ROAD PRINCETON, NEW JERSEY 08540

Donald E. Allen 2-7-96
DATE
DONALD E. ALLEN
N.J. LAND SURVEYOR NO. 17423

van note-harvey associates
consulting engineers, planners & land surveyors
777 Alexander Road Princeton, N.J. 08540
223 North Main Street Cape May Court House, N.J. 08210

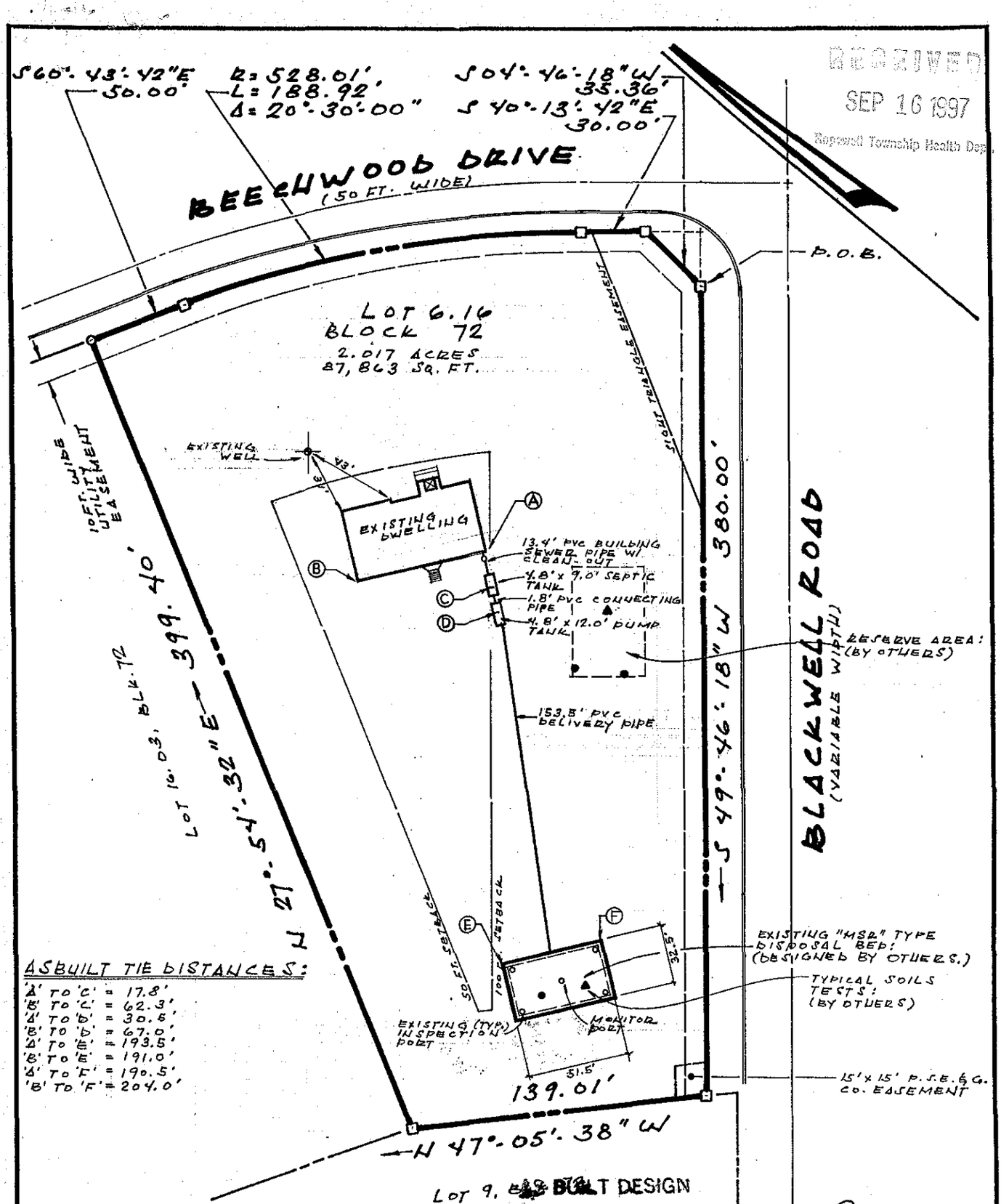
Robert A. Hough 2/7/96
DATE OF SIGNATURE
ROBERT A. HOUGH
N.J. P.E. No. 33444

PLOT PLAN AND SEPTIC SYSTEM DESIGN FOR

LOT 6.15 BLOCK 72

HOPEWELL TOWNSHIP MERCER CO., N.J.
SCALE 1" = 60' FEBRUARY 1996.

DRAWN BY BJF	FIELD BK	ORDER No.	FILE No.	SHEET No.
CHECKED BY RAH	PAGE	2.22. 32340-32	FLAT FILE	1 OF 7



RECEIVED
SEP 16 1997
Hopewell Township Health Dept.

ASBUILT TIE DISTANCES:

'A' TO 'C' = 17.8'
'B' TO 'C' = 62.3'
'A' TO 'D' = 30.5'
'B' TO 'D' = 67.0'
'A' TO 'E' = 193.5'
'B' TO 'E' = 191.0'
'A' TO 'F' = 190.5'
'B' TO 'F' = 204.0'

• NOTE: THIS PLAN IS FOR MUNICIPAL HEALTH DEPT. APPROVAL ONLY.

FRANK J. FALCONE
PROF. LAND SURVEYOR # 32112 & PROF. PLANNER # 3760

SHEET	BLOCK	LOT
19	72	6.16

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT PLAN
OF LOT 6.16, BLOCK 72, FOR:
DICKSON DEVELOPMENT CORP.
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
FRANK J. FALCONE	P.L.S.	NO. 32112

12/30/96
DATE

FRANK J. FALCONE: PLS # 32112 PP # 3760

DRAWN	DATE
J.M.	12/30/96
CHECK FJF / GB	SCALE 1"=60'
REV.	

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327

12/30/96
D. GEOFFREY BROWN: PE & LS # 24327

LEGEND

SOIL LOGS ▲

BASIN FLOODS △

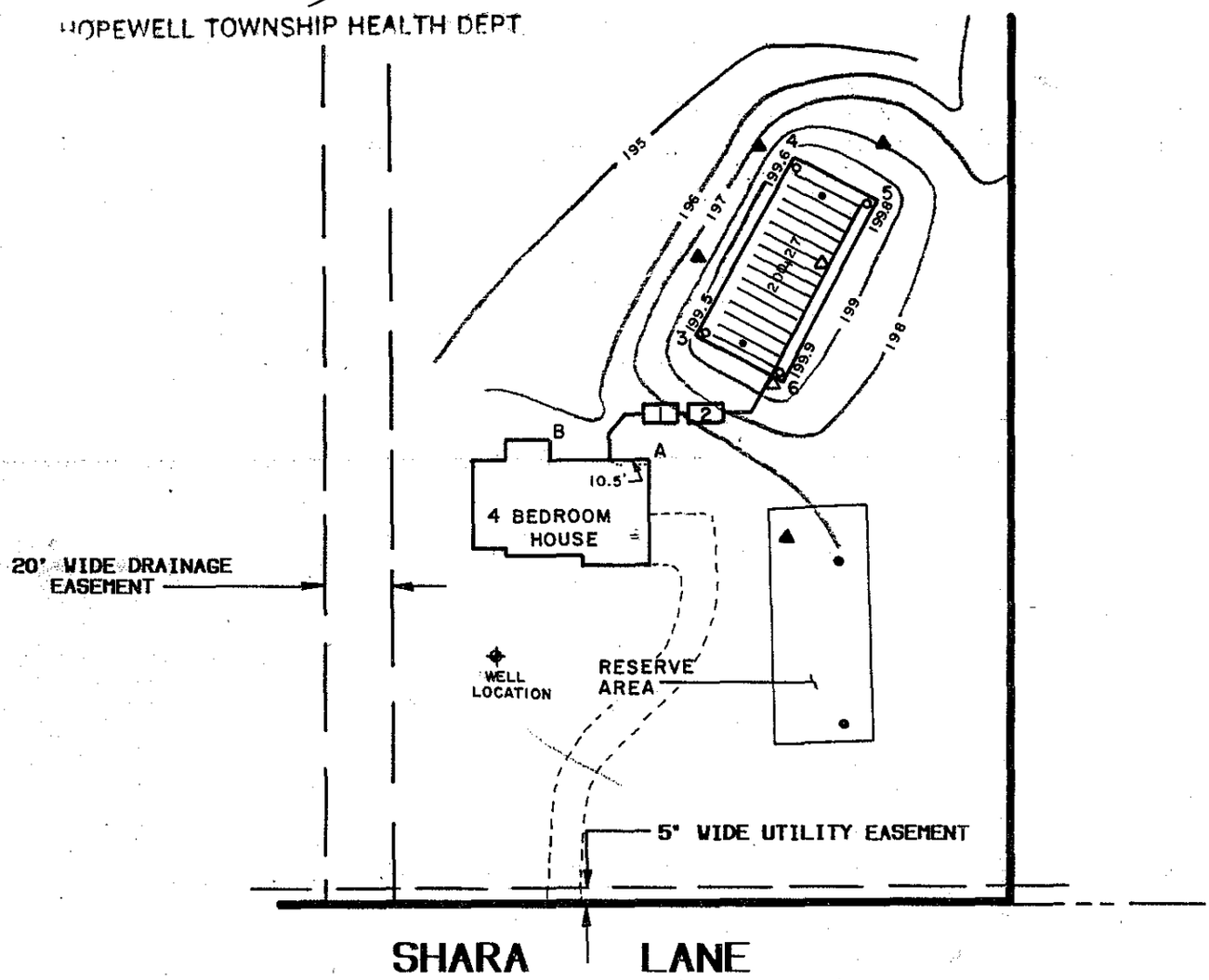
PERC TESTS ⊛
(IN SELECT FILL)

A-1. 15.0'	B-1. 37.0'	SEPTIC TANK
A-2. 22.5'	B-2. 49.0'	DOSING TANK
A-3. 40.0'	B-3. 55.5'	CORNER OF FIELD
A-4. 103.0'	B-4. 114.5'	CORNER OF FIELD
A-5. 105.0'	B-5. 125.0'	CORNER OF FIELD
A-6. 48.0'	B-6. 74.0'	CORNER OF FIELD

AS BUILT DESIGN

DATE: 6-30-94

HOPEWELL TOWNSHIP HEALTH DEPT



THE SEPTIC COMPONENTS OF THIS SYSTEM CONTAIN ONE 1000 GALLON CONCRETE SEPTIC TANK, ONE 1300 GALLON CONCRETE DOSING TANK. ONE 4" END MANIFOLD WITH 15 1" LATERALS AND FOUR INSPECTION PORTS PROVIDED IN THE FOUR CORNERS OF THE BED.

REFERENCE PLAN : "SURVEY FOR HOMES-R-US. INC. LOCATION: TOWNSHIP OF HOPEWELL MERCER COUNTY, N.J." DATED 11/17/93. SCALE 1" = 80'. PREPARED BY ROBINS ASSOCIATES RIVERSIDE N.J.

NOTE : SEPTIC AS-BUILT IS CERTIFIED FOR LOCATION OF SEPTIC SYSTEM ONLY.

von note-harvey associates
consulting engineers, planners & land surveyors
777 Alexander Road Princeton, N.J. 08540
223 North Main Street Cape May Court House, N.J. 08210

6/24/94
DATE OF SIGNATURE

JOHN C. RYDER
N.J. PROFESSIONAL ENGINEER No. 38287

SEPTIC AS-BUILT PLAN

FOR

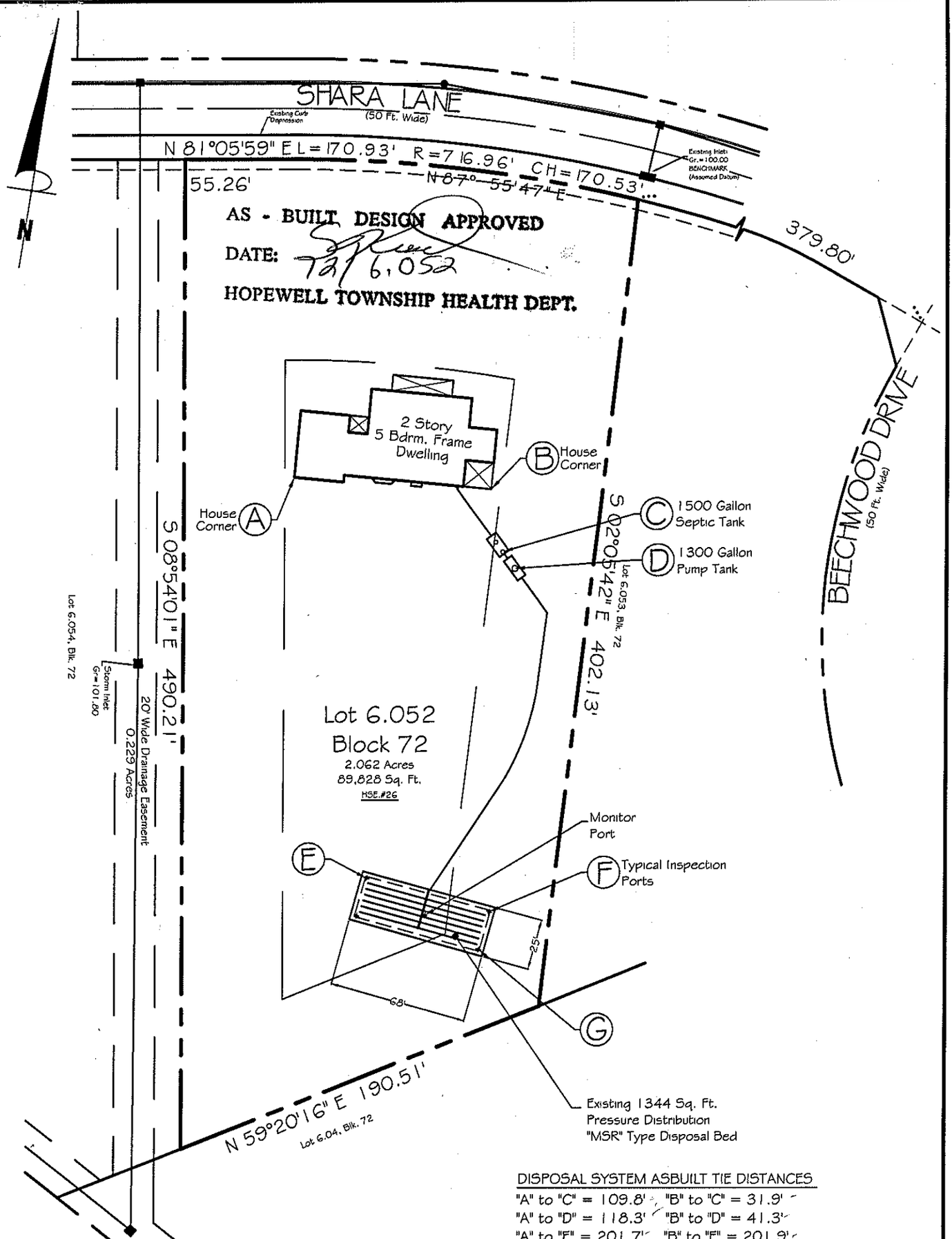
LOT 6.05 - BLOCK 72

HOPEWELL TOWNSHIP
SCALE 1" = 50'

MERCER CO., N.J.
JUNE 1994.

DRAWN BY	FIELD BK	ORDER No.	FILE No.	SHEET No.
BJF	PAGE	2.31. 31529-32	FLAT FILE	1 OF 1
CHECKED BY JCR				

P 8.5 x 14 VNH TITLE BLOCK MYLAR - 927[0,37]PF: SEPTIC 150 22-Jun-94 10:00 AM / 4.11.00010-94



DISPOSAL SYSTEM ASBUILT TIE DISTANCES

"A" to "C" = 109.8' "B" to "C" = 31.9'
"A" to "D" = 118.3' "B" to "D" = 41.3'
"A" to "E" = 201.7' "B" to "E" = 201.9'
"A" to "F" = 236.2' "B" to "F" = 209.4'
"A" to "G" = 251.4' "B" to "G" = 228.1'

NOTE: This plan is for Municipal Health Department approval only.

Bryce M. Rittenhouse New Jersey Professional Engineer & Land Surveyor License #13453

Frank J. Falcone New Jersey Professional Land Surveyor License #32112

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Plot Plan & Disposal System Design
of Lot-6.052, Block-72 for
Compton Lane Homes, LLC
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249
Kevin M. Brakel	PE	No.44194

* NJ and PA Licensed.

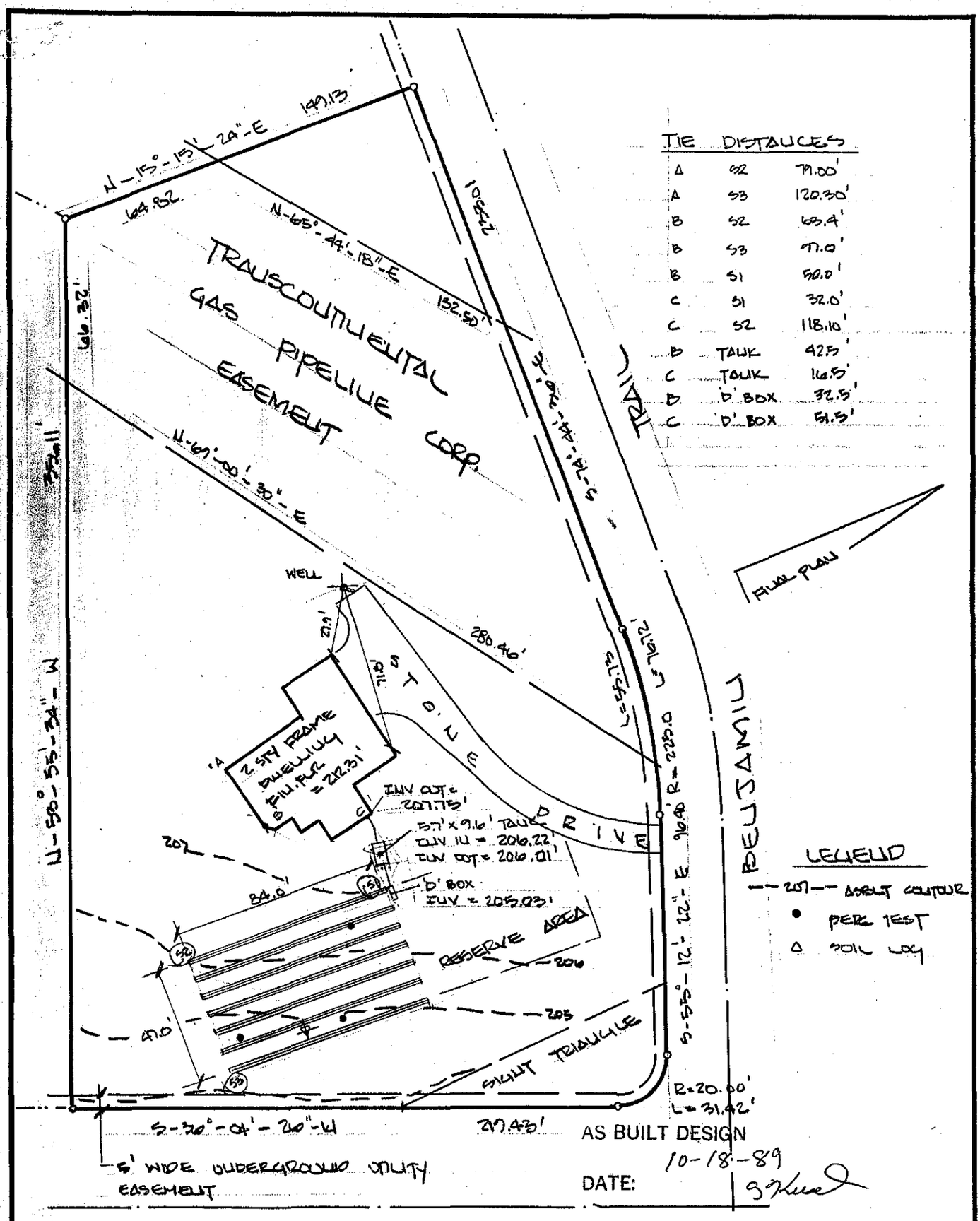
Bryce M. Rittenhouse, PE & LS #13453 10/18/04 Date

Frank J. Falcone: PLS #32112 & PP #3760 10/18/04 Date

Date: 10/18/04
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

Revisions:

Job# F03250G2
Dwg: LCO5B072.dwg
View: Plan
Layers: Septic Asbuilt



D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327

SHEET	BLOCK	LOT
	72	10.01

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.01, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP MERCER CO NJ

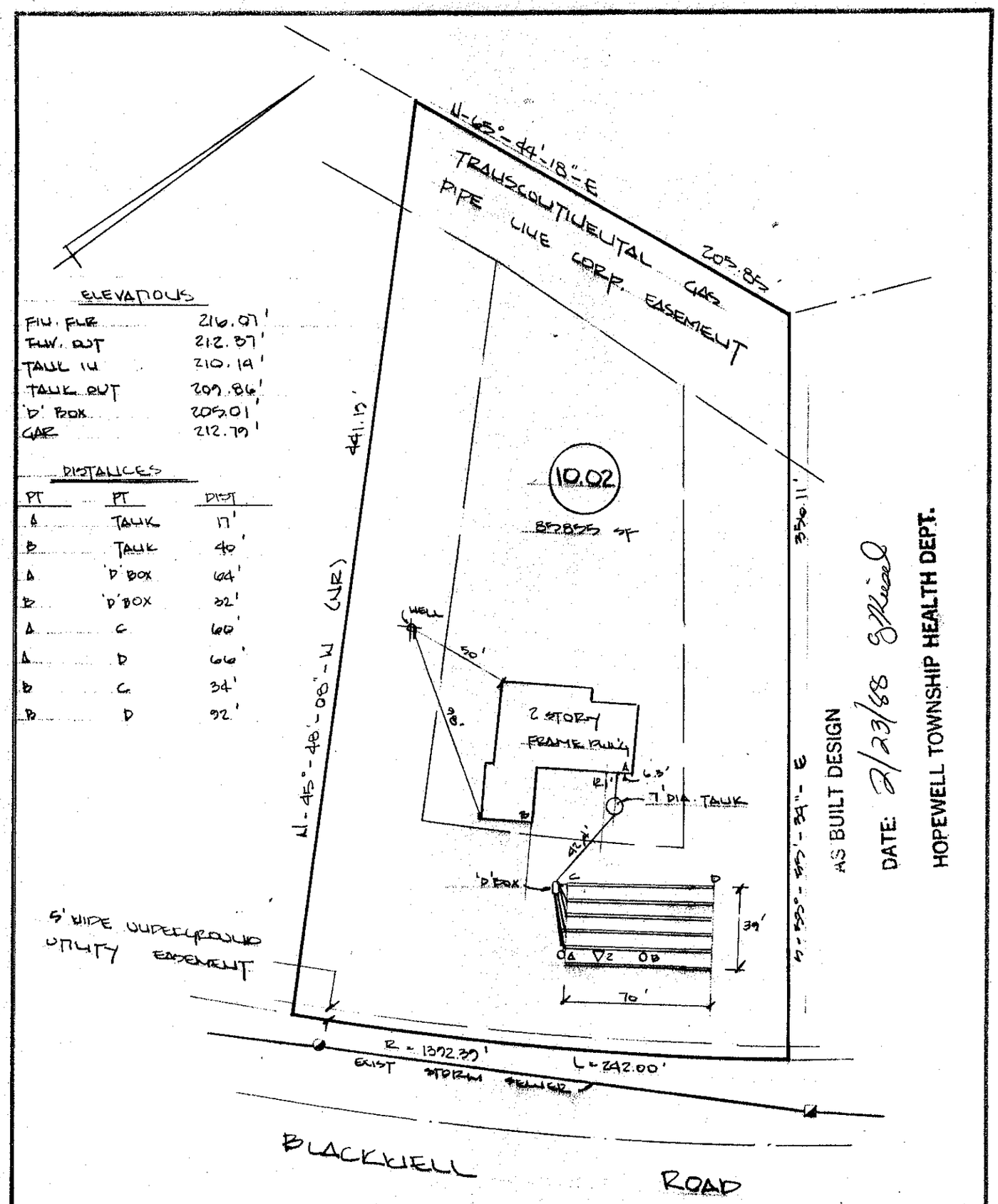
FRANK L. QUINBY	P.E. & P.L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
KEVIN M. SMITH	P.E.	NO.	30718
FRANK J. FALCONE	P.L.S.	NO.	32112

D. GEOFFREY BROWN PE — DATE 10-16-89

DRAWN	DATE
KD	10-16-89
CHECK	
REV.	SCALE 1" = 50'

CERTIFIED AS CORRECT TO:

RECEIVED
OCT 18 1989
HOPEWELL TOWNSHIP HEALTH DEPT.



AS BUILT DESIGN

DATE: 2/23/88

HOPEWELL TOWNSHIP HEALTH DEPT.

HOPEWELL TWP TAX MAP DATA

SHEET	BLOCK	LOT
	72	10.02

ARNOLD RYDEN JR. PROFESSIONAL LAND SURVEYOR No. 21223

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT OF LOT-10.02, BLOCK-72 FOR

ROBULU DEVELOPMENT CO.

HOPEWELL TWP MERCER CO. N.J.

FRANK L. QUINN	P.E. & P.L.S.	NO. 11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
KEVIN M. SMITH	P.E.	NO. 30718
FRANK J. FALCONE	P.L.S.	NO. 32112

Arnold Ryden Jr. 2/18/88
ARNOLD RYDEN JR. LS DATE

DRAWN: KRB
CHECK: ARJr
REV.
DATE: 2-10-88
SCALE: 1" = 40'

CERTIFIED AS CORRECT TO:

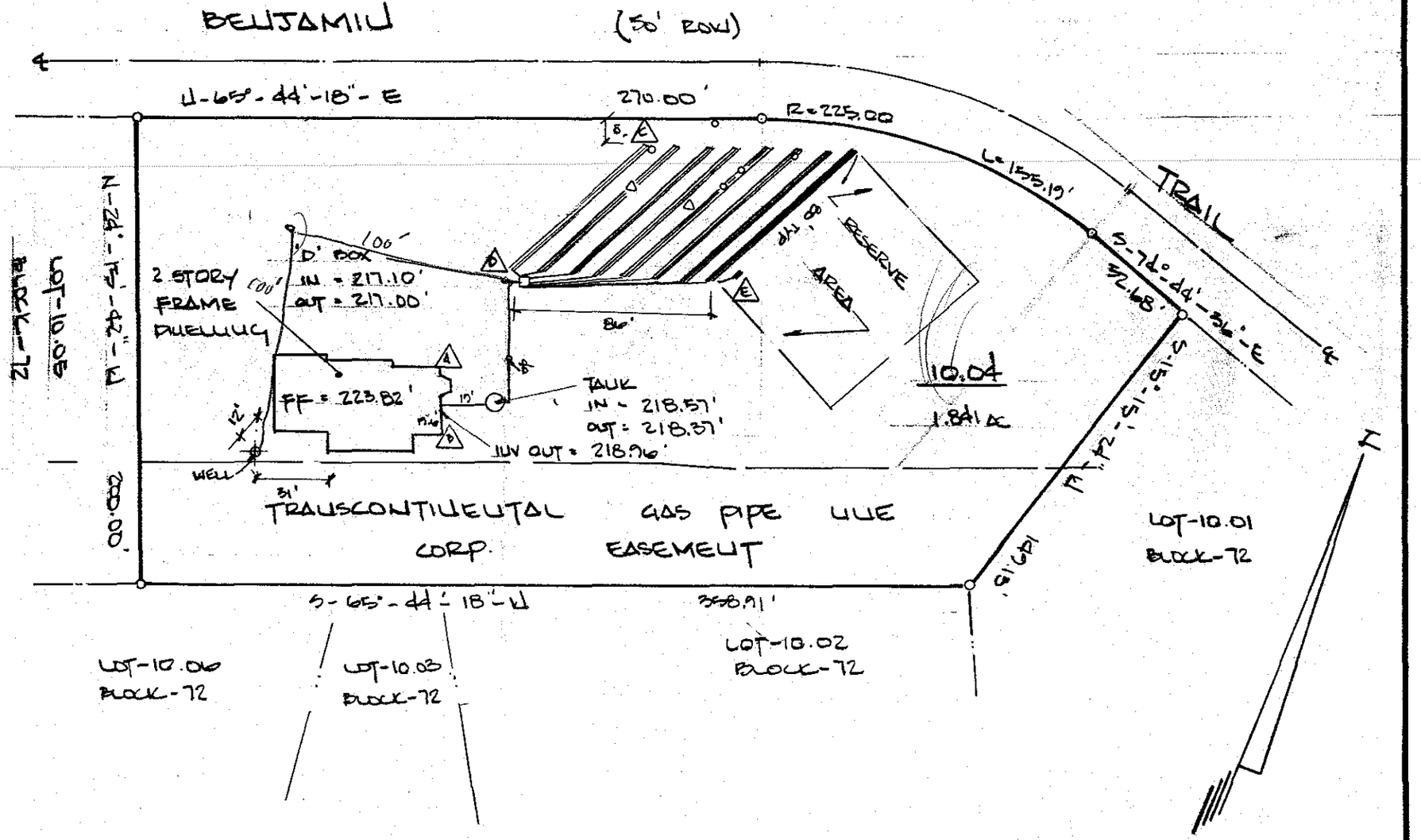
AS BUILT DESIGN

DATE: 11-10-88

HOPEWELL TOWNSHIP HEALTH DEPT.

TIE DISTANCES

PT	TO	PT	DIST	PT	TO	PT	DIST
A		C	131.0'	A		C	151.0'
		D	30.0'			D	75.0'
		E	122.0'			E	152.0'
		6" BOX	31.0'			6" BOX	74.0'
		TALK	28.0'			TALK	26.0'



D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

BRUCE M. RITTENHOUSE P.E. & P.L.S. NO. 13453
ARNOLD RYDER, JR. P.L.S. NO. 21223
D. GEOFFREY BROWN P.E. NO. 24327
WESLEY J. LANE P.L.S. NO. 26747
FRANK J. FALCONE P.L.S. NO. 32112

DATE 11-7-88

D. GEOFFREY BROWN PE

DRAWN | CHECKED | REV.

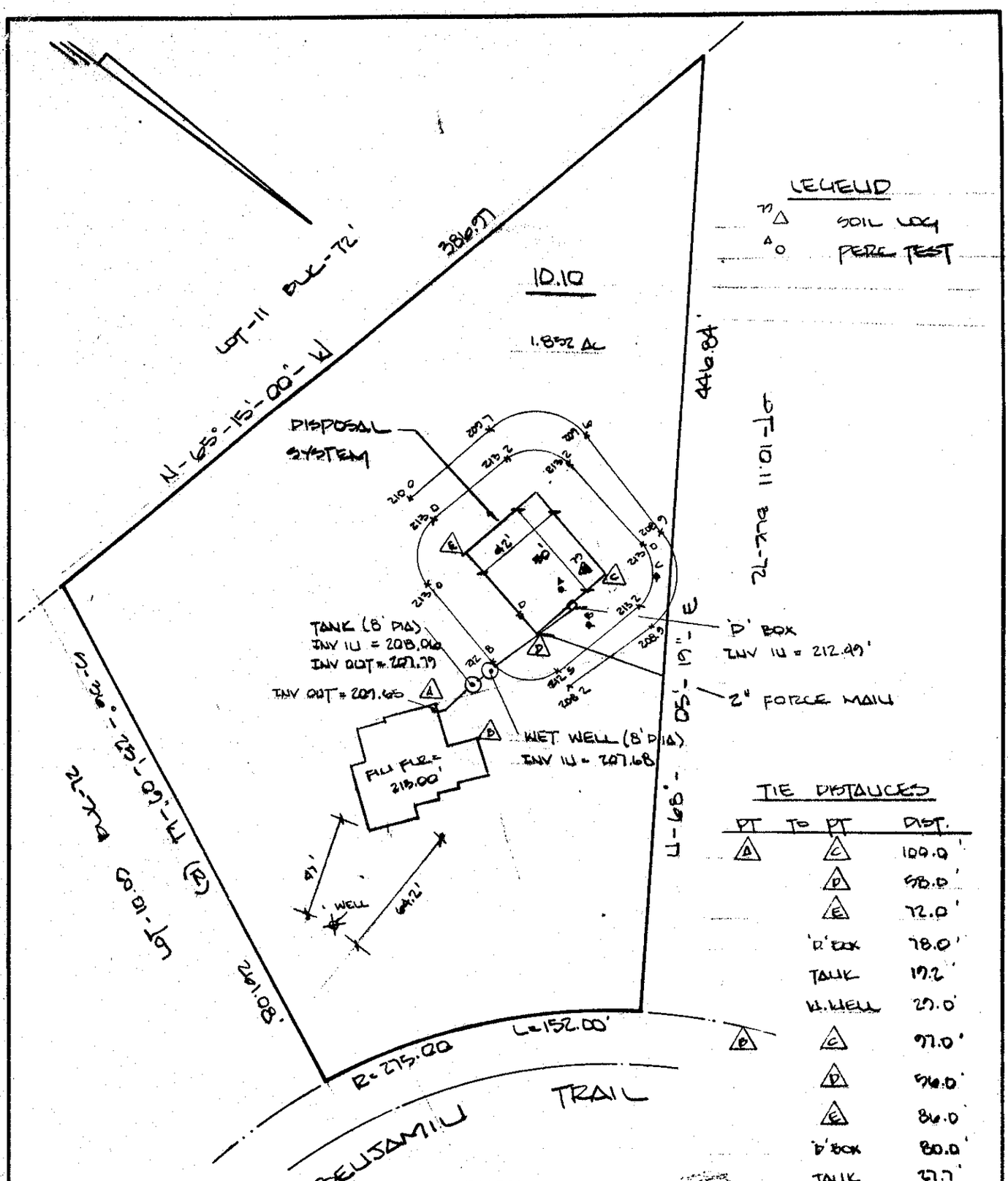
DATE 6-17-88 | SCALE 1" = 40'

CERTIFIED AS CORRECT TO:

RECEIVED
NOV 9 1988
HOPEWELL TOWNSHIP HEALTH DEPT

DISPOSAL SYSTEM ASBUILT
OF LOT-10.04, BLOCK-72 FOR
ROBOTU DEVELOPMENT CORP.
HOPEWELL TWP MERCER CO. NJ.

SHEET	BLOCK	LOT
	72	10.04



AS BUILT DESIGN

DATE: 2-1-89

HOPEWELL TOWNSHIP HEALTH DEPT.

D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327

SHEET	BLOCK	LOT
	72	10.10

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM AS-BUILT
OF LOT-10.10, BLOCK-72 FOR
ROBYN DEVELOPMENT CORP.
HOPEWELL TWP MERCER CO. N.J.

FRANK L. QUINBY	P.E. & L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E. & L.S.	NO.	13453
ARNOLD RYDEN, JR.	L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	L.S.	NO.	30747

DRAWN | DATE 11-2-88 | CHECK | SCALE 1"=60' | REV.

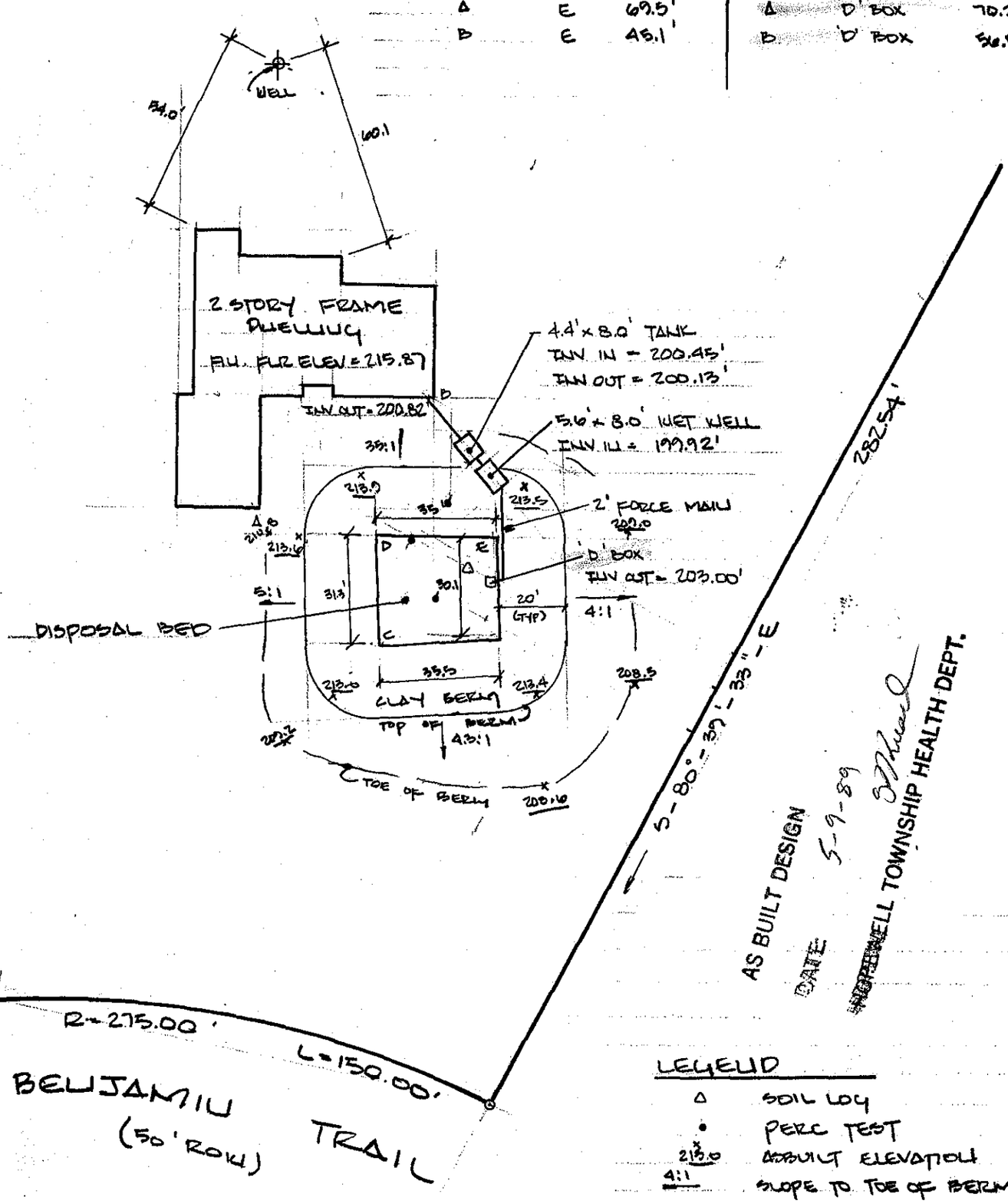
11-3-88
D. GEOFFREY BROWN PE — DATE

CERTIFIED AS CORRECT TO: RECEIVED
NOV 10 1988
HOPEWELL TOWNSHIP HEALTH DEPT.

129304
GARDEN STATE REPROGRAPHICS

TIE DISTANCES

PT	TO	PT	DISTANCE	PT	TO	PT	DISTANCE
A		C	54.0'	A		TANK	63.2'
B		C	74.8'	B		TANK	18.3'
A		D	35.3'	A		WET WELL	68.0'
B		D	43.0'	B		WET WELL	28.5'
A		E	69.5'	A		'D' BOX	70.2'
B		E	45.1'	B		'D' BOX	56.5'



AS BUILT DESIGN

DATE 5-9-89

HOPEWELL TOWNSHIP HEALTH DEPT.

LEGEND

- △ SOIL LOG
- • PERC TEST
- 213.0 ASBUILT ELEVATION
- 4:1 SLOPE TO TOE OF BERM

D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327	SHEET	BLOCK	LOT
		72	10.11

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.11, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP. MERCER CO. NJ

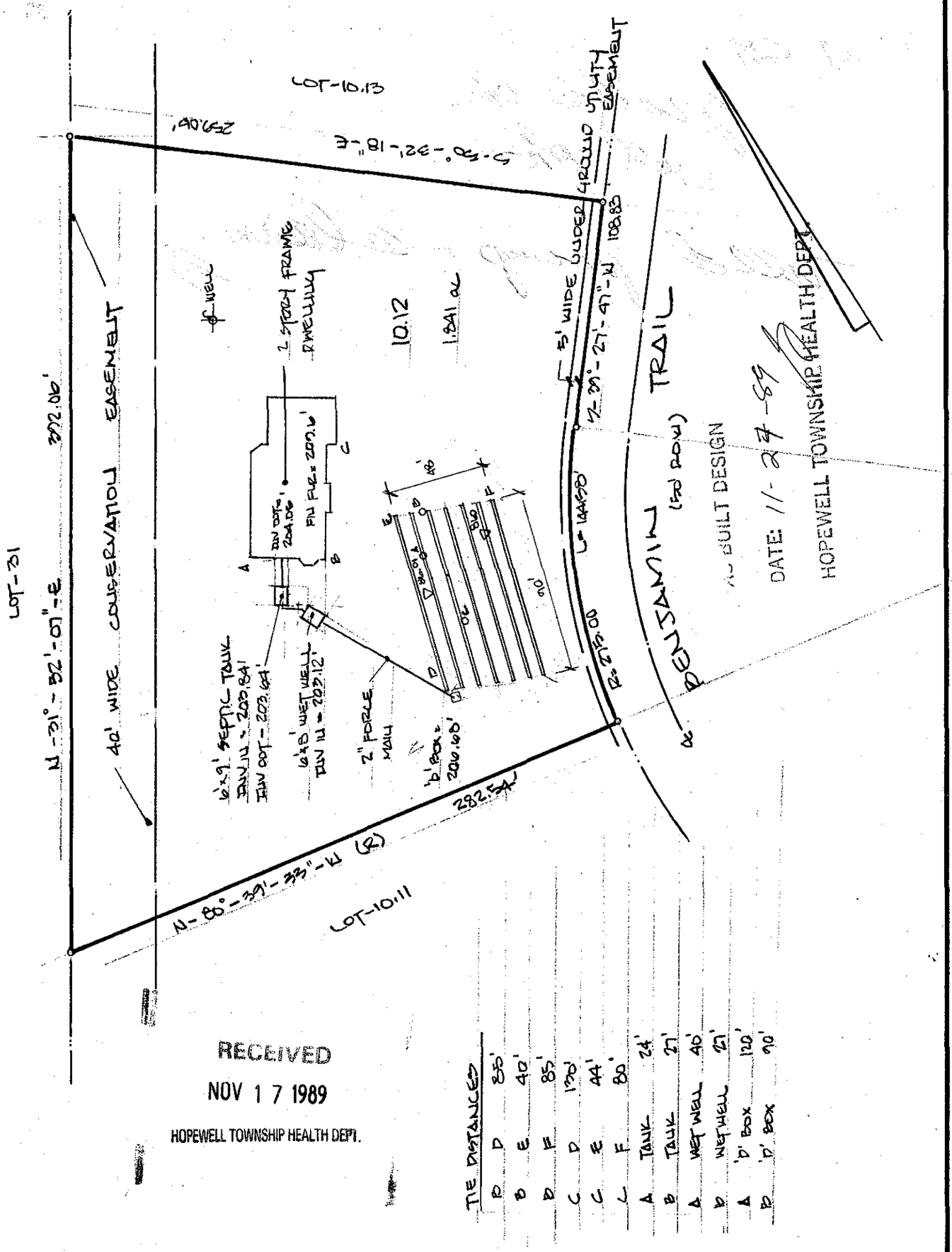
FRANK L. QUINBY	P.E. & P.L.S.	NO. 11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
KEVIN M. SMITH	P.E.	NO. 30718
FRANK J. FALCONE	P.L.S.	NO. 32112

D. Geoffrey Brown 5-1-89
D. GEOFFREY BROWN PE — DATE

DRAWN	DATE
KED	4-30-89
CHECK	
REV.	SCALE 1"=40'

CERTIFIED AS CORRECT TO:

RECEIVED
MAY 1 1989
HOPEWELL TOWNSHIP HEALTH DEPT.



RECEIVED
NOV 17 1989
HOPEWELL TOWNSHIP HEALTH DEPT.

D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327

SHEET	BLOCK	LOT
	72	10.12

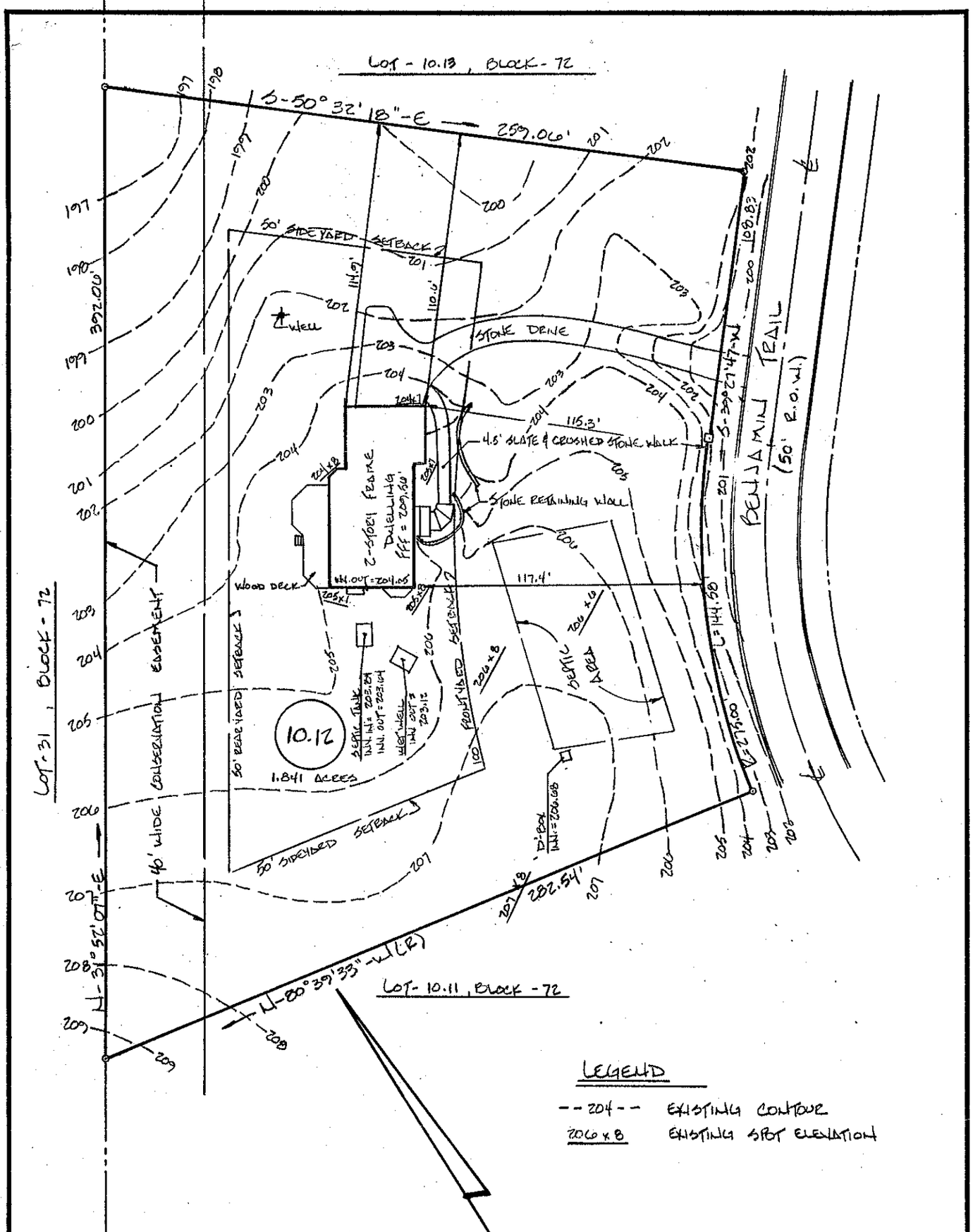
PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.12, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP. MERCER CO. NJ

FRANK L. QUINBY	P.E. & P.L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
KEVIN M. SMITH	P.E.	NO.	30718
FRANK J. FALCONE	P.L.S.	NO.	32112

D. Geoffrey Brown 11-13-89
D. GEOFFREY BROWN PE — DATE

DRAWN	DATE	CERTIFIED AS CORRECT TO:
KB	11-13-89	
CHECK		
	SCALE	
REV.	1"=60'	



LEGEND

- - 204 - - EXISTING CONTOUR

206 x 8 EXISTING SPOT ELEVATION

D. GEOFFREY BROWN PROFESSIONAL ENGINEER NO. 24327

ARNOLD RYDEN, JR PROFESSIONAL LAND SURVEYOR NO. 21223

SHEET	BLOCK	LOT
	72	10.12

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

AS-BUILT GRADING PLAN
OF LOT-10.12, BLOCK-72, FOR
EDWARD A. STEIMAN AND KATHRIN E. MORRIS
HOPEWELL TOWNSHIP - MERCER COUNTY, NEW JERSEY

~~FRANK L. QUINDY~~	~~P.E. & P.L.S.~~	~~NO.~~	~~14887~~
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
~~KEVIN M. SMITH~~	~~P.E.~~	~~NO.~~	~~30746~~
FRANK J. FALCONE	P.L.S.	NO.	32112

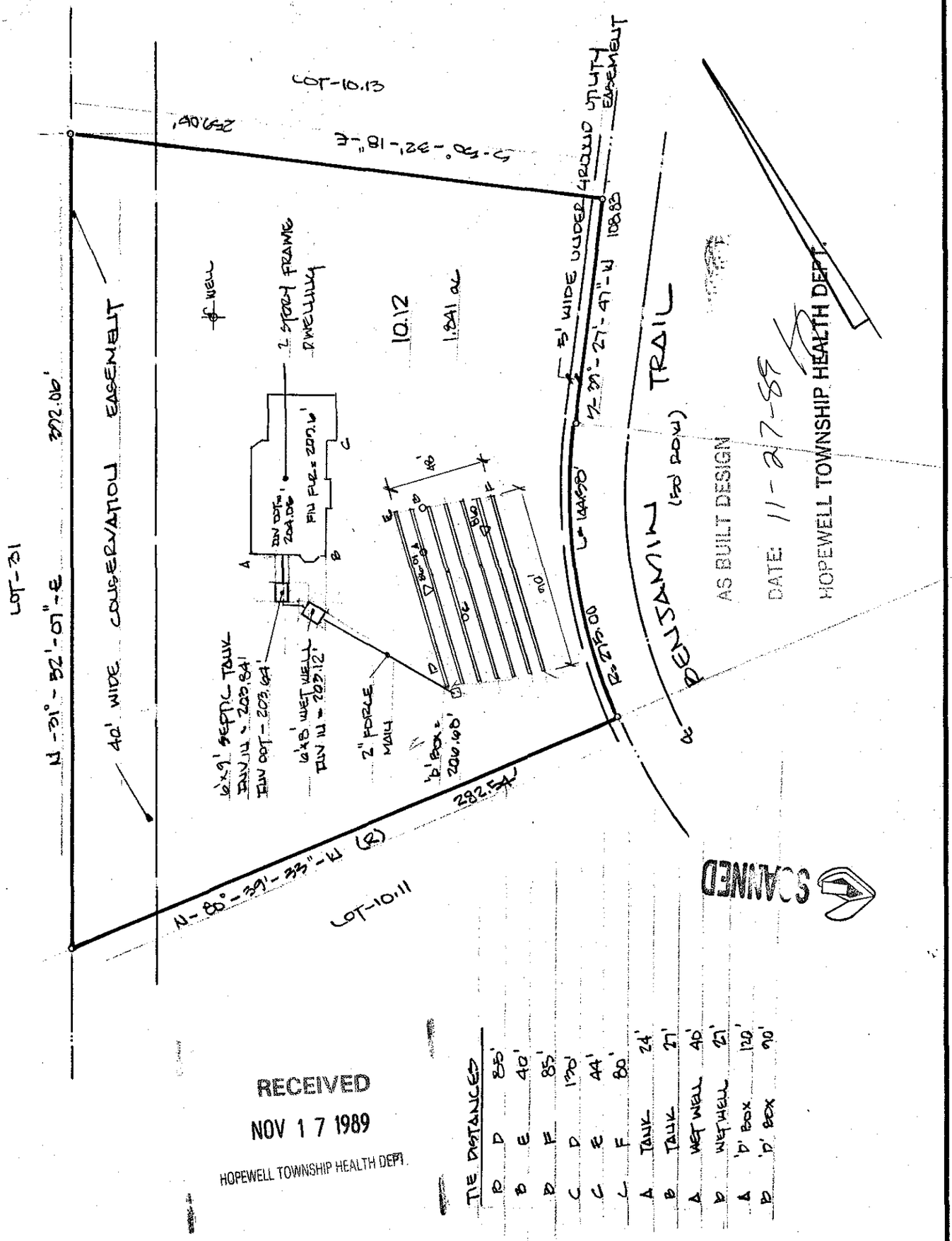
DRAWN: SS
CHECK:
REV.:
DATE: 11/16/89
SCALE: 1"=50'

CERTIFIED AS CORRECT TO:

RECEIVED
NOV 30 1989
HOPEWELL TOWNSHIP HEALTH DEPT.

Arnold Ryden 11/28/89
ARNOLD RYDEN, JR. PLS# 21223 DATE

D. GEOFFREY BROWN P.E. #24327 DATE



D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327	SHEET	BLOCK	LOT
		72	10.12

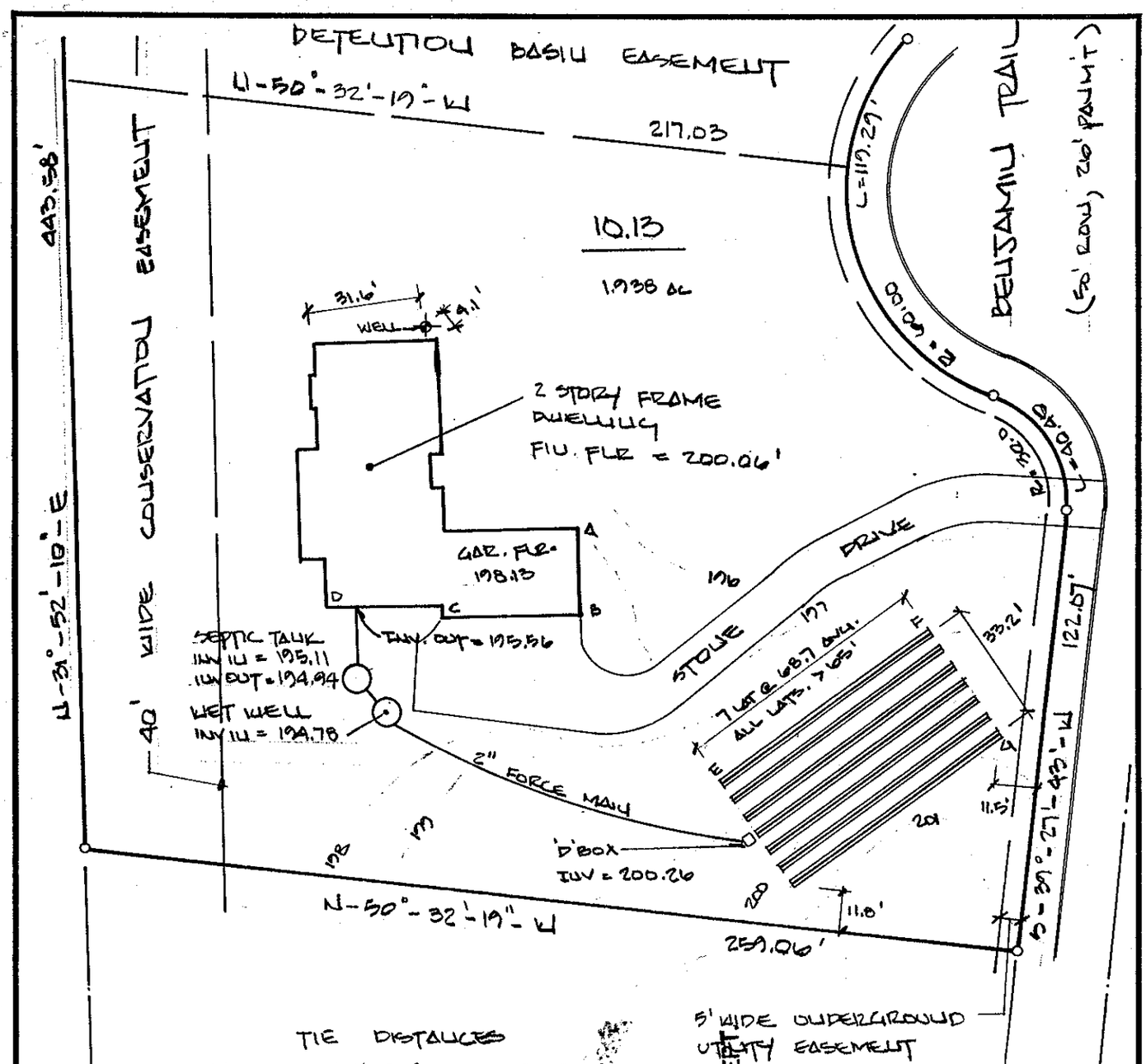
PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.12, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP. MERCER CO. NJ

FRANK L. QUINBY	P.E. & P.L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
KEVIN M. SMITH	P.E.	NO.	30718
FRANK J. FALCONE	P.L.S.	NO.	32112

D. Geoffrey Brown 11-13-89
D. GEOFFREY BROWN P.E. — DATE

DRAWN	DATE	CERTIFIED AS CORRECT TO:
KB	11-13-89	
CHECK	SCALE	
	1"=60'	
REV.		



TIE DISTANCES

PT	PT	DESCRIP.		DISTANCE
A	E	SEPTIC	COR.	80.50'
	F	"	"	102.0'
	G	"	"	129.0'
B	E	"	"	60.6'
	F	"	"	96.5'
	G	"	"	119.5'
A	'D' BOX			97.5'
B	'D' BOX			76.5'
C	TANK	8' DIA.		27.3
D	TANK	8' DIA.		21.4
C	WET WELL	8' DIA.		27.1
D	WET WELL	8' DIA.		33.1

AS BUILT DESIGN 6/28/89

DATE

HOPEWELL TOWNSHIP HEALTH DEPT

D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327

SHEET	BLOCK	LOT
	72	10.13

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.13, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP MERCER CO. N.J.

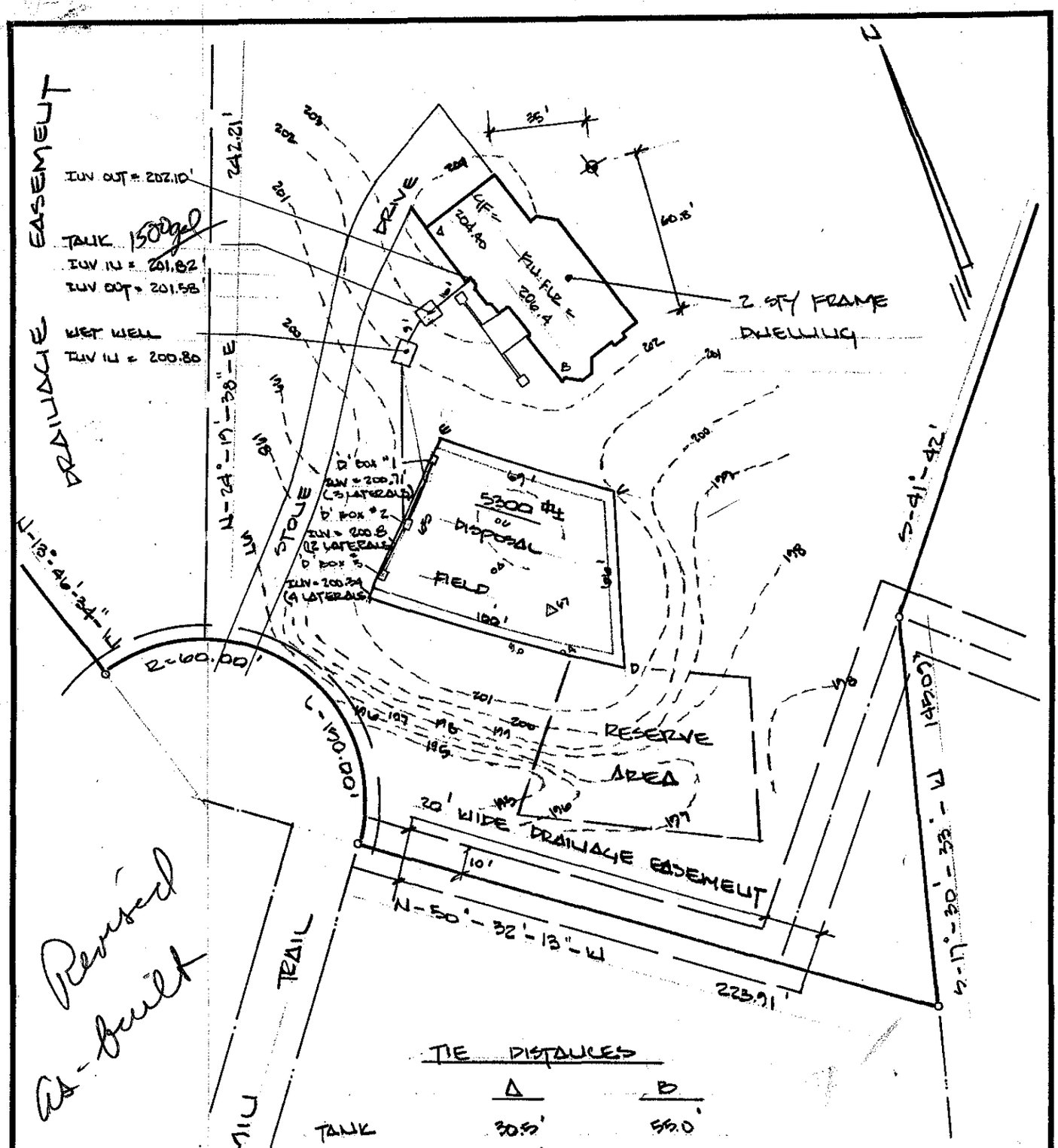
FRANK L. QUINBY	P.E. & P.L.S.	NO. 11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
KEVIN M. SMITH	P.E.	NO. 30718
FRANK J. FALCONE	P.L.S.	NO. 32112

6.26.89
D. GEOFFREY BROWN PE — DATE

DRAWN KB
CHECK
REV.
DATE 6.26.89
SCALE 1"=40'

CERTIFIED AS CORRECT TO:

RECEIVED
JUN 27 1989
HOPEWELL TOWNSHIP HEALTH DEPT.



TIE DISTANCES

	A	B
TANK	30.5'	55.0'
WET WELL	47.0'	60.0'
D' BOX 1	92.0	62.0'
D' BOX 2	110.0'	78.5'
D' BOX 3	129.5'	98.5'
C	121.0'	45.0'
D	180.0'	109.0'
E	78.0'	50.0'

LEGEND

--200--	ASBUILT CONTOUR
⊕	SOIL LOG
⊕	PERC. TEST

D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327

SHEET	BLOCK	LOT
	72	10.14

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.14, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP · MERCER CO. NJ

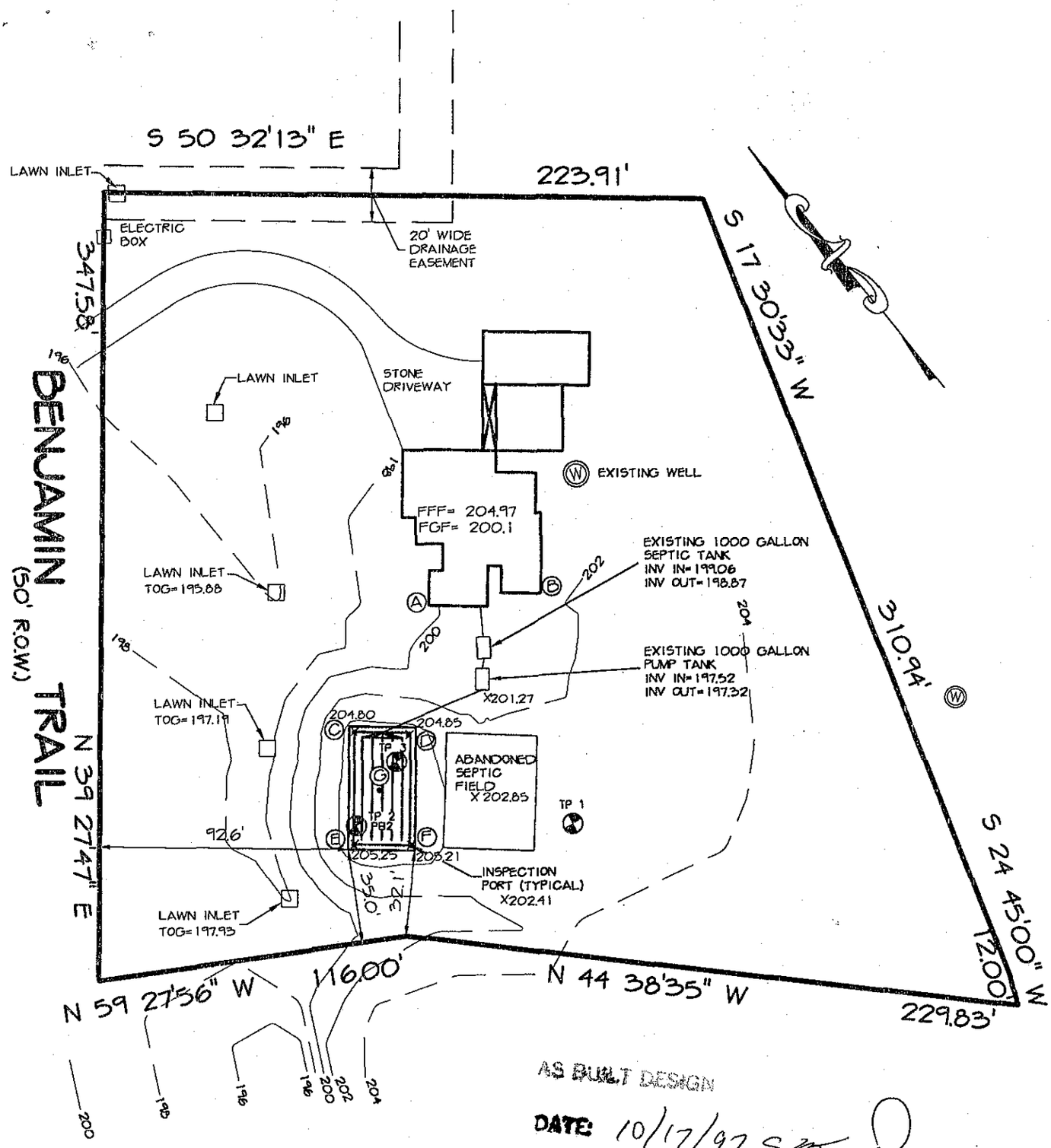
FRANK L. QUINBY	P.E. & P.L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
KEVIN M. SMITH	P.E.	NO.	30718
FRANK J. FALCONE	P.L.S.	NO.	32112

D. Geoffrey Brown 1.12.89
D. GEOFFREY BROWN PE — DATE

DRAWN	DATE
KB	1.12.89
CHECK	
REV. 1.23.89	SCALE 1"=50'

CERTIFIED AS CORRECT TO:

RECEIVED
JAN 20 1989
HOPEWELL TOWNSHIP HEALTH DEPT.



TIE DISTANCES

COMPONENT	HOUSE CORNER "A"	HOUSE CORNER "B"
INSPECTION PORT "C"	54.7'	87.1'
INSPECTION PORT "D"	48.6'	72.5'
INSPECTION PORT "E"	93.5'	117.3'
INSPECTION PORT "F"	89.3'	105.9'
INSPECTION PORT "G"	71.3'	95.4'

TAX MAP DATA:
LOT 10.15
BLOCK 72
NET AREA: 80,934.8
1.858 AC.

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

KENNETH E. BAILL P.E., P.L.S. 30111
P.P. 04122
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEPTIC SYSTEM AS-BUILT

PREPARED FOR

LOT 10.15, BLOCK 72

HOPEWELL

DRAWN BY: TFU	CHECKED BY: KEB	SCALE: 1"=50'	DATE: 10/15/97	PROJ. NO: 97-159

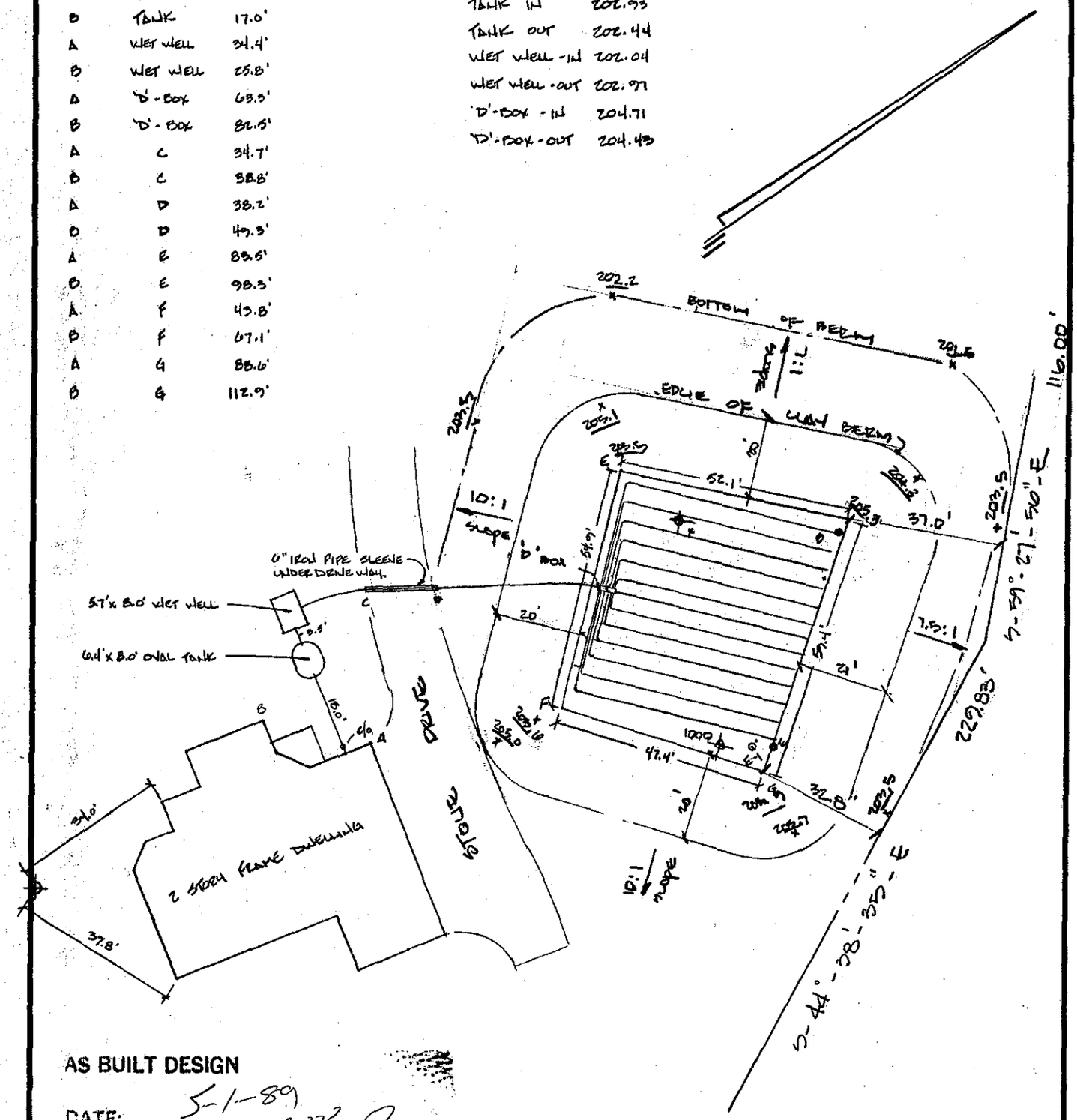
FILE: H\97-159\AS-BUILT

TIE DISTANCES

PT.	TO PT.	DISTANCE
A	TANK	23.5'
B	TANK	17.0'
A	WET WELL	34.4'
B	WET WELL	25.8'
A	'D'-BOX	63.5'
B	'D'-BOX	82.5'
A	C	34.7'
B	C	38.8'
A	D	38.2'
B	D	49.3'
A	E	83.5'
B	E	98.3'
A	F	43.8'
B	F	67.1'
A	G	88.6'
B	G	112.9'

ELEVATIONS

INV. OUT	204.07
TANK IN	202.93
TANK OUT	202.44
WET WELL-IN	202.04
WET WELL-OUT	202.97
'D'-BOX-IN	204.71
'D'-BOX-OUT	204.43



AS BUILT DESIGN

DATE: 5-1-89

HOPEWELL TOWNSHIP HEALTH DEPT.

203.16 DENOTES ASBUILT ELEVATION

D. GEOFFREY BROWN	PROFESSIONAL ENGINEER No. 24327	SHEET	BLOCK	LOT
			72	10.16

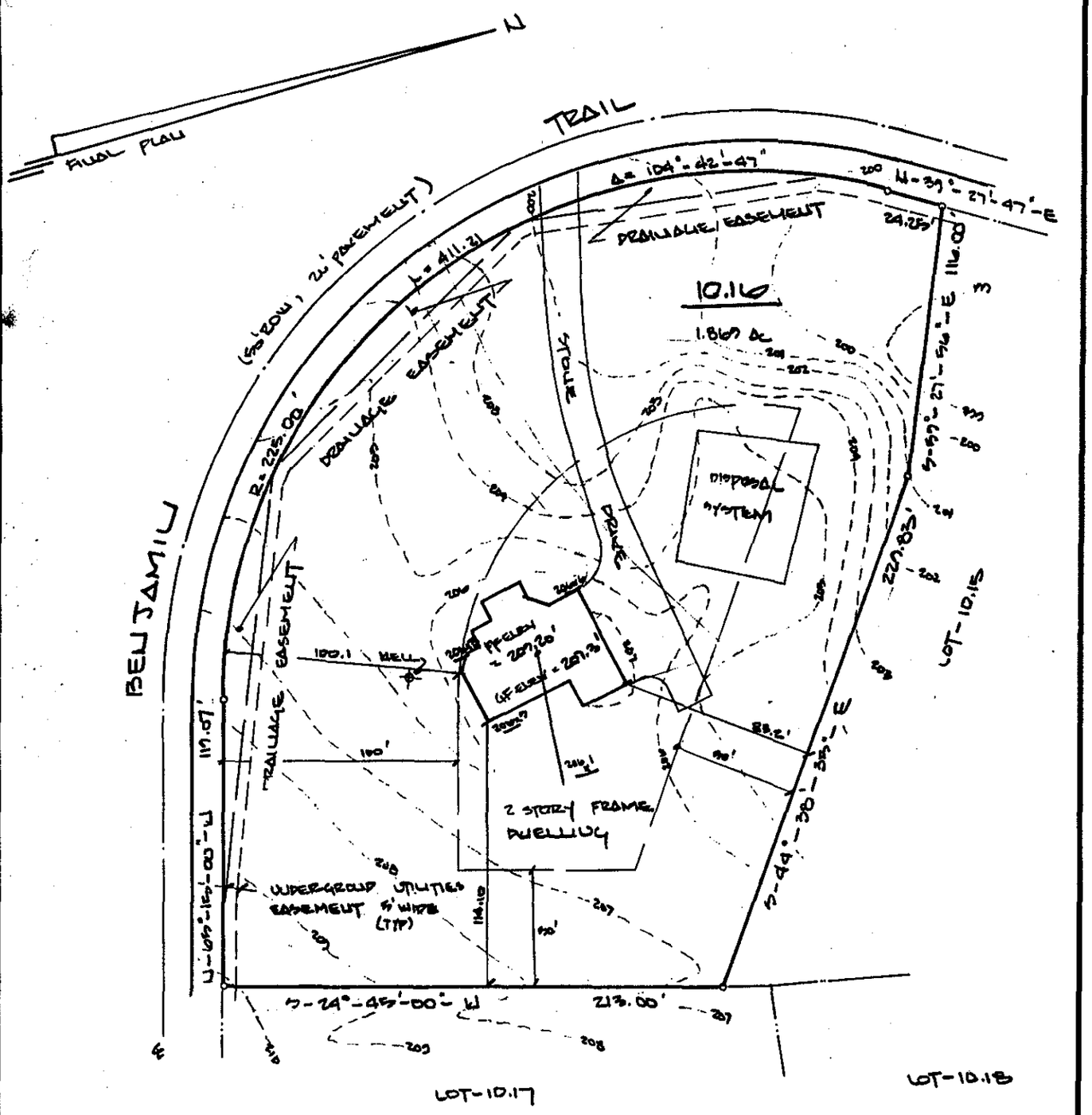
PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM AS-BUILT
OF LOT-10.16, BLOCK-72 FOR
ROSLYN DEVELOPMENT CORP.
HOPEWELL TOWNSHIP · MERCER COUNTY · NEW JERSEY

FRANK L. QUINBY	P.E. & P.L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
KEVIN M. SMITH	P.E.	NO.	30718
FRANK J. FALCONE	P.L.S.	NO.	32112

4.24.89
DATE

DRAWN	DATE	CERTIFIED AS CORRECT TO:
SS	3-28-89	
CHECK	SCALE	
	1"=30'	
REV. 4.28.89		



LEGEND

---210--- ASBUILT CONTOUR

206.1 ASBUILT ELEVATION

ARNOLD RYDEN JR. PROFESSIONAL LAND SURVEYOR No. 21223	SHEET	BLOCK	LOT
		72	10.16

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

FINAL ASBUILT PLAN
OF LOT-10.16, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP. MERCER CO. NJ

FRANK L. QUINBY	P.E. & P.L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
KEVIN M. SMITH	P.E.	NO.	30718
FRANK J. FALCONE	P.L.S.	NO.	32112

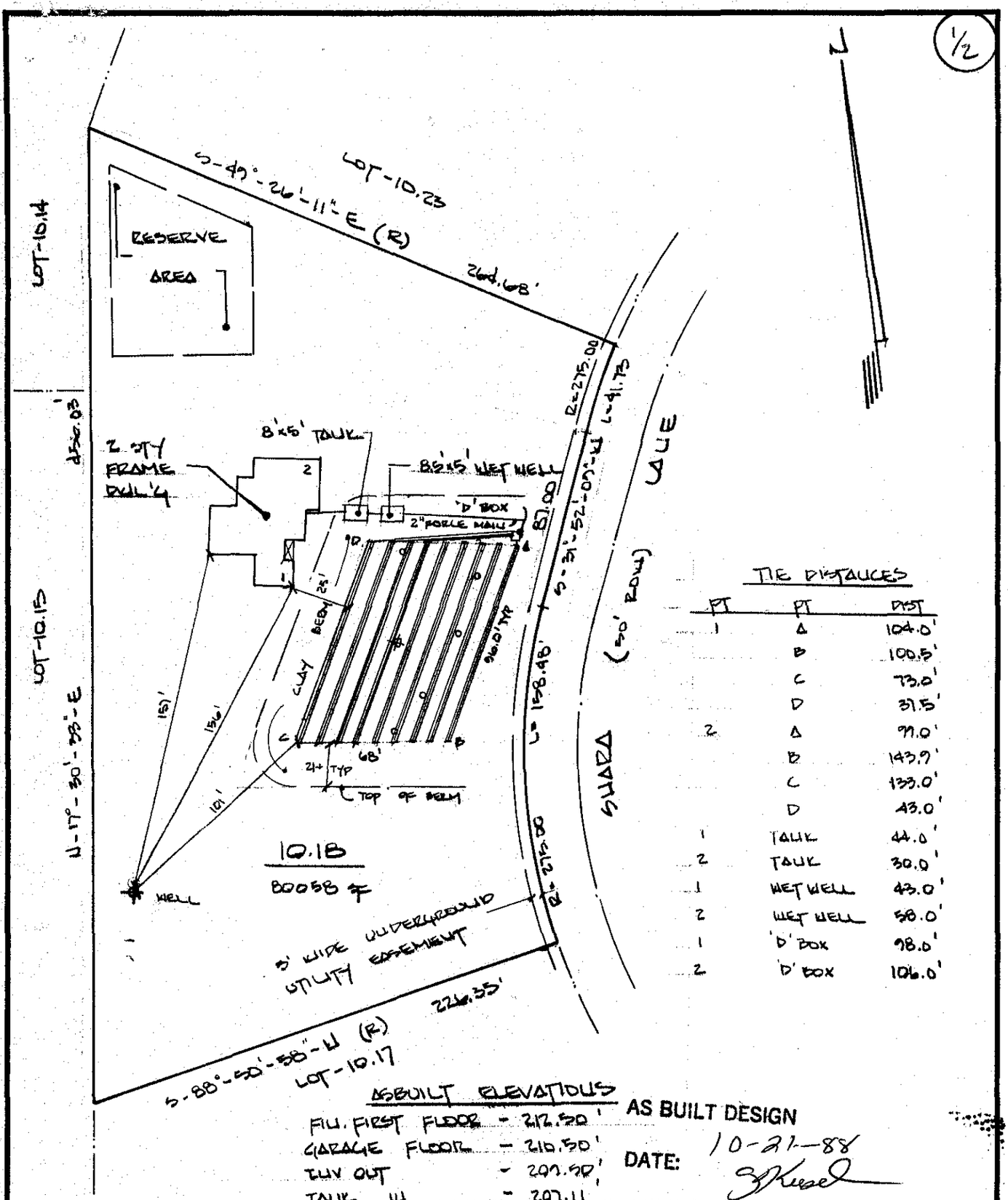
Arnold Ryden Jr. 4.21.89
ARNOLD RYDEN JR. DATE

DRAWN	DATE
KPS	4.21.89
CHECK	
REV.	SCALE 1"=60'

CERTIFIED AS CORRECT TO:

RECEIVED
APR 2 5 1989
HOPEWELL TOWNSHIP HEALTH DEPT

1/2



TIE DISTANCES

PT	PT	DIST
1	A	104.0'
	B	100.5'
	C	73.0'
	D	31.5'
2	A	91.0'
	B	143.9'
	C	133.0'
	D	43.0'
1	TANK	44.0'
2	TANK	30.0'
1	WET WELL	43.0'
2	WET WELL	58.0'
1	'D' BOX	98.0'
2	'D' BOX	106.0'

ASBUILT ELEVATIONS

FIN. FIRST FLOOR	- 212.50'
GARAGE FLOOR	- 210.50'
TWV OUT	- 207.50'
TANK IN	- 207.11'
OUT	- 206.75'
WET WELL IN	- 206.00
'D' BOX IN	- 210.95'
OUT	- 210.85

AS BUILT DESIGN

DATE: 10-27-88

HOPEWELL TOWNSHIP HEALTH DEPT.

D. GEOFFREY BROWN PROFESSIONAL ENGINEER #24327

SHEET	BLOCK	LOT
	72	10.18

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.18, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP. MERCER CO. NJ

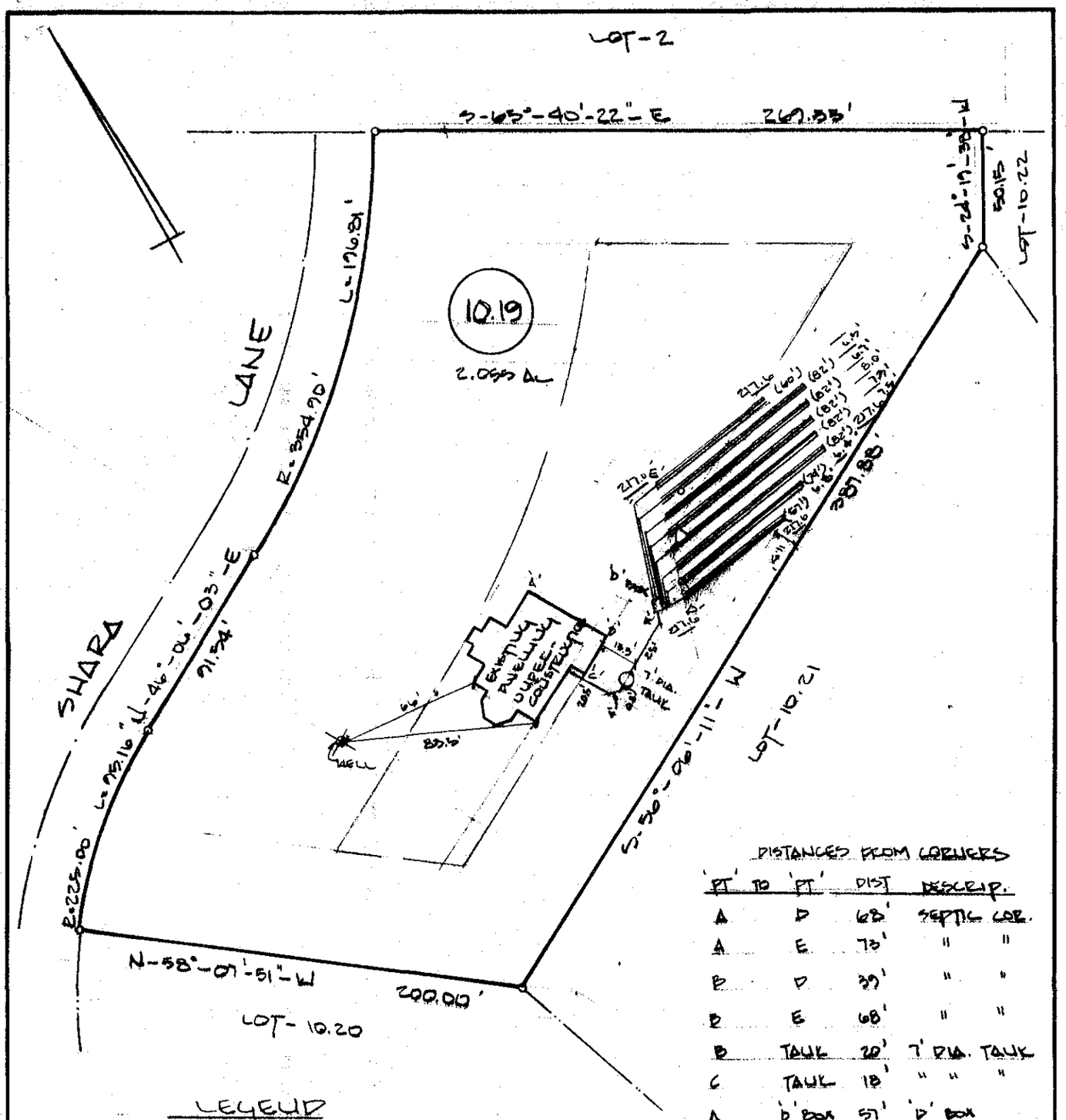
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
FRANK J. FALCONE	P.L.S.	NO.	32114

D. Geoffrey Brown 10/20/88
D. GEOFFREY BROWN DATE

DRAWN
CHECK
REV. 10/20/88

DATE 10/13/88
SCALE 1"=60'

CERTIFIED AS CORRECT TO:



DISTANCES FROM CORNERS

'PT'	TO	'PT'	DIST	DESCRIP.
A	D	68'	SEPTIC	COR.
A	E	73'	"	"
B	D	39'	"	"
B	E	68'	"	"
B	TANK	20'	7' DIA.	TANK
C	TANK	18'	"	"
A	'D' BOX	57'	'D'	BOX
B	'D' BOX	25'	'D'	BOX

EXIST ELEVATIONS

TANK IN - 217.09
TANK OUT - 216.75
'D' BOX - 215.51

LEGEND

△ DENOTES SOIL LOG
○ DENOTES PERC TEST
(74) DENOTES LENGTH OF DISPOSAL TRENCH
217.6 DENOTES EXIST ELEVATION

AS BUILT DESIGN

DATE:

HOPEWELL TOWNSHIP HEALTH DEPT.

HOPEWELL TWP. TAX MAP

PROFESSIONAL ENGINEER	SHEET	BLOCK	LOT
D. GEOFFREY BROWN No. 24327		72	10.19

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.19, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP MERCER CO. N.J.

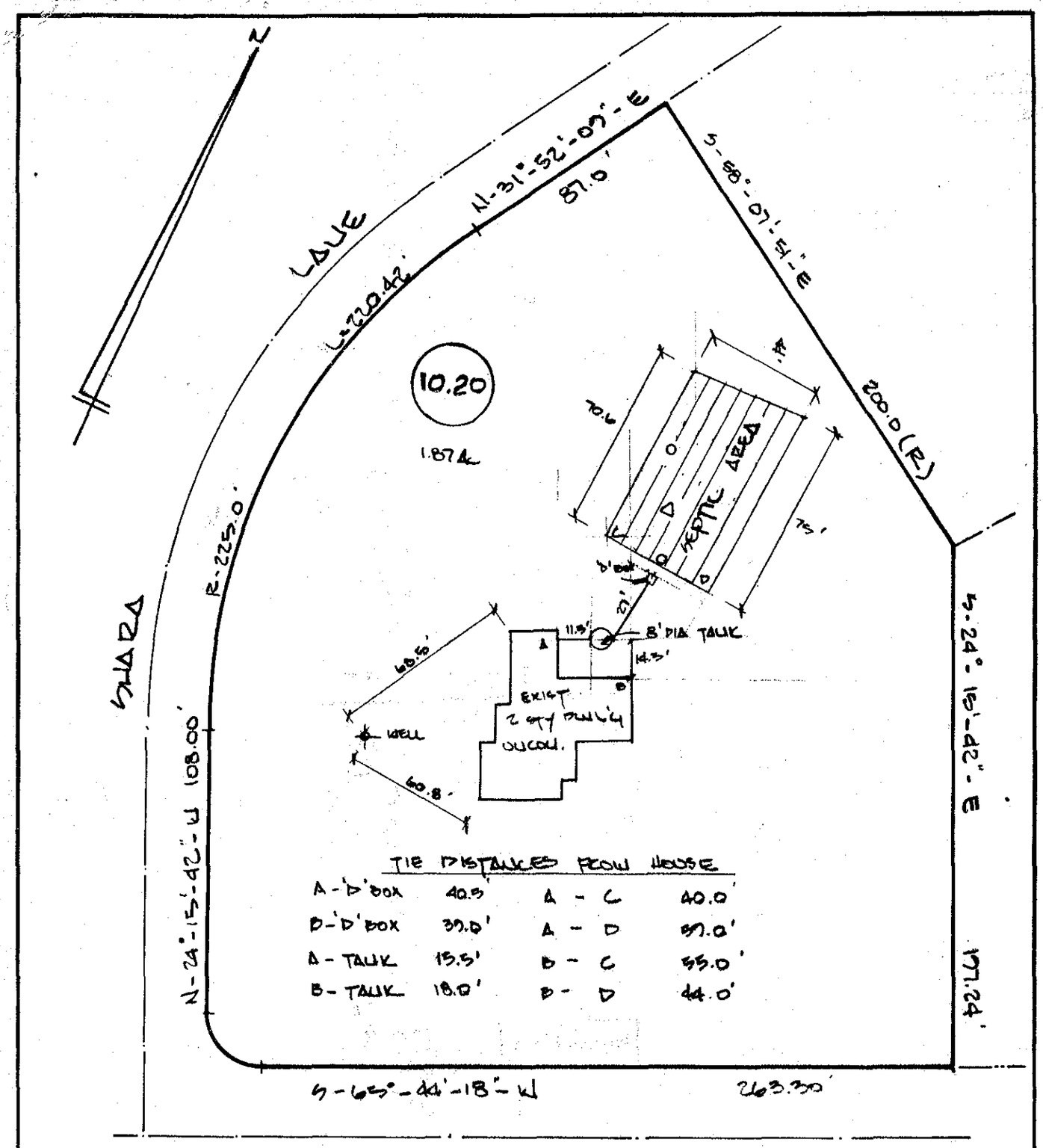
FRANK L. QUINBY	P.E. & L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E. & L.S.	NO.	13453
ARNOLD RYDEN, JR.	L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	L.S.	NO.	30747

DRAWN: KB
DATE: 12/4/87
CHECK:
SCALE: 1"=60'
REV.

CERTIFIED AS CORRECT TO:

D. GEOFFREY BROWN PE 12-4-87
DATE

129304
GARDEN STATE REPROGRAPHICS



BENJAMIN TRAIL

AS BUILT DESIGN

▽ DENOTES SOIL LOG

○ DENOTES PERC TEST

DATE: 11-20-87

HOPEWELL TOWNSHIP HEALTH DEPT.

HOPEWELL TWP TAX MAP DATA

		SHEET	BLOCK	LOT
D. GEOFFREY BROWN	PROFESSIONAL ENGINEER No. 24327		72	10.20

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

SEPTIC ASBUILT
OF LOT-10.20, BLOCK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP MERCER CO. N.J.

FRANK L. QUINBY	P.E. & L.S.	NO. 11087
BRYCE M. RITTENHOUSE	P.E. & L.S.	NO. 13453
ARNOLD RYDEN, JR.	L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	L.S.	NO. 30747

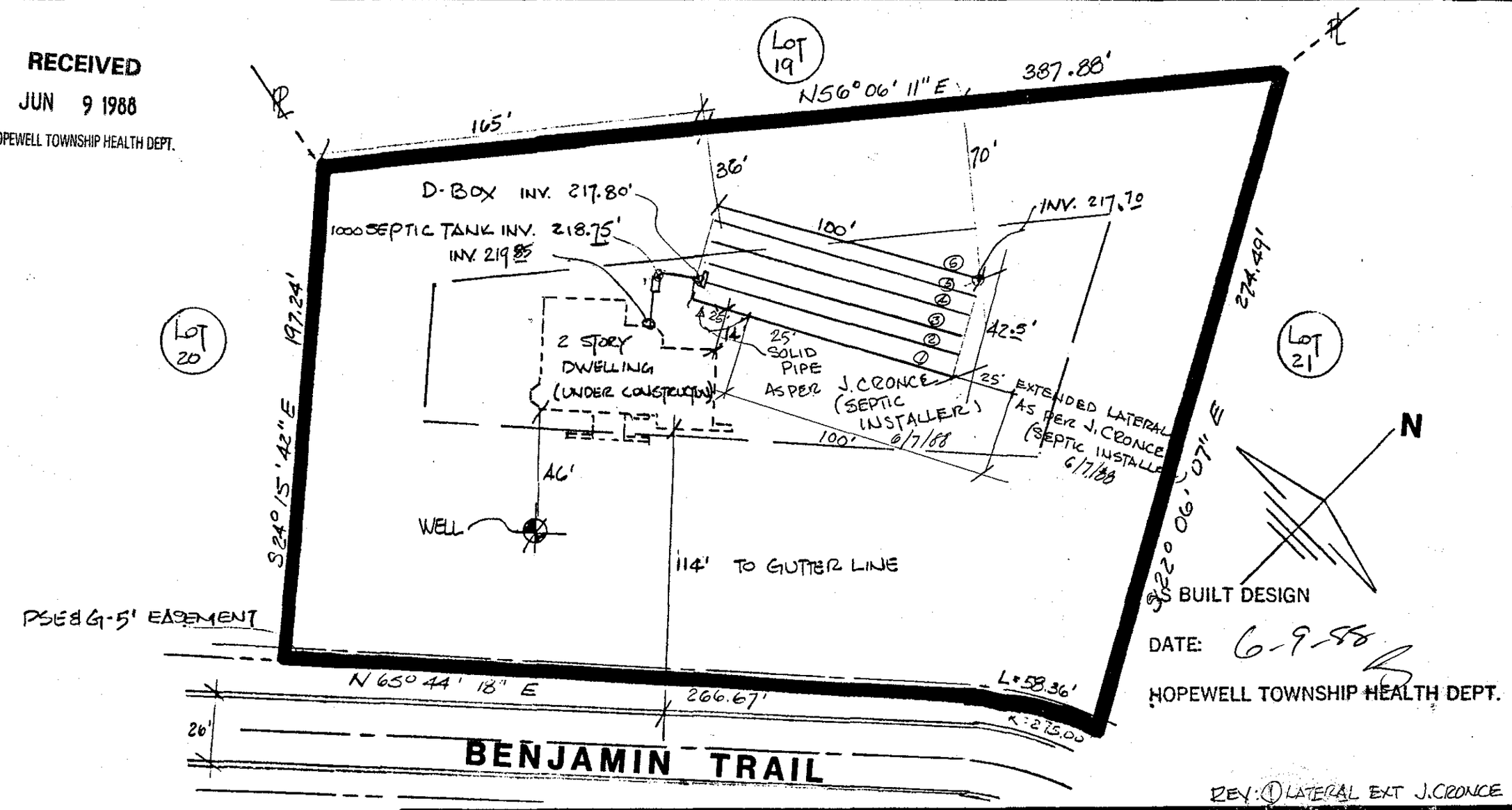
D. GEOFFREY BROWN PE — 10-8-87 DATE

DRAWN	DATE	CERTIFIED AS CORRECT TO:
KB	10-7-87	
CHECK GB	SCALE 1"=50'	
REV. 10-20-87		

129304

GARDEN STATE REPROGRAPHICS

RECEIVED
JUN 9 1988
HOPEWELL TOWNSHIP HEALTH DEPT.



AS BUILT DESIGN

DATE: 6-9-88

HOPEWELL TOWNSHIP HEALTH DEPT.

REV: ① LATERAL EXT J. CRONCE 6/7/88

BM = 203.00'
CUT ON SE CORNER OF
YELLOW CINDER BLOCK WAREHOUSE
ON BLACKWELL ROAD.
(EST. BY PRINCETON JUNCTION ENG'G)

SEPTIC ASBUILT

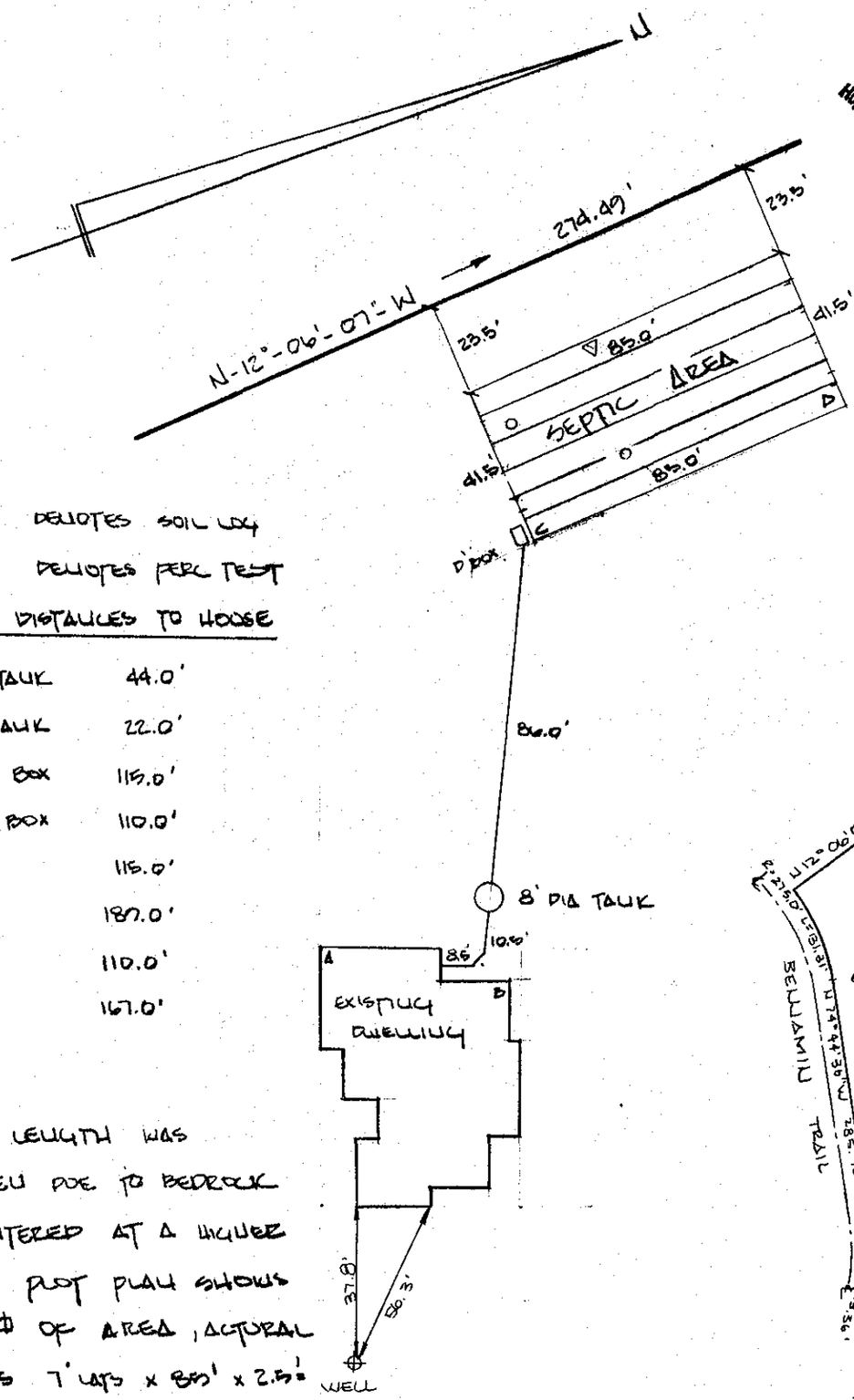
LOT 10.21 BLOCK 72
SCALE: 1" = 50' MAY 1988

OAK RIDGE PARK

HOPEWELL TOWNSHIP
MERCER COUNTY STATE of NEW JERSEY

DONALD J. MAUER, JR
N.J. PROFESSIONAL ENGINEER 28231
6/8/88
RD#1 BOX 175-G SCHOOLHOUSE ROAD
WRIGHTSTOWN, N.J 08562 758-0504

RECEIVED
NOV 3 1987
Hopewell Township Health Dept.



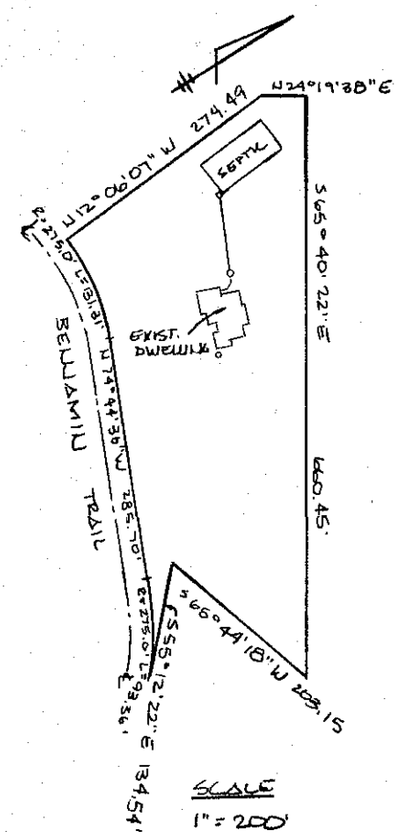
▽ DENOTES SOIL LOG

○ DENOTES PERC TEST

TIE DISTANCES TO HOUSE

A - TANK	44.0'
B - TANK	22.0'
A - 'D' BOX	115.0'
B - 'D' BOX	110.0'
A - C	115.0'
A - D	187.0'
B - C	110.0'
B - D	167.0'

NOTE
TRENCH LENGTH WAS LENGTHEN DUE TO BEDROCK ENCOUNTERED AT A HIGHER DEPTH. PLOT PLAN SHOWS 1312.5 □ OF AREA, ACTUAL AREA IS 7' WIDE x 85' x 2.5' = 1487.5 □ SUPPLIED



SEPTIC DETAIL

AS BUILT DESIGN

DATE: 11-3-87

HOPEWELL TOWNSHIP HEALTH DEPT.

HOPEWELL TWP. TAX MAP DATA

SHEET	BLOCK	LOT
	72	10.22

D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

SEPTIC ASBUILT
OF LOT-10.22, BLOCK-72 FOR
ROBIN DEVELOPMENT CORP.
HOPEWELL TWP. MERCER CO. N.J.

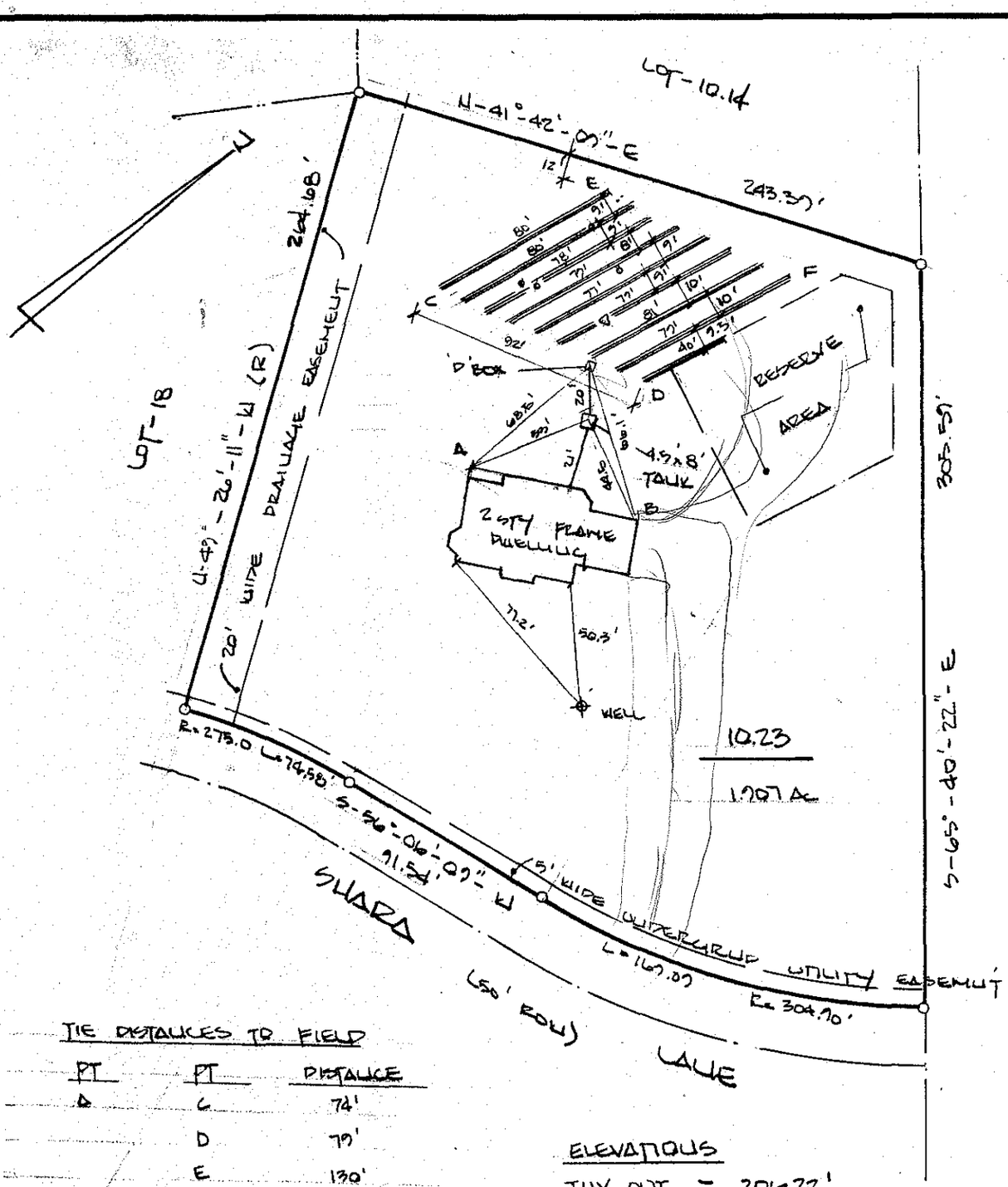
FRANK T. CONROY	P.E. & P.L.S.	NO. 11097
BRYCE M. HUTTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN JR.	P.L.S.	NO. 21233
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
KEVIN M. SMITH	P.E.	NO. 30716
FRANK J. FALCONE	P.L.S.	NO. 32112

D. Geoffrey Brown 10-1-87
D. GEOFFREY BROWN PE DATE

DRAWN	DATE
KD	8-4-87
CHECK	
REV. 10-8-87	SCALE 1" = 40'

CERTIFIED AS CORRECT TO:

10-20-87



TIE DISTANCES TO FIELD

PT	PT	DISTANCE
A	C	74'
	D	79'
	E	130'
	F	153'
B	C	125'
	D	57'
	E	136.5'
	F	116.5'

ELEVATIONS

INV. OUT - 206.22'
TANK IN - 203.31'
OUT - 203.12'
'D' BOX IN - 201.85'

LEGEND

o SOIL LOG
▷ PERC TEST

AS BUILT DESIGN

DATE: 9-7-88

HOPEWELL TOWNSHIP HEALTH DEPT.

D. GEOFFREY BROWN PROFESSIONAL ENGINEER No. 24327	SHEET	BLOCK	LOT
		72	10.23

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DISPOSAL SYSTEM ASBUILT
OF LOT-10.23, BLK-72 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP MERCER CO NJ

FRANK L. QUINBY	P.E. & P.L.S.	NO. 11067
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
KEVIN M. SMITH	P.E.	NO. 30718
FRANK J. FALCONE	P.L.S.	NO. 32112

D. Geoffrey Brown 8-27-88
D. GEOFFREY BROWN PE — DATE

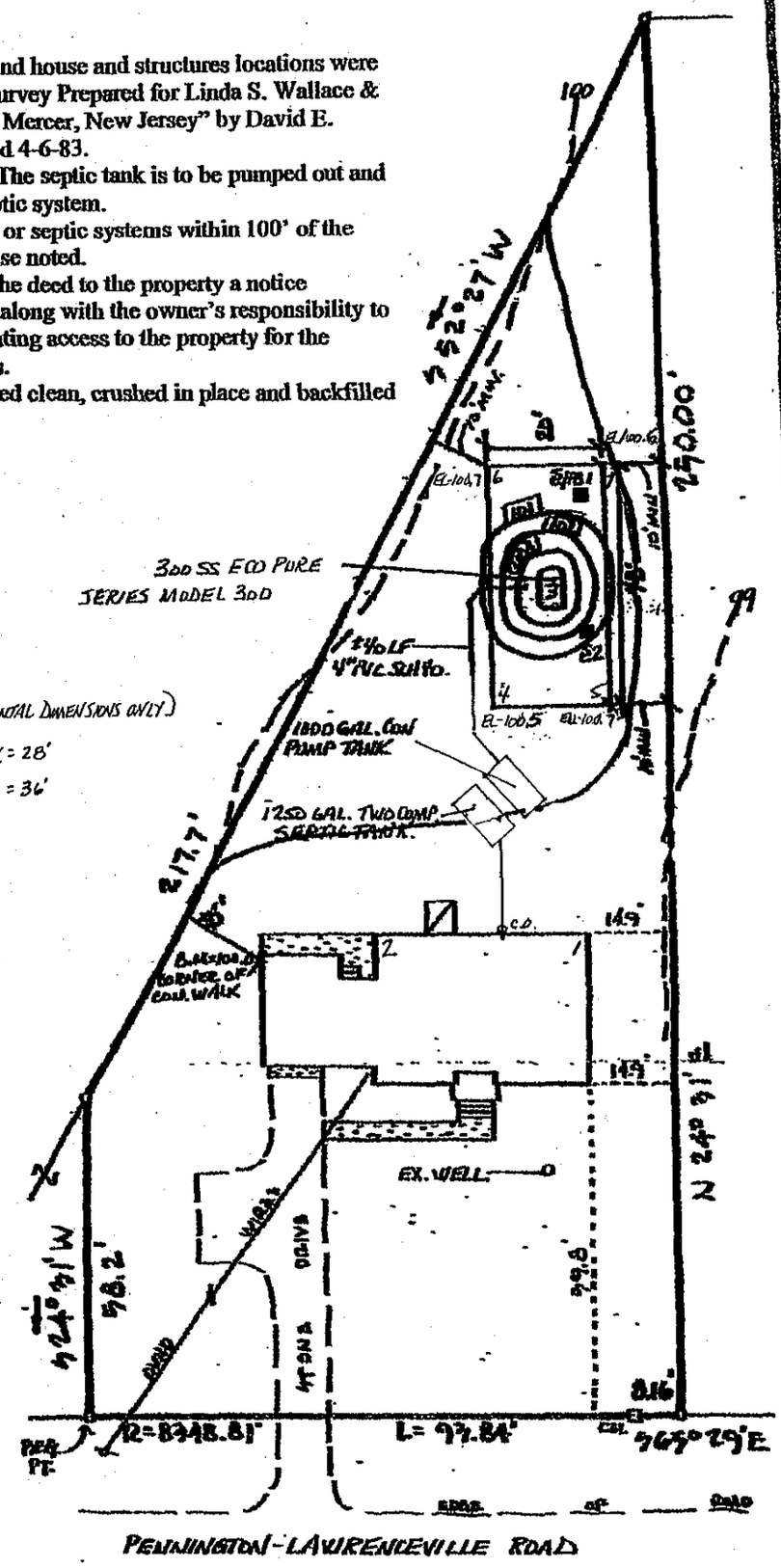
DRAWN: KB
DATE: 8-25-88
CHECK:
SCALE: 1"=60'
REV.

CERTIFIED AS CORRECT TO:

RECEIVED
AUG 30 1988
HOPEWELL TOWNSHIP HEALTH DEPT.

General Notes:

1. The property line, metes and bounds, and house and structures locations were taken from a plan entitled "Loaction Survey Prepared for Linda S. Wallace & Craig A. Lanning Hopewell township, Mercer, New Jersey" by David E. Goldenbaum and Associated, Inc. dated 4-6-83.
2. The existing septic tank is to remain. The septic tank is to be pumped out and inspected during installation of the septic system.
3. There is no existing or proposed wells or septic systems within 100' of the proposed septic system unless otherwise noted.
4. The property owner is to record with the deed to the property a notice indicating the use of the Peat biofilter along with the owner's responsibility to operate and maintain the unit and granting access to the property for the purpose of monitoring and inspections.
5. The existing septic tank is to be pumped clean, crushed in place and backfilled with clean fill.



SEPTIC AS-BUILT DIMENSIONS (HORIZONTAL DIMENSIONS ONLY)

1-SEPTIC TANK = 31'	2-SEPTIC TANK = 28'
1-PUMP TANK = 31'	2-PUMP TANK = 36'
1-3 = 62'	2-3 = 67'
1-4 = 44'	2-4 = 45'
1-5 = 42'	2-5 = 58'
1-6 = 84'	2-6 = 85'
1-7 = 82'	2-7 = 93'

1-C.O. - 15'6"

REV.	DESCRIPTION	DATE	BY
1	Revise notes	7/26/05	CAP
2	REVISE PEAT BIOFILTER	8/5/05	CAP
3	ADD AS-BUILT DIMENSIONS	8/23/05	CAP
4	REV. TITLE BLOCK, ELEVATIONS	8/30/05	CAP

Kent L. Scully 7-8-05

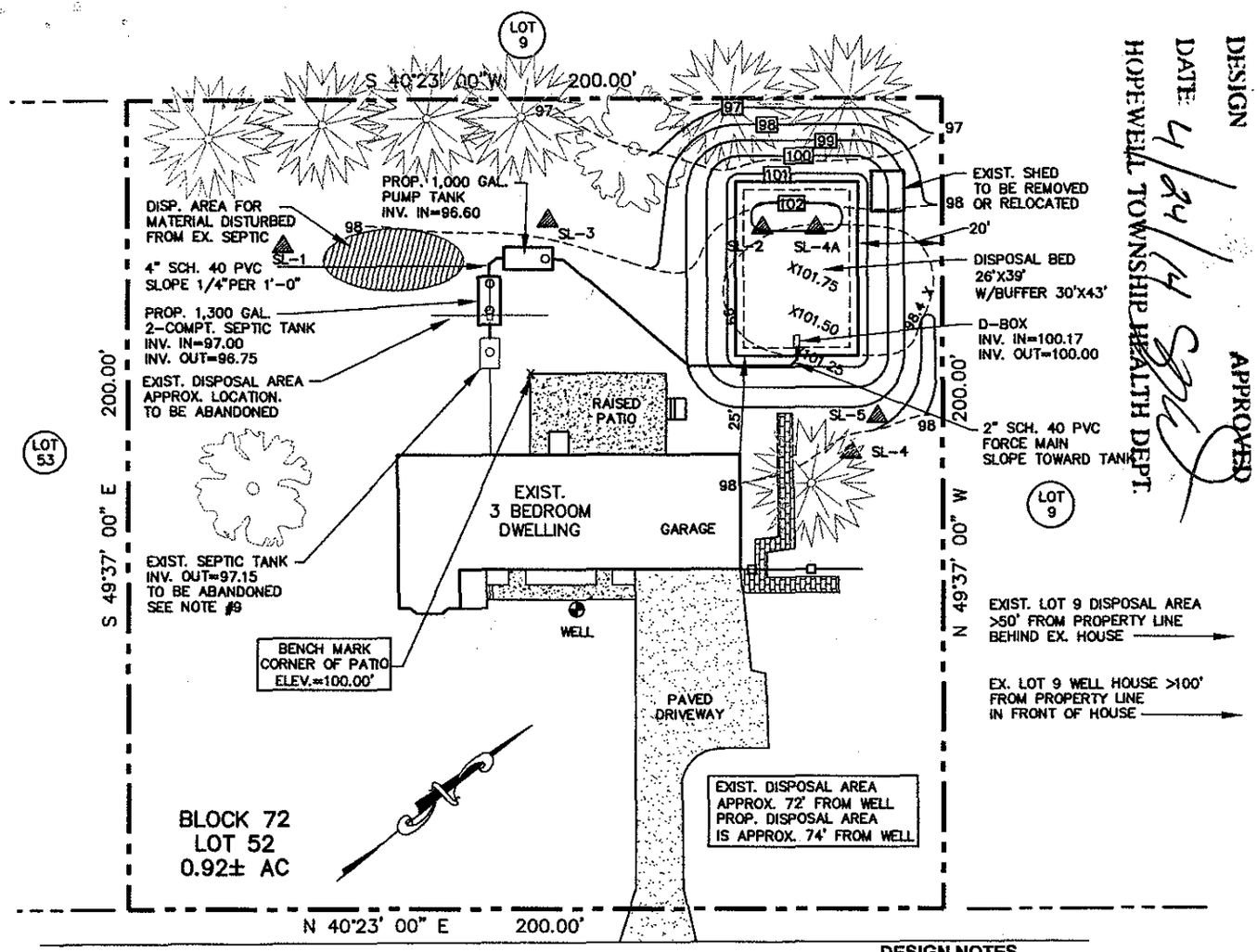
KENT L. SCULLY — DATE

N.J. P.E. No. 26220

SEPTICS BY PATTERSON, INC.
SOIL TESTING, SEPTIC DESIGN, INSPECTIONS
887 NEW RD. CHURCHVILLE, PA 18966 215-942-9017

SEPTIC SYSTEM AS-BUILT
PREPARED FOR
BLOCK 72 **LOT** 28
SITUATED IN
HOPEWELL TOWNSHIP MERCER COUNTY

SCALE: 1" = 30'	DRAWN BY:	
DATE: 7/8/05	CHECKED BY:	PAGE: 1 OF 6



DESIGN
DATE 4/24/14
HOPEWELL TOWNSHIP HEALTH DEPT.
APPROVED

SITE PLAN

SCALE 1"=40'

DESIGN NOTES

EXISTING 3 BEDROOM DWELLING
500 GPD X 1.61 SF/GPD = 805 SF
25% OVERDESIGN = 202 SF
AREA REQUIRED = 1,007 SF
PROPOSE: 26' X 39' = 1,014 SF
W/BUFFER: 30' X 43'

Soil Log #1 Performed 11/13/13
0 - 8" 10YR 3/4 Dark yellowish brown silt loam topsoil
8 - 42" 10YR 5/4 Yellowish brown clay loam, weak subangular blocky, dry
42 - 60" Non-soil, fractured red shale, hard & tight
> 60" Machine refusal No Ground Water

Soil Log #2 Performed 11/13/13
0 - 8" 10YR 3/4 Dark yellowish brown silt loam topsoil
8 - 44" 10YR 5/4 Yellowish brown clay loam, weak subangular blocky, dry, friable, common medium distinct mottles of 10YR 7/1 light gray at 32"
44 - 84" Non-soil, Fractured red shale, gravel to cobble in size, tight
>84" Machine refusal No Ground Water

Soil Log #3 Performed 11/13/13
0 - 8" 10YR 3/4 Dark yellowish brown silt loam topsoil
8 - 32" 10YR 4/4 Dark yellowish brown clay loam, moderate subangular blocky, moist, friable
32 - 57" 5YR 4/3 Reddish brown clay loam, moderate subangular blocky, moist, friable with 10% gravel, common medium distinct mottles of 10YR 7/1 light gray at 36"
57 - 84" Non-soil, Fractured red shale, gravel to stone in size with 10 % fillings
> 84" Machine refusal No Ground Water

PB-1 performed on 2-28-14 in SL5 at a depth of 96", yielding a permeability rate of 1.8 in/hr following an 18 inch rise in water level.

Soil Log #4 Performed 11/13/13
0 - 8" 10YR 3/4 Dark yellowish brown silt loam topsoil
8 - 30" 5YR 4/3 Reddish brown clay loam, moderate subangular blocky, moist, friable
30 - 90" `Non-soil, Fractured red shale, gravel to stone in size, common medium distinct mottles of 10YR 7/1 light gray at 30-50"
> 84" Machine refusal No Ground Water

Soil Log #4A Performed 2/27/14
0 - 10" 10YR 3/4 dark yellowish brown silt loam toposil
10 - 36" `0YR 5/4 Yellowish brown clay loam, weak subangular blocky, moist, friable
36 - 132" Non-soil, fractured red shale, gravel to cobble in size, 5 % clay loam fillings, tight
Common medium distinct mottles of 10YR 7/1 light gray through horizon
>132" Refusal to further excavation, Seepage at 36"

Soil Log #5 Performed 2/27/14
0 - 10" `10YR 3/4 Dark yellowish brown silt loam topsoil
10 - 34" 5Y 4/3 Reddish brown clay loam, moderate subangular blocky, moist, friable
34 - 115" Non-soil, fractured red shale, gravel to cobble in size, ground water entry at 87"
Common medium distinct mottles of 10YR 7/1 light gray through horizon
>115" Refusal to further excavation

DESIGN NOTES - LIMITATIONS - MAINTENANCE

1. The septic tank and disposal bed have not been designed to accommodate a garbage grinder unit within the dwelling. The use of a garbage grinder unit will require modification of the system as proposed herein to include as a minimum, greater septic tank capacity and a larger disposal area.
2. Water softener backwash shall not be discharged to the septic disposal system. Dry wells or seepage pits are recommended.
3. Lawn irrigation systems shall not be placed over the septic disposal area.
4. Maintenance of septic disposal systems shall include as a minimum, pumping of the septic tank at 2 - 3 year intervals and cleaning of the effluent filter as needed. (typically on a 6 - 12 month frequency with adjustment based on solids accumulation)

REFERENCE DRAWING:
Plan of Survey, Lot 52, Block 72, Hopewell Township, Mercer County New Jersey as prepared by Frank R. Klapinski dated June 26, 2006

REVISION	DATE
MISC. PER HEALTH COMMENT	4/1/14
MOVE BED - RE-GRADE	4/6/14

DATE: 3/18/14
SCALE: 1"=40'
SHEET: 1 OF 4

SEPTIC SYSTEM ALTERATION

133 BLACKWELL ROAD
BLOCK 72 LOT 52
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

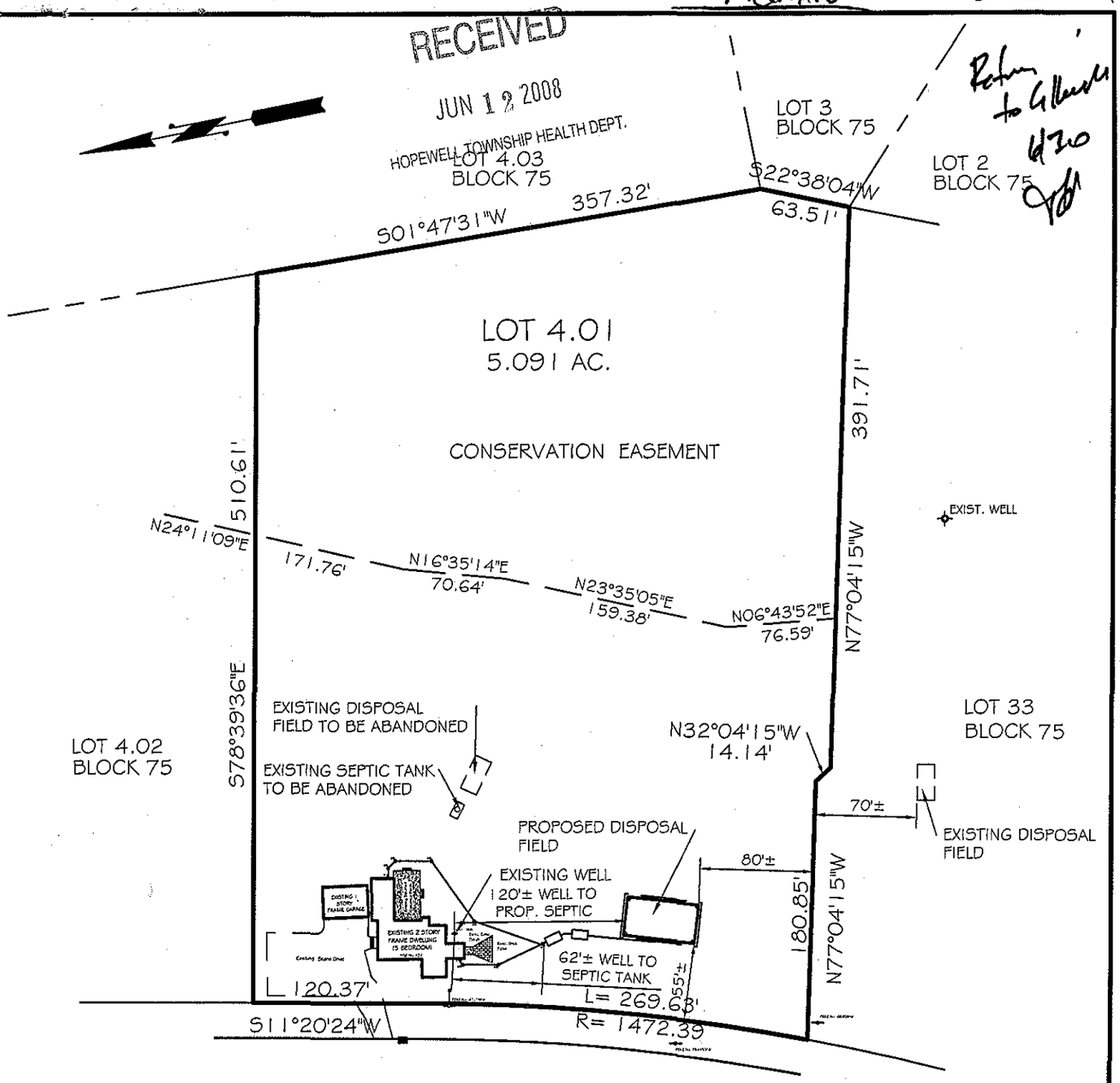
G BARKLEY ENGINEERING, LLC
Cert. No. 24GA28229400
17 Probasco Drive
Allentown, NJ 08501
phone: 609-286-8794

GREGG W. BARKLEY
New Jersey Professional Engineer
License No. GE34675

Admin 25089

RECEIVED
JUN 12 2008
HOPEWELL TOWNSHIP HEALTH DEPT.

Return to Gilbert 6/20



HOPEWELL TOWNSHIP
JUN 18 2008
ADMINISTRATION

PLAN NOTES:

1. THE MINIMUM ALLOWABLE DISTANCE FROM SEPTIC TANK TO WELL IS 50 FEET
2. THE MINIMUM ALLOWABLE DISTANCE FROM PROPOSED DISPOSAL FIELD TO ANY WELL IS 100 FEET.
3. THE MINIMUM ALLOWABLE DISTANCE FROM PROPOSED DISPOSAL FIELD TO ADJOINING DISPOSAL FIELD IF 50 FEET.
4. SEE SHEET 2/8 FOR PLAN DETAILS.

REFERENCE PLAN:
BOUNDARY INFORMATION FROM A PLAN ENTITLED"PLAN OF SURVEY, LOT 4.01, BLOCK 75, HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY" DATED 4/17/08, SCALE 1"=40' PREPARED BY FRANK R. KALAPINSKI, PLS No. 31657

Kevin M. Brakel — New Jersey Professional Engineer No 44194

Wesley J. Lane — New Jersey Professional Land Surveyor License No. 30747

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Disposal System Alteration Plan

of Lot- 4.01, Block - 75 for

Edward & Kristen Gegnas

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35668
Martin D. Katz	PLS	No.36249
Kevin M. Brakel	PE	No.44194

* NJ and PA Licensed.

Kevin M. Brakel, PE #44194 — 6/09/08 Date

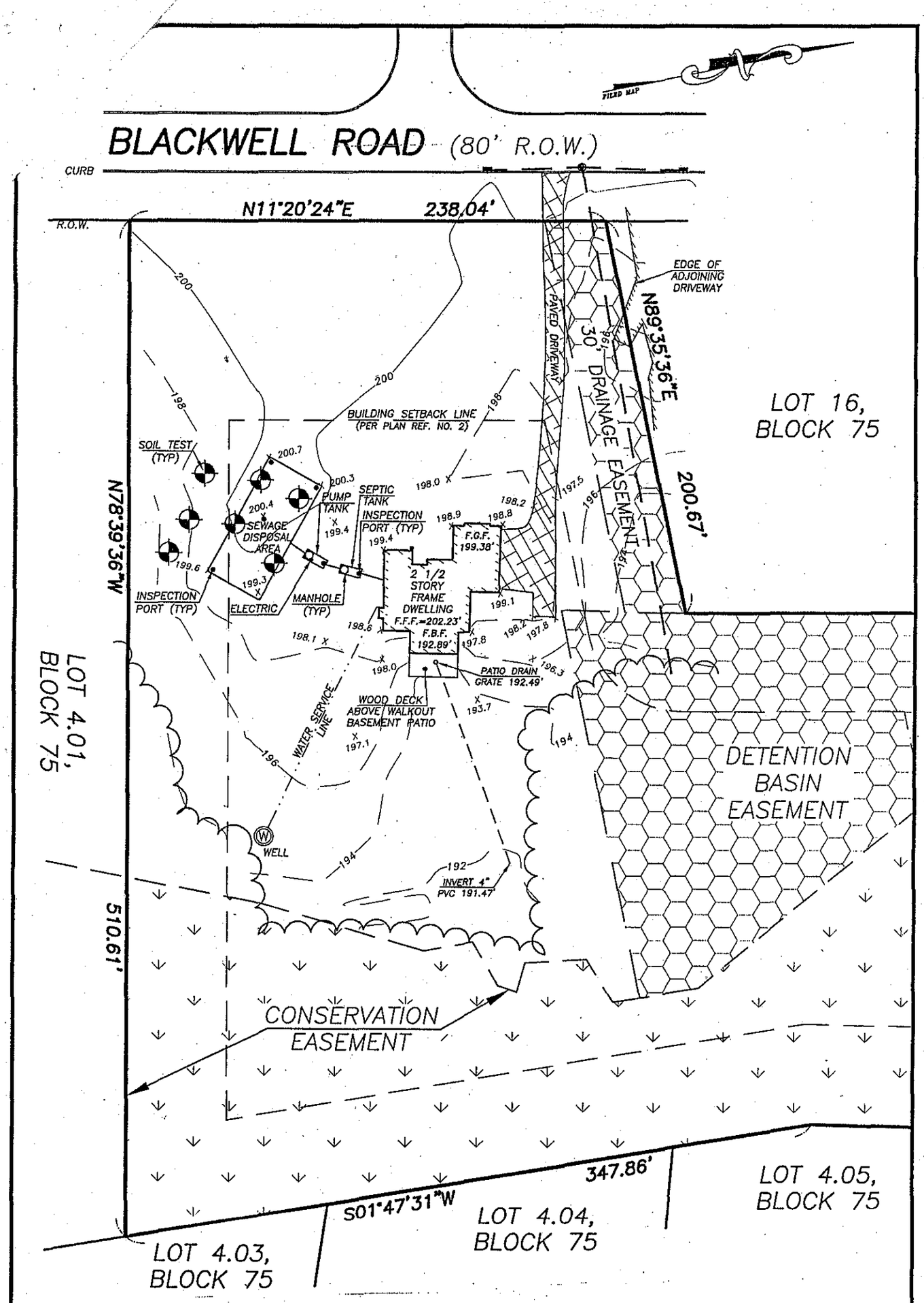
Wesley J. Lane, PLS #30747 — 6/09/08 Date

Date: 6/09/08
Scale: 1"= 100'
Drawn: kmb
Check: KMB

1/8

Revisions:

Job#: L06041
Dwg:PLAN
View:Plot



CERTIFICATE OF AUTHORIZATION NUMBER 24GA28005600

K. E. Baill 3/12/04

KENNETH E. BAILL P.E., P.L.S., P.P.
NEW JERSEY LICENSED PROFESSIONAL ENGINEER #30111
NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR #30111
NEW JERSEY LICENSED PROFESSIONAL PLANNER #04122

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

GRADING & SEPTIC AS-BUILT

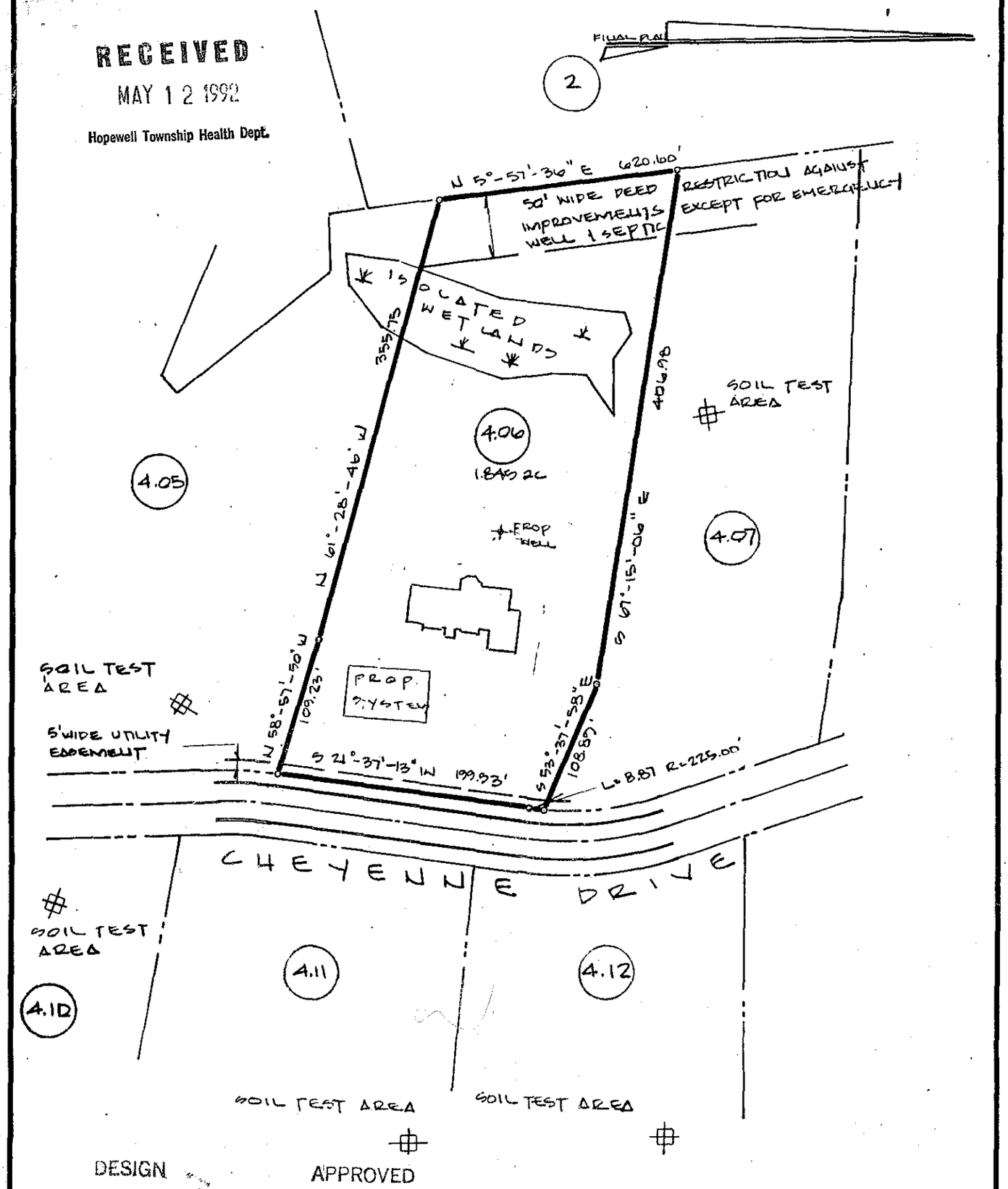
PREPARED FOR

LOT 4.02, BLOCK 75

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: WMB	CHECKED BY: AHM	SCALE: 1" = 60'	DATE: MARCH 12, 2004	PROJ. NO: 04-021	SHEET 2 OF 2
FILE: H:\04-021\AS-BUILT					

RECEIVED
MAY 12 1992
Hopewell Township Health Dept.



DESIGN APPROVED

DATE: 5-20-92

HOPEWELL TOWNSHIP HEALTH DEPT

SHEET 1 OF 7

ARNOLD RYDEN JR.
PROFESSIONAL LAND SURVEYOR No. 21223

SHEET	BLOCK	LOT
	75	4.06

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

PLOT PLAN
OF LOT-4.06, BLOCK-75 FOR
ROBLYN DEVELOPMENT CORP.
HOPEWELL TWP. MERCER CO. NJ

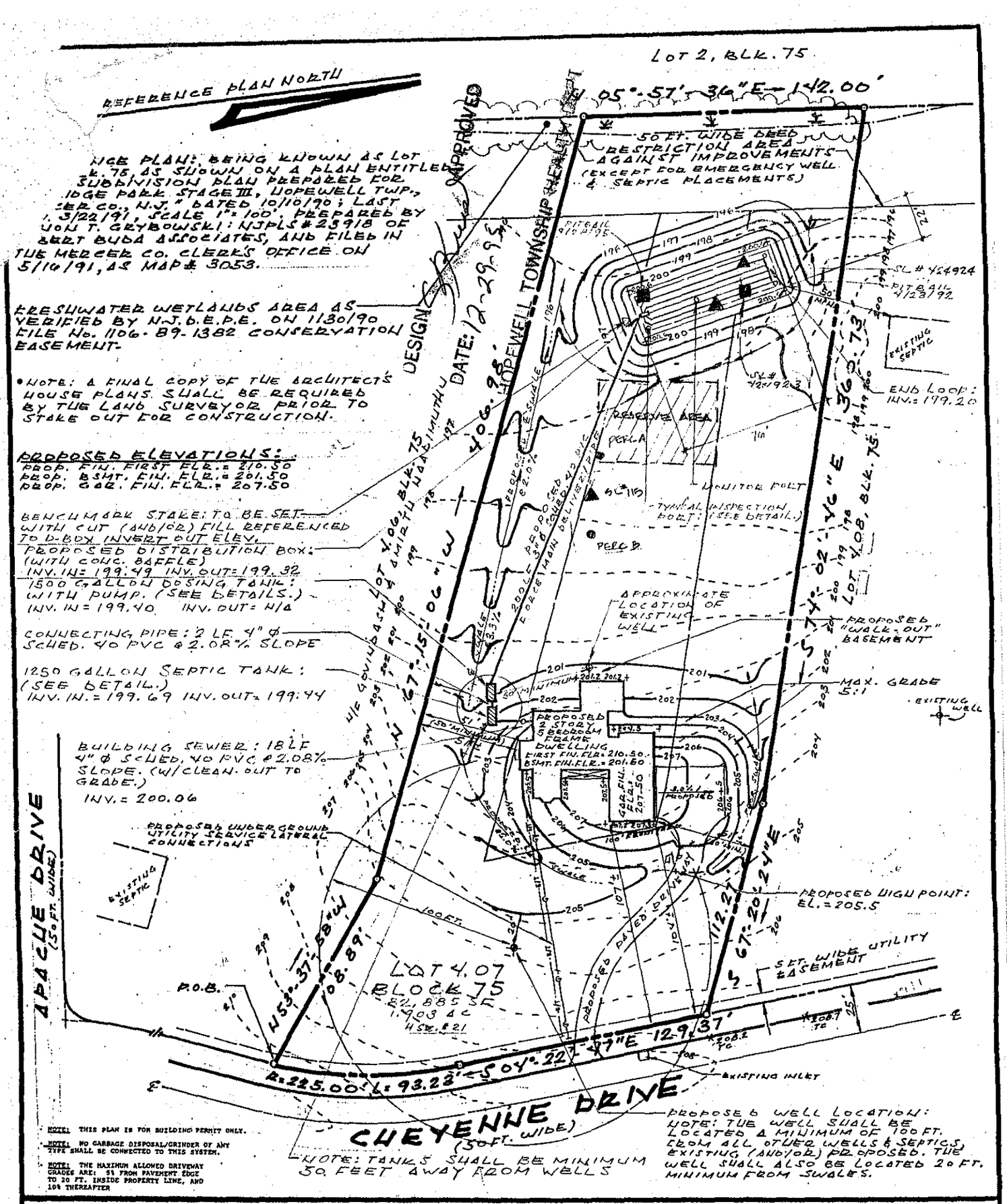
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
FRANK J. FALCONE	P.L.S.	NO. 32112

Arnold Ryden Jr. 5-7-92
ARNOLD RYDEN JR. DATE

DRAWN	DATE
KB	5-7-92
CHECK	SCALE
AFJF	1"=100'
REV.	

CERTIFIED AS CORRECT TO:

REV: 5-11-92



NOTE: THIS PLAN IS FOR BUILDING PERMIT ONLY.

NOTE: NO GARBAGE DISPOSAL/GRINDER OF ANY TYPE SHALL BE CONNECTED TO THIS SYSTEM.

NOTE: THE MAXIMUM ALLOWED DRIVEWAY GRADES ARE: 5% FROM PAVEMENT EDGE TO 20 FT. INSIDE PROPERTY LINE, AND 10% THEREAFTER

ARNOLD RYDEN, JR.
NEW JERSEY PROFESSIONAL LAND SURVEYOR # 21223 & PROF. PLANNER # 2396

PRINCETON JCT. ENGINEERING, P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 FAX (609) 799 1524

PLOT PLAN & DISPOSAL SYSTEM DESIGN
OF LOT 4.07, BLOCK 75, FOR:
ROBLYN DEVELOPMENT CORP.
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

Bryce M. Rittenhouse	N.J. P.E. & P.L.S.	No. 19463	P.P. No. 4663
	PA. P.E.	No. PE-020525-E	
Arnold Ryden, Jr.	N.J. P.L.S.	No. 21223	P.P. No. 2396
D. Geoffrey Brown	N.J. P.E. & P.L.S.	No. 24327	P.P. No. 4073
Wesley J. Lane	N.J. P.L.S.	No. 30747	P.P. No. 4650
Frank J. Falcone	N.J. P.L.S.	No. 32112	P.P. No. 3760
Peter R. Eshowsky	N.J. P.L.S.	No. 34001	P.P. No. 4180
	PA. P.L.S.	No. SU-042316-R	
Ted W. Pivovarnick	N.J. P.L.S.	No. 35868	

DRAWN	DATE
J.M.	10/1/95
CHECK	
GB	
SCALE	
1"= 60'	
REV.	
*	

Arnold Ryden 10-30-95
ARNOLD RYDEN, JR.: NJPLS # 21223 PP# 2396 DATE

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327

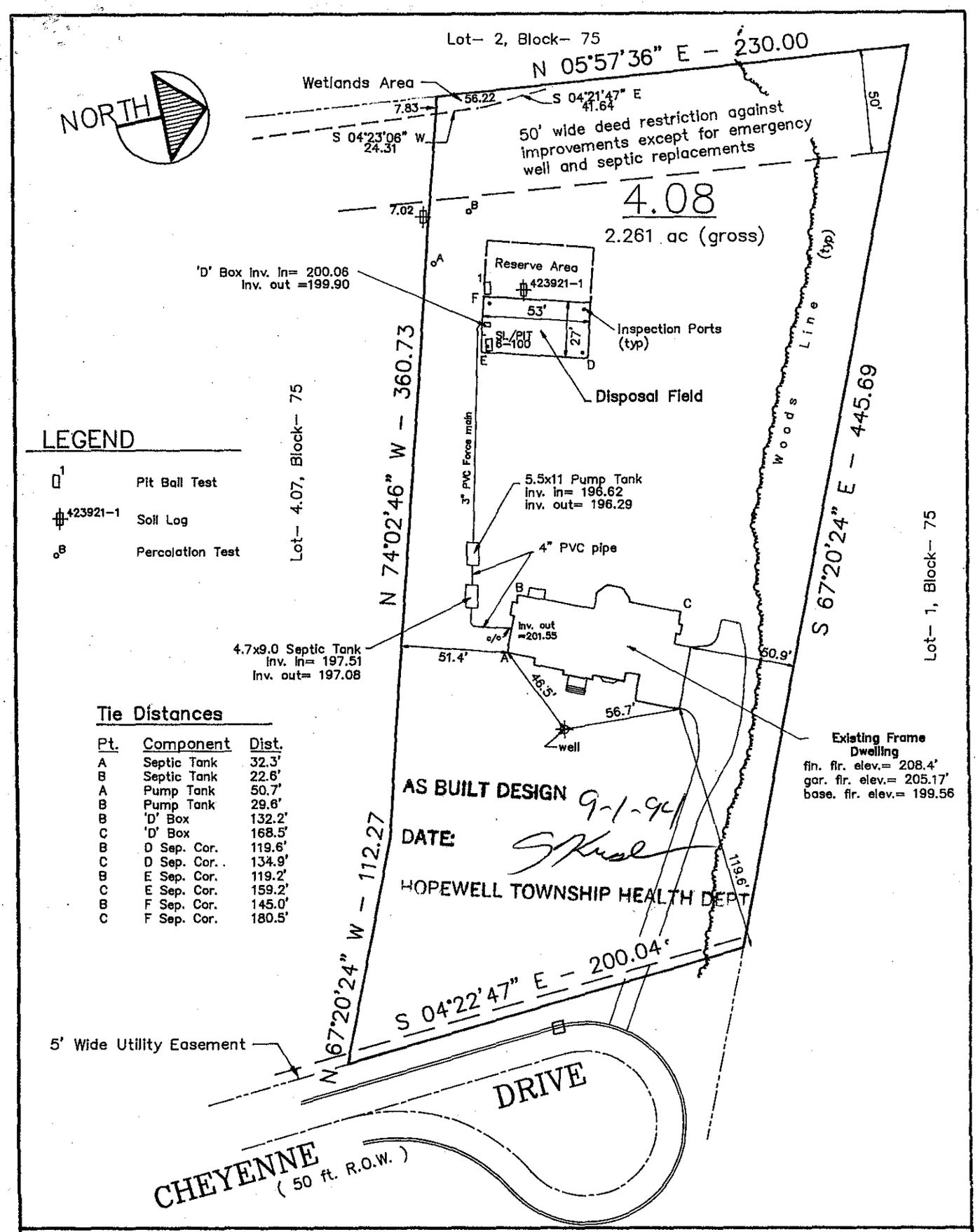
RECEIVED
DEC 15 1995
Hopewell Township Health Dept.

10-30-95
D. GEOFFREY BROWN: P.E. & L.S. # 24327 DATE

* REVISED 12/7/95: INCREASE TO 5 BEDROOMS.
12/14/95: ADD SOIL TEST 14 & MOVE RESERVE

147

1/7



LEGEND

1	Pit Bail Test
423921–1	Soil Log
B	Percolation Test

Tie Distances

Pt.	Component	Dist.
A	Septic Tank	32.3'
B	Septic Tank	22.6'
A	Pump Tank	50.7'
B	Pump Tank	29.6'
B	'D' Box	132.2'
C	'D' Box	168.5'
B	D Sep. Cor.	119.6'
C	D Sep. Cor.	134.9'
B	E Sep. Cor.	119.2'
C	E Sep. Cor.	159.2'
B	F Sep. Cor.	145.0'
C	F Sep. Cor.	180.5'

ARNOLD RYDEN JR. New Jersey Professional Land Surveyor License No. 21223

D. GEOFFREY BROWN New Jersey Professional Engineer & Land Surveyor License No. 24327

PRINCETON JUNCTION ENGINEERING, P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 53 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

Septic System As–Built Plan

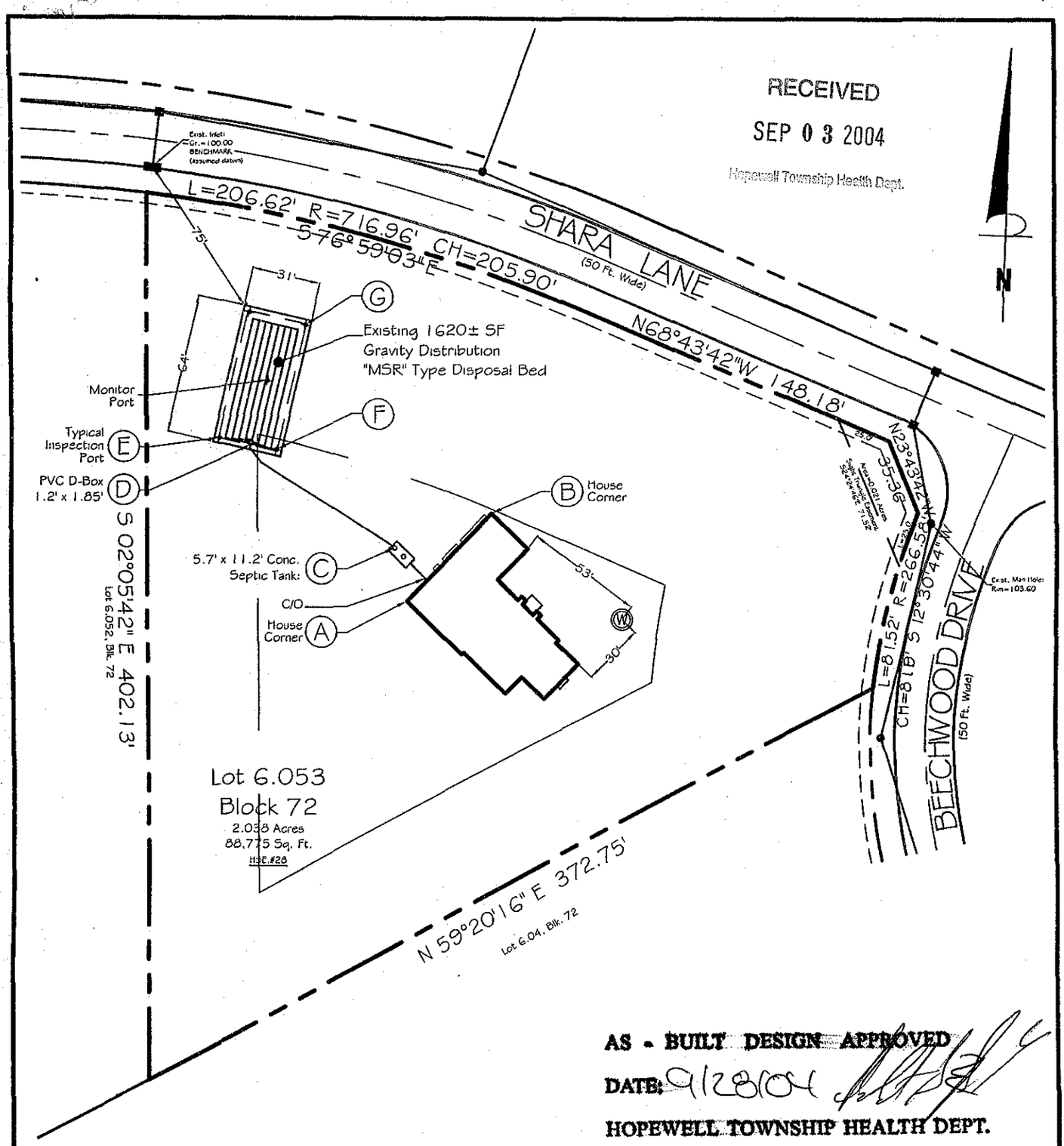
of Lot– 4.08, Block– 75 for
ROBLYN DEVELOPMENT CORP.
Hopewell Twp. * Mercer County * NJ

D. GEOFFREY BROWN	P.E.	L.S.	NO. 24327
BRYCE M. RITTENHOUSE	P.E.	L.S.	NO. 13453
ARNOLD RYDEN, JR.		L.S.	NO. 21223
WESLEY J. LANE		L.S.	NO. 30747
FRANK J. FALCONE		L.S.	NO. 32112
PETER ESHEWSKY		L.S.	NO. 34001
TED W. SVOVARNICK		L.S.	NO. 35868
MARTIN D. KATZ		L.S.	NO. 36249

Arnold Ryden Jr. PLS — 9-1-94 DATE

DRAWN	DATE
kmb	8–8–94
CHECK	
	SCALE
REV.	1"= 60'

D. Geoffrey Brown PE & LS — 9-1-94 DATE



AS - BUILT DESIGN APPROVED

DATE: 9/28/04

HOPEWELL TOWNSHIP HEALTH DEPT.

DISPOSAL SYSTEM ASBUILT TIE DISTANCES:

"A" to "C" = 24.3' "B" to "C" = 46.5'
"A" to "D" = 99.9' "B" to "D" = 113.3'
"A" to "E" = 112.0' "B" to "E" = 127.7'
"A" to "F" = 89.8' "B" to "F" = 101.3'
"A" to "G" = 133.4' "A" to "G" = 120.4'

NOTE: This plan is for Municipal Health Department approval only.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Disposal System Asbuilt Plan
of Lot-6.053, Block-72 for
Blue Crest Builders, LLC
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & LS #13453 — Date 9/8/04

Frank J. Falcone: PLS #32112 & PP #3760 — Date 9/8/04

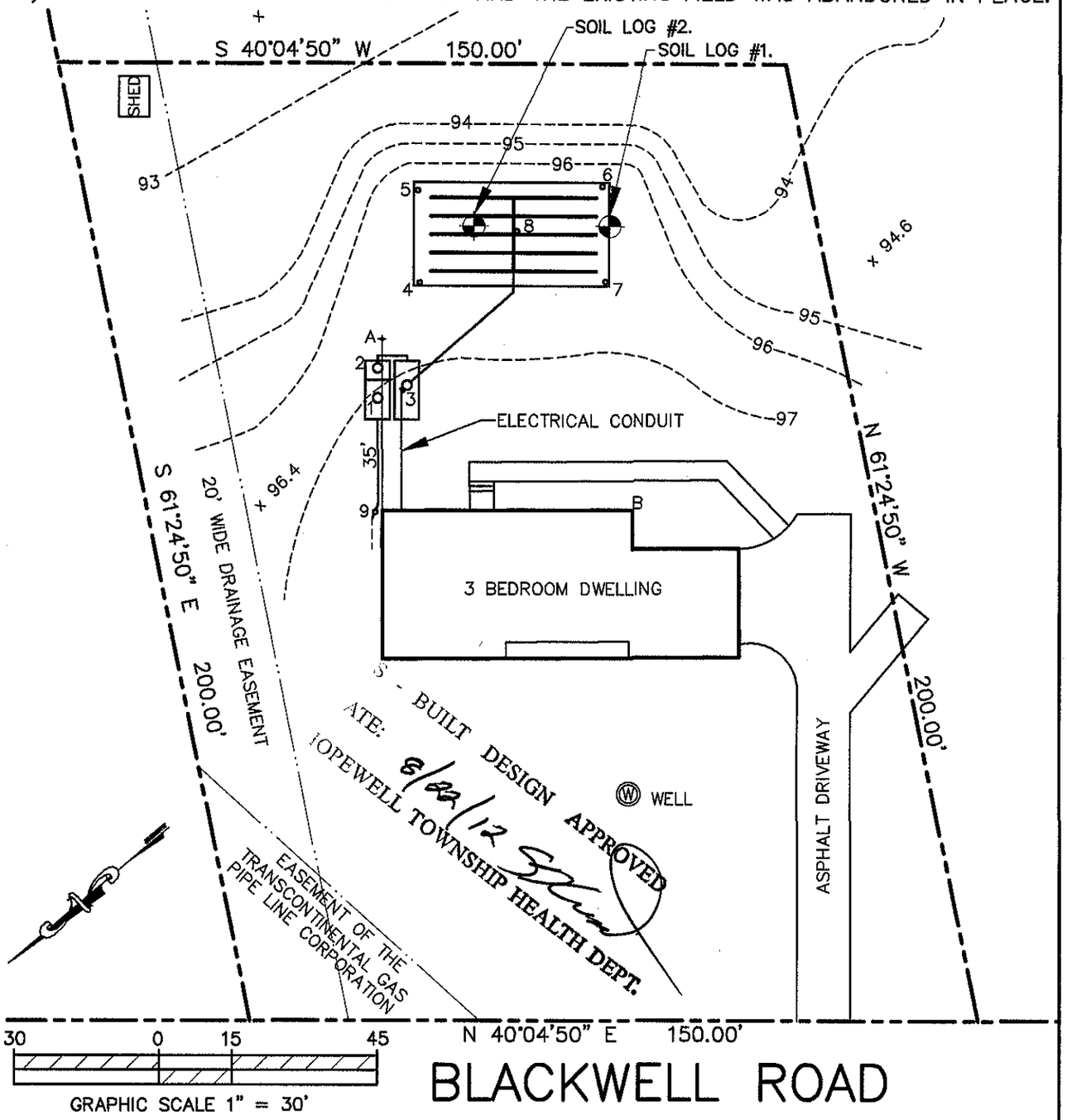
Date: 04/23/04
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

Revisions: 9/28/04-CONNECTING LINE & WELL

Job#:P990630
Dwg:1609572.dwg
View:Plan
Layout: SEP 03

NOTES:

1). THIS IS NOT A SURVEY OF THE PROPERTY.
2). DISTANCES AND ELEVATIONS SHOWN ARE APPROXIMATE.
3). EXISTING FEATURES SHOWN ON THE BASE MAP ARE FOR THE CONSTRUCTION OF THE PROPOSED SEPTIC SYSTEM ONLY. EXISTING FEATURES OUTSIDE THE AREA OF CONSTRUCTION ARE NOT SHOWN.
4). CONDITION SHOWN ARE EXISTING.
5). REFERENCE PLAN : "LOCATION SURVEY FOR JAMES RIGEL & CHERLY RIGEL HOPEWELL . TWSP. MERCER COUNTY NEW JERSEY". PREPARED BY M.R. MASTRANGELO & ASSOCIATES,. INC. DATED NOVEMBER 25, 1986. SCALE 1" = 40'
6). EXISTING SEPTIC TANK WAS REMOVED AND THE EXISTING FIELD WAS ABANDONED IN PLACE.



A–1.	12.2'	B–1.	57.2'	MH. FIRST COMPARTMENT 1300 GAL. SEPTIC TANK
A–2.	6.0'	B–2.	59.7'	MH. SECOND COMPARTMENT 1300 GAL. SEPTIC TANK
A–3.	10.8'	B–3.	52.7'	MH. 1300 GAL. DOSING TANK
A–4.	13.9'	B–4.	63.8'	INSPECTION PORT
A–5	32.2'	B–5	79.0'	INSPECTION PORT
A–6.	55.3'	B–6.	66.9'	INSPECTION PORT
A–7	47.6'	B–7	47.1'	INSPECTION PORT
A–8.	35.3'	B–8.	61.6'	DEEP INSPECTION PORT
A–9.	30.7'	B–9.	52.9'	SANITARY SEWER CLEANOUT

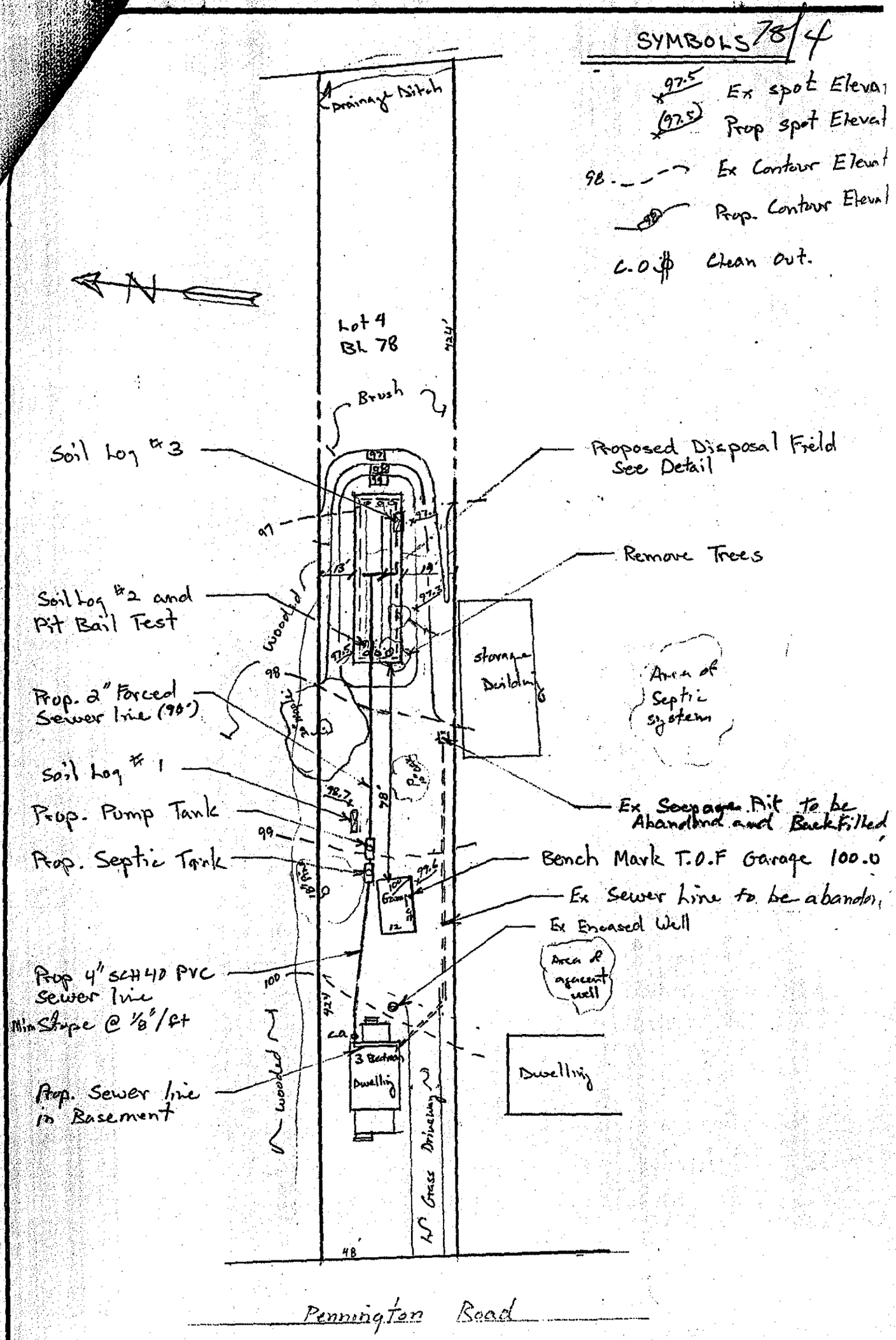
van note – harvey associates, p.c.
consulting engineers, planners & land surveyors
777 ALEXANDER ROAD
PRINCETON, NEW JERSEY
08540

KENNETH R. RAIKE
NEW JERSEY PROFESSIONAL LAND SURVEYOR No. 36753

3/30/12
DATE OF SIGN

SEPTIC SYSTEM REPAIR DESIGN
OF
LOT 16 – BLOCK 75
PREPARED FOR
#128 BLACKWELL ROAD
SITUATED IN
HOPEWELL TOWNSHIP — MERCER CO., N.J.
SCALE : 1" = 30' — MARCH 2012

DRAWN BY: BJF	FIELD BK	ORDER No.	FILE No.	SHEET No.
CHECKED BY:	PAGE	40828–330–22	TWP. BLK.	1 OF 1

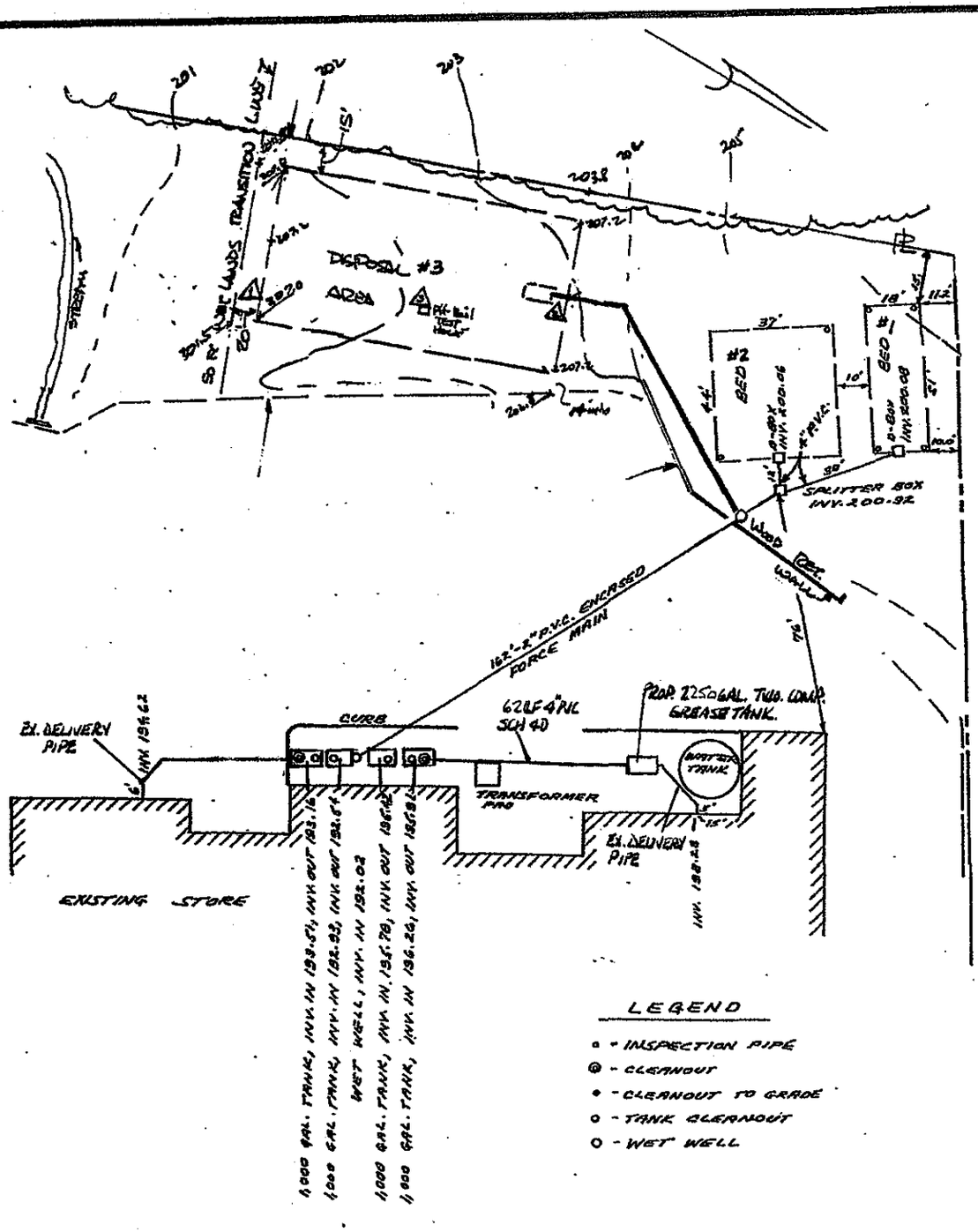


SITE PLAN

1" = 40'

Barry K. Wham

Lot 4 Block 78 Hopewell Twp Mercer Co NJ	Barry K. Wham PE Rev 7/27/94	SITE PLAN	10 of 16



General Notes:

1. The existing septic tanks, pump tanks, disposal beds #'s 1 & 2 locations, and inverts taken from a plan entitled "As-Built Disposal System Shop-Rite of Pennington, Inc. Hopewell Twp., Mercer Co., N.J" by Princeton Jct. Engineering CO. dated 10/14/88.
2. Existing disposal bed #3 taken from plan entitled "On-Site Disposal System Lots 5 & 6 Block 85 Hopewell Twp., Mer. CO., N.J." by Arora and Associates, P.C. – Consulting Engineers, last revised 4/8/98.
3. All elevations are to be confirmed by the contractor prior to the beginning of construction.
4. Maintenance of the grease traps are to follow the conditions set forth by NJDEPS Permit # NJG0141780 and the Hopewell Township Health Department..

REV.	DESCRIPTION	DATE	BY

SEPTICS BY PATTERSON, INC.
SOIL TESTING, SEPTIC DESIGN, INSPECTIONS
887 NEW RD. CHURCHVILLE, PA 18966 215-942-9017

SEPTIC SYSTEM DESIGN

PREPARED FOR

BLOCK 85 LOT 2

SITUATED IN

HOPEWELL TOWNSHIP MERCER COUNTY

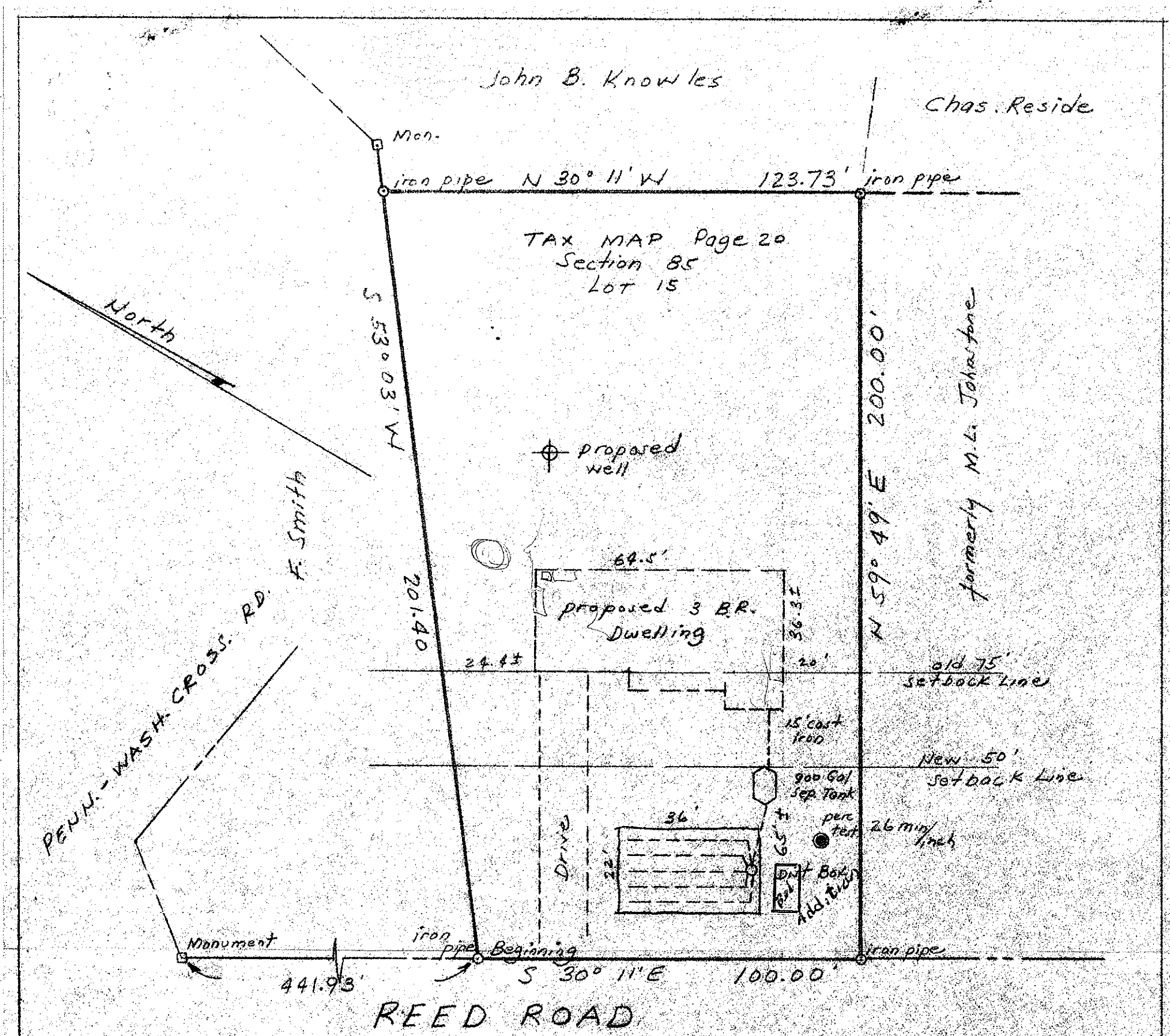
2-17-05

KENT L. SCULLY DATE

N.J. P.E. No. 26220

SCALE: 1" = 50'	DRAWN BY:	
DATE: 2/16/05	CHECKED BY:	PAGE: 1 OF 3

N047986



PLAN OF PROPERTY

lands of

LUIGI LUNGHI, ET. UX.

Hopewell Township Mercer County New Jersey

Scale 1" = 30' October 11 1969

prepared by Philip J. Vecere P.E. & L.S. No. 9884

RECEIVED

MAR 06 2009

HOPEWELL TOWNSHIP HEALTH DEPT

STANDARD FORMS FOR CERTIFICATE OF COMPLIANCE

County/Municipality of _____

INSTRUCTIONS: Part A is to be completely filled in for all Certifications. Only Part B or Part C will be completed. Part B will be completed if the administrative authority relies upon the certification signed and sealed by New Jersey licensed professional engineer that the system has been located, constructed, installed or altered in compliance with the requirements of N.J.A.C. 7:9A-1 and the Application to Construct/Alter/Repair and Individual Subsurface Sewage Disposal System which was approved by the administrative authority. Part C will be completed if the administrative authority performs the certification.

PART A- General Information

1. Permitted Activities (Check applicable categories):

Permit Number _____

_____ New Construction
_____ Alteration/No Expansion or Change of Use
_____ Alteration/Expansion or Change in Use
✓ Alteration/Malfunctioning System
_____ Deviation from Standards
_____ Repairs to Existing System

2. Location of Project:

Municipality Hopewell Lot 23 Block 85

Street Address 1640 Reed Rd.

3. Name and Present Address of Applicant: Carmine DiLocco, P.O. Box 465, Pennington, NJ 08534

Applicant's Phone Number 609-209-3552

PART B - Professional Engineers Certification

I certify under penalty of law that the subsurface sewage disposal system identified in Part A has been located, constructed, installed or altered in compliance with the requirements of N.J.A.C. 7:9A-1 and the Application to Construct/Alter/Repair an Individual Subsurface Sewage Disposal System which was approved by the administrative authority, I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(Signature)

SEAL

Donald P. Schlachter, N.J.P.E. no. 23805
Name (Type or Print), License

Date: 23 JAN 09

PART C -Certification by Administrative Authority

I certify under penalty of law that the subsurface sewage disposal system identified in Part A has been located, constructed, installed or altered in compliance with the requirements of N.J.A.C. 7:9A-1 and the Application to Construct/Alter/Repair an Individual Subsurface Sewage Disposal System which was approved by the administrative authority. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Authorized Signature	*Type of License Held*
Name (Typed or Printed)	*License Number*

Date: _____

For Agency Use Only

Date Received: _____

Form Determined to be: X *Complete* *Incomplete* _____

Date Returned _____

Date Received _____

Date Certification Approved: 5/8/09

Authorized Signature: [illegible]

Form 3d
Percolation Test Data

1. Test Number ___2___ Replicate (Letter)_____ Date Tested ___11/13/08___
2. Depth_____14"_____
3. Pre-soak:_____

   __x__ Sandy Textured Soil Only, Shortened Pre-soak—Indicate Time Required for 12 Inches of Water to Drain After Second Filling, Minutes_____10_____

   ____ Four Hour Pre-soak Completed—Indicate Result:

   ____ Test Hole Drained Within 16 to 24 Hours After Pre-soak

   ____ Test Hole Did Not Drain Within 24 Hours After Pre-soak

4. Rate of Fall Data:

   a. Time Interval Selected, Minutes_____5_____

   b. Record the Drop in Water Level During Each Time Interval to the Nearest 1/10th-Inch On the Lines Below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level(Inches)
7	9.25	2.25
7	9.25	2.25
7	9.00	2.00

5. Percolation Rate:

   a. Time, minutes, Required for a Six-inch Drop in Water Level__18___

   b. Percolation Rate = a/6 = __18__/6 = __3__ min/in

I hereby certify that the information furnished on Form 3d of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____ Date___1/23/09___

Signature of Professional Engineer _____ License # ___23805___

1/20/2009 / F:\dosapps\health\ch199\form3d.doc

Form 3d
Percolation Test Data

1. Test Number ___1___ Replicate (Letter)_____ Date Tested ___11/13/08___
2. Depth_____14"_____
3. Pre-soak:_____

   __x__ Sandy Textured Soil Only, Shortened Pre-soak—Indicate Time Required for 12 Inches of Water to Drain After Second Filling, Minutes_____10_____

   ____ Four Hour Pre-soak Completed—Indicate Result:

   ____ Test Hole Drained Within 16 to 24 Hours After Pre-soak

   ____ Test Hole Did Not Drain Within 24 Hours After Pre-soak

4. Rate of Fall Data:

   a. Time Interval Selected, Minutes_____5_____

   b. Record the Drop in Water Level During Each Time Interval to the Nearest 1/10th-Inch On the Lines Below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level(Inches)
7	9.50	2.50
7	9.50	2.50
7	9.50	2.50

5. Percolation Rate:

   a. Time, minutes, Required for a Six-inch Drop in Water Level__18___

   b. Percolation Rate = a/6 = __18__/6 = __3__ min/in

I hereby certify that the information furnished on Form 3d of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Site Evaluator _____Craig A Patterson_____ Date___1/23/09___

Signature of Professional Engineer _____ License # ___23805___

1/20/2009 / F:\dosapps\health\ch199\form3d.doc

Van Cleef Engineering Assoc.

4AAA Drive
Suite 102
Hamilton, NJ 08691

CONCRETE SAND FOR SEPTIC BEDS

Township: **Hopewell**
County: **Mercer**
Block: **85**
Lot: **23**

Job: **1609**
Client: **Patterson**
Date of Analysis: **12/02/08**

Sample Identification: **Concrete Sand**
Source or Depth: **LOI Phoenix Pit**
Date of Sample: **12/01/08**

Moisture Calculation

Wt. Wet Soil = 575 grams
Wt. Dry Soil = 556.2 grams
Moisture Content = 3.3 %

Coarse Fragment Content

Wt. Dry Soil.= 556.2 grams
Wt. Retained on #8 = 47.2 grams
% Coarse Fragment = 8.5 %

Sieve Analysis

Sieve	Size (mm)	Wt. Soil Retained (grams)	Cum. Wt Soil Retained (grams)	Percent Passing	Required % Passing*
3/8"	12.5	0	0.0	100.0	100
#8	2.36	47.2	47.2	91.5	80 - 100
#16	1.18	66.9	114.1	79.5	50 - 85
#30	0.6	141.3	255.4	54.1	25 - 60
#50	0.3	219.4	474.8	14.6	10 - 30
#100	0.15	70.5	545.3	2.0	2 - 10
Pan	- - - -	10.4	555.7	0.1	

* Pursuant to NJDEP Treatment Works Approval (TWA) Permit No. 03-3487-4SG. for the use of Concrete Sand within the Zone of Treatment or Zone of Disposal.

