



DuBois Environmental Consultants, LLC

D1626.001

**Freshwater Wetlands Application
Notice to Neighboring Landowners and Interested Parties**

Date: July 30, 2019

Application submitted by: Manchester (Route 37) DG, LLC/Attn: Steve Camp

Regarding property at:

Block 41.01, Lot 1
Manchester Township, Ocean County, New Jersey

Dear Interested Party:

This letter is to provide you with legal notification that an application for a Transition Area Waiver – Averaging Plan and a Freshwater Wetlands General Permit #6 to fill Non-tributary Wetlands has been submitted to the New Jersey Department of Environmental Protection, Division of Land Use Regulation for review of the permits on the enclosed plan. This request is for the part of the approval of a proposed Dollar General.

The complete permit application package can be reviewed at either the municipal clerk's office or by appointment at the Department's Trenton Office. The Department of Environmental Protection welcomes comments and any information that you may provide concerning the proposed development and site. Please submit your written comments within 15 calendar days of the date of this letter to:

New Jersey Department of Environmental Protection
Division of Land Use Regulation
P.O. Box 420, Code 501-02A
Trenton, New Jersey 08625
Attn: Manchester Township Supervisor

Please feel free to contact the agent below with any questions regarding the application.

Sincerely,

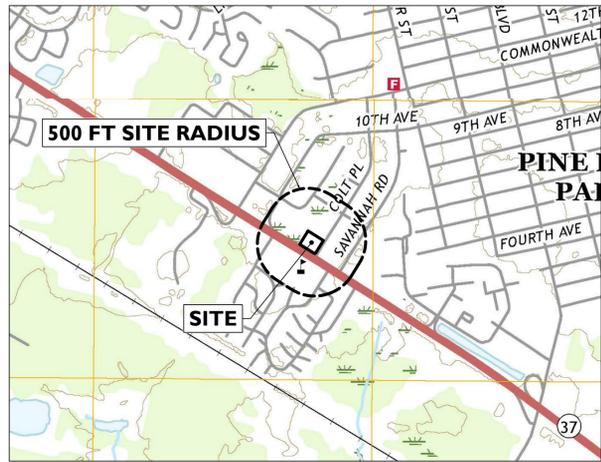
Manchester (Route 37) DG, LLC/
Attn: Steve Camp

Applicants Agent:

Mr. Israel Berrios
DuBois Environmental Consultants
190 North Main Street
Manahawkin, NJ 08050

Doc: 07D626ATTA001

190 North Main Street · Manahawkin · New Jersey · 08050
Phone: 609-488-2857 or 609-488-2859
Website: www.denviro.com



SOURCE: UNITED STATES GEOLOGIC SURVEY MAP, KESWICK GROVE, LAKEHURST, LAKEWOOD & TOMS RIVER QUADRANGLE, 7.5 MINUTE SERIES

KEY MAP

SCALE: 1" = 1000'±

PRELIMINARY AND FINAL MAJOR SITE PLAN

FOR

DOLLAR GENERAL®

PROPOSED RETAIL BUILDING

TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
 1924 NEW JERSEY STATE ROUTE 37
 TOWNSHIP OF MANCHESTER, OCEAN COUNTY, NEW JERSEY



Know what's below
 Call before you dig.

APPROVAL BLOCK	
APPROVED BY THE TOWNSHIP OF MANCHESTER PLANNING BOARD	
BOARD CHAIR	DATE
SECRETARY	DATE
ENGINEER	DATE

APPLICANT
 MANCHESTER (ROUTE 37) DG, LLC
 361 SUMMIT BOULEVARD, SUITE 110
 BIRMINGHAM, ALABAMA 35243
 (205) 281-5053

OWNER
 ANGSTER EDWARD F.
 29 CENTRAL AVENUE
 TOMS RIVER, NEW JERSEY 08757

ATTORNEY
 PRIME LAW
 14000 HORIZON WAY, SUITE 325
 MOUNT LAUREL, NEW JERSEY 08054
 PHONE: (856) 273-8300
 FAX: (856) 273-8383

PER COMMENTS FOR PLANNING BOARD SUBMISSION	PD	CIS	BY	DATE	ISSUE	DESCRIPTION
	2	07/23/2019				
	1	06/20/2019				

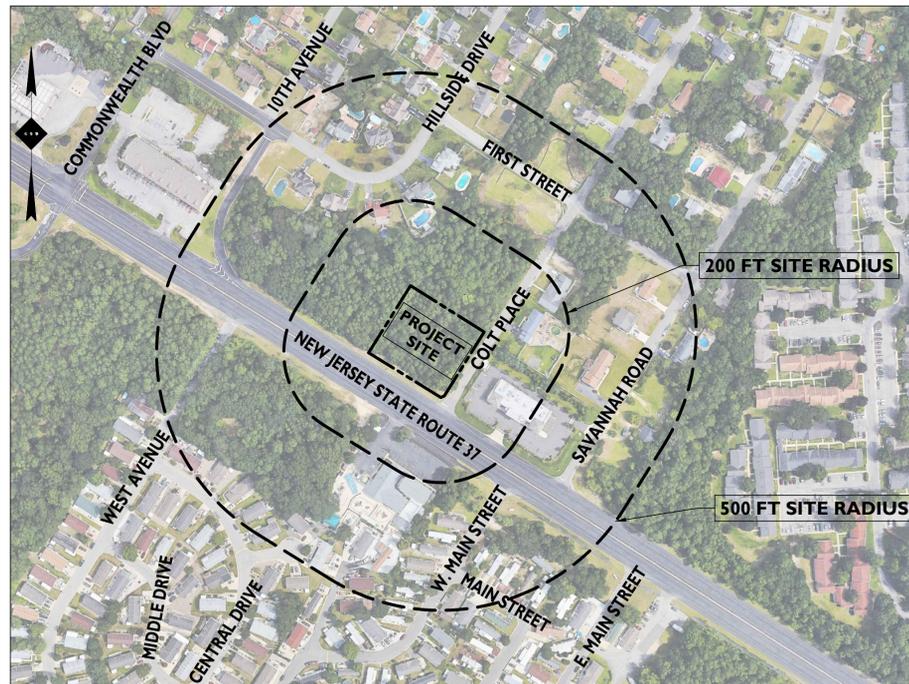
NOT APPROVED FOR CONSTRUCTION

STONEFIELD
 engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
 www.stonefielddeng.com

15 Spring Street, Princeton, NJ 08542
 Phone 609.362.6900

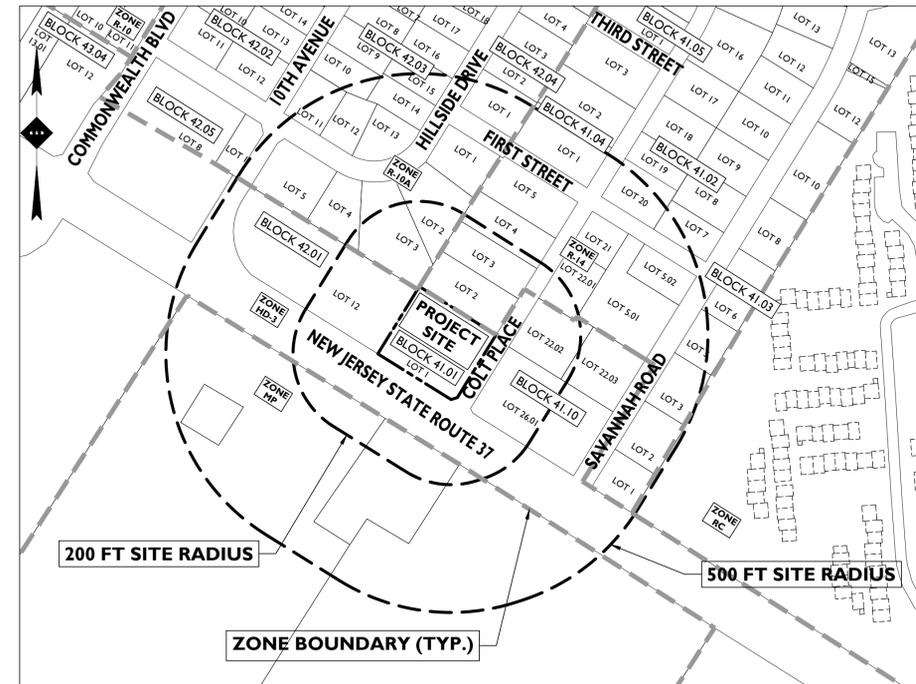
ZONING RELIEF TABLE		
CODE SECTION	REQUIRED	PROPOSED
MINIMUM LOT AREA	3 AC (130,680 SF)	0.87 AC (37,961 SF) (EN)
MINIMUM LOT FRONTAGE	300 FT	200.0 FT (EN)
MINIMUM LOT WIDTH	300 FT	184.6 FT (EN)
MINIMUM IMPROVABLE LOT AREA	40,000 SF	22,615.6 SF (EN) *
MINIMUM FRONT YARD SETBACK	100 FT	8.2 FT (COLT PLACE) (V) 30.0 FT (RT 37) (V)
MINIMUM SITE IMPROVEMENT RATIO	0.18	0.20 (V)
MAXIMUM BUILDING COVERAGE	18% (6,833 SF)	19.8% (7,500 SF) (V)
MAXIMUM LOT COVERAGE	65% (24,674 SF)	68.9% (26,175 SF) (V)
MINIMUM FLOOR AREA	15,000 SF	7,500 SF (V)
§ 245-27 C.(2)(a)	MAX. WALL SIGN AREA = 40% OF SIGNABLE WALL AREA, UP TO 60 SF	149.6 SF (V)
§ 245-27 E.(5)	40% x 21 FT x 30 FT = 252 SF > 40 SF	
§ 245-27 E.(15)(b)	GROUND SIGN SETBACK = 1/2 FRONT YARD SETBACK	3 FT (V)
§ 245-28 B.	1 SPACE PER 200 SF OF FLOOR AREA	30 SPACES (V)
§ 245-28 D.(2)	7,500 SF / 200 SF = 38 SPACES	
§ 245-28 D.(2)	STREET RIGHT-OF-WAY LINE: 20 FT	COLT PLACE: 37.0 FT RT 37: 13.0 FT (V)
§ 245-28 D.(2)	SIDE YARD: 1/2 OF SIDE YARD SETBACK FOR PRINCIPAL STRUCTURES (MIN. 10 FT)	4.2 FT (V)
§ 245-28 D.(2)	1/2 x 50 FT = 12.5 FT	
§ 245-28 G.(4)	REAR YARD: 1/2 OF REAR YARD SETBACK FOR PRINCIPAL STRUCTURES (MIN. 10 FT)	22.8 FT (V)
§ 245-28 G.(4)	1/2 x 50 FT = 25 FT	
§ 245-28 G.(9)	NON-RESIDENTIAL DRIVEWAYS MUST BE 20 FT FROM SIDE PROPERTY LINE	0.0 FT (V)
§ 245-28 G.(9)	MAX. LENGTH OF CURB DEPRESSION FOR NON-RESIDENTIAL DRIVEWAY: DRIVEWAY WIDTH PLUS 10 FT, MAX. 35 FT	78.6 FT (V) 85.8 FT (V)
§ 245-28 G.(11)	ALONG RT 37: 30 FT + 10 FT = 40 FT > 35 FT ALONG COLT PLACE: 35 FT + 10 FT = 45 FT > 35 FT	
§ 245-29 B.1	NO DRIVEWAYS WITHIN 200 FT OF PUBLIC STREET INTERSECTION	ALONG RT 37: 111.6 FT (V) ALONG COLT PLACE: 112.1 FT (V)
§ 245-29 B.1	WHENEVER THE PROPERTY LINE OF AN OCCUPIED LOT IN THE H-D ZONE ABUTS A RESIDENTIAL ZONE, A 50 FT BUFFER AREA SHALL BE ESTABLISHED. WHENEVER EXISTING VEGETATION OF SUFFICIENT DENSITY AND VIABILITY EXISTS, AS DETERMINED BY THE PLANNING BOARD ENGINEER, THE BUFFER AREA REQUIREMENTS CAN BE SUPPLEMENTED WITH NEW INFILL PLANTINGS.	DOES NOT COMPLY (V)
§ 245-29 B.2.a	ALONG LOT LINES OTHER THAN STREET LINES WITHIN SAID BUFFER AREA, A SOLID AND CONTIGUOUS SCREEN SHALL BE PLANTED AND MAINTAINED. SAID LANDSCAPING SHALL CONSIST OF MASSES OF EVERGREENS AND DECIDUOUS TREES AND SHRUBS OF SUCH SPECIES AND SIZE AS WILL PRODUCE, WITHIN TWO GROWING SEASONS, A SCREEN OF AT LEAST EIGHT FEET IN HEIGHT. SUCH SCREEN SHALL CONSIST OF A MINIMUM OF DOUBLE ROW OF STAGGERED PLANT MATERIALS PLANTED 10 FEET ON CENTER AND STAGGERED OR PARALLEL, SERPENTINE, OR BROKEN ROWS AS APPROVED BY THE MUNICIPAL AGENCY.	DOES NOT COMPLY (V)
(V)	VARIANCE	
(EN)	EXISTING NON-COMFORMITY	
*	IMPROVEMENT WITHIN WETLAND TRANSITION AREA PENDING NJDEP PERMIT	



SOURCE: GOOGLE EARTH PRO, IMAGERY RETRIEVED 04/27/2018

AERIAL MAP

SCALE: 1" = 200'±



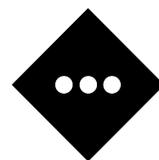
SOURCE: TOWNSHIP OF MANCHESTER, OCEAN COUNTY, NJ TAX MAP SHEET 8.01, TOWNSHIP OF MANCHESTER ZONING MAP.

TAX MAP

SCALE: 1" = 200'±

TOWNSHIP OF MANCHESTER 200' PROPERTY OWNERS LIST			
BLOCK	LOT	OWNER	OWNER'S ADDRESS
41.01	2	EDWARD F ANGSTER	29 CENTRAL AVE TOMS RIVER, NJ 08757
41.01	3	KAREN MANDEL	PO BOX 109 LAKEWOOD, NJ 08701
41.01	4.01	KRUPNICK FAMILY TRUST	PO BOX 109 LAKEWOOD, NJ 08701
41.01	4.02	KRUPNICK FAMILY TRUST	PO BOX 109 LAKEWOOD, NJ 08701
41.10	22.01	SERV PROPERTIES & MANAGEMENT INC	20 SCOTCH RD EWING, NJ 08628
41.10	22.02	ROSS MARTIN & LEANNA GUIDO	64 COLT PL MANCHESTER, NJ 08759
41.10	22.03	R A WARREN, JR & D A GRADONE, SR	51 SAVANNAH RD TOMS RIVER, NJ 08757
41.10	26.01	BLOCK 4110 LLC	PO BOX 1059 ISLAND HEIGHTS, NJ 08732
41.10	5.01	JEAN FELIPE	95 SAVANNAH RD TOMS RIVER, NJ 08757
42.01	12	KRUPNICK, FELDMAN & IZBIKY ET ALS	PO BOX 109 LAKEWOOD, NJ 08701
42.01	2	JEFFREY & JEANA TAFROW	98 HILLSIDE DR MANCHESTER, NJ 08759
42.01	3	MLB 2 LLC % RIVKA SENDER	4706 18TH AVE BROOKLYN, NY 11204
42.01	4	GERALD T & DANIELLE C PIATNOCZIKA	74 HILLSIDE DR MANCHESTER, NJ 08759
44	10	PINE ACRES LLC	1881 HWY 37 TOMS RIVER, NJ 08757
44	11	BAY RUM LLC C/O HILLTOP NURSERY SCL	1917 HWY 37 TOMS RIVER, NJ 08757
44	15.02	PINE ACRES MOBILE HOME PARK	157 70TH ST AVALON, NJ 08202

PLANS PREPARED BY:



STONEFIELD
 engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI

www.stonefielddeng.com

15 Spring Street, Princeton, NJ 08542
 Phone 609.362.6900

PLAN REFERENCE MATERIALS:

- THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
 - SURVEY PREPARED BY VALLEY LAND SERVICES, LLC, DATED NOVEMBER 28, 2018
 - ARCHITECTURAL PLANS PREPARED BY LARSON DESIGN GROUP, DATED APRIL 15, 2019.
 - STORMWATER INVESTIGATION REPORT PREPARED BY J2M ENGINEERING, DATED MAY 1, 2019.
 - GEOTECHNICAL REPORT PREPARED BY PROFESSIONAL SERVICE INDUSTRIES, INC, DATED DECEMBER 12, 2018.
 - APPROVED LETTER OF INTERPRETATION PREPARED BY THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (ACTIVITY NUMBER: FWW190001), DATED MARCH 21, 2019.
 - AERIAL MAP OBTAINED FROM GOOGLE EARTH PRO
 - LOCATION MAP OBTAINED FROM USGS KESWICK GROVE, LAKEHURST, LAKEWOOD, AND TOMS RIVER QUADRANGLE 7.5 MIN SERIES
- ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

SHEET INDEX

DRAWING TITLE	SHEET #
COVER SHEET	C-1
EXISTING CONDITIONS PLAN	C-2
DEMOLITION PLAN	C-3
SITE PLAN	C-4
GRADING PLAN	C-5
DRAINAGE PLAN	C-6
UTILITY PLAN	C-7
LIGHTING PLAN	C-8 - C-9
SOIL EROSION & SEDIMENT CONTROL PLAN	C-10 - C-11
LANDSCAPING PLAN	C-12
LANDSCAPING DETAILS	C-13
CONSTRUCTION DETAILS	C-14 - C-20
TRUCK TURNING PLAN	C-21

PRELIMINARY AND FINAL MAJOR SITE PLAN
PROPOSED RETAIL STORE



TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
 1924 NEW JERSEY STATE ROUTE 37
 TOWNSHIP OF MANCHESTER
 OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
 NEW JERSEY LICENSE No. 47290
 LICENSED PROFESSIONAL ENGINEER



SCALE: AS SHOWN PROJECT ID: Z-18070

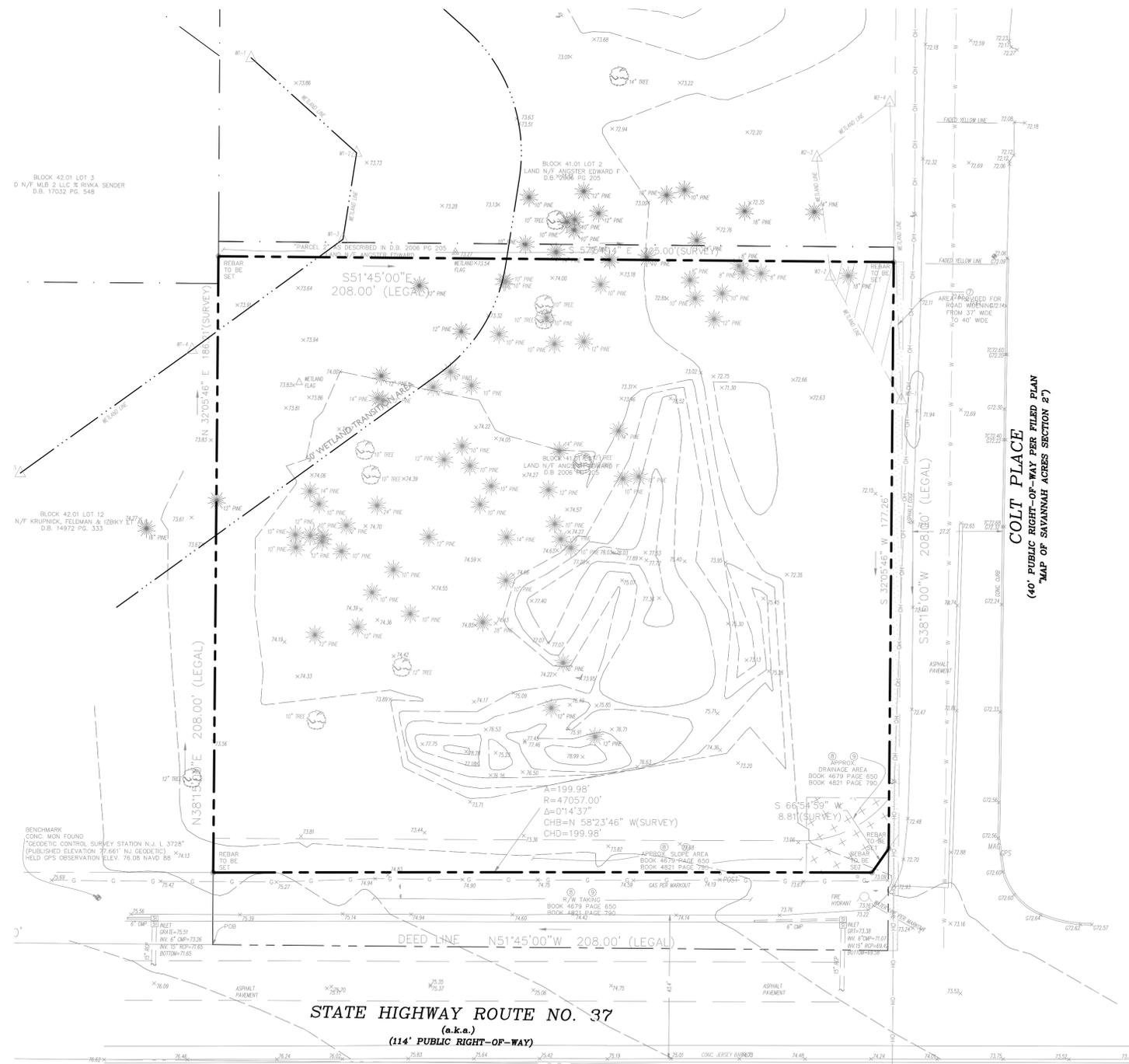
TITLE:

COVER SHEET

DRAWING:

C-1

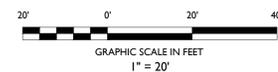
Z:\PROJECTS\2024\182-180\DOUGLAS GENERAL - 21 CENTRAL AVENUE STORE LEVEL INFO\DOUGLAS GENERAL\182-180.DWG



SYMBOLS

- | | | |
|---------------------------|--------------------------|----------------------------|
| ● MONUMENT FOUND | ○ POWERPOLE | ○ SEWER MANHOLE |
| ○ MONUMENT SET | ○ GUY WIRE | ○ CLEAN OUT |
| ○ P.K. NAIL FOUND | ○ LIGHT POLE | ○ STORM DRAIN MANHOLE |
| ○ P.K. NAIL SET | ○ STREET LIGHT POLE | ○ STORM INLET |
| ○ FND X MARK | ○ ELEC. TRANSFORMER | ○ CURB INLET |
| ○ SET X MARK | ○ AIR CONDITIONER | ○ PAY PHONE |
| ▲ R.R. SPIKE FOUND | ○ BURIED ELECTRIC | ○ TELEPHONE BOX |
| ▲ R.R. SPIKE SET | ○ OVERHEAD ELECTRIC | ○ TELEPHONE MANHOLE |
| ▲ BENCHMARK | ○ ELEC. MANHOLE | ○ TELEPHONE POLE |
| ○ RECORD DATA | ○ ELECTRIC METER | ○ TELEPHONE LINE |
| (M) MEASURED DATA | ○ WATER LINE | ○ TELEPHONE MARKER |
| (S) SURVEYED DATA | ○ WATER MANHOLE | ○ CABLE TELEVISION |
| R/W RIGHT OF WAY | ○ WATER VALVE | ○ CABLE BOX |
| BSL BACK SET LINE | ○ WATER METER | ○ UNDERGROUND CABLE MARKER |
| RCF REINFORCED CONC PIPE | ○ HYDRANT | ○ UNDERGROUND CABLE MARKER |
| CMF CORRUGATED METAL PIPE | ○ BACK FLOW PREVENTOR | ○ GAS VALVE |
| PMV PLASTIC PIPE | ○ GAS METER | ○ TRAFFIC SIGNAL |
| MT METAL | ○ UNDERGROUND GAS MARKER | ○ TRAFFIC SIGNAL BOX |
| AG ABOVE GROUND LEVEL | ○ GAS MANHOLE | ○ TRAFFIC SIGNAL BOX |
| LANDSCAPING | ○ GAS LINE | ○ STOP SIGN |
| TREE | ○ BOLLARD | ○ SIGN |
| ○ METAL TANK COVER | ○ BORE HOLE | |
| | ○ MONITORING WELL | |
| | ○ MAIL BOX | |
| | ○ UNKNOWN MANHOLE | |
| | ○ SQUARE METAL LID | |
| | ○ FUEL TANK LID | |
| | ○ FLAG POLE | |

SURVEY NOTE:
 THE SURVEY LISTED WITHIN THE PLAN REFERENCES ON THE COVER SHEET SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THE SURVEY AND ASSOCIATED DOCUMENTS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF THE SURVEY AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.



NOT APPROVED FOR CONSTRUCTION

STONEFIELD
 engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
 www.stonefielddesign.com
 15 Spring Street, Princeton, NJ 08542
 Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN
PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #6.01, BLOCK 41.01, LOT 1
 1924 NEW JERSEY STATE ROUTE 37
 TOWNSHIP OF MANCHESTER
 OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
 NEW JERSEY LICENSE No. 47290
 LICENSED PROFESSIONAL ENGINEER

STONEFIELD
 engineering & design

SCALE: 1" = 20' PROJECT ID: Z-18070

TITLE:
EXISTING CONDITIONS PLAN

DRAWING:

C-2

DATE	BY	DESCRIPTION
07/23/2019	PD	PER COMMENTS
06/20/2019	CIS	FOR PLANNING BOARD SUBMISSION
	ISSUE	

DEMOLITION NOTES

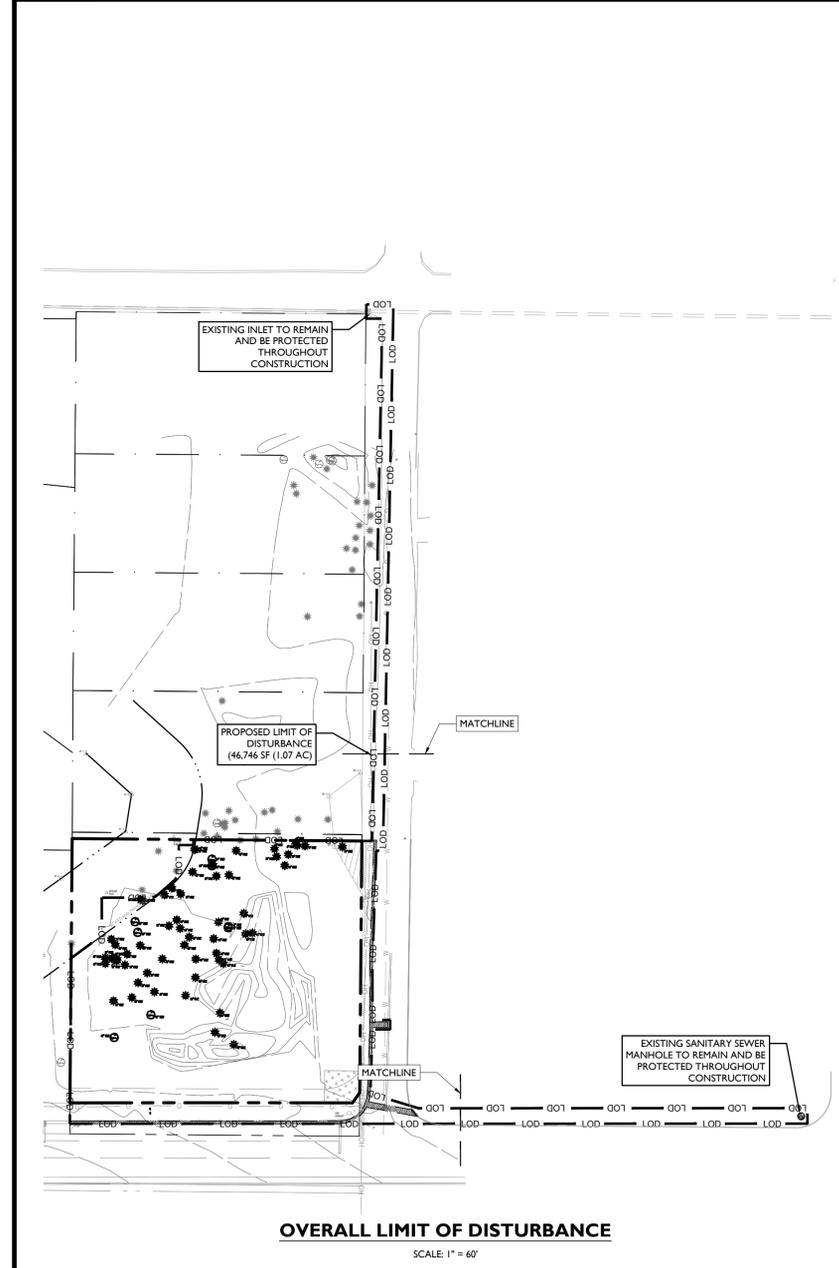
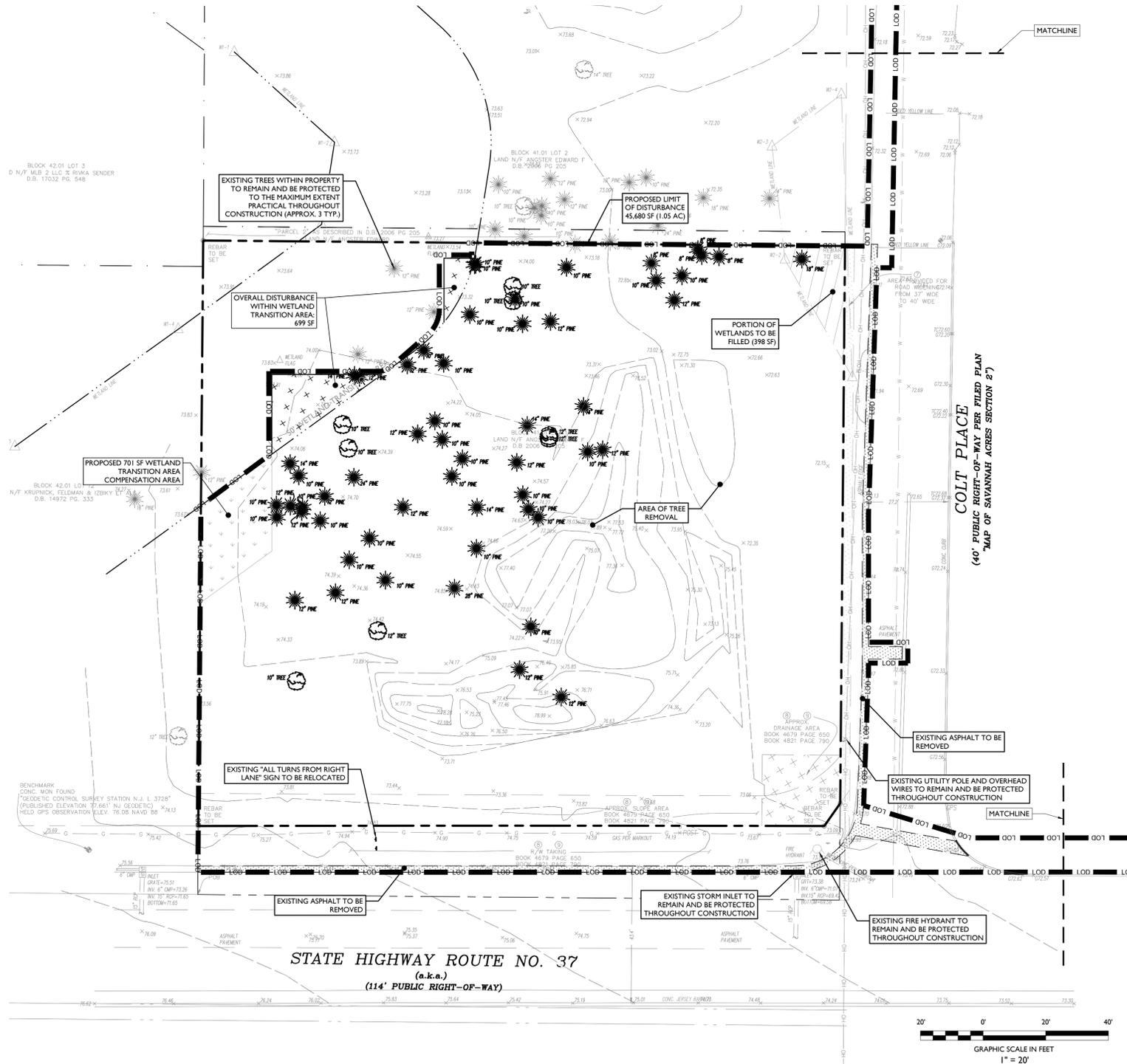
1. THE WORK REFLECTED ON THE DEMOLITION PLAN IS TO PROVIDE GENERAL INFORMATION TOWARDS THE EXISTING ITEMS TO BE DEMOLISHED AND/OR REMOVED. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THE ENTIRE PLAN SET AND ASSOCIATED REPORTS/REFERENCE DOCUMENTS INCLUDING ALL DEMOLITION ACTIVITIES AND INCIDENTAL TASKS NECESSARY TO COMPLETE THE SITE IMPROVEMENTS.
2. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF DEMOLITION ACTIVITIES.
3. EXPLOSIVES SHALL NOT BE USED UNLESS WRITTEN CONSENT FROM BOTH THE OWNER AND ANY APPLICABLE GOVERNING AGENCY IS OBTAINED. BEFORE THE START OF ANY EXPLOSIVE PROGRAM, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL SEISMIC TESTING AS REQUIRED AND ANY DAMAGES AS THE RESULT OF SAID DEMOLITION PRACTICES.
4. ALL DEMOLITION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL CODES. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL UTILITIES ARE DISCONNECTED IN ACCORDANCE WITH THE UTILITY AUTHORITIES REQUIREMENTS PRIOR TO STARTING THE DEMOLITION OF ANY STRUCTURE. ALL EXCAVATIONS ASSOCIATED WITH DEMOLISHED STRUCTURES OR REMOVED TANKS SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO SUPPORT SITE AND BUILDING IMPROVEMENTS. A GEOTECHNICAL ENGINEER SHOULD BE PRESENT DURING BACKFILLING ACTIVITIES TO OBSERVE AND CERTIFY THAT BACKFILL MATERIAL WAS COMPACTED TO A SUITABLE CONDITION.
5. DEMOLISHED DEBRIS SHALL NOT BE BURIED ON SITE. ALL WASTE/DEBRIS GENERATED FROM DEMOLITION ACTIVITIES SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN ALL RECORDS OF THE DISPOSAL TO DEMONSTRATE COMPLIANCE WITH THE ABOVE REGULATIONS.

ALL SITE FEATURES WITHIN THE LIMIT OF DISTURBANCE INDICATED ON THIS PLAN ARE TO BE REMOVED / DEMOLISHED UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IF SIGNIFICANT DISCREPANCIES ARE DISCERNED BETWEEN THIS PLAN AND FIELD CONDITIONS



Know what's below
Call before you dig.

