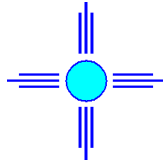


TAMER KHARRUBI
8 COUNTY ROUTE 518
TOWNSHIP OF MONTGOMERY
SOMERSET COUNTY, NJ



STORMWATER OPERATIONS & MAINTENANCE MANUAL

FOR THE
PROPOSED SINGLE FAMILY
RESIDENCE

BLOCK 24001, LOT 37
TOWNSHIP OF MONTGOMERY
SOMERSET COUNTY, NJ

PREPARED BY:
BAYER-RISSE ENGINEERING, INC.
78 ROUTE 173 WEST, SUITE 6
HAMPTON, NJ 08827

THEODORE H. BAYER, NJPE #33806
DECEMBER 1, 2023

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Executive Summary

The applicant, Tamer Kharrubi, is proposing to construct a 3-bedroom single family residence on a site which is currently vacant and minimally developed with a 411-square-foot (sf) concrete pad. Development does not exceed the major development thresholds of one (1) acre of temporary disturbance or 0.25 acres of impervious coverage. The proposed residential development will be located on Block 24001, Lot 37 in the Township of Montgomery, Somerset County, NJ. The 0.272-acre property is located 180 feet to the northeast of the intersection of Somerset County Route 518 (Georgetown and Franklin Turnpike) and Province Line Road. This section of Province Line Road is the boundary between Montgomery Township, Somerset County and Hopewell Township, Mercer County. The Township's zoning designation for this site is R-5 (Single Family Residential).

Bayer-Risse Engineering, Inc. (BRE) has prepared variance plan drawings that present the proposed improvements to the site. The variance plan drawings support this stormwater management report and are included by reference. The variance plan drawings identify the proposed stormwater improvements that will collect and control stormwater runoff from the site. Stormwater runoff generated by the improved areas onsite is directed to a proposed underground detention structure to be located below the proposed porous pavement driveway. Runoff from a drainage area to the rear of the proposed improvements (which will remain unimproved) and a drainage area in front of the proposed improvements (within the Right-of-way of County Route 518) bypass the detention structure. The proposed infiltration structure is comprised of ten (10) 12-inch diameter HDPE pipes of varying lengths enclosed in a gravel envelope. Design soil permeability below the structure is 0.0 inches per hour (in/hr).

The balance of this report describes the operations and maintenance requirements of the system.

General Maintenance Requirements

The Property Owner is the entity responsible for maintaining the stormwater management system.

Property Owner

ATTN: Mr. Tamer Kharrubi

8 County Route 518

Skillman, NJ 08858



The proposed stormwater management system must be inspected once a quarter and after each rainfall event in excess of 1". All grates, pipes, and other orifices will be cleared as necessary to achieve positive flow through the system. All structural components must be inspected for cracking, subsidence, spalling, erosion, and deterioration at least annually.



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The Appendix to this report includes a stormwater maintenance schedule, an inspection checklist, and a maintenance log for record-keeping purposes. These forms will be completed as required and maintained in a logbook for inspection by the Municipal Engineer, Delaware & Raritan Canal Commission, or other designated agent. The Property Owner will establish and maintain an escrow account that will fund routine inspections of the stormwater system by the Municipal Engineer.

Safety of inspection and maintenance personnel is paramount. Non-technical staff may effectively perform many measures and tasks; however, all programs must adequately ensure the safety of anyone carrying out the maintenance tasks. Some tasks dictate a professional be hired to conduct the work. Confined Spaces should never be entered without proper training and permits from occupational and safety regulatory agencies. Additionally, professional judgment should be solicited regularly to ensure that all needs of the facility are met. Though non-professionals can readily perform some of the routine maintenance tasks, problems may arise which are not obvious to an untrained eye.

All maintenance personnel assigned to maintaining the stormwater system covered by this maintenance manual shall review this manual thoroughly. Maintenance personnel must also review the videos under Maintenance of Stormwater Management Measures found at <http://njstormwater.org/training.htm> on an annual basis. The appendix includes a Training Log which must be updated annually for each maintenance personnel to document they are up to date on their training.

The following subsections cover detailed maintenance information for the main components of the stormwater management system.

Access Points

Access to the porous pavement and detention structure is via inspection ports located at various points within the porous pavement. Access to the stormwater outlet pipe is available via the county-maintained drainage inlet to the immediately East of the property within the County Right-of-Way.

Inspection Requirements

- All collection system components must be inspected for clogging and excessive accumulation of debris and/or sediment.
- All structural components including inlets, manholes, conveyance conduits and must be inspected for cracking, deterioration, spalling and subsidence.