12/3/08

Gregg W. Barkley
N.J.P.E. #34675

Date

Form 3b. Tube Permeameter Test Data

Block: **85**
Lot: **23**
Municipality: **Hopewell**
County: **Mercer**

Job Number: **1609**
Client: **Patterson**
Date Collected: **12/01/08**

Sample Identification: **Concrete Sand**

Material Tested: **Concrete Sand Phoenix Pit** Depth = **LOI**

Type of Sample: **XX** Undisturbed _____ Disturbed

		Replicate A	Replicate B	
Sample Dimensions:	Inside radius of Sample Tube, R, in cm. =	2.38	2.38	(1 7/8" ID)
	Length of Sample, L, in inches =	4.75	4.75	

Bulk density determination (Disturbed Samples Only) :

	A	B
Sample Weight, grams =		
Sample Volume, Cubic centimeters (cc) =	215	215
Bulk Density, grams/cc =	**N/A**	**N/A**

Standpipe Used: _____ No XX Yes, Internal Radius, r , in cm. = A: 0.476 (3/8" ID) B: 0.476 (3/8" ID)

Height of water level, in inches:

	A	B
At the beginning of each test interval, H1 =	14.00	14.00
At the end of each test interval, H2 =	8.00	8.00

Rate of Water Level Drop:

Replicate A		Replicate B	
Time for Water Drop	Length of test (minutes) t	Time for Water Drop	Length of test (minutes) t
10 sec	0.17	9 sec	0.15
10 sec	0.17	9 sec	0.15
10 sec	0.17	9 sec	0.15

Calculation of Permeability:

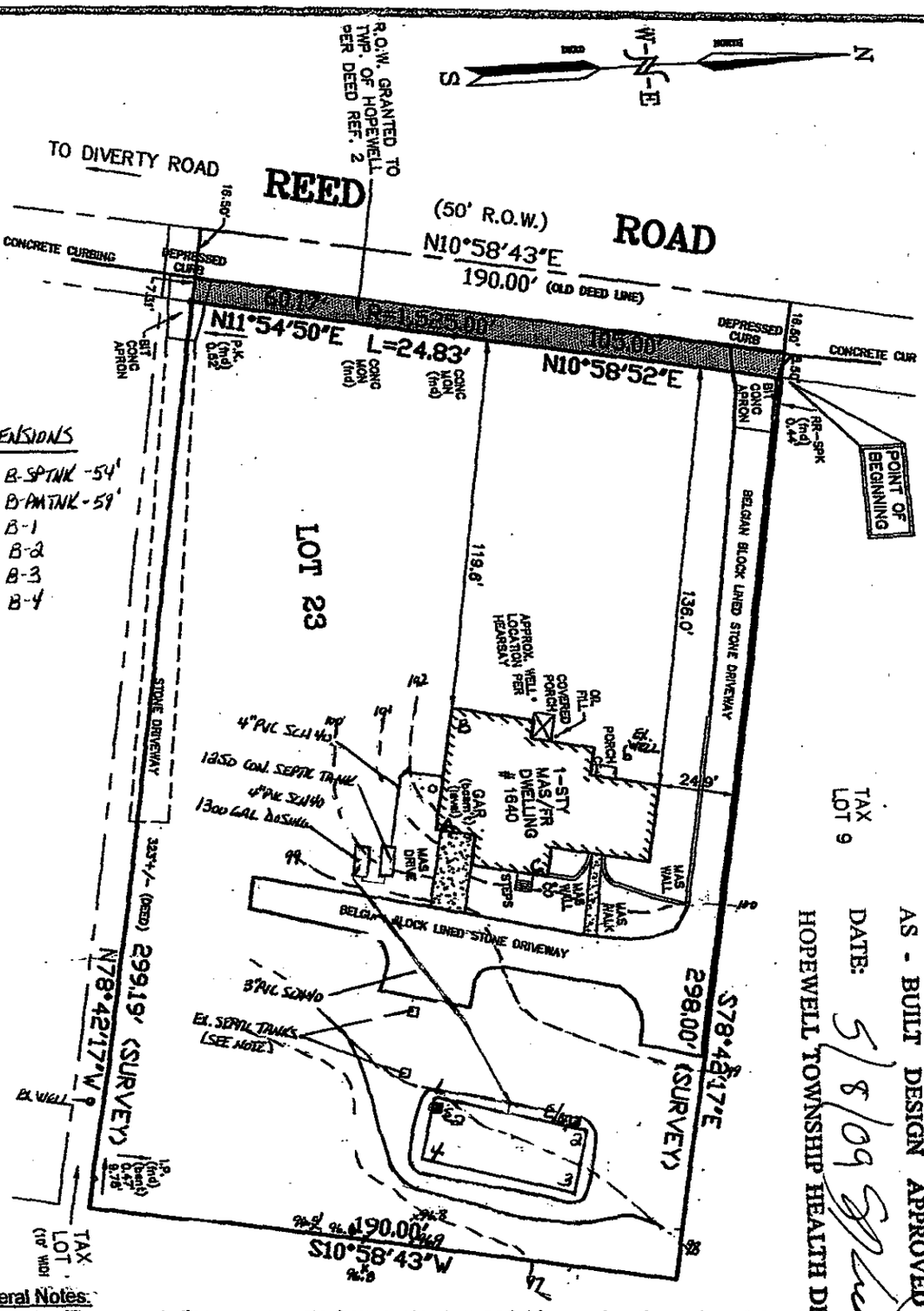
K = 60 x (L/t) x (r2/R2) x Ln (H1/H2) = A: **37.5** in/hr B: **42.5** in/hr

Defects in Sample:

XX	None	_____	Cracks	_____	Worm Channels
_____	Large Gravel	_____	Large Roots	_____	Root Channels
_____	Dry soil	_____	Smearing	_____	Compaction
_____	Soil/Tube contact			_____	Other

I hereby certify that the information furnished on form 3b of this application is true and accurate. I am aware that falsification of this data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to the penalities as prescribed in N.J.A.C. 7:14-8.

Signature of Professional Engineer _____ Date : 12/3/08
Gregg W. Barkley, #34675



AS-BUILT DIMENSIONS

A-SPTNK -17'	B-SPTNK -54'
A-PMTNK -27'	B-PMTNK -59'
A-1 - 87'	B-1
A-2 - 1'	B-2
A-3 - 127'	B-3
A-4 - 109'	B-4

AS - BUILT DESIGN APPROVED
DATE: 5/8/09
HOPEWELL TOWNSHIP HEALTH DEPT.

General Notes:

1. The property lines, easements, house, structure and driveway locations where taken from plan entitled "Plan of Survey Lot 23 Block 85 Hopewell Township, Mercer County, New Jersey" by Frank R. Klapinski, dated 8/29/08.
2. The topography was taken from field notes.
3. A benchmark of 100.00 was set on top of slate walk at intersection with back walk and driveway as shown.
4. If any part of the existing septic system is excavated, the material must be buried on site.
5. The existing septic tank is to be pumped clean, crushed, and backfilled in place with clean fill.
6. There are no existing wells or septic systems within 200' of the proposed septic system unless otherwise noted.
7. The existing building in back corner of property is to be removed.
8. This is an alteration to an existing septic system as per N.J.A.C. 7:14A-3.3(d)(e).

REV.	DESCRIPTION	DATE	BY
1	AS-BUILT	1/23/09	CAP

SEPTICS BY PATTERSON, INC.
SOIL TESTING, SEPTIC DESIGN, INSPECTIONS
887 NEW RD. CHURCHVILLE, PA 18966 215-942-9017

SEPTIC SYSTEM DESIGN

PREPARED FOR

BLOCK 85 LOT 23

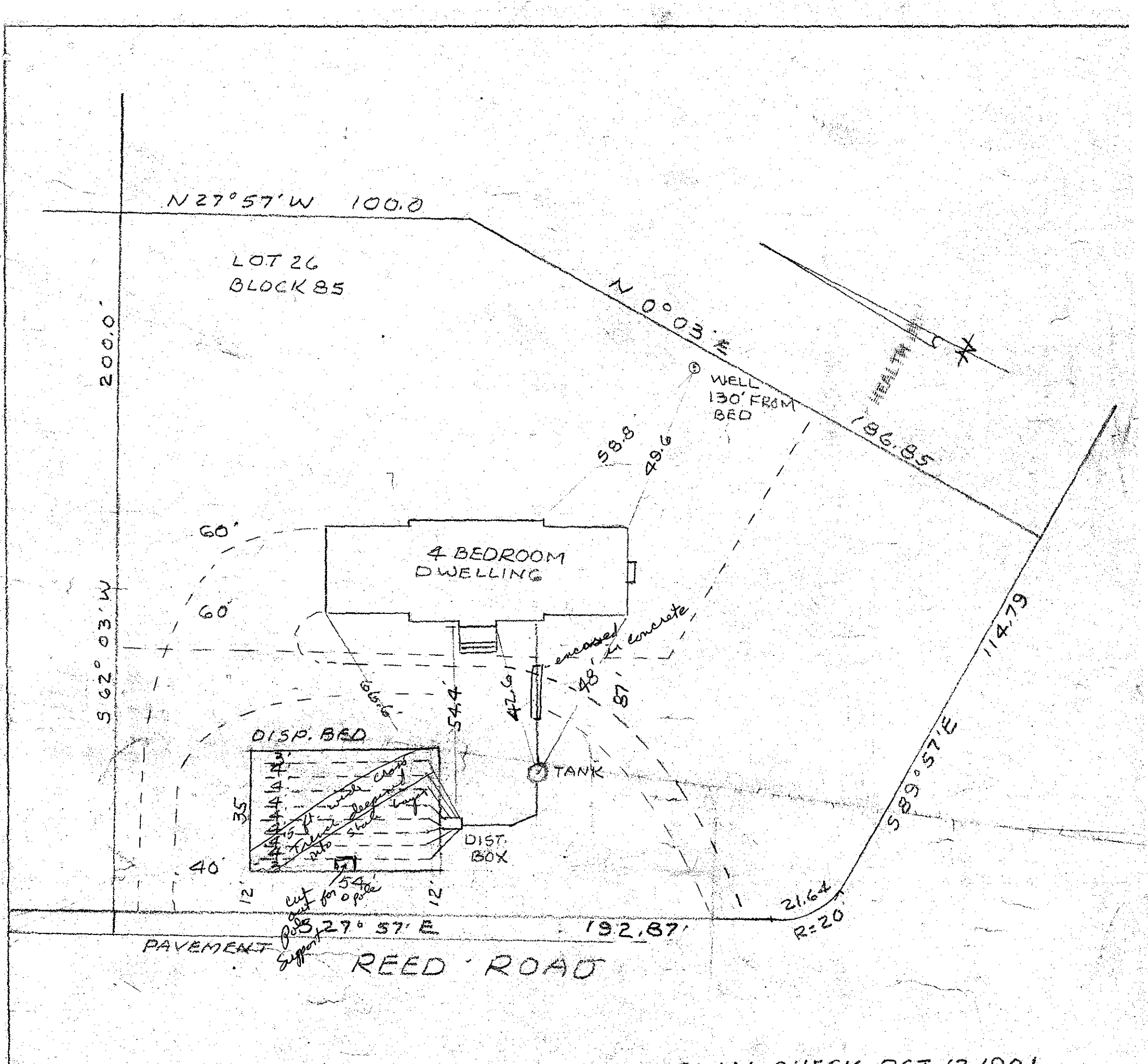
SITUATED IN

HOPEWELL TOWNSHIP MERCER COUNTY

2/25/08

DONALD P. SCHLACHTER DATE
New Jersey Professional Engineer No. 23805

SCALE: 1"=50'	DRAWN BY:	
DATE: 9/19/08	CHECKED BY:	PAGE: 1 OF 7



FINAL CHECK OCT. 12, 1981

AS BUILT DESIGN

DATE: 10-16-81

S. A. Suarino

HOPEWELL TOWNSHIP HEALTH DEPT.

B 85-426

PREPARED BY

JOHN B. McNALLY

John B. McNally

PROF. ENG. & LAND SURVEYOR LIC. NO. 435

6 CHARLTON ST. PRINCETON N.J.

PLAN

COMPLETED HOUSE LOCATION

DIST. BOX, WELL AND SEPTIC TANK

FOR

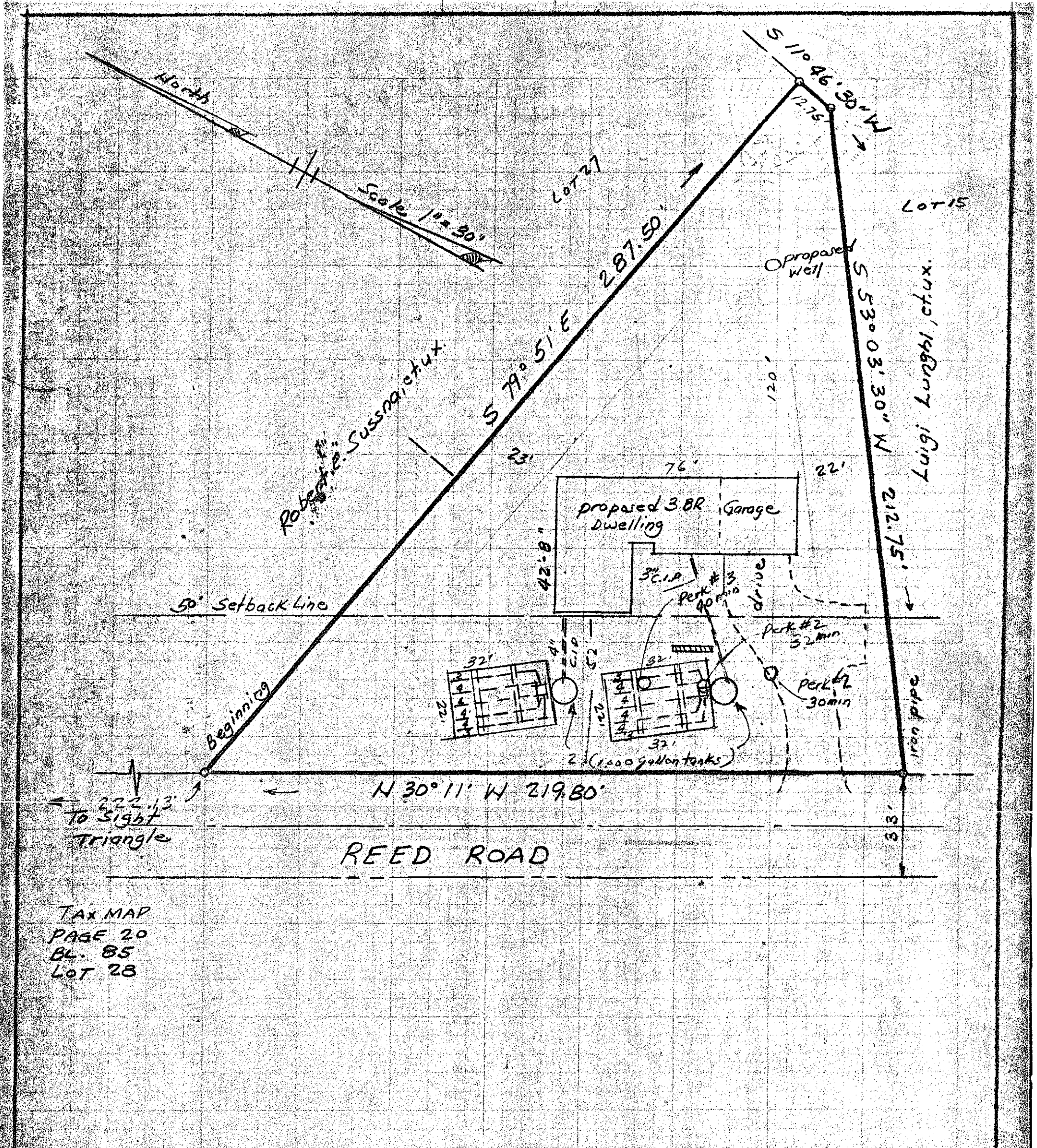
HENRY & JO ANN SUFNAR

HOPEWELL TOWNSHIP

MERCER COUNTY N.J.

SCALE 1" = 30'

OCT. 12, 1981



TAX MAP
PAGE 20
BL. 85
LOT 28

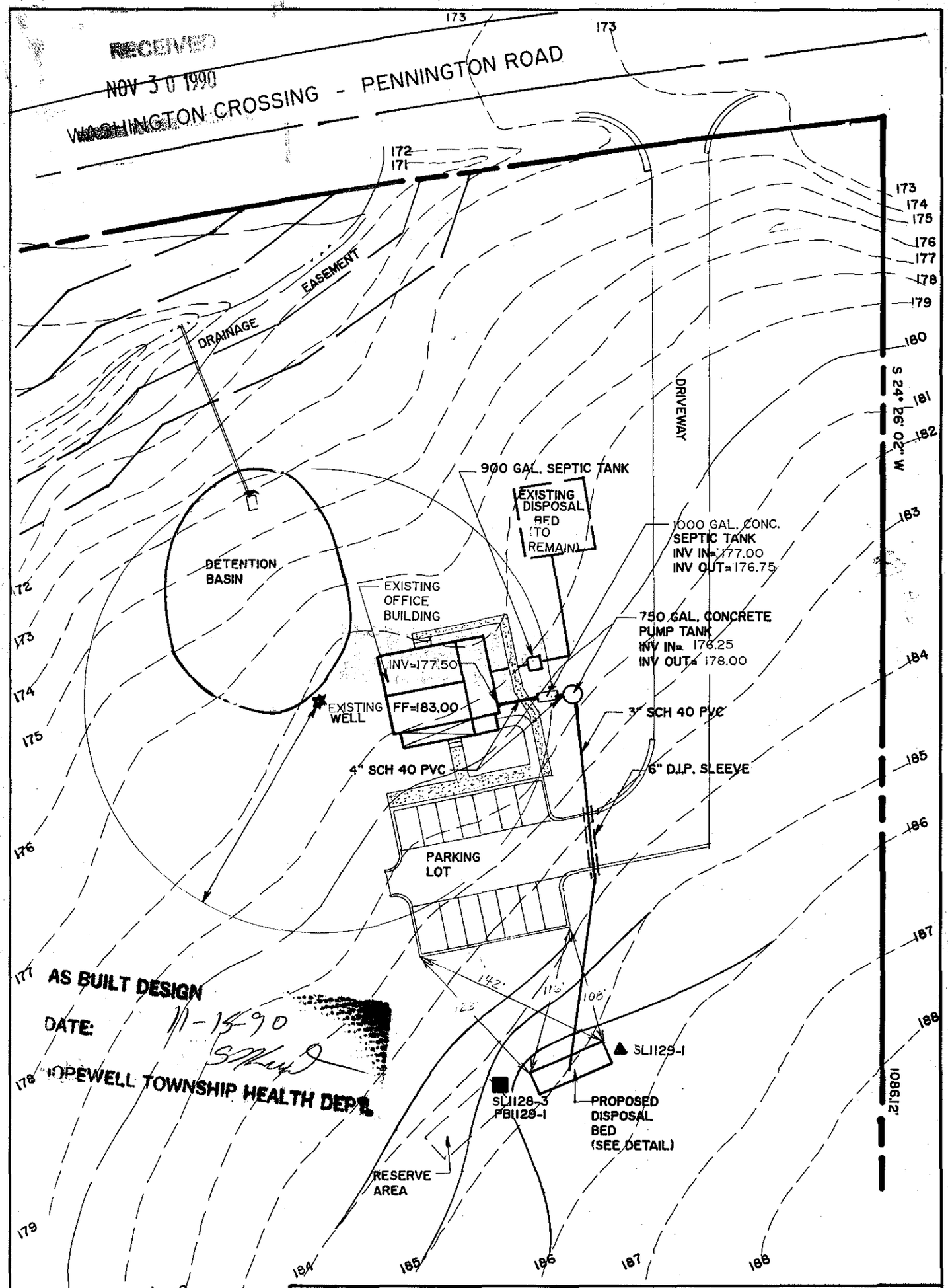
VITO COCCO, et ux
Hopewell Township Mercer County N.J.

PLOT PLAN

DRAWN BY P.J.V	DATE 4-29-78
CHECKED M.C	SCALE 30
PROJECT NO.	SHEET NO.

PHILIP J. VECERE P.E. & L.S.
PROFESSIONAL ENGINEER AND LAND SURVEYOR N.J. LIC. NO. 5684
P.O. BOX 455 TITUSVILLE MERCER COUNTY NEW JERSEY 08560

Philip J. Vecere — SIGNATURE
5-23-78 — DATE



SEPTIC SYSTEM DESIGN

FOR

BLOCK 91 LOT 1

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

REVISIONS	DATE	
CHANGE INV. 5-2-90 SH	1/4/90	2 Clerico Lane P.O. Box 1079 Belle Mead, N.J. 08502-1079 201/359-5501
AS BUILT 10-29-90 SH	SCALE 1"= 50' - 00"	Applied Wastewater Technology, Inc.
	DESIGNED BY PS	
	DRAWN BY DS	
	JOB NO. 9785	by:
	SHEET 1 OF 7	THEODORE H. BAYER N.J.P.E.# 33806

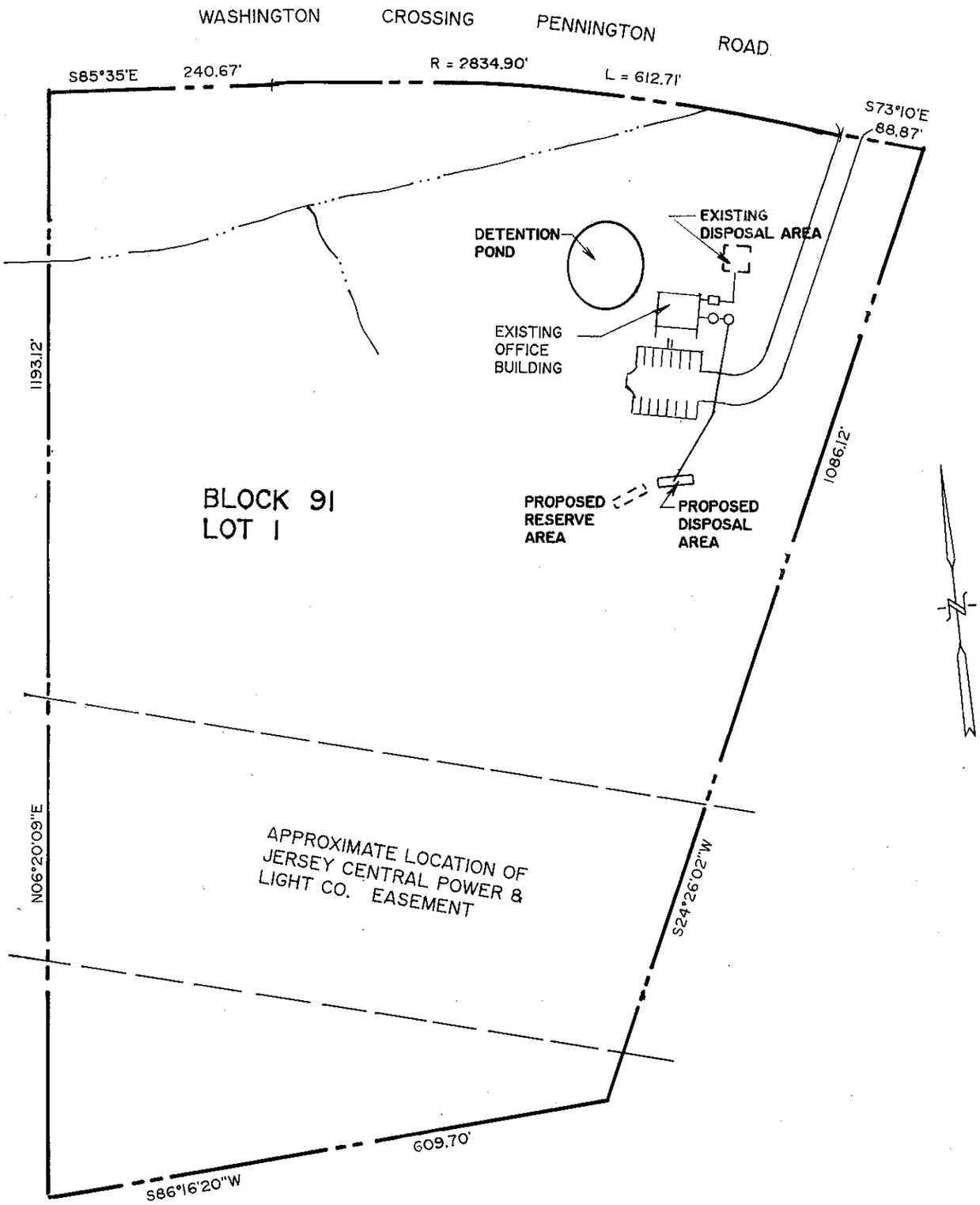
LEGEND

■ PIT BAIL IN SOIL LOG

▲ SOIL LOG

148457

TRUKMANN'S



SEPTIC SYSTEM DESIGN

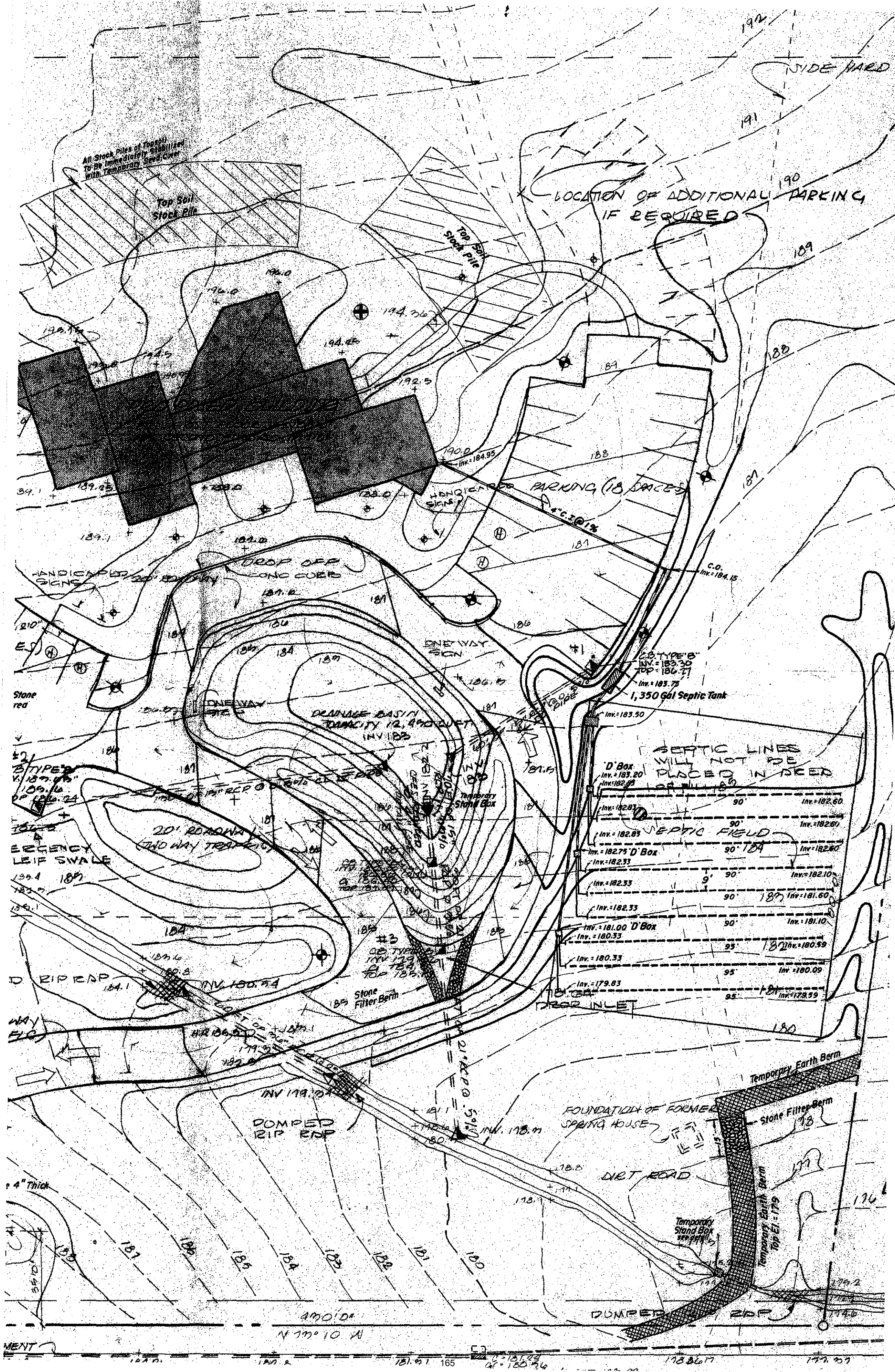
BLOCK 91 LOT 1

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY.

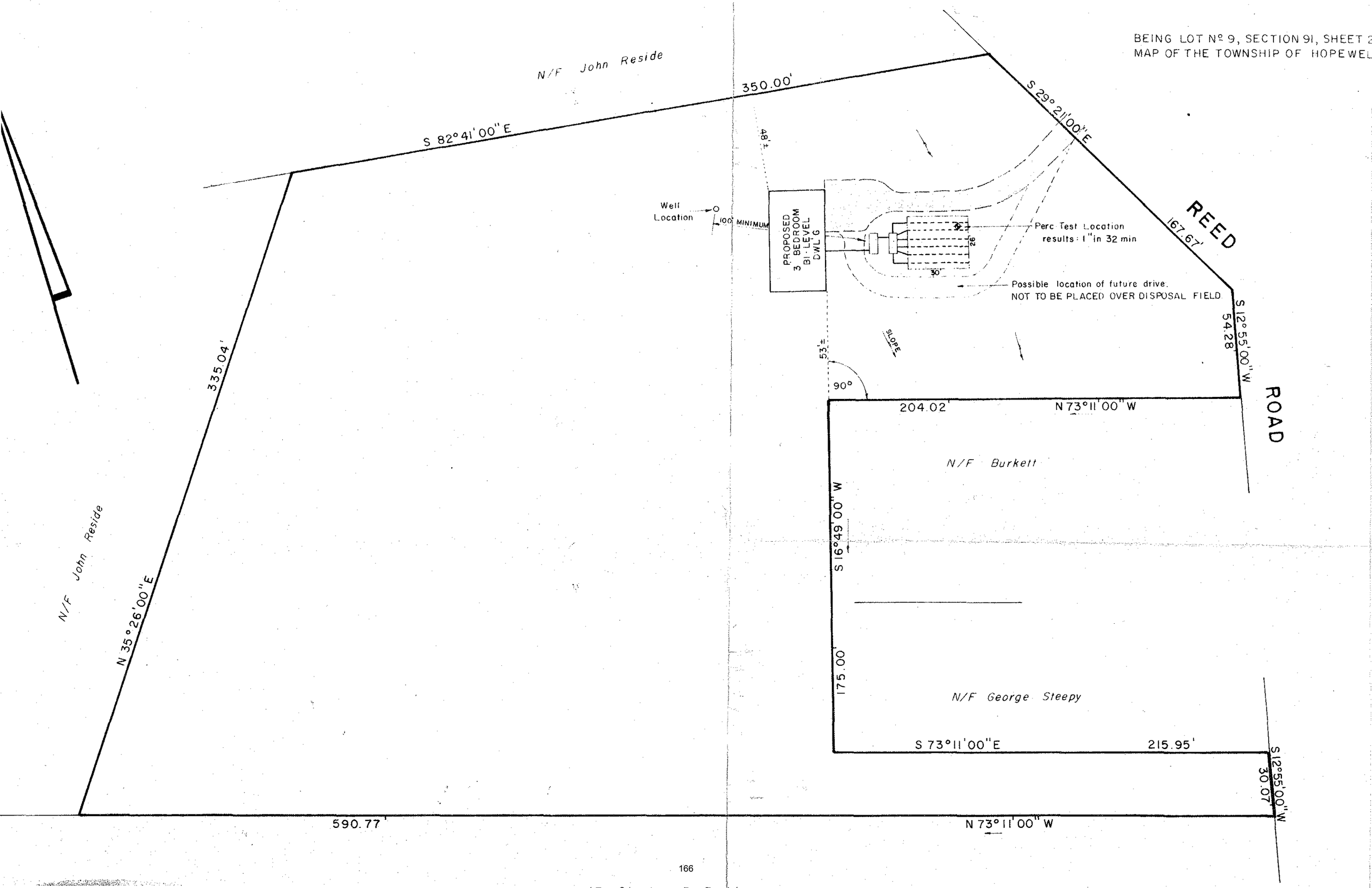
REVISIONS		
	DATE 1/4/1990	2 Cierico Lane P.O. Box 1079 Belle Mead, N.J. 08502-1079 201/359-5501
	SCALE 1" = 150'-0"	Applied Wastewater Technology, Inc.
	DESIGNED BY PS	
	DRAWN BY SH	
	JOB NO. 9785	by:
	SHEET 2 OF 7	THEODORE H. BAYER N.J.P.E.# 33806

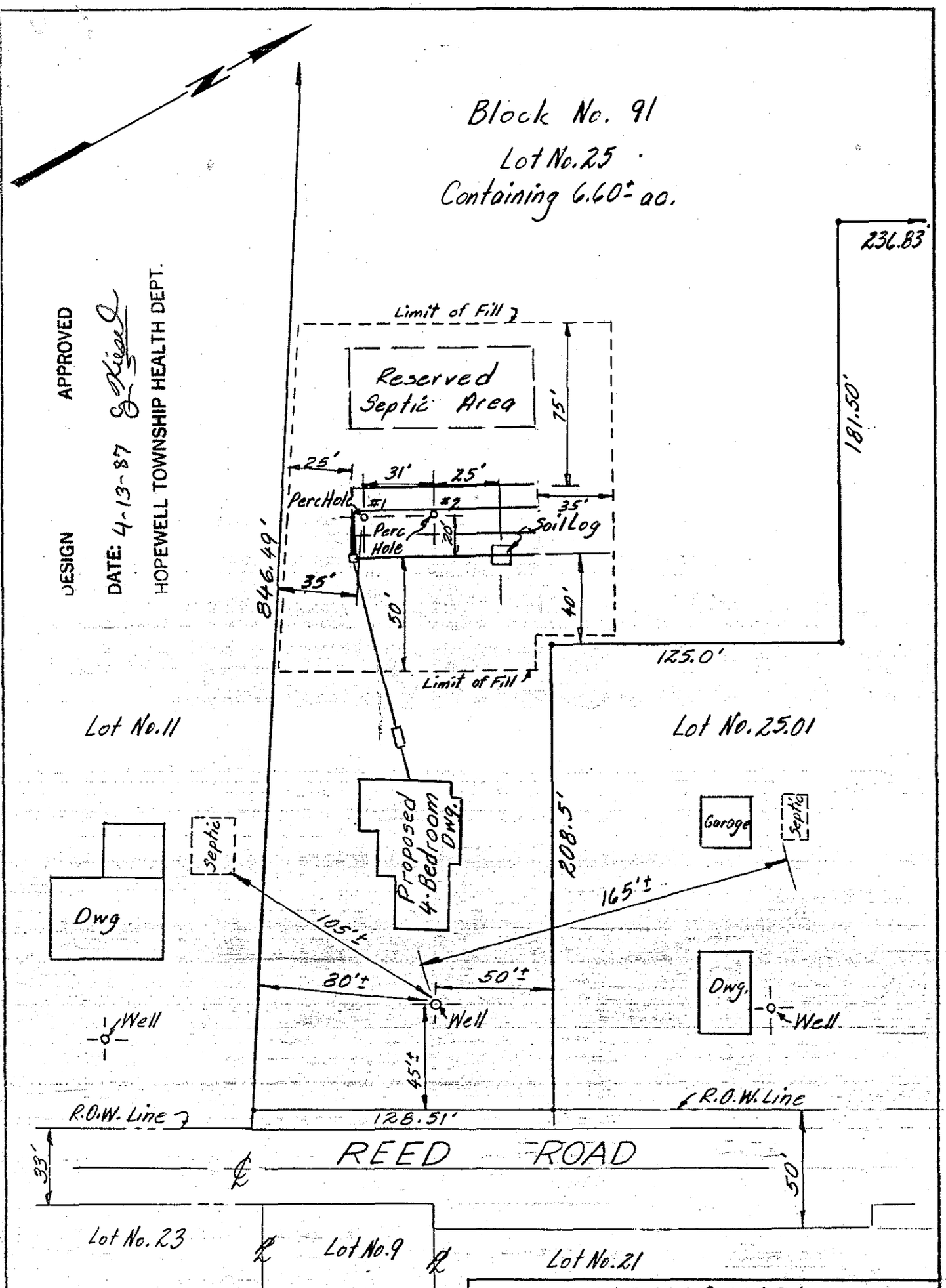
148457

TRUKMANN'S


All Stock Piles of Topsoil
To Be Immediately Stabilized
With Temporary Seed Cover
Top Soil
Stock Pile
Top Soil
Stock Pile
SIDE YARD
LOCATION OF ADDITIONAL PARKING
IF REQUIRED
PARKING (18 SPACES)
HANDICAPPED
SIGNS
DROP OFF
CONC CURB
HANDICAPPED
SIGNS
ONE WAY
SIGN
ONE WAY
SIGN
DRAINAGE BASIN
TOTAL CITY 12,490 CUFT
INV 183
C.O.
Inv.=184.15
C.B. TYPE "B"
INV.=183.30
TOP=186.71
Inv.=183.75
1,350 Gal Septic Tank
Inv.=183.50
SEPTIC LINES
WILL NOT BE
PLACED IN DEED
OF WILL
"D" Box
Inv.=183.20
Inv.=182.83
Inv.=182.60
Inv.=182.83
Inv.=182.60
SEPTIC FIELD
Inv.=182.83
Inv.=182.75 "D" Box
Inv.=182.60
Inv.=182.33
Inv.=182.10
Inv.=182.33
Inv.=181.60
Inv.=182.33
Inv.=181.00 "D" Box
Inv.=181.10
Inv.=180.33
Inv.=180.59
Inv.=180.33
Inv.=180.09
Inv.=179.83
Inv.=179.59
DROP INLET
Temporary
Stone Box
20' ROADWAY
(TWO WAY TRAFFIC)
EMERGENCY
SPILLWAY SWALE
Stone
Filter Berm
RIP RAP
INV. 180.74
DUMPED
RIP RAP
INV 179.04
INV. 178.71
FOUNDATION OF FORMER
SPRING HOUSE
Temporary Earth Berm
Stone Filter Berm
DIRT ROAD
Temporary
Stand Pipe
Temporary Earth Berm
Top El. = 179
DUMPED RIP RAP
4" Thick
N 17° 10' W

BEING LOT Nº 9, SECTION 91, SHEET 2
MAP OF THE TOWNSHIP OF HOPEWEL





GUZIKOWSKI

Hopewell Township – Mercer County

New Jersey

JOHN WALDNER, P.E. #15525

Licensed New Jersey Professional Engineer

John M. Waldner 4/16/87

69 Upper Ferry Rd., Trenton, N.J. 08628

SEPTIC SYSTEM DESIGN

Block No. 91 Lot No. 25

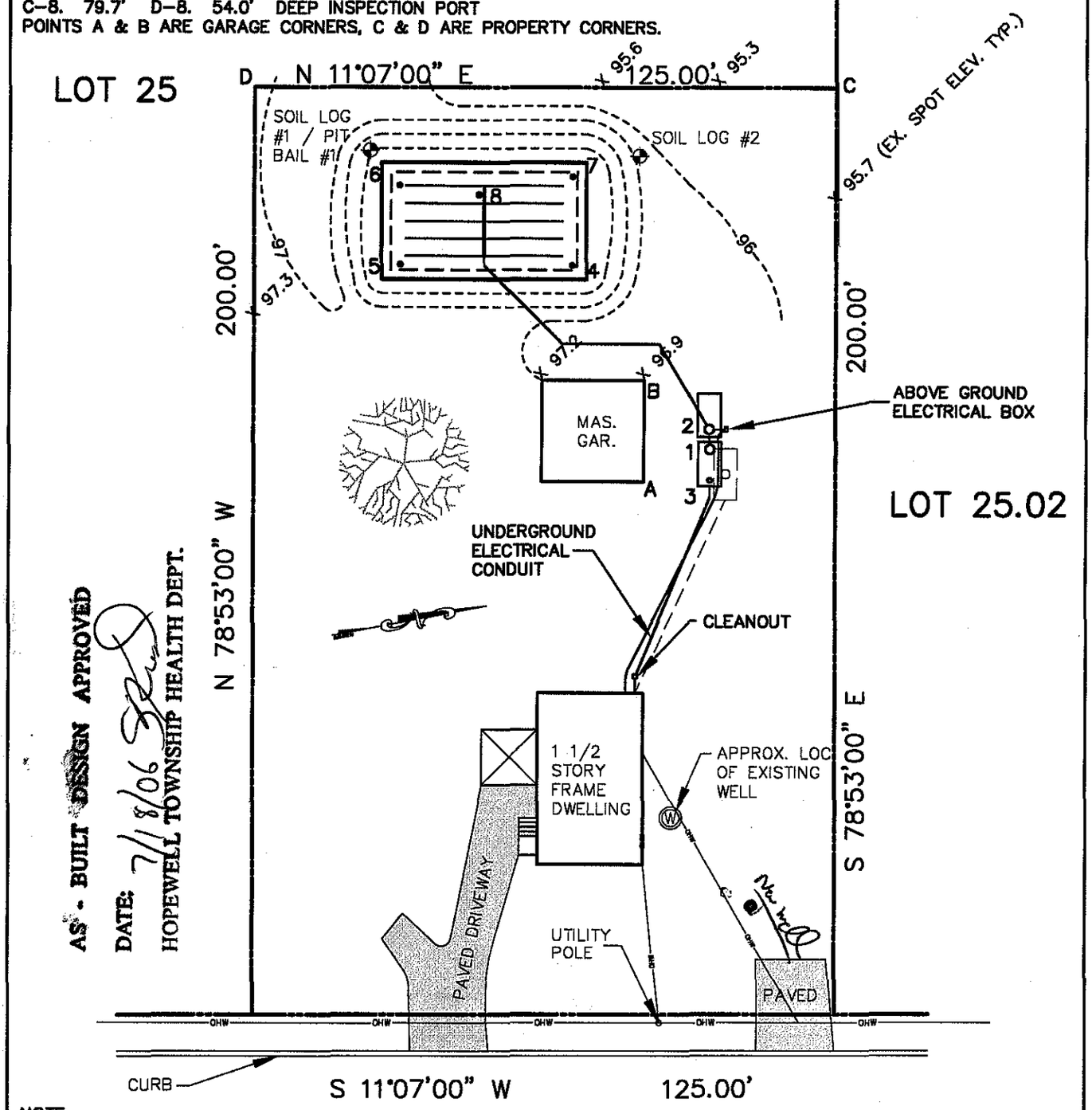
Date: March 1987 Scale: 1" = 50'

A–1.	15.6'	B–1.	20.6'	MH. 1000 GALLON SEPTIC TANK
A–2.	17.9'	B–2.	17.7'	MH. 1000 GALLON DOSING TANK
A–3.	13.8'	B–3.	25.4'	CLEANOUT
C–4.	68.6'	D–4.	77.9'	INSPECTION PORT
C–5.	100.9'	D–5.	49.5'	INSPECTION PORT
C–6.	96.1'	D–6.	37.6'	INSPECTION PORT
C–7.	60.2'	D–7.	71.6'	INSPECTION PORT
C–8.	79.7'	D–8.	54.0'	DEEP INSPECTION PORT

POINTS A & B ARE GARAGE CORNERS, C & D ARE PROPERTY CORNERS.

JUL 17 2006

Hopewell Township Health Dept.



AS - BUILT DESIGN APPROVED
DATE: 7/18/06
HOPEWELL TOWNSHIP HEALTH DEPT.

NOTE:
OUTBOUND TAKEN FROM REF. PLAN NOTE #3.

NOTES:
1). THIS IS NOT A SURVEY OF THE PROPERTY.
2). DISTANCES AND ELEVATIONS SHOWN ARE APPROXIMATE
3). REFERENCE PLAN: "PLAN OF SURVEY FOR RICHARD FURLONG 1641 REED ROAD HOPEWELL TOWNSHIP MERCER COUNTY NEW JERSEY". PREPARED BY A–1 LAND SURVEYS, INC. DATED 10.28.05

GRAPHIC SCALE

30 0 15 30

1 inch = 30 ft.

van note — harvey associates, p.c.

consulting engineers, planners & land surveyors

vnh

777 ALEXANDER ROAD
PRINCETON, NEW JERSEY
08540

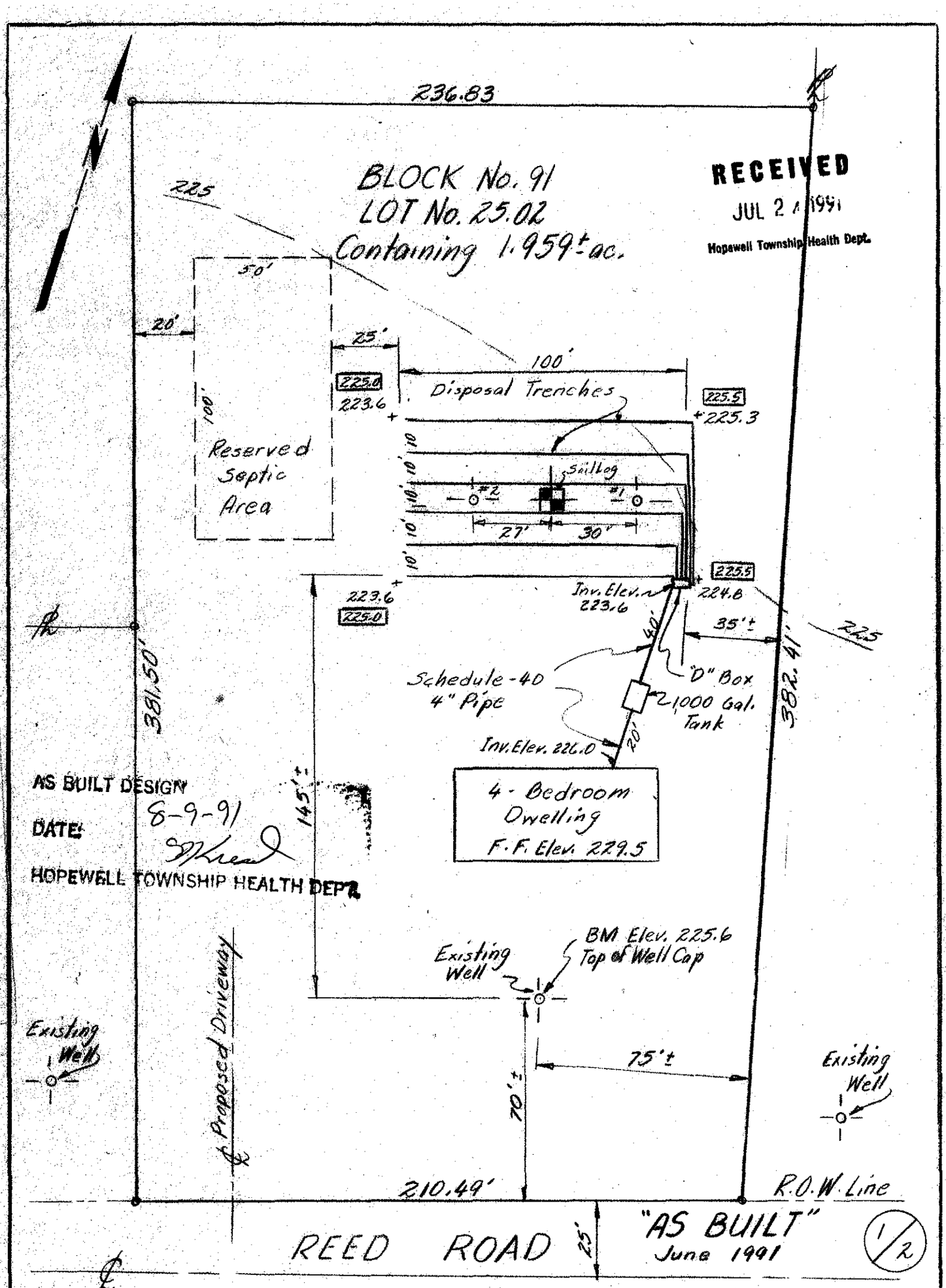
HARRY J. SYPNIEWSKI
NEW JERSEY PROFESSIONAL LAND SURVEYOR No. 20808

7-13-06
DATE OF SIGN

SEPTIC SYSTEM AS–BUILT PLAN
OF
LOT 25.01 – BLOCK 91
PREPARED FOR
RICHARD FURLONG
SITUATED IN

HOPEWELL TOWNSHIP — MERCER CO., N.J.
SCALE : 1" = 40' — JUNE 2006

DRAWN BY: BJF	FIELD BK	ORDER No.	FILE No.	SHEET No.
CHECKED BY:	PAGE	36457–330–22	TWP. BLK.	1 OF 1



LEGEND
000 - Existing Grade
000 - Proposed Grade

KOLODZIEJ
Hopewell Township - Mercer County
New Jersey

JOHN M. WALDNER, P.E. #15525
Licensed New Jersey Professional Engineer
7/16/91
69 Upper Ferry Rd., Trenton, N.J. 08628

SEPTIC SYSTEM DESIGN
Block No. 91 Lot No. 25.02
Date: Nov. 1989 Scale: 1" = 40'
Rev. Jan. 1990

BLOCK No. 91
LOT No. 43
Containing 2.97 ± acres

N

600.74'

Well

AS - BUILT DESIGN APPROVED
DATE: 2/28/06
HOPEWELL TOWNSHIP HEALTH DEPT.

75.0'

Lot No. 27

844.74' to ℄

Lot No. 28

Disposal Bed

Pump Tank 1,300 Gal.

Septic Tank 2,000 Gal.

Lot No. 12

250.0' to ℄

Existing 4-Bedroom Dwelling

Paved Driveway

R.O.W. Line

101.96'

30'

Curb

15'

℄ REED ROAD

"AS BUILT" (Feb. 25, 2006)

SEPTIC SYSTEM LOCATION

1-A	46'
1-B	47'
1-C	91'
1-D	90'
1-Septic Tank	57'
1-Pump Tank	73'
2-A	44'
2-B	56'
2-3	94'
2-4	87'
2-Septic Tank	50'
2-Pump Tank	66'

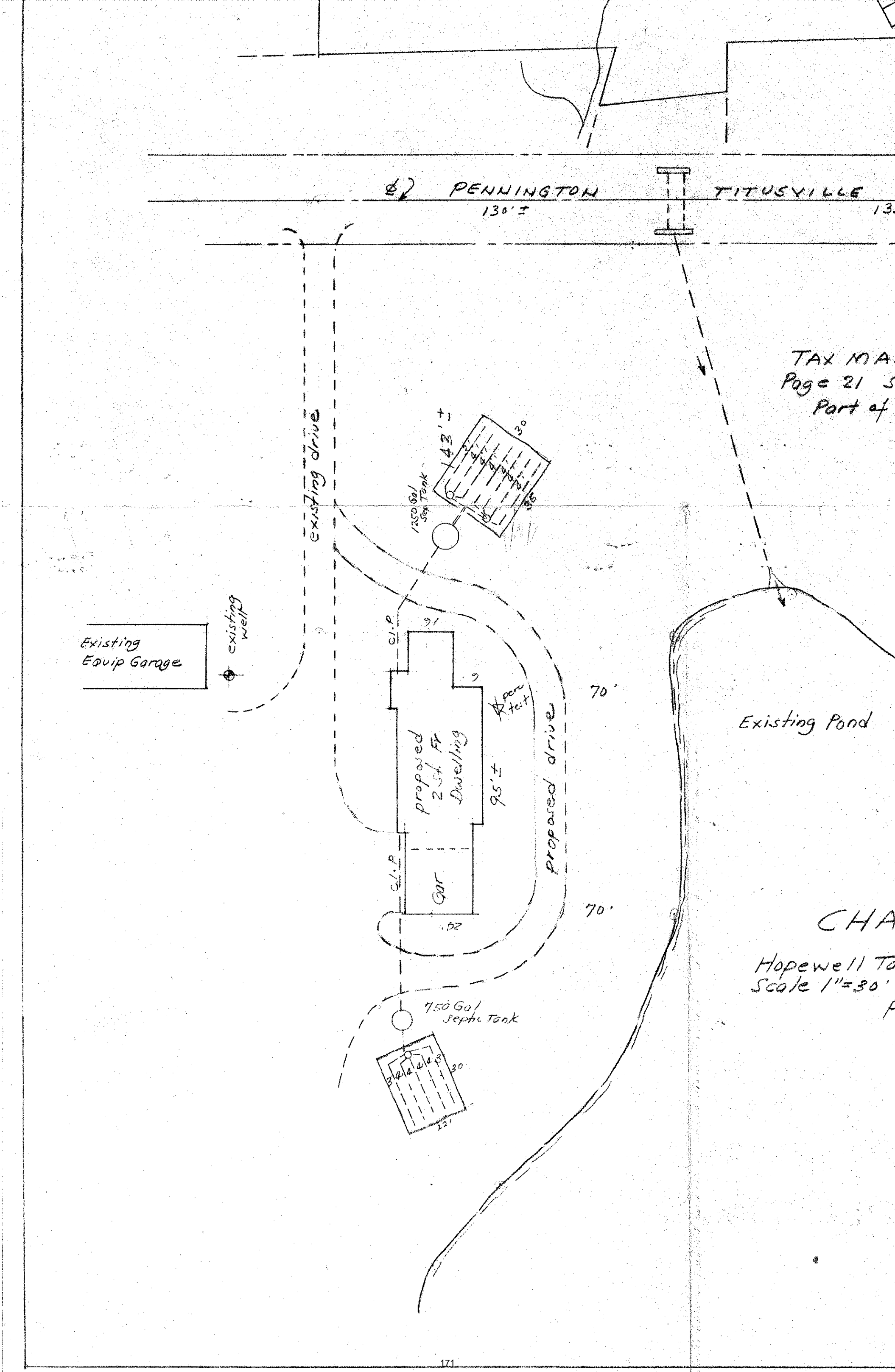
STRATTON
Township of Hopewell - County of Mercer
New Jersey

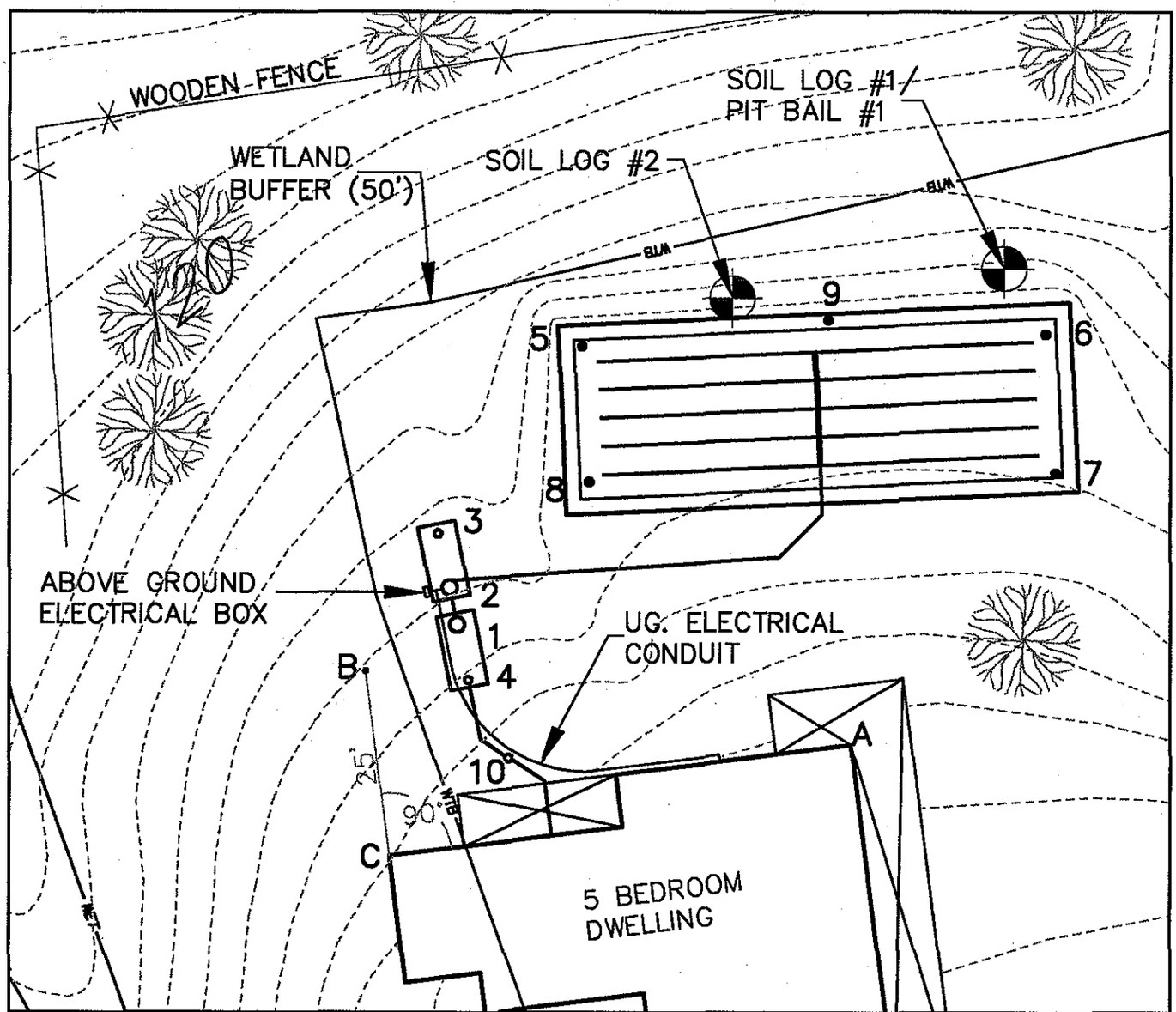
JOHN M. WALDNER, P.E. 15525
Licensed New Jersey Professional Engineer
John M. Waldner 2/27/06
69 Upper Ferry Rd., Trenton, NJ 08628: Phone: 609 883-7754

SEPTIC SYSTEM DESIGN

Block No. 91 Lot No. 43

Date: Feb. 25, 2006 Scale: 1" = 40'


PENNINGTON
TITUSVILLE
130'±
TAX MA
Page 21 S
Part of
Existing drive
1250 Gal Sep Tank
43'±
30
Existing well
Existing Equip Garage
C.L.P.
91
9
perc test
70'
proposed 2 St Fr Dwelling
95'±
Existing Pond
Proposed drive
Gar
52
70'
CHA
Hopewell To
Scale 1"=30'
750 Gal Septic Tank
30
221



A–1.	54.8'	B–1.	13.6'	MH. COVER 1500 GAL. CONCRETE SEPTIC TANK.
A–2.	57.4'	B–2.	15.7'	MH. COVER 1500 GAL. CONCRETE DOSING TANK.
A–3.	61.2'	B–3.	21.0'	TANK CLEANOUT.
A–4.	51.6'	B–4.	13.6'	TANK CLEANOUT.
A–5.	65.0'	B–5.	53.1'	INSPECTION PORT.
A–6.	61.2'	B–6.	101.0'	INSPECTION PORT.
A–7.	44.7'	B–7.	95.0'	INSPECTION PORT.
A–8.	49.3'	B–8.	38.8'	INSPECTION PORT.
A–9.	57.6'	B–9.	77.9'	DEEP INSPECTION PORT.
C–10.	20.6'	B–10.	22.3'	SANITARY CLEANOUT.

AS - BUILT DESIGN APPROVED

DATE: 7/5/07

HOPEWELL TOWNSHIP HEALTH DEPT.

20 0 10 30

GRAPHIC SCALE 1" = 20'

NOTES:

1). THIS IS NOT A SURVEY OF THE PROPERTY.

2). DISTANCES AND ELEVATIONS SHOWN ARE APPROXIMATE.

3). EXISTING FEATURES SHOWN ARE FOR THE CONSTRUCTION OF THE PROPOSED SEPTIC SYSTEM ONLY. EXISTING FEATURES OUTSIDE THE AREA OF CONSTRUCTION ARE NOT SHOWN .

4). OUTBOUND REFERENCE : " BOUNDARY LINE SURVEY LOT No. 3 BLOCK No. 93 OF PROPERTY FOR SEA ISLAND CAPITAL PARTNERS, INC.". DATED SEPT. 1, 1998. LAST REVISED 1/21/99. PREPARED BY VAN NOTE–HARVEY ASSOCIATES P.C.

5). TOPOGRAPHY AND PHYSICAL FEATURES SHOWN HEREON PROVIDED BY ATLANTIS AERIAL SURVEY CO., INC, TAKEN FROM PHOTOGRAPHY DATED FEBRUARY 2, 1998.

6). THE FRESHWATER WETLAND AND STATE OPEN WATER BOUNDARIES SHOWN HEREON WERE ESTABLISHED BY VNHA DURING SITE VISITS IN MARCH 1998 AND MAY 2005, AND WERE FIELD LOCATED BY VNHA DURING SITE VISITS IN MARCH 1998 AND AUGUST 2005.

van note – harvey associates, p.c.

consulting engineers, planners & land surveyors

vnh

777 ALEXANDER ROAD
PRINCETON, NEW JERSEY
08540

KENNETH R. RAIKE
NEW JERSEY PROFESSIONAL LAND SURVEYOR No. 36753

6.21.07
DATE OF SIGN

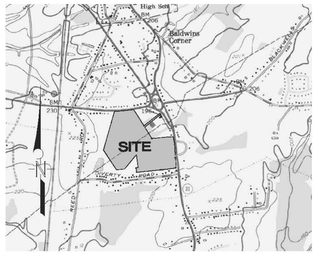
SEPTIC SYSTEM AS–BUILT PLAN
OF
LOT 3 – BLOCK 93
PREPARED FOR
MERRILL LYNCH (OLDIS FARM)
SITUATED IN

HOPEWELL TOWNSHIP — MERCER CO., N.J.
SCALE : 1" = 20' — JUNE 2007

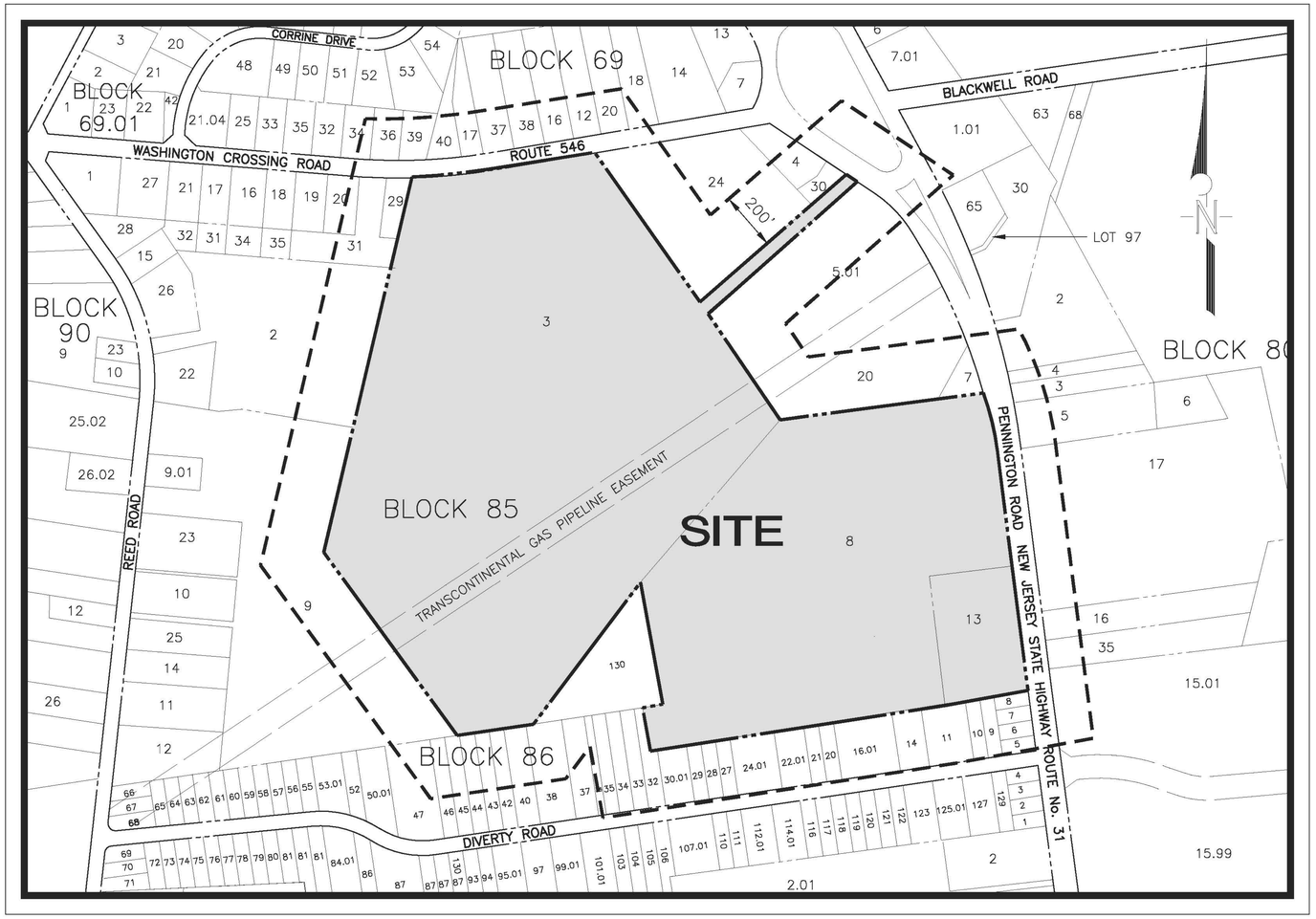
DRAWN BY: BJF	FIELD BK	ORDER No.	FILE No.	SHEET No.
CHECKED BY:	PAGE	36975–330–22	TWP. BLK.	1 OF 1

BOUNDARY AND TOPOGRAPHIC SURVEY

BLOCK 85 - LOT 3, 8 AND 13
TAX MAP SHEET No. 20
TOWNSHIP OF HOPEWELL, MERCER COUNTY, NEW JERSEY



QUAD MAP
SCALE: 1"=2000'



LOCATION MAP
SCALE: 1" = 200'

DECEMBER 22, 2004

SHEET INDEX	
SHEET NO.	DESCRIPTION
1	COVER SHEET
2	BOUNDARY AND TOPOGRAPHIC SURVEY
3	BOUNDARY AND TOPOGRAPHIC SURVEY
4	BOUNDARY AND TOPOGRAPHIC SURVEY
5	BOUNDARY AND TOPOGRAPHIC SURVEY

REFERENCES:

1) A CERTAIN TITLE COMMITMENT PREPARED BY FIDELITY NATIONAL TITLE DATED SEPTEMBER 1, 2004 COMMITMENT NUMBER 04-75048112.

2) DEED BOOK 2901 PAGE 1 (LOT 2 BLOCK 85)
3) DEED BOOK 3714 PAGE 219 (LOT 5.01 BLOCK 85)
4) DEED BOOK 2161 PAGE 235 (LOT 7 BLOCK 85)
5) DEED BOOK 2546 PAGE 916 (LOT 8 BLOCK 85)
6) DEED BOOK 2417 PAGE 406 (LOT 9 BLOCK 85)
7) DEED BOOK 1598 PAGE 258 (LOT 18 BLOCK 85)
8) DEED BOOK 1457 PAGE 554 (LOT 19 BLOCK 85)
9) DEED BOOK 3926 PAGE 212 (LOT 20 BLOCK 85)
10) DEED BOOK 2468 PAGE 272 (LOT 29 BLOCK 85)
11) DEED BOOK 3229 PAGE 207 (LOT 31 BLOCK 31)
12) DEED BOOK 1828 PAGE 498 (LOT 5&6 BLOCK 86)
13) DEED BOOK 1828 PAGE 495 (LOT 7 BLOCK 86)
14) DEED BOOK 2507 PAGE 306 (LOT 8 BLOCK 86)
15) DEED BOOK 4421 PAGE 17 (LOT 9 BLOCK 86)
16) DEED BOOK 2924 PAGE 90 (LOT 10 BLOCK 86)
17) DEED BOOK 3459 PAGE 281 (LOT 11.01 BLOCK 86)
18) DEED BOOK 4461 PAGE 235 (LOT 14 BLOCK 86)
19) DEED BOOK 4595 PAGE 25 (LOT 16.01 BLOCK 86)
20) DEED BOOK 2087 PAGE 315 (LOT 20&21 BLOCK 86)
21) DEED BOOK 2198 PAGE 517 (LOT 22.01 BLOCK 86)
22) DEED BOOK 2997 PAGE 344 (LOT 24.01 BLOCK 86)
23) DEED BOOK 1519 PAGE 214 (LOT 27&28 BLOCK 86)
24) DEED BOOK 1807 PAGE 896 (LOT 29 BLOCK 86)
25) DEED BOOK 4548 PAGE 205 (LOT 30 BLOCK 86)
26) DEED BOOK 2130 PAGE 478 (LOT 32 BLOCK 86)
27) DEED BOOK 2334 PAGE 508 (LOT 40 BLOCK 86)
28) DEED BOOK 1550 PAGE 238 (LOT 42&43 BLOCK 86)
29) DEED BOOK 3197 PAGE 257 (LOT 44,45,&46 BLOCK 86)
30) DEED BOOK 3488 PAGE 143 (LOT 130 BLOCK 86)
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SHEET 1 OF 5
JOB No: 0403663

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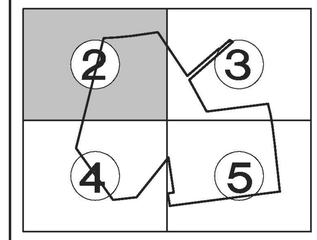

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BOUNDARY AND TOPOGRAPHIC SURVEY

BLOCK 85 – LOTS 3, 8, & 13

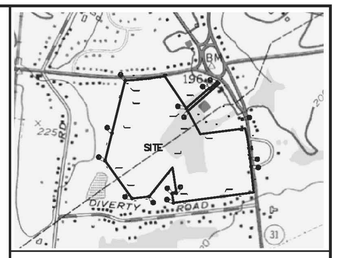
HOPEWELL TOWNSHIP MERCER COUNTY NEW JERSEY

PROJECT NO	040366302
DATE	12/22/04
DRAWN BY	JA
DESIGNED BY	JA
SCALE	1"=50'
CHECKED BY	
SCHOOR DEPALMA	
SHEET NO.	2 of 5

MANALNT

ABOVE

BELOW



KEY MAP
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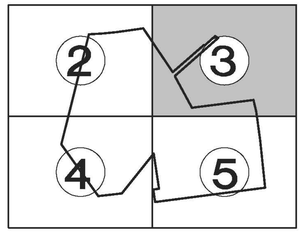

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BOUNDARY AND TOPOGRAPHIC SURVEY

BLOCK 85 – LOT 3, 8 & 13

HOPEWELL TOWNSHIP MERCER COUNTY NEW JERSEY

PROJECT NO.	DATE
040366302	12/22/04
DRAWN BY JA	DESIGNED BY JA
SCALE 1"=50'	CHECKED BY
SCHOOR DEPALMA	
SHEET NO. 3 of 5	

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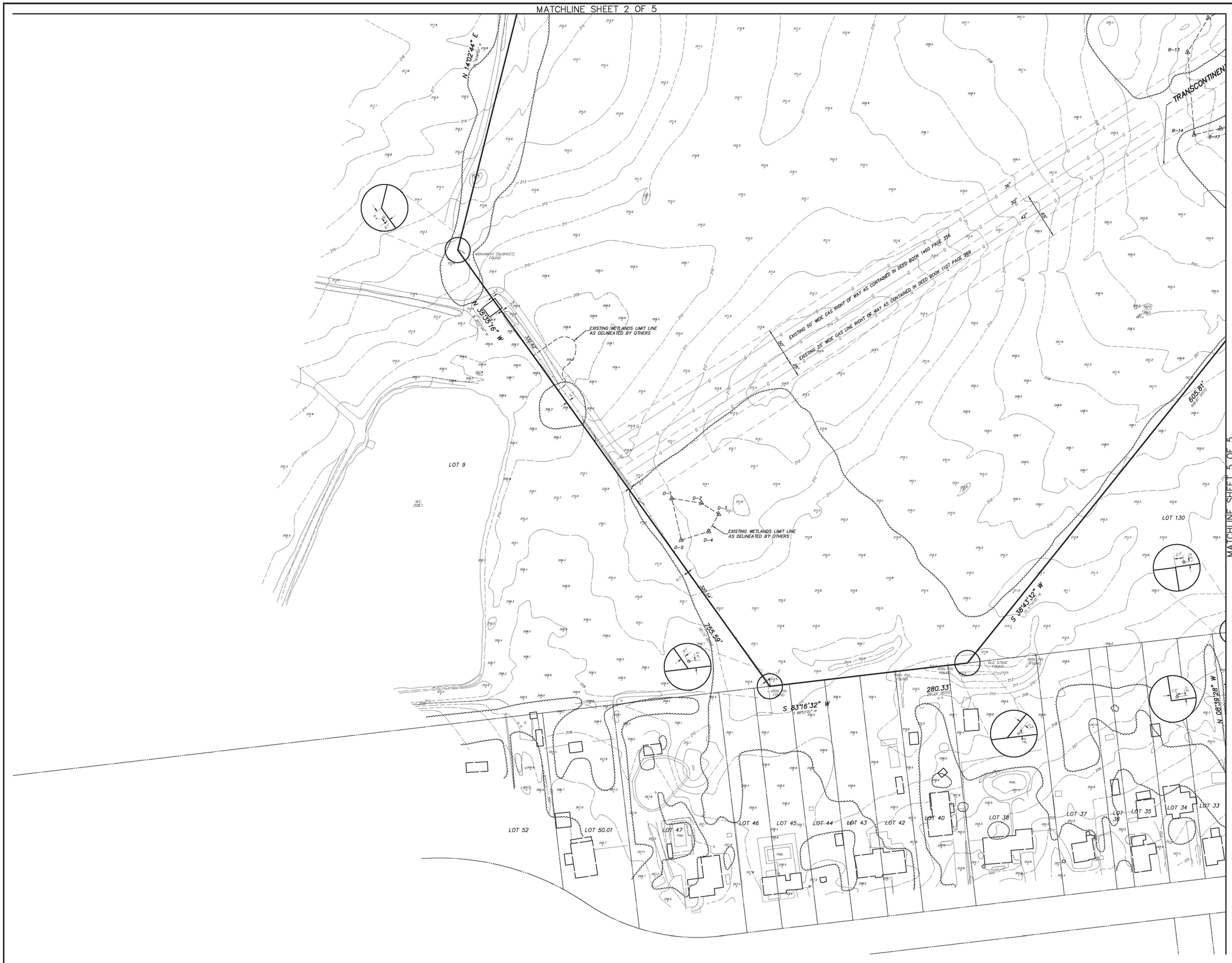
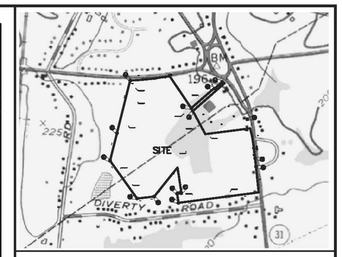
MATCHLINE SHEET 2 OF 5





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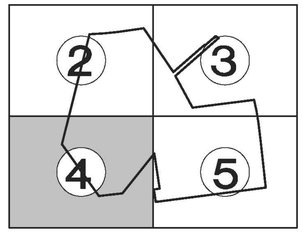

MATCHLINE SHEET 5 OF 5

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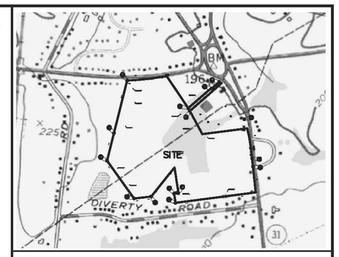
BLOCK 85 – LOT 3, 8 & 13

HOPEWELL TOWNSHIP MERCER COUNTY NEW JERSEY

PROJECT NO 040366302	DATE 12/22/04
DRAWN BY JA	DESIGNED BY JA
SCALE 1"=50'	CHECKED BY
SCHOOR DEPALMA	
SHEET NO. 4 of 5	

MANALNT

MATCHLINE SHEET 2 OF 5



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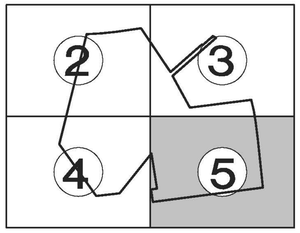

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12) DEED BOOK 1828 PAGE 498 (LOT 5&6 BLOCK 86)
13) DEED BOOK 1828 PAGE 495 (LOT 7 BLOCK 86)
14) DEED BOOK 2507 PAGE 306 (LOT 8 BLOCK 86)
15) DEED BOOK 4421 PAGE 17 (LOT 9 BLOCK 86)
16) DEED BOOK 2924 PAGE 90 (LOT 10 BLOCK 86)
17) DEED BOOK 3459 PAGE 281 (LOT 11.01 BLOCK 86)
18) DEED BOOK 4461 PAGE 235 (LOT 14 BLOCK 86)
19) DEED BOOK 4595 PAGE 25 (LOT 16.01 BLOCK 86)
20) DEED BOOK 2087 PAGE 315 (LOT 20&21 BLOCK 86)
21) DEED BOOK 2198 PAGE 517 (LOT 22.01 BLOCK 86)
22) DEED BOOK 2997 PAGE 344 (LOT 24.01 BLOCK 86)
23) DEED BOOK 1519 PAGE 214 (LOT 27&28 BLOCK 86)
24) DEED BOOK 1807 PAGE 896 (LOT 29 BLOCK 86)
25) DEED BOOK 4548 PAGE 205 (LOT 30 BLOCK 86)
26) DEED BOOK 2130 PAGE 478 (LOT 32 BLOCK 86)
27) DEED BOOK 2334 PAGE 508 (LOT 40 BLOCK 86)
28) DEED BOOK 1550 PAGE 238 (LOT 42&43 BLOCK 86)
29) DEED BOOK 3197 PAGE 257 (LOT 44,45,&46 BLOCK 86)
30) DEED BOOK 3488 PAGE 143 (LOT 130 BLOCK 86)

31) A CERTAIN MAP ENTITLED "DIVERTY PARK TRACT, HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY" PREPARED BY THE MURRAY COMPANY DATED FEBRUARY, 1917, SAID MAP BEING DULY FILED IN THE MERCER COUNTY CLERKS OFFICE APRIL 26, 1927 AS MAP No. 526.

32) A CERTAIN MAP ENTITLED "TRENTON-PENNINGTON ROAD, EWING-HOPEWELL AND BOROUGH OF PENNINGTON, MERCER COUNTY NEW JERSEY" PREPARED BY THEODORE P. VAIL RESIDENT ENGINEER DATED JUNE 1926, SAID MAP BEING DULY FILED IN THE MERCER COUNTY CLERKS OFFICE FEBRUARY 21, 1973 AS MAP FILE No. 2172.

33) A CERTAIN MAP ENTITLED "TRENTON-PENNINGTON ROAD, EWING-HOPEWELL AND BOROUGH OF PENNINGTON, MERCER COUNTY NEW JERSEY" PREPARED BY THEODORE P. VAIL RESIDENT ENGINEER DATED JUNE 1926, SAID MAP BEING DULY FILED IN THE MERCER COUNTY CLERKS OFFICE FEBRUARY 21, 1973 AS MAP FILE No. 2172.

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35) A CERTAIN MAP ENTITLED "STATE OF NEW JERSEY, HIGHWAY DEPARTMENT PLANS OF ROUTE 30 SECTION 2B ROUTE 69 FROM BULL RUN ROAD TO PENNINGTON CIRCLE WIDENING AND RESURFACING, HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY" MAP FILE NUMBER 1/28.

36) A CERTAIN MAP ENTITLED "STATE OF NEW JERSEY, HIGHWAY DEPARTMENT AS-BUILT PLANS OF ROUTE 30 SECTION 10, PENNINGTON BY-PASS, MERCER COUNTY, NEW JERSEY" MAP FILE NUMBERS;1/45, 3/45, 4/45, 5/45, 6/28, 7/28, 8/28, 9/28, 10/28, 11/28, 12/28, 1/34, 3/34.

37) TAX MAP OF HOPEWELL TOWNSHIP, MERCER COUNTY, MAP NUMBERS;61 AND 63

GENERAL NOTES:

1.) ALL INTERNAL LOT GEOMETRY AS RECITED IN THE DEEDS AND MAPS LISTED ABOVE HAVE BEEN MAINTAINED, HOWEVER THE ENTIRE SITE HAS BEEN ROTATED INTO THE NEW JERSEY STATE PLANE GRID COORDINATE SYSTEM, NAD 83/96.

2.) EXISTING SITE TOPOGRAPHIC DATA IS BASED UPON AERIAL PHOTOGRAPHY PREPARED BY ATLANTIS AERIAL SURVEY FROM PHOTOGRAPHY DATED OCTOBER 23, 2004, NAVD 88.

REVISION NO.	DATE	REVISION

—NOTICE—

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50 0 50 100
GRAPHIC SCALE IN FEET

MARTIN F. TIRELLA
PROFESSIONAL LAND SURVEYOR, N.J. LIC. No. 27477

SCHOOR DEPALMA
Engineers and Consultants
Cert. Of Authorization 24GA27926200
MANALAPAN • WHITE PLAINS • EGG HARBOR • BRICK • CLINTON • EXTON • KULPSVILLE
PARSIPPANY • PHILADELPHIA • PHILLIPSBURG • STAFFORD • VOORHEES

200 STATE HIGHWAY NINE
P.O. BOX 900
MANALAPAN, NJ 07726
TEL (732)577-9000
FAX (732)577-9888

BOUNDARY ANS TOPOGRAPHIC SURVEY

BLOCK 85 – LOT 3, 8 & 13

HOPEWELL TOWNSHIP MERCER COUNTY NEW JERSEY

PROJECT NO. 040366302	DATE 12/22/04
DRAWN BY JA	DESIGNED BY JA
SCALE 1"=50'	CHECKED BY
SCHOOR DEPALMA	
SHEET NO. 5 of 5	

MANALNT

Hopewell Township Supplemental Scoping Comments

02.27.15

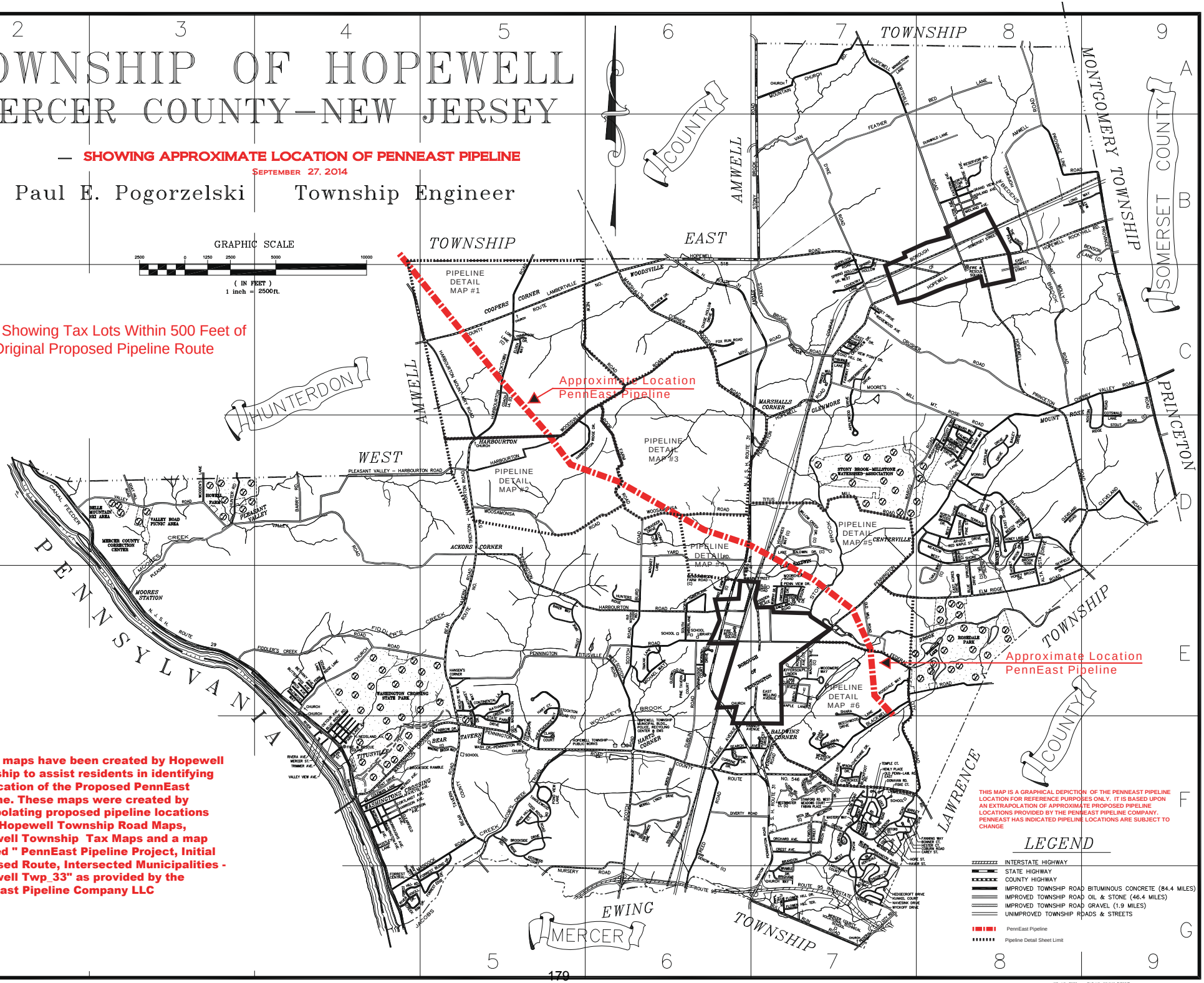
Record Maps from Hopewell Township Health Department
of
Individual Tax Lots along Proposed Initial Route

TOWNSHIP OF HOPEWELL
MERCER COUNTY—NEW JERSEY

— SHOWING APPROXIMATE LOCATION OF PENNEAST PIPELINE

SEPTEMBER 27, 2014

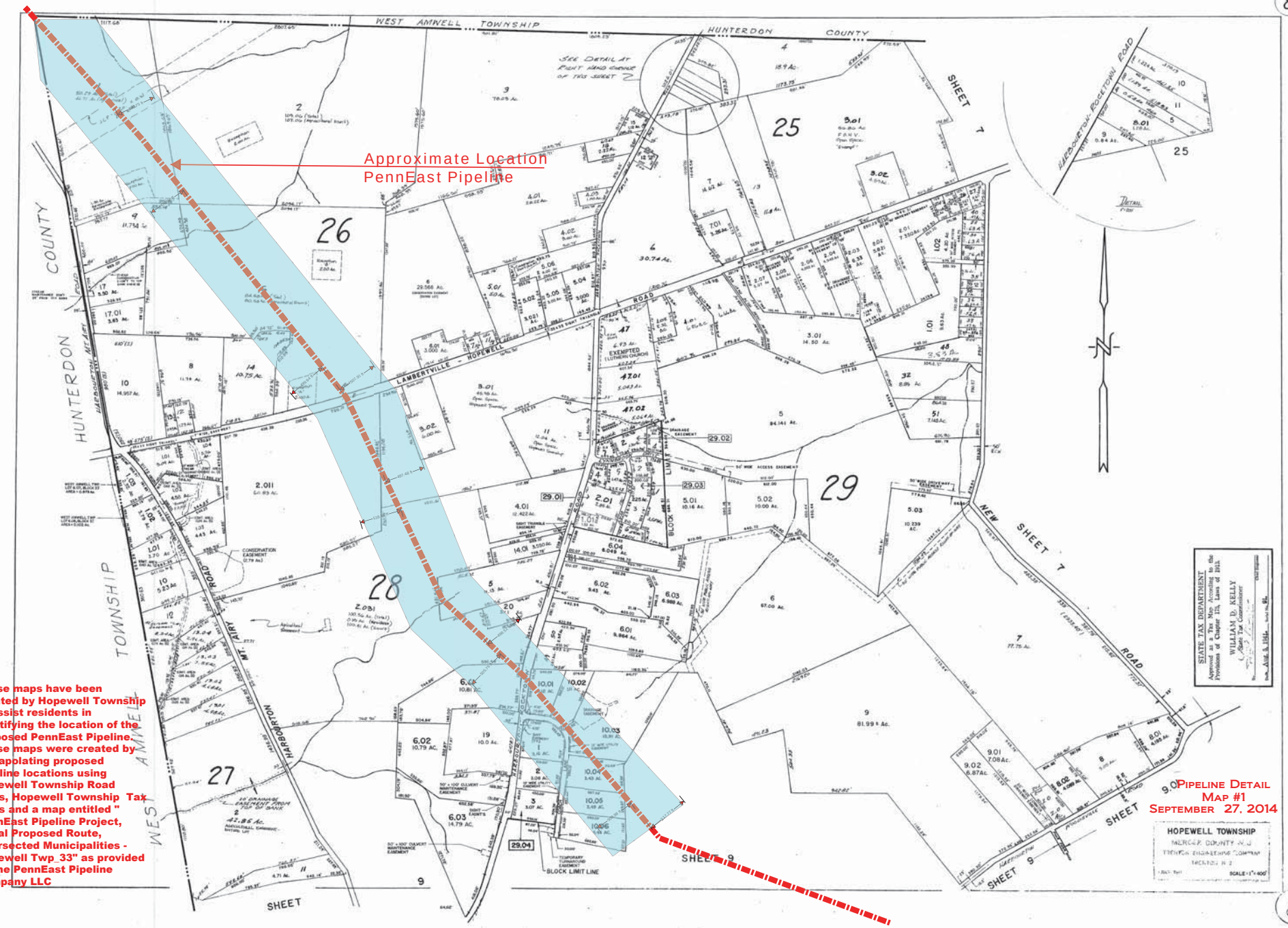
Paul E. Pogorzelski Township Engineer



These maps have been created by Hopewell Township to assist residents in identifying the location of the Proposed PennEast Pipeline. These maps were created by extrapolating proposed pipeline locations using Hopewell Township Road Maps, Hopewell Township Tax Maps and a map entitled " PennEast Pipeline Project, Initial Proposed Route, Intersected Municipalities - Hopewell Twp_33" as provided by the PennEast Pipeline Company LLC

THIS MAP IS A GRAPHICAL DEPICTION OF THE PENNEAST PIPELINE LOCATION FOR REFERENCE PURPOSES ONLY. IT IS BASED UPON AN EXTRAPOLATION OF APPROXIMATE PROPOSED PIPELINE LOCATIONS PROVIDED BY THE PENNEAST PIPELINE COMPANY. PENNEAST HAS INDICATED PIPELINE LOCATIONS ARE SUBJECT TO CHANGE

JOB. NO. 7058 FILE NO. 221046 (17286)



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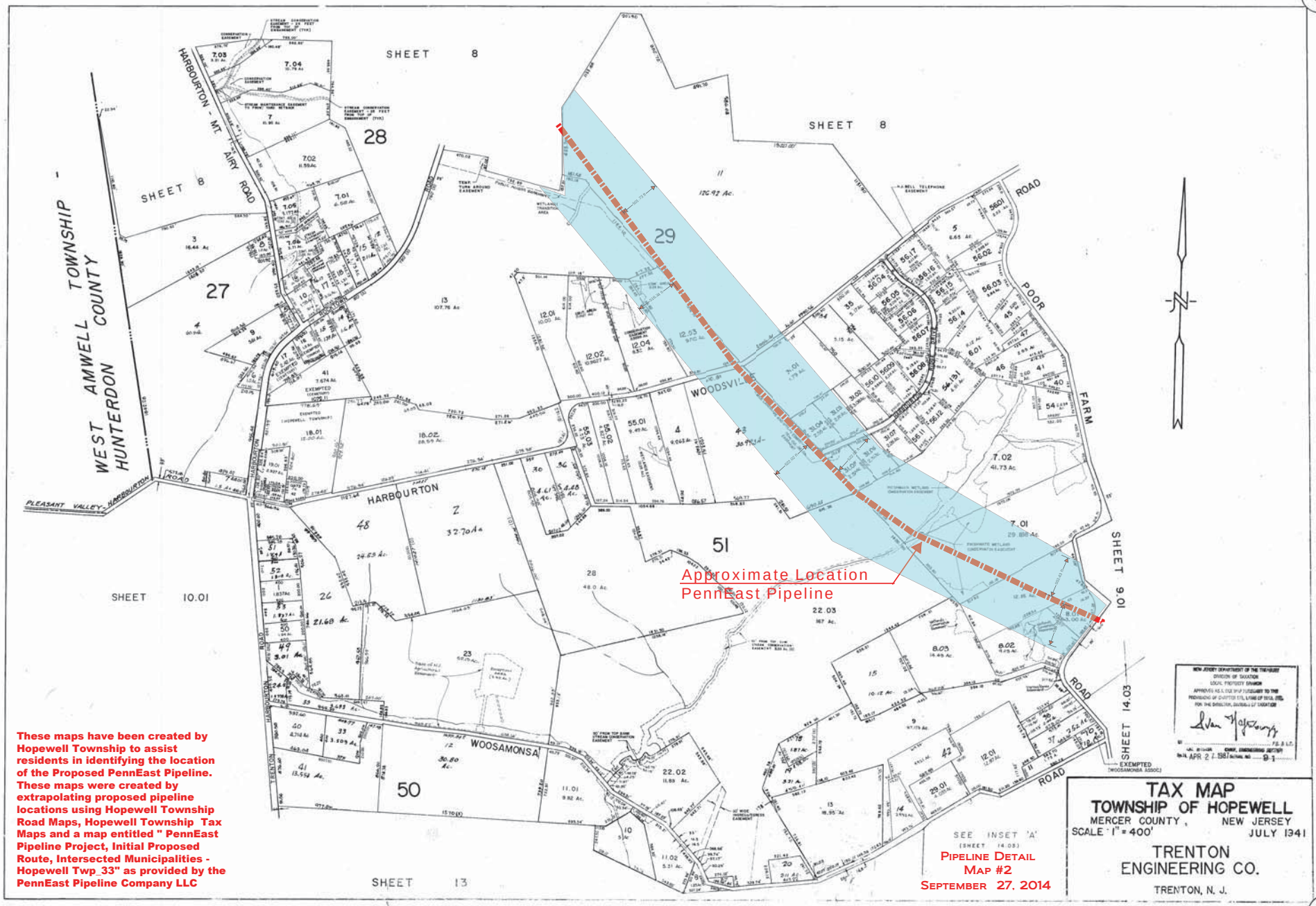

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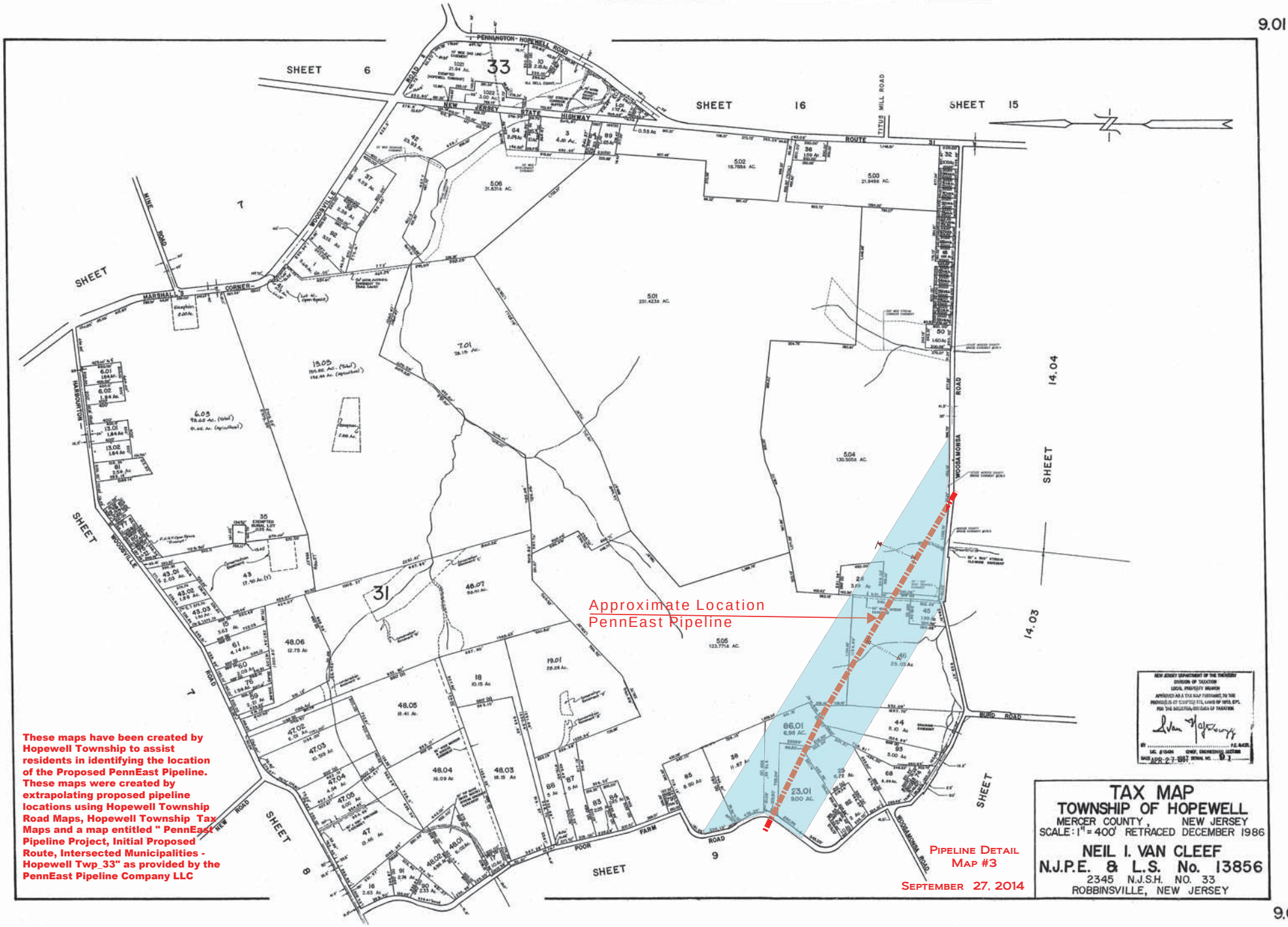

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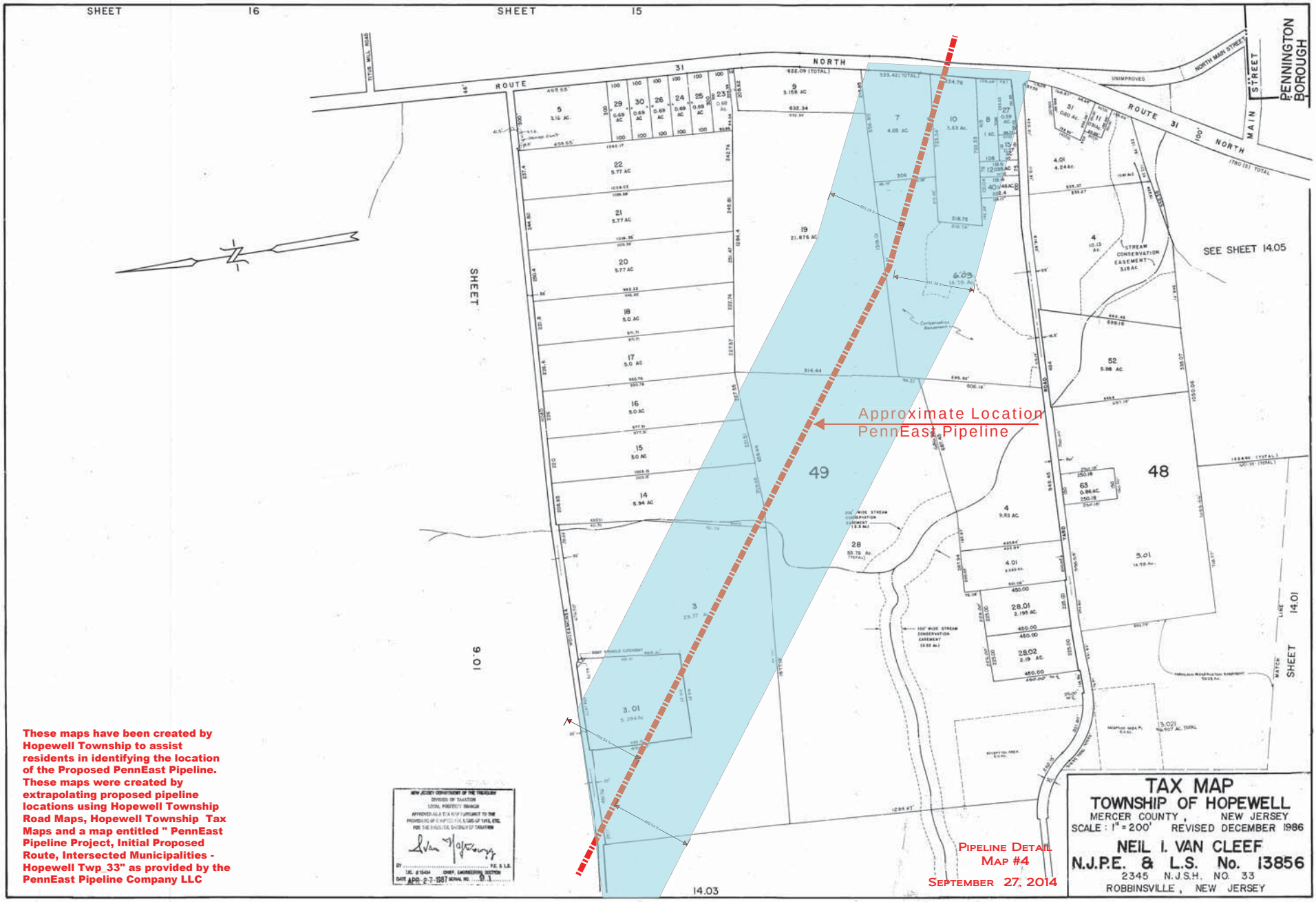

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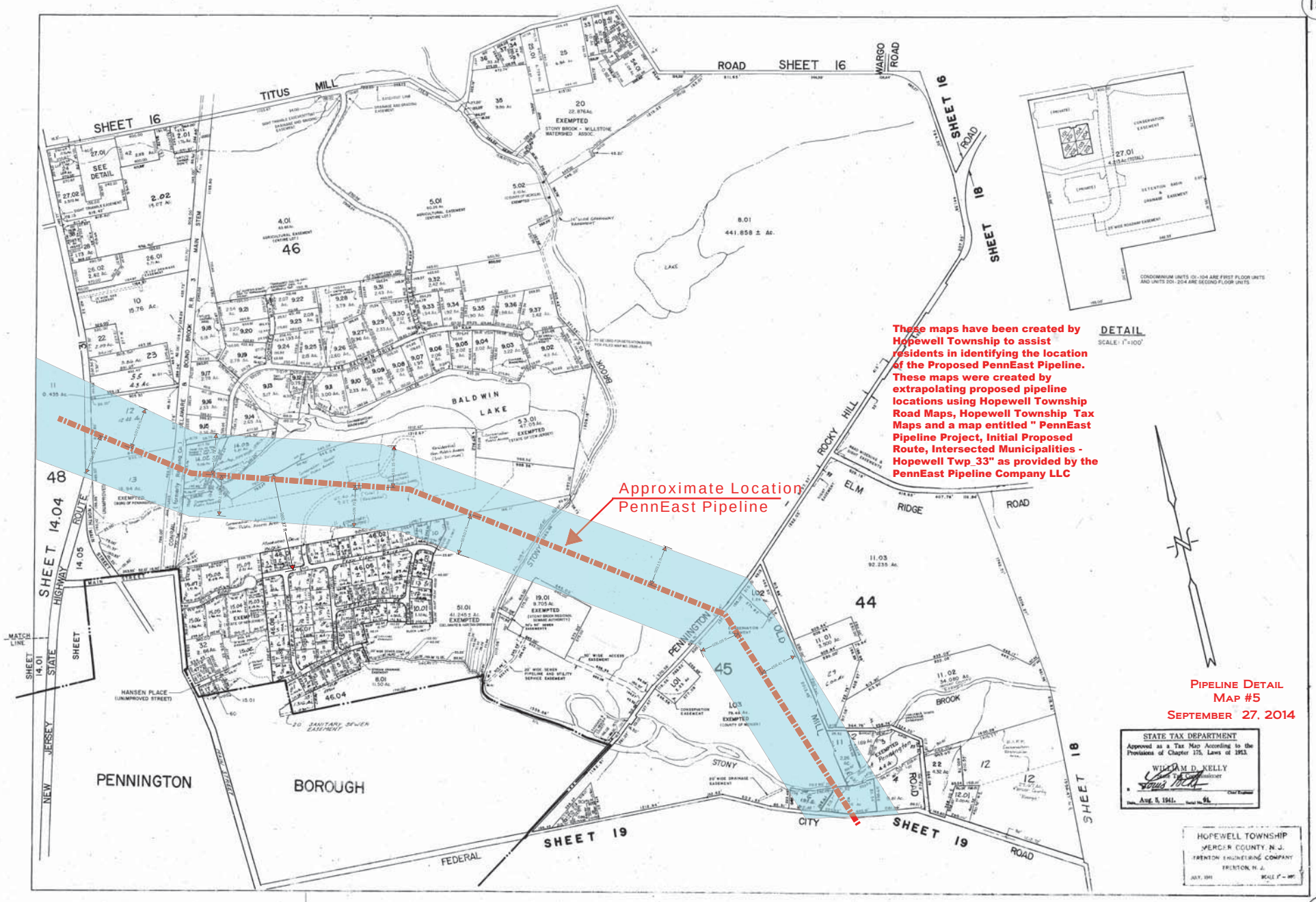
15
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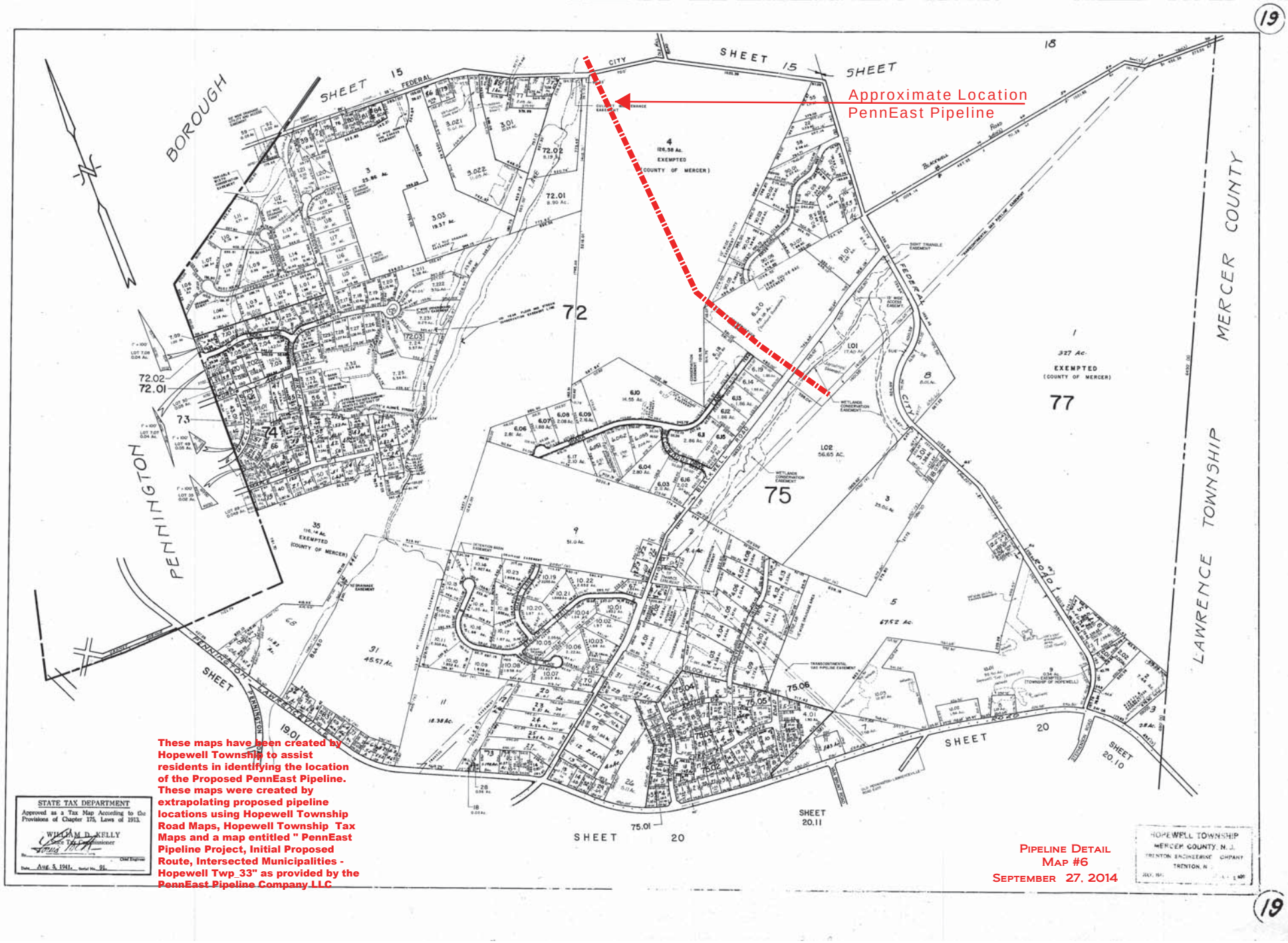
Approximate Location
PennEast Pipeline
DETAIL
SCALE: 1"=100'
Pipeline Detail
Map #5
September 27, 2014
STATE TAX DEPARTMENT
Approved as a Tax Map According to the Provisions of Chapter 175, Laws of 1953.
WILLIAM D. KELLY
Aug. 5, 1941.
HOPEWELL TOWNSHIP
MERCER COUNTY, N.J.
TRENTON ENGINEERING COMPANY
TRENTON, N. J.
JULY, 1941
SCALE 1" = 100'
TITUS MILL
SHEET 16
ROAD
WARGO ROAD
SHEET 18
SHEET 14.04
SHEET 19
BALDWIN LAKE
LAKE
ROCKY HILL
ELM RIDGE ROAD
PENNINGTON
OLD MILL ROAD
STONY BROOK
CITY
FEDERAL
ROUTE 31
NEW JERSEY STATE HIGHWAY
MAIN STREET
HANSEN PLACE (UNIMPROVED STREET)
MATCH LINE
PENNINGTON
BOROUGH
441.658 ± Ac.
EXEMPTED
SEE DETAIL
46
48
45
44
18

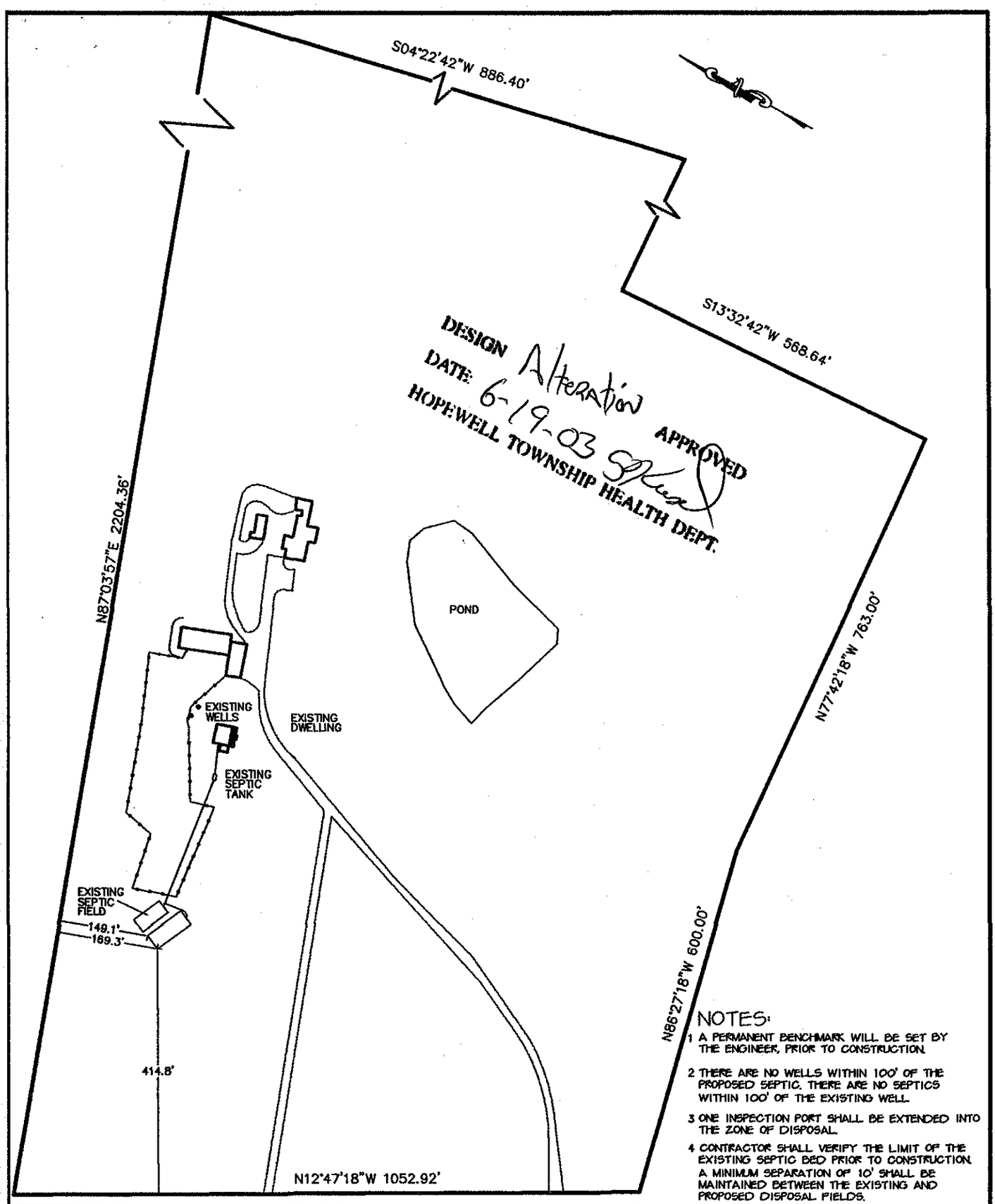

19
Approximate Location
PennEast Pipeline
SHEET 15
SHEET 15
SHEET
18
BOROUGH
PENNINGTON
MERCER COUNTY
LAWRENCE TOWNSHIP
72
73
74
75
77
72.02
72.01
4
126.58 Ac.
EXEMPTED
(COUNTY OF MERCER)
1
327 Ac.
EXEMPTED
(COUNTY OF MERCER)
35
116.14 Ac.
EXEMPTED
(COUNTY OF MERCER)
SHEET 19.01
SHEET 20
SHEET 20.11
SHEET 20
SHEET 20.10
75.01
STATE TAX DEPARTMENT
Approved as a Tax Map According to the Provisions of Chapter 175, Laws of 1913.
WILLIAM D. KELLY
Date Aug. 5, 1941.
These maps have been created by Hopewell Township to assist residents in identifying the location of the Proposed PennEast Pipeline. These maps were created by extrapolating proposed pipeline locations using Hopewell Township Road Maps, Hopewell Township Tax Maps and a map entitled " PennEast Pipeline Project, Initial Proposed Route, Intersected Municipalities - Hopewell Twp_33" as provided by the PennEast Pipeline Company LLC
Pipeline Detail
Map #6
September 27, 2014
HOPEWELL TOWNSHIP
MERCER COUNTY, N. J.
TRENTON ENGINEERING COMPANY
TRENTON, N.
19

PennEast Pipeline Original Proposed Route

Block	Lot	File	Scanned	Comments
26	1			vacant parcel w/ soils test
26	2			no plans
26	9			no plans
26	14			no plans
26	16			no plans
28	2.011	x	x	1/20/2015
28	2.031	x	x	1/20/2015
28	3.01			no folder
28	5			no plans
28	6.01	x	x	1/20/2015
28	20	x	x	1/20/2015
29	1			no folder
29	10.01	x	x	1/20/2015
29	10.02	x	x	1/20/2015
29	10.03			no plans
29	10.04	x	x	1/20/2015
29	10.05	x	x	1/20/2015
29	10.06	x	x	1/20/2015
29	11	x	x	1/20/2015
29	12.03	x	x	1/20/2015
29	13			no plans
29	49	x	x	1/20/2015
31	5.04			no plans (TrapRock)
31	5.05			no plans (TrapRock)
31	23.01	x	x	1/20/2015
31	25	x	x	1/20/2015
31	28	x	x	1/20/2015
31	44	x	x	1/20/2015
31	46			no plans
31	86.01			tests but no plans
31	93	x	x	1/20/2015
45	1.03			no plans
45	5	x	x	1/20/2015
45	6	x	x	1/20/2015
45	11	x	x	1/20/2015
46	8.01			no plans (BMS)
46	12	x	x	1/20/2015
46	13			no plans
46	14	x	x	1/20/2015
46	14.02	x	x	1/20/2015
46	14.03	x	x	1/20/2015
46	51.01			no plans
49	3	x	x	1/20/2015
49	3.01			no plans

PennEast Pipeline Original Proposed Route

Block	Lot	File	Scanned	Comments
49	6.03	x	x	1/20/2015
49	7	x	x	1/20/2015
49	10			no plans
49	14	x	x	1/20/2015
49	19			no plans
49	28	x	x	1/20/2015
51	7.01	x	x	1/20/2015
51	7.02			no plans
51	8.01	x	x	1/20/2015
51	8.02			no plans
51	22.03			no plans
51	31.01			no plans
51	31.04	x	x	1/20/2015
51	31.05	x	x	1/20/2015
51	32	x	x	1/20/2015
51	43			no plans
72	4	x	x	1/20/2015
72	6.18	x	x	1/20/2015
72	6.19	x	x	1/20/2015
72	72.01	x	x	1/20/2015
72	72.02	x	x	1/20/2015
72	90.05	x	x	1/20/2015
72	101			no folder
72	102			no folder
72	6.2O			no plans



HARBOURTON—MT. AIRY ROAD

NOTES:

1 A PERMANENT BENCHMARK WILL BE SET BY THE ENGINEER, PRIOR TO CONSTRUCTION.

2 THERE ARE NO WELLS WITHIN 100' OF THE PROPOSED SEPTIC. THERE ARE NO SEPTICS WITHIN 100' OF THE EXISTING WELL.

3 ONE INSPECTION PORT SHALL BE EXTENDED INTO THE ZONE OF DISPOSAL.

4 CONTRACTOR SHALL VERIFY THE LIMIT OF THE EXISTING SEPTIC BED PRIOR TO CONSTRUCTION. A MINIMUM SEPARATION OF 10' SHALL BE MAINTAINED BETWEEN THE EXISTING AND PROPOSED DISPOSAL FIELDS.

5 CONTRACTOR SHALL VERIFY THE FIRST FLOOR ELEVATION AND THE CLEANOUT ELEVATION PRIOR TO CONSTRUCTION TO ENSURE A MINIMUM OF 2% SLOPE TO THE NEW FIELD.

REV #	DATE	REVISION	DRAWN BY	REV'D BY
#1	6\9\03	REVISE BED SIZE	AHM	KEB

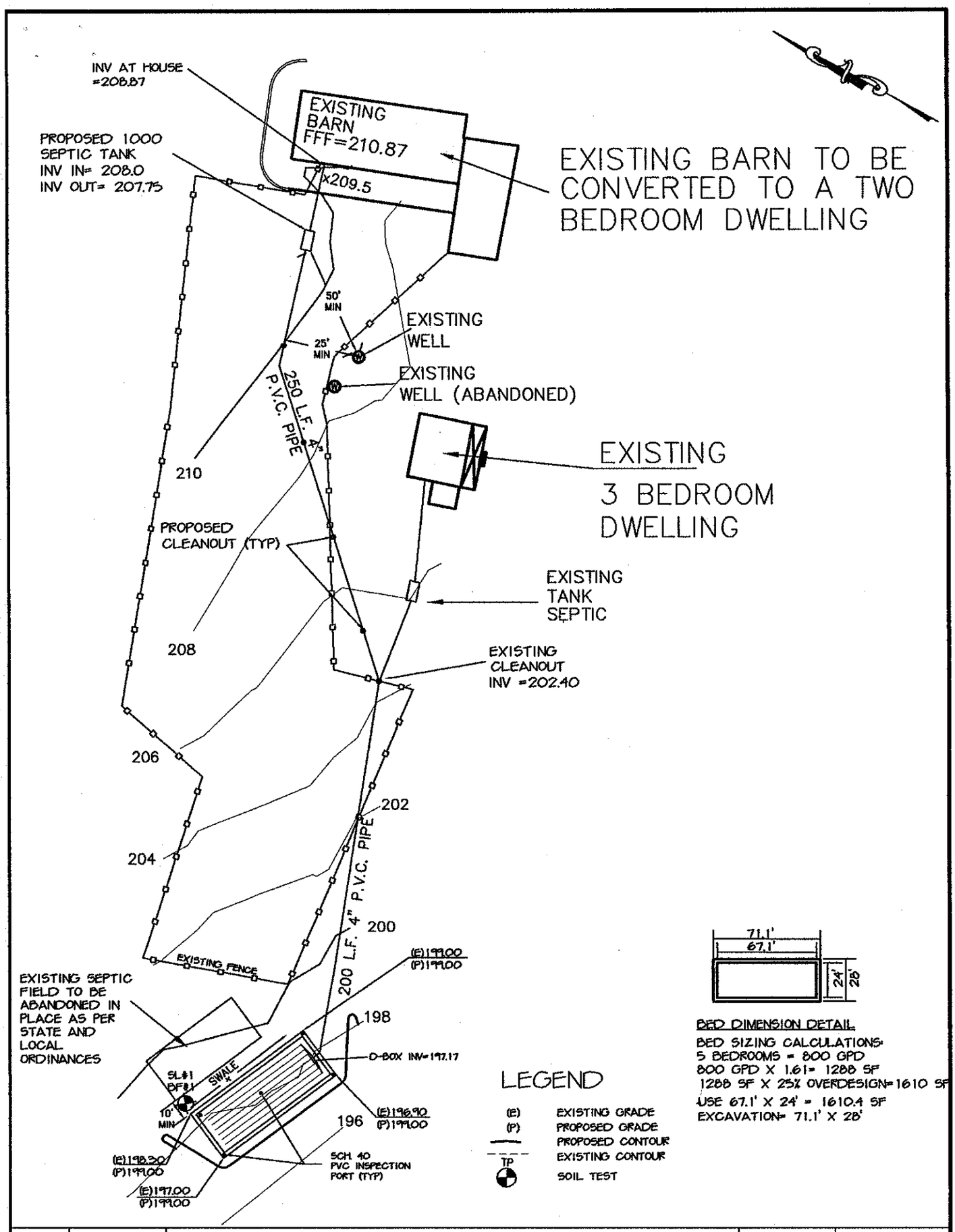
CERTIFICATE OF AUTHORIZATION NUMBER 24GA28005600

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

KENNETH E. BAILL P.E., P.L.S., P.P.
NEW JERSEY LICENSED PROFESSIONAL ENGINEER #30111
NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR #30111
NEW JERSEY LICENSED PROFESSIONAL PLANNER #04122

SEWAGE DISPOSAL SYSTEM
FOR
LOT 13, BLOCK 28
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO:	
AHM	KEB	1"= 200'	2/13/03	90-117	1/4



REV #	DATE	REVISION	DRAWN BY	REV'D BY
#1	6\9\03	REVISE BED SIZE	AHM	KEB

CERTIFICATE OF AUTHORIZATION NUMBER 24GA28005600

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NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR #30111
NEW JERSEY LICENSED PROFESSIONAL PLANNER #04122

SEWAGE DISPOSAL SYSTEM
FOR
LOT 13, BLOCK 28
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO:	2/4
AHM	KEB	1"= 60'	3/13/03	90-117	

1.) MINIMUM SLOPE OF PIPE SHALL BE 1/4" PER FOOT FOR FIELD PIPE.

2.) DISPOSAL SYSTEM SHALL CONSIST OF (7) (4") DIA. PVC PERFORATED PIPES IN A 24' X 67.1' SOIL REPLACEMENT FILL ENCLOSED DISPOSAL BED (EXCAVATION SIZE= 28' X 71.1')

3.) ELEVATIONS ARE BASED ON FIELD TOPOGRAPHY USING ASSUMED DATUM

4.) THERE ARE NO POTABLE WATER WELLS WITHIN 100' OF THE PROPOSED DISPOSAL AREA.

5.) THIS SEPTIC SYSTEM DESIGN IS BASED ON A TOTAL OF 5 BEDROOMS

6.) ALL TREES SHALL BE REMOVED WITHIN 10' OF THE SYSTEM.

7.) A CLEANOUT SHALL BE INSTALLED EVERY 50' FOR GRAVITY FLOW FIELD PIPE.

8.) THIS DESIGN IS BASED ON THE ASSUMED PERMEABILITY RATE OF SELECT FILL (6- 20) INCHES/HOUR).

9.) FILL MATERIAL SHALL BE TESTED BY A SOILS TESTING LABORATORY AND CERTIFIED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION.

10.) A TUBE PERMEAMETER TEST SHALL BE CONDUCTED USING SAMPLES OF FILL MATERIAL WHICH HAVE BEEN COMPACTED TO A BULK DENSITY EQUIVALENT TO THAT ACHIEVED IN THE CONSTRUCTION OF THE DISPOSAL FIELD. THE PERMEABILITY CLASS RATING METHOD SHALL ALSO BE REQUIRED TO DETERMINE WHETHER THE FILL MATERIAL USED MEETS THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

11.) THE SELECT FILL USED IN THE ZONE OF TREATMENT SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

12.) THE SELECT FILL USED IN THE ZONE OF DISPOSAL SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)5.

13.) FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS, ONE FOOT OR LESS IN THICKNESS.

14.) COMPACTION MAY BE ACCOMPLISHED MANUALLY OR MECHANICALLY BY TAMPING OR ROLLING, OR BY DRIVING OVER THE FIELD IN A CONTROLLED PATTERN USING TRACKED OR RUBBER TIRED VEHICLES.

15.) CLEAN CRUSHED STONE MUST CONFORM WITH NJDOT STANDARD SIZES FOR COURSE AGGREGATE (SIZE #24, #3, OR #4).

16.) ALL FIELD PIPE EXCLUDING DISPOSAL FIELD SHALL BE SCHEDULE 40 PVC.

17.) ALL LATERALS MUST BE CAPPED AND HAVE NO MORE THAN A 2" SLOPE PER 100 FEET.

18.) THE MANIFOLD MUST BE INSTALLED AS PER N.J.A.C. 7:9A-9.4 211 & 9.4 51, 11, 111.

19.) AN INSPECTION PORT SHALL BE INSTALLED IN EACH CORNER OF THE DISPOSAL BED EXTENDING FROM THE LEVEL OF INFILTRATION TO FINISHED GRADE, THE PORT SHALL CONSIST OF SCH 40 PERFORATED PVC PIPES WITH A REMOVABLE CAP. ONE OF THE INSPECTION PORTS SHALL BE EXTENDED INTO THE ZONE OF DISPOSAL.

20.) WHEN HEAVY EXCAVATING EQUIPMENT IS OPERATED WITHIN THE EXCAVATION FOR THE PURPOSE OF PLACEMENT OR COMPACTION OF THE FILL MATERIAL, THIS EQUIPMENT SHALL NOT BE DRIVEN DIRECTLY ON THE EXPOSED BOTTOM OF THE EXCAVATION, A MINIMUM OF ONE FOOT FILL MATERIAL SHALL BE MAINTAINED BELOW THE VEHICLE TRACKS OR WHEELS AT ALL TIMES.

21.) A MINIMUM OF SIX INCHES AND NO MORE THAN EIGHTEEN INCHES OF BACK FILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.

22.) BACK FILL MATERIAL SHALL BE OF EARTH SIMILAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONRY, OR OTHER CONSTRUCTION MATERIAL.

23.) IN NO CASE SHALL THE BACK FILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.

24.) BACK FILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL BED OR EACH OF THE DISPOSAL TRENCHES AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.

25.) HEAVY MACHINERY, RUBBER-TIRE VEHICLES OR OTHER VEHICLES EXERTING A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH SHALL NOT BE PERMITTED TO PASS OVER THE DISPOSAL FIELD AFTER THE FILTER MATERIAL AND DISTRIBUTION NETWORK HAVE BEEN INSTALLED.

26.) TRACKED EQUIPMENT MAY BE USED FOR THE PURPOSE OF BACK FILLING AND FINAL GRADING PROVIDED THAT THIS EQUIPMENT DOES NOT EXERT A PRESSURE ON THE UNDERLYING SOIL IN EXCESS OF EIGHT POUNDS PER SQUARE INCH.

27.) FINAL GRADING SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING DESIGN AND IN SUCH A MANNER THAT SURFACE WATER WILL NOT COLLECT OVER THE DISPOSAL FIELD.

28.) AFTER COMPLETION OF BACK FILLING AND FINAL GRADING, THE BACK FILLED AREA OVER THE DISPOSAL FIELD SHALL BE SEEDED OR SODDED TO ESTABLISH A VEGETATIVE COVER OR OTHERWISE STABILIZED AGAINST EROSION IN A MANNER ACCEPTABLE TO THE ADMINISTRATIVE AUTHORITY.

29) ENGINEER SHALL PERFORM A TEXTURAL ANALYSIS OF THE FILL MATERIAL FROM AN ON SITE STOCKPILE AND A PERCOLATION TEST WITHIN THE INSTALLED FILL MATERIAL. THE RESULTS SHALL BE FILED WITH THE THE HOPEWELL TOWNSHIP BOARD OF HEALTH.

REV #	DATE	REVISION	DRAWN BY	REV'D BY
#1	6\9\03	REVISE BED SIZE	AHM	KEB

CERTIFICATE OF AUTHORIZATION NUMBER 24GA28005600

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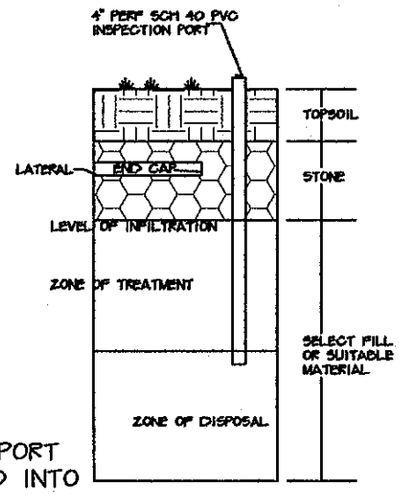
NEW JERSEY LICENSED PROFESSIONAL PLANNER #04122

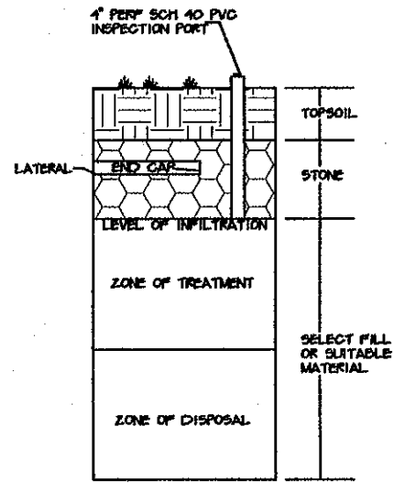
SEWAGE DISPOSAL SYSTEM
FOR
LOT 13, BLOCK 28
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO:	3/4
AHM	KEB	NONE	3/13/03	90-117	



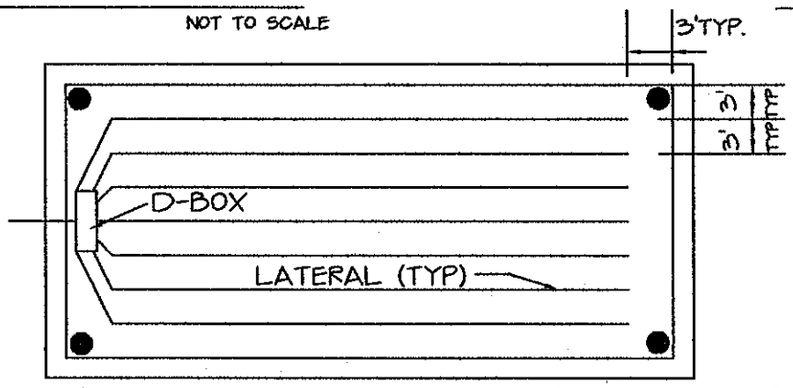
ONE INSPECTION PORT TO BE EXTENDED INTO THE ZONE OF DISPOSAL

NOT TO SCALE



TYPICAL INSPECTION PORT DETAIL

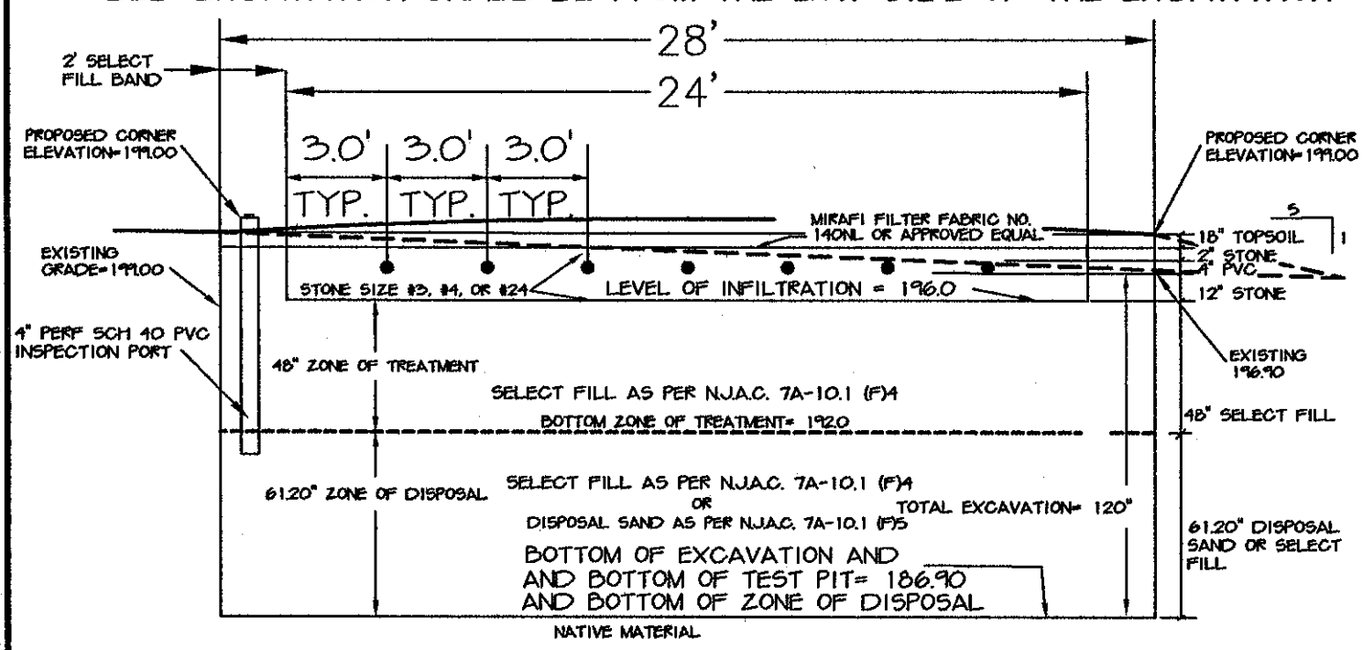
NOT TO SCALE



DISPOSAL BED TOP VIEW

NOT TO SCALE

BED EXCAVATION SHALL BE FROM THE LOW SIDE OF THE EXCAVATION



DISPOSAL BED X-SECTION

NOT TO SCALE

REV #	DATE	REVISION	DRAWN BY	REV'D BY
#1	6\9\03	REVISE BED SIZE	AHM	KEB

CERTIFICATE OF AUTHORIZATION NUMBER 24GA28005600

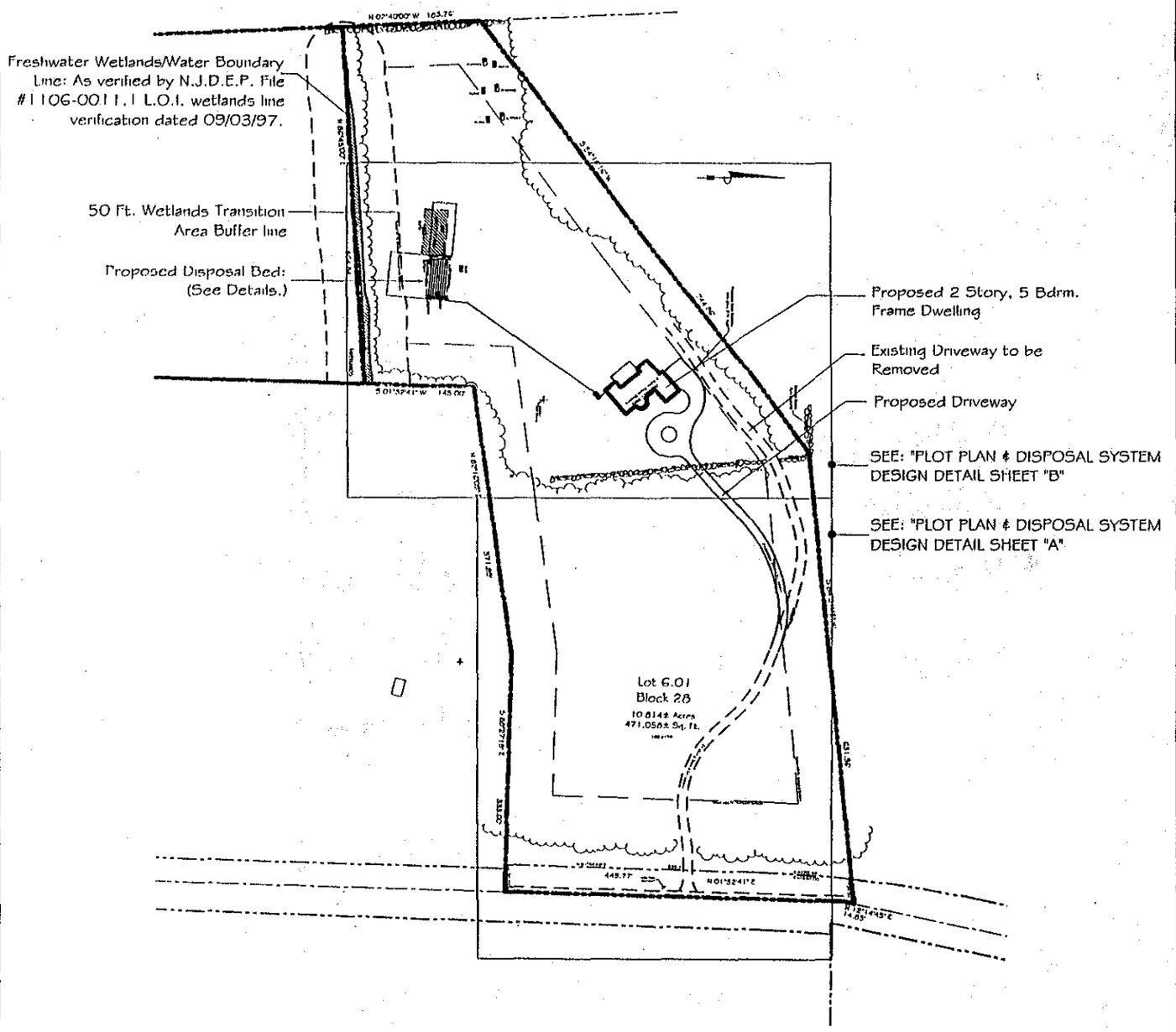
GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

KENNETH E. BAILL P.E., P.L.S., P.P.
NEW JERSEY LICENSED PROFESSIONAL ENGINEER #30111
NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR #30111
NEW JERSEY LICENSED PROFESSIONAL PLANNER #04122

SEWAGE DISPOSAL SYSTEM
FOR
LOT 13, BLOCK 28
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO:	4/4
AHM	KEB	NONE	3/13/03	90-117	

File Copy



DESIGN APPROVED

DATE: 2-21-02

HOPEWELL TOWNSHIP HEALTH DEPT.

NOTE: This plan is for Building Permit only.
NOTE: No garbage grinder/disposal of any type shall be permitted to be connected to this disposal system.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Plot Plan & Disposal System Design Cover Sheet

of Lot-6.01, Block-28 for

Robert & Heidi Cook

Hopewell Township * Mercer County * New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Pyoun	PE&PLS	No.24327
Wesley L. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Piovanetti	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE # LS #13453 — 02/01/02 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 02/01/02 Date

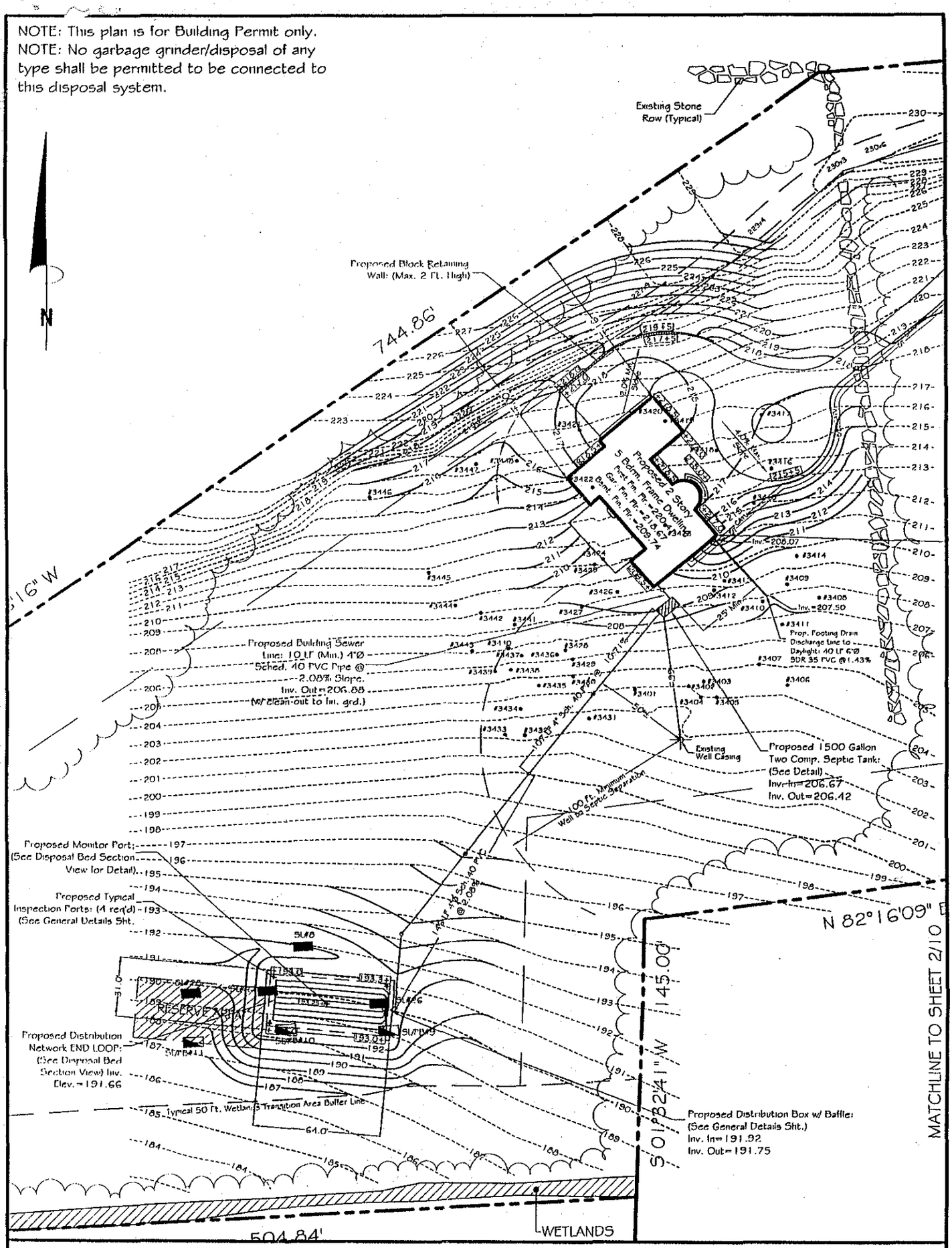
Date: 02/01/02
Scale: 1"=200'
Drawn: JRM
Check: FJF/BMR

Revisions:

1/10

Cook-011217
Cook-LSO192Bor.dwg
Cover Plan
Jobno: CR_SHT

NOTE: This plan is for Building Permit only.
NOTE: No garbage grinder/disposal of any type shall be permitted to be connected to this disposal system.



Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
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Plot Plan & Disposal System Design Detail Sheet "B"

of Lot-6.01, Block-28 for

Robert & Heidi Cook

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE/PLS	No.13453
D. Geoffrey Brown	PE/PLS	No.24327
Wesley L. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Piscatelli*	PLS	No.35066
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse 02/01/02
Bryce M. Rittenhouse: PE & LS #13453 Date

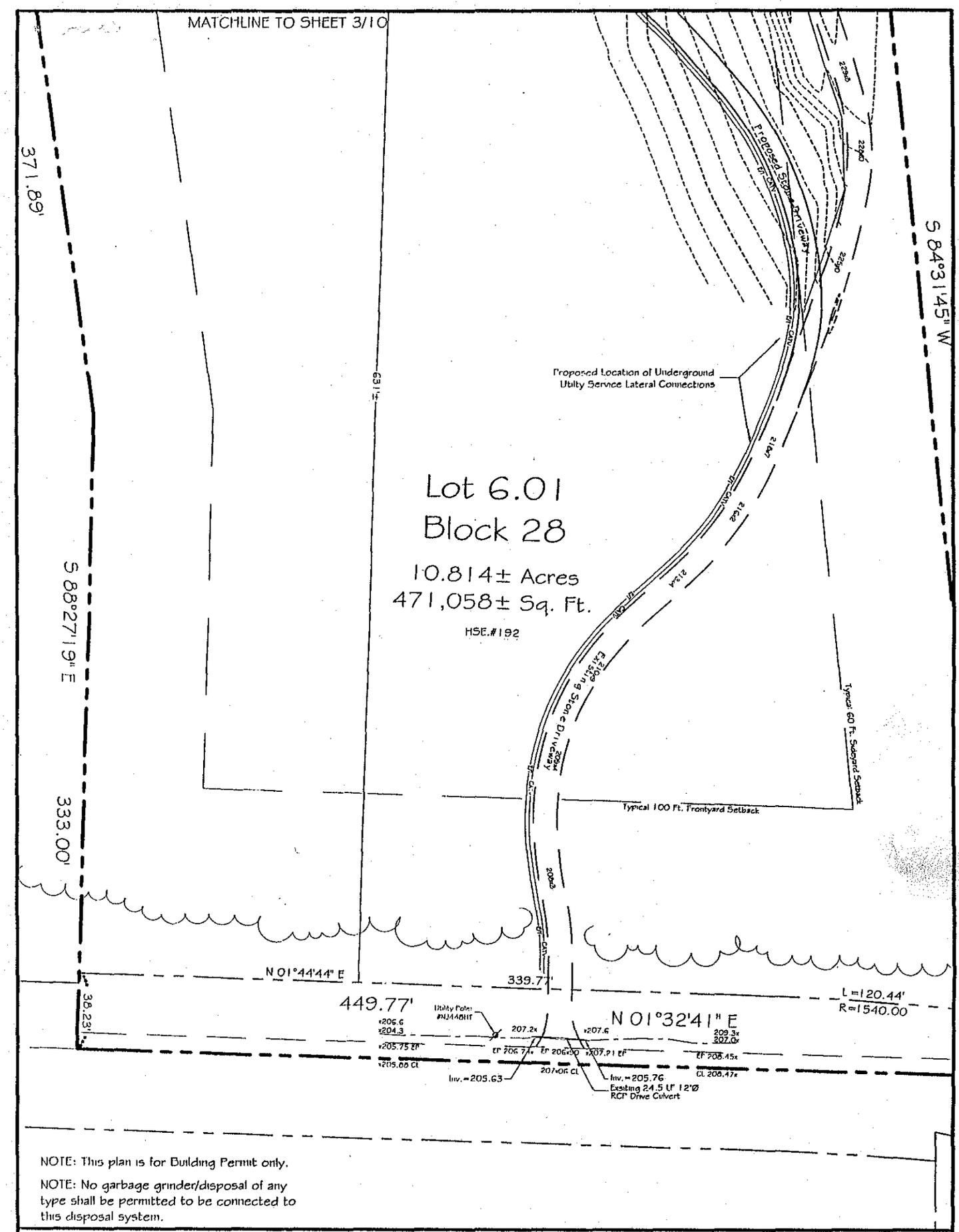
02/01/02
Frank J. Falcone: PLS #32112 & PP #3760 Date

Date: 02/01/02
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

Revisions:

3/10

Job#01217
Dwg:LSD1b2Bsp_b.dwg
Vwpt:Pjx
Layout: PLOT_PJW



NOTE: This plan is for Building Permit only.

NOTE: No garbage grinder/disposal of any type shall be permitted to be connected to this disposal system.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Plot Plan & Disposal System Design Detail Sheet "A"

of Lot-6.01, Block-28 for

Robert & Heidi Cook

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Fiewarnick	PLS	No.35668
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

Bryce M. Rittenhouse: PE & LS #13453 — 02/01/02 Date

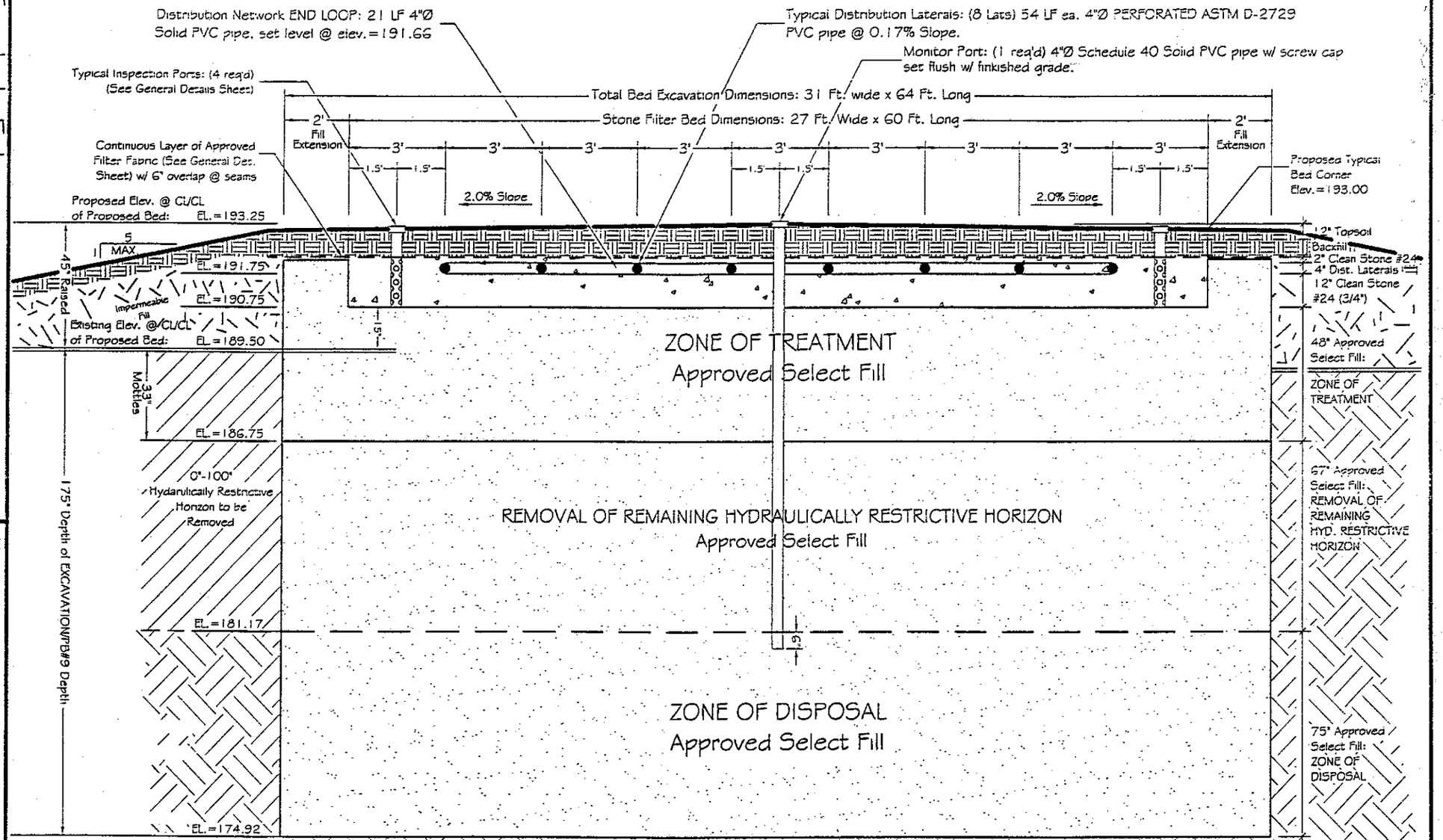
Frank J. Falcone: PLS #32112 & PP #3760 — 02/01/02 Date

Date: 02/01/02
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

2/10

Revisions:

Job: 01-127
Cook-01127.dwg
Vol: Plan
Layout: 2



MOUNDED SOIL REPLACEMENT DISPSOAL BED SECTION VIEW:

Scale: 1"=4'

NOTE: The Hopewell Township Health Dept. requires a Soil Permeability Class Rating Test on the stockpiled select fill. The contractor shall notify the Design Engineer 24 hours in advance of the said stockpiling in order to obtain samples of the fill for testing.
The select fill shall not be emplaced until a passing soil analysis has been obtained.

The distribution network shall not be constructed until a passing percolation test or tube permeameter test has been performed on the emplaced select fill, to insure proper compaction. The contractor shall notify the Design Engineer 24 hours in advance in order to perform said test.

DISPOSAL BED SIZING CALCULATION:
Proposed 5 Bedroom Dwelling=200 GPD+(4 x 150 GPD)=800 GPD "Q"
Assume in place select fill @ 3-15 MPI; 1.61 SF/GPD Req'd min. Gravity Distribution
800 GPD x 1.61 SF/GPD= 1288 SF Min. Btm. Area
1288 SF Min. Btm. Area x 1.25 (25% Red'd Over Design by Hopewell Twp.)=1610 Sq. Ft. Min.
1610 Sq. Ft. SF/27' (Prop. bed width)=59.62' (Min. Bed Length/USE 60')
"Note: "MSR" Type bed req's 2 Ft. fill extension"
Excavate total btm. area of bed: 31 Ft. Wide x 64 Ft. Long (=1984 SF)
Construct stone filter bed: 27 Ft. Wide x 60 Ft. Long (=1620 SF)

Bryce M. Rittenhouse* PE#15 No.13453
D. Geoffrey Bryan PE#15 No.24327
Wesley L. Lane* PLS No.30717
Frank J. Falcone PLS No.32112
Peter R. Estrowitz* PLS No.34001
Carl W. Pancamack PLS No.35868
Martin D. Katz PLS No.36249
*Licensed Planner

Frank J. Falcone
Professional Land Surveyor #32112 & Professional Planner #3760

PJE Princeton Junction Engineering, P.C.
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Princeton Junction, New Jersey 08550
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Bryce M. Rittenhouse
Professional Engineer & Land Surveyor #13453

Bryce M. Rittenhouse: PE # 15 PLS #13453 — 02/01/02 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 02/01/02 Date

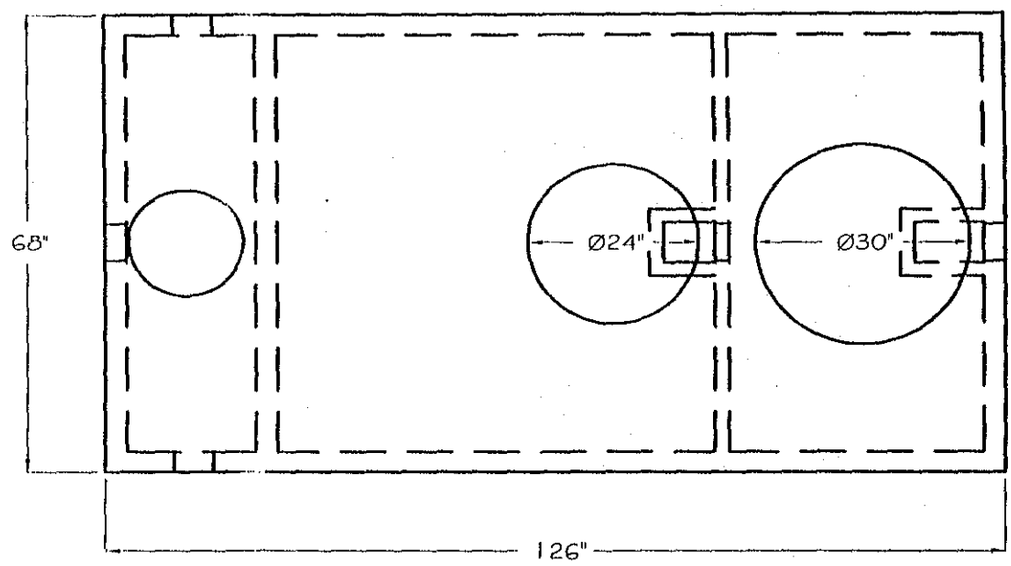
Disposal Bed Section View Detail
of Lot-6.01, Block-28 for
Robert & Heidi Cook
Hopewell Township • Mercer County • New Jersey

Date: 02/01/02
Scale: 1"=4'
Drawn: JRM
Check: FJF/BMR

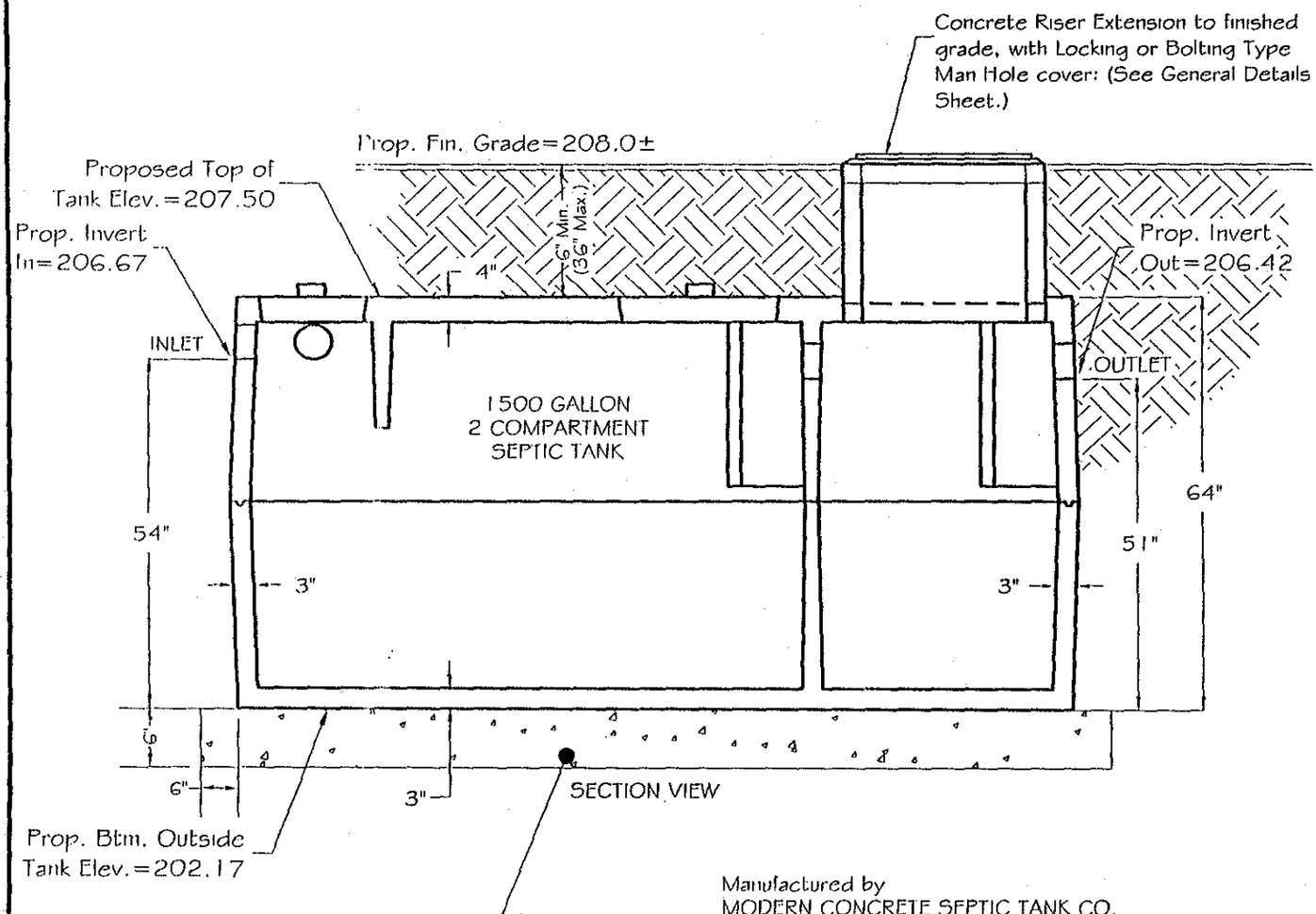
Revisions:

Job#:F011217
Dwg:LS01b28hs.dwg
View:Plan

4/10



PLAN VIEW



Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant

NOTE: Septic Tank shall be placed on a firm & stable foundation of 3/4" (NJDOT size #24) stone, compacted & level, 6" thick, extending 6" beyond the tank walls.

NOTE: See sheet 9/10 for notes concerning septic tanks.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

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Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

1500 Gallon 2 Comp. Septic Tank
of Lot-6.01, Block-28 for
Robert & Heidi Cook
Hopewell Township • Mercer County • New Jersey

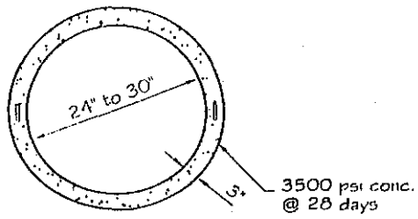
Bryce M. Rittenhouse	PE&PLS	No.13453
D. Geoffrey Bryson	PE&PLS	No.24327
Wesley L. Lord	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Earl W. Fitzgerald	PLS	No.35068
Martin D. Lutz	PLS	No.36249

Bryce M. Rittenhouse: PE & LS #13453 — 02/01/02 Date

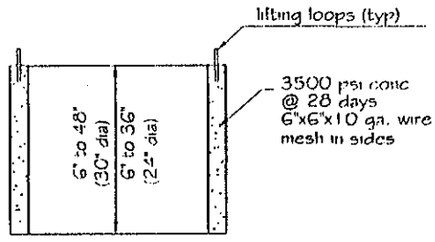
Frank J. Falcone: PLS #32112 & PP #3760 — 02/01/02 Date

Date: 02/01/02
Scale: None
Drawn: JRM
Check: FJF/BMR

5/10



Plan View



Section View

CONCRETE EXTENSION

(rits)

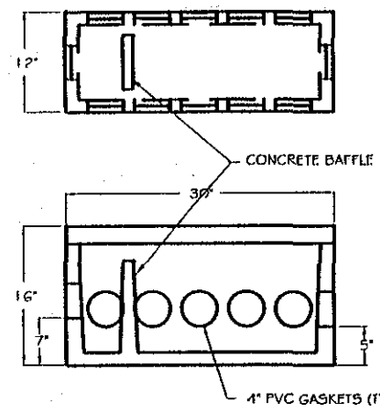
FILTER FABRIC SPECIFICATIONS

TERRATEX 5D OR EQUAL

GRAB TENSILE STRENGTH	125 LBS.
MULLEN BURST STRENGTH	275 LBS./SQ. IN.
ELONGATION	80 %
WATER PERMEABILITY COEFFICIENT	-2 CM/SEC.

THE FABRIC IS TO BE LAPPED OVER THE TOP OF STONE A MIN. OF 6"

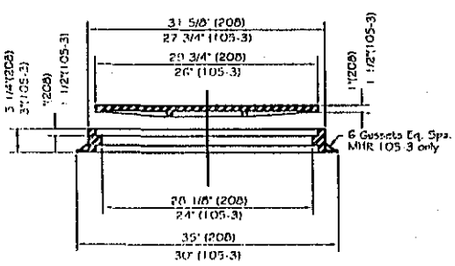
1-1 OUTLET DISTRIBUTION BOX



Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant

DISTRIBUTION BOX DETAIL:

not to scale



Specifications:

Specifications are from Quarm. The frame and covers are made of gray iron which meets of exceeds ASTM A48, Class 30B. Other grades of gray iron available upon request. Furnished with standard one coat of black asphaltum paint. Uncoated castings available upon

MHR 105-3:

Round flange manhole frame and cover for Septic Tanks. Shall be provided with a bolting and gasketed cover.

MHR 208 BF:

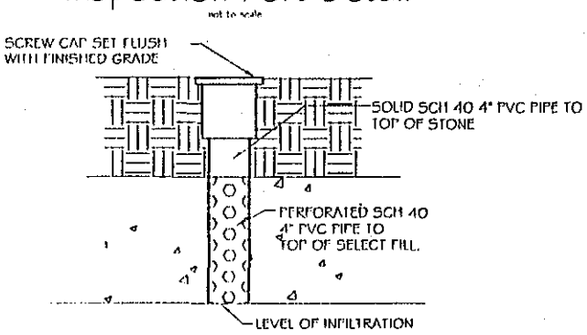
Light duty manhole frame and cover for Dosing Tanks. Shall be provided with a bolting and gasketed cover.

Manhole Frame Detail

no scale

Inspection Port Detail

not to scale



Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
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P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

General Disposal System Details

of Lot-6.01, Block-28 for

Robert & Heidi Cook

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No 13453
D. Geoffrey Dwyer	PE&PLS	No 24327
Wesley J. Lunt*	PLS	No 30747
Frank J. Falcone	PLS	No 32112
Todd W. Parsons	PLS	No 35068
Mark D. Lutz	PLS	No 36249

*Office Manager

Bryce M. Rittenhouse: PE & LS #13453 — 02/01/02 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 02/01/02 Date

Date: 02/01/02
Scale: None
Drawn: JRM
Check: FJF/BMR

Revisions:

8/10

Job#:9011217
Dwg:L601-9-28det.dwg
Vault:

Disposal System Notes

1. Prior to the installation of fill material, the disposal field excavation shall be performed in accordance with N.J.A.C. 7:9a10.3(c) 1 through 5.
2. Work should be scheduled so that the bottom and sidewalls of the excavation will not be exposed to rainfall or windblown silt between time of excavation and time of final inspection and grading.
3. Any loose soil or debris which is washed into or deposited within the excavation shall be removed prior to the construction of the distribution network.
4. Any smeared or compacted soil surfaces within the disposal field excavation shall be removed to expose a fresh soil surface.
5. Excavations in soils other than sands or loamy sands shall not be continued when soil moisture content is above the lower plastic limit. This means when a small loop of soil, taken from the depth of the proposed excavation, can be rolled out with the fingers to form a wire or rod one-eight of an inch in thickness and does not crumble when handled.
6. Clayey soils encountered in the bottom of the excavation shall be removed and replaced with suitable fill.
7. The fill material installed in the zone of disposal shall have a textural analysis (composition by weight of size fraction passing through a two millimeter sieve) 70%+ med. coarse sand, but not less than 90% total sand. The fill material shall also have a percolation rate faster than 15 minutes per inch.
8. The suitable fill material installed in the zone of treatment shall have a coarse fragment content less than 15% by volume or less than 25% by weight. It shall also have a textural analysis (composition by weight of size fraction passing the two millimeter sieve), from 70% to 90% med. coarse sand; 0-25% fine sand; 5% to 10% silt + clay ; min. clay 2%. Fill material shall also have a percolation rate of 3 to 15 min/in. or a permeability rate of 6-20 in/hr
9. All fill material shall be spread and compacted in layers one foot or less in thickness and compacted manually or mechanically, by tamping or rolling, by driving over the filled area in a controlled pattern using tracked or rubber tired vehicles, or by rodding.
10. Heavy excavating equipment shall not be operated directly on the exposed bottom of the excavation. If heavy excavating equipment is used to compact the fill material, the first lift shall be one foot in thickness.
11. The filter material shall consist of washed gravel or crushed stone, free of fines, dust, ashes or clay. It shall conform in size and gradation to size #24, #3 or #4 of the N.J.D.O.T. standard for coarse aggregates.
12. The filter material shall be installed into the disposal system excavation using a backhoe, front end loader or dump truck from the sides.
13. Construction of the distribution network shall be in accordance with 7:9a-10.3(d).
14. PVC distribution laterals shall meet ASTM standards D-2729, D-3033 or D-3034.
15. Filter material is to be covered with drainage fabric as the laying of distribution lines progresses. Drainage fabric shall be overlapped a minimum of 6".
16. Filter fabric shall have a grab tensile strength of 125 lbs., mullen burst strength of 275 lbs., elongation 80% + permeability coefficient of 0.2 cm/sec. Filter fabric shall be Tenatex 5-ef or equal.
17. Construction of the distribution box shall be in accordance with 7:9a-9.4.
18. The distribution box shall be set directly on the filter material within the disposal bed.
19. A permanent concrete monument will be installed over the distribution box flush with finished grade.
20. Construction of the connecting pipe or delivery pipe shall be in accordance with 7:9a-9.3.
21. All changes of direction in the soil pipe and connecting pipe shall employ max. 45° fittings and shall include cleanouts.
22. Soil pipe and connecting pipe shall be placed on a stabilized base of quarry blend stone extending to virgin ground.
23. PVC connecting pipes will meet ASTM standard D-2665 - schedule 40, SDR-21 or SDR-26.
24. The building sewer shall be designed and constructed in accordance with the provisions of the state uniform construction code, N.J.A.C. 5:23, adopted pursuant to the uniform construction code act, N.J.S.A. 52:27d119 et seq.
25. Septic tanks shall be precast concrete tanks constructed of concrete conforming to ACI318-16-4.5.1 and 318-16-4.5.2. Certification shall be provided by the manufacturer and the certification displayed on the tank.
26. Septic tank shall be 1500 gal. TWO compartment tank.
27. All manhole covers and inspection ports in the septic tank shall have water tight bolted or locked caps set flush with finish grade.
28. All interior concrete surfaces shall be sealed with two coatings of an approved inert coating to minimize corrosion. Coating shall be applied prior to delivery by the manufacturer.
29. Septic tanks shall be fabricated and installed in accordance with 7:9a-8.2.
30. A permanent marker shall be placed on grade above the septic tank upon completion of the installation.
31. Backfill and final grading shall be carried out in accordance with 7:9a-10.3(l).
32. Topsoil shall be lightly compacted by tamping or rolling to prevent settlement and shall be seeded and mulched or sodded immediately upon completion of final grading.
33. All trees with drip lines within 10 ft. of the disposal field shall be removed prior to construction.
34. There shall be no existing or proposed disposal systems within 50 ft. of the proposed disposal field.
35. No garbage disposal unit of any kind shall be connected to this disposal system.
36. Backwash from water softeners or other drainage other than sanitary sewage shall not enter the disposal system.
37. All soil evaluation procedures relied upon as a basis for the design of the subject individual subsurface sewage disposal system were carried out by or under the direct supervision of a professional engineer and witnessed by the administrative authority.
38. Vegetative planting in the disposal area shall be limited to grass unless otherwise specified by the administrative authority.
39. An annual inspection of the system shall begin three (3) years after installation or pump out of the septic tank.
40. The disposal system contractor is responsible for confirmation that all materials utilized in the construction of the disposal system are in accordance with N.J.A.C. 7:9a.
41. When placement of the disposal field is proposed in an area of disturbed ground as defined at 7:9a - 5.10, an acceptable state of compaction of the soil or fill material shall be verified by laboratory tests, and the design engineer shall certify a minimum compaction of 90 percent of the standard proctor density.
42. All regraded areas shall comply with 7:9a-10.3.
43. Storm sewers within 75 ft. of the disposal system shall be constructed with watertight joints.
44. There shall be no existing or proposed wells within 100 ft. of the proposed disposal field.
45. THIS PLAN IS FOR BUILDING PERMIT ONLY.