SYMBOL	DESCRIPTION
---	FEATURE TO BE REMOVED / DEMOLISHED
---	LIMIT OF DISTURBANCE



NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design
Rutherford, NJ • Princeton, NJ • Long Island City, NY • Royal Oak, MI
www.stonefielddesign.com
15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN
PROPOSED RETAIL STORE
DOLLAR GENERAL
TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 4730
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

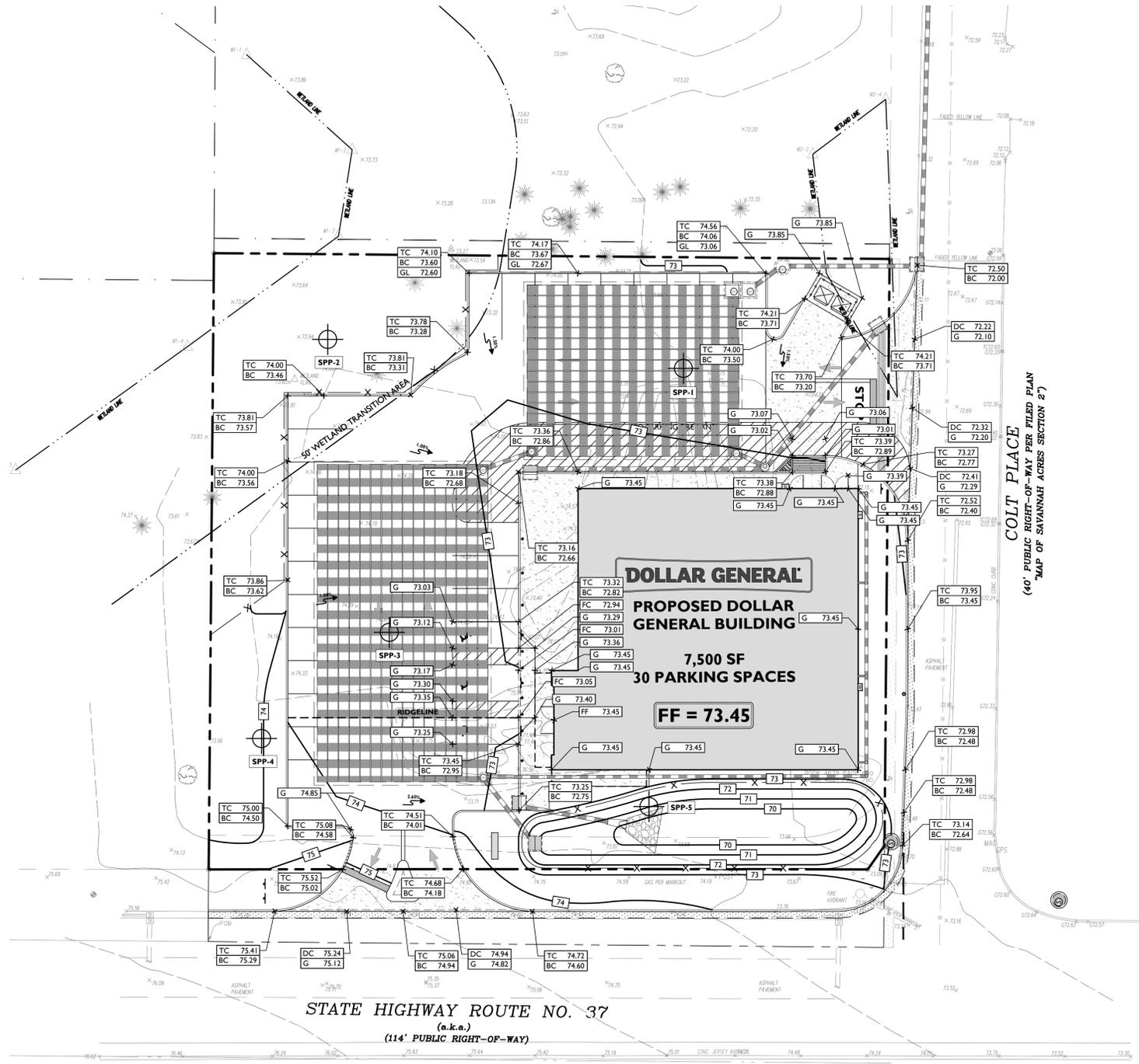
SCALE: 1" = 20' PROJECT ID: Z-18070

TITLE:
DEMOLITION PLAN

DRAWING:
C-3

Z:\PROJECTS\2018\1801\DOUGLAS GENERAL - 71 CENTRAL AVENUE, TOPS LEVEL, INFO\CDR\KUTLUPURU\01.DWG

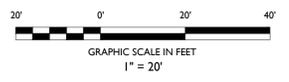
Z:\PROJECTS\2021\1870 DOLLAR GENERAL - 21 CENTRAL AVENUE TOPS LEVEL INFO\CAD\DWG\GRADING



SYMBOL	DESCRIPTION
---	PROPERTY LINE
100	PROPOSED GRADING CONTOUR
---	PROPOSED GRADING RIDGELINE
←	PROPOSED DIRECTION OF DRAINAGE FLOW
X G 100.00	PROPOSED GRADE SPOT SHOT
X TC 100.50 BC 100.00	PROPOSED TOP OF CURB / BOTTOM OF CURB SPOT SHOT
X FC 100.00	PROPOSED FLUSH CURB SPOT SHOT
X DC 100.12 BC 100.00	PROPOSED DEPRESSED CURB / BOTTOM OF CURB SPOT SHOT
X TW 102.00 BV 100.00	PROPOSED TOP OF WALL / BOTTOM OF WALL SPOT SHOT
X TC 100.00 BC 99.00 GL 98.00	PROPOSED TOP OF CURB / BOTTOM CURB / GUTTER LOW
⊙	PROPOSED SOIL TEST PIT LOCATIONS

- GRADING NOTES**
- ALL SOIL AND MATERIAL REMOVED FROM THE SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. ANY GROUNDWATER DE-WATERING PRACTICES SHALL BE PERFORMED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL. THE CONTRACTOR IS REQUIRED TO OBTAIN ALL NECESSARY PERMITS FOR THE DISCHARGE OF DE-WATERED GROUNDWATER. ALL SOIL IMPORTED TO THE SITE SHALL BE CERTIFIED CLEAN FILL. CONTRACTOR SHALL MAINTAIN RECORDS OF ALL FILL MATERIALS BROUGHT TO THE SITE.
 - THE CONTRACTOR IS REQUIRED TO PROVIDE TEMPORARY AND/OR PERMANENT SHORING WHERE REQUIRED DURING EXCAVATION ACTIVITIES, INCLUDING BUT NOT LIMITED TO UTILITY TRENCHES, TO ENSURE THE STRUCTURAL INTEGRITY OF NEARBY STRUCTURES AND STABILITY OF THE SURROUNDING SOILS.
 - PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 4 INCHES TO 7 INCHES ABOVE EXISTING GRADES UNLESS OTHERWISE NOTED. THE CONTRACTOR WILL SUPPLY ALL STAKEOUT CURB GRADE SHEETS TO STONEFIELD ENGINEERING & DESIGN, LLC. FOR REVIEW AND APPROVAL PRIOR TO POURING CURBS.
 - THE CONTRACTOR IS RESPONSIBLE TO SET ALL PROPOSED UTILITY COVERS AND RESET ALL EXISTING UTILITY COVERS WITHIN THE PROJECT LIMITS TO PROPOSED GRADE IN ACCORDANCE WITH ANY APPLICABLE MUNICIPAL, COUNTY, STATE AND/OR UTILITY AUTHORITY REGULATIONS.
 - MINIMUM SLOPE REQUIREMENTS TO PREVENT PONDING SHALL BE AS FOLLOWS:
 - CURB GUTTER: 0.50%
 - CONCRETE SURFACES: 1.00%
 - ASPHALT SURFACES: 1.00%
 - A MINIMUM SLOPE OF 1.00% SHALL BE PROVIDED AWAY FROM ALL BUILDINGS. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE FROM THE BUILDING IS ACHIEVED AND SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IF THIS CONDITION CANNOT BE MET.
 - FOR PROJECTS WHERE BASEMENTS ARE PROPOSED, THE DEVELOPER IS RESPONSIBLE TO DETERMINE THE DEPTH TO GROUNDWATER AT THE LOCATION OF THE PROPOSED STRUCTURE. IF GROUNDWATER IS ENCOUNTERED WITHIN THE BASEMENT AREA, SPECIAL CONSTRUCTION METHODS SHALL BE UTILIZED AND REVIEWED/APPROVED BY THE CONSTRUCTION CODE OFFICIAL. IF SUMP PUMPS ARE UTILIZED, ALL DISCHARGES SHALL BE CONNECTED DIRECTLY TO THE PUBLIC STORM SEWER SYSTEM WITH APPROVAL FROM THE GOVERNING STORM SEWER SYSTEM AUTHORITY.

- ADA NOTES**
- THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION WITHIN THE ADA PARKING SPACES AND ACCESS AISLES.
 - THE CONTRACTOR SHALL PROVIDE COMPLIANT SIGNAGE AT ALL ADA PARKING SPACES IN ACCORDANCE WITH STATE GUIDELINES.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 5.00% RUNNING SLOPE AND A MAXIMUM OF 2.00% CROSS SLOPE ALONG WALKWAYS WITHIN THE ACCESSIBLE PATH OF TRAVEL (SEE THE SITE PLAN FOR THE LOCATION OF THE ACCESSIBLE PATH). THE CONTRACTOR IS RESPONSIBLE TO ENSURE THE ACCESSIBLE PATH OF TRAVEL IS 36 INCHES WIDE OR GREATER UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION AT ALL LANDINGS. LANDINGS INCLUDE, BUT ARE NOT LIMITED TO, THE TOP AND BOTTOM OF AN ACCESSIBLE RAMP. AT ACCESSIBLE BUILDING ENTRANCES AT AN AREA IN FRONT OF A WALK-UP PATH AND AT TURNING SPACES ALONG THE ACCESSIBLE PATH OF TRAVEL, THE LANDING AREA SHALL HAVE A MINIMUM CLEAR AREA OF 60 INCHES BY 60 INCHES UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
 - THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 8.33% RUNNING SLOPE AND A MAXIMUM 2.00% CROSS SLOPE ON ANY CURB RAMPS ALONG THE ACCESSIBLE PATH OF TRAVEL. WHERE PROVIDED, CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 10.00% IF A LANDING AREA IS PROVIDED AT THE TOP OF THE RAMP. FOR ALTERATIONS, A CURB RAMP FLARE SHALL NOT HAVE A SLOPE GREATER THAN 8.33% IF A LANDING AREA IS NOT PROVIDED AT THE TOP OF THE RAMP. CURB RAMPS SHALL NOT RISE MORE THAN 6 INCHES IN ELEVATION WITHOUT A HANDRAIL. THE CLEAR WIDTH OF A CURB RAMP SHALL BE NO LESS THAN 36 INCHES WIDE.
 - ACCESSIBLE RAMPS WITH A RISE GREATER THAN 6 INCHES SHALL CONTAIN COMPLIANT HANDRAILS ON BOTH SIDES OF THE RAMP AND SHALL NOT RISE MORE THAN 30" IN ELEVATION WITHOUT A LANDING AREA IN BETWEEN RAMP RUNS. LANDING AREAS SHALL ALSO BE PROVIDED AT THE TOP AND BOTTOM OF THE RAMP.
 - A SLIP RESISTANT SURFACE SHALL BE CONSTRUCTED ALONG THE ACCESSIBLE PATH AND WITHIN ADA PARKING AREAS.
 - THE CONTRACTOR SHALL ENSURE A MAXIMUM OF 1/4 INCHES VERTICAL CHANGE IN LEVEL ALONG THE ACCESSIBLE PATH. WHERE A CHANGE IN LEVEL BETWEEN 1/4 INCHES AND 1/2 INCHES EXISTS, CONTRACTOR SHALL ENSURE THAT THE TOP 1/4 INCH CHANGE IN LEVEL IS BEVELED WITH A SLOPE NOT STEEPER THAN 1 UNIT VERTICAL AND 2 UNITS HORIZONTAL (2:1 SLOPE).
 - THE CONTRACTOR SHALL ENSURE THAT ANY OPENINGS (GAPS OR HORIZONTAL SEPARATION) ALONG THE ACCESSIBLE PATH SHALL NOT ALLOW PASSAGE OF A SPHERE GREATER THAN 1/2 INCH.



PER COMMENTS	PD	BY
FOR PLANNING BOARD SUBMISSION <td>CIS <td></td> </td>	CIS <td></td>	

ISSUE	DATE	BY
2	07/23/2019	
1	06/20/2019	

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #6.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

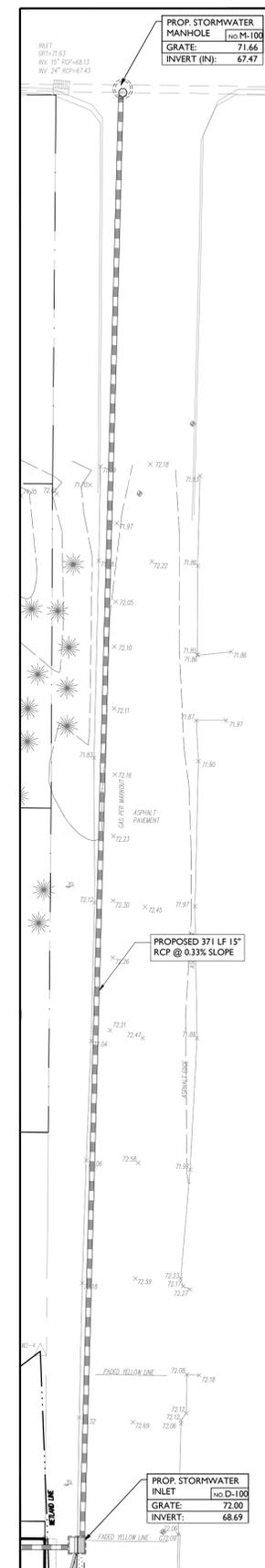
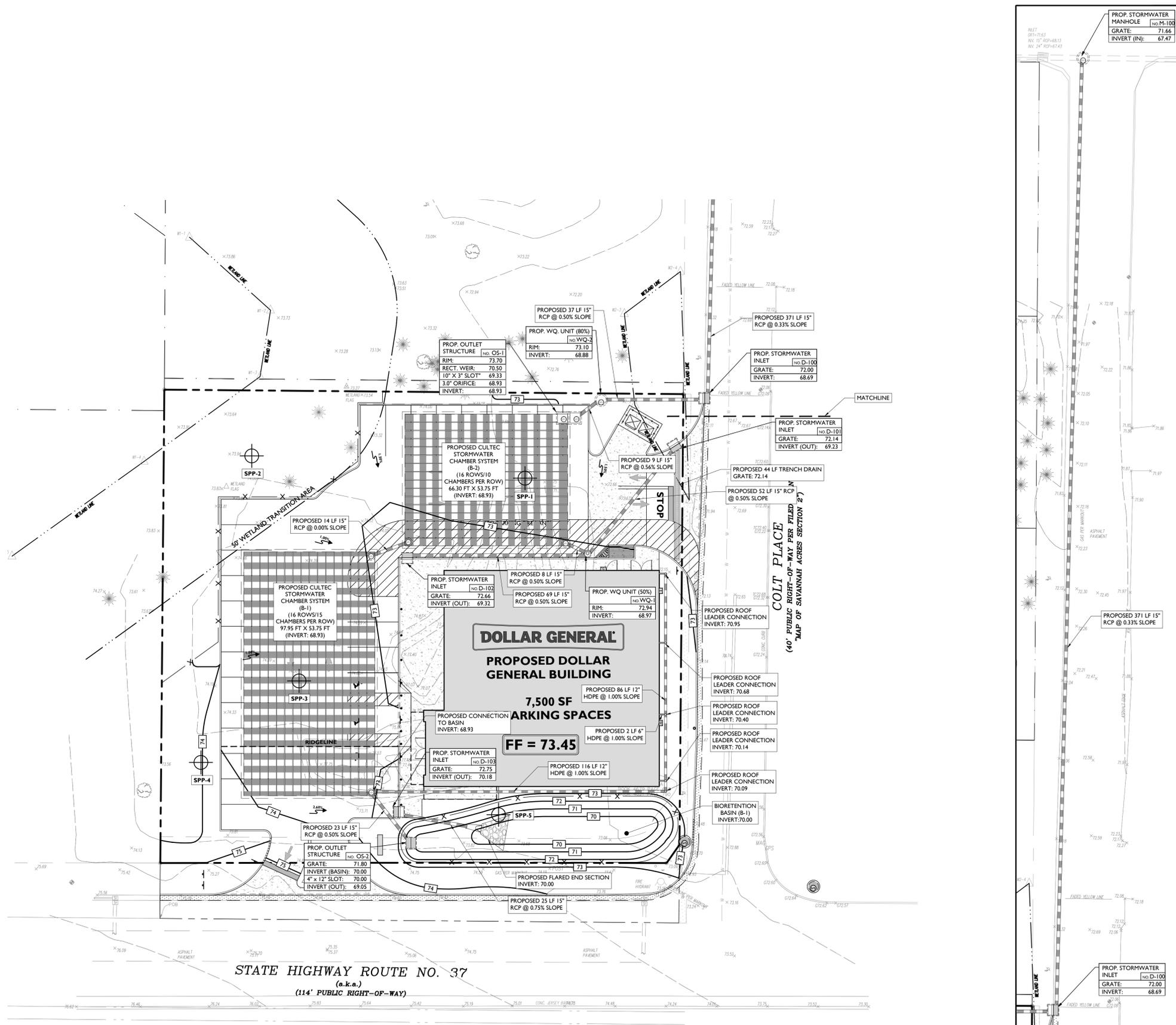
STONEFIELD
engineering & design

SCALE: 1" = 20' PROJECT ID: Z-18070

TITLE:
GRADING PLAN

DRAWING:
C-5

Z:\PROJECTS\2024\1870\DOUGLAS GENERAL - 25 CENTRAL AVENUE - TDRS - 10% RFP\CD\DWG\1870-06-GRADING.dwg



PROPOSED STORM PIPE EXTENSION PLAN VIEW

SCALE: 1"=20'

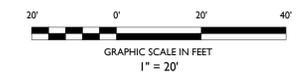
SYMBOL	DESCRIPTION
---	PROPERTY LINE
100	PROPOSED GRADING CONTOUR
---	PROPOSED GRADING RIDGELINE
←	PROPOSED DIRECTION OF DRAINAGE FLOW
[Symbol]	PROPOSED STORMWATER STRUCTURES
[Symbol]	PROPOSED STORMWATER PIPING

- DRAINAGE AND UTILITY NOTES**
- THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR STORMWATER IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IN WRITING.
 - CONTRACTOR SHALL START CONSTRUCTION OF STORM LINES AT THE LOWEST INVERT AND WORK UP GRADIENT.
 - THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. THE CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IMMEDIATELY IN WRITING.
 - THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.

- EXCAVATION, SOIL PREPARATION, AND DEWATERING NOTES**
- THE CONTRACTOR IS REQUIRED TO REVIEW THE REFERENCED GEOTECHNICAL DOCUMENTS PRIOR TO CONSTRUCTION. THESE DOCUMENTS SHALL BE CONSIDERED A PART OF THE PLAN SET.
 - THE CONTRACTOR IS REQUIRED TO PREPARE SUBGRADE SOILS BENEATH ALL PROPOSED IMPROVEMENTS AND BACKFILL ALL EXCAVATIONS IN ACCORDANCE WITH RECOMMENDATIONS BY THE GEOTECHNICAL ENGINEER OF RECORD.
 - THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SHORING FOR ALL EXCAVATIONS AS REQUIRED. CONTRACTOR SHALL HAVE THE SHORING DESIGN PREPARED BY A QUALIFIED PROFESSIONAL ENGINEER. ALL EXCAVATION EQUIPMENT SHALL BE SUBMITTED TO STONEFIELD ENGINEERING & DESIGN, LLC. AND THE OWNER PRIOR TO THE START OF CONSTRUCTION.
 - THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL OPEN EXCAVATIONS ARE PERFORMED AND PROTECTED IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS.
 - THE CONTRACTOR IS RESPONSIBLE FOR ANY DEWATERING DESIGN AND OPERATIONS AS REQUIRED. TO CONSTRUCT THE PROPOSED IMPROVEMENTS, THE CONTRACTOR SHALL OBTAIN ANY REQUIRED PERMITS FOR DEWATERING OPERATIONS AND GROUNDWATER DISPOSAL.

- STORMWATER INFILTRATION BMP CONSTRUCTION NOTES**
- PRIOR TO THE START OF CONSTRUCTION, ANY AREA DESIGNATED TO BE USED FOR AN INFILTRATION BMP (E.G. BASIN, BIORETENTION AREA, ETC.) SHALL BE FENCED OFF AND SHALL NOT BE UTILIZED AS STORAGE FOR CONSTRUCTION EQUIPMENT OR AS A STOCKPILE AREA FOR CONSTRUCTION MATERIALS. NO ACTIVITY SHALL BE PERMITTED WITHIN THE INFILTRATION BASIN AREA UNLESS RELATED TO THE CONSTRUCTION OF THE INFILTRATION BASIN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ALL SUBCONTRACTORS OF BASIN AREA RESTRICTIONS.
 - THE CONTRACTOR SHALL MAKE EVERY EFFORT, WHERE PRACTICAL, TO AVOID SUBGRADE SOIL COMPACTION IN THE AREAS DESIGNATED TO BE USED FOR AN INFILTRATION BMP.
 - ALL EXCAVATION WITHIN THE LIMITS OF ANY INFILTRATION BMP SHALL BE PERFORMED WITH THE LIGHTEST PRACTICAL EXCAVATION EQUIPMENT. ALL EXCAVATION EQUIPMENT SHALL BE PLACED OUTSIDE THE LIMITS OF THE BASIN WHERE FEASIBLE. THE USE OF LIGHT-WEIGHT, RUBBER-TIRED EQUIPMENT (LESS THAN 8 PSI APPLIED TO THE GROUND SURFACE) IS RECOMMENDED WITHIN THE BASIN LIMITS.
 - THE SEQUENCE OF SITE CONSTRUCTION SHALL BE COORDINATED WITH BASIN CONSTRUCTION TO ADHERE TO SEQUENCING LIMITATIONS.
 - DURING THE FINAL GRADING OF AN INFILTRATION BASIN, THE BOTTOM OF THE BASIN SHALL BE DEEPLY TILLED WITH A ROTARY TILER OR DISC HARROW AND THEN SMOOTHED OUT WITH A LEVELING DRAW OR EQUIVALENT GRADING EQUIPMENT. ALL GRADING EQUIPMENT SHALL BE LOCATED OUTSIDE OF THE BASIN BOTTOM WHERE FEASIBLE.
 - FOLLOWING CONSTRUCTION OF AN INFILTRATION BASIN, SOIL INFILTRATION TESTING BY A LICENSED GEOTECHNICAL ENGINEER IS REQUIRED TO CERTIFY COMPLIANCE WITH THE DESIGN INFILTRATION RATES IN ACCORDANCE WITH APPENDIX E OF THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION'S BEST MANAGEMENT PRACTICES MANUAL, LATEST EDITION. IF THE FIELD INFILTRATION RATES ARE LOWER THAN THE RATE USED DURING DESIGN, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IN WRITING IMMEDIATELY TO DETERMINE THE APPROPRIATE COURSE OF ACTION.
 - THE CONTRACTOR SHALL NOTIFY THE MUNICIPALITY TO DETERMINE IF WITNESS TESTING IS REQUIRED DURING INFILTRATION BASIN EXCAVATION AND/OR SOIL INFILTRATION TESTING.

- STORMWATER UNDERGROUND BMP CONSTRUCTION NOTES**
- THE CONTRACTOR SHALL INSTALL AND BACKFILL THE UNDERGROUND BMP IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
 - UNDERGROUND BASINS SHALL UTILIZE A STONE BACKFILL WITH A MINIMUM VOID RATIO OF 40%.
 - NO CONSTRUCTION LOADING OVER UNDERGROUND BASINS IS PERMITTED UNTIL BACKFILL IS COMPLETE PER THE MANUFACTURER'S SPECIFICATIONS. NO VEHICLES SHALL BE STAGED OR OPERATE FROM A FIXED POSITION OVER THE BASIN.



NO.	DATE	ISSUE	BY	DESCRIPTION
2	07/23/2019	PD		PER COMMENTS FOR PLANNING BOARD SUBMISSION
1	06/20/2019	CIS		

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #6.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

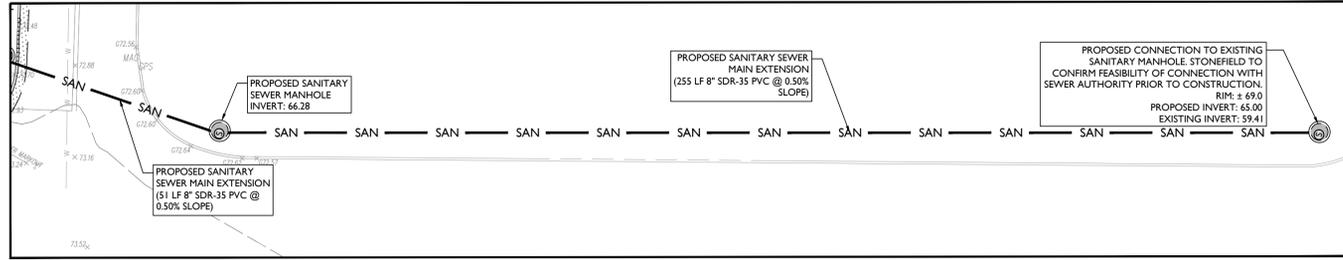
JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE NO. 47290
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

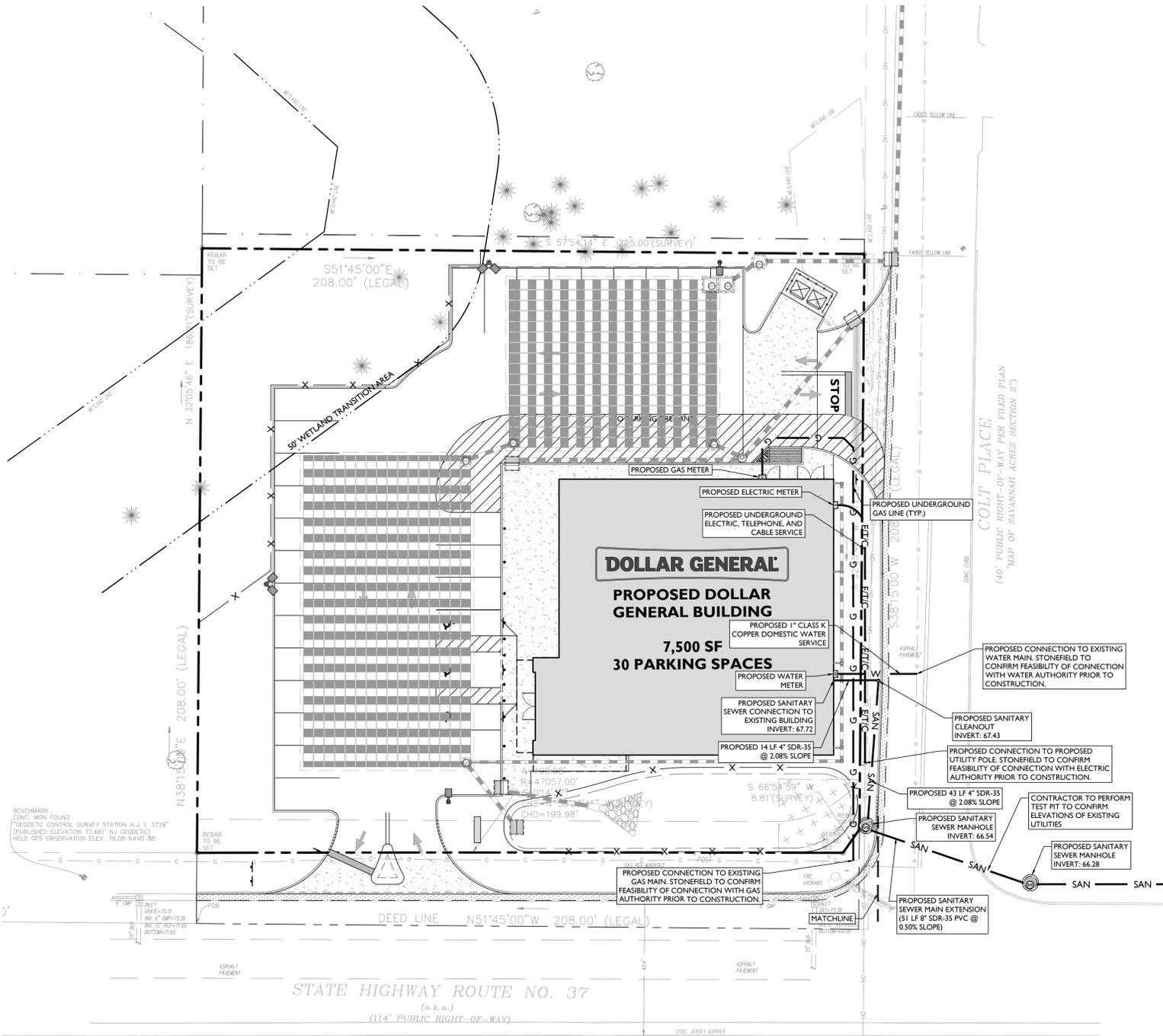
SCALE: 1" = 20' PROJECT ID: Z-18070

TITLE:
DRAINAGE PLAN

DRAWING:
C-6

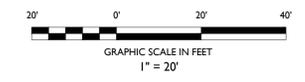


PROPOSED SANITARY PIPE EXTENSION PLAN VIEW
SCALE: 1"=20'



SYMBOL	DESCRIPTION
---	PROPERTY LINE
SAN	PROPOSED SANITARY LATERAL
W	PROPOSED DOMESTIC WATER SERVICE
E/T/C	PROPOSED ELECTRICAL/DATA CONDUITS
T/C	PROPOSED DATA CONDUITS
E	PROPOSED ELECTRIC CONDUITS
OH	PROPOSED OVERHEAD WIRES
G	PROPOSED GAS LINE
Valve Symbol	PROPOSED VALVE
Water Tee Symbol	PROPOSED WATER TEE / BEND
Hydrant Symbol	PROPOSED FIRE HYDRANT
FD Connection Symbol	PROPOSED FIRE DIRECT CONNECTION (FDC)
Manhole Symbol	PROPOSED SANITARY MANHOLE / CLEANOUT
Utility Pole Symbol	PROPOSED UTILITY POLE
Transformer Symbol	PROPOSED TRANSFORMER ON CONCRETE PAD WITH BOLLARDS

- DRAINAGE AND UTILITY NOTES**
1. THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IMMEDIATELY IN WRITING.
 2. THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN IN OPERATION ALL UTILITIES NOT DESIGNATED TO BE REMOVED.
 3. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING UTILITY IDENTIFIED TO REMAIN WITHIN THE LIMITS OF THE PROPOSED WORK DURING CONSTRUCTION.
 4. A MINIMUM HORIZONTAL SEPARATION OF 10 FEET IS REQUIRED BETWEEN ANY SANITARY SEWER SERVICE AND ANY WATER LINES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
 5. ALL WATER LINES SHALL BE VERTICALLY SEPARATED ABOVE SANITARY SEWER LINES BY A MINIMUM DISTANCE OF 18 INCHES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
 6. THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR WATER AND SANITARY SEWER CONNECTION IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IN WRITING.
 7. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING GAS, ELECTRIC AND TELECOMMUNICATION CONNECTIONS WITH THE APPROPRIATE GOVERNING AUTHORITY.
 8. CONTRACTOR SHALL START CONSTRUCTION OF ANY GRAVITY SEWER AT THE LOWEST INVERT AND WORK UP GRADIENT.
 7. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD SET OF PLANS REFLECTING THE LOCATION OF EXISTING UTILITIES THAT HAVE BEEN CAPPED, ABANDONED, OR RELOCATED BASED ON THE DEMOLITION/REMOVAL ACTIVITIES REQUIRED IN THIS PLAN SET. THIS DOCUMENT SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
 8. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.



PER COMMENTS FOR PLANNING BOARD SUBMISSION	PD	C/S	DATE	BY
2	07/23/2019	1	06/20/2019	
			ISSUE	

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

SCALE: 1" = 20' PROJECT ID: Z-18070

TITLE:
UTILITY PLAN

DRAWING:
C-7

Z:\PROJECTS\2018\2-18070 DOLLAR GENERAL - 21 CENTRAL AVENUE STORE LEVEL\PCAD\PCAD\UTIL\UTIL.DWG

SOIL COMPACTION MITIGATION NOTES

- PROCEDURES SHALL BE USED TO MITIGATE EXCESSIVE SOIL COMPACTION PRIOR TO PLACEMENT OF TOPSOIL AND ESTABLISHMENT OF PERMANENT VEGETATIVE COVER.
- RESTORATION OF COMPACTED SOILS SHALL BE THROUGH DEEP SCARIFICATION/TILLAGE (6" MINIMUM DEPTH) WHERE THERE IS NO DANGER TO UNDERGROUND UTILITIES (CABLES, IRRIGATION SYSTEMS, ETC.). IN THE ALTERNATIVE, ANOTHER METHOD AS SPECIFIED BY A NEW JERSEY LICENSED PROFESSIONAL ENGINEER MAY BE SUBSTITUTED SUBJECT TO DISTRICT APPROVAL.
- SOIL COMPACTION TESTING IS NOT REQUIRED IF WHEN SUBSOIL COMPACTION REMEDIATION (SCARIFICATION/TILLAGE 6" MINIMUM DEPTH) IS PROPOSED AS PART OF THE SEQUENCE OF CONSTRUCTION.

TOPSOILING NOTES

- TOPSOIL SHOULD BE HANDLED ONLY WHEN IT IS DRY ENOUGH TO WORK WITHOUT DAMAGING SOIL STRUCTURE.
- A UNIFORM APPLICATION TO AN AVERAGE DEPTH OF 5" (MINIMUM 4") FIRMED IN PLACE IS REQUIRED.
- PURSUANT TO THE REQUIREMENTS IN SECTION 7 OF THE STANDARD FOR PERMANENT VEGETATIVE STABILIZATION, THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT PERMANENT VEGETATIVE COVER BECOMES ESTABLISHED ON AT LEAST 80% OF THE SOILS TO BE STABILIZED WITH VEGETATION. FAILURE TO ACHIEVE THE MINIMUM COVERAGE MAY REQUIRE ADDITIONAL WORK TO BE PERFORMED.

SEQUENCE OF CONSTRUCTION

- INSTALL INLET FILTERS ON EXISTING INLETS. (1 DAY)
- INSTALL SILT FENCE, CONSTRUCTION ENTRANCE, SILT FENCING, AND TREE PROTECTION FENCING. (3 DAYS)
- CLEAR TREES AND BRUSH, PERFORM DEMOLITION. (14 DAYS)
- ROUGH GRADING AND TEMPORARY SEEDING. (21 DAYS)
- CONSTRUCT CONDUIT AND STORM PIPING. (21 DAYS)
- INSTALL INLET PROTECTION ON NEW INLETS. (1 DAY)
- BUILDING AND SITE CONSTRUCTION. (2 MONTHS)
- SOIL COMPACTION TESTING AND/OR SUBSOIL COMPACTION REMEDIATION. (2 DAYS)
- TOPSOIL AND FINAL GRADING OF LOT. (3 DAYS)
- LANDSCAPING IMPROVEMENTS AND FINAL SEEDING. (7 DAYS)
- PERMANENT STABILIZATION. (3 DAYS)
- REMOVE SILT FENCE AND SOIL EROSION MEASURES. (2 DAYS)
- INSTALL K5 SAND AND CONDUIT OUTLET PROTECTION TO AVOID CONTAMINATION OF SAND DURING ITS USE AS A SEDIMENT BASIN. (3 DAYS)

NOTE:

- TIME DURATIONS ARE APPROXIMATE AND ARE INTENDED TO ACT AS A GENERAL GUIDE TO THE CONSTRUCTION TIMELINE. ALL DURATIONS ARE SUBJECT TO CHANGE BY CONTRACTOR. CONTRACTOR SHALL SUBMIT CONSTRUCTION SCHEDULE TO TOWNSHIP AND ENGINEER. CONTRACTOR SHALL PHASE CONSTRUCTION ACCORDINGLY.
- ALL BASINS MUST BE PROPERLY CONSTRUCTED AND BASIN SLOPES MUST BE PERMANENTLY STABILIZED PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.