Recommended corrective responses for problems discovered during inspections are identified under Corrective Maintenance Tasks below.



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Routine Maintenance Tasks

All basin components expected to receive and/or trap debris and sediment must be inspected for clogging and excessive debris and sediment accumulation at least four (4) times annually as well as after every storm exceeding 1" of rainfall. Such components include inlets, forebay, and outlet structures. Routine maintenance tasks to be conducted:

- Sediment removal should take place when the system's components are thoroughly dry. Disposal of debris, trash, sediment, and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations. The estimated cost of disposal is \$75 - \$100 per year.
- Pervious paved surfaces (driveway) shall be swept and / or hosed to remove accumulated sediment, waste, and other debris.

Corrective Maintenance Measures

The following are potential measures to be taken for solutions to problems which may be encountered in the stormwater management facility; however, these are not all-inclusive and other problems may be encountered. Should problems not specifically identified below be discovered onsite, the responsible party should exercise sound judgment or seek professional help in determining the severity of the problem.

- a. Cracking, spalling, subsidence, or deteriorating structures
Should cracking, spalling, subsidence, or deterioration of any structural elements throughout the stormwater management system be discovered, the damage should be closely monitored. If the condition worsens or the condition is severe or poses a danger, a licensed professional engineer should be consulted for evaluation and repair planning. Some cases may require that a structure be replaced if damage is too extensive for repair.
- b. Clogged structures and conduits
Should clogs be noted in structures or conduits which impede flow, the clog should be removed by hand if accessible and possible. If clogging debris is too large or inaccessible to remove by hand, a vacuum truck and/or other equipment may be used to flush or lift the debris out. Removed debris must be taken to a suitable disposal/recycling site identified below.

Routine Maintenance Equipment and Costs

Routine Maintenance Equipment Needs and Costs:

Routine maintenance equipment for The 8 Kharrubi Residence stormwater management system includes the following.

- Gloves
- Garbage Bags
- Shovel



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- Wheelbarrow
- Vacuum Truck Service

It is important to note that additional equipment may be necessary for non-routine maintenance work. An assessment of equipment needs should be conducted after each year of operation.

Most routine maintenance costs associated with clearing debris from drainage grates and structures is minimal. The most expensive task is the cost for hauling and disposal of accumulated debris and sediment from deep structures such as inlets. It is anticipated that a 2,500 gallon vacuum truck will be used at a charge of approximately \$650 per day including operator. Hauling and disposal rates are variable depending on destination, nature of the waste and quantity; therefore, waste hauling and disposal rates are not included in the above estimated costs. Estimated maintenance costs are for 2023. Subsequent year costs should include an inflation factor of 3 to 4 percent.

Available Disposal/Recycling Sites and Services

The following list of disposal /recycling sites is current as of July 2023, but sites may change over time.

Bridgewater Resources, Inc. (approx. distance to site: 17 miles)
15 Polhemus Lane
Bridgewater, NJ 08807
732-271-2800

Plainfield Transfer Station (approx. distance to site: 22 miles)
95 Rock Avenue
Plainfield, NJ 07063
908-226-2518

Russell Reid Waste Management (approx. distance to site: 29 miles)
2157 NJ-31
Glenn Gardner, NJ 08826
800-356-4468

PCFAWC - Warren County Landfill & Recycling (approx. distance to site: 41 miles)
500 Mt. Pisgah Avenue
Oxford, NJ 07863
908-475-8918



APPENDIX



Stormwater Management Measures

Maintenance Plan & Field Manuals

Development Name: _____

(For linear development, use road name, mile marker, region, or other appropriate title to denote the scopes of this Maintenance Plan)

Address: _____

Block(s) / Lot(s): _____

Township, County: _____

Party Responsible for Maintenance:

Address: _____

Contact Person(s): _____ Phone: _____

Prepared by: _____ Date: _____

This plan is recorded in

Deed Book # _____ Page # _____ with _____ County Clerk on Date _____

Last Revised on MM / DD / YYYY



NOTE

This Maintenance Plan is intended to be editable and adjustable in accordance with the design of stormwater management measures, the site conditions, and the special needs of responsible party. The Engineer should supplement information and best management practice to assist the responsible party to perform maintenance.

Blue text indicates information which may be deleted and/or replaced as necessary.



Inspection Checklist Log

1. The responsible party shall report issues to the local authority and mosquito commission as required by local ordinances and regulatory authorities.
2. The maintenance crew should fill out the checklist in the field manual when performing each inspection/maintenance task.
3. After the maintenance task is performed, the checklist should be filed in the Maintenance Plan and recorded in the log below.