General Notes

1. The Health Department shall receive 48 hours notification prior to the start of any construction on the system.
2. Once the excxavation of bed is complete a bottom of excavation inspection shall be performed by the Design Engineer and approved prior to the placement of the select fill.
3. After suitable fill is placed and compacted a min. of 1 permeabilty test shall be performed and approved by the Design Engineer, and if required the test shall be witnessed by the Health Department prior to the placement of stone.
4. The results of the select fill analysis shall be forwarded to the Health Department (see note No.8 in the Disposal System notes)
5. All manholes covers and inspection port caps inthe septic tank shall have water tight bolted or locked caps.
6. All interior concrete surfaces shall be sealed with 2 coatings of an "approved inert coating to minimize corrosion, coating shall be applied prior to delivery by the manufacturer.
7. The 'D' box shall sit in the disposal bed area on the filter material.
8. This plan is for building permit only.
9. No existing/proposed wells or disposal systems within 100 ft. of the proposed disposal field and well.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
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Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

General Disposal System Notes
of Lot-6.01, Block-28 for
Robert & Heidi Cook
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lace*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Dwovanko	PLS	No.35068
Martin D. Katz	PLS	No.36249

*Officer/Licensed

Bryce M. Rittenhouse: PE & LS #13453 — 02/01/02 Date

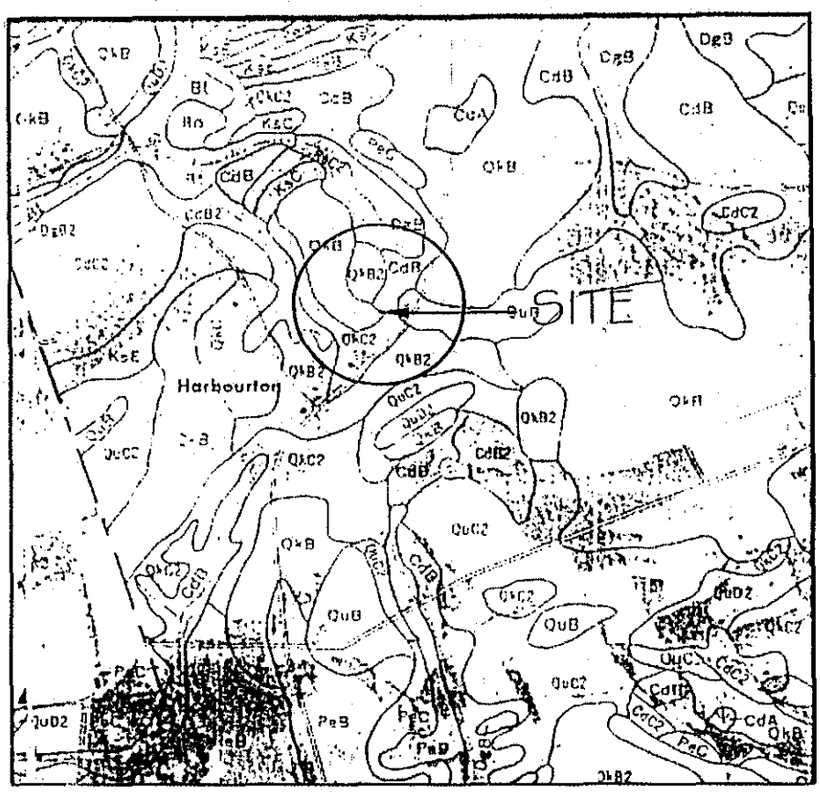
Frank J. Falcone: PLS #32112 & PP #3760 — 02/01/02 Date

Date: 02/01/02
Scale: None
Drawn: JRM
Check: FJF/BMR

Revisions:

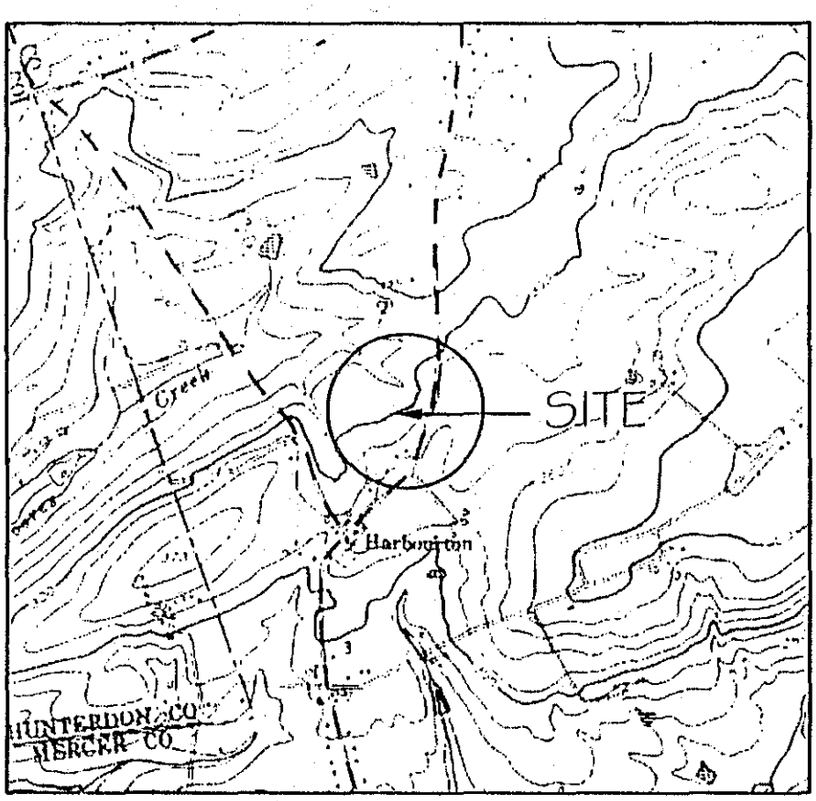
9/10

Job# 01127
Dwg:60182Proc.dwg
View Plan



MERCER CO. SOIL SURVEY MAP:

Sheet #7; Scale 1"=1320'



U.S.G.S. QUADRANGLE MAP:

Pennington Quad.; Scale 1"=2000'

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Key Maps

of Lot-6.01, Block-28 for

Robert & Heidi Cook

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE/PLS	No.13453
D. Geoffrey Brown	PE/PLS	No.24327
Wesley L. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Parsons	PLS	No.35868
Martin D. Zulz	PLS	No.36249

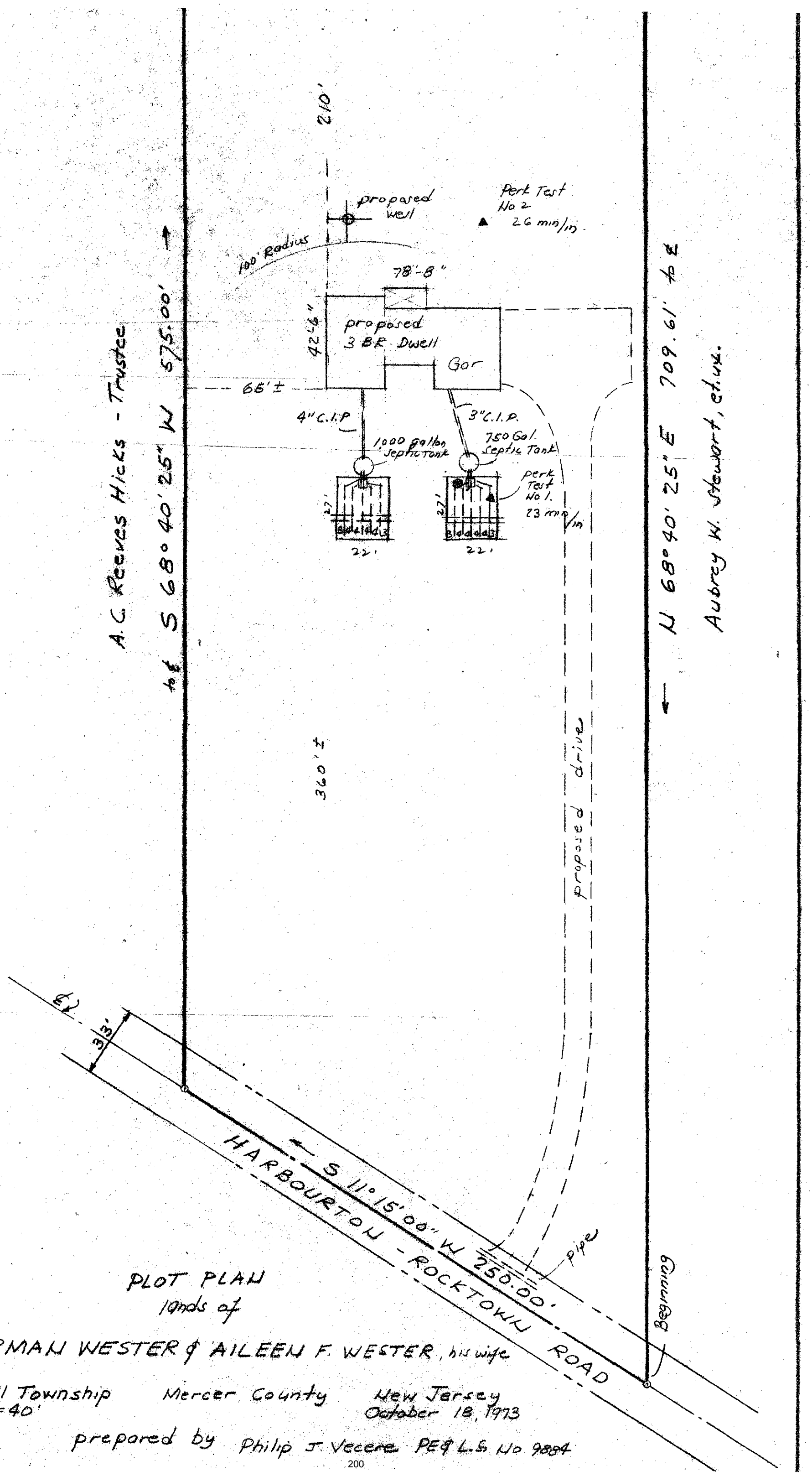
*Licensed Professional

Bryce M. Rittenhouse 02/01/02
Bryce M. Rittenhouse: PE & LS #13453 Date

02/01/02
Frank J. Falcone: PLS #32112 & PP #3760 Date

Date: 02/01/02
Scale: As Shown
Drawn: JRM
Check: FJF/BMR

10/10

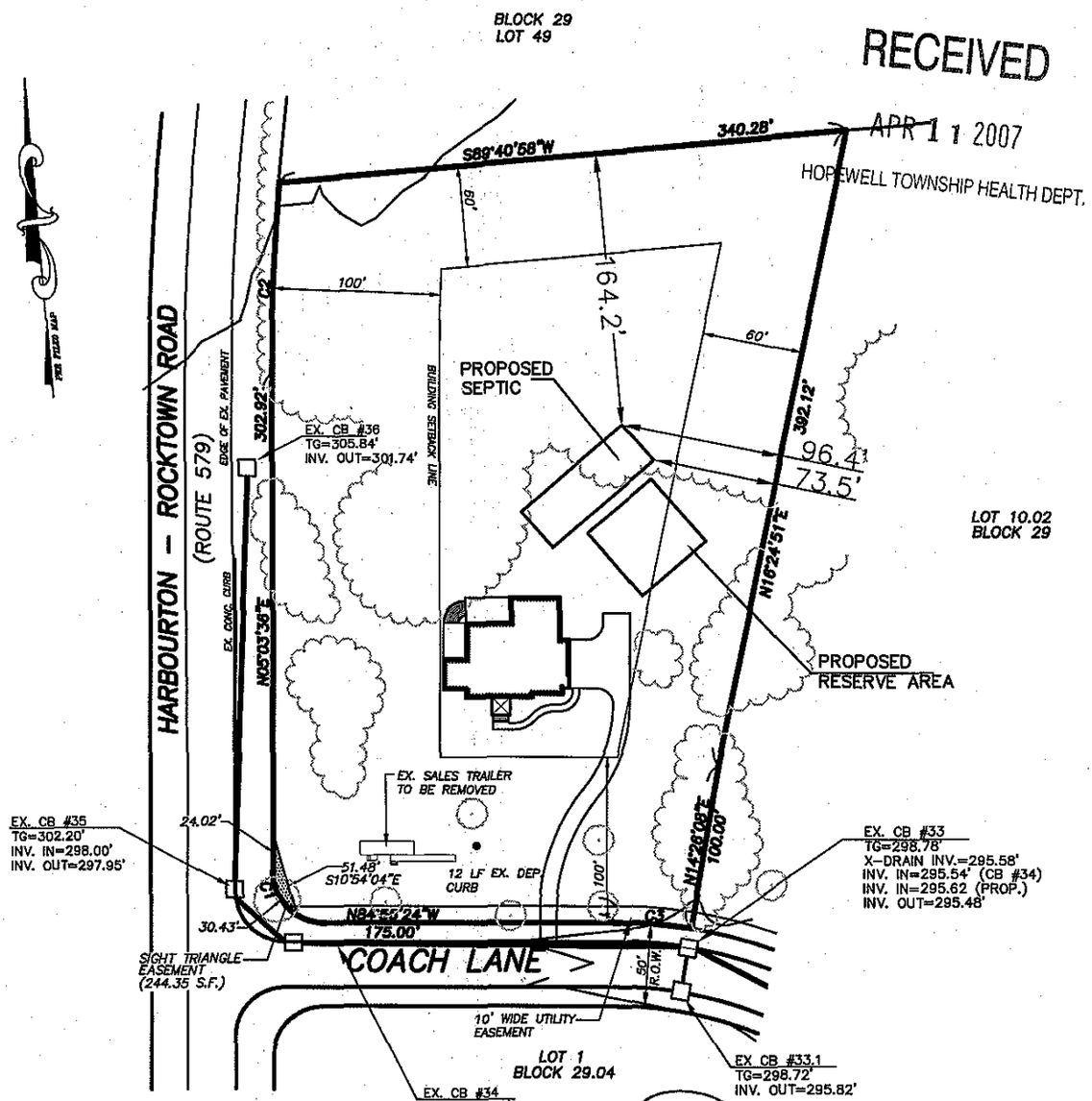


PLOT PLAN
lands of

NORMAN WESTER & AILEEN F. WESTER, his wife

Hopewell Township Mercer County New Jersey
Scale 1" = 40'
October 18, 1973

prepared by Philip J. Vecere PE & L.S. No. 9884



GENERAL NOTES:

1. A PERMANENT BENCH MARK WILL BE SET BY THE ENGINEER PRIOR TO CONSTRUCTION
2. THE USE OF GARBAGE GRINDERS IS NOT PERMITTED WITH THIS DESIGN.
3. THIS PLAN IS FOR THE CONSTRUCTION OF THE SEWAGE DISPOSAL SYSTEM ONLY.
4. THE BOUNDARY INFORMATION IS BASED ON SURVEY PERFORMED BY THIS GOLDENBAUM BAILL ASSOCIATES, INC.
5. THIS SEPTIC SYSTEM PLAN HAS BEEN PREPARED FOR CARLOS VALENTINO AND IS NOT TO BE USED BY ANOTHER CORPORATION, PERSON OR ENTITY.
6. THE DESIGN ENGINEER SHALL INSPECT THE ENTIRE SYSTEM AND SIGN THE CERTIFICATE OF COMPLIANCE AND FINAL AS-BUILTS AS PER HOPEWELL TOWNSHIP ORDINANCE
7. ONE INSPECTION PORT SHALL BE EXTENDED INTO THE ZONE OF DISPOSAL.
8. THE LOCATION OF THE EXISTING SEPTIC TRENCHES AND THE EXISTING SEPTIC TANK WERE PROVIDED BY THE APPLICANT.

DATE	DESCRIPTION	DRAWN BY:	CHECKED BY
3/14/07	ADD SECOND SEPTIC TANK TO ACCOMMODATE EJECTOR PUMP	AHM	KEB

CERTIFICATE OF AUTHORIZATION NUMBER 24GA28005600

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 0853
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

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NEW JERSEY LICENSED PROFESSIONAL ENGINEER #30111
NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR #30111
NEW JERSEY LICENSED PROFESSIONAL PLANNER #04122

SEWAGE DISPOSAL SYSTEM

OF LOT 10.01 BLOCK 29 PREPARED FOR,

CARLOS VALENTINO

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: AHM	CHECKED BY: KEB	SCALE: 1"=100'	DATE: 2/5/07	PROJ. NO: 94-125-1	1/7

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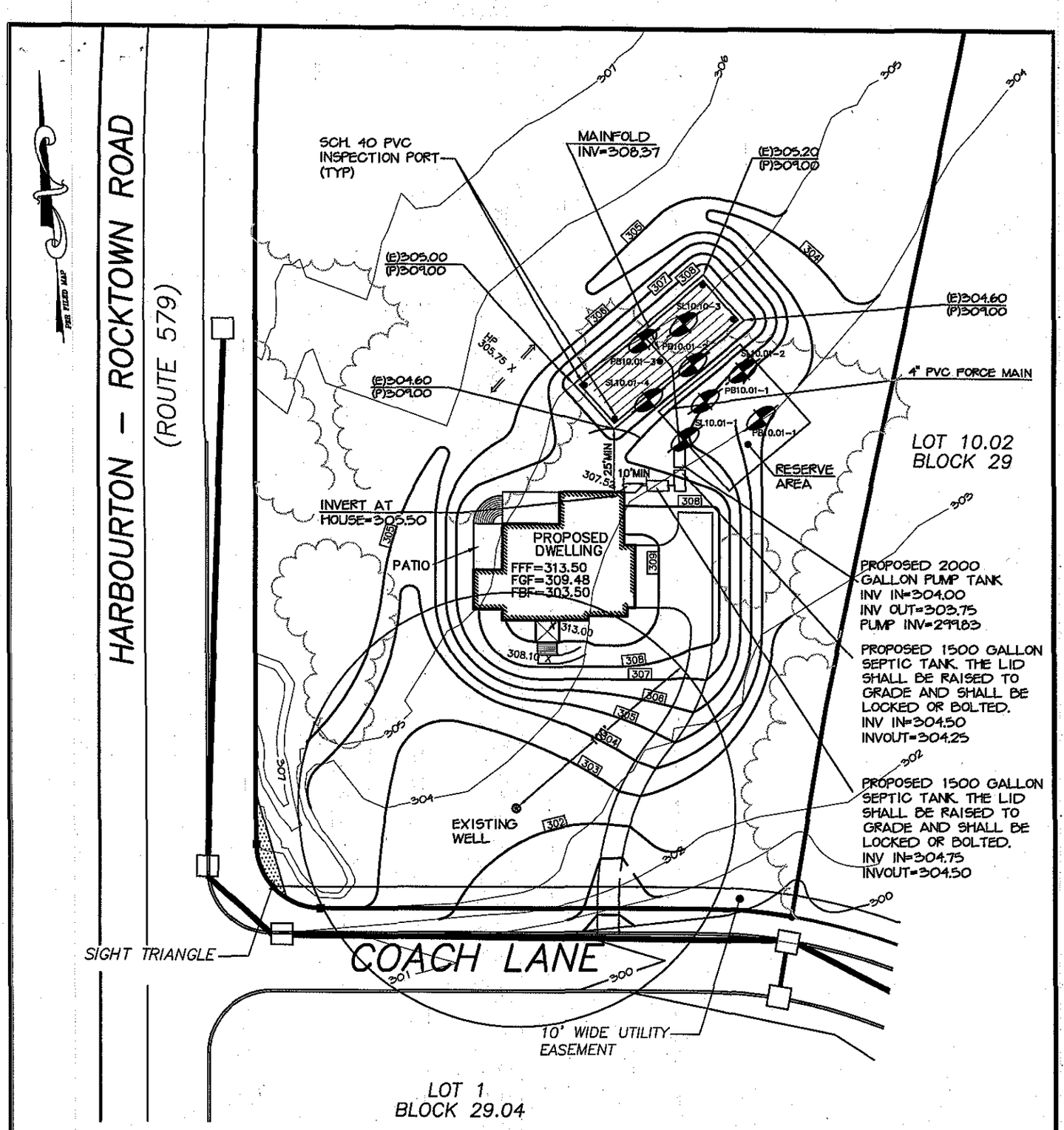
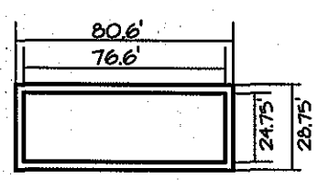


BED DIMENSION DETAIL

BED SIZING CALCULATIONS
6 BEDROOMS = 950 GPD
950 GPD X 1.33= 1263.50 SF
1263.5 SF X 25% OVERDESIGN=1895.25SF
USE 24.75' X 76.6'= 1895.85 SF
EXCAVATION = 28.75' X 80.6'



N.T.S.

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SEWAGE DISPOSAL SYSTEM

OF LOT 10.01 BLOCK 29 PREPARED FOR,

CARLOS VALENTINO

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: AHM	CHECKED BY: KEB	SCALE: 1"=60'	DATE: 2/5/07	PROJ. NO: 94-125-1	2/7
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1.) MINIMUM SLOPE OF PIPE SHALL BE 1/4" PER FOOT FOR FIELD PIPE.

2.) DISPOSAL SYSTEM SHALL CONSIST OF (12) (1.25") DIA. PVC PERFORATED PIPES IN A 24.75' X 76.6' MOUNDED SOIL REPLACEMENT DISPOSAL BED (EXCAVATION SIZE= 28.75' X 80.6')

3.) ELEVATIONS ARE BASED ON FIELD TOPOGRAPHY USING ASSUMED DATUM

4.) THERE ARE NO POTABLE WATER WELLS WITHIN 100' OF THE PROPOSED DISPOSAL AREA.

5.) THIS SEPTIC SYSTEM DESIGN IS BASED ON 6 BEDROOM DWELLING

6.) ALL TREES SHALL BE REMOVED WITHIN 10' OF THE SYSTEM.

7.) A CLEANOUT SHALL BE INSTALLED EVERY 50' FOR GRAVITY FLOW FIELD PIPE.

8.) THIS DESIGN IS BASED ON THE ASSUMED PERMEABILITY RATE OF SELECT FILL (6- 20 INCHES/HOUR).

9.) FILL MATERIAL SHALL BE TESTED BY A SOILS TESTING LABORATORY AND CERTIFIED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION.

10.) A TUBE PERMEAMETER TEST SHALL BE CONDUCTED USING SAMPLES OF FILL MATERIAL WHICH HAVE BEEN COMPACTED TO A BULK DENSITY EQUIVALENT TO THAT ACHIEVED IN THE CONSTRUCTION OF THE DISPOSAL FIELD. THE PERMEABILITY CLASS RATING METHOD SHALL ALSO BE REQUIRED TO DETERMINE WHETHER THE FILL MATERIAL USED MEETS THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

11.) THE SELECT FILL USED IN THE ZONE OF TREATMENT SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

12.) THE SELECT FILL USED IN THE ZONE OF DISPOSAL SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)5.

13.) FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS, ONE FOOT OR LESS IN THICKNESS.

14.) COMPACTION MAY BE ACCOMPLISHED MANUALLY OR MECHANICALLY BY TAMPING OR ROLLING, OR BY DRIVING OVER THE FIELD IN A CONTROLLED PATTERN USING TRACKED OR RUBBER TIRED VEHICLES.

15.) CLEAN CRUSHED STONE MUST CONFORM WITH NJDOT STANDARD SIZES FOR COURSE AGGREGATE (SIZE #24, #3, OR #4).

16.) ALL FIELD PIPE EXCLUDING DISPOSAL FIELD SHALL BE SCHEDULE 40 PVC.

17.) ALL LATERALS MUST BE CAPPED AND HAVE NO MORE THAN A 2" SLOPE PER 100 FEET.

18.) THE MANIFOLD MUST BE INSTALLED AS PER N.J.A.C. 7:9A-9.4 211 & 9.4 51, 11, 111.

19.) AN INSPECTION PORT SHALL BE INSTALLED IN EACH CORNER OF THE DISPOSAL BED EXTENDING FROM THE LEVEL OF INFILTRATION TO FINISHED GRADE, THE PORT SHALL CONSIST OF SCH 40 PERFORATED PVC PIPES WITH A REMOVABLE CAP. ONE OF THE INSPECTION PORTS SHALL BE EXTENDED INTO THE ZONE OF DISPOSAL.

20.) WHEN HEAVY EXCAVATING EQUIPMENT IS OPERATED WITHIN THE EXCAVATION FOR THE PURPOSE OF PLACEMENT OR COMPACTION OF THE FILL MATERIAL, THIS EQUIPMENT SHALL NOT BE DRIVEN DIRECTLY ON THE EXPOSED BOTTOM OF THE EXCAVATION, A MINIMUM OF ONE FOOT FILL MATERIAL SHALL BE MAINTAINED BELOW THE VEHICLE TRACKS OR WHEELS AT ALL TIMES.

21.) A MINIMUM OF SIX INCHES AND NO MORE THAN EIGHTEEN INCHES OF BACK FILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.

22.) BACK FILL MATERIAL SHALL BE OF EARTH SIMILAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONRY, OR OTHER CONSTRUCTION MATERIAL.

23.) IN NO CASE SHALL THE BACK FILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.

24.) BACK FILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL BED OR EACH OF THE DISPOSAL TRENCHES AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.

25.) HEAVY MACHINERY, RUBBER-TIRE VEHICLES OR OTHER VEHICLES EXERTING A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH SHALL NOT BE PERMITTED TO PASS OVER THE DISPOSAL FIELD AFTER THE FILTER MATERIAL AND DISTRIBUTION NETWORK HAVE BEEN INSTALLED.

26.) TRACKED EQUIPMENT MAY BE USED FOR THE PURPOSE OF BACK FILLING AND FINAL GRADING PROVIDED THAT THIS EQUIPMENT DOES NOT EXERT A PRESSURE ON THE UNDERLYING SOIL IN EXCESS OF EIGHT POUNDS PER SQUARE INCH.

27.) FINAL GRADING SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING DESIGN AND IN SUCH A MANNER THAT SURFACE WATER WILL NOT COLLECT OVER THE DISPOSAL FIELD.

28.) AFTER COMPLETION OF BACK FILLING AND FINAL GRADING, THE BACK FILLED AREA OVER THE DISPOSAL FIELD SHALL BE SEEDED OR SODDED TO ESTABLISH A VEGETATIVE COVER OR OTHERWISE STABILIZED AGAINST EROSION IN A MANNER ACCEPTABLE TO THE ADMINISTRATIVE AUTHORITY.

29) ENGINEER SHALL PERFORM A TEXTURAL ANALYSIS OF THE FILL MATERIAL FROM AN ON SITE STOCKPILE AND A PERCOLATION TEST WITHIN THE INSTALLED FILL MATERIAL. THE RESULTS SHALL BE FILED WITH THE THE HOPEWELL TOWNSHIP BOARD OF HEALTH.

3/14/07	ADD SECOND SEPTIC TANK TO ACCOMMODATE EJECTOR PUMP	AHM	KEB
DATE	DESCRIPTION	DRAWN BY:	CHECKED BY:

CERTIFICATE OF AUTHORIZATION NUMBER 24GA28005600

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NEW JERSEY LICENSED PROFESSIONAL PLANNER #04122

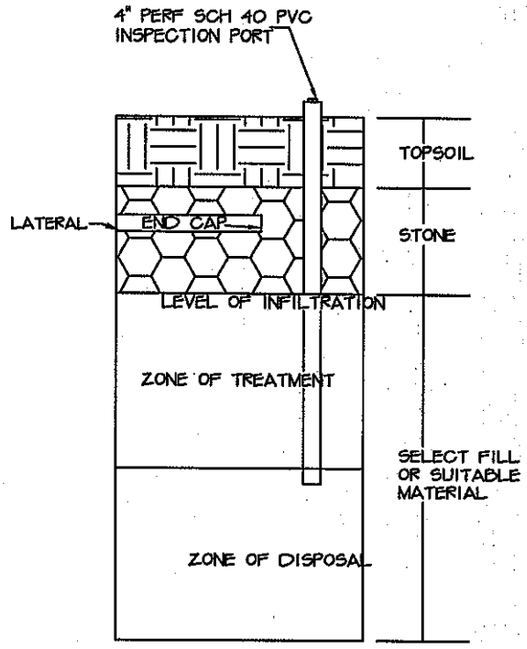
SEWAGE DISPOSAL SYSTEM

OF LOT 10.01 BLOCK 29 PREPARED FOR,

CARLOS VALENTINO

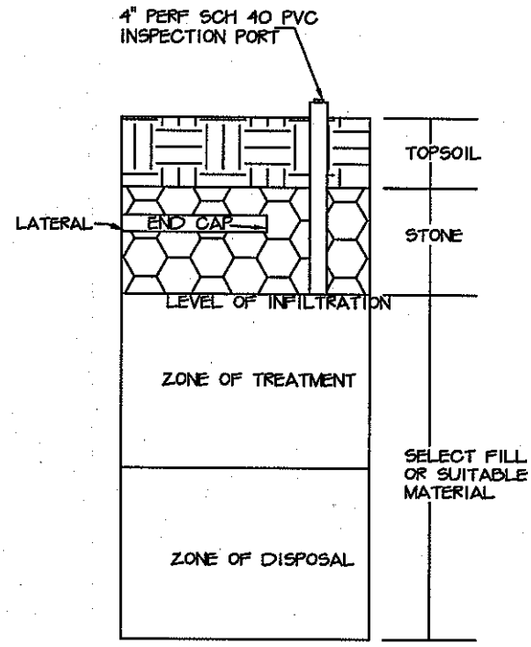
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: AHM	CHECKED BY: KEB	SCALE: NONE	DATE: 2/5/07	PROJ. NO: 94-125-1	3/7
G\1994\94-125\10.01					



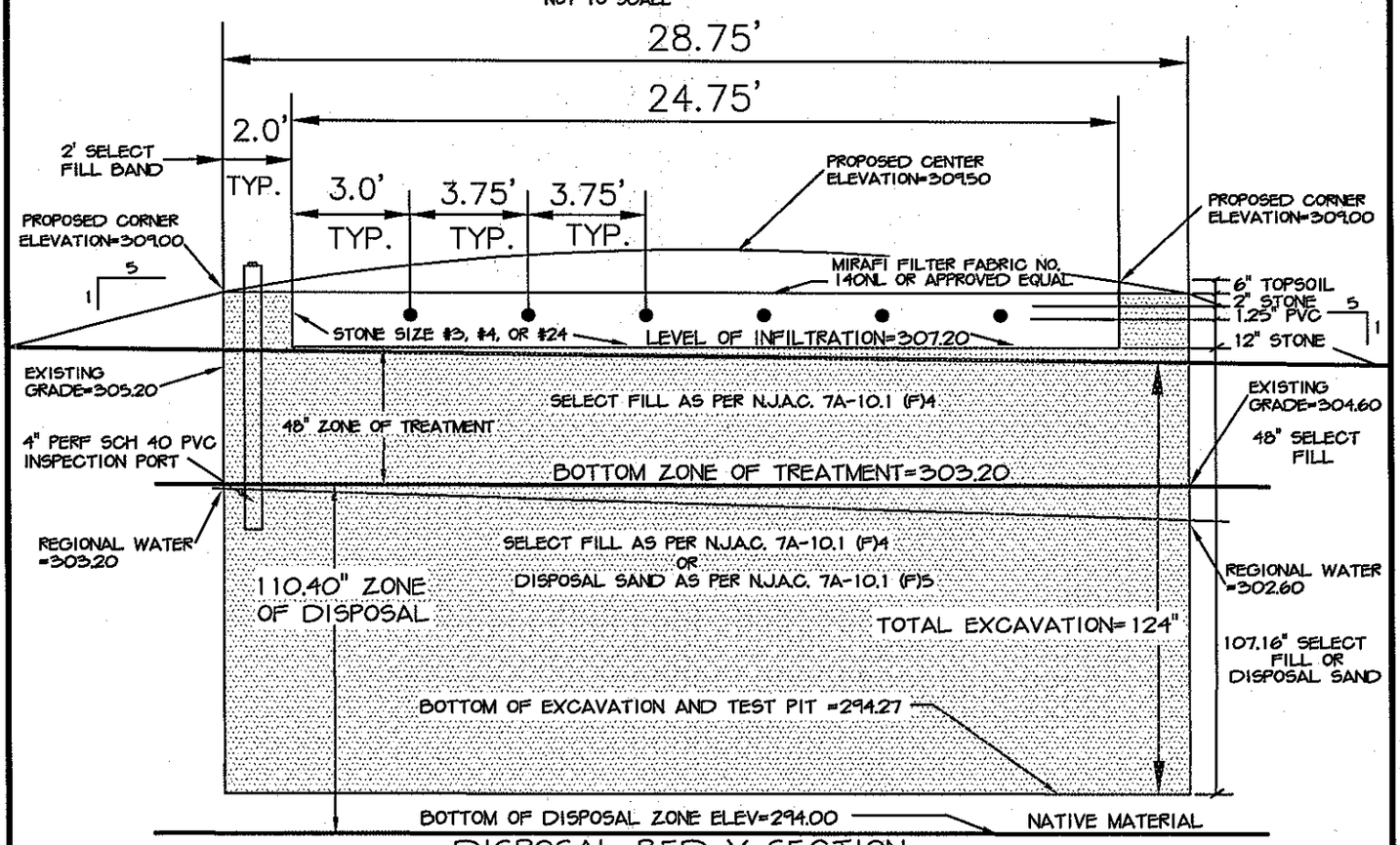
ONE INSPECTION PORT
TO BE EXTENDED INTO
THE ZONE OF DISPOSAL

NOT TO SCALE



TYPICAL INSPECTION PORT DETAIL

NOT TO SCALE



DISPOSAL BED X-SECTION

NOT TO SCALE

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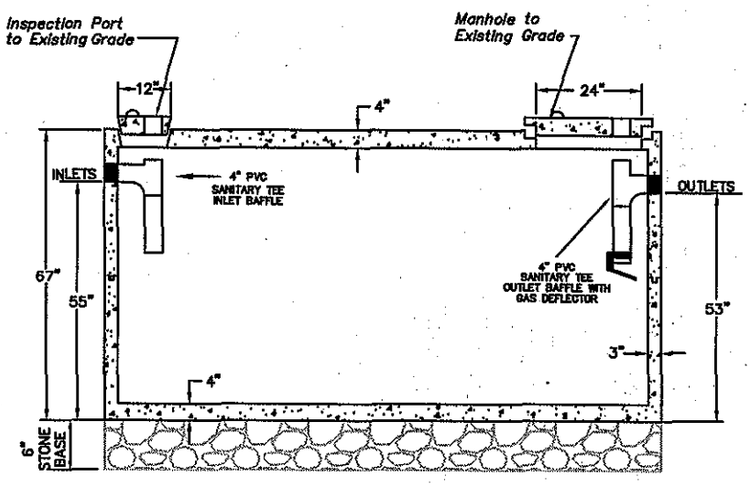
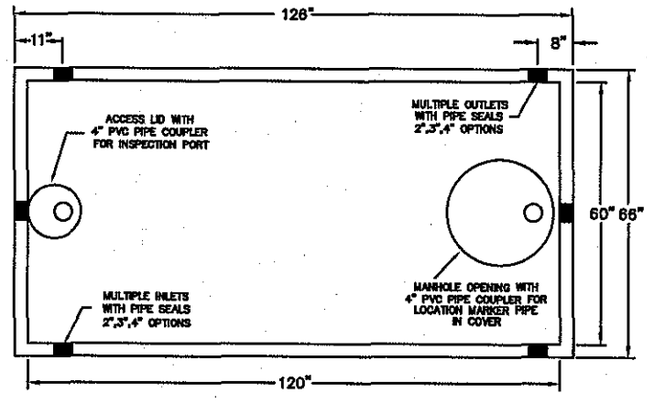
AHM	KEB	NONE	2/5/07	94-125-1	4/7

G\1994\94-125\10.01

Septic Tank Shall Meet All Requirements of Section 7:9A-8.2 of the Standards for Individual Subsurface Sewage Disposal Systems, Operative Date: 1/1/90

NOTE:
Manhole Covers Must be Locked or Bolted



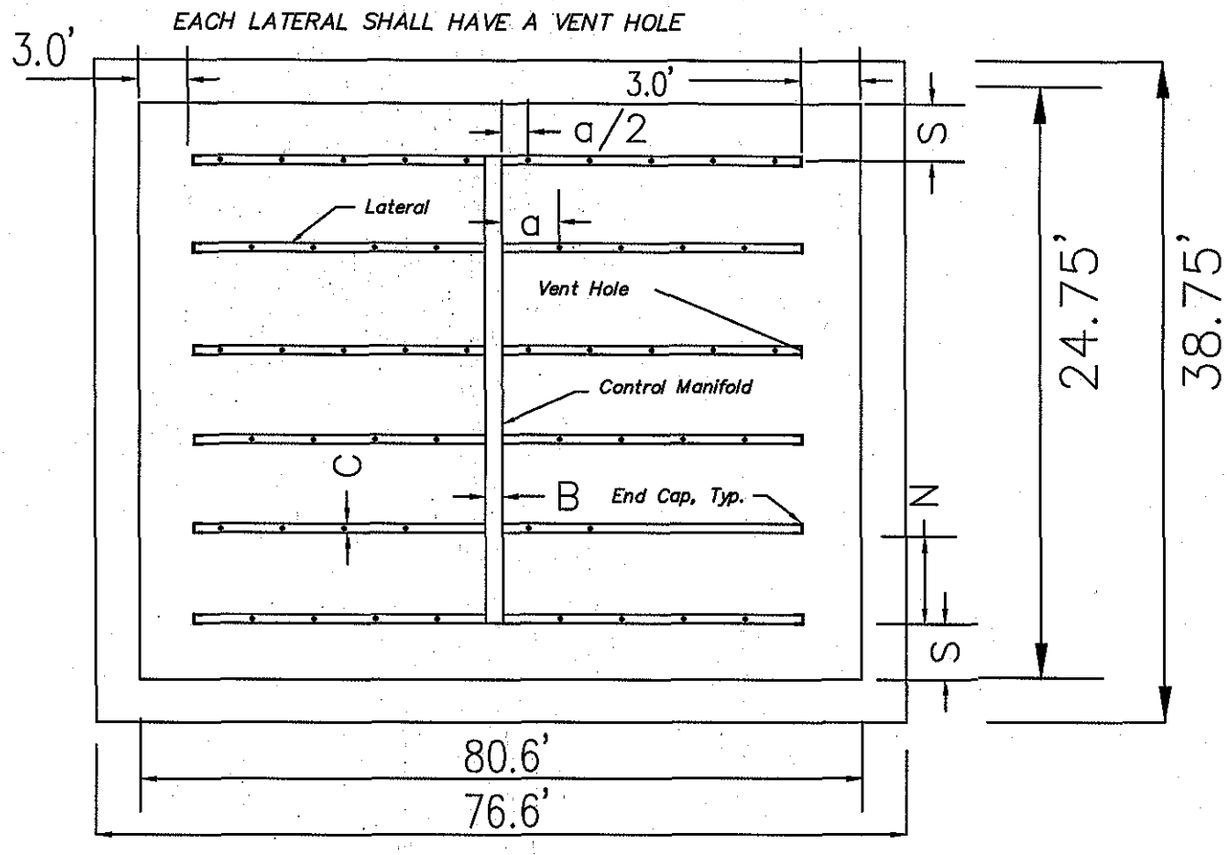


Capacity 1500
Manufacturer FLEMINGTON

THE TANK LID AND INSPECTION PORT SHALL BE SEALED TO BE WATERTIGHT TO PREVENT GROUND WATER FROM ENTERING THE TANK. THE TANK SEAM SHALL BE WRAPPED WITH CONWRAP PER THE MANUFACTURES INSTRUCTIONS THE TANK SHALL BE CAPABLE OF SUPPORTING 4' OF COVER

Septic Tank Section
NTS

EACH LATERAL SHALL HAVE A VENT HOLE



Length of excavation=	80.6'	Side of bed,	S= 3.0'
Length of bed	= 76.6'	Dia of manifold	B= 3"
Length of lateral,	L= 35.3'	Dia of lateral	C= 1_1/4"
Width of excavation,	=24.75'	Lat. hole dia	D= 1/4"
Width of bed,	W= 28.75'	Hole spacing	a= 36"
Cl to Cl lateral	N= 3.75'		

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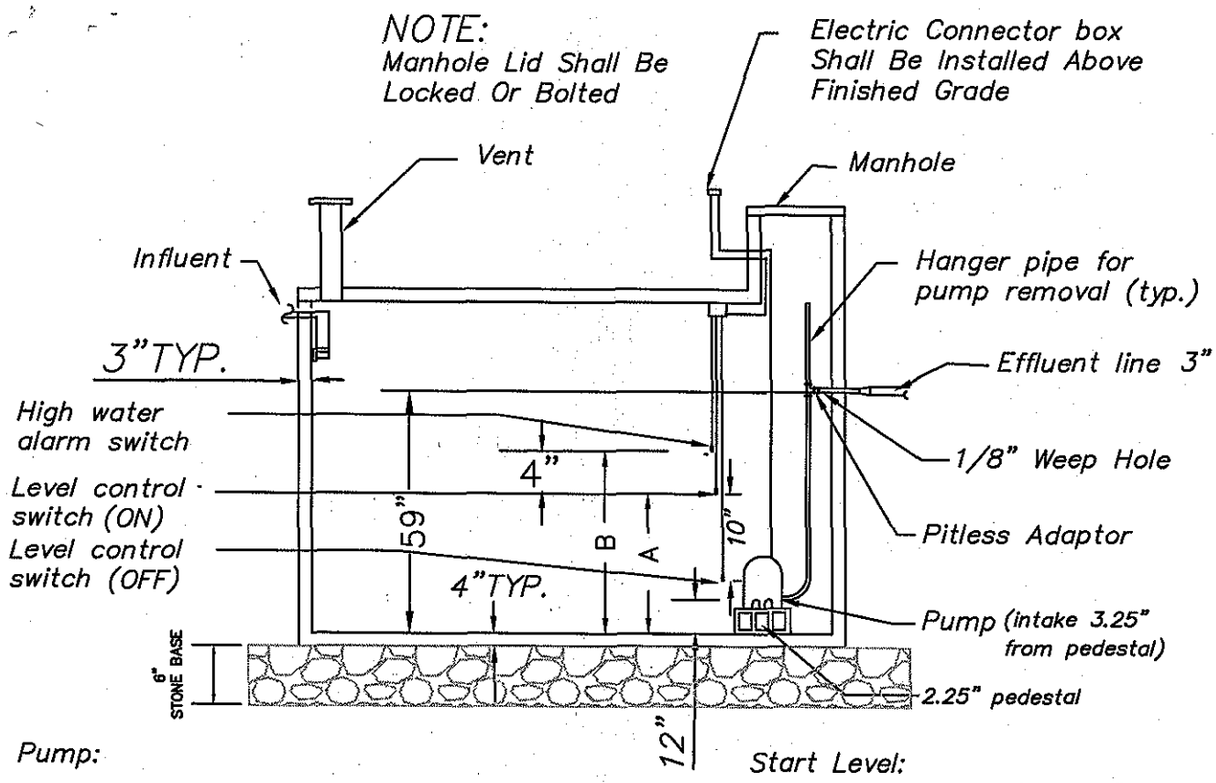
SEWAGE DISPOSAL SYSTEM
OF LOT 10.01 BLOCK 29 PREPARED FOR,
CARLOS VALENTINO
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO:	
AHM G\1994\94-125\10.01	KEB	NONE	2/5/07	94-125-1	5/7



Pump:

Hf–Friction Head	1.187'
He–Elevation Head	8.49'
Hp–Design Pressure	2.5
Ho–Operating Head	12.177'

Hf+He+Hp=Ho

Internal Volume of Network: (V) 66.49

Daily Volume of Sewage: (Q) 950

Dose Volume: min 75% (V) max 25% (Q)

MIN 75% V=49.87 per dose
MAX 25% Q=237.50 per dose
USE 237.50 GALS PER DOSE

Dose Volume =	237.50
(V) =	66.49
Pump Displacement =	7.5
Total Dose Volume =	311.49

System Discharge:

Hole Discharge	1.18
Lateral Discharge	12.98
Total Discharge	155.76

Pump Manufacturer: GOULDS

Model	3886
Series	WS 10B

APPROVED EQUAL

Start Level:

Pump On Level (A)	22"
Pump Off Level	12"
Alarm Level: (B)	26"

Reserve Capacity After alarm: 1028

Tank Capacity 1750

Tank manfactureer: FLEMINGTON or approved equal

Internal Tank Dimensions:
120"(L) x 60"(W) x 59"(D)

Note:
Pump Tank Shall Meet All Requirements Of N.J.A.C 7:9A

Note:
Reserve capacity is the inside volume of the dosing tank which lies between the level at which the high–water alarm switch is set and the invert elevation of the tank inlet. (N.J.A.C. 7:9A–9.2(b)3

THE TANK LID AND INSPECTION PORT SHALL BE SEALED TO BE WATERTIGHT TO PREVENT GROUND WATER FROM ENTERING THE TANK. THE TANK SEAM SHALL BE WRAPPED WITH CONWRAP PER THE MANUFACTURES INSTRUCTIONS THE TANK SHALL BE CAPABLE OF SUPPORTING 4' OF COVER

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SEWAGE DISPOSAL SYSTEM

OF LOT 10.01 BLOCK 29 PREPARED FOR,

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HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

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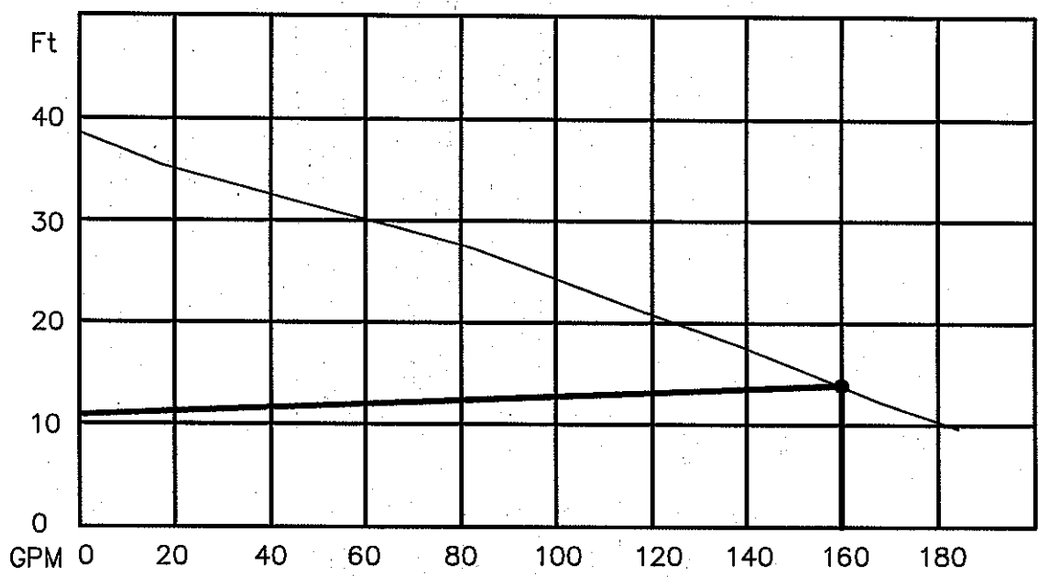
AHM	KEB	NONE	2/5/07	94-125-1	6/7
G\1994\94-125\10.01					

GOULDS PUMP 3886 SERIES MODEL WS 10B



MANIFOLD INVERT =303.27
PUMP OFF LEVEL=294.58
STATIC LIFT =8.69

FRICTION LOSS FOR TURNS AND ELBOWS:
3 (90°) + 8 (45°) + 1 UNION
3 (5) + 8 (2.5) + 1'
36'

EQUIVALENT PIPE LENGTH =36'
ACTUAL PIPE LENGTH =75'
TOTAL PIPE LENGTH = 111'

USE 3886 (WS 10B) AT 160 GPM

4" DELIVERY LINE

PUMP GPM	FRICTION LOSS PER 100 L.F.	HEAD LOSS Hf	STATIC LIFT He	DESIGN PRESSURE Hp	TOTAL DYNAMIC HEAD Ho
0	0	0	8.49	2.5	10.99
90	0.46	0.396	8.49	2.5	11.386
120	0.78	0.671	8.49	2.5	11.661
140	1.04	0.894	8.49	2.5	11.884
150	1.17	1.006	8.49	2.5	11.996
160	1.38	1.187	8.49	2.5	12.177

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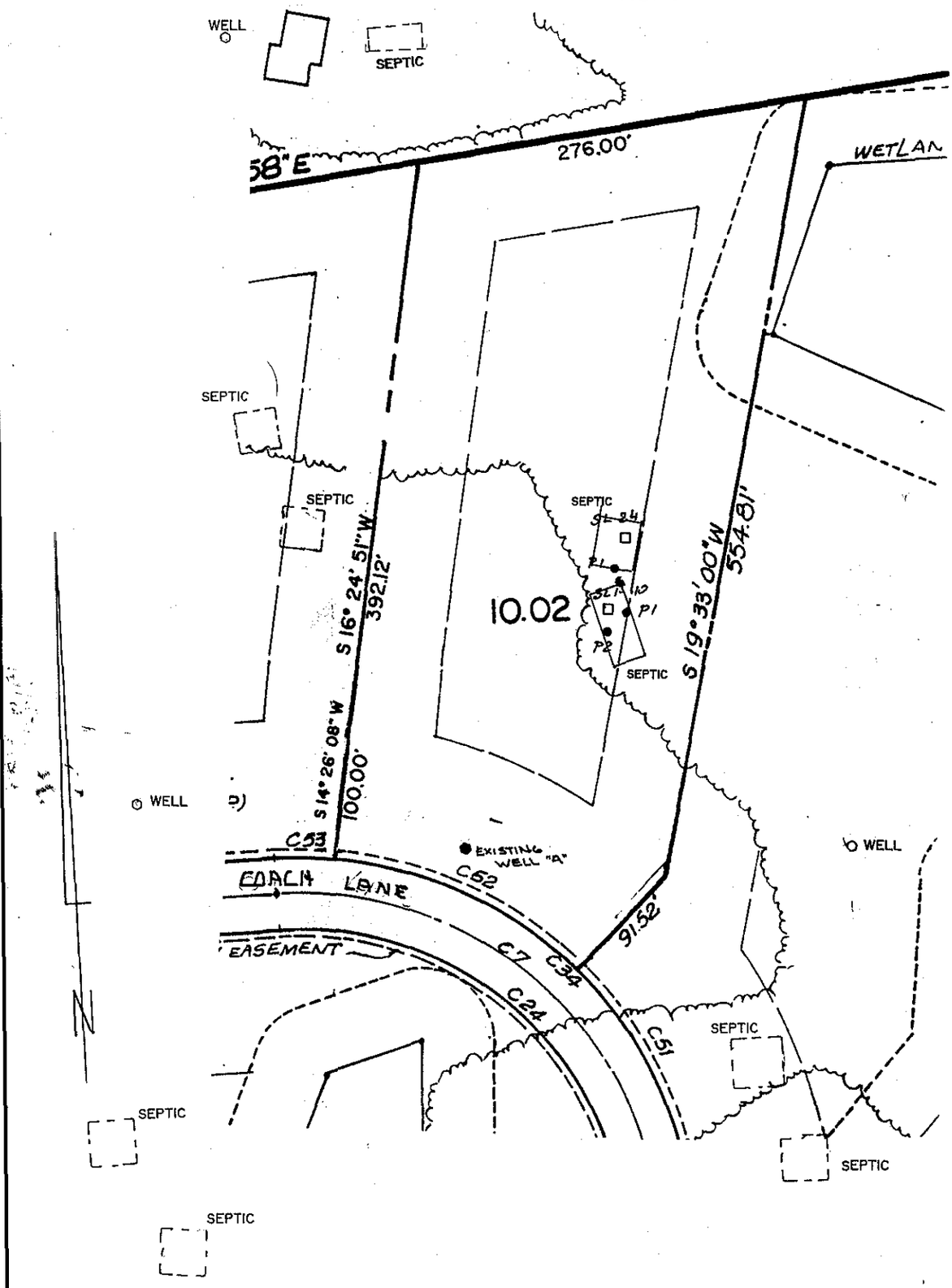
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO:	
AHM G\1994\94-125\10.01	KEB	NONE	2/5/07	94-125-1	7/7

DESIGN 7/19/93 APPROVED

DATE

HOPEWELL TOWNSHIP HEALTH DEPT



REV.NO.	DATE	REVISION	DRAWN BY	CHK'D BY
2	5/14/93	REV. PER H.T.H.D. LETTER OF 11/30/92	PAH	KEB
1	3/10/92	REVISED PER H.T.H.D. LETTER DATED 11/6/91	AHM	KEB

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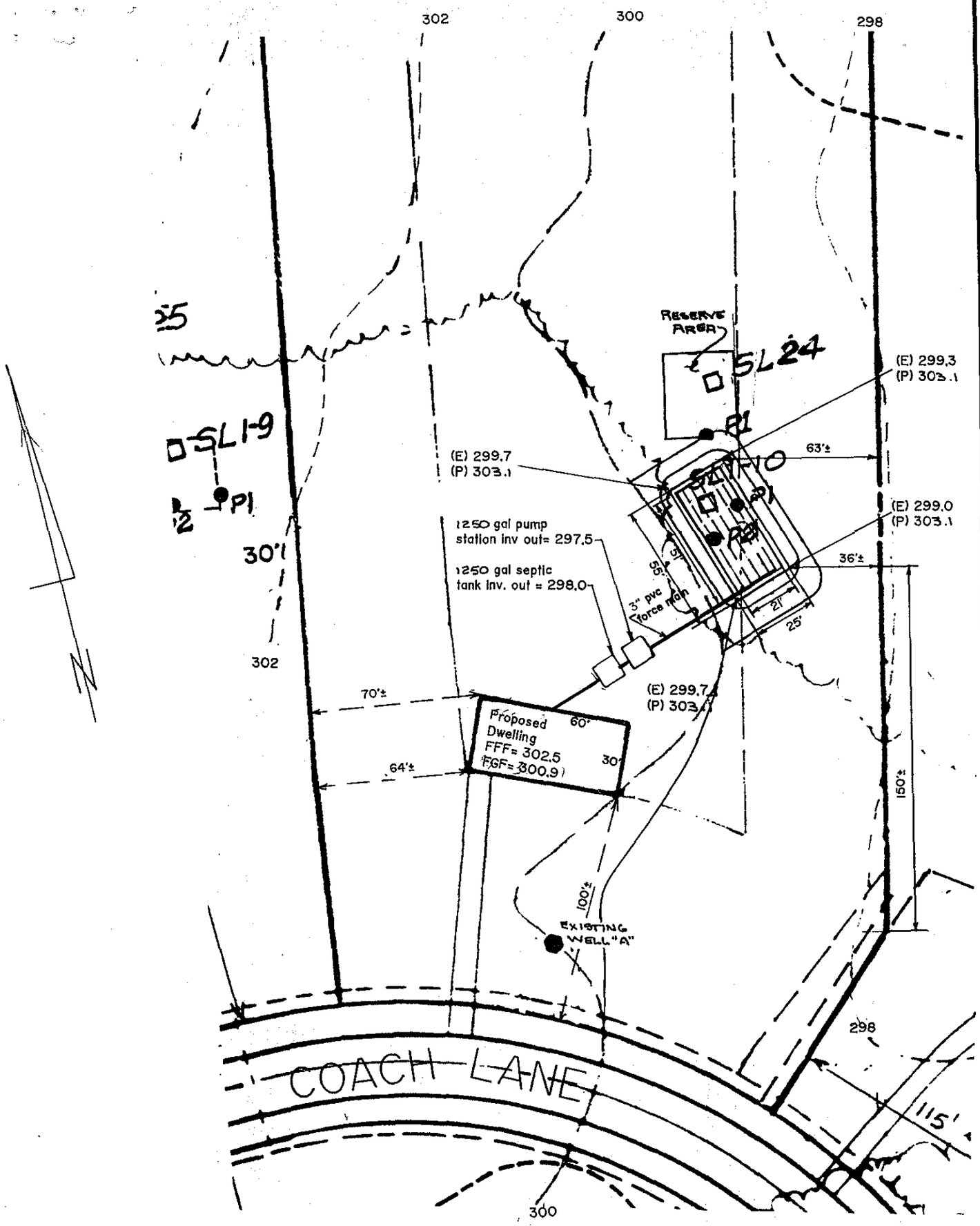
SEWAGE DISPOSAL SYSTEM FOR
BLOCK 29, LOT 10.02
HOPEWELL TWP. MERCER CO. NJ

Ken E. Baill

KENNETH E. BAILL NJPE 30111

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:
JK/AHM	KEB	1" = 100'	3/10/92	87-201-1

1/5



REV.NO.	DATE	REVISION	DRAWN BY	CHK'D BY
2	5/14/93	REV. PER. H.T.H.D LETTER OF 11/30/92	PAH	KEB
1	3/10/92	REVISED PER H.T.H.D. LETTER DATED 11/6/91	AHM	KEB

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING · LAND SURVEYING · PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N.J. 08530
Telephone: (609) 397-1505 Fax: (609) 397-1739

SEWAGE DISPOSAL SYSTEM FOR
BLOCK 29, LOT 10.02
HOPEWELL TOWNSHIP, MERCER CO. NJ

Kenneth E. Baill
KENNETH E. BAILL NJPE 30111

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:	
AHM	KEB	1" = 50'	3/10/92	87-201-1	2/5

LOT #10.02

SOIL LOG #24 EXCAVATED 7/14/88, WIT'D BY GEORGE KIESEL

0" - 7" TOPSOIL
7" - 29" CLAY W/SOME SILT
29" - 86" FRACTURED BLUE SHALE W/SILTY LOAM, LOOSE LAYERED
86" - 108" TIGHT LAY FRACTURED BLUE SHALE, HARD BOTTOM, WATER @ BOTTOM

PERCOLATION TEST PERFORMED 7/14/88, WIT'D BY GEORGE KIESEL

PERCOLATION TEST #1 @ 46" DEPTH: 17 MIN/INCH

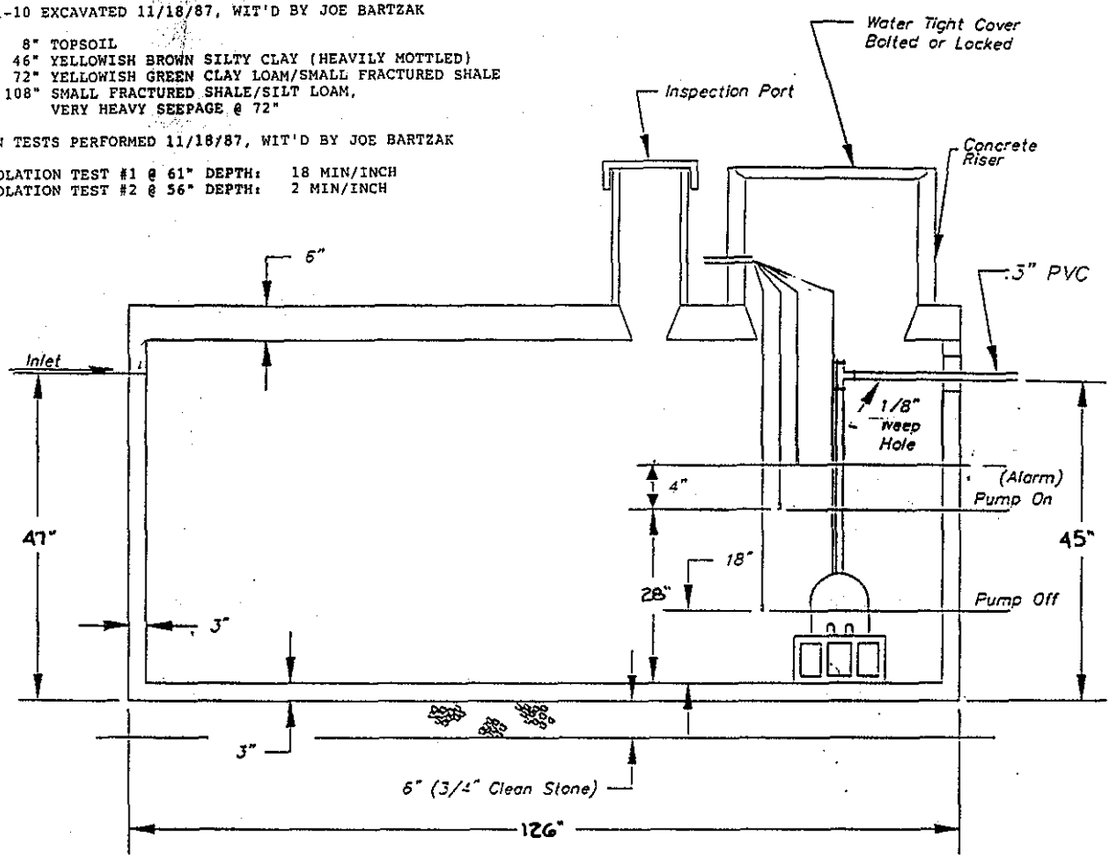
SOIL LOG #1-10 EXCAVATED 11/18/87, WIT'D BY JOE BARTZAK

0" - 8" TOPSOIL
8" - 46" YELLOWISH BROWN SILTY CLAY (HEAVILY MOTTLED)
46" - 72" YELLOWISH GREEN CLAY LOAM/SMALL FRACTURED SHALE
72" - 108" SMALL FRACTURED SHALE/SILT LOAM, VERY HEAVY SEEPAGE @ 72"

PERCOLATION TESTS PERFORMED 11/18/87, WIT'D BY JOE BARTZAK

PERCOLATION TEST #1 @ 61" DEPTH: 18 MIN/INCH
PERCOLATION TEST #2 @ 56" DEPTH: 2 MIN/INCH

All Electrical Connections to be Made Within A Weather Proof Strucrure



Tank – 1250 GALS.
Manufacturer – *Modern Concrete*
Pump – SESH-5W 1/2 hp
Manufacturer – ABS

Pump On Inv = 295.92
Pump Off Inv = 295.00
Alarm = 296.25

Tank Inv In = 297.75

PUMP:

Hf-FRICTION HEAD	0.9405'
He-ELEVATION HEAD	6.76'
Hp-DESIGN PRESSURE	2.5'
Ho-OPERATING HEAD	10.2005'
Hm+Hf+He+Hp=Ho	
	11'
NETWORK VOLUME : (V)	44.98 GALS
DAILY VOLUME OF SEWAGE: (Q)	800 GALS
DOSE VOLUME:	
25% (Q) ÷ (V)	244 GALS
DOSES PER DAY	4

SYSTEM DISCHARGE:

HOLE DISCHARGE	1.18 GPM
LATERAL DISCHARGE	20.06 GPM
TOTAL DISCHARGE	100.3 GPM

Note:
The main pump and reserve pump shall be of the same. manfacturer and model type and shall alternate between dosing cycles. The pump shall be wired so that in the event of a failur the remaining pump shall operate independently triggered by the Lag pump switch.

REV.NO.	DATE	REVISION	DRAWN BY	CHK'D BY
1	5/14/93	REV. PER H.T.H.D. LETTER OF 11/30/93	PAH	KEB

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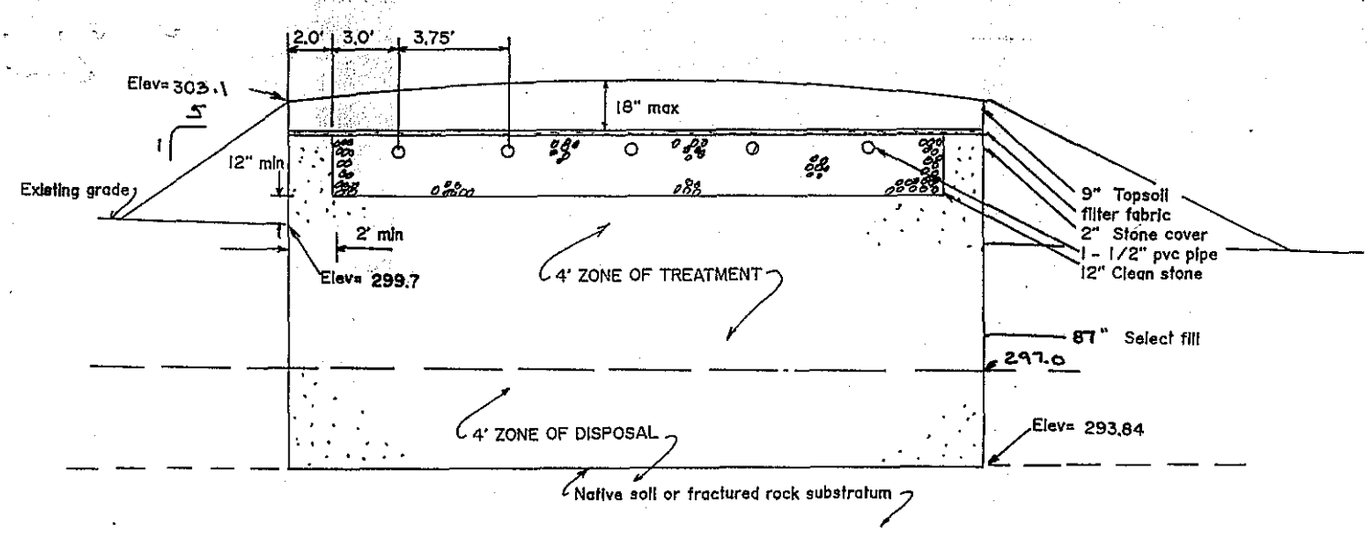
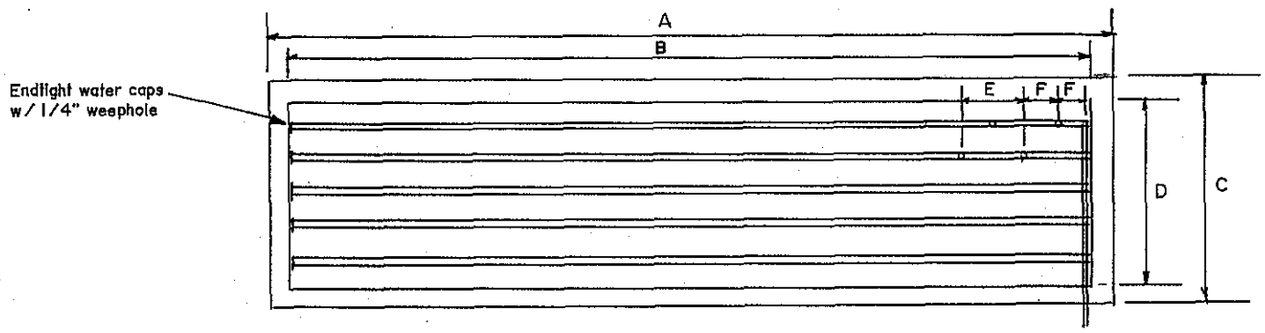
SEWAGE DISPOSAL SYSTEM FOR
BLOCK 29, LOT 10.02
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

KENNETH E. BAILL NJPE 30111

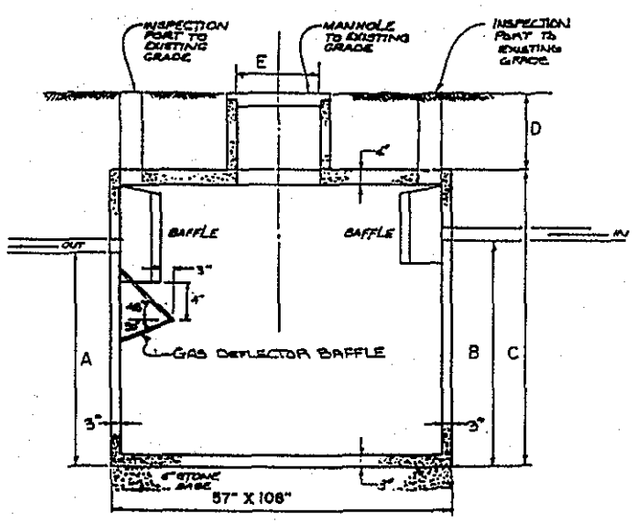
DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:
AHM	KEB	NONE	3/10/92	87-201-1

3/5/93





DISPOSAL BED SIZE:	21' X 51'	DELIVERY PIPE:	3"
EXCAVATION SIZE:	25' X 55'	DIMENSIONS:	
LATERALS:		A	55'
DIA.	1 - 1/2"	B	51'
LENGTH	50'	C	25'
HOLE SIZE	1/4"	D	21'
MANIFOLD:		E	36"
DIA.	3"	F	18"
LENGTH	15'		



MANHOLE COVER MUST BE LOCKED OR BOLTED

DIMENSIONS	
A	45"
B	47"
C	59"
D	12" MIN
E	24" DIA.
CAPACITY	1250 GAL
MANFACTURER:	FLEMINGTON

NOTE:
SEPTIC TANK SHALL MEET ALL REQUIREMENTS OF SECTION 7:9A-6.2 OF THE STANDARDS FOR INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEMS OPERATIVE DATE: 1/1/90

SEPTIC TANK, SECTION
NTS

REV.NO.	DATE	REVISION	DRAWN BY	CHK'D BY
1	5/14/93	REV PER H.T.H.D. LETTER OF 11/30/93	PAH	KEB

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SEWAGE DISPOSAL SYSTEM FOR
BLOCK 29, LOT 10.02
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

K. E. Baill
KENNETH E. BAILL NJPE 30111

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:
AHM	KEB	NONE	3/10/92	87-201-1

4/5

NOTES:

1) MINIMUM SLOPE OF PIPE SHALL BE 1/4" PER FOOT FOR FIELD PIPE.

2) DISPOSAL SYSTEM SHALL CONSIST OF (5) 1 - 1/2" DIA. PVC PIPES IN A 21' X 51' PRESSURE DOSED MOUNDED SOIL REPLACEMENT DISPOSAL BED. EXCAVATION SIZE: 25' X 55'

3) ELEVATIONS ARE BASED ON A FLIGHT TAKEN 3/18/87, VERTICAL DATUM N.J.G.S. MON. # 1667, ELEV.= 282.087.

4) THERE ARE NO POTABLE WATERWELLS WITHIN 100' OF PROPOSED DISPOSAL AREA.

5) THIS SEPTIC SYSTEM DESIGN IS BASED ON A (5) BEDROOM DWELLING

6) ALL TREES SHALL BE REMOVED WITHIN 10' OF THE SYSTEM.

7) A CLEANOUT SHALL BE INSTALLED EVERY 50' FOR GRAVITY FLOW FIELD PIPE.

8) THIS DESIGN IS BASED ON THE ASSUMED PERCOLATON RATE OF SELECT FILL (3 - 15 MIN. PER INCH).

9) FILL MATERIAL SHALL BE TESTED BY A SOILS TESTING LABORATORY AND CERTIFIED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION.

10) A TUBE PERMEATER TEST SHALL BE CONDUCTED USING SAMPLES OF FILL MATERIAL WHICH HAVE BEEN COMPACTED TO A BULK DENSITY EQUIVALENT TO THAT ACHIEVED IN THE CONSTRUCTION OF THE DISPOSAL FIELD. IN LIEU OF THIS, THE PERMEABILITY CLASS RATING METHOD MAY BE USED TO DETERMINE WHETHER THE FILL MATERIAL USED MEETS THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1 (f)4.

11) THE SELECT FILL USED IN THE ZONE OF TREATMENT SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(f)4.

12) THE SELECT FILL USED IN THE ZONE OF DISPOSAL SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(f)5.

13) FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS, ONE FOOT OR LESS IN THICKNESS

14) COMPACTION MAY BE ACCOMPLISHED MANUALLY OR MECHANICALLY BY TAMPING OR ROLLING, OR BY DRIVING OVER THE FILLED AREA IN A CONTROLED PATTERN USING TRACKED OR RUBBER TIRE VEHICLES.

15) 3/4"- 2 1/2" CLEAN CRUSHED STONE MUST CONFORM WITH NJDOT STANDARD SIZES FOR COURSE AGGREGATES (SIZE # 24, # 3 OR # 4)

16) ALL FIELD PIPE EXCLUDING DISPOSAL FIELD SHALL BE SCH 40 PVC.

17) ALL LATERALS MUST BE CAPPED AND HAVE NO MORE THAN A 2" SLOPE PER 100 FEET.

18) THE D-BOX MUST BE INSTALLED AS PER N.J.A.C 7:9A-9.4 2II & 9.4 5I, II, III.

19) AN INSPECTION PORT SHALL BE INSTALLED NEAR THE END OF EACH LATERAL EXTENDING FROM THE LEVEL OF INFILTRATION TO FINISHED GRADE, THE PORT SHALL CONSIST OF PERFORATED PVC PIPE WITH A REMOVEABLE CAP

20) WHEN HEAVY EXCAVATING EQUIPMENT IS OPERATED WITHIN THE EXCAVATION FOR THE PURPOSE OF PLACEMENT OF COMPACTION OF THE FILL MATERIAL, THIS EQUIPMENT SHALL NOT BE DRIVEN DIRECTLY ON THE EXPOSED BOTTOM OF THE EXCAVATION. A MINIMUM OF ONE FOOT OF FILL MATERIAL SHALL BE MANTAINED BELOW THE VEHICLE TRACKS OR WHEELS AT ALL TIMES.

21) A MINIMUM OF NINE INCHES AND NO MORE THAN EIGHTEEN INCHES OF BACKFILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.

22) BACKFILL MATERIAL SHALL BE OF EARTH SIMILIAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONARY OR OTHER CONSTRUTION MATERIAL.

23) IN NO CASE SHALL THE BACKFILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.

24) BACKFILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL BED OR EACH OF THE DISPOSAL TRENCHES AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.

25) HEAVY MACHINERY, RUBBER- TIRE VEHICLES OR OTHER VEHICLES EXERTING A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH SHALL NOT BE PERMITTED TO PASS OVER THE DISPOSAL FIELD AFTER THE FILTER MATERIAL AND DISTRIBUTION NETWORK HAVE BEEN INSTALLED

26) TRACKED EQUIPMENT MAY BE USED FOR THE PURPOSE OF BACKFILLING AND FINAL GRADING PROVIDED THAT THIS EQUIPMENT DOES NOT EXERT A PRESSURE ON THE UNDERLYING SOIL IN EXCESS OF EIGHT POUNDS PER SQUARE INCH.

27) FINAL GRADING SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING DESIGN AND IN SUCH A MANNER THAT SURFACE WATER WILL NOT COLLECT OVER THE DISPOSAL FIELD.

28) AFTER COMPLETION OF BACKFILLING AND FINAL GRADING, THE BACKFILLED AREA OVER THE DISPOSAL FIELD SHALL BE SEEDED OR SODDED TO ESTABLISH A VEGATATIVE COVER OR OTHERWISE STABILIZED AGAINST EROSION IN A MANNER ACCEPTABLE TO THE ADMINISTRATIVE AUTHORITY.

REV.NO.	DATE	REVISION	DRAWN BY	CHK'D BY
1	5/14/93	REV. PER H.T.H.D. LETTER OF 11/30/93	PAH	KEB

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THE ENGINEERS LIABILITY FOR THIS DESIGN TERMINATES AT ACCEPTANCE OR CERTIFICATION BY THE ADMINISTRATIVE AUTHORITY UNLESS THE ENGINEER IS RETAINED TO INSPECT THE INSTALLATION OF THE SYSTEM.

SEWAGE DISPOSAL SYSTEM FOR

BLOCK 29 , LOT 10.02

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

KENNETH E. BAILL NJPE 30111

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJ. NO.:
AHM	KEB	NONE	3/10/92	87-201-1 5/5

RECEIVED
JUL 22 1997
Hopewell Township Health Dept.

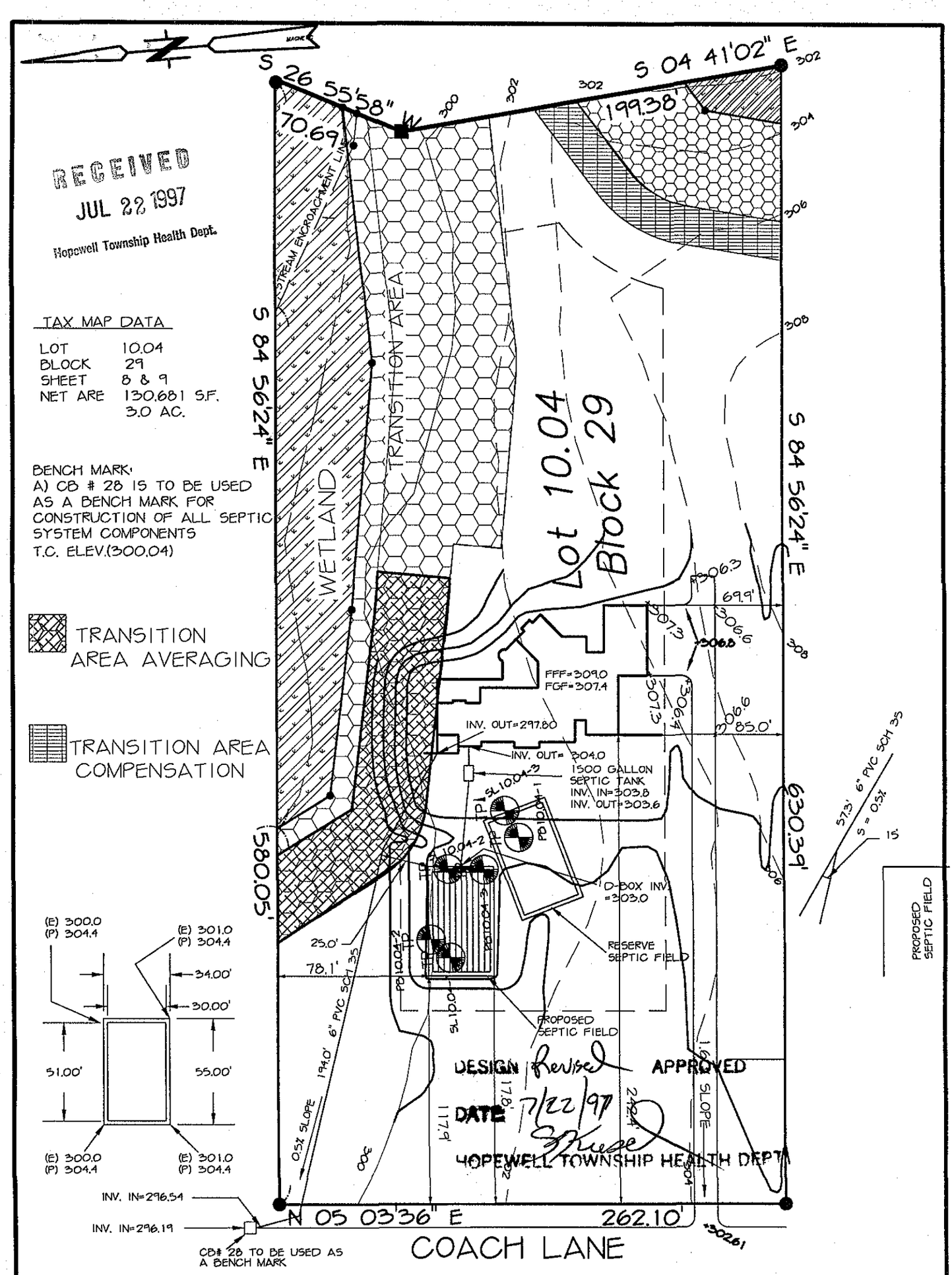
TAX MAP DATA

LOT	10.04
BLOCK	29
SHEET	8 & 9
NET ARE	130,681 S.F.
	3.0 AC.

BENCH MARK:
A) CB # 28 IS TO BE USED AS A BENCH MARK FOR CONSTRUCTION OF ALL SEPTIC SYSTEM COMPONENTS
T.C. ELEV.(300.04)

TRANSITION AREA AVERAGING

TRANSITION AREA COMPENSATION



1	07/14/97	GENERAL REVISIONS	ABT	JPM

I CERTIFY THAT THE SEASONAL HIGH WATER TABLE IS AT A DEPTH OF TWO (2) FEET BELOW EXISTING GRADE AS PER THE U.S.D.A. SOIL SURVEY OF MERCER COUNTY, NEW JERSEY(ISSUED JANUARY 1972) AND EXCAVATED SOIL LOGS.

KENNETH E. BAILL P.E., P.L.S. 30111
P.P. 04122

NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSED PROFESSIONAL PLANNER

GOLDENBAUM BAILL ASSOCIATES, INC.
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SEPTIC SYSTEM PLAN

PREPARED FOR

LOT 10.04, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

DRAWN BY: ABT	CHECKED BY: JPM	SCALE: 1"=60'	DATE: 06/18/97	PROJ. NO: 94-125	1/5

FILE: H:\94-125\SEPTIC

NOTES:

1.) MINIMUM SLOPE OF PIPE SHALL BE 1/4" PER FOOT FOR FIELD PIPE.

2.) DISPOSAL SYSTEM SHALL CONSIST OF (9) (4.0") DIA. PVC PERFORATED PIPES IN 30.0' X 51.0' MOUNDED SOIL REPLACEMENT FILL ENCLOSED DISPOSAL FIELD (34.0' X 55.0')

3.) ELEVATIONS ARE BASED ON ASSUMED VERTICAL DATUM

4.) THERE ARE NO POTABLE WATERWELLS WITHIN 100 OF PROPOSED DISPOSAL AREA.

5.) THIS SEPTIC SYSTEM DESIGN IS BASED ON (6) BEDROOMS DWELLING WITHOUT A DOMESTIC GARBAGE GRINDER.

6.) ALL TREES SHALL BE REMOVED WITHIN 10' OF THE SYSTEM.

7.) A CLEANOUT SHALL BE INSTALLED EVERY 50' FOR GRAVITY FLOW FIELD PIPE.

8.) THIS DESIGN IS BASED ON THE ASSUMED PERMEABILITY RATE OF SELECT FILL (6-20 INCHES/HOUR).

9.) FILL MATERIAL SHALL BE TESTED BY A SOILS TESTING LABORATORY AND CERTIFIED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION.

10.) A TUBE PERMEAMETER TEST SHALL BE CONDUCTED USING SAMPLES OF FILL MATERIAL WHICH HAVE BEEN COMPACTED TO A BULK DENSITY EQUIVALENT TO THAT ACHIEVED IN THE CONSTRUCTION OF THE DISPOSAL FIELD. THE PERMEABILITY CLASS RATING METHOD SHALL ALSO BE REQUIRED TO DETERMINE WHETHER THE FILL MATERIAL USED MEETS THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

11.) THE SELECT FILL USED IN THE ZONE OF TREATMENT SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

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13.) FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS, ONE FOOT OR LESS IN THICKNESS.

14.) COMPACTION MAY BE ACCOMPLISHED MANUALLY OR MECHANICALLY BY TAMPING OR ROLLING, OR BY DRIVING OVER THE FIELD IN A CONTROLLED PATTERN USING TRACKED OR RUBBER TIRED VEHICLES.

15.) 3/4" - 2 1/2" CLEAN CRUSHED STONE MUST CONFORM WITH NJDOT STANDARD SIZES FOR COURSE AGGREGATE (SIZE #24, #3, OR #4).

16.) ALL FIELD PIPE EXCLUDING DISPOSAL FIELD SHALL BE SCHEDULE 40 PVC.

17.) ALL LATERALS MUST BE CAPPED AND HAVE NO MORE THAN A 2" SLOPE PER 100 FEET.
EACH LATERAL SHALL HAVE A VENT HOLE.

18.) THE D-BOX MUST BE INSTALLED AS PER N.J.A.C. 7:9A-9.4 211 & 9.4 51, 11, 111.

19.) AN INSPECTION PORT SHALL BE INSTALLED IN EACH CORNER OF THE DISPOSAL BED EXTENDING FROM THE LEVEL OF INFILTRATION TO FINISHED GRADE, THE PORT SHALL CONSIST OF SCH 40 PERFORATED PVC PIPES WITH A REMOVABLE CAP.

20.) WHEN HEAVY EXCAVATING EQUIPMENT IS OPERATED WITHIN THE EXCAVATION FOR THE PURPOSE OF PLACEMENT OR COMPACTION OF THE FILL MATERIAL, THIS EQUIPMENT SHALL NOT BE DRIVEN DIRECTLY ON THE EXPOSED BOTTOM OF THE EXCAVATION, A MINIMUM OF ONE FOOT FILL MATERIAL SHALL BE MAINTAINED BELOW THE VEHICLE TRACKS OR WHEELS AT ALL TIMES.

21.) A MINIMUM OF NINE INCHES AND NO MORE THAN EIGHTEEN INCHES OF BACKFILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.

22.) BACKFILL MATERIAL SHALL BE OF EARTH SIMILAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONRY, OR OTHER CONSTRUCTION MATERIAL.

23.) IN NO CASE SHALL THE BACKFILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.

24.) BACKFILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL BED OR EACH OF THE DISPOSAL TRENCHES AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.

25.) HEAVY MACHINERY, RUBBER-TIRE VEHICLES OR OTHER VEHICLES EXERTING A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH SHALL NOT BE PERMITTED TO PASS OVER THE DISPOSAL FIELD AFTER THE FILTER MATERIAL AND DISTRIBUTION NETWORK HAVE BEEN INSTALLED.

26.) TRACKED EQUIPMENT MAY BE USED FOR THE PURPOSE OF BACKFILLING AND FINAL GRADING PROVIDED THAT THIS EQUIPMENT DOES NOT EXERT A PRESSURE ON THE UNDERLYING SOIL IN EXCESS OF EIGHT POUNDS PER SQUARE INCH.

27.) FINAL GRADING SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING DESIGN AND IN SUCH A MANNER THAT SURFACE WATER WILL NOT COLLECT OVER THE DISPOSAL FIELD.

28.) AFTER COMPLETION OF BACKFILLING AND FINAL GRADING, THE BACKFILLED AREA OVER THE DISPOSAL FIELD SHALL BE SEEDED OR SODDED TO ESTABLISH A VEGETATIVE COVER OR OTHERWISE STABILIZED AGAINST EROSION IN A MANNER ACCEPTABLE TO THE ADMINISTRATIVE AUTHORITY.

THE ENGINEER DOES NOT GUARANTEE OR WARRANT THIS DESIGN UNLESS GOLDENBAUM BAILL ASSOCIATES IS RETAINED TO STAKE-OUT THE LOCATION OF THE SEPTIC SYSTEM AND TO INSPECT THE INSTALLATION OF THE SEPTIC SYSTEM.
THE ENGINEER DOES NOT GUARANTEE OR WARRANT THIS DESIGN FOR ANY PERSON OR CORPORATION OTHER THAN THE CLIENT FOR WHOM THE DESIGN WAS CREATED.

1	07/14/97	GENERAL REVISIONS	ABT	JPM

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P.P. 04122
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEPTIC SYSTEM PLAN
PREPARED FOR
LOT 10.04, BLOCK 29
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

DRAWN BY: ABT	CHECKED BY: JPM	SCALE: 1"=60'	DATE: 06/18/97	PROJ. NO: 94-125	2/5
FILE: H:\94-125\SEPTIC					

SOIL LOG #10.04-1 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0- 7"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE MOIST, MANY FINE ROOTS, DISTINCT BOUNDARY
7- 53"	7.5 YR 5/6 STRONG BROWN CLAY LOAM, MOIST, FIRM, MASSIVE MOTTLES 24" TO 70"(COARSE, DISTINCT, COMMON, 5 YR 8/1)
53- 71"	5 YR 4/4 OLIVE SILT LOAM W/ 40% FINE SHALE LOOSE MOIST, SUBANGULAR BLOCKY, GRADUAL WAVY BOUNDARY
71-128"	7.5 4/N DARK GRAY FRACTURED SHALE, WEATHERD SOFT GRAVEL SIZE MOIST, SUBANGULAR BLOCKY

SEEPAGE AT 90"
RIPPABLE BOTTOM

SOIL LOG #10.04-2 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0- 7"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE MOIST, MANY FINE ROOTS, DISTINCT BOUNDARY
7- 47"	7.5 YR 5/6 STRONG BROWN CLAY LOAM, MOIST, FIRM, MASSIVE MOTTLES 24" TO 63" (COARSE, DISTINCT, COMMON, 5 YR 8/1)
47- 66"	5 YR 3/2 DARK REDDISH BROWN SILT LOAM, MOIST, 30% FINE SHALE SUBANGULAR BLOCKY, MOTTLES 47-63" (DISTINCTCOMMON, COARSE 5 YR 8/1) GRADUAL WAVY BOUNDARY
66- 120"	7.5 4/N DARK GRAY FRACTURED SHALE, WEATHERD SOFT 2" THICKNESS SUBANGULAR BLOCKY

MODERATE SEEPAGE AT 72"
RIPPABLE BOTTOM

SOIL LOG #10.04-2 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0- 8"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE MOIST, MANY FINE ROOTS, DISTINCT BOUNDARY
8- 44"	7.5 YR 5/6 STRONG BROWN CLAY LOAM, MOIST, FIRM, MASSIVE MOTTLES 24" TO 48" (COARSE, DISTINCT, COMMON, 5 YR 8/1) CLEAR WAVY BOUNDARY
44- 61"	5 YR 4/4 OLIVE FINE GRADUALY SHALE WITH 30% LOAM, MOIST, SEEPAGE AT 59", SOFT, GRADUAL WAVY BOUNDARY
61- 124"	7.5 4/N DARK GRAY FRACTURED SHALE, WEATHERD SOFT 2" THICKNESS SUBANGULAR BLOCKY

MODERATE SEEPAGE AT 76"
RIPPABLE BOTTOM

PITBAIL #10.04-1 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	83.00	2.00	3.00	6.00				
2	80.50	2.50	3.00	7.50	2.00	6.75	2.52	5.09
2	79.50	2.50	3.00	7.50	1.00	7.50	2.66	2.30
5	78.50	2.50	3.00	7.50	1.00	7.50	2.75	0.93
10	76.00	3.00	3.00	9.00	2.50	8.25	2.89	1.31
10	74.50	3.00	3.00	9.00	1.50	9.00	3.06	0.88
10.	73.00	3.00	3.00	9.00	1.50	9.00	3.18	0.89
10	72.00	3.00	3.00	9.00	1.00	9.00	3.29	0.61
10.	71.00	3.50	3.00	10.50	1.00	9.75	3.37	0.66

24 HR WATER LEVEL: 4.0' DEPTH OF PIT: 76" IMPERMEABLE STRATUM: 10.25 FINAL K=0.66

PITBAIL #10.04-2 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	79.00	2.00	3.00	6.00				
2	76.00	3.20	3.00	9.60	3.00	7.80	0.24	14.04
2	74.50	4.00	3.00	12.00	1.50	10.80	0.43	9.77
2	73.50	4.00	3.00	12.00	1.00	12.00	0.53	7.27
10	71.00	4.30	3.00	12.90	2.50	12.45	0.63	3.80
10	68.50	4.50	3.00	13.50	2.50	13.20	0.89	4.09
10	66.00	5.20	3.00	15.60	2.50	14.55	1.10	4.60

24 HR WATER LEVEL: 2.25' DEPTH OF PIT: 106" IMPERMEABLE STRATUM: 10.25 FINAL K=4.60

PITBAIL #10.04-3 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	101.00	2.00	3.00	6.00				
2	97.00	3.00	3.00	9.00	4.00	7.50	0.58	9.23
2	95.00	3.00	3.00	9.00	2.00	9.00	0.83	5.58
2	93.00	3.33	3.00	9.99	2.00	9.50	1.00	5.93
2	91.00	3.83	3.00	11.49	2.00	10.74	1.16	6.77
2	90.00	4.33	3.00	12.99	1.00	12.24	1.29	3.89
2	89.00	4.50	3.00	13.50	1.00	13.25	1.37	4.23

24 HR WATER LEVEL: 2.0' DEPTH OF PIT: 80" IMPERMEABLE STRATUM: 10.25 FINAL K=4.23

1	07/14/97	GENERAL REVISIONS	ABT	JPM

GOLDENBAUM BAILL ASSOCIATES, INC.
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NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEPTIC SYSTEM PLAN

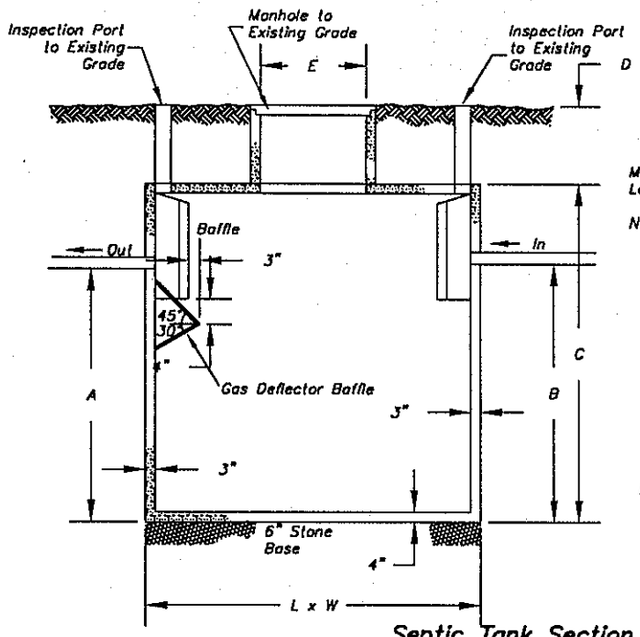
PREPARED FOR

LOT 10.04, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

DRAWN BY: ABT	CHECKED BY: JPM	SCALE: 1"=60'	DATE: 06/18/97	PROJ. NO: 94-125	3/5

FILE: H:\94-125\SEPTIC



Manhole Cover Must be Locked or Bolted

NOTE:
Septic Tank Shall Meet All Requirements of Section 7:9A-8.2 of the Standards for Individual Subsurface Sewage Disposal Systems, Operative Date: 1/1/90

Dimensions	
A	40"
B	42"
C	54"
D	9" Min.
E	24" Dia.
L x W	126"x66"
Capacity	1000 Gallon
Manufacturer	Flemington

Septic Tank Section
NTS

1	07/14/97	GENERAL REVISIONS	ABT	JPM

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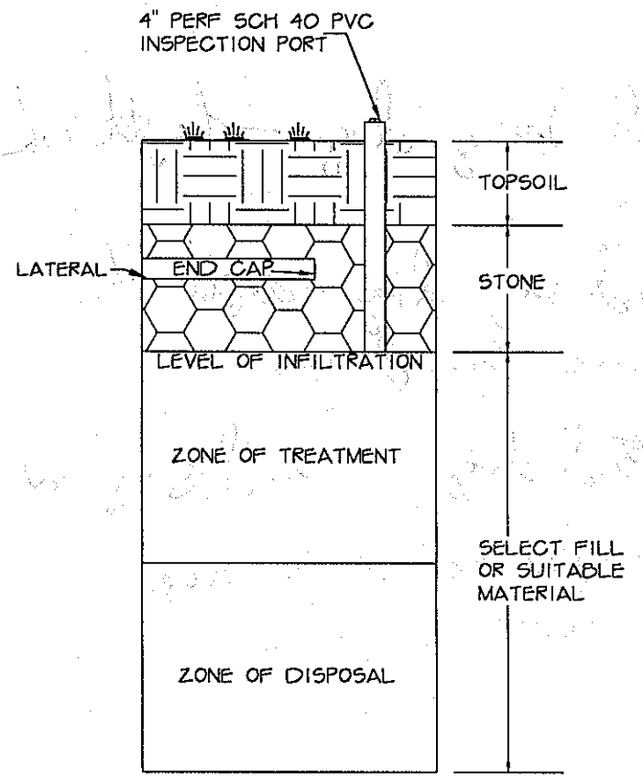
SEPTIC SYSTEM PLAN
PREPARED FOR
LOT 10.04, BLOCK 29
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

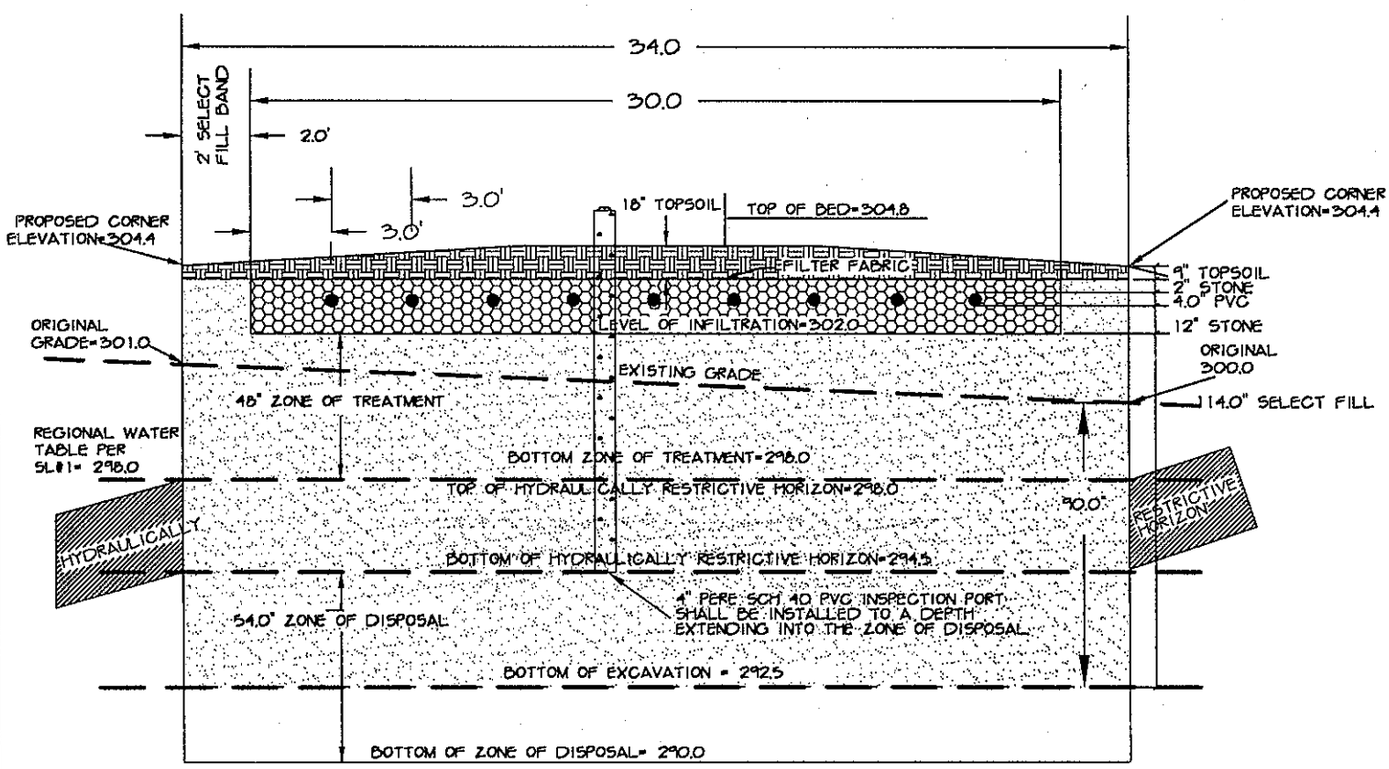
DRAWN BY: ABT	CHECKED BY: JPM	SCALE: 2/16"=60'	DATE: 06/18/97	PROJ. NO: 94-125	5/5

FILE: H:\94-125\SEPTIC



INSPECTION PORT DETAIL

NOT TO SCALE



DISPOSAL BED X-SECTION

NOT TO SCALE

1	07/14/97	GENERAL REVISIONS	ABT	JPM

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SEPTIC SYSTEM PLAN

PREPARED FOR

LOT 10.04, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

DRAWN BY: ABT	CHECKED BY: JPM	SCALE: 2½"=60'	DATE: 06/18/97	PROJ. NO: 94-125	4/5

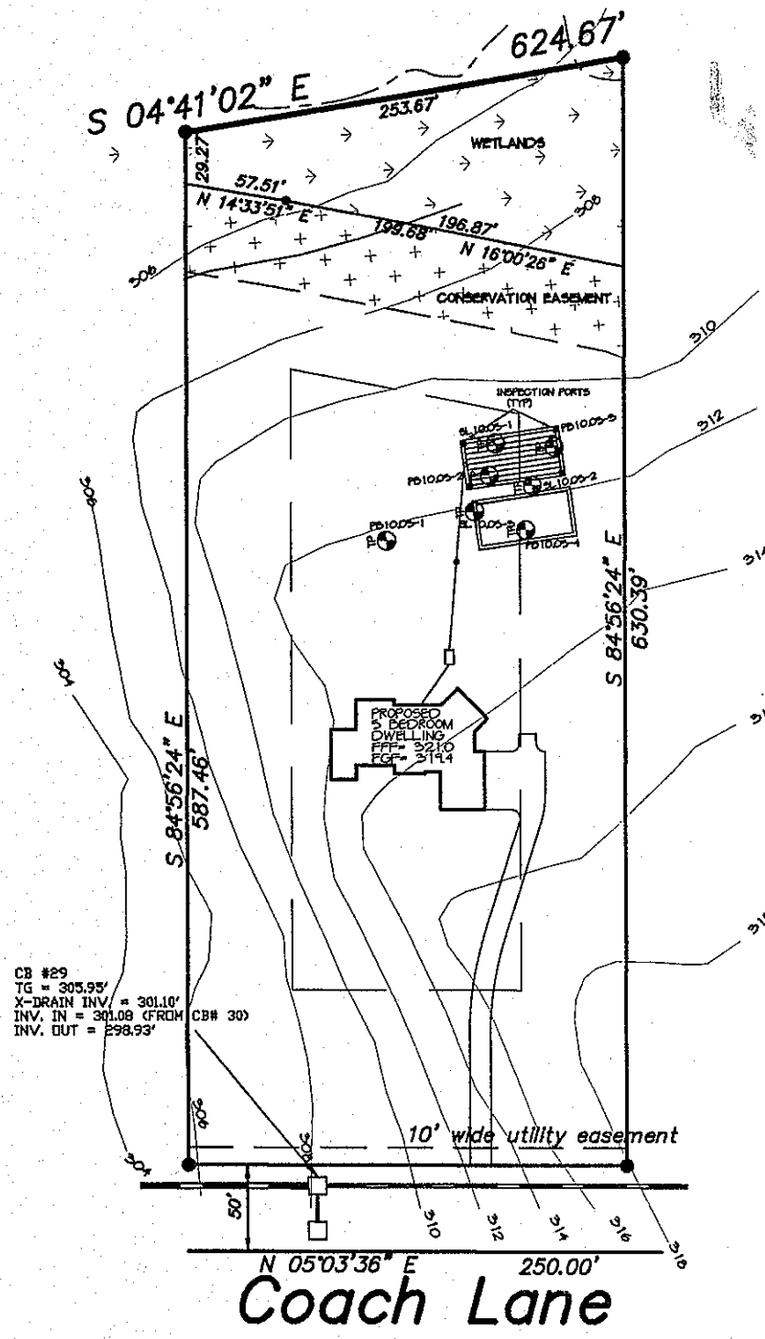
FILE: H\94-125\SEPTIC

99/09

RECEIVED

JUL 14 1999

Hopewell Township Health Dept.



COMPUTATION METHOD:

VOLUME OF SEWAGE BASED ON
5 BEDROOM DWELLING
=(1 X 200)+(4 X 150)=800 GPD
800 X 1.61=1288.0 S.F.
USE 24.0' X 53.7' = 1288.8 S.F.

TAX MAP DATA:

LOT 10.05
BLOCK 29
AREA: 152,233.0 S.F.
3.49 AC.

DESIGN APPROVED

DATE: 7/20/99

HOPEWELL TOWNSHIP HEALTH DEPT

1	7/09/99	REVISED PER HTHD LETTER DATED 07/02/99	ABT	KEB

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SEPTIC SYSTEM PLAN

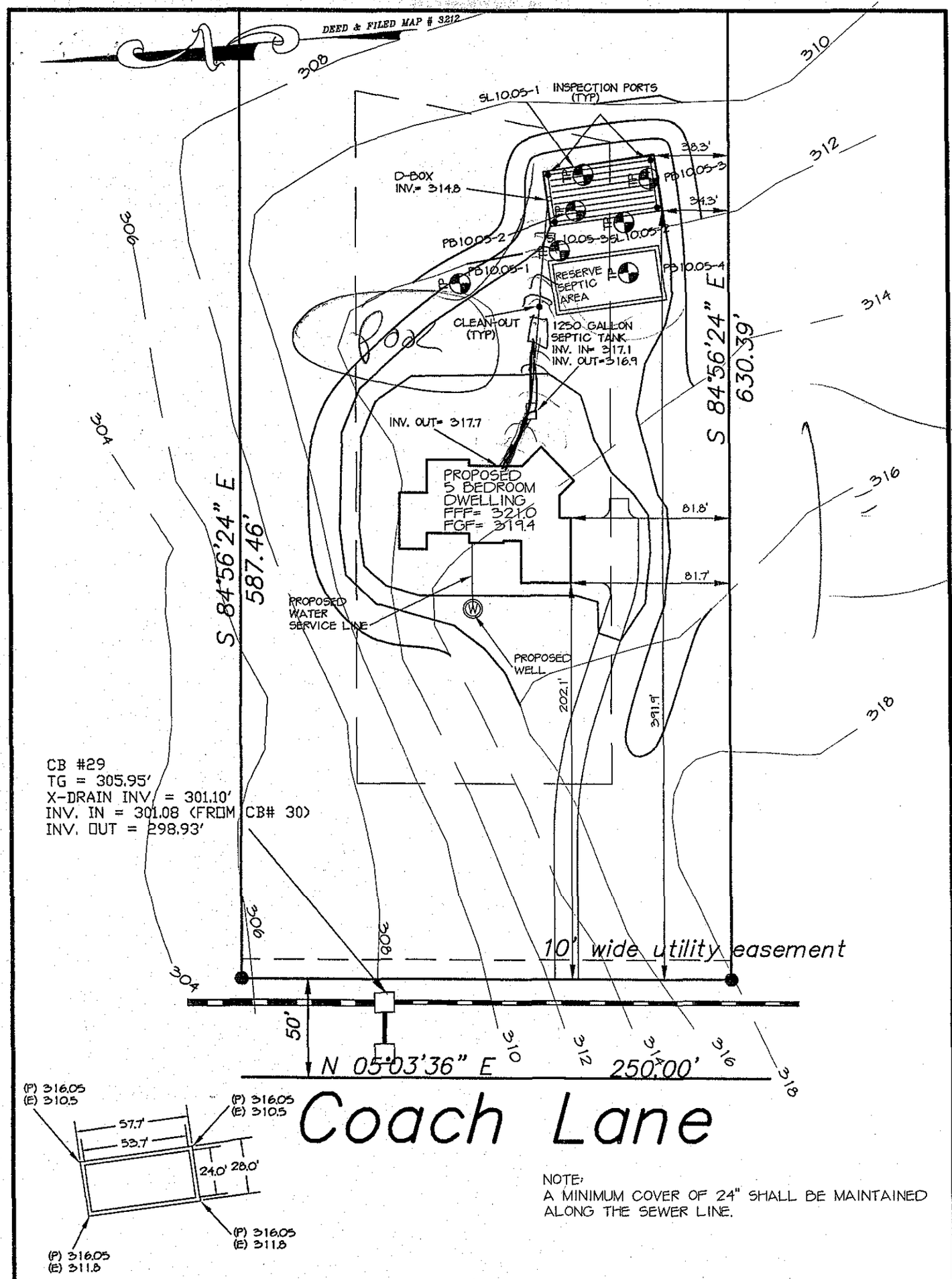
PREPARED OFR

LOT 10.05, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: ABT	CHECKED BY: KEB	SCALE: 1"=100'	DATE: 06/15/99	PROJ. NO: 94-125	1/5

FILE: H:\94-125\S\LOT10.05\PLAN



NOTE:
A MINIMUM COVER OF 24" SHALL BE MAINTAINED ALONG THE SEWER LINE.

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SEPTIC SYSTEM PLAN

PREPARED OFR

LOT 10.05, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: ABT	CHECKED BY: KEB	SCALE: 1"=60'	DATE: 06/15/99	PROJ. NO: 94-125	2/5

FILE: H:\94-125\S\LOT10.05\LOT

SOIL LOG #10.05-1 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0-8"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE MOIST, MANY COARSE ROOTS, DISTINCT BOUNDARY
8-45"	7.5 YR 5/6 STRONG BROWN CLAY LOAM, MOIST, FIRM, MASSIVE MOTTLES 24-70" (COARSE, DISTINCT, COMMON, 5YR 8/1) GRADUAL WAVY BOUNDARY.
45-71"	5Y 5/4 OLIVE SILT LOAM, MOIST, FIRM, SUBANGULAR BLOCKY, 10% SHALE PIECES, MOTTLES FROM 45" TO 70" (DISTINCT, COARSE, COMMON, 5YR 8/1) GRADUAL BOUNDARY.
71-120"	7.5 YR N3/ VERY DARK GRAY FRACTURED SHALE, WEATHERED, 1" TO 3" PIECES. SOFT SEEPAGE AT 85" RIPPABLE BOTTOM, SUBANGULAR BLOCKY.

SOIL LOG #10.05-2 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0-9"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE, MOIST MANY MEDUILM ROOTS, DISTINCT BOUNDARY
9-48"	7.5 YR 5/8 STRONG BROWN CLAY LOAM, MOIST, FIRM, MASSIVE, MOTTLES 24" TO 49" (COARSE, DISTINCT, COMMON, 5 YR 8/1) GRADUAL WAVY BOUNDARY.
48-74"	5Y 5/4 OLIVE FINE GRAVELLY SHALE, SOFT, 20% LOAM, MOIST, GRADUAL BOUNDARY.
74-116"	7.5 YR N/4 DARK GRAY FRACTURED SHALE 2" THICKNESS, SOFT, WATER ACCUMULATING ON RAPIDLY, SEEPAGE 90", RIPPABLE BOTTOM.

SOIL LOG #10.05-3 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0-8"	10 YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE, MOIST, MANY FINE-MEDUIM ROOTS, DISTINCT BOUNDARY
8-50"	7.5 YR 5/6 STRONG BROWN CLAY LOAM, FIRM, MOIST, MASSIVE MOTTLES 24" TO 50" (DISTINCT, MEDUIM, FEW, 5YR 8/1) GRADUAL WAVY BOUNDARY.
50-114"	7.5 YR N3/ VERY DARK GRAY FRACTURED SHALE, PLATTY, VERY SOFT, WEATHERED, SEEPAGE AT 90", SEMI HARD BOTTM.

PITBAIL #10.05-2 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	97.00	2.50	3.00	7.50				
2	91.00	3.17	3.00	9.51	6.00	8.51	0.84	42.08
2	87.00	4.50	3.00	13.50	4.00	11.51	1.25	40.13
2	85.50	5.00	3.00	15.00	1.50	14.25	1.48	19.44
2	83.50	5.00	3.00	15.00	2.00	15.00	1.63	28.17
2	81.50	5.00	3.00	15.00	2.00	15.00	1.80	29.36
2	79.50	5.00	3.00	15.00	2.00	15.00	1.96	30.78

24 HR WATER LEVEL: 4.58' DEPTH OF PIT: 103.0" IMPERMEABLE STRATUM: 8.67' FINAL K=30.78

PITBAIL #10.05-3 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	78.00	2.50	2.50	6.25				
2	74.00	3.33	3.00	9.99	4.00	8.12	2.00	42.6
2	71.00	3.83	3.00	11.49	3.00	10.74	2.29	48.25
2	69.50	4.00	3.00	12.00	1.50	11.75	2.48	29.35
2	68.00	4.33	3.00	12.99	1.50	12.50	2.60	33.94
2	66.50	4.50	3.00	13.50	1.50	13.25	2.73	39.59
2	65.00	4.50	3.00	13.50	1.50	13.50	2.85	45.09

24 HR WATER LEVEL: 4.58' DEPTH OF PIT: 76.0" IMPERMEABLE STRATUM: 8.33' FINAL K=45.09

PITBAIL #10.06-3 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	79.00	2.00	3.00	6.00				
2	76.50	3.00	3.00	9.00	2.50	7.50	2.35	27.10
2	74.00	3.33	3.00	9.99	2.50	9.50	2.56	38.64
2	72.50	3.67	3.00	11.01	1.50	10.50	2.73	28.76
2	71.00	3.83	3.00	11.49	1.50	11.25	2.85	34.09
5	69.00	4.33	3.00	12.99	2.00	12.24	3.00	22.75
5	67.00	4.50	3.00	13.50	2.00	13.25	3.16	30.04

24 HR WATER LEVEL: 5.0' DEPTH OF PIT: 76" IMPERMEABLE STRATUM: 8.83 FINAL K=30.04

1	7/09/99	REVISED PER HTHD LETTER DATED 07/02/99	ABT	KEB

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NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEPTIC SYSTEM PLAN

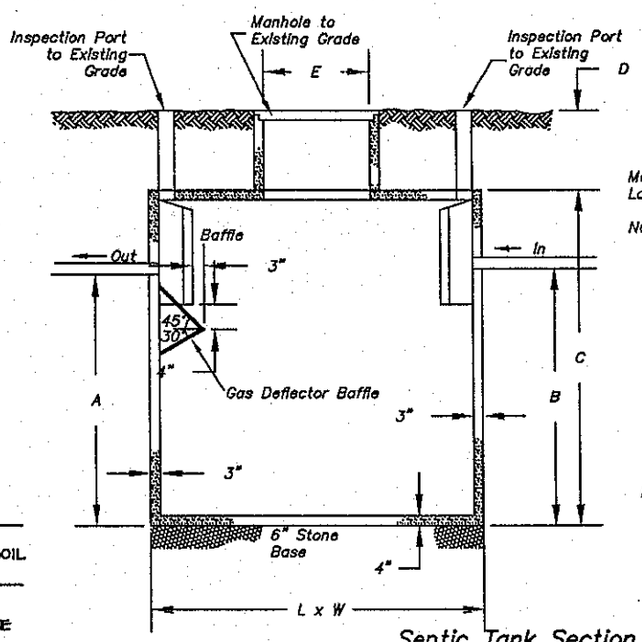
PREPARED FOR

LOT 10.05, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

DRAWN BY: ABT	CHECKED BY: KEB	SCALE: NONE	DATE: 06/08/99	PROJ. NO: 94-125	3/5

FILE: H:\94-125\SEPTICS\LOT10.05\NOTES

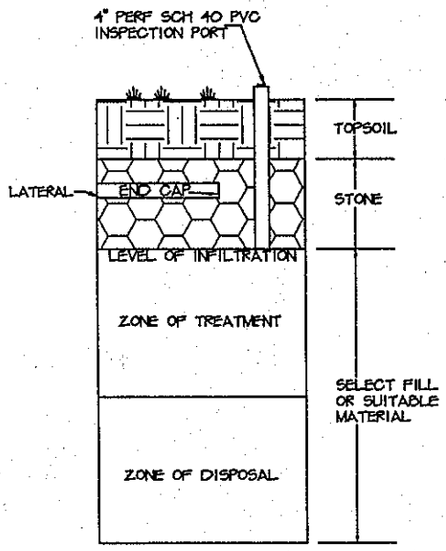


Manhole Cover Must be Locked or Bolted

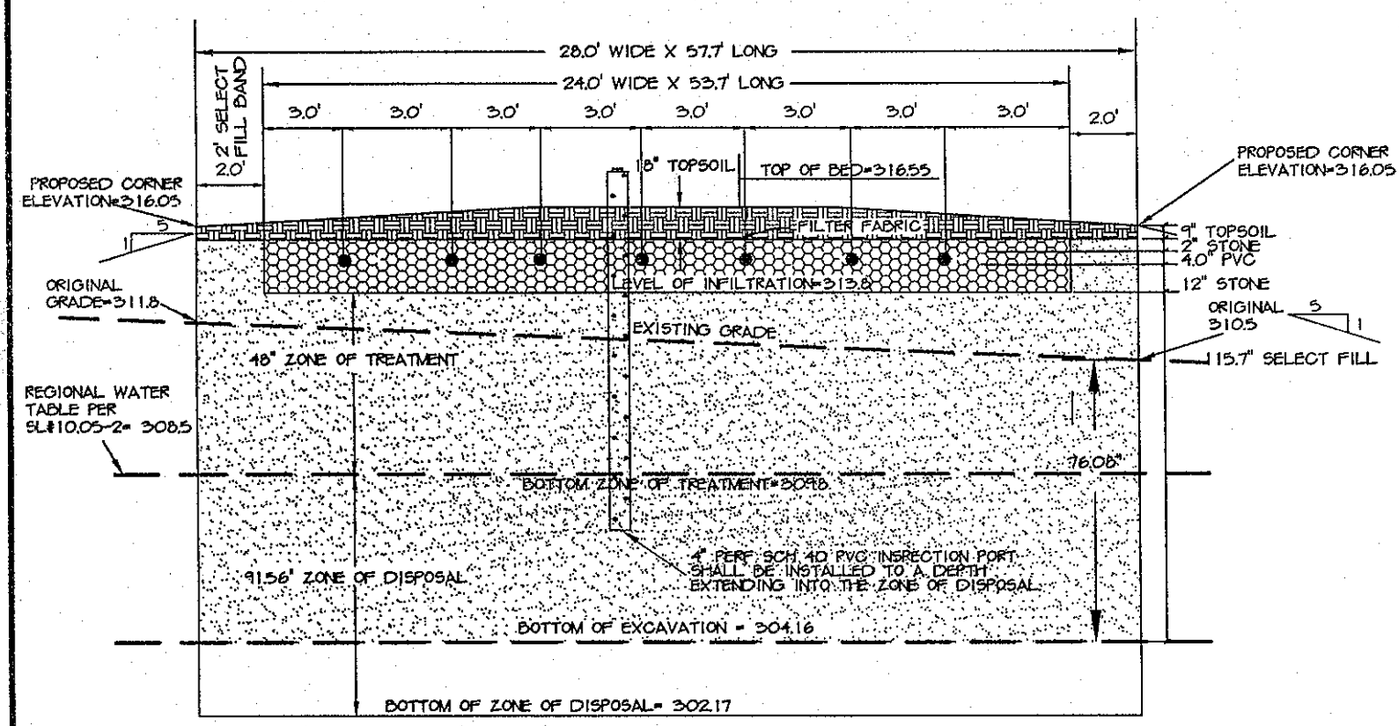
NOTE:
Septic Tank Shall Meet All Requirements of Section 7:9A-8.2 of the Standards for Individual Subsurface Sewage Disposal Systems, Operative Date: 1/1/90

Dimensions	
A	45"
B	47"
C	59"
D	9" Min.
E	24" Dia.
L x W	126"x66"
Capacity	1250 Gallon
Manufacturer Flemington	

Septic Tank Section
NTS



INSPECTION PORT DETAIL
NOT TO SCALE



DISPOSAL BED X-SECTION
NOT TO SCALE

1	7/09/99	REVISED PER HTHD LETTER DATED 07/02/99	ABT	KEB

K. E. Baill

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SEPTIC SYSTEM PLAN
PREPARED FOR
LOT 10.05, BLOCK 29
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JEREY

DRAWN BY: ABT	CHECKED BY: KEB	SCALE: NONE	DATE: 06/08/99	PROJ. NO: 94-125	4/5

FILE: H:\94-125\S\LOT10.05\TANK

NOTES:

1.) MINIMUM SLOPE OF PIPE SHALL BE 1/4" PER FOOT FOR FIELD PIPE.

2.) DISPOSAL SYSTEM SHALL CONSIST OF (7) (4.0") DIA. PVC PERFORATED PIPES IN 24.0' X 53.7' MOUNDED SOIL REPLACEMENT FILL ENCLOSED DISPOSAL FIELD (28.0' X 57.7')EXCAVATION.

3.) ELEVATIONS ARE BASED ON AERIAL TOPOGRAPHY

4.) THERE ARE NO POTABLE WATERWELLS WITHIN 100 OF PROPOSED DISPOSAL AREA.

5.) THIS SEPTIC SYSTEM DESIGN IS BASED ON (5) BEDROOMS DWELLING WITHOUT A DOMESTIC GARBAGE GRINDER.

6.) ALL TREES SHALL BE REMOVED WITHIN 10' OF THE SYSTEM.

7.) A CLEANOUT SHALL BE INSTALLED EVERY 50' FOR GRAVITY FLOW FIELD PIPE.

8.) THIS DESIGN IS BASED ON THE ASSUMED PERMEABILITY RATE OF SELECT FILL (6-20 INCHES/HOUR).

9.) FILL MATERIAL SHALL BE TESTED BY A SOILS TESTING LABORATORY AND CERTIFIED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION.

10.) A TUBE PERMEAMETER TEST SHALL BE CONDUCTED USING SAMPLES OF FILL MATERIAL WHICH HAVE BEEN COMPACTED TO A BULK DENSITY EQUIVALENT TO THAT ACHIEVED IN THE CONSTRUCTION OF THE DISPOSAL FIELD. THE PERMEABILITY CLASS RATING METHOD SHALL ALSO BE REQUIRED TO DETERMINE WHETHER THE FILL MATERIAL USED MEETS THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

11.) THE SELECT FILL USED IN THE ZONE OF TREATMENT SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

12.) THE SELECT FILL USED IN THE ZONE OF DISPOSAL SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)5.

13.) FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS, ONE FOOT OR LESS IN THICKNESS.

14.) COMPACTION MAY BE ACCOMPLISHED MANUALLY OR MECHANICALLY BY TAMPING OR ROLLING, OR BY DRIVING OVER THE FIELD IN A CONTROLLED PATTERN USING TRACKED OR RUBBER TIRED VEHICLES.

15.) 3/4" - 2 1/2" CLEAN CRUSHED STONE: MUST CONFORM WITH NJDOT STANDARD SIZES FOR COURSE AGGREGATE (SIZE #24, #3, OR #4).

16.) ALL FIELD PIPE EXCLUDING DISPOSAL FIELD SHALL BE SCHEDULE 40 PVC.

17.) ALL LATERALS MUST BE CAPPED AND HAVE NO MORE THAN A 2" SLOPE PER 100 FEET.

18.) THE D-BOX MUST BE INSTALLED AS PER N.J.A.C. 7:9A-9.4 211 & 9.4 51, 11, 111.

19.) AN INSPECTION PORT SHALL BE INSTALLED IN EACH CORNER OF THE DISPOSAL BED EXTENDING FROM THE LEVEL OF INFILTRATION TO FINISHED GRADE, THE PORT SHALL CONSIST OF SCH 40 PERFORATED PVC PIPES WITH A REMOVABLE CAP.

20.) WHEN HEAVY EXCAVATING EQUIPMENT IS OPERATED WITHIN THE EXCAVATION FOR THE PURPOSE OF PLACEMENT OR COMPACTION OF THE FILL MATERIAL, THIS EQUIPMENT SHALL NOT BE DRIVEN DIRECTLY ON THE EXPOSED BOTTOM OF THE EXCAVATION, A MINIMUM OF ONE FOOT FILL MATERIAL SHALL BE MAINTAINED BELOW THE VEHICLE TRACKS OR WHEELS AT ALL TIMES.

21.) A MINIMUM OF NINE INCHES AND NO MORE THAN EIGHTEEN INCHES OF BACKFILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.

22.) BACKFILL MATERIAL SHALL BE OF EARTH SIMILAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONRY, OR OTHER CONSTRUCTION MATERIAL.

23.) IN NO CASE SHALL THE BACKFILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.

24.) BACKFILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL BED OR EACH OF THE DISPOSAL TRENCHES AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.

25.) HEAVY MACHINERY, RUBBER-TIRE VEHICLES OR OTHER VEHICLES EXERTING A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH SHALL NOT BE PERMITTED TO PASS OVER THE DISPOSAL FIELD AFTER THE FILTER MATERIAL AND DISTRIBUTION NETWORK HAVE BEEN INSTALLED.

26.) TRACKED EQUIPMENT MAY BE USED FOR THE PURPOSE OF BACKFILLING AND FINAL GRADING PROVIDED THAT THIS EQUIPMENT DOES NOT EXERT A PRESSURE ON THE UNDERLYING SOIL IN EXCESS OF EIGHT POUNDS PER SQUARE INCH.

27.) FINAL GRADING SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING DESIGN AND IN SUCH A MANNER THAT SURFACE WATER WILL NOT COLLECT OVER THE DISPOSAL FIELD.

28.) AFTER COMPLETION OF BACKFILLING AND FINAL GRADING, THE BACKFILLED AREA OVER THE DISPOSAL FIELD SHALL BE SEEDED OR SODDED TO ESTABLISH A VEGETATIVE COVER OR OTHERWISE STABILIZED AGAINST EROSION IN A MANNER ACCEPTABLE TO THE ADMINISTRATIVE AUTHORITY.

THE ENGINEER DOES NOT GUARANTEE OR WARRANT THIS DESIGN UNLESS GOLDENBAUM BAILL ASSOCIATES IS RETAINED TO STAKE-OUT THE LOCATION OF THE SEPTIC SYSTEM AND TO INSPECT THE INSTALLATION OF THE SEPTIC SYSTEM.
THE ENGINEER DOES NOT GUARANTEE OR WARRANT THIS DESIGN FOR ANY PERSON OR CORPORATION OTHER THAN THE CLIENT FOR WHOM THE DESIGN WAS CREATED.

1	7/09/99	REVISED PER HTHD LETTER DATED 07/02/99	ABT	KEB

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SEPTIC SYSTEM PLAN

PREPARED FOR

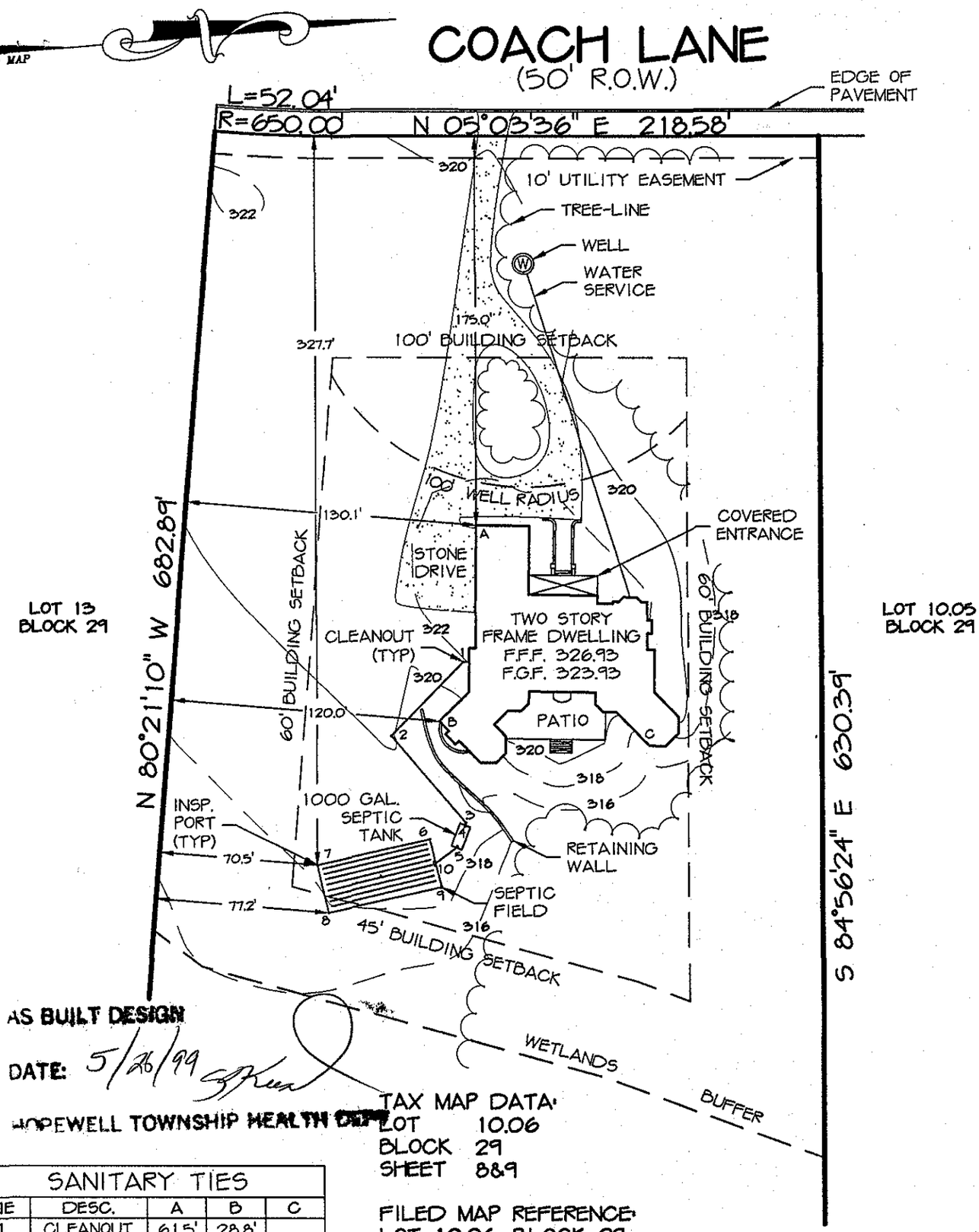
LOT 10.05, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

DRAWN BY: ABT	CHECKED BY: KEB	SCALE: NONE	DATE: 06/08/99	PROJ. NO: 94-125	5/5

FILE: H:\94-125\SEPTICS\LOT10.05\NOTES

FILED MAP



AS BUILT DESIGN

DATE: 5/26/99

HOPEWELL TOWNSHIP HEALTH DEPT

TAX MAP DATA:
LOT 10.06
BLOCK 29
SHEET 8&9

SANITARY TIES				
TIE	DESC.	A	B	C
1	CLEANOUT	61.5'	28.8'	
2	CLEANOUT	102.2'	22.6'	
3	CLEANOUT		47.2'	89.1'
4	CLEANOUT		48.8'	90.4'
5	MANHOLE		57.0'	97.3'
6	INSP. PORT		53.5'	107.1'
7	INSP. PORT		84.5'	158.2'
8	INSP. PORT		99.7'	162.3'
9	INSP. PORT		74.9'	113.0'
10	D-BOX		64.1'	109.5'

FILED MAP REFERENCE:
LOT 10.06, BLOCK 29
"FINAL PLAT OF THE RESERVE"
(FORMERLY ROSEMEADE AT HARBOURTON-SECTION 1B) DATED 11/2/92, REVISED TO 5/8/98, FILED 7/14/98, MAP NO. 3346

NOTES:
CONTAINING 4.48 ACRES OF LAND MORE OR LESS.

K. E. Baill

KENNETH E. BAILL P.E., P.L.S. 30111
P.P. 04122

NEW JERSEY LICENSED PROFESSIONAL PLANNER
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

AS-BUILT SEPTIC & GRADING PLAN

PREPARED FOR

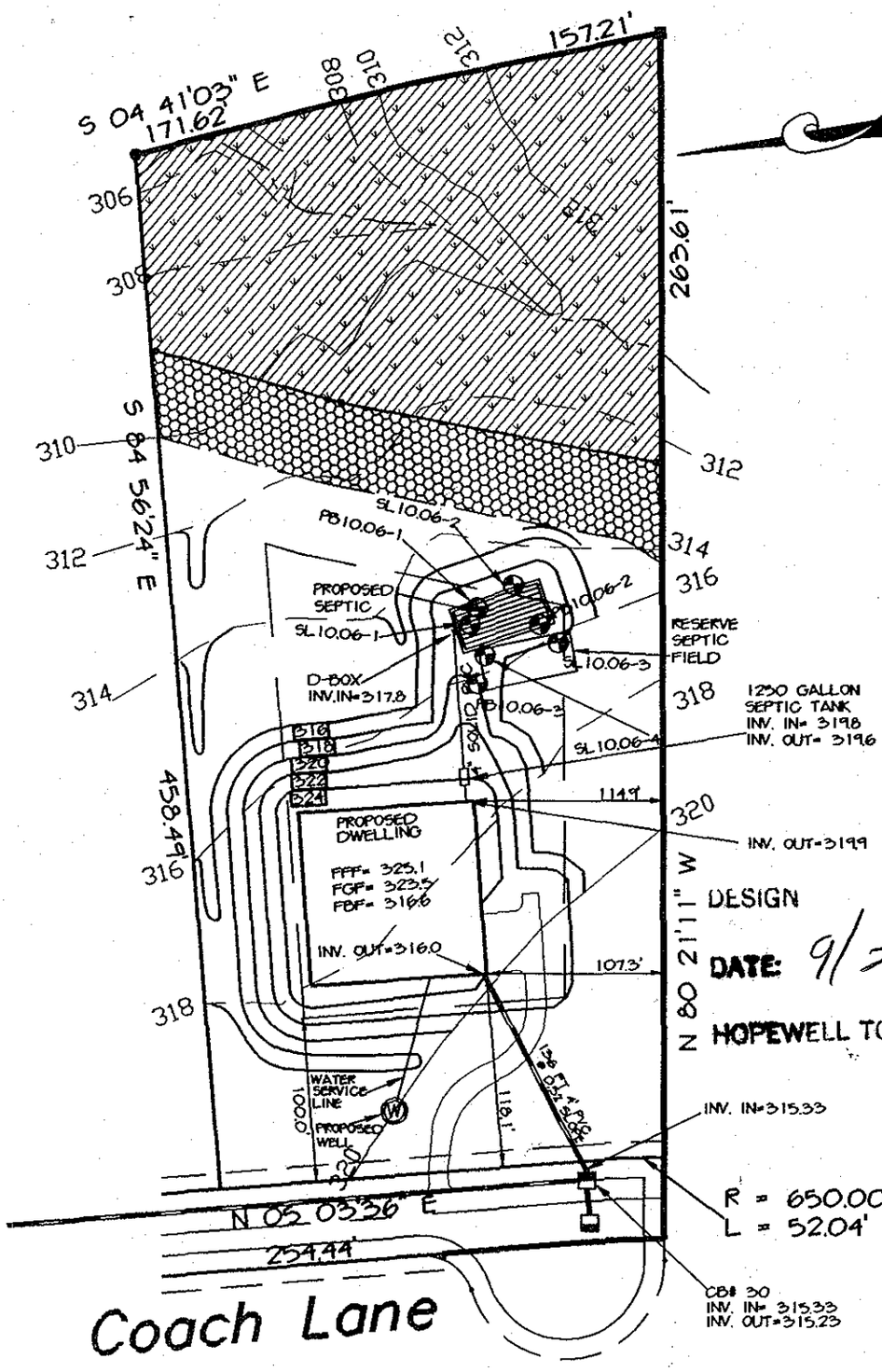
LOT 10.06, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: JFG	CHECKED BY: KEB	SCALE: 1"=60'	DATE: 5/17/1999	PROJ. NO: 94-125
FILE: H\94-125\1006SEPT				

RECEIVED
SEP 18 1997
Hopewell Township Health Dept.

DEED BK. 2000, PG. 846

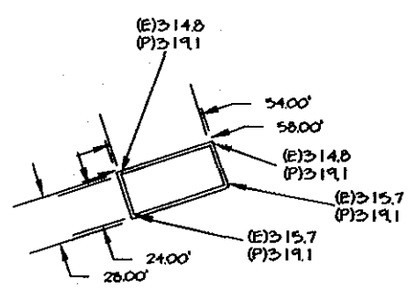


DESIGN APPROVED

DATE: 9/24/97

HOPEWELL TOWNSHIP HEALTH DEPT

BED DIMENSION DETAIL
NOT TO SCALE



TAX MAP DATA:
LOT 10.06
BLOCK 29
AREA: 195,038 S.F.
4.477 AC.

BENCH MARK:
A) CB # 30 IS TO BE USED AS A BENCH MARK FOR CONSTRUCTION OF ALL SEPTIC SYSTEM COMPONENTS
T.C. ELEV.(319.85)

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NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEWAGE DISPOSAL PLAN

PREPARED OFR

LOT 10.06, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: ABT	CHECKED BY: JPM	SCALE: 1"=100'	DATE: 09/05/97	PROJ. NO. 94-125	1/5

FILE: H:\94-125\SL\LOT10.06\SEPTIC

NOTES:

1.) MINIMUM SLOPE OF PIPE SHALL BE 1/4" PER FOOT FOR FIELD PIPE.

2.) DISPOSAL SYSTEM SHALL CONSIST OF (7) (4.0") DIA. PVC PERFORATED PIPES IN 24.0' X 54.0' MOUNDED SOIL REPLACEMENT FILL ENCLOSED DISPOSAL FIELD (28.0' X 58.0')EXCAVATION.

3.) ELEVATIONS ARE BASED ON AERIAL TOPOGRAPHY

4.) THERE ARE NO POTABLE WATERWELLS WITHIN 100 OF PROPOSED DISPOSAL AREA.

5.) THIS SEPTIC SYSTEM DESIGN IS BASED ON (5) BEDROOMS DWELLING WITHOUT A DOMESTIC GARBAGE GRINDER.

6.) ALL TREES SHALL BE REMOVED WITHIN 10' OF THE SYSTEM.

7.) A CLEANOUT SHALL BE INSTALLED EVERY 50' FOR GRAVITY FLOW FIELD PIPE.

8.) THIS DESIGN IS BASED ON THE ASSUMED PERMEABILITY RATE OF SELECT FILL (6-20 INCHES/HOUR).

9.) FILL MATERIAL SHALL BE TESTED BY A SOILS TESTING LABORATORY AND CERTIFIED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION.

10.) A TUBE PERMEAMETER TEST SHALL BE CONDUCTED USING SAMPLES OF FILL MATERIAL WHICH HAVE BEEN COMPACTED TO A BULK DENSITY EQUIVALENT TO THAT ACHIEVED IN THE CONSTRUCTION OF THE DISPOSAL FIELD. THE PERMEABILITY CLASS RATING METHOD SHALL ALSO BE REQUIRED TO DETERMINE WHETHER THE FILL MATERIAL USED MEETS THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

11.) THE SELECT FILL USED IN THE ZONE OF TREATMENT SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

12.) THE SELECT FILL USED IN THE ZONE OF DISPOSAL SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)5.

13.) FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS, ONE FOOT OR LESS IN THICKNESS.

14.) COMPACTION MAY BE ACCOMPLISHED MANUALLY OR MECHANICALLY BY TAMPING OR ROLLING, OR BY DRIVING OVER THE FIELD IN A CONTROLLED PATTERN USING TRACKED OR RUBBER TIRED VEHICLES.

15.) 3/4" - 2 1/2" CLEAN CRUSHED STONE MUST CONFORM WITH NJDOT STANDARD SIZES FOR COURSE AGGREGATE (SIZE #24, #3, OR #4).

16.) ALL FIELD PIPE EXCLUDING DISPOSAL FIELD SHALL BE SCHEDULE 40 PVC.

17.) ALL LATERALS MUST BE CAPPED AND HAVE NO MORE THAN A 2" SLOPE PER 100 FEET.
EACH LATERAL SHALL HAVE A VENT HOLE.

18.) THE D-BOX MUST BE INSTALLED AS PER N.J.A.C. 7:9A-9.4 2:1 & 9.4 5:1, 1:1, 1:1:1.

19.) AN INSPECTION PORT SHALL BE INSTALLED IN EACH CORNER OF THE DISPOSAL BED EXTENDING FROM THE LEVEL OF INFILTRATION TO FINISHED GRADE. THE PORT SHALL CONSIST OF SCH 40 PERFORATED PVC PIPES WITH A REMOVABLE CAP.

20.) WHEN HEAVY EXCAVATING EQUIPMENT IS OPERATED WITHIN THE EXCAVATION FOR THE PURPOSE OF PLACEMENT OR COMPACTION OF THE FILL MATERIAL, THIS EQUIPMENT SHALL NOT BE DRIVEN DIRECTLY ON THE EXPOSED BOTTOM OF THE EXCAVATION. A MINIMUM OF ONE FOOT FILL MATERIAL SHALL BE MAINTAINED BELOW THE VEHICLE TRACKS OR WHEELS AT ALL TIMES.

21.) A MINIMUM OF NINE INCHES AND NO MORE THAN EIGHTEEN INCHES OF BACKFILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.

22.) BACKFILL MATERIAL SHALL BE OF EARTH SIMILAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONRY, OR OTHER CONSTRUCTION MATERIAL.

23.) IN NO CASE SHALL THE BACKFILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.

24.) BACKFILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL BED OR EACH OF THE DISPOSAL TRENCHES AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.

25.) HEAVY MACHINERY, RUBBER-TIRE VEHICLES OR OTHER VEHICLES EXERTING A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH SHALL NOT BE PERMITTED TO PASS OVER THE DISPOSAL FIELD AFTER THE FILTER MATERIAL AND DISTRIBUTION NETWORK HAVE BEEN INSTALLED.

26.) TRACKED EQUIPMENT MAY BE USED FOR THE PURPOSE OF BACKFILLING AND FINAL GRADING PROVIDED THAT THIS EQUIPMENT DOES NOT EXERT A PRESSURE ON THE UNDERLYING SOIL IN EXCESS OF EIGHT POUNDS PER SQUARE INCH.

27.) FINAL GRADING SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING DESIGN AND IN SUCH A MANNER THAT SURFACE WATER WILL NOT COLLECT OVER THE DISPOSAL FIELD.

28.) AFTER COMPLETION OF BACKFILLING AND FINAL GRADING, THE BACKFILLED AREA OVER THE DISPOSAL FIELD SHALL BE SEEDED OR SODDED TO ESTABLISH A VEGETATIVE COVER OR OTHERWISE STABILIZED AGAINST EROSION IN A MANNER ACCEPTABLE TO THE ADMINISTRATIVE AUTHORITY.

THE ENGINEER DOES NOT GUARANTEE OR WARRANT THIS DESIGN UNLESS GOLDENBAUM BAILL ASSOCIATES IS RETAINED TO STAKE-OUT THE LOCATION OF THE SEPTIC SYSTEM AND TO INSPECT THE INSTALLATION OF THE SEPTIC SYSTEM.
THE ENGINEER DOES NOT GUARANTEE OR WARRANT THIS DESIGN FOR ANY PERSON OR CORPORATION OTHER THAN THE CLIENT FOR WHOM THE DESIGN WAS CREATED.

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NEW JERSEY LICENSED PROFESSIONAL LAND SURVEYOR
NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEPTIC SYSTEM PLAN
PREPARED FOR
LOT 10.06, BLOCK 29
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

DRAWN BY: ABT	CHECKED BY: JPM	SCALE: NONE	DATE: 09/05/97	PROJ. NO: 94-125	2/5

FILE: H:\94-125\SEPTICS\LOT10.06\NOTES

SOIL LOG #10.06-1 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0- 10"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE MOIST, FEW FINE ROOTS, DISTINCT BOUNDARY
10- 31"	7.5 YR 5/8 STRONG BROWN CLAY LOAM, MOIST, LOOSE,SUBANGULAR BLOCKY MOTTLES FROM 24" TO 36"(DISTINCT, MEDUIM, COMMON, 5YR 8/1) GRADUAL WAVY BOUNDARY
31-98"	2.5 YR 4/4 OLIVE BROWN FRACTURED SHALE, PLATTY, SOFT BECOMING VERY TIGHT WITH DEPTH, HEAVEY SEEPAGE AT 50" WATER ACCUMULATING RAPIDLY, HARD BOTTOM WEATHERED

SOIL LOG #10.06-2 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0 - 14"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE MOIST, FEW FINE ROOTS, DISTINCT BOUNDARY
14 - 42"	7.5 YR 5/6 STRONG BROWN CLAY LOAM, FRIABLE, MOIST, SUBANGULAR BLOCKY MOTTLES 24" TO 42" (DISTINCT, COARSE, COMMON, 5 YR 8/1)
42- 114"	7.5YR N3/ VERY DARK GRAY FRACTURED SHALE, SOFT, PLATTY , HEAVY SEEPAGE AT 58" , RIPPABLE BOTTOM, WEATHERED

SOIL LOG #10.06-3 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0- 9"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE MOIST, FEW FINE ROOTS, DISTINCT BOUNDARY
9- 35"	7.5 YR 5/6 STRONG BROWN CLAY LOAM, FRIABLE, MOIST, SUBANGULAR BLOCKY MOTTLES 25" TO 56" (COARSE, DISTINCT, COMMON, 5 YR 8/1) GRADUAL VERY WAVY BOUNDARY
35- 58"	10YR 5/3 BROWN CLAY LOAM, FRIABLE, MOIST, SUBANGULAR BLOCKY MOTTLES, COARSE, DISTINCT, COMMON, 5YR 8/1 GRADUAL WAVEY BOUNDARY.
58- 112"	7.5 N/3 VERY DARK GRAY FRACTURED SHALE, PLATTY, SOFT HEAVY SEEPAGE AT 60", HARD BOTTOM, WEATHERED.

SOIL LOG #10.06-4 EXCAVATED ON 4/11/97 AND WITNESSED BY GEORGE KIESEL

0- 7"	10YR 2/2 VERY DARK BROWN SILT LOAM, LOOSE MOIST, FEW FINE ROOTS, DISTINCT BOUNDARY
7- 28"	7.5 YR 5/8 STRONG BROWN CLAY LOAM, FRIABLE, MOIST, SUBANGULAR BLOCKY MOTTLES 24" TO 48" (COARSE, DISTINCT, FEW, 5 YR 8/1)
28- 60"	2.5 Y 4/4 OLIVE BROWN FINE GRADUALLY SHALE W 20% SILT LOAM, SOFT, MOIST, GRADUAL WAVY BOUNDARY
60- 91"	7.5 N/3 VERY DARK GRAY FRACTURED SHALE, BLOCKY, MODERATE SEEPAGE AT 60", SEMI HARD BOTTOM

PITBAIL #10.06-1 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	74.00	4.00	3.00	12.00				
2	70.00	4.50	3.00	13.50	4.00	12.75	1.60	23.40
2	68.00	4.83	3.00	14.49	2.00	14.00	1.85	13.24
2	66.00	5.16	3.00	15.48	2.00	14.99	2.02	14.51
2	64.00	5.58	3.00	16.74	2.00	16.11	2.18	16.01
2	62.00	6.00	3.00	18.00	2.00	17.37	2.35	17.77

24 HR WATER LEVEL: 2.0' DEPTH OF PIT: 78" IMPERMEABLE STRATUM: 7.6 FINAL K=17.77

PITBAIL #10.06-2 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	94.00	3.00	3.00	9.00				
2	89.00	3.67	3.00	11.00	5.00	10.00	1.58	17.88
2	86.00	4.00	3.00	12.00	3.00	11.50	1.91	12.74
2	84.00	4.50	3.00	13.50	2.00	12.75	2.12	7.79
2	82.00	5.00	3.00	15.00	2.00	14.25	2.28	11.01
2	80.00	5.17	3.00	15.50	2.00	15.25	2.45	12.06
2	78.00	5.33	3.00	16.00	2.00	15.75	2.62	12.77

24 HR WATER LEVEL: 2.92' DEPTH OF PIT: 104" IMPERMEABLE STRATUM: 9.17 FINAL K=12.77

PITBAIL #10.06-3 PERFORMED ON 3/17/97, WITNESSED BY GEORGE KIESEL

T	D(IN)	LENGTH	WIDTH	A(FT2)	HR(IN)	AA(FT2)	H(FT)	K
0	80.00	3.33	3.00	10.00				
2	76.00	4.00	3.00	12.00	4.00	11.00	2.17	26.43
2	71.00	4.67	3.00	14.00	5.00	13.00	2.54	42.45
2	68.00	5.17	3.00	15.50	3.00	14.75	2.88	31.73
2	66.00	5.67	3.00	17.00	2.00	16.25	3.08	24.99
2	64.00	6.00	3.00	18.00	2.00	17.50	3.25	28.67
2	62.00	6.00	3.00	18.00	2.00	18.00	3.42	31.67

24 HR WATER LEVEL: 3.5' DEPTH OF PIT: 80" IMPERMEABLE STRATUM: 8.67 FINAL K=31.67

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NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEPTIC SYSTEM PLAN

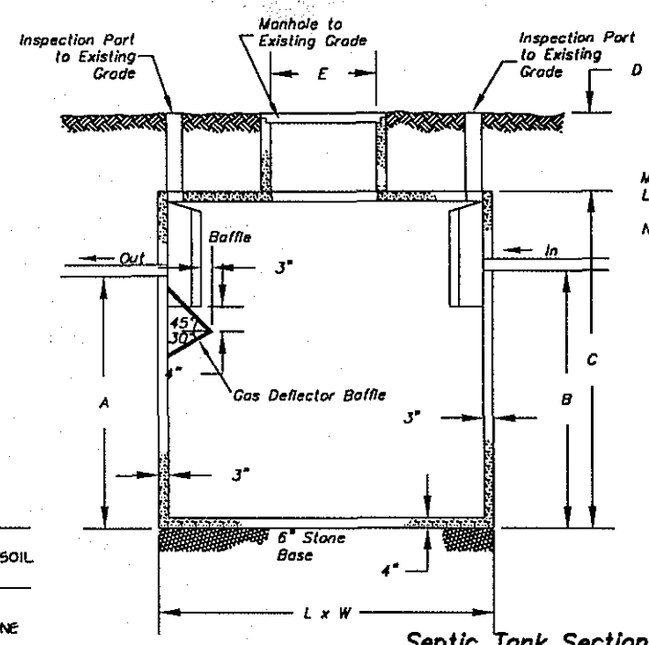
PREPARED FOR

LOT 10.06, BLOCK 29

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERESEY

DRAWN BY: ABT	CHECKED BY: JPM	SCALE: NONE	DATE: 09/05/97	PROJ. NO. 94-125	3/5

FILE: H:\94-125\SEPTICS\LOT10.06\NOTES

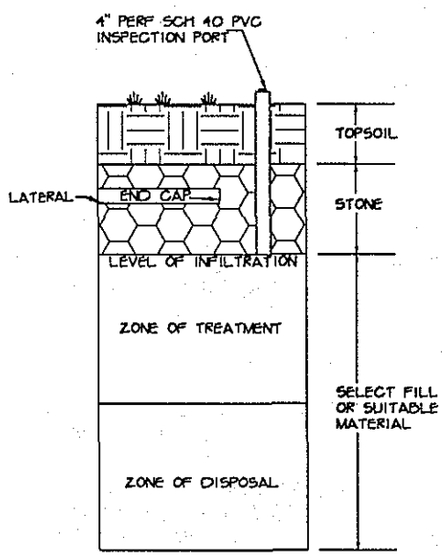


Manhole Cover Must be Locked or Bolted

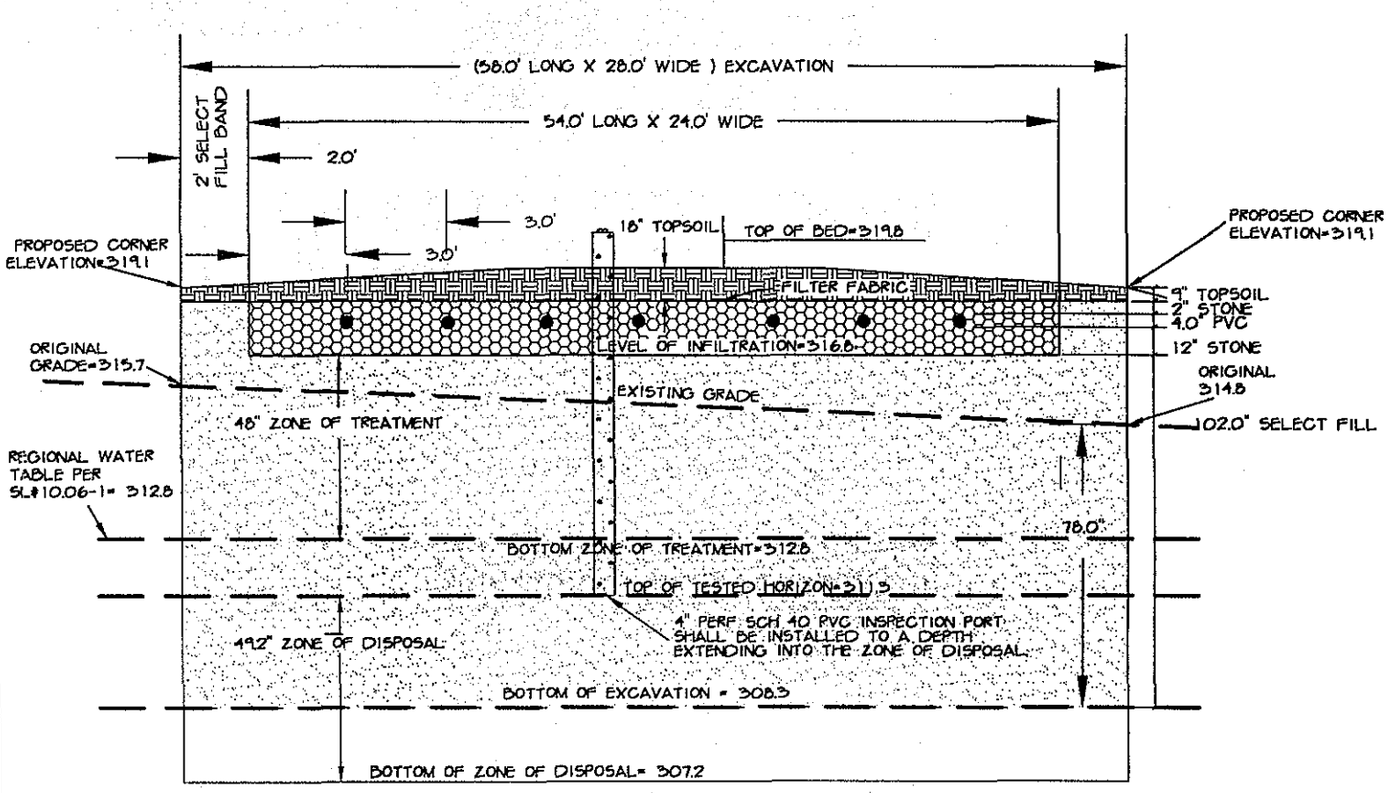
NOTE:
Septic Tank Shall Meet All Requirements of Section 7:9A-8.2 of the Standards for Individual Subsurface Sewage Disposal Systems, Operative Date: 1/1/90

Dimensions	
A	45"
B	47"
C	59"
D	9" Min.
E	24" Dia.
L x W	126"x66"
Capacity	1250 Gallon
Manufacturer	Flemington

Septic Tank Section
NTS



INSPECTION PORT DETAIL
NOT TO SCALE



DISPOSAL BED X-SECTION
NOT TO SCALE

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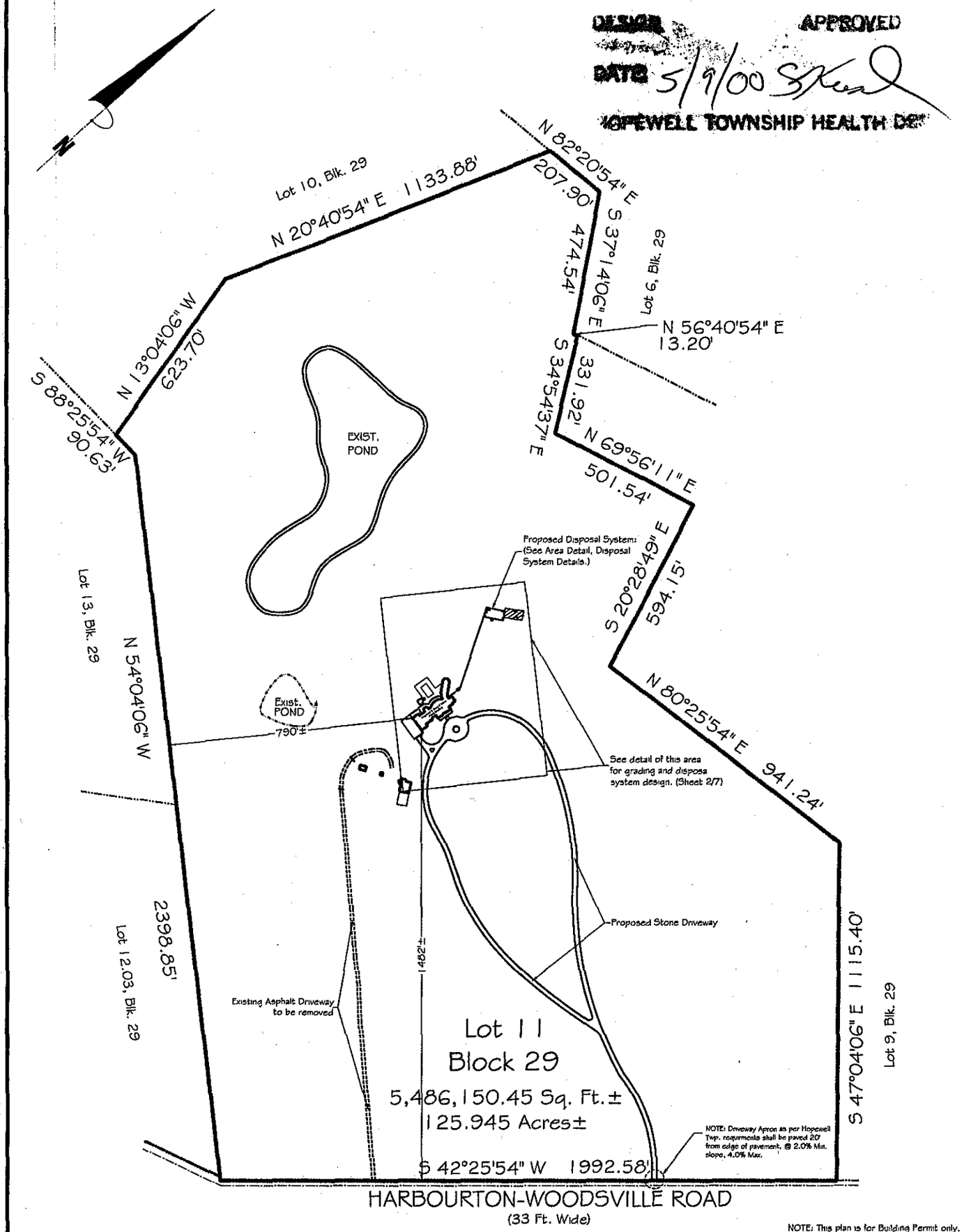
SEPTIC SYSTEM PLAN
PREPARED FOR
LOT 10.06, BLOCK 29
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JEREY

DRAWN BY: ABT	CHECKED BY: JPM	SCALE: NONE	DATE: 09/05/97	PROJ. NO: 94-125	4/5

FILE: H:\94-125\S\LOT10.06\TANK

DESIGN APPROVED
DATE 5/9/00
HOPEWELL TOWNSHIP HEALTH DEPT



NOTE: This plan is for Building Permit only.
NOTE: No garbage grinder/disposal of any type shall be permitted to be connected to this disposal system.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Plot Plan & Disposal System Design

of Lot-11, Block-29 for

Richard Gillespie

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse 03/17/00
Bryce M. Rittenhouse: PE & LS #13453 Date

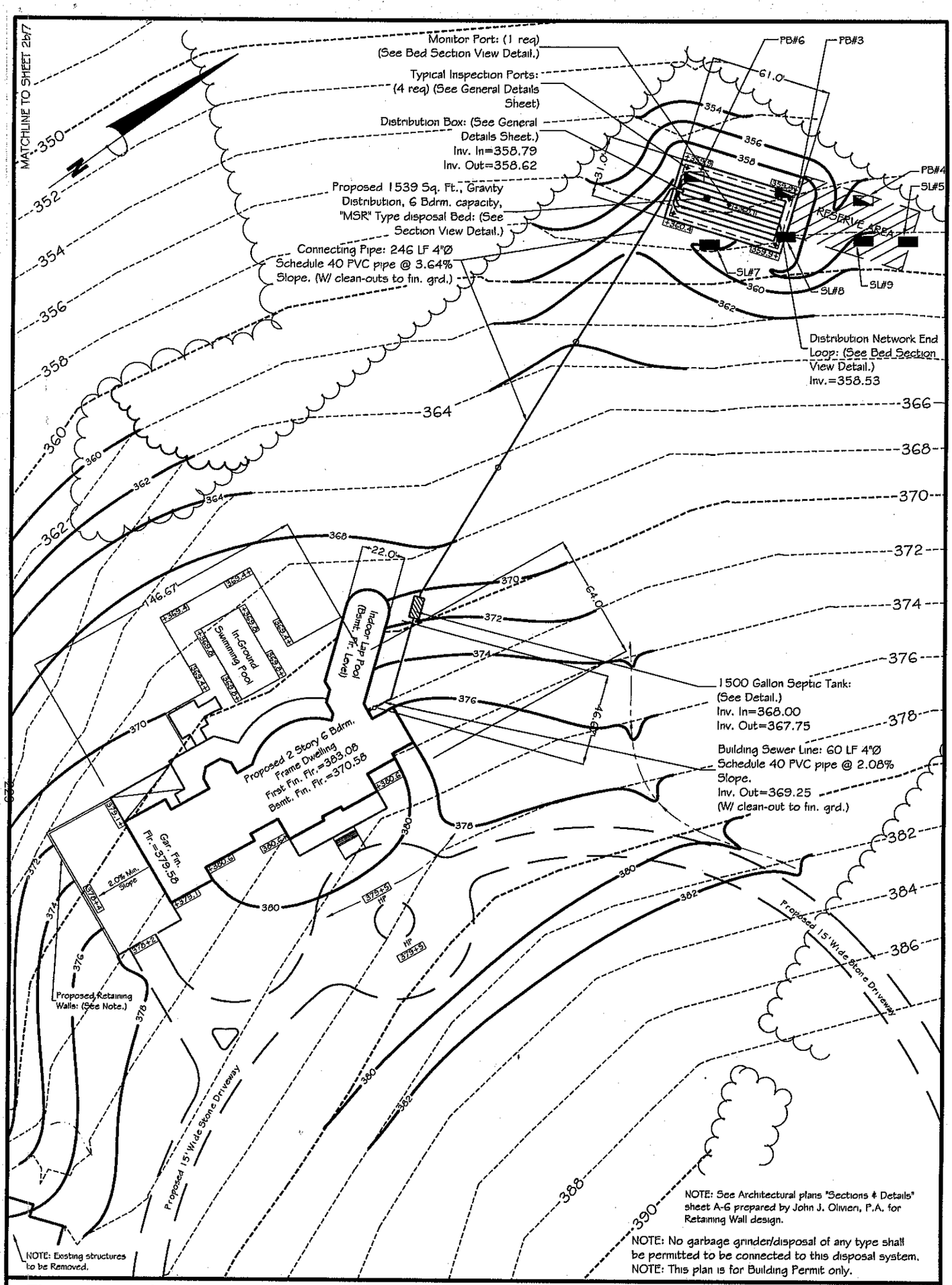
03/17/00
Frank J. Falcone: PLS #32112 & PP #3760 Date

Date: 03/17/00
Scale: 1"=400'
Drawn: JRM
Check: FJF/BMR

1/7

Revisions:

Job#F99013
Dwg:L11b29.dwg
View:Plan
Layers: PLOT PLAN



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* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & LS #13453 — 03/20/00 Date

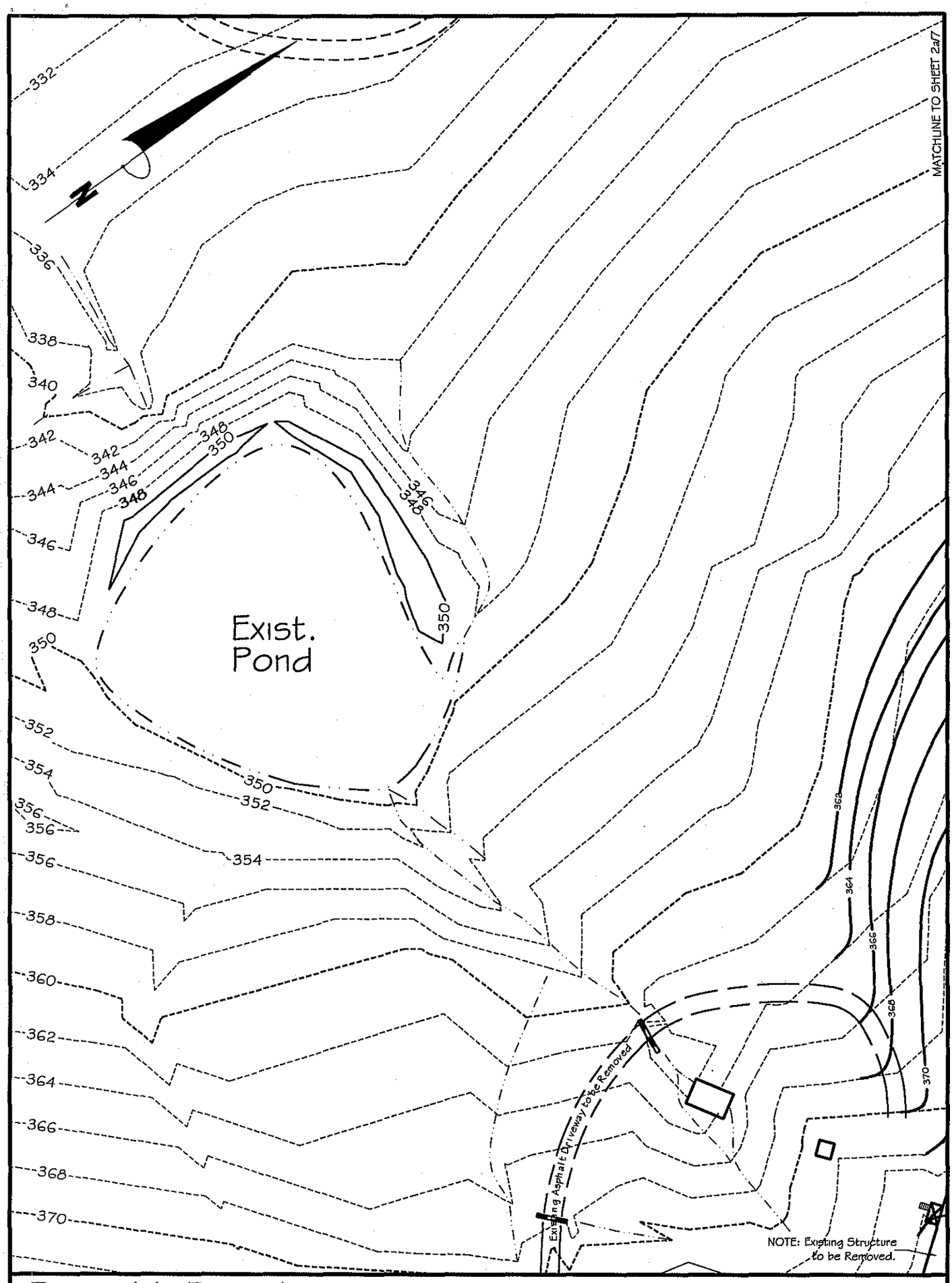
Frank J. Falcone: PLS #32112 & PP #3760 — 03/20/00 Date

Date: 03/20/00
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

Revisions:

Jobf:P29Q13
Dwgf:11x22pjes_a.dwg
Vlset:Rittenhouse
Layout: PLOT_PLAN

2a/7



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* NJ and PA Licensed.

Bryce M. Rittenhouse 03/17/00
Bryce M. Rittenhouse: PE & PLS #13453 Date

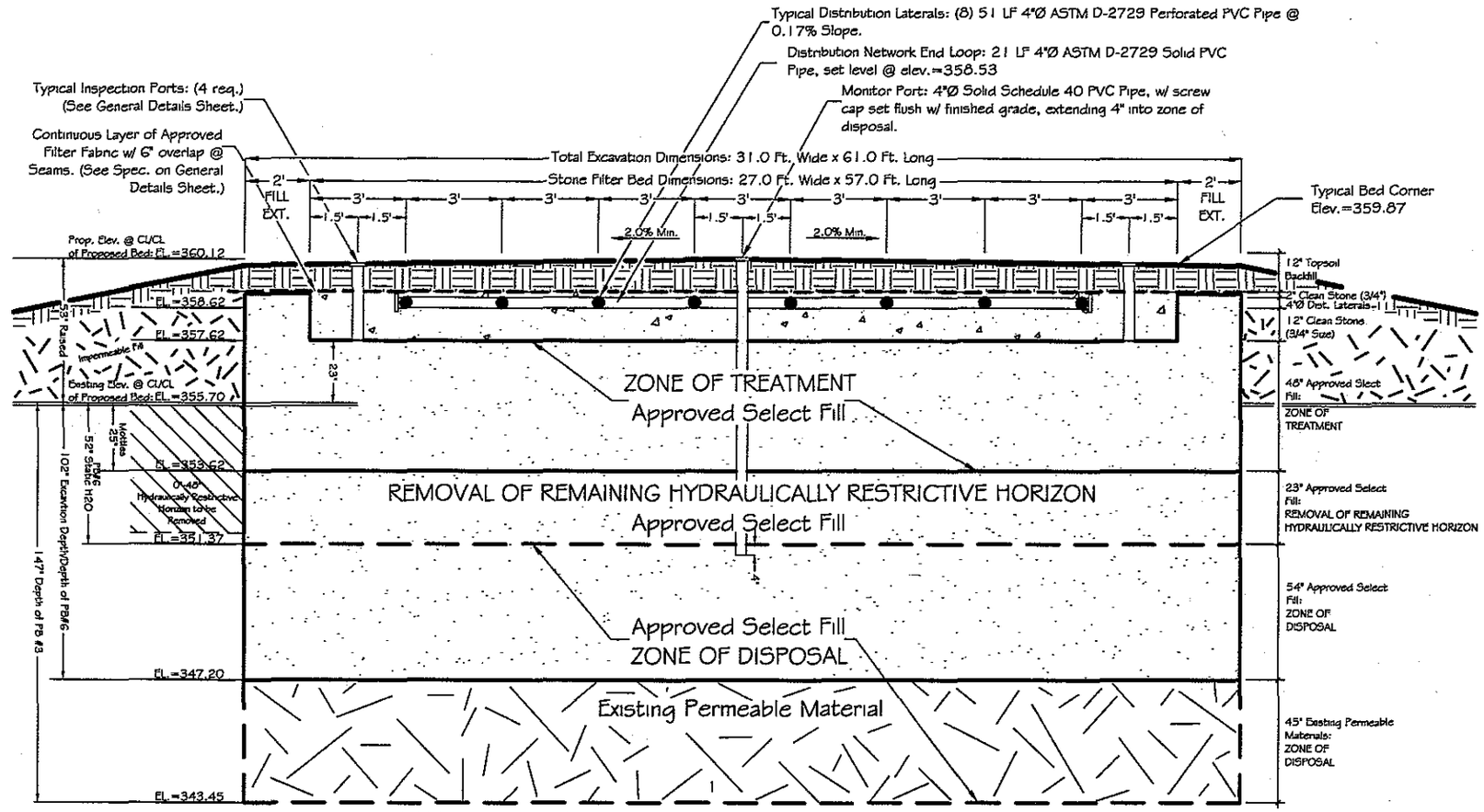
03/17/00
Frank J. Falcone: PLS #32112 & PP #3760 Date

Date: 03/17/00
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

Revisions:

2b/7

Job#:P99013
Dwg:L11b29pp_b.dwg
View:Plan



MOUNDED SOIL REPLACEMENT DISPOSAL BED SECTION VIEW DETAIL:
Scale: 1"=5'

NOTE: The Hopewell Township Health Dept. requires a Soil Permeability Class Rating Test on the stockpiled select fill. The contractor shall notify the Design Engineer 24 hours in advance of the said stockpiling in order to obtain samples of the fill for testing.
The select fill shall not be emplaced untill a passing soil analysis has been obtained.

The distribution network shall not be constructed untill a passing percolation test or tube permeameter test has been performed on the emplaced select fill, to insure proper compaction. The contractor shall notify the Design Engineer 24 hours in advance in order to perform said test.

DISPOSAL BED SIZING CALCULATION:
Proposed 6 Bedroom Dwelling=200 GPD+(5x150 GPD)=950 GPD "Q"
Assume in place select fill @ 3-15 MPI; 1.61 SF/GPD Req'd min. Pressure Dosing
950 GPD x 1.61 SF/GPD= 1529.5 SF Min. Btm. Area (USE 1530 Sq. Ft.)
1530 SF/27' (Prop. bed width)=56.67' (Min. Bed Length/USE 57')
*Note: "MSR" TYpe bed req's 2 Ft. fill extension"
Excavate total btm. area of bed: 31Ft. Wide x 61 Ft. Long (=1891 SF)
Construct stone filter bed: 27 Ft. Wide x 57 Ft. Long (=1539 SF)

Bryce M. Rittenhouse
Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

PJE Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Bryce M. Rittenhouse* PE#PLS No.13453
D. Geoffrey Brown PE#PLS No.24327
Wesley J. Lane* PLS No.30747
Frank J. Falcone PLS No.32112
Peter R. Estkowsky* PLS No.34001
Ted W. Pivovarnick PLS No.35868
Martin D. Katz PLS No.36249
* NJ and PA Licensed.

Bryce M. Rittenhouse PE & PLS #13453 03/20/00 Date
Frank J. Falcone: PLS #32112 & PP #3760 03/20/00 Date

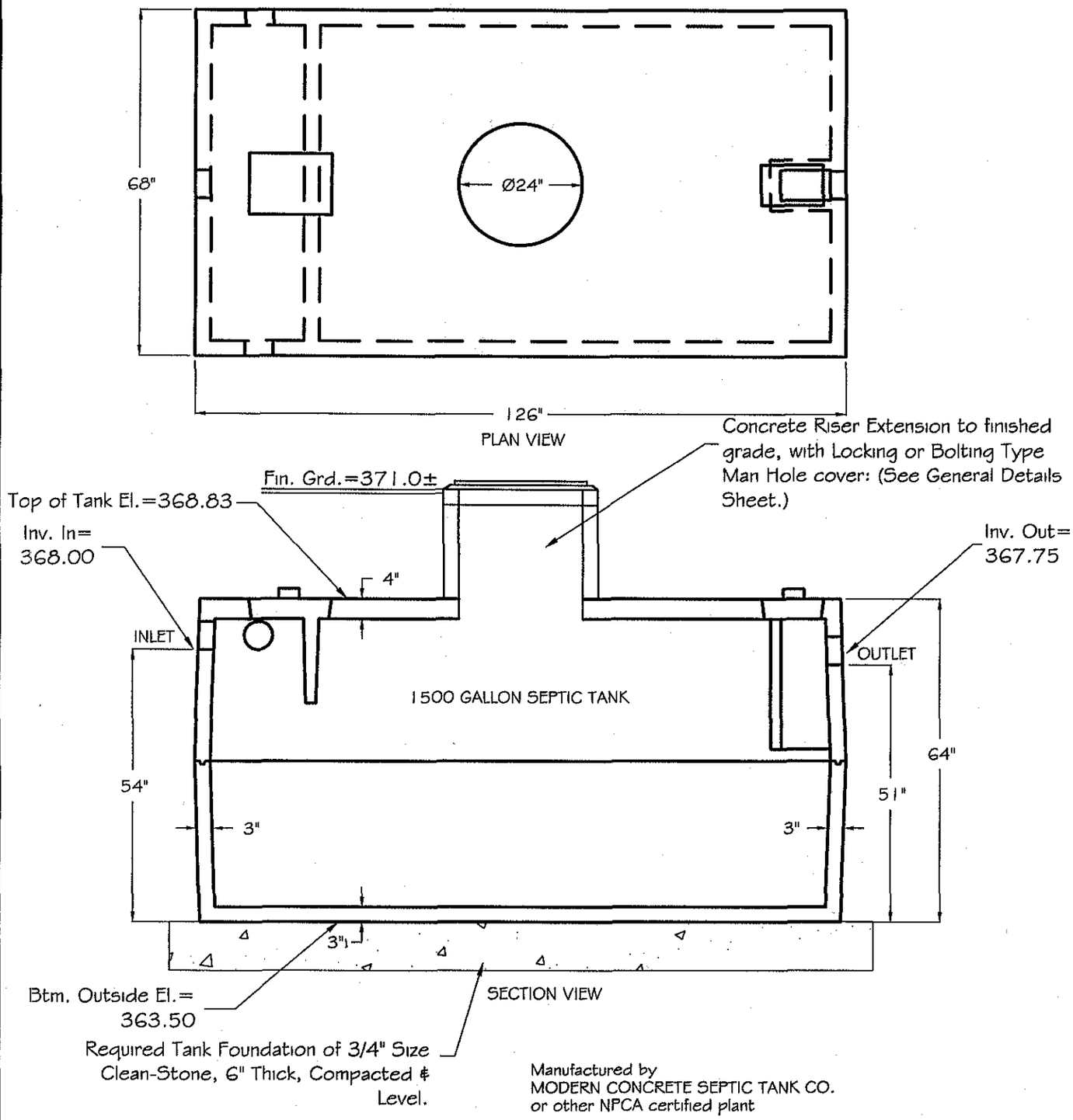
Disposal Bed Section View Detail
of Lot-11, Block-29 for
Ricahrd Gillespie
Hopewell Township • Mercer County • New Jersey

Date: 03/20/00
Scale: 1"=5'
Drawn: JRM
Check: FJF/BMR

Revisions:

Job#:F99013
Dwg:L11b29bs.dwg
View:Plan

3/7



Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

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1500 Gallon Septic tank

of Lot-11, Block-29 for

Richard Gillespie

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
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Ted W. Fivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

Bryce M. Rittenhouse: PE & PLS #13453 — 03/20/00 Date

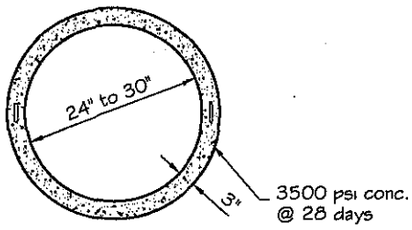
Frank J. Falcone: PLS #32112 & PP #3760 — 03/20/00 Date

Date: 03/20/00
Scale: None
Drawn: JRM
Check: FJF/BMR

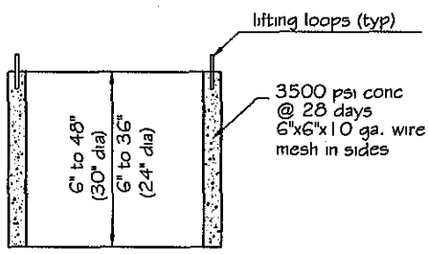
Revisions:

4/7

Job#:F99013
Dwg:L11b29st.dwg
View:Plan



Plan View



Section View

CONCRETE EXTENSION

(nts)

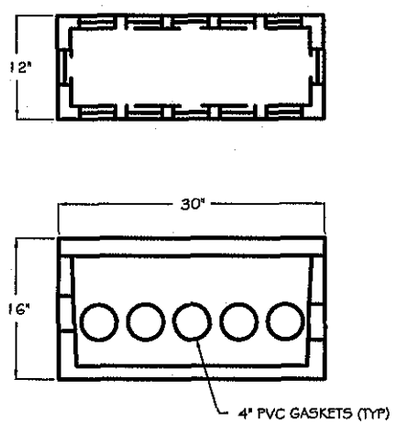
FILTER FABRIC SPECIFICATIONS

TERRATEX SD OR EQUAL

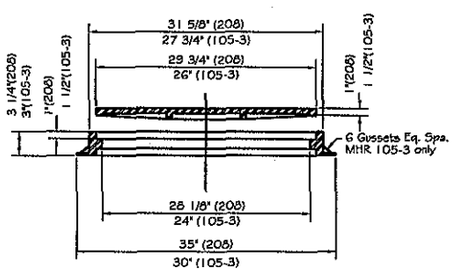
GRAB TENSILE STRENGTH	125 LBS.
MULLEN BURST STRENGTH	275 LBS./SQ. IN.
ELONGATION	80 %
WATER PERMEABILITY COEFFICIENT	-2 CM/SEC.

THE FABRIC IS TO BE LAPPED OVER THE TOP OF STONE A MIN. OF 6"

11 OUTLET DISTRIBUTION BOX



Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant



Specifications:

Specifications are from Quinn. The frame and covers are made of gray iron which meets of exceeds ASTM A48, Class 30B. Other grades of gray iron available upon request. Furnished with standard one coat of black asphaltum paint. Uncoated castings available upon

MHR 105-3:

Round flange manhole frame and cover for Septic Tanks. Shall be provided with a bolting and gasketed cover.

MHR 208 BF:

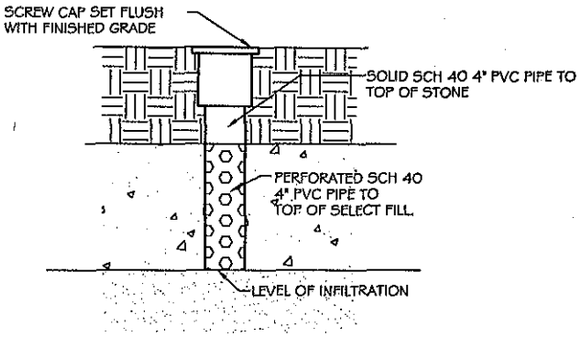
Light duty manhole frame and cover for Dosing Tanks. Shall be provided with a bolting and gasketed cover.

Manhole Frame Detail

no scale

Inspection Port Detail

not to scale



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General Disposal System Details

of Lot-11, Block-29 for

Richard Gillespie

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

Bryce M. Rittenhouse: PE & PLS #13453 — 03/20/00 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 03/20/00 Date

Date: 03/20/00
Scale: None
Drawn: JRM
Check: FJF/BMR

Revisions:

5/7

Job#:F990113
Dwg:L11B29det.dwg
View:Plan

Disposal System Notes

1. Prior to the installation of fill material, the disposal field excavation shall be performed in accordance with N.J.A.C. 7:9a10.3(c) 1 through 5.
2. Work should be scheduled so that the bottom and sidewalls of the excavation will not be exposed to rainfall or windblown silt between time of excavation and time of final inspection and grading.
3. Any loose soil or debris which is washed into or deposited within the excavation shall be removed prior to the construction of the distribution network.
4. Any smeared or compacted soil surfaces within the disposal field excavation shall be removed to expose a fresh soil surface.
5. Excavations in soils other than sands or loamy sands shall not be continued when soil moisture content is above the lower plastic limit. This means when a small lump of soil, taken from the depth of the proposed excavation, can be rolled out with the fingers to form a wire or rod one-eight of an inch in thickness and does not crumble when handled.
6. Clayey soils encountered in the bottom of the excavation shall be removed and replaced with suitable fill.
7. The fill material installed in the zone of disposal shall have a textural analysis (composition by weight of size fraction passing through a two millimeter sieve) 70%+ med.-coarse sand, but not less than 90% total sand. The fill material shall also have a percolation rate faster than 15 minutes per inch.
8. The suitable fill material installed in the zone of treatment shall have a coarse fragment content less than 15% by volume or less than 25% by weight. It shall also have a textural analysis (composition by weight of size fraction passing the two millimeter sieve). from 70% to 90% med.-coarse sand; 0-25% fine sand; 5% to 10% silt & clay ; min. clay 2%, Fill material shall also have a percolation rate of 3 to 15 min/in. or a permeability rate of 6-20 in/hr.
9. All fill material shall be spread and compacted in layers one foot or less in thickness and compacted manually or mechanically, by tamping or rolling, by driving over the filled area in a controlled pattern using tracked or rubber tired vehicles, or by puddling.
10. Heavy excavating equipment shall not be operated directly on the exposed bottom of the excavation. If heavy excavating equipment is used to compact the fill material, the first lift shall be one foot in thickness.
11. The filter material shall consist of washed gravel or crushed stone, free of fines, dust, ashes or clay. It shall conform in size and gradation to size #24, #3 or #4 of the N.J.D.O.T. standard for coarse aggregates.
12. The filter material shall be installed into the disposal system excavation using a backhoe, front end loader or dump truck from the sides.
13. Construction of the distribution network shall be in accordance with 7:9a-10.3(d).
14. PVC distribution laterals shall meet ASTM standards D-2729, D-3033 or D-3034.
15. Filter material is to be covered with drainage fabric as the laying of distribution lines progresses. Drainage fabric shall be overlapped a minimum of 6".
16. Filter fabric shall have a grab tensile strength of 125 lbs., mullen burst strength of 275 lbs., elongation 80% & permeability coefficient of 0.2 cm/sec. Filter fabric shall be Terratex sd or equal.
17. Construction of the distribution box shall be in accordance with 7:9a-9.4.
18. The distribution box shall be set directly on the filter material within the disposal bed.
19. A permanent concrete monument will be installed over the distribution box flush with finished grade.
20. Construction of the connecting pipe or delivery pipe shall be in accordance with 7:9a-9.3.
21. All changes of direction in the soil pipe and connecting pipe shall employ max. 45' fittings and shall include cleanouts.
22. Soil pipe and connecting pipe shall be placed on a stabilized base of quarry blend stone extending to virgin ground.
23. PVC connecting pipes will meet ASTM standard D-2665 - schedule 40, SDR-21 or SDR-26.
24. The building sewer shall be designed and constructed in accordance with the provisions of the state uniform construction code, N.J.A.C. 5:23, adopted pursuant to the uniform construction code act, N.J.S.A. 52:27d119 et seq.
25. Septic tanks shall be precast concrete tanks constructed of concrete conforming to ACI318-16-4.5.1 and 318-16-4.5.2. Certification shall be provided by the manufacturer and the certification displayed on the tank.
26. Septic tank shall be 1500 gal. single compartment tank.
27. All manhole covers and inspection ports in the septic tank shall have water tight bolted or locked caps set flush with finish grade.
28. All interior concrete surfaces shall be sealed with two coatings of an approved inert coating to minimize corrosion. Coating shall be applied prior to delivery by the manufacturer.
29. Septic tanks shall be fabricated and installed in accordance with 7:9a-8.2.
30. A permanent marker shall be placed on grade above the septic tank upon completion of the installation.
31. Backfill and final grading shall be carried out in accordance with 7:9a-10.3(f).
32. Topsoil shall be lightly compacted by tamping or rolling to prevent settlement and shall be seeded and mulched or sodded immediately upon completion of final grading.
33. All trees with drip lines within 10 ft. of the disposal field shall be removed prior to construction.
34. There shall be no existing or proposed disposal systems within 50 ft. of the proposed disposal field.
35. No garbage disposal unit of any kind shall be connected to this disposal system.
36. Backwash from water softeners or other drainage other than sanitary sewage shall not enter the disposal system.
37. All soil evaluation procedures relied upon as a basis for the design of the subject individual subsurface sewage disposal system were carried out by or under the direct supervision of a professional engineer and witnessed by the administrative authority.
38. Vegetative planting in the disposal area shall be limited to grass unless otherwise specified by the administrative authority.
39. An annual inspection of the system shall begin three (3) years after installation or pump out of the septic tank.
40. The disposal system contractor is responsible for confirmation that all materials utilized in the construction of the disposal system are in accordance with N.J.A.C. 7:9a.
41. When placement of the disposal field is proposed in an area of disturbed ground as defined at 7:9a - 5.10, an acceptable state of compaction of the soil or fill material shall be verified by laboratory tests, and the design engineer shall certify a minimum compaction of 90 percent of the standard procter density.
42. All regraded areas shall comply with 7:9a-10.3.
43. Storm sewers within 75 ft. of the disposal system shall be constructed with watertight joints.
44. There shall be no existing or proposed wells within 100 ft. of the proposed disposal field.
45. THIS PLAN IS FOR BUILDING PERMIT ONLY.