SOIL CHARACTERISTICS CHART

TYPE OF SOIL	ATSON SAND (AtsAO)
PERCENT OF SITE COVERAGE	98.7%
HYDROLOGIC SOIL GROUP	D
DEPTH TO RESTRICTIVE LAYER	> 80 INCHES
SOIL PERMEABILITY	0.71 TO 19.98 IN / HR
DEPTH TO WATER TABLE	0 TO 12 INCHES
TYPE OF SOIL	LAKEHURST SAND (LakB)
PERCENT OF SITE COVERAGE	1.3%
HYDROLOGIC SOIL GROUP	A
DEPTH TO RESTRICTIVE LAYER	> 80 INCHES
SOIL PERMEABILITY	2.00 TO 19.98 IN / HR
DEPTH TO WATER TABLE	18 TO 42 INCHES

SOIL EROSION AND SEDIMENT CONTROL NOTES

- THE CONTRACTOR IS RESPONSIBLE FOR SOIL EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
- THE CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL IN COMPLIANCE WITH LOCAL, STATE, AND FEDERAL AIR QUALITY STANDARDS.
- THE CONTRACTOR IS RESPONSIBLE TO INSPECT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES WEEKLY AND AFTER A PRECIPITATION EVENT GREATER THAN 1 INCH. THE CONTRACTOR SHALL MAINTAIN AN INSPECTION LOG ON SITE AND DOCUMENT CORRECTIVE ACTION TAKEN THROUGHOUT THE COURSE OF CONSTRUCTION AS REQUIRED.

OCEAN COUNTY SOIL EROSION AND SEDIMENT CONTROL NOTES

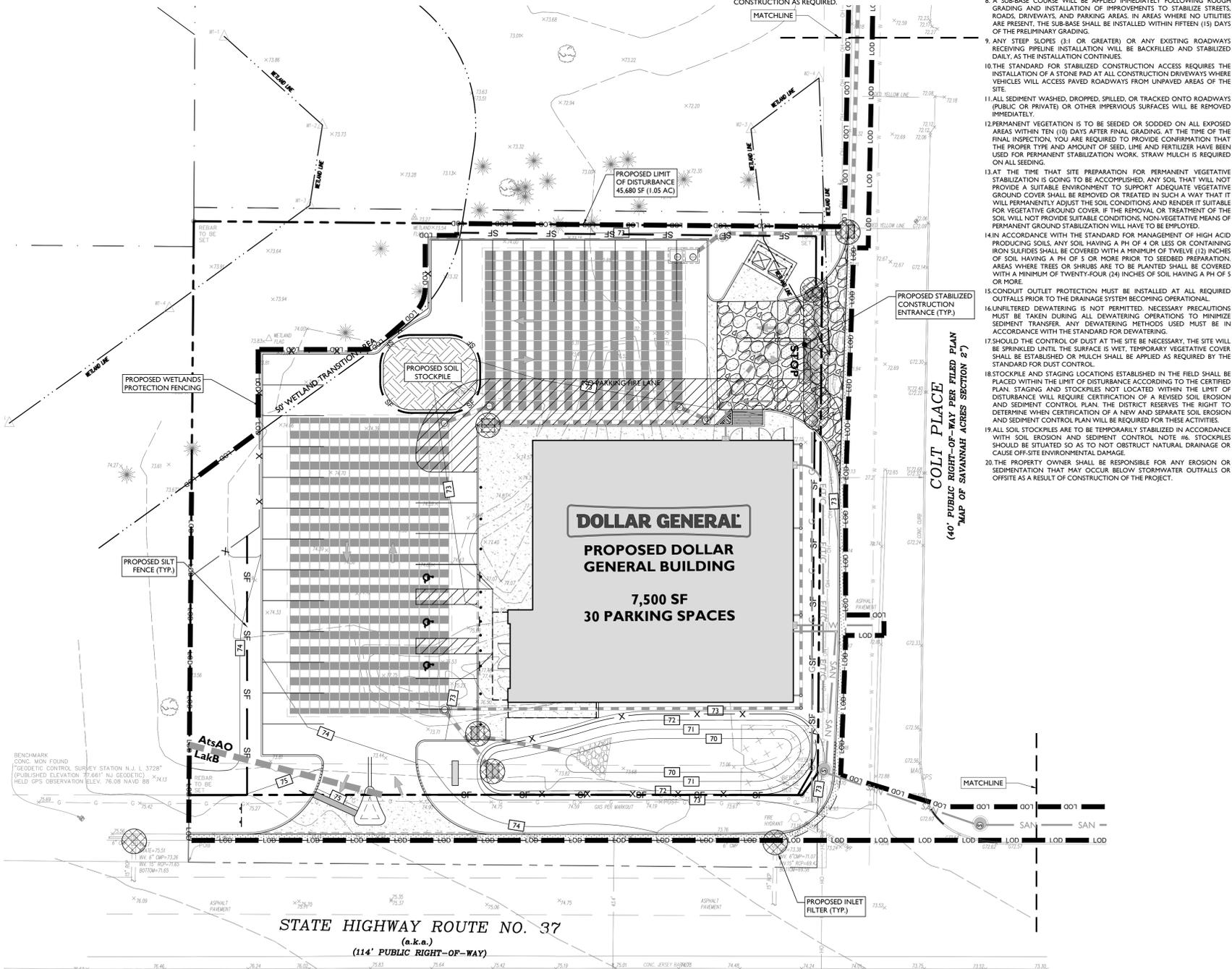
- THE OCEAN COUNTY SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED FORTY-EIGHT (48) HOURS IN ADVANCE OF ANY LAND DISTURBANCE.
- ALL WORK IS TO BE DONE IN ACCORDANCE WITH THE STATE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.
- ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE OR IN THEIR PROPER SEQUENCE AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
- ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLANS WILL REQUIRE THE SUBMISSION OF REVISED SOIL EROSION AND SEDIMENT CONTROL PLANS TO THE DISTRICT. THE REVISED PLANS MUST MEET ALL CURRENT STATE SOIL EROSION AND SEDIMENT CONTROL STANDARDS. LINK TO 2014 STANDARDS: [HTTP://WWW.STATE.NJ.US/AGRICULTURE/DIVISIONS/SOIL/SOILEROSION.HTML](http://www.state.nj.us/agriculture/divisions/soil/soilerosion.html)
- N.J.S.A. 42A:39 ET SEQ. REQUIRES THAT NO CERTIFICATE OF OCCUPANCY BE ISSUED BEFORE THERE HAS BEEN COMPLIANCE WITH PROVISIONS OF A CERTIFIED PLAN FOR PERMANENT MEASURES. ALL SITE WORK, AND ALL WORK AROUND INDIVIDUAL LOTS IN SUBDIVISIONS, MUST BE COMPLETED PRIOR TO THE DISTRICT ISSUING A REPORT OF COMPLIANCE FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE MUNICIPALITY.
- ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN THIRTY (30) DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL AT A RATE OF 2 TO 2 1/2 TONS PER ACRE, ACCORDING TO STATE STANDARD FOR STABILIZATION WITH MULCH ONLY.
- IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E. STEEP SLOPES AND ROADWAY EMBANKMENTS) WILL RECEIVE TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF 1 1/2 TO 2 TONS PER ACRE, ACCORDING TO STATE STANDARDS.
- A SUB-BASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS TO STABILIZE STREETS, ROADS, DRIVEWAYS, AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUB-BASE SHALL BE INSTALLED WITHIN FIFTEEN (15) DAYS OF THE PRELIMINARY GRADING.
- ANY STEEP SLOPES (3:1 OR GREATER) OR ANY EXISTING ROADWAYS RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION CONTINUES.
- THE STANDARD FOR STABILIZED CONSTRUCTION ACCESS REQUIRES THE INSTALLATION OF A STONE PAD AT ALL CONSTRUCTION DRIVEWAYS WHERE VEHICLES WILL ACCESS PAVED ROADWAYS FROM UNPAVED AREAS OF THE SITE.
- ALL SEDIMENT WASHED, DROPPED, SPILLED, OR TRACKED ONTO ROADWAYS (PUBLIC OR PRIVATE) OR OTHER IMPERVIOUS SURFACES WILL BE REMOVED IMMEDIATELY.
- PERMANENT VEGETATION IS TO BE SEED OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING. AT THE TIME OF THE FINAL INSPECTION, YOU ARE REQUIRED TO PROVIDE CONFIRMATION THAT THE PROPER TYPE AND AMOUNT OF SEED, LIME AND FERTILIZER HAVE BEEN USED FOR PERMANENT STABILIZATION WORK. STRAW MULCH IS REQUIRED ON ALL SEEDING.
- AT THE TIME THAT SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT IT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON-VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
- IN ACCORDANCE WITH THE STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOILS, ANY SOIL HAVING A PH OF 4 OR LESS OR CONTAINING IRON SULFIDES SHALL BE COVERED WITH A MINIMUM OF TWELVE (12) INCHES OF SOIL HAVING A PH OF 5 OR MORE PRIOR TO SEEDBED PREPARATION. AREAS WHERE TREES OR SHRUBS ARE TO BE PLANTED SHALL BE COVERED WITH A MINIMUM OF TWENTY-FOUR (24) INCHES OF SOIL HAVING A PH OF 5 OR MORE.
- CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
- UNFILTERED DEWATERING IS NOT PERMITTED. NECESSARY PRECAUTIONS MUST BE TAKEN DURING ALL DEWATERING OPERATIONS TO MINIMIZE SEDIMENT TRANSFER. ANY DEWATERING METHODS USED MUST BE IN ACCORDANCE WITH THE STANDARD FOR DEWATERING.
- SHOULD THE CONTROL OF DUST AT THE SITE BE NECESSARY, THE SITE WILL BE SPRINKLED UNTIL THE SURFACE IS WET, TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED OR MULCH SHALL BE APPLIED AS REQUIRED BY THE STANDARD FOR DUST CONTROL.
- STOCKPILE AND STAGING LOCATIONS ESTABLISHED IN THE FIELD SHALL BE PLACED WITHIN THE LIMIT OF DISTURBANCE ACCORDING TO THE CERTIFIED PLAN. STAGING AND STOCKPILES NOT LOCATED WITHIN THE LIMIT OF DISTURBANCE WILL REQUIRE CERTIFICATION OF A REVISED SOIL EROSION AND SEDIMENT CONTROL PLAN. THE DISTRICT RESERVES THE RIGHT TO DETERMINE WHEN CERTIFICATION OF A NEW AND SEPARATE SOIL EROSION AND SEDIMENT CONTROL PLAN WILL BE REQUIRED FOR THESE ACTIVITIES.
- ALL SOIL STOCKPILES ARE TO BE TEMPORARILY STABILIZED IN ACCORDANCE WITH SOIL EROSION AND SEDIMENT CONTROL NOTE #6. STOCKPILES SHOULD BE SITUATED SO AS TO NOT OBSTRUCT NATURAL DRAINAGE OR CAUSE OFF-SITE ENVIRONMENTAL DAMAGE.
- THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR ANY EROSION OR SEDIMENTATION THAT MAY OCCUR BELOW STORMWATER OUTFALLS OR OFFSITE AS A RESULT OF CONSTRUCTION OF THE PROJECT.

SYMBOL DESCRIPTION

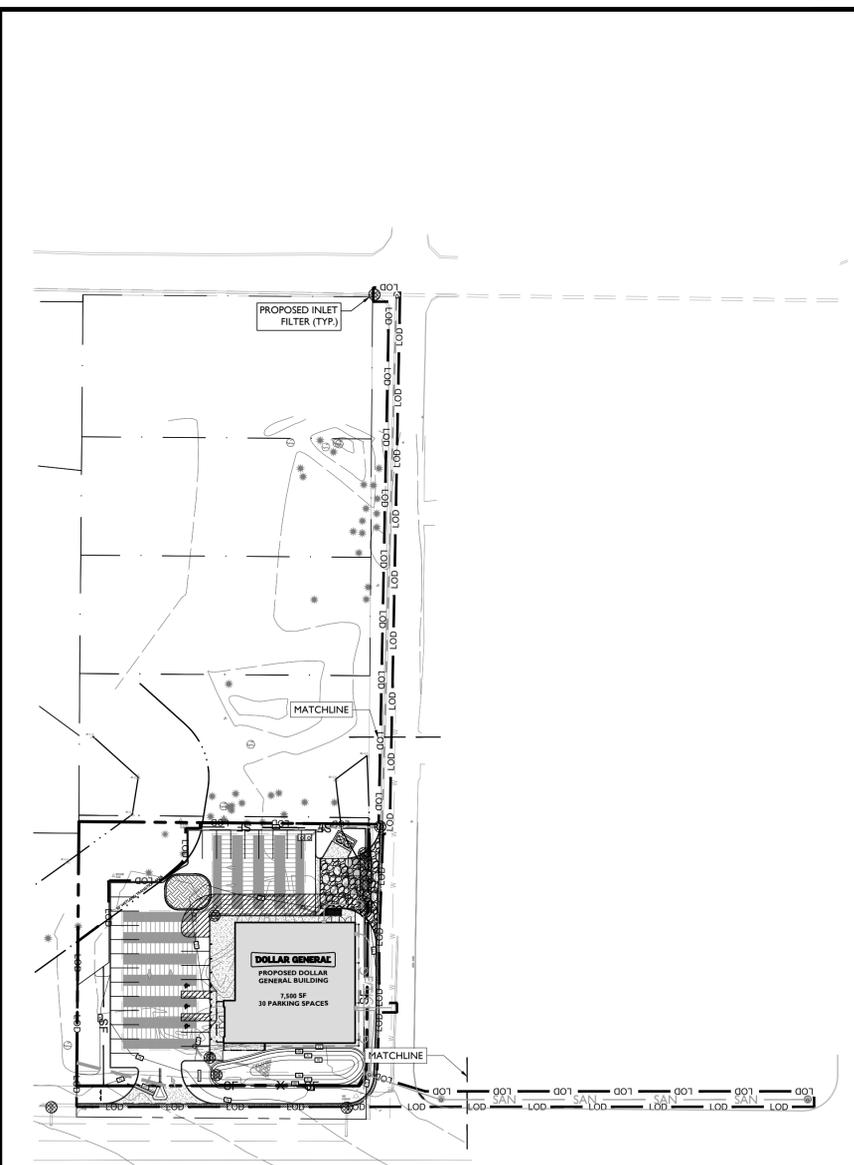
- PROPERTY BOUNDARY
- ADJACENT PROPERTY BOUNDARY
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED SILT FENCE
- PROPOSED WETLANDS PROTECTION FENCE
- PROPOSED TREE PROTECTION FENCE
- PROPOSED STOCKPILE & EQUIPMENT STORAGE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED INLET PROTECTION FILTER



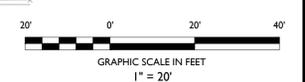
Know what's below
Call before you dig.



COLT PLACE
(40' PUBLIC RIGHT-OF-WAY PER FILED PLAN
MAP OF SAVANNAH ACRES SECTION 27)



OVERALL LIMIT OF DISTURBANCE



NO.	DATE	ISSUE	BY	PER COMMENTS FOR PLANNING BOARD SUBMISSION	DESCRIPTION
2	07/23/2019	PD			
1	06/20/2019	CIS			

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ • Princeton, NJ • Long Island City, NY • Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #6.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

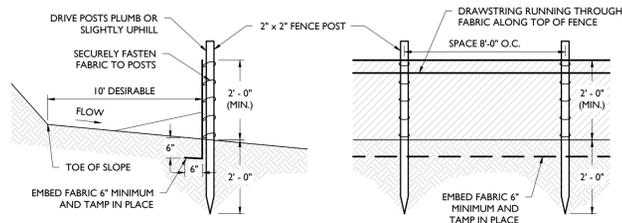
STONEFIELD
engineering & design

SCALE: 1" = 20' PROJECT ID: Z-18070

TITLE:
SOIL EROSION & SEDIMENT CONTROL PLAN

DRAWING:
C-10

Z:\PROJECTS\2018\21801 DOLLAR GENERAL - 21 CENTRAL AVENUE LOT 05 FINAL INFO\CDR\CDR\PLAN SET 11.DWG

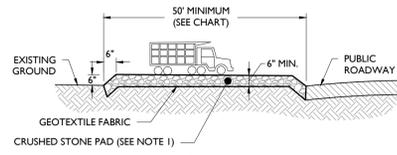


- NOTES:
1. SECURELY FASTEN GEOTEXTILE TO FENCE POST BY USE OF WIRE TIES, HOG RINGS, STAPLES OR POCKETS. FOUR TO SIX FASTENERS PER POST.
 2. GEOTEXTILE FABRIC TO BE EMBEDDED 6" (MIN.) AND TAMP IN PLACE.
 3. SECURELY FASTEN ENDS OF INDIVIDUAL ROLLS OF GEOTEXTILE TO A POST BY WRAPPING EACH END OF THE GEOTEXTILE AROUND THE POST TWICE AND ATTACHING AS SPECIFIED IN NOTE 1 ABOVE. SPLICING OF INDIVIDUAL ROLLS SHALL NOT OCCUR AT LOW POINTS.
 4. SET SILT FENCE WITHIN PROJECT LIMITS. 10' IS DESIRABLE.

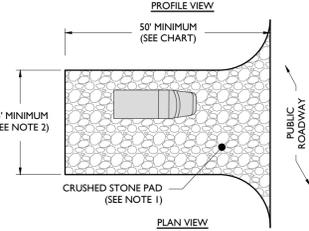
SILT FENCE DETAIL

NOT TO SCALE

1



SLOPE OF PUBLIC ROADWAY	LENGTH OF STONE REQ'D	
	COARSE GRAINED SOILS	FINE GRAINED SOILS
0% TO 2%	50 FEET	100 FEET
2% TO 5%	100 FEET	200 FEET
> 5%	SEE NOTE 4	

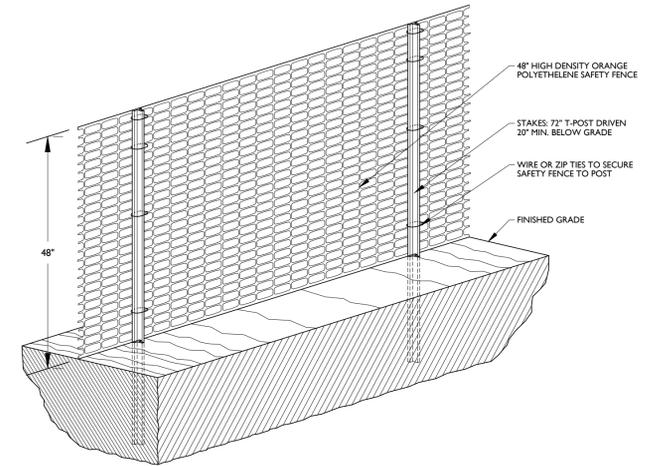


- NOTES:
1. STONE SHALL BE ASTM C-33, SIZE No. 2 (2.5" TO 1.5") OR No. 3 (2" TO 1") CLEAN CRUSHED ANGULAR STONE.
 2. WIDTH SHALL BE 15' MINIMUM OR THE FULL WIDTH OF THE ACCESS POINT, WHICHEVER IS GREATER.
 3. STORMWATER FROM UP-SLOPE AREAS SHALL BE DIVERTED AWAY FROM THE STABILIZED PAD, WHERE POSSIBLE. AT POORLY DRAINED LOCATIONS, SUBSURFACE DRAINAGE GRAVEL FILTER OR GEOTEXTILE SHALL BE INSTALLED BEFORE THE STABILIZED CONSTRUCTION ENTRANCE.
 4. WHERE THE SLOPE OF THE ROADWAY EXCEEDS 5%, A STABILIZED BASE OF HOT MIX ASPHALT BASE COURSE SHALL BE INSTALLED. THE TYPE AND THICKNESS OF THE BASE COURSE AND USE OF DENSE GRADED AGGREGATE SUB-BASE SHALL BE AS PRESCRIBED BY LOCAL MUNICIPAL ORDINANCE OR GOVERNING AUTHORITY.
 5. CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN THE STABILIZED CONSTRUCTION ACCESS AND THE PUBLIC ROADWAY.

STABILIZED CONSTRUCTION ACCESS DETAIL

NOT TO SCALE

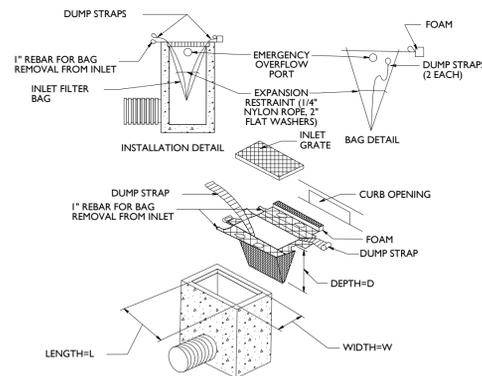
2



ORANGE CONSTRUCTION FENCE DETAIL

NOT TO SCALE

3

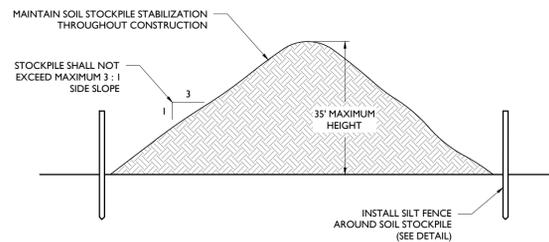


INLET FILTER BAG DETAIL

NOT TO SCALE

- NOTES:
1. THE FILTER BAG SHALL SAFELY PASS FLOWS GREATER THAN THE 1-YEAR 24-HOUR STORM EVENT.
 2. SEDIMENT REMOVAL AND MAINTENANCE SHALL BE PERFORMED FREQUENTLY AND AFTER EVERY STORM EVENT.

4



SOIL STOCKPILE DETAIL

NOT TO SCALE

- NOTES:
1. STOCKPILES SHALL BE SITUATED SO AS NOT TO OBSTRUCT NATURAL DRAINAGE OR CAUSE OFF-SITE ENVIRONMENTAL DAMAGE.
 2. STOCKPILES SHALL BE STABILIZED IN ACCORDANCE WITH THE STANDARDS FOR PERMANENT OR TEMPORARY VEGETATIVE COVER FOR SOIL STABILIZATION, AS APPROPRIATE (SEE SOIL EROSION NOTES).

5

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

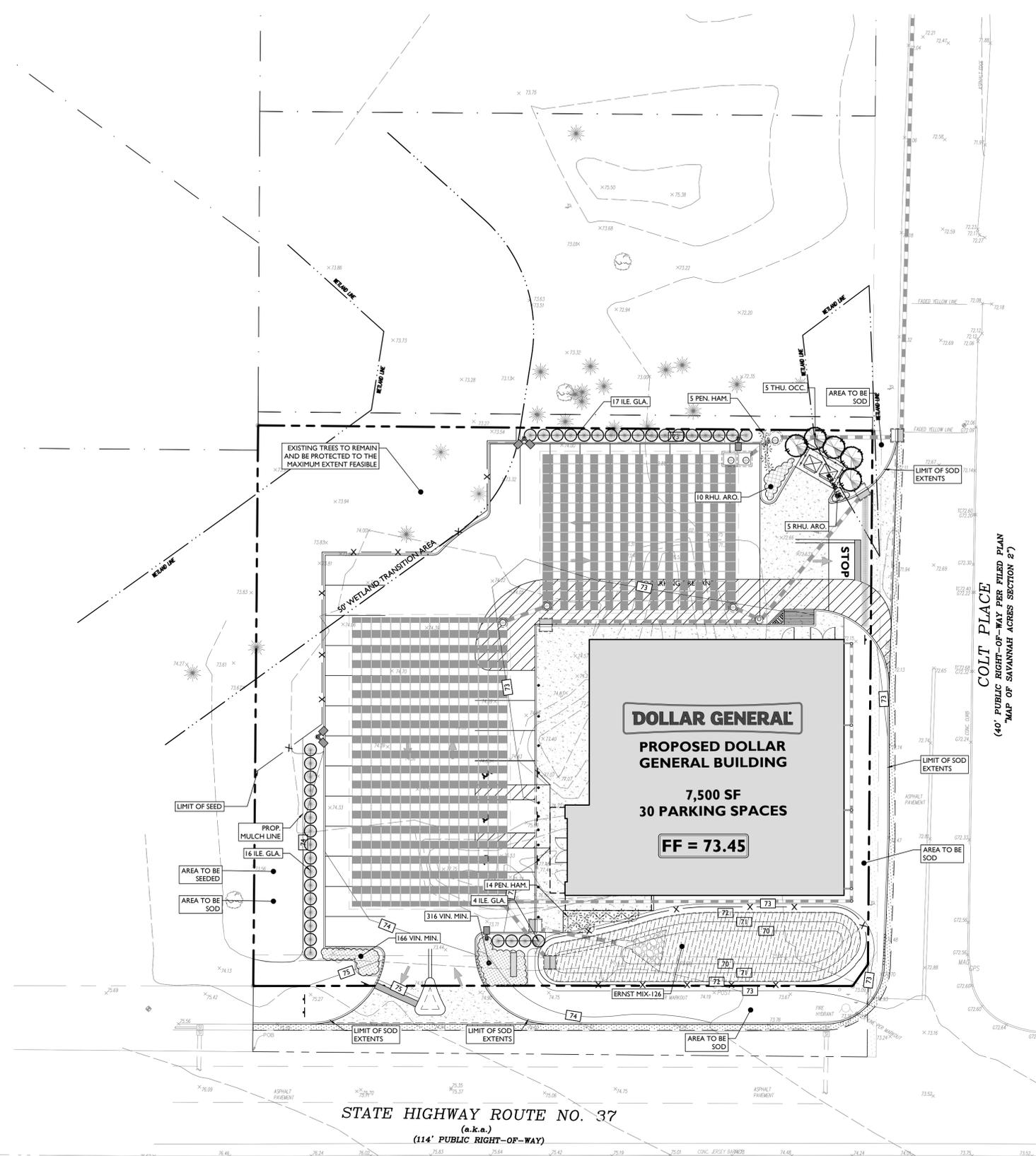
STONEFIELD
engineering & design

SCALE: 1" = 20' PROJECT ID: Z-18070

TITLE: **SOIL EROSION & SEDIMENT CONTROL NOTES & DETAILS**

DRAWING:

C-11



- IRRIGATION NOTES:
- ALL LANDSCAPE AREAS AND LAWNS ADJACENT TO PAVED AREAS AND/OR STREETS ARE TO BE FULLY IRRIGATED.
 - IRRIGATION SYSTEM TO INCLUDE ALL SPRAY HEADS, VALVES AND CONTROLLERS.
 - A SEPARATE METER AND BACKFLOW PREVENTER WILL BE REQUIRED.
 - LOCATE HEADS A MINIMUM OF 2'-0" FROM EDGE OF PAVEMENT / CURB.
 - LOCATE RAINBIRD CONTROL PANEL IN RECEIVING AREA NEXT TO ELECTRICAL PANELS.

PLANT SCHEDULE					
PLANT KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
EVERGREEN TREES					
THU. OCC.	5	THUJA PLICATA 'GREEN GIANT'	GREEN GIANT ARBROVITAE	5' - 6'	B&B
EVERGREEN SHRUBS					
ILE. GLA.	37	ILEX GLABRA 'COMPACTA'	INKBERRY HOLLY	30" - 36"	B&B
GROUND COVERS					
RHU. ARO.	15	RHUS AROMATICA 'GRO LOW'	FRAGRANT SUMAC	15" - 18"	CONT. 18" O.C.
VIN. MIN.	482	VINCA MINOR	PERIWINKLE	2.5" POTS	CONT. 10" O.C.
PERENNIALS					
PEN. HAM.	19	PENNISSETUM ALOPECUROIDES 'HAMELY'	FOUNTAIN GRASS	1 GAL.	24" O.C.
SEEDING					
ERNST MIX-126	1,935 SF	SEE BELOW FOR BREAKDOWN BY SPECIES	ERNST MIX-126	20 - 40 LBS/ACRE	

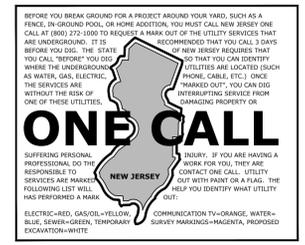
NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN ON THE LANDSCAPE PLAN AND WITHIN THE PLANT LIST, THE PLAN SHALL DICATE.

LANDSCAPING AND BUFFER REQUIREMENTS		
CODE SECTION	REQUIRED	PROPOSED
§ 245-29.A	TOTAL LANDSCAPED AND/OR GREEN AREA SHALL BE A MINIMUM OF 30% OF TOTAL LOT AREA FOR THE H-D ZONE.	31.0%
§ 245-29.B.1	WHEREVER THE PROPERTY LINE OF AN OCCUPIED LOT IN THE H-D ZONE ADJUTS A RESIDENTIAL ZONE, A 50 FT BUFFER AREA SHALL BE ESTABLISHED. WHENEVER EXISTING VEGETATION OF SUFFICIENT DENSITY AND VIABILITY EXISTS, AS DETERMINED BY THE PLANNING BOARD ENGINEER, THE BUFFER AREA REQUIREMENTS CAN BE SUPPLEMENTED WITH NEW INFILL PLANTINGS.	DOES NOT COMPLY (V)
§ 245-29.B.2.a	ALONG LOT LINES OTHER THAN STREET LINES WITHIN SAID BUFFER AREA, A SOLID AND CONTINUOUS SCREEN SHALL BE PLANTED AND MAINTAINED. SAID LANDSCAPING SHALL CONSIST OF MASSES EVERGREEN AND DECIDUOUS TREES AND SHRUBS OF SUCH SPECIES AND SIZE AS WILL PRODUCE WITHIN TWO GROWING SEASONS, A SCREEN OF AT LEAST EIGHT FEET IN HEIGHT. SUCH SCREEN SHALL CONSIST OF A MINIMUM OF DOUBLE ROW OF STAGGERED PLANT MATERIALS PLANTED 10 FEET ON CENTER AND STAGGERED OR PARALLEL, SERPENTINE, OR BROKEN ROWS AS APPROVED BY THE MUNICIPAL AGENCY.	DOES NOT COMPLY (V)
§ 245-29.B.2.b	THE LANDSCAPE SCREEN SHALL BE LOCATED SO AS NOT TO BE CLOSER THAN 10 FEET FROM A STREET RIGHT-OF-WAY LINE.	COMPLIES
§ 245-29.B.2.c	THE REQUIRED HEIGHT OF THE LANDSCAPE SCREEN AS REQUIRED ABOVE SHALL BE MEASURED IN RELATION TO THE ELEVATION OF THE ADJACENT PARKING AREA. IN SUCH CASES WHERE THE GROUND ELEVATION OF THE LOCATION AT WHICH THE SCREEN IS TO BE PLANTED IS LESS THAN THE ELEVATION OF THE EDGE OF AN ADJACENT PARKING AREA, THE REQUIRED HEIGHT OF THE SCREEN SHALL BE INCREASED IN THE AMOUNT EQUAL TO SAID DIFFERENCE IN ELEVATION.	COMPLIES
§ 245-29.B.2.d	NATURAL BUFFER AREAS ARE TO BE AUGMENTED BY ADDITIONAL PLANTING TO MEET MINIMUM REQUIREMENTS OF BUFFER AREAS.	COMPLIES
§ 245-29.B.2.e	THE DISTURBED BUFFER AREA SHALL BE GRADED AND PLANTED WITH GRASS, SEED, CHIPS, OR GRAVEL AND SUCH OTHER SHRUBBERY OR TREES IN ACCORDANCE WITH APPROVED PLANS. THE ENTIRE AREA SHALL BE ATTRACTIVELY MAINTAINED BY THE OWNER AND KEPT CLEAN OF ALL DEBRIS AND RUBBISH.	COMPLIES
§ 245-29.B.2.f	IN THE EVENT THAT ANY OF THE PLANTINGS, IN ACCORDANCE WITH THE ABOVE REQUIREMENTS, DO NOT LIVE, THEY SHALL BE REPLACED IMMEDIATELY BY THE OWNER, OR IF THE SEASON IS NOT APPROPRIATE, IN THE NEXT PLANTING SEASON.	WILL COMPLY
§ 245-30.D.1	AT THE INTERSECTION OF TWO OR MORE STREETS, NO HEDGE SHALL BE HIGHER THAN 30 INCHES ABOVE THE EDGE OF PAVEMENT ELEVATION.	COMPLIES

ERNST SEED CO. RETENTION BASIN FLOOR SEEDING SPECIFICATIONS (ERNST MIX-126):

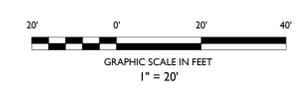
- 20.0% Puccinellia distans 'Fults'
- 19.0% Panicum clandestinum 'Toga'
- 18.0% Agrostis stolonifera
- 18.0% Elymus virginicus
- 15.0% Poa palustris
- 5.0% Carex vulpinoidea
- 3.0% Juncus effusus
- 2.0% Carex scoparia
- Alkali grass
- Deertongue
- Creeping Bentgrass
- Virginia Wildrye
- Fowl Bluegrass
- Fox Sedge
- Soft Rush
- Blunt Broom Sedge

- SOW ABOVE MIX AT A RATE OF 20-40 LBS/ACRE
- SUPPLEMENT ABOVE MIX WITH ANNUAL RYE AT A RATE OF 10 LBS/ACRE.
- MOW SEEDED AREA ONCE PER YEAR. MOWING SHALL TAKE PLACE IN EARLY SPRING ONLY.



LANDSCAPING NOTES

- THE CONTRACTOR SHALL RESTORE ALL DISTURBED GRASS AND LANDSCAPED AREAS TO MATCH EXISTING CONDITIONS UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
- THE CONTRACTOR SHALL RESTORE ALL DISTURBED LAWN AREAS WITH A MINIMUM 5 INCH LAYER OF TOPSOIL AND SEED.
- THE CONTRACTOR SHALL RESTORE MULCH AREAS WITH A MINIMUM 3 INCH LAYER OF MULCH.
- THE MAXIMUM SLOPE ALLOWABLE IN LANDSCAPE RESTORATION AREAS SHALL BE 3 FEET HORIZONTAL TO 1 FOOT VERTICAL (3:1 SLOPE) UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
- THE CONTRACTOR IS REQUIRED TO LOCATE ALL SPRINKLER HEADS IN AREA OF LANDSCAPING DISTURBANCE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL RELOCATE SPRINKLER HEADS AND LINES IN ACCORDANCE WITH OWNER'S DIRECTION WITHIN AREAS OF DISTURBANCE.
- THE CONTRACTOR SHALL ENSURE THAT ALL DISTURBED LANDSCAPED AREAS ARE GRADED TO MEET FLUSH AT THE ELEVATION OF WALKWAYS AND TOP OF CURB ELEVATIONS EXCEPT UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET. NO ABRUPT CHANGES IN GRADE ARE PERMITTED IN DISTURBED LANDSCAPING AREAS.



DATE	ISSUE	BY	DESCRIPTION
07/23/2019	1	PD	PER COMMENTS FOR PLANNING BOARD SUBMISSION
06/20/2019	2	CIS	

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #6.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

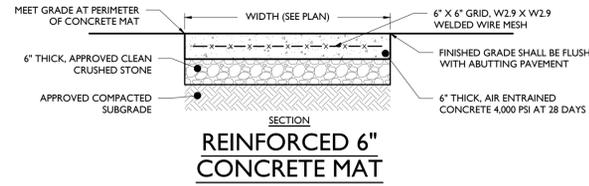
STONEFIELD
engineering & design

SCALE: 1" = 20' PROJECT ID: Z-18070

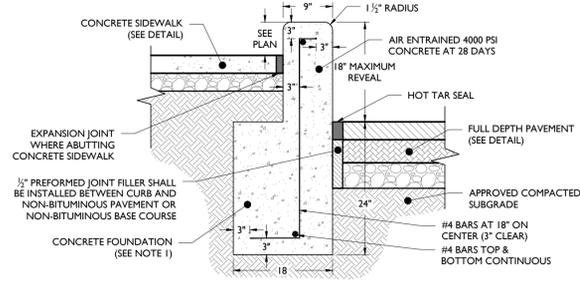
TITLE:
LANDSCAPING PLAN

DRAWING:
C-12

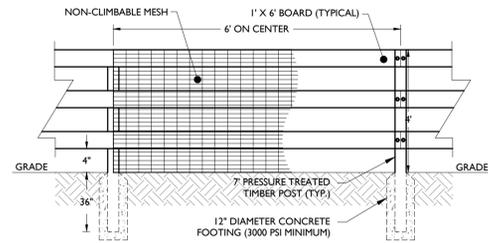
Z:\PROJECTS\2018\18070 DOLLAR GENERAL - 21 CENTRAL AVENUE TOPS OVER VIEW\PC\DRAWING\PLANS\LD_LANDSCAPING



- NOTES:
- 1/2" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED 1/4" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
 - 1" DEEP BY 1/2" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
 - CONCRETE SHALL RECEIVE BROOM FINISH.
 - ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.