Cycle of Inspection	Stormwater Management Measure No.	Checklist No.	Date(s) of Inspection
(1st Quarter) MM/DD/YYYY	(Basin #1, GS #1, GS#2)		
(2nd Quarter) MM/DD/YYYY			
(3rd Quarter) MM/DD/YYYY			
(4th Quarter) MM/DD/YYYY			
(Unscheduled Inspection; e.g., after 1" rain) MM/DD/YYYY			
(1st Quarter) MM/DD/YYYY			
(2nd Quarter) MM/DD/YYYY			
(3rd Quarter) MM/DD/YYYY			
(4th Quarter) MM/DD/YYYY			
(Unscheduled Inspection; e.g., after 1" rain) MM/DD/YYYY			
(1st Quarter) MM/DD/YYYY			
(2nd Quarter) MM/DD/YYYY			
(3rd Quarter) MM/DD/YYYY			



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Inspection Checklist for Stormwater Management Facilities

Location: _____ Date: _____

Weather: _____

Facility Item	O.K. ¹	Routine ²	Urgent ³	Comments ⁴			
1. Downspouts							
A. Condition of Structure							
B. Trash & Debris							
C. Sediment							
D. Other:							
2. Structures (Inlets, connecting pipes, manholes, detention basin)							
A. Condition of Structure							
B. Trash & Debris							
C. Sediment							
D. Standing Water:							
E. Other							
3. Porous Pavement							
A. Condition of Structure							
B. Trash & Debris							
C. Sediment							
D. Standing Water:							
E. Other							

¹ The item checked is in good condition and the maintenance program is adequate

² The item checked requires attention, but does not present an immediate threat to the facility function or the other facility components.

³ The item checked requires immediate attention to keep the facility operational or to prevent damage to other facility components.

⁴ Provide explanation and details if columns 2 or 3 are checked (Include location of structure where necessary)

Remarks (Refer to Item No., If Applicable)

Inspector _____



Training Plan and Records

As per NJDEP BMP Manual Ch. 8 (February 2004), maintenance training begins with a basic description of the purpose and function of the overall stormwater management measure and its major components. Such understanding will enable maintenance personnel to provide more effective component maintenance and more readily detect maintenance-related problems. Depending on the size, character, location, and components of each stormwater management measure, maintenance personnel may also require training in specialized inspection and maintenance tasks and/or the operation and care of specialized maintenance equipment. Training should also be provided in the need for and use of all required safety equipment and procedures.

I. Training Plan

Types of Training

- Mandatory Stormwater Management Basic Training and Field Manual Usage Training for new maintenance crews
- Occupational Safety Training
- Subcontractor training, if applicable

Content of Training

- **Stormwater Management Basic Training**
 - Purposes and Functions of BMPs

Example Training Material

- NJDEP Stormwater BMP Manual, Chapter Nine: Structural Stormwater Management Measures
 - Chapter 9.1 Bioretention Systems
 - Chapter 9.2 Constructed Wetlands
 - Chapter 9.3 Dry Wells
 - Chapter 9.4 Extended Detention Basins
 - Chapter 9.5 Infiltration Basins
 - Chapter 9.6 Manufactured Treatment Devices
 - Chapter 9.7 Pervious Paving Systems
 - Chapter 9.8 Rooftop Vegetated Cover
 - Chapter 9.9 Sand Filters
 - Chapter 9.10 Vegetative Filter Strips
 - Chapter 9.11 Wet Ponds
 - Chapter 9.12 Grass Swales
 - Chapter 9.13 Subsurface Gravel Wetlands



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More training information is available at NJ Stormwater.org
(<http://www.nj.gov/dep/stormwater/training.htm>)

- Vegetation Care

- Example Training Material

- NJDEP Stormwater BMP Manual, Chapter Seven: Landscaping
(*provides information on vegetation and landscaping for stormwater management measures*)
 - Other