General Notes

1. The Health Department shall receive 48 hours notification prior to the start of any construction on the system.
2. Once the excxavation of bed is complete a bottom of excavation inspection shall be performed by the Design Engineer and approved prior to the placement of the select fill.
3. After suitable fill is placed and compacted a min. of 1 permeabilty test shall be performed and approved by the Design Engineer, and if required the test shall be witnessed by the Health Department prior to the placement of stone.
4. The results of the select fill analysis shall be forwarded to the Health Department (see note No.8 in the Disposal System notes)
5. All manholes covers and inspection port caps inthe septic tank shall have water tight bolted or locked caps.
6. All interior concrete surfaces shall be sealed with 2 coatings of an "approved inert coating to minimize corrosion, coating shall be applied prior to delivery by the manufacturer.
7. The 'D' box shall sit in the disposal bed area on the filter material.
8. This plan is for building permit only.
9. No existing/proposed wells or disposal systems within 100 ft. of the proposed disposal field and well.

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General Disposal System Notes
of Lot-11, Block-29 for
Richard Gillespie
Hopewell Township * Mercer County * New Jersey

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* NJ and PA Licensed.

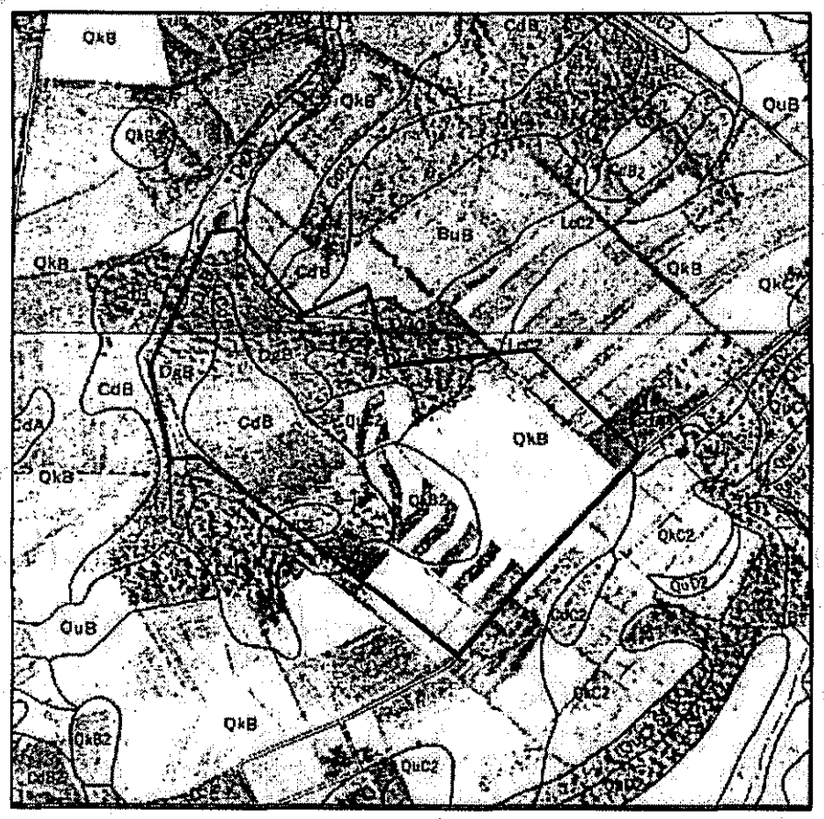
Bryce M. Rittenhouse: PE & LS #13453 — 03/20/00 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 03/20/00 Date

Date: 03/20/00
Scale: None
Drawn: JRM
Check: FJF/BMR

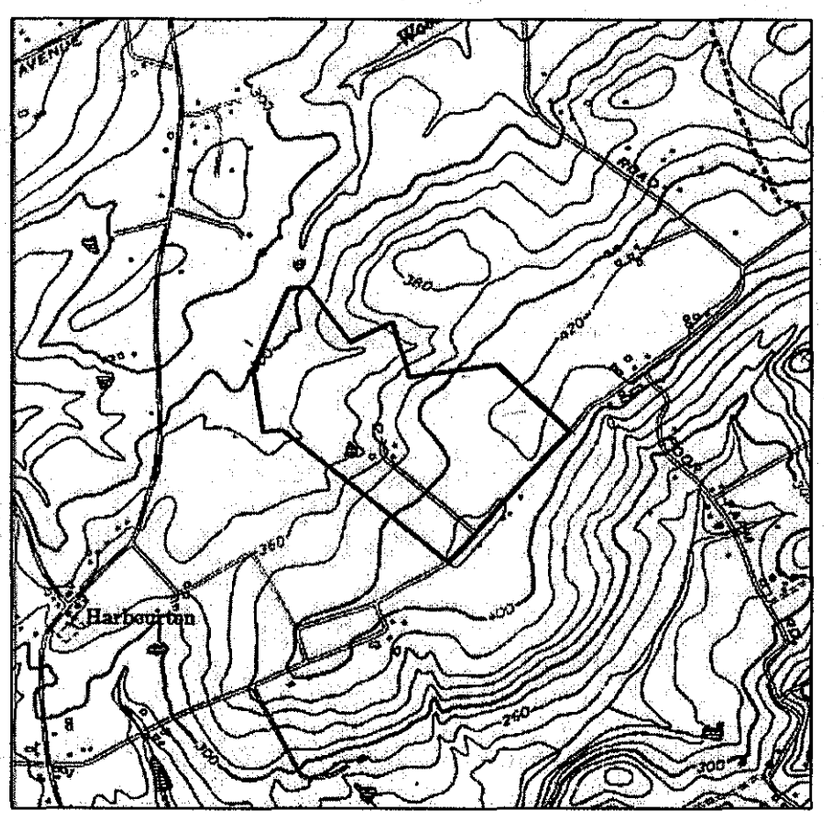
Revisions:

6/7



MERCER CO. SOIL SURVEY MAP:

Sheets #2 & #7; Scale 1"=1320'



U.S.G.S. QUADRANGLE MAP:

Hopewell Quad.; Scale 1"=2000'

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Key Maps

of Lot-11, Block-29 for

Richard Gillespie

Hopewell Township • Mercer County • New Jersey

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Bryce M. Rittenhouse: PE & PLS #13453 — 03/20/00 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 03/20/00 Date

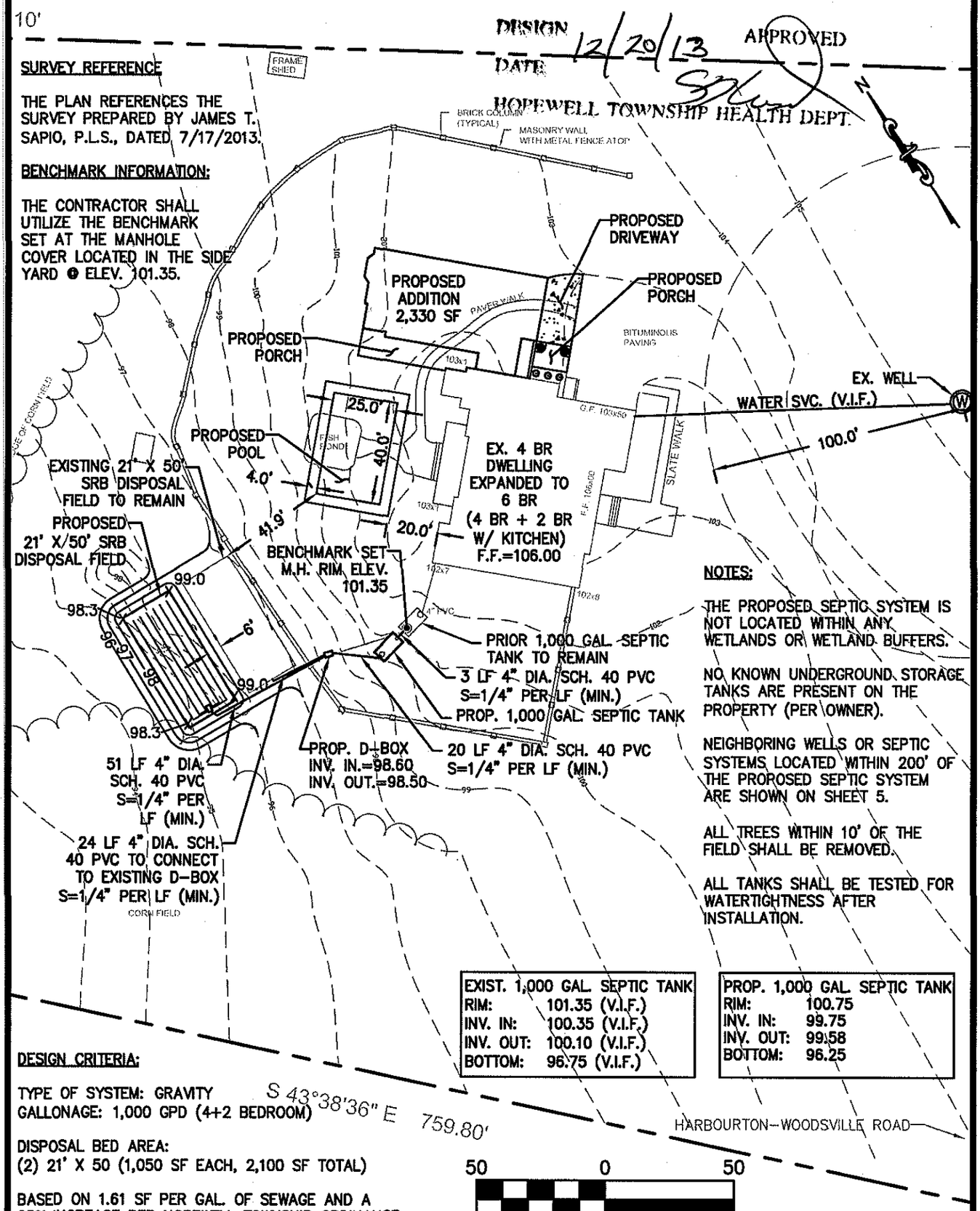
Date: 03/20/00
Scale: As Shown
Drawn: JRM
Check: FJF/BMR

Revisions:

7/7

Job#:1990113
Dwg:L1 1x28Key-Jwg
View:Plan

DISIGN DATE 12/20/13 APPROVED
HOPEWELL TOWNSHIP HEALTH DEPT.



SURVEY REFERENCE

THE PLAN REFERENCES THE SURVEY PREPARED BY JAMES T. SAPIO, P.L.S., DATED 7/17/2013.

BENCHMARK INFORMATION:

THE CONTRACTOR SHALL UTILIZE THE BENCHMARK SET AT THE MANHOLE COVER LOCATED IN THE SIDE YARD ● ELEV. 101.35.

NOTES:

THE PROPOSED SEPTIC SYSTEM IS NOT LOCATED WITHIN ANY WETLANDS OR WETLAND BUFFERS.

NO KNOWN UNDERGROUND STORAGE TANKS ARE PRESENT ON THE PROPERTY (PER OWNER).

NEIGHBORING WELLS OR SEPTIC SYSTEMS LOCATED WITHIN 200' OF THE PROPOSED SEPTIC SYSTEM ARE SHOWN ON SHEET 5.

ALL TREES WITHIN 10' OF THE FIELD SHALL BE REMOVED.

ALL TANKS SHALL BE TESTED FOR WATERTIGHTNESS AFTER INSTALLATION.

EXIST. 1,000 GAL. SEPTIC TANK	
RIM:	101.35 (V.I.F.)
INV. IN:	100.35 (V.I.F.)
INV. OUT:	100.10 (V.I.F.)
BOTTOM:	96.75 (V.I.F.)

PROP. 1,000 GAL. SEPTIC TANK	
RIM:	100.75
INV. IN:	99.75
INV. OUT:	99.58
BOTTOM:	96.25

DESIGN CRITERIA:

TYPE OF SYSTEM: GRAVITY
GALLONAGE: 1,000 GPD (4+2 BEDROOM)

DISPOSAL BED AREA:
(2) 21' X 50 (1,050 SF EACH, 2,100 SF TOTAL)

BASED ON 1.61 SF PER GAL. OF SEWAGE AND A 25% INCREASE PER HOPEWELL TOWNSHIP ORDINANCE (2.0125 EFFECTIVE RATE)
1,000 GPD X 2.0125 SF/GPD = 2,012.5 SF REQUIRED

ZONE OF TREATMENT SOILS:
SELECT FILL: 48" N.J.A.C. 7:9A FILL SPEC MATERIAL

ZONE OF DISPOSAL SOILS:
SELECT FILL: 48" N.J.A.C. 7:9A FILL SPEC MATERIAL

PROP. SEPTIC TANKS:
(1) EXIST. 1,000 GAL. TO REMAIN
(1) PROP. 1,000 GAL.

50 0 50
SCALE 1" = 50 FT

TITLE:
147 HARBOURTON WOODSVILLE ROAD
INDIVIDUAL SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

Engineering & Land Planning Associates, Inc.
54 OLD HIGHWAY 22, SUITE 300 CLINTON, NJ 08809
(908) 238-0544 FAX: (908) 238-9572
C.O.A. #: 24GA28021500
A PROFESSIONAL ASSOCIATION

LOCATION:
BLOCK 29 LOT 12.03
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

WAYNE J. INGRAM P.E. LICENSE #24GE048393 DATE 11/26/13

NO.	REVISION	BY	DATE
1	REV. PER COMMENTS	PMH	11/26/13

DATE: 7/19/13			
PROJECT NO.: 13099	DESIGNED BY: KTP	CHECKED BY: WJI	
FILENAME: SITE.DWG	SCALE: 1" = 50'	SHEET NO.: 1 OF 5	

GENERAL NOTES

1. ALL CONSTRUCTION PRACTICES AND PROCEDURES SHALL BE IN COMPLIANCE WITH N.J.A.C. 7:9A.
2. ALL CONSTRUCTION PRACTICES AND PROCEDURES SHALL BE IN COMPLIANCE WITH THE MERCER COUNTY (AND/OR HOPEWELL TOWNSHIP) BOARD OF HEALTH.

EXCAVATION

1. EXCAVATION FOR THE DISPOSAL FIELD SHALL BE IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:
   a. ADEQUATE MEASURES SHALL BE USED TO INSURE THAT THE BOTTOM OF THE DISPOSAL BED IS LEVEL.
   b. IN SOIL TEXTURES OTHER THAN SANDS OR LOAMY SANDS, EXCAVATION WHICH EXPOSES THE INFILTRATIVE SURFACE OF THE DISPOSAL FIELD SHALL NOT BE CARRIED OUT WHEN THE SOIL MOISTURE CONTENT IS ABOVE THE LOWER PLASTIC LIMIT. THIS MEANS THAT WHEN A SMALL LUMP OF SOIL, TAKEN FROM THE DEPTH OF THE PROPOSED EXCAVATION, CAN BE ROLLED OUT WITH THE FINGERS TO FORM A WIRE OR ROD, ONE-EIGHTH OF AN INCH IN THICKNESS, AND DOES NOT CRUMBLE WHEN HANDLED, THE SOIL IS TOO WET TO PROCEED WITH THE EXCAVATION.
   c. EXCAVATION SHALL BE CARRIED OUT IN A MANNER THAT WILL AVOID UNNECESSARY COMPACTION OF THE DISPOSAL FIELD BOTTOM AND SIDE WALLS. HEAVY EQUIPMENT SUCH AS BULLDOZERS OR FRONT-END LOADERS SHALL NOT BE DRIVEN OVER THE EXPOSED INFILTRATIVE SURFACE OF THE DISPOSAL FIELD. EXCAVATION SHOULD BE CARRIED OUT WITH A BACKHOE OPERATING FROM OUTSIDE THE PERIMETER OF PREVIOUSLY EXCAVATED PORTIONS OF THE DISPOSAL BED. IF IT BECOMES NECESSARY TO WALK ON THE DISPOSAL FIELD BOTTOM, A SUITABLE BOARD SHALL BE LAID OVER THE SOIL TO AVOID TRAMPLING.
   d. ANY SMEARED OR COMPACTED SOIL SURFACES WHICH HAVE BEEN PRODUCED ON THE BOTTOM OR SIDEWALLS OF THE EXCAVATION SHALL BE REMOVED TO EXPOSE A FRESH SOIL SURFACE WHICH IS ROUGH AND UNEVEN.
   e. WORK SHOULD BE SCHEDULED SO THAT THE BOTTOM AND SIDEWALLS OF THE EXCAVATION WILL NOT BE EXPOSED TO RAINFALL OR WIND-BLOWN SILT BETWEEN THE TIME OF EXCAVATION AND THE TIME OF FINAL INSPECTION AND BACKFILLING. ANY LOOSE SOIL OR DEBRIS WHICH IS WASHED INTO OR OTHERWISE DEPOSITED WITHIN THE EXCAVATION AS A RESULT OF THE EXCAVATION REMAINING OPEN TO THE ELEMENTS SHALL BE CAREFULLY REMOVED PRIOR TO BACKFILLING.

SEPTIC AND DOSING TANK

1. THE MINIMUM COMPRESSIVE STRENGTH FOR ALL CONCRETE SECTIONS SHALL BE 4000 P.S.I.

FILTER MATERIAL AND DRAINAGE FABRIC NOTES

FILTER MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS:

1. FILTER MATERIAL SHALL COVER THE DISTRIBUTION LINES AND EXTEND THE FULL WIDTH OF THE TRENCH OR BED, SHALL EXTEND BETWEEN 12 AND 18 INCHES DEEP BENEATH THE BOTTOM OF THE DISTRIBUTION LINES AND SHALL EXTEND AT LEAST TWO INCHES ABOVE THE TOP OF THE LINES.
2. THE FILTER MATERIAL SHALL BE WASHED GRAVEL OR CRUSHED STONE, FREE OF FINES, DUST, ASHES OR CLAY. REFER TO THE NEW JERSEY DEPARTMENT OF TRANSPORTATION STANDARD SIZES FOR COARSE AGGREGATES AS SHOWN IN FIGURE 26 OF APPENDIX A OF N.J.A.C. 7:9A. THE FILTER MATERIAL SHALL CONFORM IN SIZE AND GRADATION TO SIZE NUMBER 24, SIZE NUMBER THREE OR SIZE NUMBER FOUR.
3. THE FILTER MATERIAL SHALL BE COVERED WITH DRAINAGE FABRIC AS THE LAYING OF THE DISTRIBUTION LINES PROGRESSES. THE FOLLOWING REQUIREMENTS SHALL BE MET:
   I. EDGES OF ADJACENT SHEETS SHALL BE OVERLAPPED BY A MINIMUM OF SIX INCHES.
   II. DRAINAGE FABRIC SHALL BE SPECIFIED IN THE ENGINEERING DESIGN AND SHALL HAVE ADEQUATE TENSILE STRENGTH TO PREVENT RIPPING DURING INSTALLATION AND BACKFILLING, ADEQUATE AIR PERMEABILITY TO ALLOW FREE PASSAGE OF GASES, AND ADEQUATE PARTICLE RETENTION TO PREVENT DOWNWARD MIGRATION OF SOIL PARTICLES INTO THE FILTER MATERIAL.
   III. USE OF WATERPROOF PAPER IS PROHIBITED.
4. THE FILTER MATERIAL MAY BE LAID INTO THE EXCAVATION USING A BACKHOE, FRONT-END LOADER OR DUMP TRUCK PROVIDED THAT THIS OPERATION IS CARRIED OUT FROM SIDES OF THE SYSTEM RATHER THAN BY DRIVING OUT ONTO THE EXPOSED DISPOSAL FIELD INFILTRATIVE SURFACE. IN THE CASE OF LARGE BEDS, TRACKED EQUIPMENT MAY BE OPERATED WITHIN THE DISPOSAL BED PROVIDED THAT THE EQUIPMENT DOES NOT EXERT A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH AND PROVIDED THAT THE FILTER MATERIAL IS PUSHED OUT IN FRONT OF THE VEHICLE WHILE MAINTAINING A MINIMUM THICKNESS OF ONE FOOT OF FILTER MATERIAL BELOW THE VEHICLE TRACKS AT ALL TIMES.

DISTRIBUTION NETWORK

1. SLOPE OF DISTRIBUTION LATERALS TO BE NO GREATER THAN 2" PER 100 FEET.
2. ALL JOINTS TO BE WATERTIGHT.
3. CONNECTING PIPES AND DELIVERY PIPES SHALL BE LAID ON A FIRM FOUNDATION SATISFACTORY TO THE ADMINISTRATIVE AUTHORITY, AND IN ACCORDANCE WITH PLAN DETAILS.

BACKFILL AND FINAL GRADING

1. NO COMPONENT OF THE SEPTIC SYSTEM SHALL BE BACKFILLED UNTIL A FINAL INSPECTION HAS BEEN CONDUCTED BY THE ADMINISTRATIVE AUTHORITY OR ITS AUTHORIZED AGENT.
2. BACKFILL AND FINAL GRADING SHALL BE COMPLETED AS FOLLOWS:
   a. A MINIMUM OF NINE INCHES AND NO MORE THAN 18 INCHES OF BACKFILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.
   b. BACKFILL MATERIAL SHALL BE OF EARTH SIMILAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONRY OR OTHER WASTE CONSTRUCTION MATERIAL.
   c. IN NO CASE SHALL BACKFILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.
   d. BACKFILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL FIELD AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.
3. AFTER COMPLETION OF BACKFILL AND FINAL GRADING, THE BACKFILLED AREA SHALL BE SEEDED, OR SODDED, TO ESTABLISH A GOOD VEGETATIVE COVER AND TO PREVENT EROSION.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LINES, ELEVATIONS, AND MEASUREMENTS, EXERCISING PRECAUTION TO VERIFY ALL DIMENSIONS SHOWN ON DRAWING.
2. THESE DRAWINGS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. THE CONTRACTOR SHALL BE RESPONSIBLE TO INSURE "ON THE JOB" SAFETY FOR HIS EMPLOYEES, EMPLOYEES OF THE OWNER AND ALL OTHER PERSONS HAVING AUTHORIZED OR UNAUTHORIZED ACCESS TO THE WORK AND THE PUBLIC. CONTRACTOR SHALL PERFORM HIS WORK IN A SAFE MANNER AND IN COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
3. THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER AS PRESCRIBED IN N.J.A.C. 7:9A OR WHENEVER CONSULTATION, CLARIFICATION OR INSPECTIONS ARE REQUIRED. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO EXCAVATION TO DISCUSS SPECIFIC REQUIREMENTS RELATIVE TO EXCAVATION, PLACEMENT AND CERTIFICATION OF FILL, ETC.
4. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE DESIGN ENGINEER SHOULD DEPARTURES FROM THE APPROVED DESIGN BECOME NECESSARY DUE TO CIRCUMSTANCES WHICH ARISE DURING CONSTRUCTION.
5. DRAINAGE FROM BASEMENT FLOORS, FOOTINGS OR ROOFS SHALL NOT ENTER THE DISPOSAL SYSTEM AND SHALL BE DIVERTED AWAY FROM THE AREA OF THE DISPOSAL FIELD. BACKWASH FROM WATER SOFTENERS SHALL NOT BE DISPOSED OF WITHIN THE DISPOSAL SYSTEM.
6. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED ON THE DRAWINGS AND EACH DRAWING HAS BEEN REVISED TO INDICATE "ISSUED FOR CONSTRUCTION".
7. BEFORE EXCAVATING IN THE PROJECT AREA, THE CONTRACTOR IS TO VERIFY THE LOCATION OF ANY UNDERGROUND UTILITIES (GAS MAINS, ELECTRICAL LINES, TELEPHONE LINES, WATER AND SEWER MAINS, ETC.) THAT INTERFERE WITH CONSTRUCTION. SHOULD UNDERGROUND STRUCTURES OR FACILITIES INTERFERE WITH PROJECT CONSTRUCTION, THE ENGINEER SHALL BE NOTIFIED BEFORE PROCEEDING WITH WORK. THE CONTRACTOR SHALL NOTIFY ALL UNDERGROUND UTILITY COMPANIES 3 DAYS PRIOR TO COMMENCEMENT OF ANY EXCAVATION FOR ACCURATE FIELD LOCATIONS. FOR UTILITY MARKOUT, CALL 1-800-272-1000.
8. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL INSPECTIONS AS REQUIRED BY THE ENGINEER AND THE BOARD OF HEALTH, AND ALL OTHER TOWNSHIP AGENCIES OF JURISDICTION.
9. THE ENGINEER IS TO BE NOTIFIED IF ANY CONDITIONS ARE ENCOUNTERED THAT WOULD RENDER THIS PLAN UNCONSTRUCTABLE. THE ENGINEER SHALL ALSO BE NOTIFIED OF ANY DEVIATIONS FROM THE PLANS DURING CONSTRUCTION.

FILL

I. FILL STANDARDS: (PER N.J.A.C. 7:9A-CHAPTER 10 REVISED APRIL 2, 2012)

FILL USED IN THE ZONE OF TREATMENT AND/OR THE ZONE OF DISPOSAL SHALL MEET THE FOLLOWING REQUIREMENTS:

1. ASTM C-136 TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COURSE AGGREGATES MUST BE USED FOR CHARACTERIZING THE SELECT FILL.
2. THE MATERIAL SHALL MEET THE STANDARDS OF ASTM C33-93 STANDARD SPECIFICATION FOR CONCRETE AGGREGATE, OR
3. THE MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS:
   A. COURSE FRAGMENT CONTENT (GREATER THAN THE No.8 SIEVE) LESS THAN 15% BY VOLUME OR LESS THAN 20% BY WEIGHT;
   B. TEXTURAL ANALYSIS (COMPOSITION, WEIGHT, OF SIZE FRACTION PASSING THE PARTICULAR SIEVE AS STATED):
      100% MUST PASS A 3/8"SIEVE;
      BETWEEN 80% AND 100% MUST PASS THE No. 8 SIEVE (2.36mm);
      BETWEEN 50% AND 85% MUST PASS THE No. 16 SIEVE (1.18mm);
      BETWEEN 25% AND 60% MUST PASS THE No. 30 SIEVE (0.6mm);
      BETWEEN 10% AND 30% MUST PASS THE No. 50 SIEVE (0.3mm);
      BETWEEN 2% AND 10% MUST PASS THE No. 100 SIEVE (0.15mm).
4. PERMEABILITY FOR THESE MATERIALS IS ESTABLISHED WITHIN THE RANGE OF 6-20 IN/HR.
5. SELECT FILL SHALL BE TESTED FOR FINE AND VERY FINE SAND, AND BE 25% OR LESS BY WEIGHT.
6. COMPACTION OF SELECT FILL MUST BE PERFORMED IN 1' (MAX.) LIFTS.

SITE SPECIFIC NOTES

1. GARBAGE DISPOSALS AND SUMP PUMPS CANNOT BE USED WITH THIS SEPTIC SYSTEM.
2. THIS PROPERTY AND ALL NEIGHBORING PROPERTIES ARE SUPPLIED BY WELLS. THERE ARE NO NEIGHBORING WELLS WITHIN 100 FT. OF THE PROPOSED DISPOSAL FIELD. THERE ARE NO KNOWN NEIGHBORING DISPOSAL FIELDS WITHIN 50 FT. OF THE PROPOSED DISPOSAL FIELD.
3. THERE ARE NO KNOWN UNDERGROUND STORAGE TANKS PRESENT ON SITE (PER OWNER).

NO.	REVISION	BY	DATE
1	REV. PER COMMENTS	PMH	11/26/13

TITLE: 147 HARBOURTON WOODSVILLE ROAD
INDIVIDUAL SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

Engineering & Land Planning Associates, Inc.
54 OLD HIGHWAY 22, SUITE 300 CLINTON, NJ 08809
(908) 238-0544 FAX: (908) 238-9572
C.O.A. #: 24GA28021500
A PROFESSIONAL ASSOCIATION

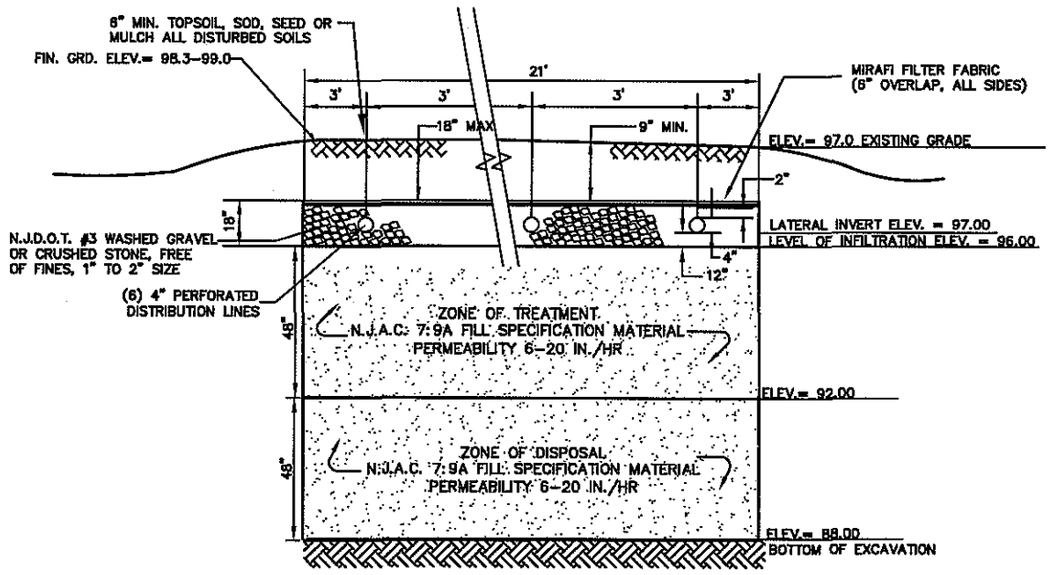
LOCATION:
BLOCK 29 LOT 12.03
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

DATE: 7/19/13

WAYNE J. INGRAM P.E. LICENSE #24GE048393 DATE 11/26/13

PROJECT NO.: 13099 | DESIGNED BY: KTP | CHECKED BY: WJI

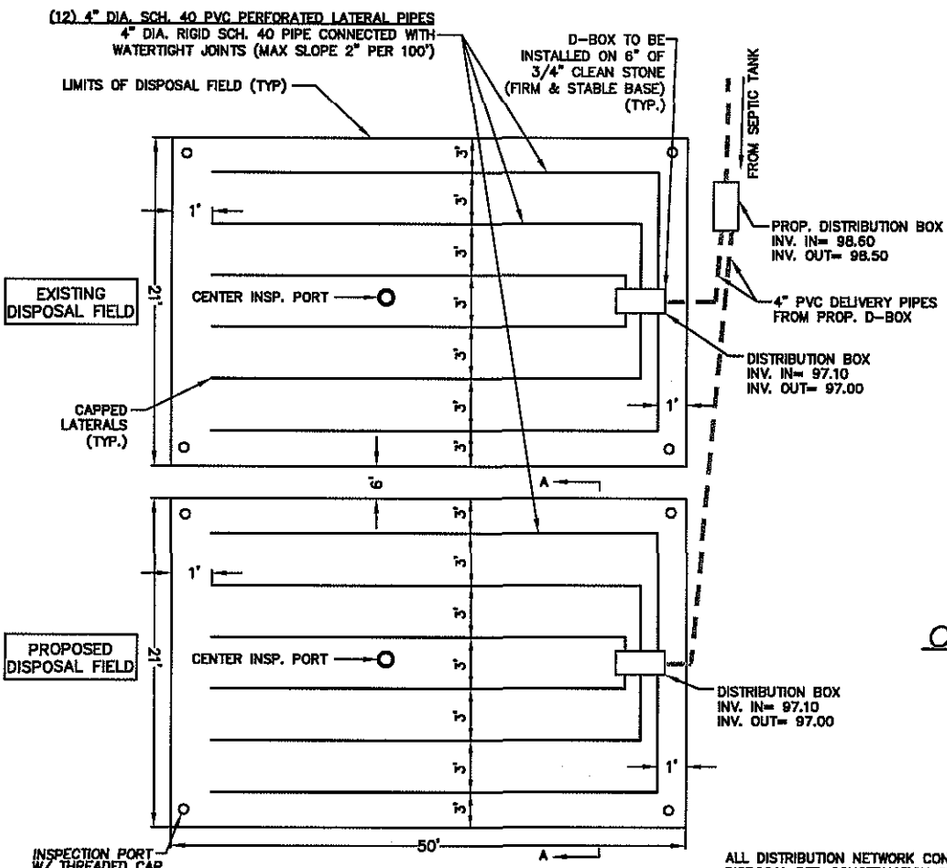
FILENAME: NOTES.DWG | SCALE: N.T.S. | SHEET NO.: 2 OF 5



DISPOSAL BED SECTION A-A

"SOIL REPLACEMENT BOTTOM LINED"

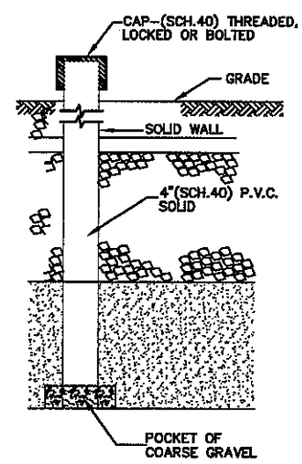
N.T.S.



DISPOSAL FIELD PLAN

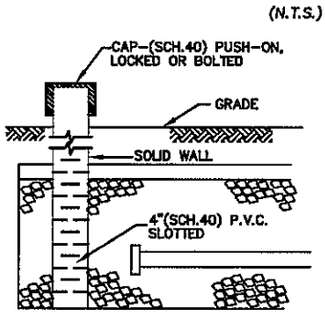
(N.T.S.)

ALL DISTRIBUTION NETWORK CONSTRUCTION AND DISPOSAL BED CONSTRUCTION SHALL CONFORM TO ALL CODE REQUIREMENTS OF NJAC 7:9A



CENTER INSPECTION PORT DETAIL

N.T.S.



INSPECTION PORT DETAIL

N.T.S.

TITLE:

147 HARBOURTON WOODSVILLE ROAD
INDIVIDUAL SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

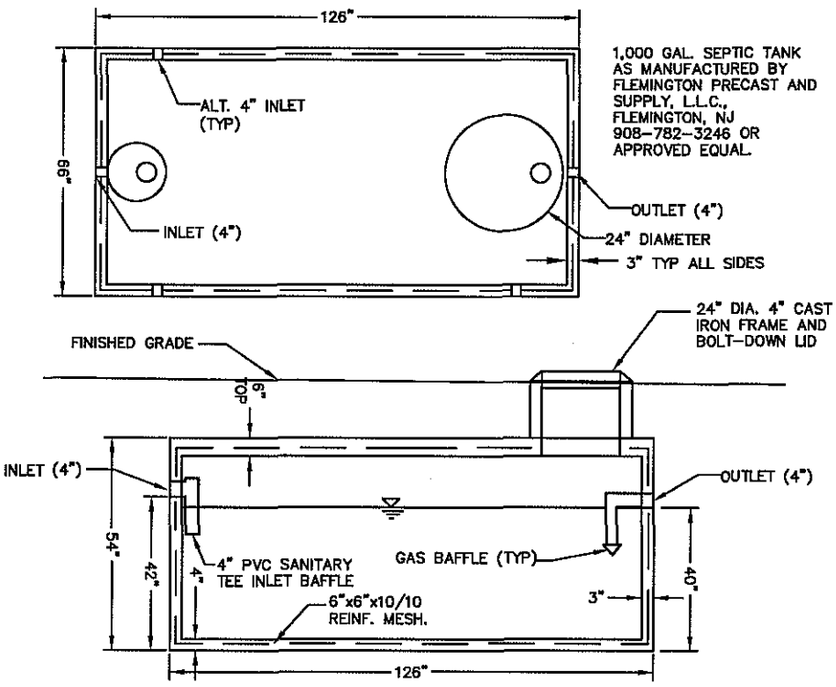
Engineering & Land Planning Associates, Inc.
54 OLD HIGHWAY 22, SUITE 300 CLINTON, NJ 08809
(908) 238-0544 FAX: (908) 238-9572
C.O.A. #: 24GA28021500
A PROFESSIONAL ASSOCIATION

LOCATION:
BLOCK 29 LOT 12.03
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

11/26/13
WAYNE J. INGRAM P.E. LICENSE #24GE048393/ DATE

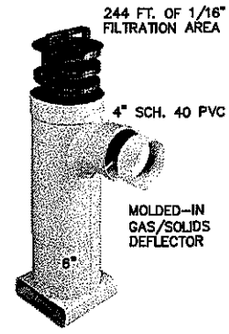
NO.	REVISION	BY	DATE
1	REV. PER COMMENTS	PMH	11/26/13

DATE: 7/19/13			
PROJECT NO.: 13099	DESIGNED BY: KTP	CHECKED BY: WJI	
FILENAME: DETAILS.DWG	SCALE: N.T.S.	SHEET NO.: 3 OF 5	



(2) 1,000 GAL SEPTIC TANK 1 COMPARTMENT

(NTS)



1500 GPD

TUF-TITE EF-6 EFFLUENT FILTER

(NTS)

TITLE: 147 HARBOURTON WOODSVILLE ROAD INDIVIDUAL SEWAGE DISPOSAL SYSTEM HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

Engineering & Land Planning Associates, Inc.
54 OLD HIGHWAY 22, SUITE 300 CLINTON, NJ 08809
(908) 238-0544 FAX: (908) 238-9572
C.O.A. #: 24GA28021500
A PROFESSIONAL ASSOCIATION

LOCATION: BLOCK 29 LOT 12.03 HOPEWELL TOWNSHIP MERCER COUNTY, NJ

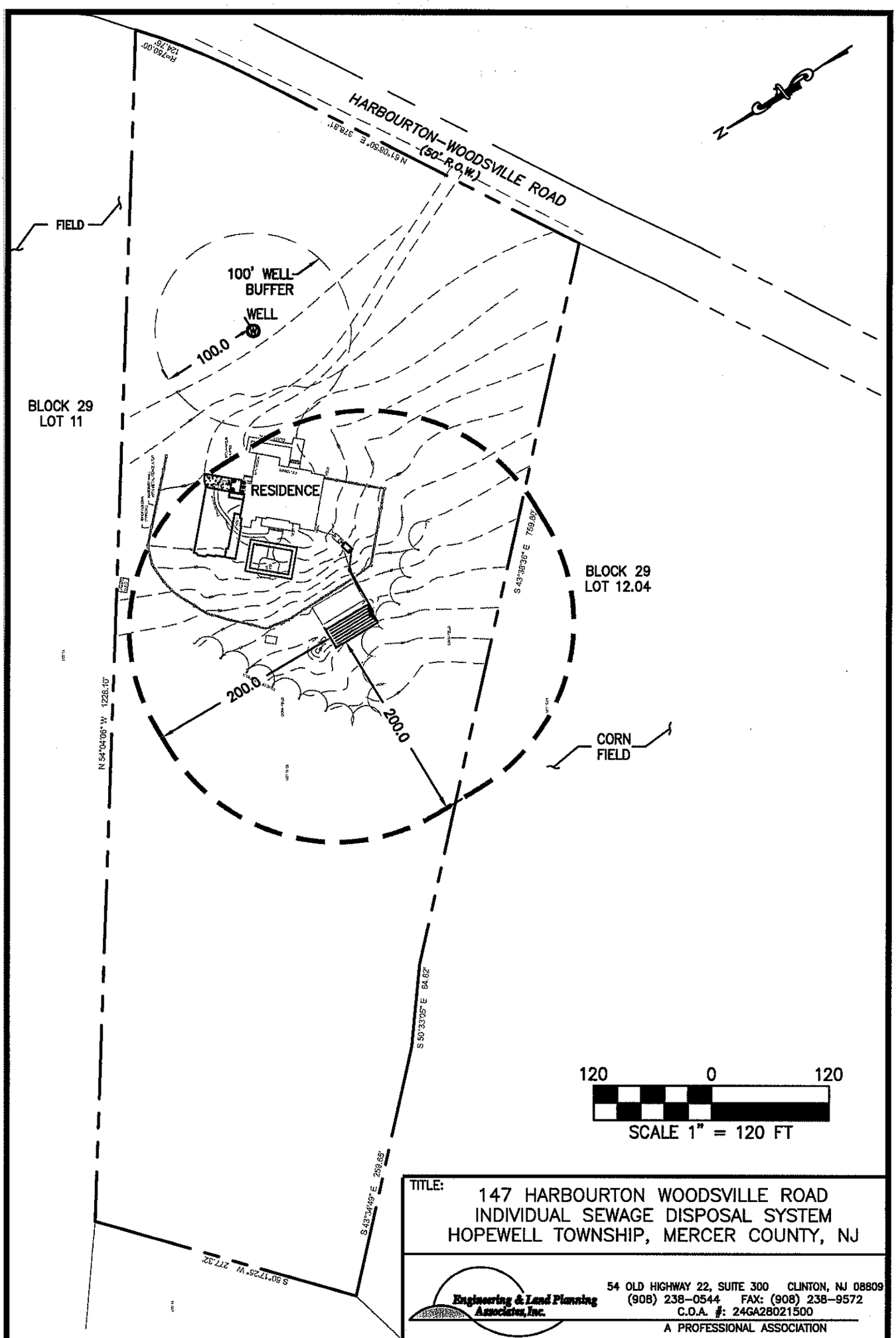
DATE: 7/19/13

WAYNE J. INGRAM P.E. LICENSE #24GE048393 DATE 11/26/13

PROJECT NO.: 13099 | DESIGNED BY: KTP | CHECKED BY: WJI

FILENAME: DETAILS.DWG | SCALE: N.T.S. | SHEET NO.: 4 OF 5

NO.	REVISION	BY	DATE
1	REV. PER COMMENTS	PMH	11/26/13



TITLE:
147 HARBOURTON WOODSVILLE ROAD
INDIVIDUAL SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

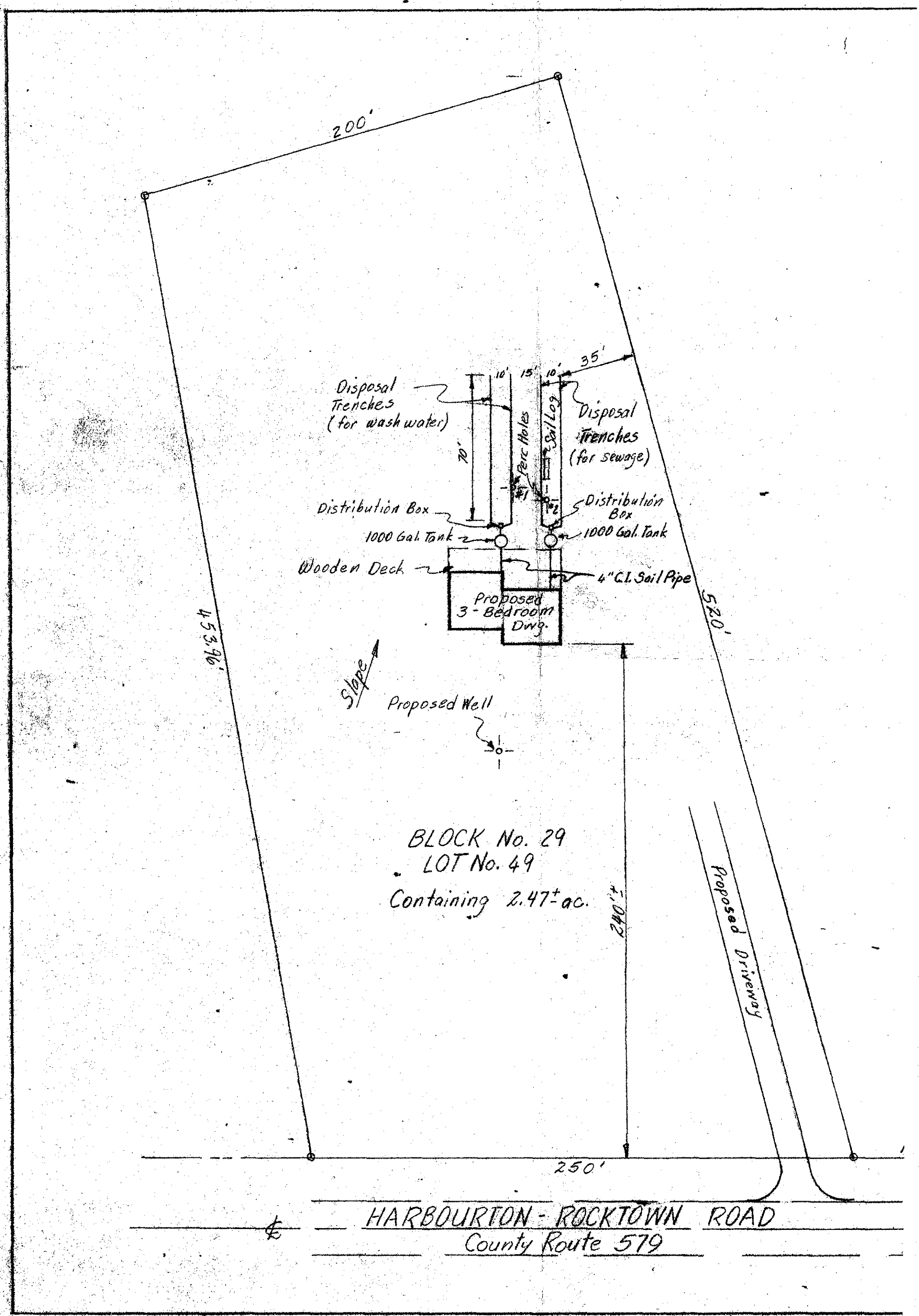
Engineering & Land Planning Associates, Inc.
54 OLD HIGHWAY 22, SUITE 300 CLINTON, NJ 08809
(908) 238-0544 FAX: (908) 238-9572
C.O.A. #: 24GA28021500
A PROFESSIONAL ASSOCIATION

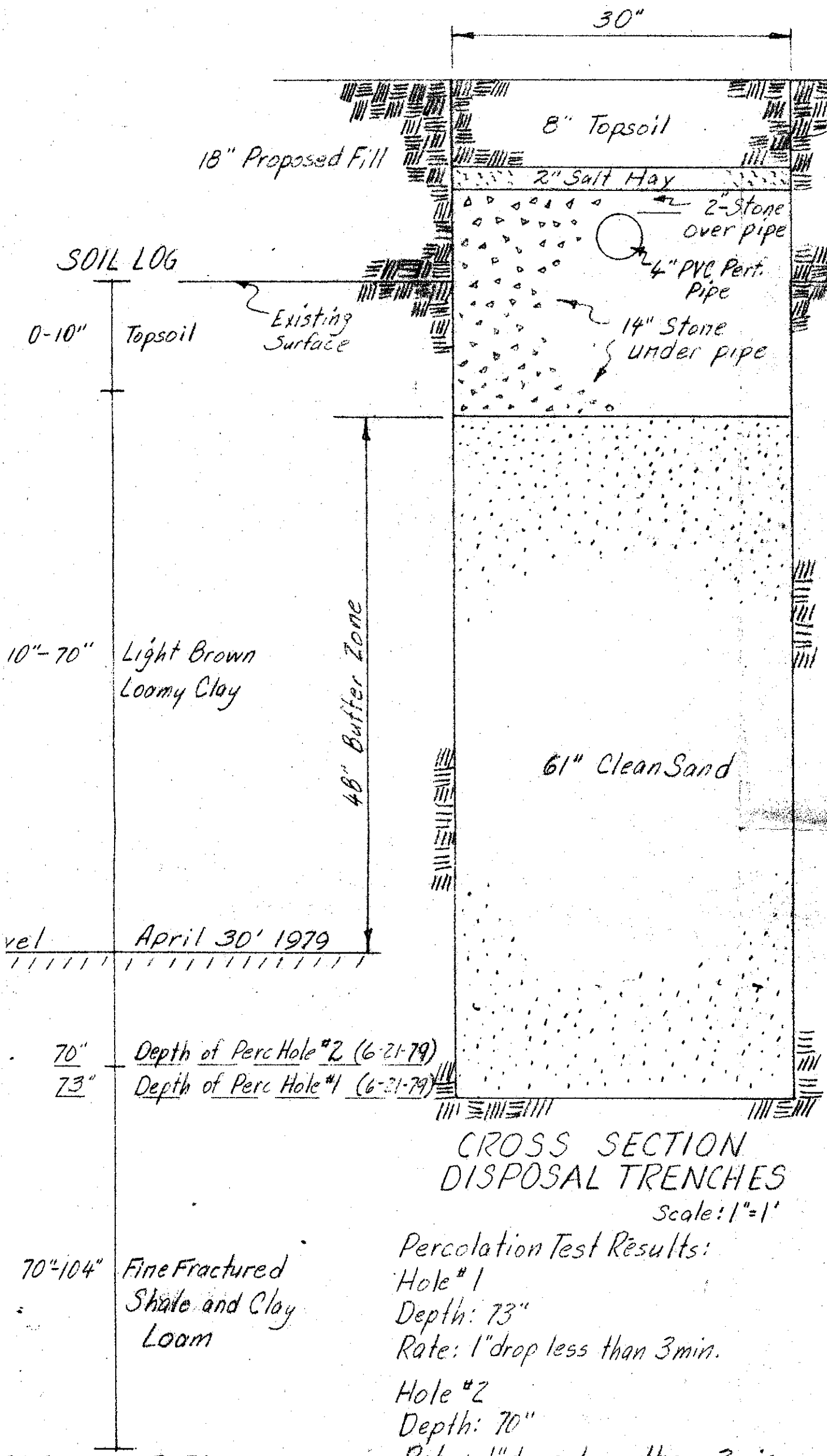
LOCATION:
BLOCK 29 LOT 12.03
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

WAYNE J. INGRAM P.E. LICENSE #24GE048393 DATE 11/26/13

NO.	REVISION	BY	DATE
1	REV. PER COMMENTS	PMH	11/26/13

DATE:	7/19/13		
PROJECT NO.:	13099	DESIGNED BY: KTP	CHECKED BY: WJI
FILENAME:	SITE.DWG	SCALE: 1" = 120'	SHEET NO.: 5 OF 5


200'
35'
10'
15'
10'
Disposal Trenches (for wash water)
Disposal Trenches (for sewage)
70'
Perc Holes
Soil Log
#1
#2
Distribution Box
Distribution Box
1000 Gal. Tank
1000 Gal. Tank
Wooden Deck
4" C.I. Soil Pipe
Proposed 3 - Bedroom Dwg.
453.96'
520'
Slope
Proposed Well
BLOCK No. 29
LOT No. 49
Containing 2.47± ac.
240'±
Proposed Driveway
250'
℄ HARBOURTON - ROCKTOWN ROAD
County Route 579



CROSS SECTION
DISPOSAL TRENCHES
Scale: 1"=1'

Percolation Test Results:
Hole #1
Depth: 73"
Rate: 1" drop less than 3 min.

Hole #2
Depth: 70"
Rate: 1" drop less than 3 min.

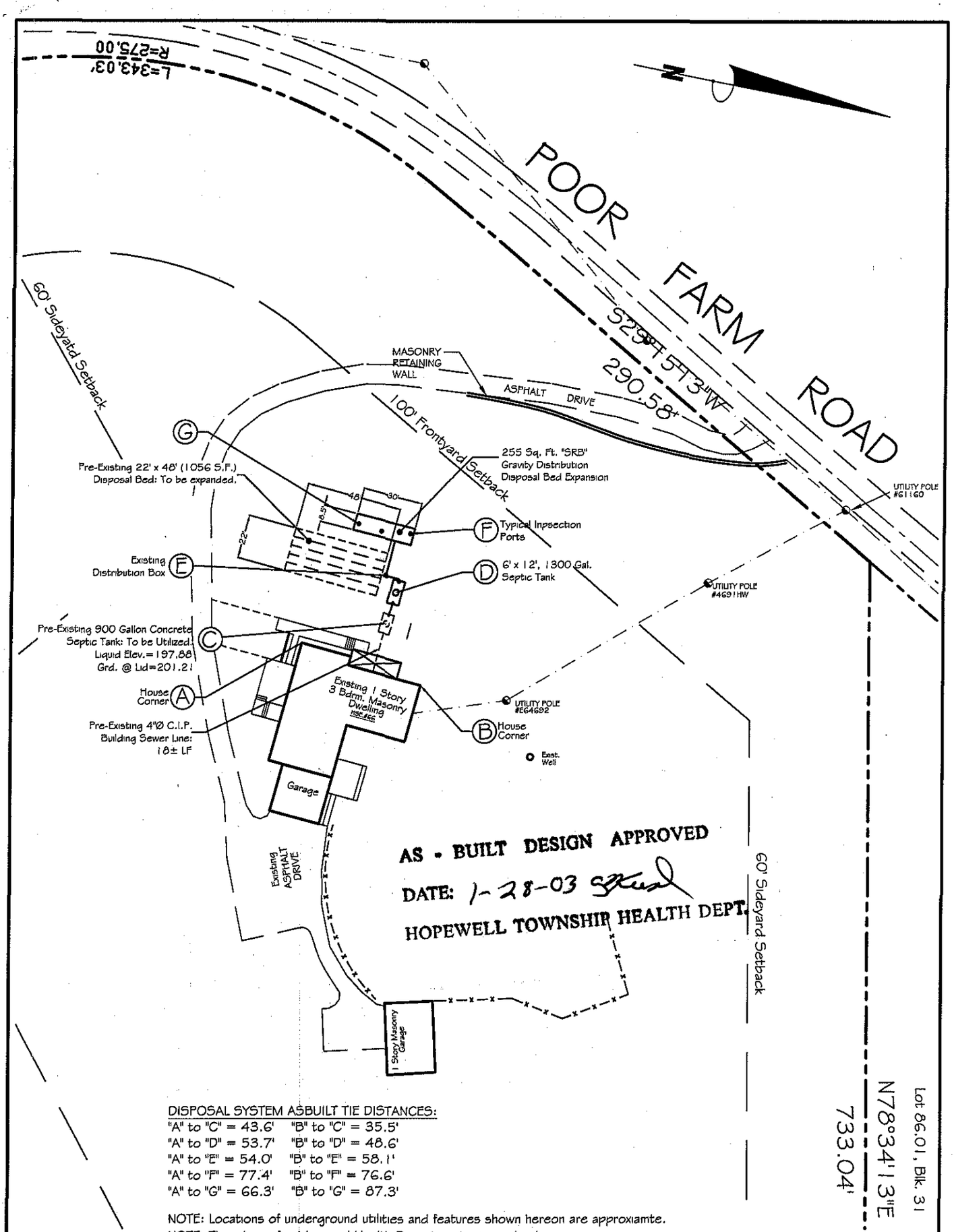
SEPTIC SYSTEM:
(2) 1,000 Gal. - Reinf. Conc.
280 Lin.Ft. - 4" PVC Pe
20 Inch. - 1½" Washed
(55 Ton.
61 Inch. - Clean Sand
2 Inch. - Salt Hay
18 Inch. - Fill Over D
8 Inch. - Min. Cover O
Trenches

Both Soil Log & Perc
Witnessed by Denis

ALBERT DI
Hopewell Townsh
New Je

JOHN WALDNER, PE #15525
New Jersey Professional Engineer
John M. Waldner 6-27-79
69 Upper Ferry Rd., Trenton, N.J. 08628

SEPTIC
Block No. 29
Date: June 197



DISPOSAL SYSTEM ASBUILT TIE DISTANCES:

"A" to "C" = 43.6'	"B" to "C" = 35.5'
"A" to "D" = 53.7'	"B" to "D" = 48.6'
"A" to "E" = 54.0'	"B" to "E" = 58.1'
"A" to "F" = 77.4'	"B" to "F" = 76.6'
"A" to "G" = 66.3'	"B" to "G" = 87.3'

NOTE: Locations of underground utilities and features shown hereon are approxiamte.
NOTE: This plan is for Municipal Health Department approval only.
NOTE: No garbage grinder/disposal of any type shall be permitted to be connected to this disposal system.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Disposal System Asbuilt Plan
of Lot-23.01, Block-31 for
Mark H. Ellenbogen
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Fivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

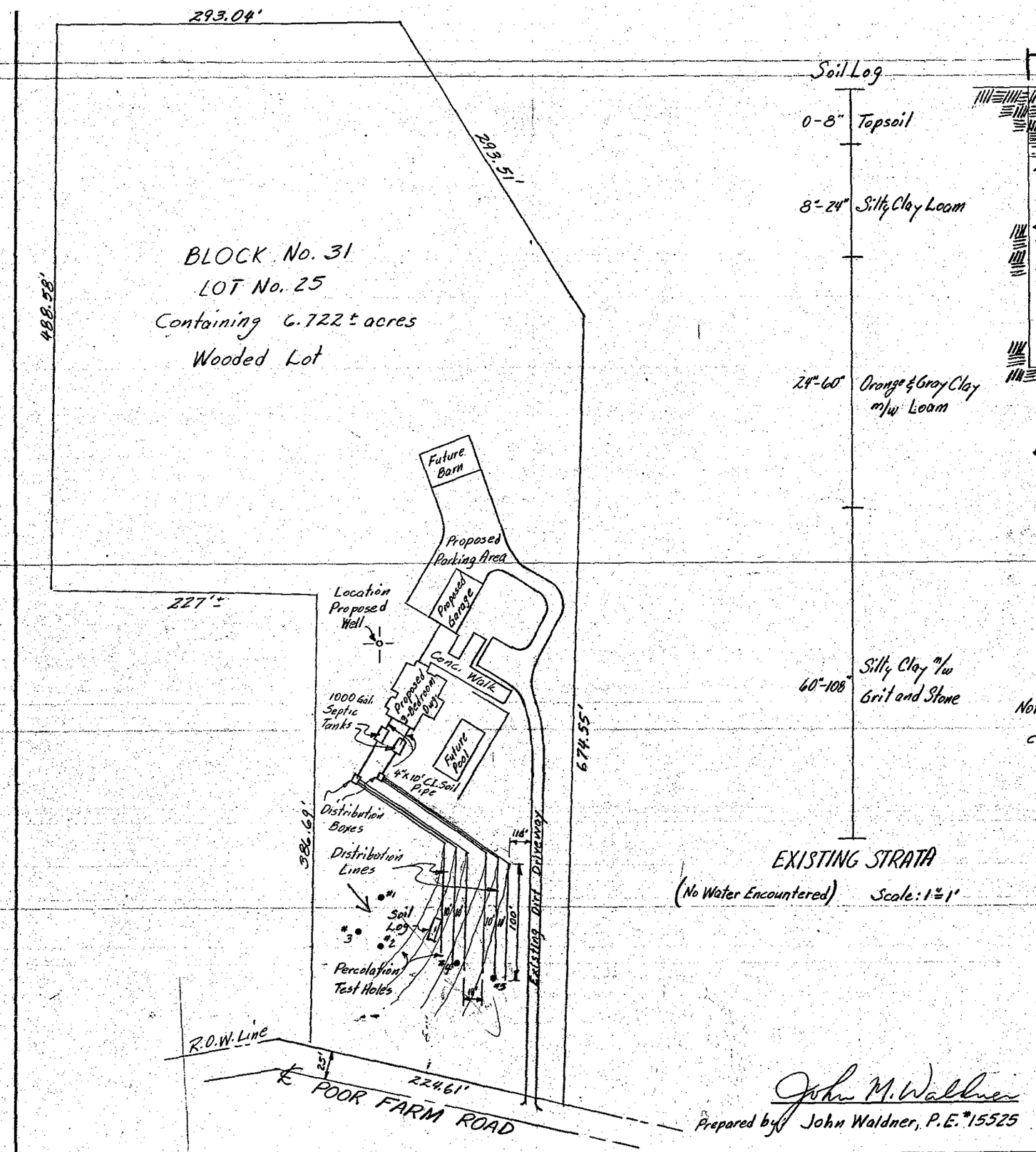
Bryce M. Rittenhouse: PE & LS #13453 — 01/15/03 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 01/15/03 Date

Date: 01/15/03
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

Revisions:

Jobf:(01)121
Dwg:1230163_sep-asb.dwg
View:Plan
Layers: 3D_ASB

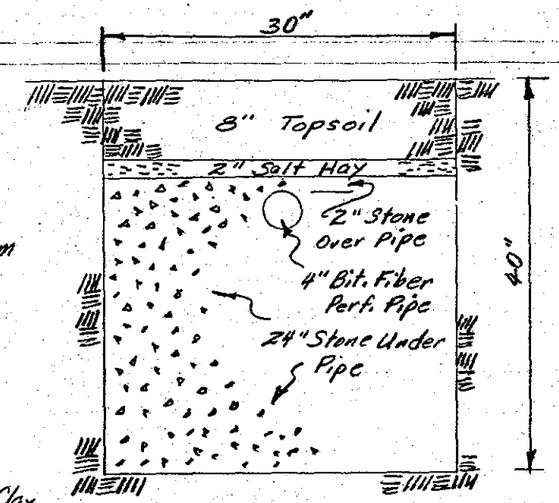


Soil Log

0-8"	Topsoil
8"-24"	Silty Clay Loam
24"-60"	Orange & Gray Clay m/w Loam
60"-108"	Silty Clay m/w Grit and Stone

EXISTING STRATA

(No Water Encountered) Scale: 1"=1'



CROSS SECTION
DISPOSAL TRENCH
Scale: 1"=1'

DISPOSAL SYSTEM

2-1000 Gal. Reinf. Conc. Septic Tanks
300 L.F. - 4" Bit. Fiber Perf. Pipe
30 Inch. - 1½" Washed Crushed Stone
2 Inch. - Salt Hay
8 Inch. - Min. Earth Cover

Note: It is not necessary that Disposal Area be completely cleared of all trees.

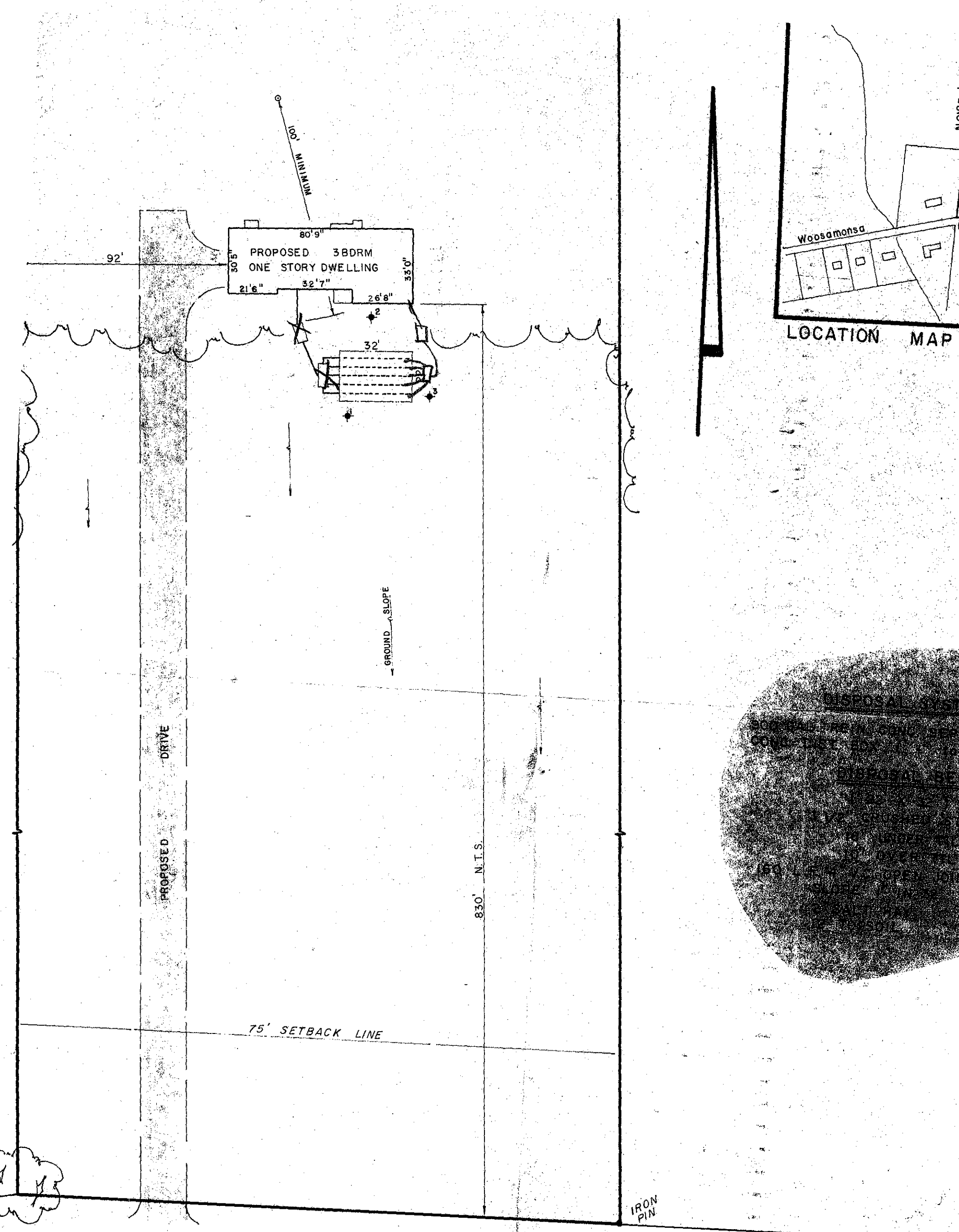
DESIGN
SANITARY SEWER TREATMENT
for
WESLEY D. BACON

Hopewell Township - Mercer County

Date: May 1978 Scale: 1"=60'

Feet: 0 30 60 120 180
Inch: 0 ½ 1 2 3

John M. Waldner
Prepared by: John Waldner, P.E. #15525



F LOT 28, SEC. 31, PG 14, ON THE TOWNSHIP TAX MAPS.

E DATA SUPPLIED BY OWNER.

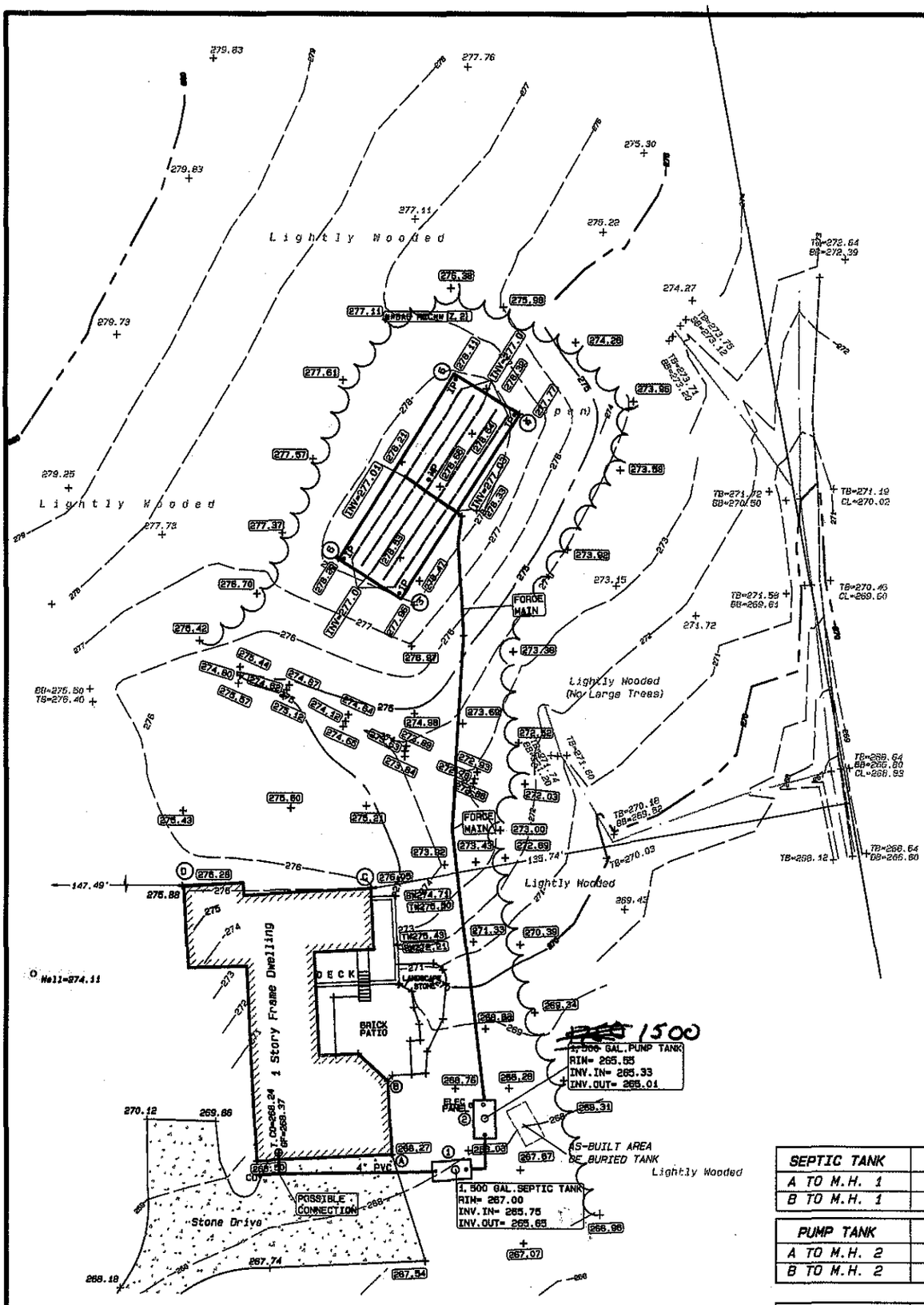
DENOTES PERC. TEST LOCATION (SEE FORMS)

THOMAS TYLER MOORE ASSOCIATE
PROFESSIONAL ENGINEERS AND LAND SU
TRENTON NEW

FOR

HENRY E. HARR

AS - BUILT DESIGN APPROVED
DATE: 11/12/15
HOPEWELL TOWNSHIP HEALTH DEPT.



SEPTIC TANK	DISTANCE FROM HOUSE
A TO M.H. 1	32.7 FEET
B TO M.H. 1	43.1 FEET

PUMP TANK	DISTANCE FROM HOUSE
A TO M.H. 2	42.0 FEET
B TO M.H. 2	43.8 FEET

DISPOSAL FIELD	DISTANCE FROM HOUSE
C TO IP-3	82.3 FEET
C TO IP-4	137.5 FEET
C TO IP-5	143.3 FEET
C TO IP-6	91.8 FEET
D TO IP-3	101.4 FEET
D TO IP-4	160.1 FEET
D TO IP-5	159.9 FEET
D TO IP-6	101.2 FEET

GRAPHIC SCALE 1"=30'

0 30 60 90

TRENTON ENGINEERING CO., INC.
PROFESSIONAL ENGINEERS, PLANNERS AND LAND SURVEYORS
ESTABLISHED 1907
2193 SPRUCE STREET TRENTON, N.J. 08638
TEL. NO. 609-882-0616
FAX. NO. 609-882-6004
D.F. STRATTON, L.S. N.J.-27523 P.P.N.J.-5021
JOSEPH MESTER
N.J. PROFESSIONAL ENGINEER AND PROFESSIONAL LAND SURVEYOR No. 19462
11/11/14 Joseph Mester
DATE

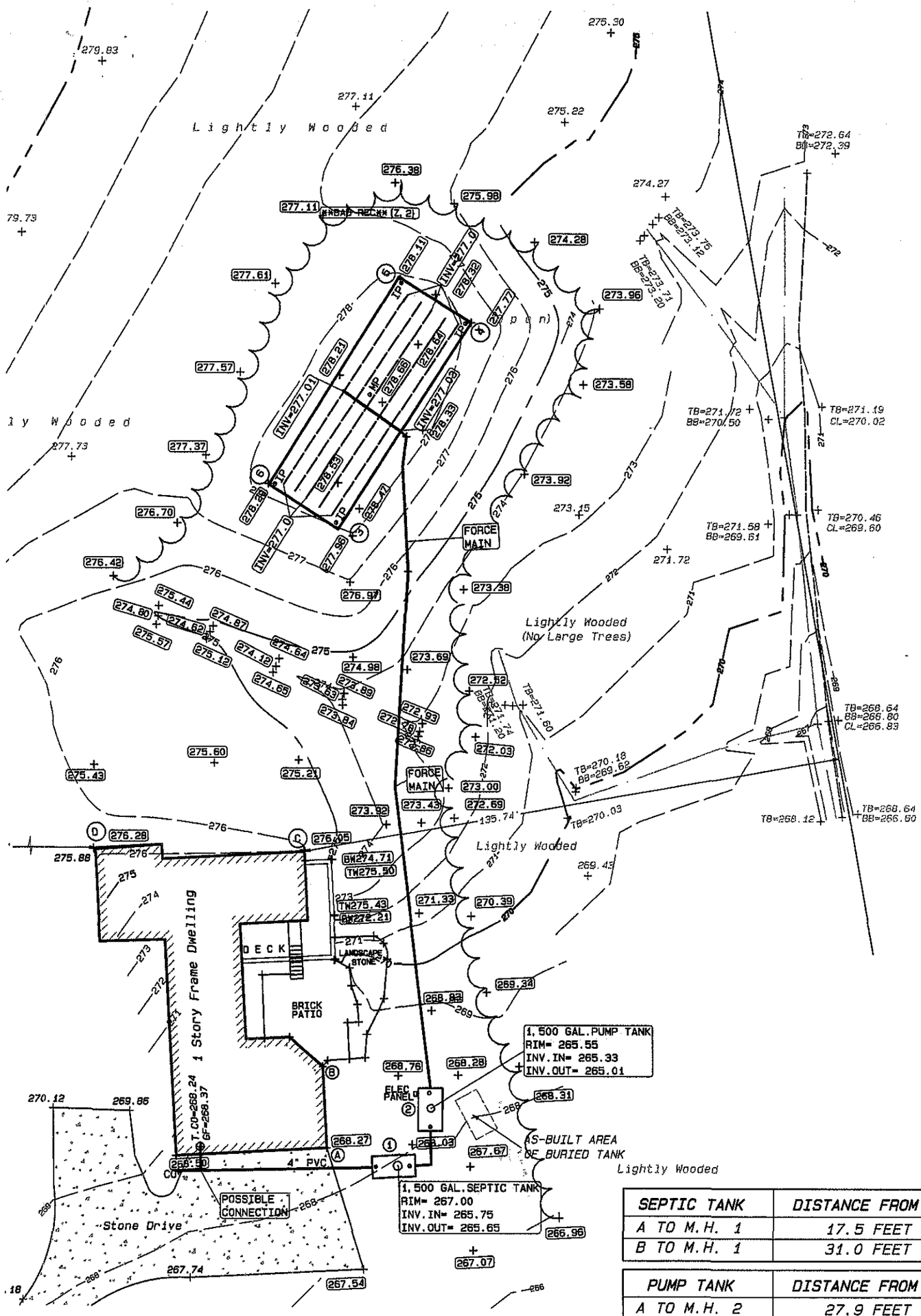
AS-BUILT OF SEPTIC SYSTEM
at
#93 Woosamonsa Road
for
Alice De Tiberge
in
TOWNSHIP OF HOPEWELL
MERCER CO., NEW JERSEY

CERTIFICATE OF AUTHORIZATION NO. 24GA28052600

TAX MAP DATA		
LOT	BLOCK	PAGE
44	31	9

DATE 11-10-14
INV. 43271
DRAWN BY: BDS
SCALE 1"=30'
FB. PG.
FILE 80-35B

Draft2-\\Drafting2\c\wjohn\WOOSAMONSA RD 93-SEPTIC DESIGN.prp



SEPTIC TANK	DISTANCE FROM HOUSE
A TO M.H. 1	17.5 FEET
B TO M.H. 1	31.0 FEET

PUMP TANK	DISTANCE FROM HOUSE
A TO M.H. 2	27.9 FEET
B TO M.H. 2	29.0FEET

DISPOSAL FIELD	DISTANCE FROM HOUSE
C TO IP-3	82.3 FEET
C TO IP-4	137.5 FEET
C TO IP-5	143.3 FEET
C TO IP-6	91.8 FEET
D TO IP-3	101.4 FEET
D TO IP-4	160.1 FEET
D TO IP-5	159.9 FEET
D TO IP-6	101.2 FEET

STANDARD FORMS FOR CERTIFICATE OF COMPLIANCE

County/Municipality of MERCER/HOPEWEL L TOWNSHIP

INSTRUCTIONS: Part A is to be completely filled in for all Certifications. Only Part B or Part C will be completed. Part B will be completed if the administrative authority relies upon the certification signed and sealed by a New Jersey licensed professional engineer that the system has been located, constructed, installed or altered in compliance with the requirements of N.J.A.C. 7:9A-1 and the Application to Construct/Alter/Repair an Individual Subsurface Sewage Disposal System which was approved by the administrative authority. Part C will be completed if the administrative authority performs the certification.

Part A — General Information

1. Permitted Activities (Check applicable categories):

   Permit Number _____

   X New Construction

   ___ Alteration/No Expansion or Change of Use

   ___ Alteration/Expansion or Change in Use

   ___ Alteration/Malfunctioning System

   ___ Deviation from Standards

   ___ Repairs to Existing System

2. Location of Project:

   Municipality HOpewell Township Lot 44 Block 31

   Street Address 93 Woosamonsa Road

3. Name and Present Address of Applicant:

   Alice DiTiberge
   344 Bedens Brook Road, Skillman NJ 08558

   Applicant's Phone Number (609) 203-9660

Part B—Professional Engineers Certification

I certify under penalty of law that the subsurface sewage disposal system identified in Part A has been located, constructed, installed or altered in compliance with the requirements of N.J.A.C. 7:9A-1 and the Application to Construct/Alter/Repair an Individual Subsurface Sewage Disposal System which was approved by the administrative authority. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Joseph Mester
(Signature)

SEAL

Joseph Mester, P.E.& L.S. #19462
Name (Type or Print), License #

Date: 11/11/14

Page ___ of ___

Form 3d. Percolation Test Data - 93 Woosamonsa Rd

1. Test Number 1 Replicate (Letter) ___ Date Tested 4/29/14

2. Depth 10"

3. Pre-soak: 2 Times - Sand Fill

___Sandy Textured Soil only, shortened pre-soak -Indicate time required for 12 inches of water to drain after second filling, minutes

___Four hour pre-soak completed - Indicate result:

___Test hole drained within 16 to 24 hours after pre-soak

___Test hole did not drain within 24 hours after pre-soak

4. Rate of Fall Data:

a. Time interval selected, minutes 1

b. Record the drop in water level during each time interval to the nearest 1/10th inch on the lines below:

Depth of Water, Start of Interval (inches)	Depth of Water, End of Interval (inches)	Drop in Water Level (inches)

5. Percolation Rate:

a. Time, minutes, required for a six-inch drop in water level 12.0

b. Percolation rate = a/6 = 12 /6 = 2 min/in

9. I hereby certify that the information furnished on Form 3d of this application (and the attachments thereto) is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator ___ Date ___

Signature of Professional Engineer Joseph Mestre License # 19462

CERTIFIED TESTING LABORATORIES, INC.

Clayton Sand

CLIENT: Trenton Engineering Co., Inc.
2193 Spruce Street
Trenton, New Jersey 08638

LAB NO.: B-2014-14

REPORT NO: PM-1

PROJECT: **93 Wossamonsa Road**

1. Test Number: **1** Replicate (letter): -
2. Sample Depth: - Soil Pit/Boring Number: - Date Collected: **04-10-2014**
3. Coarse Fragment Content:
   Total Weight of Sample, WT, Grams: **917.0**
   Weight of Material Retained on 2mm sieve, WCF Grams: **36.0**
   Weight % Coarse Fragment (WCF/WT x 100): **3.9**
4. Oven Dry Weight (24 hrs., 105°C) of 40 Gram Air Dried Sample, Grams WT: **39.95**
5. Hydrometer Calibration, Rc: **4.0 @ 68°F**
6. Hydrometer Reading @ 40 Seconds, R1: **5.8**
   Temperature of Suspension: **70°F**
7. Corrected Hydrometer Reading, R1': **5.8 - 4.0 + 0.4 =2.20**
8. Hydrometer Reading @ 2 Hours, R2: **4.4**
   Temperature of Suspension: **70°F**
9. Corrected Hydrometer Reading, R2': **4.4- 4.0 + 0.4 = 0.8**
10. % Sand = (WT – R1') / WT x 100 = **(39.95 - 2.20) / 39.95** x 100 = **94.5**
11. % Clay = R2' / WT x 100 = **0.81 / 39.95** x 100 = **2.0**
12. Sieve Analysis:
    a. Oven Dry Weight (2 hrs., 105°C) Total Sand Fraction
       (Soil Retained in 0.047mm Sieve), Grams: **39.8**
    b. WT of Fine Plus Very Fine Sand Fraction
       (Sand Passing 0.25mm Sieve), Grams: **2.6**
    c. % Fine Plus Very Fine Sand (b/a): **6.5**
13. Soil Morphology (Natural Soil Samples Only)
    Structure of Soil Horizon Tested
    Consistency of Soil Horizon Tested Dry: Moist:
14. Soil Permeability Class Rating (Based Upon Average Textural Analysis of This Replicate And Other Replicate Samples: **K-5**
15. I hereby certify that the information furnished on Form 3C of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (NJSA 58: 10A-1Et seq.) And is subject to penalties as prescribed in NJAC 7: 14-8.

All information listed in this report as to Test No., Depth, Locations, Sample/Collection Dates and Project are as represented to us by the client. Results indicated reflect laboratory test data only on samples submitted by client.

Signature of Laboratory Technician: B. Singh Date: 04-14-2014

Main Office
155 U.S. Route 130 • Bordentown, NJ 08505 • (609) 298-3255 • Fax (609) 298-7288

CTL

CERTIFIED TESTING LABORATORIES, INC.

CLIENT: Trenton Engineering Co., Inc.
2193 Spruce Street
Trenton, New Jersey 08638

DATE: 04-14-2014

LAB NO.: B-2014-14

PROJECT: 93 Woosamomsa, Road

REPORT NO.: AG-1

ON SAMPLE OF: Sand Material

RECEIVED: 04-10-2014

SAMPLED BY: Client

MARKED: Sample #1

EXAMINED WITH THE FOLLOWING RESULTS:

1. Grain size analysis (ASTM C 422). Material finer than the #200 (ASTM D 1140)

Sieve Size	% Passing
2"	100.0
1"	100.0
3/4"	100.0
3/8"	100.0
#4	99.4
#10	96.1
#40	41.1
#60	7.0
#100	1.9
#200	0.5
#270	0.4

Respectfully Submitted,
Certified Testing Laboratories, Inc.

Terry Kifer, General Manager

TK/mir

All reports are the confidential property of clients and information contained may not be published or reproduced, pending our written approval.

Main Office
155 U.S. Route 130 • Bordentown, NJ 08505 • (609) 298-3255 • Fax (609) 298-7288

SEPTIC TANK

Certificate # 2121

Township: Hopewell County: Mercer Block: 31.00 Lot: 44.00

Street Address: 93 Woosamonsa Rd., Hopewell., NJ

Purchaser: Ron Miller Jr Excavating

I, Daryl Thomas certify that the Septic Tank installed on the above referenced block and lot has passed the Watertightness Test as described by the ASTM, C-1227 as set by N.J.A.C. 7:9A "Standards for Individual Subsurface Disposal Systems".

Daryl Thomas
Signature

5/1/14
Date of Test

Type of Tank: Concrete X Polyethylene ___

Type of Test: Vacuum Testing X

Daryl Thomas
Name of Tester (Please Print)

Daryl Thomas
Signature of Tester

MERSHON CONCRETE
Company Name

Witness By Ron

PO BOX 254 RT. 130 SOUTH, BORDENTOWN, NJ 08505
Address

609-298-2150
Phone Number with Area Code

Witness Ron

SEPTIC TANK

Certificate # 2122

Township: Hopewell County: Mercer Block: 31.00 Lot: 44.00

Street Address: 93 Woosamonsa Rd., Hopewell, NJ

Purchaser: Ron Miller Jr Excavating

I, W M Edge certify that the Septic Tank installed on the above referenced block and lot has passed the Watertightness Test as described by the ASTM, C-1227 as set by N.J.A.C. 7:9A "Standards for Individual Subsurface Disposal Systems".

W M Edge
Signature

5-2-14
Date of Test

Type of Tank: Concrete X Polyethylene ___

Type of Test: Vacuum Testing X

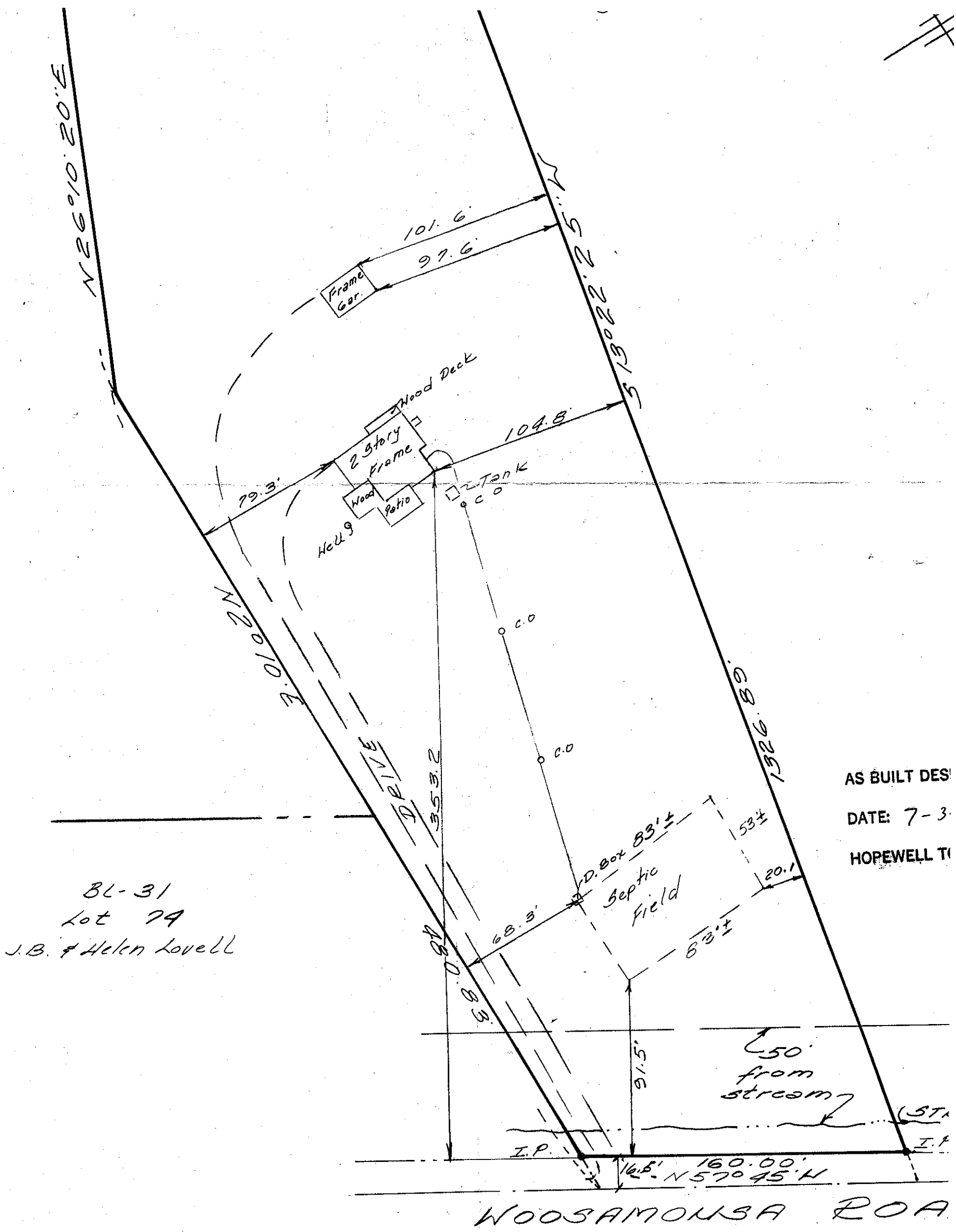
W M Edge
Name of Tester (Please Print)

W M Edge
Signature of Tester

MERSHON CONCRETE
Company Name
PO BOX 254 RT. 130 SOUTH, BORDENTOWN, NJ 08505
Address
609-298-2150
Phone Number with Area Code

Witness By _____

Witness _____



BRYCE M. RITTENHOUSE Professional Engineer & Land Surveyor #13453

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS

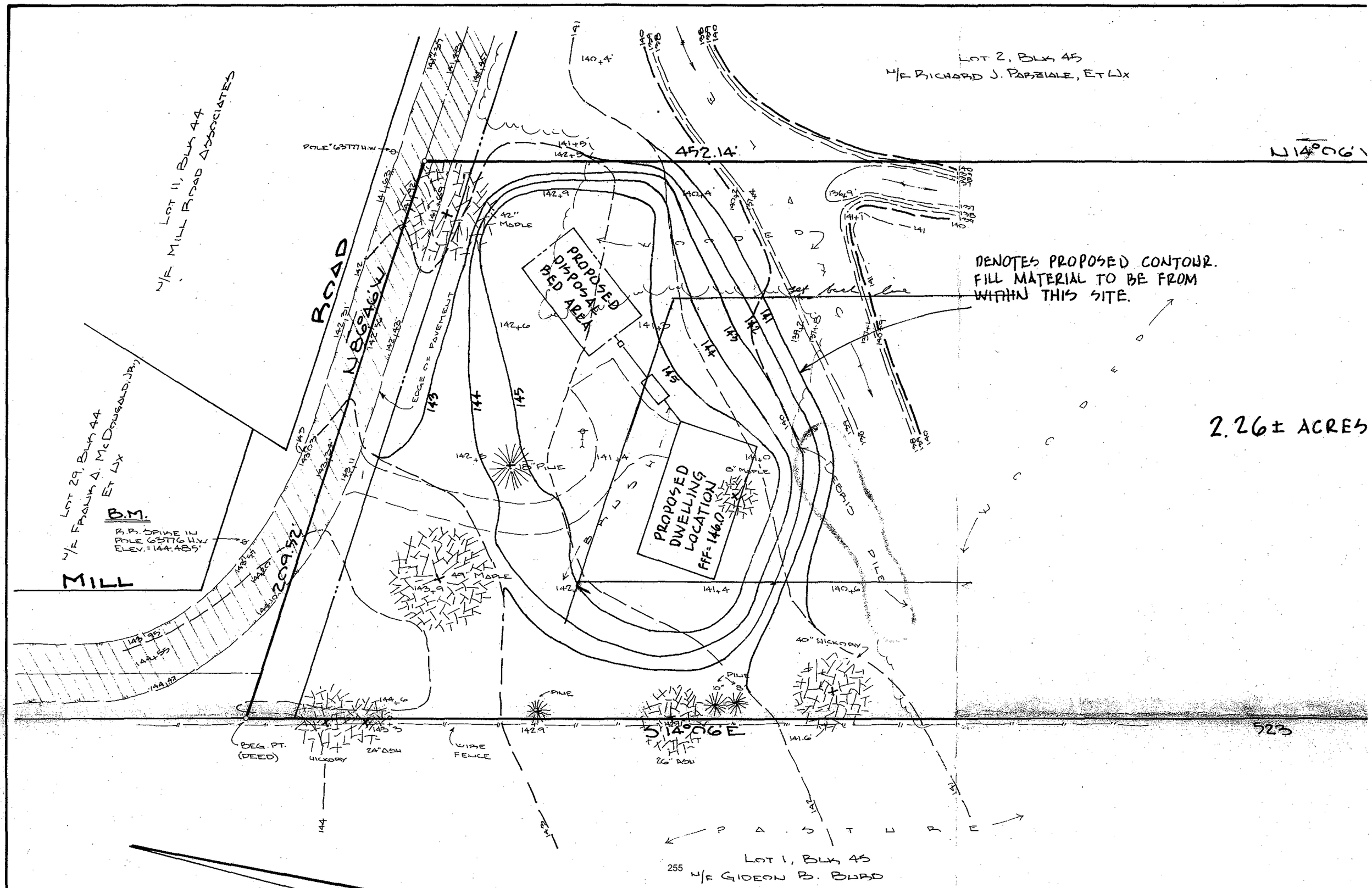
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

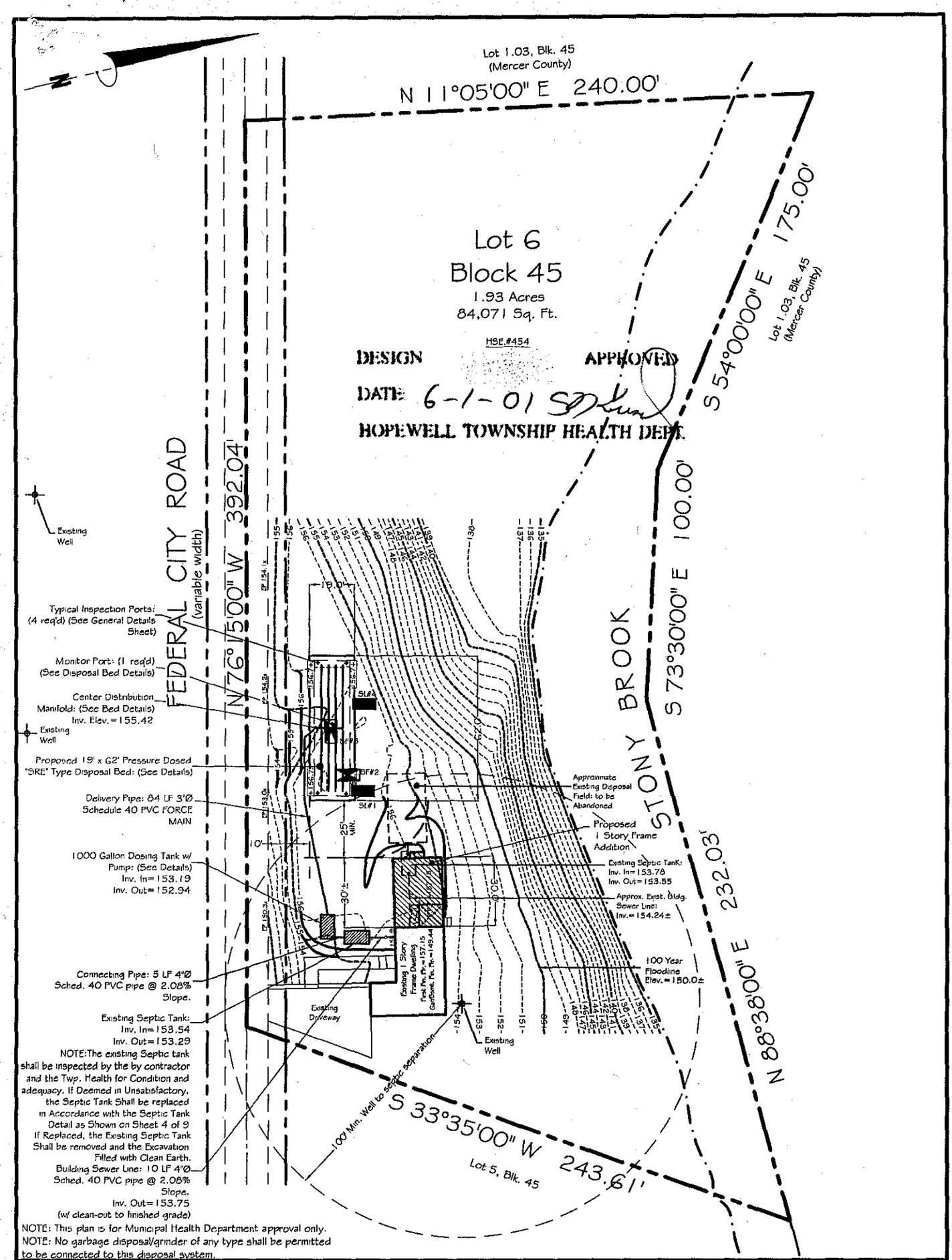
As-B
& FINAL
Ros
Hopew
Mercer

FRANK L. QUINBY	P.E.	L.S.	NO.	11087
BRYCE M. RITTENHOUSE	P.E.	L.S.	NO.	13453
ARNOLD RYDEN, JR.		L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.		NO.	24327

Bryce M. Rittenhouse 7/13/81
DATE

DRAWN	DATE	CER
ARS	7/13/81	Ro
CHECK	SCALE	Cer
BK	1"=50'	As
REV.		


LOT 2, BLK 45
M/F RICHARD J. PARZIALE, ET UX
LOT 11, BLK 44
M/F MILL ROAD ASSOCIATES
LOT 29, BLK 44
M/F FRANK A. McDONOGHUD, JR., ET UX
452.14'
N 14°06'W
N 86°46'W
ROAD
MILL
209.52'
B.M.
B.B. SPIKE IN POLE 63776 H.W.
ELEV.: 144.485'
PROPOSED DISPOSAL BED AREA
PROPOSED DWELLING LOCATION FFF=146.0
DENOTES PROPOSED CONTOUR. FILL MATERIAL TO BE FROM WITHIN THIS SITE.
2.26± ACRES
EDGE OF PAVEMENT
42" MAPLE
49" MAPLE
18" PINE
8" MAPLE
40" HICKORY
26" ASH
24" ASH
HICKORY
WIRE FENCE
BEG. PT. (DEED)
S 14°06'E
523
P A S T U R E
LOT 1, BLK 45
M/F GIDEON B. BURD



NOTE: This plan is for Municipal Health Department approval only.
NOTE: No garbage disposal/grinder of any type shall be permitted to be connected to this disposal system.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Plot Plan of Proposed Addition & Plan of Disposal System Repair

of Lot-6, Block-45 for

Dean Anglin

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

Bryce M. Rittenhouse: PE & LS #13453 — 04/26/01 Date

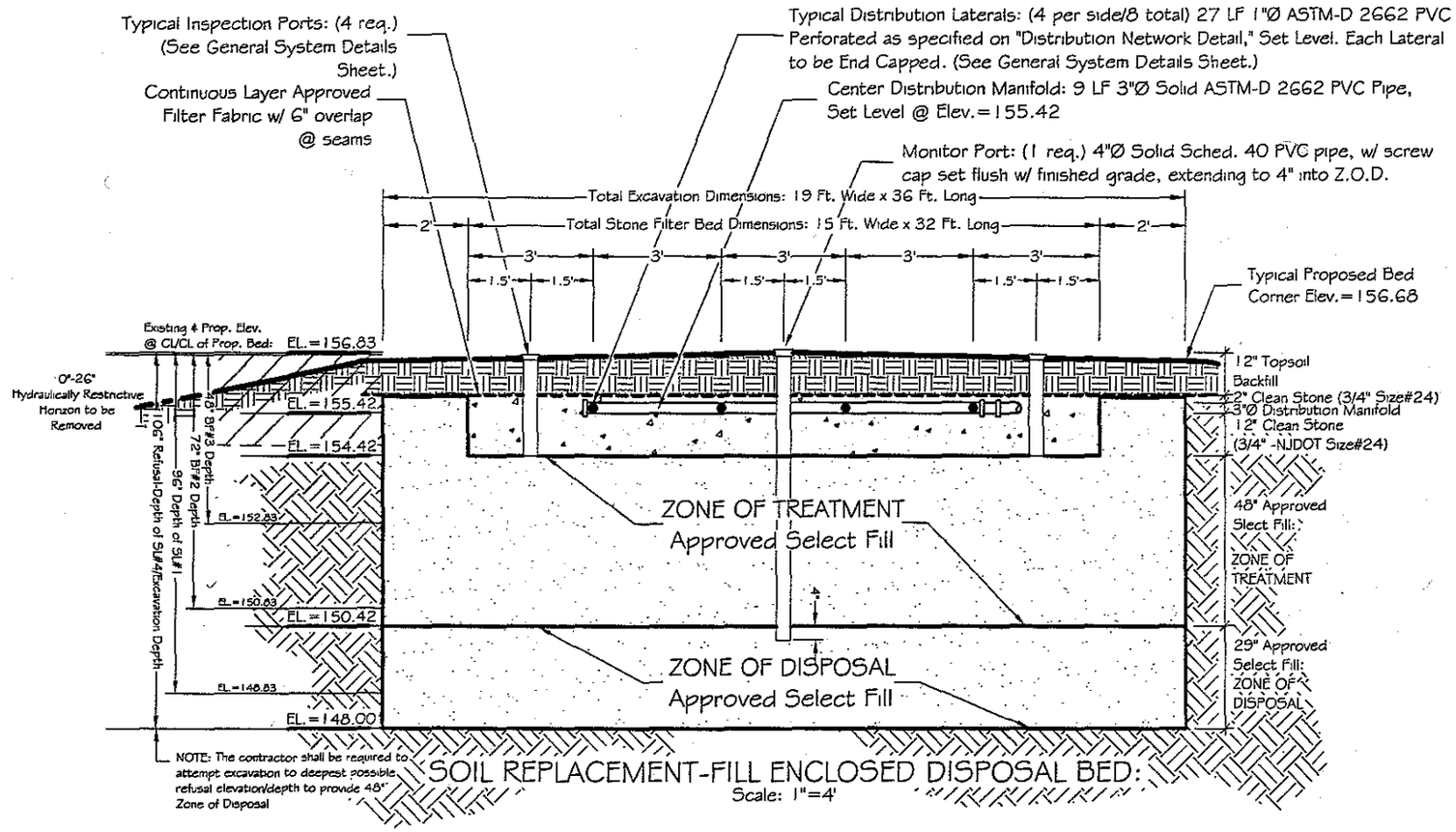
Frank J. Falcone: PLS #32112 & PP #3760 — 04/26/01 Date

Date: 04/26/01
Scale: 1"=50'
Drawn: JRM
Check: FJF/BMR

1/9

Bedrooms: 3/4/01: addition.

Job#:P01-0402
Proj:dan5.dwg
Xrefs:
Layers: SIP_XZP



NOTE: The Hopewell Township Health Dept. requires a Soil Permeability Class Rating Test on the stockpiled select fill. The contractor shall notify the Design Engineer 24 hours in advance of the said stockpiling in order to obtain samples of the fill for testing.
The select fill shall not be emplaced untill a passing soil analysis has been obtained.

The distribution network shall not be constructed untill a passing percolation test or tube permeameter test has been performed on the emplaced select fill, to insure proper compaction. The contractor shall notify the Design Engineer 24 hours in advance in order to perform said test.

DISPOSAL BED SIZING CALCULATION:
Existing 4 Bedroom Dwelling=200 GPD+(3x150 GPD)=650 GPD "Q"
Assume in place select fill @ 3-15 MPI; 1.33 SF/GPD Req'd min. Pressure Dosing
650 GPD x 1.33 SF/GPD= 864.5 SF Min. Btm. Area (USE 865 Sq. Ft.)
865 SF/15' (Prop. bed width)=57.67' (Min. Bed Length/USE 58')
Note: "MSR" TYpe bed req's 2 Ft. fill extension
Excavate total btm. area of bed: 19 Ft. Wide x 62 Ft. Long (=1178 SF)
Construct stone filter bed: 15 Ft. Wide x 58 Ft. Long (=870 SF)

Bryce M. Rittenhouse
Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760
Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Bryce M. Rittenhouse* PE&PLS No. 13453
D. Geoffrey Brown PE&PLS No. 24327
Wesley J. Lane* PLS No. 30747
Frank J. Falcone PLS No. 32112
Ted W. Pivovarnick PLS No. 35868
Martin D. Katz PLS No. 36249
* NJ and PA licensed.

Frank J. Falcone: PLS #32112 & PP #3760
Bryce M. Rittenhouse: PE & PLS #13453

04/26/01
Date

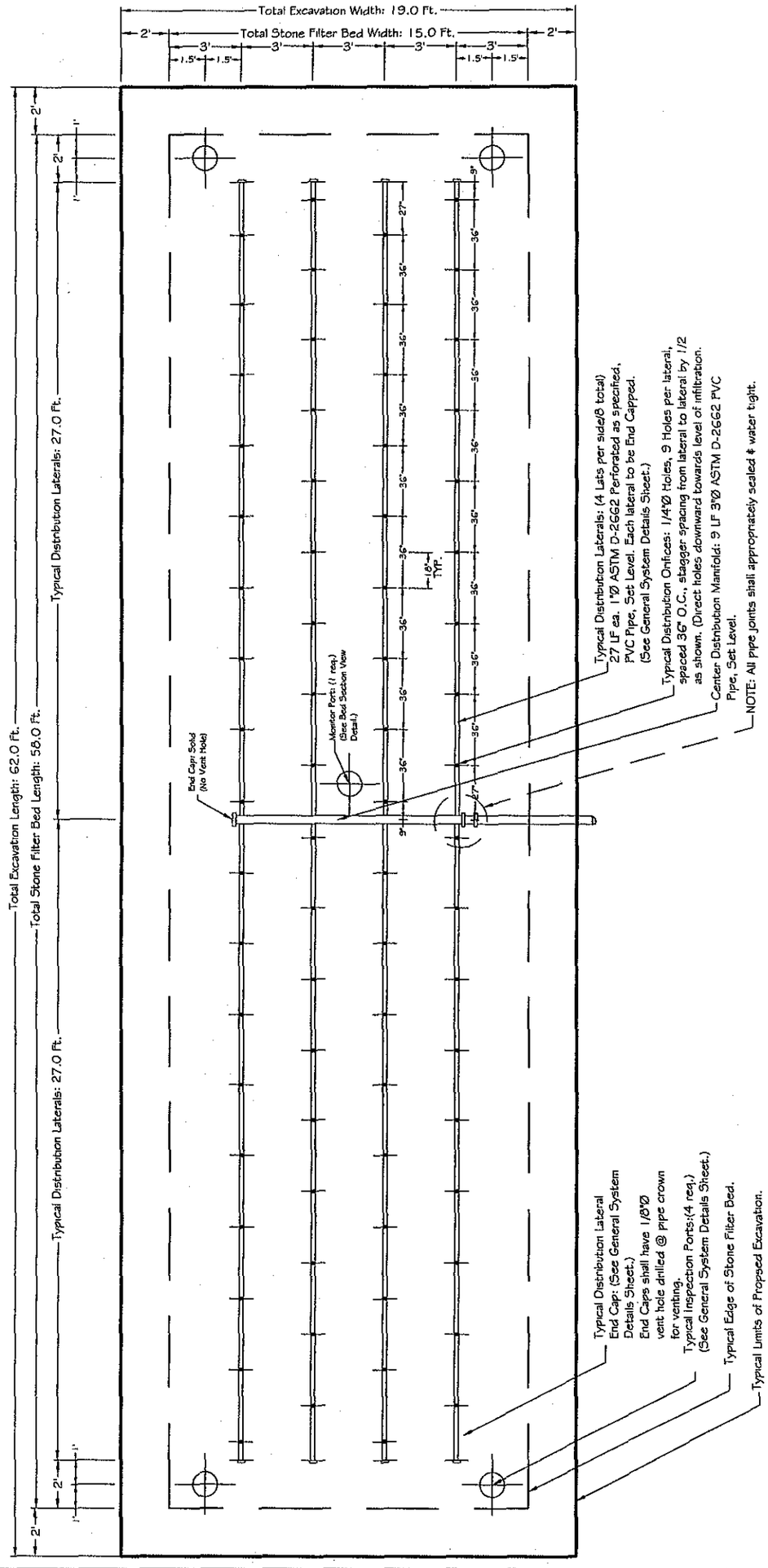
Disposal Bed Section View Detail
of Lot-6, Block-45 for
Dean Anglin
Hopewell Township • Mercer County • New Jersey

Date: 04/26/01
Scale: 1"=4'
Drawn: JRM
Check: FJF/BMR

Revisions:

Job#:P010402
Dwg:L6b45bs.dwg
View:Plan

2/9



Frank J. Falcone
Professional Land Surveyor #32112 & Professional Planner #3760

Bryce M. Rittenhouse
Professional Engineer & Land Surveyor #13453

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Distribution Network Deatil
of Lot-6, Block-45 for
Dean Anglin
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & LS #13453 — 04/26/01 Date

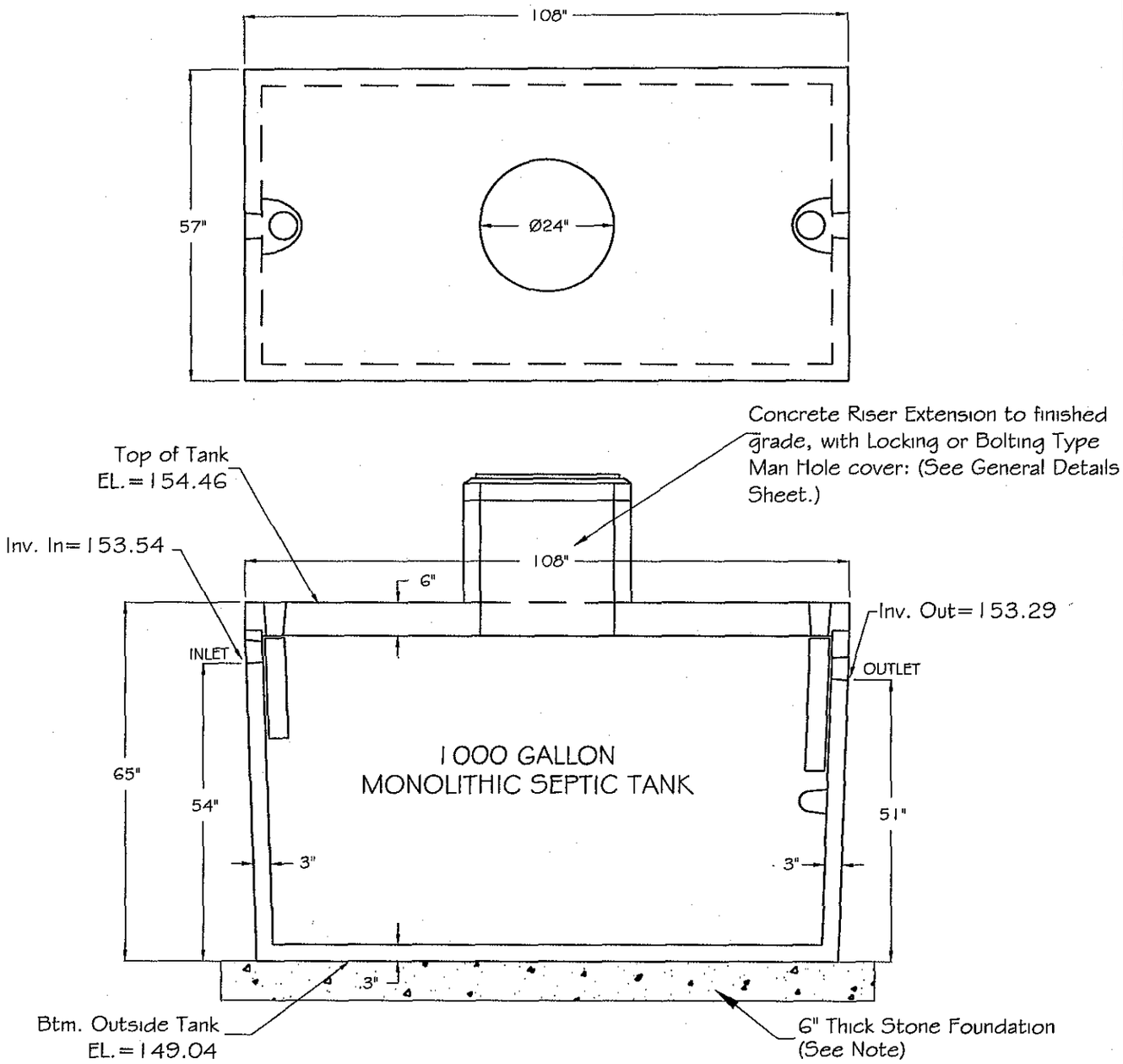
Frank J. Falcone: PLS #32112 & PP #3760 — 04/26/01 Date

Date: 04/26/01
Scale: 1"=6'
Drawn: JRM
Check: FJF/BMR

3/9

Revisions:

Joint#010402
Dwg:LotSlip.dwg
View:Plan
Layers:



Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant

Note: The septic tank shall be placed on a firm & stable foundation of 3/4" size clean stone, compacted and level, 6" thick.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

1000 Gallon Septic tank Detail

of Lot-6, Block-45 for

Dean Anglin

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & PLS #13453 — 04/26/01 Date

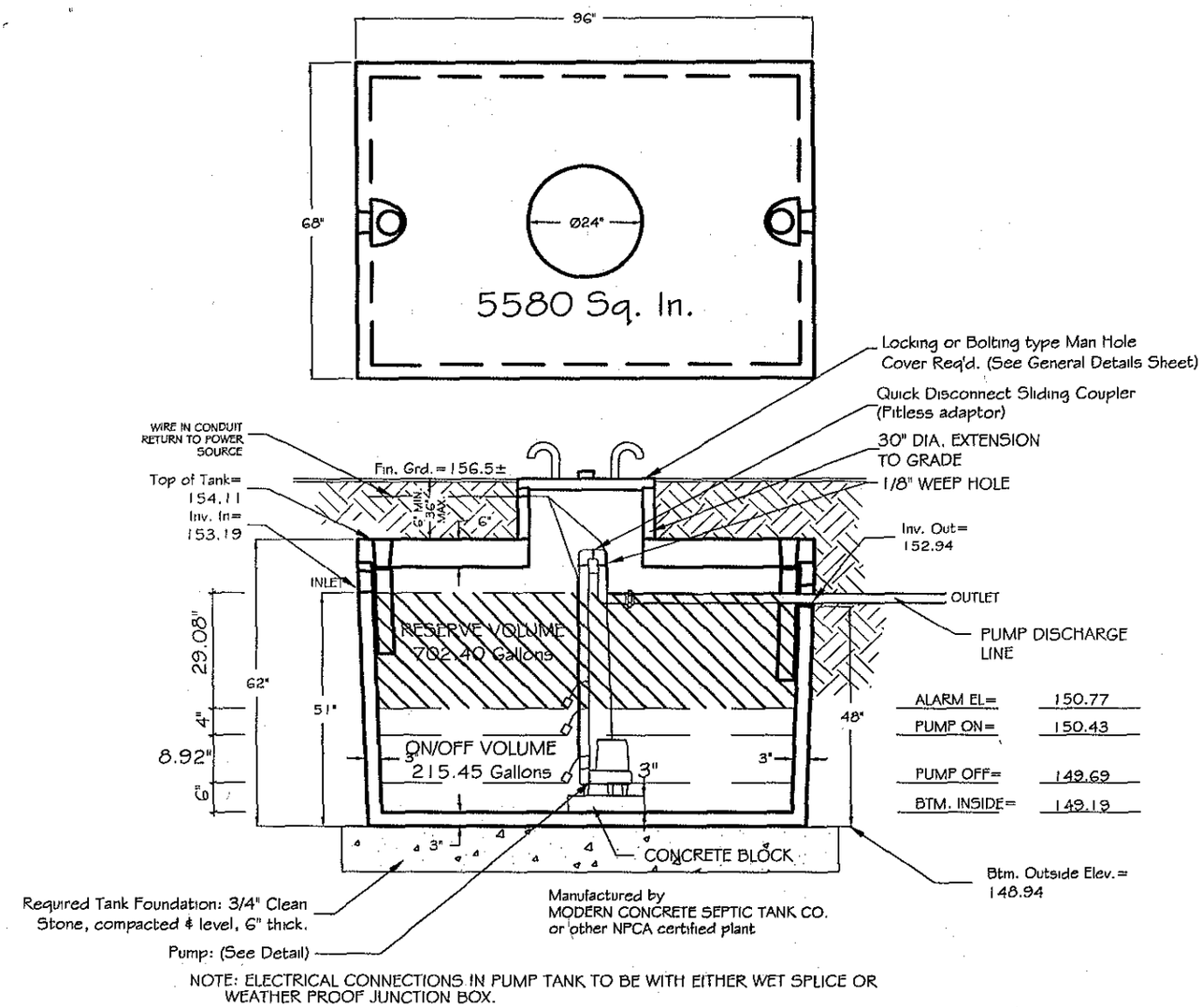
Frank J. Falcone: PLS #32112 & PP #3760 — 04/26/01 Date

Date: 04/26/01
Scale: NONE
Drawn: JRM
Check: FJF/BMR

Revisions:

4/9

Job#:F01-0402
Dwg:LG-455c.dwg
View:Plan



NOTE: ELECTRICAL CONNECTIONS IN PUMP TANK TO BE WITH EITHER WET SPLICE OR WEATHER PROOF JUNCTION BOX.

1000 GALLON DOSING TANK DETAIL

(NTS)

DOSING TANK INFORMATION

1000 GALLON CAPACITY

SWITCH ELEVATIONS:

ALARM ELEVATION = 150.77

PUMP ON ELEVATION = 150.43

PUMP OFF ELEVATION = 149.69

INVERT IN. = 153.19 INV. OUT=152.94

BOTTOM OF TANK ELEVATION = 149.19 (Inside) 148.94 (Outside)

PUMP SPECIFICATIONS; HYDROMATIC SP50H OR APPROVED EQUAL

1000 GALLON CAPACITY

DOSE VOLUME = 162.50 Gals. (25%Q) ON/OFF VOL.=215.45 Gals.

PUMP DELIVERY @ 9.53 FT. TOTAL HEAD = 84.96 gpm

TANK ALERT II PLUS ALARM SYSTEM/PUMP CONTROL, SJ ELECTRO SYSTEMS INC.

AUDIO & VISUAL ALARMS REQUIRED FITLESS ADAPTER REQUIRED.

RESERVE CAPACITY BETWEEN INVERT IN AND ALARM ELEVATION = 702.4 gal > 650 gal. OK

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

1000 Gallon Dosing Tank Detail
of Lot-6, Block-45 for
Dean Anglin
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & LS #13453 — Date 04/26/01

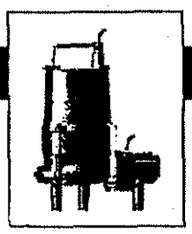
Frank J. Falcone: PLS #32112 & PP #3760 — Date 04/26/01

Date: 04/26/01
Scale: None
Drawn: JRM
Check: FJF/BMR

5/9

Revisions:

Jobs\01040\2 Dwg\Gal-Dsn.dwg Year Plan



ENGINEERING DETAILS - SPD50H

Pump Characteristics

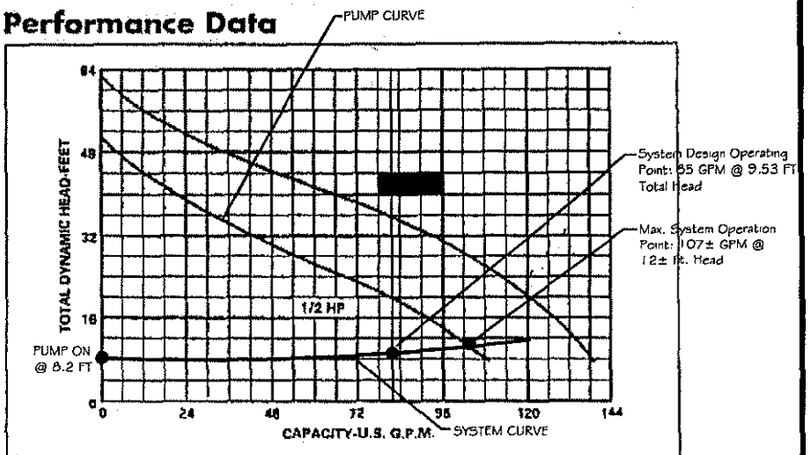
Pump/Motor Unit	Submersible				
Manual Model (50)	MH1	MH2	MH6	MH4	MH5
Automatic Models	AH1	AH2	–	–	–
Horsepower	1/2				
Full Load Amps	15.0	7.5	4.0	1.8	1.5
Motor Type	Capacitor Start		Three-Phase		
R.P.M.	3450				
Phase Ø	1		3		
Voltage	115	230	200	460	575
[redacted]					
Hertz	60				
Operation	Intermittent				
Temperature	140°F Ambient				
NEMA Design	B				
Insulation	Class B				
Discharge Size	2" NPT (3" opt.)				
Solids Handling	3/4"				
Unit Weight	73 lbs.				

Power Cord: SPD50H 14/3, STW-A, 1a, 115V = 10' std. (20' opt.)–14/4, STW-A, 1a, 115V = 10' std. (20' opt.)–16/3, STW-A, 1a, 230V = 20' std.–16/4, STW-A, 1a, 230V = 20' std. SPD100H 16/3, STW-A, 1a, 230V = 20' std.–16/4, STW-A, 1a, 230V = 20' std.–18/3, STW-A, 3a, 200V, 230V, 460V or 575V = 20' std.

Materials of Construction

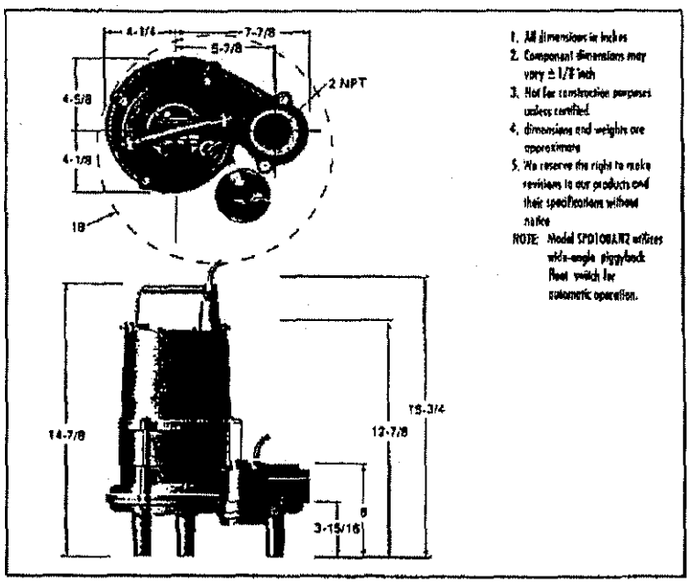
Handle	Steel
Lubricating Oil	Dielectric Oil
Motor Housing	Cast Iron
Seal Housing	Cast Iron
Pump Casing	Cast Iron
Shaft	Stainless Steel
Mechanical Shaft Seal	Seal Faces: Carbon/Ceramic Seal Body: Brass Spring: Stainless Steel Bellows: Buna-N
Impeller	Cast Iron
Upper Bearing	Single Row Ball Bearing
Lower Bearing	Single Row Ball Bearing
Base	Cast Iron
Fasteners	Stainless Steel

Performance Data



Total Head (feet)		10	20	30	40	50	60
GPM	1/2 HP	105	77	50	23	0	–
	[redacted]						

Dimensional Data



1. All dimensions in inches
2. Component dimensions may vary ± 1/8 inch
3. Not for construction purposes unless certified.
4. dimensions and weights are approximate
5. We reserve the right to make revisions to our products and their specifications without notice

NOTE: Model SPD100AH2 utilizes wide-angle piggyback float switch for automatic operation.

AURORA/HYDROMATIC Pumps, Inc.
1840 Baney Road, Ashland, Ohio 44805
(419) 289-3042

- OR DESIGN ENGINEER APPROVED EQUAL.
- AN AUDIO & VISUAL PUMP FAILURE ALARM IS REQUIRED.
- THE ALARM SHALL BE PLACED IN A NOTICEABLE AND APPROPRIATE LOCATION INSIDE THE PROPOSED DWELLING.
- SEPARATE ELECTRICAL CIRCUITS SHALL BE PROVIDED FOR THE PUMP SYSTEM AND THE ALARM SYSTEM.

Bryce M. Rittenhouse Professional Engineeer & Land Surveyor #13453

Frank J. Falcone Profesional Land Surveyor #32112 & Professional Planner #3760

PJE Princeton Junction Engineering, P.C
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Pump Detail
of Lot-6, Block-45 for
Dean Anglin
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & LS #13453 — 04/26/01 Date

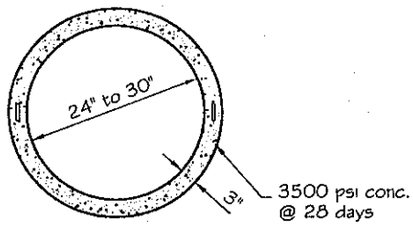
Frank J. Falcone: PLS #32112 — 04/26/01 Date

Date: 04/26/01
Scale: None
Drawn: JRM
Check: FJF/BMR

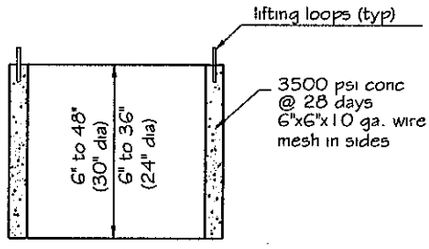
6/9

Revisions:

Job#01010402
Dwg:Lot-6-Spec.dwg
Vienyton



Plan View



Section View

CONCRETE EXTENSION

(nts)

FILTER FABRIC SPECIFICATIONS

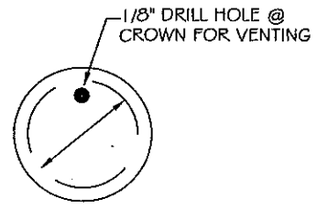
TERRATEX SD OR EQUAL

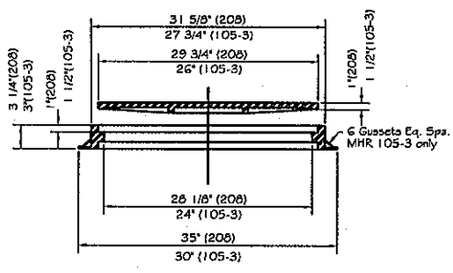
GRAB TENSILE STRENGTH	125 LBS.
MULLEN BURST STRENGTH	275 LBS/SQ. IN.
ELONGATION	80 %
WATER PERMEABILITY COEFFICIENT	-2 CM/SEC.

THE FABRIC IS TO BE LAPPED OVER THE TOP OF STONE A MIN. OF 6"

End Cap Detail

not to scale





Specifications:

Specifications are from Quirin. The frame and covers are made of gray iron which meets of exceeds ASTM A48, Class 30B. Other grades of gray iron available upon request. Furnished with standard one coat of black asphaltum paint. Uncoated castings available upon

MHR 105-3:

Round flange manhole frame and cover for Septic Tanks. Shall be provided with a bolting and gasketed cover.

MHR 208 BF:

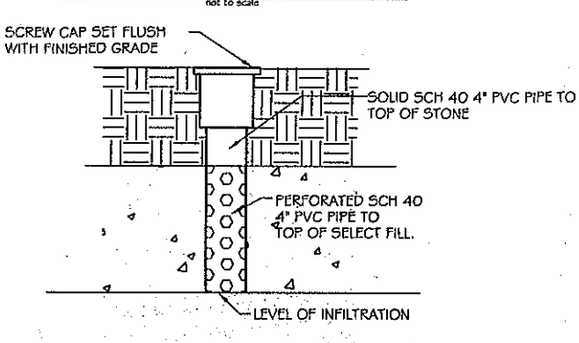
Light duty manhole frame and cover for Dosing Tanks. Shall be provided with a bolting and gasketed cover.

Manhole Frame Detail

no scale

Inspection Port Detail

not to scale



Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

General Disposal System Details

of Lot-6, Block-45 for

Dean Anglin

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

Bryce M. Rittenhouse: PE & LS #13453 — 04/26/01 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 04/26/01 Date

Date: 04/26/01
Scale: None
Drawn: JRM
Check: FJF/BMR

Revisions:

7/9

Job#:F010402
Dwg:LGM-Sec.dwg
View:Plan

Disposal System Notes

1. Prior to the installation of fill material, the disposal field excavation shall be performed in accordance with N.J.A.C. 7:9a10.3(c) 1 through 5.
2. Work should be scheduled so that the bottom and sidewalls of the excavation will not be exposed to rainfall or windblown silt between time of excavation and time of final inspection and grading.
3. Any loose soil or debris which is washed into or deposited within the excavation shall be removed prior to the construction of the distribution network.
4. Any smeared or compacted soil surfaces within the disposal field excavation shall be removed to expose a fresh soil surface.
5. Excavations in soils other than sands or loamy sands shall not be continued when soil moisture content is above the lower plastic limit. This means when a small lump of soil, taken from the depth of the proposed excavation, can be rolled out with the fingers to form a wire or rod one-eight of an inch in thickness and does not crumble when handled.
6. Clayey soils encountered in the bottom of the excavation shall be removed and replaced with suitable fill.
7. The fill material installed in the zone of disposal shall have a textural analysis (composition by weight of size fraction passing through a two millimeter sieve) 70%+ med.-coarse sand, but not less than 90% total sand. The fill material shall also have a percolation rate faster than 15 minutes per inch.
8. The suitable fill material installed in the zone of treatment shall have a coarse fragment content less than 15% by volume or less than 25% by weight. It shall also have a textural analysis (composition by weight of size fraction passing the two millimeter sieve). from 70% to 90% med.-coarse sand; 0-25% fine sand; 5% to 10% silt & clay ; min. clay 2%, Fill material shall also have a percolation rate of 3 to 15 min/in. or a permeability rate of 6-20 in/hr.
9. All fill material shall be spread and compacted in layers one foot or less in thickness and compacted manually or mechanically, by tamping or rolling, by driving over the filled area in a controlled pattern using tracked or rubber tired vehicles, or by puddling.
10. Heavy excavating equipment shall not be operated directly on the exposed bottom of the excavation. If heavy excavating equipment is used to compact the fill material, the first lift shall be one foot in thickness.
11. The filter material shall consist of washed gravel or crushed stone, free of fines, dust, ashes or clay. It shall conform in size and gradation to size #24, #3 or #4 of the N.J.D.O.T. standard for coarse aggregates.
12. The filter material shall be installed into the disposal system excavation using a backhoe, front end loader or dump truck from the sides.
13. Construction of the distribution network shall be in accordance with 7:9a-10.3(d).
14. PVC distribution laterals shall meet ASTM standards D-2729, D-3033 or D-3034.
15. Filter material is to be covered with drainage fabric as the laying of distribution lines progresses. Drainage fabric shall be overlapped a minimum of 6".
16. Filter fabric shall have a grab tensile strength of 125 lbs., mullen burst strength of 275 lbs., elongation 80% & permeability coefficient of 0.2 cm/sec. Filter fabric shall be Terratex sd or equal.
17. Construction of the distribution box shall be in accordance with 7:9a-9.4.
18. The distribution box shall be set directly on the filter material within the disposal bed.
19. A permanent concrete monument will be installed over the distribution box flush with finished grade.
20. Construction of the connecting pipe or delivery pipe shall be in accordance with 7:9a-9.3.
21. All changes of direction in the soil pipe and connecting pipe shall employ max. 45' fittings and shall include cleanouts.
22. Soil pipe and connecting pipe shall be placed on a stabilized base of quarry blend stone extending to virgin ground.
23. PVC connecting pipes will meet ASTM standard D-2665 - schedule 40, SDR-21 or SDR-26.
24. The building sewer shall be designed and constructed in accordance with the provisions of the state uniform construction code, N.J.A.C. 5:23, adopted pursuant to the uniform construction code act, N.J.S.A. 52:27d119 et seq.
25. Septic tanks shall be precast concrete tanks constructed of concrete conforming to ACI318-16-4.5.1 and 318-16-4.5.2. Certification shall be provided by the manufacturer and the certification displayed on the tank.
26. Septic tank shall be 1000 gal. single compartment tank.
27. All manhole covers and inspection ports in the septic tank shall have water tight bolted or locked caps set flush with finish grade.
28. All interior concrete surfaces shall be sealed with two coatings of an approved inert coating to minimize corrosion. Coating shall be applied prior to delivery by the manufacturer.
29. Septic tanks shall be fabricated and installed in accordance with 7:9a-8.2.
30. A permanent marker shall be placed on grade above the septic tank upon completion of the installation.
31. Backfill and final grading shall be carried out in accordance with 7:9a-10.3(f).
32. Topsoil shall be lightly compacted by tamping or rolling to prevent settlement and shall be seeded and mulched or sodded immediately upon completion of final grading.
33. All trees with drip lines within 10 ft. of the disposal field shall be removed prior to construction.
34. There shall be no existing or proposed disposal systems within 50 ft. of the proposed disposal field.
35. No garbage disposal unit of any kind shall be connected to this disposal system.
36. Backwash from water softeners or other drainage other than sanitary sewage shall not enter the disposal system.
37. All soil evaluation procedures relied upon as a basis for the design of the subject individual subsurface sewage disposal system were carried out by or under the direct supervision of a professional engineer and witnessed by the administrative authority.
38. Vegetative planting in the disposal area shall be limited to grass unless otherwise specified by the administrative authority.
39. An annual inspection of the system shall begin three (3) years after installation or pump out of the septic tank.
40. The disposal system contractor is responsible for confirmation that all materials utilized in the construction of the disposal system are in accordance with N.J.A.C. 7:9a.
41. When placement of the disposal field is proposed in an area of disturbed ground as defined at 7:9a - 5.10, an acceptable state of compaction of the soil or fill material shall be verified by laboratory tests, and the design engineer shall certify a minimum compaction of 90 percent of the standard procter density.
42. All regraded areas shall comply with 7:9a-10.3.
43. Storm sewers within 75 ft. of the disposal system shall be constructed with watertight joints.
44. There shall be no existing or proposed wells within 100 ft. of the proposed disposal field.
45. THIS PLAN IS FOR BUILDING PERMIT ONLY.

General Notes

1. The Health Department shall receive 48 hours notification prior to the start of any construction on the system.
2. Once the excxavation of bed is complete a bottom of excavation inspection shall be performed by the Design Engineer and approved prior to the placement of the select fill.
3. After suitable fill is placed and compacted a min. of 1 permeabilty test shall be performed and approved by the Design Engineer, and if required the test shall be witnessed by the Health Department prior to the placement of stone.
4. The results of the select fill analysis shall be forwarded to the Health Department (see note No.8 in the Disposal System notes)
5. All manholes covers and inspection port caps inthe septic tank shall have water tight bolted or locked caps.
6. All interior concrete surfaces shall be sealed with 2 coatings of an "approved inert coating to minimize corrosion, coating shall be applied prior to delivery by the manufacturer.
7. The 'D' box shall sit in the disposal bed area on the filter material.
8. This plan is for building permit only.
9. No existing/proposed wells or disposal systems within 100 ft. of the proposed disposal field and well.

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Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

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Princeton Junction, New Jersey 08550
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General Disposal System Notes
of Lot-6, Block-45 for
Dean Anglin
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & LS #13453 — 04/26/01 Date

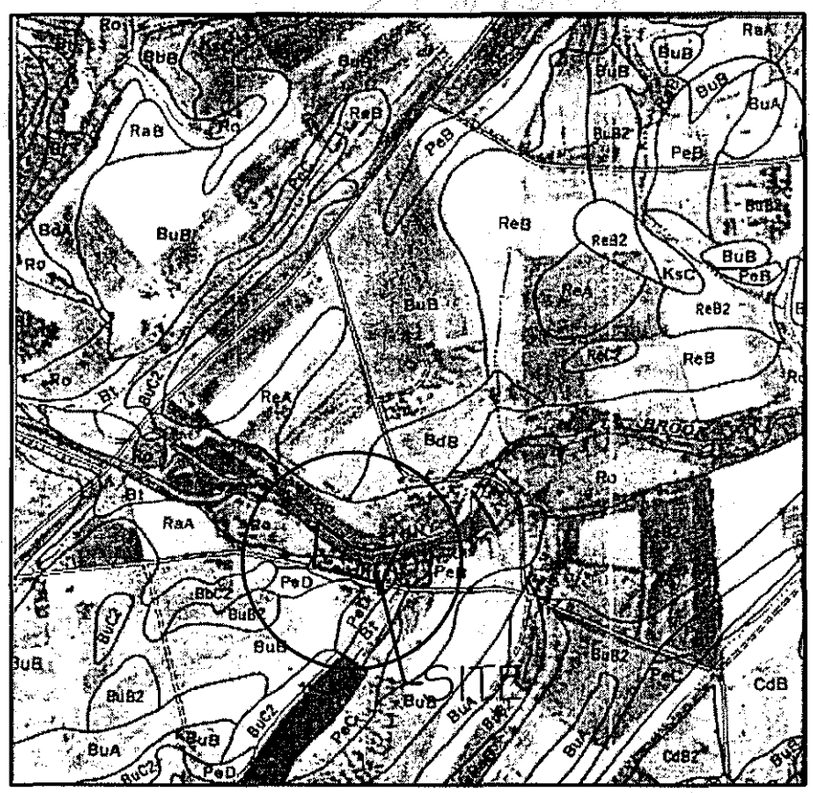
Frank J. Falcone: PLS #32112 & PP #3760 — 04/26/01 Date

Date: 04/26/01
Scale: None
Drawn: JRM
Check: FJF/BMR

Revisions:

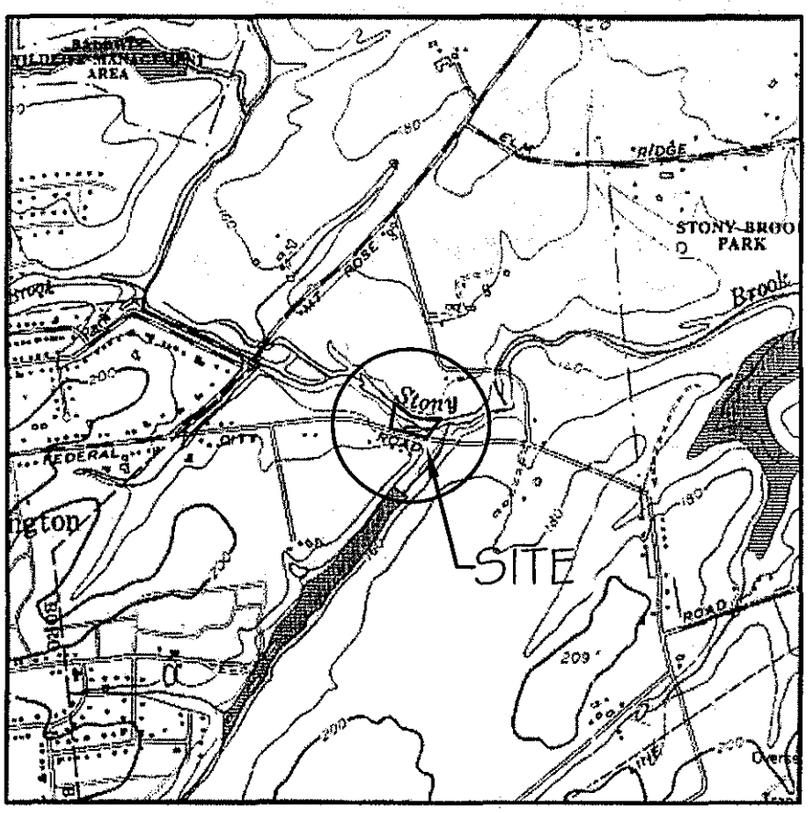
8/9

Job#:P010402
Dwgs:Lot-6-45Site.dwg
View:Plan



MERCER CO. SOIL SURVEY MAP:

Sheet #8; Scale 1"=1320'



U.S.G.S. QUADRANGLE MAP:

Pennington Quad.; Scale 1"=2000'

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

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Key Maps

of Lot-6, Block-45 for

Dean Anglin

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
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Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

Bryce M. Rittenhouse: PE & LS #13453 — 04/26/01 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 04/26/01 Date

Date: 04/26/01
Scale: As Shown
Drawn: JRM
Check: FJF/BMR

Revisions:

9/9

Job#:P010402
Dwg:LBs45lay.dwg
View:Plan

99034

RECEIVED
APR 5 1999
Hopewell Township Health Dept.

BALDWIN LAKE
Lot 53.01, Blk. 46

Typical Inspection Port: (See Details.)
Proposed 1272 Sq. Ft. "MSR" Type Pressure Dosed Disposal Bed: (See Details.)
Center Distribution Manifold: Inv. Elev.=177.29 (See Disposal Bed Details.)

SL#44
SL#43
SL/BF#28
BF#27
SL/BF#25
SL#42
SL/BF#26

Typical Clearing Limit Line
Daylight Inv.= 176.82
36 LF 6"Ø SDR 35 PVC drain @ 0.50% Slope
220 LF 30"R35 PVC @ 1.00%
C.O. to Grade (TYP.)
Lawn Inlet: Gr.=178.50 Inv.=177.00
100' MIN.
2.0% MIN. Slope
Gar. Fin. Flr.= 180.32
Existing Well Location
Proposed 2 Story 6 Bdrm. Frame Dwelling
First Fin. Flr.=183.67
Bsmt. Fin. Flr.=174.84
Dry Well
FUTURE POOL HOUSE
FUTURE POOL

Monitor Port: (See Bed Details.)
Typical 5:1 Maximum Grade
Delivery Pipe: 20 LF 3"Ø Schedule 40 PVC FORCE MAIN
1500 Gallon Dosing Tank W/ Pump: (See DEtails.)
Inv. Out=173.50
Inv. In=173.75
Connecting Pipe: 114 LF 4"Ø Schedule 40 PVC pipe @ 2.08% Slope. W/ Clean-Outs to finished grade @ 50 Ft. O.C.
1500 Gallon Septic Tank: (See Detail.)
Inv. In=176.37
Inv. Out=176.12
Building Sewer Line: 10 LF 4"Ø Schedule 40 PVC pipe @ 2.08% Slope.
Inv.=176.58
W/ Clean-Out to finished grade.

LOT 14
BLOCK 46
67.398 Acres

WOODED

DESIGN APPROVED
DATE: 4/5/99
HOPEWELL TOWNSHIP HEALTH DEPT

NOTE: No garbage Grinder/Disposal of any type shall be permitted to be connected to this disposal system.
NOTE: This plan is for Building Permit ONLY.

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

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Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email: PJEPC@compuserve.com

Plot Plan & Disposal System Design

of Lot-14, Block-46 for

Alexander D. Hanson

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
Arnold Ryden Jr.	PLS	No.21223
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Frank J. Falcone: PLS #32112 & PP #3760 — 3/30/99 Date

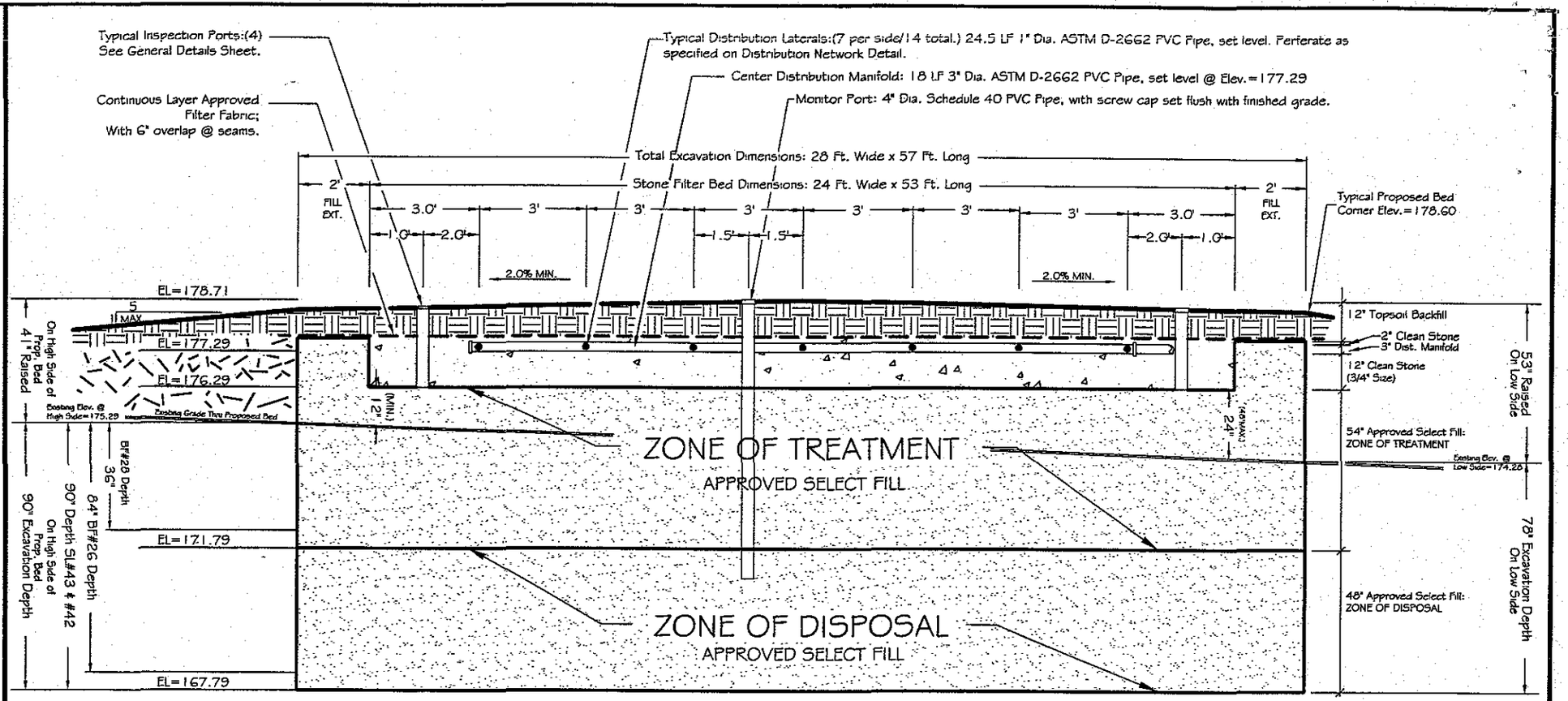
Bryce M. Rittenhouse: PE & LS #13453 — 3/30/99 Date

Date: 02/25/99
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

1/9

Revisions: 3/30/99 Add Bedroom

Job#:F98025
Dwg:L14b4Gpprd.dwg
View:Plan



MOUNDED SOIL REPLACEMENT DISPOSAL BED:

Scale: 1"=4'

DISPOSAL BED SIZING CALCULATION:

Proposed 6 Bedroom Dwelling = 950 GPD "Q"
Assume in-place select fill @ 3-15 MPI: Prop. Pressure Dosed System, use 1.33 SF/GPD
1.33 SF x 950 GPD = 1264 SF min. bed area required.
1264 SF/24' (Prop. Bed Width)=52.67' Min. Bed Length (USE 53')
Note: "MSR" Type Bed requires 2 Ft. fill extension
Excavate total Bottom Area of Bed: 28' Wide x 57' Long = 1596 SF
Construct Stone Filter Bed: 24' Wide x 53' Long = 1272SF

NOTE: The Hopewell Township Health Dept. requires a Soil Permeability Class Rating Test on the stockpiled Select Fill. The Contractor shall notify the Design Engineer 24 hours in advance of the said stockpiling in order to obtain samples for testing.
The Select Fill shall NOT be emplaced untill a passing soil analysis has been obtained.
The Distribution Network shall not be constructed untill a passing percolation test (or Tube Permeameter Test.) has been performed on the in-place and compacted select fill material, to insure proper compaction. The contractor shall notify the Design Engineer 24 hours in advance in order to perform said test.

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

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Martin D. Katz PLS No.36249
*NJ and PA Licensed.

Frank J. Falcone: PLS#32112 & PP #3760 — 3/30/99 Date

Bryce M. Rittenhouse: PE*PLS #13453 — 3/30/99 Date

Disposal Bed Section Veiw Detail

of Lot-14, Block-46 for

Alexander D. Hanson

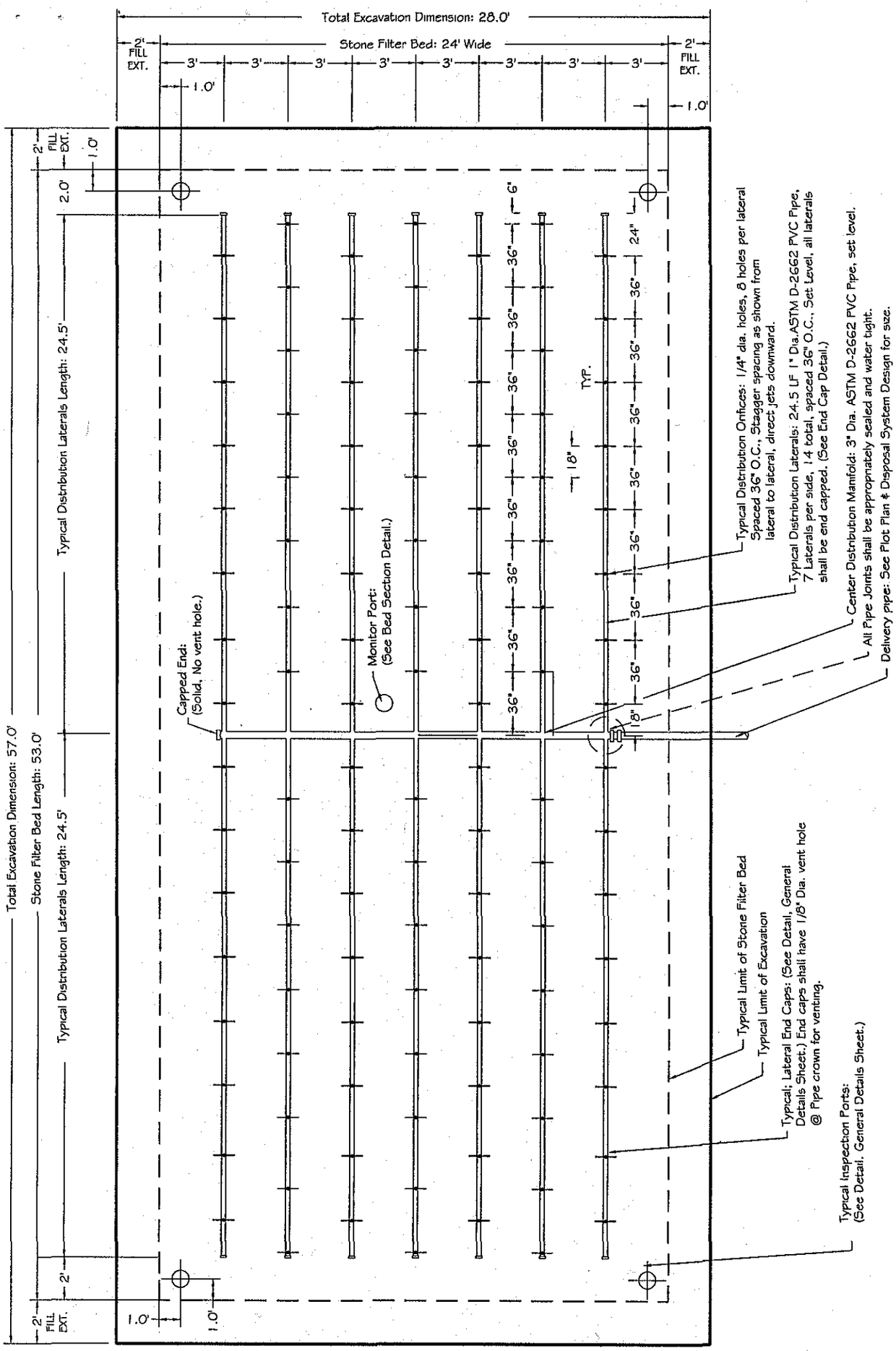
Hopewell Township * Mercer County * New Jersey

Date: 02/25/99
Scale: No Scale
Drawn: JRM
Check: FJF/BMR

2/9

Revisions:
3/30/99
Add Bedroom

Job#:F98025
Dwg:L14b46bs.dwg
View:Plan



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Distribution Network Detail

of Lot-14, Block-46 for

Alexander D. Hanson

Hopewell Township • Mercer County • New Jersey

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Arnold Ryden Jr.	PLS	No.21223
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Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Frank J. Falcone: PLS #32112 & PP #3760 — 3/30/99 Date

Bryce M. Rittenhouse: PE&PLS #13453 — 3/30/99 Date

Date: 02/25/99
Scale: 1"=6'
Drawn: JRM
Check: FJF/BMR

3/9

Revisions: 3/30/99 Add Bedroom

Job#:F98025
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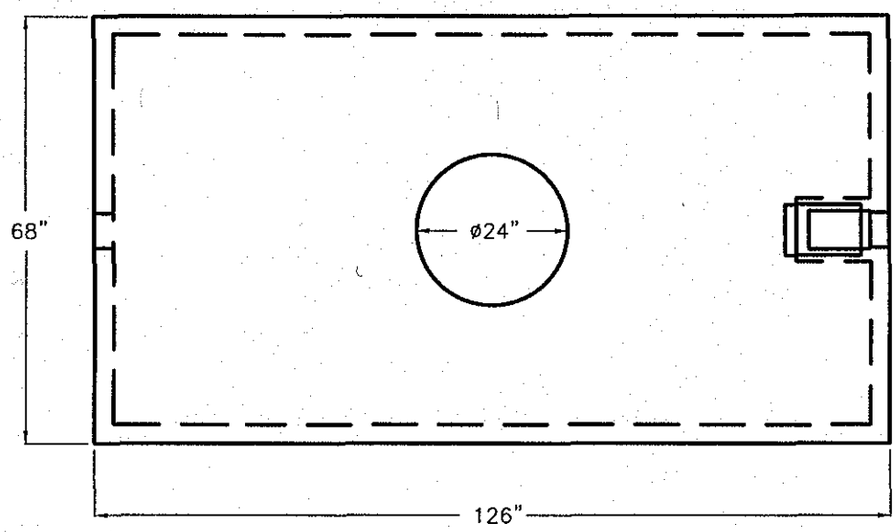
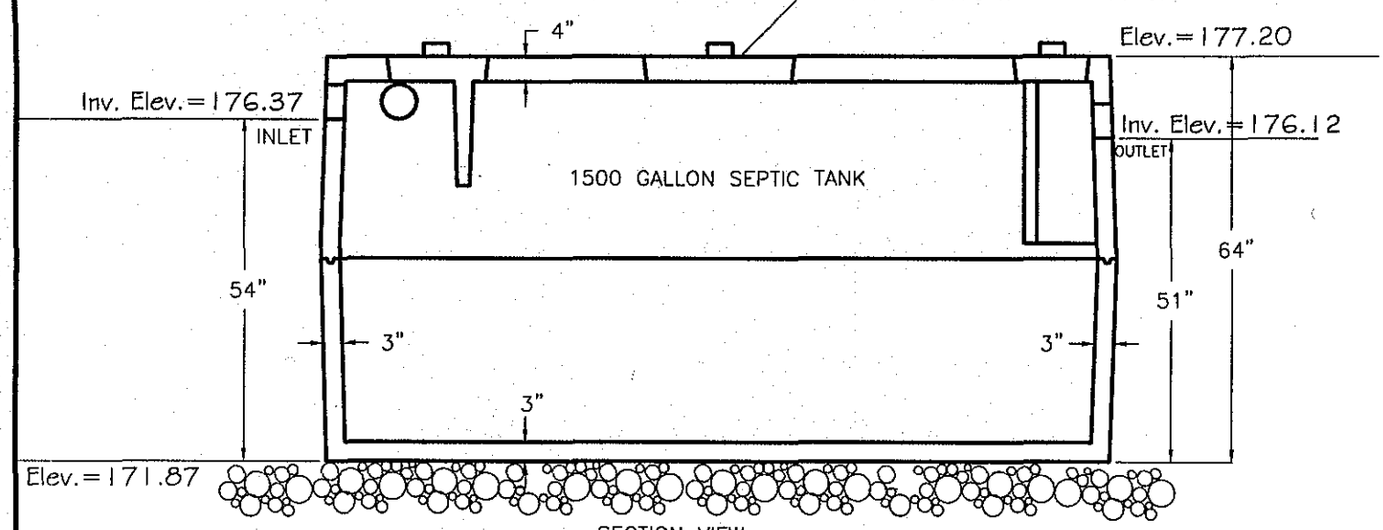
View:Plan



PLAN VIEW

Note: Tank Opening Shall be Extended to Finished Grade Using 36" Dia. Concrete Riser Extentions With Locking Metallic Frame and Manhole Cover



SECTION VIEW

Note: The Septic Tank Shall be Placed on a 6" Layer of 3/4 Stone on.a Stable Earth Footing

Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

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Septic Tank Detail

of Lot-14, Block-46 for

Alexander D. Hanson

Hopewell Township • Mercer County • New Jersey

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Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

Frank J. Falcone: PLS #32112 & PP #3760 — 3/30/99 Date

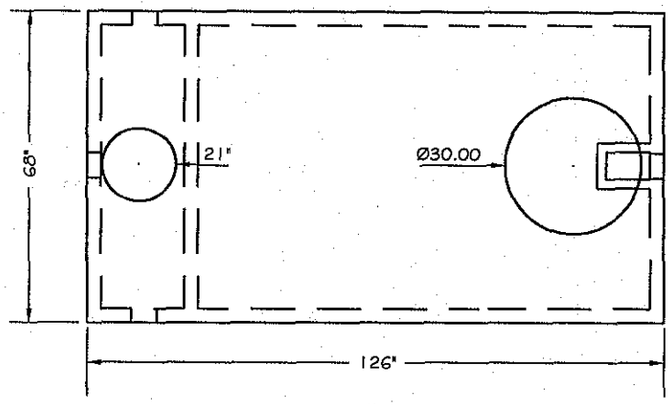
Bryce M. Rittenhouse: PE & PLS #13453 — 3/30/99 Date

Date: 02/25/99
Scale: None
Drawn: JRM
Check: FJF/BMR

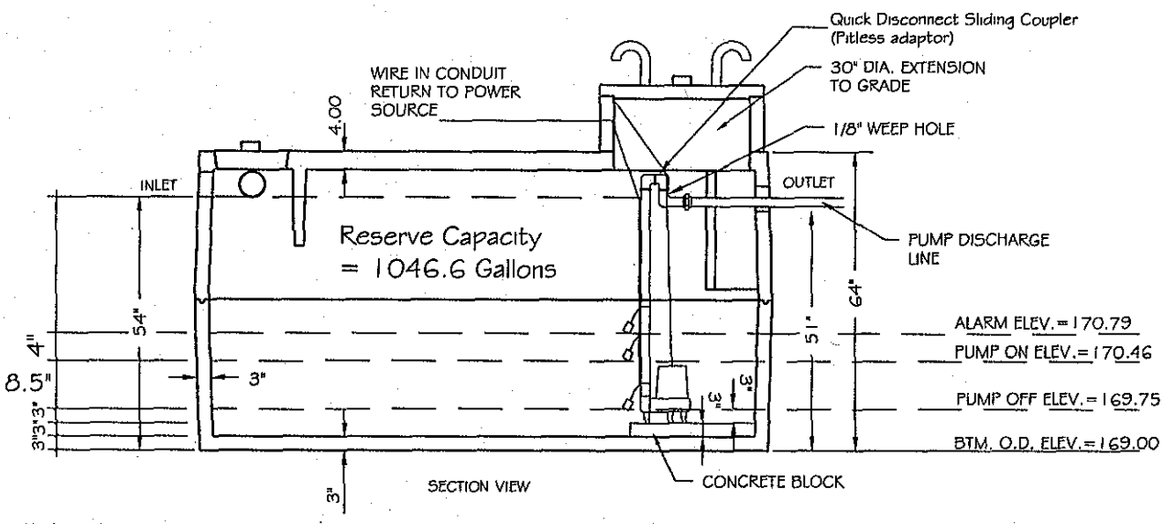
4/9

Revisions: 3/30/99 Add Bedroom

Job#:F98025
Dwg:L14b46s.dwg
View:Plan



PLAN VIEW



Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant

NOTE: ELECTRICAL CONNECTIONS IN PUMP TANK TO BE WITH EITHER WET SPLICE OR WEATHER PROOF JUNCTION BOX.

1500 GALLON DOSING TANK DETAIL

(NTS)

DOSING TANK INFORMATION

1500 GALLON CAPACITY

SWITCH ELEVATIONS:

ALARM ELEVATION = 178.79

PUMP ON ELEVATION = 170.46

PUMP OFF ELEVATION = 169.75

INVERT IN. = 173.50

BOTTOM OF TANK ELEVATION = 169.00(Outside) 169.25(Inside)

PUMP SPECIFICATIONS; HYDROMATIC SP100
OR APPROVED EQUAL

1500 GALLON CAPACITY

DOSE VOLUME = 275.44 Gal. (25%Q + pump displacement & drainback))

PUMP DELIVERY @ 10.455 OF HEAD
= 136 gpm

TANK ALERT II PLUS ALARM SYSTEM/PUMP

CONTROL, SJ ELECTRO SYSTEMS INC.

AUDIO & VISUAL ALARMS REQUIRED PITLESS
ADAPTER REQUIRED.

RESERVE CAPACITY BETWEEN INVERT IN AND
ALARM ELEVATION = 1046.6 gal > 950 gal. OK

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

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1500 Gallon Dosing Tank Detail
of Lot-14, Block-46 for
Alexander D. Hanson
Hopewell Township • Mercer County • New Jersey

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* NJ and PA Licensed.

Frank J. Falcone: PLS #32112 & PP #3760 — Date 3/30/99

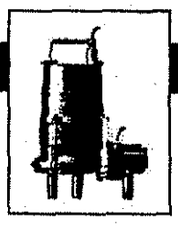
Bryce M. Rittenhouse: PE & LS #13453 — Date 3/30/99

Date: 02/25/99
Scale: None
Drawn: JRM
Check: FJF/BMR

5/9

Revisions:
3/30/99
Add Bedroom

Job#:F98025
Dwg:L14b46pt.dwg
View:Plan



ENGINEERING DETAILS - SPD /100H

Pump Characteristics

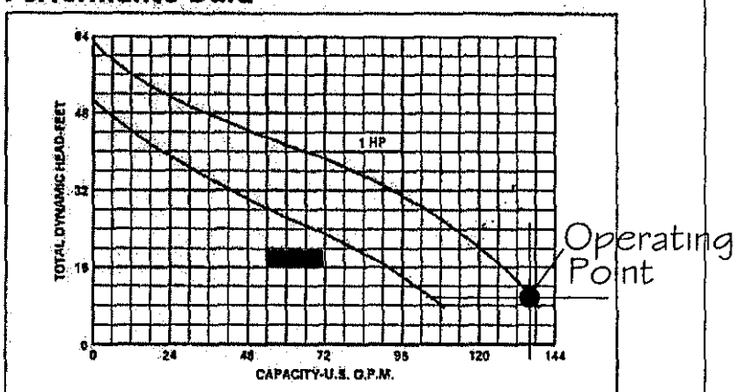
Pump/Motor Unit	Submersible				
Manual Model (50)	MH1	MH2	MH6	MH4	MH5
Automatic Models	AH1	AH2	--	--	--
Horsepower	1/2				
Full Load Amps	15.0	7.5	4.0	1.8	1.5
Motor Type	Capacitor Start		Three-Phase		
R.P.M.	3450				
Phase Ø	1		3		
Voltage	115	230	200	460	575
Manual Model (100)	MH2	MH6	MH3	MH4	MH5
Automatic Models	AH2	--	--	--	--
Horsepower	1				
Full Load Amps	9.5	4.5	4.0	1.7	1.5
Motor Type	Cap.		Three-Phase		
R.P.M.	3450				
Phase Ø	1		3		
Voltage	230	200	230	460	575
Hertz	60				
Operation	Intermittent				
Temperature	140°F Ambient				
NEMA Design	B				
Insulation	Class B				
Discharge Size	2" NPT (3" opt.)				
Solids Handling	3/4"				
Unit Weight	73 lbs.				

Power Cord: SPD50H 14/3, SJTW-A, 1ø, 115V = 10' std. (20' opt.)–14/4, STW-A, 1ø, 115V = 10' std. (20' opt.)–16/3, STW-A, 1ø, 230V = 20' std.–16/4, STW-A, 1ø, 230V = 20' std. SPD100H 14/3, STW-A, 1ø, 230V = 20' std.–16/4, STW-A, 1ø, 230V = 20' std.–18/3, STW-A, 3ø, 200V, 230V, 460V or 575V = 20' std.

Materials of Construction

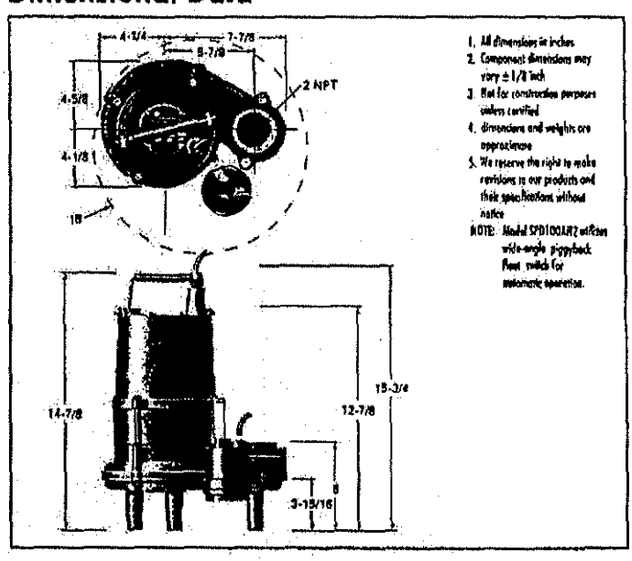
Handle	Steel
Lubricating Oil	Dielectric Oil
Motor Housing	Cast Iron
Seal Housing	Cast Iron
Pump Casing	Cast Iron
Shaft	Stainless Steel
Mechanical Shaft Seal	Seal Faces: Carbon/Ceramic Seal Body: Brass Springs: Stainless Steel Bellows: Buna-N
Impeller	Cast Iron
Upper Bearing	Single Row Ball Bearing
Lower Bearing	Single Row Ball Bearing
Base	Cast Iron
Fasteners	Stainless Steel

Performance Data



Total Head (feet)		10	20	30	40	50	60
GPM	1 HP	137	120	96	67	31	0

Dimensional Data



1. All dimensions in inches
2. Component dimensions may vary ± 1/8 inch
3. Not for construction purposes unless certified
4. dimensions and weights are approximate
5. We reserve the right to make revisions in our products and their specifications without notice

NOTE: Model SPD100AH2 utilizes wide-angle piggyback float switch for automatic operation.

AURORA/HYDROMATIC Pumps, Inc.
1840 Boney Road, Ashland, Ohio 44805
(419) 289-3042

- OR DESIGN ENGINEER APPROVED EQUAL.
- AN AUDIO & VISUAL PUMP FAILURE ALARM IS REQUIRED.
- THE ALARM SHALL BE PLACED IN A NOTICEABLE AND APPROPRIATE LOCATION INSIDE THE PROPOSED DWELLING.
- SEPARATE ELECTRICAL CIRCUITS SHALL BE PROVIDED FOR THE PUMP SYSTEM AND THE ALARM SYSTEM.

Frank J. Falcone Profesional Land Surveyor #32112 & Professional Planner #3760

Bryce M. Rittenhouse Professional Engineeer & Land Surveyor #13453

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@compuserve.com

PUMP DETAIL
of Lot-14, Block-46 for
Alexander D. Hanson
Hopewell Township * Mercer County * New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
Arnold Ryden Jr.	PLS	No.21223
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

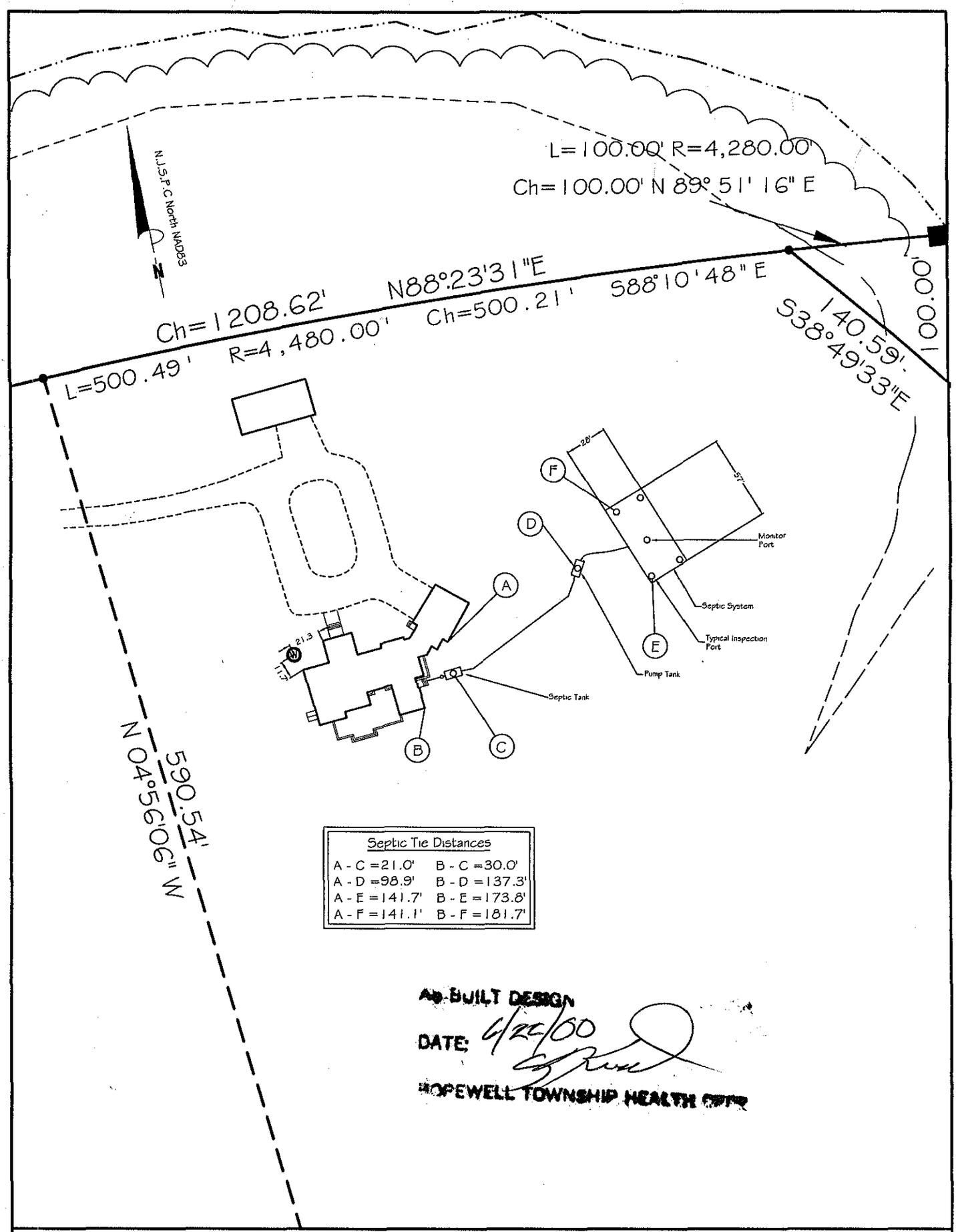
* NJ and PA Licensed.

Frank J. Falcone: PLS #32112 — 3/30/99 Date

Bryce M. Rittenhouse: PE&PLS #13453 — 3/30/99 Date

Date: 02/25/99
Scale: None
Drawn: JRM
Check: FJF/BMR

6/9
Revisions: 3/30/99 Add Bedroom
Job#:F98025
Dwg:L14b46pmp.dwg
Viewplan



Septic Tie Distances	
A - C = 21.0'	B - C = 30.0'
A - D = 98.9'	B - D = 137.3'
A - E = 141.7'	B - E = 173.8'
A - F = 141.1'	B - F = 181.7'

AS-BUILT DESIGN
DATE: 6/22/00
HOPEWELL TOWNSHIP HEALTH DEPT

Bryce M. Rittenhouse — New Jersey Professional Engineer and Land Surveyor License No. 13453

Frank J. Falcone — New Jersey Professional Land Surveyor License No.32112

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email: pjepc@pjepc.com

Septic Asbuilt
of Lot-14, Block-46 for
Alex Hanson
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshowsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35668
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse — Date 6/16/00
Frank J. Falcone — Date 6/16/00

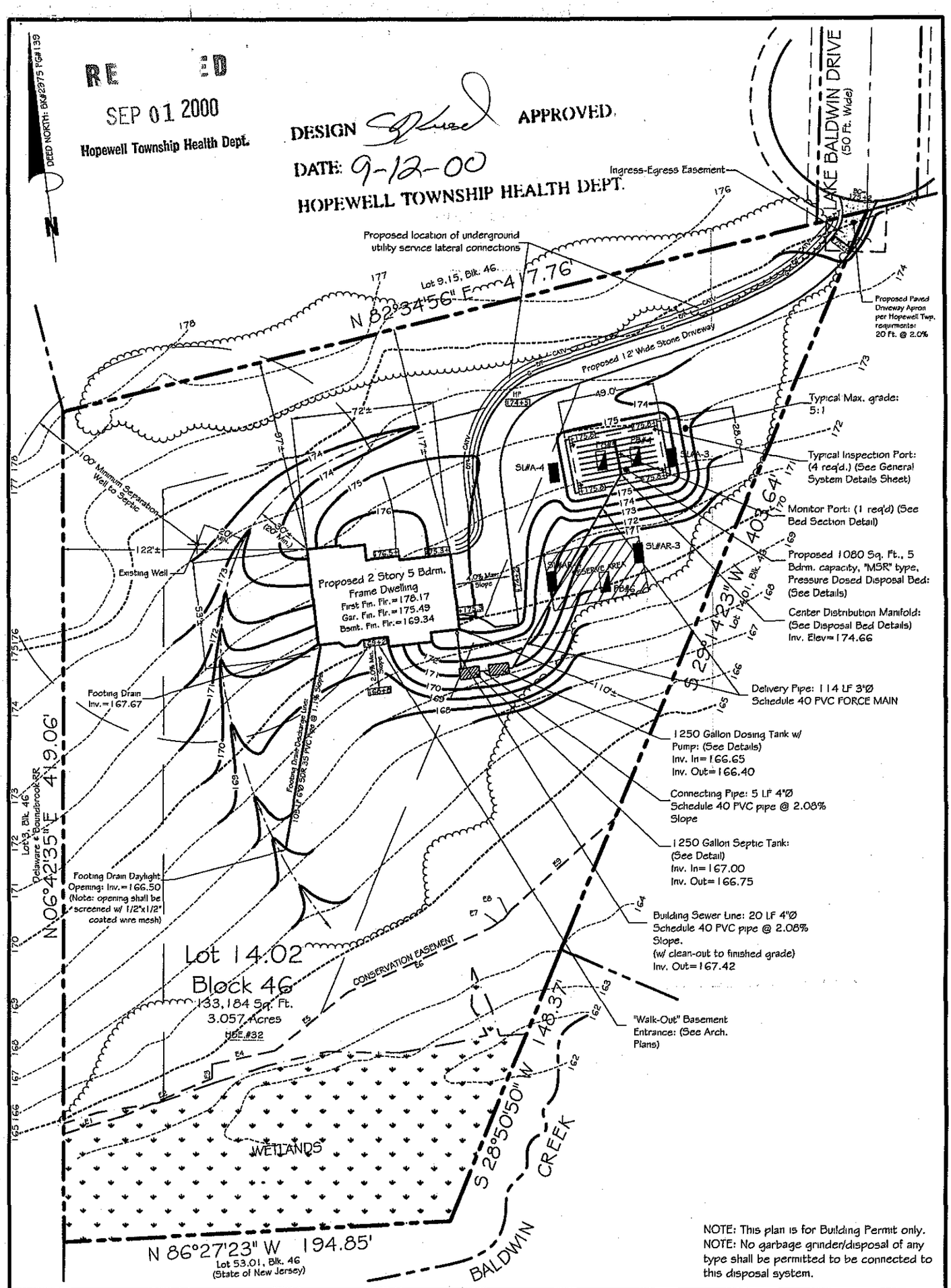
Date: 6/15/00
Scale: 1"=60'
Drawn: FJF
Check: FJF/BMR

Revisions:

Job#:
Dwg:
Vol#:

RE ED
SEP 01 2000
Hopewell Township Health Dept.

DESIGN APPROVED
DATE: 9-12-00
HOPEWELL TOWNSHIP HEALTH DEPT.



NOTE: This plan is for Building Permit only.
NOTE: No garbage grinder/disposal of any type shall be permitted to be connected to this disposal system.