- NOTES:
- CONCRETE SHALL BE 4000 PSI AT 28 DAYS, AIR-ENTRAINED.
 - 1/2" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 30 FOOT INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED 1/4" FROM SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
 - 1" DEEP AND 1/2" WIDE TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS, OR 30 FOOT MAX.

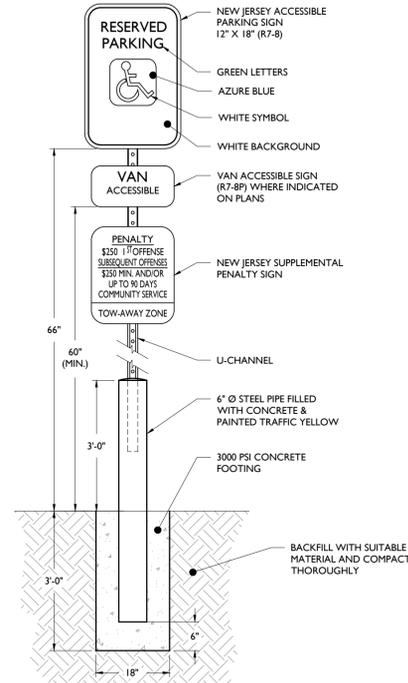


- NOTE:
- ALL WOOD TO BE PRESSURE TREATED

M.U.T.C.D. NUMBER	TEXT	COLOR		SIZE OF SIGN (WIDTH X HEIGHT)	TYPE OF MOUNT
		LEGEND	BACKGROUND		
STOP SIGN (R1-1)		WHITE	RED	36"x36"	GROUND
NO LEFT TURN (R3-2)		CIRCLE AND DIAGONAL: RED LEGEND: BLACK	WHITE	24"x24"	GROUND

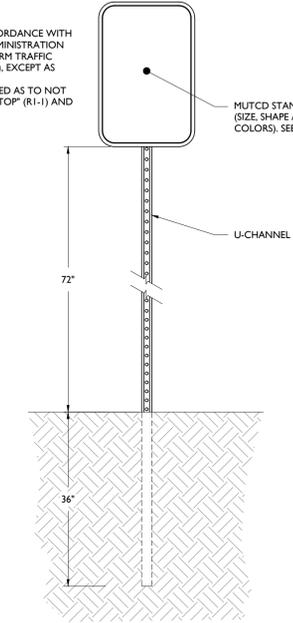
- NOTE:
- ALL SIGNS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), EXCEPT AS NOTED.
 - ALL SIGNS SHALL BE MOUNTED AS TO NOT OBSTRUCT THE SHAPE OF "STOP" (R1-1) AND "YIELD" (R1-2) SIGNS.

SIGN DATA TABLE
NOT TO SCALE



NOT TO SCALE

- NOTE:
- ALL SIGNS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), EXCEPT AS NOTED.
 - ALL SIGNS SHALL BE MOUNTED AS TO NOT OBSTRUCT THE SHAPE OF "STOP" (R1-1) AND "YIELD" (R1-2) SIGNS.



NOT TO SCALE

NO.	DATE	ISSUE	BY	DESCRIPTION
2	07/23/2019	PD		
1	06/20/19	C/S		

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

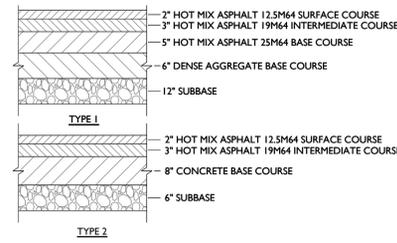
STONEFIELD
engineering & design

SCALE: AS SHOWN PROJECT ID: Z-18070

TITLE:
CONSTRUCTION DETAILS

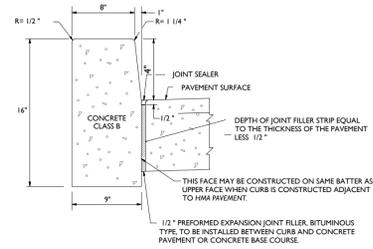
DRAWING:

C-15



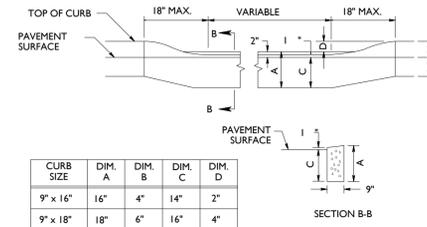
NJDOT PAVEMENT SECTION AND REPAIR STRIP DETAIL
(FOR USE WITHIN NJDOT ROW)

- NOTES:
- FOR AREAS 5.0 FEET OR MORE IN WIDTH, USE TYPE 1.
 - FOR AREAS LESS THAN 5.0 FEET IN WIDTH WHEN PROPER ASPHALT COMPACTION IS NOT POSSIBLE, USE TYPE 2.
 - IF PAVEMENT CONSTRUCTION ENCRROACHES ON EXISTING TRAVEL LANES, THE ENTIRE LANE SHALL BE MILLED AND RESURFACED.
 - FOR MILLING AND RESURFACING, USE HOT MIX ASPHALT 12.5 ME SURFACE COURSE, 2" THICK.
 - SAW CUT PAVEMENT PRIOR TO EXCAVATION.
 - UNDERCUT SOFT SUBGRADE AREAS AND REPLACE WITH ADDITIONAL DENSE GRADED AGGREGATE BASE COARSE.
 - UNIFORMLY SPRAY TACK COAT WHEN PLACING HOT MIX ASPHALT ON PAVED SURFACE.
 - USE POLYMERIZED JOINT ADHESIVE FOR LONGITUDINAL JOINT OF THE NEW SURFACE COARSE WITH EXISTING HOT MIX ASPHALT, CURB, OR ANY VERTICAL SURFACE ALONG THE NEW SURFACE.
 - EXISTING CONCRETE PAVEMENT SHOULD BE REPAIRED IN KIND FOR FULL WIDTH OF LANE IN ACCORDANCE WITH THE STANDARD DETAIL CD-453.
 - DENSE GRADED AGGREGATE BASE COARSE AND SUBBASE SHOULD EXTEND A MINIMUM OF 3" BEYOND THE OUTER EDGE OF THE PROPOSED CURB.
 - REPAIR ANY ASPHALT PAVEMENTS, WHICH EXHIBIT HIGH SEVERITY CRACKING, POTHOLES, OR OTHER DAMAGE IN ACCORDANCE WITH 401.03.01.D OF 2007 NJDOT SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION (ITEM NO. 401021M).
 - IF ANY PAVEMENT CONSTRUCTION (WIDENING, NEW/RESETTING CURB ETC.) ENCRROACH AN EXISTING TRAVEL LANE, THEN MILL 2" OF EXISTING PAVEMENT AND RESURFACE WITH 2" THICK HOT MIX ASPHALT 12.5ME SURFACE COURSE THE FULL WIDTH OF THAT TRAVEL LANE ALONG NEW CONSTRUCTION WITHOUT ANY JOINTS.
 - UNDERCUT SOFT SUBGRADE AREAS AND REPLACE WITH ADDITIONAL SUBBASE WHERE THE WATER TABLE IS NOT ENCOUNTERED WITHIN THE DEPTH OF EXCAVATION.
 - SHOULD THE EXISTING CORE THICKNESS SHOW ASPHALT DEPTH LESS THAN 8", THIS PAVEMENT SECTION SHALL BE USED.
 - CONTRACTOR TO EXCAVATE AND REPLACE ANY UNSTABLE MATERIAL WITH SUBBASE.



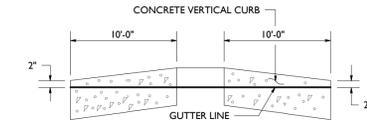
9"X16" CONCRETE VERTICAL CURB
(FOR USE WITHIN NJDOT ROW)
NOT TO SCALE

- NOTES:
- TRANSVERSE JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CURB 20 FEET APART AND SHALL BE FILLED WITH PREFORMED BITUMINOUS-IMPREGNATED FIBER JOINT FILLER RECESSED 1/4" IN FROM FRONT FACE AND TOP OF CURB.
 - EXPANSION JOINTS THRU AND ADJACENT TO THE CURB SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CURB.



CURB SIZE	DIM. A	DIM. B	DIM. C	DIM. D
9" x 16"	16"	4"	14"	2"
9" x 18"	18"	6"	16"	4"

NJDOT METHOD OF DEPRESSING CURB AT DRIVEWAYS
(FOR USE WITHIN NJDOT ROW)
NOT TO SCALE



NJDOT CURB TREATMENT AT CURB END
(FOR USE WITHIN NJDOT ROW)

1 2 3 4

PER COMMENTS FOR PLANNING BOARD SUBMISSION	DATE	BY	DESCRIPTION
2	07/23/2019		
1	06/20/19		

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddeng.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

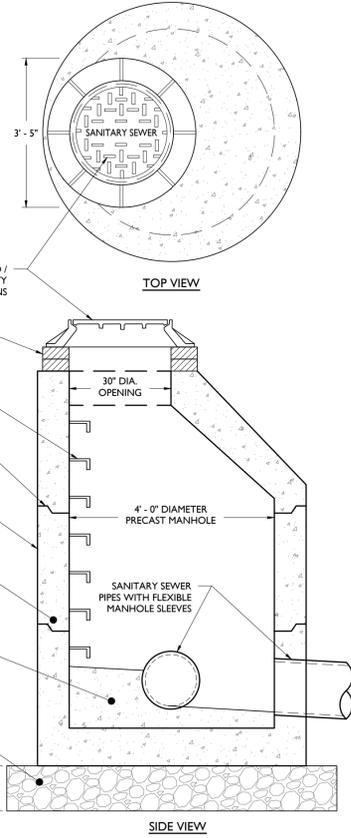
STONEFIELD
engineering & design

SCALE: AS SHOWN PROJECT ID: Z-18070

TITLE:
CONSTRUCTION DETAILS

DRAWING:
C-16

- NOTES:
- STRUCTURE TO BE CONSTRUCTED OF REINFORCED PRECAST CONCRETE.
 - FRAME AND COVER TO BE CAST-IRON AND SUPPORT MINIMUM H-25 LOADING.
 - ALL JOINTS TO BE WATER-TIGHT.
 - SUBGRADE BENEATH STRUCTURE SHALL BE LEVELED AND COMPACTED AS NECESSARY PRIOR TO INSTALLING STRUCTURE.

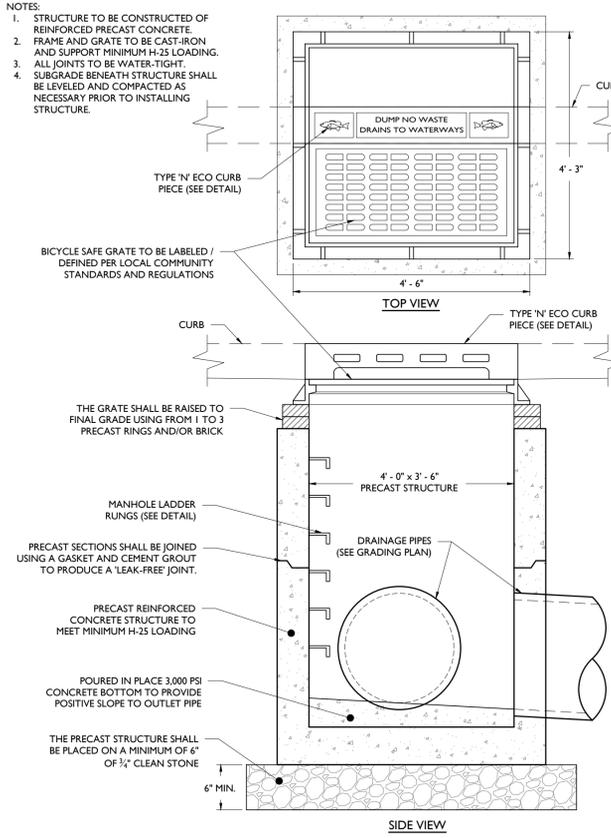


SANITARY MANHOLE DETAIL

NOT TO SCALE

1

- NOTES:
- STRUCTURE TO BE CONSTRUCTED OF REINFORCED PRECAST CONCRETE.
 - FRAME AND GRATE TO BE CAST-IRON AND SUPPORT MINIMUM H-25 LOADING.
 - ALL JOINTS TO BE WATER-TIGHT.
 - SUBGRADE BENEATH STRUCTURE SHALL BE LEVELED AND COMPACTED AS NECESSARY PRIOR TO INSTALLING STRUCTURE.

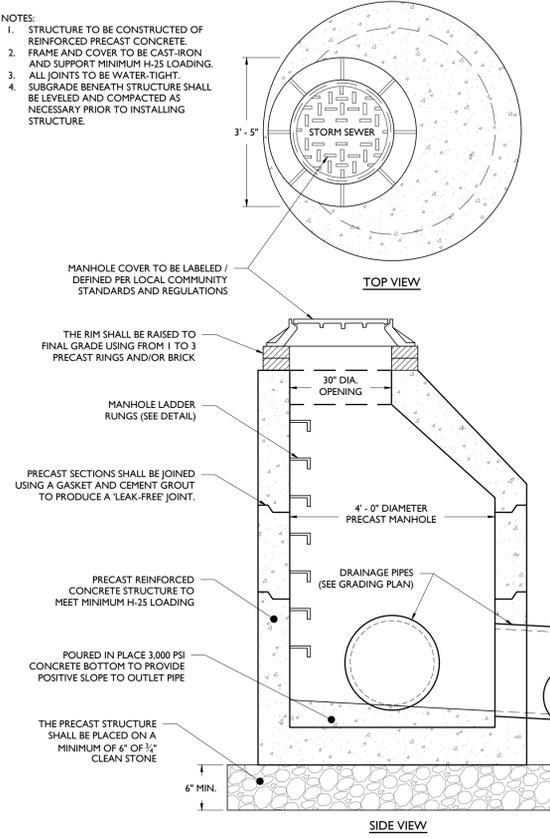


TYPE 'B' STORM INLET DETAIL

NOT TO SCALE

2

- NOTES:
- STRUCTURE TO BE CONSTRUCTED OF REINFORCED PRECAST CONCRETE.
 - FRAME AND COVER TO BE CAST-IRON AND SUPPORT MINIMUM H-25 LOADING.
 - ALL JOINTS TO BE WATER-TIGHT.
 - SUBGRADE BENEATH STRUCTURE SHALL BE LEVELED AND COMPACTED AS NECESSARY PRIOR TO INSTALLING STRUCTURE.

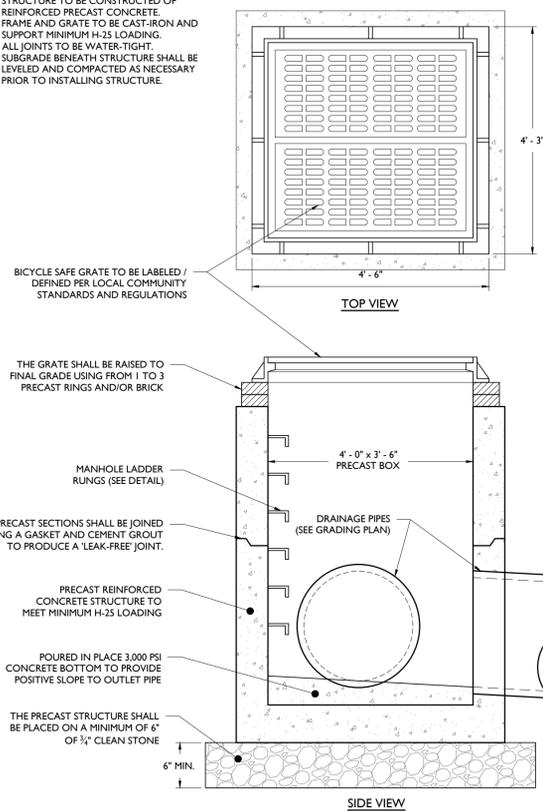


STORM MANHOLE DETAIL

NOT TO SCALE

3

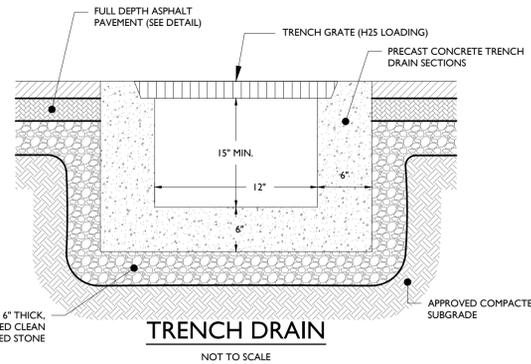
- NOTES:
- STRUCTURE TO BE CONSTRUCTED OF REINFORCED PRECAST CONCRETE.
 - FRAME AND GRATE TO BE CAST-IRON AND SUPPORT MINIMUM H-25 LOADING.
 - ALL JOINTS TO BE WATER-TIGHT.
 - SUBGRADE BENEATH STRUCTURE SHALL BE LEVELED AND COMPACTED AS NECESSARY PRIOR TO INSTALLING STRUCTURE.



TYPE 'E' STORM INLET DETAIL

NOT TO SCALE

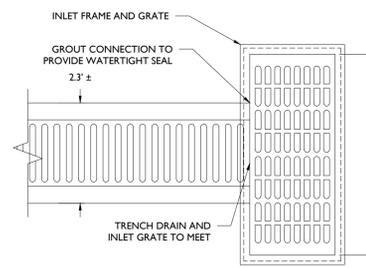
4



TRENCH DRAIN

NOT TO SCALE

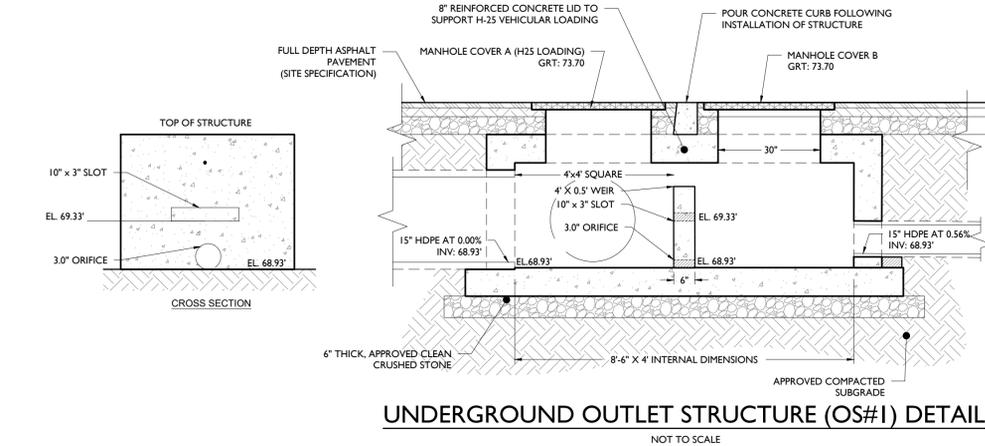
- NOTE:
- SEE DRAINAGE PLAN FOR DIRECTION OF INTERNAL DRAINAGE FLOWS. INTERNAL DEPTH TO VARY TO PROVIDE 0.5% SLOPE IN DIRECTION NOTED ON PLAN.



TRENCH DRAIN AND INLET CONNECTION DETAIL

NOT TO SCALE

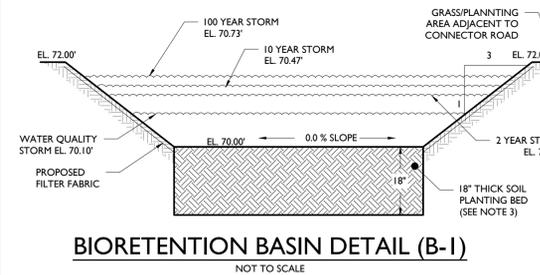
7



UNDERGROUND OUTLET STRUCTURE (OS#1) DETAIL

NOT TO SCALE

6

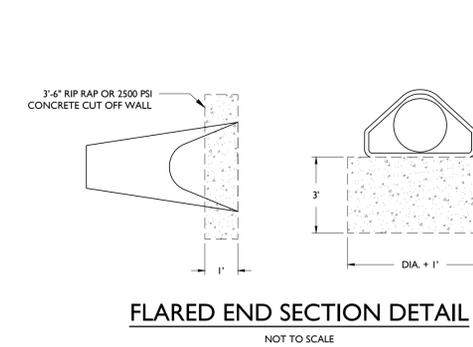


BIORETENTION BASIN DETAIL (B-1)

NOT TO SCALE

- NOTES:
- BIORETENTION AREA CONSTRUCTION MUST NOT COMPACT SOILS BELOW SOIL BED BOTTOM.
 - THE PLANTING SOIL BED SHALL CONSIST OF THE FOLLOWING MIX: 85%-95% SANDS WITH <25% OF THE SANDS CLASSIFIED AS FINE OR VERY FINE, <15% SILT AND CLAY WITH 2%-5% CLAY CONTENT. THE MIX SHALL BE AMENDED WITH 5%-7% ORGANICS. pH LEVELS SHALL RANGE FROM 5.5 TO 6.5. THE SOIL MIX MUST BE CERTIFIED BY EITHER THE VENDOR OR A LICENSED PROFESSIONAL ENGINEER DURING ONSITE MIXING.
 - THE PLANTING SOIL BED SHALL BE PLACED IN 12" TO 18" LIFTS.
 - REFER TO THE LANDSCAPING PLANS FOR BIORETENTION AREA PLANTINGS.

8



FLARED END SECTION DETAIL

NOT TO SCALE

9

NO.	DATE	ISSUE	BY	DESCRIPTION
2	07/23/2019	PD		
1	06/20/2019	CIS		

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #6.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

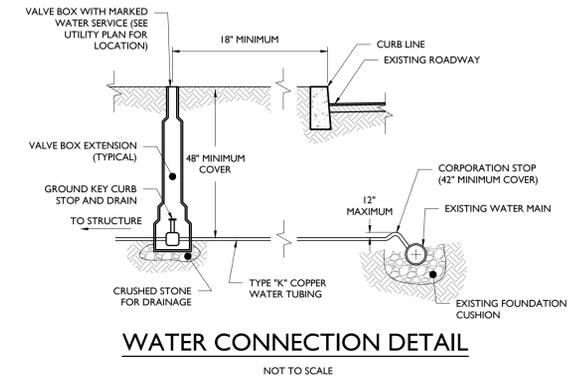
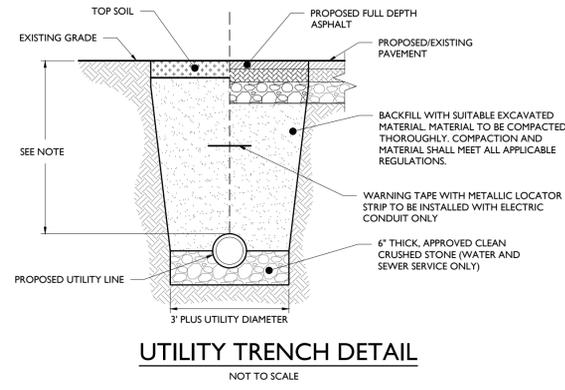
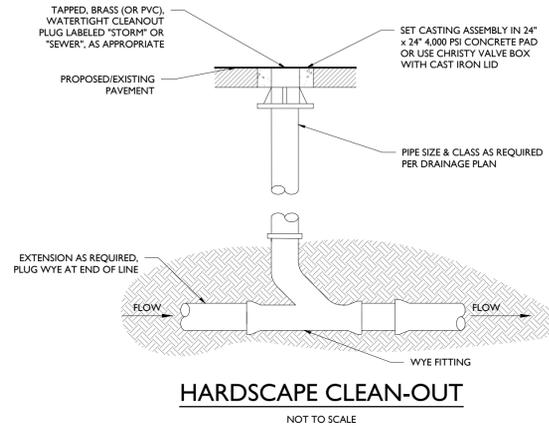
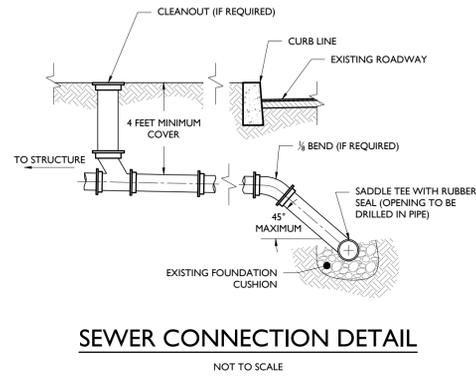
STONEFIELD
engineering & design

SCALE: AS SHOWN PROJECT ID: Z-18070

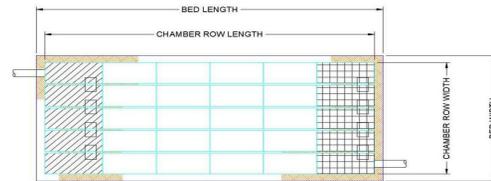
TITLE:
CONSTRUCTION DETAILS

DRAWING:
C-17

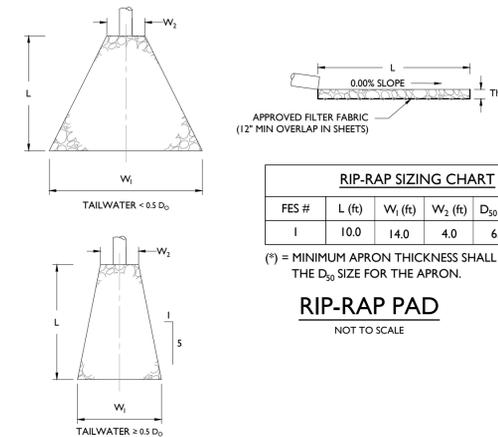
Z:\PROJECTS\2018\21801\DOUGLAS GENERAL - 21 CENTRAL AVENUE, TOPS LEVEL, INFO\CDR\DTL\DP-H-2B-DTL.DWG



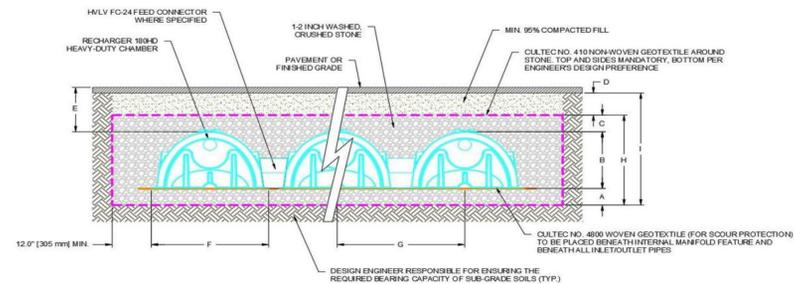
NOTE:
MINIMUM PIPE COVER SHALL BE AS FOLLOWS:
 • ELECTRIC SERVICE - PER APPLICABLE UTILITY AUTHORITY
 • GAS SERVICE - PER APPLICABLE UTILITY AUTHORITY
 • SEWER SERVICE - 36" MINIMUM
 • WATER SERVICE - 48" MINIMUM



Bed Layout Information		
Number of Rows Wide	16	pieces
Number of Chambers Long	15	pieces
Chamber Row Width	63.00	feet
Chamber Row Length	95.95	feet
MAX Bed Width	65.00	feet
Bed Length	97.95	feet
Bed Area Required	6366.75	sq. feet
Length of Separator Row	N/A	feet



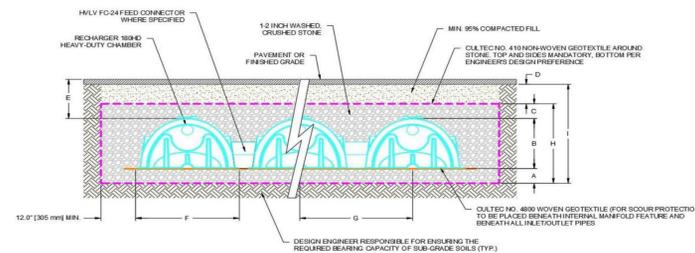
Bed Layout Information		
Number of Rows Wide	16	pieces
Number of Chambers Long	10	pieces
Chamber Row Width	63.00	feet
Chamber Row Length	64.30	feet
MAX Bed Width	65.00	feet
Bed Length	66.30	feet
Bed Area Required	4309.50	sq. feet
Length of Separator Row	N/A	feet



Cross Section Table Reference		
A	Depth of Stone Base	6.0 inches
B	Chamber Height	20.5 inches
C	Depth of Stone Above Units	6.0 inches
D	Depth of 95% Compacted Fill	8.0 inches
E	Max. Depth Allowed Above the Chamber	12.00 feet
F	Chamber Width	36.0 inches
G	Center to Center Spacing	4.00 feet
H	Effective Depth	2.71 feet
I	Bed Depth	3.38 feet

CULTEC R180HD STORMWATER CHAMBER SYSTEM (B-1)

NOT TO SCALE



Cross Section Table Reference		
A	Depth of Stone Base	6.0 inches
B	Chamber Height	20.5 inches
C	Depth of Stone Above Units	6.0 inches
D	Depth of 95% Compacted Fill	8.0 inches
E	Max. Depth Allowed Above the Chamber	12.00 feet
F	Chamber Width	36.0 inches
G	Center to Center Spacing	4.00 feet
H	Effective Depth	2.71 feet
I	Bed Depth	3.38 feet

CULTEC R180HD STORMWATER CHAMBER SYSTEM (B-2)

NOT TO SCALE

STONEFIELD
engineering & design

Rutherford, NJ - Princeton, NJ - Long Island City, NY - Royal Oak, MI
www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN
PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

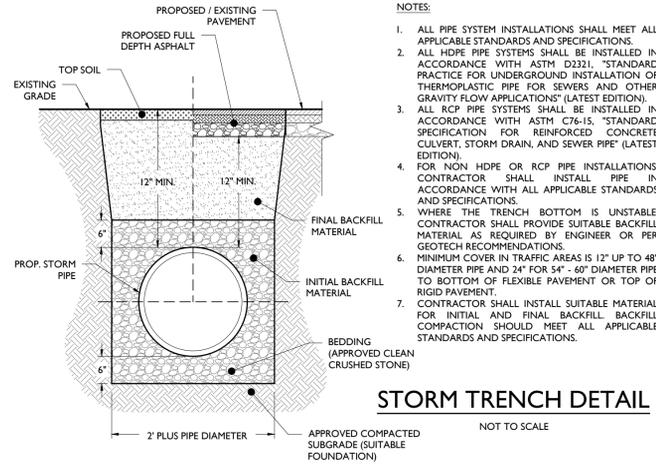
STONEFIELD
engineering & design

SCALE: AS SHOWN PROJECT ID: Z-18070

TITLE:
CONSTRUCTION DETAILS

DRAWING:

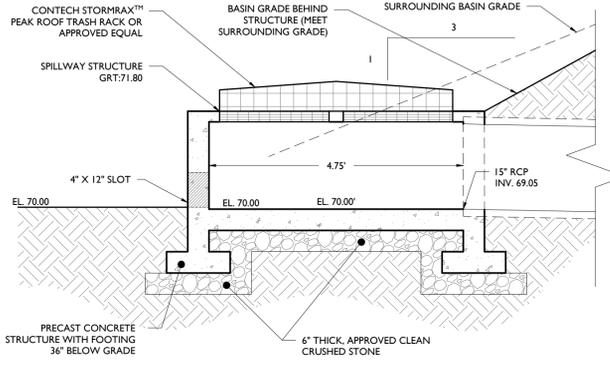
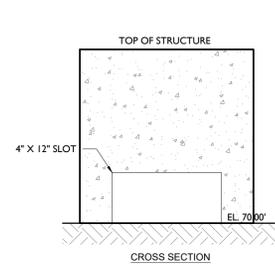
C-18



- NOTES:**
1. ALL PIPE SYSTEM INSTALLATIONS SHALL MEET ALL APPLICABLE STANDARDS AND SPECIFICATIONS.
 2. ALL HDPE PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321. "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS" (LATEST EDITION).
 3. ALL RCP PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM C76-15. "STANDARD SPECIFICATION FOR REINFORCED CONCRETE CULVERT, STORM DRAIN, AND SEWER PIPE" (LATEST EDITION).
 4. FOR NON HDPE OR RCP PIPE INSTALLATIONS, CONTRACTOR SHALL INSTALL PIPE IN ACCORDANCE WITH ALL APPLICABLE STANDARDS AND SPECIFICATIONS.
 5. WHERE THE TRENCH BOTTOM IS UNSTABLE, CONTRACTOR SHALL PROVIDE SUITABLE BACKFILL MATERIAL AS REQUIRED BY ENGINEER OR PER GEOTECH RECOMMENDATIONS.
 6. MINIMUM COVER IN TRAFFIC AREAS IS 12" UP TO 48" DIAMETER PIPE AND 24" FOR 54" - 60" DIAMETER PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.
 7. CONTRACTOR SHALL INSTALL SUITABLE MATERIAL FOR INITIAL AND FINAL BACKFILL. BACKFILL COMPACTION SHOULD MEET ALL APPLICABLE STANDARDS AND SPECIFICATIONS.

STORM TRENCH DETAIL

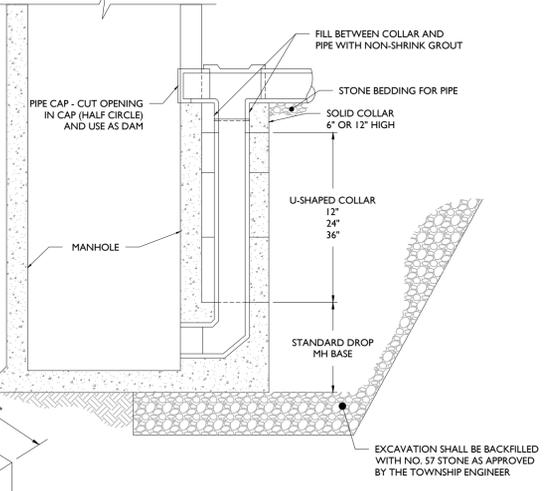
NOT TO SCALE



ABOVE-GROUND OUTLET STRUCTURE (OS#2) DETAIL

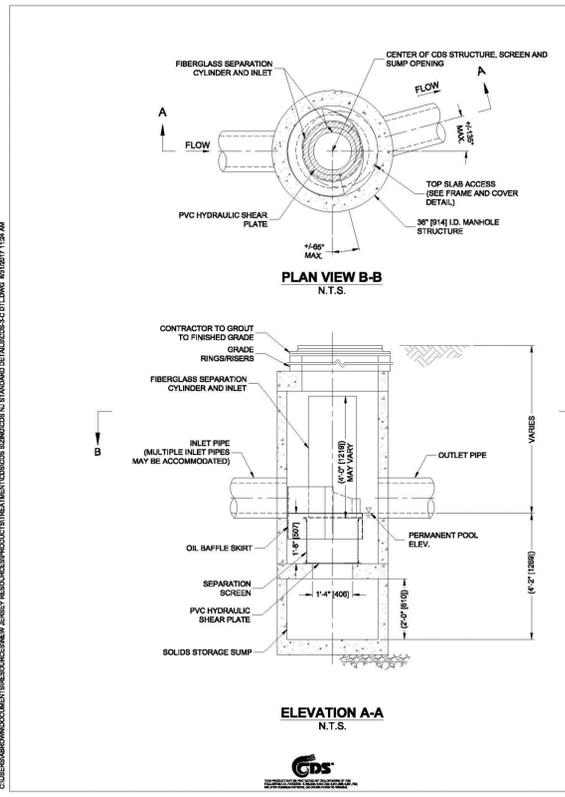
NOT TO SCALE

- NOTE:**
1. STRUCTURE SHALL SUPPORT H2S LOADING.
 2. STRUCTURE TO BE CONSTRUCTED OF REINFORCED PRECAST CONCRETE.
 3. ALL JOINTS TO BE WATER-TIGHT.
 4. TRASH RACKS CONSTRUCTED OF NON-CORROSIVE MATERIALS TO BE PROVIDED.