- Field Manual Usage Training

- Example Training Material

- Field Manuals attached to this Maintenance Plan
 - Other

- Equipment and Tools Operation Training

- Example Training Material

- Equipment or tool manufacturer's Operation & Maintenance Manual
 - Other

- Occupational Safety Training

- Example Training Material

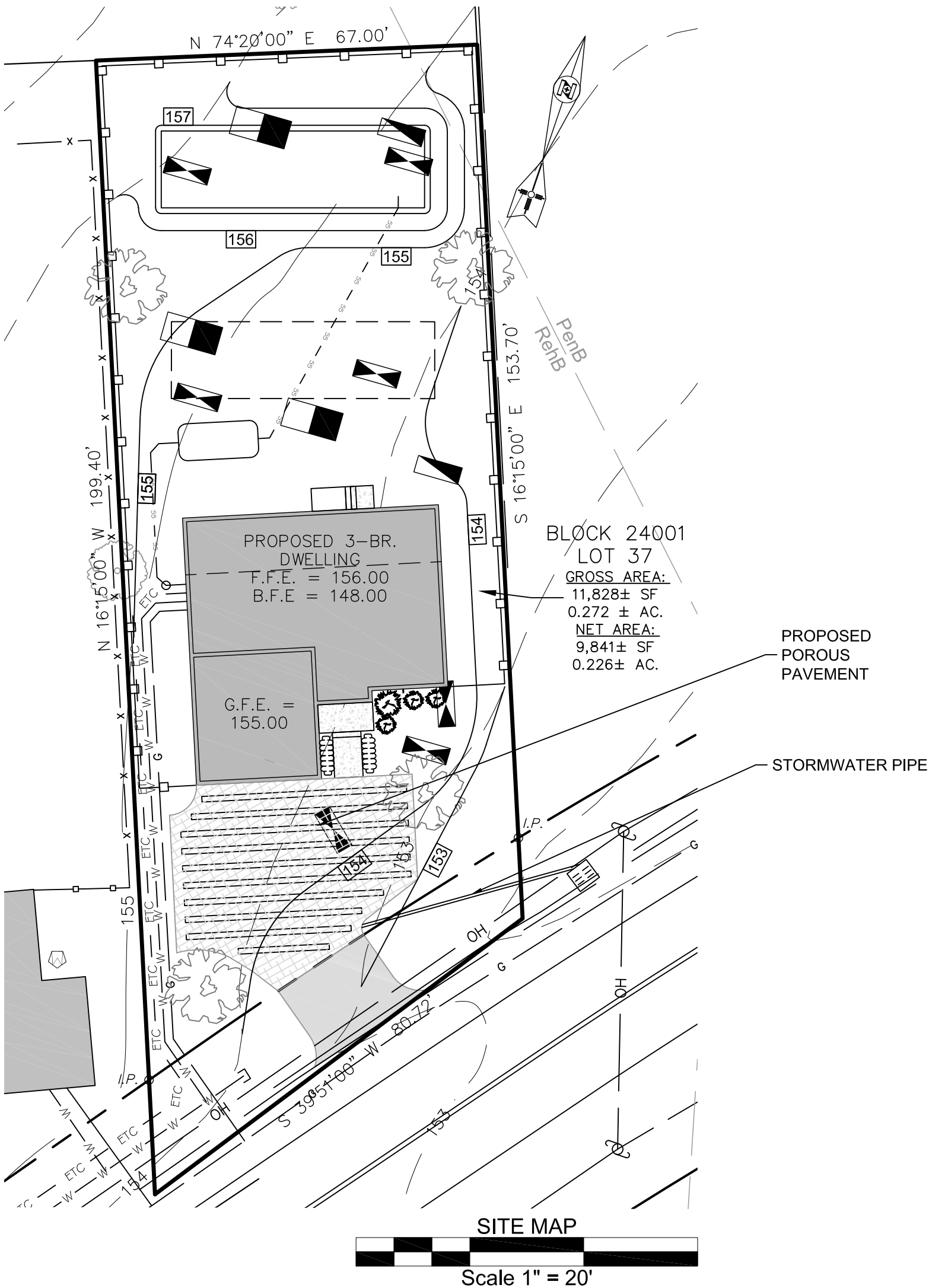
- OSHA Training
 - Equipment or tool manufacturer's Operation & Maintenance Manual
 - Other



II. Training Records

Training attendance sheets should be attached by the responsible party after each training.

Attach training attendance sheets from each training





 BAYER-RISSE ENGINEERING, INC. 78 ROUTE 173 WEST, SUITE 6 HAMPTON, NEW JERSEY 08827 PHONE 908-735-2255 FAX. 908-735-5838 Certificate of Authorization No. 24GA27943900					
		REVISION DESCRIPTION		DATE	APPROVED
 THEODORE H. BAYER, P.E. New Jersey Professional Engineer Licence No. GE33806		DRAINAGE AREA MAP MAINTENANCE PLAN			
		Tamer Kharrubi Block 24001, Lot 37 8 County Route 518 MONTGOMERY TOWNSHIP, SOMERSET COUNTY, NEW JERSEY			
		DRAWN BY: MH	DESIGNED BY: MH	CHECKED BY: THB	DWG NO.: DM-MNT
SCALE: As Noted		DATE: December 1, 2023		SHEET: 1 of 1	
				BRE JOB#: 23-2586	