D. Geoffrey Brown Professional Engineer & Land Surveyor #24327

Martin D. Katz Professional Land Surveyor #36249

PJE Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email: PJEPC@pjepc.com

Plot Plan & Disposal System Design

of Lot-14.02, Block-46 for

Valentino/Lake Baldwin

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

D. Geoffrey Brown: PE & LS #24327 — 08/23/00 Date

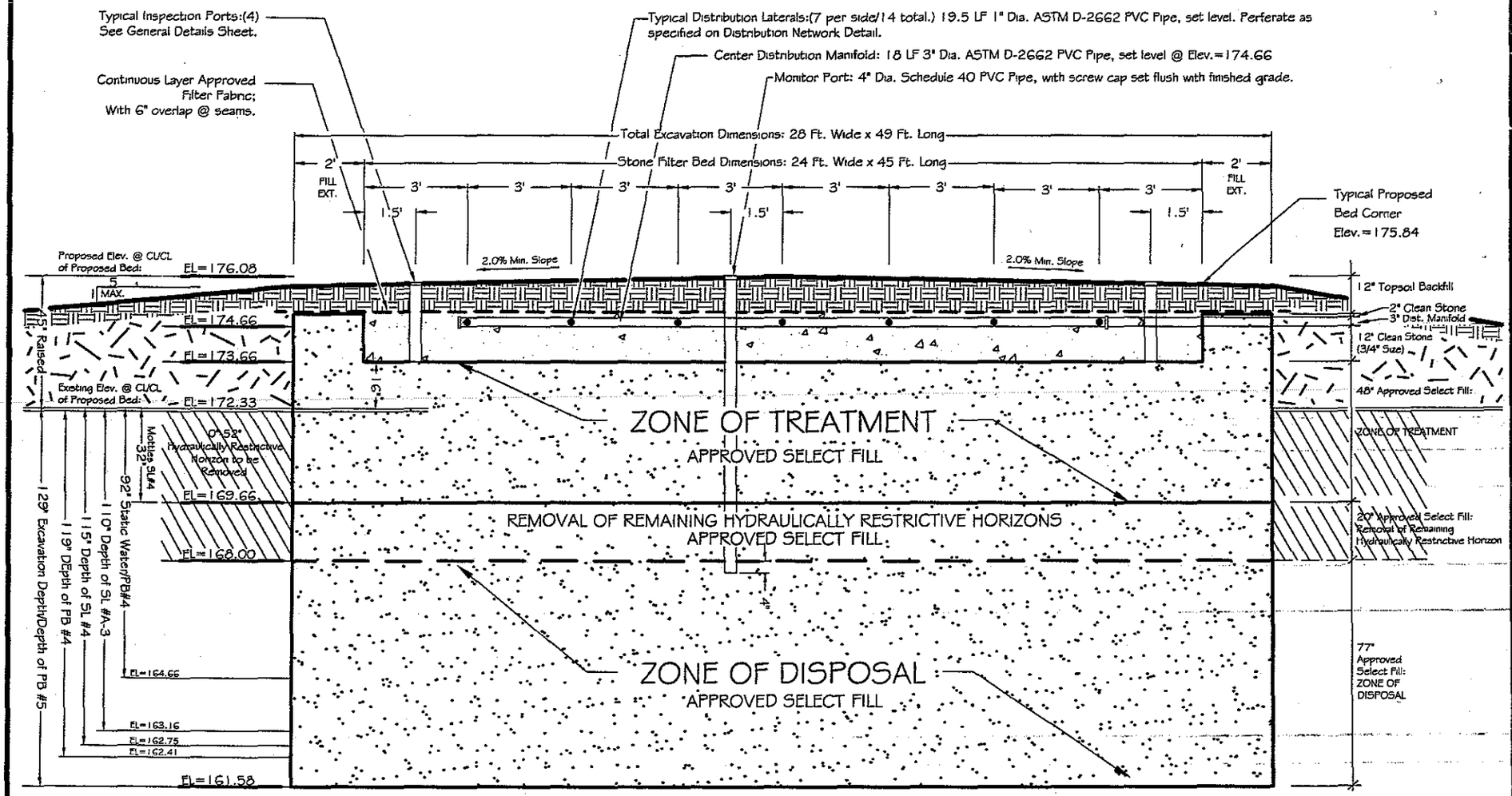
Martin D. Katz: PLS#36249 — 08/23/00 Date

Date: 08/23/00
Scale: 1"=60'
Drawn: JRM
Check: MDK/DGB

Revisions:

1/9

Job#:K000309
Dwg:L1402sdpp.dwg
View:Plan
Layers: PLOT PLAN



MOUNDED SOIL REPLACEMENT DISPOSAL BED SECTION VIEW DETAIL:
1"=4'

173.78
161.58
11.20
4.20
15.40

DISPOSAL BED SIZING CALCULATION:
Proposed 5 Bedroom Dwelling = 800 GPD "Q"
Assume in-place select fill @ 3-15 MPI: Prop. Pressure Dosed System, use 1.33 SF/GPD
1.33 SF x 800 GPD = 1064 SF min. bed area required.
1064 SF/24' (Prop. Bed Width)=44.33' Min. Bed Length (USE 45')
Note: "MSR" Type Bed requires 2 Ft. fill extension
Excavate total Bottom Area of Bed: 28' Wide x 49' Long (=1372 SF)
Construct Stone Filter Bed: 24' Wide x 45' Long (=1080 SF)

NOTE: The Hopewell Township Health Dept. requires a Soil Permeability Class Rating Test on the stockpiled Select Fill. The Contractor shall notify the Design Engineer 24 hours in advance of the said stockpiling in order to obtain samples for testing.
The Select Fill shall NOT be emplaced untill a passing soil analysis has been obtained.
The Distribution Network shall not be constructed untill a passing percolation test (or Tube Permeameter Test,) has been performed on the in-place and compacted select fill material, to insure proper compaction. The contractor shall notify the Design Engineer 24 hours in advance in order to perform said test.

D. Geoffrey Brown Professional Engineer # Land Surveyor #24327

Martin D. Katz Professional Land Surveyor #36249

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Professional Engineers, Land Surveyors and Planners
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Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Bryce M. Rittenhouse* PE&PLS No.13453
D. Geoffrey Brown PE&PLS No.24327
Wesley J. Lane* PLS No.30747
Frank J. Falcone PLS No.32112
Peter R. Esherwsky* PLS No.34001
Ted W. Provowmick PLS No.35868
Martin D. Katz PLS No.36249
*NJ and PA Licensed.

D. Geoffrey Brown PE&PLS #24327 08/23/00 Date

Martin D. Katz PLS #36249 08/23/00 Date

Disposal Bed Section View Detail

of Lot-14.02, Block-46 for

Carlos Valentino

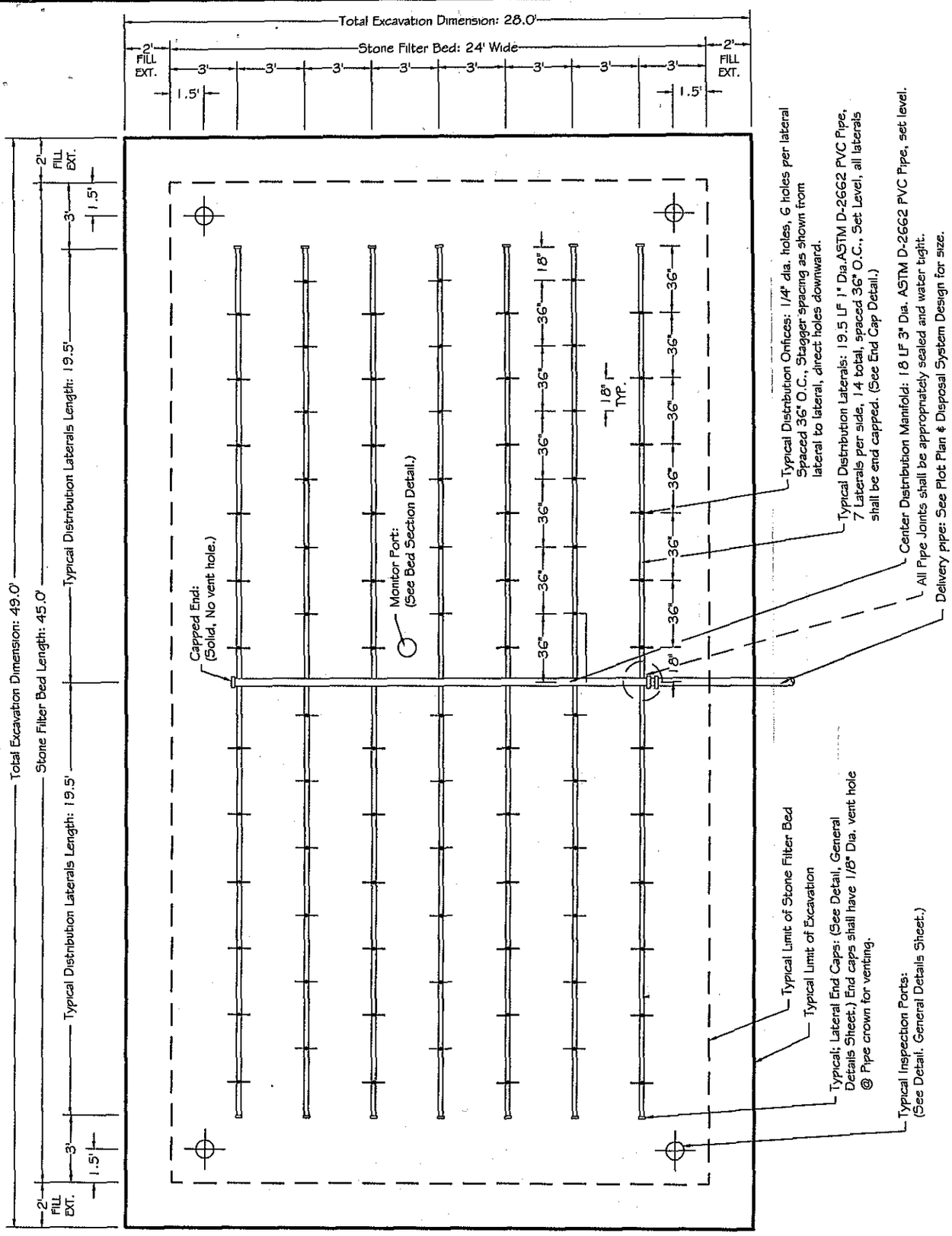
Hopewell Township * Mercer County * New Jersey

Date: 08/23/00
Scale: 1"=4'
Drawn: JRM
Check: MDK/DGB

Revisions:

Job#:K000807
Dwg:L1402b46bs.dwg
View:Plan

2/9



D. Geoffrey Brown Professional Engineer & Land Surveyor #24327

Martin D. Katz Professional Land Surveyor #36249

Princeton Junction Engineering, P.C.
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P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Distribution Network Detail

of Lot-14.02 Block-46 for

Carlos Valentino

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

D. Geoffrey Brown: PE & PLS #24327 — 08/23/00 Date

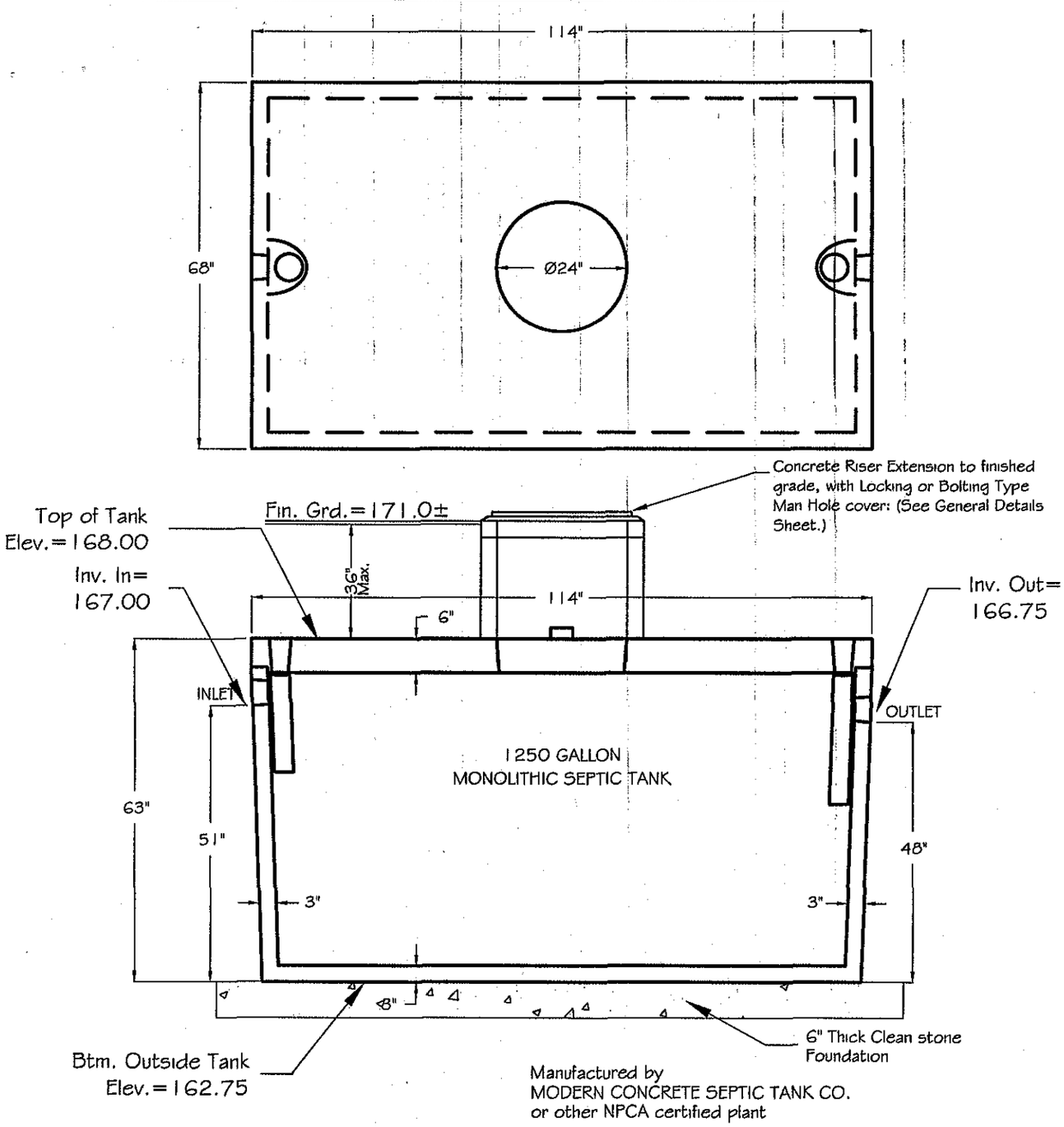
Martin D. Katz: PLS #36249 — 08/23/00 Date

Date: 08/23/00
Scale: 1"=6'
Drawn: JRM
Check: MDK/DGB

Revisions:

3/9

Job#:K000309
Dwg:L14-02B46b.dwg
View:Plan



Note: The septic tank shall be placed on a firm & stable foundation of 3/4" size clean stone, compacted and level, 6" thick.

D. Geoffrey Brown Professional Engineer & Land Surveyor #24327

Martin D. Katz Professional Land Surveyor #36249

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

1250 Gallon Septic Tank Detail

of Lot-14.02, Block-46 for

Carlos Valentino

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

D. Geoffrey Brown: PE & LS #24327 — Date 08/23/00

Martin D. Katz: PLS #36249 — Date 08/23/00

Date: 08/23/00
Scale: None
Drawn: JRM
Check: MDK/DGB

Revisions:

4/9

Job#:K000007
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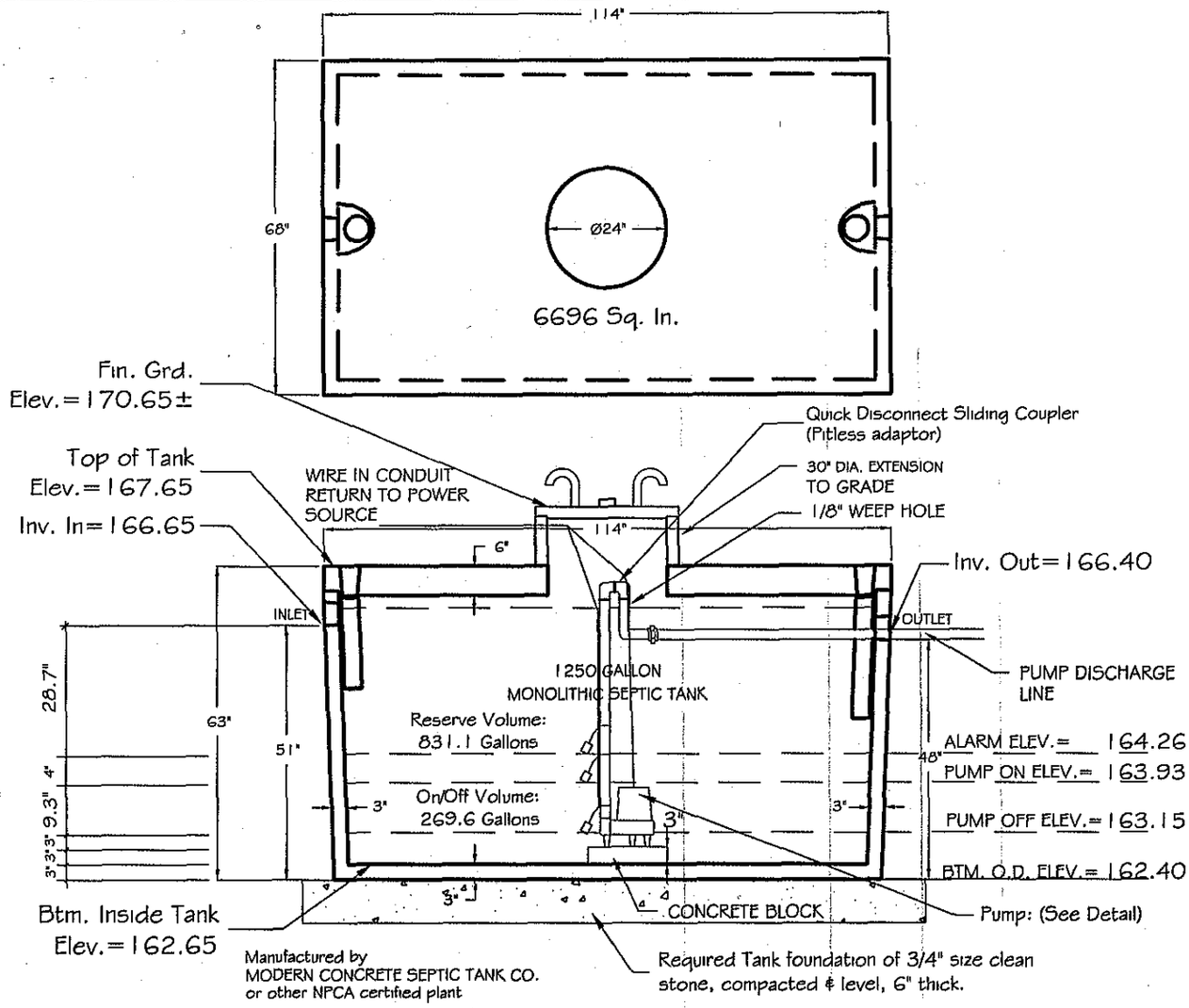
View:Plan



NOTE: ELECTRICAL CONNECTIONS IN PUMP TANK TO BE WITH EITHER WET SPLICE OR WEATHER PROOF JUNCTION BOX.

1250 GALLON DOSING TANK DETAIL

(NTS)

DOSING TANK INFORMATION

1250 GALLON CAPACITY
SWITCH ELEVATIONS:
ALARM ELEVATION = 164.26
PUMP ON ELEVATION = 163.93
PUMP OFF ELEVATION = 163.15
INVERT IN. = 166.65 INVERT OUT= 166.40
BOTTOM OF TANK ELEVATION = 162.65 (Inside) 162.40 (Outside)
PUMP SPECIFICATIONS; HYDROMATIC SPD100H
OR APPROVED EQUAL
1250 GALLON CAPACITY
DOSE VOLUME = 200 Gals. (25%Q) ON/OFF VOL.= 269.6 Gals.
PUMP DELIVERY @16.36 FT. OF HEAD
= 99.12 gpm
TANK ALERT II PLUS ALARM SYSTEM/PUMP
CONTROL, SJ ELECTRO SYSTEMS INC.
AUDIO & VISUAL ALARMS REQUIRED PITLESS
ADAPTER REQUIRED.

RESERVE CAPACITY BETWEEN INVERT IN AND
ALARM ELEVATION = 831.1 gal > 800 gal. OK

D. Geoffrey Brown Professional Engineer & Land Surveyor #24327

Martin D. Katz Professional Land Surveyor #36249

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
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Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

1250 Gallon Dosing Tank Detail
of Lot-14.02, Block-46 for
Carlos Valentino
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

D. Geoffrey Brown: PE&PLS #24327 — 08/23/00 Date

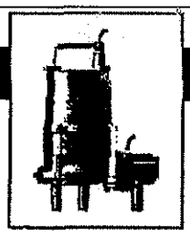
Martin D. Katz: PLS #6249 — 08/23/00 Date

Date: 08/23/00
Scale: None
Drawn: JRM
Check: MDK/DGB

Revisions:

5/9

Job#:K0000607
Dwg:L1402B46pt.dwg
View:Plan



ENGINEERING DETAILS - SPD 100H

Pump Characteristics

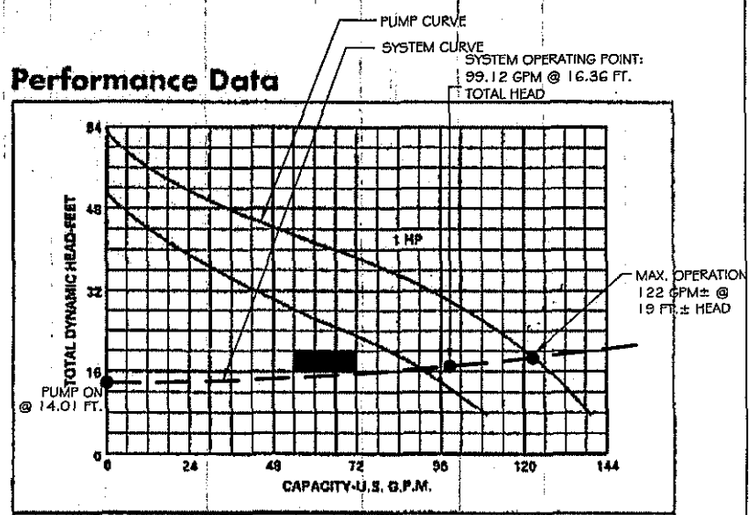
Pump/Motor Unit	Submersible				
[redacted]					
Manual Model (100)	MH2	MH6	MH3	MH4	MH5
Automatic Models	AH2	-	-	-	-
Horsepower	1				
Full Load Amps	9.5	4.5	4.0	1.7	1.5
Motor Type	Cap.	Three-Phase			
R.P.M.	3450				
Phase Ø	1	3			
Voltage	230	200	230	460	575
Hertz	60				
Operation	Intermittent				
Temperature	140°F Ambient				
NEMA Design	B				
Insulation	Class B				
Discharge Size	2" NPT (3" opt.)				
Solids Handling	3/4"				
Unit Weight	73 lbs.				

Power Cord: SPD50H 14/3, SJTW-A, 1o, 115V = 10' std. (20' opt.)–14/4, STW-A, 1o, 115V = 10' std. (20' opt.)–16/3, STW-A, 1o, 230V = 20' std.–16/4, STW-A, 1o, 230V = 20' std. SPD100H 16/3, STW-A, 1o, 230V = 20' std.–16/4, STW-A, 1o, 230V = 20' std.–18/5, STW-A, 3o, 200V, 230V, 460V or 575V = 20' std.

Materials of Construction

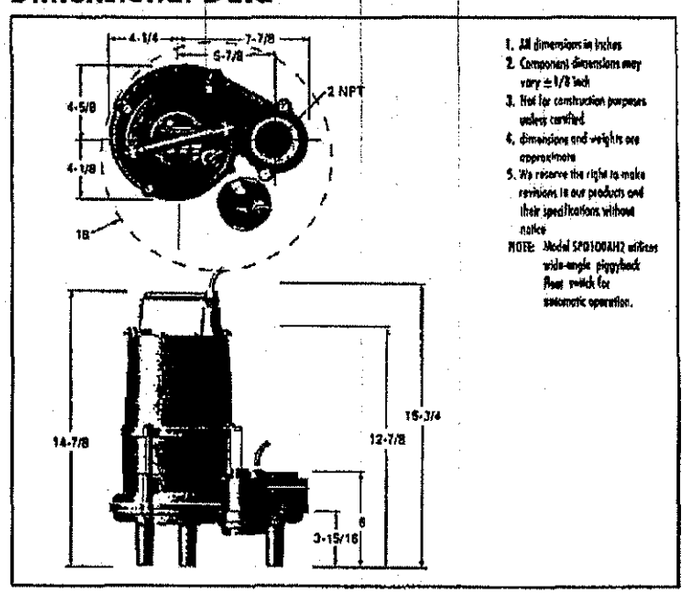
Handle	Steel
Lubricating Oil	Dielectric Oil
Motor Housing	Cast Iron
Seal Housing	Cast Iron
Pump Casing	Cast Iron
Shaft	Stainless Steel
Mechanical Shaft Seal	Seal Faces: Carbon/Ceramic Seal Body: Brass Spring: Stainless Steel Bellows: Buna-N
Impeller	Cast Iron
Upper Bearing	Single Row Ball Bearing
Lower Bearing	Single Row Ball Bearing
Base	Cast Iron
Fasteners	Stainless Steel

Performance Data



Total Head (feet)		10	20	30	40	50	60
[redacted]							
GPM	1 HP	137	120	96	67	31	0

Dimensional Data



1. All dimensions in inches
2. Component dimensions may vary ±1/8 inch
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4. dimensions and weights are approximate
5. We reserve the right to make revisions in our products and their specifications without notice

NOTE: Model SPD100AH2 utilizes wide-angle piggyback float switch for automatic operation.

AURORA/HYDROMATIC Pumps, Inc.
1840 Baney Road, Ashland, Ohio 44805
(419) 289-3042

- OR DESIGN ENGINEER APPROVED EQUAL.
- AN AUDIO & VISUAL PUMP FAILURE ALARM IS REQUIRED.
- THE ALARM SHALL BE PLACED IN A NOTICEABLE AND APPROPRIATE LOCATION INSIDE THE PROPOSED DWELLING.
- SEPARATE ELECTRICAL CIRCUITS SHALL BE PROVIDED FOR THE PUMP SYSTEM AND THE ALARM SYSTEM.

D. Geoffrey Brown Professional Engineeer & Land Surveyor #24327

Martin D. Katz Profesional Land Surveyor #36249

Princeton Junction Engineering, P.C
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Pump Detail
of Lot-14.02, Block-46 for
Carlos Valentino
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

D. Geoffrey Brown: PE & PLS #24327 — 08/23/00 Date

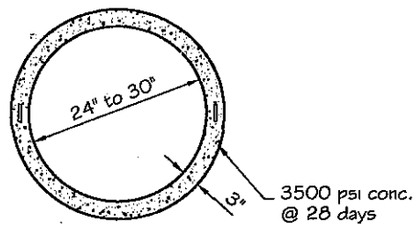
Martin D. Katz: PLS #36249 — 08/23/00 Date

Date: 08/23/00
Scale: None
Drawn: JRM
Check: MDK/DGB

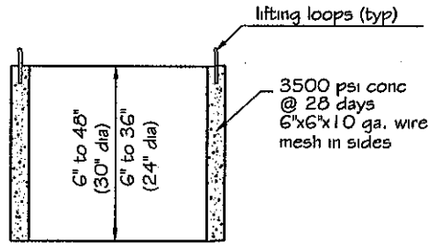
6/9

Revisions:

Job#:5000007
Dwg:L14.02b4pump.dwg
Valentin



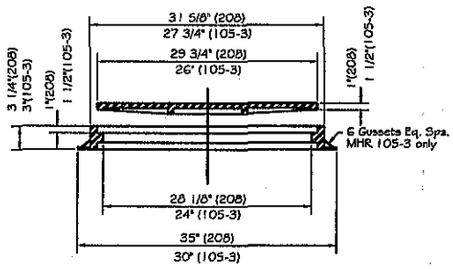
Plan View



Section View

CONCRETE EXTENSION

(nts)



Specifications:

Specifications are from Quinn. The frame and covers are made of gray iron which meets of exceeds ASTM A48, Class 30B. Other grades of gray iron available upon request. Furnished with standard one coat of black asphaltum paint. Uncoated castings available upon

MHR 105-3:

Round flange manhole frame and cover for Septic Tanks. Shall be provided with a bolting and gasketed cover.

MHR 208 BF:

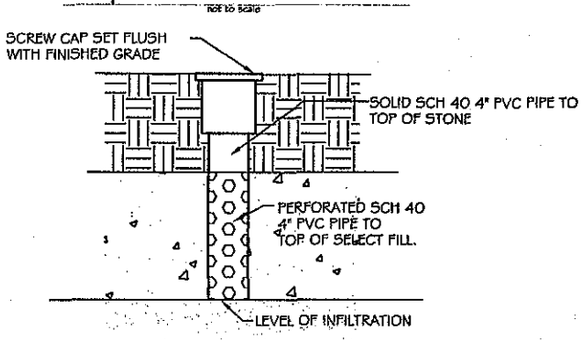
Light duty manhole frame and cover for Dosing Tanks. Shall be provided with a bolting and gasketed cover.

Manhole Frame Detail

no scale

Inspection Port Detail

not to scale



FILTER FABRIC SPECIFICATIONS

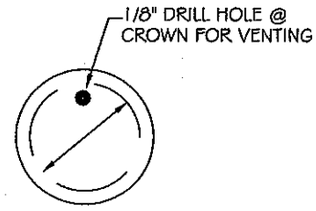
TERRATEX 5D OR EQUAL

GRAB TENSILE STRENGTH	125 LBS.
MULLEN BURST STRENGTH	275 LBS./SQ. IN.
ELONGATION	80 %
WATER PERMEABILITY COEFFICIENT	-2 CM/SEC.

THE FABRIC IS TO BE LAPPED OVER THE TOP OF STONE A MIN. OF 6"

End Cap Detail

not to scale



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Martin D. Katz Professional Land Surveyor #36249

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General Disposal System Details

of Lot-14.02, Block-46 for

Carlos Valentino

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Peter R. Eshewsky*	PLS	No.34001
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

D. Geoffrey Brown PE & PLS #24327 — 08/23/00 Date

Martin D. Katz: PLS #36249 — 08/23/00 Date

Date: 08/23/00
Scale: None
Drawn: JRM
Check: MDK/DGB

Revisions:

7/9

Job#:1000607
Dwg:L1402MCdet.dwg
View:Plan

Disposal System Notes

1. Prior to the installation of fill material, the disposal field excavation shall be performed in accordance with N.J.A.C. 7:9a10.3(c) 1 through 5.
2. Work should be scheduled so that the bottom and sidewalls of the excavation will not be exposed to rainfall or windblown silt between time of excavation and time of final inspection and grading.
3. Any loose soil or debris which is washed into or deposited within the excavation shall be removed prior to the construction of the distribution network.
4. Any smeared or compacted soil surfaces within the disposal field excavation shall be removed to expose a fresh soil surface.
5. Excavations in soils other than sands or loamy sands shall not be continued when soil moisture content is above the lower plastic limit. This means when a small lump of soil, taken from the depth of the proposed excavation, can be rolled out with the fingers to form a wire or rod one-eight of an inch in thickness and does not crumble when handled,
6. Clayey soils encountered in the bottom of the excavation shall be removed and replaced with suitable fill.
7. The fill material installed in the zone of disposal shall have a textural analysis (composition by weight of size fraction passing through a two millimeter sieve) 70%+ med.-coarse sand, but not less than 90% total sand. The fill material shall also have a percolation rate faster than 15 minutes per inch.
8. The suitable fill material installed in the zone of treatment shall have a coarse fragment content less than 15% by volume or less than 25% by weight. It shall also have a textural analysis (composition by weight of size fraction passing the two millimeter sieve). from 70% to 90% med.-coarse sand; 0-25% fine sand; 5% to 10% silt & clay ; min. clay 2%, Fill material shall also have a percolation rate of 3 to 15 min/in. or a permeability rate of 6-20 in/hr.
9. All fill material shall be spread and compacted in layers one foot or less in thickness and compacted manually or mechanically, by tamping or rolling, by driving over the filled area in a controlled pattern using tracked or rubber tired vehicles, or by puddling.
10. Heavy excavating equipment shall not be operated directly on the exposed bottom of the excavation. If heavy excavating equipment is used to compact the fill material, the first lift shall be one foot in thickness.
11. The filter material shall consist of washed gravel or crushed stone, free of fines, dust, ashes or clay. It shall conform in size and gradation to size #24, #3 or #4 of the N.J.D.O.T. standard for coarse aggregates.
12. The filter material shall be installed into the disposal system excavation using a backhoe, front end loader or dump truck from the sides.
13. Construction of the distribution network shall be in accordance with 7:9a-10.3(d).
14. PVC distribution laterals shall meet ASTM standards D-2729, D-3033 or D-3034.
15. Filter material is to be covered with drainage fabric as the laying of distribution lines progresses. Drainage fabric shall be overlapped a minimum of 6".
16. Filter fabric shall have a grab tensile strength of 125 lbs., mullen burst strength of 275 lbs., elongation 80% & permeability coefficient of 0.2 cm/sec. Filter fabric shall be Terratex sd or equal.
17. Construction of the distribution box shall be in accordance with 7:9a-9.4.
18. The distribution box shall be set directly on the filter material within the disposal bed.
19. A permanent concrete monument will be installed over the distribution box flush with finished grade.
20. Construction of the connecting pipe or delivery pipe shall be in accordance with 7:9a-9.3.
21. All changes of direction in the soil pipe and connecting pipe shall employ max. 45' fittings and shall include cleanouts.
22. Soil pipe and connecting pipe shall be placed on a stabilized base of quarry blend stone extending to virgin ground.
23. PVC connecting pipes will meet ASTM standard D-2665 - schedule 40, SDR-21 or SDR-26.
24. The building sewer shall be designed and constructed in accordance with the provisions of the state uniform construction code, N.J.A.C. 5:23, adopted pursuant to the uniform construction code act, N.J.S.A. 52:27d119 et seq.
25. Septic tanks shall be precast concrete tanks constructed of concrete conforming to ACI318-16-4.5.1 and 318-16-4.5.2. Certification shall be provided by the manufacturer and the certification displayed on the tank.
26. Septic tank shall be 1250 gal. single compartment tank.
27. All manhole covers and inspection ports in the septic tank shall have water tight bolted or locked caps set flush with finish grade.
28. All interior concrete surfaces shall be sealed with two coatings of an approved inert coating to minimize corrosion. Coating shall be applied prior to delivery by the manufacturer.
29. Septic tanks shall be fabricated and installed in accordance with 7:9a-8.2.
30. A permanent marker shall be placed on grade above the septic tank upon completion of the installation.
31. Backfill and final grading shall be carried out in accordance with 7:9a-10.3(f).
32. Topsoil shall be lightly compacted by tamping or rolling to prevent settlement and shall be seeded and mulched or sodded immediately upon completion of final grading.
33. All trees with drip lines within 10 ft. of the disposal field shall be removed prior to construction.
34. There shall be no existing or proposed disposal systems within 50 ft. of the proposed disposal field.
35. No garbage disposal unit of any kind shall be connected to this disposal system.
36. Backwash from water softeners or other drainage other than sanitary sewage shall not enter the disposal system.
37. All soil evaluation procedures relied upon as a basis for the design of the subject individual subsurface sewage disposal system were carried out by or under the direct supervision of a professional engineer and witnessed by the administrative authority.
38. Vegetative planting in the disposal area shall be limited to grass unless otherwise specified by the administrative authority.
39. An annual inspection of the system shall begin three (3) years after installation or pump out of the septic tank.
40. The disposal system contractor is responsible for confirmation that all materials utilized in the construction of the disposal system are in accordance with N.J.A.C. 7:9a.
41. When placement of the disposal field is proposed in an area of disturbed ground as defined at 7:9a - 5.10, an acceptable state of compaction of the soil or fill material shall be verified by laboratory tests, and the design engineer shall certify a minimum compaction of 90 percent of the standard procter density.
42. All regraded areas shall comply with 7:9a-10.3.
43. Storm sewers within 75 ft. of the disposal system shall be constructed with watertight joints.
44. There shall be no existing or proposed wells within 100 ft. of the proposed disposal field.
45. THIS PLAN IS FOR BUILDING PERMIT ONLY.

General Notes

1. The Health Department shall receive 48 hours notification prior to the start of any construction on the system.
2. Once the excxavation of bed is complete a bottom of excavation inspection shall be performed by the Design Engineer and approved prior to the placement of the select fill.
3. After suitable fill is placed and compacted a min. of 1 permeabilty test shall be performed and approved by the Design Engineer, and if required the test shall be witnessed by the Health Department prior to the placement of stone.
4. The results of the select fill analysis shall be forwarded to the Health Department (see note No.8 in the Disposal System notes)
5. All manholes covers and inspection port caps inthe septic tank shall have water tight bolted or locked caps.
6. All interior concrete surfaces shall be sealed with 2 coatings of an "approved inert coating to minimize corrosion, coating shall be applied prior to delivery by the manufacturer.
7. The 'D' box shall sit in the disposal bed area on the filter material.
8. This plan is for building permit only.
9. No existing/proposed wells or disposal systems within 100 ft. of the proposed disposal field and well.

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of Lot-14.02, Block-46 for
Carlos Valentino
Hopewell Township * Mercer County * New Jersey

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Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA licensed.

D. Geoffrey Brown PE & LS #24327 — 08/23/00 Date

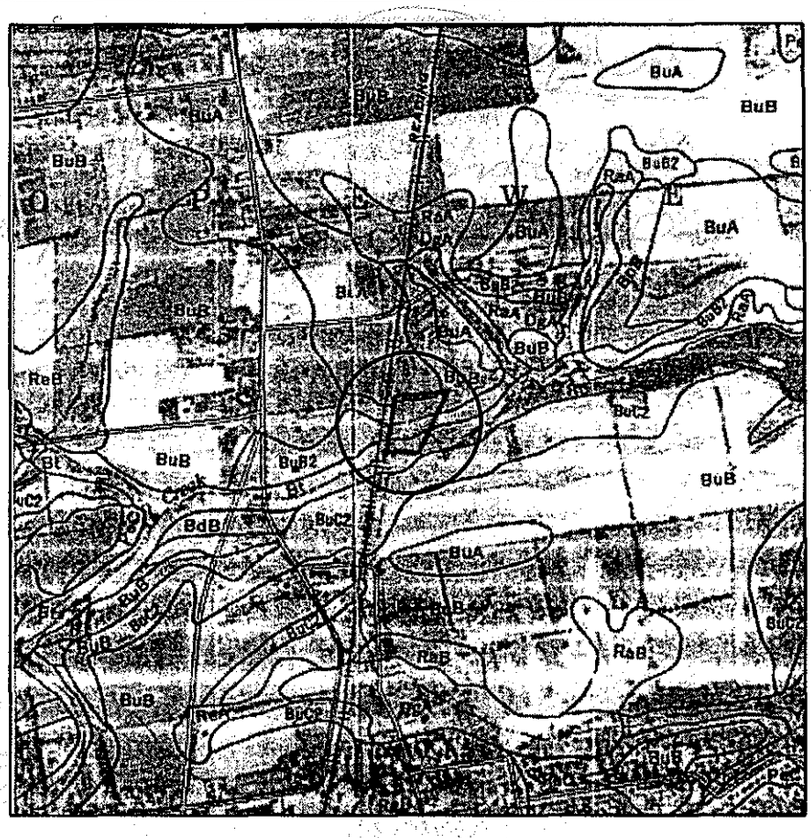
Martin D. Katz: PLS#36249 — 08/23/00 Date

Date: 08/23/00
Scale: None
Drawn: JRM
Check: MDK/DGB

Revisions:

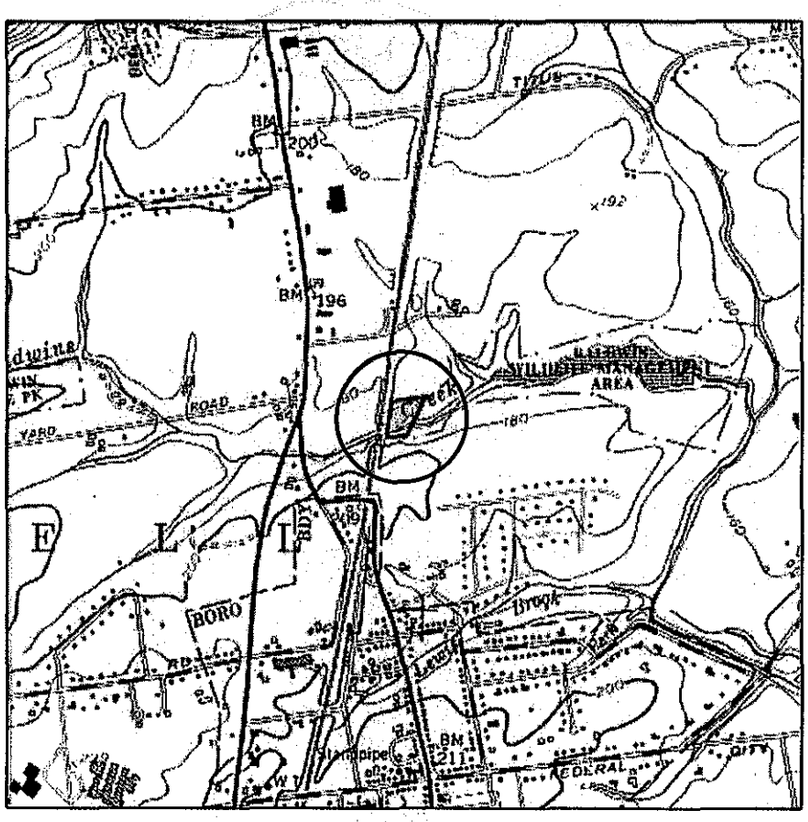
8/9

Job#K000807
Dwg:L14.02B46nts.dwg
View:Plan



MERCER CO. SOIL SURVEY MAP:

Sheet #8; Scale 1"=1320'



U.S.G.S. QUADRANGLE MAP:

Pennington Quad.; Scale 1"=2000'

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Key Maps

of Lot-14.02, Block-46 for

Carlos Valentino

Hopewell Township • Mercer County • New Jersey

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* NJ and PA Licensed.

D. Geoffrey Brown: PE & LS #24327 — 08/23/00 Date

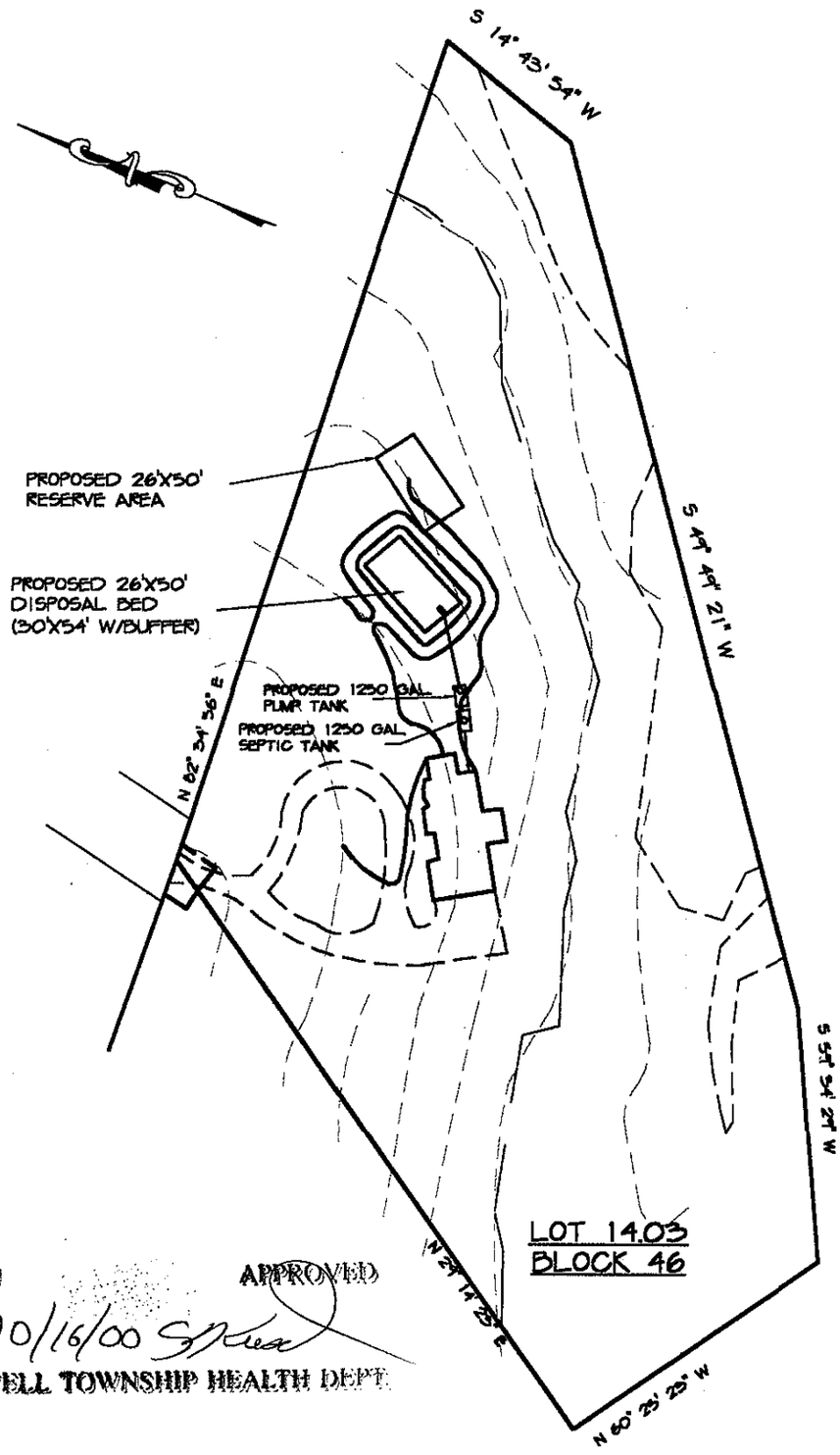
Martin D. katz: PLS #36249 — 08/23/00 Date

Date: 08/23/00
Scale: As Shown
Drawn: JRM
Check: MDK/DGB

Revisions:

9/9

Job#:K000007
Dwg:L14.02b4cBoy.dwg
View:Plan



DESIGN APPROVED

DATE: 10/16/00

HOPEWELL TOWNSHIP HEALTH DEPT.

LOT LAYOUT

FILE #110-00-01

SEPTIC SYSTEM DESIGN PLAN
LOT 14.03 BLOCK 46
LAKE BALDWIN DRIVE
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

REVISIONS	DESIGNED: GWB	DATE: 10/10/00
	CAD: GWB/JL	SCALE: 1"=100'
	CHECKED: GWB	SHEET: 1 OF 8

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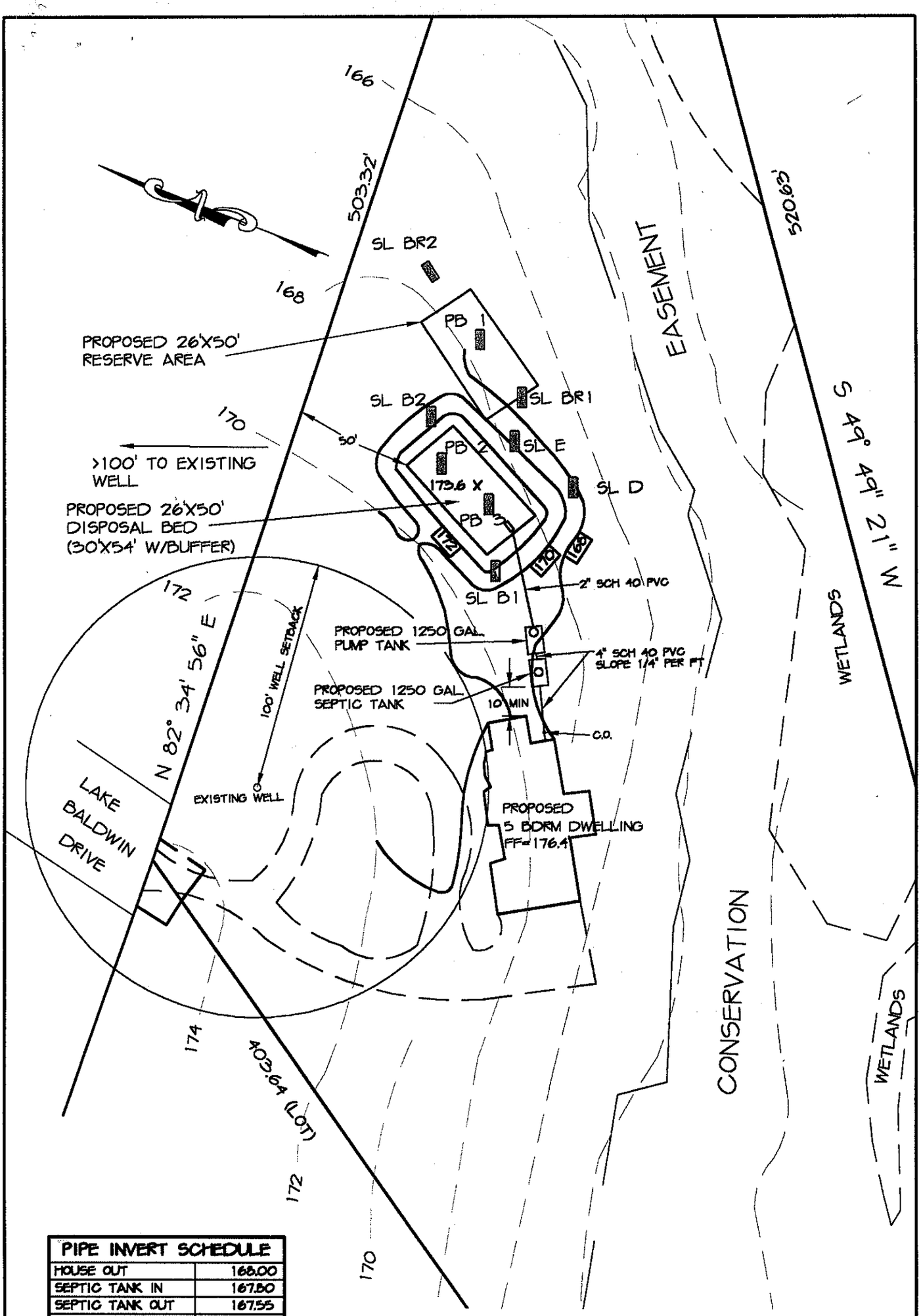

PIPE INVERT SCHEDULE	
HOUSE OUT	168.00
SEPTIC TANK IN	167.80
SEPTIC TANK OUT	167.55
PUMP TANK IN	167.45
"D" BOX IN	171.82
"D" BOX OUT	171.65

SEPTIC SYSTEM DESIGN PLAN
LOT 14.03 BLOCK 46
LAKE BALDWIN DRIVE
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

REVISIONS	DESIGNED: GWB	DATE: 10/10/00
	CAD: GWB/JL	SCALE: 1"=50'
	CHECKED: GWB	SHEET: 2 OF 8

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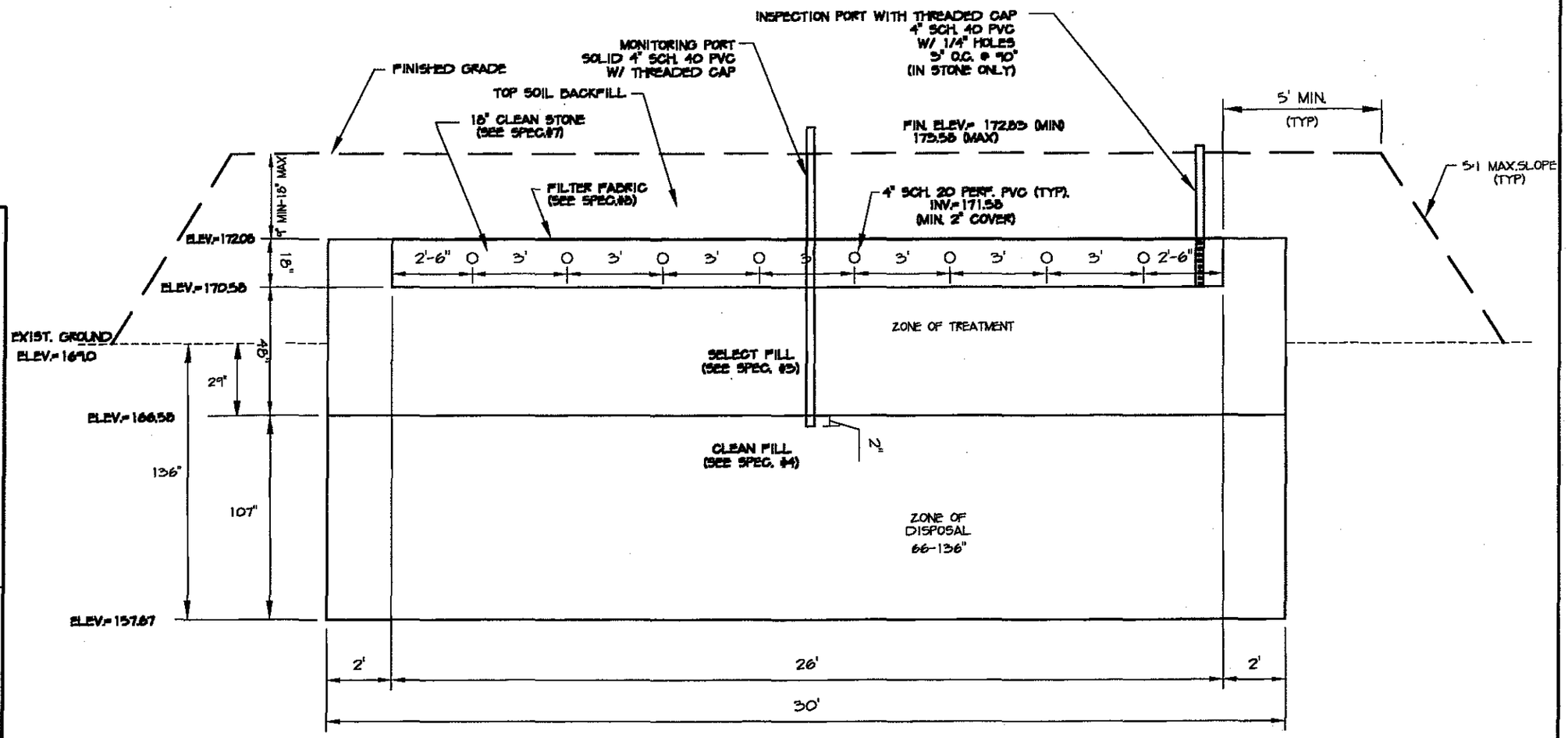

26' WIDE DISPOSAL BED WITH BUFFER CROSS SECTION

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New Jersey Professional Engineer
License No. 34875

SEPTIC SYSTEM DESIGN PLAN
LOT 14.03 BLOCK 46
LAKE BALDWIN DRIVE
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

REVISIONS

DESIGNED: GWB	DATE: 10/10/00
CAD: gb	SCALE: SHOWN
CHECKED: GWB	SHEET: 3 OF 8

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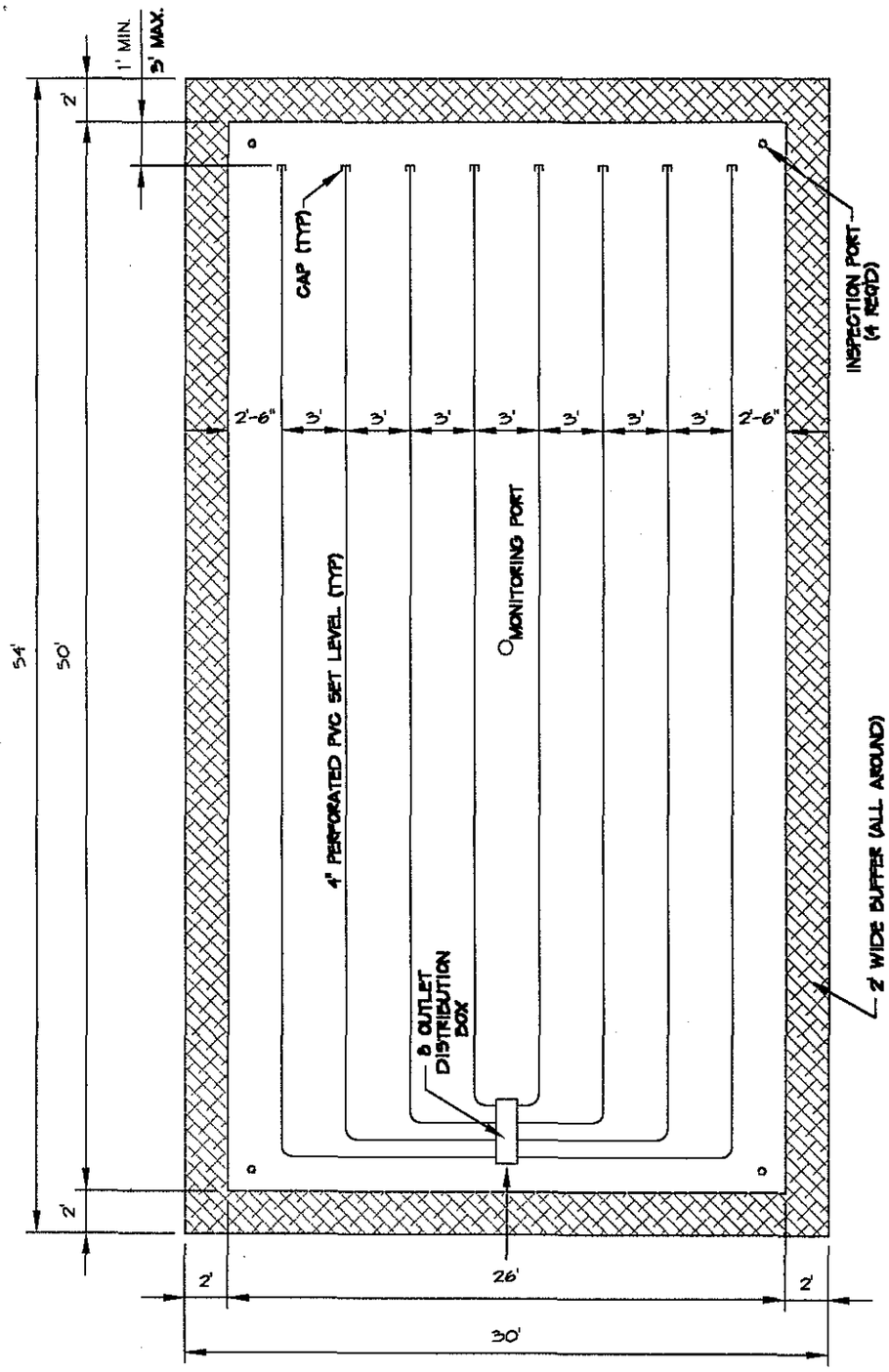
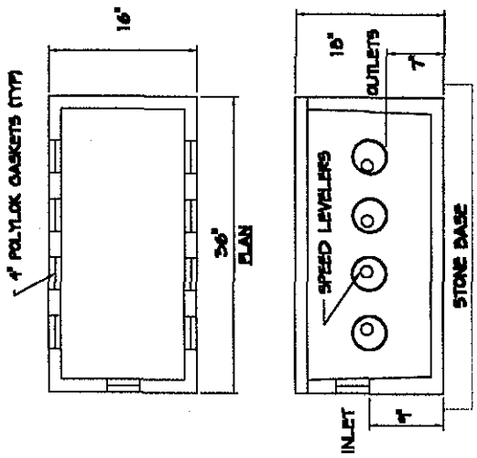


26' X 50' DISPOSAL BED WITH BUFFER

1/8" = 1'-0"



8 OUTLET DISTRIBUTION BOX

SEPTIC SYSTEM DESIGN PLAN
LOT 14.03 BLOCK 46
LAKE BALDWIN DRIVE
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

REVISIONS	DESIGNED: GWB	DATE: 10/10/00
	CAD: gb	SCALE: NONE
	CHECKED: GWB	SHEET: 4 OF 8

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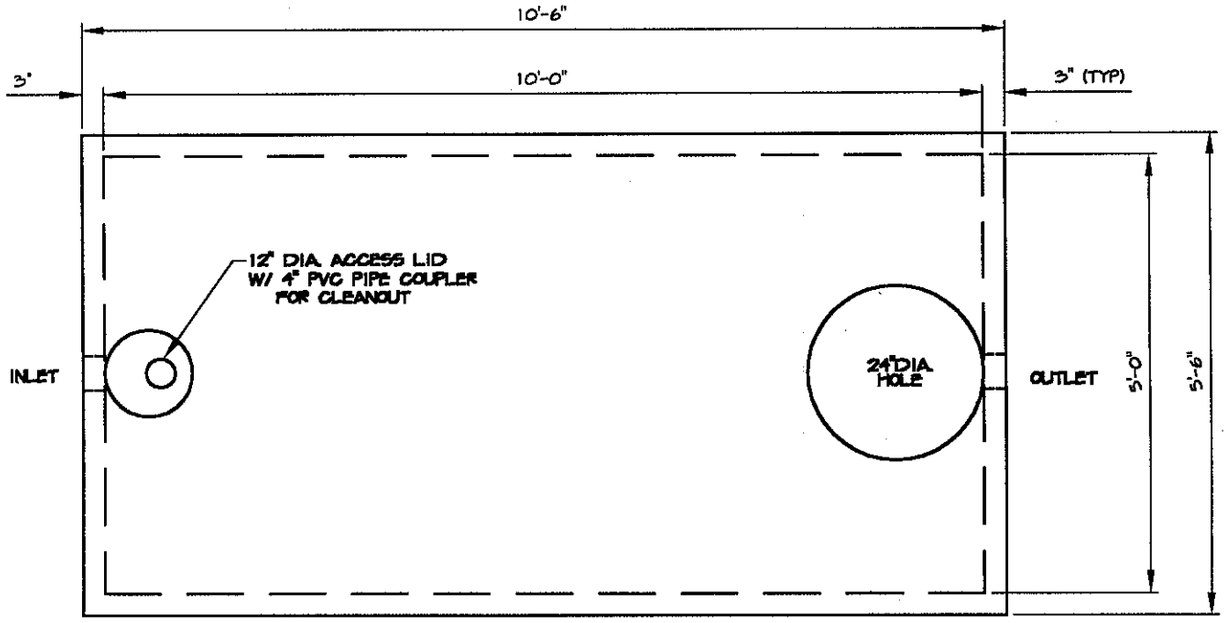
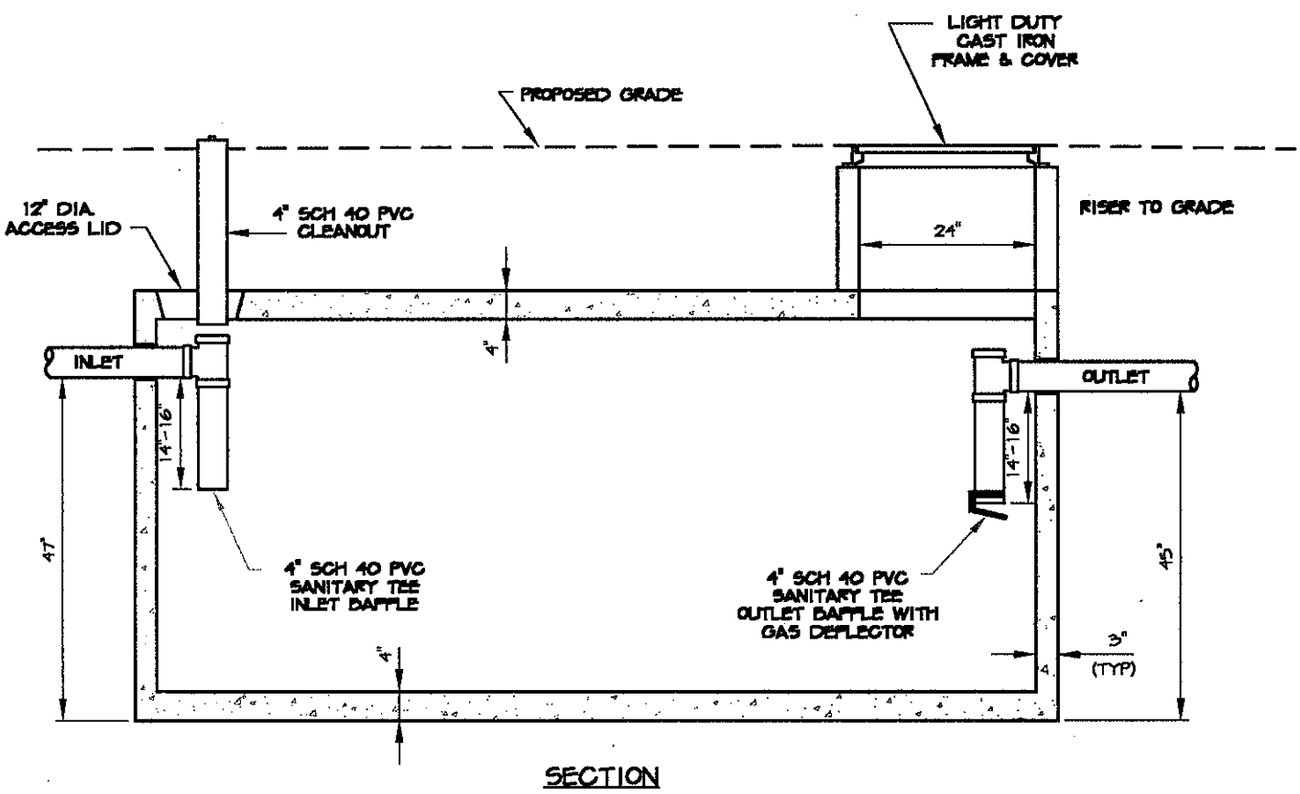


PLAN



SECTION

1250 GALLON SEPTIC TANK

1/2"=1'-0"

SEPTIC SYSTEM DESIGN PLAN
LOT 14.03 BLOCK 46
LAKE BALDWIN DRIVE
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

REVISIONS	DESIGNED: GWB	DATE: 10/10/00
	CAD: gb	SCALE: SHOWN
	CHECKED: GWB	SHEET: 5 OF 8

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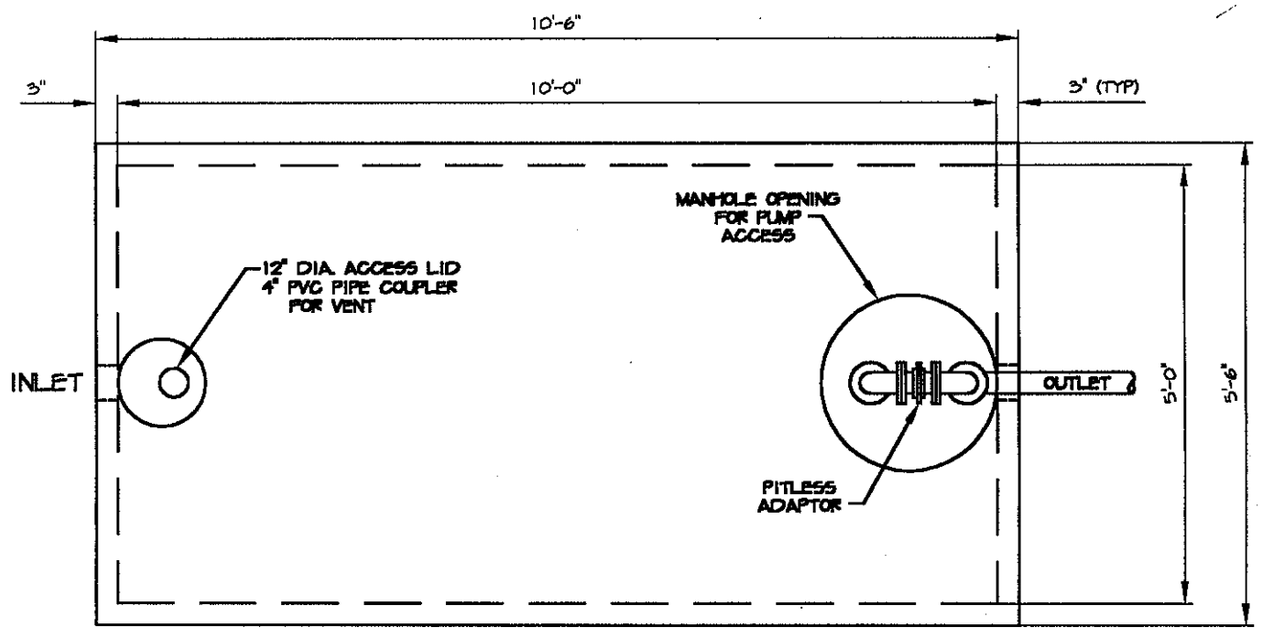
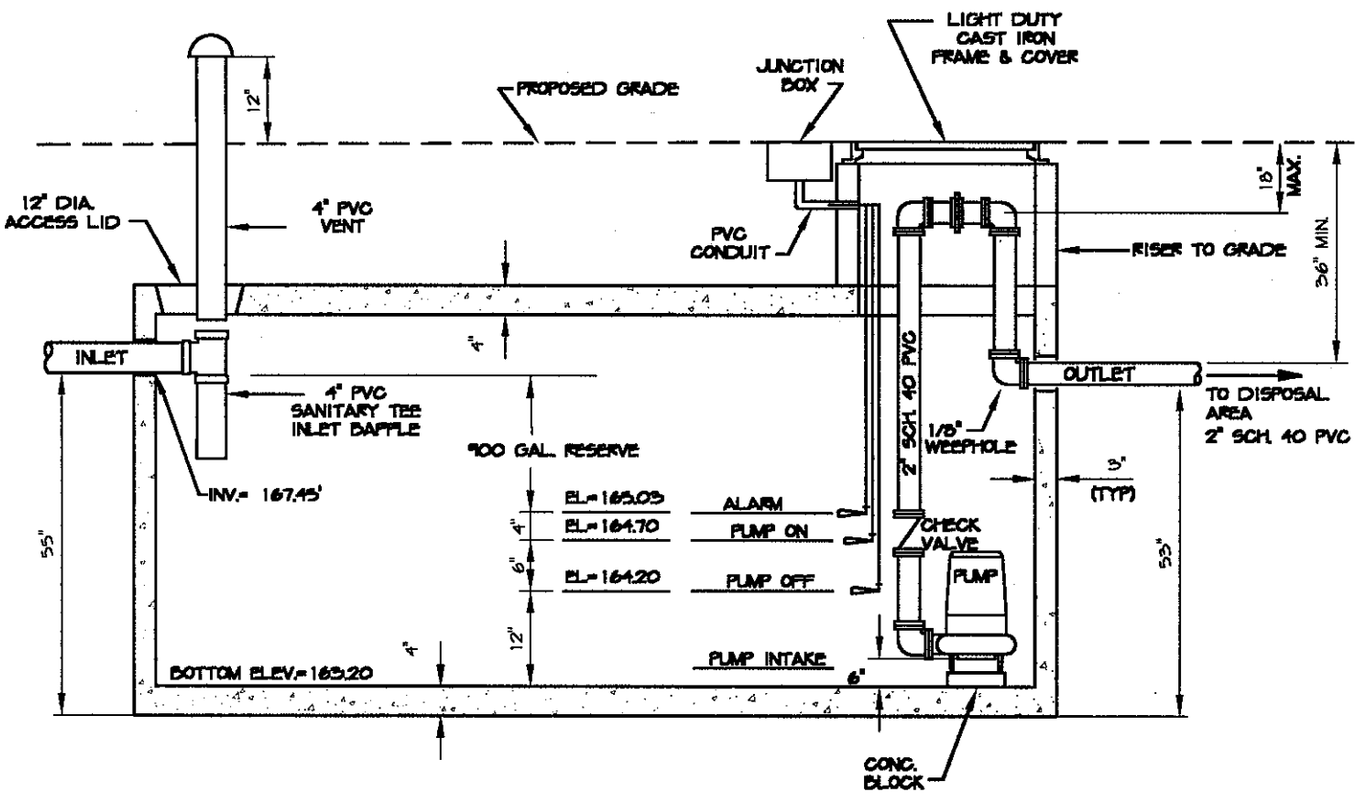


PLAN



SECTION

PUMP SPECIFICATION
HYDROMATIC SW33
CAPABLE OF 38 GPM @ 11' TDH

1500 GALLON PUMP TANK

1/2" = 1'-0"

SEPTIC SYSTEM DESIGN PLAN
LOT 14.03 BLOCK 46
LAKE BALDWIN DRIVE
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

REVISIONS	DESIGNED: GWB	DATE: 10/10/00
	CAD: gb	SCALE: SHOWN
	CHECKED: GWB	SHEET: 6 OF 8

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DESIGN NOTES: HOPEWELL TOWNSHIP, MERCER COUNTY, BLOCK 46, LOT 14.03

GENERAL NOTES:

1. THIS WASTEWATER DISPOSAL SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF N.J.A.C. 7:9A "STANDARDS FOR INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEMS", AND THOSE OF THE HOPEWELL TOWNSHIP HEALTH DEPARTMENT.
2. ALL SOIL TESTING WAS CONDUCTED BY RUSSELL REID ENGINEERING, L.L.C. AND WITNESSED BY A REPRESENTATIVE OF THE HOPEWELL TOWNSHIP HEALTH DEPARTMENT.
3. PROPERTY LINE AND TOPOGRAPHIC INFORMATION OBTAINED FROM PLANS ENTITLED "PROPOSED SEPTIC SYSTEM DESIGN AND LOCATION FOR WILLOW CREEK, BLOCK 46, LOT 14.03, HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY" AS PREPARED BY LANNING ENGINEERING. PROPOSED DWELLING AND GRADING INFORMATION OBTAINED FROM PLANS ENTITLED "PLOT PLAN, LAKE BALDWIN DRIVE - LOT 14.03 BLOCK 46, TOWNSHIP OF HOPEWELL, MERCER COUNTY, NEW JERSEY" AS PREPARED BY FISK ASSOCIATES.
4. CONSTRUCTION ELEVATION INFORMATION BASED ON TOPOGRAPHY OF PLAN.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY AND ALL NECESSARY PERMITS INCLUDING BUT NOT LIMITED TO SEPTIC CONSTRUCTION, ELECTRICAL, PLUMBING, SOIL DISTURBANCE OR OTHER RELATED PERMITS PRIOR TO THE START OF CONSTRUCTION.
6. PRIOR TO THE DISPOSAL BED STAKEOUT BY THE ENGINEER AND ANY CONSTRUCTION, THE CONTRACTOR HAVE ALL UNDERGROUND UTILITIES LOCATED BY THE APPROPRIATE UTILITY COMPANIES. NJ ONE-CALL 800-272-1000
7. THE FOLLOWING DISTANCES SHALL BE MAINTAINED:
   - A. DISPOSAL FIELD TO BE A MINIMUM OF 100' FROM ALL WELLS
   - B. SEPTIC TANK TO BE A MINIMUM OF 50' FROM ALL WELLS
   - C. DISPOSAL FIELD TO BE A MINIMUM OF 25' FROM DWELLING
   - D. SEPTIC TANK TO BE A MINIMUM OF 10' FROM DWELLING
   - E. NO TREES WITHIN 10' OF DISPOSAL BED
8. THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY TO INSURE THAT ALL MATERIALS USED ARE IN ACCORDANCE WITH N.J.A.C. 7:9A ET. SEQ. AND MEET THE SPECIFICATIONS OF THIS PLAN.
9. FIELD CHANGES TO THE DESIGN SHALL NOT BE PERMITTED. THE ENGINEER AND HEALTH DEPARTMENT SHALL REVIEW AND APPROVE ANY DEVIATIONS FROM THIS DESIGN.
10. AS-BUILT PLANS TO BE PREPARED BY THE ENGINEER AND SUBMITTED TO THE HEALTH DEPARTMENT.

SPECIFICATIONS:

1. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE HEALTH DEPARTMENT 48 HOURS PRIOR TO CONSTRUCTION SO THAT ALL INSPECTIONS MAY BE SCHEDULED. ALL PHASES OF THE CONSTRUCTION SHALL BE INSPECTED AND APPROVED BY THE ENGINEER PRIOR TO BACKFILLING. THE CONTRACTOR SHALL SCHEDULE, AT A MINIMUM, THE FOLLOWING INSPECTIONS:
   - A. STAKE OUT, IDENTIFICATION OF THE BENCHMARK TO BE USED THROUGHOUT THE CONSTRUCTION, AND STOCKPILE SAND FOR SAMPLING AND ANALYSIS.
   - B. OPEN BED EXCAVATION.
   - C. SELECT FILL EMPLACEMENT AND COMPACTION.
   - D. STONE AND LATERALS, CONSTRUCTION OF DISTRIBUTION SYSTEM, DISTRIBUTION BOX IF APPLICABLE.
   - E. TANKS, RISERS, AND CONNECTING LINES.
   - F. PUMPS, FLOATS, ALARM, IF APPLICABLE.
   - G. FINAL GRADING AND SEEDING.
2. THE CONTRACTOR SHALL SUPPLY THE ENGINEER WITH A REPRESENTATIVE SAMPLE OF THE SELECT FILL AND SAND INTENDED TO BE USED FOR THE SYSTEM, PRIOR TO THE DELIVERY OF THE MATERIAL TO THE SITE. THE ENGINEER SHALL ADVISE THE CONTRACTOR OF THE SUITABILITY OF THE MATERIAL RELATIVE TO THE SPECIFICATIONS PRIOR TO THE CONTRACTOR STOCKPILING THE REQUIRED VOLUME OF MATERIAL AT THE SITE. FOLLOWING DELIVERY OF ALL MATERIAL TO THE SITE, A COMPOSITE SAMPLE OF THE STOCKPILED MATERIAL WILL BE OBTAINED BY THE ENGINEER FOR ANALYSIS AND TESTED PRIOR TO THE PLACEMENT OF THE MATERIAL IN THE DISPOSAL AREA.
3. NJDEP SPECIFICATION FOR SELECT FILL (PER N.J.A.C. 7:9A-10.1(F)4)
   SELECT FILL SHALL HAVE A COARSE FRAGMENT CONTENT OF LESS THAN 15% BY VOLUME OR LESS THAN 25% BY WEIGHT; A TEXTURAL ANALYSIS (COMPOSITION, BY WEIGHT, OF SIZE FRACTION PASSING THE 2 MM SIEVE) OF 85-95% SAND, 5-15% SILT PLUS CLAY, (MINIMUM OF 2% CLAY) AND SHALL EXHIBIT A PERMEABILITY RATE OF 2-20 IN/HR OR A PERCOLATION RATE OF 3-30 MIN/IN.
   ENGINEER'S REQUIRED SPECIFICATION FOR SELECT FILL
   SELECT FILL SHALL HAVE A COARSE FRAGMENT CONTENT OF LESS THAN 15% BY VOLUME OR LESS THAN 25% BY WEIGHT, A TEXTURAL ANALYSIS (COMPOSITION, BY WEIGHT, OF SIZE FRACTION PASSING THE 2 MM SIEVE) OF 90-95% SAND*, 5-10% SILT AND CLAY (MINIMUM 2% CLAY) AND AN IN-PLACE PERMEABILITY BETWEEN 8-20 IN/HR.
   *THE AMOUNT OF FINE + VERY FINE SAND SHALL NOT EXCEED 25% OF THE TOTAL SAND FRACTION, AND SHALL HAVE A COEFFICIENT OF UNIFORMITY LESS THAN 5.
4. CLEAN FILL SHALL HAVE A TEXTURAL ANALYSIS (COMPOSITION, BY WEIGHT, OF SIZE FRACTION PASSING THE 2MM SIEVE) OF 90% OR MORE SAND AND A PERMEABILITY RATE GREATER THAN 8 IN/HR OR A PERCOLATION RATE FASTER THAN 10 MIN/IN.
5. SELECT FILL AND CLEAN FILL SHALL BE INSTALLED WITH A TRACKED MACHINE IN CONFORMANCE WITH N.J.A.C. 7:9A 10.4(F)3. NO WHEELED VEHICLES ARE TO BE DRIVEN OVER ANY PART OF THE DISPOSAL AREA.
6. PERCOLATION TESTS AND/OR PERMEABILITY TESTS ARE TO BE PERFORMED BY A REPRESENTATIVE OF THE CERTIFYING ENGINEER WITHIN THE FILL MATERIAL AT THE LEVEL OF INFILTRATION. WITNESSING OF THE PERCOLATION TESTS BY THE HEALTH DEPARTMENT MAY BE REQUIRED. PERMEABILITY TESTS WILL INCLUDE UNDISTURBED AND DISTURBED CORE TUBE SAMPLES FOR THE DETERMINATION OF THE IN PLACE PERMEABILITY.
7. CLEAN WASHED CRUSHED STONE SHALL CONFORM TO SIZE AND GRADATION SPECIFIED IN THE N.J. D.O.T. SPECIFICATIONS FOR STANDARD SIZES OF COARSE AGGREGATE, SIZE NUMBER 3, 4, OR 24.
8. FILTER FABRIC IS TO BE A NON-WOVEN GEOTEXTILE PRODUCT (MIRAFI 140NL, AMOCO 4545 OR EQUAL).
9. SEPTIC AND PUMP TANKS: CONCRETE USED IN THE TANK CONSTRUCTION SHALL CONFORM TO THE AMERICAN CONCRETE INSTITUTE (ACI) STANDARDS FOR FROST RESISTANCE (ACI 318-16-4.5.1) AND WATER TIGHTNESS (ACI 318-16-4.5.2.) CONSTRUCTION JOINTS FOR TWO OR MORE PIECE TANKS SHALL BE SEALED WITH A BUTYL SEALANT SUCH AS CONSEAL CS-101 OR EQUIVALENT. THE INSIDE SURFACES OF THE TANKS SHALL BE SEALED WITH TWO COATS OF AN APPROPRIATE INERT COATING. TANK PENETRATIONS INCLUDING THOSE FOR ACCESS OPENINGS, PIPING, RISERS AND ELECTRICAL CONDUITS SHALL MAINTAIN A WATER TIGHT SEAL.
10. PUMPS: THE PUMP CONTROL PANEL SHALL BE COMPATIBLE WITH THE PUMPS PROVIDED. ALL ELECTRICAL WORK SHALL BE IN CONFORMANCE WITH THE LATEST REQUIREMENTS OF THE NATIONAL ELECTRIC CODE (NEC). SEPARATE CONDUITS SHALL BE PROVIDED FOR THE PUMP POWER AND CONTROL CIRCUITS. CONDUITS ENTERING THE PUMP TANKS SHALL BE SEALED TO PREVENT GASSES FROM ENTERING THE JUNCTION BOX AND LEAKAGE OF WATER INTO THE TANK.
11. MATERIAL USED IN THE CONSTRUCTION OF THE BERM TO HAVE A PERMEABILITY LESS THAN THAT OF THE MATERIAL WITHIN THE ZONE OF TREATMENT.
12. DISPOSAL AREA SHALL BE GRADED SO THAT SURFACE RUNOFF IS DIVERTED AWAY FROM THE DISPOSAL AREA.
13. AFTER COMPLETION OF THE BACKFILLING AND ROUGH GRADING, TOPSOIL SHALL SPREAD OVER THE ENTIRE DISTURBED AREA. THE DISTURBED AREA SHALL THEN BE FERTILIZED, SEEDED AND MULCHED ACCORDING TO THE FOLLOWING:
    - A. FERTILIZER: (10-20-10) AT A RATE OF 14 LBS PER 1000 SF
    - B. SEED: PERENNIAL RYEGRASS 10 LBS/ACRE, KENTUCKY BLUEGRASS 25 LBS/ACRE, RED FESCUE 15 LBS/ACRE, AND SPREADING FESCUE 15 LBS/ACRE
    - C. MULCH: UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING AT 90 LBS/1000 SF

SEPTIC SYSTEM DESIGN PLAN
LOT 14.03 BLOCK 46
LAKE BALDWIN DRIVE
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

REVISIONS	DESIGNED: GWB	DATE: 10/10/00
	CAD: gb	SCALE: NONE
	CHECKED: GWB	SHEET: 7 OF 8

GREGG W. BARKLEY
New Jersey Professional Engineer
License No. 34875

Russell Reid.
ENGINEERING, L.L.C.
200 SMITH STREET
P.O.BOX 311
KEASBEY, NJ 08832-0311
(800) 777-1550
FAX: (732) 225-9264

DESIGN NOTES: HOPEWELL TOWNSHIP, MERCER COUNTY, BLOCK 46, LOT 14.03

1. SOIL LOGS

PRIMARY AREA **SOIL LOG B-1** **PERFORMED 5/20/97**

0 - 8" 7.5YR 4/2 BROWN SILTY CLAY LOAM, NO MOTTLING, SUBANGULAR STRUCTURE, DRY, LOOSE, COMMON ROOTS.
8 - 39" 7.5YR 4/6 STRONG BROWN SILTY CLAY, FEW FINE FAINT MOTTLING ,5YR 6/1 AT 29"-39", SUBANGULAR STRUCTURE, DRY, FRIABLE, COMMON ROOTS, CLEAR SMOOTH BOUNDARY.
39 - 53" 2.5YR 3/4 DARK REDDISH BROWN 30% SILTY CLAY, .25" SHALE, SUBANGULAR, NO MOTTLING, MOIST,FRIABLE TO FIRM, NO ROOTS, IRREGULAR BOUNDARY.
53 - 114" 2.5YR 3/4 DARK REDDISH BROWN, 20% SILTY CLAY .25" TO 3" SHALE, SUBANGULAR TO ANGULAR, NO MOTTLING, SUBANGULAR TO PLATEY, MOIST,FRIABLE TO FIRM, NO ROOTS IRREGULAR BOUNDARY.

SOIL LOG B-2 **PERFORMED 5/20/97**

0 - 10" 10YR 3/4 DARK YELLOWISH BROWN, SILTY CLAY LOAM, SUBANGULAR STRUCTURE, DRY, LOOSE.
10 - 59" 7.5YR 4/6 STRONG BROWN SILTY CLAY, FEW FINE FAINT MOTTLING, 5YR 6/1 LIGHT GRAY AT 48"- 59", SUBANGULAR, DRY, FRIABLE,SMOOTH BOUNDARY.
59 - 66" 2.5YR 3/6 DARK RED SILTY CLAY,.25" SHALE, SUBANGULAR,DRY,FRIABLE, WAVY BOUNDARY.
66 - 124" 2.5YR 3/6 25% SILTY CLAY .25"TO 3" SHALE, SUBANGULAR, DRY, FRIABLE TO FIRM, WAVY BOUNDARY.

RESERVE AREA **SOIL LOG BR-1** **PERFORMED 5/20/97**

0 - 8" 10YR 3/4 DARK YELLOWISH BROWN SILTY CLAY LOAM, SUBANGULAR, MOIST, LOOSE, COMMON ROOTS.
8 - 60" 7.5YR 4/6 STRONG BROWN SILTY CLAY, FEW FINE FAINT MOTTLING 5YR 6/1 LIGHT GRAY AT 45" TO 56" SUBANGULAR STRUCTURE, MOIST, FRIABLE, FEW ROOTS, WAVY BOUNDARY.
60 - 70" 2.5YR 3/6 DARK RED SILTY CLAY 20%, SHALE SUBANGULAR, NO MOTTLING, ANGULAR STRUCTURE, MOIST, FRIABLE, FEW ROOTS, WAVY BOUNDARY.
70 - 124" 2.5YR 3/6 DARK RED COBBLES SUBANGULAR, NO MOTTLING, ANGULAR STRUCTURE, MOIST, FRIABLE TO FIRM, NO ROOTS, WAVY BOUNDARY.

SOIL LOG BR-2 **PERFORMED 5/20/97**

0 - 9" 10YR 3/4 DARK YELLOWISH BROWN SILTY CLAY LOAM, SUBANGULAR STRUCTURE, MOIST,FRIABLE, COMMON ROOTS.
9 - 46" 7.5YR 4/6 STRONG BROWN SILTY CLAY, SUBANGULAR STRUCTURE, MOIST, FRIABLE, SMOOTH BOUNDARY.
46 - 64" 2.5YR 3/6 DARK RED SILTY CLAY, .25" TO 2" ANGULAR SHALE , FEW FINE FAINT MOTTLES 5YR 5/2 REDDISH GRAY 50" TO 64", ANGULAR STRUCTURE, MOIST FRIABLE TO FIRM, NO ROOTS, WAVY BOUNDARY.
64 - 120" 2.5YR DARK RED SILTY CLAY (20%) 12" SHALE FRAGMENTS, NO MOTTLES, ANGULAR SHALE, MOIST TO SATURATED, FRIABLE TO FIRM, NO ROOTS, IRREGULAR BOUNDARY.

2. PERMEABILITY TESTS

PRIMARY AREA

PIT BAILING TEST PB-2 WAS PERFORMED ON MAY 27, 1997 AT A DEPTH OF 142". THE TEST YIELDED A PERMEABILITY RATE OF 9.11 IN/HR FOLLOWING A 16.5" RISE DURING THE 240 MINUTE TEST.

PIT BAILING TEST PB-3 WAS PERFORMED ON MAY 20, 1997 AT A DEPTH OF 136". THE TEST YEILDED A PERMEABILITY RATE OF 12.50 IN/HR FOLLOWING A 12" RISE DURING THE 150 MINUTE TEST.

RESERVE AREA

PIT BAILING TEST PB-1 WAS PERFORMED O MAY 20, 1997 AT A DEPTH OF 127". THE TEST YIELDED A PERMEABILITY RATE OF 6.11 IN/HR FOLLOWING A 22.5" RISE DURING THE 240 MINUTE TEST.

3. WASTEWATER GENERATION/DAILY DESIGN FLOW

PROPOSED 5 BEDROOM DWELLING = 800 GPD

4. DISPOSAL AREA SIZING

800 GPD X 1.61 SF/GPD = 1,288 SF REQUIRED PROPOSE: 26' X 50' = 1,300 SF
FILL ENCLOSED BED: 30' X 54' = 1,620 SF OVERALL SIZE

5. SEPTIC TANK SIZING

5 BEDROOM DWELLING = 1,250 GALLON MINIMUM

GREGG W. BARKLEY
New Jersey Professional Engineer
License No. 34675

SEPTIC SYSTEM DESIGN PLAN
LOT 14.03 BLOCK 46
LAKE BALDWIN DRIVE
HOPEWELL TOWNSHIP
MERCER COUNTY NEW JERSEY

REVISIONS	DESIGNED: GWB	DATE: 10/10/00
	CAD: JL	SCALE: NONE
	CHECKED: GWB	SHEET: 8 of 8

Russell Reid.
ENGINEERING, L.L.C.
200 SMITH STREET
P.O.BOX 311
KEASBEY, NJ 08832-0311
(800) 777-1550
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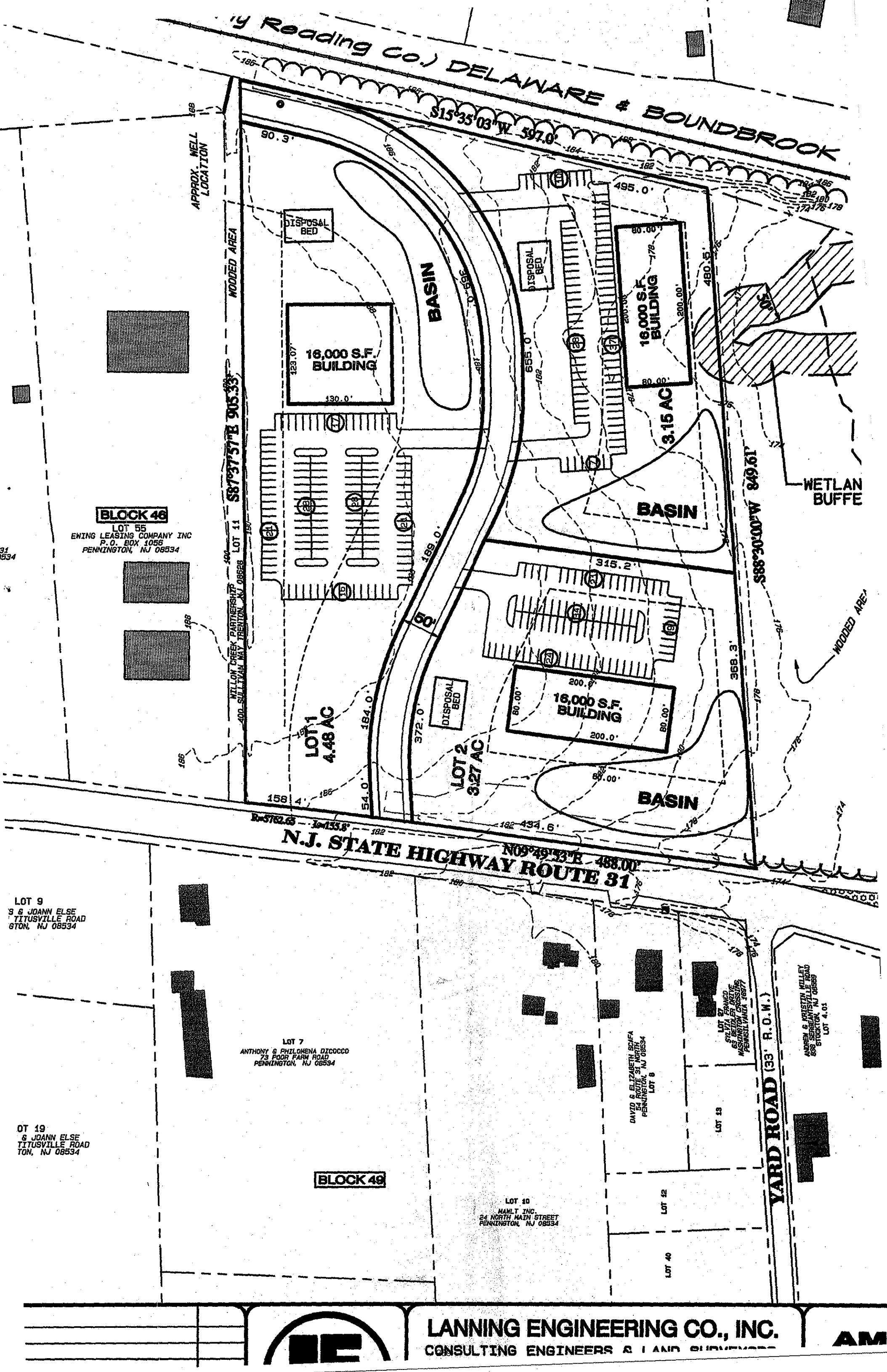
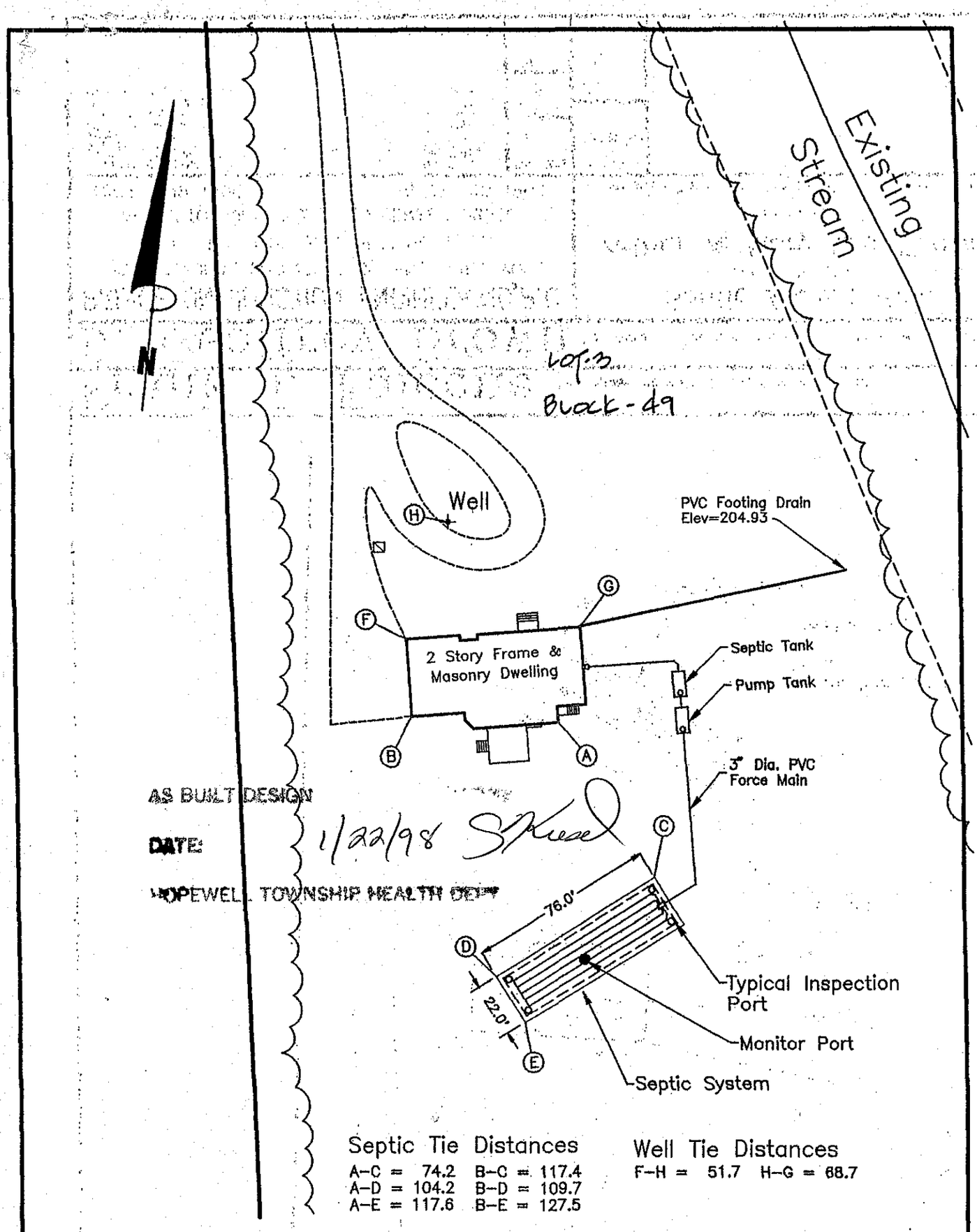

y Reading Co.) DELAWARE & BOUNDBROOK
S15°35'03"W 597.0'
90.3'
495.0'
APPROX. WELL LOCATION
WOODED AREA
DISPOSAL BED
BASIN
359.0'
16,000 S.F. BUILDING
130.0'
123.07'
655.0'
80.00'
200.00'
480.5'
50'
3.15 AC
WETLAN BUFFE
S87°37'57"E 905.33'
BLOCK 46
LOT 55
EWING LEASING COMPANY INC
P.O. BOX 1056
PENNINGTON, NJ 08534
LOT 11
WILLOW CREEK PARTNERSHIP
400 SULLIVAN WAY TRENTON, NJ 08628
189.0'
315.2'
S88°30'00"W 819.61'
358.3'
WOODED AREA
LOT 1
4.48 AC
184.0'
372.0'
LOT 2
3.27 AC
200.0'
158.4'
54.0'
434.6'
R=5762.65' L=133.8'
N05°49'53"E 488.00'
N.J. STATE HIGHWAY ROUTE 31
LOT 9
'S & JOANN ELSE
TITUSVILLE ROAD
GTON, NJ 08534
LOT 7
ANTHONY & PHILOMENA DICOCCO
73 POOR FARM ROAD
PENNINGTON, NJ 08534
OT 19
& JOANN ELSE
TITUSVILLE ROAD
TON, NJ 08534
BLOCK 49
LOT 10
MAHLT INC.
24 NORTH MAIN STREET
PENNINGTON, NJ 08534
DAVID & ELIZABETH SCAFA
54 ROUTE 31 NORTH
PENNINGTON, NJ 08534
LOT 8
LOT 27
SYLVIA FRANCO
65 BETTLER DRIVE
WASHINGTON CROSSING, PENNSILVANIA 18977
LOT 13
LOT 12
LOT 40
YARD ROAD (33' R.O.W.)
ANDREW & KRISTIN MILLEY
898 SERGEANTSVILLE ROAD
STOCKTON, NJ 08559
LOT 4.01
LANNING ENGINEERING CO., INC.
CONSULTING ENGINEERS & LAND SURVEYORS
AM



Septic Tie Distances

A–C =	74.2	B–C =	117.4
A–D =	104.2	B–D =	109.7
A–E =	117.6	B–E =	127.5

Well Tie Distances

F–H = 51.7 H–G = 68.7

Frank J. Falcone New Jersey Professional Land Surveyor #32112

D. Geoffrey Brown New Jersey Professional Engineer and Land Surveyor #24327

PRINCETON JUNCTION ENGINEERING, P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 53 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

Septic Asbuilt Plan

of Lot 3, Block 49 for

Arthur & Mary Lou Ferrara

Situate in

Hopewell Township Mercer County New Jersey

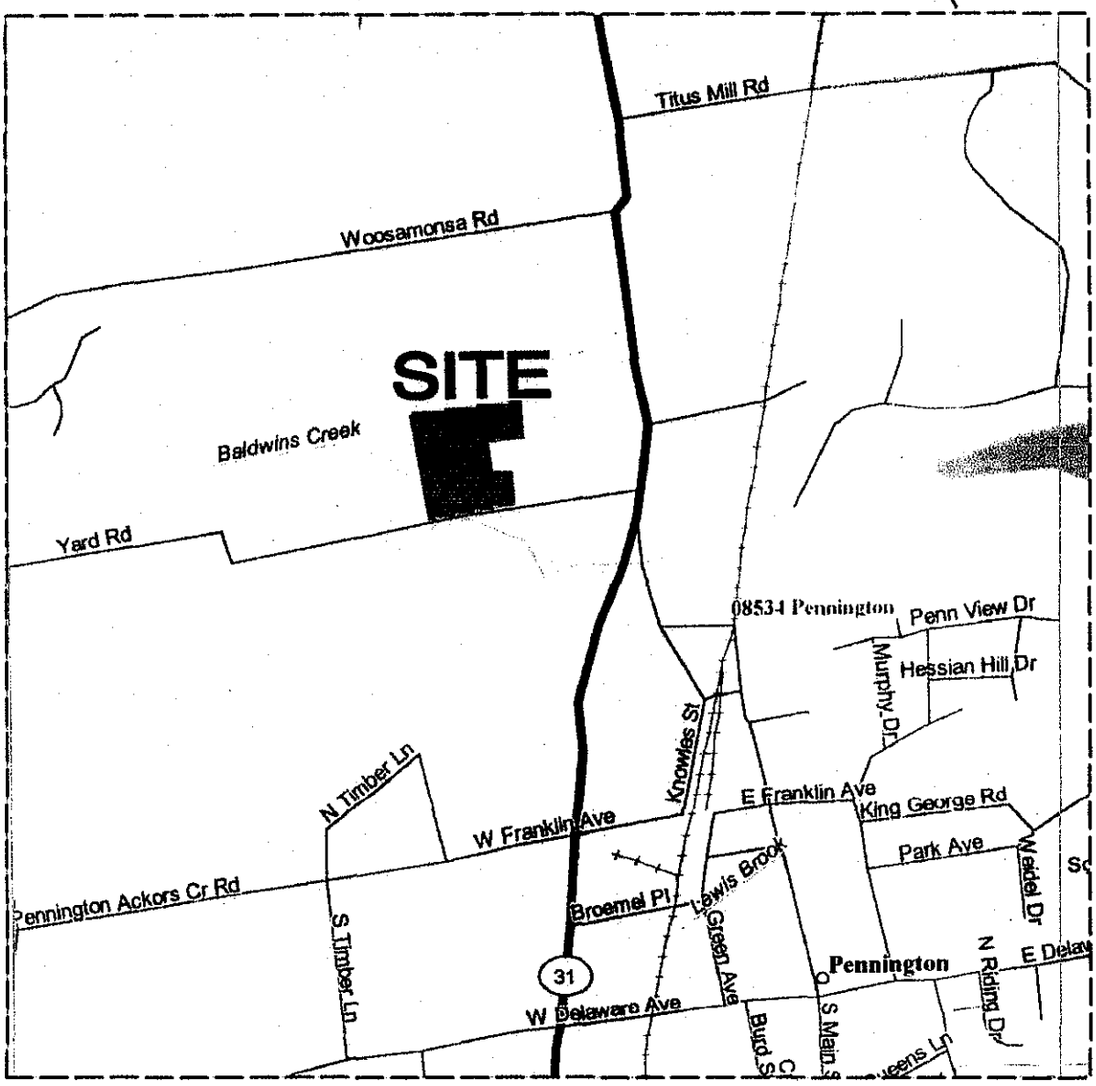
D. GEOFFREY BROWN	P.E.	L.S.	No. 24327
BRYCE M. RITTENHOUSE	P.E.	L.S.	No. 13453
ARNOLD RYDEN, JR.		L.S.	No. 21223
WESLEY J. LANE		L.S.	No. 30747
FRANK J. FALCONE		L.S.	No. 32112
PETER ESHEWSKY		L.S.	No. 34001
TED W. PIVOVARNICK		L.S.	No. 35868
MARTIN D. KATZ		L.S.	No. 36249

1/16/98
DATE

DRAWN	DATE
FJF	1/16/98
CHECK GB	SCALE 1"=50'
REV.	

1/16/98
DATE

File Copy.



ASBUILT DATES

BOTTOM OF SAND ELEVATION - 4/05/02

DISTRIBUTION LINES ELEV.- 4/10/02

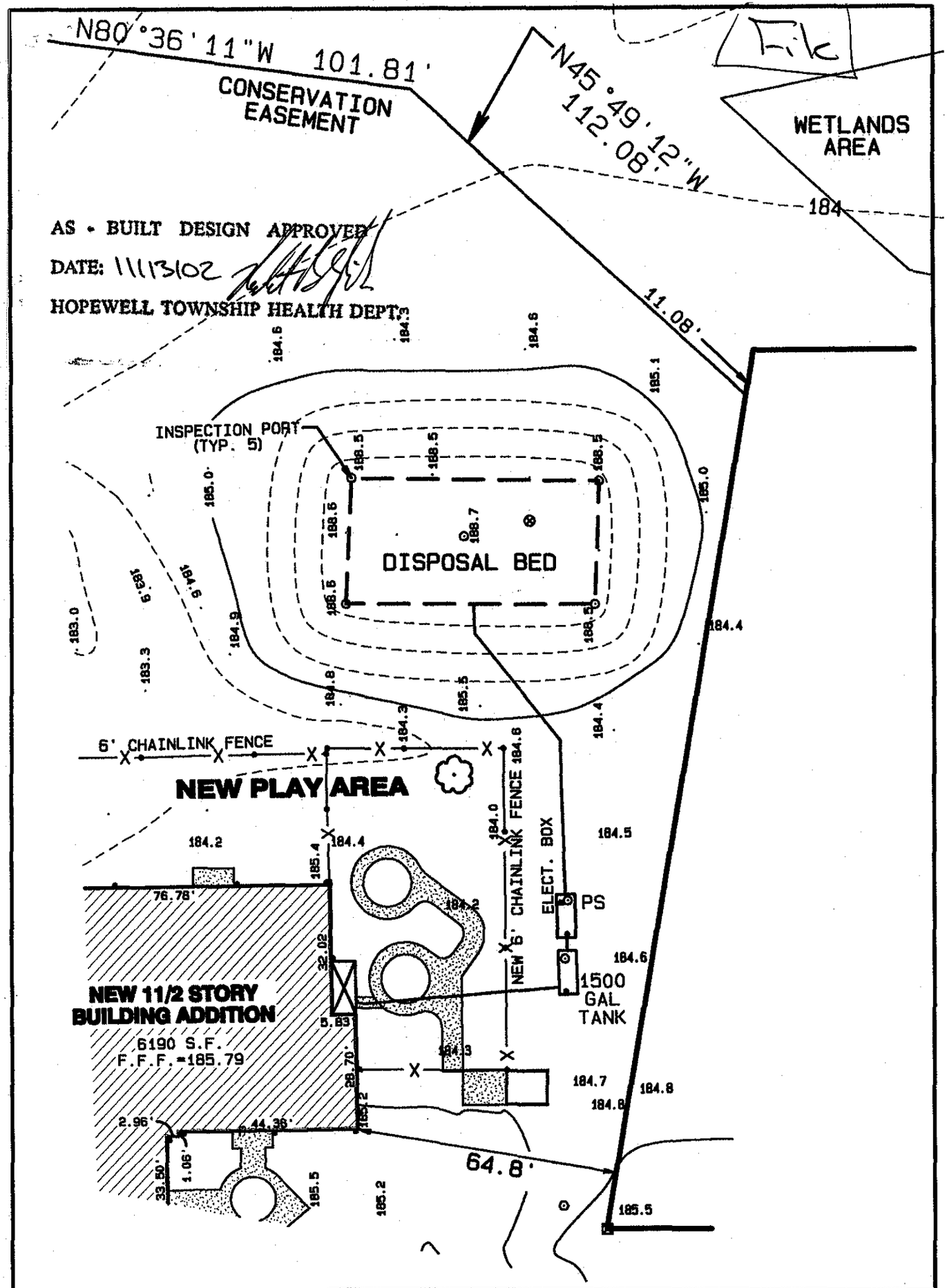
FINAL GRADES OVER SYSTEM- 8/28/02

TODDLER'S VILLAGE LEARNING CENTER			
HOPEWELL TWP — YARD ROAD — MERCER COUNTY N.J.			
LOCATION SKETCH & ASBUILT DATES			
LANNING ENGINEERING CO., INC. 3123 KLOCKNER ROAD HAMILTON, NEW JERSEY 08690	F.B. PG. N.O.	DRAWN AL CHECKED FAG	DATE 10/29/02 SCALE 1"=30'
FRANCIS A. GOEKE, P.E. PROFESSIONAL ENGINEER N.J. LIC. No. 23574 SIGNATURE — DATE OF SIGNATURE 10/29/02			

RECEIVED

NOV 4 2002

Hopewell Township Health Dept.



TODDLER'S VILLAGE LEARNING CENTER

YARD ROAD

HOPEWELL TWP — MERCER COUNTY N.J.

DISPOSAL SYSTEM ASBUILT- PLAN VIEW

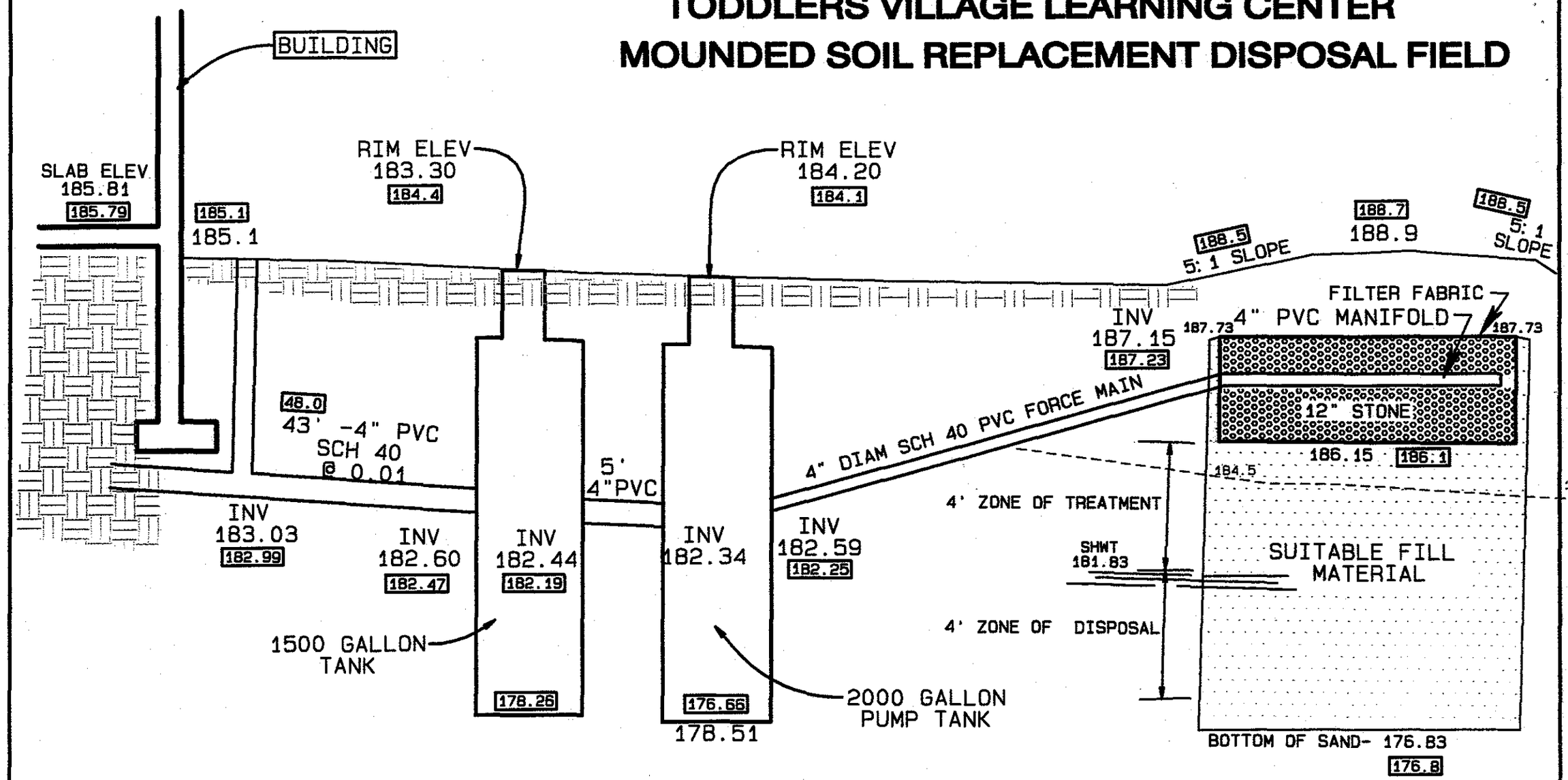
LANNING ENGINEERING CO., INC. 3123 KLOCKNER ROAD HAMILTON, NEW JERSEY 08690	F.B.	DRAWN AL	DATE 10/29/02
	PG.	CHECKED FAG	SCALE 1"=30'
	N.O.		

FRANCIS A. GOEKE, P.E.

PROFESSIONAL ENGINEER — N.J. LIC. No. 23574

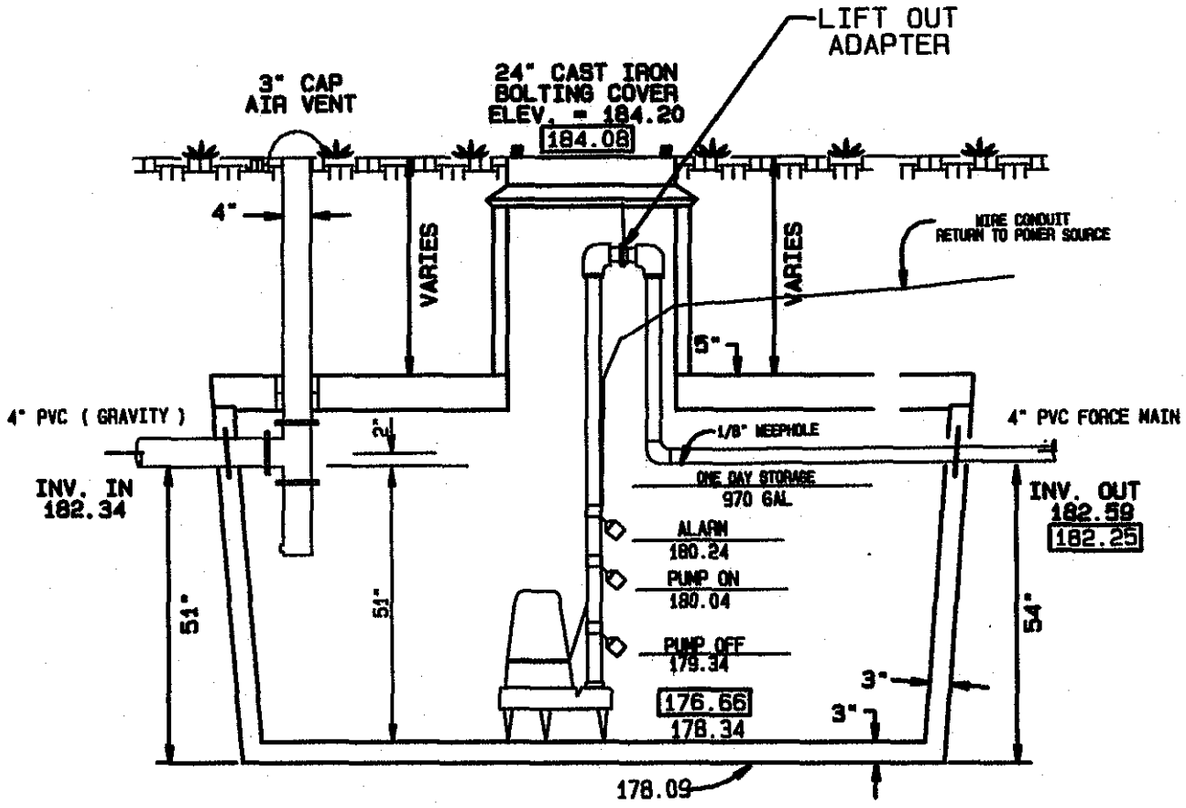
SIGNATURE — DATE OF SIGNATURE 10/29/02

TODDLERS VILLAGE LEARNING CENTER
MOUNDED SOIL REPLACEMENT DISPOSAL FIELD



NOTE: ALL ELEVATION IN BOXES REPRESENT ASBUILT ELEVATIONS

ASBUILT PROFILE VIEW



NOTE: TANK SHALL BE 4,000 P.S.I. CONCRETE, STEEL REINFORCED.
CONCRETE CONFORMS TO: ACI 318-16-4.5.1. AND 318-16-4.5.2.

2000 GALLON PUMP TANK DETAIL

NOT TO SCALE

NOTE: ALL ELEVATION IN BOXES REPRESENT ASBUILT ELEVATIONS

TODDLER'S VILLAGE LEARNING CENTER

YARD ROAD

HOPEWELL TWP MERCER COUNTY N.J.

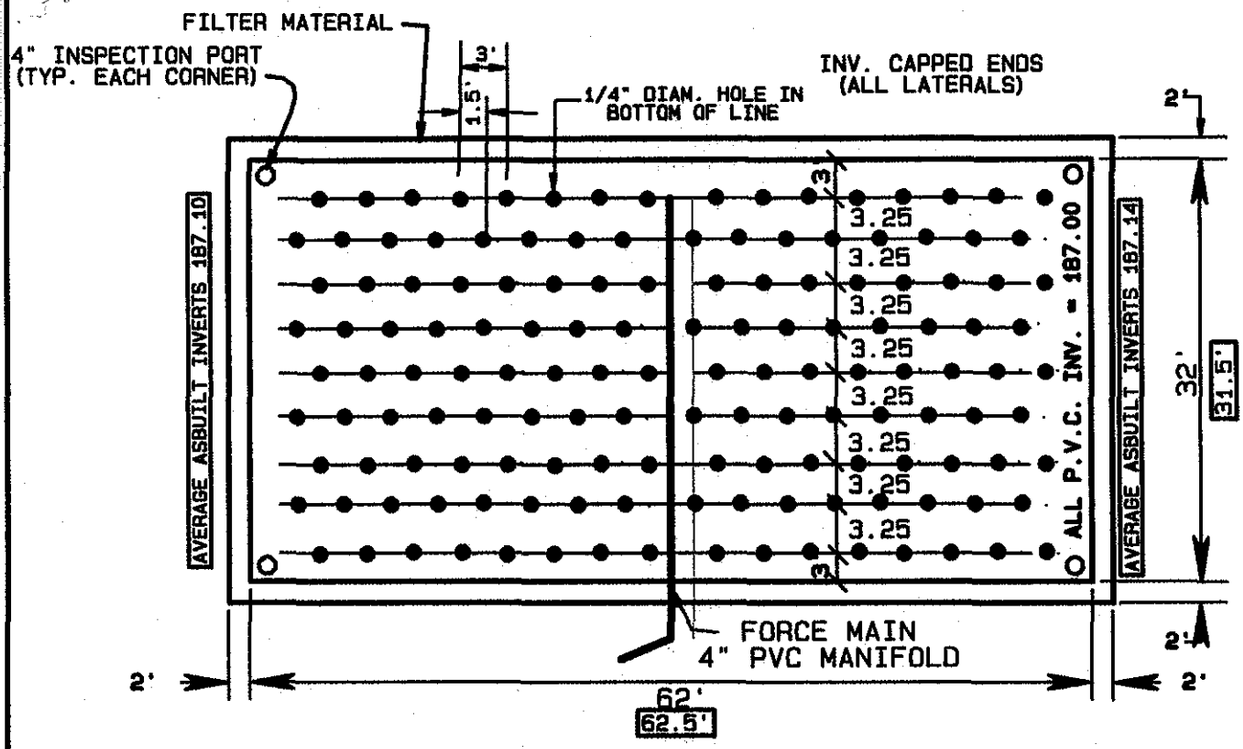
DISPOSAL SYSTEM ASBUILT - TANK

LANNING ENGINEERING CO., INC. 3123 KLOCKNER ROAD HAMILTON, NEW JERSEY 08690	F.B. PG. W.O.	DRAWN A.W.R.	DATE 10/29/02
		CHECKED FAG	SCALE 1"=30'

FRANCIS A. GOEKE, P.E.

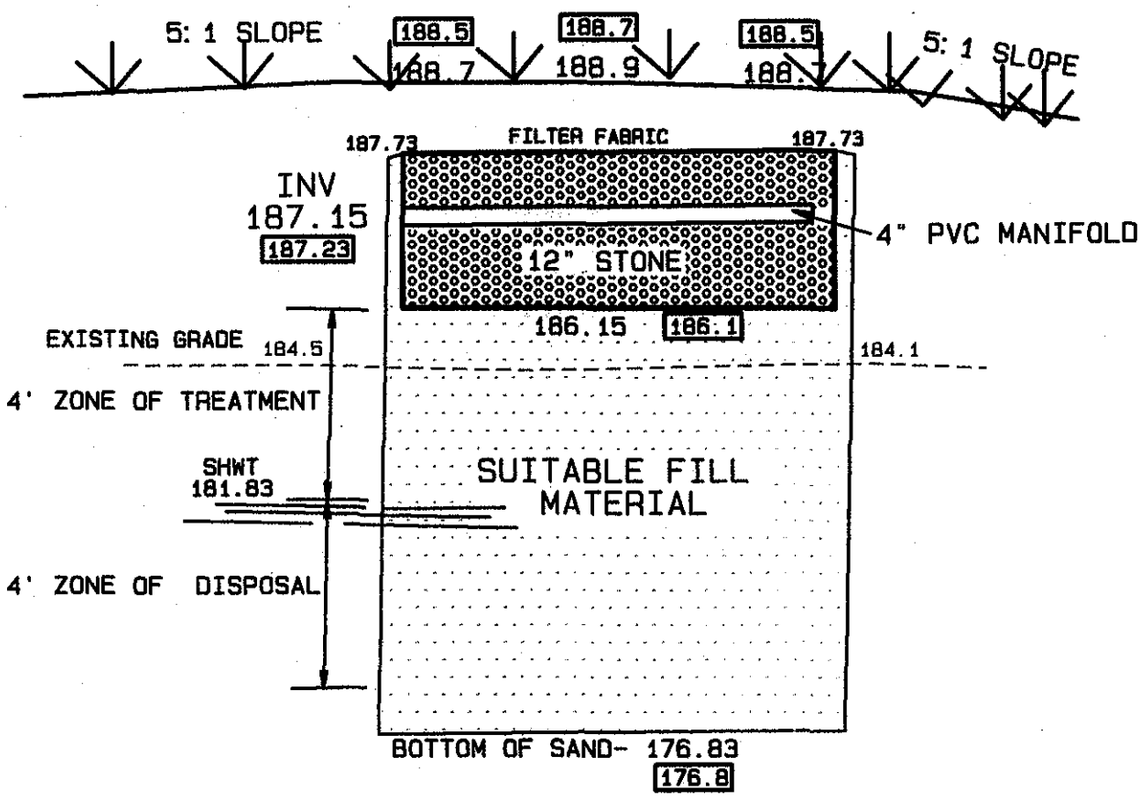
PROFESSIONAL ENGINEER N.J. LIC. No. 23574

SIGNATURE DATE OF SIGNATURE 10/29/02



SEPTIC SYSTEM PLAN VIEW

NOT TO SCALE



NOTE: ALL ELEVATION IN BOXES REPRESENT ASBUILT ELEVATIONS

SEPTIC SYSTEM PROFILE VIEW

NOT TO SCALE

TODDLER'S VILLAGE LEARNING CENTER

YARD ROAD

HOPEWELL TWP MERCER COUNTY N.J.

DISPOSAL SYSTEM ASBUILT- BED

LANNING ENGINEERING CO., INC. 3123 KLOCKNER ROAD HAMILTON, NEW JERSEY 08690	F.B. PG. W.O.	DRAWN AL	DATE 10/29/02
		CHECKED FAG	SCALE 1"=30'

FRANCIS A. GOEKE, P.E.

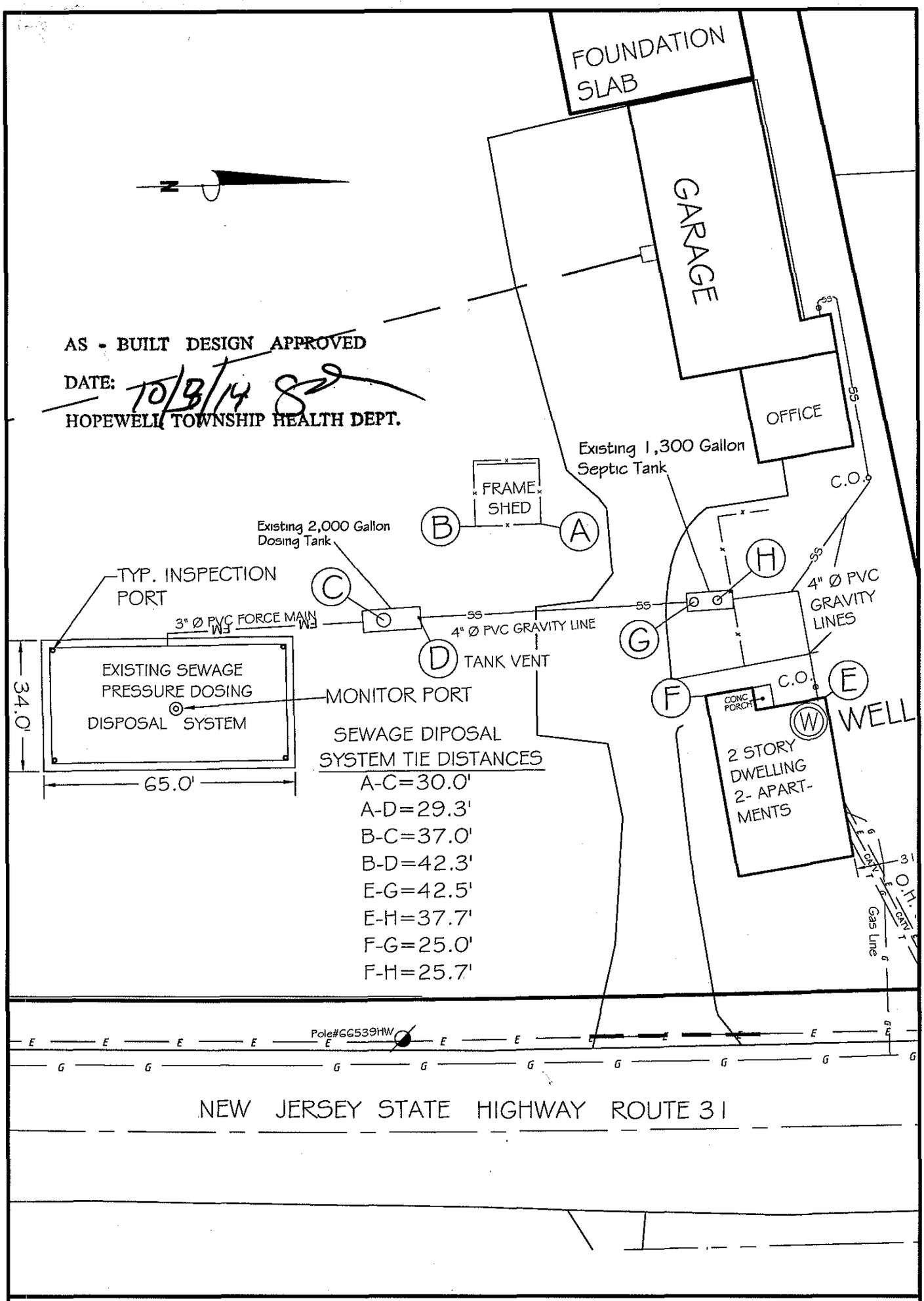
PROFESSIONAL ENGINEER N.J. LIC. No. 23574

SIGNATURE DATE OF SIGNATURE 10/29/02

RECEIVED

NOV 4 2002

Hopewell Township Health Dept.



Frank J. Falcone New Jersey Professional Planner and Land Surveyor

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email: pjepc@pjepc.com

Sewage Disposal Asbuilt Plan

of Lot-7, Block-49 for

C.M. DiCocco Excavating

Hopewell Township * Mercer County * New Jersey

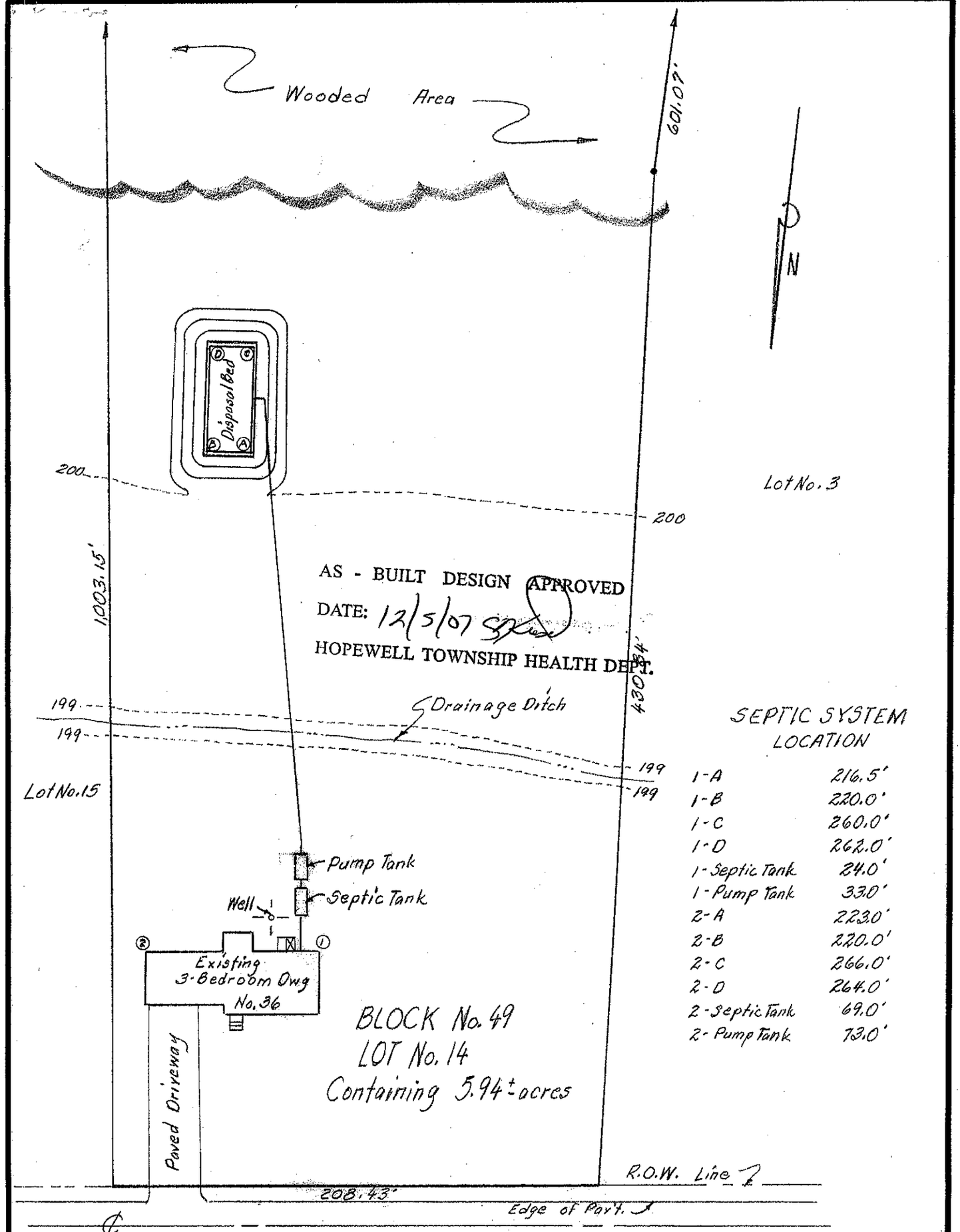
D. Geoffrey Brown	PE&PLS	No.24327
Frank J. Falcone	PLS	No.32112
	PP	No.3760
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249
Kevin M. Brakel	PP	No.44194

Frank J. Falcone 5/16/14 Date

Date: 5/16/13
Scale: 1"=30'
Drawn: FJF
Check: FJF/KMB

Revisions:

Job#: F120423
Dwg: 002 SEPTIC ASBUILT
View: Window



SEPTIC SYSTEM LOCATION

1-A	216.5'
1-B	220.0'
1-C	260.0'
1-D	262.0'
1-Septic Tank	24.0'
1-Pump Tank	33.0'
2-A	223.0'
2-B	220.0'
2-C	266.0'
2-D	264.0'
2-Septic Tank	69.0'
2-Pump Tank	73.0'

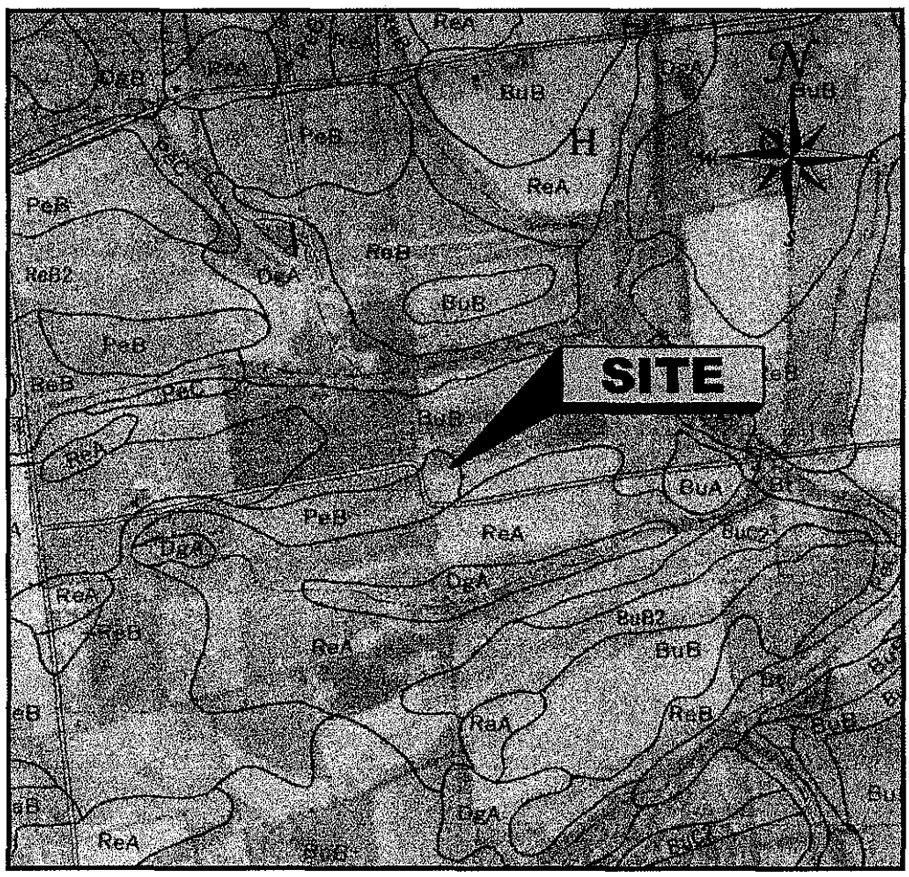
CAMP
Township of Hopewell - County of Mercer
New Jersey

JOHN M. WALDNER, P.E. 15525
Licensed New Jersey Professional Engineer
John M. Waldner 10/29/07
69 Upper Ferry Rd., Trenton, NJ 08628: Phone: 609 883-7754

SEPTIC SYSTEM DESIGN

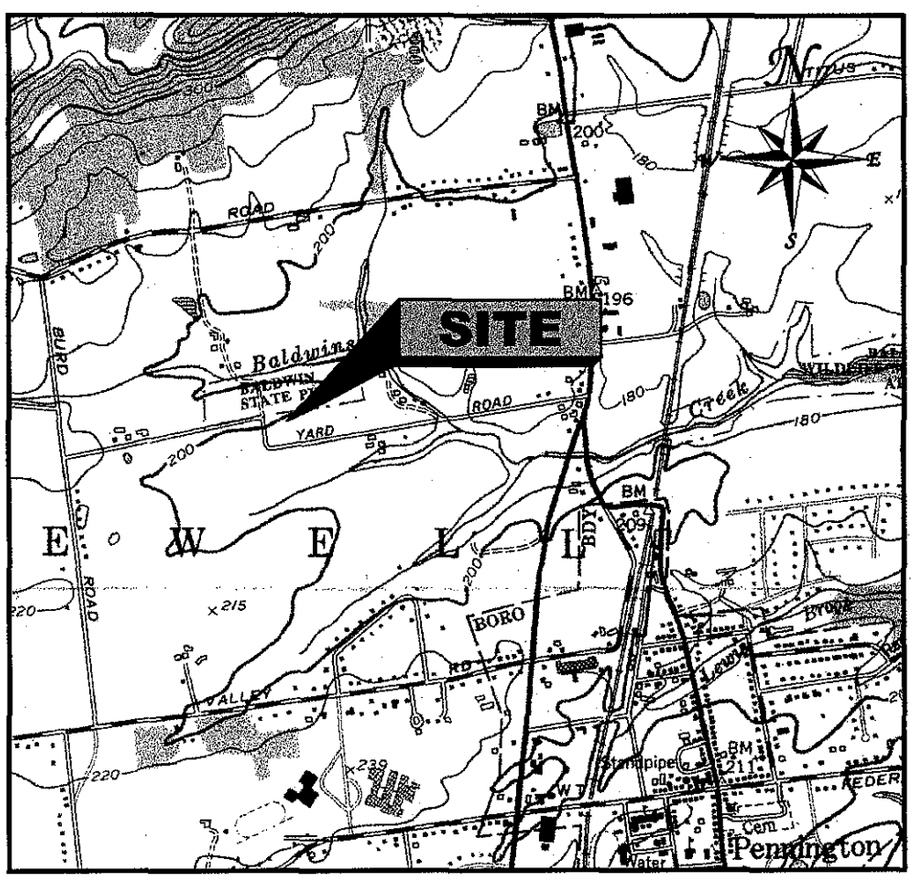
Block No. 49 Lot No. 14

Date: Oct. 27, 2007 Scale: 1" = 50'



MERCER COUNTY SOIL SURVEY MAP:

Sheets #8; Scale 1"=1000'



U.S.G.S. QUADRANGLE MAP:

Pennington Quad; SCALE 1"=1200'

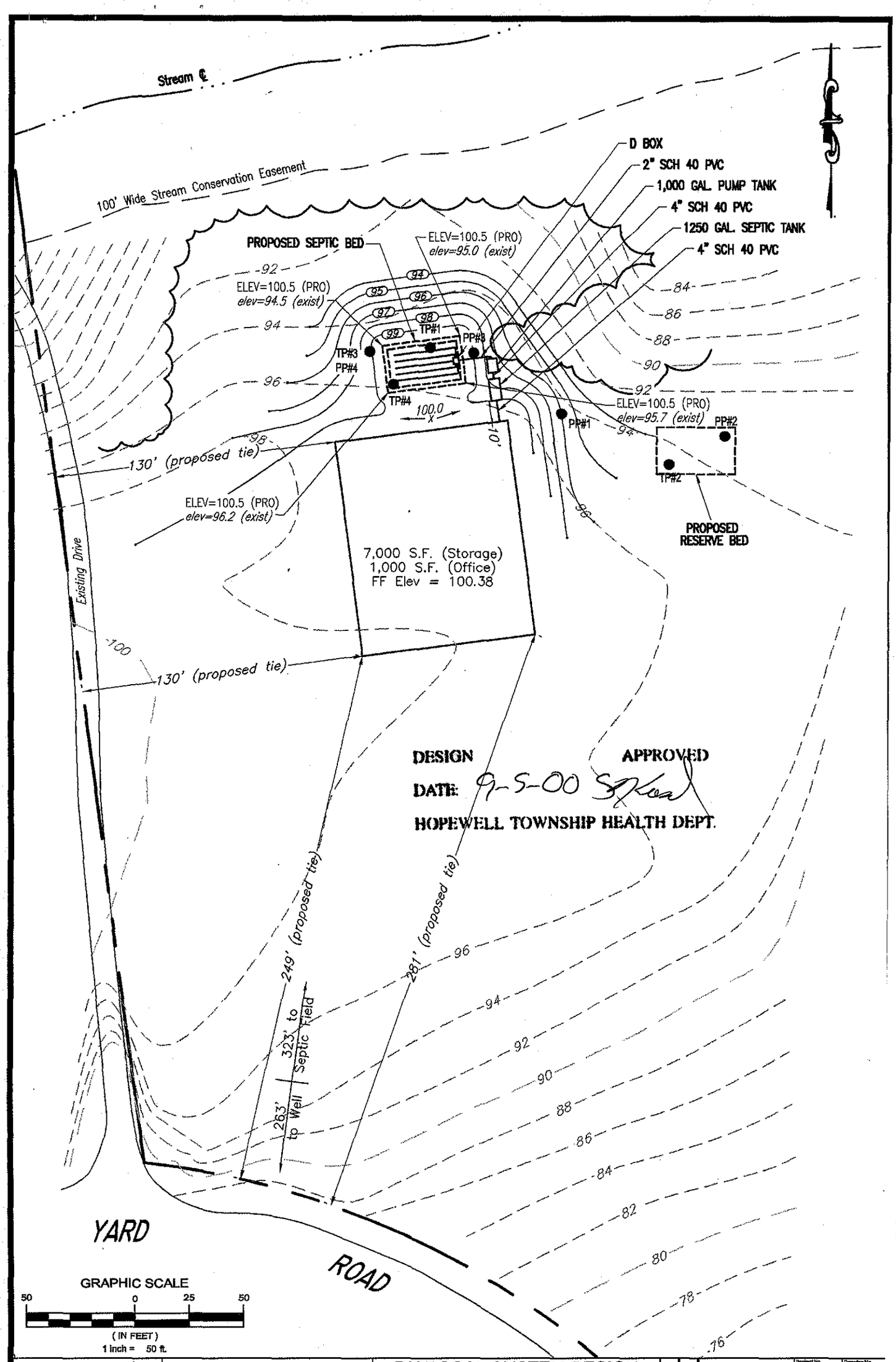
HILL ENVIRONMENTAL GROUP, INC.
19 Brookside Avenue Tel. (609) 730-1208
Pennington, NJ 08534 Fax. (609) 730-1222
www.hillenvironmentalgroup.com

ALBERT J. PHILLIPS, P.E.
New Jersey Professional Engineer License No. 32509

KEY MAPS
for
HARBAT FARMS
Situate In
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

Rev	Date	Description
1	8/25/00	As per Twp. review

Project No. 253-01-02	Drawing No. SEPTIC
Designed AJP	Scale AS SHOWN
Drawn GPF	Date 08/11/00
Reviewed AJP	SHT 1 OF 8



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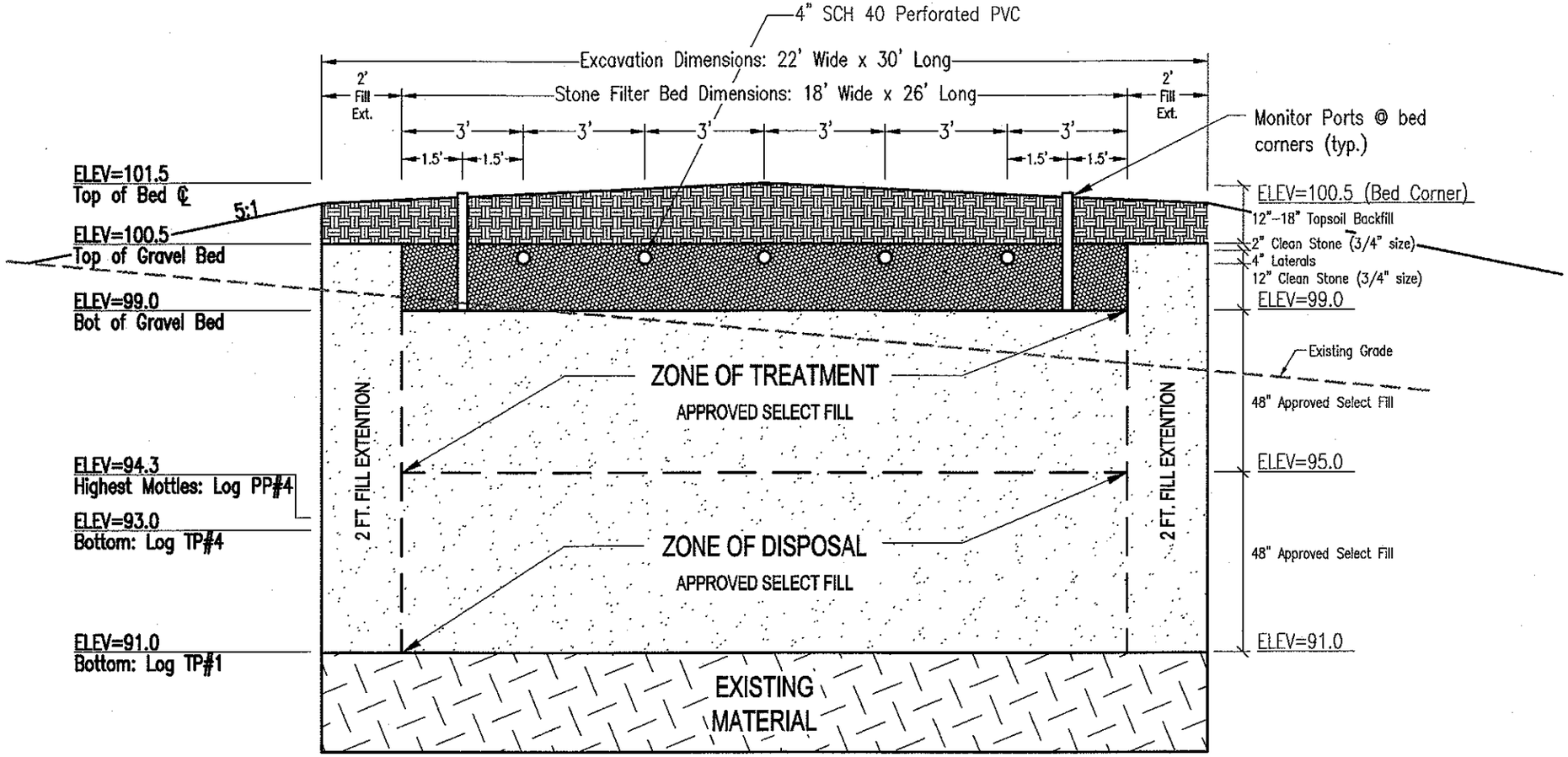
Tel. (609) 730-1208 Fax. (609) 730-1222
www.hillenvironmentalgroup.com

ALBERT J. PHILLIPS, P.E.
New Jersey Professional Engineer License No. 32509

DISPOSAL SYSTEM DESIGN
for
HARBAT FARMS
Situate In
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

Rev	Date	Description
1	8/28/00	As per Twp. review

Project No. 253-01-02	Drawing No. SEPTIC
Designed AJP	Scale AS SHOWN
Drawn GPF	Date 08/11/00
Reviewed AJP	SHT 2 OF 9



NOTE:

1. The Hopewell Township Health Dept. requires a Soil Permeability Class Rating Test on the stockpiled select fill. The contractor shall notify the Design Engineer 24 hours in advance of the said stockpiling in order to obtain samples of the fill for testing.

2. The select fill shall not be emplaced untill a passing soil analysis has been obtained.

3. The distribution network shall not be constructed until a passing percolation test or tube permeameter test has been performed on the emplaced select fill, to insure proper compaction. The contractor shall notify the Design Engineer 24 hours in advance in order to perform said test.

Assume in-place select fill @ 3-15 MPI

*"MSR" type bed requires a 2 Ft. fill extension
Excavate total btm. area of bed: 22'W x 30'L (660 Sq. Ft.)
Construct stone filter bed: 18'W x 26'L (=468 Sq. Ft.)

HILL ENVIRONMENTAL GROUP, INC.
10 Rockaway Avenue
Pennington, NJ 08534
Tel. (609) 730-1200
Fax. (609) 730-1222
www.hillenvironmentalgroup.com

ALBERT J. PHILLIPS, P.E.
New Jersey Professional Engineer License No. 32509

DISPOSAL BED SECTIONAL VIEW

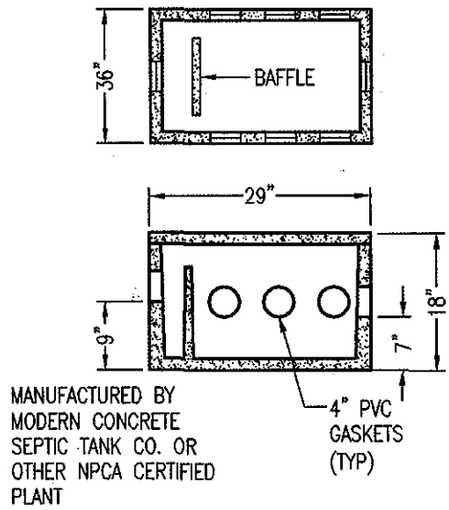
for

HARBAT FARMS

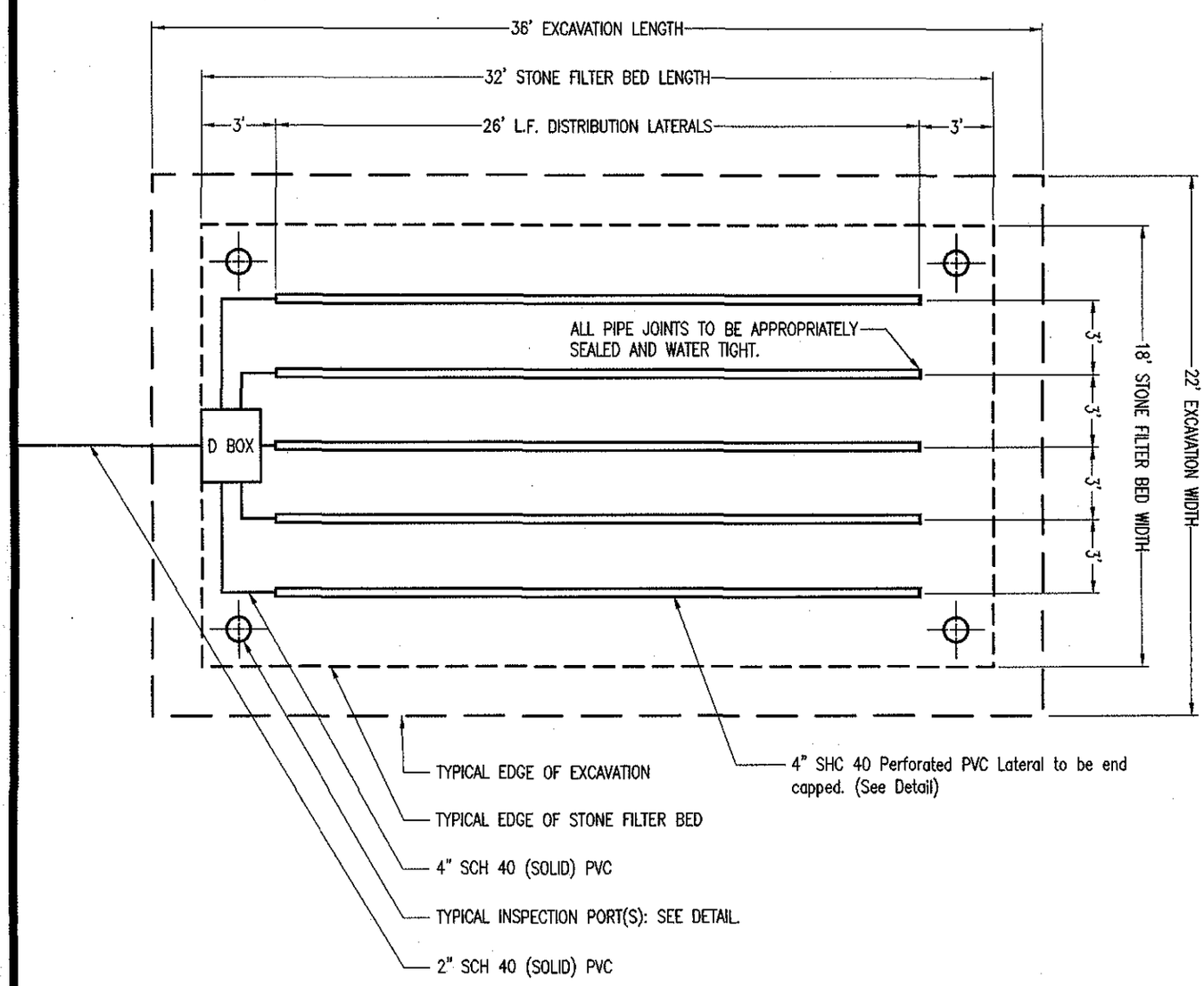
Situate in
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

Rev.	Date	Description
1	9/28/00	As per Twp. review

Project No.	253-01-02
Drawing No.	SEPTIC
Designed	AJP
Scale	AS SHOWN
Drawn	GPF
Date	08/11/00
Reviewed	AJP
BK.	3 OF 8



7 OUTLET
DISTIBUTION BOX DETAIL
NOT TO SCALE



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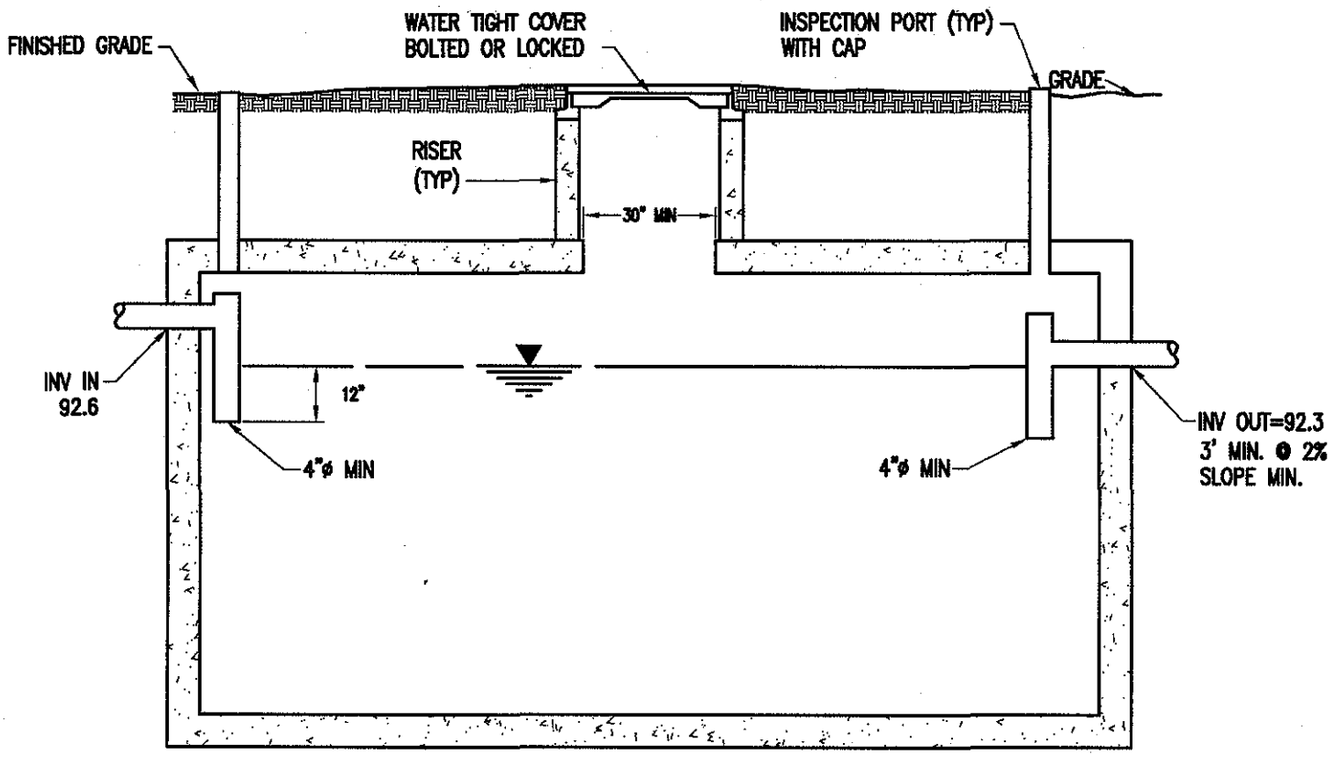
19 Brookside Avenue Tel. (609) 730-1205
Pennington, NJ 08534 Fax. (609) 730-1222
www.hillenvironmentalgroup.com

ALBERT J. PHILLIPS, P.E.
New Jersey Professional Engineer License No. 32509

DISTRIBUTION NETWORK DETAIL
for
HARBAT FARMS
Situate In
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

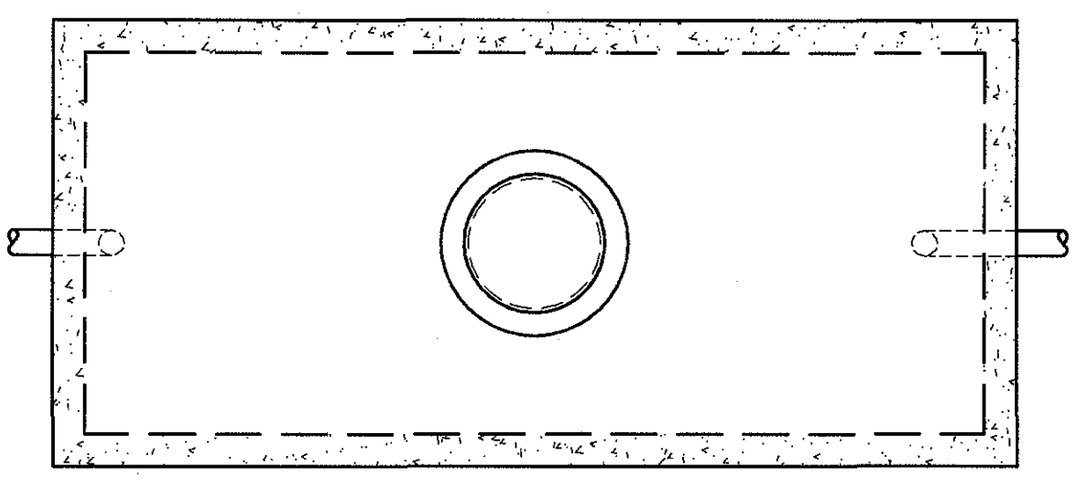
Rev	Date	Description
1	8/28/00	As per Twp. review

Project No.	253-01-02
Drawing No.	SEPTIC
Designed	AJP
Scale	AS SHOWN
Drawn	GPF
Date	08/11/00
Reviewed	AJP
Sheet	4 OF 9



ELEVATION

VOL=TOTAL LIQUID CAPACITY=1250 Gallons



PLAN

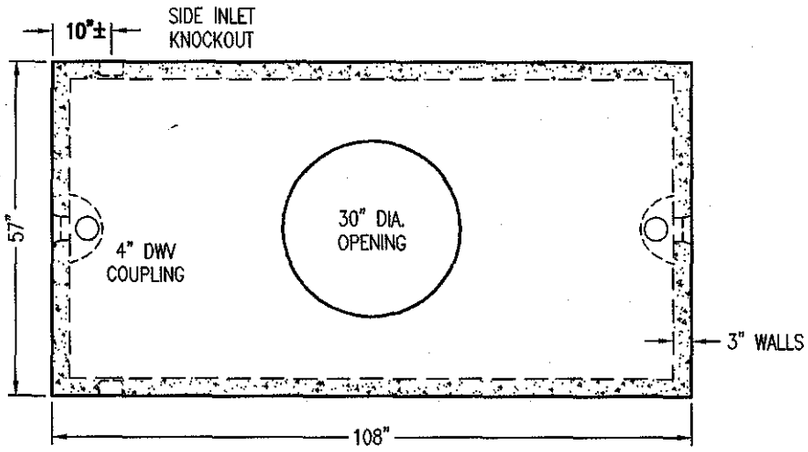
HILL ENVIRONMENTAL GROUP, INC.
19 Brookside Avenue, Pennington, NJ 08534
Tel. (609) 730-1208
Fax. (609) 730-1222
www.hillenvironmentalgroup.com

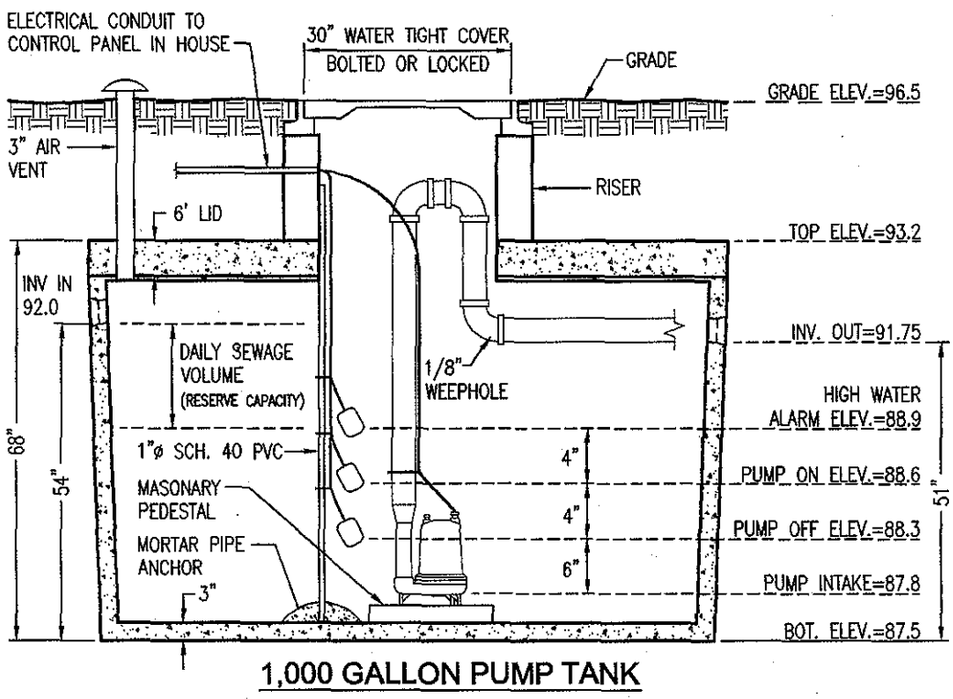
ALBERT J. PHILLIPS, P.E.
New Jersey Professional Engineer License No. 32509

1250 GALLON SEPTIC TANK
for
HARBAT FARMS
Situate In
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

Rev	Date	Description
1	8/25/00	As per Twp. review

Project No.	253-01-02
Drawing No.	SEPTIC
Designed	AJP
Scale	AS SHOWN
Drawn	GPF
Date	08/11/00
Reviewed	AJP
SHT	5 OF 9





1,000 GALLON PUMP TANK

Notes:

1. The pump-on and pump-off switches shall be set at appropriate levels to provide a dose volume as required in N.J.A.C. 7:9A-9.2(a)2. The pump-off switch shall be set six inches above the pump intake.

2. A high-water alarm switch shall be set four inches above the pump-on switch and shall activate visible and audible alarms which can be readily seen and heard by occupants within the building served. The high-water alarm switch shall meet the same requirements prescribed for pump-control switches in (1.) above. The Alarm and its switch shall not be on the same electrical circuit as the pump and its switches.

3. All electrical contacts and relays shall be located outside of the dosing tank and a gas-tight seal shall be provided where electrical conduits enter the tank.

4. All electrical service lines from the home or facility to the pump control panel shall be protected by electrical conduit.

* QUICK DISCONECT COUPLINGS TO BE PROVIDED.

* CONCRETE STRENGTH-4,000 P.S.I. @ 28 DAYS

* STEEL REINFORCEMENT-CONFORMS TO ASTM A615- A185-5

* JOINT - SEALED WITH A FLEXIBLE BUTYL SEALANT OR EQUIVALENT/MEETS AASHTO M-198B

* DESIGN-ABOVE TANKS ARE DESIGNED FOR 30% IMPACT AND 30lbs. FT2 EQUIVALENT FLUID PRESUURE; AS MANUFACTURED NY "MODERN CONCRETE SEPTIC TANK COMPANY" OR EQUIVALENT.

HILL ENVIRONMENTAL GROUP, INC.
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1,000 GALLON PUMP TANK
for
HARBAT FARMS
Situate In
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

Rev	Date	Description
1	8/28/00	As per Twp. review

Project No. 253-01-02	Drawing No. SEPTIC
Designed AJP	Scale AS SHOWN
Drawn GPF	Date 08/11/00
Reviewed AJP	S/D 8 OF 9

Goulds

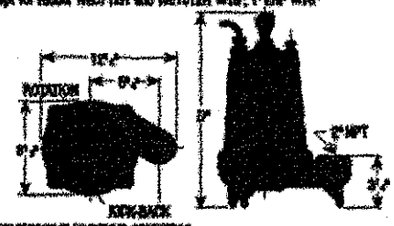
Submersible Effluent Pump

MODEL

3885

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)
D= ½, ¾, 1 and 1 HP = 15"
except for model WE0715H and WE1012H =18"; 1½ HP =19"



EFFLUENT EJECTOR SYSTEM

Effluent ejector system offers ease of ordering and installation. A single ordering number specifies a complete system designed for most residential and commercial sump and effluent pump applications.

Package includes:
Submersible Effluent Pump WE0511H, 12L or WE0711H, 12M, WE0715H, 12N
Mechanical Level Control Switch
AS-4 (115V), AS-6 (230V)
Basin AY-1822, Basin Cover AB-1822
Check Valve AB-6P
Order No. WE0511H, WE0511L, WE0711H, WE0711L, WE0715H, WE0715L, WE1012H, WE1012L.

APPLICATIONS

Specifically designed for the following uses:
- Homes
- Farms
- Trailer courts
- Motels
- Schools
- Hospitals
- Industry
- Effluent systems

SPECIFICATIONS

Pump
- Solids handling capabilities: ¾" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 128 GPM.
- Total heads: up to 123 feet TDH.
- Mechanical seal: silicon carbide-rotary seat/silicon carbide-stationary seat, 300 series stainless steel metal parts, BUNA-N elastomers.
- Temperature: 104 F (40 C) continuous 140 F (60 C) intermittent.
- Fasteners: 300 series stainless steel.
- Capable of running dry without damage to components.

Motor

Single phase:
- ⅓ HP, 115 V, 200 V, 230 V, 60 Hz, 1750 RPM; ½ HP, 115 V, 60 Hz, 3500 RPM; ½ HP – 1½ HP, 230 V, 60 Hz, 3500 RPM.
- Built-in overload with automatic reset.
- Class B insulation.

Three phase:
- ½ HP – 1½ HP 200/230/460 V, 60 Hz, 3500 RPM.
- Class B insulation.
- Overload protection must be provided in starter unit.
- Shaft: threaded, 400 series stainless steel.
- Bearings: ball bearings upper and lower.
- Power cord: 20 foot standard length (optional lengths available).

Single phase:
- ⅓ and ½ HP – 16/3 SJTO with 115 V or 230 V three prong plug.
- ¾-1½ HP – 14/3 STO with bare leads.

Three phase:
- ½-1½ HP – 14/4 STO with bare leads. On CSA listed models – 20 foot length SJTW and STW are standard.

FEATURES

■ **Impeller:** Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

■ **Casing:** Cast iron volute type for maximum efficiency. 2" NPT discharge adaptable for slide rail systems.

■ **Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE** sealing faces. Stainless steel metal parts, BUNA-N elastomers.

■ **Shaft:** Corrosion-resistant stainless steel. Threaded design. Locknut on three phase models to guard against component damage on accidental reverse rotation.

■ **Motor:** Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.

■ **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage.

■ **Bearings:** Upper and lower heavy duty ball bearing construction.

■ **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking.

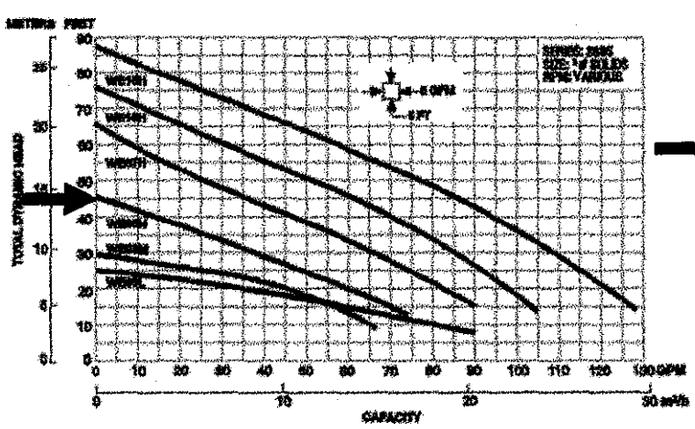
■ **O-ring:** Assures positive sealing against contaminants and oil leakage.

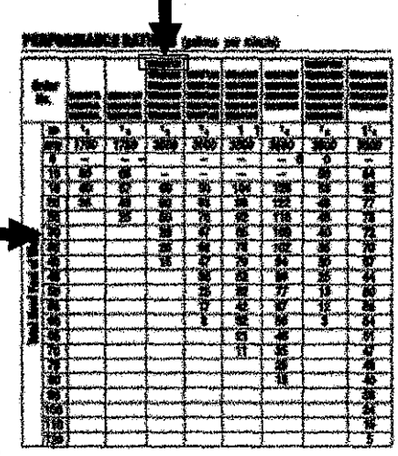
AGENCY LISTINGS

Canadian Standards Association
File #LR20848

Underwriters Laboratories
File #E82314

ETL Listed Submersible Pump
01000121-000/File #7236.00
CLASS I AND II DIV. 2 AND
CLASS II DIV. 1 AND 2
ETL TESTING LABORATORIES, INC.
CORTLAND, NEW YORK 13045





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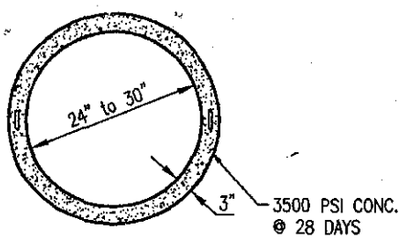
ALBERT J. PHILLIPS, P.E.
New Jersey Professional Engineer License No. 32509

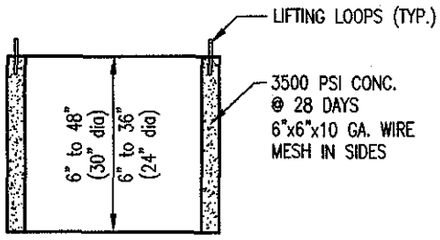
PUMP DETAILS
for
HARBAT FARMS
Situate In
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

Rev	Date	Description
1	8/23/00	As per Twp. review

Project No. 253-01-02	Drawing No. SEPTIC
Designed AJP	Scale AS SHOWN
Drawn GPF	Date 08/11/00
Reviewed AJP	S/O 7 OF 9



PLAN VIEW



SECTION VIEW

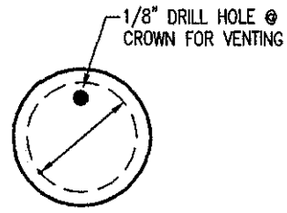
CONCRETE EXTENSION

NOT TO SCALE

FILTER FABRIC SPECIFICATIONS

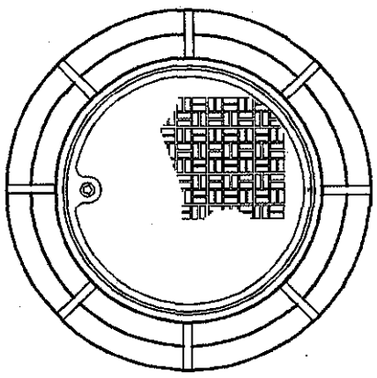
TERRATEX SD OR EQUAL
GRAB TENSILE STRENGTH . . . . . 125 LBS.
MULLEN BURST STRENGTH . . . . . 275 LBS./SQ. IN.
ELONGATION . . . . . 80 %
WATER PERMEABILITY COEFFICIENT . . . -2 CM/SEC.

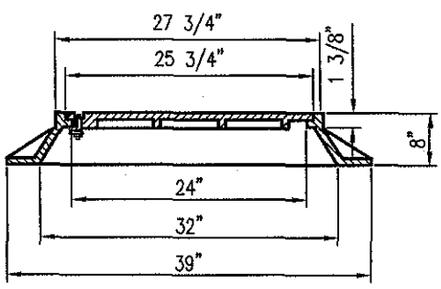
THE FABRIC IS TO BE LAPPED OVER THE TOP OF STONE A MIN. OF 6"



END CAP DETAIL

NOT TO SCALE

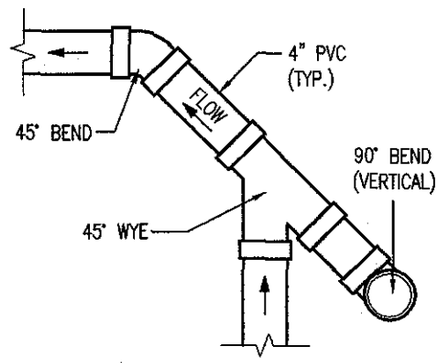




Specifications:
Specifications are from Campbell Foundry Company, Model No.1487 Heavy Duty Manhole Frame & Locking Cover or approved equal.

MANHOLE FRAME DETAIL

NOT TO SCALE



CLEANOUT DETAIL

NOT TO SCALE

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ALBERT J. PHILLIPS, P.E.
New Jersey Professional Engineer License No. 32509

GENERAL DETAILS
for
HARBAT FARMS
Situate In
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

Rev	Date	Description
1	8/28/00	As per Twp. review

Project No. 253-01-02	Drawing No. SEPTIC
Designed AJP	Scale AS SHOWN
Drawn GPF	Date 08/11/00
Reviewed AJP	S/O 8 OF 9

Disposal System Notes

1. Prior to the installation of fill material, the disposal field excavation shall be performed in accordance with N.J.A.C. 7:9a10.3(c) 1 through 5.

2. Work should be scheduled so that the bottom and sidewalls of the excavation will not be exposed to rainfall or windblown silt between time of excavation and time of final inspection and grading.

3. Any loose soil or debris which is washed into or deposited within the excavation shall be removed prior to the construction of the distribution network.

4. Any smeared or compacted soil surfaces within the disposal field excavation shall be removed to expose a fresh soil surface.

5. Excavations in soils other than sands or loamy sands shall not be continued when soil moisture content is above the lower plastic limit. This means when a small lump of soil, taken from the depth of the proposed excavation, can be rolled out with the fingers to form a wire or rod one-eight of an inch in thickness and does not crumble when handled.

6. Clayey soils encountered in the bottom of the excavation shall be removed and replaced with suitable fill.

7. The fill material installed in the zone of disposal shall have a textural analysis (composition by weight of size fraction passing through a two millimeter sieve) 70%+ med.-coarse sand, but not less than 90% total sand. The fill material shall also have a percolation rate faster than 15 minutes per inch.

8. The suitable fill material installed in the zone of treatment shall have a coarse fragment content less than 15% by volume or less than 25% by weight. It shall also have a textural analysis (composition by weight of size fraction passing the two millimeter sieve). from 70% to 90% med.-coarse sand; 0-25% fine sand; 5% to 10% silt & clay ; min. clay 2%, Fill material shall also have a percolation rate of 3 to 15 min/in. or a permeability rate of 6-20 in/hr.

9. All fill material shall be spread and compacted in layers one foot or less in thickness and compacted manually or mechanically, by tamping or rolling, by driving over the filled area in a controlled pattern using tracked or rubber tired vehicles, or by puddling.

10. Heavy excavating equipment shall not be operated directly on the exposed bottom of the excavation. If heavy excavating equipment is used to compact the fill material, the first lift shall be one foot in thickness.

11. The filter material shall consist of washed gravel or crushed stone, free of fines, dust, ashes or clay. It shall conform in size and gradation to size #24, #3 or #4 of the N.J.D.O.T. standard for coarse aggregates.

12. The filter material shall be installed into the disposal system excavation using a backhoe, front end loader or dump truck from the sides.

13. Construction of the distribution network shall be in accordance with 7:9a-10.3(d).

14. Pressure dosing networks shall be constructed of PVC Plastic (ASTM D-2662), schedule 40.

15. Filter material is to be covered with drainage fabric as the laying of distribution lines progresses. Drainage fabric shall be overlapped a minimum of 6".

16. Filter fabric shall have a grab tensile strength of 125 lbs., mullen burst strength of 275 lbs., elongation 80% & permeability coefficient of 0.2 cm/sec. Filter fabric shall be Terratex sd or equal.

17. Construction of the connecting pipe or delivery pipe shall be in accordance with 7:9a-9.3.

18. All changes of direction in the soil pipe and connecting pipe shall employ max. 45° fittings and shall include cleanouts.

19. Oil pipe and connecting pipe shall be placed on a stabilized base of quarry blend stone extending to virgin ground.

20. A sample of the filter material shall be tested prior to delivery to site. After placement, filter material shall be tested in-site and must pass the required perm rate.

21. PVC connecting pipes will meet ASTM standard D-1785-91 - schedule 40, SDR-21 or SDR-26.

22. The building sewer shall be designed and constructed in accordance with the provisions of the state uniform construction code, N.J.A.C. 5:23, adopted pursuant to the uniform construction code act, N.J.S.A. 52:27d119 et seq.

23. Septic tanks shall be precast concrete tanks constructed of concrete conforming to ACI318-16-4.5.1 and 318-16-4.5.2. Certification shall be provided by the manufacturer and the certification displayed on the tank.

24. Septic tank shall be 1000 gal. dual compartment tank.

25. All manhole covers and inspection ports in the septic tank shall have water tight bolted or locked caps set flush with finish grade covered by green fiberglass lids.

26. All interior concrete surfaces shall be sealed with two coatings of an approved inert coating to minimize corrosion. Coating shall be applied prior to delivery by the manufacturer.

27. Septic tanks shall be fabricated and installed in accordance with 7:9a-8.2.

28. A permanent marker shall be placed on grade above the septic tank upon completion of the installation.

29. Backfill and final grading shall be carried out in accordance with 7:9a-10.3(f).

30. Topsoil shall be lightly compacted by tamping or rolling to prevent settlement and shall be seeded and mulched or sodded immediately upon completion of final grading.

31. Backwash from water softeners or other drainage other than sanitary sewage shall not enter the disposal system.

32. All soil evaluation procedures relied upon as a basis for the design of the subject individual subsurface sewage disposal system were carried out by or under the direct supervision of a professional engineer and witnessed by the administrative authority.

33. Vegetative planting in the disposal area shall be limited to grass unless otherwise specified by the administrative authority.

34. An annual inspection of the system shall begin three (3) years after installation or pump out of the septic tank.

35. The disposal system contractor is responsible for confirmation that all materials utilized in the construction of the disposal system are in accordance with N.J.A.C. 7:9a.

36. When placement of the disposal field is proposed in an area of disturbed ground as defined at 7:9a - 5.10, an acceptable state of compaction of the soil or fill material shall be verified by laboratory tests, and the design engineer shall certify a minimum compaction of 90 percent of the standard procter density.

37. All regraded areas shall comply with 7:9a-10.3.

38. Storm sewers within 100 ft. of the disposal system shall be constructed with watertight joints.

39. There shall be no existing or proposed wells within 100 ft. of the proposed disposal field.

40. THIS PLAN IS FOR BUILDING PERMIT ONLY.

General Notes

1. The Health Department shall receive 48 hours notification prior to the start of any construction on the system.

2. Once the excavation of bed is complete a bottom of excavation inspection shall be performed by the Design Engineer and approved prior to the placement of the select fill.

3. After suitable fill is placed and compacted a min. of 1 permeability test shall be performed and approved by the Design Engineer, and if required the test shall be witnessed by the Health Department prior to the placement of stone.

4. The results of the select fill analysis shall be forwarded to the Health Department (see note No.8 in the Disposal System notes)

5. All manholes covers and inspection port caps in the septic tank shall have water tight bolted or locked caps.

6. All interior concrete surfaces shall be sealed with 2 coatings of an approved inert coating to minimize corrosion, coating shall be applied prior to delivery by the manufacturer.