SANITARY PRECAST DROP SEWER CONNECTION RISERS

NOT TO SCALE



CDS-3-C (CDS1515) DESIGN NOTES

CDS-3-C RATED TREATMENT CAPACITY IS 0.52 (14.72 L/s) CFS. IF THE SITE CONDITIONS EXCEED 6.0 (170 L/s) CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CDS-3-C HAS A MINIMUM OIL STORAGE CAPACITY OF 34 GALLONS AND A MINIMUM SUMP CAPACITY OF 0.6 CUBIC YARDS.

THE STANDARD CDS-3-C CONFIGURATION IS SHOWN.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	WQ-1
WATER QUALITY FLOW RATE (CFS OR L/s)	0.35 CFS
PEAK FLOW RATE (CFS OR L/s)	2.74 CFS
RETURN PERIOD OF PEAK FLOW (YRS)	-
SCREEN APERTURE (2400 OR 4700)	-
PIPE DATA:	I.E. MATERIAL DIAMETER
INLET PIPE 1	RCP 15"
INLET PIPE 2	RCP 15"
OUTLET PIPE	-
RIM ELEVATION	72.94 FT
ANTI-FLOTATION BALLAST	WIDTH HEIGHT
NOTES/SPECIAL REQUIREMENTS:	-
* PER ENGINEER OF RECORD	

- GENERAL NOTES:**
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
 2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
 3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
 4. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLY STRUCTURE.
 5. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
 6. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.
- INSTALLATION NOTES:**
- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
 - C. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
 - D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION RELATED EROSION RUNOFF.
 - E. CONTRACTOR TO REMOVE TRANSFER HOLE COVERS PRIOR TO PLACING SYSTEM ONLINE.

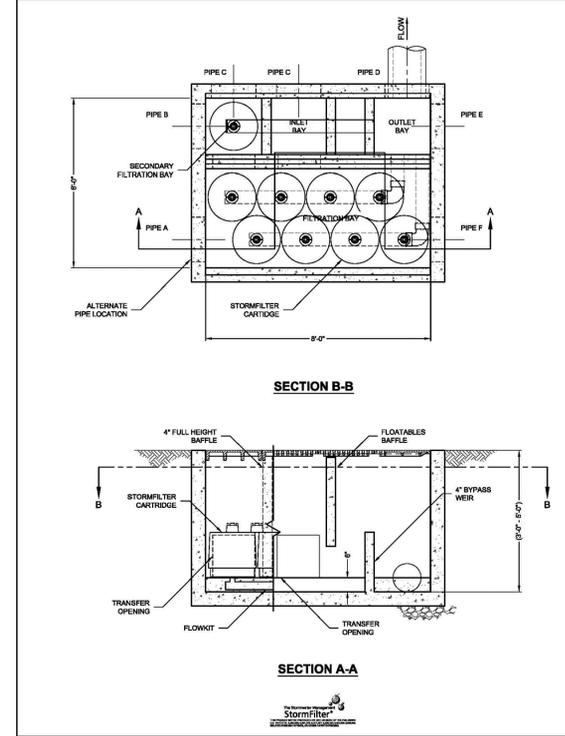
CONTECH ENGINEERED SOLUTIONS LLC

9028 Centre Parkway, Suite 400, West Chester, OH 45380
800-338-1122 513-845-7000 513-845-7865 FAX

CDS-3-C (CDS1515) ONLINE CDS STANDARD DETAIL

WATER QUALITY UNIT (WQ-1)

NOT TO SCALE



6' x 8' LINEAR GRATE STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD VAULT STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (6). VAULT MAY BE CONSTRUCTED WITH NO SECONDARY FILTRATION BAY, ALLOWING FOR 0) CARTRIDGES AND ADDITIONAL INLET PIPE LOCATIONS.

CARTRIDGE SELECTION	27"	18"	LOW DROP*
RECOMMENDED HYDRAULIC DROPT (h)	3.00	2.3	1.8
SPECIFIC FLOW RATE (gpm/ft)	2 gpm/ft	1.87 gpm/ft	1.87 gpm/ft
CARTRIDGE FLOW RATE (gpm)	22.5	18.75	15
PEAK HYDRAULIC CAPACITY	27"	18"	LOW DROP*
CARTRIDGE HEIGHT	3"	4"	3"
DEPTH (RM TO INVERT)	18"	15.87"	12.75"
PEAK TREATMENT CAPACITY (CFS)	1.87	1.50	1.25
PEAK TREATMENT CAPACITY (GPM)	15.87	12.75	10.42

* 1.87 gpm/ft SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHORUS[®] (P30CR8) MEDIA ONLY.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	WQ-2
WATER QUALITY FLOW RATE (CFS OR L/s)	0.02 CFS
PEAK FLOW RATE (CFS OR L/s)	1.79 CFS
RETURN PERIOD OF PEAK FLOW (YRS)	-
SCREEN APERTURE (2400 OR 4700)	-
PIPE DATA:	I.E. MATERIAL DIAMETER
INLET PIPE 1	RCP 15"
INLET PIPE 2	RCP 15"
OUTLET PIPE	-
RIM ELEVATION	73.10 FT
ANTI-FLOTATION BALLAST	WIDTH HEIGHT
NOTES/SPECIAL REQUIREMENTS:	-
* PER ENGINEER OF RECORD	

- GENERAL NOTES:**
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
 2. DIMENSIONS MARKED WITH (1) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
 3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
 4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
 5. STRUCTURE SHALL MEET ASHTO H202 LOAD RATING, ASSUMING EARTH COVER OF 0' - 8" AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET ASHTO M202 AND BE CAST WITH THE CONTECH LOGO.
 6. FILTER CARTRIDGES SHALL BE MEDIA FILLS: PASSIVE, SIPHON ACTIVATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 7" INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
 7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).
 8. STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-407 AND ASHTO LOAD FACTOR DESIGN METHOD.
- INSTALLATION NOTES:**
- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER VAULT (LIFTING CLUTCHES PROVIDED).
 - C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL VAULT SECTIONS AND ASSEMBLY VAULT.
 - D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
 - E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION RELATED EROSION RUNOFF.
 - F. CONTRACTOR TO REMOVE TRANSFER HOLE COVERS PRIOR TO PLACING SYSTEM ONLINE.

CONTECH ENGINEERED SOLUTIONS LLC

9028 Centre Parkway, Suite 400, West Chester, OH 45380
800-338-1122 513-845-7000 513-845-7865 FAX

6' x 8' LINEAR GRATE STORMFILTER STORMFILTER STANDARD DETAIL

WATER QUALITY UNIT (WQ-2)

NOT TO SCALE

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #6.01, BLOCK 41.01, LOT 1
1924 NEW JERSEY STATE ROUTE 37
TOWNSHIP OF MANCHESTER
OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47390
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: AS SHOWN PROJECT ID: Z-18070

TITLE: **CONSTRUCTION DETAILS**

DRAWING: **C-19**

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

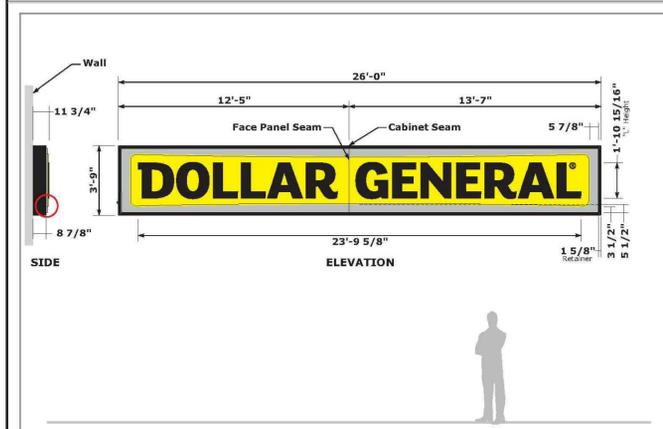
166

167

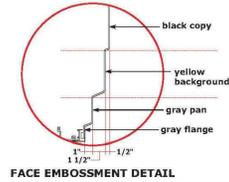
168

169

DOLLAR GENERAL 3'-9" x 26'-0" WALL CABINET



.150" clear UV polycarbonate (Spartech) pan formed face with Black copy over Spraylat C8-2633 Yellow on PMS Cool Gray 5 background. Cabinet to be painted Semi-Gloss Black.

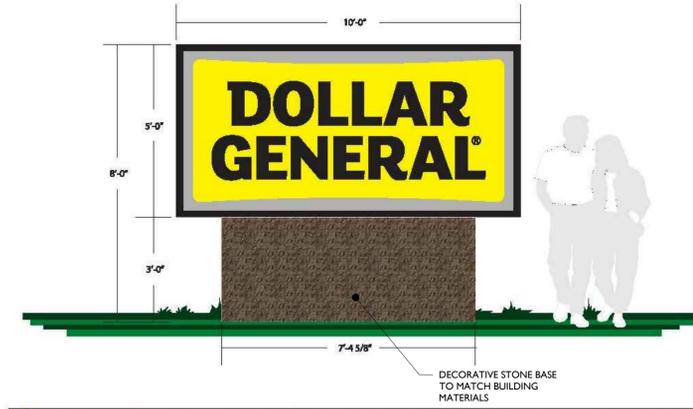


SQUARE FOOTAGE	COLOR SPECIFICATIONS
ACTUAL	Yellow: match Spraylat C8-2633
97.50 sq. ft.	Embossed Aluminum: match Spraylat M8-171
	Black (Copy): match Spraylat Black
	Semi-Gloss Black (Metal): match Black Polyurethane
	Cool Gray: match PMS Cool Gray 5
	Rock Bottom Gray: match Sherwin Williams SW7062
	Green: match PMS 368C

DOLLAR GENERAL File Name: Dollar General Cutsheets 2013
 Project #: 13-0181 Page 11 of 33
 Date: 08/30/2013
 Approved By: [Signature]

135 SOUTH DAVID LANE
 KNOXVILLE, TN 37922
 OFFICE: 615-539-4001
 FAX: 615-539-0851
 WWW.LINKENBERG.COM

DOLLAR GENERAL WALL SIGN
 NOT TO SCALE



Everbrite	DISCLAIMER: This sign is for general purposes only and not intended for advertising or promotional use. For advertising or promotional use, please contact Everbrite for more information.
Customer: KUMCON	Description: M50 @ 8' OAH
Project No: 402659	Scale: M50 @ 8' OAH
Date: 03/05/19	Drawn By: KRVV
Location & Site No: NEC of Ridgeway Rd & Washington Ave Manchester, NJ	Revised: [Blank]
	Revised: [Blank]
	Customer Signature: [Blank]
	DATE: [Blank]
	Location Signature: [Blank]
	DATE: [Blank]

DOLLAR GENERAL MONUMENT SIGN

NOTES:
 1. SIGN FACE WILL BE INTERNALLY ILLUMINATED

NOT TO SCALE

PER COMMENTS FOR PLANNING BOARD SUBMISSION	PD	BY	DESCRIPTION
	07/23/2019	CIS	
	06/20/2019	CIS	
	2	ISSUE	
	1	DATE	

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
 engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
 www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
 Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
 1924 NEW JERSEY STATE ROUTE 37
 TOWNSHIP OF MANCHESTER
 OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
 NEW JERSEY LICENSE No. 47290
 LICENSED PROFESSIONAL ENGINEER

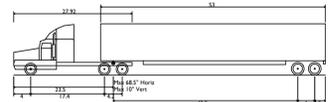
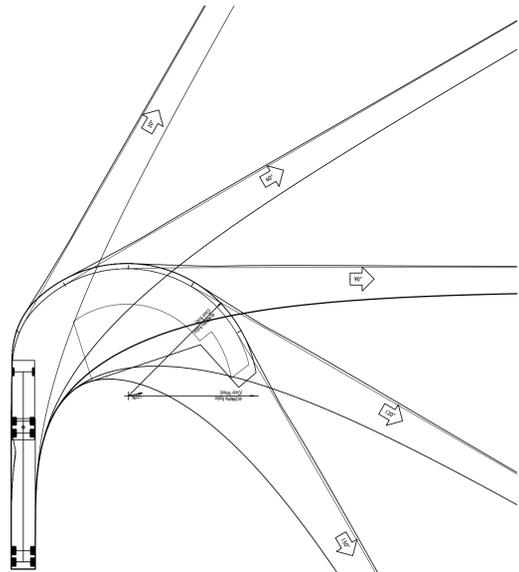
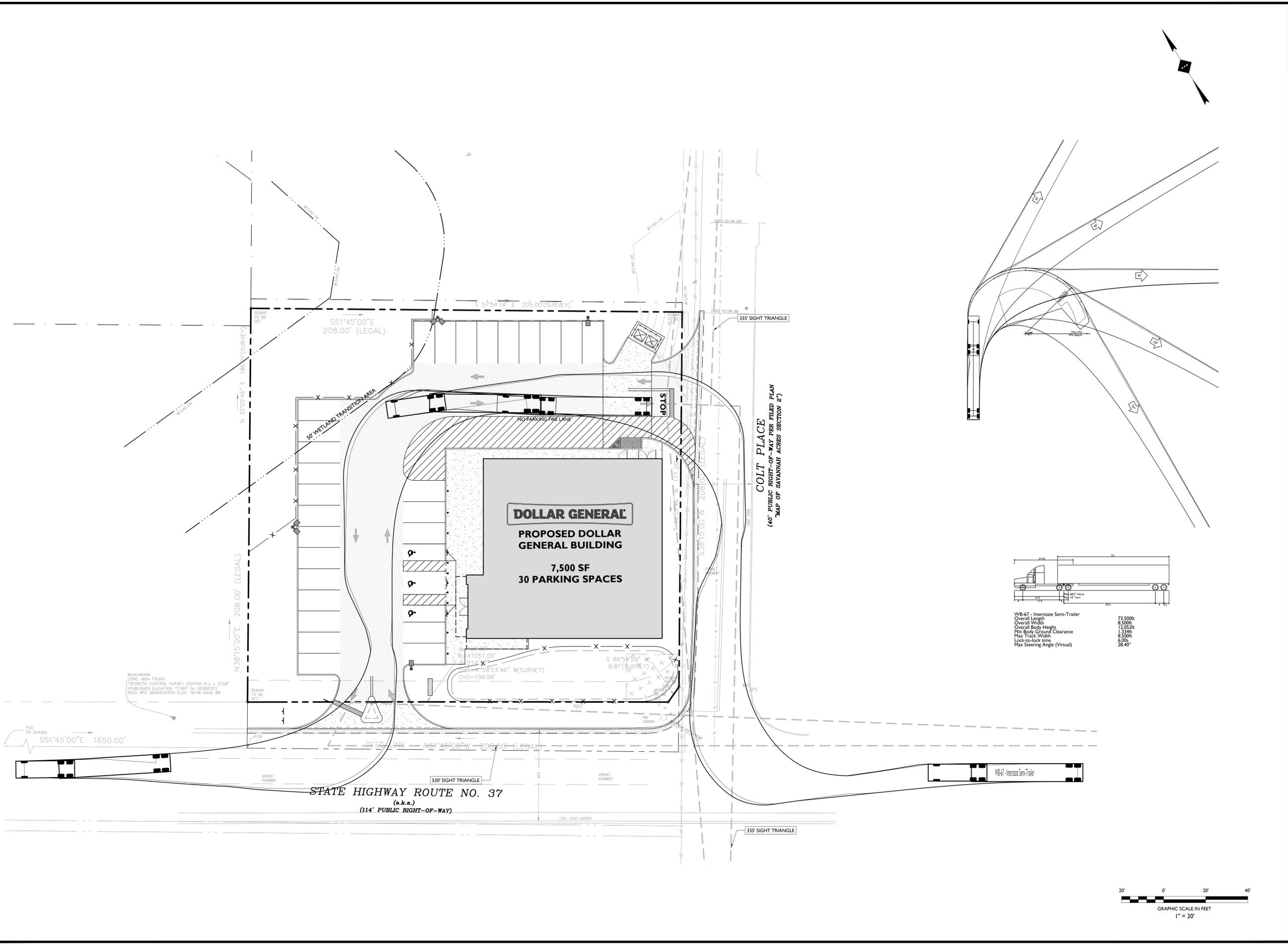
STONEFIELD
 engineering & design

SCALE: AS SHOWN PROJECT ID: Z-18070

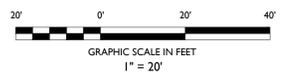
TITLE:
CONSTRUCTION DETAILS

DRAWING:
C-20

Z:\PROJECTS\2020\1870 DOLLAR GENERAL - 21 CENTRAL AVENUE, TORR HILLS, NJ\CD\PROJECT\DWG_21TRUCK TURNING PLAN.DWG



WB-47 - Interstate Semi-Trailer
 Overall Length: 73.500ft
 Overall Width: 8.500ft
 Overall Body Height: 12.052ft
 Min Body Ground Clearance: 1.34ft
 Max Track Width: 8.500ft
 Lock-to-lock time: 6.00s
 Max Steering Angle (Virtual): 28.40°



ISSUE	DATE	BY	DESCRIPTION
2	07/23/2019	PD	PER COMMENTS FOR PLANNING BOARD SUBMISSION
1	06/20/2019	CIS	

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
 engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
 www.stonefielddesign.com

15 Spring Street, Princeton, NJ 08542
 Phone 609.362.6900

PRELIMINARY AND FINAL MAJOR SITE PLAN

PROPOSED RETAIL STORE

DOLLAR GENERAL

TAX MAP SHEET #8.01, BLOCK 41.01, LOT 1
 1924 NEW JERSEY STATE ROUTE 37
 TOWNSHIP OF MANCHESTER
 OCEAN COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
 NEW JERSEY LICENSE No. 47290
 LICENSED PROFESSIONAL ENGINEER

STONEFIELD
 engineering & design

SCALE: 1" = 20' PROJECT ID: Z-18070

TITLE:
TRUCK TURNING PLAN

DRAWING:
C-21



STONEFIELD
engineering & design

ENVIRONMENTAL IMPACT STATEMENT

DOLLAR GENERAL®

**PROPOSED DOLLAR GENERAL RETAIL STORE
BLOCK 41.01, LOT 1
1927 STATE ROUTE 37
MANCHESTER TOWNSHIP
OCEAN COUNTY, NEW JERSEY**

PREPARED FOR:

MANCHESTER (ROUTE 37) DG, LLC

PREPARED BY:

STONEFIELD ENGINEERING & DESIGN, LLC
JUNE 20, 2019
Z-18070

JEFFREY A. MARTELL PE, PP, LEED AP
NEW JERSEY PROFESSIONAL ENGINEER LICENSE # 47290

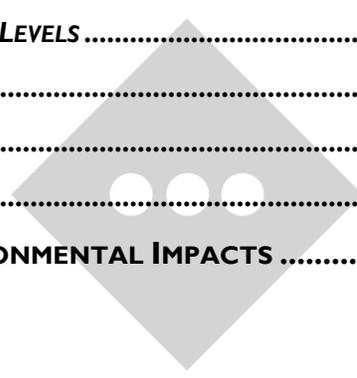
stonefieldeng.com

92 Park Avenue, Rutherford, NJ 07070 t. 201.340.4468 t. 201.340.4472 f.



REPORT CONTENTS

1.0	SITE DESCRIPTION.....	1
2.0	INVENTORY OF EXISTING ENVIRONMENTAL CONDITIONS	1
2.1	AIR & WATER QUALITY.....	1
2.2	WATER SUPPLY.....	1
2.3	HYDROLOGY & STORMWATER.....	1
2.4	GEOLOGY.....	2
2.5	SOILS.....	3
2.6	SEWERAGE SYSTEM.....	3
2.7	TOPOGRAPHY & SLOPE	3
2.8	VEGETATION, WILDLIFE HABITAT, AND AQUATIC ORGANISMS.....	3
2.9	NOISE CHARACTERISTICS AND LEVELS	5
2.10	DEMOGRAPHY & LAND USE	5
2.11	AESTHETICS & HISTORY	6
2.12	TRAFFIC.....	6
3.0	ENVIRONMENTAL IMPACT ASSESSMENT.....	6
3.1	AIR & WATER QUALITY.....	6
3.2	WATER SUPPLY.....	7
3.3	HYDROLOGY & STORMWATER.....	7
3.4	GEOLOGY.....	7
3.5	SOILS.....	8
3.6	SEWERAGE SYSTEM.....	8
3.7	TOPOGRAPHY & SLOPE	8
3.8	VEGETATION ,WILDLIFE HABITAT, AND AQUATIC ORGANISMS.....	9
3.9	NOISE CHARACTERISTICS AND LEVELS	9
3.10	DEMOGRAPHY & LAND USE	9
3.11	AESTHETICS & HISTORY	9
3.12	TRAFFIC.....	9
4.0	STEPS TO MINIMIZE ENVIRONMENTAL IMPACTS	10





APPENDICIES

PROJECT FIGURES.....A
 AERIAL MAP..... FIGURE 1
 USGS LOCATION MAP..... FIGURE 2
 TAX/ZONING MAP..... FIGURE 3
 NJDEP GEOWEB WETLANDS LOCATIONS MAP..... FIGURE 4
NRCS COUNTY SOILS SURVEY..... B
NATIONAL HERITAGE DATABASE REPORT C
GEOTECHNICAL SERVICES REPORTD



1.0 SITE DESCRIPTION

Manchester (Route 37) DG, LLC is proposing the construction of a Dollar General retail store. The subject property is designated Block 41.01, Lot 1 commonly known as 1924 New Jersey Route-37. The subject property is located within the Highway Development (HD-3) Zoning District and is bounded by Colt Place to the east, State Highway Route 37 to the south and residential properties to the west and vacant lots along Colt Place. The total project area is 37,960 SF (0.87 acres). Project Figures can be found in Appendix A of this Report.

Under existing conditions, the site is undeveloped and heavily wooded. The proposed development includes clearing the existing wooded area to construct a 7,500 SF Dollar General retail store and supporting improvements inclusive of parking facilities, landscape, utilities, site lighting, and stormwater management facilities. Under existing conditions no access is provided to the site due to lack of development.

This Environmental Impact Statement has been prepared per the Manchester Township requirements to investigate the existing conditions of the property, evaluate the potential impacts of the proposed redevelopment, and discuss the measures to mitigate environmental impacts, if any.

2.0 INVENTORY OF EXISTING ENVIRONMENTAL CONDITIONS

2.1 AIR & WATER QUALITY

Air quality and water quality on-site is likely enhanced by vegetation and the absence of a commercial development under existing conditions.

2.2 WATER SUPPLY

The site is currently undeveloped and does not have water supply. Per the Survey prepared by Valley Land Services, LLC, a water main is located at the intersection of Colt Place and State Route 37 which connects to the existing fire hydrant at the corner of the intersection.

2.3 HYDROLOGY & STORMWATER

Under existing conditions, the site is comprised of two (2) drainage areas. The site consists of several berms where slopes vary greatly. Slopes vary from 2% to 58% in the north, 1.5% to 25% in the east, 0.7% to 16% in the west, and 5% to 33% in the south. A portion of the site slopes to the east towards Colt Place. This stormwater delineated as drainage area E-1 flows overland from the site and is collected by the existing conveyance system

located at the corner of Colt Place and First Street. The remaining portion of the site slopes from the front of the site to the north western corner of the site, delineated as drainage area E-2.

2.4 GEOLOGY

A Geotechnical Engineering Services Report was prepared by Professional Service Industries Inc. (PSI). Regarding the geology on-site, PSI utilized NJDEP GeoWeb mapping and found that the surficial geology at the site is mapped as Upland Gravel, Lower Phase (Q_{tu}). This formation's lithology is described as "fine to medium sand, minor coarse sand, slightly clayey in places, and pebble gravel, yellow, very pale brown, reddish-yellow". Generally, less than 5 feet thick but can be as much as 10 feet thick laid down by groundwater seepage on pediments, pebble concentrates from winnowing sand from older surficial deposits, and from the Cohansey Formation from groundwater sapping or surface runoff.

PSI also reported that below the surficial deposits, the "Bedrock Geologic Map of the Lakehurst Quadrangle – Ocean County, New Jersey" (by Sugarman, Castelli, et al., 2016) indicates that the project site is underlain by the Cohansey Formation (T_{ch}), which is a Coastal Plain sediment formation. The Coastal Plain sediments of this formation consists of sand (light brown to dark-yellowish-orange and yellowish-gray to light gray; medium to coarse grained) with pebbles and commonly cross-bedded. The overall thickness of this formation can be up to 100 feet and typically underlain by other Coastal Plain formations.

Based on nine SPT borings drilled to boring termination depths ranging from approximately 10 to 22 feet below the existing ground surface (bgs), the generalized subsurface stratigraphy below the surficial materials typically consisted of FILL or Alluvium overtop Coastal Plain sediments to the respective boring terminated depths. The soils typically consisted of Sands with varying amounts of silts. Based on the SPT N-values, the soils exhibited very loose to loose relative densities to typical depths ranging from approximately 4 to 6 feet below existing ground surface. However, at Boring B-1 soils with loose relative densities extended to a depth of 10 feet.

2.5 SOILS

The site is underlain by the following soil classifications, based upon the County Soil Survey (Appendix B):

TABLE I: NRCS PROJECT SOILS

Soil Unit Code	Soil Description	Approximate Project Coverage	Hydrologic Soil Group
AtsAO	Atsion Sand, 0 to 2 percent slopes, Northern Tidewater Area	98.7%	D
LakB	Lakehurst Sand, 0 to 5 percent slopes	1.3%	A

The hydrologic soil group classifications above have been utilized in the landcover data for the stormwater analysis performed on the project.

2.6 SEWERAGE SYSTEM

The site is currently undeveloped and does not have sewer supply. Per the Survey prepared by Valley Land Services, LLC, a sewer manhole is located to the far east located next to Savannah Road. Per NJDEP GeoWeb, the site is located within a sewer service area within the jurisdiction of....

2.7 TOPOGRAPHY & SLOPE

The site consists of several berms where slopes vary greatly. The site slopes from the front of the site to the north western portion of the site as well as to the east of the site towards Colt Place. Slopes vary from 2% to 58% in the north, 1.5% to 25% in the east, 0.7% to 16% in the west, and 5% to 33% in the south.

2.8 VEGETATION, WILDLIFE HABITAT, AND AQUATIC ORGANISMS

In accordance with NJDEP regulations a National Heritage Database request was submitted to determine if any rare species of animals, plants or ecological communities existing on-site or within a one-mile radius of the site. A copy of the NHD report and definitions of the code used in the response can be found in Appendix C of this Report.

Per the NJDEP's Natural Heritage Database (NHD), there are endangered or threatened fauna's flora and or habitats on-site: the species recorded on site and within the vicinity of the site are summarized in the following tables:

TABLE II: RARE WILDLIFE SPECIES OR WILDLIFE HABITAT ON-SITE: SPECIES BASED PATCHES

<i>Scientific Name</i>	<i>Common Name</i>	<i>Federal Protection</i>	<i>State Protection</i>	<i>Global Rank</i>	<i>State Rank</i>
Pituophis Melanoleucus	Northern Pine Snake	N/A	State Threatened	G4T4	S2

TABLE III: RARE WILDLIFE SPECIES OR WILDLIFE HABITAT WITHIN THE IMMEDIATE VICINITY OF THE SITE: SPECIES BASED PATCHES

<i>Scientific Name</i>	<i>Common Name</i>	<i>Federal Protection</i>	<i>State Protection</i>	<i>Global Rank</i>	<i>State Rank</i>
Hyla Andersonii	Pine Barrens Treefrog (Breeding Sighting)	N/A	State Threatened	G4	S2
Hyla Andersonii	Pine Barrens Treefrog (Occupied Habitat)	N/A	State Threatened	G4	S2
Ardea Herodias	Great Blue Heron	N/A	Special Concern	G5	S3B,S4N
Pituophis Melanoleucus	Northern Pine Snake	N/A	State Threatened	G4T4	S2

TABLE IV: RARE WILDLIFE SPECIES OR WILDLIFE HABITAT WITHIN ONE-MILE OF THE SITE: SPECIES BASED PATCHES

<i>Scientific Name</i>	<i>Common Name</i>	<i>Federal Protection</i>	<i>State Protection</i>	<i>Global Rank</i>	<i>State Rank</i>
Hyla Andersonii	Pine Barrens Treefrog (Breeding Sighting)	N/A	State Threatened	G4	S2
Hyla Andersonii	Pine Barrens Treefrog (Occupied Habitat)	N/A	State Threatened	G4	S2
Hyla Andersonii	Pine Barrens Treefrog (Vernal Pool Breeding)	N/A	State Threatened	G4	S2
Strix Varia	Barred Owl	N/A	State Threatened	G5	S2B,S2N
Accipiter Cooperii	Cooper's Hawk	N/A	Special	G5	S3B,S4N

			Concern		
Ardea Herodias	Great Blue Heron	N/A	Special Concern	G5	S3B,S4N
Sternula Antillarum	Least Tern	N/A	State Endangered	G4	S1B,S1N
Egretta Thula	Snowy Egret	N/A	Special Concern	G5	S3B,S4N
Hesperia Attalus Slossonae	Dotted Skipper	N/A	Special Concern	G3G4T3	S3
Pantherophis Guttatus	Corn Snake	N/A	State Endangered	G5	S1
Pituophis Melanoleucus	Northern Pine Snake	N/A	State Threatened	G4T4	S2

TABLE V: OTHER ANIAML SPECIES ON THE PROJECT SITE, WITHIN THE IMMEDIATE VICINITY AND WITHIN ONE-MILE OF THE SITE BASED ON ADDITIONAL SPECIES TRACKED BY ENDANGERED AND NONGAME SPECIES PROGRAM

<i>Scientific Name</i>	<i>Common Name</i>	<i>Federal Protection</i>	<i>State Protection</i>	<i>Global Rank</i>	<i>State Rank</i>
Catocala Herodias Gerhardi	Herodias or Pine Barrens Underwing	N/A	N/A	G3T3	S3
Cicindela patruela consentanea	New Jersey Pine Barrens Tiger Beetle	N/A	N/A	G3T1T3	S2S3
Grammia placentia	Placentia Tiger Moth	N/A	N/A	G3G4	S1S3
Lithophane lemmeri	Lemmer's Noctuid Moth	N/A	N/A	G3G4	S2
Metarranthis pilosaria	Coastal Bog Metarranthis	N/A	N/A	G3G4	S3S4
Ptichodis bistrigata	Southern Ptichodis	N/A	N/A	G3	S1S3
Zanclonatha dentata	A Noctuid Moth	N/A	N/A	G3G4	S3

2.9 NOISE CHARACTERISTICS AND LEVELS

The site is currently undeveloped and does not contribute to the noise levels of the surrounding area. The prevailing noise levels are generated by the roadways that are adjacent to the site.

2.10 DEMOGRAPHY & LAND USE

The existing site is undeveloped and does not affect to the population of the municipality. Per NJDEP GeoWeb, the land use is currently classified as forest.

2.11 AESTHETICS & HISTORY

There are no portions of the site which would be considered to have unique, scenic and/or historic qualities.

2.12 TRAFFIC

Under existing conditions, the property receives no traffic due to the lack of development.

The site has approximately 200 feet of frontage along New Jersey Route 37 and approximately 177 feet of frontage along Colt Place.

A Level of Service and Volume/Capacity analysis was conducted for the 2018 Existing Condition during weekday evening and Saturday midday peak hours at the study intersections. Under the existing condition, the approaches at the unsignalized intersection of Route 37 and Colt Place are calculated to operate at overall Level of Service B during both the weekday evening peak hour and Saturday midday peak hours.

Please refer to the Traffic Impact Study prepared by Stonefield Engineering and Design for additional information.

3.0 ENVIRONMENTAL IMPACT ASSESSMENT

3.1 AIR & WATER QUALITY

Air quality on the developed site will likely be similar to that of surrounding commercial uses on New Jersey State Route 37 and Colt Place. As the site is currently undeveloped, there is potential negative air quality impacts due to the proposed development of the site with a commercial use and the increase in traffic. Landscaping is proposed along the perimeter of the site where feasible to mitigate any potential negative air quality impacts.

As the project will add 0.6 acres of new impervious area, there is potential negative water quality impacts due to the proposed development of the site. To offset this degradation, stormwater management measures are proposed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality storm by 50% of the anticipate load from the developed site. The stormwater best management practices (BMP) proposed on site include one underground detention basin that collect all of the runoff associated with the site and meet the total suspended solids removal (TSS) removal requirements as certified by the NJDEP BMP Manual.

3.2 WATER SUPPLY

The proposed development will require the installation of a 1” domestic water service line which will connect to the existing water main along Colt Place. The proposed water demand is summarized in the following table:

TABLE 2: SUMMARY OF PROPOSED WATER DEMAND

<i>Type of Establishment</i>	<i>Number of Measurement Units</i>	<i>Gallons per Day per Unit</i>	<i>Projected Flow (GPD)</i>
Retail	7,500 SF	0.125 Gal / SF	937.5
TOTAL FLOW			938 GPD

All values are based on N.J.A.C. Title 7, Chapter 10, Subchapter 12.6 "Water volume requirements", Table 1: Average Daily Water Demand

3.3 HYDROLOGY & STORMWATER

Under proposed conditions the site is comprised of six (6) drainage areas. Runoff from the building is conveyed via roof leaders into the underground basin. The southernmost parking area and pervious area along State Highway 37 is conveyed into the aboveground bio retention basin where it is pretreated before going into the underground basin, then connects to the system along Colt Place and First Street. The western and northern parking area is conveyed via the underground basins and is pretreated through a water quality unit before entering the basins. The western and northern pervious portion of the site as well as the rear portion of pervious area along Colt Place is undetained and flows off site.

The proposed project complies with all applicable stormwater management regulations and standards. Runoff quantity, recharge, and quality requirements are addressed by the implementation of cultic chamber system and an aboveground bioretention basin. As such, the project is not anticipated to have any adverse impacts or neighboring properties, downstream watercourses, or conveyance systems within the watershed.

Please refer to the Stormwater Management Report prepared by Stonefield Engineering & Design for additional information.

3.4 GEOLOGY

The geology on-site is to remain unchanged by the proposed development.

3.5 SOILS

Soils on-site will be unaffected by the proposed development, and existing soil conditions have been considered when designing the stormwater management practices to be utilized.

As the project proposes to disturb over 5,000 SF of land, an application to the Ocean County Soil Conservation District has been submitted for soil erosion and sediment control plan certification. A soil erosion plan has been included within the plan set and all temporary and permanent soil erosion measures have been designed in accordance with the Standards for Soil Erosion and Sediment Control Manual for New Jersey.

3.6 SEWERAGE SYSTEM

The proposed development will require the installation of a 4” sanitary sewer line and sewer main extension to the existing sewer manhole within the frontage of the adjacent development along New Jersey State Route 37. The sewer line piping will be installed at a minimum slope of 2.08% and the main will be installed at 0.50% within the right-of-way and outside the property. The sanitary sewer projected flow is summarized in the following table:

TABLE 3: SANITARY SEWER PROJECTED FLOW

<i>Type of Establishment</i>	<i>Number of Measurement Units</i>	<i>Gallons per Day per Unit</i>	<i>Projected Flow (GPD)</i>
Retail	7,500 SF	0.1 GAL/unit	750 GPD
TOTAL FLOW			750 GPD

All flow values are based on N.J.A.C. Title 7, Chapter 14A, Subchapter 23.3 "Projected Flow Criteria"

3.7 TOPOGRAPHY & SLOPE

Proposed grades throughout the site will be less steep than existing grades. A Cultec chambers system and aboveground bioretention basin are implemented to convey the runoff to the same two points-of interest as under existing conditions. The proposed finish floor elevation is 73.45 FT. Slopes on the developed portion of the site range from 1.5%-5%.