7. This plan is for building permit only.

8. No existing/proposed wells or disposal systems within 100 ft. of the proposed disposal field and well.

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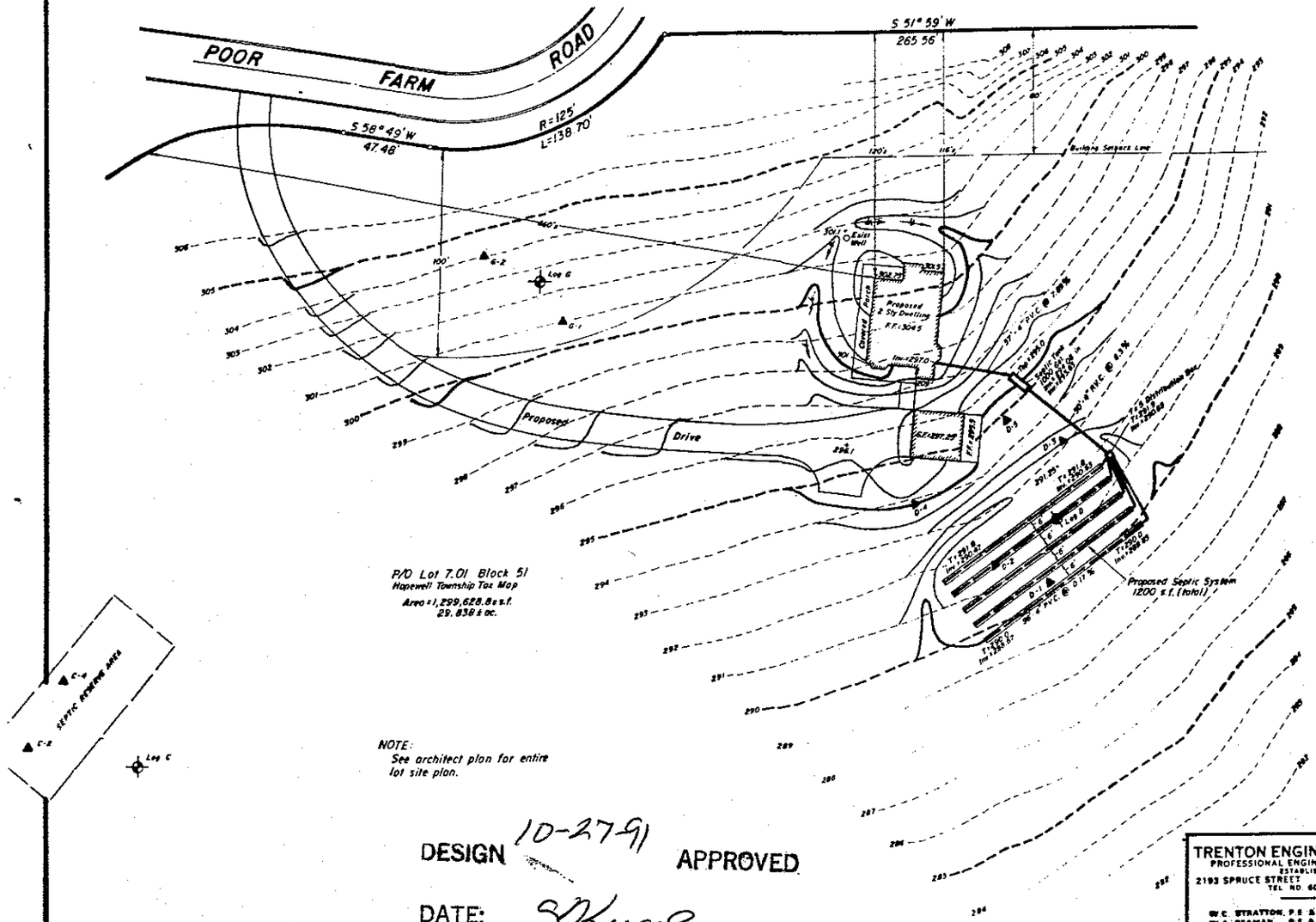
New Jersey Professional Engineer License No. 32509

GENERAL DETAILS
for
HARBAT FARMS
Situate In
Lot 28 Block 49
Hopewell Township, Mercer County, New Jersey

Rev.	Date	Description
1	6/28/00	As per Twp. review

Project No. 253-01-02	Drawing No. SEPTIC
Designed AJP	Scale AS SHOWN
Drawn GPF	Date 08/11/00
Reviewed AJP	Sht 9 OF 9



NOTE:
See architect plan for entire lot site plan.

DESIGN 10-27-91 APPROVED

DATE: S Kusel

HOPEWELL TOWNSHIP HEALTH DEPT.

RECEIVED
OCT 4 1991
Hopewell Township Health Dept.

TRENTON ENGINEERING CO., INC.
PROFESSIONAL ENGINEERS AND SURVEYORS
ESTABLISHED 1907
2193 SPRUCE STREET TRENTON, N.J. 08638
TEL. NO. 609-882-0816

W.C. STRATTON, P.E. & L.S. N.J. 9179 PA. 17343E
W.A. SEAMAN, P.E. & L.S. N.J. 20403
W.M. DITMARS, L.S. N.J. 27792 PA. 20645E
D.F. STRATTON, L.S. N.J. 27927

WALTER A. SEAMAN
P.E. & L.S. N.J. 20403

DATE 7/12/91

SEPTIC DESIGN AND GRADING PLAN

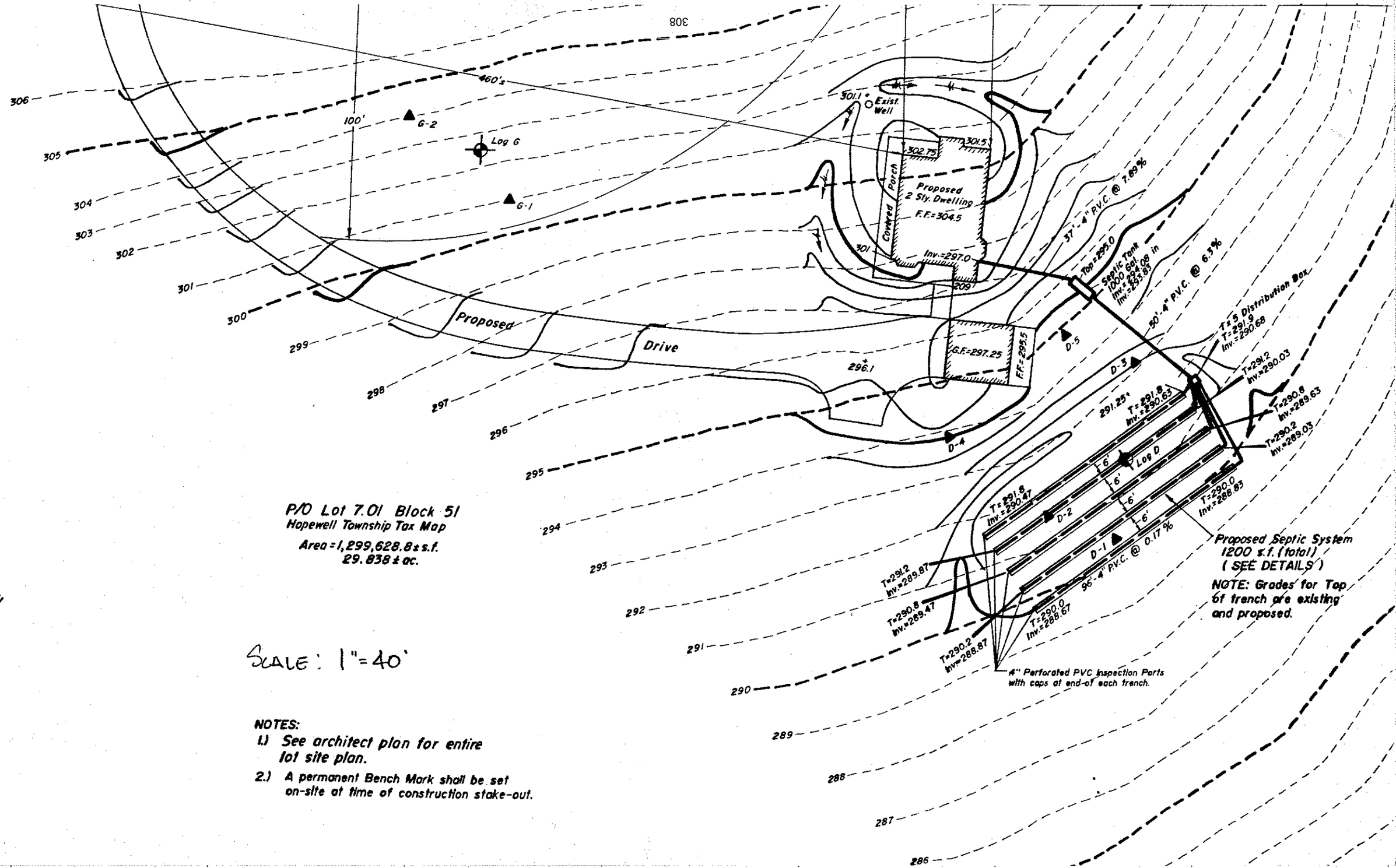
for

Frank J. Hollendonner, Jr.

in

HOPEWELL TOWNSHIP
MERCER COUNTY, N.J.

REV.	10-2-91
DATE	9-12-91
INV.	37612
DRAWN BY	A.G.
SCALE	1"=40'
FB.	PG.
FILE	92-105



P/O Lot 7.01 Block 51
Hopewell Township Tax Map

Area = 1,299,628.8 ± s.f.
29.838 ± ac.

SCALE: 1" = 40'

NOTES:

1.) See architect plan for entire lot site plan.

2.) A permanent Bench Mark shall be set on-site at time of construction stake-out.

og C

LOT 7.01

DESIGN DATA

Soil Log D - 121" DEEP - NO WATER (1.19.88)

PERC TESTS D-1 - 78" DEEP - 20 min./in - (2.29.88)

D-2 - 54" DEEP - 9 min/in - (2.29.88)

D-3 - 76" DEEP - DISCONTINUED - (2.29.88)

D-4 - 48" DEEP - DISCONTINUED (2.29.88)

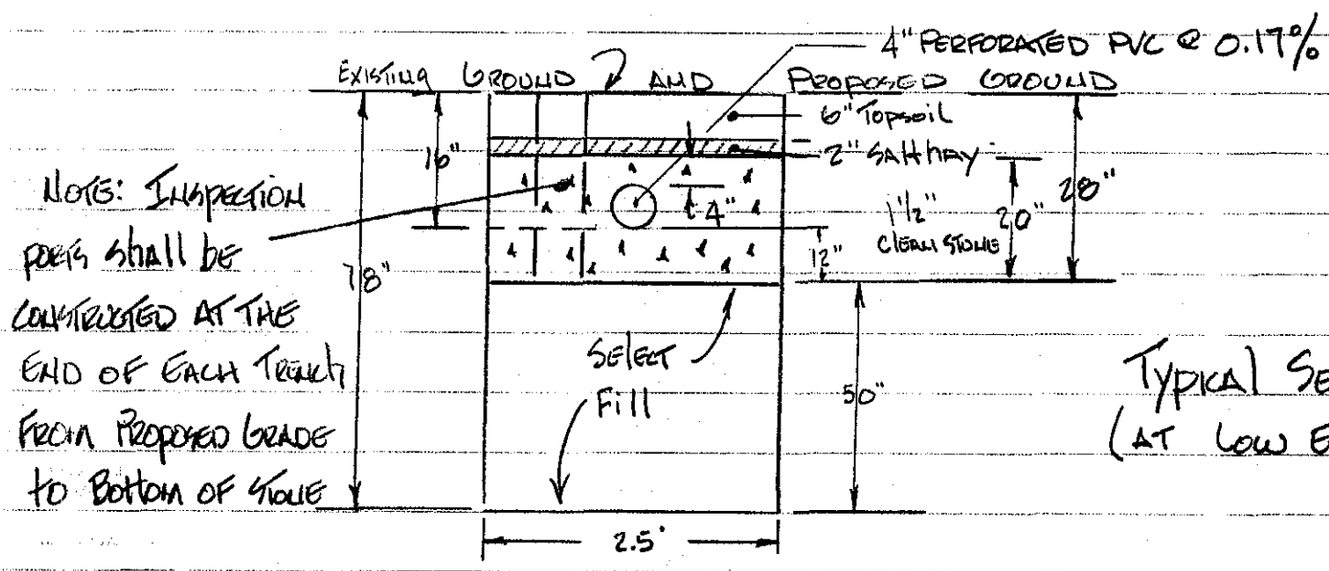
D-5 - 50" DEEP - DISCONTINUED (2.29.88)

Vol./BEDROOM = 200 gal - 1st + 150 gal x 3 = 450 gal.
(4 BEDROOM DWLG) TOTAL daily Vol. REQUIRED = 650 gal/day

SYSTEM AREA - USE 16 to 30 PERC. RATE = 0.59 x 650 gal/day
(TRENCH) = 383.5 L.F. X 125% (OVERDESIGN) = 479.4
USE 480 L.F.

SEPTIC TANK - 250 gal/B.R x 4 = 1,000 gal REQUIRED

TRENCH - 96' x 2.5' x 5' = 1,200 SF OR 480.0 L.F.



TYPICAL SECTION
(AT LOW END)

309

LOT 7.01

Fill Material Requirements

1) Coarse fragment content less than 15 percent by volume or less than 25 percent by weight.

2) Textural analysis (composition by weight, of size fraction passing the two millimeter sieve): From 85 to 95 percent sand, from 5 to 15 percent silt plus clay, minimum 2 percent clay

3) Permeability from 2 to 20 inches per hour, or percolation rate from 3 to 30 min. per inch.

Septic Tank Requirements

1.) Single Family Dwelling: Tank shall have the minimum capacity of 250 gal. per Bedroom. Expansion attics shall b considered Additional bedrooms. In no case shall the capacity be less than 1000 gal.

2.) Septic Tanks shall be designed and constructed in accordance with: 7:9A-8.2, Standards for Individual Subsurface Sewage Disposal Systems

LOT 7.01

Distribution Box Requirements

1) A Distribution Box is required for all gravity flow systems where effluent shall be distributed between two or more distribution laterals

2) Construction requirements shall be in accordance with 7:9A-9.4, Standards for Individual Subsurface Sewage Disposal Systems.

Laterals: Gravity Distribution Requirements

1.) Gravity flow networks an gravity dosing networks may consist of a single distribution lateral, two or more laterals connected by means of elbows or tees, or two or more separate distribution laterals connected independently to a distribution box.

2) Laterals shall meet the requirements of section 7:9A-9.5, Standards for Individual Subsurface Sewage Disposal Systems

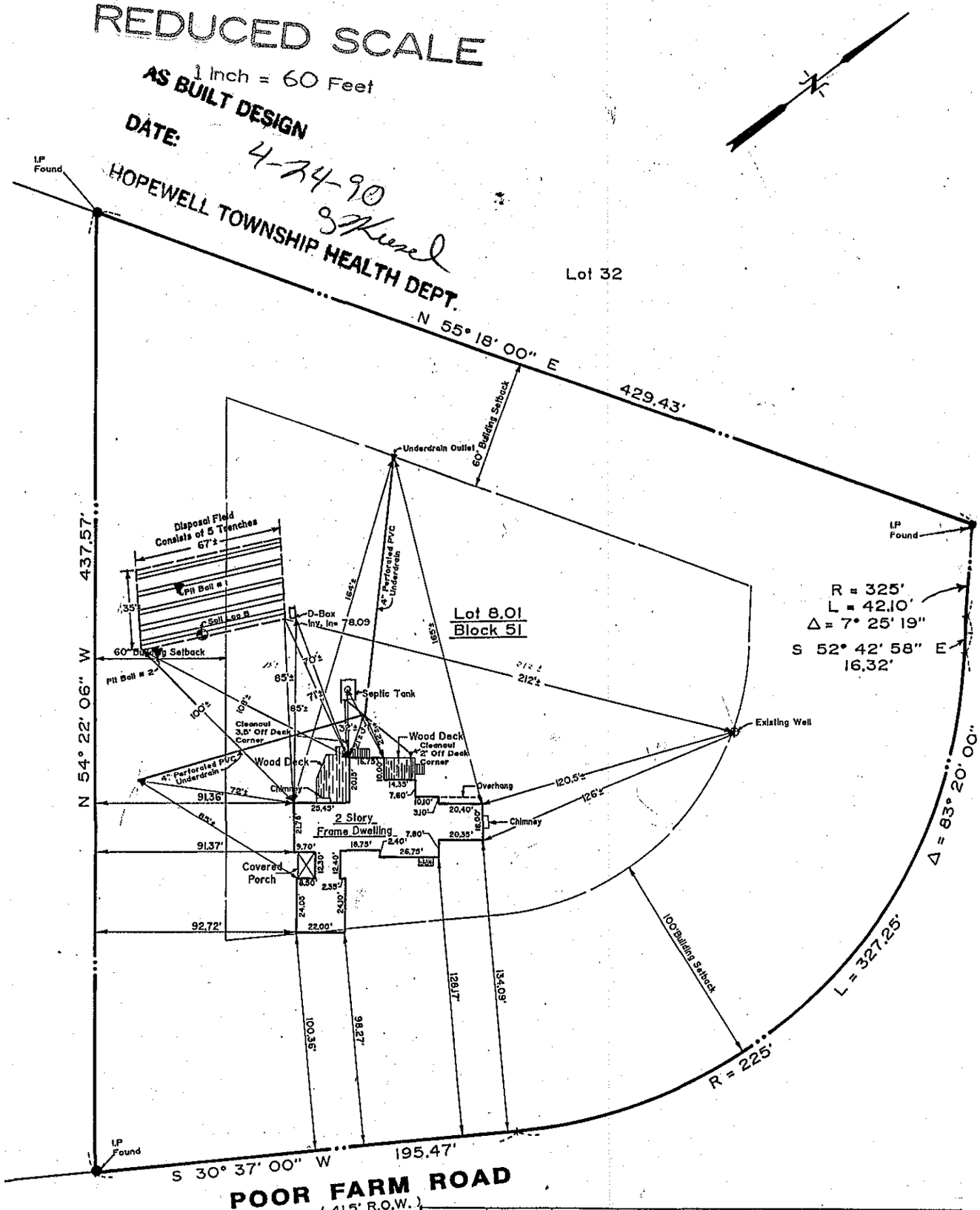
REDUCED SCALE

1 Inch = 60 Feet

AS BUILT DESIGN

DATE: 4-24-90

HOPEWELL TOWNSHIP HEALTH DEPT.



Rev. No.	Date	Initial	Chk'd. By	Description of Revision
1	04/12/90	G.P.F.		Added Underdrain & Cleanouts

REFERENCES :

Township of Hopewell Tax Map

Survey Entitled "Plan of Survey for Anthony T. Chianese" Prepared by Walter A. Seaman P.E. & L.S. N.J. 20403 Dated 02/26/88

Hopewell Valley Engineering Associates, Inc.

Engineers, Planners, and Land Surveyors

Suites 17-18, Pennytown Village
Route 31, P.O. Box 710
Pennington, N.J 08534
(609)-466-0800

As Built Septic Location
for
Anthony T. Chianese & Barbara Chianese
of
Lot 8.01 in Block 51
Hopewell Township , Mercer County , New Jersey

Albert J. Phillips 3-20-90 Date Signed
Albert J. Phillips N.J.P.E. 32509

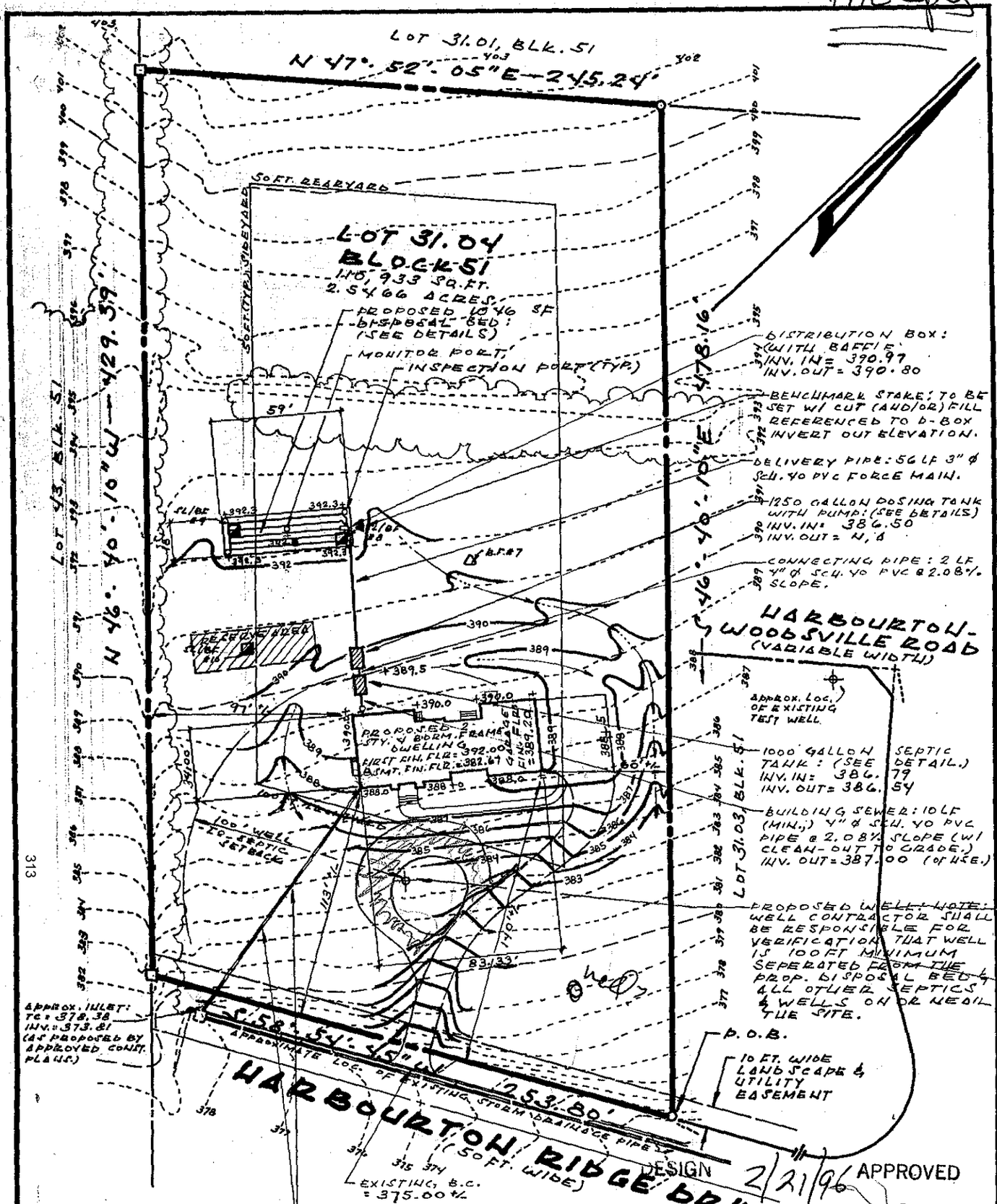
Albert J. Phillips
N.J.P.E. 32509
Penna.P.E. 037037-R
N.J.P.P. 03734

James D. McEwen 3/20/90 Date Signed
James D. McEwen N.J.L.S. 31659

James D. McEwen
N.J.L.S. 31659
Penna L.S. 038572-R
N.J.P.P. 03655

Drawn:	Checked:	Job No:	Date:	Scale:	Sheet:
G.P.F.		110651IA	03/12/90	1" = 40'	1 of 1

File Copy



DESIGN 2/21/96 APPROVED

DATE:

HOPEWELL TOWNSHIP HEALTH DEPT

- NOTE: THIS PLAN IS FOR BUILDING PERMIT ONLY.
- NOTE: NO GARBAGE DISPOSAL/GRINDER OF ANY TYPE SHALL BE CONNECTED TO THIS SYSTEM.
- NOTE: THE MAXIMUM ALLOWED DRIVEWAY GRADES ARE: 5% FROM PAVEMENT EDGE TO 20 FT. INSIDE PROPERTY LINE, AND 10% THEREAFTER

FRANK J. FALCONE
PROFESSIONAL LAND SURVEYOR #32112 & PROF. PLANNER # 3760

SHEET	BLOCK	LOT
9	51	31.04

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

PLOT PLAN & DISPOSAL SYSTEM DESIGN
OF LOT 31.04, BLOCK 51, FOR:
MARK & RUTH IORIO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
FRANK J. FALCONE	P.L.S.	NO.	32112

1/9/96
FRANK J. FALCONE: PLS # 32112 & PP # 3760 — DATE

DRAWN	DATE
J.M.	1/9/96
CHECK DF/GB	SCALE 1" = 60'
REV.	

D. GEOFFREY BROWN:
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327

1-9-96
D. GEOFFREY BROWN: PE & LS # 24327

313

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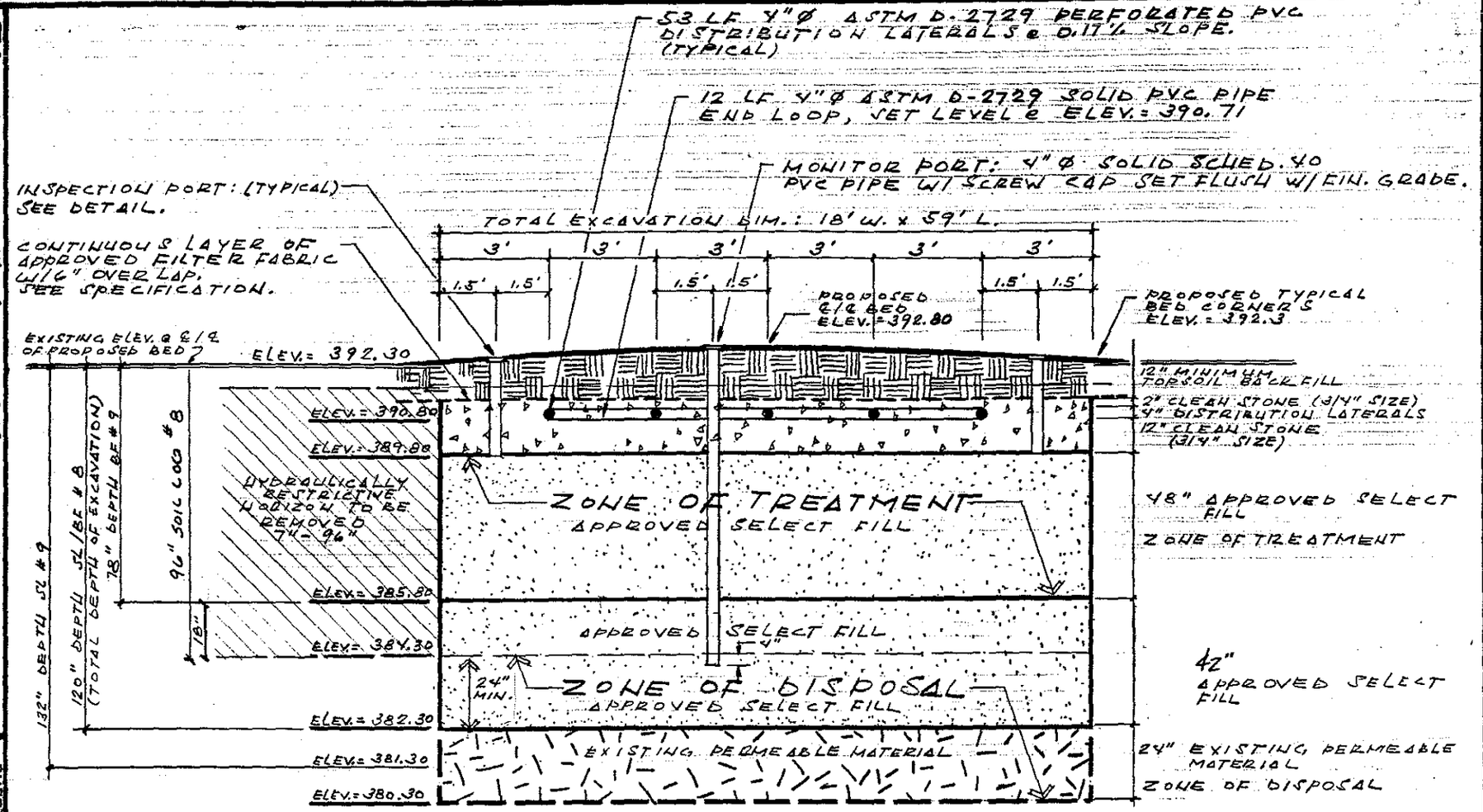
1



SOIL REPLACEMENT - BOTTOM LINED DISPOSAL BED:
SCALE: 1" = 4'

- NOTE: The HOPEWELL TOWNSHIP Health Dept. requires a Soil Permeability Class Rating Test on the Stockpiled Select Fill. The contractor shall notify the design engineer 24 hrs. in advance of the said stockpiling in order to obtain samples of the fill for testing.
- The select fill shall not be emplaced until a passing soil analysis has been obtained.
- The distribution network shall not be constructed until a passing percolation test has been performed on the emplaced select fill, to insure proper compaction. The contractor shall notify the design engineer 24 hrs. in advance in order to perform said test.

PROPOSED 4 BDRM. DWLG.: 650 GPD "Q"
ASSUME IN PLACE SELECT FILL @ 3-15 MPI
1.61 SF/GPD x 650 GPD = 1046.5 SF REQ'D. (USE 1047)
1047 ÷ 18' (PROP. BED WIDTH) = 58.17' (REQ. LENGTH) (USE 59')

EXCAVATE DISPOSAL BED: 18' WIDE x 59' LONG (= 1062 SF)

FRANK J. FALCONE
PROF. LAND SURVEYOR #32112 & PROF. PLANNER #3760

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

BRYCE M. RITTENHOUSE P.E. & P.L.S. NO. 13453
ARNOLD RYDEN, JR. P.L.S. NO. 21223
D. GEOFFREY BROWN P.E. NO. 24327
WESLEY J. LANE P.L.S. NO. 30747
FRANK J. FALCONE P.L.S. NO. 32112

FRANK J. FALCONE: PLS # 32112 & PP # 3760 — 1/9/96 DATE

DRAWN	CHECK	REV.
J.M.	BJF 1/96	

DATE	SCALE
1/9/96	1" = 4'

DISPOSAL BED SECTION
VIEW DETAIL
OF LOT 31.04, BLOCK 51, FOR:
MARK & RUTH IORIO
SITUATED IN: HOPEWELL TWP., MERCER CO., NEW JERSEY.

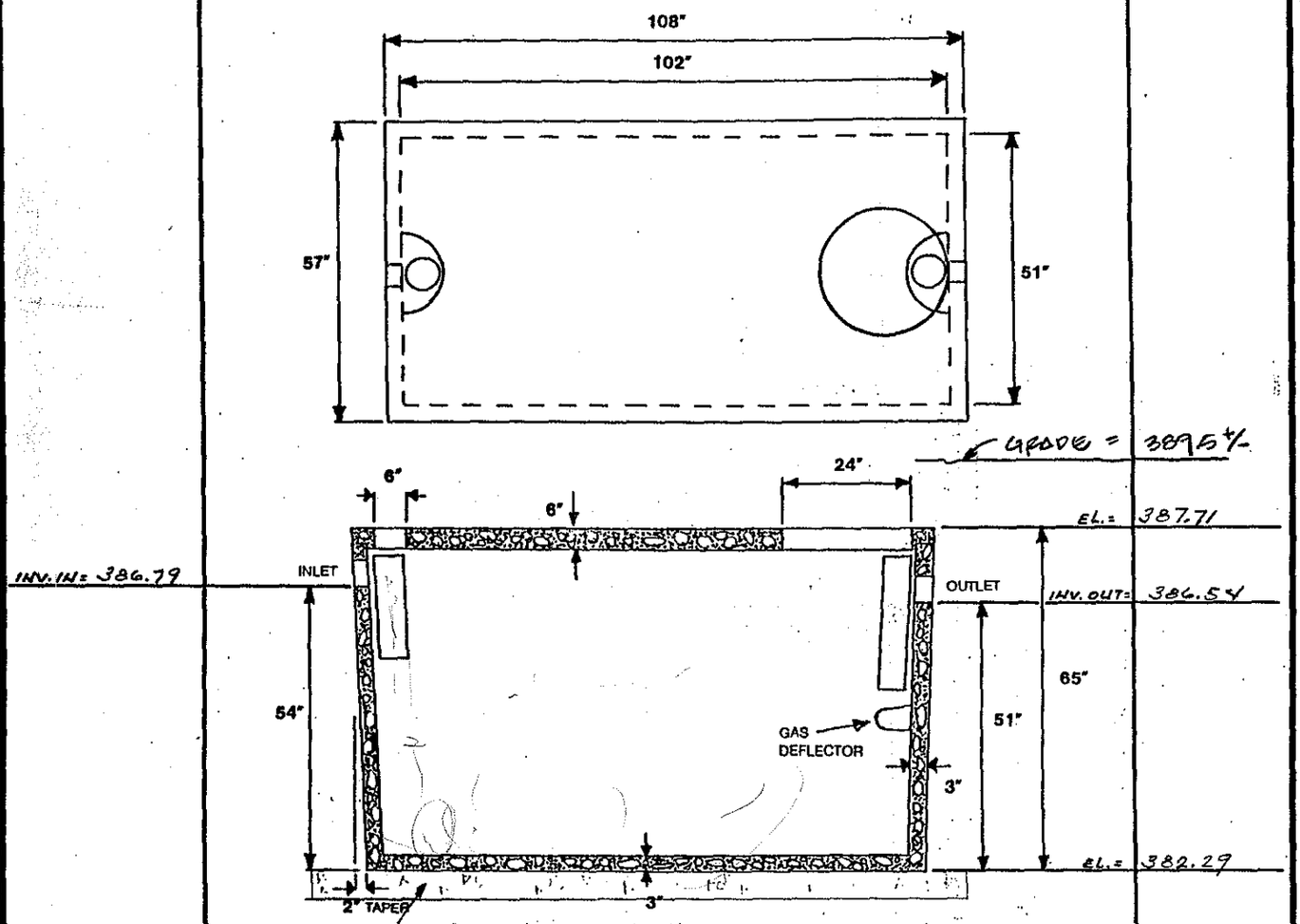
D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR #24327

D. GEOFFREY BROWN: PE & LS # 24327 — 1-9-96 DATE

SHEET	BLOCK	LOT
9	51	31.04

2

NEW JERSEY 1000 GALLON MONOLITHIC SEPTIC TANK



SPECIFICATIONS

- **Minimum Concrete Strength** — 3,500 P.S.I. @ approx. 28 Days
- **Steel Reinforcement** — #4 Rebar in lid, #3 in sides 6" x 6" x 10" — gauge wire mesh in bottom
- **Joint** — Sealed with a synthetic resin sealant or equivalent
- **Design** — Septic Tank shall be as manufactured by MODERN CONCRETE SEPTIC TANK COMPANY

• NOTE: THE SEPTIC TANK SHALL BE PLACED ON A FIRM & STABLE FOUNDATION OF 3/4" SIZE CLEAN STONE, 6" THICK.

FRANK J. FALCONE
NEW JERSEY LICENSED LAND SURVEYOR #32112

SHEET	BLOCK	LOT
9	51	31.04

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

1000 GALLON SEPTIC TANK DETAIL
FOR LOT 31.04, BLOCK 51, FOR;
MARK & RUTH IORIO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO. 13453
ARNOLD RYDEN, JR.	P.L.S.	NO. 21223
D. GEOFFREY BROWN	P.E.	NO. 24327
WESLEY J. LANE	P.L.S.	NO. 30747
FRANK J. FALCONE	P.L.S.	NO. 32112

1/9/96
FRANK J. FALCONE: N.J.L.L.S. #32112 DATE

DRAWN	DATE
J.M.	1/9/96
CHECK	
BJG/GB	
REV.	SCALE NONE

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327

1/9/96
D. GEOFFREY BROWN: P.E. & L.S. #24327

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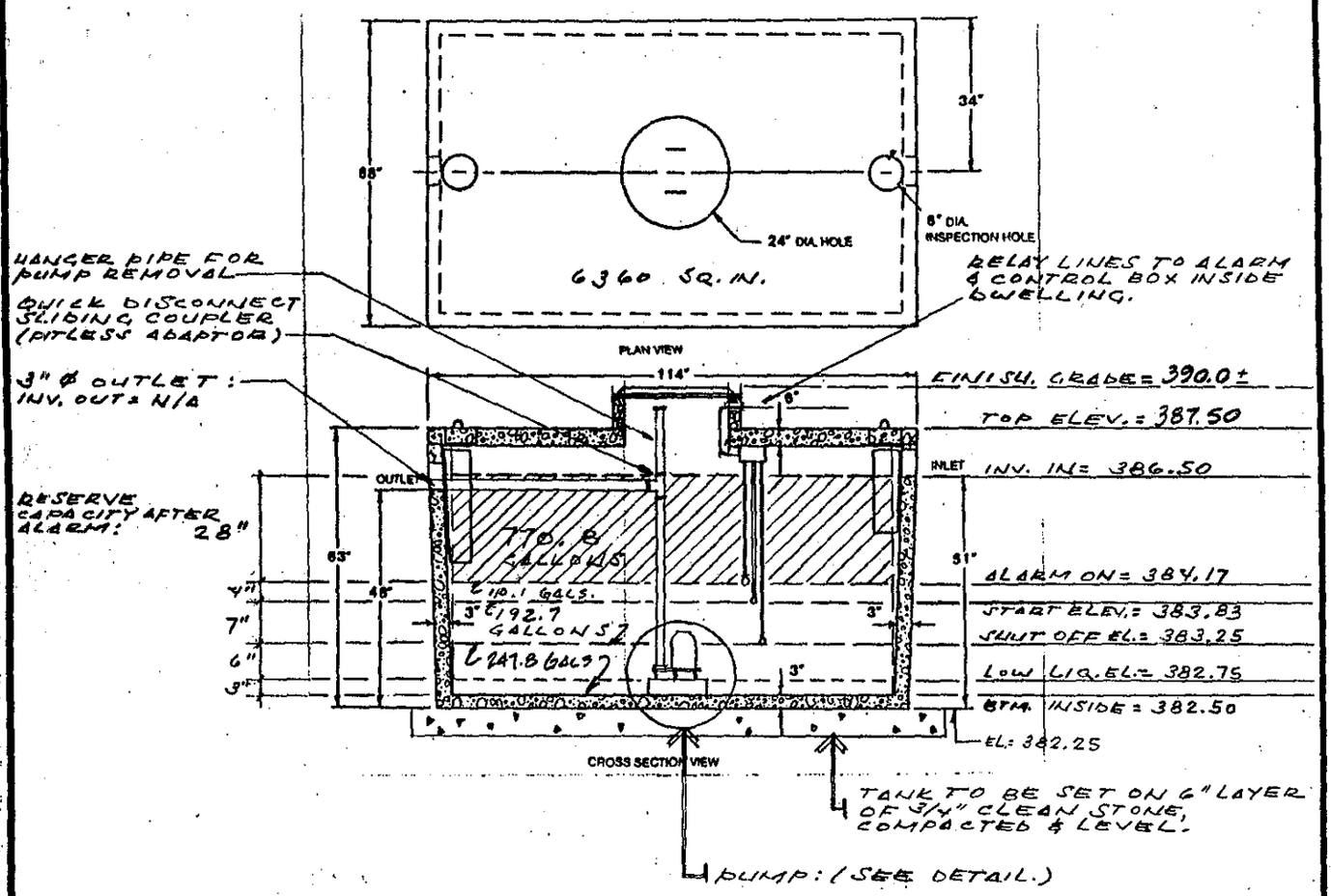
1250 GALLON SEPTIC TANK



THE PROPOSED DOSING TANK USING A PUMP HAS SUFFICIENT CAPACITY TO DISTRIBUTE EFFLUENT EQUALLY TO ALL PARTS OF DISPOSAL FIELD DURING EACH DOSE CYCLE.

THE PROPOSED DOSING TANK PROVIDES ADEQUATE RESERVE AREA IN THE EVENT OF A PUMP MALFUNCTION.

THE PROPOSED DOSING TANK PROVIDES A TOTAL LIQUID CAPACITY TO ACCOMODATE THE MINIMUM DOSE VOLUME AND Vep & Vpd.

THE PROPOSED, SPECIFIED PUMP OR AN APPROVED EQUAL SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLAN. IF THE CONTRACTOR SELECTS A PUMP THAT IS DIFFERENT THAN THE APPROVED SHOWN IN THE APPROVED DESIGN, THE PUMP MODEL AND ITS SPECIFICATIONS SHALL BE GIVEN TO THE DESIGN ENGINEER FOR APPROVAL PRIOR TO ITS INSTALLATION.

THE PUMP SHALL BE SET ON A PEDESTAL AND THE INTAKE SHALL BE SET A MINIMUM OF 3 INCHES ABOVE THE BOTTOM OF THE DOSING TANK.

THE PUMP ON AND OFF SETTINGS SHALL PROVIDE THE MINIMUM DOSE VOLUME.

THE HIGH WATER ALARM SHALL BE INSTALLED 4 INCHES ABOVE THE "PUMP ON" INVERT AND SHALL ACTIVE BOTH A VISIBLE AND AUDIBLE ALARM.

THE PUMP AND THE ALARM SHALL UTILIZE SEPARATE ELECTRICAL CIRCUITS.

THE DOSING TANK SHALL BE CONSTRUCTED OF THE SAME MATERIAL AS THOSE ALLOWED FOR SEPTIC TANK CONSTRUCTION.

THE DOSING TANK SHALL BE BACKFILLED UTILIZING THE SAME REQUIREMENTS FOR BACKFILLING THE SEPTIC TANK.

ALL ELECTRICAL LINES FROM THE BUILDING TO THE PUMP CONTROL PANEL SHALL BE PROTECTED BY A CONDUIT.

A GAS TIGHT SEAL SHALL BE PROVIDED WHERE ELECTRICAL CONDUITS ENTER THE DOSING TANK.

WHEN THE DELIVERY PIPE IS SUBJECT TO FROST PENETRATION, THE DELIVERY PIPE WILL DRAIN BACK TO THE DOSING TANK AFTER EACH DOSE CYCLE.

WHEN THE LOW WATER LEVEL IN THE DOSING TANK IS LOWER THAN THE INVERT OF THE DISTRIBUTION NETWORK, THE DELIVERY PIPE SHALL SLOPE BACK TO THE DOSING TANK.

THERE IS NO CHECK VALVE AT THE PUMP AND THE DELIVERY PIPE DRAINS BACK TO THE DOSING TANK.

A 1/8" WEEP HOLE IS PROVIDED AT THE INVERT OF THE PUMP DISCHARGE PIPE, ABOVE THE HIGH WATER LEVEL IN THE DOSING TANK.

A 1/8" WEEP HOLE SHALL BE PROVIDED IN THE DELIVERY PIPE AT THE HIGHEST POINT IN THE DOSING TANK WHERE THE LOW WATER LEVEL IS HIGHER THAN THE DISTRIBUTION BOX OR DISTRIBUTION LATERAL.

- DOSE VOLUME: 162.50 GALLONS
- ON/OFF VOLUME: 192.70 GALLONS
- DISTANCE BETWEEN ON SWITCH & OFF SWITCH: 7"
- REQ'D. RESERVE VOLUME: 650 GALLONS
- RESERVE VOLUME PROVIDED: 770 GALLONS
- NOTE: NO SUBSTITUTION OF THE SPECIFIED TANK, IT'S ELEVATIONS, SWITCH SETTINGS, OR PROPOSED LOCATION SHALL BE MADE WITHOUT THE NOTIFICATION, REVIEW, AND APPROVAL OF THE DESIGN ENGINEER.

SPECIFICATIONS

- Concrete Minimum Strength — 3,500 P.S.I. @ 28 Days
- Steel Reinforcement — #4 Rebar in lid, #3 Rebar in sides — 6 x 6 x 10 gauge wire mesh in bottom
- Joint — Sealed with a synthetic resin sealant or equivalent
- Design — Septic Tank shall be as manufactured by MODERN CONCRETE SEPTIC TANK COMPANY

FRANK J. FALCONE
N.J. LIC. LAND SURVEYOR #32112 & PROF. PLANNER #3760

SHEET	BLOCK	LOT
9	51	31.04

PRINCETON JCT. ENGINEERING CO.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 223 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

DOSING TANK DETAIL (1250 GALLON)
FOR LOT 31.04, BLOCK 51, FOR:
MARK & RUTH IORIO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

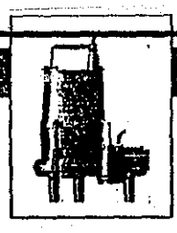
BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
FRANK J. FALCONE	P.L.S.	NO.	32112

FRANK J. FALCONE: NJLLS #32112 — 1/9/96 DATE

DRAWN: J.M. | DATE: 1/9/96 | CHECK: FJF/98 | SCALE: NONE | REV.

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR #24327

1-9-96
D. GEOFFREY BROWN: PE&LS #24327



ENGINEERING DETAILS - SPD50H

Pump Characteristics

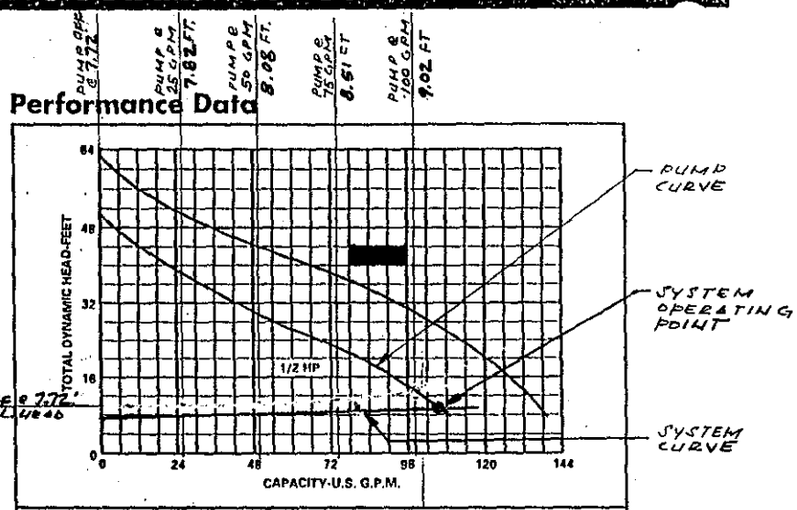
Pump/Motor Unit	Submersible				
Manual Model (50)	MH1	MH2	MH6	MH4	MH5
Automatic Models	AH1	AH2	–	–	–
Horsepower	1/2				
Full Load Amps	15.0	7.5	4.0	1.8	1.5
Motor Type	Capacitor Start		Three-Phase		
R.P.M.	3450				
Phase Ø	1		3		
Voltage	115	230	200	460	575
[redacted]					
Hertz	60				
Operation	Intermittent				
Temperature	140°F Ambient				
NEMA Design	B				
Insulation	Class B				
Discharge Size	2" NPT (3" opt.)				
Solids Handling	3/4"				
Unit Weight	73 lbs.				

Power Cord: SPD50H 14/3, STW-A, 1ø, 115V = 10' std. (20' opt.)–14/4, STW-A, 1ø, 115V = 10' std. (20' opt.)–16/3, STW-A, 1ø, 230V = 20' std.–16/4, STW-A, 1ø, 230V = 20' std. SPD100H 16/3, STW-A, 1ø, 230V = 20' std.–16/4, STW-A, 1ø, 230V = 20' std.–18/3, STW-A, 3ø, 200V, 230V, 460V or 575V = 20' std.

Materials of Construction

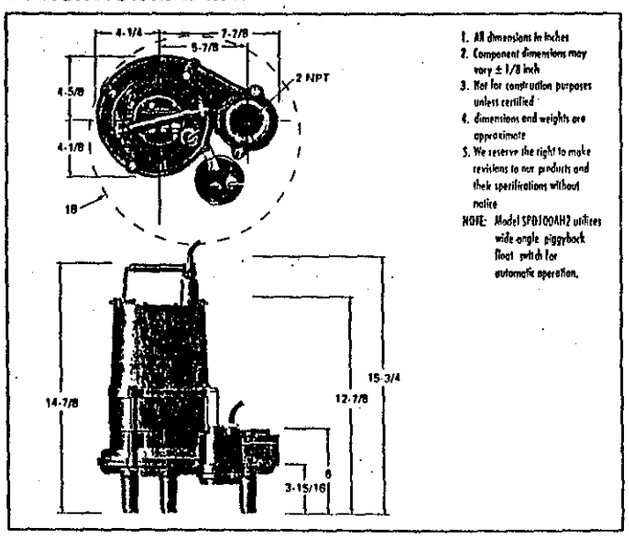
Handle	Steel
Lubricating Oil	Dielectric Oil
Motor Housing	Cast Iron
Seal Housing	Cast Iron
Pump Casing	Cast Iron
Shaft	Stainless Steel
Mechanical Shaft Seal	Seal Faces: Carbon/Ceramic Seal Body: Brass Spring: Stainless Steel Bellows: Buna-N
Impeller	Cast Iron
Upper Bearing	Single Row Ball Bearing
Lower Bearing	Single Row Ball Bearing
Base	Cast Iron
Fasteners	Stainless Steel

Performance Data



Total Head (feet)		10	20	30	40	50	60
GPM	1/2 HP	105	77	50	23	0	–
	[redacted]						

Dimensional Data



1. All dimensions in inches
2. Component dimensions may vary ± 1/8 inch
3. Not for construction purposes unless certified
4. dimensions and weights are approximate
5. We reserve the right to make revisions to our products and their specifications without notice

NOTE: Model SPD100AH2 utilizes wide-angle piggyback float switch for automatic operation.

AURORA/HYDROMATIC Pumps, Inc.
1840 Baney Road, Ashland, Ohio 44805
(419) 289-3042

25M 1-90-KCC PRINTED IN USA

FRANK J. FALCONE
PROF. LAND SURVEYOR # 32112 & PROF. PLANNER # 3760

SHEET	BLOCK	LOT
9	51	31.04

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX 610 NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

PUMP DETAIL
FOR LOT 31.04, BLOCK 51, FOR:
MARK & RUTH IORIO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
FRANK J. FALCONE	P.L.S.	NO.	32112

1/9/96
FRANK J. FALCONE: PLS # 32112 PP # 3760 DATE

DRAWN J.M. DATE 1/9/96
CHECK RJF/DGB
SCALE NONE
REV.

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327
1/9/96
D. GEOFFREY BROWN: PE & LS # 24327

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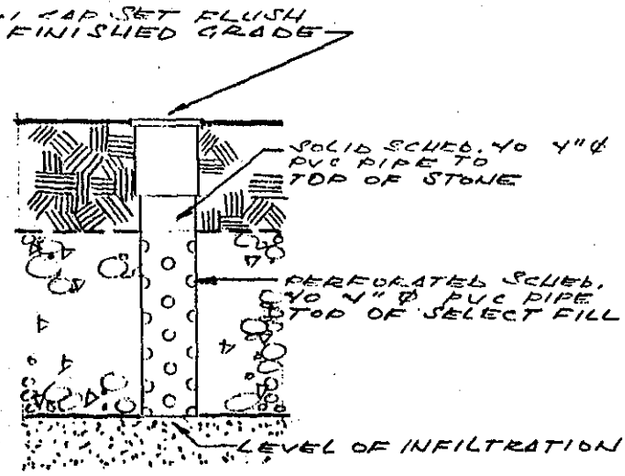
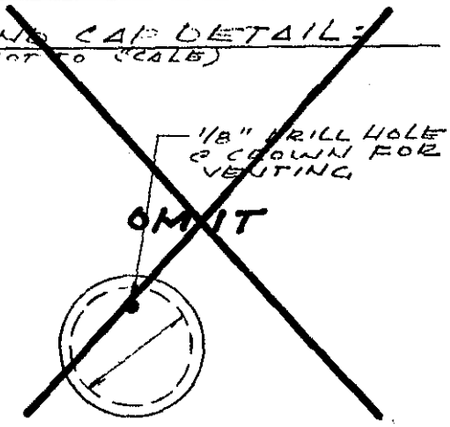
INSPECTION PORT DETAIL:
(NOT TO SCALE)



END CAP DETAIL:
(NOT TO SCALE)



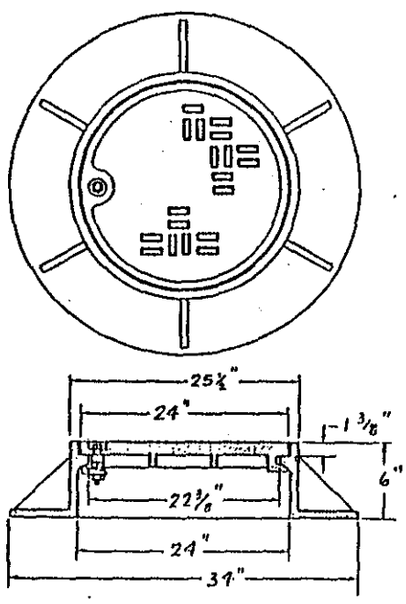
FILTER FABRIC SPECIFICATIONS

TERRATEX SD OR EQUAL

GRAB TENSILE STRENGTH	125 LBS.
MULLEN BURST STRENGTH	275 LBS./SQ.IN.
ELONGATION	80%
WATER PERMEABILITY COEFFICIENT	~2 CM/SEC.

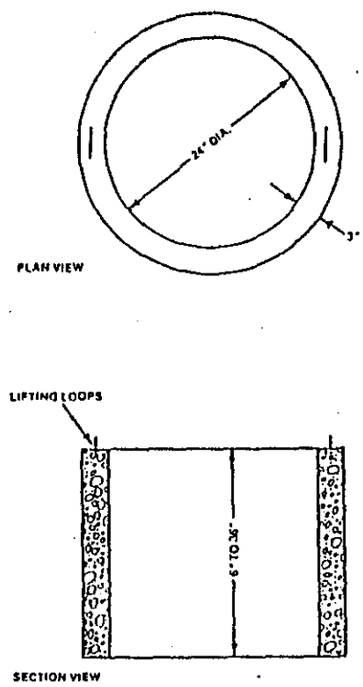
THE FABRIC IS TO BE LAPPED OVER THE TOP OF STONE A MIN: OF 6"

STANDARD TYPE FRAME
CAMPBELL No. 1452C



MANHOLE DETAIL

N.T.S.



SPECIFICATIONS

- Concrete Minimum Strength — 3,500 P.S.I. @ 28 Days
- Steel Reinforcement — 6" x 6" x 10 ga. wire mesh in sides

CONCRETE EXTENSION DETAIL

N.T.S.

FRANK J. FALCONE P.R. # 3760
NEW JERSEY LICENSED LAND SURVEYOR # 32112

SHEET	BLOCK	LOT
9	51	31.04

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

GENERAL DISPOSAL SYSTEM DETAILS
FOR LOT 31.04, BLOCK 51, FOR:
MARK & RUTH IORIO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
FRANK J. FALCONE	P.L.S.	NO.	32112

1/9/96
FRANK J. FALCONE: N.J.L.L.S. # 32112 DATE

DRAWN	DATE
J.M.	11/9/96
CHECK FJF/93	SCALE NONE
REV.	

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327

1-9-96
D. GEOFFREY BROWN: P.E. & L.S. # 24327

B
6

DISPOSAL SYSTEM CONSTRUCTION NOTES

- Prior to the installation of fill material, the disposal field excavation shall be performed in accordance with N.J.A.C. 7:9A10.3(c) 2 through 5.
- The filter material (crushed stone) shall consist of washed gravel or crushed stone, free of fines, dust, ashes or clay. It shall conform in size and gradation to size #24, #3 or #4 of the N.J.D.O.T. standard for course aggregates.

The suitable fill material installed in the zone of treatment shall have a coarse fragment content less than 15% by volume or less than 25% by weight. It shall also have a textural analysis (composition by weight of size fraction passing the two millimeter sieve) from 80% to 90% med.-coarse sand; 10-20% fine sand; silt & clay; max. silt & clay 3%; min. clay 2% fill material shall also have a percolation rate of 3 to 15 min/in. or permeability from 4 to 20 inches per hour.

- The fill material installed in the zone of treatment shall have a permeability rate of 2 to 20 in/hr or a percolation rate of 3 to 30 min/in.
- The fill material installed in the zone of disposal shall have a textural analysis (composition by weight of size fraction passing through a two millimeter sieve) 85% or more sand.
- The filter material shall be installed into the disposal system excavation using a Backhoe, Front End Loader or Dump Truck from the sides.
- All changes in direction of the delivery pipe shall utilize a maximum 45° fitting.
- End caps shall be installed on the end of all laterals in in the disposal field or a looped end network shall be installed. (see design)
- There are no existing or proposed wells within 100 feet of the proposed disposal system.
- Soils testing has been performed by KEN E. BAHL: PE #30111 and witnessed by JOE BARTZAK of the HOPEWELL TWP. Health Department.
- The disposal field shall be excavated to a depth of 120" from existing grade and replace with an approved specified fill material.
- All fill installed in the disposal system shall be placed in maximum 12" lifts and compacted to 85% to 95% modified proctor density.
- Backfill around the septic tank shall be installed in maximum 8" layers.
- Connecting and delivery pipes are to be installed on a firm foundation satisfactory to the Administrative Authority.
- If necessary to walk on the disposal field bottom, a suitable board shall be laid over the soil.
- Smeared or compacted soil surfaces produced on bottom or sidewall of the excavation shall be removed to expose a fresh soil surface which is rough and uneven.
- Work should be scheduled so that the bottom and sidewalls of the excavation will not be exposed to rainfall or windblown silt between time of excavation and time of final inspection and backfilling.
- Any loose soil or debris which is washed into or deposited within the excavation shall be removed prior to the construction of the distribution network.
- Perforations shall evenly spaced along rows running the length of the pipe, on each side, midway between the invert and the center-line which separates the upper and lower halves of the pipe. Perforations shall be no smaller than three eight inch and no longer than three quarter inch in diameter.
- A minimum of nine inches and no more than 18 inches of backfill shall be placed over the top of the disposal field filter material.
- Backfill material shall be of earth similar to that found at the site and free of large stones, tree stumps, broken masonry or other waste construction material.
- In no case shall the backfill material be more permeable than the surrounding material.
- Compaction will be accomplished manually or mechanically by tamping, rolling or driving over fill material in a controlled pattern.
- Heavy equipment will not be driven directly on exposed area of the excavation. A minimum of one foot of fill below must be maintained at all times.
- Construction of the disposal field and distribution network are as prescribed for conventional installations, 7:9A-10.3(d).
- Pipe joints are to be water-tight and protected against damage by roots.
- Connecting pipes shall be installed with a minimum grade of ¼" per foot unless otherwise authorized by the Administrative Authority.
- The distribution box is to be installed level.
- Topsoil shall be lightly compacted by tamping or rolling to prevent settlement and shall be seeded and mulched or sodded immediately upon completion of final grading.
- The fill material to be installed in the zone of treatment and in the zone of disposal shall be stockpiled at the disposal system site and the design engineer shall be notified of the fill material delivery. The design engineer shall then derive samples to be analyzed by a laboratory for compliance with specifications of the approved disposal system design. The design engineer shall then notify the contractor as to the results of the laboratory analysis. No filter material shall be installed without the authorization of the design engineer.
- The design engineer is to be notified 48 hours prior to the initial construction of the disposal system.
- The design engineer shall be notified prior to the commencement of the following construction:

  1. Excavation of the disposal field.
  2. Placement of the filter material.
  3. Installation of distribution network.
  4. Final grading.

- The design engineer shall perform soils testing in the zone of treatment to insure proper compaction prior to installation of the crushed stone and piping network.
- All trees within 10 feet of the disposal system shall be removed.

SEPTIC TANK NOTES

- The disposal system contractor shall obtain a septic tank certification from the manufacturer for conformance with N.J.A.C. 7:9A-8.1. "Septic Tanks" et seq.".
- The septic tank, pump tank and distributon boxes shall be placed on a minimum of 6" of 3/4" clean stone.
- All manhole covers and inspection port caps in the septic pump tank shall have water tight, bolted or locked covers.
- All interior concrete surfaces shall be sealed with 2 coatings of an "approved inert coating" to minimize corrosion. Coating of precast tanks shall be applied by the manufacturer prior to delivery.
- Inside tank dimension length shall be at least twice the inside tank dimension width.
- The disposal system contractor is responsible for confirmation that all materials utilized in the construction of the disposal system are in accordance with the N.J.A.C. 7:9A et seq.
- Filter material is to be covered with drainage fabric, untreated building paper or 4" to 8" of salt hay or straw.
- Drainage fabric or untreated paper shall be overlayed a minimum of 6".
- Drainage fabric is specified in the engineering design to have requsite qualities.
- Backwash from water softeners or other drainage other than sanitary sewage shall not enter the disposal system.
- The building sewer shall be designed and constructed in accordance with the provisions of the State Uniform Construction Code, N.J.A.C. 5:23, adopted pursuant to the Uniform Construction Code Act, N.J.S.A. 52:27D-119 et seq.
- Concrete used in the construction of septic tanks shall conform to the American Concrete Institute (ACI) standards for frost resistance (ACI 318-16-4.5.2). In case of built-in-place tanks, certification that these standards have been met shall be sign, sealed and attached to the approved engineering design. In the case of precast tanks, certification shall be provided by the manufacturer and the certification shall be displayed on the tank.
- Adequate measures shall be used to insure bottom of disposal bed or each individual trench is level.
- In soil textures other than sands or loamy sands, excavation which exposes the infiltrative surface of the disposal field is not carried out when the soil moisture content is above the lower plastic limit.
- The excavation will be carried out in a manner that will avoid unnecessary compaction of the disposal field. Heavy equiptment (bulldozers/front end loaders) will not be drive over the exposed infiltrative surface of the disposal field. Excavation should be carried out with a backhoe operating from between the disposal trenches or outside the perimeter of previously excavated portions of the disposal bed.

FRANK J. FALCONE P.P. # 3760
NEW JERSEY LICENSED LAND SURVEYOR # 32112

SHEET	BLOCK	LOT
9	51	31.04

PRINCETON JCT. ENGINEERING P.C.
PROFESSIONAL ENGINEERS & LAND SURVEYORS
P.O. BOX NORTH POST RD.
PRINCETON JUNCTION, NEW JERSEY 08550
(609) 799 1906 (609) 799 1963

GENERAL DISPOSAL SYSTEM NOTES
FOR LOT 31.04, BLOCK 51, FOR:
MARK & RUTH IORIO
SITUATED IN:
HOPEWELL TWP., MERCER CO., NEW JERSEY.

BRYCE M. RITTENHOUSE	P.E. & P.L.S.	NO.	13453
ARNOLD RYDEN, JR.	P.L.S.	NO.	21223
D. GEOFFREY BROWN	P.E.	NO.	24327
WESLEY J. LANE	P.L.S.	NO.	30747
FRANK J. FALCONE	P.L.S.	NO.	32112

1/9/96
FRANK J. FALCONE: N.J.L.L.S. #32112 DATE

DRAWN	DATE
J.M.	1/9/96
CHECK	
DJF/GB	
REV.	SCALE NONE

D. GEOFFREY BROWN
PROFESSIONAL ENGINEER & LAND SURVEYOR # 24327

1/9/96
D. GEOFFREY BROWN: P.E. & L.S. # 24327

8
7

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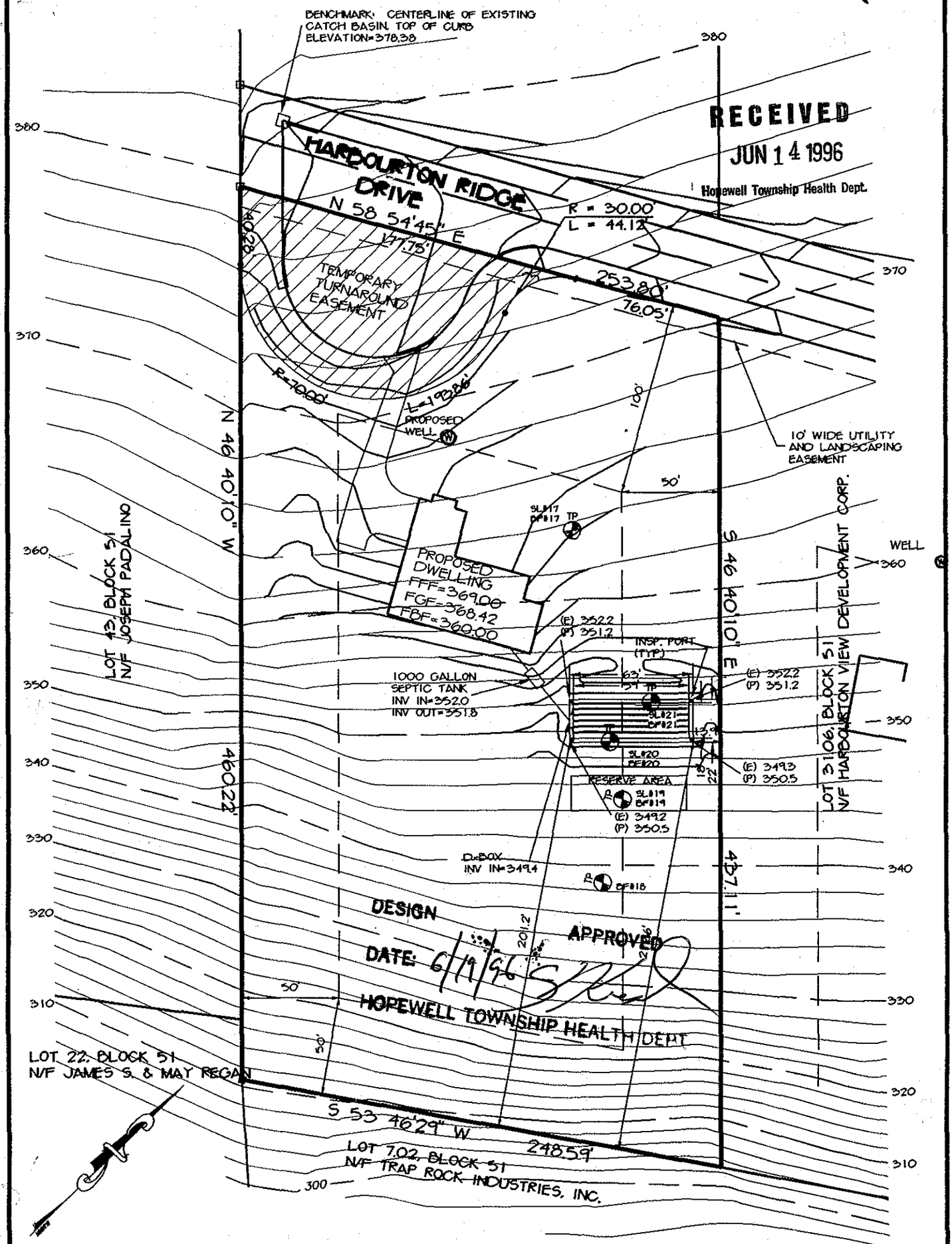

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JUN 14 1996
Hopewell Township Health Dept.

DATE	REV. NO.	DESCRIPTION	CHECKED BY:	DRAWN BY:
6/12/96	1	REVISED HOUSE LOCATION	KEB	TPU

I CERTIFY THAT THE SEASONAL HIGH WATER TABLE IS AT A DEPTH OF 7 (SEVEN) FEET BELOW EXISTING GRADE AS PER EXCAVATED SOIL LOGS.

K. E. Baill

KENNETH E. BAILL P.E. 30111, P.P. 04122
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL PLANNER

GOLDENBAUM BAILL ASSOCIATES, INC.
ENGINEERING - LAND SURVEYING - PLANNING
119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
TELEPHONE: (609) 397-1505 FAX: (609) 397-1739

SEWAGE DISPOSAL PLAN

PREPARED FOR

LOT 31.05, BLOCK 51

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: GD	CHECKED BY: KEB	SCALE: 1"=60'	DATE: 5/23/96	PROJ. NO: 95-241	1/4

FILE: H:\95-241\PLAN3

NOTES:

1.) MINIMUM SLOPE OF PIPE SHALL BE 1/4" PER FOOT FOR FIELD PIPE.

2.) DISPOSAL SYSTEM SHALL CONSIST OF (5) (4") DIA. PVC PERFORATED PIPES IN 18' X 59' SOIL REPLACEMENT FILL ENCLOSED DISPOSAL BED (22' X 63' EXCAVATION).

3.) ELEVATIONS ARE BASED ON U.S.C. & G. SURVEY MONUMENT #1667 LOCATED ON STATE HIGHWAY #31, EL=282.09.

4.) THERE ARE NO POTABLE WATERWELLS WITHIN 100' OF PROPOSED DISPOSAL AREA.

5.) THIS SEPTIC SYSTEM DESIGN IS BASED ON 4 BEDROOM

6.) ALL TREES SHALL BE REMOVED WITHIN 10' OF THE SYSTEM.

7.) A CLEANOUT SHALL BE INSTALLED EVERY 50' FOR GRAVITY FLOW FIELD PIPE.

8.) THIS DESIGN IS BASED ON THE ASSUMED PERMEABILITY RATE OF SELECT FILL (6-20 INCHES/HOUR).

9.) FILL MATERIAL SHALL BE TESTED BY A SOILS TESTING LABORATORY AND CERTIFIED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION.

10.) A TUBE PERMEAMETER TEST SHALL BE CONDUCTED USING SAMPLES OF FILL MATERIAL WHICH HAVE BEEN COMPACTED TO A BULK DENSITY EQUIVALENT TO THAT ACHIEVED IN THE CONSTRUCTION OF THE DISPOSAL FIELD. THE PERMEABILITY CLASS RATING METHOD SHALL ALSO BE REQUIRED TO DETERMINE WHETHER THE FILL MATERIAL USED MEETS THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

11.) THE SELECT FILL USED IN THE ZONE OF TREATMENT SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)4.

12.) THE SELECT FILL USED IN THE ZONE OF DISPOSAL SHALL MEET THE REQUIREMENTS OF N.J.A.C. 7:9A-10.1(F)5.

13.) FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS, ONE FOOT OR LESS IN THICKNESS.

14.) COMPACTION MAY BE ACCOMPLISHED MANUALLY OR MECHANICALLY BY TAMPING OR ROLLING, OR BY DRIVING OVER THE FIELD IN A CONTROLLED PATTERN USING TRACKED OR RUBBER TIRED VEHICLES.

15.) 3/4" - 2 1/2" CLEAN CRUSHED STONE MUST CONFORM WITH NJDOT STANDARD SIZES FOR COURSE AGGREGATE (SIZE #24, #3, OR #4).

16.) ALL FIELD PIPE EXCLUDING DISPOSAL FIELD SHALL BE SCHEDULE 40 PVC.

17.) ALL LATERALS MUST BE CAPPED AND HAVE NO MORE THAN A 2" SLOPE PER 100 FEET.

18.) THE D-BOX MUST BE INSTALLED AS PER N.J.A.C. 7:9A-9.4 2.11 & 9.4 5.1, .11, .111.

19.) AN INSPECTION PORT SHALL BE INSTALLED IN EACH CORNER OF THE DISPOSAL BED EXTENDING FROM THE LEVEL OF INFILTRATION TO FINISHED GRADE. THE PORT SHALL CONSIST OF SCH 40 PERFORATED PVC PIPES WITH A REMOVABLE CAP.

20.) WHEN HEAVY EXCAVATING EQUIPMENT IS OPERATED WITHIN THE EXCAVATION FOR THE PURPOSE OF PLACEMENT OF COMPACTION OF THE FILL MATERIAL, THIS EQUIPMENT SHALL NOT BE DRIVEN DIRECTLY ON THE EXPOSED BOTTOM OF THE EXCAVATION. A MINIMUM OF ONE FOOT FILL MATERIAL SHALL BE MAINTAINED BELOW THE VEHICLE TRACKS OR WHEELS AT ALL TIMES.

21.) A MINIMUM OF NINE INCHES AND NO MORE THAN EIGHTEEN INCHES OF BACKFILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.

22.) BACKFILL MATERIAL SHALL BE OF EARTH SIMILAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONRY, OR OTHER CONSTRUCTION MATERIAL.

23.) IN NO CASE SHALL THE BACKFILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.

24.) BACKFILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL BED OR EACH OF THE DISPOSAL TRENCHES AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.

25.) HEAVY MACHINERY, RUBBER-TIRE VEHICLES OR OTHER VEHICLES EXERTING A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH SHALL NOT BE PERMITTED TO PASS OVER THE DISPOSAL FIELD AFTER THE FILTER MATERIAL AND DISTRIBUTION NETWORK HAVE BEEN INSTALLED.

26.) TRACKED EQUIPMENT MAY BE USED FOR THE PURPOSE OF BACKFILLING AND FINAL GRADING PROVIDED THAT THIS EQUIPMENT DOES NOT EXERT A PRESSURE ON THE UNDERLYING SOIL IN EXCESS OF EIGHT POUNDS PER SQUARE INCH.

27.) FINAL GRADING SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING DESIGN AND IN SUCH A MANNER THAT SURFACE WATER WILL NOT COLLECT OVER THE DISPOSAL FIELD.

28.) AFTER COMPLETION OF BACKFILLING AND FINAL GRADING, THE BACKFILLED AREA OVER THE DISPOSAL FIELD SHALL BE SEEDED OR SODDED TO ESTABLISH A VEGETATIVE COVER OR OTHERWISE STABILIZED AGAINST EROSION IN A MANNER ACCEPTABLE TO THE ADMINISTRATIVE AUTHORITY.

THE ENGINEERS LIABILITY FOR THIS DESIGN TERMINATES AT ACCEPTANCE OR CERTIFICATION BY THE ADMINISTRATIVE AUTHORITY UNLESS THE ENGINEER IS RETAINED TO INSPECT THE INSTALLATION OF THE SYSTEM.

Ken E. Baill

KENNETH E. BAILL P.E. 30111, P.P. 04122
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL PLANNER

GOLDENBAUM BAILL ASSOCIATES, INC.
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119 DOUGLAS STREET LAMBERTVILLE, N. J. 08530
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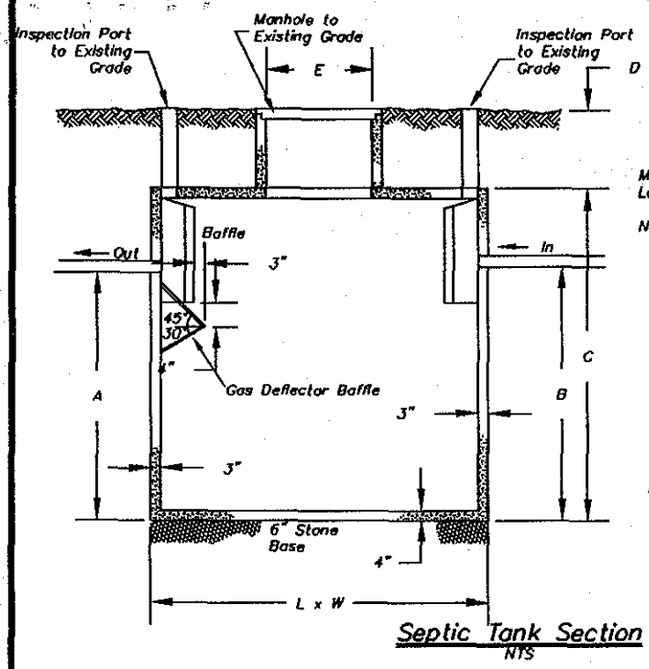
SEWAGE DISPOSAL PLAN
PREPARED FOR
LOT 31.05, BLOCK 51
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: JEH	CHECKED BY: KEB	SCALE: NONE	DATE: 5/23/96	PROJ. NO: 95-241	2/4
FILE: H:\95-241\NOTES					

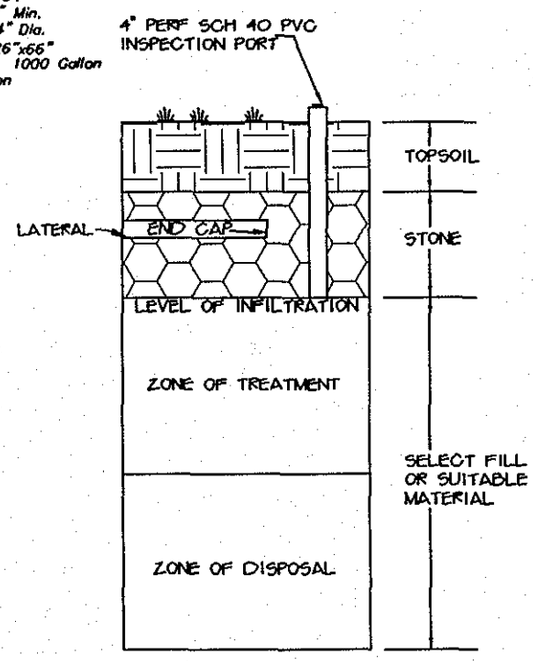


Septic Tank Section
NTS

Manhole Cover Must be Locked or Bolted

NOTE:
Septic Tank Shall Meet All Requirements of Section 7:9A-8.2 of the Standards for Individual Subsurface Sewage Disposal Systems, Operative Date: 1/1/90

Dimensions	
A	40"
B	42"
C	54"
D	9" Min.
E	24" Dia.
L x W	126"x66"
Capacity	1000 Gallon
Manufacturer	Flemington



INSPECTION PORT DETAIL

NOT TO SCALE

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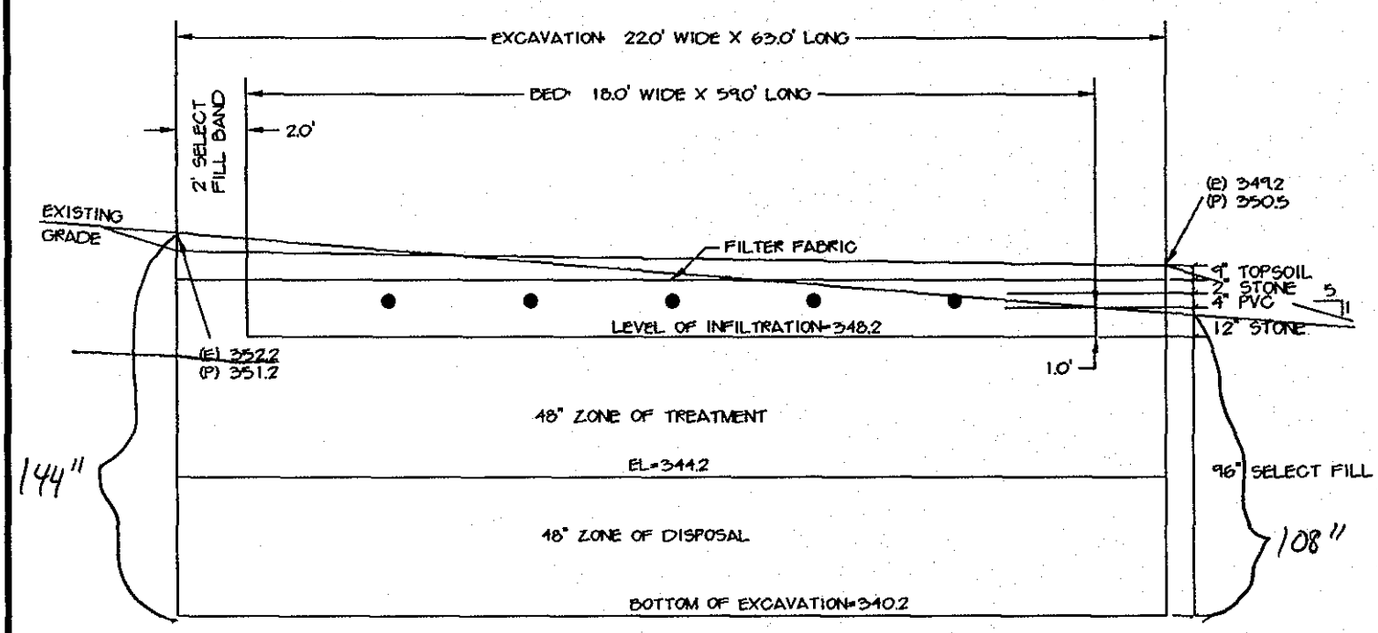

DISPOSAL BED X-SECTION

NOT TO SCALE

13 of 23

GOLDENBAUM BAILL ASSOCIATES, INC.
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NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEWAGE DISPOSAL PLAN

PREPARED FOR

LOT 31.05, BLOCK 51

HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: JEH	CHECKED BY: KEB	SCALE: 3=NONE	DATE: 5/23/96	PROJ. NO: 95-241	3/4
FILE: H\95-241\DETAIL					

Soil Log #19 Excavated 8/1/90, Wit'd by Joe Bartzak

0" – 10" 10 YR 3/3 dark brown, friable, silt loam, weak w/heavy root system, distinct boundary
10" – 37" 5 YR 3/4 dark reddish brown, firm, silty clay loam, moderate, gradual boundary
37" – 60" 5 YR 3/4 dark reddish brown, firm, silty clay loam w/30% cobble sized sandstone, gradual boundary
60" – 108" 10 YR 5/8 yellowish brown, friable, silt, moderate, 10 YR 8/1 white and 10 YR 8/8 yellow, many, coarse, prominent mottles (between 78" & 90" only), distinct boundary
108" – 132" 10 YR 3/4 dark reddish brown, cobble sized sandstone w/35% silt loam as filler, no seepage

Basin Flood Test #19 Performed 7/31/90, Wit'd by Joe Bartzak

Basin Flood Test #19 @ 132" Depth: Acceptable

Soil Log #20 Excavated 8/1/90, Wit'd by Joe Bartzak

0" – 10" 10 YR 3/4 dark yellowish brown, friable, silt loam, weak, distinct boundary
10" – 74" 10 YR 5/4 yellowish brown, firm, silty clay loam w/some sandstone increasing in amount w/depth, gradual boundary
74" – 102" 10 YR 6/8 brownish yellow, stone sized sandstone w/10% sandy loam as filler, hard bottom, machine refusal, no seepage, no mottling

Basin Flood Test #20 Performed 7/31/90, Wit'd by Joe Bartzak

Basin Flood Test #20 @ 72" Depth: Acceptable

Soil Log #21 Excavated 8/1/90, Wit'd by Joe Bartzak

0" – 10" 10 YR 3/4 dark yellowish brown, friable, silt loam w/some roots, weak, distinct boundary
10" – 62" 10 YR 4/4 dark yellowish brown, firm, clay loam w/20% cobble sized sandstone, gradual boundary
62" – 84" 7.5 YR 4/6 strong brown, firm, silty clay loam w/10% cobble sized sandstone, distinct boundary
84" – 127" 10 YR 6/6 brownish yellow, friable, silt, moderate, 10 YR 8/1 white, many, coarse, prominent mottles, gradual boundary
127" – 134" 10 YR 4/6 dark yellowish brown, decomposed sandstone w/45% silt loam as filler

Basin Flood Test #21 Performed 8/1/90, Wit'd by Joe Bartzak

Basin Flood Test #21 @ 132" Depth: Acceptable

Basin Flood Test #17 Performed 7/30/90, Wit'd by Joe Bartzak

Basin Flood Test #17 @ 72" Depth: Unacceptable

Basin Flood Test #18 Performed 7/31/90, Wit'd by Joe Bartzak

Basin Flood Test #18 @ 72" Depth: Unacceptable

GOLDENBAUM BAILL ASSOCIATES, INC.
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KENNETH E. BAILL PE. 30111, PP. 04122
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSED PROFESSIONAL PLANNER

SEWAGE DISPOSAL PLAN
PREPARED FOR
LOT 31.05, BLOCK 51
HOPEWELL TOWNSHIP, MERCER COUNTY, NEW JERSEY

DRAWN BY: JEH	CHECKED BY: KEB	SCALE: NONE	DATE: 5/23/96	PROJ. NO: 95-241	4/4
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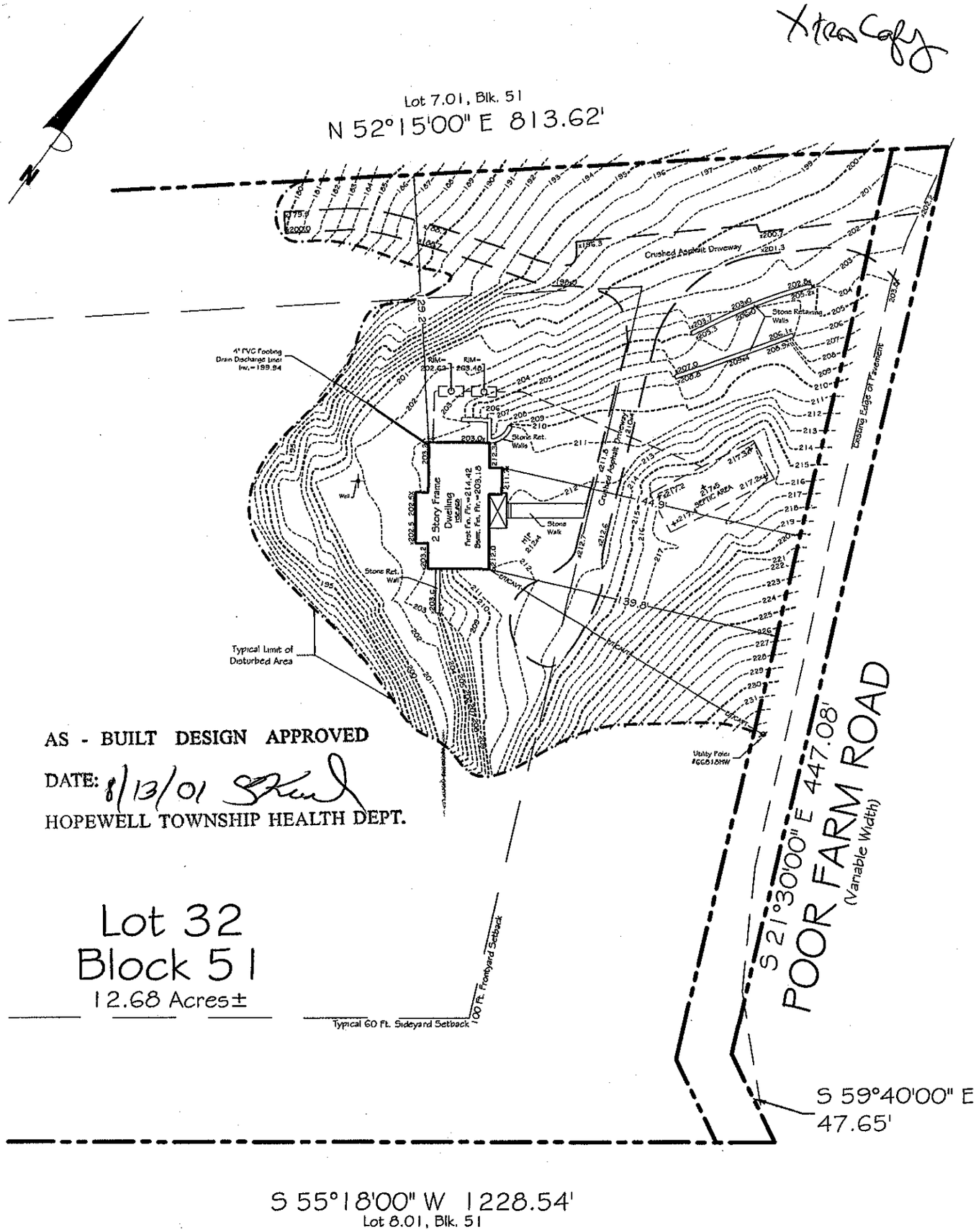

AS - BUILT DESIGN APPROVED

DATE: 8/13/01

HOPEWELL TOWNSHIP HEALTH DEPT.

Lot 32
Block 51
12.68 Acres±

NOTE: Locations of underground utilities shown hereon are approximate.

NOTE: This plan is for Municipal Engineering approval only.

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@compuserve.com

Final Asbuilt Plan
of Lot-32, Block-51 for
Martin & Joann Hemenetz
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Frank J. Falcone: PLS #32112 & PP #3760 — 07/15/01 Date

Date: 07/15/01
Scale: 1"=60'
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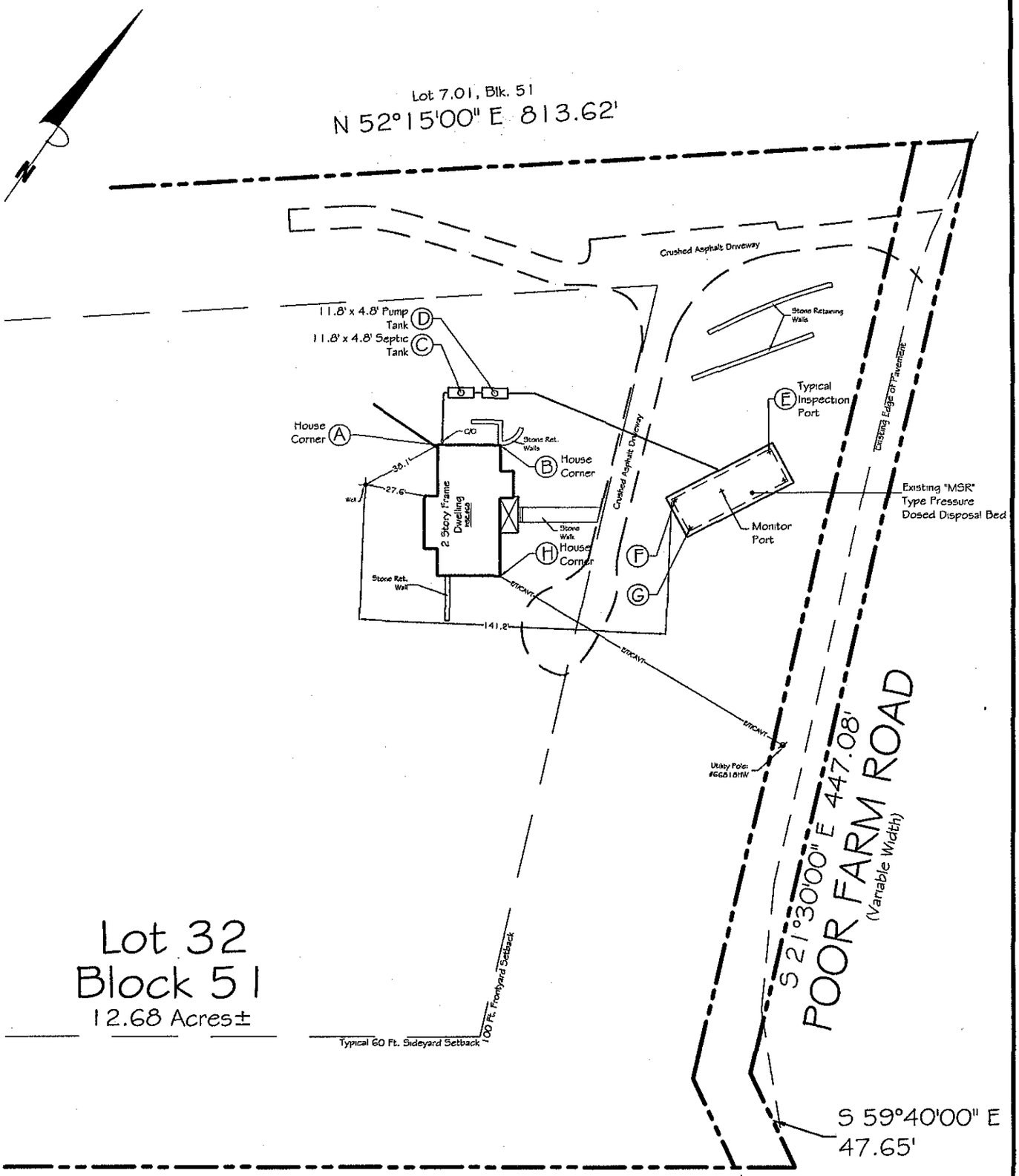
Check: FJF

Job#:F99012
Dwg:L32b51pp.dwg
View:Plan
Layers: FIN01,FINAL



DISPOSAL SYSTEM ASBUILT TIE DISTANCES:
"A" to "C" = 26.8' "B" to "C" = 30.7'
"A" to "D" = 36.0' "B" to "D" = 24.8'
"B" to "E" = 123.8' "H" to "E" = 137.0'
"B" to "F" = 85.2' "H" to "F" = 89.2'
"B" to "G" = 95.7' "H" to "G" = 90.6'

NOTE: No garbage grinder/disposal of any type shall be permitted to be connected to this disposal system.
NOTE: This plan is for Municipal Health Department approval only.

Bryce M. Rittenhouse Professional Engineer & Land Surveyor #13453

Frank J. Falcone Professional Land Surveyor #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@compuserve.com

Disposal System Asbuilt Plan

of Lot-32, Block-51 for

Martin & Joann Hemenetz

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & PLS #13453 — 07/15/01 Date

Frank J. Falcone: PLS #32112 & PP #3760 — 07/15/01 Date

Date: 07/15/01
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

Job#:F99012
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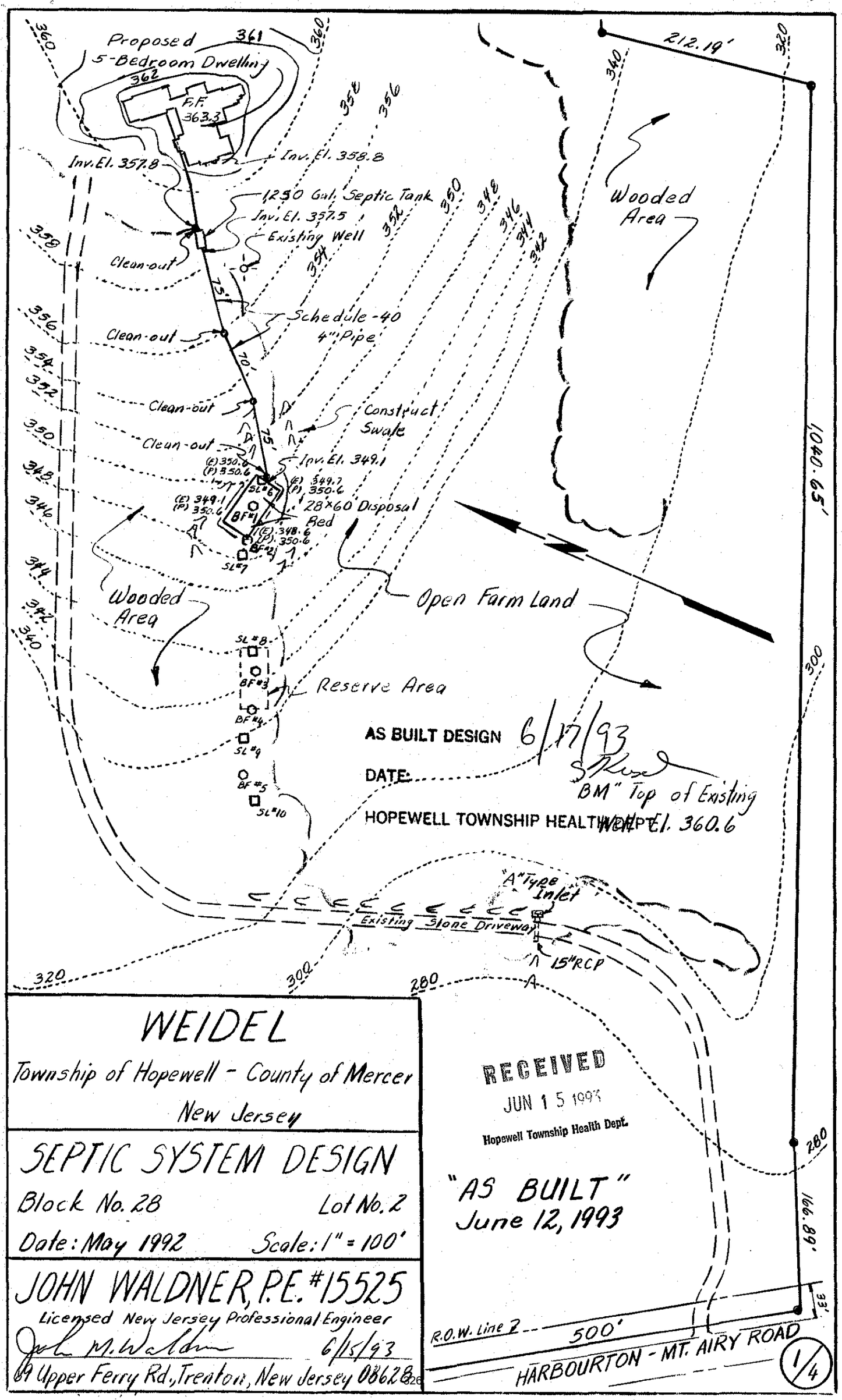
Layers: BBTLABSN



WEIDEL

Township of Hopewell - County of Mercer

New Jersey

SEPTIC SYSTEM DESIGN

Block No. 28 Lot No. 2

Date: May 1992 Scale: 1" = 100'

JOHN WALDNER, P.E. #15525

Licensed New Jersey Professional Engineer

6/15/93

69 Upper Ferry Rd., Trenton, New Jersey 08628

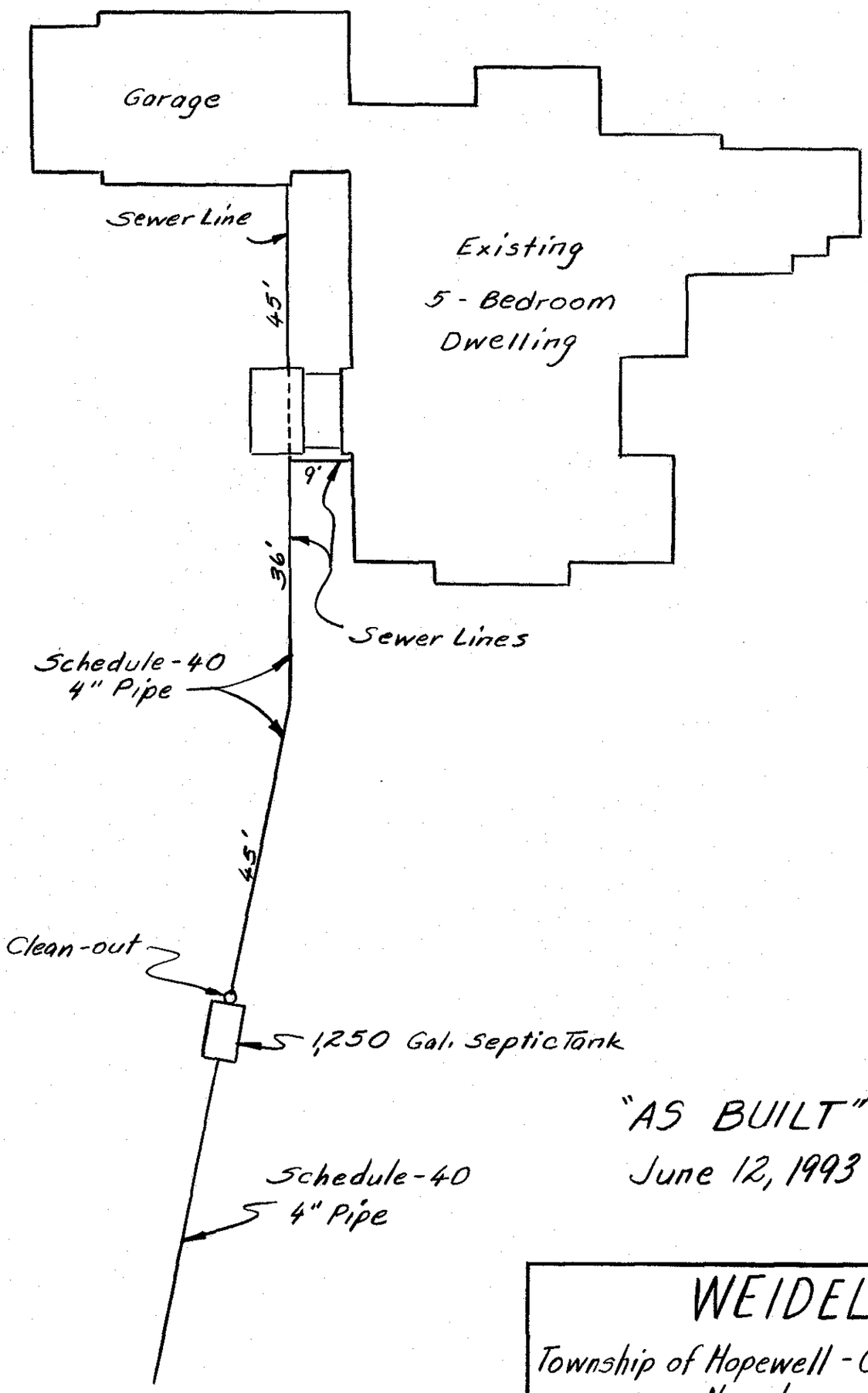
RECEIVED

JUN 15 1993

Hopewell Township Health Dept.

"AS BUILT"

June 12, 1993



"AS BUILT"
June 12, 1993

2/4

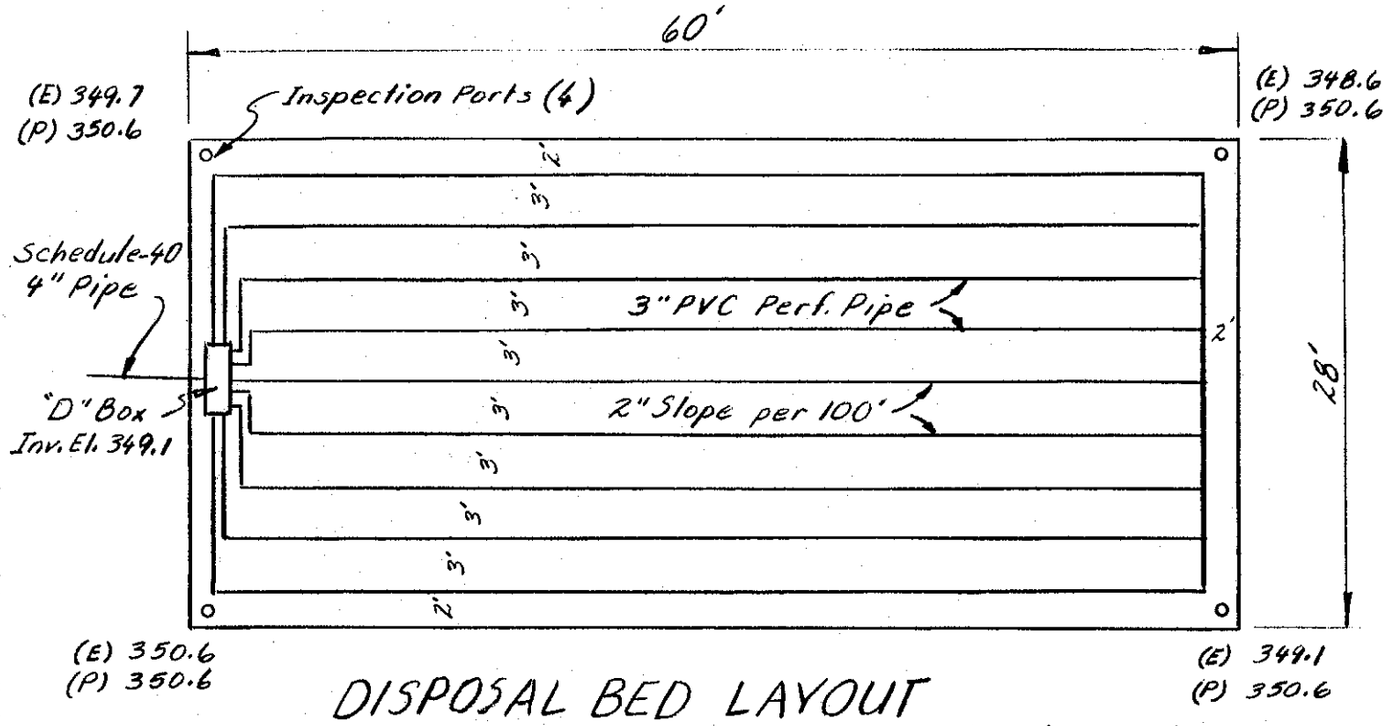
WEIDEL

Township of Hopewell - County of Mercer
New Jersey

JOHN WALDNER, P.E. #15525
Licensed New Jersey Professional Engineer
John M. Waldner 6/15/93
68 Upper Ferry Rd., Trenton, N.J. 08628

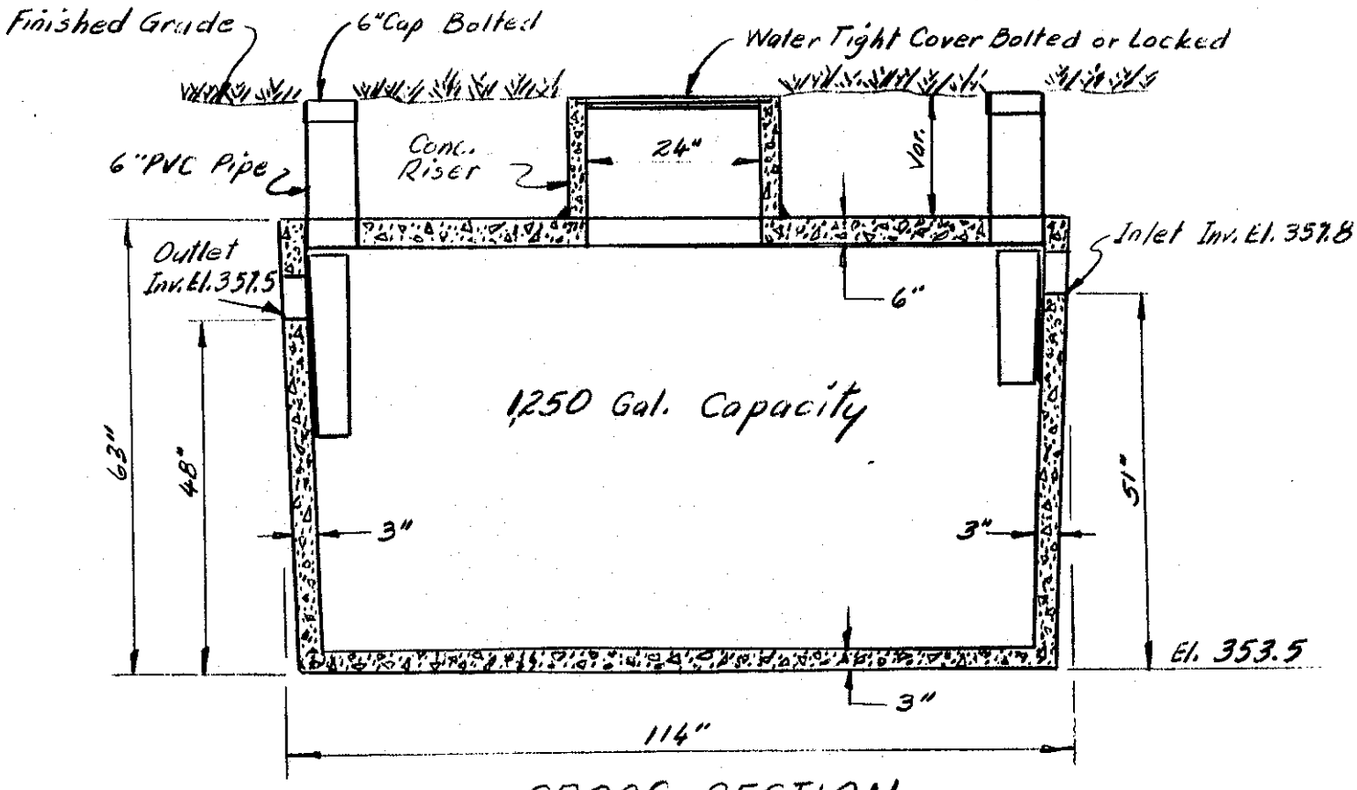
SEPTIC SYSTEM

Block No. 28 Lot No. 2
Date: June 1993 Scale: 1"=20'

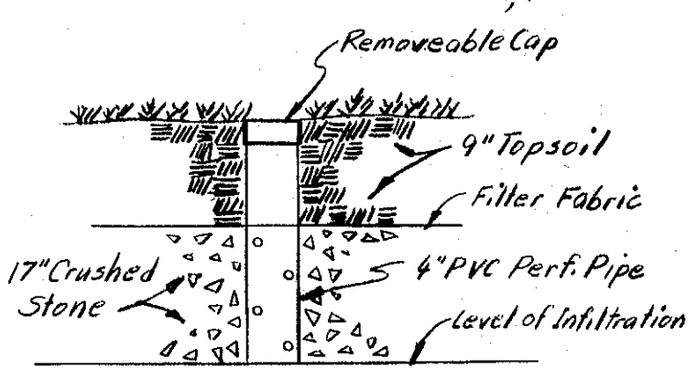


DISPOSAL BED LAYOUT

Scale: 1"=10'



CROSS SECTION
1,250 Gal. SEPTIC TANK
"No Scale"



DETAIL of INSPECTION PORT
"No Scale"

3/4

WEIDEL

Township of Hopewell-County of Mercer
New Jersey

JOHN WALDNER, P.E. #15525
Licensed New Jersey Professional Engineer
John M. Waldner 6/15/93
6 Upper Ferry Rd, Trenton, New Jersey 08628

SEPTIC SYSTEM DESIGN

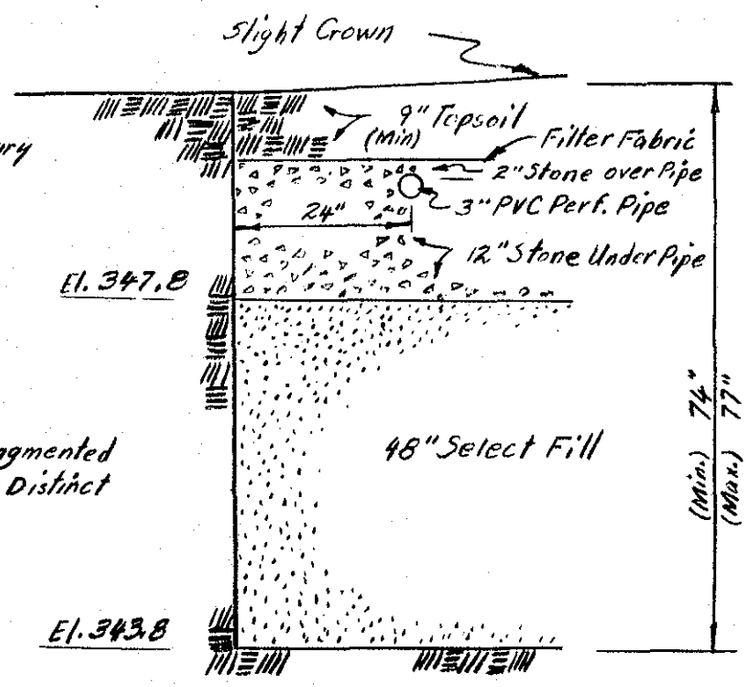
Block No. 28 Lot No. 2
Date: May, 1992 Scale: Noted

SOIL LOG #6 (2/17/90)

0-14"	(5Y 2.5/1) Silty Loam Topsoil w/Heavy Root System; Loose; Friable; Distinct Boundary
14"-84"	(10Y 3/6) Silty Clay Loam w/Large Fragmented Shale 36"x24"x6"; Firm; Friable; Distinct Boundary
84"-120"	(5Y 5/3) Blocky Shale 48"x36"x18" w/10% Silt Clay Loam; Firm; Friable; Distinct Boundary Hard Bottom - No Seeage - No Mottling

EXISTING STRATA

Scale: 1"=2'



CROSS SECTION DISPOSAL BED

Scale: 1"=2'

SEPTIC SYSTEM

1,250 Gal. - Reinf. Conc. Septic Tank

17 Inch - 1½" Washed Crushed Stone

600 Lin. Ft. - 3" PVC Perf. Pipe

48 Inch. - Select Filter Material

1,700 Sq. Ft. - Filter Fabric

300 Lin. Ft. - 4" PVC Schedule - 40 Pipe with (4) clean-outs

9 Inch - Min. Eart Cover

NOTE

All tests were conducted by Goldenbaum-Bail Associates, Inc. and witnessed by George Kiesel, Hopewell Township Inspector

Select Fill shall meet all the requirements of N.J.A.C. 7:9A-10.1(f)4; and Septic Tank shall meet all requirements of Section 7:9A-6.2 of Chapter 9A, Standard For Individual Subsurface Sewage Disposal Systems

4/4

WEIDEL

Township of Hopewell - County of Mercer
New Jersey

JOHN WALDNER, P.E. #15525
License New Jersey Professional Engineer
John M. Waldner 6/15/93
69 Upper Ferry Rd, Trenton, New Jersey 08628

SEPTIC SYSTEM DESIGN

Block No. 28 Lot No. 2

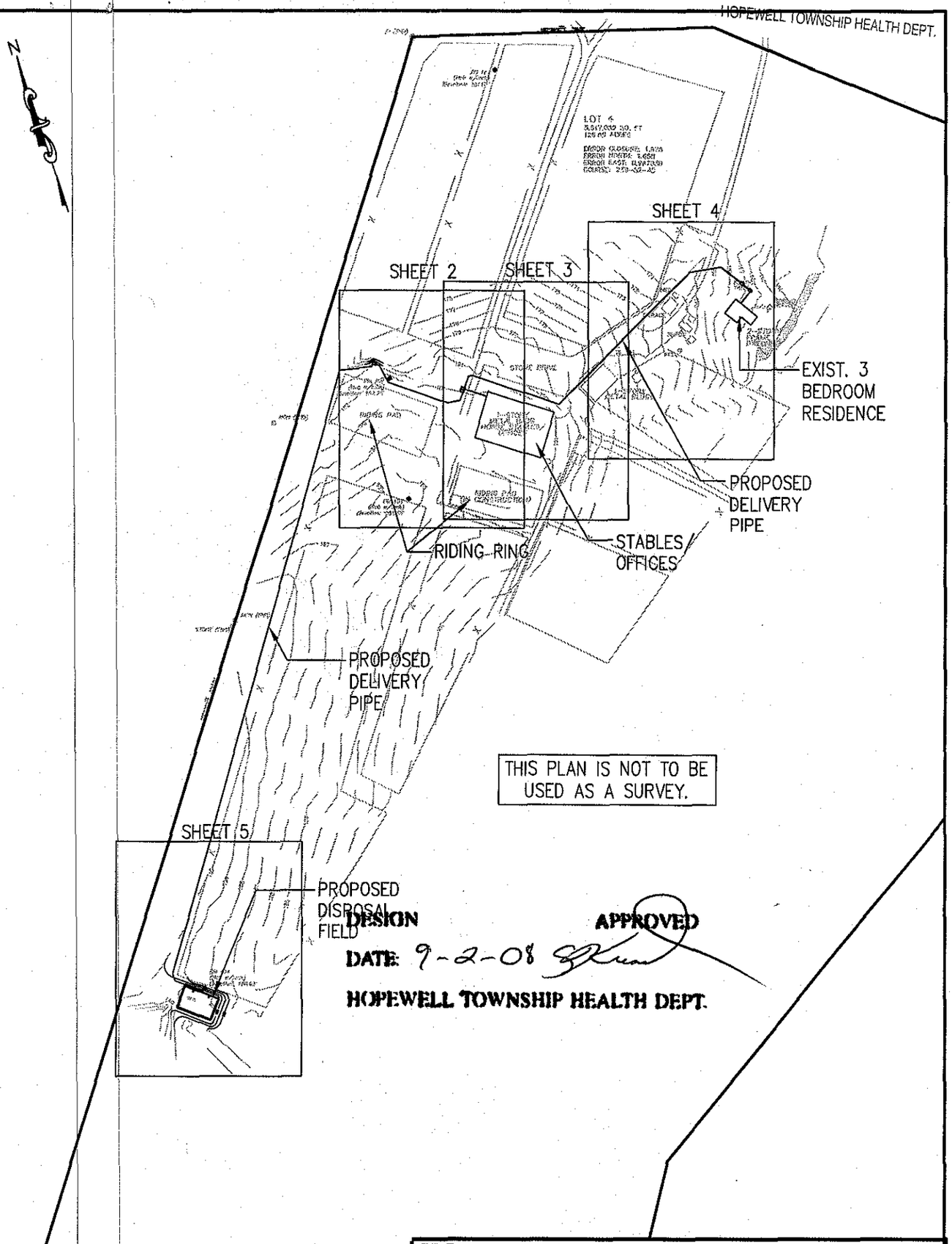
Date: May, 1992 Scale: Noted

Rev. July 1992

File

JUN 6 2008

HOPEWELL TOWNSHIP HEALTH DEPT.



THIS PLAN IS NOT TO BE USED AS A SURVEY.

DESIGN APPROVED

DATE: 9-2-08

HOPEWELL TOWNSHIP HEALTH DEPT.

300 0 300

Scale 1" = 300 ft

TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

E&LP

ENGINEERING & LAND PLANNING ASSOCIATES, INC.

6 EAST MAIN STREET CLINTON, NJ 08809

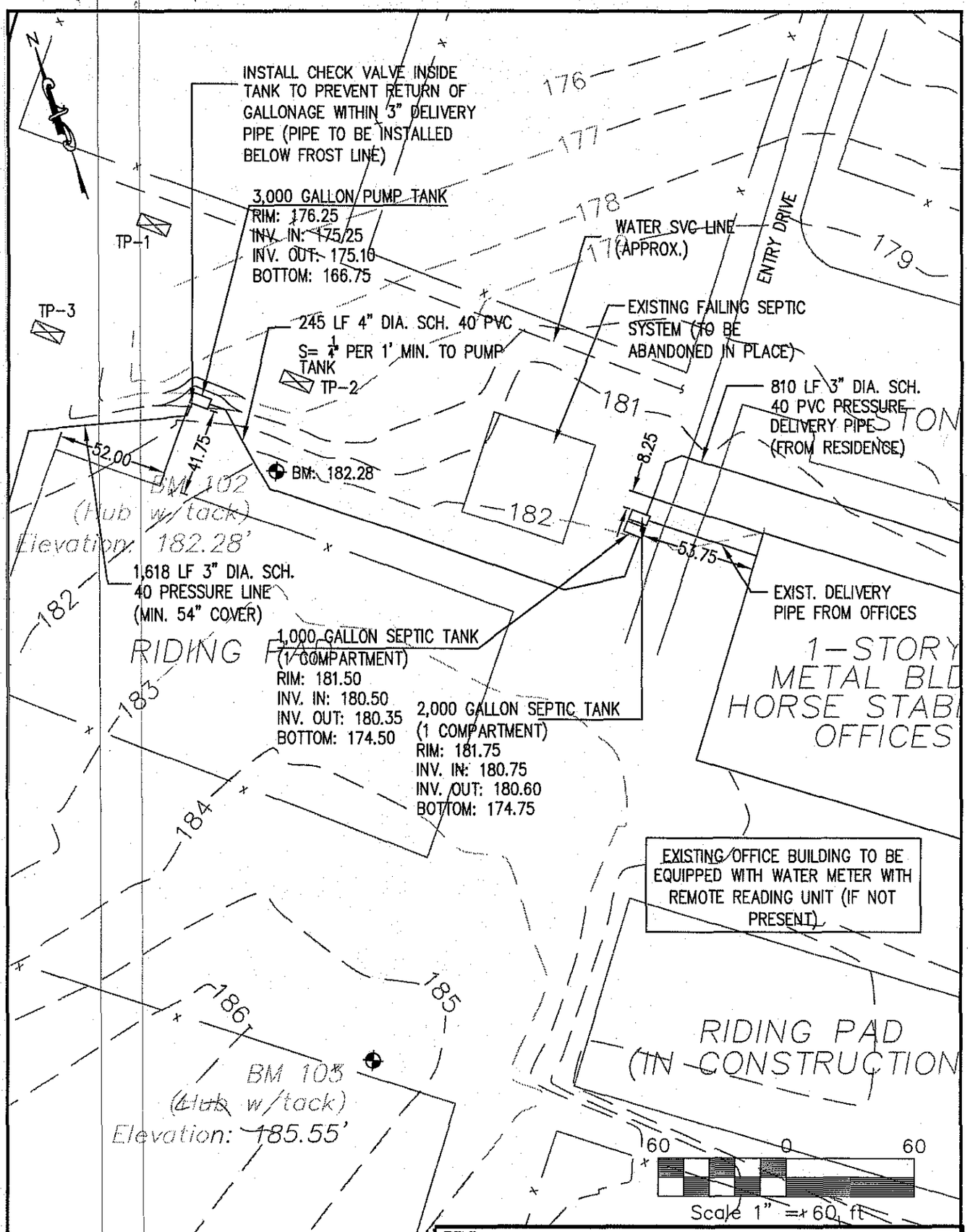
A PROFESSIONAL ASSOCIATION

LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

ERIC J. RAES P.E. LICENSE #24GE038823 5.30.08 DATE

DATE: 5/30/08			
PROJECT NO.: 8007	DESIGNED BY: WJI	CHECKED BY: JJC	
FILENAME: SITE.DWG	SCALE: 1" = 300'	SHEET NO.: 1 OF 14	

REVISION	BY	DATE



TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

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ENGINEERING & LAND PLANNING ASSOCIATES, INC.
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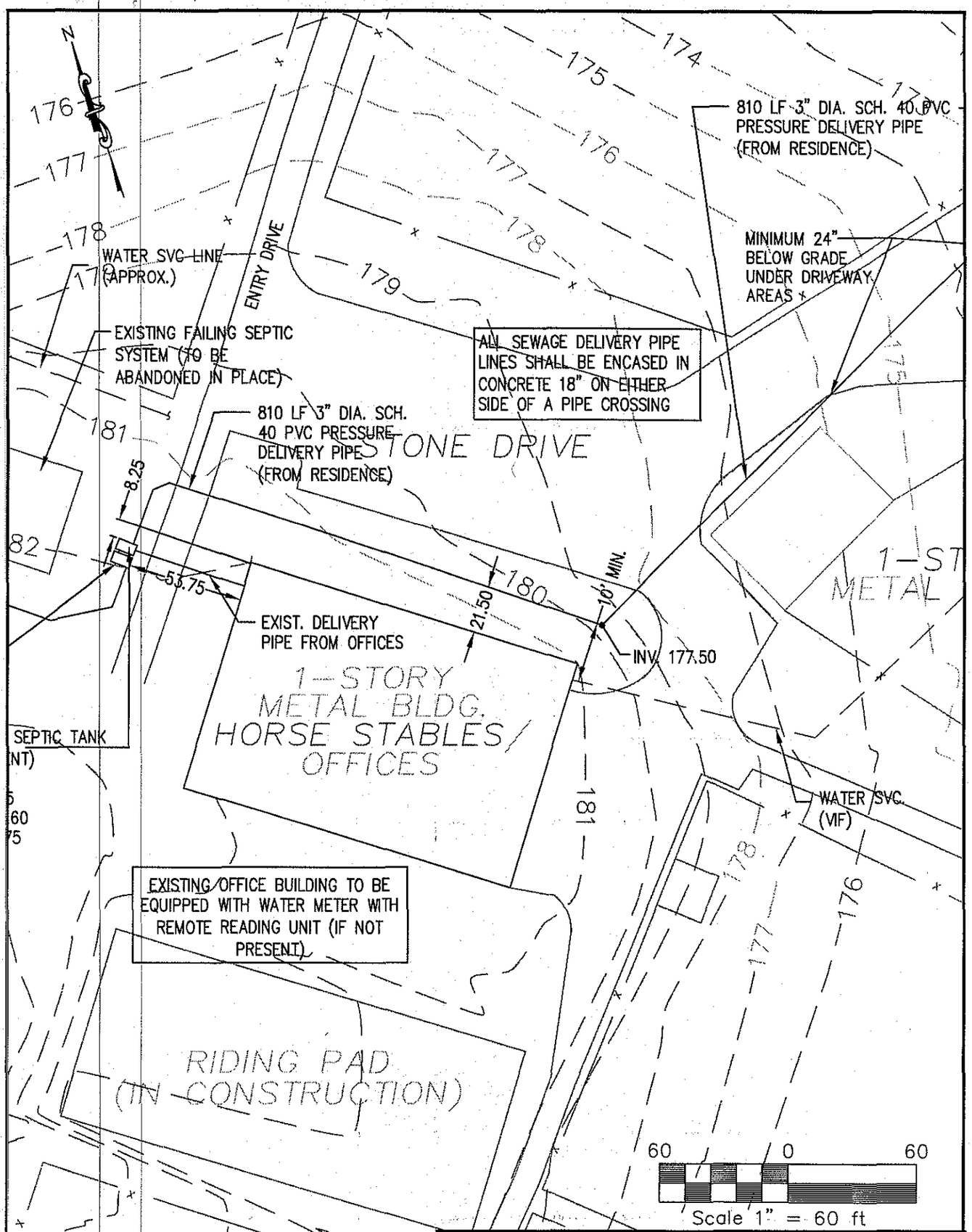
ERIC J. RAE P.E. LICENSE #24GE038823 5.30.08 DATE

PROJECT NO.: 8007 | DESIGNED BY: WJI | CHECKED BY: JJC

FILENAME: SITE.DWG | SCALE: 1" = 60' | SHEET NO.: 2 OF 14

NO.	REVISION	BY	DATE



TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

E&LP
ENGINEERING & LAND PLANNING ASSOCIATES, INC.
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FEDERAL CITY ROAD
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MERCER COUNTY, NJ

DATE: 5/30/08

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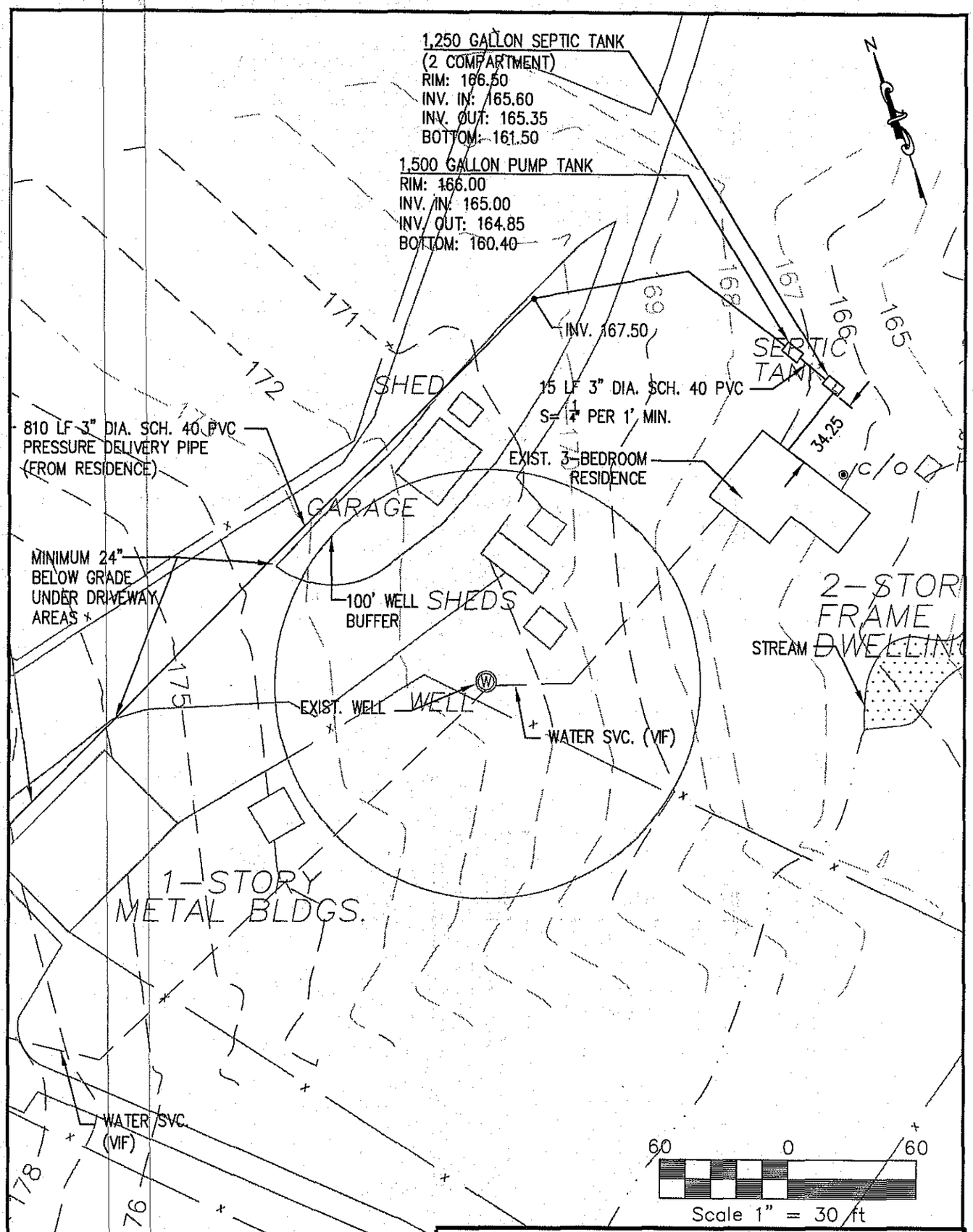
PROJECT NO.: 8007 | DESIGNED BY: WJI | CHECKED BY: JJC

FILENAME: SITE.DWG | SCALE: 1" = 60' | SHEET NO.: 3 OF 14

NO.	REVISION	BY	DATE



TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

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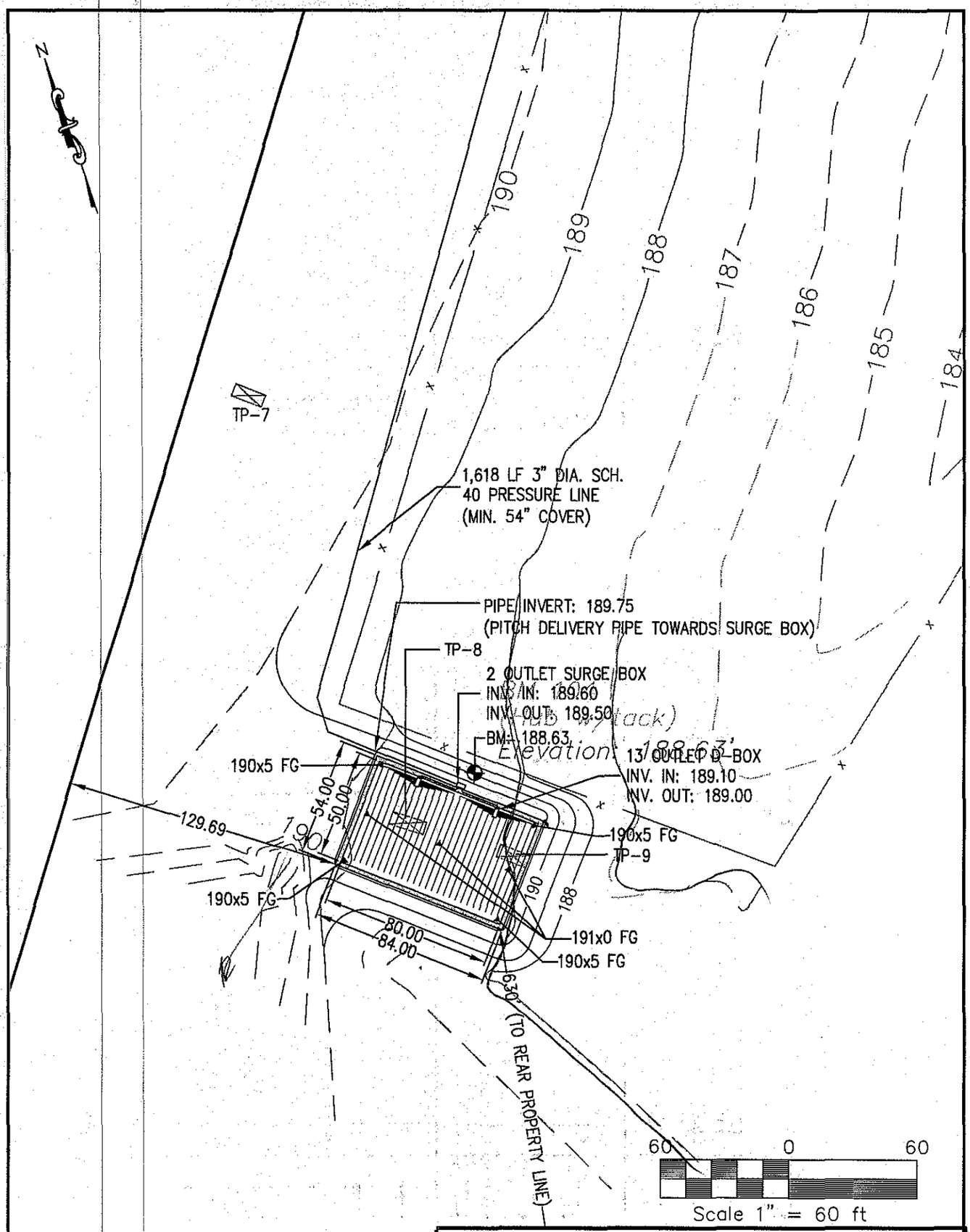
MERCER COUNTY, NJ

ERIC J. RAES P.E. LICENSE #24GE038823 — 5.30.08 DATE

NO.	REVISION	BY	DATE

DATE: 5/30/08			
PROJECT NO.: 8007	DESIGNED BY: WJI	CHECKED BY: JJC	
FILENAME: SITE.DWG	SCALE: 1" = 60'	SHEET NO.: 4 OF 14	



TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

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LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

DATE: 5/30/08

ERIC J. RAES P.E. LICENSE #24GE038823 — 5.30.08 DATE

PROJECT NO.: 8007 | DESIGNED BY: WJI | CHECKED BY: JJC

FILENAME: SITE.DWG | SCALE: 1" = 60' | SHEET NO.: 5 OF 14

NO.	REVISION	BY	DATE

GENERAL NOTES

1. ALL CONSTRUCTION PRACTICES AND PROCEDURES SHALL BE IN COMPLIANCE WITH N.J.A.C. 7:9A (AS AMMENDED)
2. ALL CONSTRUCTION PRACTICES AND PROCEDURES SHALL BE IN COMPLIANCE WITH THE MERCER COUNTY (AND/OR HOPEWELL TOWNSHIP) BOARD OF HEALTH.

EXCAVATION

1. EXCAVATION FOR THE DISPOSAL FIELD SHALL BE IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:
   a. ADEQUATE MEASURES SHALL BE USED TO INSURE THAT THE BOTTOM OF THE DISPOSAL BED IS LEVEL.
   b. IN SOIL TEXTURES OTHER THAN SANDS OR LOAMY SANDS, EXCAVATION WHICH EXPOSES THE INFILTRATIVE SURFACE OF THE DISPOSAL FIELD SHALL NOT BE CARRIED OUT WHEN THE SOIL MOISTURE CONTENT IS ABOVE THE LOWER PLASTIC LIMIT. THIS MEANS THAT WHEN A SMALL LUMP OF SOIL, TAKEN FROM THE DEPTH OF THE PROPOSED EXCAVATION, CAN BE ROLLED OUT WITH THE FINGERS TO FORM A WIRE OR ROD, ONE-EIGHTH OF AN INCH IN THICKNESS, AND DOES NOT CRUMBLE WHEN HANDLED, THE SOIL IS TOO WET TO PROCEED WITH THE EXCAVATION.
   c. EXCAVATION SHALL BE CARRIED OUT IN A MANNER THAT WILL AVOID UNNECESSARY COMPACTION OF THE DISPOSAL FIELD BOTTOM AND SIDE WALLS. HEAVY EQUIPMENT SUCH AS BULLDOZERS OR FRONT-END LOADERS SHALL NOT BE DRIVEN OVER THE EXPOSED INFILTRATIVE SURFACE OF THE DISPOSAL FIELD. EXCAVATION SHOULD BE CARRIED OUT WITH A BACKHOE OPERATING FROM OUTSIDE THE PERIMETER OF PREVIOUSLY EXCAVATED PORTIONS OF THE DISPOSAL BED. IF IT BECOMES NECESSARY TO WALK ON THE DISPOSAL FIELD BOTTOM, A SUITABLE BOARD SHALL BE LAID OVER THE SOIL TO AVOID TRAMPLING.
   d. ANY SMEARED OR COMPACTED SOIL SURFACES WHICH HAVE BEEN PRODUCED ON THE BOTTOM OR SIDEWALLS OF THE EXCAVATION SHALL BE REMOVED TO EXPOSE A FRESH SOIL SURFACE WHICH IS ROUGH AND UNEVEN.
   e. WORK SHOULD BE SCHEDULED SO THAT THE BOTTOM AND SIDEWALLS OF THE EXCAVATION WILL NOT BE EXPOSED TO RAINFALL OR WIND-BLOWN SILT BETWEEN THE TIME OF EXCAVATION AND THE TIME OF FINAL INSPECTION AND BACKFILLING. ANY LOOSE SOIL OR DEBRIS WHICH IS WASHED INTO OR OTHERWISE DEPOSITED WITHIN THE EXCAVATION AS A RESULT OF THE EXCAVATION REMAINING OPEN TO THE ELEMENTS SHALL BE CAREFULLY REMOVED PRIOR TO BACKFILLING.

SEPTIC AND DOSING TANK

1. THE MINIMUM COMPRESSIVE STRENGTH FOR ALL CONCRETE SECTIONS SHALL BE 4000 P.S.I.

FILTER AND DRAINAGE FABRIC

1. THE FILTER MATERIAL MAY BE LAID INTO THE EXCAVATION USING A BACKHOE, FRONT END LOADER OR DUMP TRUCK PROVIDED THAT THIS OPERATION IS CARRIED OUT FROM SIDES OF THE SYSTEM RATHER THAN BY DRIVING OUT ONTO THE EXPOSED DISPOSAL FIELD INFILTRATIVE SURFACE. IN THE CASE OF LARGE BEDS, TRACKED EQUIPMENT MAY BE OPERATED WITHIN THE DISPOSAL BED PROVIDED THAT THE EQUIPMENT DOES NOT EXERT A GROUND PRESSURE IN EXCESS OF EIGHT POUNDS PER SQUARE INCH AND PROVIDED THAT THE FILTER MATERIAL IS PUSHED OUT IN FRONT OF THE VEHICLE WHILE MAINTAINING A MINIMUM THICKNESS OF ONE FOOT OF FILTER MATERIAL BELOW THE VEHICLE TRACKS AT ALL TIMES.
2. THE FILTER MATERIAL SHALL BE COVERED WITH DRAINAGE FABRIC AS THE LAYING OF THE DISTRIBUTION LINES PROGRESSES. THE FOLLOWING REQUIREMENTS SHALL BE MET:

DISTRIBUTION NETWORK

1. SLOPE OF DISTRIBUTION LATERALS TO BE NO GREATER THAN 2" PER 100 FEET.
2. ALL JOINTS TO BE WATERTIGHT.
3. CONNECTING PIPES AND DELIVERY PIPES SHALL BE LAID ON A FIRM FOUNDATION SATISFACTORY TO THE ADMINISTRATIVE AUTHORITY, AND IN ACCORDANCE WITH PLAN DETAILS.

BACKFILL AND FINAL GRADING

1. NO COMPONENT OF THE SEPTIC SYSTEM SHALL BE BACKFILLED UNTIL A FINAL INSPECTION HAS BEEN CONDUCTED BY THE ADMINISTRATIVE AUTHORITY OR ITS AUTHORIZED AGENT.
2. BACKFILL AND FINAL GRADING SHALL BE COMPLETED AS FOLLOWS:
   a. A MINIMUM OF NINE INCHES AND NO MORE THAN 18 INCHES OF BACKFILL SHALL BE PLACED OVER THE TOP OF THE DISPOSAL FIELD FILTER MATERIAL.
   b. BACKFILL MATERIAL SHALL BE OF EARTH SIMILAR TO THAT FOUND AT THE SITE AND FREE OF LARGE STONES, TREE STUMPS, BROKEN MASONRY OR OTHER WASTE CONSTRUCTION MATERIAL.
   c. IN NO CASE SHALL BACKFILL MATERIAL BE MORE PERMEABLE THAN THE SURROUNDING SOIL.
   d. BACKFILL SHALL COMPLETELY COVER THE ENTIRE DISPOSAL BED AND SHALL BE GRADED SMOOTHLY INTO THE SURROUNDING TOPOGRAPHY ON ALL SIDES.
3. AFTER COMPLETION OF BACKFILL AND FINAL GRADING, THE BACKFILLED AREA SHALL BE SEEDED, OR SODDED, TO ESTABLISH A GOOD VEGETATIVE COVER AND TO PREVENT EROSION.

SITE SPECIFIC NOTES

1. GARBAGE DISPOSALS AND SUMP PUMPS CANNOT BE USED WITH THIS SEPTIC SYSTEM.
2. THIS PROPERTY AND ALL NEIGHBORING PROPERTIES ARE SUPPLIED BY WELLS. THERE ARE NO NEIGHBORING WELLS WITHIN 100 FT. OF THE PROPOSED DISPOSAL FIELD, THERE ARE NO DISPOSAL FIELDS WITHIN 50 FEET OF THE PROPOSED DISPOSAL FIELD.
3. ALL TANKS TO BE TESTED FOR WATERTIGHTNESS IN ACCORDANCE WITH ASTM C-1227 TESTING PRCEDURES.
4. THE PROPOSED SEPTIC SYSTEM IS NOT LOCATED WITHIN ANY WETLANDS OR WETLAND BUFFERS.
5. NO UNDERGROUND STORAGE TANKS ARE PRESENT ON-SITE (PER OWNER).
6. THE PLAN IS BASED ON A BOUNDARY SURVEY PREPARED BY NEIL VAN CLEEF, P.E., P.L.S, OF VAN CLEEF ENGINEERING ASSOCIATES ENTITLED CURTIS LAKE WOODS ACQUISITION PROJECT AND DATED 10/18/89. SUPPLEMENTAL TOPOGRAPHIC INFORMATION AS PREPARED BY ROBERT. ENT JR., P.L.S., ON A PLAN ENTITLED "TOPOGRPAHIC MAP" AND DATED APRIL 2008.
7. SOIL TESTING CONDUCTED UNDER THE SUPERVISION OF ERIC RAES, P.E. AND WITNESSED BY GEORGE KIESEL OF THE HOPEWELL TOWNSHIP HEALTH DEPARTMENT.

DESIGN CRITERIA

TYPE OF SYSTEM: GRAVITY DOSING

GALLONS PER DAY
EXISTING RESIDENCE: 500 (3 BEDROOMS)
EQUESTRIAN CENTER: 1,375 (275 OCCUPANTSx 5 GAL/PER.)
TOTAL: 1,875 GALLONS PER DAY

DISPOSAL BED SIZING:

1,875 GALLONS/DAY x 1.61 = 3,019 SF

3,019 SF x 1.25 (HOPEWELL ORDINANCE) = 3,773 SF

DISPOSAL BED AREA (AS DESIGNED): 4,000 SF (50'x80')

SEPTIC TANK SIZE: 1,000 GAL (RESIDENCE)
2,250 GAL (EQUESTRIAN CENTER)

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LINES, ELEVATIONS, AND MEASUREMENTS, EXERCISING PRECAUTION TO VERIFY ALL DIMENSIONS SHOWN ON DRAWING.
2. THESE DRAWINGS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. THE CONTRACTOR SHALL BE RESPONSIBLE TO INSURE "ON THE JOB" SAFETY FOR HIS EMPLOYEES, EMPLOYEES OF THE OWNER AND ALL OTHER PERSONS HAVING AUTHORIZED OR UNAUTHORIZED ACCESS TO THE WORK AND THE PUBLIC. CONTRACTOR SHALL PERFORM HIS WORK IN A SAFE MANNER AND IN COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
3. THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER AS PRESCRIBED IN N.J.A.C. 7:9A OR WHENEVER CONSULTATION, CLARIFICATION OR INSPECTIONS ARE REQUIRED. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO EXCAVATION TO DISCUSS SPECIFIC REQUIREMENTS RELATIVE TO EXCAVATION, PLACEMENT AND CERTIFICATION OF FILL, ETC.
4. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE DESIGN ENGINEER SHOULD DEPARTURES FROM THE APPROVED DESIGN BECOME NECESSARY DUE TO CIRCUMSTANCES WHICH ARISE DURING CONSTRUCTION.
5. DRAINAGE FROM BASEMENT FLOORS, FOOTINGS OR ROOFS SHALL NOT ENTER THE DISPOSAL SYSTEM AND SHALL BE DIVERTED AWAY FROM THE AREA OF THE DISPOSAL FIELD. BACKWASH FROM WATER SOFTENERS SHALL NOT BE DISPOSED OF WITHIN THE DISPOSAL SYSTEM.
6. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED ON THE DRAWINGS AND EACH DRAWING HAS BEEN REVISED TO INDICATE "ISSUED FOR CONSTRUCTION".
7. BEFORE EXCAVATING IN THE PROJECT AREA, THE CONTRACTOR IS TO VERIFY THE LOCATION OF ANY UNDERGROUND UTILITIES (GAS MAINS, ELECTRICAL LINES, TELEPHONE LINES, WATER AND SEWER MAINS, ETC.) THAT INTERFERE WITH CONSTRUCTION. SHOULD UNDERGROUND STRUCTURES OR FACILITIES INTERFERE WITH PROJECT CONSTRUCTION, THE ENGINEER SHALL BE NOTIFIED BEFORE PROCEEDING WITH WORK. THE CONTRACTOR SHALL NOTIFY ALL UNDERGROUND UTILITY COMPANIES 3 DAYS PRIOR TO COMMENCEMENT OF ANY EXCAVATION FOR ACCURATE FIELD LOCATIONS. FOR UTILITY MARKOUT, CALL 1-800-272-1000.
8. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL INSPECTIONS AS REQUIRED BY THE ENGINEER AND THE BOARD OF HEALTH, AND ALL OTHER TOWNSHIP AGENCIES OF JURISDICTION.
9. THE ENGINEER IS TO BE NOTIFIED IF ANY CONDITIONS ARE ENCOUNTERED THAT WOULD RENDER THIS PLAN UNCONSTRUCTABLE. THE ENGINEER SHALL ALSO BE NOTIFIED OF ANY DEVIATIONS FROM THE PLANS DURING CONSTRUCTION.

FILL

FILL STANDARDS: (ALTERNATIVE FILL SPECIFICATION PER NJDEP PERMIT TO CONSTRUCT AND OPERATE TREATMENT WORKS (TWA) PERMIT No. 03-3487-4SG DATED MARCH 1, 2003)

FILL USED IN THE ZONE OF TREATMENT AND/OR THE ZONE OF DISPOSAL SHALL MEET THE FOLLOWING REQUIREMENTS:

1. ASTM C-136 TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COURSE AGGREGATES MUST BE USED FOR CHARACTERIZING THE SELECT FILL.
2. THE MATERIAL SHALL MEET THE STANDARDS OF ASTM C33-93 STANDARD SPECIFICATION FOR CONCRETE AGGREGATE, OR
3. THE MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS:
   A. COURSE FRAGMENT CONTENT (GREATER THAN THE No.8 SIEVE) LESS THAN 15% BY VOLUME OR LESS THAN 20% BY WEIGHT;
   B. TEXTURAL ANALYSIS (COMPOSITION, WEIGHT, OF SIZE FRACTION PASSING THE PARTICULAR SIEVE AS STATED):
      100% MUST PASS A 3/8"SIEVE;
      BETWEEN 80% AND 100% MUST PASS THE No. 8 SIEVE (2.36mm);
      BETWEEN 50% AND 85% MUST PASS THE No. 16 SIEVE (1.18mm);
      BETWEEN 25% AND 60% MUST PASS THE No. 30 SIEVE (0.6mm);
      BETWEEN 10% AND 30% MUST PASS THE No. 50 SIEVE (0.3mm);
      BETWEEN 2% AND 10% MUST PASS THE No. 100 SIEVE (0.15mm).
4. PERMEABILITY FOR THESE MATERIALS IS ESTABLISHED WITHIN THE RANGE OF 6-20 IN/HR.
5. SELECT FILL SHALL BE TESTED FOR FINE AND VERY FINE SAND, AND BE 25% OR LESS BY WEIGHT.

II. FILL MATERIAL TO BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ALTERNATIVE FILL SPECIFICATION (NJDEP TWA 03-3487-4SG)
-COMPACTION OF SELECT FILL MUST BE PERFORMED IN 1' (MAX.) LIFTS.

THE HEALTH DEPARTMENT AND THE DESIGN ENGINEER SHALL BE NOTIFIED 48 HOURS PRIOR TO THE START OF CONSTRUCTION TO SCHEDULE THE NECESSARY INSPECTIONS.

INSPECTIONS SHALL CONSIST OF THE FOLLOWING ITEMS TO BE WITNESSED BY THE DESIGN ENGINEER IN ADDITION TO ANY INSPECTIONS REQURIED BY THE TOWNSHIP:
- A) STAKEOUT
- B) BOTTOM OF BED
- C) STOCKPILE AND CERTIFICATION OF SELECT FILL
- D) FILL EMPLACEMENT, COMPACTION
- E) LEVEL OF INFILTRATION
- F) TANK INSTALLATION
- G) PUMP SYSTEM INSPECTION
- H) DELIVERY PIPE INSTALLATION

PRIOR TO EXCAVATION THE INSTALLED SHALL BE REQUIRED TO NOTIFY THE UTILITY COMPANIES OF THE INTENDED WORK BY CALLING 1-800-272-1000. THE OWNER SHALL ALSO BE NOTIFIED OF THE EXCAVATION TO IDENTIFY ANY OTHER KNOWN UTILITY CONFLICTS.

INSTALLER SHALL BE RESPONSIBLE FOR COORDINATING ALL CONSTRUCTIONER PERMITS INCLUDING BUT NOT LIMITED TO PLUMBING, ELECTRICAL, AND HEALTH DEPARTMENT PERMITS.

FIELD CHANGES TO THIS DESIGN SHALL NOT BE PERMITTED UNLESS APPROVED BY THE DESIGN ENGINEER AND THE TOWNSHIP HEALTH DEPARTMENT

ALL DISTURBED AREAS SHALL BE RAKED AND SEEDED FOLLOWING THE SETTLEMENT OF THE SYSTEM.

INSTALLER SHALL ENSURE ALL MATERIALS USED IN THE CONSTRUCTION OF THE SYSTEM MEET THE STANDARDS OF N.J.A.C. 7:9A AND THOSE PROVIDED IN THIS DESIGN.

THIS DESIGN MAKES NO REPRESENTATION AS TO THE LOCATION OR ADEQUACY OF INTERNAL PLUMBING OR ELECTRICAL SERVICES.

NO.	REVISION	BY	DATE

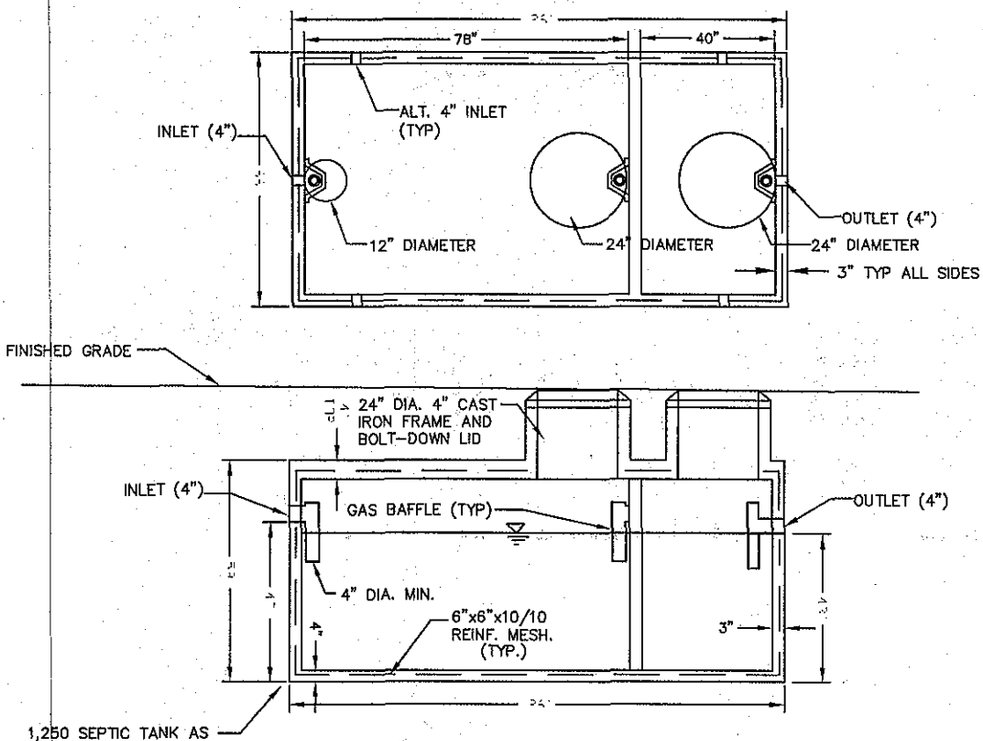
TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

E&LP
ENGINEERING & LAND PLANNING ASSOCIATES, INC.
6 EAST MAIN STREET CLINTON, NJ 08809
A PROFESSIONAL ASSOCIATION

LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

ERIC J. RAES P.E. LICENSE #24GE038823 — DATE: 5.30.08

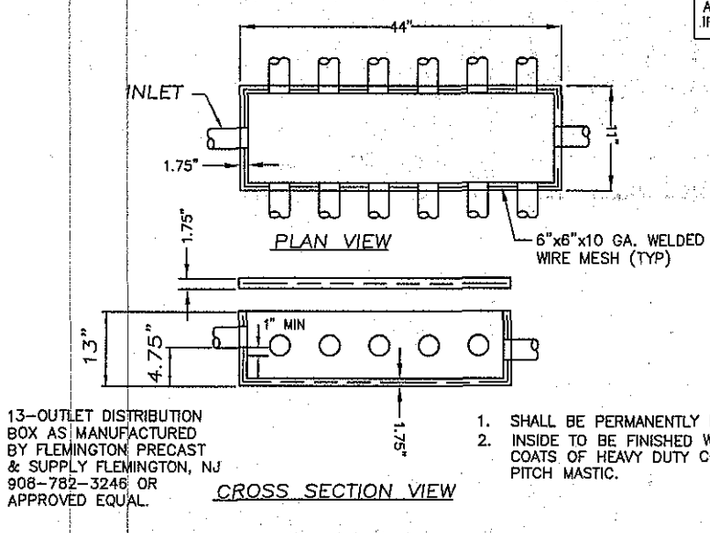
DATE: 5/30/08			
PROJECT NO.: 8007	DESIGNED BY: WJI	CHECKED BY: JJC	
FILENAME: NOTES.DWG	SCALE: N.T.S.	SHEET NO.: 6 OF 14	



1,250 GAL SEPTIC TANK
2 COMPARTMENT
(TO BE INSTALLED AT RESIDENCE)

(NTS)

ALL SEPTIC TANKS SHALL BE PROVIDED WITH CAST IRON LOCKING MANHOLES RAISED TO GRADE.

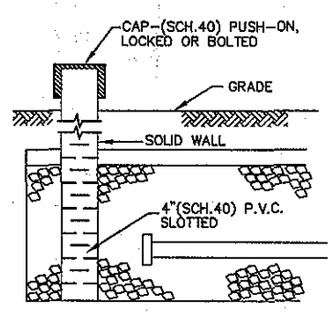


13-OUTLET DISTRIBUTION BOX AS MANUFACTURED BY FLEMINGTON PRECAST & SUPPLY FLEMINGTON, NJ 908-782-3246 OR APPROVED EQUAL.

1. SHALL BE PERMANENTLY MARKED
2. INSIDE TO BE FINISHED WITH 2 COATS OF HEAVY DUTY COAL TAR PITCH MASTIC.

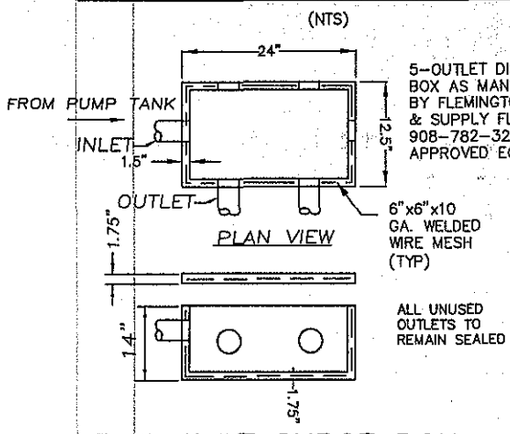
13-OUTLET DISTRIBUTION BOX

(NTS)



INSPECTION PORT DETAIL

N.T.S.



5-OUTLET DISTRIBUTION BOX AS MANUFACTURED BY FLEMINGTON PRECAST & SUPPLY FLEMINGTON, NJ 908-782-3246 OR APPROVED EQUAL.

ALL UNUSED OUTLETS TO REMAIN SEALED

5-OUTLET SURGE BOX

(NTS)

NO.	REVISION	BY	DATE

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SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

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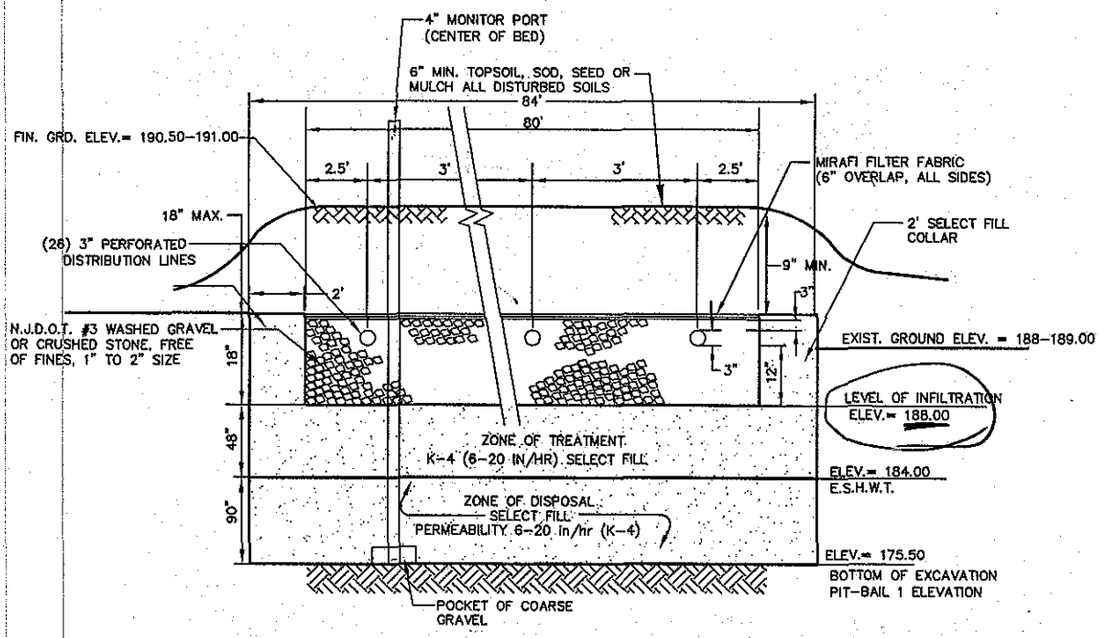
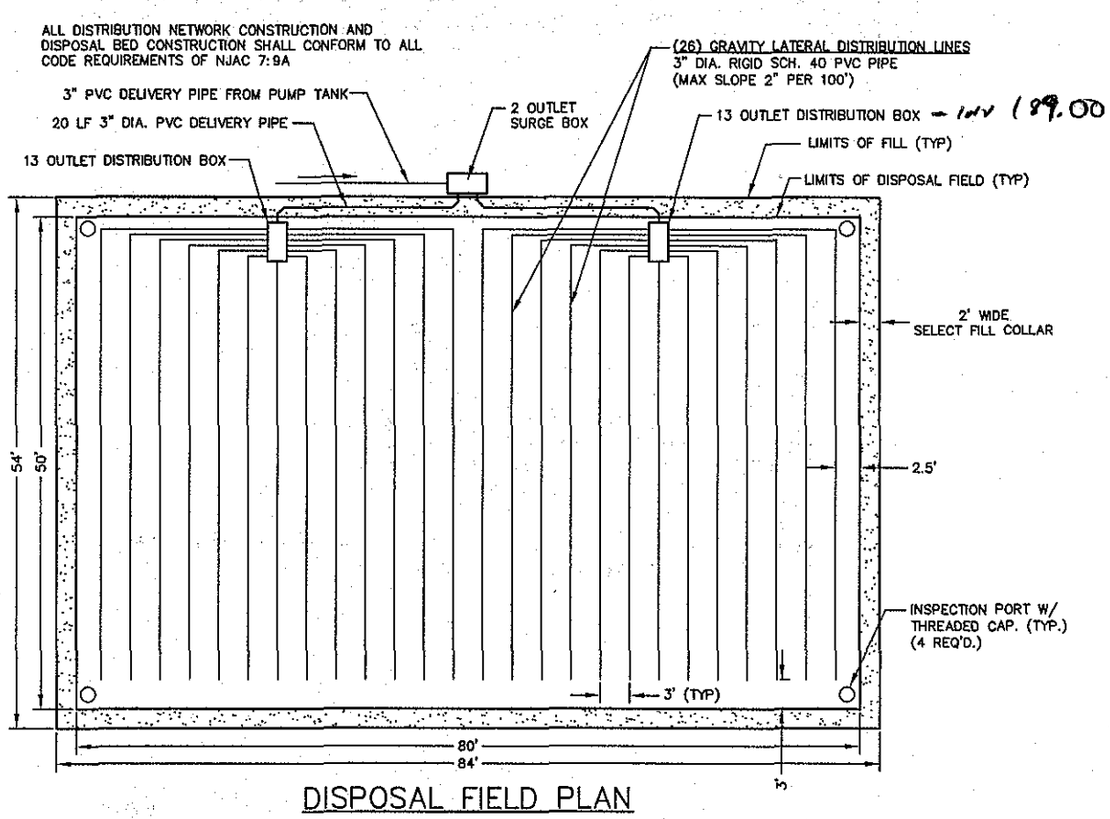
ERIC J. RAES P.E. LICENSE #24GE038823 — DATE: 5-30-08

DATE: 5/30/08		
PROJECT NO.: 8007	DESIGNED BY: WJI	CHECKED BY: JJC
FILENAME: DETAILS.DWG	SCALE: N.T.S.	SHEET NO.:7 OF 14



DISPOSAL BED SECTION

"FILL ENCLOSED" N.T.S.



DISPOSAL FIELD PLAN

(N.T.S.)

TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

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A PROFESSIONAL ASSOCIATION

LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

DATE: 5/30/08

ERIC J. RAES P.E. LICENSE #24GE038823 5.30.08 DATE

PROJECT NO.: 8007 | DESIGNED BY: WJI | CHECKED BY: JJC

FILENAME: DETAILS.DWG | SCALE: N.T.S. | SHEET NO.: 8 OF 14

NO.	REVISION	BY	DATE

GENERAL NOTES:

1. ALL ELECTRIC WORK TO CONFORM TO EXPLOSION PROOF STANDARDS, NEC AND LOCAL ELECTRICAL CODES FOR MERCER COUNTY (HOPEWELL TWP.)
2. ALL FITTINGS ARE SCHEDULE 80 SOLVENT WELDED FOR PRESSURE CONDITIONS
3. SHOP DRAWINGS ARE TO BE SUBMITTED FOR ALL PUMP STATIONS, VALVE CHAMBERS AND CONTROL BUILDING COMPONENTS.

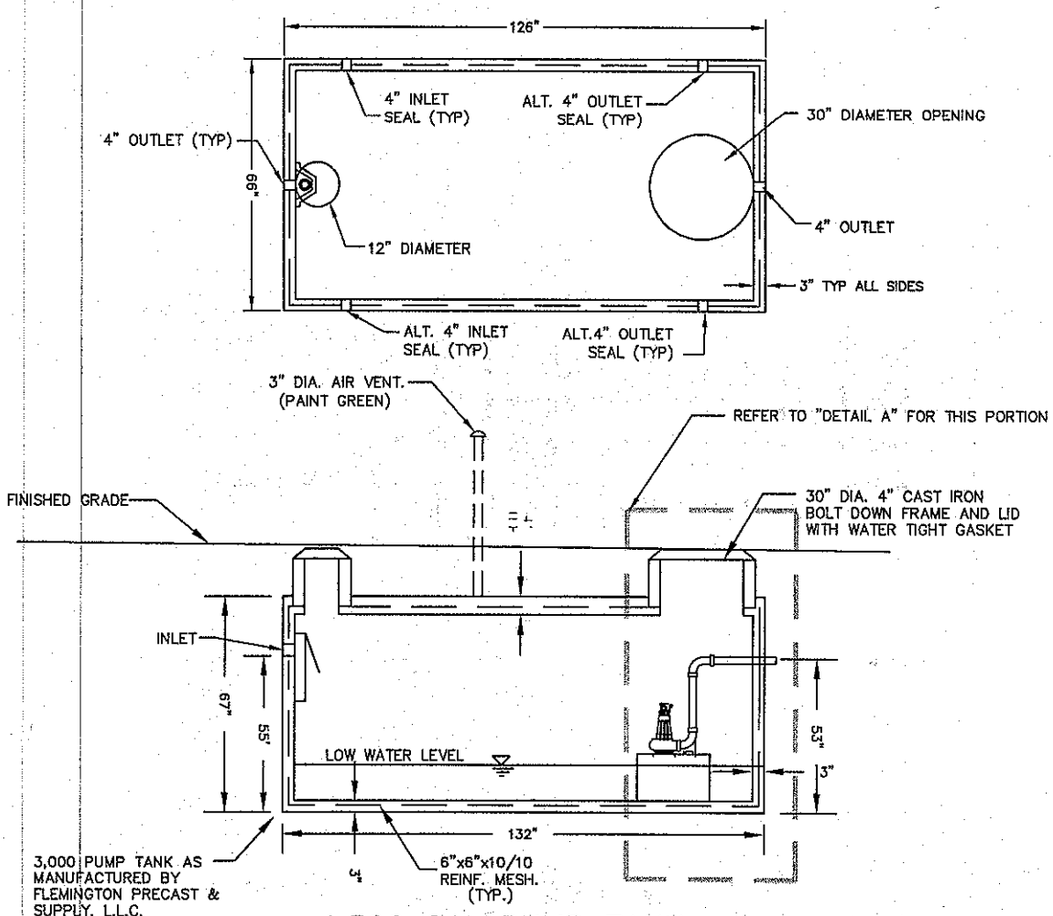
NOTES:

PUMP CHAMBER TO BE A 1500 GAL. SEPTIC TANK AS MANUFACTURED BY MODERN CONC., S.T. CO., OR APPROVED EQUAL MODIFICATIONS SHALL SPECIFY NO BAFFLES & BE WATERPROOF BY MANU. (4000 P.S.I. CONC.)

ALL INSIDE SURFACES TO BE COATED WITH 2 COATS HEAVY DUTY INERT MATERIAL, ACI 318-16-4.5.1 +4.5.2 STANDARD CERT. (DISPLAYED ON TANK).

ALL SWITCHES MUST BE CORROSION & HUMIDITY PROOF

ALL ELECT. MATERIALS & WORK SHALL CONFORM TO NA. ELECT. CODE NFPA 70-CURRENT ED. AND LOCAL CODES



1,500 GAL PUMP TANK

(NTS)

(WITH PUMP SYSTEM)

TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

E&LP
ENGINEERING & LAND PLANNING ASSOCIATES, INC.
6 EAST MAIN STREET CLINTON, NJ 08809
A PROFESSIONAL ASSOCIATION

LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

ERIC J. RAES P.E. LICENSE #24GE038823 — DATE: 5-30-08

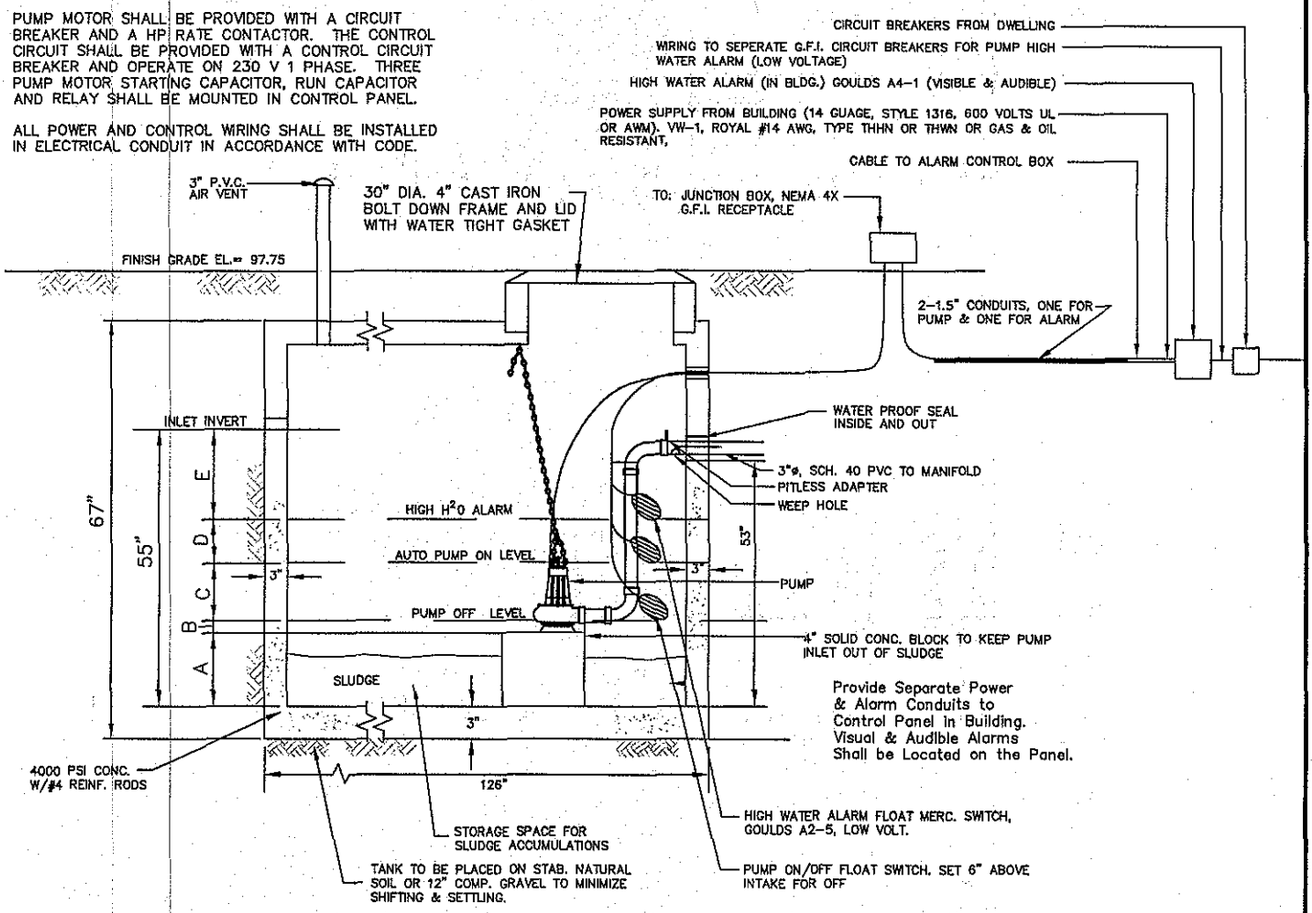
NO.	REVISION	BY	DATE

DATE:	5/30/08		
PROJECT NO.:	8007	DESIGNED BY: WJI	CHECKED BY: JJC
FILENAME:	DETAILS.DWG	SCALE: N.T.S.	SHEET NO.: 9 OF 14

POWER EQUIPMENT

PUMP MOTOR SHALL BE PROVIDED WITH A CIRCUIT BREAKER AND A HP RATE CONTACTOR. THE CONTROL CIRCUIT SHALL BE PROVIDED WITH A CONTROL CIRCUIT BREAKER AND OPERATE ON 230 V 1 PHASE. THREE PUMP MOTOR STARTING CAPACITOR, RUN CAPACITOR AND RELAY SHALL BE MOUNTED IN CONTROL PANEL.

ALL POWER AND CONTROL WIRING SHALL BE INSTALLED IN ELECTRICAL CONDUIT IN ACCORDANCE WITH CODE.



1,500 GAL. PUMP TANK
PUMP CHAMBER DETAIL A

N.T.S.

PUMP SPECIFICATIONS

ELECTRIC SUBMERSIBLE PUMP
GOULDS MODEL WS1012BHF
DESIGN POINT 85 GPM @ 34.25' TDH, 1 HP 2" DISCHARGE, 1 PHASE 60 Hz ELECTRIC POWER.
PUMP SHALL BE AS MANUFACTURED BY GOULDS PUMP INC., SENECA FALLS, NY AND DISTRIBUTED BY PUMPING SERVICES INC. MIDDLESEX, NJ (732) 469-4540.

SIMPLEX PUMP CONTROL PANEL:

PROVIDE FLOAT LEVEL CONTROL SYSTEM TO AUTOMATICALLY CONTROL THE OPERATION OF THE PUMP AS REQUIRED BY INFLUENT FLOW. FLOAT SWITCHES ARE TO SENSE THE PUMP OFF, PUMP ON, AND HIGH WATER ALARM CONDITION. FLOAT LEVEL SENSORS SHALL BE GOULD PUMP MODEL NO. A2-5 WITH SUFFICIENT CABLE AS REQUIRED FOR INSTALLATION.

EACH PANEL SHALL BE PROVIDED WITH HAND/OFF/AUTOMATIC SELECTOR SWITCH PUMP RUN LIGHT AND COUNTER.

PANEL SHALL INCLUDE EXTERNAL ALARM LIGHT AND ALARM HORN.

(A) 4" STATIC WATER LEVEL (PUMP OFF) = 135 GALS.
(B) 6" SEPARATION BETWEEN PUMP OFF LEVEL & PUMP INTAKE
(C) 13.5" SEPARATION BETWEEN PUMP ON & PUMP OFF LEVEL, YIELDING A DOSE VOLUME OF 420 GALS. (SET BY TIMER, 5 MIN.)
(D) 4" SEPARATION BETWEEN AUTO PUMP ON & HIGH WATER LEVEL
(E) 27.5" RESERVE STORAGE CAPACITY, IN CASE OF PUMP OR POWER FAILURE, EQUAL TO 857 GALS.

ALARM AND PUMP ARE TO BE LOCATED ON SEPARATE CIRCUIT BREAKERS

NO.	REVISION	BY	DATE

TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

E&LP
ENGINEERING & LAND PLANNING ASSOCIATES, INC.
6 EAST MAIN STREET CLINTON, NJ 08809
A PROFESSIONAL ASSOCIATION

LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

ERIC J. RAES P.E. LICENSE #24GE038823 — 5-30-08 DATE

DATE: 5/30/08		
PROJECT NO.: 8007	DESIGNED BY: WJI	CHECKED BY: JJC
FILENAME: DETAILS.DWG	SCALE: N.T.S.	SHEET NO. 10 OF 14

GENERAL NOTES:

1. ALL ELECTRIC WORK TO CONFORM TO EXPLOSION PROOF STANDARDS, NEC AND LOCAL ELECTRICAL CODES FOR MERCER COUNTY (HOPEWELL TWP.)
2. ALL FITTINGS ARE SCHEDULE 80 SOLVENT WELDED FOR PRESSURE CONDITIONS
3. SHOP DRAWINGS ARE TO BE SUBMITTED FOR ALL PUMP STATIONS, VALVE CHAMBERS AND CONTROL BUILDING COMPONENTS.

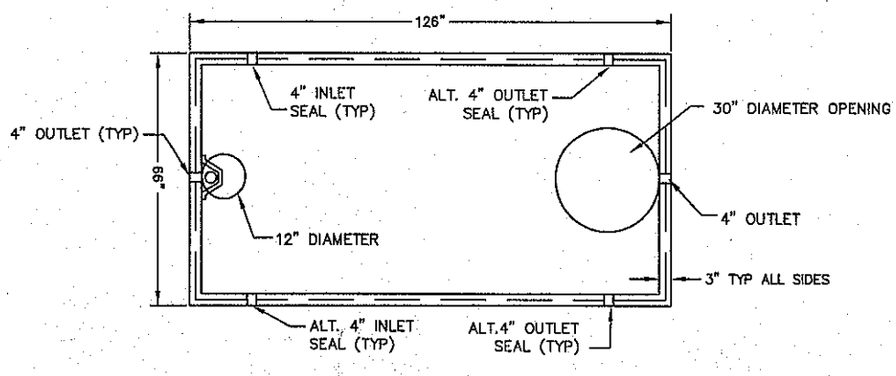
NOTES:

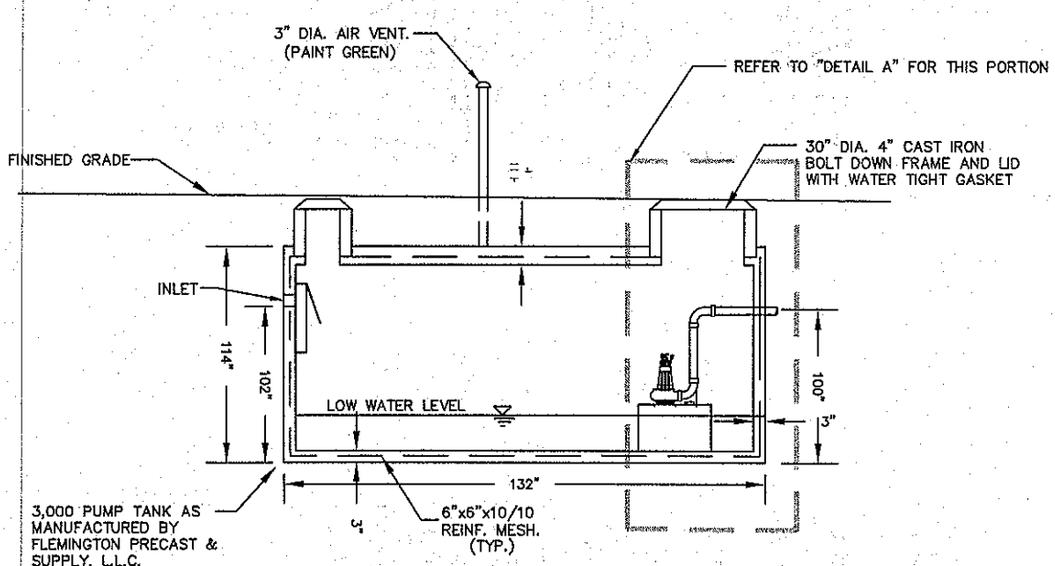
PUMP CHAMBER TO BE A 1500 GAL. SEPTIC TANK AS MANUFACTURED BY MODERN CONC., S.T. CO., OR APPROVED EQUAL MODIFICATIONS SHALL SPECIFY NO BAFFLES & BE WATERPROOF BY MANU. (4000 P.S.I. CONC.)

ALL INSIDE SURFACES TO BE COATED WITH 2 COATS HEAVY DUTY INERT MATERIAL, ACI 318-16-4.5.1 +4.5.2 STANDARD CERT. (DISPLAYED ON TANK).

ALL SWITCHES MUST BE CORROSION & HUMIDITY PROOF

ALL ELECT. MATERIALS & WORK SHALL CONFORM TO NA. ELECT. CODE NFPA 70-CURRENT ED. AND LOCAL CODES





3,000 GAL PUMP TANK

(NTS)

(WITH PUMP SYSTEM)

TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

E&LP

ENGINEERING & LAND PLANNING ASSOCIATES, INC.