3.8 VEGETATION ,WILDLIFE HABITAT, AND AQUATIC ORGANISMS

The proposed development plans to mitigate any potential negative effects on endangered species on site. Development impacts do not extend off-site and will therefore not affect nearby threatened or endangered species within the vicinity of the site.

The existing wooded area within the proposed limit of disturbance of 41,239 SF (0.947 AC) is to be removed. A landscaping plan has been designed for the proposed development inclusive of trees, shrubs, ground cover, and perennials within the limit of disturbance. Shrubs are proposed along the perimeter of the parking area to provide a visual screen. Additionally, screening is proposed around the trash enclosure.

The proposed development exceeds the township requirement for proposed landscaped areas; the Township requires a minimum of 30% whereas 31.0% is proposed.

3.9 NOISE CHARACTERISTICS AND LEVELS

Noise levels will increase as a result of the proposed developed. The prevailing noise levels on site are generated from vehicular circulation onsite. The level of noise on the developed site will likely be similar to that of the surrounding commercial uses. Noise generated from the proposed development would not be considered significant as to greatly increase noise levels in the community, especially compared to the levels generated by the roadways. Proposed landscaping along the property lines will buffer noise levels. The levels of noise that will be generated by the improvements on site are in compliance with NJAC 7:29.

3.10 DEMOGRAPHY & LAND USE

The proposed land use is commercial and will not impact demographics. The municipality has zoned the site for business uses and thus the property is currently being underutilized due to its lack of development. A retail use is a compatible use for the property and the surrounding area.

3.11 AESTHETICS & HISTORY

There are no portions of the site which would be considered to have unique, scenic and/or historic qualities; as such, no impacts are anticipated.

3.12 TRAFFIC

Access is proposed via one (1) right-in/right-out driveway along Route 37 and one (1) full movement driveway along Colt Place. The proposed Dollar General building would be located in the southeastern corner of

the subject property and access to the track enclosure would be provided in the northeastern corner of the site. Circulation throughout the site would be facilitated via a minimum of 25-foot-wide two-way drive aisles.

The Township of Manchester requires one (1) parking space per 200 square feet of floor area for retail uses. This equates to a parking requirement of 38 spaces for the proposed 7,500-square-foot Dollar General. The site would provide 30 parking spaces, inclusive of three (3) ADA-accessible parking spaces. The parking spaces would be 10 feet wide by 20 feet deep in accordance with industry standards.

In order to assess the typical parking demand of a Dollar General of similar size and layout to the proposed development, a parking study was conducted at multiple existing Dollar General locations in New Jersey on multiple dates. The full methodology and results from the parking study can be found appended to this report. The study findings show that the average parking demand for a typical weekday peak period was nine (9) vehicles and the maximum parking demand of the study locations was 25 parked vehicles. The average parking demand for a typical Saturday peak period was 9.4 parked vehicles and the maximum parking demand across all of the studied locations was 20 parked vehicles. The results of this study indicate that the proposed parking supply of 30 spaces would be sufficient to accommodate the anticipated parking demand of the proposed Dollar General.

Please refer to the Traffic Impact Statement prepared by Stonefield Engineering & Design for additional information.

4.0 STEPS TO MINIMIZE ENVIRONMENTAL IMPACTS

The development of the project and site plan design enhances the property and minimizes environmental damage by completing the following:

- Planting low-maintenance landscape vegetation while minimizing the use of lawn areas and enhancing site aesthetics. Providing 31.0% landscaping whereas 30% is required.
- Implementing non-structural stormwater management strategies in conjunction with underground basins to comply with runoff quantity, groundwater recharge, and water quality requirements.
- Installing temporary soil erosion and sediment control measures inclusive of silt fencing, stabilized construction entrances, and inlet filters. Permanent post-construction measures include conduit outlet protection, native vegetation, rip-rap lining.

APPENDIX A PROJECT FIGURES

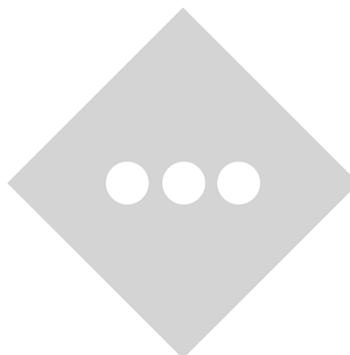
INVENTORY

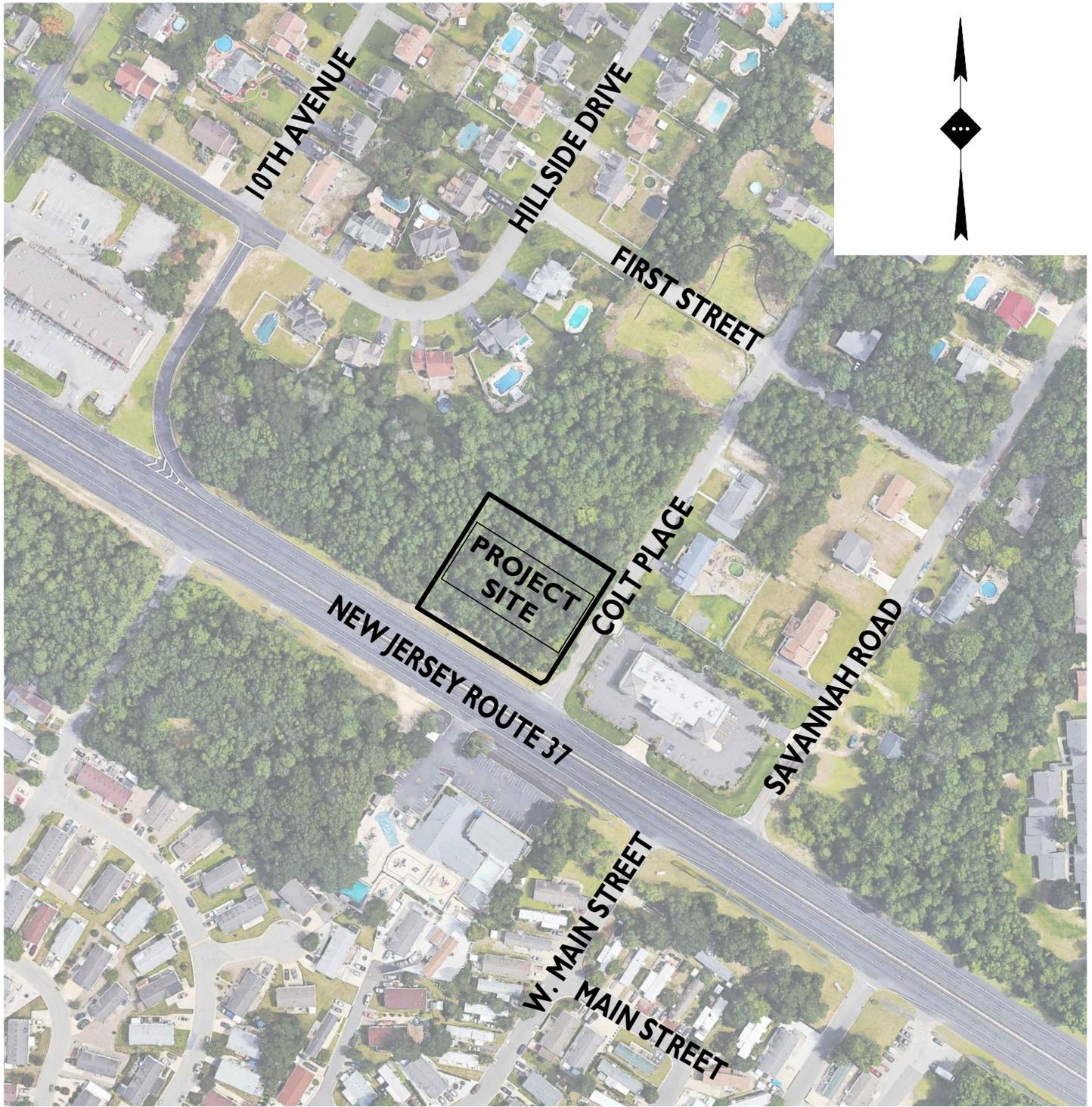
AERIAL MAP

TAX & ZONING MAP

USGS LOCATION MAP

NJDEP GEOWEB WETLANDS MAP





GRAPHIC SCALE IN FEET

1"=200'

AERIAL MAP

SOURCE: GOOGLE EARTH PRO RETRIEVED 04/27/2018

PROPOSED DOLLAR GENERAL
 BLOCK 41.01, LOT 1
 1924 NJ-37
 MANCHETSER TOWNSHIP
 OCEAN COUNTY, NEW JERSEY



DRAWN BY:	CJS
CHECKED BY:	PDM
DATE:	04/18/2019
SCALE:	1" = 200'
PROJECT ID:	Z-18070

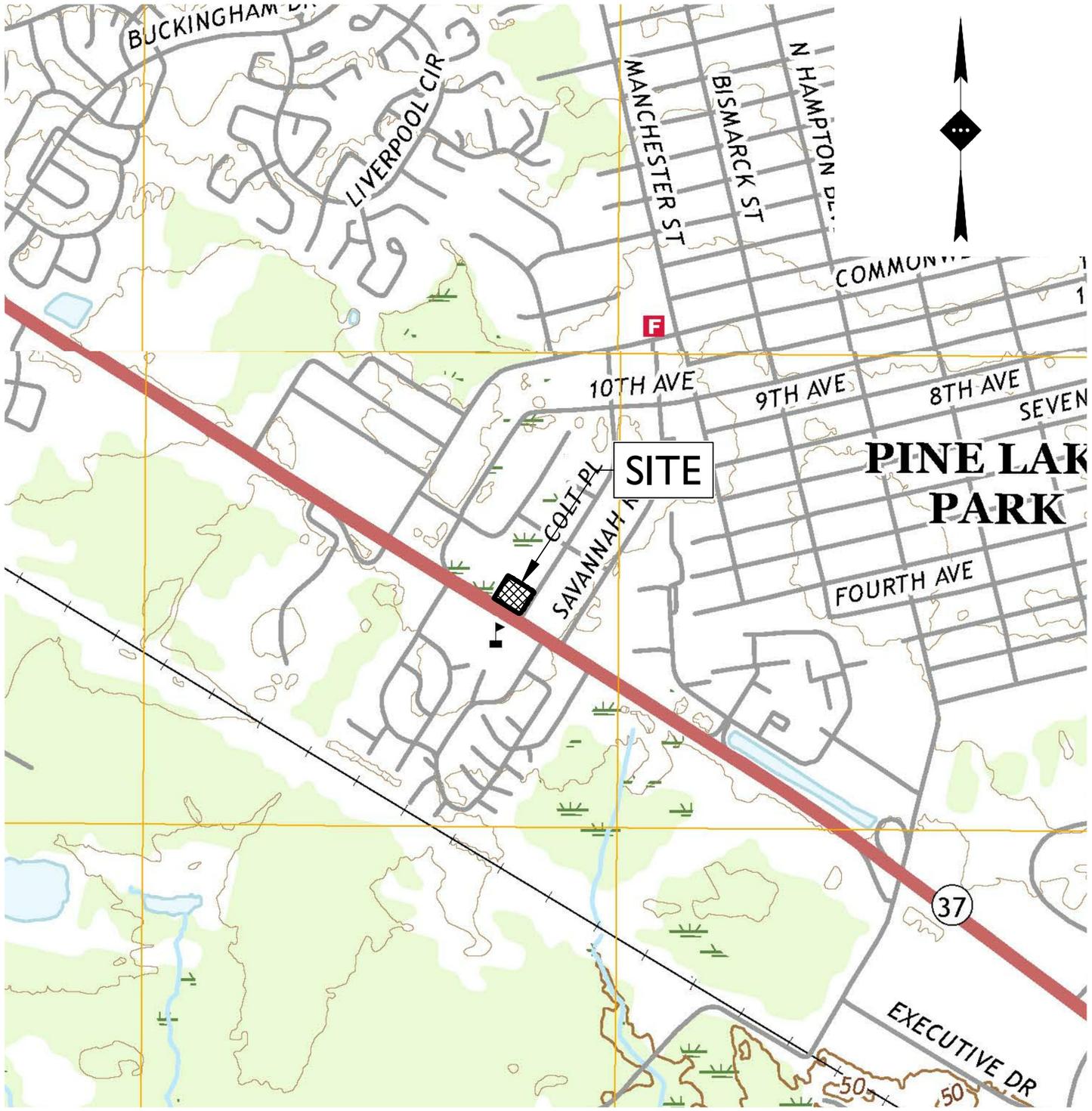


STONEFIELD
 engineering & design

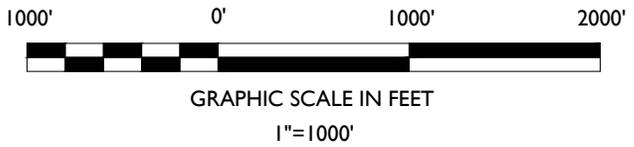
Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddeng.com

15 Spring Street, Princeton, NJ 08542
 Phone 609.362.6900

Z:\Princeton\2018\Z-18070 Dollar General - 29 Central Avenue, Toms River, NJ\CADD\Exhibit\Project Maps\2019-04-18, Project Maps.dwg



USGS QUADRANGLE MAP



SOURCE: USGS KESWICK GROVE, LAKEHURST, LAKEWOOD AND TOMS RIVER QUADRANGLE NEW JERSEY 7.5 MINUTE SERIES, DATED 2016

PROPOSED DOLLAR GENERAL
 BLOCK 41.01, LOT 1
 1924 NJ-37
 MANCHETSER TOWNSHIP
 OCEAN COUNTY, NEW JERSEY



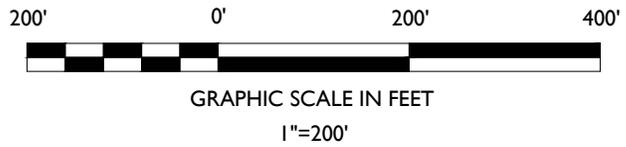
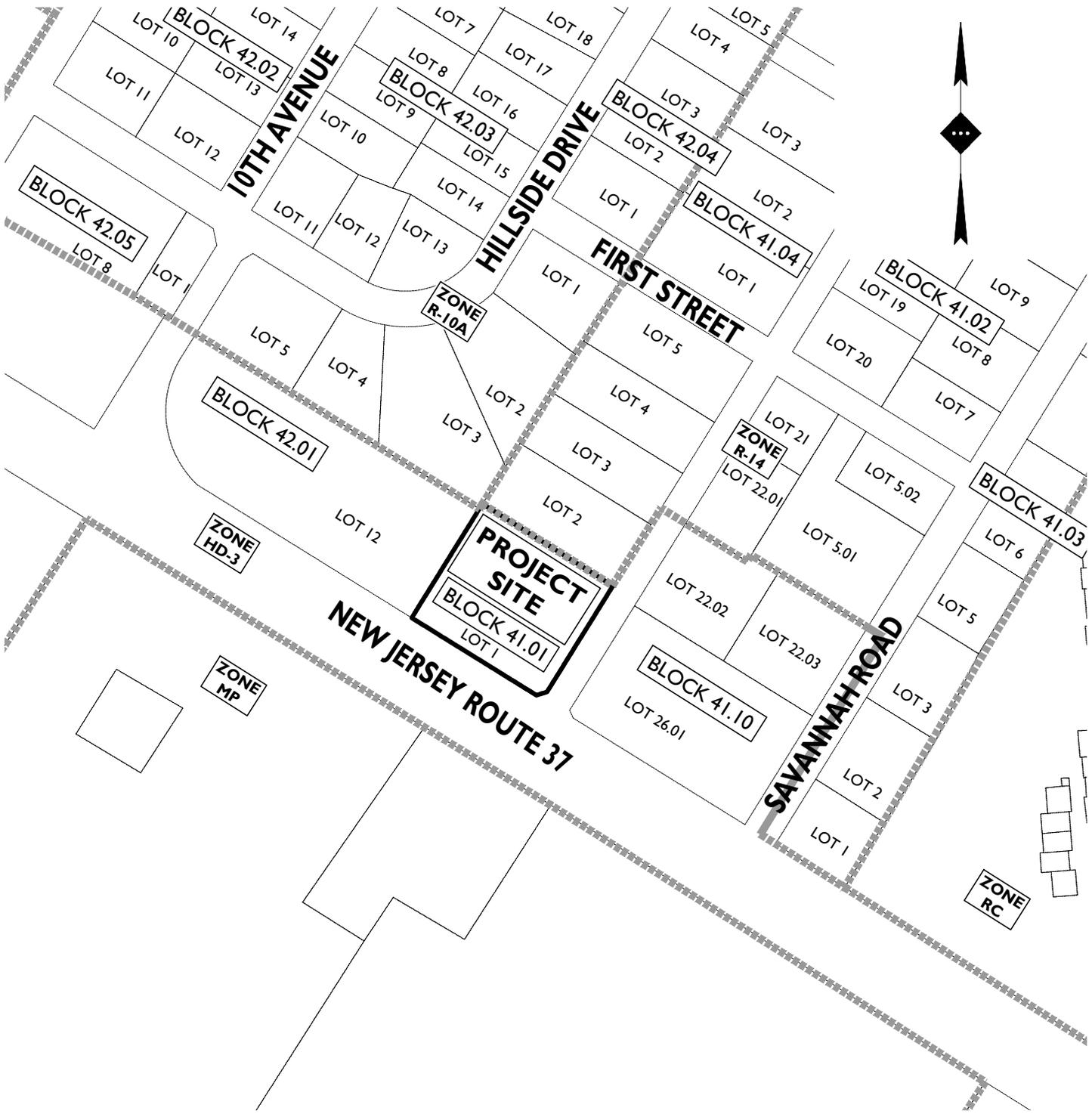
DRAWN BY:	CJS
CHECKED BY:	PDM
DATE:	04/18/2019
SCALE:	1" = 1000'
PROJECT ID:	Z-18070

STONEFIELD
 engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefielddeng.com

15 Spring Street, Princeton, NJ 08542
 Phone 609.362.6900

Z:\Princeton\2018\Z-18070 Dollar General - 29 Central Avenue, Toms River, NJ\CADD\Exhibit\Project Maps\2019-04-18, Project Maps.dwg



TAX / ZONING MAP

SOURCE: TOWNSHIP OF MANCHESTER TAX MAP SHEET 8.01 & ZONING MAP

PROPOSED DOLLAR GENERAL
 BLOCK 41.01, LOT 1
 1924 NJ-37
 MANCHETSER TOWNSHIP
 OCEAN COUNTY, NEW JERSEY



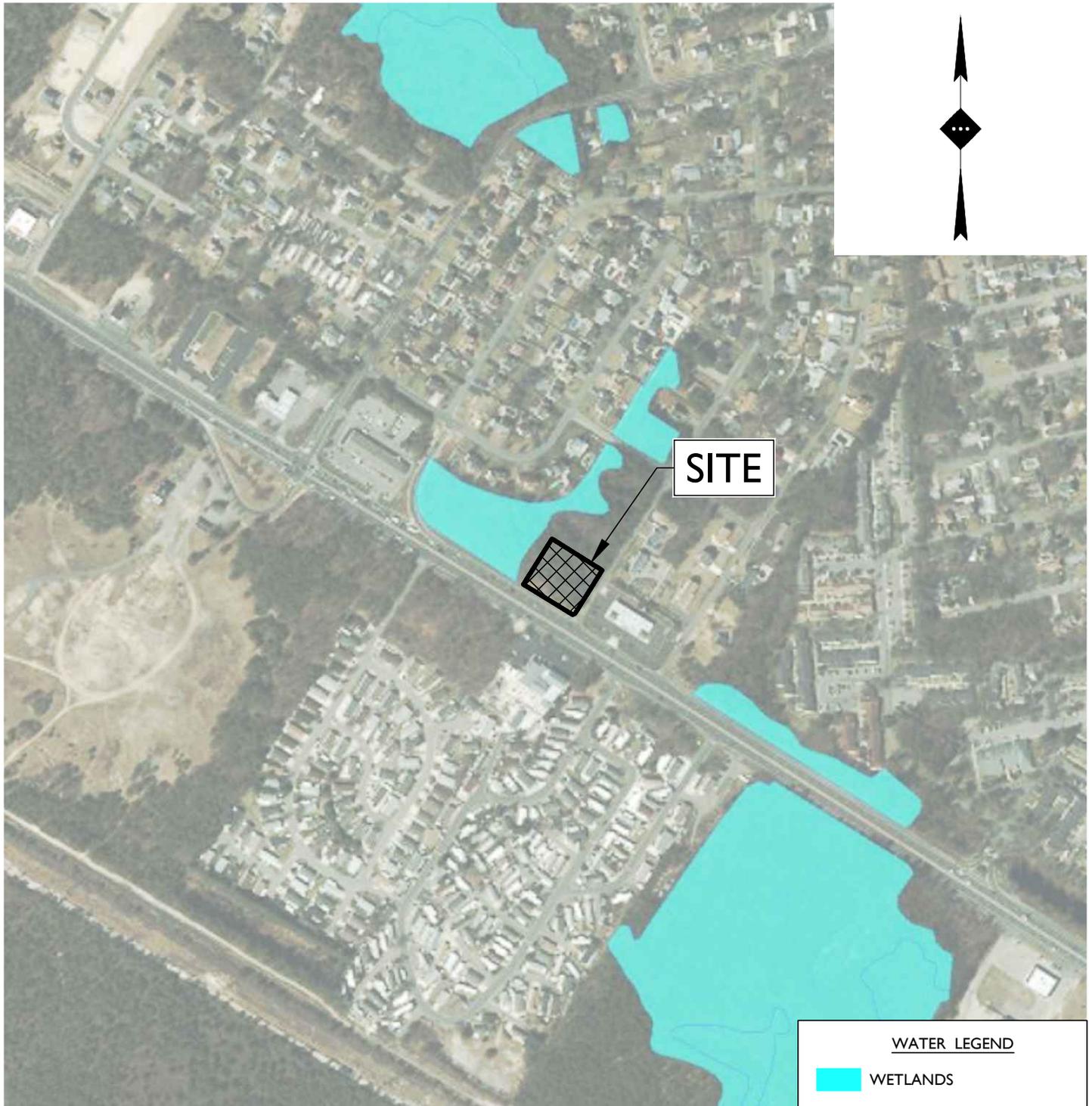
DRAWN BY:	CJS
CHECKED BY:	PDM
DATE:	04/18/2019
SCALE:	1" = 200'
PROJECT ID:	Z-18070

STONEFIELD
 engineering & design

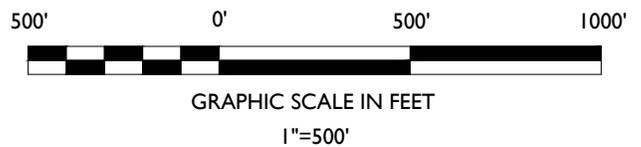
Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefieldeng.com

15 Spring Street, Princeton, NJ 08542
 Phone 609.362.6900

Z:\Princeton\2018\Z-18070 Dollar General - 29 Central Avenue, Toms River, NJ\CADD\Exhibit\Project Maps\2019-04-18 - Project Maps.dwg



NJDEP GEOWEB WETLANDS LOCATIONS



SOURCE: STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF GIS
MAP RETRIEVED 04/18/2019

PROPOSED DOLLAR GENERAL
BLOCK 41.01, LOT 1
1924 NJ-37
MANCHETSER TOWNSHIP
OCEAN COUNTY, NEW JERSEY

DOLLAR GENERAL

DRAWN BY:	CJS
CHECKED BY:	PDM
DATE:	04/18/2019
SCALE:	1" = 500'
PROJECT ID:	Z-18070



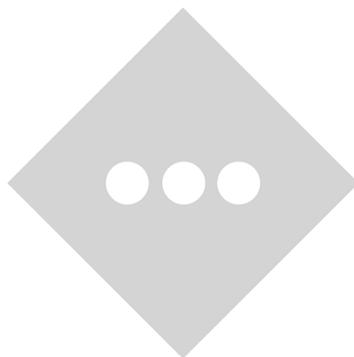
STONEFIELD
engineering & design

Rutherford, NJ · Princeton, NJ · Long Island City, NY · Royal Oak, MI
www.stonefieldeng.com

15 Spring Street, Princeton, NJ 08542
Phone 609.362.6900

Z:\Princeton\2018\Z-18070 Dollar General - 29 Central Avenue, Toms River, NJ\CADD\Exhibit\Project Maps\2019-04-18, Project Maps.dwg

APPENDIX B
NRCS COUNTY SOIL SURVEY



Custom Soil Resource Report for Ocean County, New Jersey



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Ocean County, New Jersey.....	13
AtsAO—Atsion sand, 0 to 2 percent slopes, Northern Tidewater Area.....	13
LakB—Lakehurst sand, 0 to 5 percent slopes.....	14
References	16

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

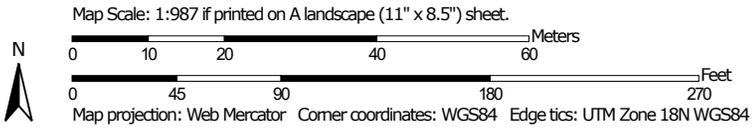
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Ocean County, New Jersey
 Survey Area Data: Version 16, Sep 13, 2018

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 17, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AtsAO	Atsion sand, 0 to 2 percent slopes, Northern Tidewater Area	1.8	97.2%
LakB	Lakehurst sand, 0 to 5 percent slopes	0.1	2.8%
Totals for Area of Interest		1.8	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

Custom Soil Resource Report

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Ocean County, New Jersey

AtsAO—Atsion sand, 0 to 2 percent slopes, Northern Tidewater Area

Map Unit Setting

National map unit symbol: 2thvz
Elevation: 0 to 230 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 46 to 66 degrees F
Frost-free period: 190 to 260 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Atsion and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Atsion

Setting

Landform: Drainageways, depressions, deflation flats, flats
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Sandy eolian deposits and/or fluviomarine deposits

Typical profile

O_i - 0 to 2 inches: peat
A - 2 to 4 inches: sand
E - 4 to 26 inches: sand
B_{hs} - 26 to 34 inches: sand
C_g - 34 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (K_{sat}): Moderately high to very high (0.71 to 19.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Berryland, occasionally flooded

Percent of map unit: 5 percent

Custom Soil Resource Report

Landform: Flats, depressions, drainageways, deflation flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: Yes

Lakehurst

Percent of map unit: 5 percent
Landform: Flats, low hills
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Talf, rise
Down-slope shape: Linear
Across-slope shape: Linear, convex
Hydric soil rating: No

LakB—Lakehurst sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: rdtz
Elevation: 20 to 150 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Farmland of local importance

Map Unit Composition

Lakehurst and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lakehurst

Setting

Landform: Flats, dunes
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Sandy fluviomarine deposits

Typical profile

O_i - 0 to 2 inches: slightly decomposed plant material
A - 2 to 4 inches: sand
E - 4 to 18 inches: sand
B_h - 18 to 32 inches: sand
BC - 32 to 45 inches: sand
C - 45 to 54 inches: sand
C_g - 54 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches

Custom Soil Resource Report

Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 19.98 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Berryland, rarely flooded

Percent of map unit: 5 percent
Landform: Depressions, drainageways, flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Quakerbridge

Percent of map unit: 5 percent
Landform: Knolls, flats
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

Atsion, rarely flooded

Percent of map unit: 5 percent
Landform: Flats, depressions
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, dip, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: Yes

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



APPENDIX C
NATIONAL HERITAGE DATABASE REPORT



State of New Jersey

MAIL CODE 501-04

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF PARKS & FORESTRY

NEW JERSEY FOREST SERVICE

OFFICE OF NATURAL LANDS MANAGEMENT

P.O. BOX 420

TRENTON, NJ 08625-0420

Tel. (609) 984-1339 Fax (609) 984-0427

PHILIP D. MURPHY

Governor

SHEILA Y. OLIVER

Lt. Governor

CATHERINE R. McCABE

Commissioner

April 26, 2019

Nafen Bachkhaz
Stonefield Engineering
15 Spring Street, 2nd Floor
Princeton, NJ 08536

Re: 1924 NJ-37
Block(s) - 41.01, Lot(s) - 1
Manchester Township, Ocean County

Dear Nafen Bachkhaz:

Thank you for your data request regarding rare species information for the above referenced project site.

Searches of the Natural Heritage Database and the Landscape Project (Version 3.3) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the topographic map(s) submitted with the Natural Heritage Data Request Form into our Geographic Information System. We do not typically verify that your project bounds are accurate, or check them against other sources.

We have checked the Landscape Project habitat mapping and the Biotics Database for occurrences of any rare wildlife species or wildlife habitat on the referenced site. The Natural Heritage Database was searched for occurrences of rare plant species or ecological communities that may be on the project site. Please refer to Table 1 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented on site. A detailed report is provided for each category coded as 'Yes' in Table 1.

We have also checked the Landscape Project habitat mapping and Biotics Database for occurrences of rare wildlife species or wildlife habitat in the immediate vicinity (within ¼ mile) of the referenced site. Additionally, the Natural Heritage Database was checked for occurrences of rare plant species or ecological communities within ¼ mile of the site. Please refer to Table 2 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented within the immediate vicinity of the site. Detailed reports are provided for all categories coded as 'Yes' in Table 2. These reports may include species that have also been documented on the project site.

We have also checked the Landscape Project habitat mapping and Biotics Database for all occurrences of rare wildlife species or wildlife habitat within one mile of the referenced site. Please refer to Table 3 (attached) to determine if any rare wildlife species or wildlife habitat is documented within one mile of the project site. Detailed reports are provided for each category coded as 'Yes' in Table 3. These reports may include species that have also been documented on the project site.

For requests submitted as part of a Flood Hazard Area Control Act (FHACA) rule application, we report records for all rare plant species and ecological communities tracked by the Natural Heritage Program that may be on, or in the immediate vicinity of, your project site. A subset of these plant species are also covered by the FHACA rules when the records are located within one mile of the project site. One mile searches for FHACA plant species will only report precisely located occurrences for those wetland plant species identified under the FHACA regulations as being critically dependent on the watercourse. Please refer to Table 3 (attached) to determine if any precisely located rare wetland plant species covered by

the FHACA rules have been documented. Detailed reports are provided for each category coded as 'Yes' in Table 3. These reports may include species that have also been documented on, or in the immediate vicinity of, the project site.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and ecological communities. Please refer to Tables 1, 2 and 3 (attached) to determine if any priority sites are located on, in the immediate vicinity, or within one mile of the project site.

A list of rare plant species and ecological communities that have been documented from the county (or counties), referenced above, can be downloaded from <http://www.state.nj.us/dep/parksandforests/natural/heritage/countylist.html>. If suitable habitat is present at the project site, the species in that list have potential to be present.

Status and rank codes used in the tables and lists are defined in EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS, which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/nhpcodes_2010.pdf.

Beginning May 9, 2017, the Natural Heritage Program reports for wildlife species will utilize data from Landscape Project Version 3.3. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive web application at the following URL, <https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=0e6a44098c524ed99bf739953cb4d4c7>, or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program at (609) 292-9400.

For additional information regarding any Federally listed plant or animal species, please contact the U.S. Fish & Wildlife Service, New Jersey Field Office at <http://www.fws.gov/northeast/njfieldoffice/endangered/consultation.html>.