6 EAST MAIN STREET CLINTON, NJ 08809

A PROFESSIONAL ASSOCIATION

LOCATION: FEDERAL CITY ROAD BLOCK 72 LOT 4 HOPEWELL TOWNSHIP MERCER COUNTY, NJ

ERIC J. RAES P.E. LICENSE #24GE038823 — DATE: 5.30.08

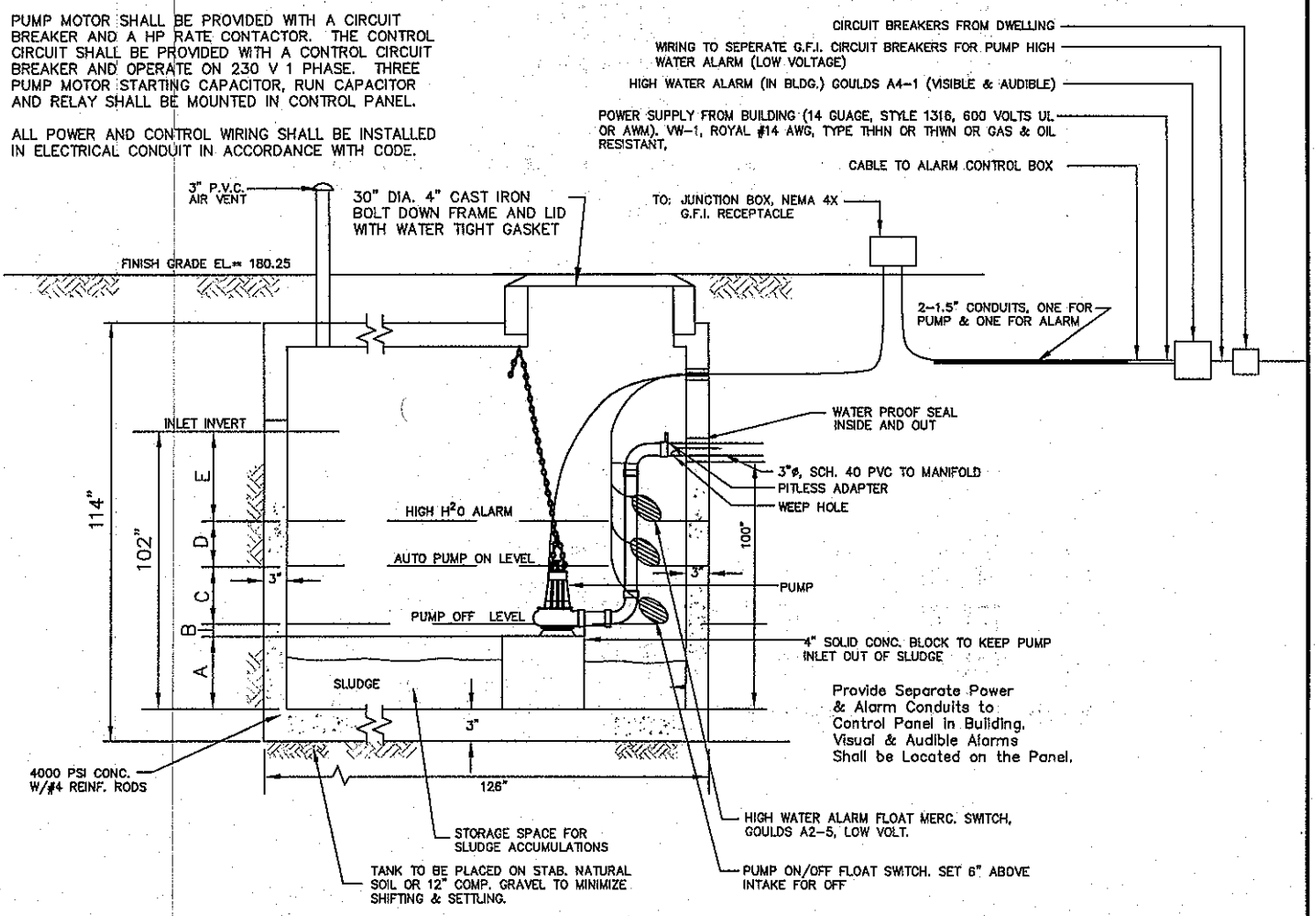
NO.	REVISION	BY	DATE

DATE: 5/30/08			
PROJECT NO.: 8007	DESIGNED BY: WJI	CHECKED BY: JJC	
FILENAME: DETAILS.DWG	SCALE: N.T.S.	SHEET NO. 11 OF 14	

POWER EQUIPMENT

PUMP MOTOR SHALL BE PROVIDED WITH A CIRCUIT BREAKER AND A HP RATE CONTACTOR. THE CONTROL CIRCUIT SHALL BE PROVIDED WITH A CONTROL CIRCUIT BREAKER AND OPERATE ON 230 V 1 PHASE. THREE PUMP MOTOR STARTING CAPACITOR, RUN CAPACITOR AND RELAY SHALL BE MOUNTED IN CONTROL PANEL.

ALL POWER AND CONTROL WIRING SHALL BE INSTALLED IN ELECTRICAL CONDUIT IN ACCORDANCE WITH CODE.



3,000 GAL. PUMP TANK
PUMP CHAMBER DETAIL A

N.T.S.

SIMPLEX PUMP CONTROL PANEL:

PROVIDE FLOAT LEVEL CONTROL SYSTEM TO AUTOMATICALLY CONTROL THE OPERATION OF THE PUMP AS REQUIRED BY INFLUENT FLOW. FLOAT SWITCHES ARE TO SENSE THE PUMP OFF, PUMP ON, AND HIGH WATER ALARM CONDITION. FLOAT LEVEL SENSORS SHALL BE GOULD PUMP MODEL NO. A2-5 WITH SUFFICIENT CABLE AS REQUIRED FOR INSTALLATION.

EACH PANEL SHALL BE PROVIDED WITH HAND/OFF/AUTOMATIC SELECTOR SWITCH PUMP RUN LIGHT AND COUNTER.

PANEL SHALL INCLUDE EXTERNAL ALARM LIGHT AND ALARM HORN.

PUMP SPECIFICATIONS

ELECTRIC SUBMERSIBLE PUMP
GOULDS MODEL WS2012BHF
DESIGN POINT 90 GPM @ 57.6' TDH, 2 HP 2" DISCHARGE, 1 PHASE 60 Hz ELECTRIC POWER.
PUMP SHALL BE AS MANUFACTURED BY GOULDS PUMP INC., SENECA FALLS, NY AND DISTRIBUTED BY PUMPING SERVICES INC. MIDDLESEX, NJ (732) 469-4540.

(A) 4" STATIC WATER LEVEL (PUMP OFF) = 135 GALS.
(B) 6" SEPARATION BETWEEN PUMP OFF LEVEL & PUMP INTAKE
(C) 16.25" SEPARATION BETWEEN PUMP ON & PUMP OFF LEVEL, YIELDING A DOSE VOLUME OF 506 GALS. (SET BY TIMER, 5 MIN.)
(D) 4" SEPARATION BETWEEN AUTO PUMP ON & HIGH WATER LEVEL
(E) 71.75" RESERVE STORAGE CAPACITY, IN CASE OF PUMP OR POWER FAILURE, EQUAL TO 2,236 GALS.

ALARM AND PUMP ARE TO BE LOCATED ON SEPARATE CIRCUIT BREAKERS

NO.	REVISION	BY	DATE

TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

E&LP
ENGINEERING & LAND PLANNING ASSOCIATES, INC.
6 EAST MAIN STREET CLINTON, NJ 08809
A PROFESSIONAL ASSOCIATION

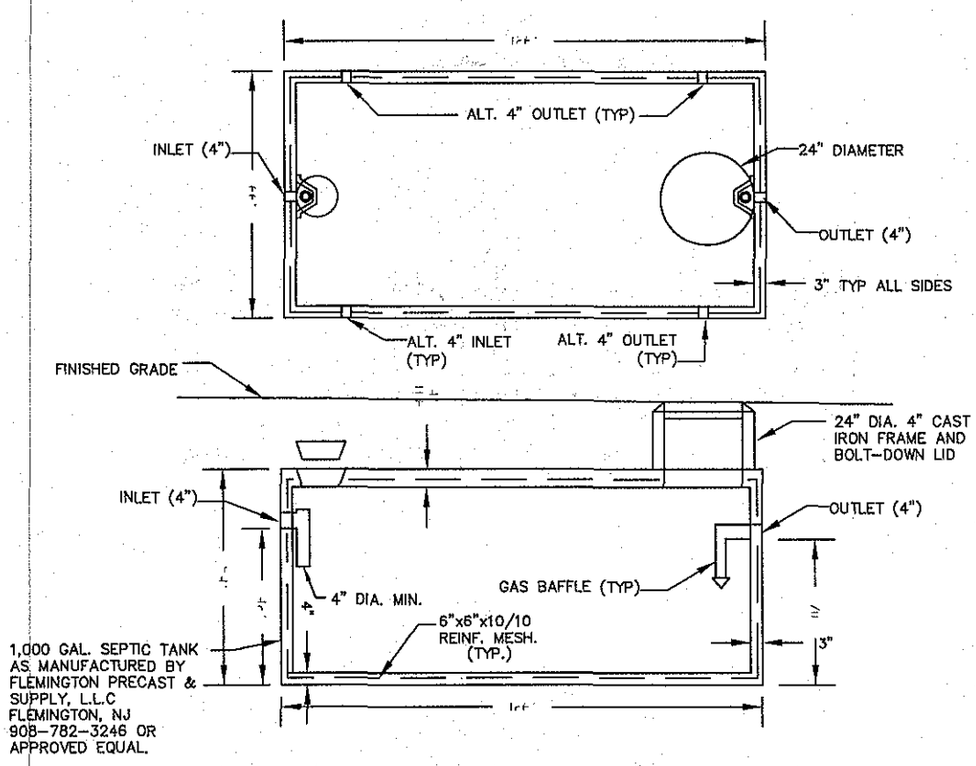
LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

DATE: 5/30/08

ERIC J. RAES P.E. LICENSE #24GE038823 — 5.30.08 DATE

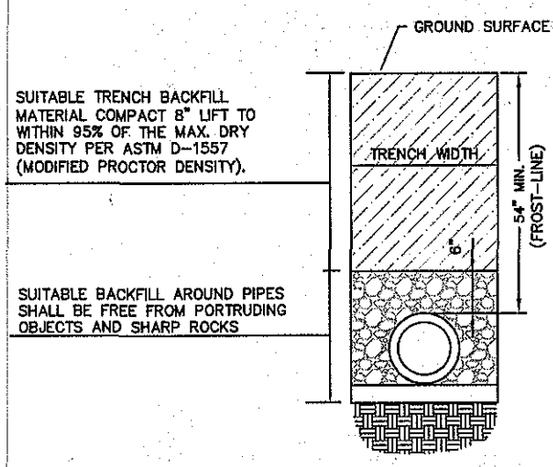
PROJECT NO.: 8007 | DESIGNED BY: WJI | CHECKED BY: JJC

FILENAME: DETAILS.DWG | SCALE: N.T.S. | SHEET NO. 12 OF 14



1,000 GAL SEPTIC TANK
(TO BE INSTALLED AT STABLES/OFFICE BUILDING)

(NTS)



NOTE:

1. TRENCH WIDTH SHALL BE A MINIMUM OF 1' EACH SIDE PLUS THE OUTSIDE DIAMETER OF THE PIPE. TRENCH WIDTH SHALL NOT EXCEED THAT REQUIRED FOR PROPER INSTALLATION BACKFILL AND COMPACTION OPERATIONS.
2. SUITABLE BACKFILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO INSTALLATION.
3. WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT, THE PAVEMENT SHALL BE MECHANICALLY CUT. PATCHING SHALL CONSIST OF TACKING EDGES OF EXISTING PAVEMENT.

TYPICAL TRENCH DETAIL FOR PRESSURIZED PVC PIPE
(FROM 3,000 GAL. PUMP TANK TO FIELD)

NOT TO SCALE

NO.	REVISION	BY	DATE

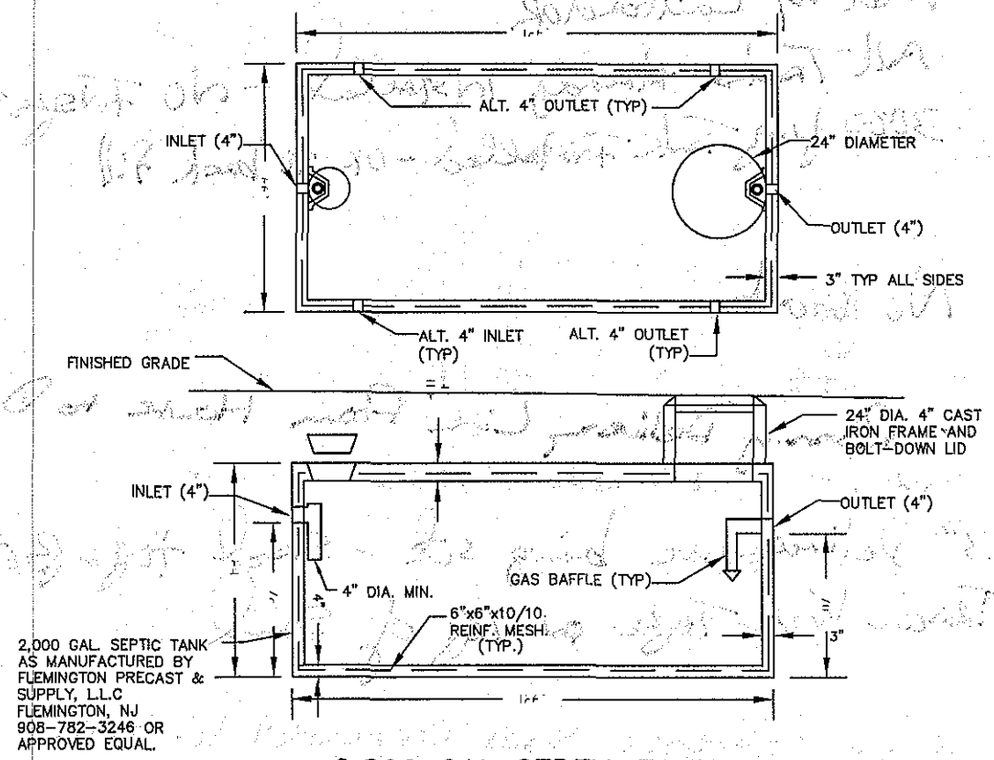
TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

E&LP
ENGINEERING & LAND PLANNING ASSOCIATES, INC.
6 EAST MAIN STREET CLINTON, NJ 08809
A PROFESSIONAL ASSOCIATION

LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

ERIC J. RAES P.E. LICENSE #24GE038823 — DATE: 5-30-08

DATE: 5/30/08			
PROJECT NO.: 8007	DESIGNED BY: WJI	CHECKED BY: JJC	
FILENAME: DETAILS.DWG	SCALE: N.T.S.	SHEET NO. 13 OF 14	



2,000 GAL SEPTIC TANK
(TO BE INSTALLED AT STABLES/OFFICE BUILDING)

(NTS)

NO.	REVISION	BY	DATE

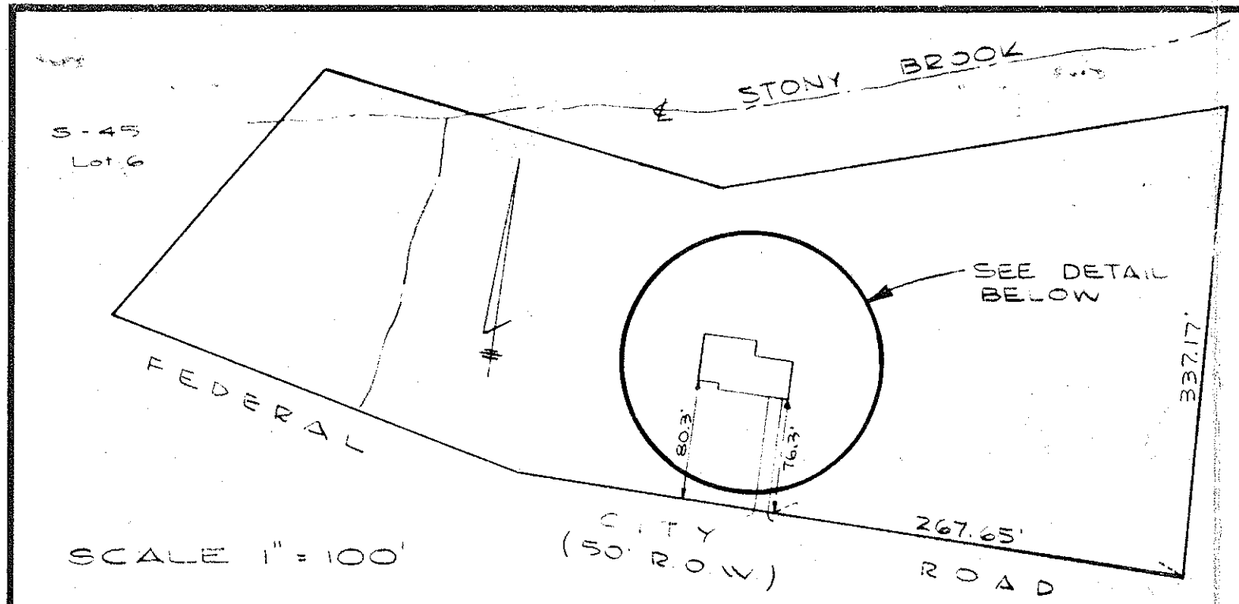
TITLE: MERCER COUNTY EQUESTRIAN CENTER
SEWAGE DISPOSAL SYSTEM
HOPEWELL TOWNSHIP, MERCER COUNTY, NJ

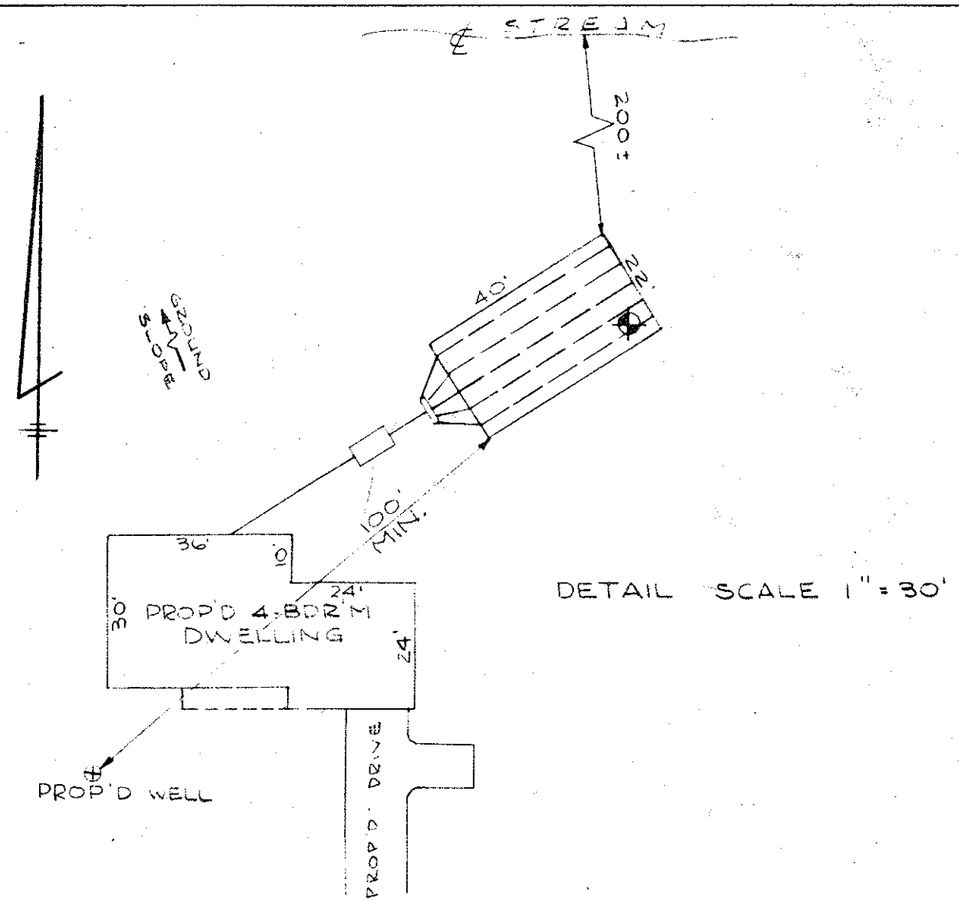
E&LP
ENGINEERING & LAND PLANNING ASSOCIATES, INC.
6 EAST MAIN STREET CLINTON, NJ 08809
A PROFESSIONAL ASSOCIATION

LOCATION:
FEDERAL CITY ROAD
BLOCK 72 LOT 4
HOPEWELL TOWNSHIP
MERCER COUNTY, NJ

ERIC J. RAES P.E. LICENSE #24GE038823 — DATE 5-30-08

DATE: 5/30/08			
PROJECT NO.: 8007	DESIGNED BY: WJI	CHECKED BY: JJC	
FILENAME: DETAILS.DWG	SCALE: N.T.S.	SHEET NO. 14 OF 14	





DETAIL SCALE 1" = 30'

BEING LOT 12 SECT. 45, HOPEWELL TWP. TAX MAPS

DISPOSAL SYSTEM

1250 GAL. REIN. CONC. SEPTIC TANK
1 TO 5 CONC. DISTRIBUTION BOX

DISPOSAL BED (22'×40')

200 L.F. ~ 4" V.C. PIPE
4' O.C., SLOPE 1" IN 50'
12" TOPSOIL (MAX.)
2" SALT HAY (MIN.)
1½" CRUSHED STONE
6" OVER PIPE
12" UNDER PIPE

BED BOTTOM TO BE LEVEL AND UNTAMPED

✦ TEST LOCATION - RESULT 20 MIN./IN. (12/17/69)

INSPECTION BY THE DESIGN ENGINEER OF THE DISPOSAL SYSTEM DURING CONSTRUCTION IS AVAILABLE AT A FEE UPON REQUEST.

SOIL LOG

0"-4"	TOPSOIL
4"-36"	RED SHALE

TO ALL PERSONS AND PARTIES IN INTEREST:

THIS PLAN WAS PREPARED FOR A FEE, FOR THE PERSONS AND PURPOSES INDICATED HEREON. ANY OTHER USE OF THIS PLAN (OR COPIES, OR ALTERATIONS OF IT NOT IMPRESSED WITH THE SEAL OF THE LICENSED ENGINEER, OR SURVEYOR WHO PREPARED THIS PLAN) ARE NOT THE RESPONSIBILITY OF THE UNDERSIGNED.

REFFRENCE TO RECORDED PLATS, ETC. HEREON IS FOR IDENTIFICATION ONLY AND IS NOT TO BE CONSTRUED AS A GUARANTEE OF THE ACCURACY OR COMPLETENESS OF THE DESCRIPTION OF THE PREMISES IN QUESTION.

REF. 46-88

Thomas Tyler Moore
P.E. & L.S. #1517

THOMAS TYLER MOORE ASSOCIATES, INC.
PROFESSIONAL ENGINEERS AND LAND SURVEYORS
TRENTON NEW JERSEY

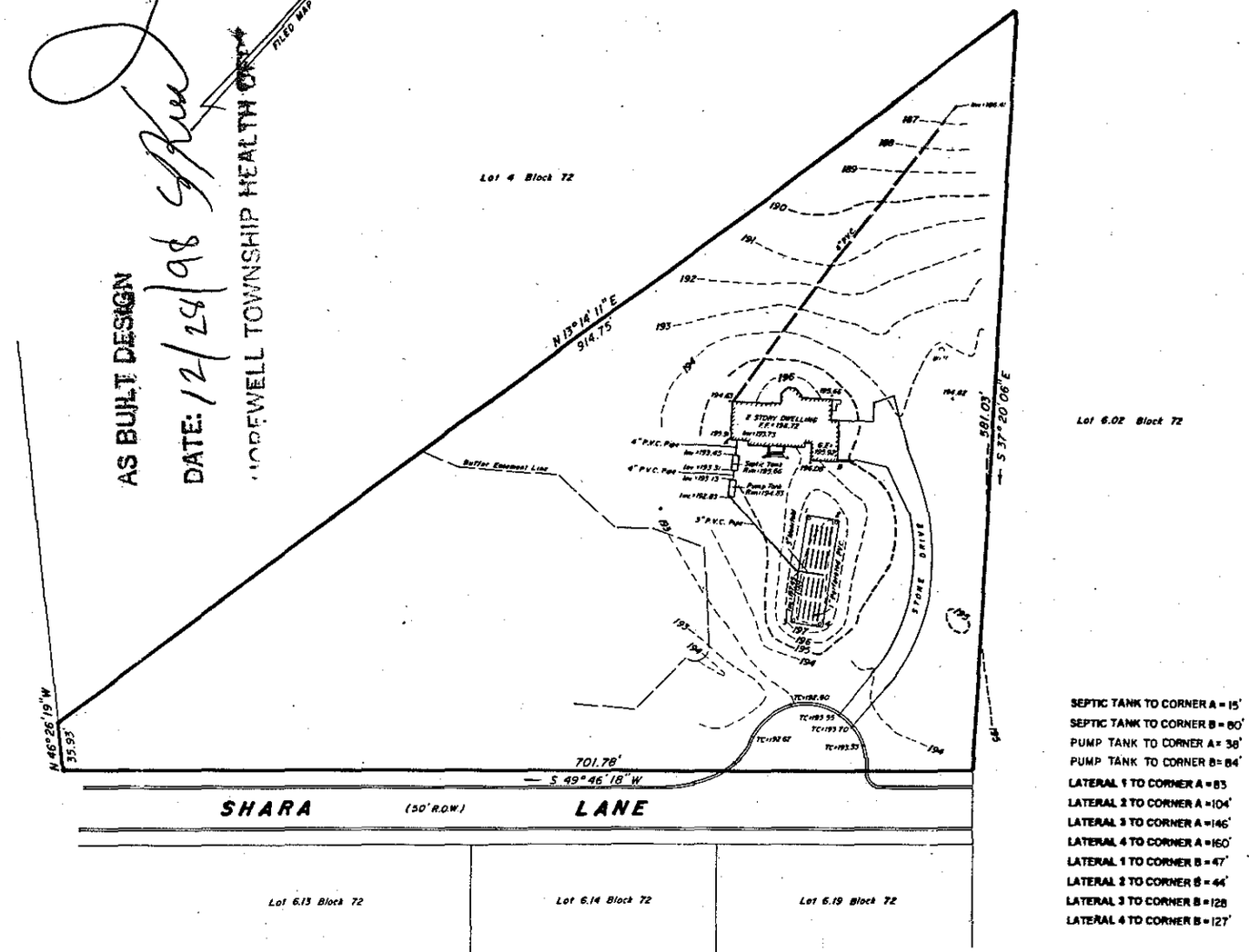
PROPOSED DWELLING
AND WELL LOCATION
& SEPTIC SYSTEM LOCATION & DESIGN
FOR
ALEXANDER F SCHAAFSMA, et ux
OF
LANDS SITUATE IN
TOWNSHIP OF HOPEWELL, MERCER Co., N.J.

date	1/9/70
scale	AS SHOWN
fld bk	300
pg	50
drwn.	TMT
ck'd	FOC
project no.	6-487-0
file no.	300-F-06

BRUNING 40-21 11193

RECEIVED
DEC 28 1998
Hopewell Township Health Dept.

AS BUILT DESIGN
DATE: 12/29/98
HOPEWELL TOWNSHIP HEALTH DEPT.
FILED MAP



SEPTIC TANK TO CORNER A = 15'
SEPTIC TANK TO CORNER B = 80'
PUMP TANK TO CORNER A = 38'
PUMP TANK TO CORNER B = 84'
LATERAL 1 TO CORNER A = 83
LATERAL 2 TO CORNER A = 104'
LATERAL 3 TO CORNER A = 146'
LATERAL 4 TO CORNER A = 160'
LATERAL 1 TO CORNER B = 47'
LATERAL 2 TO CORNER B = 44'
LATERAL 3 TO CORNER B = 128
LATERAL 4 TO CORNER B = 127'

TRENTON ENGINEERING CO., INC.
PROFESSIONAL ENGINEERS AND SURVEYORS
ESTABLISHED 1901
2193 SPRUCE STREET TRENTON, N.J. 08638
TEL NO. 609 883 0616

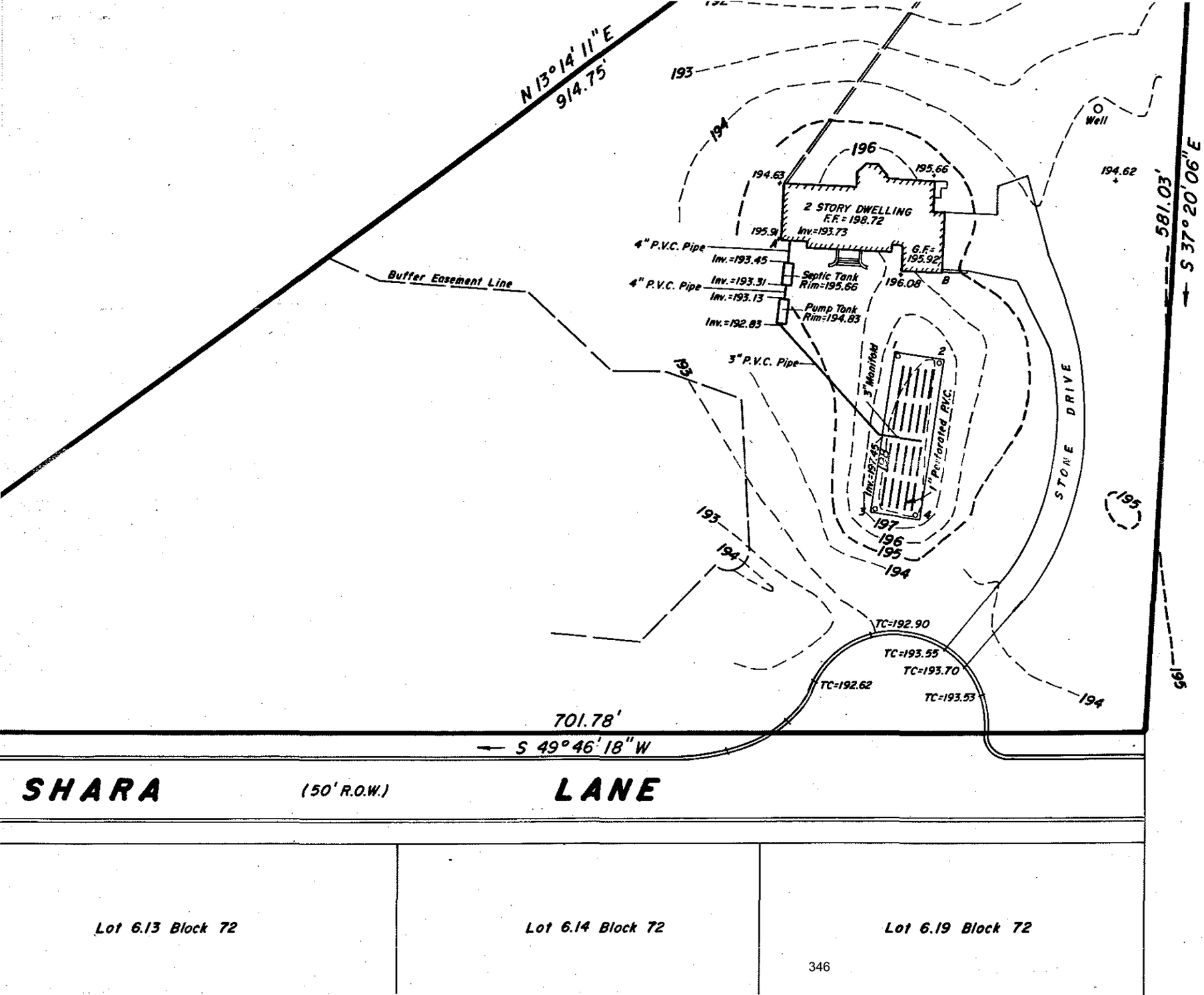
W C STRATTON P E & L S N J 3170 PA 173432
W A STAMAN P E & L S N J 29403
W M DITMARS L S N J 27523 PA 28449
D F STRATTON L S N J 27523

DAVID F. STRATTON
L.S. N.J. 27523

David F. Stratton
DATE

FINAL GRADING AND SEPTIC AS BUILT PLAN
OF
Lot 6.18 Block 72
FOR
David F. & Patricia E. Erkoboni
IN
HOPEWELL TOWNSHIP
MERCER COUNTY, N.J.

REV.	
DATE	5-21-98
INV.	39343
DRAWN BY	A.G.
SCALE	
FB.	PG.
FILE	90-888



SEPTIC TANK TO CORNER A = 15'
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PUMP TANK TO CORNER A = 38'
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LATERAL 2 TO CORNER B = 44'
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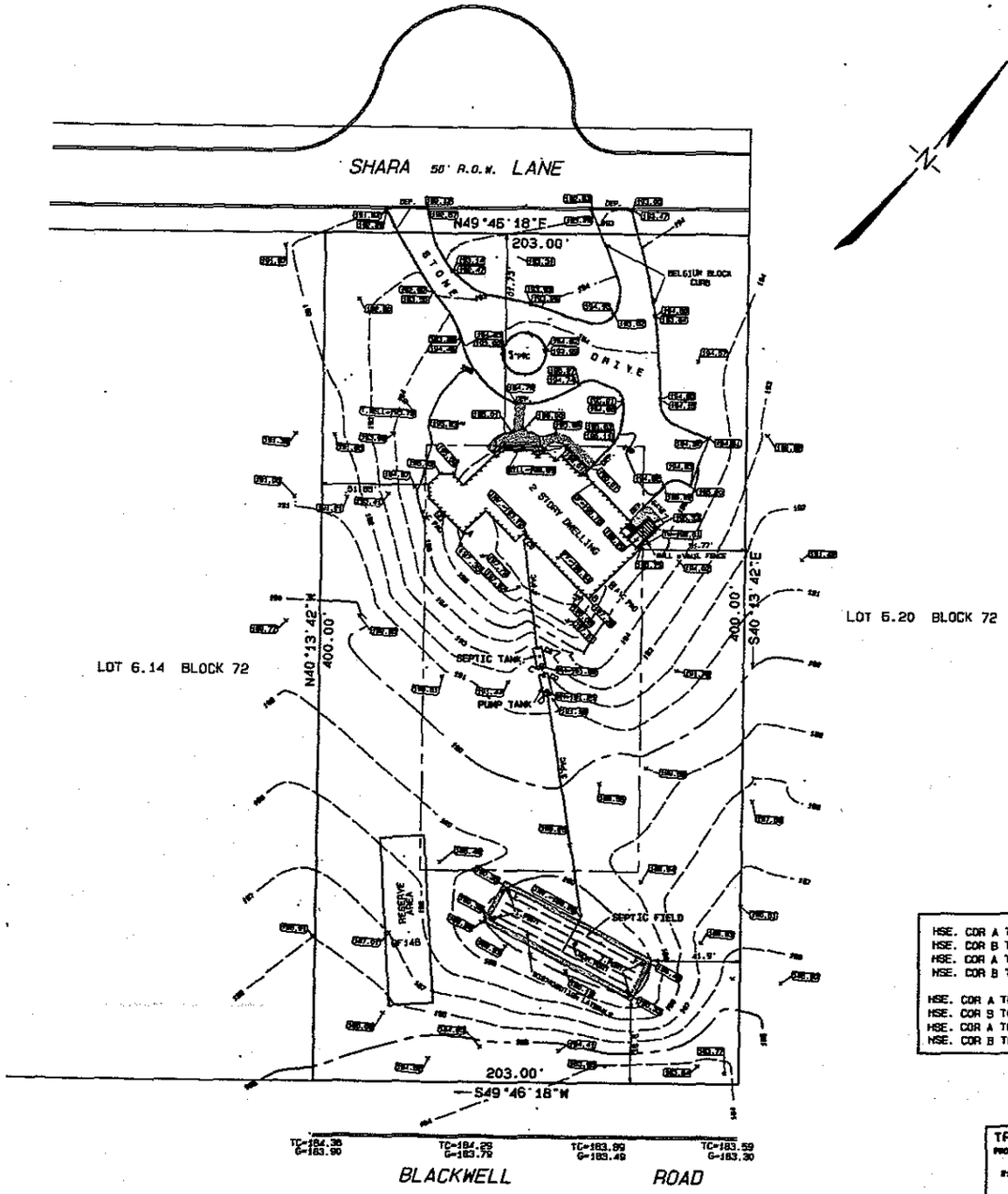


AS - BUILT DESIGN APPROVED

DATE: 12-28-01

HOPEWELL TOWNSHIP HEALTH DEPT.

HSE. COR A TO M.H. C - 72.6'	M.H. - SEPTIC TANK
HSE. COR B TO M.H. C - 38.3'	
HSE. COR A TO M.H. D - 84.2'	M.H. - PUMP TANK
HSE. COR B TO M.H. D - 47.5'	
HSE. COR A TO I.P. E - 169.8'	I.P. - SEPTIC FIELD
HSE. COR B TO I.P. E - 142.1'	
HSE. COR A TO I.P. F - 220.3'	I.P. - SEPTIC FIELD
HSE. COR B TO I.P. F - 173.7'	

TRENTON ENGINEERING CO., INC.
PROFESSIONAL ENGINEERS, PLANNERS AND LAND SURVEYORS
ESTABLISHED 1887
2150 LAWRENCE STREET TRENTON, N.J. 08638
TEL. NO. 609-882-0865
FAX. NO. 609-882-0864

DAVID F. STRATTON
L.S.N.J. 27523

12-18-01

AS BUILT SEPTIC AND GRADING PLAN

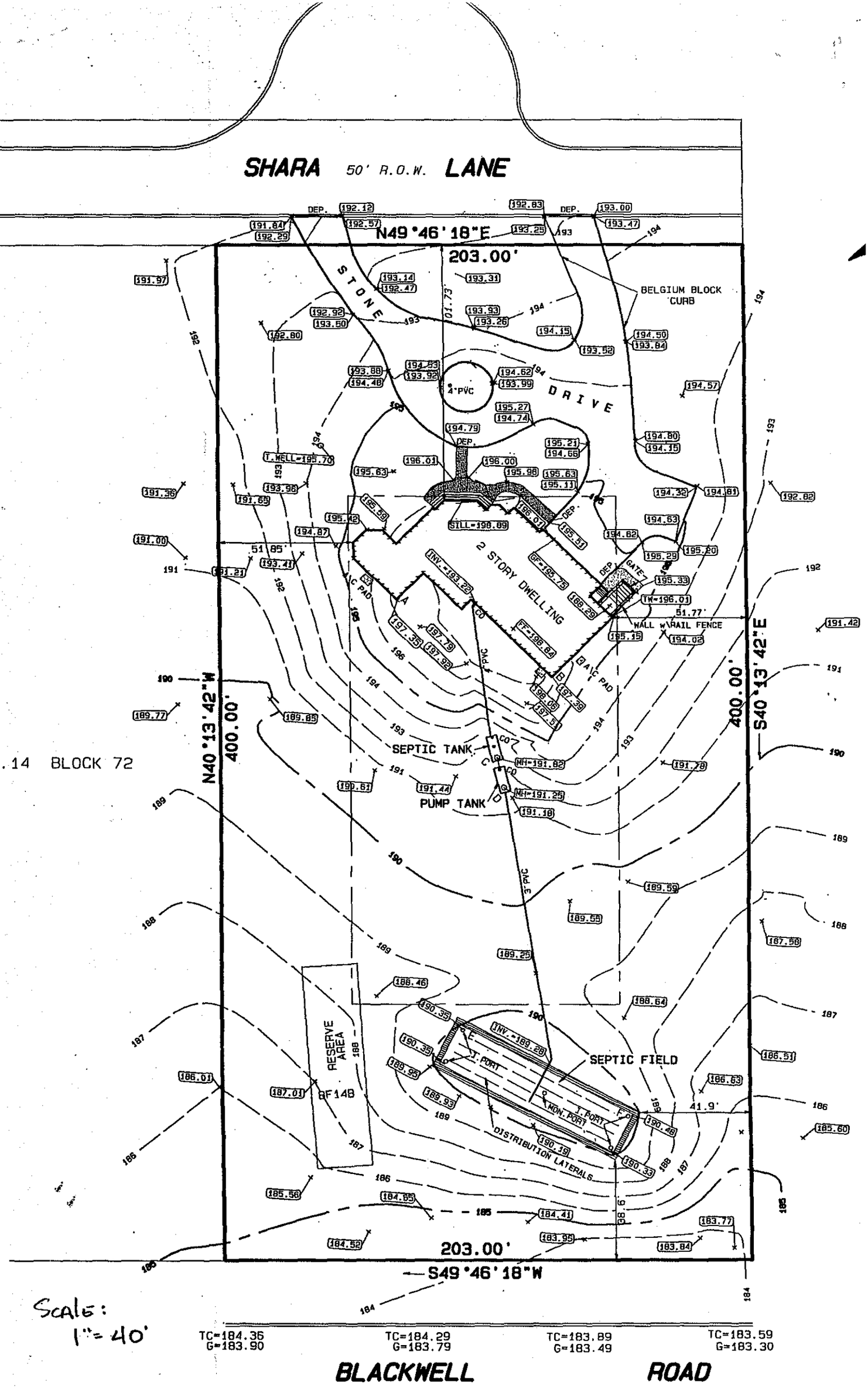
for

JOHN KULPINSKI

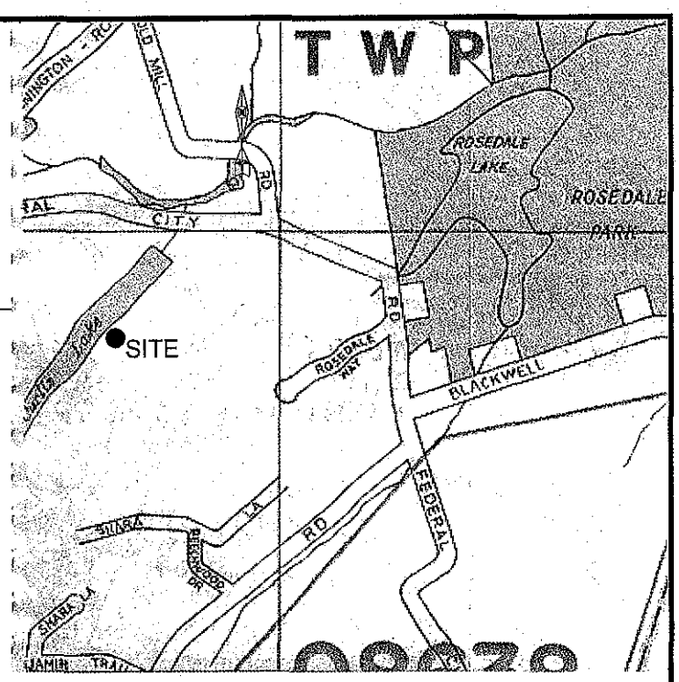
in

HOPEWELL TOWNSHIP
MERCER COUNTY, N.J.

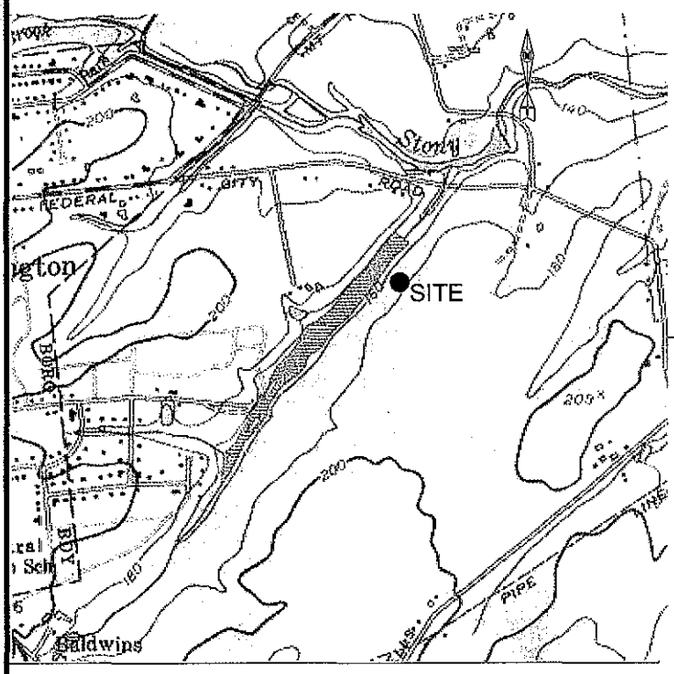
TAX MAP DATA		
LOT	BLOCK	PARC
6.19	72	19
DATE 12-18-01		
INV. 40020		
DRAWN BY: DS		
SCALE 1"=40'		
FB.1040 PG.		
FILE 90-88D		


SHARA 50' R.O.W. LANE
N49°46'18"E
203.00'
STONE DRIVE
BELGIUM BLOCK CURB
2 STORY DWELLING
SEPTIC TANK
PUMP TANK
SEPTIC FIELD
RESERVE AREA
BF14B
DISTRIBUTION LATERALS
WALL W/RAIL FENCE
GATE
51.85'
51.77'
41.9'
N40°13'42"W
400.00'
S40°13'42"E
400.00'
203.00'
S49°46'18"W
.14 BLOCK 72
Scale: 1"=40'
TC=184.36 G=183.90
TC=184.29 G=183.79
TC=183.89 G=183.49
TC=183.59 G=183.30
BLACKWELL ROAD

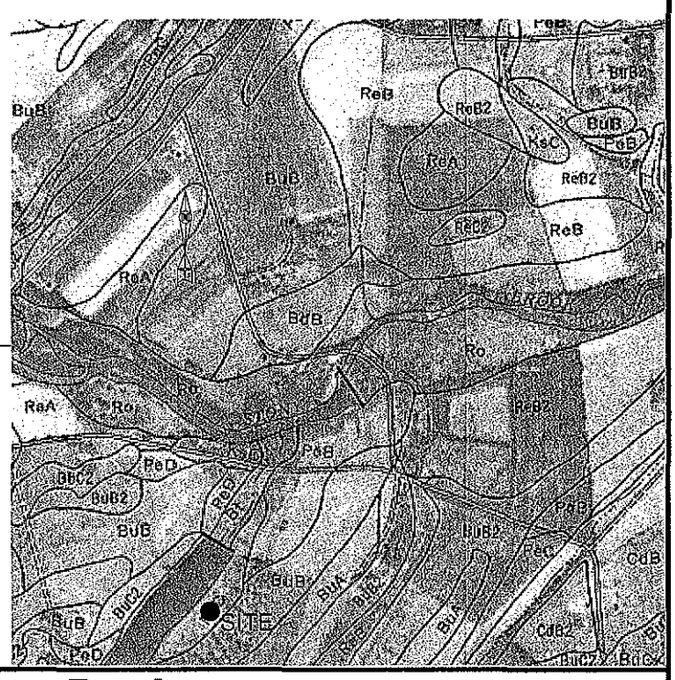
SITE MAP
1:26,000



USGS PENNINGTON, NJ QUADRANGLE
1:24,000



USDA MERCER COUNTY SOIL SURVEY
1:15,840



Septic System Design
Key Maps

Ronald Weinberger | Block 72, Lot 72.01 | Hopewell Township, Mercer County, New Jersey | 451 Federal City Road

DRAWN BY:	DESIGNED BY:	CHECKED BY:	DWG NO.	BRE JOB#:	SCALE:	DATE:	SHEET:
WMJ	WMJ	SMR	WEI-2	03-506	As Noted	December 15, 2003	2 of 9

STEPHEN M. RISSE, P.E.
New Jersey Professional Engineer License No. GE34795

BAYER–RISSE ENGINEERING, INC.
148 MAIN STREET, P.O. BOX 131
LEBANON, NEW JERSEY 08833-0131
PHONE 908-236-2255 FAX. 908-236-2232
Certificate of Authorization No. 24GA27943900

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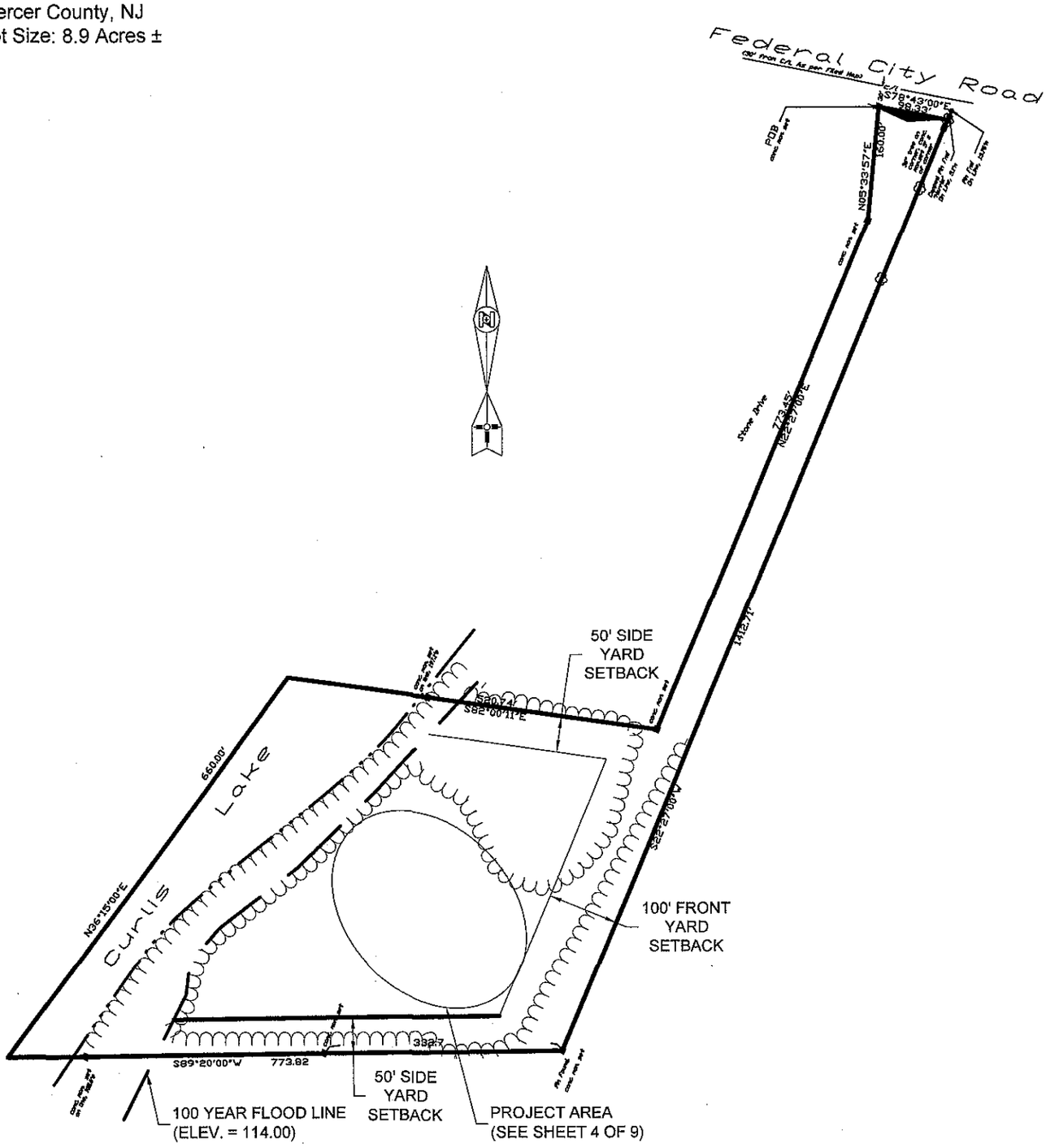
451 Federal City Road
Block 72, Lot 72.01
Hopewell Township
Mercer County, NJ
Lot Size: 8.9 Acres ±



Graphic Scale

1" = 200'

Update with 2nd Pit Bail Test in Reserve Area	04/30/07	SMR
REVISION DESCRIPTION	DATE	APPROVED

Septic System Design
Existing Conditions

Ronald Weinberger *Block 72, Lot 72.01* *Hopewell Township, Mercer County, New Jersey* *451 Federal City Road*

DRAWN BY:	DESIGNED BY:	CHECKED BY:	DWG NO.	BRE JOB#:	SCALE:	DATE:	SHEET:
WMJ	WMJ	SMR	WEI-3	03-506	As Noted	December 15, 2003	3 of 9

STEPHEN M. RISSE, P.E.
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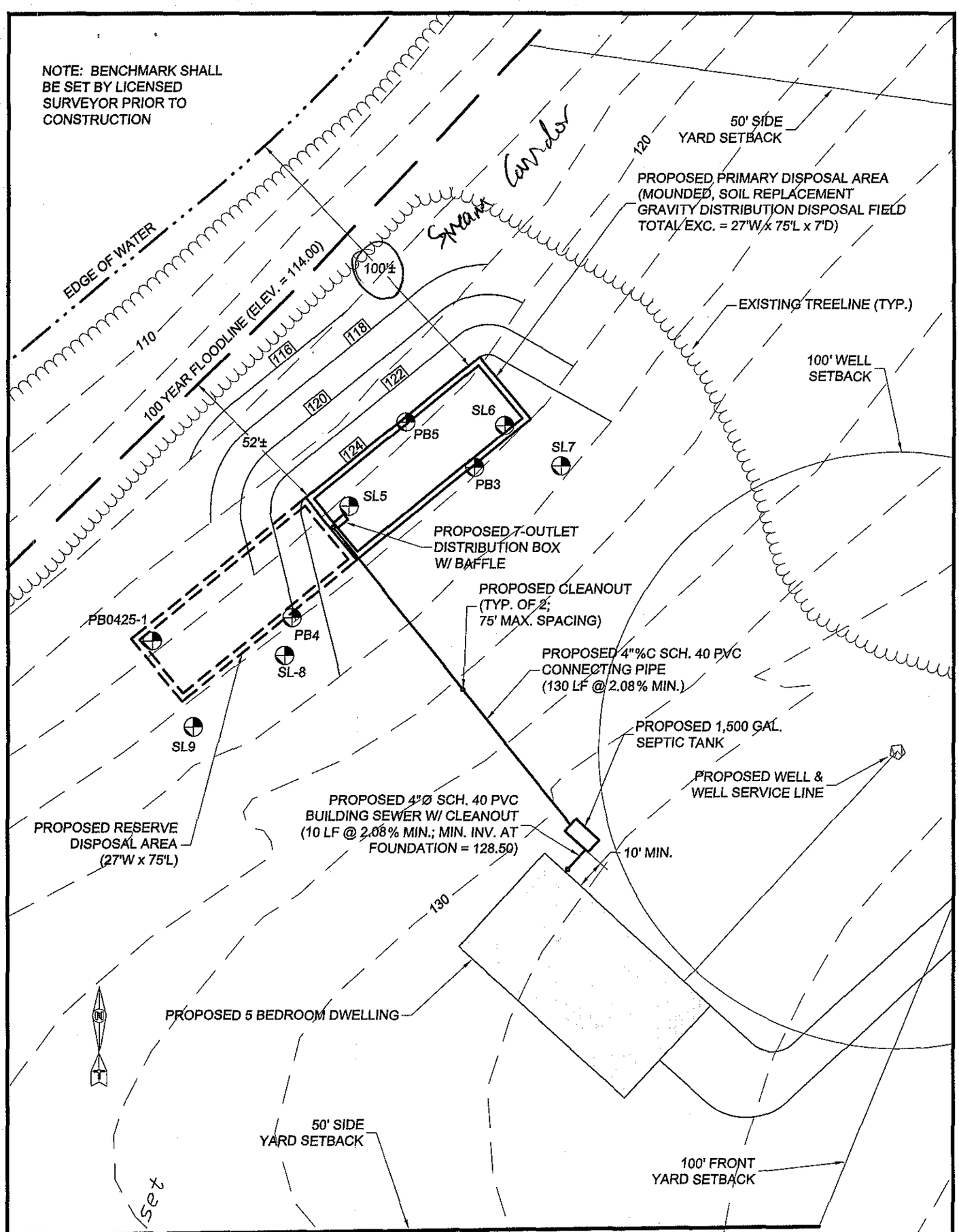

Update with 2nd Pit Bail Test in Reserve Area	04/30/07	SMR
REVISION DESCRIPTION	DATE	APPROVED

Graphic Scale

1" = 40'

Septic System Design
Proposed Conditions

Ronald Weinberger Block 72, Lot 72.01 Hopewell Township, Mercer County, New Jersey 451 Federal City Road

DRAWN BY:	DESIGNED BY:	CHECKED BY:	DWG NO.	BRE JOB#:	SCALE:	DATE:	SHEET:
WMJ	WMJ	SMR	WEI-4	03-506	As Noted	December 15, 2003	4 of 9

STEPHEN M. RISSE, P.E.
New Jersey Professional Engineer License No. GE34795

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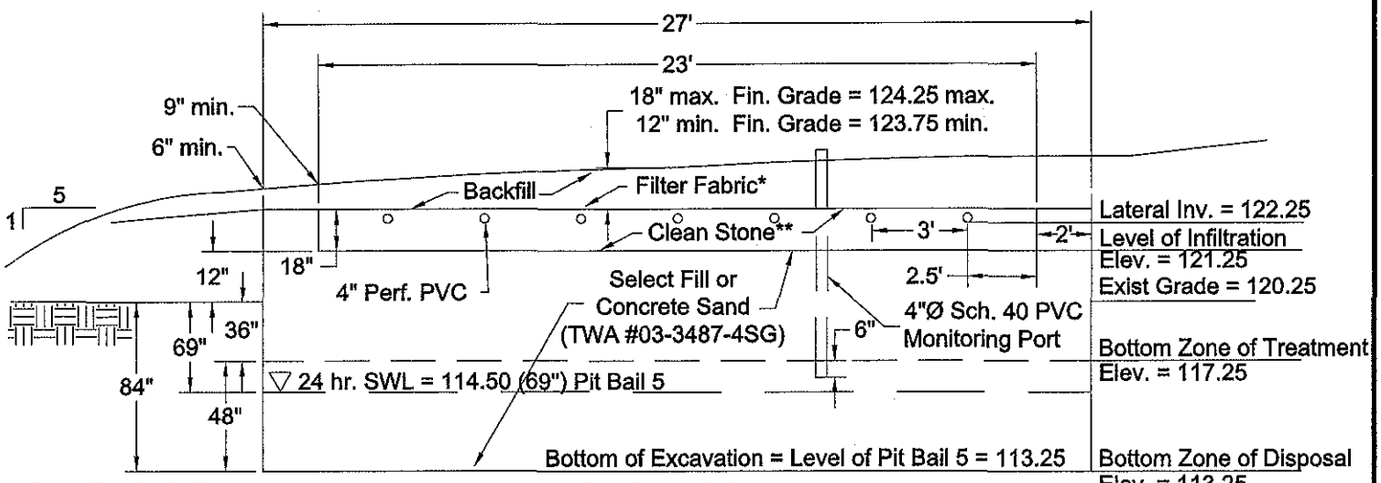
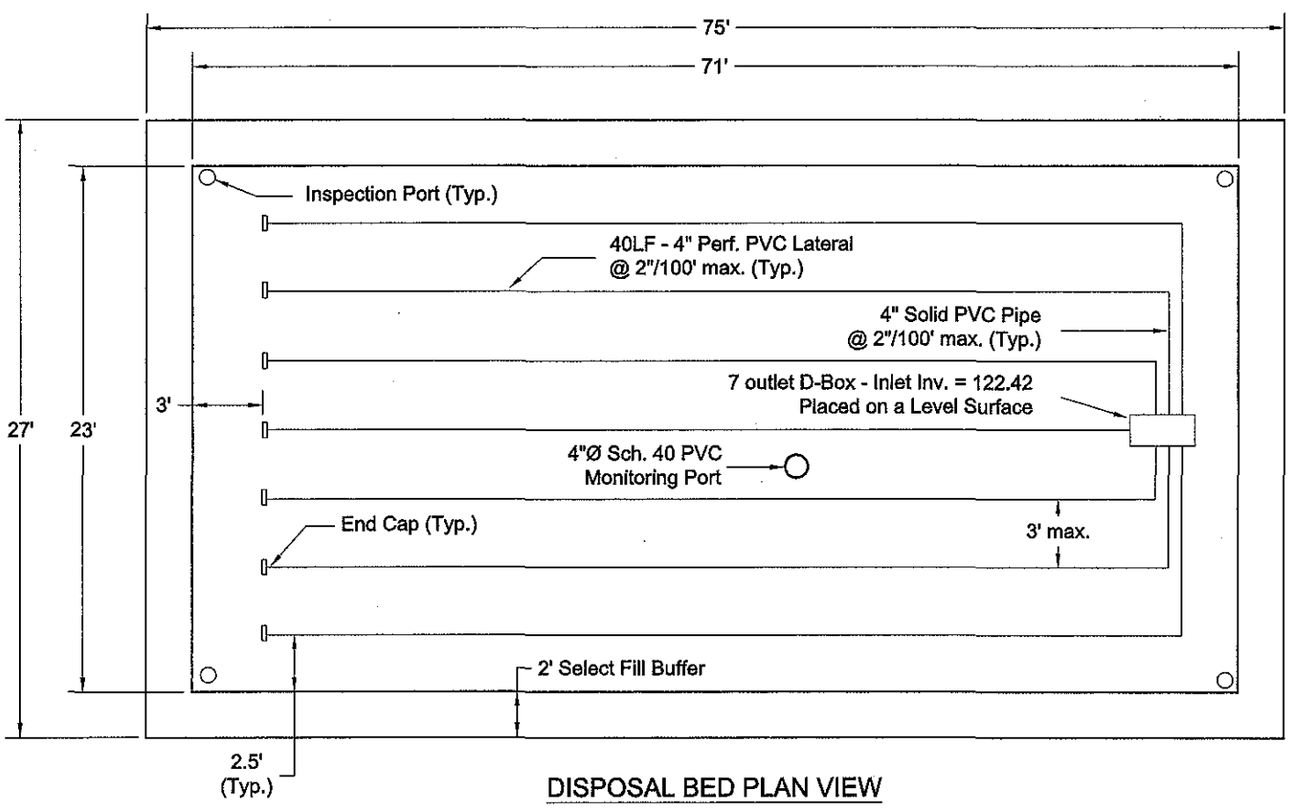


*Filter Fabric shall be a non-woven geotextile product (See General Note #18).
**Clean filter stone shall be NJDOT #3, 4, or 24 (See General Note #22)

DISPOSAL FIELD SECTION VIEW
Not to Scale



DISPOSAL BED PLAN VIEW
Not To Scale

Update with 2nd Pit Bail Test in Reserve Area	04/30/07	SMR
REVISION DESCRIPTION	DATE	APPROVED

Septic System Design
Disposal Field Details

Ronald Weinberger *Block 72, Lot 72.01* *Hopewell Township, Mercer County, New Jersey* *451 Federal City Road*

DRAWN BY:	DESIGNED BY:	CHECKED BY:	DWG NO.	BRE JOB#:	SCALE:	DATE:	SHEET:
WMJ	WMJ	SMR	WEI-5	03-506	As Noted	December 15, 2003	5 of 9

STEPHEN M. RISSE, P.E.
New Jersey Professional Engineer License No. GE34795

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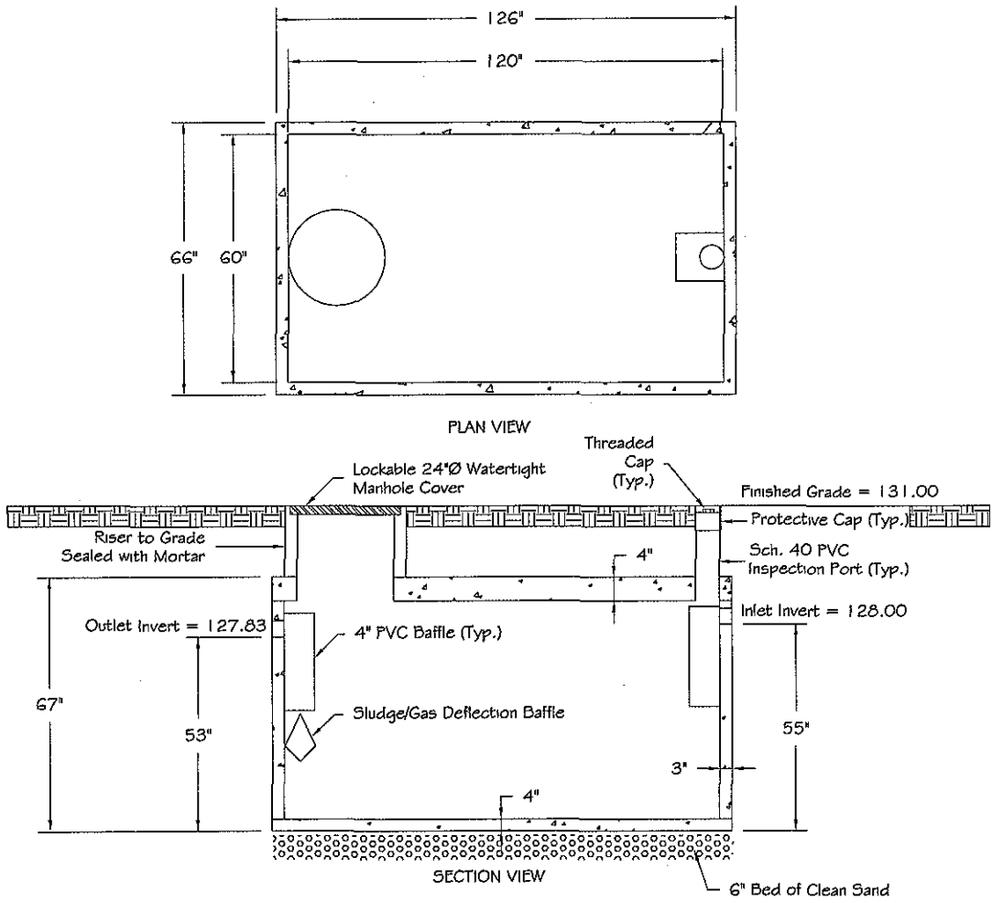

NJ 1,500 GALLON SEPTIC TANK

Not to Scale

By Flemington Septic Tank Co.

Update with 2nd Pit Bail Test in Reserve Area	04/30/07	SMR
REVISION DESCRIPTION	DATE	APPROVED

Septic System Design
Septic Tank Details

Ronald Weinberger *Block 72, Lot 72.01* *Hopewell Township, Mercer County, New Jersey* *451 Federal City Road*

DRAWN BY:	DESIGNED BY:	CHECKED BY:	DWG NO.	BRE JOB#:	SCALE:	DATE:	SHEET:
WMJ	WMJ	SMR	WEI-6	03-506	As Noted	December 15, 2003	6 of 9

STEPHEN M. RISSE, P.E.
New Jersey Professional Engineer License No. GE34795

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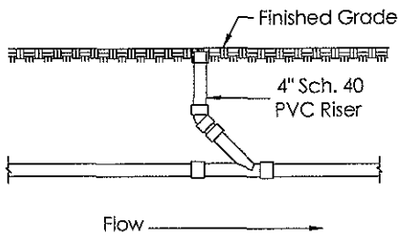
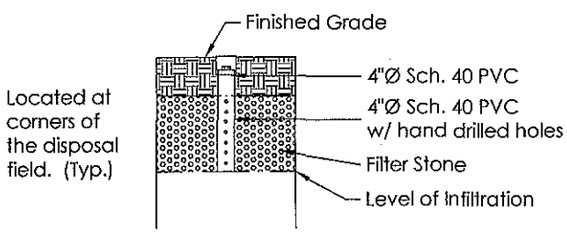
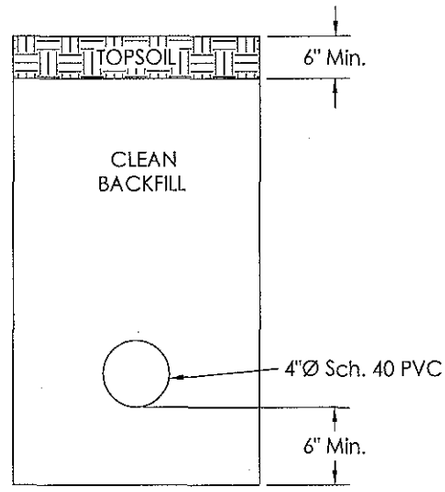


CLEAN OUT DETAIL
Not To Scale

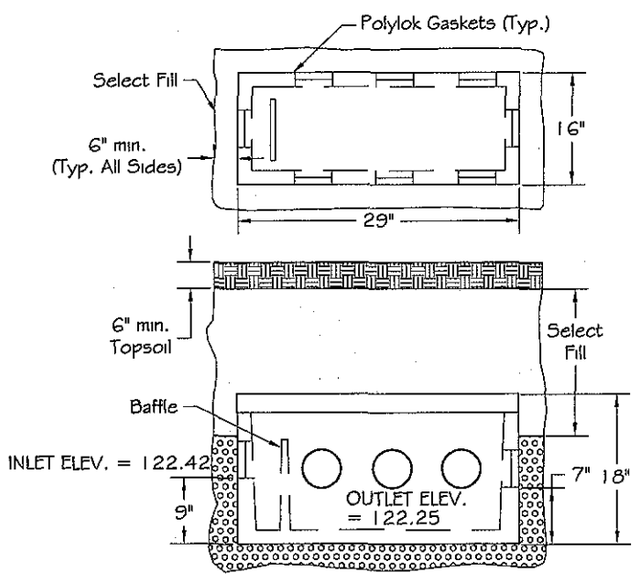


INSPECTION PORT DETAIL
Not To Scale



Note:
Clean Backfill shall be free of large stone and objectionable material. Clean Backfill shall be compacted in 12" max. lifts.

PIPE BEDDING DETAIL
Not To Scale



7-OUTLET DISTIBUTION BOX w/ BAFFLE
Not To Scale

*Not Intended for Construction Vehicles to drive on or over

Update with 2nd Pit Bail Test in Reserve Area	04/30/07	SMR
REVISION DESCRIPTION	DATE	APPROVED

Septic System Design
Piping Details

Ronald Weinberger *Block 72, Lot 72.01* *Hopewell Township, Mercer County, New Jersey* *451 Federal City Road*

DRAWN BY:	DESIGNED BY:	CHECKED BY:	DWG NO.	BRE JOB#:	SCALE:	DATE:	SHEET:
WMJ	WMJ	SMR	WEI-7	03-506	As Noted	December 15, 2003	7 of 9

STEPHEN M. RISSE, P.E.
New Jersey Professional Engineer License No. GE34795

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148 MAIN STREET, P.O. BOX 131
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1) DESIGN FLOW

- Proposed five (5) bedroom dwelling
- First bedroom @ 200 gpd
- 4 additional bedroom(s) @ 150 gpd / bedroom = 600 gpd
- *Proposed Design Flow = 800 gpd*

2) DISPOSAL FIELD AND SEPTIC TANK SIZING

(a) The disposal field is a mounded, soil replacement disposal bed system. N.J.A.C. 7:9A 10.2(c) requires a minimum of 1.61 square feet per gallon per day for this type of system. The Hopewell Township Health Department requires a minimum increase of 25% over the design rate.

800 gpd x 1.61 ft^2/gpd x 25% = 1610 ft^2
Use a 23 ft x 71 ft disposal bed = 1633 ft^2. Provide 2-ft select fill buffer around bed
Overall disposal bed area with Buffer = 27 ft x 75 ft = 2025 ft^2

Use one gravity distribution system with seven (7) - four inch diameter (4" dia.) perforated PVC laterals, 46 ft long on 3 ft centers (see detail). One 7-outlet distribution box shall be installed on a level surface to distribute the effluent evenly to the laterals.

(b) N.J.A.C. 7:9A-8.2b(1) is used to size the septic tank with a 250 gallon increase in the total required capacity per the Hopewell Township Health Department. The septic tank is a 1,500 gallon, single compartment concrete septic tank which meets the requirements of N.J.A.C. 7:9A-8.2h and 7:9A-8.2i(4). The new septic tank shall be fit with inspection ports, septic solids retainer, and a riser flush with grade. (See Septic Tank Detail)

(c) Inspection ports shall be placed in the disposal field and shall extend down to the level of infiltration.

(d) A cleanout shall be placed a maximum of 5 feet prior to the distribution box.

(e) A 4" dia. sch. 40 PVC monitoring port shall be placed in the disposal field and shall extend six inches (6") below the bottom of the zone of treatment.

Update with 2nd Pit Bail Test in Reserve Area	04/30/07	SMR
REVISION DESCRIPTION	DATE	APPROVED

Septic System Design
Design Notes

Ronald Weinberger *Block 72, Lot 72.01* *Hopewell Township, Mercer County, New Jersey* *451 Federal City Road*

DRAWN BY:	DESIGNED BY:	CHECKED BY:	DWG NO.	BRE JOB#:	SCALE:	DATE:	SHEET:
WMJ	WMJ	SMR	WEI-8	03-506	As Noted	December 15, 2003	8 of 9

STEPHEN M. RISSE, P.E.
New Jersey Professional Engineer License No. GE34795

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GENERAL NOTES:

1. This Wastewater disposal system has been designed in accordance with the requirements of *N.J.A.C. 7:9A, Standards for Individual Subsurface Sewage Disposal Systems* and the Hopewell Township Health Department. This plan is not a survey and is to be used for construction of the septic system only. It is not intended to be used as a plot plan for construction of any structures or proposed improvements.
2. Property line information has been obtained from a survey plan of Block 72, Lot 72.01 by B2A Survsat, dated February 6, 2003 and last revised March 6, 2003.
3. All soil testing was conducted by Bay Point Engineering on May 6-7, 1996 and witnessed by a representative of Hopewell Township.
4. The Engineer and the Health Department shall be notified 48 hours prior to construction so that all inspections may be scheduled. All phases of the construction shall be inspected and approved by the Engineer and Health Department prior to backfilling.
5. Inspection Schedule
   - Stake out and stockpiling of sand
   - Open ditch
   - Sand emplacement, compaction, and percolation rate
   - Stone emplacement
   - Lateral emplacement
   - Tanks and final grading
6. Sand Specifications:

   Select fill shall have:
   - A coarse fragment content less then 15% by volume or less than 25% by weight
   - A textural analysis (composition by weight of the size fraction passing the 2 mm sieve):
     - 85-95% Fine to Coarse Sand (maximum 25% fine plus very fine sand)
     - 5-15% Silt and Clay (minimum 2% clay)
   - Permeability from 2 - 20 in./hr. (percolation rate 3-30 min./in.)

   Concrete Sand (TWA #03-3487-4SG) shall have:
   - A coarse fragment content (greater than No. 8 sieve) less then 15% by volume or less than 20% by weight
   - A textural analysis (composition by weight of the size fraction passing the particular sieve as stated):
     - 100% passing 3/8" sieve; 80%-100% passing No. 8 sieve; 50%-85% passing No. 16 sieve; 25%-60% passing No. 30 sieve; 10%-30% passing No. 50 sieve; 2%-10% passing No. 100 sieve.
   - Permeability from 6 - 20 in./hr. (percolation rate 3-15 min./in.)
7. All sand shall be stockpiled on-site and tested by the Engineer prior to placement into the disposal area.
8. Sand shall be installed in twelve inch (12") maximum lifts and compacted in conformance with *N.J.A.C. 7:9A-10.4f(3)*. After installation and compaction, percolation tests shall be conducted at the level of infiltration in accordance with the number and placement requirements shown in *Appendix C of N.J.A.C. 7:9A*.
9. No wheeled vehicles are to be driven over any part of the disposal area.
10. The Engineer will inspect the entire installation of the system and provide a Certificate of Compliance and Record Drawings to the Health Department.
11. Prior to the disposal bed stake out by the Engineer and any construction activities by the installer, the installer shall require the owner to have all underground utilities located by the responsible utility company(ies). CALL 1-800-272-1000 BEFORE YOU DIG.
12. Construction information is based on topography of plan. Elevations may be modified after final survey.
13. Disposal area shall be graded so that surface runoff is diverted away from the disposal area.
14. Field changes to the design shall not be permitted. The Engineer and the Health Department shall review and approve any deviations from this design.
15. The installer shall be responsible for obtaining any and all of the required permits prior to construction.
16. After completion of backfilling and final grading, all disturbed areas shall be raked, seeded and mulched to establish a vegetative cover in a manner acceptable to the Administrative Authority.
17. The installer shall ensure that all materials used in the construction of the system are in accordance with *N.J.A.C. 7:9A et. seq.* and meet the specifications of the design.
18. Filter fabric shall be a non-woven geotextile product (TerraTex SD or approved equal).
19. No trees are to remain within ten feet (10') of the disposal area.
20. Septic tank(s) shall be located a minimum of ten feet (10') and disposal areas shall be located a minimum of twenty five feet (25') from dwellings.
21. Septic tank(s) shall be located a minimum of fifty feet (50'), disposal area(s) shall be located a minimum of one hundred feet (100'), and building sewer(s) shall be located a minimum of twenty five feet (25') from a well.
22. Crushed stone filter material shall be NJDOT number 3, 4, or 24 size stone and be free of fines, dust, ashes, or clay.
23. All septic disposal fields shall be constructed at least twenty five feet (25') from excavated cuts (drop) greater than two feet (2').
24. There are no off-site wells within 100 ft and no off-site disposal systems within 50 ft of the proposed disposal field.
25. Bayer-Risse Engineering, Inc. makes no representation as to the location and/or adequacy of the internal plumbing and electric service. The limits of this design are from the septic tank to the disposal area.
26. This septic design has been based on the soil conditions and site constraints recorded at the time soil testing was performed. If subsurface conditions present at the time of construction vary significantly from those documented during soil testing the contractor shall immediately cease construction and notify the Engineer and the Health Department so that appropriate action may be taken.

Update with 2nd Pit Bail Test in Reserve Area	04/30/07	SMR
REVISION DESCRIPTION	DATE	APPROVED

Septic System Design General Notes

Ronald Weinberger *Block 72, Lot 72.01* *Hopewell Township, Mercer County, New Jersey* *451 Federal City Road*

DRAWN BY:	DESIGNED BY:	CHECKED BY:	DWG NO.	BRE JOB#:	SCALE:	DATE:	SHEET:
WMJ	WMJ	SMR	WEI-9	03-506	As Noted	December 15, 2003	9 of 9

STEPHEN M. RISSE, P.E.
New Jersey Professional Engineer License No. GE34795

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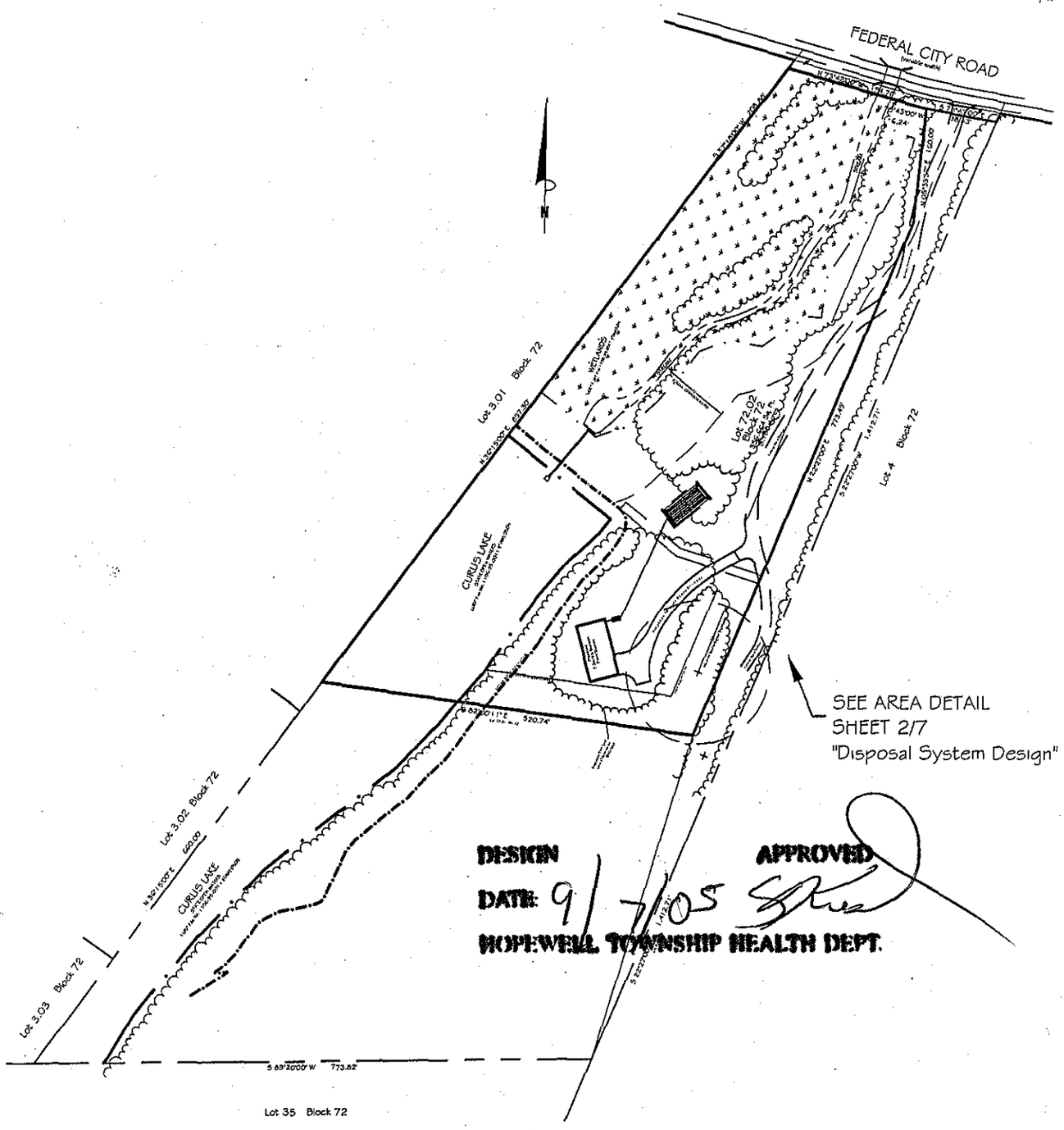


DESIGN APPROVED
DATE: 9/7/05
HOPEWELL TOWNSHIP HEALTH DEPT.

Bryce M. Rittenhouse New Jersey Professional Engineer & Land Surveyor License #13453

Frank J. Falcone New Jersey Professional Land Surveyor License #32112

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Cover Sheet

of Lot - 72.02, Block - 72 for

Philip Caton

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249
Kevin M. Brakel	PE	No.44194

* NJ and PA Licensed.

Bryce M. Rittenhouse: NJ PE&PLS #13453 — 08/08/05 Date

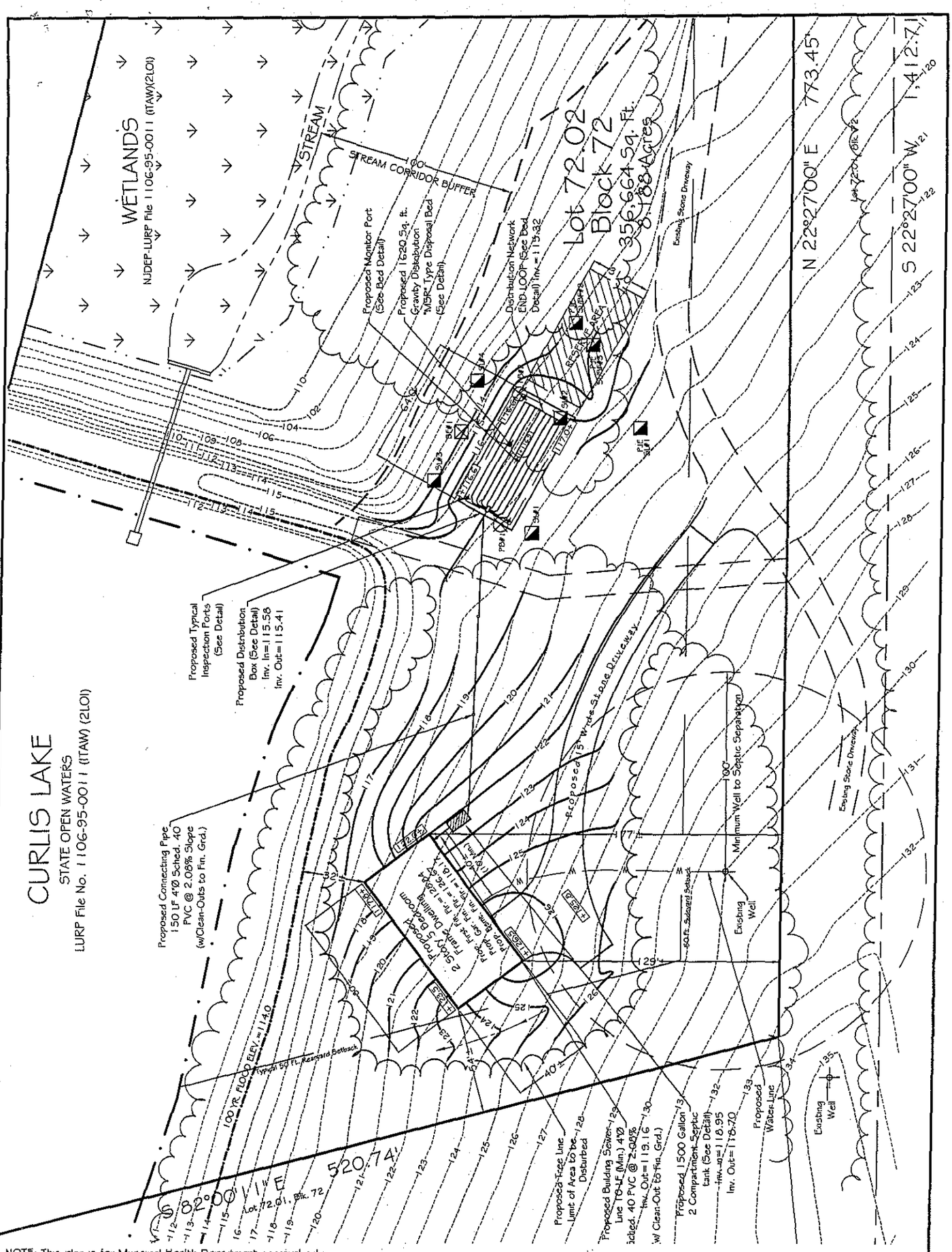
Frank J. Falcone: NJ PLS #32112 & PP #3760 — 08/08/05 Date

Date: 08/08/05
Scale: 1"=200'
Drawn: JRM
Check: FJF/BMR

1/7

Revisions:

Job#: F05031.5
Dwg: 01-72.02-72 Cover Sheet
View: Plot
Layer: Septic Design



NOTE: This plan is for Muncipal Health Department approval only.
NOTE: No garbage grinder/disposal of any type shall be permitted to be connected to this disposal system.

Bryce M. Rittenhouse New Jersey Professional Engineer & Land Surveyor License #13453

Frank J. Falcone New Jersey Professional Land Surveyor License #32112

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
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Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Disposal System Design

of Lot - 72.02, Block - 72 for

Philip Caton

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249
kevin M. Brakel	PE	No.44194

* NJ and PA Licensed.

Bryce M. Rittenhouse: NJ PE & LS #13453 — 08/08/05 Date

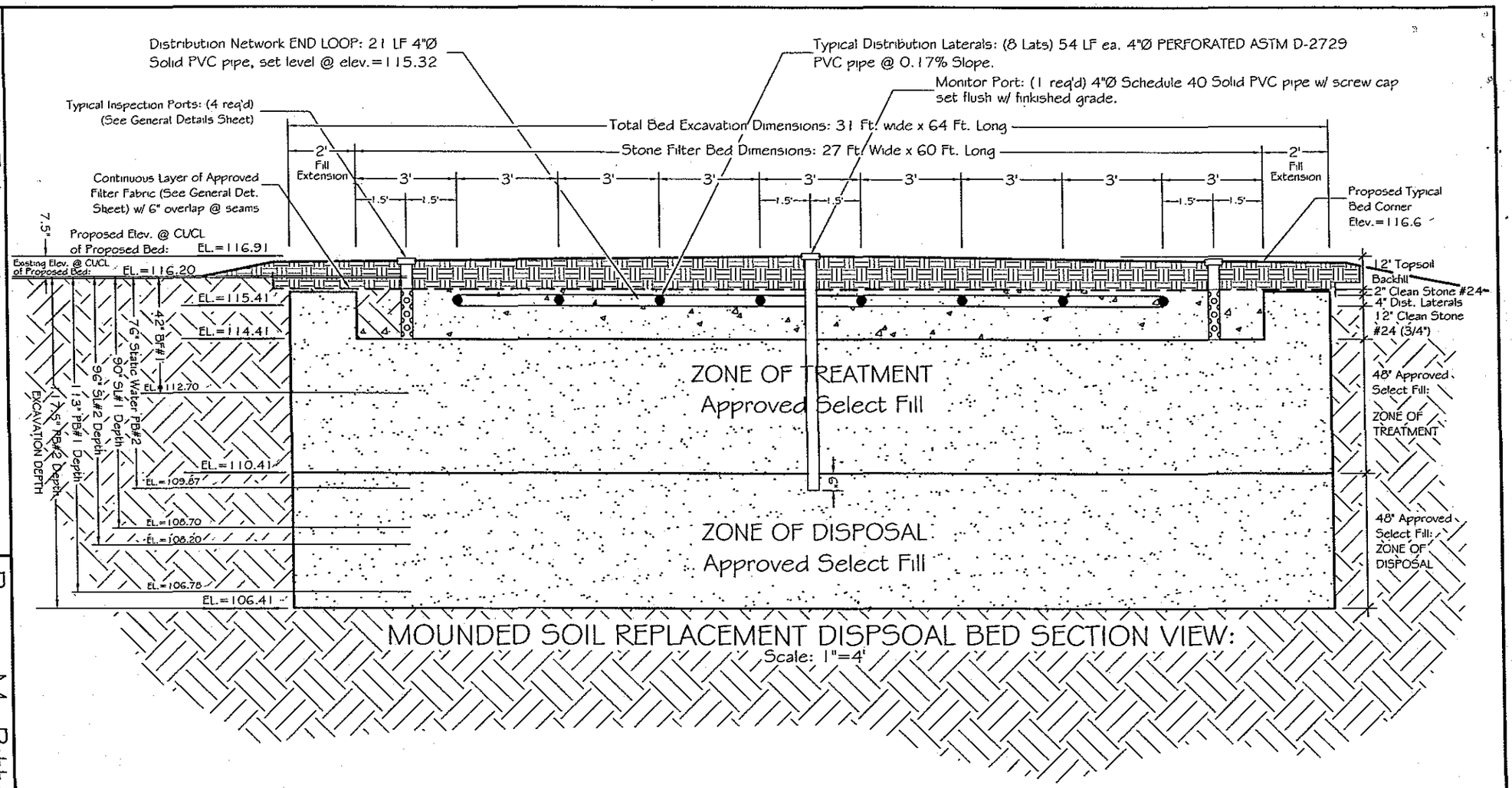
Frank J. Falcone: NJ PLS #32112 & PP #3760 — 08/08/05 Date

Date: 08/08/05
Scale: 1"=60'
Drawn: JRM
Check: FJF/BMR

2/7

Revisions:

Job#: 6105031.15
Drawing: 6105031-72 Septic Design
View: Plot
Layers: Septic Design



NOTE: The Hopewell Township Health Dept. requires a Soil Permeability Class Rating Test on the stockpiled select fill. The contractor shall notify the Design Engineer 24 hours in advance of the said stockpiling in order to obtain samples of the fill for testing.
The select fill shall not be emplaced untill a passing soil analysis has been obtained.

The distribution network shall not be constructed untill a passing percolation test or tube permeameter test has been performed on the emplaced select fill, to insure proper compaction. The contractor shall notify the Design Engineer 24 hours in advance in order to perform said test.

DISPOSAL BED SIZING CALCULATION:
Proposed 5 Bedroom Dwelling=200 GPD+(4 x 150 GPD)=800 GPD "Q"
Assume in place select fill @ 3-15 MPI; 1.61 SF/GPD Req'd min. Gravity Distribution
800 GPD x 1.61 SF/GPD= 1288 SF Min. Btm. Area
1288 SF Min. Btm. Area x 1.25 (25% Req'd Over Design by Hopewell Twp.)=1610 Sq. Ft. Min.
1610 Sq. Ft. SF/27' (Prop. bed width)=59.62' (Min. Bed Length/USE 60')
Note: "MSR" TYpe bed req's 2 Ft. fill extension
Excavate total btm. area of bed: 31 Ft. Wide x 64 Ft. Long (=1984 SF)
Construct stone filter bed: 27 Ft. Wide x 60 Ft. Long (=1620 SF)

Frank J. Falcone
Professional Land Surveyor #32112 & Professional Planner #3760

Bryce M. Rittenhouse
Professional Engineer & Land Surveyor #13453

PJE Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
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D. Geoffrey Brown PE, PLS
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Martin D. Katz PLS
Kevin M. Brakel* PE
No.13453
No.24327
No.30747
No.32112
No.35868
No.36249
No.44194
*NJ and PA Licensed

Bryce M. Rittenhouse PE & LS #13453 — 08/08/05 Date
Frank J. Falcone: PLS #32112 & PP #3760 — 08/08/05 Date

Disposal Bed Section View

of Lot - 72.02, Block - 72 for

Philip Caton

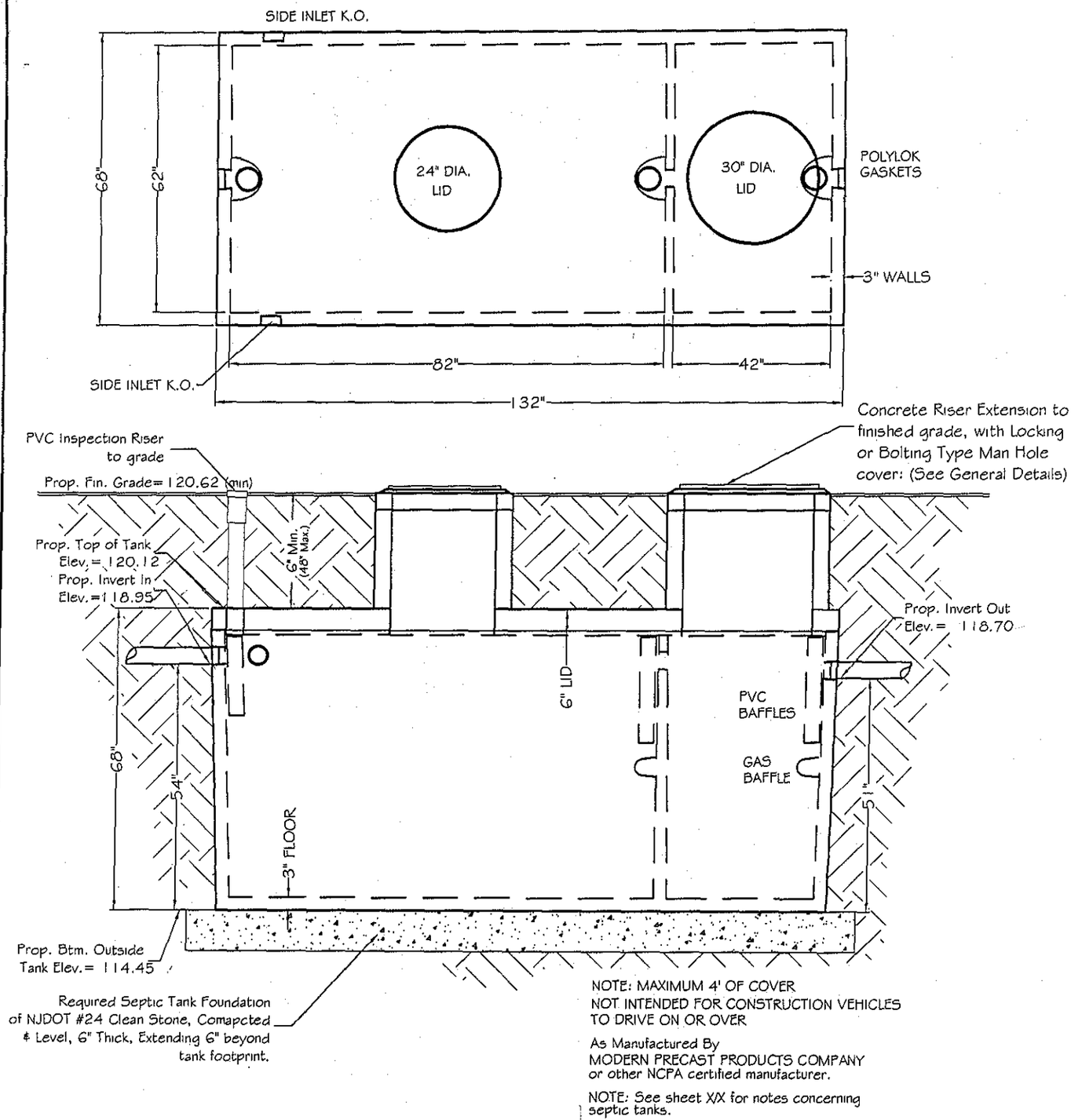
Hopewell Township • Mercer County • New Jersey

Date: 08/08/05
Scale: 1"=4'
Drawn: JRM
Check: FJF/BMR

Revisions:

3/7

Job#:f0503.15
Dwg:03-.7202b72 Bed Section View.Plot



NOTE: MAXIMUM 4' OF COVER
NOT INTENDED FOR CONSTRUCTION VEHICLES TO DRIVE ON OR OVER

As Manufactured By
MODERN PRECAST PRODUCTS COMPANY
or other NCPA certified manufacturer.

NOTE: See sheet X/X for notes concerning septic tanks.

1500 GALLON TWO COMP. SEPTIC TANK:

(Not to Scale)

Bryce M. Rittenhouse New Jersey Professional Engineer & Land Surveyor License #13453

Frank J. Falcone New Jersey Professional Land Surveyor License #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

1500 Gallon Two Comp. Septic Tank
of Lot - 72.02, Block - 72 for
Philip Caton
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35666
Martin D. Katz	PLS	No.36249
Kevin M. Brakel	PE	No.44194

* NJ and PA Licensed.

Bryce M. Rittenhouse: NJ PE & LS #13453 — Date 08/08/05

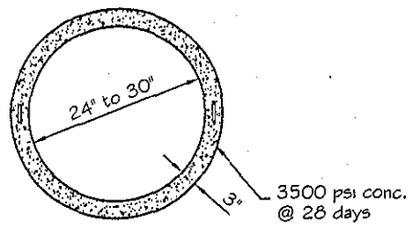
Frank J. Falcone: PLS #32112 & PP #3760 — Date 08/08/05

Date: 08/08/05
Scale: None
Drawn: JRM
Check: FJF/BMR

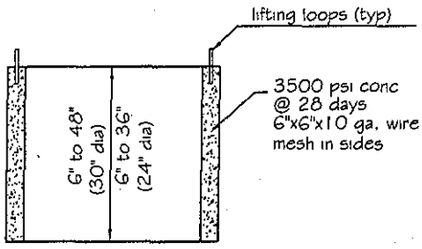
4/7

Revisions:

J:\04-F0503.5
Dwg:04-17202b-72 Septic Tank
View:Page
Layers:



Plan View



Section View

CONCRETE EXTENSION

(nts)

FILTER FABRIC SPECIFICATIONS

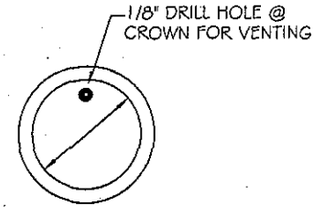
TERRATEX 5D OR EQUAL

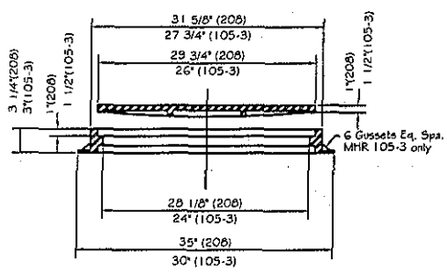
GRAB TENSILE STRENGTH	125 LBS.
MULLEN BURST STRENGTH	275 LBS./SQ. IN.
ELONGATION	80 %
WATER PERMEABILITY COEFFICIENT	-2 CM/SEC.

THE FABRIC IS TO BE LAPPED OVER THE TOP OF STONE A MIN. OF 6"

End Cap Detail

not to scale





Specifications:

Specifications are from Quirin. The frame and covers are made of gray iron which meets of exceeds ASTM A48, Class 30B. Other grades of gray iron available upon request. Furnished with standard one coat of black asphaltum paint. Uncoated castings available upon

MHR 105-3:

Round flange manhole frame and cover for Septic Tanks. Shall be provided with a bolting and gasket cover.

MHR 208 BF:

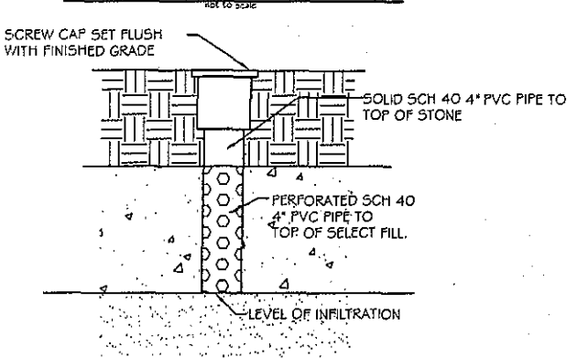
Light duty manhole frame and cover for Dosing Tanks. Shall be provided with a bolting and gasket cover.

Manhole Frame Detail

no scale

Inspection Port Detail

not to scale



Bryce M. Rittenhouse New Jersey Professional Engineer & Land Surveyor License #13453

Frank J. Falcone New Jersey Professional Land Surveyor License #32112 & Professional Planner #3760

Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

General Disposal System Details

of Lot - 72.02, Block - 72 for

Philip Caton

Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249
Kevin M. Brakel	PE	No.44194

* NJ and PA Licensed.

Bryce M. Rittenhouse: NJ PE & LS #13453 — 08/08/05 Date

Frank J. Falcone: NJ PLS #32112 & PP #3760 — 08/08/05 Date

Date: 08/08/05
Scale: None
Drawn: JRM
Check: FJF/BMR

5/7

Revisions:

Job#:1030315
Dwg:05-L7202-72 Details
View:Poc

DISPOSAL SYSTEM NOTES:

1. Prior to the installation of fill material, the disposal field excavation shall be performed in accordance with N.J.A.C. 7:9a10.3(c) 1 through 5.
2. Work should be scheduled so that the bottom and sidewalls of the excavation will not be exposed to rainfall or windblown silt between time of excavation and time of final inspection and grading.
3. Any loose soil or debris which is washed into or deposited within the excavation shall be removed prior to the construction of the distribution network.
4. Any smeared or compacted soil surfaces within the disposal field excavation shall be removed to expose a fresh soil surface.
5. Excavations in soils other than sands or loamy sands shall not be continued when soil moisture content is above the lower plastic limit. This means when a small lump of soil, taken from the depth of the proposed excavation, can be rolled out with the fingers to form a wire or rod one-eight of an inch in thickness and does not crumble when handled,
6. Clayey soils encountered in the bottom of the excavation shall be removed and replaced with suitable fill.
7. The fill material installed in the zone of disposal shall have a textural analysis (composition by weight of size fraction passing through a two millimeter sieve) 70%+ med.-coarse sand, but not less than 90% total sand. The fill material shall also have a percolation rate faster than 15 minutes per inch.
8. The suitable fill material installed in the zone of treatment shall have a coarse fragment content less than 15% by volume or less than 25% by weight. It shall also have a textural analysis (composition by weight of size fraction passing the two millimeter sieve). from 70% to 90% med.-coarse sand; 0-25% fine sand; 5% to 10% silt & clay ; min. clay 2%. Fill material shall also have a percolation rate of 3 to 15 min/in. or a permeability rate of 6-20 in/hr.
9. All fill material shall be spread and compacted in layers one foot or less in thickness and compacted manually or mechanically, by tamping or rolling, by driving over the filled area in a controlled pattern using tracked or rubber tired vehicles, or by puddling.
10. Heavy excavating equipment shall not be operated directly on the exposed bottom of the excavation. If heavy excavating equipment is used to compact the fill material, the first lift shall be one foot in thickness.
11. The filter material shall consist of washed gravel or crushed stone, free of fines, dust, ashes or clay. It shall conform in size and gradation to size #24, #3 or #4 of the N.J.D.O.T. standard for coarse aggregates.
12. The filter material shall be installed into the disposal system excavation using a backhoe, front end loader or dump truck from the sides.
13. Construction of the distribution network shall be in accordance with 7:9a-10.3(d).
14. PVC distribution laterals shall meet ASTM standards D-2729, D-3033 or D-3034.
15. Filter material is to be covered with drainage fabric as the laying of distribution lines progresses. Drainage fabric shall be overlapped a minimum of 6".
16. Filter fabric shall have a grab tensile strength of 125 lbs., mullen burst strength of 275 lbs., elongation 80% & permeability coefficient of 0.2 cm/sec. Filter fabric shall be Terratex sd or equal.
17. Construction of the distribution box shall be in accordance with 7:9a-9.4.
18. The distribution box shall be set directly on the filter material within the disposal bed.
19. A permanent concrete monument will be installed over the distribution box flush with finished grade.
20. Construction of the connecting pipe or delivery pipe shall be in accordance with 7:9a-9.3.
21. All changes of direction in the soil pipe and connecting pipe shall employ max. 45' fittings and shall include cleanouts.
22. Soil pipe and connecting pipe shall be placed on a stabilized base of quarry blend stone extending to virgin ground.
23. PVC connecting pipes will meet ASTM standard D-2665 - schedule 40, SDR-21 or SDR-26.
24. The building sewer shall be designed and constructed in accordance with the provisions of the state uniform construction code, N.J.A.C. 5:23, adopted pursuant to the uniform construction code act, N.J.S.A. 52:27d119 et seq.
25. Septic tanks shall be precast concrete tanks constructed of concrete conforming to ACI318-16-4.5.1 and 318-16-4.5.2. Certification shall be provided by the manufacturer and the certification displayed on the tank.
26. Septic tank shall be 1500 gal. dual compartment tank.
27. All manhole covers and inspection ports in the septic tank shall have water tight bolted or locked caps set flush with finish grade.
28. All interior concrete surfaces shall be sealed with two coatings of an approved inert coating to minimize corrosion. Coating shall be applied prior to delivery by the manufacturer.
29. Septic tanks shall be fabricated and installed in accordance with 7:9a-8.2.
30. A permanent marker shall be placed on grade above the septic tank upon completion of the installation.
31. Backfill and final grading shall be carried out in accordance with 7:9a-10.3(f).
32. Topsoil shall be lightly compacted by tamping or rolling to prevent settlement and shall be seeded and mulched or sodded immediately upon completion of final grading.
33. All trees with drip lines within 10 ft. of the disposal field shall be removed prior to construction.
34. There shall be no existing or proposed disposal systems within 50 ft. of the proposed disposal field.
35. No garbage disposal unit of any kind shall be connected to this disposal system.
36. Backwash from water softeners or other drainage other than sanitary sewage shall not enter the disposal system.
37. All soil evaluation procedures relied upon as a basis for the design of the subject individual subsurface sewage disposal system were carried out by or under the direct supervision of a professional engineer and witnessed by the administrative authority.
38. Vegetative planting in the disposal area shall be limited to grass unless otherwise specified by the administrative authority.
39. An annual inspection of the system shall begin three (3) years after installation or pump out of the septic tank.
40. The disposal system contractor is responsible for confirmation that all materials utilized in the construction of the disposal system are in accordance with N.J.A.C. 7:9a.
41. When placement of the disposal field is proposed in an area of disturbed ground as defined at 7:9a - 5.10, an acceptable state of compaction of the soil or fill material shall be verified by laboratory tests, and the design engineer shall certify a minimum compaction of 90 percent of the standard procter density.
42. All regraded areas shall comply with 7:9a-10.3.
43. Storm sewers within 75 ft. of the disposal system shall be constructed with watertight joints.
44. There shall be no existing or proposed wells within 100 ft. of the proposed disposal field.
45. THIS PLAN IS FOR BUILDING PERMIT ONLY.

GENERAL NOTES:

1. The Health Department shall receive 48 hours notification prior to the start of any construction on the system.
2. Once the excxavation of bed is complete a bottom of excavation inspection shall be performed by the Design Engineer and approved prior to the placement of the select fill.
3. After suitable fill is placed and compacted a min. of 1 permeabilty test shall be performed and approved by the Design Engineer, and if required the test shall be witnessed by the Health Department prior to the placement of stone.
4. The results of the select fill analysis shall be forwarded to the Health Department (see note No.8 in the Disposal System notes)
5. All manholes covers and inspection port caps inthe septic tank shall have water tight bolted or locked caps.
6. All interior concrete surfaces shall be sealed with 2 coatings of an "approved inert coating to minimize corrosion, coating shall be applied prior to delivery by the manufacturer.
7. The 'D' box shall sit in the disposal bed area on the filter material.
8. This plan is for building permit only.
9. No existing/proposed wells or disposal systems within 100 ft. of the proposed disposal field and well.

Bryce M. Rittenhouse New Jersey Professional Engineer & Land Surveyor License#13453

Frank J. Falcone New Jersey Professional Land Surveyor License #32112 & Professional Planner #3760

PJE Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
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General Disposal System Notes
of Lot- 72.02, Block - 72 for
Philip Caton
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
Frank J. Falcone	PLS	No.32112
Ted W. Pivovarnick	PLS	No.35068
Martin D. Katz	PLS	No.36249
Kevin M. Brakel	PE	No.44194

* NJ and PA Licensed.

Bryce M. Rittenhouse: PE & LS #13453 — Date 08/08/05

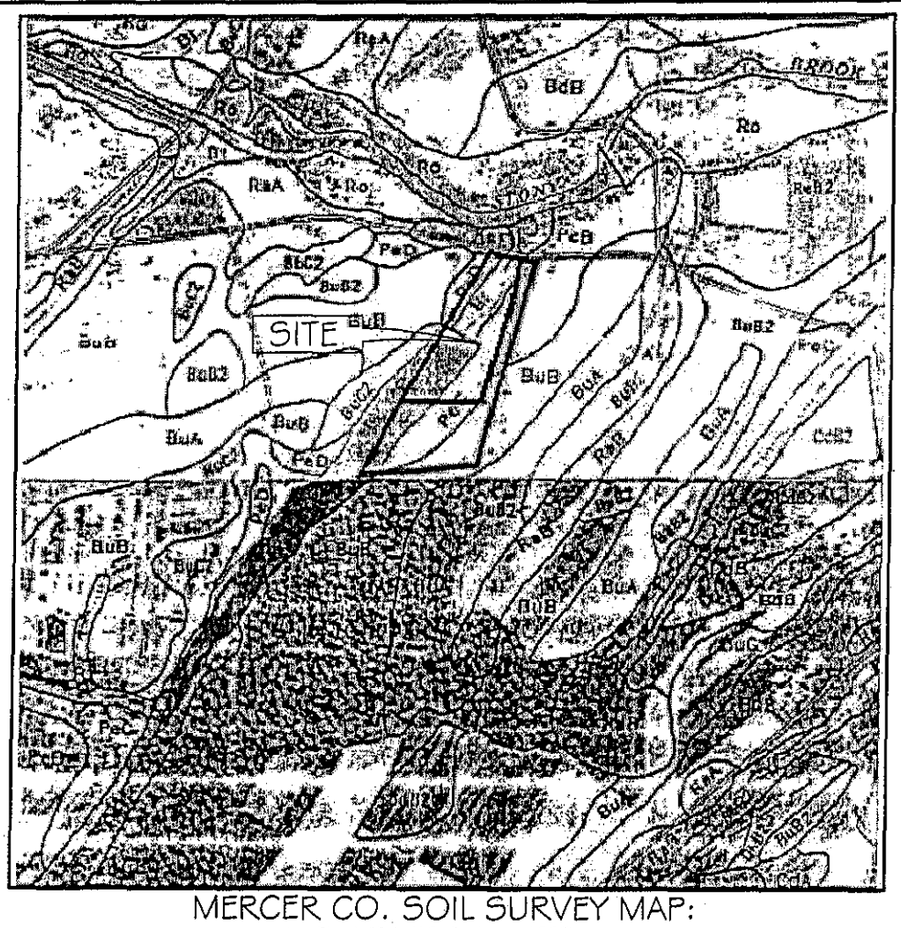
Frank J. Falcone: PLS #32112 & PP #3760 — Date 08/08/05

Date: 08/08/05
Scale: None
Drawn: JRM
Check: FJF/BMR

6/7

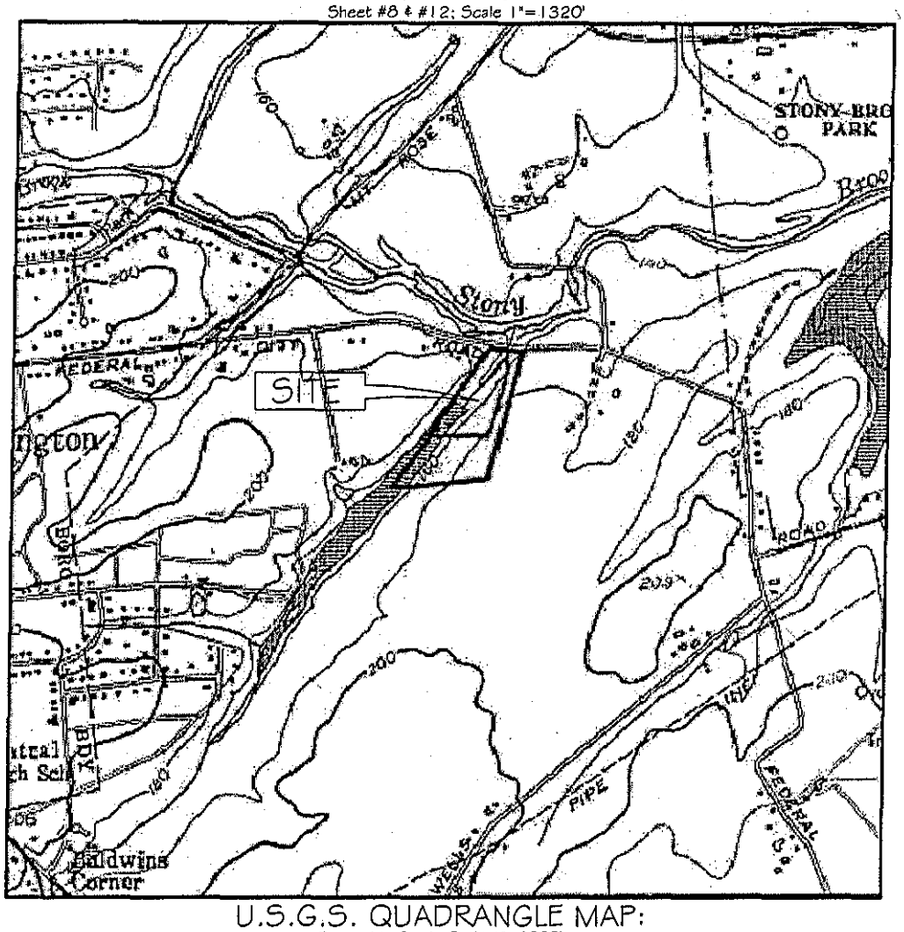
Revisions:

Job#: F050315
Dwg:06-L7202b72 Notes
View:Plot



MERCER CO. SOIL SURVEY MAP:

Sheet #8 & #12; Scale 1"=1320'



U.S.G.S. QUADRANGLE MAP:

Pennington Quad.; Scale 1"=2000'

Bryce M. Rittenhouse New Jersey Professional Engineer & Land Surveyor License#13453

Frank J. Falcone New Jersey Professional Land Surveyor #32112 & Professional Planner #3760

PJE Princeton Junction Engineering, P.C.
Professional Engineers, Land Surveyors and Planners
P.O. Box 610 - 53 North Post Road
Princeton Junction, New Jersey 08550
Telephone: 609.799.1906 Facsimile: 609.799.1524 Email:PJEPC@pjepc.com

Key Maps
of Lot-72.02, Block-72 for
Philip Caton
Hopewell Township • Mercer County • New Jersey

Bryce M. Rittenhouse*	PE&PLS	No.13453
D. Geoffrey Brown	PE&PLS	No.24327
Wesley J. Lane*	PLS	No.30747
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Ted W. Pivovarnick	PLS	No.35868
Martin D. Katz	PLS	No.36249
Kevin M. Brakel	PE	No.44194

* NJ and PA Licensed.

Bryce M. Rittenhouse 08/08/05
Bryce M. Rittenhouse: NJ PE & LS #13453 Date

08/08/05
Frank J. Falcone: NJ PLS #32112 & PP #3760 Date

Date: 08/08/05
Scale: As Shown
Drawn: JRM
Check: FJF/BMR

7/7

Scan:

J:\04\0503-5
Dwg07-17\2025-72 Key Maps
Mac-Fox

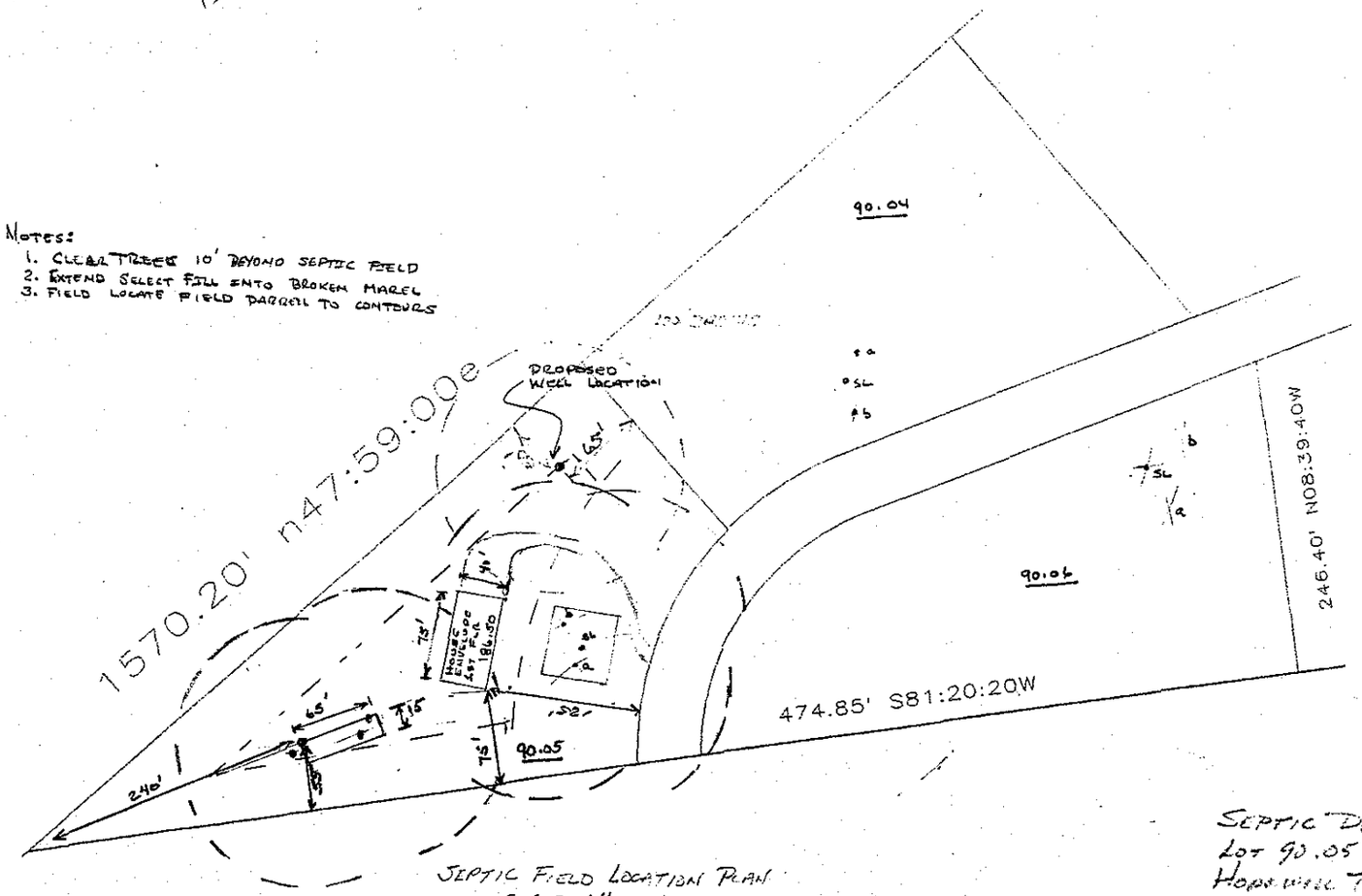
13

DESIGN APPROVED 12/14/93

DATE:

HOPEWELL TOWNSHIP HEALTH DEPT

Notes:
1. Clear trees 10' beyond septic field
2. Extend select fill into broken marel
3. Field locate field parcell to contours



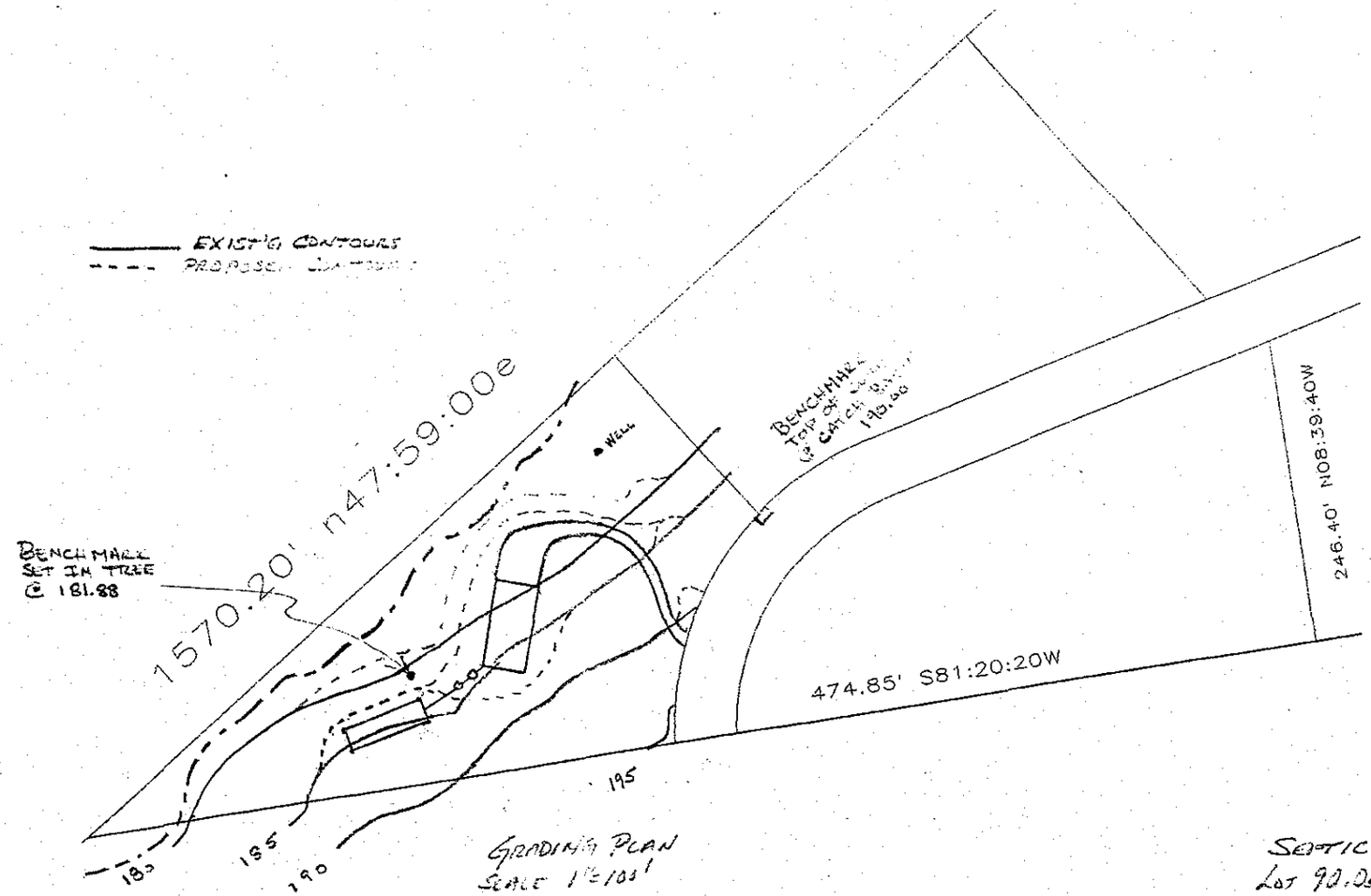
Septic Field Location Plan
Scale: 1" = 100'

Septic Design
Lot 90.05 Blk 72
Hopewell Twp NJ
Buyer: Vaughan S Grundy III
Seller: Pelican Hus Dev

Engineer:
Douglas C. Pelican
NJ PE GE27632 12/10/93

Drawing 1/5

12/5/93



GRADING PLAN
SCALE 1"=10'

NOTE. SEE DETAIL GRADING SCHEMATIC FOR MORE DETAILS

SEPTIC DESIGN
LOT 90.05 BLK 72
HOPEWELL TWP NJ
BUYER: VAUGHAN S. ERDMAN III
SELLER: PELICAN HOS DEV
ENGINEER:
DOUGLAS C. PELIKAN
NJ PE GE 27632 11/12/93
12/5/93
DOUGLAS C. PELIKAN

Select Fill Specs

3. When a mounded soil replacement installation is proposed, the zone of treatment may consist partly or entirely of fill material provided that the requirements of N.J.A.C. 7:9A-10.6 are satisfied and the fill material used meets the requirements of (f)4 below. The zone of disposal may contain a layer of fill provided that the fill material used within the zone of disposal meets the requirements of (f)5 below.

4. When fill material is utilized within the zone of treatment, the fill shall meet the following requirements:

i. Coarse fragment content less than 15 percent by volume or less than 25 percent by weight;

ii. Textural analysis (composition, by weight, of size fraction passing the two millimeter sieve): from 85 to 95 percent sand, from five to 15 percent silt plus clay, minimum two percent clay; and

iii. Permeability from two to 20 inches per hour, or percolation rate from three to 30 minutes per inch.

5. When fill material is placed within the zone of disposal, the fill material [illegible] meet the following requirements:

i. [illegible] analysis (composition, by weight, of size fraction passing [illegible] two millimeter sieve): 85 percent or more sand; and

ii. Permeability greater than two inches per hour, or percolation rate faster than 30 minutes per inch.

(g) The following requirements shall be met when installing a "[septic tank]" "disposal field" in sloping ground"[.]"."

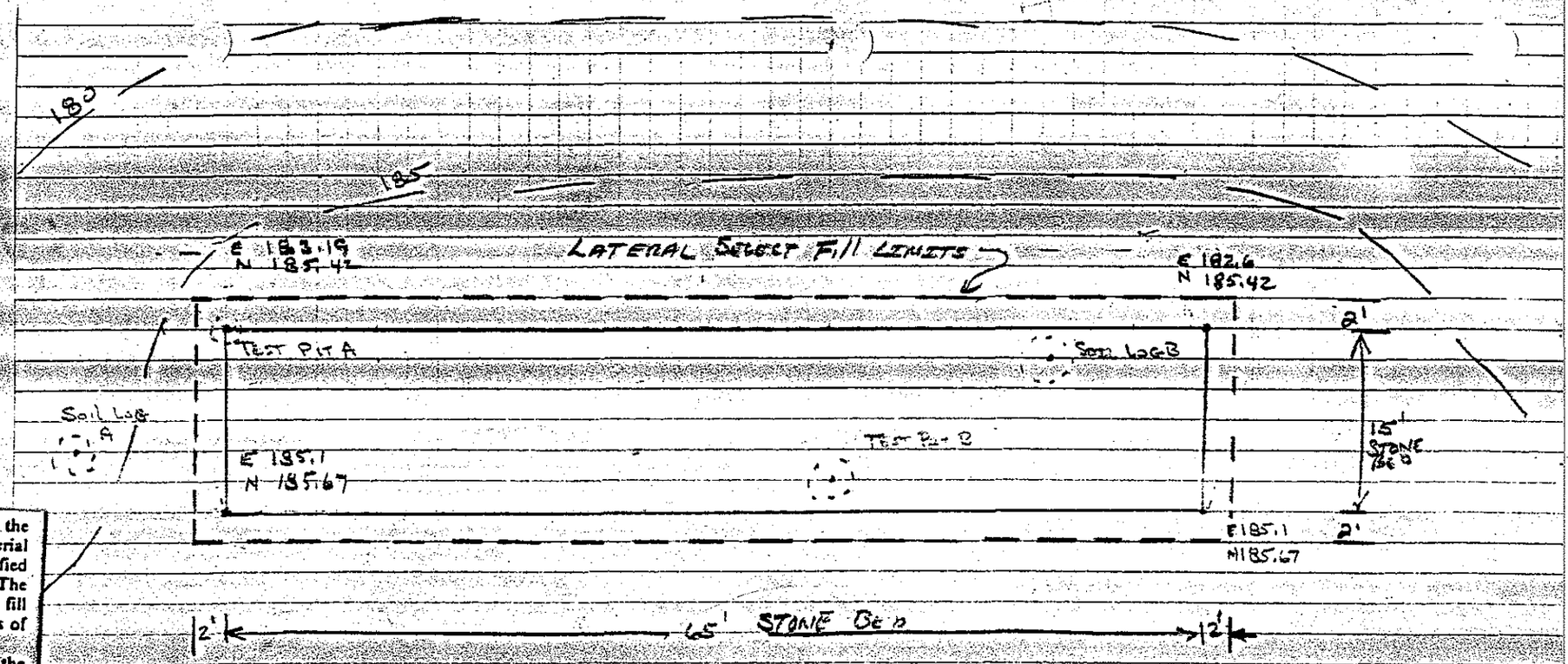
1. The interface between filter material and the underlying soil or fill material at the bottom of each individual trench or bed shall be level;

2. On strongly sloping sites the shape of the disposal field shall be elongated with the long axis parallel to the topographic contour;

3. When the slope is greater than 10 percent, trenches shall be used rather than beds;

4. Mound or mounded soil replacement installations shall be restricted to slopes less than 10 percent; and

5. When disposal trenches are installed at different elevations and gravity flow or gravity dosing are used, the distribution of effluent between trenches shall be accomplished by means of a [illegible]



SEPTIC FIELD GRADES [illegible] BOTTOM AREA 97[illegible]

E = EXISTING
N = NEW PROPOSED GRADES

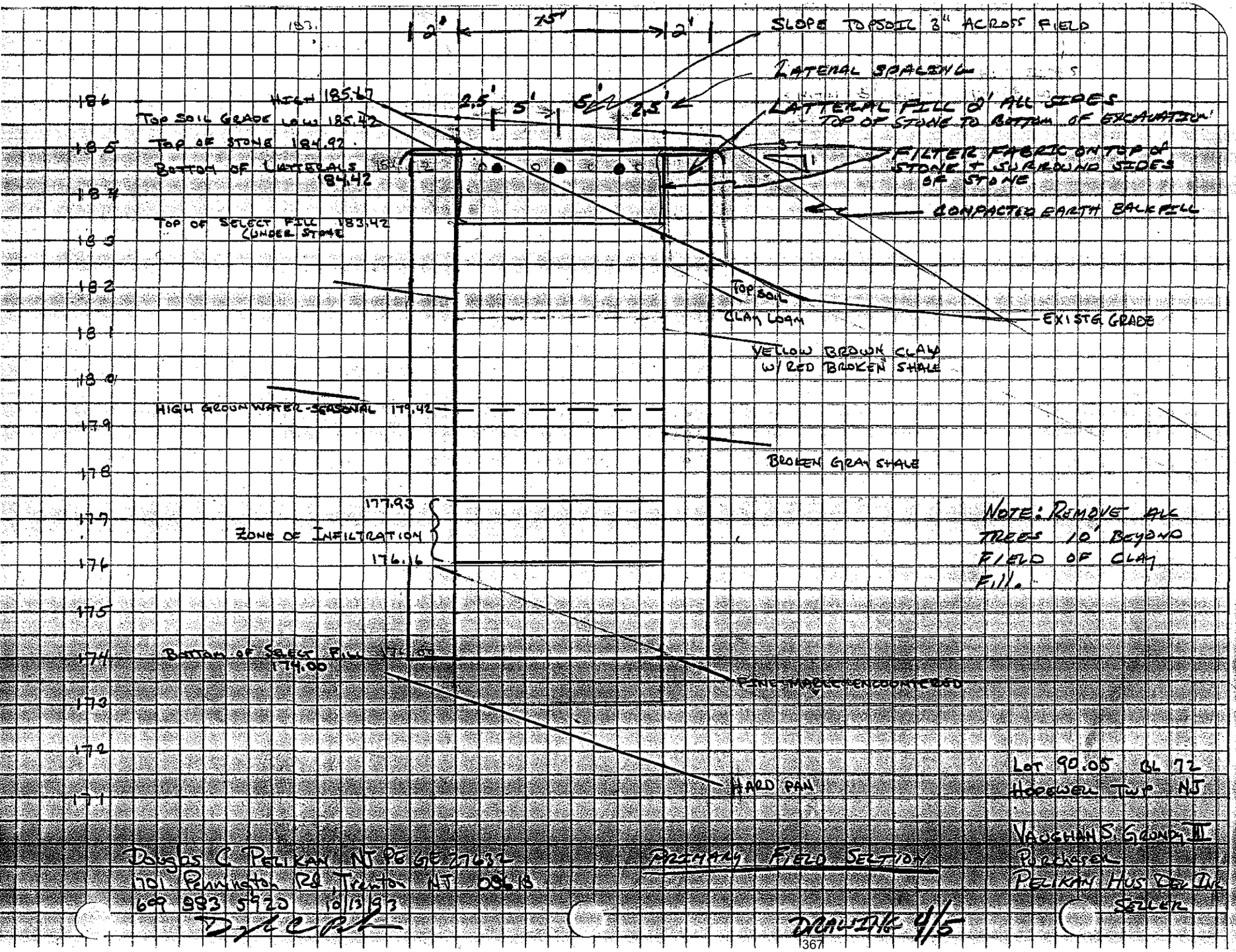
LOT 90.05 BLK 72
HOPEWELL TWP NJ

SEPTIC DESIGN
LOT 90.05 BLK 72
HOPEWELL TWP NJ

ROGER G. PARKER
NJ PE & LS [illegible]
PROFESSIONAL ENGINEER

12/5/93

3/5



Lot 90.05 Bl 72
Hopewell Twp NJ

Vaughan S. Gronda II
Purchaser
Pelican Hus Dev Inc
Seller

Douglas C. Pelikan NJ PG 27632
1701 Pennington Rd, Trenton NJ 08618
609 883 5920 10/13/93

PRIMARY FIELD SECTION

DRAWING 4/5

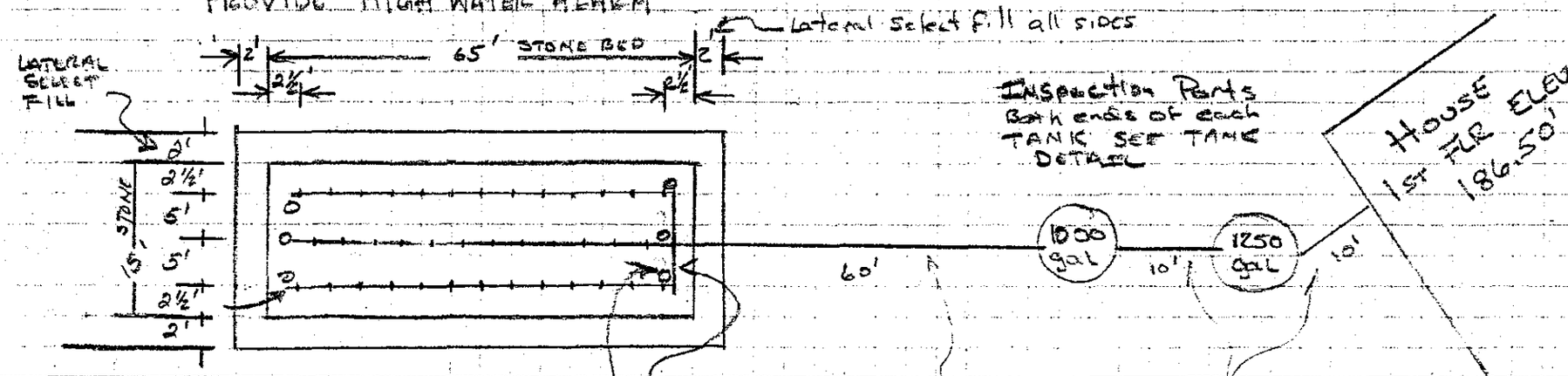
SEPTIC DESIGN
LOT 90.05 BLK 72
HOPEWELL TWP NJ

SEPTIC TANK: INVERT IN 183.5
INVERT OUT 183.3

DOSING TANK: INVERT IN 183.2
TANK BOTTOM 179.5
PUMP OFF 180.1
PUMP ON 180.6
ALARM ON 181.1

DOSING PUMP: ZOLLER MODEL P267 W/BACKFLOW VALVE
1/2 HP 115V OR EQUAL W/QUICK COUPLING

PROVIDE HIGH WATER ALARM



LATERALS: 3 ea. 60 long 1¼" sch 40 pvc w/ 1/4" HOLES SPACED 5' OC
ALTERNATE alignment of holes on adjacent laterals. Cap ends of laterals

Header - 3" sched 40 PVC 10' long cap ENDS

3" sched 40 PVC

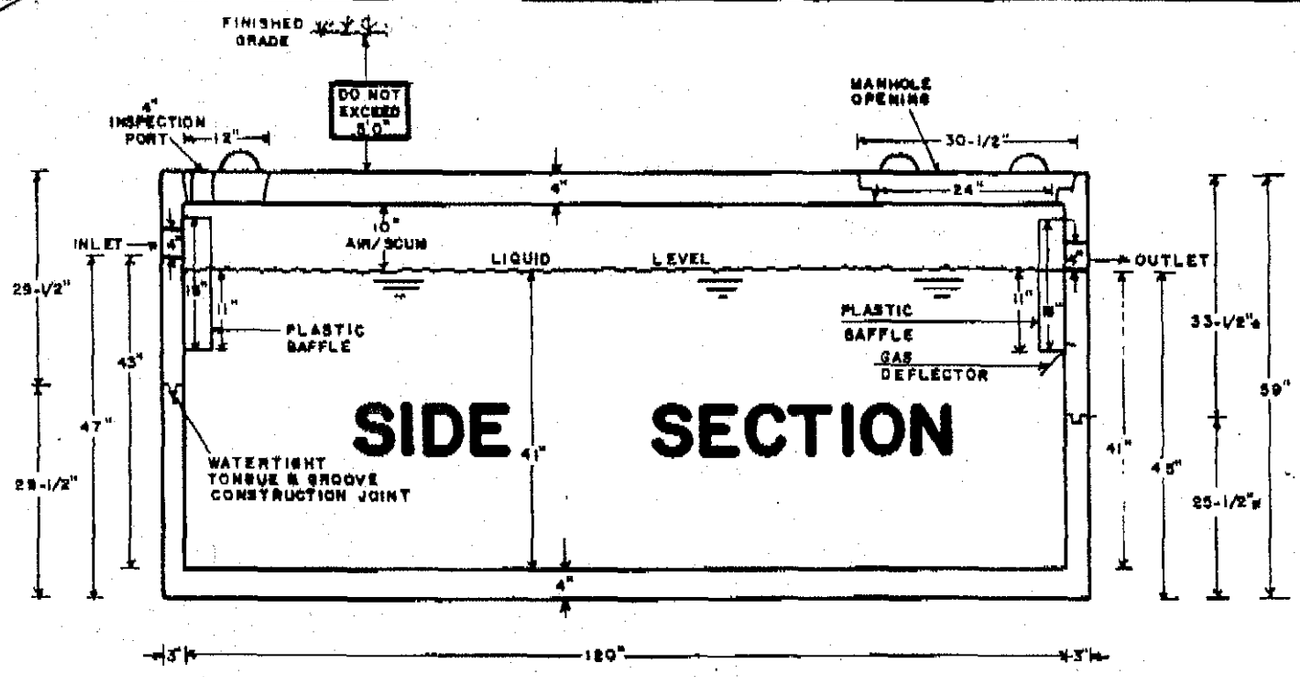
4" sched 40 PVC

BED + TANK PIPING SCHEMATIC

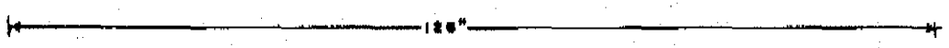
OBSERVATION PORTS: 4" perf PVC sch 20
CAP TOPS EXTEND 6" ABOVE GRADE
TO BOTTOM OF STONE BED
6 pipes placed @ ENDS of laterals

DRAWING 5/5

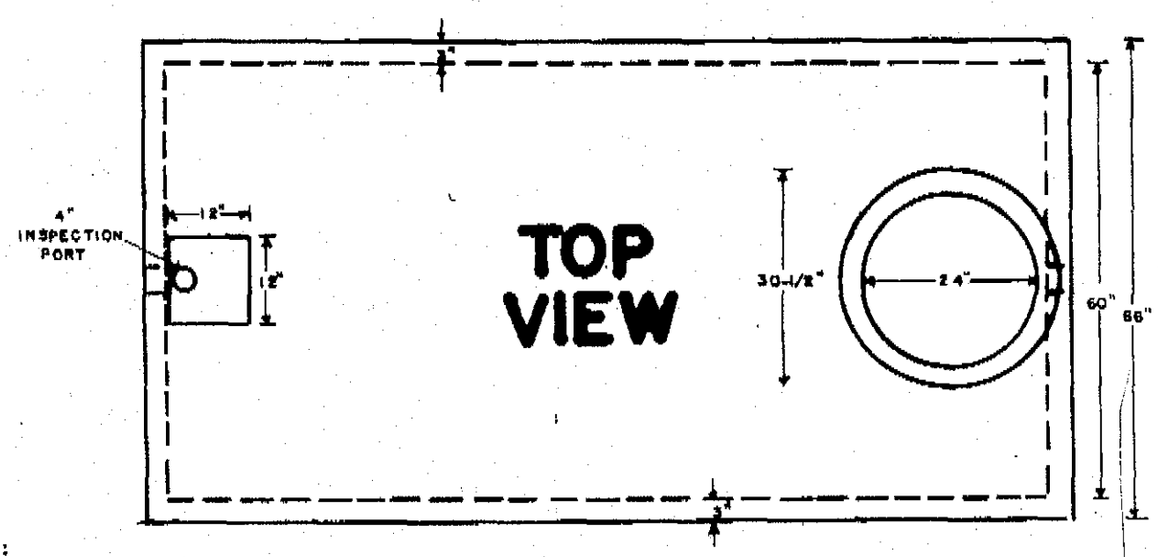
12/8/97



CONCRETE CONFORMS TO: ACI 318-16-4.5.1 (Frost Resistance) and ACI 318-16-4.5.2 (Water-Tightness)



* ALTERNATE CONFIGURATION



NOTES:

1. All manholes shall be extended flush with finished grade by means of concrete risers (not included) fitted with a removable water-tight cover. Covers (not included) shall be of cast iron and either bolted or locked.
2. Inspection Ports shall be extended to finished grade with a 4" Cast Iron or PVC pipe with a bolted or locked cap. Pipe and caps are not included.

1,250 Gallon Septic Tank Single Compt.

SPECIFICATIONS

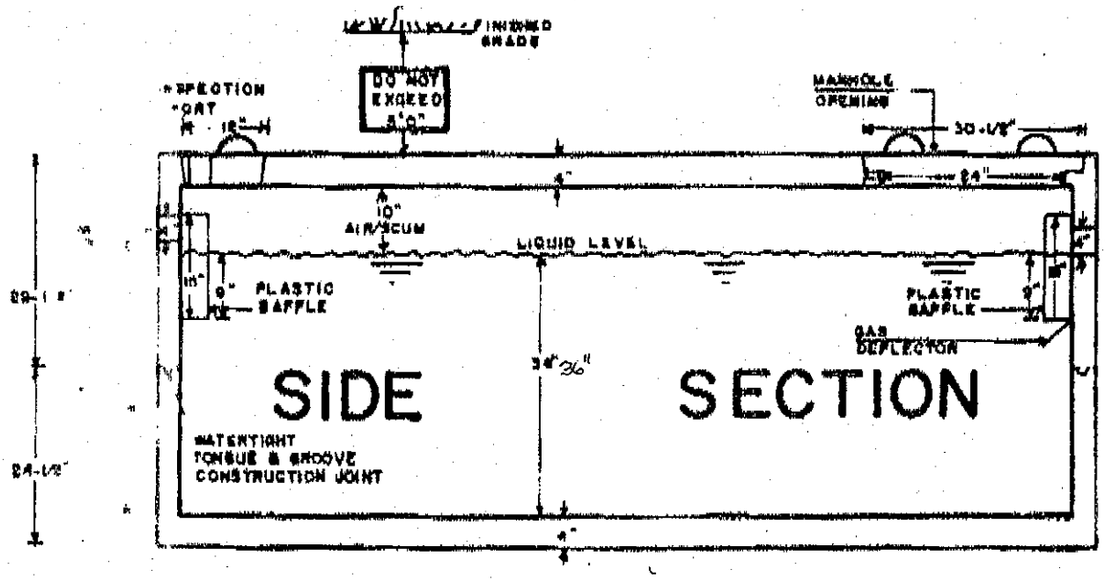
- CONCRETE MINIMUM STRENGTH - 3,500 p.s.i. @ 28 days
- STEEL REINFORCEMENT - TOP: No. 3 Rebar, 10" O.C., & No. 4 Rebar, 12" SIDES & BOTTOM: 6"x 6"x 10 gauge wire mesh, 2 layers
- PIPE CONNECTIONS - POLYLOK (TM) pipe seals
- As manufactured by FLEMINGTON SEPTIC TANK CO., 31 Leffler Hill Rd Flemington, N.J. 08822, (201) 782-3246
- CONSTRUCTION JOINT - Sealed with butyl rubber base mastic

Lot 90.05 Blk 72 Dosing Tank Details

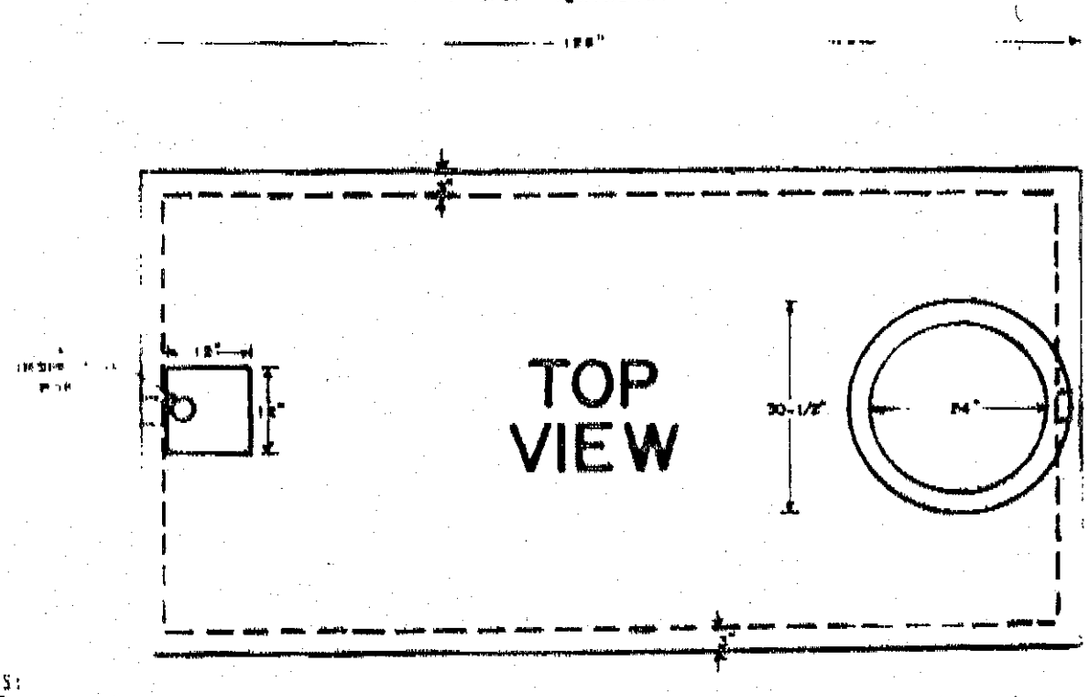
IP set on 4" Masonry Block
MP of @ 7" up
IP on @ 13 1/2" up > 163 gal dose
12M on @ 19" up > 650 gal reserve
of Water 36"

To: Dept [illegible]

FROM PTIC & BU .001



CONCRETE CONFORMS TO: ACI 318-16-4.5.1 (Frost Resistance) and ACI 318-16-4.5.2 (Water-Tightness)

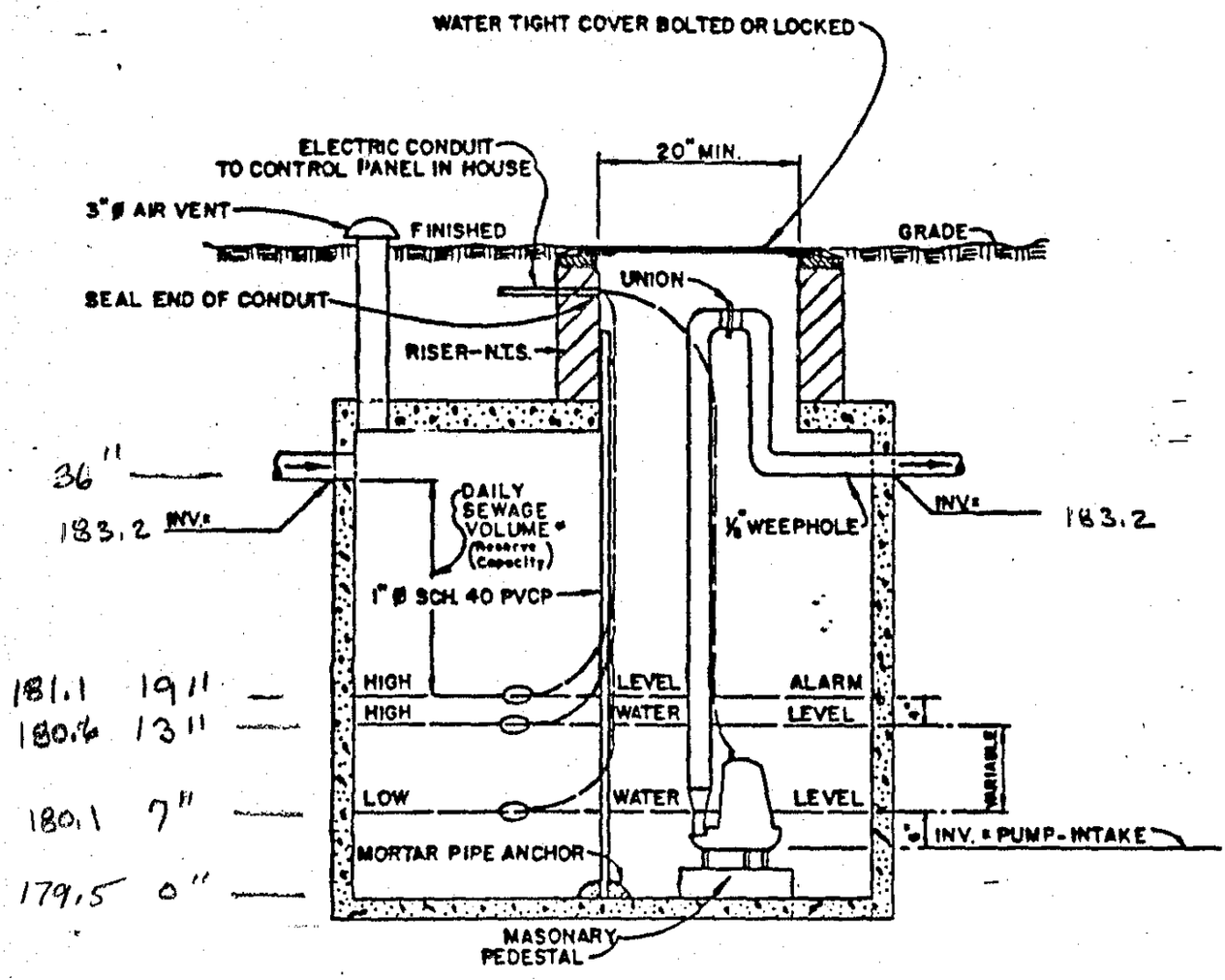


NOTES:
1. A[illegible] shall be extended flush with finished grade by means of concrete risers (not [illegible] water-tight cover. Covers (not included) shall be of cast iron and eithe[illegible] [illegible]cked.
2. In [illegible] shall be extended to finished grade with a 4" Cast Iron or PVC pipe with [illegible] locked ca[illegible] [illegible]raps are not included.

1,000 Gallon Septic Tank Single Compt.

SPECIFICATIONS

- CONCRETE MINIMUM STRENGTH - 3,500 p.s.i. @ 28 days
- STEEL REINFORCEMENT - TOP: No.4 Rebar, 10" O.C., @ No 3 Rebar, 12" O.C., SIDES & BOTTOM: 6"x6"x 10 gauge wire mesh, 2 layers
- CONSTRUCTION JOINT - Sealed with butyl rubber base mastic
- PIPE CONNECTIONS - POLYLOK (TM) pipe seals
- As manufactured by FLEMINGTON SEPTIC TANK CO [illegible] Leffler Hill Rd., Flemington, N.J. 08822, (201) 782-3246



* Except where dual pumps used.

Figure 13. Dosing Tank with Pump.

Schematic — NO SCALE —

Lot 90.05 BLK 72

ZONE – R200

FRONT SETBACK 100'

REAR&SIDE SETBACK 50'

LOT 4 BLK 72

WESTERLY PORTION OF 20' DR

NOTE: Dotted lines show position of ...
Line & conc. low flow channel in detention basin

LOT 90.04 BLK 72

N

STREAM PRESERVATION EASMENT
PLACE SILT FENCE ALONG THIS
DURING CONST.

N 47°59'0.221" E 579.000

S 42°00'59.106"

73.870

N. CB.

CB

CB

SEPTIC

R=250'00 Lc=202.67'

TEMP CULDESAC

LOT 90.06 BLK 72

LOT 90.05 BLK 72

178 180 182 184 186 188 190 192 194

S 81°20'19.592" W 484.879

1ST FLR ELEV 186.5
GARAGE ELEV 185

EXIST'G CONTOURS
PROPOSED CONTOURS
PROPOSED SPOT GRADES XXX.X

0 50 100

CONTOURS NGVD 1929 DATUM

LOT 6 BLK 72

VAUGHAN S. GRUNDY III
10 ROSEDALE WAY
HOPEWELL TWP. MERCER CO. STATE OF NEW JERSEY
SCALE: 1" = 50'
DATE: 11/10/93
DRAWN: DCP
DOUGLAS C. PELIKAN, 1701 PENNINGTON RD, TRENTON, N.J. 08618 PH: 609-883-5920
ENGINEER: NJPE# GE27632

Hopewell Township Supplemental Scoping Comments

02.27.15

Additional Information
From
Hopewell Township Historic Preservation Commission

Hopewell Township Preservation Commission

Effects of the PennEast Pipeline Routes on Historic Resources in Hopewell Township Mercer County, NJ

Executive Summary:

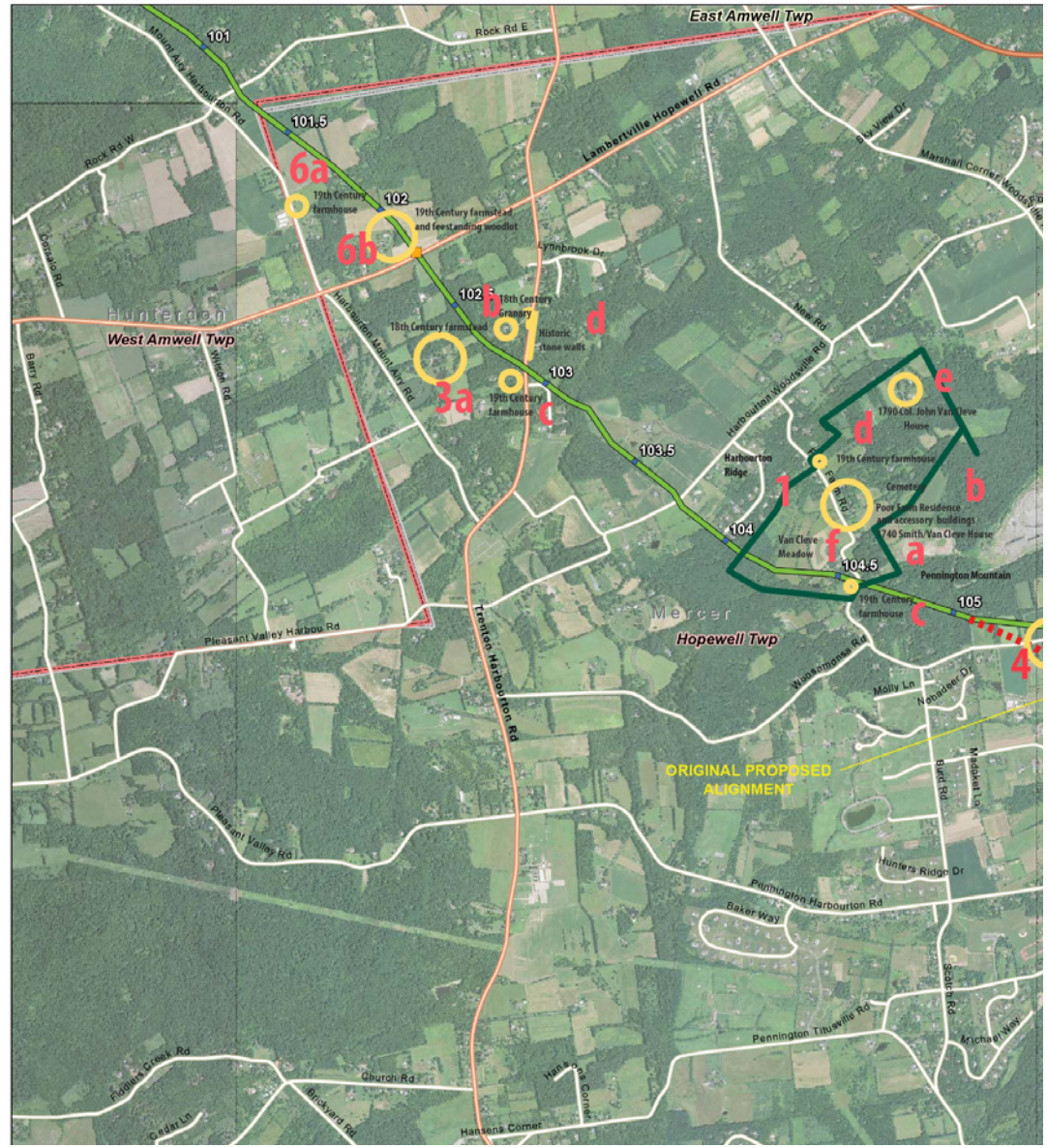
The Hopewell Township Historic Preservation Commission is responsible by ordinance to identify, designate, and manage changes to historic buildings, sites, structures, and objects with the goal of preserving the historic resources and historic character of Hopewell Township. Accordingly, the Commission has reviewed the two proposed routes for the PennEast pipeline in Hopewell Township, one as proposed in September, 2014 and modified; and the other as proposed in January, 2015. Both routes have potential deleterious effects on historic properties in the township, by damaging the context of historic resources, thereby reducing their value and consequent longevity.

September, 2014 Proposed Route as Modified in December, 2014

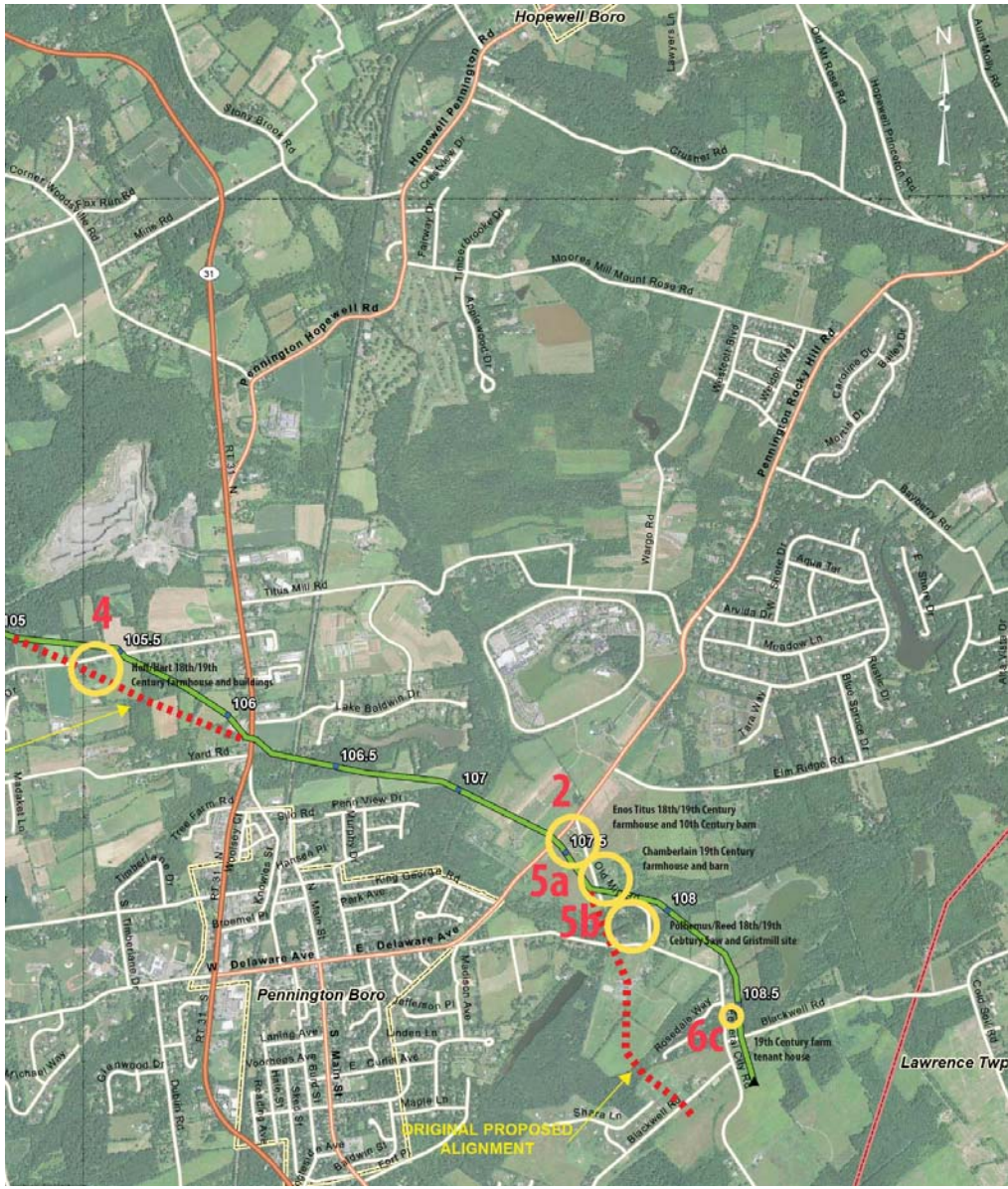
This route enters the northern boundary of the Township near Harbourton-Mt. Airy Road and travels SSW across the center of the Township to its southeastern corner along Blackwell Road where it connects with the Transco Pipeline east of Federal City Road.

The route has potential negative impact on several sites and groups of sites, photographs of which follow.

PennEast Pipeline
Original Proposed Route in Hopewell Township
Map Locating Historic Resources Near Route
Western Half



PennEast Pipeline
Original Proposed Route in Hopewell Township
Map Locating Historic Resources Near Route
Eastern Half



Poor Farm Historic District (Eligible) View Looking North Across Van Cleve's Meadow toward Harbourton Ridge. Pipeline would cut a swath through Woods on ridge at center left of picture.

1f

Poor Farm Historic District (eligible for designation). This district lies between and includes parts of Harbourton Ridge and Pennington Mountain, both wooded slopes that frame the valley floor that was the farmland of the Smith and Van Cleve families in the 18th Century. Resources include the 1740 Smith/Van Cleve House, the 1850's Poor Farm residential building and its ancillary buildings, and the Poor Farm Cemetery. Construction of the Pipeline on this route would cut out a swath of forest on Harbourton Ridge and Pennington Mountain severely affecting the historic context of Poor Farm Valley. The path of the pipeline would leave a visible swath through the large meadow on the valley floor. On the southern edge of this proposed district is a mid 19th century farmhouse and barn. Another 19th century house is on the northern edge.
Blocks and Lots in Rural Historic District: Block 31: Lots 17, 18, 19, 20, 38, 48, 48.01, 48.02, 48.03, 48.04, 79, 83, 84, 85, 87, 88. Block 51: Lots 7.01, 7.02, 8 (partial), 8.02, 22 (partial), 32, 40, 41, 43 (partial), 46, and 54.

C. 1740 Smith/ Van Cleve two-cell house

1a

C. 1850 Poor Farm Residence and Accessory building

1a

Three Building View of Poor Farm Buildings
and Smith/Van Cleve House

1a

19th Century Farmhouse at north side of Poor Farm Valley Historic District.

1d

19th Century Farmhouse at south side of Poor Farm Valley Historic District.

1c

Poor Farm Valley Historic District (Eligible) looking southeast at Pennington Mountain. Pipe line route would cut swatch through these trees.

C. 1750 Jonathan Smith farmhouse
Photo not available

42 Mt Airy Road farmhouse

18th and 19th Smith Farmstead
Photo not available

42 Mt Airy Road farmstead

“The Granary”
photo not available

1573 Rocktown Road

CC.H. Wilson 19th Century farmhouse
1559 Rocktown Road

3c

Stone wall, west side Route 579

3d

Stone wall, east side Route 579

3d

Chamberlain 19th Century Farmhouse

5a

Chamberlain 19th Century Barn

5b

R. Phillips Early 19th Century Farmhouse

6a

N.R. Blackwell Late 19th Century Farmhouse
and free standing woodlot to right of picture

6b

H. Blackwell early 19th Century tenant farmhouse
Federal City Road

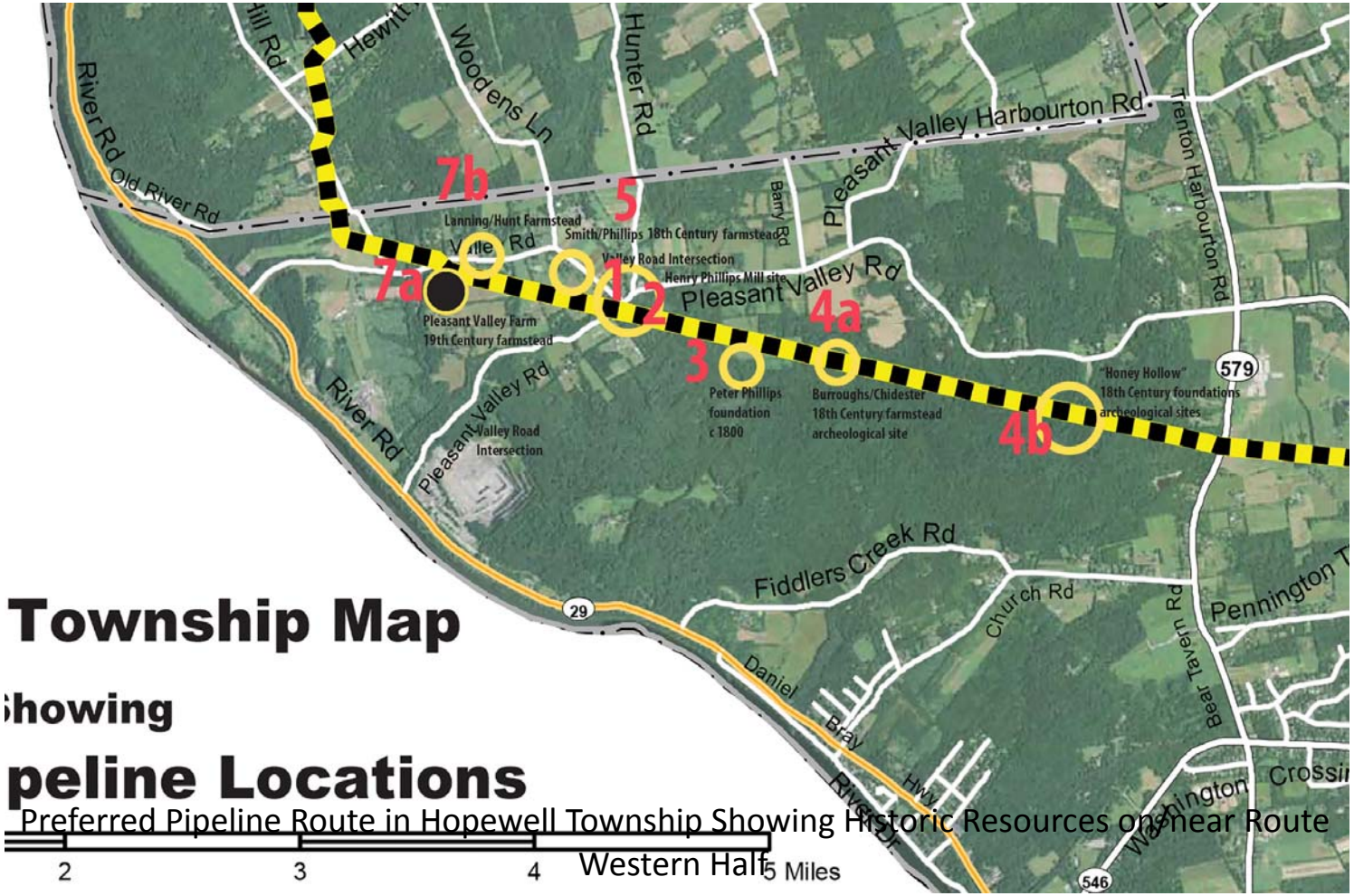
6c

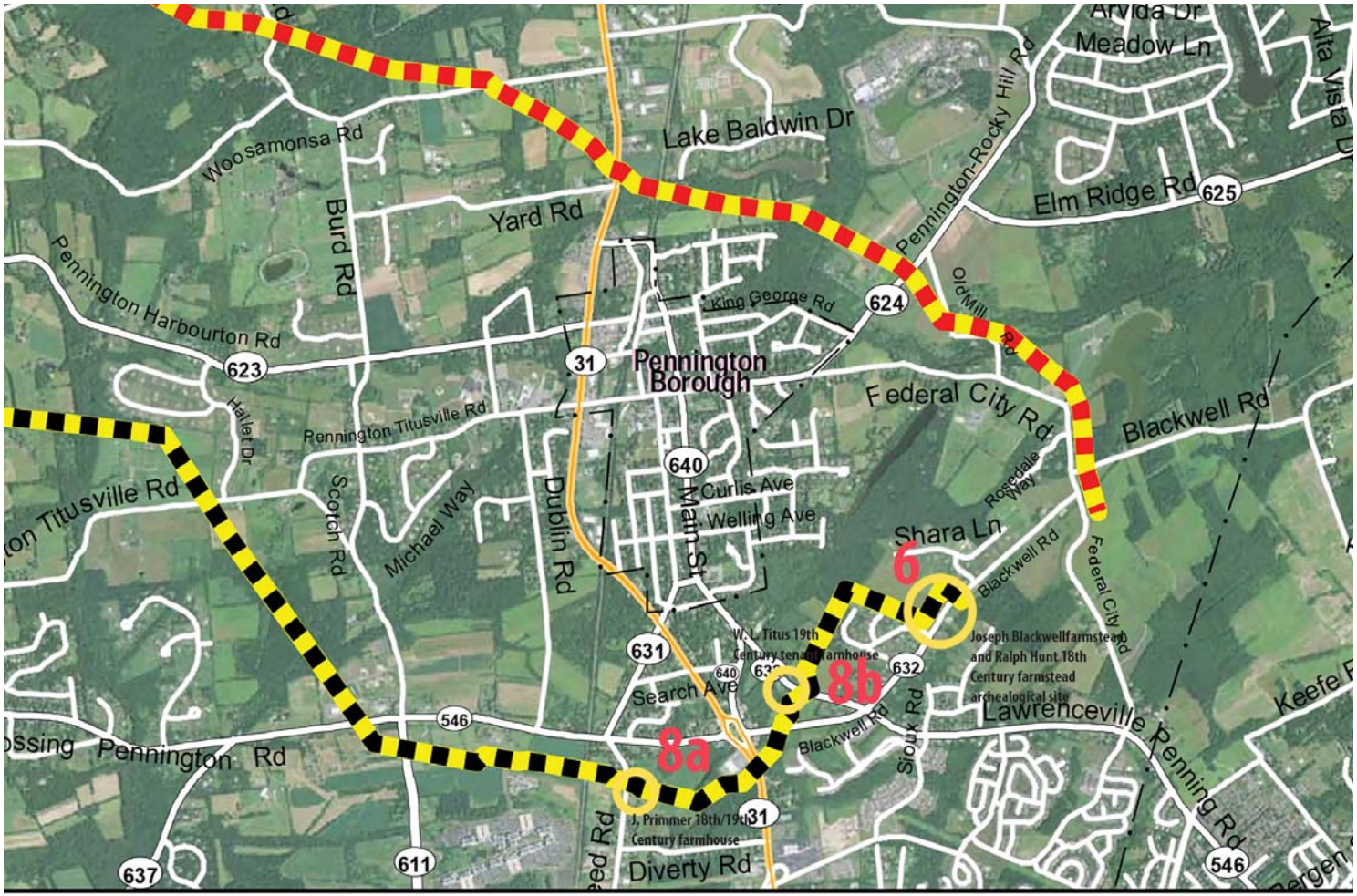
January, 2015 Proposed Co-location PennEast Pipeline Route

This route enters the northern boundary of Hopewell Township under a power line right of way or easement leaving West Amwell Township just west of Goat Hill Road, joins the JCP&L power line easement and travels SSE within it almost to Reed Road where it leaves that easement, travels across Reed Road and associates with the Transco pipeline easement before crossing Rt. 31. The proposed route leaves the Transco easement to go north into the Curlis Lake Woods Preserve thus avoiding a residential area. It then takes three courses on the property at Blackwell Road before crossing the road to join the Transco Pipeline.

This review is based on the proposed pipeline staying within the existing JCP&L easement, either on the north side, or down the center of that easement. There are many historic resources that are not mentioned in this report, on the assumption that the pipeline will conform to those limitations.

Because the JCP&L easement goes through the Pleasant Valley Rural Historic District, there are several concerns about archaeological sites that are contributing resources to the district, and therefore of a high order of importance. The following are the affected historic resources on the co-location route.


Township Map
Showing
Pipeline Locations
Preferred Pipeline Route in Hopewell Township Showing Historic Resources on/near Route
Western Half
2
3
4
5 Miles
7b
7a
5
1
2
3
4a
4b
Lanning/Hunt Farmstead
Smith/Phillips 18th Century farmstead
Valley Road Intersection
Henry Phillips Mill site
Pleasant Valley Farm
19th Century farmstead
Peter Phillips
foundation
c 1800
Burroughs/Chidester
18th Century farmstead
archeological site
"Honey Hollow"
18th Century foundations
archeological sites
Valley Road
Intersection
Pleasant Valley Harbourton Rd
Pleasant Valley Rd
River Rd
Old River Rd
Woodens Ln
Hunter Rd
Barry Rd
Trenton Harbourton Rd
Fiddlers Creek Rd
Church Rd
Bear Tavern Rd
Daniel Bray Hwy
Pennington
Washington
579
29
546



Preferred Pipeline Route in Hopewell Township Showing Historic Resources on/near Route Eastern Half

Pipeline route on JCP&L right of way crossing center of Pleasant Valley Historic District at Valley Road. Any visible Pipeline infrastructure would further deteriorate the context of the District.

1a

Henry Phillips Mill site on Moore's Creek
Across road from Pleasant Valley School
Wooded ridge on right protects context of site.
JCP&L tower immediately adjacent.

2

Moore's Creek at Valley Road/Pleasant Valley road intersection, view to west. Pipeline would cross in the foreground and no doubt damage the historical context.

1b

Moore's Creek at Valley Road/Pleasant Valley Road Intersection, view to east with Pleasant Valley School And Phillips cemetery in background

1c

Peter Phillips House foundation, view to north
Fence line for JCP&L right of way in foreground, tower visible over far corner of foundation. Blasting 200 feet away could damage this foundation, a contributing resource of the Pleasant Valley State and National Historic District.

Peter Phillips house foundation, view to west
Power line right of way clearing to right

3

18th Century Smith/ Phillips Farmstead. Pipeline Route passes through western edge of this property out of picture to left. This property is in the State and National Pleasant Valley Rural Historic District.

5

C. 1870 Joseph Blackwell Farmhouse, eligible for Hopewell Township Landmark Status. Pipeline route is immediately behind this house, which will seriously decrease its real estate value.

6

18th Century Lanning/Hunt Farmhouse Valley Road

18th and 19th Century Lanning/Hunt barns, Valley Road

7b

W.L. Titus Farmhouse
Pennington-Lawrenceville Road

8b

John Primmer Farmhouse
Reed Road

8a

TOWNSHIP OF HOPEWELL

MERCER COUNTY

PLANNING BOARD

201 Washington Crossing Pennington Road
Titusville, New Jersey 08560-1410
Phone: 609.737.0605
Lower Level Fax: 609.737.2770
www.hopewelltwp.org

February 25, 2015

Honorable Cheryl A. LaFleur, Chair
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Docket PF15-1-000
Proposed Gas Pipeline
PennEast Pipeline Company LLC
Hopewell Township, Mercer County

Dear Ms. LaFleur:

Hopewell Township Planning Board respectfully submits the following scoping comments for its use in the development of an Environmental Impacts Statement (EIS) for the proposed PennEast pipeline:

1. There has not been a complete evaluation of the **NO ACTION** alternative. PennEast asserts that if they do not build this proposed pipeline another entity will build and in doing so will create equal or greater impacts than the proposed pipeline construction. This assertion is speculative and completely unsupported by factual data. There are 15 similar pipelines proposed for construction in New Jersey which serve the same stated purposes as this pipeline. FERC must, under NEPA, comprehensively consider impacts created by all other pipeline projects proposed in New Jersey and Pennsylvania. FERC must evaluate the NO ACTION Alterative using a Programmatic Environmental Impact Statement.

2. The only source of drinking water for the majority of Hopewell Township residents is groundwater obtained from fractured bedrock aquifers beneath the municipality. Township residents and businesses rely on groundwater obtained from on-lot wells and do not have other options for potable water. The Planning Board has worked tirelessly in the past 20 years to create zoning and development standards that conserve and protect our groundwater. Groundwater is a priority and, as such, we request that the FERC EIS

evaluate groundwater resources beneath Hopewell Township as resources worthy of special protection and specifically address the following items as a minimum:

a. Hopewell Township within the Northwest New Jersey Sole Source Aquifer or the New Jersey Coastal Plain Aquifer.
b. Many streams in Hopewell Township are dry for months each year because groundwater levels beneath the municipality have dropped well below streambeds.
c. Redirecting even a small percentage of infiltrating water away from a recharge area could have detrimental impacts to groundwater availability.
d. Wells located in each sub watershed are dependent on incident precipitation within that same subwatershed to replenish water removed by a homeowner.
e. Backfilled excavations will likely serve as a preferred pathway for throughflow that infiltrates through soils and fill materials, but cannot penetrate the underlying poorly fractured bedrock.
f. Contaminants introduced during construction or from maintenance operations could irreparably damage this limited resource.
g. Trenching through open spaces used for recharge may severely reduce the effectiveness of open spaces to ensure continued natural replenishment of groundwater supplies.
h. Trenching across the fault and thereby creating a new preferred pathway for water runoff may reduce recharge to these valuable long-term resources.