PLEASE SEE 'CAUTIONS AND RESTRICTIONS ON NHP DATA', which can be downloaded from <http://www.state.nj.us/dep/parksandforests/natural/heritage/newcaution2008.pdf>.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,



Robert J. Cartica
Administrator

c: NHP File No. 19-3907483-16599

Table 1: On Site Data Request Search Results (6 Possible Reports)

<u>Report Name</u>	<u>Included</u>	<u>Number of Pages</u>
1. Possibly on Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites On Site	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.3	No	0 pages included
5. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

**Rare Wildlife Species or Wildlife Habitat on the
Project Site Based on Search of
Landscape Project 3.3 Species Based Patches**

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
<i>Reptilia</i>	Northern Pine Snake	Pituophis melanoleucus melanoleucus	Occupied Habitat	3	NA	State Threatened	G4T4	S2

**Other Animal Species
On the Project Site Based on
Additional Species Tracked by
Endangered and Nongame Species Program**

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
<i>Invertebrate Animals</i>					
Catocala herodias gerhardi	Herodias or Pine Barrens Underwing			G3T3	S3
Cicindela patruela consentanea	New Jersey Pine Barrens Tiger Beetle			G3T1T3	S2S3
Grammia placentia	Placentia Tiger Moth			G3G4	S1S3
Lithophane lemmeri	Lemmer's Noctuid Moth			G3G4	S2
Metarranthis pilosaria	Coastal Bog Metarranthis			G3G4	S3S4
Ptichodis bistrigata	Southern Ptichodis			G3	S1S3
Zanclognatha dentata	A Noctuid Moth			G3G4	S3
Total number of records:	7				

Table 2: Vicinity Data Request Search Results (6 possible reports)

<u>Report Name</u>	<u>Included</u>	<u>Number of Pages</u>
1. Immediate Vicinity of the Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within the Immediate Vicinity	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	1 page(s) included
4. Vernal Pool Habitat In the Immediate Vicinity of Project Site Based on Search of Landscape Project 3.3	No	0 pages included
5. Rare Wildlife Species or Wildlife Habitat In the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

**Rare Wildlife Species or Wildlife Habitat Within the
Immediate Vicinity of the Project Site Based on Search of
Landscape Project 3.3 Species Based Patches**

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
<i>Amphibia</i>								
	Pine Barrens Treefrog	Hyla andersonii	Breeding Sighting	3	NA	State Threatened	G4	S2
	Pine Barrens Treefrog	Hyla andersonii	Occupied Habitat	3	NA	State Threatened	G4	S2
<i>Aves</i>								
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
<i>Reptilia</i>								
	Northern Pine Snake	Pituophis melanoleucus melanoleucus	Occupied Habitat	3	NA	State Threatened	G4T4	S2

**Other Animal Species
In the Immediate Vicinity of the Project Site Based on
Additional Species Tracked by
Endangered and Nongame Species Program**

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
<i>Invertebrate Animals</i>					
Catocala herodias gerhardi	Herodias or Pine Barrens Underwing			G3T3	S3
Cicindela patruela consentanea	New Jersey Pine Barrens Tiger Beetle			G3T1T3	S2S3
Grammia placentia	Placentia Tiger Moth			G3G4	S1S3
Lithophane lemmeri	Lemmer's Noctuid Moth			G3G4	S2
Metarranthis pilosaria	Coastal Bog Metarranthis			G3G4	S3S4
Ptichodis bistrigata	Southern Ptichodis			G3	S1S3
Zanclognatha dentata	A Noctuid Moth			G3G4	S3
Total number of records:	7				

Table 3: Within 1 Mile for FHACA Searches (6 possible reports)

<u>Report Name</u>	<u>Included</u>	<u>Number of Pages</u>
1. Rare Plant Species Occurrences Covered by the Flood Hazard Area Control Act Rule Within One Mile of the Project Site Based on Search of Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites within 1 mile	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	2 page(s) included
4. Vernal Pool Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.3	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat Within One Mile of the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species Within One Mile of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

**Rare Wildlife Species or Wildlife Habitat Within
One Mile of the Project Site Based on Search of
Landscape Project 3.3 Species Based Patches**

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
<i>Amphibia</i>								
	Pine Barrens Treefrog	Hyla andersonii	Breeding Sighting	3	NA	State Threatened	G4	S2
	Pine Barrens Treefrog	Hyla andersonii	Occupied Habitat	3	NA	State Threatened	G4	S2
	Pine Barrens Treefrog	Hyla andersonii	Vernal Pool Breeding	3	NA	State Threatened	G4	S2
<i>Aves</i>								
	Barred Owl	Strix varia	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Cooper's Hawk	Accipiter cooperii	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Least Tern	Sternula antillarum	Foraging	4	NA	State Endangered	G4	S1B,S1N
	Snowy Egret	Egretta thula	Foraging	2	NA	Special Concern	G5	S3B,S4N
<i>Insecta</i>								
	Dotted Skipper	Hesperia attalus slossonae	Casual Flyby	2	NA	Special Concern	G3G4T3	S3
<i>Reptilia</i>								

**Rare Wildlife Species or Wildlife Habitat Within
One Mile of the Project Site Based on Search of
Landscape Project 3.3 Species Based Patches**

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
	Corn Snake	<i>Pantherophis guttatus</i>	Occupied Habitat	4	NA	State Endangered	G5	S1
	Northern Pine Snake	<i>Pituophis melanoleucus melanoleucus</i>	Occupied Habitat	3	NA	State Threatened	G4T4	S2

**Vernal Pool Habitat Within
One Mile of the Project Site
Based on Search of
Landscape Project 3.3**

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Vernal habitat area	2806
Potential vernal habitat area	1250
Total number of records:	2

**Other Animal Species Within
One Mile of the Project Site Based on
Additional Species Tracked by
Endangered and Nongame Species Program**

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
<i>Invertebrate Animals</i>					
Catocala herodias gerhardi	Herodias or Pine Barrens Underwing			G3T3	S3
Cicindela patruela consentanea	New Jersey Pine Barrens Tiger Beetle			G3T1T3	S2S3
Grammia placentia	Placentia Tiger Moth			G3G4	S1S3
Lithophane lemmeri	Lemmer's Noctuid Moth			G3G4	S2
Metarranthis pilosaria	Coastal Bog Metarranthis			G3G4	S3S4
Ptichodis bistrigata	Southern Ptichodis			G3	S1S3
Zanclognatha dentata	A Noctuid Moth			G3G4	S3
Total number of records:	7				



APPENDIX D
GEOTECHNICAL SERVICES REPORT

**UNSEALED FINAL VERSION OF REPORT
SIGNED AND SEALED ORIGINAL REPORTS
HAVE BEEN ISSUED**

**GEOTECHNICAL ENGINEERING
SERVICES REPORT**

For the proposed

**DOLLAR GENERAL
1927 NJ ROUTE 37
MANCHESTER TOWNSHIP, NEW JERSEY**

Prepared for

**Capital Growth Buchalter, Inc
361 Summit Blvd, Suite 110
Birmingham, Alabama 35243**

Prepared by

**Professional Service Industries, Inc.
1707 South Cameron Street, Suite B
Harrisburg, Pennsylvania 17104
Telephone (717) 230-8622
Fax (717) 230-8626**

PSI PROJECT NO. 04911693

December 12, 2018



Raghuveer Peddishree
Project Manager

Paul McMichael
Principal Consultant

David. B. Sabol
Vice President

Marisa Harte, P.E.
Sr. Project Engineer

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1.0 PROJECT INFORMATION.....	2
1.1 PROJECT AUTHORIZATION.....	2
1.2 PROJECT DESCRIPTION.....	2
1.3 PURPOSE AND SCOPE OF WORK	3
2.0 SITE AND SUBSURFACE CONDITIONS.....	3
2.1 SITE LOCATION AND DESCRIPTION	3
2.2 SUBSURFACE CONDITIONS.....	4
2.2.1 <i>Soil Survey & Geologic Map Review.....</i>	<i>4</i>
2.2.2 <i>Subsurface Exploration</i>	<i>4</i>
2.3 GROUNDWATER CONDITIONS	6
2.4 LABORATORY TESTING.....	6
3.0 OBSERVATIONS AND RECOMMENDATIONS	7
3.1 GENERAL.....	7
3.2 SITE PREPARATION AND EARTHWORK RECOMMENDATIONS.....	7
3.3 STRUCTURAL FILL MATERIAL AND PLACEMENT.....	8
3.4 FOUNDATION RECOMMENDATIONS.....	9
3.4.1 <i>Shallow Foundations</i>	<i>9</i>
3.4.2 <i>Uplift and Shear Resistance of Shallow Foundations</i>	<i>11</i>
3.5 SEISMIC DESIGN	12
3.5.1 <i>Seismic Parameters</i>	<i>12</i>
3.5.2 <i>Geologic/Seismic Hazards</i>	<i>13</i>
3.6 FLOOR SLAB RECOMMENDATIONS	13
3.7 PAVEMENT DESIGN	14
4.0 CONSTRUCTION CONSIDERATIONS.....	16
4.1 GROUNDWATER CONTROL	16
4.2 EXCAVATION CONSIDERATIONS	16
5.0 REPORT LIMITATIONS	17
 APPENDIX	
FIGURE 1: SITE LOCATION PLAN	
FIGURE 2: BORING LOCATION PLAN	
BORING LOGS	
GENERAL NOTES	
LABORATORY TEST RESULTS	





EXECUTIVE SUMMARY

This executive summary should be used in conjunction with the entire report for design and construction purposes.

Project Information / Site Conditions / Grading / Compaction / Foundations	
<u>ITEM</u>	<u>Summary & Recommendations</u>
Project Location	Northwest corner of the intersection of NJ Route 37 and Colt Place in Manchester Township, New Jersey.
Prop. Construction	Dollar General Store (7,500 SF) and pavements.
Structural Loading	Max column loads of 40 kips.
Existing Topography	Based on our site observations, grades across the proposed improvement areas slopes upwards from south to north.
Prop. Finished Grading/Cut-Fill	Proposed grading information was not provided. Therefore, PSI has based this report on finished grades being similar to existing grades with cuts and fills on the order of 2 feet or less, exclusive of additional cuts and fills associated with the removal of unsuitable soil sections.
Existing Conditions	At the time of our exploration, the property was a heavily wooded land with several old stockpiles covered in leaves/overgrowth with some debris.
Surface Materials	At the boring locations, topsoil was encountered and ranged in thickness from 2 to 6 inches (in-situ thicknesses of topsoil, rootmat or rootball is expected to be thicker than that collected in split-spoons). The thickness of surficial materials should be expected to vary across this site and between boring locations.
Subsurface Conditions	Based on nine SPT borings drilled to boring termination depths ranging from approximately 10 to 22 feet below the existing ground surface (bgs), the generalized subsurface stratigraphy below the surficial materials typically consisted of FILL or Alluvium overtop Coastal Plain sediments to the respective boring terminated depths. The soils typically consisted of Sands with varying amounts of silts. <u>Based on the SPT N-values, the soils exhibited very loose to loose relative densities to typical depths ranging from approximately 4 to 6 feet below existing ground surface. However, at Boring B-1 soils with loose relative densities extended to a depth of 10 feet. Due to the potential of buried organics across this site and existing FILL conditions, PSI does recommend that the site be further explored with test pits.</u>
Groundwater	At the time of our drilling activities (November 2018), groundwater was not encountered within the test borings to the depths explored (22 feet bgs or less).
Site Preparation / Earthwork / Building Support Recommendations	
Site Preparation/Earthwork	Following clearing/grubbing operations and cuts to design grades, removal and replacement of any debris or organic laden soils will be necessary for foundation/slab/pavement support.
Structural Fill	Satisfactory structural material should include clean soil with USCS classifications of GW, GM, GC, SW, SP, SM, and SC placed in 8-inch loose lifts or thinner and compacted to 95% of its maximum dry density and within 2 percent of its optimum moisture content per ASTM D 1557. PSI expects that the natural soils should be suitable for re-use as structural fill if properly moisture conditioned and free of deleterious materials.
Foundation Type, Net Allowable Bearing Pressure, Depths	PSI recommends complete removal and replacement of debris or organic laden soils beneath foundations if encountered. Afterwards, shallow foundations bearing on compacted structural fill or natural soils may be sized for 2,000 psf. Perimeter exterior foundations be located at 36 inches below final exterior grades.
Seismic Design	Soil Seismic Site Class "D" - IBC/2015, NJ Edition.
Modulus of Subgrade Reaction	100 pci on properly prepared subgrade as outlined in this report.



1.0 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc. (PSI), an Intertek Company, was provided written authorization to proceed with this project by Mr. Mark Bush with Capital Growth Buchalter, Inc. by signing the Dollar General Work Order Form on November 1, 2018. The geotechnical services were provided in general accordance with the scope of work set forth in Dollar General's "NNN" Triple Net Build to Suit Lease Scope of Work Exhibit C, dated February 24, 2014.

1.2 PROJECT DESCRIPTION

Project information was provided by Capital Growth Buchalter, Inc. (CGB) which included drawings titled "Concept B" (Sheet B-1 – dated 08/06/18) and "Concept B (Overlay)" (Sheet B-2 – dated 08/06/18) both prepared by Stonefield Engineering & Design.

PSI understands that a Dollar General retail store development is planned within an approximately 0.87-acre tract of land situated on the northeastern quadrant of the intersection of NJ Route 37 and Colt Place in Manchester Township, New Jersey. The development will consist of a one-story, rectangle-shaped (approximately 85 by 85 feet) pre-engineered structure with a slab-on-grade floor. Pavement areas are planned on the north and west sides of the building. Site access entrances are planned off of NJ Route 37 and Colt Place.

Structural loads were not provided to PSI; however, based on previous Dollar General projects, PSI understands that maximum loading of individual columns will be on the order of approximately 40 kips with little to no loads on wall footings.

Existing topographic information was not provided to PSI. Based on our site observations, grades across the proposed development area generally slopes upwards from south to north and the grade difference was estimated on the order of 6 feet. Proposed grading information was also not provided. Therefore, PSI has based this report on final grades being similar to existing grades with cuts and fills up to 2 feet, exclusive of cuts and fills associated with the removal of unsuitable soil sections.

Estimated loads, foundation sizes and cut/fill amounts have a direct effect on the recommendations in this report, including the recommended type of foundation, the allowable bearing pressure and the estimated settlement. Should any of the above information or assumptions made by PSI be inconsistent with the planned construction, we request that you contact us immediately to allow us to make any necessary modifications to this report.



1.3 PURPOSE AND SCOPE OF WORK

The purpose of our geotechnical services was to assess the subsurface conditions at the site and develop geotechnical related site preparation, fill placement, foundation, slab-on-grade and pavement recommendations. PSI's scope of services included a subsurface exploration (nine test borings) and laboratory work which formed the basis for the geotechnical recommendations contained in this report.

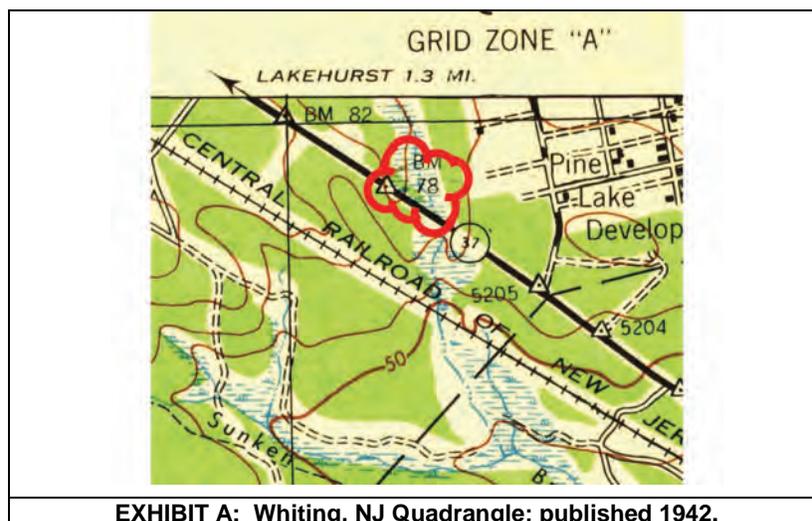
2.0 SITE AND SUBSURFACE CONDITIONS

2.1 SITE LOCATION AND DESCRIPTION

The project site is located on the northwestern quadrant of the intersection of NJ Rout 37 and Colt Place in Manchester Township, New Jersey. The subject site is generally bordered by Colt Place to the east; NJ Route 37 to the south; and residential / commercial properties to the remainder of the sides. The approximate site location is shown on a USGS topographic map in the Appendix (Figure 1).

At the time of our exploration, the property was a heavily wooded covered with leaves and along northern and northeastern portion of the site ponded surface water at the surface was present. Several stockpiles covered with leaves and overgrowth with some construction debris were observed within the proposed building footprint. Overhead utilities lines along Colt Place and underground utilities along NJ Route 37 were also observed. Based on our site observations, the site generally slopes upward from south to north with an estimated grade difference of 6 feet.

Based on available historical aerial photographs from Google Earth, the subject site appears to have been cleared of woods in 1995. Further, 1942 USGS topographic map indicate that an intermittent stream with swamps/marshes was once present at or nearby site (see Exhibit A below).





2.2 SUBSURFACE CONDITIONS

2.2.1 SOIL SURVEY & GEOLOGIC MAP REVIEW

Based on soil survey maps, the project site is predominantly mapped as “Atison sand, 0 to 2 percent slopes, Northern Tidewater Area (AtsAO)” derived from sandy eolian deposits and/or loamy fluviomarine deposits. These soils are typically located in landform depressions and drainageways. The USCS soil types typically associated with this map unit includes silty sand (SM) or poorly graded sand with silt (SP-SM). The soil colors in the upper 3 feet can range from light gray to dark gray to dark brown.

Based on the NJ-GeoWeb website (<https://www.nj.gov/dep/gis/geoweb splash.htm>), the surficial geology at the site is mapped as Upland Gravel, Lower Phase (Qtu). This formation’s lithology is described as “fine to medium sand, minor coarse sand, slightly clayey in places, and pebble gravel, yellow, very pale brown, reddish-yellow”. Generally, less than 5 feet thick but can be as much as 10 feet thick laid down by groundwater seepage on pediments, pebble concentrates from winnowing sand from older surficial deposits, and from the Cohansey Formation from groundwater sapping or surface runoff.

Below the surficial deposits, the “Bedrock Geologic Map of the Lakehurst Quadrangle – Ocean County, New Jersey” (by Sugarman, Castelli, et al., 2016) indicates that the project site is underlain by the Cohansey Formation (Tch), which is a Coastal Plain sediment formation. The Coastal Plain sediments of this formation consists of sand (light brown to dark-yellowish-orange and yellowish-gray to light gray; medium to coarse grained) with pebbles and commonly cross-bedded. The overall thickness of this formation can be up to 100 feet and typically underlain by other Coastal Plain formations.

2.2.2 SUBSURFACE EXPLORATION

On November 12 and November 13, 2018, PSI’s drilling subcontractor, Boring Brothers, Inc., drilled nine test borings at the site including B-1 through B-5 for the proposed building footprint and P-1 through P-4 across proposed pavement areas. The approximate boring locations are shown on the Boring Location Plan in the Appendix (Figure 2). The boring locations were selected and marked in the field by PSI personnel, using provided plans and measured distances from identified landmark features. Prior to final design and construction, PSI recommends that a survey of ground surface elevations be performed by a professional surveyor registered in the State of New Jersey and actual ground elevations obtained at the specific boring locations be provided to PSI. The New Jersey One Call System was notified for public utility clearance, prior to drilling the site.

Borings were advanced with hollow stem augers up to 10 feet below existing ground surface (bgs) at each boring location, followed by mud-rotary drilling to an approximate depth of 22 feet bgs at borings B-1 through B-5. Standard Penetration Tests (SPT) and split-spoon sampling was performed in general accordance with ASTM D1586.

The results of the visual classifications of recovered soil, the SPT blow counts and water level observations are presented in the boring logs in the Appendix of this report. The soil samples



will be stored in our laboratory for further analysis, if requested. Unless notified otherwise, the samples will be disposed of after 3 months. The results of the drilling are summarized as follows:

Surficial Materials:

At the boring locations, topsoil was encountered and ranged in thickness from 2 to 6 inches. However, the site is heavily wooded and the topsoil/rootmat may be thicker than indicated than the material collected in the spoon samples. Moreover, tree rootball masses may extend 2 to 3 feet below grade.

FILL/Possible FILL:

Underlying the surficial materials at borings B-1 and B-2, FILL/Possible FILL materials were encountered to depths ranging from approximately 2 to 4 feet bgs. The recovered materials were generally classified as gray-brown to black Poorly Graded SAND (SP). Debris consisting of asphalt or concrete fragments or organics were encountered within these borings to depths ranging from 2 to 4 feet bgs.

ALLUVIUM/Possible ALLUVIUM:

Underlying the FILL or surficial materials, ALLUVIUM / Possible ALLUVIUM deposits were encountered to depths ranging from approximately 4 to 10 feet bgs. The sampled soils were generally classified as dark brown to gray-brown Poorly Graded SAND (SP/SP-SM) with varying amounts of silt and organic matter. Sand with peat inclusions was also encountered at boring B-2 at depths ranging from approximately 4 to 6 feet bgs.

The SPT N-values within these granular materials ranged from 2 to 12 blows per foot (bpf) and typically between 3 and 8 bpf, indicating very loose to loose relative densities. Very loose relative densities (SPT N values between 0 and 4 bpf) were encountered at boring locations B-3, B-4, B-5, P-3 and P-4 (0 to 2 feet) and P-1 (0 to 4 feet). Loose relative densities (SPT N values between 5 and 10 bpf) were encountered at boring locations B-1 (4 to 10 feet), B-2 (2 to 6 feet), B-3 and B-4 (2 to 4 feet), and P-2 (0 to 4 feet). Laboratory moisture contents of selected soil samples within this stratum ranged from 12 to 28 percent. Fines content of four selected soil samples ranged from approximately 3 to 4 percent.

Coastal Plain:

Underlying the ALLUVIUM, Coastal Plain sediments were encountered to each boring's respective termination depth. These soils were generally classified brown gray/gray brown to yellow brown SANDS (SP/SP-SM) with varying amounts of silt. In Boring B-3 at the depths of approximately 15 feet (~1 foot thick) and again at approximately 18½ feet (until bottom of boring), layers of Elastic SILT (MH) were encountered. The SPT N-values within the granular materials ranged from 7 to 44 bpf indicating loose to dense relative densities. The SPT N-value within the fine-grained soils was 7 bpf.

The preceding subsurface descriptions are generalized to highlight the major soil strata encountered during the exploration. The boring logs included in Appendix should be reviewed for specific information at individual boring locations. The strata shown on the logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The strata represent the approximate boundaries between subsurface materials, where the actual transition may be gradual.



2.3 GROUNDWATER CONDITIONS

At the time of our drilling activities (November 2018), groundwater was not encountered during drilling operations within test boring locations to the depths explored (22 feet bgs or less). The borings were backfilled immediately upon completion for safety considerations; thus, long-term groundwater level measurements were not possible.

The observations presented on the test boring logs represent the groundwater conditions at the time of measurement and may not be indicative of other times. Additionally, discontinuous zones of perched water may exist within the overburden materials and the contractor should anticipate surface and subsurface seepage into any subsurface excavations during high moisture periods of the year. Variations in groundwater levels should be expected seasonally, annually and from location to location.

2.4 LABORATORY TESTING

PSI performed laboratory testing on selected soil samples in general accordance with ASTM standards. The laboratory testing included natural moisture content determination and grain size distribution. The laboratory test results are included in the Appendix and shown on the boring logs opposite of the sample tested and are summarized below.

Boring No.	Sample No.	Sample Depth (ft)	USCS Classification*	Passing Sieve (%)	Moisture Content (%)
				No. 200	
B-2	S-2	2 – 4	Poorly Graded SAND with silt (SP-SM)	3.6	15
B-3	S-2	2 – 4	Poorly Graded SAND (SP)	4.0	22
P-1	S-2	2 – 4	Poorly Graded SAND (SP)	2.7	19

*Based on limited laboratory testing and visual-manual classification methods.



3.0 OBSERVATIONS AND RECOMMENDATIONS

3.1 GENERAL

Based on the subsurface conditions encountered and PSI's understanding of the proposed development, the site is anticipated to require modest to significant effort in order to adapt the site for conventional shallow foundations and slab-on-grade floor. **In order to further evaluate the extent of this effort, PSI recommends that the subsurface conditions be explored with test pits.**

The following geotechnical related issues may impact site development.

- Existing Undocumented FILL: Fill soils were encountered in the upper 2 to 4 feet at the test borings B-1 and B-2. Further, several stockpiles laden with construction debris were noted within building footprint.
- Possible Buried Organic Laden Soils: Based on the historical USGS map from 1942, the project site appears to have contained a water stream or drainage way and this USGS map suggests marsh/swamps once existed in the vicinity of these streams. Below the FILL or topsoil in our test borings, PSI interpreted an alluvial soil stratum that extended to depths ranging from approximately 4 to 10 feet bgs. These were soils typically dark in color, with some organic matter or odors with SPT N-values indicating loose to very loose relative densities.

For these reasons, PSI recommends further exploration through test pitting be performed to better understand the lateral and vertical extent of FILL and organic laden soils layers at this property. PSI should be engaged to provide these additional services which at a minimum would include field observation of pitting at locations to be determined by PSI.

In general, if any FILL material or organic laden soils are encountered during construction, it should be completely removed below the proposed structure and pavements and be replaced with compacted structural fill.

3.2 SITE PREPARATION AND EARTHWORK RECOMMENDATIONS

Site preparation procedures should include removal of vegetation, topsoil, tree rootballs, debris and any other unsuitable or unstable material within the building and pavement areas. Topsoil may be stockpiled for later use in landscape areas. Under no circumstances should topsoil or organic- or debris-laden soil be placed as fill beneath or within 5 horizontal feet of building areas or beneath pavement areas.

Following clearing/grubbing operations and cuts to design grades, PSI recommends complete removal of any debris or organic laden soils if encountered. Then, the entire site including the proposed building and pavement areas should be proof-compacted with a 15-ton smooth drum vibratory roller under the observation of an Intertek-PSI or Intertek-MT Group representative. Those areas observed to rut and deflect excessively should be removed and replaced or otherwise stabilized. The subgrade repair or stabilization approaches should be determined at the time of construction, but may include scarifying subgrades, the placement of a



geotextile/geogrid or removal/recompaction or removal/replacement. Additionally, depending on weather conditions and precipitation at the time of construction, the use of additional stabilization techniques such as choking the subgrade with coarse aggregate may be required in the upper twenty-four (24) inches of the exposed subgrade. Field conditions will dictate the extent of any undercuts.

Prior to placement of stone subbase for concrete slabs or asphalt pavements, the site should be proof-rolled at each construction sequence with a 15 to 20 ton loaded tandem axle dump truck or other heavy pneumatic-tired construction equipment and soft subgrades repaired as determined by the PSI.

Any required backfill or new structural fill required to achieve the design site grades should comply with Section 3.3 Structural Fill Material Placement below. It is also recommended that Intertek-MT Group be retained to perform field density testing during fill/backfill placement. The placement of a geotextile and/or coarse stone may be required to stabilize the undercut subgrade and to facilitate backfilling.

In general, subgrade areas should be kept properly drained and free of ponded water surfaces. This may be achieved by either sloping the site topography adjacent to the construction to direct the water away from the excavation or trenching and berming to collect the excess run-off. Final excavations to desired subgrades should be accomplished immediately prior to the placement of concrete. The contractor should not place concrete on disturbed subgrades. If the subgrade soils are wet, machine or foot traffic should be reduced or eliminated to lessen disturbance of the subgrade. If the site clearing is performed separate from the proposed building construction, restoration of the site to provide for positive drainage is recommended.

3.3 STRUCTURAL FILL MATERIAL AND PLACEMENT

Materials to be used as fill/backfill should be tested for compliance with the specifications below for structural fill. If the materials do not meet the specifications, then they may be placed in non-bearing, landscaped areas or removed off-site.

The in-place soils will be sensitive to moisture content variations. This general sensitivity to water will influence construction, since subgrade support capacities will deteriorate when this soil type becomes wet and/or disturbed. It is not unusual for wet or cool season grading operations to be hindered by the continual need to dry back the on-site natural soils during placement. If fill placement must proceed during other than the summer months, the use of imported granular fill with less than 10 percent passing the No. 200 sieve may be necessary.

For any necessary fill, it is recommended that all imported or on-site soils be tested and evaluated by PSI. In general, fill materials planned for use as structural fill should be free of organic matter and construction debris, and should not be excessively wet or excessively plastic, and should have rock fragments no larger than 3 inches in maximum dimension.

Satisfactory fill material should include clean soil with USCS classifications of (GW, GM, GC, SW, SP, SM or SC). The fill material should have a maximum Liquid Limit of 40 and a Plasticity Index of 20 or less. Unsatisfactory fill material includes fine-grained or highly elastic, plastic or



organic soils (CL, ML, MH, CH, OH, OL, PT) and these materials should not be used as structural fill.

Structural fill should be placed in accordance with the following recommendations:

1. Structural fill materials should be placed in layers of not more than 8 inches in loose thickness with soils that have rock fragments that are no larger than 3 inches in their maximum dimension.
2. Structural fill materials should have maximum liquid limit of 40 and a maximum plasticity index of 20, tested per ASTM D-4318. Preference should be given to using granular with low plasticity soil fines for structural fill.
3. Moisture contents should be within ± 2 percentage points of optimum moisture content per ASTM D-1557. Adjustments to the natural moisture contents of the soils may be required in order to obtain specified compaction levels. Additionally, soils to be used as fill should have a Maximum Dry Density (MDD) of at least 110 pcf as determined by a Modified Proctor.
4. Each layer of the fill materials in the building areas and in pavement subgrade areas should be compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557).
5. A representative of the Geotechnical Engineer should monitor the fill placement and compaction operations on a full-time basis and should perform a sufficient number of density tests to verify that proper degrees of compaction are achieved.

If on-site material is considered for reuse as structural fill, then PSI recommends that at the start of construction and during construction (as needed) bulk samples be collected for laboratory testing by Intertek-PSI or Intertek-MT Group. Based on visual classifications and laboratory testing associated with our test boring exploration, the natural soils generally have suitable plasticity and gradation characteristics for use as structural fill material. However, there is the potential for debris- or organic-laden soils at this site which would not be suitable for re-use as structural fill.

3.4 FOUNDATION RECOMMENDATIONS

3.4.1 SHALLOW FOUNDATIONS

After the site has been prepared as described in Section 3.2 above, the proposed structure may be supported on shallow spread footings bearing on **firm natural soils, or compacted, approved structural fill**. These foundations can be sized for a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). Foundation bottoms should be compacted to 95 percent of its maximum dry density based on ASTM D-1557 prior to placement of reinforcing steel and concrete. Any FILL or debris- or organic-laden soils encountered within the foundation bearing stratum should be undercut and grade should be restored with structural fill.



Exterior foundations should be designed for a minimum embedment of 36 inches below final exterior grades to provide adequate cover for frost protection. However, in areas where interior foundations are constructed in heated areas, the footings may be constructed at a minimum depth of 18 inches below final exterior grades.

We recommend that wall footings have a minimum width of 18 inches and that column footings have a minimum width of 36 inches, regardless of the actual bearing pressure. Wall footings should be provided with nominal, continuous, longitudinal steel reinforcement for greater bending strength so they can span across small areas of loose or soft soils that may go undetected during construction.

Foundation bearing surface evaluations should be performed in each foundation excavation prior to placement of reinforcing steel. These evaluations should be performed by a representative of PSI to confirm that the design allowable soil bearing pressure is available and that our design assumptions about the subgrade are applicable to the conditions encountered during construction. In addition, if the bottom of footing excavation is found to be soft/loose and/or wet, it will most probably be required to be choked with coarse aggregate such as a AASHTO #1 stone or its equivalent. Should the footing excavation need to be undercut, a line drawn outward and downward at 1H:2V, where H=Horizontal and V=Vertical, from the perimeter of the foundation bearing area should define the lateral limits of over-excavation.

Prior to the placement of foundation concrete, where reinforcing steel is placed in the foundations, an inspection must be conducted to observe that specified chairs or supports are provided that the reinforcing steel is properly positioned, as specified.

Exposure to the environment can weaken the soils at the foundation-bearing surface. PSI recommends that foundation concrete be placed on the same day it is excavated, if possible. If the foundation-bearing surface becomes unstable due to exposure to the environment, remedial work, removal of soft, frozen or otherwise unsuitable soils, may need to be performed prior to concrete placement.

Once the footing concrete is placed, the foundations should be backfilled with structural fill as soon as it is safe to do so without causing damage to them. The backfill serves to protect the footing, is a component of overturning resistance and prevents accumulation of water around the foundations which can soften and weaken the bearing soils. The ground surface near the completed foundations should be sloped to drain away from the foundations throughout construction to avoid accumulation of moisture in the subgrade soils.

The settlement of shallow foundations supported on engineered fill or suitable natural soils are anticipated to be measurable, but tolerable for the type of construction proposed. PSI estimates that foundations designed and constructed in accordance with the above recommendations will experience estimated total settlements on the order of one (1)-inch or less with differential settlement on the order of a half (1/2)-inch or less. Total and differential settlements of these magnitudes are usually considered tolerable for the anticipated construction. However, the structural engineer should confirm the tolerance of the proposed structure to the predicted total and differential settlements. While settlement of this magnitude is generally considered tolerable for the proposed construction, the design of building walls must include provisions for additional reinforcing steel and liberally spaced vertical control joints to limit the effects of cosmetic



cracking.

3.4.2 UPLIFT AND SHEAR RESISTANCE OF SHALLOW FOUNDATIONS

Shallow foundations may be used to resist both uplift and lateral forces. For the case of uplift forces, the resistance should be calculated including the weight of the foundation and the weight of the overburden soil above the foundation. The overburden soil above the foundation must be well-compacted structural fill. The unit weight of the foundation and soil overburden must account for the location of the design water table.

Materials below the water table should be assigned buoyant unit weights and materials above the water table, total unit weights. For materials above the water level, PSI recommends using total unit weights of 115 and 150 pcf for soil and concrete materials in this calculation; below the water table unit weights of 53 and 88 pcf.

For sustained uplift loading conditions, the resisting force should be calculated using the weight of the foundation and the weight of the material within a vertical projection of the foundation perimeter. The safety factor for uplift resistance for the sustained loading condition should be at least 2.

For transient uplift loads, such as wind loads, the uplift resistance should be computed similarly to the case of the sustained loading, except that the prism of soil above the foundation used to compute the resistance is formed by the projection of lines from the top perimeter of the foundation upwards at an angle of 20 to 30 degrees from the vertical depending on the type of soil.

For clay backfill above the footing, the upward projection of the sides of the soil prism should be at a 30-degree angle, outward from the vertical. For sand backfill above the footing, the upward projection of the sides of the soil prism should be at a 20-degree angle, outward from the vertical. The safety factor for uplift resistance for the transient loading condition is the ratio of the sum of the foundation and overburden weights divided by the uplift force and should be at least 1.5.

Passive earth pressures of foundation materials adjacent to the footing, as well as soil friction along the footing base, may be used to resist sliding. The passive earth pressure can be calculated using an estimated passive earth pressure coefficient of 2 for limited deflection. Due to the variability of foundation materials that will be exposed at the bearing level, we have assumed relatively firm undisturbed soils or compacted structural fill as the foundation material to be used for computing passive earth pressures and soil friction. An allowable friction coefficient between the concrete footing and soil can be assumed to be 0.3.



3.5 SEISMIC DESIGN

3.5.1 SEISMIC PARAMETERS

It is PSI's understanding that the project site is located within a municipality that employs the IBC/2015, NJ Edition. As part of this code, the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site. As part of the procedure to evaluate seismic forces, the code requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface. To define the Site Class for this project, we have interpreted the results of soil test borings drilled within the project site and estimated appropriate soil properties below the base of the borings to a depth of 100 feet as permitted by the code.

Based upon our evaluation, the subsurface conditions within the site are consistent with the characteristics of a **Site Class "D"** as defined in 1613.3.2 of the IBC/2015, NJ Edition. If a specific evaluation of the shear wave velocity profile is performed, then a more favorable Site Class may be determined for this site. PSI should be engaged to perform these additional services, if needed.

The associated USGS-NEHRP (2008) probabilistic ground acceleration values and site coefficients for the general site area were obtained from the USGS geohazards web page: <http://earthquake.usgs.gov/designmaps/us/application.php>. The seismic values and coefficient are presented in Table 1 below:

Table 1: Ground Motion Values*

Period (sec)	Mapped MCE Spectral Response Acceleration** (g)		Site Coefficients		Adjusted MCE Spectral Response Acceleration (g)		Design Spectral Response Acceleration (g)	
	S_s		F_a		S_{Ms}		S_{Ds}	
0.2	S_s	0.191	F_a	1.6	S_{Ms}	0.305	S_{Ds}	0.203
1.0	S_1	0.058	F_v	2.4	S_{M1}	0.140	S_{D1}	0.093

*2% Probability of Exceedance in 50 years for Latitude 39.99536°N and Longitude 74.27631°W

**At B-C interface (i.e. top of bedrock).

MCE = Maximum Considered Earthquake; g = acceleration due to gravity



3.5.2 GEOLOGIC/SEISMIC HAZARDS

According to the IBC/2015, NJ Edition, if the Seismic Design Category, as determined from the intended building use is interpreted to be D, E or F, the code requires an assessment of slope stability, liquefaction potential and surface rupture due to faulting or lateral spreading. Detailed evaluations of these factors were beyond the scope of this study. However, the following table presents a qualitative assessment of these issues considering the site class, the subsurface soil properties, the groundwater elevation, and probabilistic ground motions.

Table 2: Qualitative Seismic Risk Assessments

Hazard	Relative Risk	Comments
Liquefaction	Low	Groundwater was not encountered within the depths explored (22 feet bgs or less).
Slope Stability	Low	Existing site grades are relatively level and new slopes are not anticipated. Probabilistic ground accelerations are also low at the site.
Surface Rupture	Low	The site is not underlain by a mapped active fault.

3.6 FLOOR SLAB RECOMMENDATIONS

The concrete slab for the structure may be ground-supported (slab-on-grade) after the aforementioned ground improvement has been performed. Should soft or loose soils be identified at slab subgrade during proofrolling, undercutting or stabilization may be required. A visual inspection of the exposed soil slab subgrade must be made by PSI.

For the subgrade prepared as recommended in this report, a Modulus of Subgrade Reaction, *k* value, of 100 pounds per cubic inch (pci) may be used on in-situ soil subgrades or approved engineered fill in the grade slab design, based on a presumed value for a 1 foot by 1 foot plate load test.

In order to provide a more consistent subgrade reaction immediately beneath any concrete slab-on-grade, we recommend that floor slabs be underlain by a minimum of 4 inches of free-draining (a maximum particle size of ¾ inch with less than 5 percent material passing the No. 200 sieve), well-graded gravel or crushed rock base course. Base course material should be moisture conditioned to within +/- 2 percent of optimum moisture content and compacted by mechanical means to a minimum of 95 percent of the material's maximum dry density as determined in accordance with ASTM D-1557.

The crushed stone should provide a capillary break to limit migration of moisture through the slab. If additional protection against moisture vapor is desired, a vapor retarding membrane may also be incorporated into the design. Factors such as cost, special considerations for construction and the floor coverings suggest that the architect and owner make decisions on the use of and placement location for vapor retarding membranes.

The precautions listed below should be followed for construction of slab-on-grade pads. These details will not reduce the amount of movement but are intended to reduce potential damage



should some settlement of the supporting subgrade take place. Some increase in moisture content is inevitable as a result of development and associated landscaping. However, extreme moisture content increases can be largely controlled by proper and responsible site drainage, building maintenance and irrigation practices.

Cracking of slabs-on-grade is normal and should be expected. Cracking can occur not only as a result of heaving or compression of the supporting soil and/or bedrock material, but also as a result of concrete curing stresses. The occurrence of concrete shrinkage cracks and problems associated with concrete curing may be reduced and/or controlled by limiting the water/cement ratio of the concrete, proper concrete placement, finishing, curing and by the placement of crack control joints at frequent intervals, particularly, where re-entrant slab corners occur. The American Concrete Institute (ACI) recommends a maximum panel size (in feet) equal to approximately three times the thickness of the slab (in inches) in both directions. For example, joints are recommended at a maximum spacing of 12 feet assuming a four-inch thick slab. PSI also recommends that the slab be independent of the foundation walls. Using fiber reinforcement in the concrete can also help control shrinkage cracking.