The Planning Board has reviewed and supports the letter submitted by Mayor Harvey Lester, and wants to emphasize our concerns regarding the critical nature of preservation of groundwater resources within Hopewell Township.

Thank you.

Sincerely,

Karen Murphy

Karen Murphy
Chairperson

TOWNSHIP OF HOPEWELL

MERCER COUNTY

201 Washington Crossing Pennington Road
Titusville, New Jersey 08560-1410
609.737.0605 Ext. 664
609.737.6839 Fax

September 3, 2015

Honorable Norman C. Bay, Chair
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Docket PF15-1-000
Proposed Gas Pipeline
PennEast Pipeline Company LLC
Hopewell Township, Mercer County

Dear Mr. Bay:

On July 28, 2015 the Hopewell Township Board of Health held a special meeting to discuss the health effects of the proposed PennEast Pipeline. Attached find a Board of Health Resolution 2015-2 and a transcript of that meeting for the record. Thank you.

Sincerely,

Harvey Lester

Harvey Lester, Chairman
Hopewell Township Board of Health

C: Hopewell Township Committee
Steven P. Goodell, Esquire
Governor Chris Christie
U.S. Senator Robert Menendez
U.S. Senator Cory Booker
Congresswoman Bonnie Watson Coleman
Mercer County Board of Chosen Freeholders

BOARD OF HEALTH
TOWNSHIP OF HOPEWELL
MERCER COUNTY, NEW JERSEY

RESOLUTION NO. 2015-2

Hopewell Township Board of Health Inquiry into the Health and Safety Impacts Presented by Construction and Operation of the Penn East Natural Gas Pipeline

RESOLUTION

THE HOPEWELL TOWNSHIP BOARD OF HEALTH ("Board"), having heard the testimony of experts and individuals regarding potential adverse health effects on the citizens of Hopewell Township as a result of construction and operation of the proposed Penn East natural gas pipeline;

THE BOARD HEREBY FINDS that the proposed Penn East natural gas pipeline will pose an unreasonable and significant risk to the health and safety of the citizens of Hopewell Township, as a result of, among other things, potential groundwater and surface water contamination, air quality degradation, blasting risk, increased risk of mental health illness, and increased risk of physical illness.

THE BOARD will forward this resolution and the record of the proceedings to the Hopewell Township Committee for use in any proceedings brought by the New Jersey Department of Environmental Protection, the Federal Energy Regulatory Commission, or other public body considering approval of the pipeline, or for other purposes which the Township Committee deems appropriate

Certification

The foregoing is a true copy of the Resolution adopted by the Board of Health of the Township of Hopewell on July 28, 2015.

Kathy Prassas

Kathy Prassas, Recording Secretary
Board of Health
Township of Hopewell, State of New Jersey

HOPEWELL TOWNSHIP
BOARD OF HEALTH

----------x
RE :
SPECIAL MEETING :
----------x

AUDIO RECORDING

DATE: July 28, 2015

TRANSCRIPT ORDERED BY:
PAUL POGORZELSKI, Hopewell Township Administrator

GUY J. RENZI & ASSOCIATES, INC.
CERTIFIED COURT REPORTERS & VIDEOGRAPHERS
GOLDEN CREST CORPORATE CENTER
2277 STATE HIGHWAY #33, SUITE 410
TRENTON, NEW JERSEY 08690
TEL: (609) 989-9199 TOLL FREE: (800) 368-7652
www.renziassociates.com

PRESENT:

MAYOR HARVEY LESTER, Chairman
TODD BRANT
JOHN R. HART, JR.
KEVIN D. KUCHINSKI
VANESSA SANDOM

APPEARANCES:

STEVEN P. GOODELL, ESQ. (Herbert, Van Ness, Cayci & Goodell, PC)
Attorney for Hopewell Township.

KATHERINE V. DRESDNER, ESQ.
Attorney for Hopewell Citizens Against the PennEast Pipeline.

MR. CHAIRMAN: This is an audiorecording of the July 28th, 2015 meeting of the Hopewell Township Board of Health. I will call this meeting to order with a notice that this -- of this meeting has been posted on the municipal bulletin board and forwarded to the Hopewell Valley News and The Trenton Times, The Trentonian on January 6th, 2015, according to public laws of 1975, Chapter 231.

May we have a roll call by our secretary?

THE SECRETARY: Mr. Brant?

MR. BRANT: Here.

THE SECRETARY: Mr. Hart?

MR. HART: Here.

THE SECRETARY: Mr. Kuchinski?

MR. KUCHINSKI: Here.

THE SECRETARY: Ms. Sandom?

MS. SANDOM: Here.

THE SECRETARY: Mayor Lester?

MR. CHAIRMAN: Here.

Welcome, everyone, to this special meeting of the Hopewell Township Board of Health. The focus of these proceedings is the potential health impacts of the PennEast Pipeline, which are unique to Hopewell Township as a result of our topography, geology and waterways.

In that regard, we are conducting a board of

health inquiry. The authority for our inquiry is found in the public practice standards of performance for local boards of health in New Jersey, as set forth in New Jersey law.

As part of the subsection entitled "Public Health Practice," a local board of health is required to provide ten essential public health services. Included among these ten essential public health services are the obligation to:

1) Monitor health status to identify community health problems.

2) Diagnose and investigate health problems in the community which includes identifying emerging epidemiological health threats.

3) Inform, educate, and empower people regarding health issues.

4) Mobilize community partnerships to identify and solve health problems.

5) Develop policies and plans which support individual and community health efforts and

6) Enforce the laws and regulations that enforce health and ensure safety.

To achieve these goals, the Board of Health will hear testimony given under oath. The proceedings will be conducted by our township attorney, Steve Goodell.

While we are interested in public questions and concerns, the chief focus of this inquiry is scientific evidence presented through testimony and/or reports.

It is our intention to create a record and a resolution which may be of interest to the Federal Energy Regulatory Commission, commonly known as FERC and/or the New Jersey Department of Environmental Protection, as well as others. It is also our intention to provide a model for other PennEast impacted local New Jersey boards of health to follow.

Before I turn these proceedings over to Mr. Goodell, does any member of the Board of Health have any comments or any questions at this time?

Not seeing anybody, Mr. Goodell?

MR. GOODELL: Thank you, Mayor. Good evening, everybody. Thank you for coming to this Board of Health meeting. This is, as you may know, a fairly unique proceeding, but it is one that is firmly based on jurisdiction given to the Board by statute and regulation.

In order for the Board to meet its requirements and to develop a resolution, it is going to hear evidence and testimony. So we have scheduled to testify the Township hydrogeologist. He will testify first, Mr. Matt Mulhall. After that, I know that Katherine Dresdner, the attorney for the Hopewell Citizens Against the Pipeline

has several witnesses that she would like to present. We will hear testimony from those expert witnesses. When those experts have finished testifying, I understand that there are certain members of the public who have signed up because they indicate that they have evidence that they would like the Board to hear, and we will hear from those individuals.

We would like to keep these proceedings moving along and so we ask that experts try to restrict themselves and their presentations to about ten minutes. And that any citizens who testify try to restrict themselves to about three minutes. Beyond that, if members of the Board of Health have any followup questions that they would like to ask any of the witnesses, we'll certainly allow that to happen.

And at the end of the proceedings, the Board can consider whether or not they've heard sufficient evidence to adopt a resolution and, if so, they can discuss that at that time.

The proceedings are being recorded. It's anticipated that these recordings will be submitted to a court reporter service and a transcript will be prepared. That transcript can then be used in other proceedings, as the Township finds necessary. And also, as the Mayor indicated, all the testimony will be under oath. So I

will swear you in if you are going to testify.

So with that said, the first witness will be Mr. Mulhall.

M A T T H E W J. M U L H A L L, WITNESS, SWORN.

MR. GOODELL: Can you state your name please?

MR. MULHALL: Matthew J. Mulhall, M-u-l-h-a-l-l.

MR. GOODELL: And, Mr. Mulhall, you are a geologist?

MR. MULHALL: Yes, I am.

MR. GOODELL: You're --

MR. MULHALL: I'm a professional geologist.

MR. GOODELL: And you are the Township's hydrogeologist?

MR. MULHALL: Yes, and I -- yes, I am.

MR. GOODELL: How long have you been the Township's hydrogeologist?

MR. MULHALL: Since at least 1999.

MR. GOODELL: All right. And can you briefly give us your training and experience as a professional geologist?

MR. MULHALL: Yes. I have a Bachelor's Degree in geology from Lafayette College. I have a Master's Degree in the geological sciences from Northwestern University. I've been practicing as geologist in New

Jersey and Eastern Pennsylvania for more than 30 years.

MR. GOODELL: Okay. You're familiar with the geology and the hydrogeology of Hopewell Township?

MR. MULHALL: Absolutely.

MR. GOODELL: And are you also familiar with the proposed PennEast Pipeline route?

MR. MULHALL: Yes, I am.

MR. GOODELL: All right. And do you have an opinion as to whether or not that route has the capacity to affect the water quality and quantity in Hopewell Township?

MR. MULHALL: Yes, I do.

MR. GOODELL: And what is that opinion?

MR. MULHALL: That opinion is that given the pipeline route, and for a number of factors, both -- well, geologic and hydrogeologic, that the pipeline route can have an adverse influence on groundwater resources, both from a quantity perspective and a quality perspective.

MR. GOODELL: Go ahead.

MR. MULHALL: Okay. First of all, I wanna emphasize that the only available resource to residence of Hopewell Township is groundwater. USEPA recognized in 1988, as did the NJDEP, that Hopewell Township is underlaid by what they term sole source aquifers. That the only source of water for residents of the Township

is groundwater and that impacts to that groundwater can make it difficult to utilize those water resources.

One -- we've known for a while now -- and historically, Hopewell Township has long recognized that there's been issues with its groundwater resources. They've conducted studies going back more than 50 years now. In addition, we do know that groundwater resources are strained. If you walk around, especially in the summertime, you'll see a lot of areas where streams should be flowing. They're not flowing. That primary reason for that is because water levels have -- have been -- have declined in the aquifer system below the stream bank.

So we already know that there's strains to groundwater resources in the Township. We also know that Hopewell Township is in one of the most populated areas of the state. As a result, those demands get further impacted by any additional growth. And the Township has put together a master plan to try to focus that growth to where those resources are available and protect the areas where those resources are not available.

One thing is both proposed pipeline pathways that have been suggested so far will cut through the northern portion of the Township where those resources are perhaps most strained. Those areas of the Township where you have igneous and metamorphic rocks, you have

the Lockatong Formation, even in its sedimentary form have very limited availability for water to be replenished. It's replenished at about a rate of less than two inches a year. It's about 4.3 percent of annual precipitation. It's not a lot of water getting into the ground up there.

In addition to that, you have very hilly nature and topography to that area. So each of those areas -- each area of the Township is divided into small subwater sheds. Each subwater shed is dependent upon precipitation that falls in that same subwater shed. It's not something where you're getting water from one area of the Township and it's migrating miles over and hitting another area of the Township.

Sorry about that. I keep hitting that light.

The pipeline pathway -- pipeline pathways, or whatever pipeline they decide to install can itself -- in itself serve as a preferred conduit. If you already have depleted water resources and that pipeline pathway becomes a preferred conduit, in other words, water that would infiltrate into fracture -- bedrock fractures, or into soils and then into bedrock fractures now migrate along the pathway of the pipeline, either on the surface or within the backfill around the pipeline, now can migrate from one subwater shed to another subwater shed and is now lost.

Not only that, it can take contaminants from one area to another area that aren't necessarily to the advantage. So you're taking recharge to some areas of the Township and you're moving it to other areas where it may not necessarily be needed or, more importantly, taking it away from areas where it is needed.

One thing is the proposed pipeline pathways will cross the Hopewell fault. The Hopewell fault, while it's not been seismically active in a very, very long time, the issue with the Hopewell fault is it is perhaps the most important water resource for Hopewell Borough. By bringing the pipeline along that -- the Hopewell fault now what you've created is an opportunity for, again, carrying water away from a groundwater resource that's available and/or creating a conduit or pathway for contaminants from one area to migrate into another area.

An issue of concern is that contaminants that are either introduced during the construction or the maintenance operations could have irreparable harm to any of the -- to the limited resources of the Township. This Township primarily must rely on dilution from our -- of contaminants to remove contaminants -- to remove -- step back a second. Dilution to reduce contaminant concentrations in groundwater, if present, both natural contaminants and manmade contaminants.

1 The pathway -- the pipeline can, as a conduit
2 can (indiscernible) move contaminants around, but it also
3 -- they can limit dilution that's necessary to remove those
4 contaminants. As I said earlier too, in somewhat
5 conclusion here, the Township's had a long history of
6 protecting its groundwater resources. They've expended
7 considerable funds to preserve open space and to ensure
8 continued natural replenishment. Cutting through these
9 open lands to install a pipeline can severely reduce the
10 effectiveness of these efforts.
11 Preservation and protection of open lands from
12 unnecessary damage is the best available method for
13 ensuring aquifer reliability. The Township has long
14 considered that and since about 1999, the Township had
15 introduced measure after measure to ensure that. They've
16 bought lands. They've protected lands. They've
17 introduced a master plan that better protects those lands.
18 The groundwater resource of the Township have
19 been recognized by both federal and state regulatory
20 authorities. We ask that FERC, as another regulatory
21 authority, a federal regulatory authority, also consider
22 the fact that these groundwater resources are limited,
23 easily affected by both on a quantity and quality
24 perspective and can be irreparably damaged as a result
25 of cutting through the sub -- shallow subsurface to install

the pipeline. And ultimately, neither of the proposed pipeline paths will benefit the Township's interest in protecting its most vital and needed groundwater natural resource.

Sorry. A little nervous tonight, so.

MR. GOODELL: All right. Thank you.

Members of the town -- of the Board of Health have any questions for Mr. Mulhall?

If -- you do?

MR. KUCHINSKI: (Indiscernible).

MR. GOODELL: Okay. Wait a minute. You're gonna have to -- and Mr. Kuchinski, why don't you identify yourself since we need to have identification for the recording?

MR. KUCHINSKI: Kevin Kuchinski, Hopewell Township Board of Health and committee member. So you mentioned potential contamination by the construction and ongoing operation of the pipeline. What are the primary sources of potential contamination that affect our groundwater?

MR. MULHALL: Well, you have natural contaminants that are present, but you also have manmade contaminants. You have fuels. You have oils, hydraulic fluids, things that are used in excavation activities. Again, the fuels that are used in the equipment. You can

have any number of factors. Maybe not necessarily the gas itself that's in the pipeline, but the materials that are used in the pipeline and that operation can have an adverse impact.

MR. KUCHINSKI: Thank you.

MR. GOODELL: Any other members of the Board of Health?

Sure.

MR. CHAIRMAN: I have one. Harvey Lester, Chair of the Board of Health. Given our dependence on groundwater, if that groundwater becomes contaminated, what are we to do?

MR. MULHALL: If it becomes contaminated, the only real resource is -- well, there's two things. Number one is a spill could result in NJDEP requiring either PennEast, or whoever causes the spill, to follow the pipeline pathway to clean that up, and/or ultimately dilution from precipitation.

And as I said before, if it gets into the aquifer system, there's not a lot of water getting into the ground in Northern Hopewell Township, about two inches per year. And that's in a normal year. So you're not talking about a lot of water that gets into the -- into the area that could dilute it. So you're limited in that ability. And if you have a small subwater shed that's affected, it may

be irreparably harmed.

MR. GOODELL: And, Mr. Mulhall, you have a report that you --

MR. MULHALL: Yes, I do. I have a report dated February 23rd, 2015.

MR. GOODELL: All right. We'll make that part of the record. Thank you very much.

MR. MULHALL: Thank you.

MR. GOODELL: Okay. All right. Ms. Dresdner, as the attorney for the Hopewell Citizens Against the Pipeline, I understand that you have some experts that you would like to present at this time?

MS. DRESDNER: Yes, I do. Thank you. Is this on? Okay. Okay. Thank you.

The first witness I would like to call -- can you hear me? Is that better?

MR. GOODELL: Yeah, you're gonna have to -- you're gonna have to speak directly into the microphone and identify yourself before you speak.

MS. DRESDNER: Okay. This Katherine Dresdner. The first expert witness is Mike Pisauro, from the Stony Brook-Millstone Watershed Association.

Mr. Pisauro?

MR. GOODELL: Mr. Pisauro, you can approach the podium.

M I C H A E L P I S A U R O, WITNESS, SWORN.

MR. GOODELL: Thank you. The record will reflect that the witness has been sworn.

MS. DRESDNER: Mr. Pisauro, can you just please tell us what your position is at the watershed and your academic background?

MR. PISAURO: Sure. I am the policy director for the Stony Brook-Millstone Watershed Association. I have -- I'm a licensed attorney in the States of New Jersey and Pennsylvania. I have a law degree from the University of Richmond and -- from 1995.

Prior to being a policy director at the Watershed, I was in private practice where I focused my practice on representing environmental organizations and citizen groups at the State House, lobbying at DEP on regulations, and other environmental issues.

MS. DRESDNER: So you have a lot of experience with environmental regulatory matters?

MR. PISAURO: Yes.

MS. DRESDNER: Okay. Please go ahead.

MR. PISAURO: Sure. I would like to take this opportunity to thank the Township and the Board of Health for this opportunity. The Stony Brook-Millstone Watershed Association is Central New Jersey's oldest environmental organization, founded in 1965, to keep New

Jersey's waters clean. And that's very important because that issue is about keeping our waters clean.

The potential impacts from the PennEast Pipeline on water quality is, as you somewhat heard, is kind of scary. Quality is an issue that is relevant tonight and to this Board of Health because the Board of Health statute in the Local Ordinance 16-7.2 gives the authority to issues that may be injurious, detrimental, or otherwise harmful to the public health or the environment.

And that environment includes pollution or the existence of a condition which causes or threatens pollution of any surface water of the Township. And you've heard tonight from the Township's expert about some of those impacts to groundwater and streams.

The PennEast Pipeline will cut through -- and I do mean that quite literally. They will trench through -- they will dig a trench through multiple Category 1 streams and other waterways.

MS. DRESDNER: Can you explain what a Category 1 stream --

MR. PISAURO: Sure.

MS. DRESDNER: -- is please?

MR. PISAURO: Category 1 streams is a designation under New Jersey DEP regulations surface water quality planning rules, flood hazard area rules, and other

rules, where those are the waters that the DEP has determined have multiple reasons including surface drinking water supplies, aesthetic environmental issues the highest quality and deserves the best protection. Those are waters that receive a 300 foot buffer. And I think those are very important, those buffers.

But -- let's see if I can do this.

MR. GOODELL: And right now you're referring to a PowerPoint?

MR. PISAURO: Yes.

MR. GOODELL: Will that PowerPoint be part of the record?

MR. PISAURO: Yes.

MR. GOODELL: Okay.

MR. PISAURO: Yes. This is a map prepared by the Watershed, looking at the route for the PennEast Pipeline. Those lines in the dark blue are Category 1 waters. But you can also see, in the lighter blue, other tributaries, other waters that drain into the D&R Canal or the Delaware River. That's important because, at least in brand new farms, the small section of Hopewell Township and where I live, that is one part of the town that gets its drinking water from Trenton Water Works. Trenton Water Works gets the water from those supplies. So any pollution that enters those waters may impact that water

supply which, again, gives the Board of Health in Hopewell Township some issues.

MR. GOODELL: And you're referring to the lines --

MR. PISAURO: Sure.

MR. GOODELL: -- on a diagram --

MR. PISAURO: Yeah.

MR. GOODELL: -- that's called impacted waters, correct?

MR. PISAURO: Yes.

MR. GOODELL: Okay.

MR. PISAURO: The D&R Canal and the Delaware River are the sort of purplish and orange lines and they're mapped -- they're marked on the legend. As you can see the PennEast Pipeline comes down and in here, here's Hopewell Township. It's a darker green line. And, again, you see all these tributaries, all these waters to supply, at least to my drinking water.

Now buffers, as I said, are vital to protecting water quality. Sorry. New Jersey DEP regulations implementing statutes recognize this. The Township ordinances recognize this, the importance of buffers. For example, in this stream corridor ordinance, as well as the forest management and tree removal ordinances.

And I'd just like to read a couple of sections.

Section 12.3.2, that's the stream corridor protection ordinance, "The purpose of the stream corridor protection provisions are to assure that adequate water supply is available and maintain the long-term natural equilibrium of ground and surface waters in Hopewell Township, and neighboring communities, and improve and maintain the quality of waters supply and sustain diverse populations of aquatic flora and fauna."

One of the things I failed to mention, a lot of those Category 1 streams were designated in part because of habitat for threatened and endangered species.

The forest protection -- the forest management and tree removal, it's intent, trees are declared to be important, cultural, ecological, scenic, and economic resource. Results -- and one of the things that help result in additional storm water runoff, which would -- sorry.

And one of the things that you cannot do with a forest is remove them because they will result in additional storm water runoff, which will impact adjacent properties.

And what I have up here, again, a PowerPoint slide entitled, "Impacted Forests," are all of the forests along the PennEast Pipeline route. Again, that's the route, and in here, you have Bald Pate Mountain and

Washington Crossing Park, which are important forests.

Forests, especially forested riparian zones provide some of the highest quality filtering, buffers filter storm water. As Mr. Mulhall indicated, if those pollutants reach into the aquifers, reach into our waterways, there's not gonna be a whole lot in summer months and low flow months for that water -- that pollution to be diluted. And so by protecting our buffers, you are protecting water quality. You are protecting our waters supply.

MR. GOODELL: And you've been referring to a slide entitled "Impacted Forests"?

MR. PISAURO: Correct.

MR. GOODELL: Okay.

MR. PISAURO: Correct.

Went to far. You know, this has been one of those days with technology.

MS. DRESDNER: You wanna go back?

MR. PISAURO: This was a picture that was taken by our staff on the Leidy Line which is in Princeton and Skillman.

MR. GOODELL: It's entitled "Leidy Line Impacts."

MR. PISAURO: Impacts. And I'm using this to demonstrate. Where that bridge is is the Rock Brook.

1 That is the Transco-Leidy Line Pipeline. There -- as you
2 can see, there is no riparian buffer. There is no
3 structure between the pipeline and the waterway. There
4 is no trees. There is no vegetation to which storm water
5 which hits the ground can hit, be filtered, slowed down
6 and infiltrated into the ground. Any storm water that
7 hits that area will have nothing to stop it to hit our
8 waters. So all the pollutants that are there will continue
9 to run in. And I think that's important. The 2012
10 integrated -- I always call it the integrated report, but
11 it's the 2012 Integrated Water Quality and Monitoring
12 Assessment report, the report that DEP prepares every two
13 years as a requirement under the EPA's Clean Water Act.
14 And that lists and reviews all of the impaired waters,
15 waters that do not meet water quality standards. And in
16 New Jersey, in this region, 90 percent of our waters do
17 not meet water quality standards.
18 Why is that? Nationally and in this state, that
19 is because 60 percent of that pollution, that impairment
20 is a result of storm water runoff. The very pollution
21 that our buffers help us, protect us from. And the
22 PennEast Pipeline will trench through, cut and remove these
23 buffers. And there will be nothing to stop, slow down,
24 and filter that water, which is why we thank the Board
25 of Health for having this hearing. We urge you to find

that these impacts are unacceptable and we appreciate it. Thank you.

MR. GOODELL: Okay. Thank you very much.

Any members of the Board of Health have any questions for Mr. Pisauro?

If not, thank you very much.

And, Ms. Dresdner, you have another witness?

MS. DRESDNER: Yes. Thank you.

The next witness is Dr. Onstott.

DR. ONSTOTT: Thank you.

D R. T U L L I S O N S T O T T, WITNESS, SWORN.

MR. GOODELL: Could you state your name and spell it please for the record?

DR. ONSTOTT: I'm Tullis C. Onstott.

MR. GOODELL: Can you spell it?

DR. ONSTOTT: T-u-l-l-i-s.

MR. GOODELL: Onstott?

DR. ONSTOTT: O-n-s-t-o-t-t.

MR. GOODELL: Okay. The record will reflect that Dr. Onstott has been sworn in.

MS. DRESDNER: Okay. Professor Onstott, can you give us the benefit of your background, educational background?

DR. ONSTOTT: Certainly. I got a Bachelor's at Caltech, Ph.D. at Princeton. I've been on the faculty

--

MS. DRESDNER: In what areas? What area?

DR. ONSTOTT: Initially, in geology. And I've been on the faculty at Princeton University for 30 years now.

MS. DRESDNER: What department?

DR. ONSTOTT: In geosciences. And I've spent the last 20 years focusing my research on low temperature geochemistry and microbiology.

MS. DRESDNER: Okay. Thank you.

DR. ONSTOTT: So today, I wanna provide you with my professional opinion on the issue of arsenic and it's relationship to the PennEast Pipeline. The main points I wanna cover is where is the arsenic coming from, how do gas pipelines affect arsenic, how does this relate specifically to this Township and its problems, and to talk a bit about what we need to do about this.

Now within the last ten years, the scientists at the geological survey of New Jersey have identified the source of arsenic in this region as coming from these black bands that you see here in this photograph. These are within the red beds of the Triassic lake sediments that form the bedrock in this region here.

And at higher magnification, they located arsenic minerals actually present in the matrix of the

1 rock. So the arsenic is leaking from these minerals into
2 the ground where it percolates through this rock, and
3 that's where the arsenic in groundwater originates.
4 It's a little bit more complicated than that.
5 This is a diagram that they published, which shows the
6 aquifers running diagonally through here. The surface
7 going from the ridges, down into the valleys and over to
8 the wetlands and streams, and what happens in the natural
9 course of events is that those pyrites that are in the
10 bedrock are exposed to air and oxidized. And oxidation
11 leads to the release of arsenic in the form of what we
12 call arsenate. And that arsenate then enters sluggishly
13 into the aquifer groundwater. But as it penetrates into
14 the surface, the oxygen levels of the groundwater diminish
15 because of microbial activity.
16 The microorganisms are using organic matter,
17 sources of electrons, hydrogen, and they dump electrons
18 onto the arsenate, and they convert that into arsenite.
19 And that arsenite is highly mobile, and it is the most
20 dangerous form of arsenic, with the exception of arsine
21 gas.
22 Now the arsenic that runs off the stream and
23 into the buffers that Mike was just talking about, the
24 wetlands and our streams, those act as the perfect sponges
25 for arsenic, and they retain it there, and microorganisms

will partially mobilize that arsenic into a vaporous form of arsenic gas. So that, in short, is the arsenic cycle.

PennEast, as was already illustrated by Mike's diagrams, are crossing these ridges and valleys and trenching right through the streams. So the orientation of the pipeline is designed to have the maximum possible impact on the aquifer and the arsenic cycle.

How does that work? Well, we already got some insight from this from Matt's presentation. They have to install the gas pipeline in the bedrock, as you just saw on the previous presentation. That will expose that bedrock to air, fracture, pulverize it, converting the arsenic and pyrite into arsenate.

Then the organics that are around that pipeline during installation process, methane leaking from the pipelines are consumed by bacteria. Those bacteria will take the electrons from the methane gas and organics, dump it on arsenate, convert to arsenite, and then become mobile. They will attack the gas pipeline and corrode it, getting electrons from the pipeline, dumping those electrons on arsenic, converting it to arsenite, making it mobile.

Now pipelines will install an active cathodic shield to prevent the corrosion. They basically stick (indiscernible) into the ground. They pump 50 amps into

the ground, converting it from -- converting the pipeline into a cathode, preventing the corrosion. But the electrons are gonna feed the bacteria. And, again, which will then dump it onto the arsenate and spread the mobilization of the arsenate around the pipeline.

Now just to show that I'm not a little crackpot about this, this is an exciting area of research just within the last five years. There are multiple papers that show that electrons feed -- bacteria feed off electrons.

Now you can go on the internet and draw down a recent study of arsenic in the Northern State of New Jersey. It's a very thorough study of groundwater. They covered 32,000 in Northern New Jersey over this course of time up to 2011, again, done by the Geological Survey. And what they found is the most significant contaminant was arsenic. That's what's causing a failure of groundwater quality in this area is arsenic.

Now when you plot it on a map of New Jersey, where those arsenic regions are located, right on the Triassic lake sediments in the areas where you're living. And so when I first learned about the PennEast Pipeline, I would discover that it went right through the middle of the arsenic regions in New Jersey, rather than circumventing it.

So now let's look a little bit closer at Hopewell

Township and get a feeling for granularity of the situation here. These are showing you wells which exceed the 5 ppb standard. So 5 ppbs is the maximum contamination level that is allowed by state law here. And so you can see the number of wells in bright orange and red that exceed those levels and the ones that do not. And keep in mind that this is not a static issue. These values will change with time. And this does not show you the wetlands. We don't have data on the wetlands. We have no idea at all of the arsenic levels that are stored in the wetlands as well.

So negotiating a three-foot pipeline through that without causing an arsenic problem has gotta be like raking leaves in a minefield. Okay?

Now I wanna finish up with some visualization of what this means. And this is a photograph taken on a farm where they're doing horizontal directional drilling, which is, in fact, the best option available for crossing wetlands, instead of trenching through them, drilling underneath them. And here, you see they're just getting started. They've got a -- sort of like about a 12-foot diameter drill rod going in there. This is gonna be for a 42-inch diameter pipeline. So they're gonna have to drill a four-foot diameter hole through the ground for about a distance of a thousand feet or so in this case.

So the big boys, the really big bits are over there on the other side. And what you see in the middle there is the drill bite. Now there's probably about, I'd say, several tens of thousands of liters of drill mud sitting right there right now and they're just getting started. By the time they're done, they'll have somewhere on the order of about a half-a-million liters of drill mud in that hole.

Now they're removing the tiny chips that are coming out of there and circulating the water. Where's the water coming from? Well, they drilled a well right next to here, into the aquifer, to extract water from the well they use to put into the drilling well, and to restore the water that's leaking out into the groundwater system underneath the water shelf.

Now they're putting bentonite (phonetic) in there to try to slow that process down. Okay? Interestingly enough, if you look at these rocks really carefully, you'll notice that there are some of the rocks in there that are these black, dark colored rocks. And sure enough, those are the dark gray beds in the Passaic Formation that have the highest concentrations of arsenic in it.

All right. So they have 500,000 liters of this drill mud and the question is, well, how much arsenic is

actually in the drill mud? If the arsenic is transferred from that crushed up bits of rock that's in the drill mud into the mud filtrate, going into the liquid phase, well, it'll be on the order of about 30 ppm. Okay.

To give you a better picture of how this works, if I have one kilogram of that rock with 10 ppm of arsenic in it, I remove the arsenic from that one kilogram, so about the size of my fist, and I put it in a one liter bottle of Fiji water, okay, how much Fiji water would it take for me to dilute that down to 5 ppb, to meet state standards? It's all about dilution, as Michael said. It would take about 5,000 bottles of Fiji water. Okay?

Now I've got 500,000 liters of drilling mud in there that has seen 2.6 million kilograms of rock. How much water will I have to add to that drilling mud to dilute it down to meet state standards? 2.5 billion liters. How much is 2.5 billion liters? It's about 12,000 Olympic sized swimming pools. So the question is how many Olympic sized swimming pools of water does this Township have? And that's just for one section of that pipeline, one sort section of the pipeline.

Okay. So I'm gonna finish here with that because I don't wanna run over time, and I'll take any questions. Thank you.

MR. GOODELL: Okay. Thank you, Dr. Onstott.

Any members of the Board of Health have any questions for Dr. Onstott?

Mr. Kuchinski?

MR. KUCHINSKI: So from your testimony, Doctor, it seems inconceivable that there is enough groundwater in Hopewell Township to sufficiently mitigate the arsenic contamination that would result from the construction process. Is that correct?

DR. ONSTOTT: That's right. That's exactly right. Now from the point of view of PennEast, they are basically stating that they don't think it's going to be a problem. And their reasoning, I assume, is that the arsenic doesn't get transferred from the rock into the groundwater at sufficiently high concentrations. In order for that to work, less than .01 percent of the arsenic has to get transferred to the groundwater. But if that were the case, your county wouldn't have an arsenic problem in its groundwater at all, and you do. So the arsenic does move from the rock into that groundwater, in sufficient quantities that it will be a problem.

MR. GOODELL: Any other members of the Board of Health have any questions?

Okay. Thank you very much, Dr. Onstott.

DR. ONSTOTT: Sure.

MS. DRESDNER: And you'll be submitting the

PowerPoint?

DR. ONSTOTT: That's right.

MS. DRESDNER: Okay. Thank you.

DR. ONSTOTT: (Indiscernible).

MR. GOODELL: We'll make sure that that's part of the record.

Ms. Dresdner, your next witness?

MS. DRESDNER: Yes.

Dr. Trachtenberg?

D R. M I C H A E L T R A C H T E N B E R G, WITNESS, SWORN.

MR. GOODELL: Could you state your name and spell it please?

DR. TRACHTENBERG: Yes. My name is Michael Trachtenberg, M-i-c-h-a-e-l, initial C, last name T-r-a-c-h-t-e-n-b-e-r-g.

MS. DRESDNER: And, Doctor, can you please give us the benefit of your professional background?

DR. TRACHTENBERG: Yes. I have a Bachelor's Degree in -- from City University of New York, and a Ph.D. from the University of California in Los Angeles, with a major in anatomy and neurobiology. I give you here on this first slide a quick thumbnail of my key employment. I currently run a small company developing flow batteries. I'm an adjunct professor at Rutgers and which I teach

a course on sustainability, which deals with a lot of the problems we're talking about today. I previously had worked in a company called Carbozyme. You can see the other issues. In my prior lifetime, I was the director of Neurological and Neurosurgical Research and, among other things, this excellent talk preceding mine brought to mind one of my first meetings was all about arsenic in well water. So it's come full circle.

MS. DRESDNER: Thank you. And if -- please give us your opinion about the impact of the PennEast Pipeline.

DR. TRACHTENBERG: The PennEast Pipeline presents some very serious health hazards for the populous at large, both in terms of toxicity, potentials for explosion, and for the earth as overall. And I'll discuss each of those in turn.

So let me sort of set the stage. We all want clean energy, preferably cheap, although that's -- may or may not be the case. We want it to be safe. That's a real consideration this evening, and we want it without adverse consequences. The case I'm going to make tonight is that the PennEast Pipeline proposal does not provide for any of those benefits. It would not be clean. It would present very high risks. Those risks would be and burdens would be transferred to Hopewell and the adjoining villages.

Let me point out that I live in Lawrenceville, and I'm speaking tonight as a private resident of Lawrenceville, New Jersey.

So there are two classes of problems that one would have to deal with: The local and the worldwide. The local problems are essentially the emissions, as they may be related to health effects, and fire and explosion issues. Worldwide, we're gonna talk about increases in carbon dioxide equivalents -- that's what the little e stands for -- and how that will impact civilization. And I don't mean that lightly.

First is a picture to show you where the pipeline is ending currently. The two proposals are in green and red. The circle in the top right is the compressor booster station, which is on Cold Soil Road, very next -- very close to Carter Road. Let me point out that I live right off Cold Soil Road.

They have not yet proposed a connection between the pipeline and the compressor station, but that will never be necessary. This is a little higher view of the compressor station. And for those who are familiar with the area, it's right across from Terhune Orchards.

So what kinds of problems does one normally encounter at compressor stations? Because that's where your big leaks really occur. There are three. There are

blowdowns, which can be scheduled and some are accidental. Many of you have received a letter with regard to blowdown activity that's going to release methane in the local area. So you're familiar with the fact that this will happen.

There are fugitive releases as they're called, meaning that they're not really sure where they're coming from. Typically, this is equipment leakage. And that means that as the compressor is rotating around the axis, there is a seal and that seal inevitably leaks and then there are evaporative losses. And, finally, there are accidents, such as occur everywhere.

Most of the releases, interestingly, are unpredictable in time, in magnitude, and in impact. Why is that the case? Well, the impact is that it depends, to a large extent on the first two events. Time, meaning when are people out and about and might be directly affected by the materials. Magnitude is pretty obvious. And impact, in part, depends upon the local wind conditions. If the wind is blowing towards you, that may not be very pretty. If it's blowing in the opposite direction, you're lucky that time.

It's important to understand that PennEast Pipeline will probably refer to EPA based protocols, but, as was said in the previous presentation and is well-known to chemist, dilution is the best way to minimize an impact.

The solution to pollution is dilution, as is well-known.

Well, the way the EPA makes its measurements is that it averages over a long period of time, a minimum of 24 hours, often longer periods of time and it just looks at the distribution in space of whatever materials are released. That's very nice because it reduces the apparent impact, but it is not effective for people who are in the immediate proximity wherein a release may occur over a period of an hour or two, and then be diluted, if you will, over the 24-hour counting period. So it's now one-twelfth of the -- the apparent release is one-twelfth of the actual release.

What kinds of things might be released? One of the -- and these are compounds, in part, that come out of the Marcellus Shale. So it contains radon. Every one of you has a radon filter in your house, to pull the air from the basement or below the basement. You're aware of this. So this is a gas that as a 3.8 day half-life, but that's not a meaningful number here because it's going to be released continuously. So it's present all of the time. It decays in the pipeline to give you lead and polonium, both of which remain in the pipeline. That's important because if you get a pipeline burst for any reason, now those radioactive compounds will be exposed. They are not gaseous.

Another thing that comes out are particulates. Those are very fine carbonaceous particles. It used to be that the standard was what was called pm 10, meaning ten microns in diameter. That has been reduced to 2.5 microns. The problem with the 2.5 micron situation is that those particles get very deep into the lung and are not prevented from accessing your respiratory system by means of the mucous membranes or the hairs in your nose.

So they EPA's (indiscernible) 2.5 has been very contentious. Mind you that when those particles are in the air, they are absorbing anything that is near them, whether -- anything that can be absorbed onto carbon will be picked up.

Here's a long list of VOCs that have been identified from sites in Pennsylvania, at compressor stations in Pennsylvania. I noted two of them in red, MBTE and benzine. Those of you who have seen gasoline storage tanks being dug up at filling stations may or may not be aware that the reason for that is the presence of MBTE leakage, which is a carcinogen. Benzine is also marked so because it's another carcinogen.

The others that are commonly found include formaldehyde and methylene chloride, also highly problematic, not to mention all of the others that are listed in this slide. So this is the kind of gas content

that is gonna be present in the gas pipeline that we're discussing.

So what is the problem? You're gonna get all of these physiological systems adversely affected. Respiratory irritation, neurologic symptoms. There's a long list on the right-hand side. You can see -- so you get headaches, coughing, dizziness, visual disorders, fatigue, loss of coordination, nausea, memory impairment, in addition to inhalation of the radioactive gas and the ultra fine particles, to the extent that they are released.

This is an important considerations. There are methods of recapturing a lot of this. Most of them are not in use. But -- so this is the risks that are being transferred, the burden shift.

Let's look at a couple of these very quickly. So here's your benzine. So I've marked it in acute, chronic, reproductive and carcinogen related problems, all of which you can read for yourself. None of those are things I would particularly sign up for, and I am sure you would not either. Benzine, as you see, is a known human carcinogen, for all routes of exposure, as designated by the EPA.

How about the next one? Methylene chloride. Well, it also doesn't sound very nice. Visual and auditory functions are adversely affected. Central nervous system

is a potential target. So if you think about VOCs, every time you heard about some kid huffing, right, from propellants in gas, that's essentially what you're doing when you're taking in VOCs.

One other PM 2.5. So those of you who have asthma will not be very happy about this. You can have nonfatal heart attacks, increase in blood pressure, lung cancer risks, pulmonary and cardiovascular diseases are exacerbated. So -- and these particles are small enough to actually move through the lung tissue and get into the capillary system, into the blood and distribute to other tissues.

Here's the conclusion on this, with respect to personal health. Compressor stations commonly release VOCs, particulates and radioactive materials. They can be toxic. They will result in discomfort and disease, and they include known carcinogens.

Next. Here's the pipeline that we've seen several times now and here are some interesting explosion maps of what would happen in the first 30 seconds, and 60 seconds, should one of these pipelines explode. You'll notice that in the yellow is a 50 percent chance of mortality at 30 seconds. In other words, if you happen to be in that space, and the pipeline should explode there, with all due humor, you're toast.

Orange line has a one percent chance of mortality at 30 seconds and 50 percent at 60 seconds. So you'd better get running and, in fact, most of the standards assume that you will be running at about five miles an hour to try to get out of the way of any kind of explosion.

And lastly, you have 40 seconds to blister burns in the outermost orange area. Notice in this zone, how many housing units and how many commercial units are included in this disaster area. But wait, let me show you a better one. Here we have two and this is centered around the area -- excuse me -- the area where the Hopewell Township city residence -- the Township City Hall is. One of the things you will notice is in the upper right between the yellow and orange line, there are four baseball fields, and absolutely no place for protection. You cannot run anywhere that will save you.

Now were we just told that there's gonna be a 42-inch diameter pipe?

MS. DRESDNER: It's -- I think it's 36 inches.

DR. TRACHTENBERG: Thirty-six. I'm sorry. Thirty-six. Well, let's take a look at these data that come from the Gas Research Institute, in their R-7 hazard paper, looking at the relationship between the hazard radius on the Y axis, the operating pressure, and the pipe diameter. And you could see the second line down is the

36-inch pipe. That unless you get under 700 pounds, you're looking at a very serious hazard radius. Okay.

So what do we conclude from this portion? Were an explosion to occur, given the population density and the lack of protective zones, fatalities are all but guaranteed, so too are numerous burn victims. What does that mean in terms of burden transfer. I'd like to talk about that. It's an important issue. It means that your hospital or other medical facilities are essentially being tasked with dealing with potential consequences. So too your volunteer fire departments, and all of those that you recruit from the adjacent townships. That is known in the trade as an externality, but I see it as a burden shift.

Let's go one more. Methane is a particularly potent greenhouse gas. It's -- over it's initial 20-year period 84 times more potent than is carbon dioxide, according to the Environmental Defense Fund. You'll see a variety of numbers in the literature, and it all depends upon the time period that's calculated.

What do we know about methane releases? And this is really critical. If methane is going to be a clean alternative and less injurious to the atmosphere, to greenhouse gas accumulations, than is burning coal, coal, you have to keep your methane losses at less than one

1 percent. Currently, methane leaks are between one and
2 eight percent of production. Remember, that's 84 times
3 the CO2 release. If you only flared that methane, you
4 would reduce its potency 84 fold.
5 The Marcellus Shale estimates by the EPA were
6 .04 to 3 grams per second of methane release. What happens
7 with data, models are fine, but data counts. The measured
8 values are between 3 and 34 grams per second, ten fold
9 what has been predicted and projected.
10 I wanna drop back for a second. Those of you
11 who have seen the recent paper, or heard about it, by Jim
12 Hansen (phonetic) and 13 colleagues -- or 16 colleagues,
13 I think this is particular important. The -- Jim Hansen
14 is the guy who had been at NASA and was one of the first
15 to call attention to greenhouse gas problems due to the
16 burning of hydrocarbons. He's at Columbia University.
17 The latest data showed that the real reason that
18 ocean levels would be rising is that the ice in the Arctic
19 and the Antarctic is being melted from below. That is
20 the ocean is warming and the ice is caving and falling
21 in. If we don't reduce our carbon emissions, or even
22 worse, our carbon equivalent emissions, we will have 10
23 to 30 feet of water in New York before you turn around.
24 My advise, buy land in the Palisades.
25 But the conclusion here is fracking and the

attendant methane release are a clear and present danger to the planet, and that means to current civilization as we know it. Let me put a fine point on that as I close. One of the important papers that recently came out indicated that a major cause of the formation of ISIS -- yes, I realize I'm going to the Near East -- is climate. Throughout history, if you are a paleo climatologist, you will realize that virtually every war has been about getting food, which is ultimately due to climate change. So when you're thinking about millions and millions of refugees, think about the methane emissions.

MR. GOODELL: Okay. Thank you, Doctor. And just so that I've got it straight in my notes, your area of expertise specifically is what?

DR. TRACHTENBERG: Two areas.

MR. GOODELL: Okay.

DR. TRACHTENBERG: I've been doing a great deal of neurobiology and the clinical consequences, such as why I spoke about health. And then I've been -- the last 15 years, I've been working in carbon capture technologies and the impact of carbon on greenhouse gas systems.

MR. GOODELL: Okay. Thank you.

DR. TRACHTENBERG: You're welcome.

MR. GOODELL: Members of the Board of Health

have any questions? No? Okay.

Thank you very much, Doctor.

DR. TRACHTENBERG: Thank you.

MR. GOODELL: Ms. Dresdner, your next witness?

MS. DRESDNER: Yes. Dr. Michael Brogan.

M I C H A E L B R O G A N, WITNESS, SWORN.

MR. GOODELL: State your name and spell it please?

DR. BROGAN: Michael J. Brogan, B-r-o-g-a-n.

MR. GOODELL: Thank you.

The record will reflect that Dr. Brogan has been sworn.

MR. GOODELL: Ms. Dresdner?

MS. DRESDNER: Thank you.

Dr. Brogan, can you just give us your educational background and your area of expertise?

DR. BROGAN: I have a Bachelor of Arts in Political Science from the University of Delaware, a Master's of Public Administration from Rutgers University. I have a Ph.D. from the City University of New York Graduate Center in Political Science, with a specialty in Public Policy and my areas are environmental policy and program evaluation.

MS. DRESDNER: Thank you.

DR. BROGAN: Tonight, my testimony will focus

on public safety risks and uncertainty associated with the construction of the proposed PennEast Pipeline. My comments focus specifically on the estimated impact of the line on the residents of Hopewell Township. My work is intended to provide some benchmarks for the Board to evaluate and prepare for uncertainty surrounding the risk associated with the construction of the proposed line. I'm going to split my comment into three short sections. One, a brief overview for of regulatory framework for natural gas transportation in the U.S. A review of existing risks associated with the delivery of natural gas. Based upon the most recent PHMSA incident reports, and an estimated impact on the number of residents who are now placed within the blast zone due the proposed construction of the line.

From the prior speakers, you get a sense that natural gas is flammable. It consists primarily of methane. It's categorized either conventional or unconventional sources. It's a commodity that is difficult to store. Typically, storage requires very complex environmental areas such as salt caverns, or through more capital and technologically intensive methods such as LNG.

The transportation of the fuel comes primarily through a pipeline network in order to connect producers

with consumers. The fuel source fits into a definition of a natural monopoly where the most efficient structure of an industry consists of a single seller.

Natural gas is heavily regulated by the Federal Government, as well as the states, at the state level because of it's -- these requirements associated with the delivery of the resource. Primarily, it's done through, of course, this national network.

Ultimately, the Feds got involved with the regulation of natural gas with the Natural Gas Act. Ultimately, as a way to ensure that demand and growth and -- were in line and that prices and supply from suppliers that -- that they be connected.

At the Federal level, there are some significant changes from the Natural Gas Policy Act in the late 1970s, led to a push for deregulation of this energy source in an attempt to align production, transportation, and consumption.

Regulating natural gas is developed under model transmission networks. Because the energy source is difficult to store, it usually takes the form similar to the form of generating electricity. Essentially, it's considered a public good. Thus, this warrants a type of relationship that has the following features. One, because it is a uniform commodity, the delivery of the

fuel is constant. It cannot be done on a discreet basis, where coal or petroleum can be stored. It also tends to be privately owned. The pipelines are privately owned. The distribution system is based on an oligopoly, where private firms are responsible for the production, transportation, delivery to consumers of the good. As I mentioned before, the fuel cannot be stored.

The network, of course, is authorized to use eminent domain as the good considers part of a public need, which creates a public interest in the expansion of pipeline networks. Safety measures, annual reporting and pipeline inspections are done primarily by natural gas firms.

Let's go back here one second. Here's -- this chart here, this PowerPoint will be for the record, indicates from the Energy Information Administration the overall national network of pipeline capacity as of 2013. And this is by states, from kind of interconnections. You can see New Jersey is a hub state, particularly into the northeast. This is primarily one of the important areas for PennEast Pipeline as a way to ship natural gas north, as well as to get it into the southern area of the country where there has been a -- a significant shift in terms of using natural gas, in terms of power burn for electricity. Shifting it from coal in -- I'm sorry.

Using natural gas, shifting it from coal.

Typically, safety measures, annual reporting and pipeline inspections are done primarily by natural gas firms and transportation companies. Oversight is conducted by state utilities and by the U.S. Department of Transportation through PHMSA.

Currently PHMSA advertises it has about 139 federal inspectors and about 300 inspectors at the state level covering roughly 2.6 million miles of pipeline across the U.S. When factoring both federal and state inspectors, this is about one inspector covering roughly six miles of pipeline. If we were to take federal inspectors alone, this equates to a ratio of one inspector per 19,000 miles of pipeline.

In the eastern region along, where we reside, there are about 21 inspectors at the federal level covering approximately 800,000 miles of pipeline, or roughly 38,000 miles of pipeline per inspector. Overall the regulatory network developed to monitor interstate lines has resulted in a relatively closed hierarchical system of oligopoly, which is coupled with segmented pseudo-markets. The problem that arises from the structure is that it's periodically failed to protect consumers in terms of pricing, supply, and residents in terms of safety.

Now there's a lot of content here, but I -- in

putting this together and looking at the PHMSA data, I'm a fan of Harper's monthly and every month, the first thing I do when I turn it -- turn it open, they have their index statistics that come out on a variety of topics and so, as an academic, we don't -- we never create anything new. We just kind of re-conceptualize and take what's been done and kind of put it in a new form.

So I've taken from the most recent PHMSA report, from 2010 to 2014, I've highlighted out items that have been reported by the industry and I wanna just kind of take a censure to give you the national picture of natural gas pipelines in terms of safety, risk and health issues.

Roughly reported one out of five incidences have resulted in some type of reported injuries. This is -- this -- I'm sorry. This coincides with about 272 individuals who are injured in these incidents. People are -- the number of incidences where you saw evacuations, almost 47 percent. This resulted in about ten -- a little less than 11,000 people being evacuated from their homes, place of business, and other residences during an incident. This points back to Dr. Trachtenberg's work before.

In this data, you have roughly seven percent have resulted in fatalities. Again, this resulted in about 57 individuals. The percent of pipeline incidences reported on private property, which the majority of the

PennEast line is proposed, is about 51 percent. Incidences reported on owner -- operator or owner properties is about two percent. So it's asymmetric here when you look at the burden that's been placed on residents and property owners.

Percent of incidences, of course, that gas ignited, about 62 percent. The percent from explosions rate one out of four. From unintentional release of gas, which we just saw a presentation on, roughly 83 percent of incidences have been reported. Total cost in nominal dollars, unadjusted, about 164 million. Total amount paid for these costs, from operators that are responsible for managing and regulating these pipelines, about 91 million.

Now to put that into context, for every dollar the industry pays back about 56 cents. We are left, as taxpayers, as communities, to cover the difference. Of course, the percent of gas pipeline failure for reasons other than natural force damage, roughly 93 percent. This includes human failure, corrosion, in addition to excavation, incorrect operation, et cetera.

MR. GOODELL: Excuse me. Dr. Brogan, all of those statistics you just testified about came from, you said, PHMSA?

DR. BROGAN: PHMSA, correct. I compiled --

MR. GOODELL: Could you --

DR. BROGAN: -- the list.

MR. GOODELL: Could you define PHMSA? What is PHMSA?

DR. BROGAN: The Pipeline Health and Safety --

UNIDENTIFIED FEMALE: The Pipeline Hazardous Material --

DR. BROGAN: Pipeline --

UNIDENTIFIED FEMALE: -- and Safety Administration.

DR. BROGAN: Pipeline Hazardous

MR. GOODELL: P-H-M-S-A?

DR. BROGAN: -- Safety Materials Administration.

MR. GOODELL: Pipeline?

DR. BROGAN: Hazardous Safety Materials Administration [sic].

MR. GOODELL: Okay. Thank you.

DR. BROGAN: Yeah. Yeah. They put out -- they put out the report. It's available on the website. I don't have -- I actually, in my report, my list of citations, I actually have the report in there.

MR. GOODELL: Okay. All right. Thank you.

DR. BROGAN: You bet.

In addition, there's some additional -- I'm not

gonna go into too much detail, but recently course studies find flaws in leak detection system, as taken from the New York Times. Again, from the Times, 2011, about safeguards under scrutiny. We've seen some changes, but again, the regulation always lags behind the industry. So there's a stronger call for tighter regulations in this area. In addition, the course that I've just mentioned, this is -- it's about 2.6.

Now what I'd like to do for homes in Hopewell Township and, ultimately, I think for addressing concerns related to PennEast, and in the regulatory framework one of the things that are -- that is advocated is the idea of utilizing the precautionary principle. And really the method here, the precautionary principle is that when a particular course of action lacks overall scientific environmental economic consensus in terms of the benefit of a project, then the burden of proof of the uncertain nature of this project must be weighed in favor of public health, safety, and environmental needs, not on simple assurances.

So utilizing the precautionary principle, I think, is a very useful term here -- useful method in order to kind of contest and to challenge what is being presented about the benefits of this project because, ultimately, the risks and the burdens are placed upon residents. Not

only along the line, right, but communities that are contiguous with the line.

So I'm not gonna go too much in terms of estimating the blast zone, but, generally, what I've put together in terms of the context here is the impact of the line in Hopewell Township, New Jersey based on the numerous routes that have been put forward. And what I was able to do was to construct it based on Hopewell tax map regions, and then I also mapped it back to the 2010 U.S. Census block group data for the State of New Jersey. These are estimates.

Looking at this in terms of the number of homes, I was able to isolate this from the Hopewell tax data and then, of course, we had to estimate household size, which I have taken from the U.S. Census and, of course, use this as a factor in terms of estimating people in the zone.

Roughly speaking, in terms of putting people within the danger zone here, of the proposed line, the burden of proof which will be -- come onto the residents not only of Hopewell Township, but residents all the way up to Dallas, Pennsylvania, generally we're looking at one out of seven residents who have been put into harm's way as a result of this transportation line.

What I would like to ask the Board is to strongly consider putting together a resolution to notify FERC that

the PennEast Pipeline poses a significant risk to Township residents and the surrounding environment and that more due diligence is required, not only from the environmental side, but also from safety and risk. Thank you.

MR. GOODELL: Okay. Thank you, Dr. Brogan.

Any members of the Board of Health have any questions of Dr. Brogan? No.

Okay. Thank you very much. And do you have a report that you'd like to submit to u?

DR. BROGAN: I'll submit the PowerPoints (indiscernible).

MR. GOODELL: Good. Thank you very much.

DR. BROGAN: (Indiscernible).

MR. GOODELL: All right.

Ms. Dresdner, you have other witnesses?

MS. DRESDNER: Yes. My next witness is Dr. Scott Donofrio, and we're having a little technical switch here. So there might be a slight delay.

THE SECRETARY: Okay. I'm gonna take --

(Off the record. Back on the record.)

DR. DONOFRIO: Hello, all. I'm Dr. Scott --

MS. DRESDNER: I think we're ready to go.

DR. DONOFRIO: -- Donofrio.

MS. DRESDNER: Can you wait a second?

DR. DONOFRIO: Oh, I'm so sorry.

1 THE SECRETARY: (Indiscernible) sworn in.
2 DR. DONOFRIO: Right.
3 THE SECRETARY: If you could raise the -- raise
4 the microphone.
5 UNIDENTIFIED MALE SPEAKER: (Indiscernible).
6 D R. S C O T T D O N O F R I O, WITNESS, SWORN.
7 MR. GOODELL: Would you state your name and
8 spell it please for the record?
9 DR. DONOFRIO: Sure. I am Scott Donofrio,
10 S-c-o-t-t D-o-n-o-f-r-i-o.
11 MR. GOODELL: Okay. Thank you. Dr. Donofrio,
12 and the record will reflect that he has been sworn.
13 MS. DRESDNER: Thank you.
14 Dr. Donofrio, would you please describe your
15 educational and professional background?
16 DR. DONOFRIO: Sure. I graduated from Boston
17 University with a BA in psychology. I graduated from the
18 New York University School of Medicine with a medical
19 doctorate, and I have been trained in general psychiatry
20 and child and adolescent psychiatry through the residency
21 and fellowship respectfully at the University of New Mexico
22 School of Medicine.
23 MS. DRESDNER: Okay. Go ahead with your
24 comments, sir. Thank you.
25 DR. DONOFRIO: Thanks.

MR. GOODELL: Let me just ask you. You have a practice in this region?

DR. DONOFRIO: I do. I live in Pennington and I practice in Pennington. I am not speaking for the practice. I am speaking both as a psychiatrist and as my -- excuse me -- as a citizen and a person who lives here.

MR. GOODELL: Okay.

DR. DONOFRIO: I'm at -- I'm at Comprehensive Mental Health Services and that is here in town, near Route 31. I'm here to talk about how some of you, certainly I have been feeling over the past few commenters' presentations. One of them just recently said that one out of seven people is in harm's way from this. I can't speak to that obviously, but I can speak to the reaction. And that's the point of my presentation, the reaction that people have knowing they're being put in a very good chance of being in harm's way. We're at least hearing that.

It turns out fear doesn't require logic. So what does fear do? What's the point of the fear that we have that I will go on and talk to tell you about how it will represent the threat of some danger itself to us, which is ironic, given what it does. It prepares us for threats to our bodily integrity. It does this though based

1 on the idea that we're going to need to act right now to
2 solve the threat.
3 If we have to maintain our high level of fear
4 for some time because an ongoing threat does not resolve,
5 then there are consequences. So these, for us
6 individuals, I'll talk about in a moment, but the upshot
7 for the community becomes decreased productivity,
8 increased suffering and disturbed relationships, within
9 and between families, among friends and community members,
10 and within markets and among businesses. As was
11 previously talked about, those folks in those blast zones
12 would be at some risk and would be prone to the related
13 fear.
14 But how do we lose the productivity and how do
15 we suffer, and what is it that puts us at other sorts of
16 risks, like getting our anxiety that responds to this --
17 to this threat treated and managed? As I've done with
18 folks, people have come into my office with concerns, and
19 anxiety, and fear related to this project for example.
20 And when I've had to do that, I've had to take care of
21 problems that they're already having, psychiatrically,
22 prior to the -- you know, digging anything anywhere near
23 here to put the pipe in.
24 So our immune system responds to fear by, in
25 some ways, not doing its job and we can get infections,

we can get cancer, whether or not they come from infections. We can get asthma attacks or worsening asthma. We can get an autoimmune disease if the immune system is affected by stress from ongoing fear.

We also actually are more -- excuse me. We are more prone to -- I don't know how to get that back. But anyway, it was about diabetes. We're more prone to insulin resistance and, thus, the development of diabetes from the high levels of stress hormones.

How else -- oh, look at that, it's back. I did it. Good for me.

So the nervous system, you know, can produce seizures in some people. Actually, all people, if there's enough of a stimulus. But most people don't get anywhere near that. Those who do would be more prone to it because we know stress is a factor that brings on seizures. So too can the headaches people experience of different kinds, and movement disorders get worse with stress as well, and fear.

So I think the -- probably the most publicized version is that atherosclerosis, and arrhythmias, and other threats to the heart, and also threats to other organs that depend on the heart, and the blood vessels and what they do can be affected by heart attack and stroke in particular, as well as -- well, no, I guess I said all

of that. Never mind.

So our gastrointestinal system can be affected too. People who have an abdominal reaction of some kind, some discomfort or pain may be found to have some of the things on the screen, peptic ulcers, et cetera, that result from this. And that's another, I think, fairly commonly understood to ongoing stress and fear.

People will eat more, some of them, and when they do from the stress eating, that can result from fear, they will -- they will be at risk for obesity and the things that happen -- happen to people's bodies, for example, degenerative joint disease from that.

And then sort of fear affecting -- affecting the experience that people have already had of something that was fearsome brings on a return, emotionally, in people's memories to a time when they were previously being threatened, at a much higher rate than those who haven't already had that experience. And those can include some very uncomfortable flashbacks, as well as a number of other anxiety manifestations.

And of course, I'm not talking about the actual fear related to an actual pipeline explosion in town, but more the knowledge that one can happen. So, in other words, this is worry that will affect people's daily course of activities in a way that's not very appropriate because

1 it's not productive, but it happens anyway, and that's
2 how we're wired for responding to chronic fear.
3 Concentration and memory problems also are
4 primary responses to fear because we're focused on what
5 to do to get safe. But if there's really nothing to do
6 to get safe then, after a while that's not too helpful.
7 So depression is something that some people are prone
8 to, a lot of people are prone to. And that would be more
9 likely if they're chronically stressed. That's -- there's
10 -- probably the most data about that -- about ways to get
11 depression, except for family history.
12 Mania is less common, but sometimes associated
13 with folks who've had depression, or could, and that is
14 another thing than can be brought out by fear and stress.
15 And people can get actually psychotic and disorganized
16 in their thinking and their behavior from stress and fear.
17 Other mental illnesses are also susceptible,
18 as are many, as we heard before, right? General medical
19 illnesses to fear response as worsening them, or bringing
20 them on. Inter-relationally, we will not treat each other
21 as well. We won't hear each other as well when we're
22 afraid. We will use more maladaptive means to cope with
23 our situation because we, being fearful, are more prone
24 to need to do something that helps us feel safe and
25 comfortable now. But it might not really be such a great

strategy for the long term, which of course it will be, if there's a pipeline installed.

Fear is prompted by news. And an example is the news, those of you heard tonight, like me, that didn't know some of the things that were presented, but also, of course, graphic images on television, et cetera. And basically, we are -- if exposed to a constant threat, we have all these changes I talked about in our bodies and they are not -- they are not able to resolve what they need to. And so we're in a fair amount of bigger trouble than we otherwise would be.

A short note on the effects of climate change. People, I think, are rightfully increasingly fearful of what that means. And when we take hydrocarbons out of the earth for any reason, we increase the -- well, frankly, we -- it's -- and I'm not speaking to, by the way, the voracity of this because I'm not an expert in this area. But my understanding, and many people's understanding, hence our fear, is that the -- in the -- any hydrocarbons coming out of the earth hasten a process of greenhouse gas emission, causing a warming trend that will cause many different problems that are very serious, among them hurricanes, tornados. There's an air quality issue because of the increased VOCs and the ozone that results.

So we can have this, which is a lovely picture

of how maybe we won't like our community to be and then suddenly this. And that's why the fear. Thank you.

MR. GOODELL: Thank you, Doctor. And just so that I -- I've got it straight. Based on your testimony, is it fair to say that your conclusion is that as a result of your training and experience, as a result of your own experience with your practice and treating patients, that you would conclude that if the pipeline continues to become a reality, there would an -- it would lead to an increase in mental illness among local residents?

DR. DONOFRIO: It would depend on the degree of fear that people have about it. And I cannot speak to an actual study. I don't know of one that's been conducted in the local area as to how many people are how fearful of that. However, I did present some evidence that I've seen the concerns manifesting as part of the stress of the people I'm already, you know, seeing that in before it goes in.

And we were given reason to believe that there's a lot of danger potentially associated with this in a number of different ways. So assuming people are aware of that, it is predictable that they would be fearful and then have these responses I've discussed.

MR. GOODELL: Okay. Thank you.

Any other members of the Board have questions?

MR. CHAIRMAN: Thank you, Doctor. Harvey Lester, Chair. Is it fair to say that your testimony is based upon a reasonable degree of psychiatric certainty?

DR. DONOFRIO: That fear causes these responses?

MR. CHAIRMAN: Your testimony in total. In other words, this is based upon your view as a practitioner of psychiatry, and you need a basis for your testimony and I would suspect it's based on a reasonable degree of psychiatric certainty based upon your training and experience.

DR. DONOFRIO: Yes, it is.

MR. CHAIRMAN: Thank you.

DR. DONOFRIO: You're welcome.

MR. GOODELL: Okay. Thank you.

You have other witnesses?

MS. DRESDNER: Yes. Dr. Lisa Dobruskin

D R. L I S A D O B R U S K I N, WITNESS, SWORN.

MR. GOODELL: Could you state your name and spell it please for the record?

DR. DOBRUSKIN: My name is Lisa Dobruskin, the last name is D-o-b-r-u-s-k-i-n.

MR. GOODELL: Okay. Dr. Dobruskin, thank you.

The record will reflect that Dr. Dobruskin has been sworn. You can fix that so that it's comfortable

for you.

DR. DOBRUSKIN: Is this good?

MR. GOODELL: Yeah.

MS. DRESDNER: Okay.

MR. GOODELL: Just --

MS. DRESDNER: Doctor, would you briefly go through your medical background for us? Thank you.

DR. DOBRUSKIN: I received a Bachelor's of Science from Cornell University in biology, with a concentration in neurobiology and behavior. I then went on to receive my medical degree from New York Medical College. Subsequent to that, I did a residency in general surgery at Long Island Jewish Medical Center in New York. And then I did an additional fellowship training in advanced laparoscopy and metabolic and bariatric surgery at New York Medical College.

I'm speaking today as a medical doctor and also as a citizen of -- a resident of Pennington, and as somebody who lives one house from the field where the pipeline is scheduled to end.

MR. GOODELL: Okay. Thank you.

DR. DOBRUSKIN: So briefly, what I wanna talk about today is just to follow up a little bit on what's been mentioned already about the medical and health effects of some of these compounds that may be released from the

pipeline.

Studies have shown that a lot of these effects are potentially very harmful to the human body. For example, radon, which we've already heard about is a radioactive gas. It's odorless and colorless, so not really detectable by the layperson. We heard about the byproducts of radon, polonium and lead that have a very significant half-life.

And the problem with the polonium and the lead that gets inhaled into the lungs as radon is that it remains in the lungs, and it further decays and causes cancer. Studies show that radon is the leading cause of lung cancer in nonsmokers, and the second leading cause of lung cancer in smokers. The EPA has estimated that there are 21,000 -- approximately 21,000 deaths related from lung cancer every year as a result of radon.

Volatile organic compounds, or VOCs, which we've heard about as well cause a lot of very serious effects. Cancer is one of them. Benzine, which has already been mentioned, is classified by the EPA as a human carcinogen for all routes of exposure. So it doesn't matter how you're exposed to benzine, when you're exposed to it, it increases your risk of developing cancer. It increases the risk of childhood leukemia. It increases the risk of aplastic anemia and other cancers. And there is no

1 known safe level of benzine. So any exposure increases
2 your risk of toxicity.
3 We know that VOCs affect the respiratory tract.
4 Even short term exposure to VOCs causes asthma like
5 symptoms in people, things like coughing, wheezing, and
6 shortness of breath. Prolonged exposure increases the
7 risk of asthma and pulmonary infections like bronchitis.
8 We know that VOCs increase the risk of
9 cardiovascular disease so that elevated levels of VOCs
10 in the blood increase the odds of developing cardiovascular
11 disease. And that's been shown in studies.
12 VOCs also affect the immune system. So studies
13 have shown that there's an increased risk of allergies
14 that are associated with the VOCs. There's an increased
15 risk of allergic type diseases like eczema and an increased
16 develop of food allergies, like allergies to milk products
17 and to eggs.
18 And then there's a risk of complications for
19 pregnancy and also a risk to fetal development. So many
20 studies document the fact that VOCs increase the risk of
21 birth defects, low birth rate, and preterm birth. And
22 what that really means is that there is a disruption to
23 fetal development.
24 And so we know, from many studies, that VOCs
25 affect many different systems that increase your risk of

1 developing many different health problems throughout life.
2 But because of this disruption to fetal development, these
3 fetuses who have born and become humans, become grown
4 people, can develop all these problems throughout their
5 lifetime. So it really affects babies that are born that
6 are exposed to this through maternal exposure.
7 The real problem though, is that a lot of these
8 studies show that a lot of these effects occur at levels
9 below what's set as safe by the EPA. I think part of the
10 problem, and a lot of studies, a lot of the more recent
11 studies are showing that the issue is that the way that
12 the levels are currently measured may not really accurately
13 reflect the risk because, as has been mentioned, it's not
14 necessarily the level in time or an average level. It's
15 peak levels. It's how frequent exposure occurs.
16 We know that different organs, organ systems,
17 different cells, different receptors on cells are affected
18 differently by these toxins. We know that there's effect
19 that's determined by duration of intensity. So if you
20 have a brief, but significant exposure to these toxins,
21 you may have more toxicity from these toxins. Studies
22 show that, you know, the effect may be immediate or it
23 may occur at some point further down the line. And so
24 this is all very difficult to measure.
25 The other thing is that the effect, the toxicity

may not be linear. It may be exponential. So a single effect may cause toxicity. It may cause disease. An exposure a second time may not double the risk. It may triple or quadruple the risk. And when these levels are measured, episodic levels are not measured. They're not documented. And so we really don't know the effect.

Another issue is the distance to the agent. A lot of the more recent studies show that people who live closer to pipelines and to pipeline facilities are more likely to experience symptoms than those who live further away. So to me, as somebody who lives very close to where this pipeline is proposed, that's a particular concern.

We also know that children, pregnant women, and the elderly are more susceptible and are more likely to be affected and are more likely to have more series effects.

And so after studying the data and reviewing the scientific literature regarding the health effects of the pipeline, I am extremely concerned about the safety and well-being of my family and of the community as a whole. Thank you.

MR. GOODELL: All right. Thank you, Doctor.

Any members of the Board of Health have any questions? No? Okay.

Thank you very much.

DR. DOBRUSKIN: Thanks.

MS. DRESDNER: Thank you. That's my last witness. I have curriculum vitae from three of the witnesses that have testified that I'd like to enter into the record and also I believe the PowerPoints which will be submitted for the others have their CVs attached to them.

MR. GOODELL: Okay.

MS. DRESDNER: So I have a CV for Dr. Dobruskin, Dr. Brogan, and Dr. Donofrio that I'd like to hand in for the record. I haven't marked them. And then I'd just like to make a brief summary statement.

MR. GOODELL: Okay. Go ahead.

MS. DRESDNER: With some slides. Thank you.

MR. GOODELL: All right. And you're gonna be making a statement yourself?

MS. DRESDNER: Yes. On behalf of Hopewell Township Citizens against PennEast Pipeline, my name is Katherine Dresdner, I'm a resident --

MR. GOODELL: If you're gonna offer testimony, I'll swear you in.

MS. DRESDNER: Okay. Sorry.

MR. GOODELL: Even though you're the lawyer.

K A T H E R I N E D R E S D N E R, WITNESS, SWORN.

MR. GOODELL: Okay. Could you state your name and spell it please?

MS. DRESDNER: Katherine Dresdner, D-r-e-s-d-n-e-r.

MR. GOODELL: All right.

MS. DRESDNER: I'm a resident of Hopewell.

MR. GOODELL: All right.

MS. DRESDNER: And I am attorney for Hopewell Township Citizens Against PennEast Pipeline. We were the applicant for the hearing, and I'd like to thank the Board for giving us this extremely important opportunity to present to the public and to the Board these concerns.

I have just a very short summary presentation. This is the -- these are the icons and the names of the companies that make up PennEast. PennEast is a consortium. It's essentially a shell corporation. PennEast itself has no record because it was formed just for the purpose of this pipeline. You have to look beyond to the actual companies that are the shareholders and the primary company to look at is UGI Energy Services. They are the project manager and they will -- if the proposed pipeline goes forward, they would operate, construct, and maintain the pipeline.

The other major involved in the gas industry, Spectra Energy, PSE&G, Elizabethtown Gas, South Jersey Industries, New Jersey Resources. PSE&G delivers gas, but these other companies are actually more involved in

1 transmission. Spectra Energy has operating pipelines all
2 through New England, going up to Canada. Okay.
3 We -- this is just a short documented piece of
4 information about what's happened. PSE&G was involved
5 in a fatal gas explosion nearby, in Ewing. And they
6 received the largest fine in the state history from the
7 Bureau of Public Utilities, a million-dollar fine.
8 Spectra, who is one of the PennEast partners,
9 has been cited by the Federal Government for multiple
10 safety violations. A division of Spectra Energies called
11 Texas Eastern Transmission, they've been cited 14 times
12 for natural gas safety violations since 2006, by PHMSA,
13 and have been fined more than $134,000 in fines.
14 Williams -- Williams, which is nearby in
15 Princeton, and we had some photographs of that situation,
16 they have not a very good record either. But they are
17 one of the largest national pipeline companies and they
18 have been fined for failure to conduct inspections and
19 they've had explosions as well. New Jersey Gas had an
20 explosion and was fined in 2014.
21 In Allentown, Pennsylvania in 2013, UGI was
22 found responsible for a fatal gas explosion and paid
23 half-a-million-dollar fine.
24 UGI's record from -- through 2014 is listed here.
25 1976, 14 dead, 14 injured, four buildings damaged. That

was in Allentown. Another explosion in Allentown in 1990, one dead, nine injured, two buildings involved. 1994, again in Allentown, one dead, 66 people injured, a 5-million-dollar building damaged. That's the half-a-million-dollar fine.

In 2006, in East Lampeter, one home was destroyed. 2011, again in Allentown, five dead, three injured, eight homes, half-a-million-dollar fine. 2002, this is a very distressing situation. UGI was notified of a gas leak and they let it go and did nothing about it for a month. And it was re-reported and very fortunately, an explosion did not occur. But they failed to address the report of the gas leak, and they got a million-dollar fine for that. And what concerns me about that is they essentially covered up a report of a gas leak. And I find that unconscionable.

In 2012, there was a ignition of gas in Hazleton. 2012, in Millersville, a driller hit a line, a house was destroyed, and then in 2014, in Dunmore, one dead and two homes damaged.

What we have seen in looking at a lot of the safety records is that sometimes the company is at fault, as in these situations here with UGI. And remember, that's -- this is the company that's gonna run this pipeline.

In other cases, third party contractors are

involved through improper excavation practices. This is the UGI report card. It shows that with respect to gas operations, it needs -- significant improvement is necessary. And materials management, significant improvement is necessary.

So -- and then this is also very of -- of great concern. This is from PHMSA. This shows all pipeline incidents from 1995 through 2014. And you can see that, I don't know why, but in 2002, there was a sudden jump from under 400 incidents per year to upwards of 700 incidents per year and this has continued. So for 2014, there were just over 700 incidents, nationally, in the year of 2014.

So that's a lot of incidents. We're not just talking about an occasional random situation. There is a trend of risks and safety issues here. Thank you.

MR. GOODELL: Okay.

Any members of the Board have any questions for Ms. Dresdner?

All right. Thank you very much. Does that end your presentation?

MS. DRESDNER: Yes. Thank you.

MR. GOODELL: Okay. Mr. Pogorzelski, can you briefly come up.

P A U L P O G O R Z E L S K I, WITNESS, SWORN.

MR. GOODELL: State your name and spell it please?

MR. POGORZELSKI: Paul Pogorzelski, P-a-u-l, E middle initial, P-o-g-o-r-z-e-l-s-k-i.

MR. GOODELL: Mr. Pogorzelski, you are the Township administrator and Township engineer for Hopewell Township?

MR. POGORZELSKI: Yes.

MR. GOODELL: And in that capacity, did you have occasion to retain a blasting expert for -- on behalf of the Township?

MR. POGORZELSKI: Yes.

MR. GOODELL: That was Frank Chiappetta?

MR. POGORZELSKI: Yes.

MR. GOODELL: C-h-i-a-p-p-e-t-t-a?

MR. POGORZELSKI: Yes.

MR. GOODELL: And who is Mr. Chiappetta?

MR. POGORZELSKI: He's a blasting analysis engineer with Blasting Analysis International.

MR. GOODELL: Did Mr. Chiappetta prepare a report for you?

MR. POGORZELSKI: He did, dated July 24th, 2015.

MR. GOODELL: All right. And at this time, would you like to submit that report into evidence for the committee?

MR. POGORZELSKI: I would.

MR. GOODELL: All right. And so we will allow that report to go into evidence and the Board can consider it as well. Okay.

MR. POGORZELSKI: Thank you.

MR. GOODELL: Thank you.

Okay. At this time, we've concluded the presentation from the experts, and we have a list of five people who've indicated that they wanted to present testimony. First is Terese Buchanan. Is Ms. Buchanan here? Here? Okay.

You go up here.

T E R E S E B U C H A N A N, WITNESS, SWORN.

MR. GOODELL: Ms. Buchanan, can you state your name and spell it for the record please?

MS. BUCHANAN: Yes. Terese, T-e-r-e-s-e, Buchanan, B-u-c-h-a-n-a-n.

MR. GOODELL: Thank you. And I understand that you have some information, some facts that you'd like the Board to consider?

MS. BUCHANAN: Yes. I'm not a resident of Hopewell Township, but I am a resident along the pipeline route. I live on a farm because. I have chemical and electrical sensitivities, I get very ill from petrochemicals, pesticides, anything that's not natural.

1 And I'm actually hoping to speak for myself and other
2 people who have chemical sensitivities.
3 The pipeline -- on our farm, we grow our own
4 food so that I can have a safe food source. My husband
5 hunts, so I can have protein -- and fishes, so we can have
6 a protein source that doesn't have antibiotics,
7 pesticides, hormones in it, so that I can eat healthy food
8 because I get very ill from all those things. And I'm
9 not -- I'm not the only person who's like this. And right
10 now, the pipeline is scheduled to wipe out all of our fruit
11 trees. You know, it's a big section of our farm, and a
12 lot of the food that I would be canning and freezing for
13 our winter food.
14 Also, it would take out half of our happy hunting
15 -- my husband's happy hunting ground, half of the wood
16 lot that we use to heat our home. And one of the reasons
17 I wanted to speak to the Board is that I'm sure -- I know
18 there are other people like myself, and when you have
19 chemical sensitivities, the reactions can be anything from
20 just simple things like headache, and nausea, and not being
21 able to think straight, being confused, being dizzy, losing
22 control of your limbs falling, but it can be
23 life-threatening.
24 I know two people who exposure to natural gas,
25 petrochemicals can be life threatening. In my case, I

cannot go in people's houses that have natural gas. For the natural gas pipeline on my property that I know will leak, I won't be able to live there. I cannot -- just the construction process itself, with all of the machinery burning, you know, the fossil fuels, the petrochemicals that will be released, that'll be burned, I will be very ill. We won't really be able to go live somewhere else. The pipeline would devaluate our property to the point where we could not sell it and then replace it with somewhere else where I could go to live safely.

And so I'm -- would like the Board just to be aware that there are people like myself and I'm sure there are some in your community, even it if's not on their property, it will affect their health very, very negatively, and so that's why my testimony. And I gave you a lot more detail in my -- in my written --

MR. GOODELL: Sure.

MS. BUCHANAN: -- comments.

MR. GOODELL: Okay. And just for the record, where are you a resident?

MS. BUCHANAN: I'm in Delaware Township, on Lower Creek Road, in -- Stockton mailing address.

MR. GOODELL: Okay. Thank you. And I do have a letter here dated July 28th, 2015 signed by you. This is the letter that you would like the Board to consider?

MS. BUCHANAN: Yes.

MR. GOODELL: Okay. We will enter that into the record.

MS. BUCHANAN: Thank you.

MR. GOODELL: Thank you very much.

Next is Sari Decesare. Is that how you pronounce that?

MS. DECESARE: (Indiscernible).

MR. GOODELL: Okay.

S A R I D E C E S A R E, RESIDENT, SWORN.

MR. GOODELL: State your name and spell it please?

MS. DECESARE: It is Sari Decesare. My first name is S-a-r-i. My last name, D-e-c-e-s-a-r-e.

Just a few comments to add to this. I'm a layperson, a citizen. I've been following this PennEast story from the first time I --

MR. GOODELL: Tell us where you live.

MS. DECESARE: Oh, yes. 26 Shara Lane.

MR. GOODELL: Okay. In Hopewell Township?

MS. DECESARE: That is correct.

MR. GOODELL: Okay.

MS. DECESARE: So I've been following this since I had seen my first sign, I guess back in September. And, you know, following with concern as a citizen. And just

for the record, the most recent change in the pipeline route, which occurred on Thursday does take that pipeline onto the -- onto the fringe of my property. So I'm just making you aware.

So, you know, one of the things that I wanted to raise in this to the Board here -- and thank you for the opportunity to do so -- is -- I need my glasses because I can't see without them.

Dr. Trachtenberg, I believe it was, who had spoke about the gas release. And I just wanted to raise, you know, a letter that had shown up in my mailbox on July 20th, from Williams Transco. Starting with a very friendly opening, "Dear Neighbor," that they wanted to let me know that they were gonna do a gas release.

Basically they said beginning on July 21st, possibly beginning as early as 7 a.m., Transco Gas Pipeline Company will be conducting a controlled venting of natural gas at its above ground facilities, located at the location referenced above. It's the one on Blackwell Road.

And it said once begun, the venting will be intermittent and continue through the evening of July 27th, 2015, just virtually a week-long like that. During that time you may notice noise coming from the direction of Transco's facility, and you may smell the odor of natural gas. Please be advised that Transco is controlling and

supervising the planned release of natural gas in the area of this -- of its facility on these dates, and it should not be a cause for alarm.

Well, I think that's very easy for them to say. This -- the odor coming through, you know, that I could smell on my property was -- you know, it made me nauseated. I mean, it was a very uncomfortable, unpleasant thing. The idea of yet another pipeline coming into this area and other opportunities for these types of unnatural substances to be released into our -- you know, to impact our quality of life is something that I find just not acceptable.

And I would hope that the Board of Health would share that concern, as well for the citizens and the well-being of our citizens. I believe that was one of the things that was mentioned in the first ten principles when we started this meeting.

Another piece of health related information that concerns me too is, you know, we moved to the Township ten years ago. We moved onto a property, like many properties in the Township that is dependent on well water, and our own sewer. You know, we have septic. So we supply our own sewer and our own water.

When I did move into the -- into the Township, we were told that, you know, it was a good idea to monitor

1 our water system to make sure that we were getting our
2 water tested regularly because this was an arsenic hot
3 zone. And we just heard Professor Onstott, you know, make
4 testimony to that effect. So now at least I know that
5 the people who are giving me this information are probably
6 giving me very good information.
7 We continue to get our water tested on a fairly
8 regular basis. Now I believe he said the threshold that
9 was acceptable by the state was the number 5. Again, I
10 don't -- I'm a layperson. I don't know the technical
11 terms. And I know that I have always been told that we
12 need to stay under that level of 5 and we're okay, we have
13 safe water. And our recent test, it's generally -- it's
14 on the high side of normal. It's under 5, but it's like
15 4.5.
16 So the idea of, you know, releasing the arsenic
17 into our -- potentially into our water supply, and it sounds
18 like at a -- if you, you know, listen to what Dr. Onstott
19 said, at a very exponential level. I think it's gonna
20 threaten, you know, my own personal water supply and the
21 supply of my neighbors who are dependent on this as well.
22 It's a worry and concern that we won't have potable water,
23 and what are we gonna do about that, and who's gonna take
24 care of that? So that's an issue for me, as well.
25 You know, radon, the release of radon, we're

also in a radon hot zone. So those kinds of potential to increase radon is also something that worries me too.

I just, you know, would want that -- you -- one of the statements, I think, in the beginning was -- again, glasses. Okay. To ensure the safety of the residents of Hopewell Township. And everything about this pipeline is really introducing known carcinogens into our everyday lifestyle, and I'm not okay with that.

These are things that cause me worry and, you know, well anxiety. I'm not gonna go there. But -- so I just wanted to raise that as well. One other piece too -- I know Katherine gave a wonderful list of, you know, just the horrific types of records that these companies had. My husband had shared with me something a little more recent on Spectra Energy. I'm just gonna go with the, you know, with the headline here.

"Canada's energy regulator orders Spectra Energy to clean up practices." This is an article dated July 14th of this month. "Canada's national energy regulator has ordered Spectra Energy Corporation to correct a series of management system failures following more than two dozen safety and security incidents at its Canadian plants and facilities since 2014."

So, you know, I don't have a lot of faith in these companies to do this job, do this job well, do this

job right. I would like to, you know, see that our Township continue to do everything they can to protect the well-being of the citizens. So thank you for the opportunity to speak with you.

MR. GOODELL: Thank you very much.

Mr. Pisauro, I assume you already testified? Okay.

Kim Robinson?

K I M R O B I N S O N, RESIDENT, SWORN.

MR. GOODELL: Thank you. Ms. Robinson, please state your name and spell it for the record?

MS. ROBINSON: Kim Robinson, R-o-b-i-n-s-o-n. I live at 1568 Harbourton-Rocktown Road, in Hopewell Township.

MR. GOODELL: Okay. Thank you.

MS. ROBINSON: I just wanna touch on three topics, but due to time, I will give the Board, for the record, copies of three comments that I have submitted that has more detail in them.

The first topic is safety. PennEast plans to build a different pipeline for different people. It has assigned citizens to classes, based on where they live, and plans to build a thicker and safer pipe for some citizens, and a thinner, less safer pipe for others. Residents of Hopewell Township are in the latter category.

PennEast has stated that they would build a pipe that is 50 percent thicker for a Class 4 child than they would for my child, who they consider a Class 1, but are graciously bumping up to a Class 2. No, my child's life is worth just as much as the life of a child living in a Class 4 area. She is not a number, and she is not an acceptable casualty. We cannot allow such discrimination against out citizens when it comes to safety.

My next topic is stress. PennEast has caused many of our residents stress for almost a year now and the project hasn't even started. It will just get worse, especially for those who've had past experiences with gas leaks and explosions.

When I was six, the church next to my aunt and uncle's house exploded, taking part of their house with it. The ceiling collapsed onto my Aunt Anna, and their house sustained major damage. When I was college age, my Uncle Mike woke up one morning and smelled gas. He called the number and got the answering machine twice. The safety measures did not work. He was getting ready to leave when the apartment exploded.

He managed to get outside, but he was burning with even his head on fire. The apartment building was gone. When he was released from the hospital, he came to live with us, but he didn't feel safe. Anytime a dish

banged, anytime a glass dropped, he would start shaking, and he would close his eyes and cover his head with his arms. He never returned to the same person I had previously known as my Uncle Mike.

Stress and the prolonged stress many of our residents would have living next to, or driving over what is essentially a bomb, could have a tremendous effect on their health. Chronic stress has been linked to a myriad of health problems, which we've heard, including but not limited to depression, heart arrhythmias, high blood pressure, and even a shorter life span. We cannot let PennEast impose such stress and health issues on our citizens.

And my last subject is asthma. My daughter has been hospitalized for asthma. 8.3 percent of adults and 7.9 percent of children in Mercer County have asthma. The NJDEP notes an association between asthma and ozone levels. The EPA has stated that green house gases, including methane, threaten the public health and can lead to increases in ground level ozone pollution linked to asthma and other respirator illnesses.

According to the EPA, of the methane released by the natural gas industry, 37 percent comes from transmission and storage. The construction and operation of the PennEast Pipeline will increase methane in the

atmosphere, increasing the amount of ozone and worsening the medical conditions of all Hopewell Township residents with respiratory illnesses. This pipeline is a threat to our safety, our health, and our well-being. Thank you.

MR. GOODELL: Thank you, Ms. Robinson. And you have a document you'd like to present to us? All right. Thank you.

Carrie Dyckman?

C A R R I E D Y C K M A N, RESIDENT, SWORN.

MS. DYCKMAN: I am a resident of Lawrence Township.

MR. GOODELL: Okay. Spell your name please?

MS. DYCKMAN: Dyckman, D-y-c-k-m-a-n.

MR. GOODELL: And is Carrie, C-a-r-r-i-e?

MS. DYCKMAN: Yes.

MR. GOODELL: All right.

MS. DYCKMAN: And I just wanna relay one incident that happened to me. I live below the transfer station, between Carter Road.

MR. GOODELL: Can you give us your address?

MS. DYCKMAN: 233 Carter Road. It's also known as Pole (phonetic) Road.

MR. GOODELL: Okay.

MS. DYCKMAN: And I'm just downwind of the transfer station, and I think -- I believe I was a victim

of one of the uncontrolled -- or release of methane gas from the pipeline. I was in my resident one evening with my family when we smelled a strong odor of gas. And I called 911.

It was probably late -- October, maybe November. And I smelled strong gas, strong enough that I was frightened for my -- safety of my family. And we called 911 and they suggested we evacuate. And we did so to -- and left and I think our H and H (phonetic) guys came because they thought maybe it was propane. That was my initial thought, that it was propane. And when they got there -- it was strong enough in my house that it was in my covered porch. It was inside the house. And it was alarming enough that I left.

And when we later returned, there was no sign of it. The propane gas guy found nothing. And we thought maybe it was coming from this transfer station, which we called the next day and, sure enough, there was a light snow storm. So the conditions were right for the, you know, atmosphere to sort of be heavier, we were downwind and Romesco (phonetic) said that they had released gas that evening, and I was really not aware of it. It must have been something that they did to release whatever.

So it was just something very alarming to me as a resident to feel that alarmed and concerned. And

my son has unexplained nose bleeds. I don't know if that's respiratory or not, but I just feel like I wanted to register that as someone who is living near a pipeline, right along side of it, and below a transfer station, I am very alarmed what's happening in our area, not only in Hopewell, but in Lawrence as well.

MR. GOODELL: Okay. Thank you very much.

Okay. That concludes the list of people. Is there anybody else that did not get a chance to sign up?

MS. CRONHEIM: Yes, I'd like to speak.

MR. GOODELL: Okay.

MS. CRONHEIM: You'll have to give me just a moment to just get out a PowerPoint (indiscernible). Come on. Everybody else's PowerPoint works, except mine? All right. Well, I'm gonna have to just do without.

MR. GOODELL: (Indiscernible).

MS. CRONHEIM: No, that's okay.

P A T T Y C R O N H E I M, RESIDENT, SWORN.

MR. GOODELL: Okay. Thank you. Please state your name and spell it for the record?

MS. CRONHEIM: My name is Patty Cronheim, P-a-t-t-y, Cronheim, C-r-o-n-h-e-i-m.

And maybe just click on the second one.

First of all, I wanna thank the Board of Health for having this hearing, and I wanna thank -- and giving

us the opportunity to express our concerns. I also wanna thank all the people who came and testified today about the PennEast Pipeline and about the cumulative impacts that the Transco compressor station would have on the Township as well.

I'm Patty Cronheim and I'm with the Hopewell Township Citizens Against the PennEast Pipeline. And I had a bunch of remarks prepared for tonight, but instead, I recently received a letter sent to me by Angele Switzler from Delaware Township that tells her story in her words, and I'd like to read that.

"On May 15th, I woke up with what I assumed was a migraine. These had been happening regularly since I first became anxious at the threat of having our four-generation family home and land destroyed by the PennEast Pipeline. PennEast was ramping up the pressure on landowners to allow surveys. This pressure was very stressful. I was called daily by the survey company and taunted that they had very important information that I needed to hear.

"Even more upsetting, a land agent showed me a map of the route through my property, with my house missing. He stated to me that unless I let them survey my property, they would use a Google Earth map that did not show my house. There is no Google Earth map without

my house on it because my house predates Google Earth.

"My headache, it turns out, was not a migraine, but a brain hemorrhage. I was paralyzed on the left half of my body. I spent almost two weeks in intensive care. It was doubtful whether I would ever be able to walk or live independently again. I then spent another six weeks in rehab. On the very day I finally returned home, I found surveyors on my property. The stress is relentless.

"This is a very hard account for me to write. I firmly believe that my health crisis was a direct result of the stress of having my home and family threatened. Sleep was almost impossible. It was small solace to hear that the pipeline was not likely to explode. In fact, they do rupture and blow up. I do not have faith in a company that uses scare tactics to intimidate homeowners.

"Just as upsetting, PennEast has labeled us as irrational and ignorant. I once overheard PennEast reps laughing and mocking landowners. Their attitude was we stand to make millions, your land's in the way. Haven't they ever been filled with the pride of ownership, made the mortgage payments, paid the taxes, and built the foundation for a life?

"If the PennEast proceeds" -- "If PennEast proceeds, we will despair over our lost daylilies, grown over generations and the chainsawed trees, knowing that

in our lifetime, we will not see new trees reach a similar size. I have had to train myself to sit, to relearn to walk, and I still do not have proper balance. I now have a 30 percent chance of having a second incident in the next two years, one that, in all likelihood, could kill me. This is the true cost of the pipeline for our family."

As Angele's story shows, our health and our land are intimately connected. We are not separate from our environment. Our well-being is rooted in our sense of place, our communities and our love of home. When our homes are threatened, as is the case with the proposed PennEast Pipeline, our health suffers. We suffer.

We are asking the Hopewell Board of Health to set an example and say no to PennEast. Let's write a resolution sending the strong message that the proposed PennEast Pipeline poses an unreasonable risk to the health and safety of Hopewell. By doing so, we say yes to the health and well-being of us all. Thank you.

MR. GOODELL: Thank you, Ms. Cronheim. And did you have a letter you wanted to submit?

MS. CRONHEIM: Yes. (Indiscernible). This is the letter from the transcript (indiscernible). And this is (indiscernible).

MR. GOODELL: Okay. All right. So we have some other documents. You submitted a July 20, 2015 letter

from Williams' Pipeline, your own remarks, and a document entitled "Human Health Impacts of the Proposed PennEast Pipeline," submitted by Lorraine Crown (phonetic) on behalf of the Concerned Citizens Against the Pipeline.

Okay. That appears to be the end of the testimony. And so now I turn to members of the Board. Is it your pleasure to adopt a resolution tonight based on what you have heard?

MR. CHAIRMAN: Members of the Board, as your chair, I would ask that we do, indeed, conclude these hearings with a resolution with appropriate language. I know that Ms. Cronheim just suggested some language. I believe our attorney has some language for us. But I do believe before we leave here, we need to make a statement and put a conclusion on these proceedings.

And the statement and the conclusion that I think would be appropriate is a resolution along the lines of what Ms. Cronheim suggested to us.

Mr. Goodell, do you have a proposed -- some proposed language for us that we can consider?

MR. GOODELL: So if it's the pleasure of the Board, something of the -- like the following, I think is based on the testimony that you've heard tonight. The Hopewell Township Board of Health, having heard the testimony of experts and individuals regarding potential

adverse health effects on the citizens of Hopewell Township as a result of the construction and operation of the proposed PennEast natural gas pipeline, the Board of Health hereby resolves that the proposed PennEast natural gas pipeline will adversely affect the health and -- health of the citizens of Hopewell Township, as a result of, among other things, potential groundwater contamination, air quality degradation, blasting risk, increased mental health illness, and increased risk of physical illness.

The Board of Health will forward this resolution and the record of these proceedings to the Hopewell Township Committee for use in any proceedings brought by the New Jersey Department of Environmental Protection, the Federal Energy Regulatory Commission, or other public body considering approval of the pipeline, or for other purposes which the Township Committee deems appropriate.

MR. CHAIRMAN: Does any member of the Board have any suggestions as to the appropriateness of the language, or different language that would be preferred?

Before we move it, Steve, I heard the indication that the Board of Health resolves. I'm thinking that since we actually heard the testimony and digested the information, that we're more determining than we are resolving because we heard the information and I believe that we are making a determination that the PennEast

Pipeline does pose an unreasonable, as well as significant risk to the health and safety of the residents of Hopewell Township. Unreasonable and significant risk to the health and safety of the residents of Hopewell Township.

MR. GOODELL: So -- so that second paragraph which said "the Board of Health hereby finds that the proposed PennEast natural gas pipeline will pose an unreasonable and significant risk to the health and safety of the citizens of Hopewell Township," correct?

MR. CHAIRMAN: Yes. Yes. It sounds good and -- yes. Unless a member of the Board has any additional language that they think would be appropriate, I would entertain a motion --

MS. SANDOM: I have a question.

MR. CHAIRMAN: Of course.

MS. SANDOM: Thank you. In addition to doing a resolution, I was wondering if there's any advice that you could provide for what other kinds of steps the Board of Health could take to reinforce the message that we're -- we would like to send today by doing a resolution. Is there anything else we can do? Because, obviously, there's a lot of concern in the Township and there's -- and it's not just the folks that have come out tonight.

I appreciate the fact that you have come out, but there are a lot of people in the Township who are not

able to come out tonight and who have shared their concerns about this for many months now. Are there things we can do besides this resolution?

MR. CHAIRMAN: (Indiscernible).

MS. SANDOM: Anybody who might know the answer to that?

MR. GOODELL: Ms. --

MS. DRESDNER: I know we're -- we would be very interested in having Hopewell Township, either the Township Committee or the Board of Health reach out to other municipalities that are affected along the pipeline route in New Jersey. And I think, honestly, Hopewell Township has been in the lead in -- you know, in doing particular steps like this, and providing a model and information about how to do this.

Perhaps they could hold their own public health hearings and hear from their residents in their municipalities. And that would help increase awareness and knowledge about the risks from this proposed pipeline. That's one thing I can think of that would be very helpful.

MR. GOODELL: Okay. Thank you, Ms. Dresdner.

Mr. Pisauro, do you have something?

MR. PISAURO: One quick thing. In the resolution, I'm not sure if I heard it. You talked about groundwater degradation, but surface water degradation

or impacts would be appropriate --

MR. GOODELL: Okay.

MR. PISAURO: -- as well, I believe.

MR. GOODELL: All right. That's a good point. As a result of, among other things, potential groundwater and surface water contamination. Okay. All right.

MS. SANDOM: And one of the other things I was thinking, I'm not sure how to add this to the resolution, but we heard from a number of different individuals from different areas speaking about different things. And here, all we say is having heard the testimony of experts. Do we want to detail a little bit more what kinds of experts they were, or what their backgrounds were in this resolution, or is it sufficient to just have the transcript of the proceedings go to the individuals?

MR. GOODELL: I think for our purposes here tonight, a resolution like this is sufficient. We will have a transcript and so we'll have the testimony of each of the experts recorded. That can speak for itself. If, in the future, the Board would like to go further and have additional findings of fact based on that, I think that that could certainly be done. That, obviously, though is more time consuming. I think for purposes of tonight's hearing, a resolution of this nature sums up the testimony in a concise way, and makes sure that the public and the

other agencies are aware of the Board's determination in a very prompt manner.

MR. KUCHINSKI: I think the other thing beyond the resolution, we need to consider moving forward as a board of health is there were some very serious dangers, and health risks, and safety risks delineated tonight, and depending, as this moves forward, we need to consider other steps that we should take, as a board of health, to protect things such as our drinking water resources for our residents, the wells, the septic systems, the protection of the C-1 stream corridors, and other sensitive environmental areas in the Township that support both mental health and the health and safety of our residents. So I think tonight this is a first step, but I think we're gonna need to go further.

MR. GOODELL: Okay.

MS. SANDOM: So does the record close tonight then? So if people do want to come and add testimony to this, how do they do that?

MR. GOODELL: Well, the record would close tonight. This is the hearing. You've got a resolution. I think that certainly the Board of Health meets monthly and to the extent that this is a continuing investigation, nothing precludes you from raising issues in the future, or hearing from people in the future at your monthly

meetings. But, certainly, for this particular hearing, the record would be closed. We've got a transcript now of -- we will make a transcript of these particular proceedings, but, again, as, you know, based on the information that Mr. Lester read at the beginning, I think it's the Board's continuing duty to monitor health impacts and effects of an issue like this in the Township.

MS. SANDOM: So, Mr. English, when is our next Board of Health meeting, if anybody wants to continue to provide testimony?

MR. ENGLISH: September --

MS. SANDOM: September --

MR. ENGLISH: -- 14th.

MR. GOODELL: September 14th. Okay. Okay. Thank you.

Okay. So the question is -- there's a motion that's been suggested. Is there anybody who wants to make that motion?

MR. HART: On motion, to move the resolution.

MR. CHAIRMAN: Is there a second?

MR. KUCHINSKI: Second.

MR. CHAIRMAN: Any questions or comments before we vote?

Then let's vote. All in favor.

MR. BRANT: Aye.

MR. HART: Aye.

MR. KUCHINSKI: Aye.

MS. SANDOM: Aye.

MR. CHAIRMAN: Aye.

Any opposed?

Any abstentions?

The resolution passes unanimously.

MR. GOODELL: Thank you, everybody, for coming, and the meeting is now adjourned.

Need a motion to close this hearing?

(Proceedings concluded)

C E R T I F I C A T I O N

I, STEFANIE LUCAS, the assigned transcriber, do hereby certify the foregoing transcript of Hopewell Township Board of Health, Special Meeting, on July 28, 2015, is prepared to the best of my ability and is a true and accurate non-compressed transcript of the proceedings, as recorded.

/s/ Stefanie Lucas
AD/T 570
Guy J. Renzi & Associates
August 26, 2015

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TOWNSHIP OF HOPEWELL

MERCER COUNTY

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September 18, 2015

Honorable Norman C. Bay, Chair
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Docket PF15-1-000
Proposed Gas Pipeline
PennEast Pipeline Company LLC
Hopewell Township, Mercer County

Dear Mr. Bay:

The impacts to Hopewell Township and its groundwater supply caused by PennEast's deviations from Hopewell Township's environmental control ordinances is significant. Hopewell Township provides many levels of protection for its water supply because the township's 60 square miles are served primarily by individual on-site wells. Protection of this critical water supply is a priority which must be honored by PennEast:

1. **Forestry Management and Tree Removal:** There is a strong interrelationship between the integrity of the township's water resources and tree removal. One mechanism Hopewell Township utilizes to protect its groundwater resources is through a Forestry Management and Tree Removal ordinance which is found in Chapter 12-4 of the Revised General Ordinances of Hopewell Township, Environmental Control (Exhibit "A" attached).

   Tree removal is regulated by requiring mitigation for the removal of a total of 150 diameter-inches of trees (each tree being at least 10 inches in diameter at breast height) on a tax lot within a 10 year period. Based upon maps filed with FERC, PennEast is advancing a plan which proposes to remove a significant number of 10 inch DBH trees, which appears to be well in excess of 150 diameter-inches on many tax lots. This removal will significantly impact the protection to the township's groundwater supply afforded by these trees.

In order to properly protect Hopewell Township's water supply as required by Chapter 12 of the Revised General Ordinances of Hopewell Township, PennEast is required to obtain a tree removal permit. The application for this permit is to be accompanied by a Tree Preservation and Removal Plan prepared by the appropriate expert. This plan shall include all information as required by section 12-4.5 (Exhibit "A" attached).

It will be necessary for PennEast to document all trees over 10 inches DBH that are to be removed in order to properly consider the application. It will also be necessary for PennEast to provide financial performance guarantees to insure the implementation of the Tree Preservation and Removal Plan.

2. **Steep Slopes:** Steep slopes are valuable resources and sensitive landforms that create microclimates where a diversity of organisms thrive. Hopewell Township has regulated disturbance of steep slopes through a steep slope protection ordinance found in section 17-116 of Hopewell Township's Revised General Ordinances (Exhibit "B" attached.

   The proposed PennEast pipeline activities will modify the natural slope system in a variety of ways and will promote instability by loading the slope, removing vital support, and increasing pore-water pressures. To mitigate the degradation of the steep slopes, PennEast must submit grading plans indicating all grading necessary for the project for review and approval by the township engineer. Such plan shall also provide for the proper protection and stabilization of all disturbed areas consistent with the design techniques established by the Soil Erosion and Sediment Control Standards, adopted as amended by the New Jersey State Soil Conservation Committee and shall include all mitigation strategies for consideration.

3. **Stream Corridors**: Hopewell Townships protects its groundwater resources through a stream corridor protection ordinance found in Chapter 12-3 of the Revised General Ordinances of Hopewell Township, Environmental Control (Exhibit "C" attached). Environmental Control Ordinances are applicable to all development and related disturbances.

   Many stream corridors are bisected by the PennEast pipeline. PennEast shall obtain the required stream corridor permit as prescribed by ordinance section 12-3.4. As part of this section, PennEast shall demonstrate if the proposed encroachment meets the general purpose and intent of the provisions of the section and whether the literal enforcement of the section is impracticable or will exact undue hardship because of peculiar conditions pertaining to the land in question. The extent to which PennEast will mitigate any encroachments into the stream corridor and rehabilitate any and all

degraded or disturbed areas within the stream corridor and maintain the integrity of the surrounding habitat and the extent to which the proposed disturbances will measurably increase the danger of flood damage or negatively impact the ecology of the stream corridor will be factors in the review.

It is recommended that PennEast begin this process as soon as other environmental permits have been obtained to provide adequate technical detail for the review to be concluded.

Again, preserving the integrity of Hopewell Township's water supply to insure quantity and quality and to preserve the sustainable recharge of this water supply is a priority for the township. Insuring the quantity and quality of the township's water supply and preserving its sustainable recharge is the dominant theme for the township's master plan. The township's zoning has been altered to protect the groundwater resources of Hopewell Township. Unmitigated, PennEast's proposed pipeline will serve to erode years of protections adopted by many governing bodies. PennEast must be required to adhere to the township's standards for Forestry Management and Tree Removal, Stream Corridors and Steep Slopes.

Thank you.

Sincerely,

Harvey Lester

Harvey Lester, Mayor

C: Hopewell Township Committee
Steven P. Goodell, Esquire
Governor Chris Christie
U.S. Senator Robert Menendez
U.S. Senator Cory Booker
Congresswoman Bonnie Watson Coleman
Mercer County Board of Chosen Freeholders

EXHIBIT A
Hopewell Township Forest Management and Tree Removal Ordinance

12-4 FOREST MANAGEMENT AND TREE REMOVAL.

12-4.1 Intent and Purpose.

Trees are declared to be an important cultural, ecological, scenic and economic resource. Proper management of this resource will ensure its maintenance and result in economic returns. Forestry management is intended to meet the objectives of preserving, protecting, enhancing and maintaining trees and providing opportunities for the continued use of forest resources by ensuring management of forest and trees through the application of sound management practices.

It shall be unlawful to cut down, damage, poison or in any other manner destroy or cause to be destroyed any trees covered by this section, except in accordance with the provisions of this section. (Ord. #12-1554)

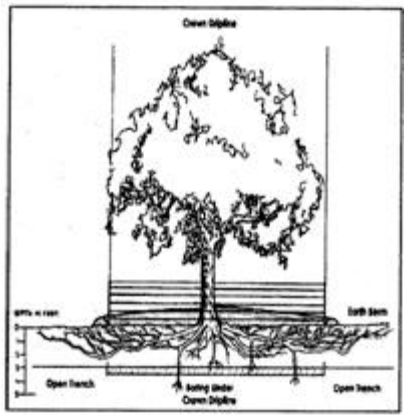
12-4.2 Definitions.

Administrative officer shall mean the individual appointed annually by the township committee who shall be responsible for the issuance of tree removal permits, in accordance with the procedures and standards set forth herein. The administrative officer shall consult with the municipal engineer with regard to engineering and technical issues. The administrative officer may consult with a certified tree expert or forester under contract with the township committee and the costs for said consultant shall be paid from the Tree Escrow Funds.

Caliper: ANSI Z60 for nursery stock. Caliper is a type of diameter measurement used in the nursery industry. The height measurement shall be taken from ground level for field grown stock and from the soil line for container grown stock, which should be at or near the top of the root flare. Caliper measurement of the trunk shall be taken six inches above the top of root flare up to and including four-inch caliper size. If the caliper at six inches above the ground exceeds four inches, the caliper should be measured at twelve inches above the top of root flare. Seldom are tree trunks perfectly round. The most accurate measurement will result from the use of a diameter tape. Caliper measurements taken with manual or electronic "slot" or "pincer" tape caliper tools should be the average of the smallest and largest measurements.

Community Forestry Management Plan shall mean a plan developed by a municipality that outlines the goals and objectives for managing trees on municipal property with the intent of minimizing liability to the municipality and maximizing the useful life of the tree resource. The plan is to be approved by the New Jersey Department of Environmental Protection, Division of Parks and Forestry, New Jersey Forest Service.

Diameter breast height (DBH) shall mean the diameter of a tree measured four and one-half feet above the uphill/highest side.



Dripline shall mean the line extending vertically from the exterior edge of a tree's live crown to the ground.

Erosion shall mean the detachment and movement of soil or rock fragments by water, ice, wind and gravity.

Exempt area shall mean the lot area as provided in this section for which tree placement shall not be required.

Forest management plan shall mean a plan for the management of timbered or forested lands approved by the New Jersey Department of Environmental Protection, New Jersey Forest Service, or similar State or Federal agency.

Open space shall mean any parcel or area of land or water essentially unimproved and set aside, dedicated, designated or reserved for public or private use and enjoyment or for the use and enjoyment of owners and occupants of land adjoining or neighboring such open spaces, provided that such areas may be improved with only those buildings, structures, streets and off-street parking and other improvements that are designated to be incidental to the natural openness of the land.

Specimen tree shall mean an individual tree that measures 60 percent or more of the circumference at breast height of a State record tree for that species.

State record tree shall mean the largest tree of each species found in New Jersey as listed on the NJ State Big Tree Register, available from the NJDEP Division of Parks & Forestry, State Forest Service, PO Box 404, Trenton, NJ, 08625.

Tree shall mean any State Record Tree, specimen tree or any other woody perennial plant greater than 20 feet in height.

Tree escrow fund shall mean a fund established by the governing body for the administration and promotion of tree and shrubbery resource sustainability projects and practices which may be consistent with the Community Stewardship Incentive Program

as outlined within the New Jersey Shade Tree and Community Forestry Assistance Act, P.L. 1996, chapter 135.

Tree expert shall mean a forester qualified by the State of New Jersey and having a minimum of five years' experience working in New Jersey, a conservation officer qualified by the State of New Jersey and having a minimum of five years' experience working in New Jersey or an arborist qualified by the State of New Jersey and having a minimum of five years' experience working in New Jersey.

Tree planting plan shall mean a specific plan adopted by Hopewell Township for the location and placement of trees on public property.

Tree preservation and removal plan shall mean a specific plan that contains tree locations and other information required by this section.

Tree removal permit shall mean a permit issued by the administrative officer.

Tree replacement plan shall mean a specific plan for replacement of removed trees in accordance with the provision of this section.
(Ord. #12-1554)

12-4.3 Applicability.

The terms and provisions of this section shall apply as follows:

a. It shall be unlawful for any person to remove or cause to remove trees above and beyond a combined total of 150 inches of DBH within a ten year period unless a tree removal permit has first been obtained (e.g. combined total of 150 inches of DBH equals 15 trees of ten inches DBH; five trees of 30 inches DBH; ten trees of 15 DBH; etc.).

b. It shall be unlawful for any person to remove or cause to remove trees which are State Record Trees or specimen trees unless a tree removal permit has first been obtained.

c. *Exceptions.* The provisions of this section shall not apply to the following:

   1. Any property upon which no trees are located, as confirmed by a site visit of the administrative officer.

   2. Any tree less than ten inches DBH.

   3. Any tree or trees removed or cut in accordance with a forest management plan, provided that such plan is filed with the tax assessor.

   4. Any tree or trees removed or cut in accordance with an approved conservation plan prepared by the Soil Conservation District, provided that such plan has been filed with the tax assessor.

5. Any tree or trees planted and grown for commercial purposes on property used as a commercial nursery, tree farm, garden center, Christmas tree plantations or tree orchards.
6. Any tree growing in a utility right-of-way or clear areas as established by the FAA for runway safety.
7. Weather emergencies such as hurricanes, fire, windstorm, ice storm, flood, freezing temperatures or other disaster.
8. Dead or diseased trees which are a hazard to persons or property.
9. Qualified right-to-farm activities.
   (Ord. #12-1554)

12-4.4 Tree Removal Permits; General.

a. Any person wishing to obtain a tree removal permit shall make application to the administrative officer by filing a written application which shall include a tree preservation and removal plan and payment of application fees as set forth in Chapter X. No application shall be considered without the payment of the required fees.

b. Removal of State record trees and specimen trees shall require approval of the township committee with consideration of recommendations by the environmental commission.

c. Where an application as required by this section has been submitted, no permit shall be issued until an application for a tree removal permit meeting all of the criteria of this section has been reviewed and approved by the administrative officer.

d. Where an application for a tree removal permit is made in connection with the construction of a building or other improvement, no building permits shall be issued until the tree removal permit has been issued.

e. All fees, including outstanding permit fees, inspection fees and tree escrow fund contributions, shall be paid prior to the issuance of the tree removal permit.

f. The administrative officer shall approve or deny the tree removal permit within ten business days after receipt of a completed application and payment of application fees. An additional ten business days shall be added to the review period if the administrative officer requests additional information as may reasonably be required to review a tree removal permit within the original review period.

g. A tree removal permit shall require the administrative officer to inspect the site from time to time to enforce the permit conditions. An inspection fee shall be paid as a condition of any tree removal permit in accordance with Chapter X, Fees and Permits.

h. The administrative officer shall notify the applicant in writing of the factual basis and criteria for any denial.

i. The final decision of the administrative officer may be appealed to the township administrator by filing written notice within ten days of the final decision. The township administrator shall issue its decision within 30 days after notice of appeal is filed. The township administrator may delegate its appeal responsibilities to the environmental commission. The township administrator's decision may be appealed to the Hopewell Township Committee who shall render a final decision within 45 days after a public hearing on the appeal.
(Ord. #12-1554)

12-4.5 Tree Preservation and Removal Plan.

Tree preservation and removal plans shall contain the following minimum information. The administrative officer reserves the right to request additional information as may reasonably be required to review a tree removal permit:

a. The name and address of the applicant.

b. The name and address of the owner of the property from which the trees are to be removed.

c. The street address and lot and block of the property.

d. A certification from the lot owner that the applicant is specifically authorized to make the application for tree removal.

e. The shape and dimensions of the lot or parcel, including the location of all existing and proposed easements.

f. Tree removal plans shall consist of a tree location sketch containing at least the minimum amount of pertinent information to enable the determination of compliance with the regulations in this section.

g. Tree preservation limits.

h. Limits of all tree protection with appropriate construction details.

i. All State record and specimen trees to be removed. The applicant shall provide documentation demonstrating that all reasonable efforts have been made to preserve State record and specimen trees, including, but not limited to, if feasible, relocation of existing and proposed infrastructure, roadways and buildings.

j. Tree replacement plan in accordance with this section. A tree replacement plan may be integrated with landscape plans submitted for other separate land use approvals.

k. A North arrow.

l. The location of existing and proposed infrastructure, roadways and buildings, if any. (Ord. #12-1554)

12-4.6 Criteria for Issuance of Permits.

The tree removal permit shall be approved by the administrative officer following his determination that the following criteria have been met:

a. A tree preservation and removal plan has been provided meeting all of the criteria in subsection 12-4.5;

b. A tree replacement plan has been provided meeting all of the criteria in subsection 12-4.9;

c. The administrative officer, after consultation with the municipal engineer, has determined that the proposed tree removal will NOT:

   1. Result in additional stormwater runoff which will impact adjacent properties;

   2. Create new erosion or will not require a soil erosion and sediment control plan approval by the Mercer County Soil Conservation District; or

   3. Impair growth or impair development of remaining trees on the applicant's property or upon adjacent properties;

   4. Create unusual dust or other nuisances during tree removal;

   5. Cause damage to on- or off-site utilities including but not limited to wastewater discharge and treatment systems, water supply and distribution systems;

   6. Result in dangerous or hazardous conditions.
   (Ord. #12-1554)

12-4.7 Term of Permit.

Approved tree removal permits shall be valid for a period not to exceed 12 calendar months from the date of issuance by the administrative officer and shall be conditioned upon payment of all permit and inspection fees. An extension may be granted by the township administrator for a period not to exceed three months for good cause shown. All work not completed within the term of permit or term of extension shall be the subject of a new application and the payment of new fees. (Ord. #12-1554)

12-4.8 Display of Permit and Right of Entry.

a. The tree removal permit shall be prominently displayed on the site continuously while trees are being removed or replaced or work done as authorized by the tree removal permit and for ten days thereafter.

b. All persons cutting or removing trees, of other than the applicant, shall carry with him/her authorization from the owner and applicant authorizing such person to cut or remove trees.

c. In the event that trees are being cut or removed in accordance with a forest management plan or a soil conservation plan, a copy of said plans shall be in the possession of the person cutting or removing such trees, if not the owner of the lot.

d. As a condition for the issuance of the permit, the applicant shall agree in writing to the entry onto his/her premises by the administrative officer or his designee as necessary to inspect the site in review of the application for a tree removal permit and to inspect the permitted tree removal work to effectuate the provisions of this section. Failure to allow such entry shall constitute a violation of the permit and this section.
(Ord. #12-1554)

12-4.9 Tree Replacement Plan.

Unless deemed an exception by subsection 12-4.3c, trees to be removed shall be replaced in accordance with a tree replacement plan which shall be prepared in accordance with the following:

a. For each tree ten inches in DBH or greater that is removed, the applicant shall prepare a replanting plan for other areas on the same tax lot which is subject to the tree removal.

b. Tree replacement on the subject tax lot to compensate for the tree removals shall be as follows:

1. Number and size of replacement trees to be used for each tree ten inches in DBH or larger that is to be removed beyond a combined total of 150 inches DBH and replacement shall be as follows:

Diameter of Removed Trees at Breast Height in Inches	Number of Replacement Trees for Each Tree Removed	Size of Replacement Trees
Greater than 10" up to 16"	2	2 – 2 1/2"
Greater than 16" up to 23"	2	3"
Greater than 23" up to 30"	4	3 1/2 – 4"
Greater than 30"	5	3 1/2 – 4"

2. Tree replacement species shall be indigenous to the area and site.

3. Trees planted within other existing natural stands of trees on site may be spaced five feet to 20 feet on center.

c. Unless otherwise set forth in this section, tree replacement shall follow the guidelines set forth in the "New Jersey No Net Loss Reforestation Act," P.L. 1993, c.106 (c.13:1L-14.2).

d. All proposed replacement tree species shall be selected from Trees For New Jersey Streets as published by the New Jersey Shade Tree Federation; Street Tree Factsheets, a publication of the Municipal Tree Restoration Program; and the adopted Hopewell Township Community Forestry Plan.

e. Tree replacement materials shall be provided in accordance with the standards set forth in ANSI Z60.1, American Standard for Nursery Stock.

f. Removal of State record trees or specimen trees requires approval of the Hopewell Township Committee. Replacement requirements for any State record tree or specimen tree approved to be removed shall be established by the governing body.

g. Credits for tree replacement shall be given on a one-to-one basis when one of the following conditions are proposed on the tree replacement plan:

1. Preservation of stands of ten or more trees with a DBH of six inches or greater within the limit of the disturbance line. Credit will only be given for native trees located within the stand.

2. Preservation of one acre or more of on-site areas having stands of trees with a DBH of six inches or greater which are to be left in natural condition. Preservation shall be provided by a deed of conservation easement from the lot owner to Hopewell Township which deed shall be filed with the Mercer County Clerk's Office by the applicant as a condition of the tree removal permit after approval by the township committee. This credit excludes all previous dedicated easements.

h. Soils disturbed during tree replacement shall be stabilized in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey.

i. All replacement trees shall be maintained in healthy condition for no less than two years from the date of planting.

j. When the site in question cannot physically accommodate the total replacement amount of trees required by this section, as certified by the applicant and verified by the administrative officer, tree replacement may be accomplished by a contribution of the monetary value of nonreplaced trees to the Township Tree Escrow Fund in an amount as set forth in Chapter X, Fees and Permits. Payment shall be a condition of the tree removal permit.
(Ord. #12-1554)

12-4.10 Tree Protection During Construction.

a. Prior to any tree removal, protection shall be installed. Tree protection shall remain until tree removal is complete.

b. Tree protection shall be provided, as a minimum, in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey.

c. There shall be no wires or attachments to trees being protected.

d. Protection is required for any soil disturbance within the dripline of any tree not being removed.

e. Any trees damaged during construction must be inspected and treated if required in accordance with written guidance from a tree expert. If the damage is unable to be treated as certified by the tree expert, the damaged tree shall be removed and replaced in accordance with this section.

f. No materials of any kind shall be stored and no construction machinery shall be placed within the dripline of any tree to be protected.

g. When the tree protection area is adjacent to street rights-of-way and utility easements, the location of street rights-of-way and utility easements shall be identified during construction.
(Ord. #12-1554)

12-4.11 Tree Replacement Escrow Fund.

A tree escrow fund shall be established to receive and disburse replacement tree contributions.

The primary purpose of the tree escrow fund is to provide for the planting and maintenance of trees and shrubs on public property. The fund will also pay administrative costs to implement the provisions of this section, including but not limited to fees for processing of permits, site inspections, consultants, and supervision of tree replacements. Administrative costs imposed in accordance with this section shall not exceed 30 percent of the fund, as determined on an annual basis.

Appropriations from the tree fund shall be authorized by the township committee in accordance with a municipal tree planting plan with consideration of recommendations made by the environmental commission. The tree escrow fund shall be maintained by the chief financial officer. (Ord. #12-1554)

12-4.12 Violations and Penalties.

a. Any person, firm, partnership, corporation, association or other legal entity violating any of the provisions of this chapter shall, upon conviction of such violation be punished by a

fine of up to two thousand ($2,000.00) dollars for each offense, in the discretion of the judge before whom conviction may be had. Each illegally removed tree shall be considered a separate violation. Each violation of any of the provisions of this section and each day the same is violated shall be defined and taken to be a separate and distinct offense. In addition, the court may order restitution (fine and/or appraised value, whichever is greater) and/or replacement of the tree illegally removed.

b. In addition to other remedies, the tree specialist or other authorized official may institute any appropriate legal action to prevent a continuing violation of the terms of this section. (Ord. #12-1554)

EXHIBIT B
Hopewell Township Steep Slope Protection Ordinances

17-116 STEEP SLOPES.

a. The following standards shall apply to all new development on lots (existing or proposed) with slopes in excess of 15 percent:

   1. In areas with slopes that exceed 25 percent, no development, regrading or removal of vegetation shall be permitted.

   2. In areas with slopes of 15 percent to 25 percent, no more than 15 percent of such areas shall be developed, regarded, or cleared of vegetation.

   3. For the purposes of subdivision each residential lot created must include a minimum of two contiguous acres of land with less than 15 percent slope on which the dwelling, septic system and accessory structures shall be located.

   4. A steep slope analysis showing slope classes 0-14.99 percent, 15-25 percent and greater than 25 percent shall be provided with all site development or subdivision plans. The slope classification shall be calculated utilizing a two-foot contour interval.

   5. A grading plan which indicates all site grading necessary for the development or subdivision of the lot shall be submitted for review and approval by the township engineer. Such plan shall also provide for the proper protection and stabilization of all disturbed areas consistent with the design techniques established by the Soil Erosion and Sediment Control Standards, adopted as amended by the New Jersey State Soil Conservation Committee. The approval of this grading plan by the township engineer shall be required prior to the issuance of a building permit.
   (Ord. #07-1411, § 1)

EXHIBIT C
Hopewell Township Stream Corridor Protection Ordinance

12-3 STREAM CORRIDOR PROTECTION.

12-3.1 Definitions.

Definitions for this section are set forth in Chapter XVII, Article X, Section 17-181 and are incorporated herein by reference. (Ord. #04-1328, § 2)

12-3.2 General Provisions.

a. *Purposes.* The purposes of the stream corridor protection provisions are to:

1. Assure that adequate water supply is available and maintain the long-term natural equilibrium of the ground and surface waters in Hopewell Township and in neighboring communities.

2. Improve and maintain the quality of the water supply and sustain diverse populations of aquatic flora and fauna.

3. Improve the currently impaired streams in the township.

4. Protect significant ecological components of stream corridors such as floodplains, woodlands, steep slopes and habitats for flora and fauna.

5. Minimize flood related damage to properties in the township and in neighboring communities.

6. Complement Federal, State, regional, county and municipal watershed, flood hazard and stream corridor protection and management programs.

b. *Applicability.* The stream corridor provisions apply to any land containing any portion of a stream corridor as defined in Chapter XVII, Article X, Section 17-181. In the event that the requirements of Section 17-115 are not applicable, then the provisions of this chapter shall be applicable.

c. *Activities Permitted in Stream Corridors.* Stream corridors shall remain in their natural state and shall not be developed or disturbed, except for the following activities:

1. Any activity subject to regulation by the New Jersey Department of Environmental Protection under the New Jersey Freshwater Wetlands Protection Act.

2. Reconstruction of a valid nonconforming structure that predates the adoption of this section* in the event of partial destruction by fire, natural hazards,

or other acts of God, provided the reconstruction does not have a greater footprint or total area than that of the damaged structure and no change in land use occurs.

3. Any use or related maintenance thereof that existed prior to the date of adoption of this section.*

4. Any agricultural use or structure existing prior to the date of adoption of this section,* but no new agricultural use or structure, except for fences, shall be permitted in a stream corridor, subject to approval by the New Jersey Department of Environmental Protection.

5. Existing stormwater management facilities located in stream corridors are permitted to remain in a stream corridor and may be expanded or modified in connection with an application for development in accordance with the requirements of the approving authority.

6. Surveying or activities for the purpose of establishing or re-establishing a boundary line or points, which use only hand-held equipment and do not involve the use of motorized vehicles to either clear vegetation or extract soil borings. The clearing of vegetation along the survey line or around the survey points shall not exceed three feet in width or diameter respectively and shall not be kept clear or maintained once the survey or delineation is completed.

d. *Prohibited Activities.* All activities not specifically permitted by the provisions of paragraph c. above are prohibited. Prohibited activities include, but are not limited to, the following:

1. Alteration of watercourses and stream corridors by development or disturbance of any type.

2. Clearing or cutting of any vegetation, except for removal of dead vegetation, pruning for reasons of safety and harvesting of agricultural products.

3. Disposal of brush, debris or any solid or liquid waste.

4. Installation of fences and sheds.
(Ord. #04-1328, § 2)

12-3.3 Administration.

a. *Stream Corridor Permit.* A stream corridor permit shall be required before any prohibited activity is undertaken within any stream corridor as defined in Chapter XVII, Article X, Section 17-181, provided that if the approving authority has considered an application for development involving a stream corridor, a stream corridor permit may not be sought for five years after the date of completion of the development.

b. *Duties and Responsibilities of the Administrative Officer.* The administrative officer shall be responsible for the issuance of stream corridor permits, in accordance with the procedures and standards set forth in subsections 12-3.4 and 12-3.5 below. The administrative officer shall consult with the township engineer with regard to engineering and technical issues.

c. *Application for Stream Corridor Permit.* Application for a stream corridor permit to allow prohibited activities to occur within stream corridors shall be made in accordance with the requirements of subsection 12-3.4 and subject to the considerations set forth in subsection 12-3.5.

d. *Appeal Procedure.* Appeals from determinations made by the administrative officer relative to the issuance of stream corridor permits may be made to the zoning board of adjustment in accordance with the requirements of subsection 12-3.7.

(Ord. #04-1328, § 2)

12-3.4 Application for Stream Corridor Permit/Procedures.

a. *Procedure.* The following procedures shall govern the issuance of stream corridor permits:

1. The applicant shall file an application with the administrative officer to allow prohibited activities to occur within a stream corridor. Such application shall be on a form prescribed by the township and shall include a concept sketch drawn to scale showing the proposed development or disturbance. Based on the nature of the development or disturbance proposed, and in the reasonable discretion of the administrative officer and the township engineer, the applicant may be required to submit, in addition to the application and the concept sketch, ten copies of a true and accurate plot plan, prepared by a qualified and licensed New Jersey professional, drawn to a scale of not less than one inch equals 50 feet. If required by the administrative officer or the township engineer in order to make an informed decision, the plot plan shall exhibit the following:

(a) The exact size, shape, location and elevation of existing and proposed structures and of any fill, regrading or areas of disturbance;

(b) Contour lines at intervals of not more than two feet;

(c)The stream corridor for a delineated stream as defined in Chapter XVII, Article X, Section 17-181;

(d) The location of all improvements and disturbance proposed in the stream corridor; and

(e) The extent of any proposed watercourse alterations.

2. The administrative officer shall review the submission and shall advise the applicant in writing within 30 days of submission if the application is incomplete and shall specify the items that are lacking. If the administrative officer does not notify the applicant that the application is incomplete, then the application shall be deemed to be complete.

3. Upon determining the application to be complete, the administrative officer shall refer the stream corridor permit application and all accompanying documents relative thereto to the environmental commission and the township engineer for review and comment. If necessary, the environmental commission shall appoint a subcommittee, consisting of less than an effective majority, in order to facilitate the prompt review of permit applications without requiring the application to await the next regularly scheduled meeting of the full commission. The commission or the subcommittee, jointly with the township engineer, shall review the application, and after giving the applicant an opportunity to be heard with respect thereto, shall provide their joint findings and recommendations in writing to the administrative officer utilizing the considerations for review set forth in subsection 12-3.5 below. The commission shall render its written report within 30 days of referral. Failure to do so without written consent to an extension of time by the applicant shall be deemed to constitute a report in favor of issuance of the permit and without recommendations or conditions.

4. After review of the consideration set forth in subsection 12-3.5 below and the joint recommendations made by the environmental commission or its subcommittee and the township engineer, the administrative officer may approve the stream corridor permit with or without conditions or may deny the stream corridor permit as deemed necessary to further the purpose of this section. The administrative officer shall make the final determination as to approval with or without conditions or denial of the requested stream corridor permit. Such final determination shall be forwarded in writing to the applicant. The administrative officer shall specify the reasons for the action taken.

5. If the stream corridor permit is approved, the administrative officer shall issue a permit to the applicant, but such permit shall not relieve the applicant from complying with other applicable laws and ordinances.

6. If the administrative officer fails to approve or deny the permit within 90 days after the date of submission of a complete application, or within such further time agreed to by the applicant in writing, the application shall be deemed to be approved.

(Ord. #04-1328, § 2)

12-3.5 Considerations for Review of Stream Corridor Permits.

a. The administrative officer shall be guided by the following considerations in reviewing applications for stream corridor permits:

1. The standards used to grant a design waiver set forth at N.J.S.A. 40:55D-51 a. and b., specifically whether the permit request is reasonable and within the general purpose and intent of the provisions of the section and whether the literal enforcement of the section is impracticable or will exact undue hardship because of peculiar conditions pertaining to the land in question.

2. The extent to which all necessary permits have been obtained from applicable Federal, State or local government agencies having jurisdiction.

3. The extent to which applicant will mitigate any encroachments into the stream corridor and rehabilitate any and all degraded or disturbed areas within the stream corridor and maintain the integrity of the surrounding habitat.

4. The extent to which the proposed activity, development or disturbance will measurably increase the danger of flood damage or negatively impact the ecology of the stream corridor.

b. In the event that the administrative officer grants a stream corridor permit, the stream corridor permit shall only allow the minimum encroachment necessary to afford relief.

c. *Interpretation of Boundaries.* The administrative officer, with the advice of the township engineer and subcommittee of the environmental commission, shall make interpretations, where needed, as to the exact location of the boundaries of the stream corridors, for example, where there appears to be a conflict between the mapped or proposed mapped boundaries and actual field conditions.

(Ord. #04-1328, § 2)

12-3.6 Stream Corridor Averaging.

An applicant may undertake stream corridor averaging, as defined in Chapter XVII, Article X, subsection 17-181. Stream corridor averaging shall only be permitted along the perimeter of retention basins. Stream corridor width may be reduced to a minimum of 25 feet for buildings or other structures or zero feet for dams, pedestrian walkways, walls, and any associated landscaped areas along the perimeter of a retention basin, provided, however, that the total length of stream corridor reduction is not greater than 40 percent of the length of the perimeter of the retention basin. For every stream corridor reduced in area along a retention basin, there shall be an equivalent increase in stream corridor area provided elsewhere along the perimeter of the retention basin. (Ord. #04-1328, § 2)

12-3.7 Appeal Procedure.

a. The zoning board of adjustment shall be designated as the agency to act as the appeal authority to hear and decide all appeals from the decision of the administrative officer.

b. Any applicant wishing to appeal the decision of the administrative officer relative to the issuance of a stream corridor permit, shall file a notice of appeal with the administrative officer within 20 days of receipt of the administrative officer's decision, specifying the grounds of such appeal. The administrative officer shall immediately transmit to the zoning board of adjustment all the documents constituting the record upon which the action appealed from was taken.

c. The zoning board of adjustment shall follow the requirements set forth in the Municipal Land Use Law, N.J.S.A. 40:55D-70a et seq., relating to the appeal of the administrative officer's determination. However, the role of the zoning board of adjustment shall not be derived from the Municipal Land Use Law but shall be a function assigned to the zoning board of adjustment by this section as the agency to perform this appeal function.

d. The zoning board of adjustment shall render a decision no later than 120 days from the date of the notice of appeal. Failure of the board to render a decision within such 120 day period or within such further time as may be consented to by the applicant in writing shall constitute a decision favorable to the applicant.

e. Any person aggrieved by the decision of the administrative officer may appeal such decision directly to the Superior Court of New Jersey as provided by the laws of the State of New Jersey or may appeal the decision of the zoning board of adjustment, as the case may be.

(Ord. #04-1328, § 2)

TOWNSHIP OF HOPEWELL

MERCER COUNTY

201 Washington Crossing Pennington Road
Titusville, New Jersey 08560-1410
609.737.0605 Ext. 664
609.737.6839 Fax

September 18, 2015

Honorable Norman C. Bay, Chair
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Docket PF15-1-000
Proposed Gas Pipeline
PennEast Pipeline Company LLC
Hopewell Township, Mercer County

Dear Mr. Bay:

Hopewell Township has an obligation to provide its fair share of affordable housing, as mandated by the New Jersey Constitution, the state Affordable Housing Act, and the New Jersey Supreme Court. See, *Adoption of N.J.A.C. 5:96 and 5:97 by N.J. Council on Affordable Housing*, 221 N.J. 1 (2015) (Mount Laurel IV).

In order to meet this requirement, Hopewell Township purchased the 46.104 acre tract known as Block 85, Lot 3 for the express purpose of providing affordable housing. This tract is integral to the Township's Affordable Housing Plan (attached), which is currently subject to the jurisdiction of the Superior Court (see, *In the Matter of the Application of the Township of Hopewell*, Docket No. MER-L-1557-15). The Penn East pipeline is planned to bisect this lot, permanently impairing its ability to provide the required affordable housing.

As part of the current litigation, an expert retained by the Fair Share Housing Center and other interested parties has issued a report indicating that Hopewell Township's constitutional housing obligation for affordable housing is 1,000 units. In order to achieve this obligation, a minimum design density of 15 dwelling units per acre would be required on the subject tract.

The PennEast pipeline will impact approximately 2 acres of developable land on this tract (see attached map). At 15 dwelling units per acre, the PennEast pipeline will prevent the construction of a minimum of 30 affordable units. This is an unacceptable impact.

On page 2 of Hopewell Township's scoping comments submitted to FERC at it 2/25/15 scoping meeting, a very specific concern was raised regarding the PennEast impact to this tract. These comments as stated read as follows:

3. *AFFORDABLE HOUSING IMPACTS*

*a. The **DRAFT** depiction of the Preferred Alternate Route will encumber land on a designated affordable housing tract known as Tax Block 85, Tax Lot 3. This encumbrance will impact Hopewell Township's ability to provide affordable housing on this tract. Providing affordable housing is a constitutional obligation which should not be pre-empted. **The EIS must address this impact.***

There has been no outreach to Hopewell Township by PennEast regarding this issue and PennEast has neglected to address this issue with any of its FERC filings. Likewise FERC has never responded to this comment.

Because Hopewell Township's obligation is a constitutional obligation, enforced by the courts, the only option available at this time is the NO impact option. There can be no loss of area to Block 85 Lot 3. This may be achieved by:

1. Relocating the pipeline such that it does not affect any portion of Block 85 Lot 3.

2. Relocating the proposed PennEast connection to the Transcontinental Gas pipeline (Transco). A physical connection to Transco is possible west of Block 85, Lot 3.

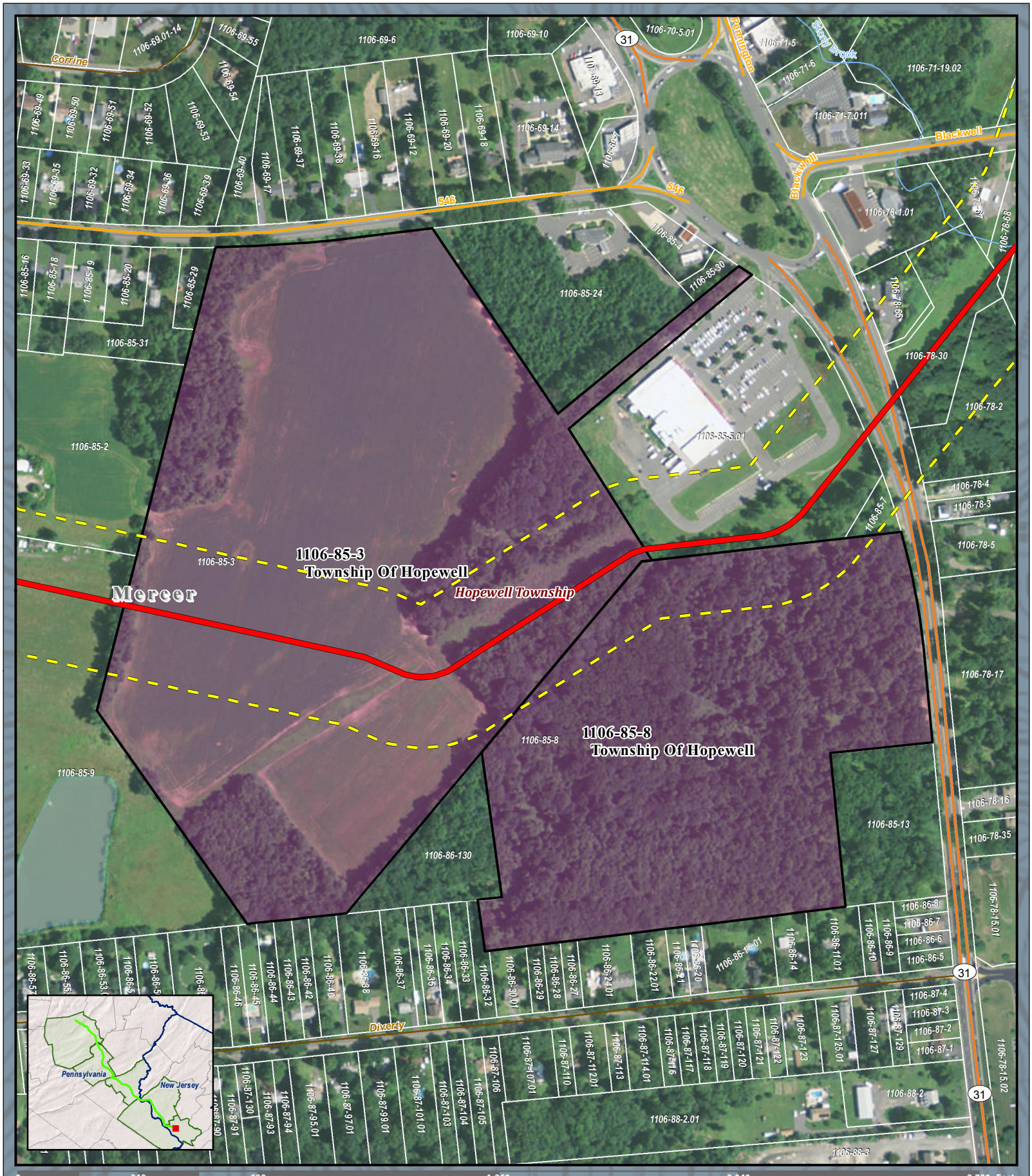
Again, any PennEast alignment that will impact Hopewell Township Tax Block 85, Lot 3 will impact the township's ability to meet its constitutional affordable housing obligation and is unacceptable. We request that FERC require that PennEast relocate its pipeline to avoid this impact.

Thank you.

Sincerely,

Harvey Lester, Mayor

C: Hopewell Township Committee
Steven P. Goodell, Esquire
Governor Chris Christie
U.S. Senator Robert Menendez
U.S. Senator Cory Booker
Congresswoman Bonnie Watson Coleman
Mercer County Board of Chosen Freeholders



1106-85-3 & 1106-85-8 (Township of Hopewell)

Hopewll Township	
New Jersey	

Coordinate System:
NAD 1983 UTM Zone 18N
Projection: Transverse Mercator
Linear Unit: Meter
Datum: North American 1983

Map Scale Units:
1:4,200
1 inch = 350 feet

Map Document Credits:
Prepared by: Amber Scott
Map Date: 8/28/2015

Preferred Route

400ft Study Corridor

WESTERN LAND SERVICES

CONFIDENTIAL

This map is the property of Western Land Services, Inc. (WLS). Reliance on information contained herein is at the user's own risk. WLS does not make any representations or warranties as to the accuracy or completeness. WLS shall not be held liable for any errors or omissions herein.

Housing Plan Element and Fair Share Plan

Township of Hopewell
Mercer County, New Jersey

Prepared by the Hopewell Township Planning Board in consultation with Francis J. Banisch III, AICP/PP

Adopted by the Planning Board on November13, 2008

Amended by the Planning Board on November 17, 2011

The original of this report was signed and sealed in accordance with N.J.A.C. 13:41-1.3

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Calculation of Fair Share

The affordable housing obligation is cumulative and includes the affordable housing need for the period 1987 to 2018. The affordable housing obligation consists of three components: the rehabilitation share; the prior round obligation (1987 to 1999); and, growth share (1999 to 2018).

Rehabilitation Share

The rehabilitation share for affordable housing is the number of existing housing units as of April 1, 2000 that are old, crowded and deficient and also occupied by households of low- and moderate-income. The rehabilitation share for each municipality is provided in Appendix C of N.J.A.C. 5:97-1 et seq. (the COAH third round substantive rules). The rehabilitation share for the Township is 5 affordable units. The Township has provided 34 rehabilitated units since April 1, 2000.

Prior Round Obligation

The prior round obligation is the municipal new construction obligation from 1987 to 1999. Obligations from the first and second rounds have been recalculated to include the most recent data from the 2000 Census. The result is the Township's prior round obligation decreased from 521 affordable units to 520 affordable units.

Credits/Reductions from Prior Round Obligation

The Township is eligible for the following credits and reductions from its prior round obligation of 520 units:

TABLE 1. Prior Round Credits/Reductions

Category/Development	Total Affordable Units	Rental Credits	Age-Restricted units	Housing Unit Credits
Regional Contribution Agreements	198			198
Pennington Pointe	5		5	5
CIFA Group Home	4	4		8
Brandon Farms	138			135
Bonus for Substantial Compliance	46			46
Hopewell Gardens Handicapped Age-restricted*	149 15 134	 15 28	 85	 30 113
Total				**535**

* Because of the cap on the number of age-restricted units, only 85 of the 134 age-restricted units could be counted in the prior round obligation. The 49 age-restricted rental units are excess units that can be carried to the third round.

Based on the above analysis, the Township has 15 excess units from its prior round obligation that can be carried forward to the Third Round (520 affordable units from prior round obligation and 535 housing unit credits). In addition, the Township has an excess of 49 age-restricted rental units that can be carried to the Third Round.

Residential Growth Share

In the rules published by COAH in January 2008, subsequently adopted in June 2008 and then draft revisions published in June 2008 and adopted in September 2008, the Council indicated that the Township would increase by 1,474 housing units from 2004 to 2018 (Appendix F of NJAC 5:97-1 et seq.). This estimate is in stark contrast to the projections of the Delaware Valley Regional Planning Commission (DVRPC), which is the Metropolitan Planning Organization (MPO) for the Township. The DVRPC has established that the Township will grow by 515 households in the period 2005-2015.

However, NJAC 5:97-2.4(a) permits the municipality to exclude market-rate units within inclusionary developments that are constructed after January 1, 2004 from residential growth for the purposes of projecting the growth share. Hopewell Grant, which includes the 240 market-rate units for the 149 unit Hopewell Gardens affordable project, has 182 units which have been occupied after January 1, 2004, and which can be used to reduce the household projection. In addition the 149 unit affordable project also can be deducted. Dividing the resulting household projection of 1,143 units by 5 (one affordable unit for each four market-rate units) yields a residential growth share of 228.6 affordable units based on this calculation.

Nonresidential Growth Share

The nonresidential growth share is based on one affordable unit for each new 16 jobs created in the Township. The estimate from Appendix F of the COAH rules is 4,064 new jobs over the period 2004-2018. Based on this calculation, the nonresidential growth share is 254 affordable units.

Total Fair Share Obligation

TABLE 2. Fair Share Obligation

Category	Required units	Units provided
Rehabilitation share	5	5
Prior round obligation	520	535
Growth share obligation	483 (Estimate of future development)	
Total	1,008	540

The Township's total fair share for the period from 1987-2018 is 1,008 affordable units. The Township has provided 535 units under the prior rules (15 units in excess of the prior round obligation), and has an additional 49 units not counted in the prior round, consisting of 49 age-restricted rental units, that it will put towards its third round obligation.

Fair Share Plan

In the previous section a fair share obligation of 1,008 units has been established. The following outlines how this obligation will be addressed.

Table 3 below summarizes the Hopewell Township fair share obligation and the plan for meeting that obligation. Additional details for each component of the plan are provided in the narrative that follows the table.

TABLE 3. Hopewell Township Fair Share Obligation, Summary of Requirements and Planned Round Three Compliance			
		Requirement	**Township Provision**
Total Fair Share Obligation		**Unknown**	--
Rounds One and Two		**520**	**535**
Rehabilitation Share		5	5
Round Three (Growth Share) Requirement		**Unknown**	
Excess		--	15
Not Counted in Prior Rounds, Eligible in Round Three		--	49
Subtotal, Excess Applicable to Round Three Requirements		--	**64**
Net New Round Three Requirement After Excess from Prior Rounds		**Unknown**	--
1.	Scattered Site Projects (Community Options, HomeFront, Wrick Avenue, Minnietown Lane)	--	15
2.	Accessory Apartments	--	10
3.	Block 78, Lot 10.04 (Project Freedom)	--	70
4.	Block 33, Lot 1.02 (Pennytown)	--	70
5.	Block 91, Lot 3.96 (Capital Health Systems)*	--	70
6.	Block 93, Lot 5 (Burroughs tract)	--	7
7.	Block 85, Lot 3 (Zaitz tract)	--	180
8.	Residential development (ongoing, inclusionary zoning distributed throughout Hopewell Township)	--	50
Total Units applicable to Round Three		--	**472**
Excess for Round Three Requirement		--	*53*

*Specifically as to CHS, the Developer's Agreement indicates the following:

"CHS will satisfy any affordable housing obligation that its project imposes on the Township, as such obligation is set forth in the Township's affordable housing ordinances enacted in accordance with the rules and regulations of the New Jersey Council on Affordable Housing as are in effect at the time the applicant applies for a Certificate of Occupancy for the proposed development or any portion thereof, or as modified or amended by the New Jersey Council on Affordable Housing and/or a court of final jurisdiction subsequent to that time, either through on site construction or other means acceptable to the Township, or a combination of both".

Rehabilitation

The Township has satisfied its rehabilitation obligation of five affordable units. Thirty-four units have been rehabilitated since April 1, 2000.

Prior Round Obligation

The adjusted prior round allocation of affordable units is 520 affordable units. The Township has provided 535 affordable units, resulting in an excess of 15 affordable units. In addition, the Township has 49 age-restricted rental units that could not be counted in the prior round obligation, but can be carried to the third round.

Excess Units from Prior Round Obligation

In accordance with the calculations provided in the previous section, the Township has established that it has 49 excess units consisting of age-restricted, rental units at the Hopewell Gardens facility, and 18 additional units that exceeded the prior round obligation. These excess units will be utilized to address a portion of the Township's fair share and rental obligations, and will be applied to limit the number of new age-restricted, affordable dwellings that can be provided.

Municipally Sponsored and 100 percent Affordable Programs

The Township is proposing the use of five properties for municipally sponsored, 100 percent affordable programs (NJAC 5:97-6.7):

- Block 2, Lot 8 is a 1.1 acre parcel on Minnietown Lane and Hopewell Wertsville Road. The Township intends to provide 2 modular units on the property. The Township owns the property, which it purchased using funds from the Township's affordable housing trust account. The property is located in a residential zoning district where the use is permitted. The Township has prepared an analysis to provide new septic systems to support the proposed use. (Table 3, Reference Number 1)
- Block 130, Lot 77.01 on Wrick Avenue, a 0.5 acre parcel which the Township obtained through a tax foreclosure. The Township has entered a contract to construct a modular home on this property. The property is located in a residential zoning district and has a well and septic system available. (Table 3, Reference Number 1)

- Block 33, Lot 1.02 is a 25 acre parcel with frontage on Marshall's Corner-Woodsville Road, Pennington-Hopewell Road (County Route 654), and Route 31. The tract currently has an on-site wastewater treatment plant that could service up to 60 affordable units. (Table 3, Reference Number 4)

- Block 93, Lot 5 on Scotch Road, is a 34 acre parcel acquired by the Township specifically for affordable housing purposes. The Township is seeking an experienced developer of affordable housing to provide 30 to 50 units on this property, and intends to prepare a Request for Proposals (RFP) to solicit such a developer. However, wastewater treatment limitations may only permit seven units if conventional on-site disposal is utilized. If possible, wastewater treatment will be provided through an on-site community wastewater treatment system or connection to ELSA, and potable water through a public water supply system or an on-site well. The property is adjacent to major employers and in close proximity to the municipal complex, and is located in a residential zoning district. (Table 3, Reference Number 6)

- Block 85, Lot 3 The Zaitz tract (Block 85, Lot 3) is hereby substituted for the previously designated Weidel Tract (Block 88, Lot 5.021). The Weidel tract was landlocked and the majority of the site (74%) is wooded. Before Weidel is capable of being developed, an estimated taxpayer investment of $3,100,000 is required to provide access to the public roadway system and sewer/water infrastructure to the site. Weidel was the only municipal site available with potential access to sewer/water infrastructure at the time of the Round 3 COAH mandate and as such it was selected as an affordable housing site.

  The Zaitz tract (Block 85, Lot 3) is more particularly well suited for housing. This 44-acre tract has frontage along Mercer County Route 546. This tract is an open agricultural lot which is disconnected from other major agricultural tracts, making it less desirable for agriculture related uses. The Zaitz tract has fewer environmental constraints than Weidel and is located within an area designated for new public sewer and public water infrastructure. The Zaitz tract is within close proximity to retail services and has access to mass transit which the Weidel tract did not. The Township plans to construct approximately 200 affordable units on the tract, utilizing an experienced developer of affordable housing and subject to a forthcoming Request for Proposals. (Table 3, Reference Number 7)

Municipally sponsored affordable housing projects require additional documentation, beyond site control as noted above. The housing sites satisfy the following criteria:

- The selected sites are suitable pursuant to NJAC 5:97-3.13 in that they are either in Planning Area 2 or are consistent with sound planning principles and the goals, policies and objectives of the State Development and Redevelopment Plan (SDRP);
- The Township has the capability to administer the projects in accordance with the Uniform Housing Affordability Controls (NJAC 5:80-26). The Township has a municipal housing liaison to administer the projects, and will seek administrative help if needed;

- The units will have a low/moderate income split in accordance with the Uniform Housing Affordability Controls (UHAC), providing at least 50% of the units for low-income households and no more than 50% for moderate-income households;
- The units will be affirmatively marketed by the Township's municipal housing liaison or another agency in accordance with the UHAC rules;
- The units will have the appropriate controls on affordability in accordance with the COAH and UHAC rules;
- The units will have the appropriate bedroom distribution, providing a mix of one-, two- and three-bedroom units for the municipal construction project;
- The municipality has adequate funding capabilities through the use of development fees, payments in lieu of construction, or bonding capability if necessary;
- The construction will begin within 2 years of the grant of substantive certification.

Accessory Apartments

The revised Third Round rules permit a deed restriction on affordability controls of 10 years, rather than the 30 year restriction that was proposed in the prior Third Round rules. The 30 year restriction was a deterrent to the program. In addition, the minimum payment to the property owner is now $25,000 for the creation of a low-income dwelling, and $20,000 for the creation of a moderate-income dwelling. The Township is including 10 units in its Third Round compliance plan, but if the program is successful can provide up to 50 units through this mechanism. (Table 3, Reference Number 2)

Supportive and Special Needs Housing

The Township is proposing the use of two group homes on property owned by the Township to address its fair share obligation (NJAC 5:97-6.10) concerning supportive and special needs housing. The first of these is designated as Lot 5 in Block 93 and is located on Scotch Road. Currently on the 34 acre property are a 2-family dwelling and a single-family dwelling, yielding three affordable dwelling units (one 3-bedroom and two 2-bedroom). The property will be leased to Home Front for 3 family rental units. (Table 3, Reference Number 1)

Block 26, Lot 4.03 on Harbourton Rocktown Road, a 1 acre parcel which includes an existing dwelling and outbuildings. The existing dwelling will be demolished and replaced. The Township owns the property, which it purchased using funds from the Township's affordable housing trust account. The property will be conveyed to Community Options for the construction of a 4 bedroom group home for individuals with learning disabilities. The property is located in a residential zoning district and the use is permitted. A new septic system has been provided. (Table 3, Reference Number 1)

Block 78, Lot 10.04 is a 22 acre parcel located on Denow Road east of Route 31. The Township is proposing to lease the land to Project Freedom for the development of approximately 100

units, the majority of which will be for the developmentally disabled. The tract currently has a sewage treatment allocation from ELSA. (Table 3, Reference Number 3)

The Township has control of these properties through fee simple ownership. The Township's contribution is the property and any assistance it may provide in securing approvals and additional ancillary funds. The interested organizations are to provide sources of funding beyond that available from the Township. The agencies have indicated that adequate funding can be provided.

The Municipal Land Use Law (MLUL, NJSA 40:55D-66.1) indicates that community residences (group homes) shall be a permitted use in all residential zoning districts of a municipality, and the requirements shall be the same as for single family dwelling units located within such districts. Both of the proposed group homes are located within a residential zoning district.

Residential Development

The Township's build-out analysis identifies properties that can meet COAH's requirement of one affordable unit per four market-rate units, i.e. a five lot subdivision is possible. This analysis of the R-150, VRC and MRC zoning districts indicates that 145 affordable units may be provided in these residential districts. However, the Township is taking credit for only 50 affordable units from this category, as it is unlikely the build-out will occur by 2018, and not all subdivided lots will contribute to growth share. In addition, the Township intends to incorporate COAH's standard for a 20 percent affordable housing set-aside into the zoning provisions for all residential and mixed-use districts. (Table 3, Reference Number 8)

Rental Housing

The COAH rules indicate that at least 25 percent of a municipality's growth share obligation shall be addressed with rental housing (NJAC 5:97-3.10(b)3), and that at least 50% of the rental housing obligation addressed within the municipality must be family housing units (NJAC 5:97-3.9). Given the Township's growth share obligation of 483 units, 121 units must be rental housing, and no more than 60 units may be addressed through age-restricted housing. The Township has a prior cycle credit of 49 age-restricted rental units. Thus, 72 additional rental units are required, 11 of which could be age-restricted units. The three units on Block 93, Lot 5 to be developed under the auspices of Home Front will satisfy some of the family unit rental obligation. With the Project Freedom project of approximately 70 units, and the municipally constructed, 100 percent affordable developments that are contemplated, the Township will well exceed its rental obligation, and thus should be eligible for additional rental credits.

Age-Restricted Housing

The COAH rules indicate that not more than 25 percent of the growth share obligation addressed within a municipality may be met with age-restricted housing (NJAC 5:97-3.10(c)2). Thus, the Township can provide up to 120 affordable units for age-restricted households. The Township has 49 excess age-restricted units that it is carrying forward to the third round. Therefore, the

Township has the option to supply 71 age-restricted units in the Municipally Sponsored and 100 percent Affordable Programs to address the growth share obligation.

Additional Potential Projects

An individual has also expressed an interest in developing a 9 unit affordable assisted living project. As the Township's growth share obligation evolves over the next decade, and the individual is in a position to present firm plans, this project may also benefit the Township's affordable housing inventory.

Nonresidential Development

With regard to nonresidential development, the Township is considering a number of options to address the growth share component created by nonresidential development, which is projected to be the bulk of the Township's growth share. The Township is amending its development fee ordinance to require a 2.5 percent contribution of the equalized assessed value of new development to the affordable housing trust fund. Some nonresidential developers have committed to addressing whatever the prospective affordable housing need entails. For example, Capital Health Systems (CHS) has committed to fulfill its affordable housing requirement, and even though the bulk of the CHS development is exempt from the growth share calculation, CHS has identified a 10 acre site that is suitable for affordable housing. A preliminary site plan for 80 affordable units has been prepared, but the short-term obligation should range between 26 and 52 units. (Table 3, Reference Number 5)

Growth Share Ordinance

The Township has prepared a draft growth share ordinance to address potential residential and nonresidential development. The draft growth share ordinance requires for residential development either construction of the affordable housing obligation on-site or off-site, or a payment in lieu of construction. The payments in lieu of construction will be utilized to fund affordable housing activities within the Township, such as the municipally sponsored construction projects.

Development Fee Ordinance

The Township has prepared an amended development fee ordinance that increases the fee to 1.5% of the equalized assessed value for residential development and 2.5% of the equalized assessed value for nonresidential development. The Township will utilize these funds to contribute to the municipally sponsored and 100% affordable projects.

Implementation Schedule

The following Table 4 identifies the implementation phasing plan for the Hopewell Township compliance plan.

Table 4. Hopewell Township Implementation Phasing Plan

2009-2010	2011-2012	2013-2014	2015-1016	2017-2018
• Municipal property acquisition • Project site planning and permitting • Provider agreements • Non-municipal financing secured • 64 units for excess units from prior round obligation • 15 units at scattered sites • 2 units for accessory apartments • 9 units for Inclusionary residential developments • 70 units for Project Freedom • Compliance assessed	• Project site planning and permitting • Provider agreements • Additional non-municipal financing secured • 2 units for accessory apartments • 6 units for inclusionary residential developments • 70 units at Pennytown • Master Plan reviewed • Housing Plan reviewed • Compliance assessed • CHS COs issued	• Project site planning and permitting • Provider agreements • Additional non-municipal financing secured • 26 units for CHS • 2 units for accessory apartments • 12 units for inclusionary residential development • 40 units for Zaitz tract • Compliance assessed	• 44 units for CHS • 7 units for Burroughs tract • 2 units for accessory apartments • 13 units for Inclusionary residential development • 90 units for Zaitz tract • Compliance assessed	• 50 units for Zaitz tract • 2 units for accessory apartments • 10 units for inclusionary residential development • Compliance assessed • Master Plan reviewed • Housing Plan reviewed
Cumulative Round III Units 160	238	318	474	536

576

Inventory of Municipal Housing Conditions

The primary source of information for the inventory of the Township's housing stock is the 2000 U.S. Census, with data reflecting conditions in 2000.

According to the 2000 Census, the Township had 5,629 housing units, of which 5,498 (98%) were occupied. Table 5 identifies the units in a structure by tenure; as used throughout this Plan Element, "tenure" refers to whether a unit is owner-occupied or renter-occupied. While the Township largely consisted of one-family, detached dwellings (86% of the total, compared to 49% in the County), there were 791 units in attached or multi-family structures. The Township had a relatively low percentage of renter-occupied units, 7%, compared to 33% in Mercer County and 34% in the State.

TABLE 5: Units in Structure by Tenure

Units in Structure	Vacant Units	Occupied Units		
		Total	Owner	Renter
1, detached	99	4,731	4,481	250
1, attached	7	549	528	21
2	13	85	21	64
3 or 4	6	23	0	23
5+	6	102	71	31
Other	0	0	0	0
Mobile home or trailer	0	8	8	0
Total	**131**	**5,498**	**5,109**	**389**

Source: 2000 U.S. Census, Summary Tape File 3 (STF-3) for Township, QT-H10.

Table 6 indicates the year housing units were built by tenure, while Table 7 compares the Township to Mercer County and the State. Approximately 79% of the owner-occupied units in the Township have been built since 1950, and 93% of the units built since 1950 were owner-occupied. Interestingly, the highest rate of renter occupied units was built before 1950.

TABLE 6: Year Structure Built by Tenure

Year Built	Vacant Units	Occupied Units		
		Total	Owner	Renter
1990-2000	13	1,672	1,639	20
1980-1989	0	531	531	0
1970-1979	6	537	514	17
1960-1969	41	864	789	34
1950-1959	22	873	746	105
1940-1949	0	282	226	56
Pre-1940	49	870	664	157

Source: 2000 U.S. Census, STF-3 for Township, QT-H7.

Table 7 compares the year of construction for all dwelling units in the Township to Mercer County and the State. The Township had a much larger percentage of units built between 1990-2000 than did the County or State, and a smaller percentage of units built before 1950, although the Township was very similar to the County and State in the 1950s and 1960s. These differences are highlighted further by the median year of construction.

TABLE 7: Comparison of Year of Construction for Township, County, and State

Year Built	----------%----------		
	Hopewell Township	Mercer County	New Jersey
1990 – 2000	29.7	10.2	10.5
1980 – 1989	9.4	12.4	12.4
1970 – 1979	9.5	12.5	14.0
1960 – 1969	15.3	15.2	15.9
1950 – 1959	15.5	16.6	17.1
1940 – 1949	5.0	9.6	10.1
Pre-1940	15.5	23.5	20.1
Median Year	**1969**	**1960**	**1962**

Source: 2000 U.S. Census, SF-3 for Township, County, and State, DP-4.

The 2000 Census documented household size in occupied housing units by tenure, and the number of bedrooms per unit by tenure; these data are reported in Tables 8 and 9, respectively. Table 4 indicates that renter-occupied units generally housed smaller households, with 68% of renter-occupied units having 2 persons or fewer compared to 50% of owner-occupied units. Table 5 indicates that renter-occupied units generally had fewer bedrooms, with 55% having two bedrooms or fewer, compared to 13% of owner-occupied units.

TABLE 8: Household Size in Occupied Housing Units by Tenure

Household Size	Total Units	Owner-occupied Units	Renter-occupied Units
1 person	878	740	138
2 persons	1960	1834	126
3 persons	978	915	63
4 persons	1105	1069	36
5 persons	442	420	22
6 persons	103	100	3
7+ persons	32	31	1
Total	**5498**	**5109**	**389**

Source: 2000 U.S. Census, SF-3 for Township, H-17.

TABLE 9: Number of Bedrooms per Unit by Tenure

Number of Bedrooms	Total Units	(%)	Vacant Units	Occupied Units		
				Total	Owner	Renter
No bedroom	0	0	0	0	0	0
1 bedroom	216	3.8	13	203	97	106
2 bedrooms	783	13.9	19	764	589	175
3 bedrooms	2126	37.8	49	2077	2013	64
4 bedrooms	2010	35.7	40	1970	1939	31
5+ bedrooms	494	8.8	10	484	471	13

Source: 2000 U.S. Census, SF-3 for Township, QT-H8.

Table 10 compares the Township's average household size for all occupied units, owner-occupied units, and renter-occupied units in 2000 to those of the County and State. The Township's average household size for owner-occupied units was the same as those of the State, and higher than those in Mercer County. The average household size for renter-occupied units was lower than for the State or County.

TABLE 10: Average Household Size for Occupied Units for Township, County, and State

Jurisdiction	All Occupied Units	Owner-occupied units	Renter-occupied units
Hopewell Township	2.77	2.81	2.21
Mercer County	2.62	2.75	2.37
New Jersey	2.68	2.81	2.43

Source: 2000 U.S. Census, SF-3 for Township, County, and State, DP-1.

The distribution of bedrooms per unit, shown in Table 11, indicates that the Township contained fewer small units (no or one bedroom) than the County or State and significantly more large units (four or more bedroom) than either the County or State in 2000. The State and County had similar patterns with two or three bedroom units being the most prevalent.

TABLE 11: Percentage of All Units by Number of Bedrooms

Jurisdiction	None or one	Two or Three	Four or More
Hopewell Township	3.8	51.7	44.5
Mercer County	17.3	57.6	25.1
New Jersey	18.3	59.2	22.6

Source: 2000 U.S. Census, SF-3 for Township, County, and State, QT-H4.

In addition to data concerning occupancy characteristics, the 2000 Census includes a number of indicators, or surrogates, which relate to the condition of the housing stock. These indicators are used by the Council on Affordable Housing (COAH) in calculating a municipality's deteriorated units and indigenous need. In the first Two Rounds of COAH's fair share allocations (1987-1999), COAH used seven indicators to calculate indigenous need: age of dwelling; plumbing facilities; kitchen facilities; persons per room; heating fuel; sewer; and, water. In the Round Three rules, COAH has reduced this to three indicators, which in addition to age of unit (Pre-1940 units in Table 6), are the following, as described in COAH's rules.

Plumbing Facilities — Inadequate plumbing is indicated by either a lack of exclusive use of plumbing or incomplete plumbing facilities.

Kitchen Facilities — Inadequate kitchen facilities are indicated by shared use of a kitchen or the non-presence of a sink with piped water, a stove, or a refrigerator.

Table 12 compares the Township, County, and State for the above indicators of housing quality. The Township has less units with inadequate plumbing and kitchen facilities than the County and State.

TABLE 12: Housing Quality for Township, County, and State

Condition	----------%----------		
	Hopewell Township	Mercer County	New Jersey
Inadequate plumbing [1]	0	.4	.5
Inadequate kitchen [1]	.1	.3	.5

Notes: [1]*The universe for these factors is all housing units.*

Source: *2000 U.S. Census, SF-3 for Township, County, and State, QT-H8 and QT-H4.*

The last factors used to describe the municipal housing stock are the housing values and gross rents for residential units. With regard to values, the 2000 Census offers a summary of housing values, seen in Table 13, which indicate that 72% of all residential properties in the Township were valued at $200,000 or more.

TABLE 13: Value of Residential Units

Value	Number of Units	--------%--------
$0 – 50,000	60	1.3
$50,000 – 99,999	73	1.6
$100,000 – 149,999	227	4.9
$150,000 – 199,999	898	19.4
$200,000 – 299,999	1774	38.4
$300,000 – 499,999	1073	23.2
$500,000 – 999,999	476	10.3
$1,000,000 +	44	1

Source: *2000 U.S. Census, SF-3 for Township, County, and State, DP-4.*

The data in Table 14 indicate that in 2000 virtually all housing units rented for more than $500/month, with the largest percentage, 51%, found between $500 and $999 per month, and 38% of the units renting for $1,000/ month or more.

TABLE 14: Gross Rents for Specified Renter-Occupied Housing Units[1]

Monthly Rent	Number of Units	--------%--------
Under $200	0	0
$200 – 299	0	0
$300 – 499	9	2.6
$500 – 749	99	28.9
$750 – 999	76	22.2
$1,000 – 1,499	76	22.2
$1,500 or more	54	15.7

Note: *Median gross rent for Hopewell Township is $833.*
Source: *2000 U.S. Census, SF-3 for Township, QT-H12.*

The data in Table 15 indicate that in 2000 there were 90 renter households earning less than $35,000 annually. At least 76 of these households were paying more than 30% of their income for rent; a figure of 30% is considered the limit of affordability for rental housing costs. All 8 renter households that make between $10,000 and $19,999 annually were paying more than 35% for gross rent.

TABLE 15: Household Income in 1999 by Gross Rent as a Percentage of Household Income in 1999[1]

Income	Number of Households	Percentage of Household Income					
		0 – 19%	20 – 24%	25 – 29%	30 – 34%	35% +	Not computed
< $10,000	0	0	0	0	0	0	0
$10,000 – 19,999	8	0	0	0	0	8	0
$20,000 – 34,999	82	6	0	8	16	52	0
$35,000 +	253	135	72	8	0	9	29

Note: *[1]The universe for this Table is specified renter-occupied housing units.*
Source: *2000 U.S. Census, SF-3 for Township,QT-H13.*

Analysis of Demographic Characteristics

As with the inventory of the municipal housing stock, the primary source of information for the analysis of the demographic characteristics of the Township's residents is the 2000 U.S. Census. The Census data provide a wealth of information concerning the characteristics of the Township's population in 2000.

The 2000 Census indicates that the Township had 16,105 residents, or 4,515 more residents than in 1990, representing a population increase of approximately 28%. The Township's 28% increase in the 1990's compares to a 7% increase in Mercer County and an 8% increase in New Jersey.

The age distribution of the Township's residents is shown in Table 16. The younger age classes (0-4, 5-19) were relatively evenly split between males and females, while males predominated in the 18-24, 25-44 and 45-64 classes, and females predominated in the 65+ classes. The disproportionate population figures for the 18-24 and 25-44 male categories represented, in large part, the all-male population at the Mercer County Corrections Center, which housed 847 persons in 2000.

TABLE 16: Population by Age and Sex

Age	Total Persons	Male	Female
0-4	1,076	553	523
5 – 19	3,499	1,797	1,702
20 – 34	2,201	1,244	957
35 – 54	5,903	2,960	2,943
55 – 69	2,162	1,085	1,077
70 +	1,264	569	695
Total	**16,105**	**8,208**	**7,897**

Source: 2000 U.S. Census, SF-3 for Township, QT-P1.

Table 17 compares the Township to the County and State for the same age categories. The principal differences among the Township, County, and State occur in the 20-34 and 35-54 age categories. The Township had a lower percentage of 20-34 year olds than the County or State, while the Township's 35-54 year old category was higher than the County and State. The Township also had a lower percentage of those over the age of 70. In the 5 to 19 age category, the school age category, the Township slightly exceeded the County and State.

TABLE 17: Comparison of Age Distribution for Township, County, and State (% of persons)

Age	Hopewell Township	Mercer County	New Jersey
0-4	6.7	6.3	6.7
5 – 19	21.8	21	20.4
20 – 34	13.7	21.1	19.9
35 – 54	36.6	30.6	30.9
55 – 69	13.4	11.9	12.4
70 +	7.8	9.3	9.7
Median	**100**	**100**	**100**

Source: 2000 U.S. Census, SF-3 for Township, County, and State. QT-P1.

Table 18 provides the Census data on household size for the Township, while Table 19 compares household sizes in the Township to those in Mercer County and the State. The Township differed from the County and State in terms of the distribution of household sizes by having fewer households of one person and more households of 4 and 5 persons. The Township also had more households of two persons that the County or State.

TABLE 18: Persons in Household

Household Size	Number of Households
1 person	878
2 persons	1,960
3 persons	978
4 persons	1,105
5 persons	442
6 persons	103
7 or more persons	32

Source: 2000 U.S. Census, STF-3 for Township, QT-P10.

TABLE 19: Comparison of Persons in Household for Township, County, and State (% of households)

Household Size	Hopewell Township	Mercer County	State
1 person	16	25.6	24.5
2 persons	35.6	30.9	30.3
3 persons	17.8	17.2	17.3
4 persons	20.1	15.4	16
5 persons	8	6.9	7.5
6 persons	1.9	2.5	2.7
7 or more persons	.6	1.6	1.7
Persons per household	**2.77**	**2.62**	**2.68**

Source: 2000 U.S. Census, SF-3 for Township, County, and State, QT-P10.

Table 20 presents a detailed breakdown of the Township's population by household type and relationship. There were 4,429 family households in the Township and 1,069 non-family households; a family household includes a householder living with one or more persons related to him or her by birth, marriage, or adoption, while a non-family household includes a householder living alone or with non-relatives only. In terms of the proportion of family and non-family households, the Township had more family households than the County or State (80.6% for the Township, 68.6% for the County, and 70.3% for the State).

TABLE 20: Persons by Household Type and Relationship

	Total
In family Households:	
Householder	4,429
Spouse	3,983
Child	2,230
In Non-Family Households:	
Male householder:	431
Living alone	327
Not living alone	104
Female householder:	638
Living alone	551
Not living alone	87
In group quarters:	
Institutionalized:	
Correctional institution	847
Nursing homes	21
Mental hospitals	0
Juvenile institutions	0
Other institutions	0
Non-institutionalized	13

Source: 2000 U.S. Census, SF-3 for Township, QT-P11 and QT-P12.

Table 21 provides 1999 income data for the Township, County, and State. The Township's per capita and median incomes were higher than those of the State and the County. The definitions used for households and families in Table 21 are similar to those identified in the description of Table 20, so that the households figure in Table 21 includes families.

TABLE 21: 1999 Income for Township, County, and State

Jurisdiction	Per Capita Income	----------Median Income----------	
		Households	Families
Hopewell Township	43,947	93,640	101,579
Mercer County	27,914	56,613	68,494
New Jersey	27,006	55,146	65,370

Source: 2000 U.S. Census, SF-3 for Township, County, and State, DP-3.

Table 22 addresses the lower end of the income spectrum, providing data on poverty levels for persons and families in 2000. The determination of poverty status and the associated income levels is based on the cost of an economy food plan and ranges from an annual income of $9,039 for a one-person household to $29,140 for an eight-person family (three-person family is $14,255). According to the data in Table 22, the Township had proportionately has fewer persons and families qualifying for poverty status than the County or State. However, the percentages in Table 22 translate to 173 persons, but only 38 families, in poverty status. Thus, the non-family households had a much larger share of the population in poverty status.

TABLE 22: Poverty Status for Persons and Families for Township, County, and State (% with 1999 income below poverty)

Jurisdiction	Persons (%)	Families (%)
Hopewell Township	1.1	.9
Mercer County	8.6	5.9
New Jersey	8.5	6.3

Source: 2000 U.S. Census, SF-3 for Township, County, and State, DP-3.

The U.S. Census includes a vast array of additional demographic data that provide interesting insights into an area's population. For example, Table 23 provides a comparison of the percent of persons who moved into their homes between the years 1995-1998; this is a surrogate measure of the mobility/stability of a population. The data indicate that the percentage of year 2000 Township residents residing in the same house as in 1995 exceeded that of the County and State.

TABLE 23: Comparison of Place of Residence for Township, County, and State (1995-1998)

Jurisdiction	Percent living in same house in 1995-1998
Hopewell Township	32
Mercer County	27
New Jersey	28

Source: *2000 U.S. Census, SF-3 for Township, County, and State, QT-H7.*

Table 24 compares the educational attainment for Township, County, and State residents. These data indicate that Township residents exceeded State and County residents in educational attainment. It is interesting to note that among the State's 21 Counties, Mercer County is sixth in the State in college graduates.

TABLE 24: Educational Attainment for Township, County, and State Residents (Persons 25 years and over)

Jurisdiction	Percent (%) high school graduates or higher	Percent (%) with bachelor's degree or higher
Hopewell Township	93	55.8
Mercer County	81.9	34
New Jersey	82.2	29.8

Source: 2000 U.S. Census, SF-3 for Township, County, and State, DP-2.

The 2000 Census also provides data on the means of transportation which people use to reach their place of work. Table 25 compares the Census data for the Township, County, and State relative to driving alone, carpooling, using public transit, and using other means of transportation. The Township had a relatively high percentage of those who drive alone, and a relatively low percentage of workers who carpool or use public transit. Of the 6.8% of workers who resided in the Township and used other means of transportation to reach work, 87% (or 438 workers) worked at home and 4% (or 24 workers) walked to work.

TABLE 25: Means of Transportation to Work for Township, County and State Residents (Workers 16 years old and over)

Jurisdiction	Percent who drive alone	Percent in carpools	Percent using public transit	Percent using other means
Hopewell Township	83.3	5.5	4.4	6.8
Mercer County	73.3	11	6.9	8.8
New Jersey	73	10.6	9.6	6.7

Source: 2000 U.S. Census, SF-3 for Township, County, and State, DP-3.

Projection of Municipal Housing Stock

As part of the mandatory contents of a housing element, the township is required to produce "a projection of the municipality's housing stock, including the probable future construction of low and moderate income housing, for the next six years, taking into account, but not necessarily limited to, construction permits issued, approvals of applications for development and probable residential development of lands." (N.J.S.A. 52:27D-310b.)

DVRPC Population Forecast for 2015

In order to forecast a 2015 population for the Township, it is necessary to consider past history, current zoning, and some expectation as to what might happen in the future; the last element obviously is the most problematic.

The DVRPC, which is the Metropolitan Planning Organization (MPO) for Mercer County, also provided draft population forecasts through the year 2030. The Township analysis of these forecasts, as reflected in the January 31, 2005 letter to the County and detailed below, has been accepted by Mercer County and the DVRPC has accepted the revision.

The following table identifies the number of housing units that were authorized by building permits over the last 30 years.

TABLE 26: History of Building Permit Issuance for Last 30 Years

Decade	Total residential units authorized by building permits	Annual range (units)- Low and high years	Average year (units)
1970 to 1979	590	28 (1975) to 97 (1973)	59
1980 to 1989	525	14 (1981) to 108 (1987)	52.5
1990 to 1999	1,794 *	24 (1991) to 442 (1993)	179.4

* This figure includes 1,293 building permits issued for the various projects at Brandon Farms.

If Brandon Farms is excluded from the above data, which is legitimate since the development resulted from the Township's past affordable housing obligation, the number of building permits issued for the 1990-1999 period is reduced to 501 building permits. Thus, the three decades show a fairly consistent development pattern of 501 to 590 units every ten years, or an average of 539 residential units every ten years. The lowest ten-year period was 1975-1984, when 370 residential units were authorized by building permits. During the ten-year period from 1983-1992, which included both boom and bust times, there were 552 residential units authorized by building permits, which closely approximates the average decade over the last three decades.

We also note that since this time period the Township has gone through a rezoning that has reduced the development potential substantially. Many of the units noted above were developed

under the two-acre zoning that prevailed in the R-200 District, which no longer exists. Given the zoning changes, we can anticipate a slower rate of growth. If the growth period of 1975-1984 prevails in the future, as might be expected considering the rezoning, we would anticipate a total of 370 units for single-family residential growth in the 2005-2015 period, excluding the ongoing construction of a townhouse development and an age-restricted development, which include 116 and 46 units, respectively. Adding those units to the forecast population growth produces the following:

TABLE 27: Forecast Dwelling Unit Growth from 2005-2015

Type of Unit	Number of Units
Single-family detached	370
Townhouse	116
Age-restricted	46
Total	532

This forecast is consistent with the history of building permit issuance in the Township, current approvals and current zoning.

Municipal Employment and Projections

As part of the mandatory contents of a housing element, the Township is to provide "an analysis of the existing and probable future employment characteristics of the community." (N.J.S.A. 52:27D-310d) In COAH's First Round (1987-1993), COAH used employment data, in terms of how many people worked within a municipal border, as an allocation factor for its affordable housing need allocations. In the Second Round (1993-1999) COAH changed this allocation factor to the value of non-residential ratables. Now in the proposed Third Round rules COAH is using the growth in non-residential jobs as a component of the growth share formula for the determination of a municipality's affordable housing obligation.

DVRPC Employment Estimate and Projections

The DVRPC also estimates and projects employment from the years 2000 to 2030. These figures are depicted below (the figure for the year 2000 is an estimate, the other years are projections):

TABLE 28: DVRPC Employment Estimate and Projections

Year	Employment
2000	8,025
2005	9,475
2010	12,125
2015	12,593
2020	13,403
2025	14,339
2030	14,893

These figures were examined relative to known employment in the Township, and the DVRPC employment in 2005 appears accurate. While an independent projection has not been prepared for the year 2015, the DVRPC numbers are reasonable. As to the DVRPC projection for 2030, again an independent projection has not been prepared, but it appears that this number is likely to underestimate the employment as of that date, given the extended approvals that have been granted to the Township's 4 major office/research employers. Thus, Mercer County notified the DVRPC that the employment projections are acceptable.