Areas supporting slabs should be properly moisture conditioned and compacted. Backfill soils in all interior and exterior water and sewer line trenches should be carefully compacted.

Exterior slabs should be isolated from the building. These slabs should be reinforced to function as independent units. Movement of these slabs should not be transmitted to the building foundation or superstructure.

3.7 PAVEMENT DESIGN

Prior to placing the aggregate base, the subgrade should be proof-compacted with a smooth steel drum vibratory roller weighing at least fifteen (15) tons and operating in the vibratory mode, in order to detect areas or pockets of unusually soft/loose material. These areas, if encountered, should be over-excavated and replaced with structural fill. Prior to placement of asphaltic concrete, the aggregate base should be proofrolled with a fully loaded triaxle dump truck and areas that pump and rut be repaired.

PSI has determined a theoretical pavement design based on the anticipated traffic use, assumed traffic loads and estimated subgrade properties. The following assumptions and design parameters were used in the flexible pavement section designs:

- 1) The traffic loading was assumed to have an equivalent traffic loading condition of 30,000 equivalent 18-kip single axle loads (ESAL's) for light-duty pavements (car traffic), and 60,000 ESAL's for heavy-duty pavements (truck traffic).
- 2) The Initial and Terminal Serviceability Indexes are 4.2 and 2.5, respectively. A reliability of 95% and a standard deviation of 0.45 were utilized.
- 3) The asphaltic concrete to be used for the proposed flexible pavement will be a NJDOT plant mix with a Structural Coefficient of 0.44 for both the Binder Course and for the Wearing Course.



- 4) The aggregate subbase material to be used is assumed to be a high quality, densely graded crushed stone with a minimum Structural Coefficient of 0.10. The drainage coefficient used for aggregate base course material was 1.0.
- 5) Based on the soils encountered in our test borings and a properly prepared subgrade, an assumed CBR value of 5 percent was used which yields an estimated Resilient Modulus of 5,800 psi.
- 6) Utilizing the above criteria, a minimum structural number of 2.28 is required for light-duty pavements and 2.56 for heavy-duty pavements.

The civil engineer for the project may have more traffic and project design data available than is currently available to PSI or thicker sections may be required in DOT right-of-way's or local ordinance and may need to modify and refine these pavement sections. We will, upon request, be pleased to provide a more detailed pavement section design when definite traffic loading and site layout plans are available. Based upon our field results, analysis and assumptions, the following pavement sections were obtained:

Light Duty

- 1.5 in. Surface Course (9.5M64 NJDOT Superpave HMA)
- 2.5 in. Intermediate Course (19M64 NJDOT Superpave HMA)
- 6.0 in. Aggregate Base Course (NJDOT 901.10.01, DGA Virgin, or equivalent)
Compacted to minimum 95 percent of maximum dry density.

Heavy Duty

- 1.5 in. Surface Course (9.5M64 NJDOT Superpave HMA)
- 3.0 in. Intermediate Course (19M64 NJDOT Superpave HMA)
- 6.0 in. Aggregate Base Course (NJDOT 901.10.01, DGA Virgin, or equivalent)
Compacted to minimum 95 percent of maximum dry density.

The asphaltic concrete is to be designed, delivered and placed in accordance with the current NJDOT Standards for the appropriate traffic volume considering the maximum legal axle loadings. The pavement should be crowned or sloped in order to promote effective surface drainage and reduce the risk of water ponding. It is also recommended a minimum slope of one and one-half (1-1/2) percent. In addition, the subgrade should be similarly sloped to promote effective subgrade drainage and incorporation of perimeter drains should be considered to facilitate drainage of aggregate base.

Rigid pavement sections merit consideration for areas that receive concentrated sustained loads such as dumpsters, loading areas, and storage bins. Rigid pavements of 6-inch minimum thickness will distribute concentrated loads and reduce the possibility of high stress concentrations to the subgrade. The concrete should be air-entrained (AE) with a minimum compressive strength of 4,000 PSI. The rigid pavement should be underlain by minimum of 6-inch aggregate base course consistent with NJDOT 901.10.01, DGA Virgin.



Actual pavement component thicknesses should be selected by the civil design engineer based on traffic loads, volume, and the owner's design life requirements. The above section represents minimum thicknesses representative of typical local construction practices, and as such, the owner and designer should anticipate the need for periodic maintenance.

4.0 CONSTRUCTION CONSIDERATIONS

4.1 GROUNDWATER CONTROL

As previously indicated at the time of our drilling activities (November 2018), groundwater was not encountered within test boring locations to the depths explored (22 feet bgs or less). However, it is possible that seasonal variations and subsurface conditions will cause the water levels across the site to vary at different times. It is also expected that perched (trapped) water may be encountered during earthwork operations.

Overall site drainage is to be arranged in a manner to restrict the possibility of water impounding below foundation areas at all times during construction. It is anticipated that foundation excavations and construction control of water may be accomplished with multiple pumps pumping from multiple properly filtered open sumps.

PSI recommends that the Contractor determine the actual groundwater levels at the site at the time of the construction activities to assess the impact groundwater may have on construction. Water should not be allowed to collect in the foundation excavation, on floor slab areas or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slabs. The grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building.

The Geotechnical engineer should be consulted if excessive and uncontrolled amounts of seepage occur. Consultation with the project Storm Civil Engineer may also be necessary.

4.2 EXCAVATION CONSIDERATIONS

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, Part 1926, Subpart P". This document was established to better enhance the safety of workers entering trenches or excavations.

Federal regulation mandates that all excavations, whether they be utility trenches, basement or footing excavations or others (i.e. underground storage tanks), be constructed in accordance with the OSHA requirements. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could risk injury to workers and be liable for substantial financial penalties.

The contractor is solely responsible for designing and constructing stable, temporary



excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in "29 CFR Part 1926", should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination or excavation depth, including utility trench excavation depth, exceed those specified in local, state and federal safety regulations.

We are providing this information solely as a service to our client. PSI is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

5.0 REPORT LIMITATIONS

The recommendations and discussions in this submittal are based on the available information obtained by PSI and design details furnished by Capital Growth Buchalter, Inc. If there are any revisions of the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

PSI warrants that the findings, recommendations, specifications or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area at the time of this report. No other warranties are implied or expressed.

The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils or other unusual conditions observed are strictly for the information of our client.

Upon completion of plans and specifications, PSI should be provided the opportunity to review the final design documents. This review process will allow PSI to verify whether or not our engineering recommendations have been properly incorporated into the design documents and that the earthwork and foundation recommendations have been properly interpreted and implemented. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Capital Growth Buchalter, Inc for the specific application to the proposed Dollar General at 1927 NJ Route 37, Manchester Township, New Jersey.



APPENDIX

Figure 1: Site Location Plan

Figure 2: Boring Location Plan

Boring Logs

General Notes

Laboratory Test Results

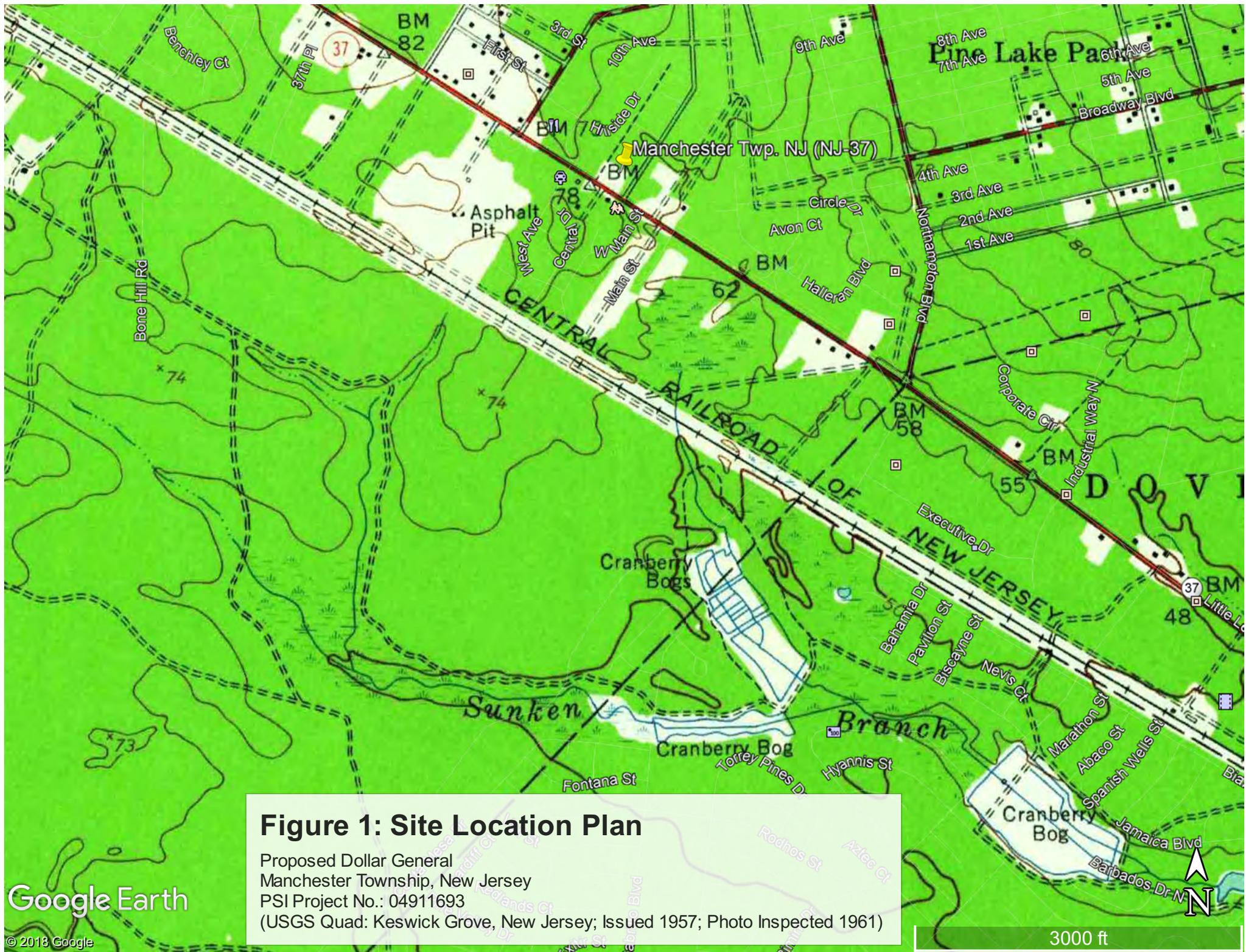


Figure 1: Site Location Plan

Proposed Dollar General
Manchester Township, New Jersey
PSI Project No.: 04911693
(USGS Quad: Keswick Grove, New Jersey; Issued 1957; Photo Inspected 1961)



FIGURE 2: BORING LOCATION PLAN
 Proposed Dollar General
 (NJ Route 37) Manchester, New Jersey
 PSI Project No.: 04911693



COLT PLACE

U.S. ROUTE 37

DOLLAR GENERAL

PROPOSED DOLLAR GENERAL BUILDING
7,500 SF

30 PARKING SPACES

LOT SIZE
± 37,910 SF
(± 0.87 AC)



GRAPHIC SCALE IN FEET
1" = 30'



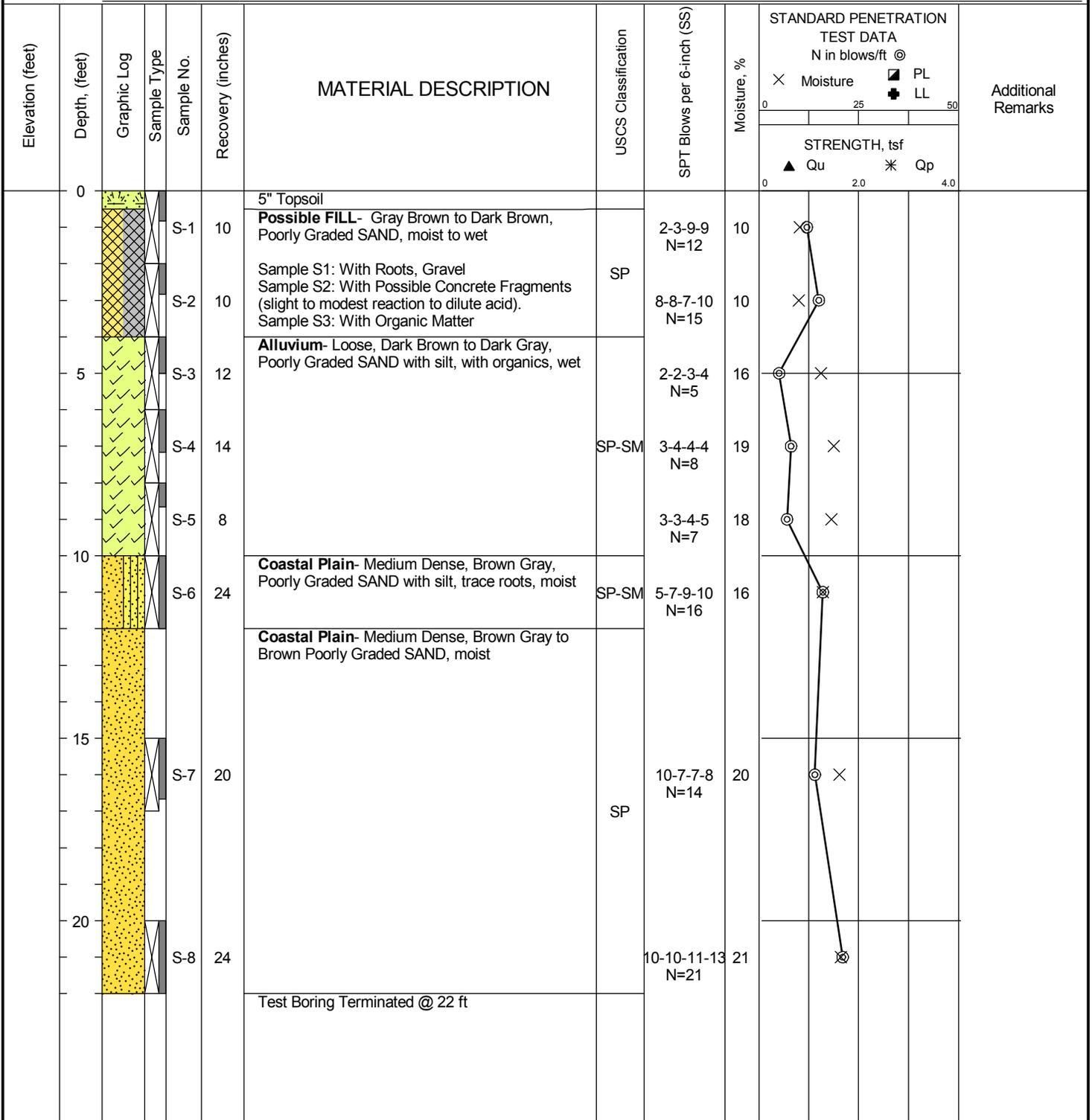
Z:\Projects\2018\Z-18070-Dollar-General-21-General-Avenues-Town-River-NJ\CAD\Concept\Concept-B\B-2-B-2.dwg (1/8) Concept-B-Plan-Overlay.dwg

DATE STARTED: 11/12/18 **DRILL COMPANY:** Boring Brothers, Inc.
DATE COMPLETED: 11/12/18 **DRILLER:** **LOGGED BY:** R. Peddishree
COMPLETION DEPTH: 22.0 ft **DRILL RIG:** CME 55
BENCHMARK: N/A **DRILLING METHOD:** Casing/Mud-Rotary
ELEVATION: N/A **SAMPLING METHOD:** 2-in SS
LATITUDE: n/a° **HAMMER TYPE:** Automatic
LONGITUDE: n/a° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** P. McMichael
REMARKS:

BORING B-1

Water
 ∇ While Drilling Not Enc.
 ▼ Upon Completion Not Enc.
 ▽

BORING LOCATION:
 See Boring Location Plan



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04911693
PROJECT: Dollar General (CGB)
LOCATION: 1927 NJ Route 37
 Manchester Twp, NJ

DATE STARTED: 11/12/18 **DRILL COMPANY:** Boring Brothers, Inc.
DATE COMPLETED: 11/12/18 **DRILLER:** **LOGGED BY:** R. Peddishree
COMPLETION DEPTH: 22.0 ft **DRILL RIG:** CME 55
BENCHMARK: N/A **DRILLING METHOD:** Casing/Mud-Rotary
ELEVATION: N/A **SAMPLING METHOD:** 2-in SS
LATITUDE: n/a° **HAMMER TYPE:** Automatic
LONGITUDE: n/a° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** P. McMichael
REMARKS:

BORING B-2

Water
 ∇ While Drilling Not Enc.
 ▼ Upon Completion Not Enc.
 ▽

BORING LOCATION:
 See Boring Location Plan

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA		Additional Remarks
										N in blows/ft	⊙	
0						4" Topsoil						
				S-1	17	FILL - Black Poorly Graded SAND with fine Gravel (Crushed Asphalt?), moist	SP	21-17-6-3 N=23	9	×	⊙	
				S-2	20	Alluvium - Loose, Gray/Brown, Poorly Graded SAND with gravel, wet (Possible Perched Water)	SP	4-3-3-3 N=6	15	⊙	×	Fines=3.6%
5				S-3	18	Alluvium - Dark Gray/Black, Peat and sand, moist		2-3-4-3 N=7	38	⊙	×	
				S-4	20	Coastal Plain - Medium Dense to Dense, Gray/Brown Poorly Graded SAND, moist		6-11-15-11 N=26	17	×	⊙	
				S-5	12			10-13-10-10 N=23	17	×	⊙	
10				S-6	12			15-20-22-22 N=42	14	×	⊙	
				S-7	14		SP	20-20-20-21 N=40	12	×	⊙	
15				S-8	10			25-24-20-22 N=44	15	×	⊙	
						Test Boring Terminated @ 22 ft						



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04911693
PROJECT: Dollar General (CGB)
LOCATION: 1927 NJ Route 37
 Manchester Twp, NJ

DATE STARTED: 11/13/18
 DATE COMPLETED: 11/13/18
 COMPLETION DEPTH: 22.0 ft
 BENCHMARK: N/A
 ELEVATION: N/A
 LATITUDE: n/a°
 LONGITUDE: n/a°
 STATION: N/A OFFSET: N/A

DRILL COMPANY: Boring Brothers, Inc.
 DRILLER: _____ LOGGED BY: R. Peddishree
 DRILL RIG: CME 55
 DRILLING METHOD: Casing/Mud-Rotary
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY: P. McMichael

BORING B-3

Water
 ▽ While Drilling Not Enc.
 ▼ Upon Completion Not Enc.
 ▾

BORING LOCATION:
 See Boring Location Plan

REMARKS:

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
0						4" Topsoil (Ponded Water at Surface)					
				S-1	12	Alluvium - Very Loose to Loose, Dark Brown/Gray Poorly Graded SAND, wet to moist Note: Faint organic odors	SP	1-2-2-4 N=4	23	⊗	
				S-2	12			1-2-3-5 N=5	22	⊗	Fines=4.0%
				S-3	24	Coastal Plain - Medium Dense, Brown Poorly Graded SAND, wet	SP	8-8-9-13 N=17	16	⊗	
				S-4	24	Coastal Plain - Medium Dense to Dense, Brown to Gray Poorly Graded SAND with silt, wet		12-12-17-24 N=29	21	⊗	
				S-5	24			14-17-23-25 N=40	16	⊗	
				S-6	16		SP-SM	8-5-7-10 N=12	21	⊗	
				S-7	20	~15 to 16 ft: Elastic SILT Layer	MH	6-13-13-12 N=26	19	⊗	
				S-8	22	Coastal Plain - Medium Stiff, Yellow Brown Elastic SILT, moist	MH	1-3-4-5 N=7	38	⊗	
						Test Boring Terminated @ 22 ft					



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04911693
 PROJECT: Dollar General (CGB)
 LOCATION: 1927 NJ Route 37
 Manchester Twp, NJ

DATE STARTED: 11/13/18 **DRILL COMPANY:** Boring Brothers, Inc.
DATE COMPLETED: 11/13/18 **DRILLER:** **LOGGED BY:** R. Peddishree
COMPLETION DEPTH: 10.0 ft **DRILL RIG:** CME 55
BENCHMARK: N/A **DRILLING METHOD:** Casing/Mud-Rotary
ELEVATION: N/A **SAMPLING METHOD:** 2-in SS
LATITUDE: n/a° **HAMMER TYPE:** Automatic
LONGITUDE: n/a° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** P. McMichael
REMARKS:

BORING P-1

Water
 ∇ While Drilling Not Enc.
 ▼ Upon Completion Not Enc.
 ∇

BORING LOCATION:
 See Boring Location Plan

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ⊙ X Moisture ⊠ PL ⊕ LL	STRENGTH, tsf ▲ Qu * Qp	Additional Remarks
0		4" Topsoil				4" Topsoil						
		VERY LIMITED SAMPLE RECOVERY - Alluvium - Peat / Organic Matter		S-1	4			1-1-1-1 N=2	36	⊙		
		Alluvium- Very Loose, Pale Gray-brown, Poorly Graded SAND, moist		S-2	18		SP	1-2-1-3 N=3	19	⊙	X	Fines=2.7%
	5	Coastal Plain- Medium Dense, Brown, Poorly Graded SAND, moist		S-3	12			5-5-7-5 N=12	14	⊙	X	
				S-4	24		SP	8-7-7-10 N=14	19	⊙	X	
				S-5				10-10-8-11 N=18	19	⊙	X	
	10					Test Boring Terminated @ 10 ft						



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04911693
PROJECT: Dollar General (CGB)
LOCATION: 1927 NJ Route 37
 Manchester Twp, NJ

DATE STARTED: 11/13/18 **DRILL COMPANY:** Boring Brothers, Inc.
DATE COMPLETED: 11/13/18 **DRILLER:** **LOGGED BY:** R. Peddishree
COMPLETION DEPTH: 10.0 ft **DRILL RIG:** CME 55
BENCHMARK: N/A **DRILLING METHOD:** Casing/Mud-Rotary
ELEVATION: N/A **SAMPLING METHOD:** 2-in SS
LATITUDE: n/a° **HAMMER TYPE:** Automatic
LONGITUDE: n/a° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** P. McMichael
REMARKS:

BORING P-2

Water
 ∇ While Drilling Not Enc.
 ▼ Upon Completion Not Enc.
 ∇

BORING LOCATION:
 See Boring Location Plan

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ⊙ X Moisture ⊠ PL ⊕ LL	STRENGTH, tsf ▲ Qu * Qp	Additional Remarks
0						3" Topsoil						
				S-1	3	VERY LIMITED SAMPLE RECOVERY - Alluvium - Peat / Organic Matter		1-2-3-2 N=5		⊙		
				S-2	12	Alluvium- Loose, Pale Gray-brown, Poorly Graded SAND, wet	SP	2-2-3-4 N=5		⊙		
	5			S-3	20	Coastal Plain- Medium Dense, Brown, Poorly Graded SAND, moist		4-5-5-3 N=10		⊙		
				S-4	14		SP	8-5-8-9 N=13		⊙		
				S-5	16			8-8-12-14 N=20		⊙		
	10					Test Boring Terminated @ 10 ft						



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04911693
PROJECT: Dollar General (CGB)
LOCATION: 1927 NJ Route 37
 Manchester Twp, NJ

DATE STARTED: 11/13/18 **DRILL COMPANY:** Boring Brothers, Inc.
DATE COMPLETED: 11/13/18 **DRILLER:** **LOGGED BY:** R. Peddishree
COMPLETION DEPTH: 10.0 ft **DRILL RIG:** CME 55
BENCHMARK: N/A **DRILLING METHOD:** Casing/Mud-Rotary
ELEVATION: N/A **SAMPLING METHOD:** 2-in SS
LATITUDE: n/a° **HAMMER TYPE:** Automatic
LONGITUDE: n/a° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** P. McMichael
REMARKS:

BORING P-3

Water
 ∇ While Drilling Not Enc.
 ▼ Upon Completion Not Enc.
 ∇

BORING LOCATION:
 See Boring Location Plan

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0						2" Topsoil					
				S-1	2	VERY LIMITED SAMPLE RECOVERY - Alluvium - Dark Roots		1-2-1-1 N=3	16		
				S-2	10	Alluvium- Dense, Pale Gray-brown, Poorly Graded SAND, with dark roots, moist	SP	3-4-6-6 N=10	12		
				S-3	18	Coastal Plain- Medium Dense, Brown, Poorly Graded SAND with silt, moist		7-8-7-10 N=15	21		
				S-4	16	Samples S3 & S4: trace roots/oraganic matter	SP-SM	8-8-8-11 N=16	21		
				S-5	24			12-12-8-12 N=20	17		
						Test Boring Terminated @ 10 ft					



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04911693
PROJECT: Dollar General (CGB)
LOCATION: 1927 NJ Route 37
 Manchester Twp, NJ

DATE STARTED: 11/13/18 **DRILL COMPANY:** Boring Brothers, Inc.
DATE COMPLETED: 11/13/18 **DRILLER:** **LOGGED BY:** R. Peddishree
COMPLETION DEPTH: 10.0 ft **DRILL RIG:** CME 55
BENCHMARK: N/A **DRILLING METHOD:** Casing/Mud-Rotary
ELEVATION: N/A **SAMPLING METHOD:** 2-in SS
LATITUDE: n/a° **HAMMER TYPE:** Automatic
LONGITUDE: n/a° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** P. McMichael
REMARKS:

BORING P-4

Water
 ∇ While Drilling Not Enc.
 ▼ Upon Completion Not Enc.
 ∇

BORING LOCATION:
 See Boring Location Plan

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0						6" Topsoil					
				S-1	10	Alluvium- Very Loose to Medium Dense, Dark Brown to Pale Gray-brown, Poorly Graded SAND, trace organic matter, moist	SP	1-1-1-1 N=2	11	⊗	
			S-2	18	2-5-7-7 N=12			16	⊗		
				S-3	24	Coastal Plain- Medium Dense, Brown to Yellow Brown, Poorly Graded SAND with silt, moist	SP-SM	5-8-11-7 N=19	20	⊗	
			S-4	24	7-7-7-8 N=14				⊗		
			S-5	24	10-12-12-14 N=24				⊗		
	10					Test Boring Terminated @ 10 ft					



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04911693
PROJECT: Dollar General (CGB)
LOCATION: 1927 NJ Route 37
 Manchester Twp, NJ

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.	☒ SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
HSA: Hollow Stem Auger - typically 3 1/4" or 4 1/4" I.D. openings, except where noted.	■ ST: Shelby Tube - 3" O.D., except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry	▮ RC: Rock Core
R.C.: Diamond Bit Core Sampler	⬇ TC: Texas Cone
H.A.: Hand Auger	☞ BS: Bulk Sample
P.A.: Power Auger - Handheld motorized auger	☑ PM: Pressuremeter
	CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N ₆₀ : A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q _u : Unconfined compressive strength, TSF
Q _p : Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼, ▼, ▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

<u>Relative Density</u>	<u>N - Blows/foot</u>
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

<u>Description</u>	<u>Criteria</u>
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

<u>Component</u>	<u>Size Range</u>
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

<u>Description</u>	<u>Criteria</u>
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

<u>Q_u - TSF</u>	<u>N - Blows/foot</u>	<u>Consistency</u>
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

<u>Description</u>	<u>Criteria</u>
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

<u>Description</u>	<u>Criteria</u>	<u>Description</u>	<u>Criteria</u>
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick	Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick	Lensed:	Inclusion of small pockets of different soils
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing	Layer:	Inclusion greater than 3 inches thick (75 mm)
Slickensided:	Fracture planes appear polished or glossy, sometimes striated	Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
		Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

<u>Q_u - TSF</u>	<u>Consistency</u>
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

<u>Description</u>	<u>Criteria</u>
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

<u>Voids</u>	<u>Void Diameter</u>
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

<u>Component</u>	<u>Size Range</u>
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

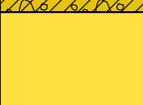
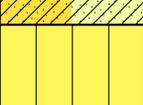
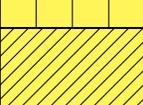
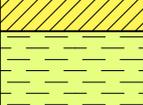
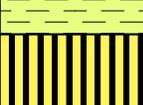
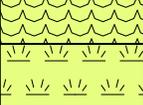
<u>Rock Mass Description</u>	<u>RQD Value</u>
Excellent	90 - 100
Good	75 - 90
Fair	50 - 75
Poor	25 - 50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

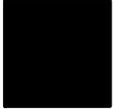
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS (LITTLE OR NO FINES)	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
	SAND AND SANDY SOILS (LITTLE OR NO FINES)	CLEAN SANDS		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
		CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
		SANDS WITH FINES		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES	
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
		SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS		
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		CH	INORGANIC CLAYS OF HIGH PLASTICITY		
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS		
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

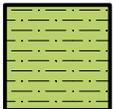
Graphic Symbols for Materials and Rock Deposits



CONCRETE
Portland Cement Concrete



BITUMINOUS CONCRETE



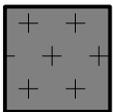
CLAYSTONE



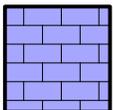
COAL
Coal, Anthracite Coal



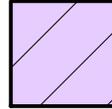
CONGLOMERATE/BRECCIA
Conglomerate, Breccia



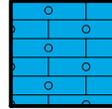
IGNEOUS ROCK
Anorthosite, Basalt, Metabasalt, Diabase (Gabbro), Gabbro, Granite/Granodionite, Homfels, Pegmatite, Rhyolite/Metarhyolite



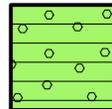
LIMESTONE
Limestone, Dolomite



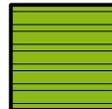
METAMORPHIC ROCK
Amphibolite, Gneiss, Marble, Phyllite, Quartzite, Schist, Serpentinite, Slate



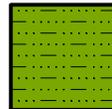
CHERT



SANDSTONE
Sandstone, Orthoquartzite (Sandstone)



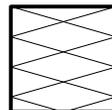
SHALE



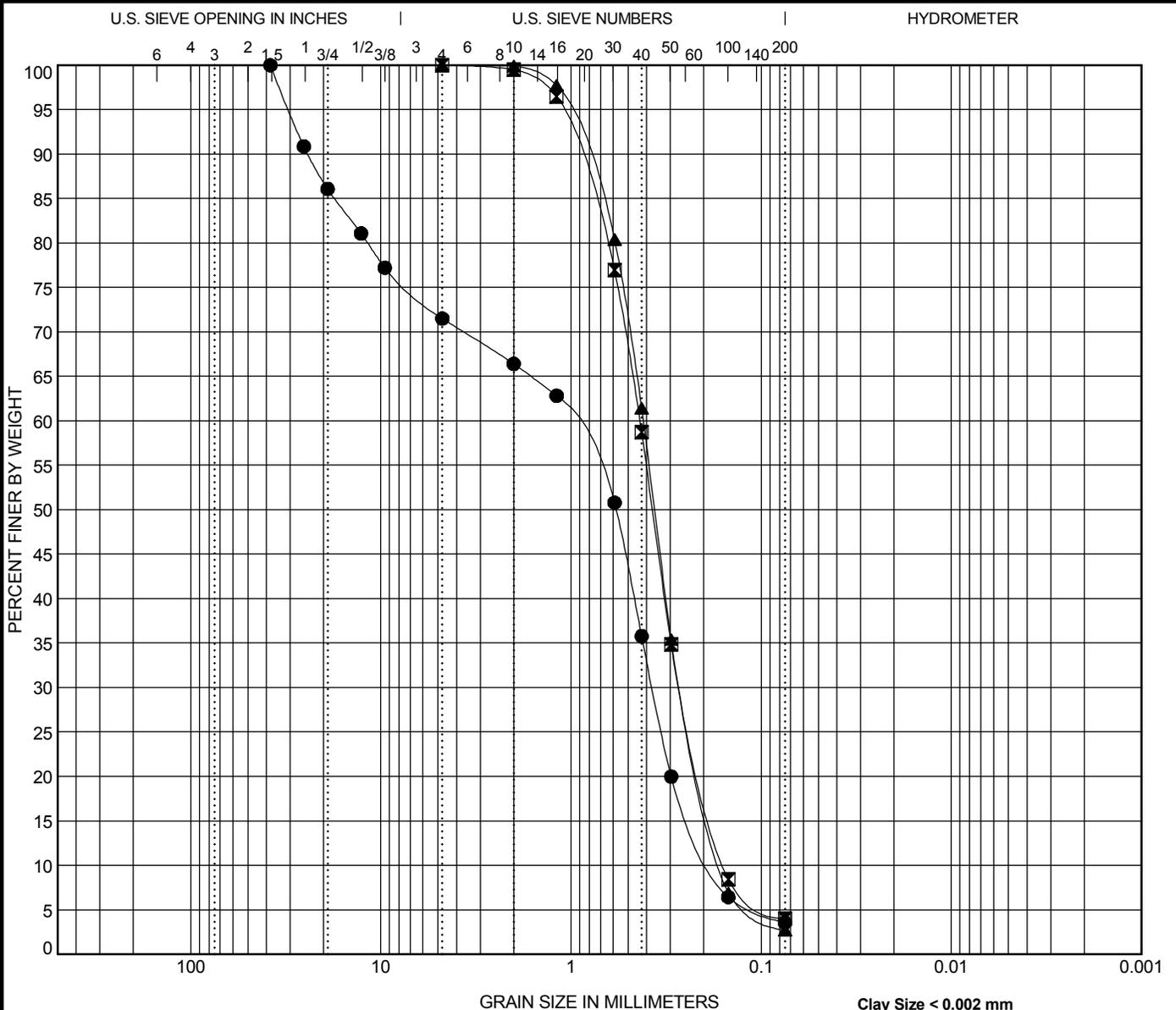
SILTSTONE



NO RECOVERY



VOID



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification				LL	PL	PI	Cc	Cu
●	B-2 3.0	Poorly Graded SAND (SP) with gravel							0.77	5.65
☒	B-3 3.0	Poorly Graded SAND (SP)							1.02	2.80
▲	P-1 3.0	Poorly Graded SAND (SP)							1.01	2.59

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2 3.0	38.1	1.009	0.373	0.179	28.5	67.9	3.6	
☒	B-3 3.0	4.75	0.435	0.262	0.155	0.0	96.0	4.0	
▲	P-1 3.0	4.75	0.417	0.261	0.161	0.0	97.3	2.7	



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622
 Fax: (717) 230-8626

GRAIN SIZE DISTRIBUTION

Project: Dollar General (CGB)
 PSI Job No.: 04911693
 Location: 1927 NJ Route 37
 Manchester Twp, NJ

Laboratory Summary Sheet

Sheet 1 of 1

Borehole	Approx. Depth	Liquid Limit	Plastic Limit	Plasticity Index	Qu (tsf)	%<#200 Sieve	Est. Specific Gravity	Water Content (%)	Dry Density (pcf)	Saturation (%)	Void Ratio
B-1	1							10			
B-1	3							10			
B-1	5							16			
B-1	7							19			
B-1	9							18			
B-1	11							16			
B-1	16							20			
B-1	21							21			
B-2	1							9			
B-2	3					3.6%		15			
B-2	5							38			
B-2	7							17			
B-2	9							17			
B-2	11							14			
B-2	16							12			
B-2	21							15			
B-3	1							23			
B-3	3					4.0%		22			
B-3	5							16			
B-3	7							21			
B-3	9							16			
B-3	11							21			
B-3	16							19			
B-3	21							38			
P-1	1							36			
P-1	3					2.7%		19			
P-1	5							14			
P-1	7							19			
P-1	9							19			
P-3	1							16			
P-3	3							12			
P-3	5							21			
P-3	7							21			
P-3	9							17			
P-4	1							11			
P-4	3							16			
P-4	5							20			



Professional Service Industries
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622
 Fax: (717) 230-8626

Summary of Laboratory Results

PSI Job No.: 04911693
 Project: Dollar General (CGB)
 Location: 1927 NJ Route 37
 Manchester Twp, NJ