

# ROCKLAND LOGISTICS CENTER

## BUILDINGS 2 & 3

### SUFFERN, NEW YORK



413 Browning Court, Purcellville, VA 20132, Phone: 703.771.9844

#### DESIGN NOTES:

##### IMPACT PIER DESIGN INFORMATION

GEOTECHNICAL ENGINEER: DYNAMIC EARTH, LLC.  
 GEOTECHNICAL REPORT: "REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION, PROPOSED INDUSTRIAL PARK, OLD MILL ROAD AND HEMION ROAD (CR 93), SECTION 55.22, BLOCK 1, LOT 1; VILLAGE OF SUFFERN SECTION 55.06, BLOCK 1, LOT 1; VILLAGE OF MONTEBELLO, ROCKLAND COUNTY, NEW YORK," DATED SEPTEMBER 1, 2020.  
 "SUPPLEMENTAL GEOTECHNICAL INVESTIGATION MEMO SUMMARY, PROPOSED ROCKLAND LOGISTICS CENTER, 25 OLD MILL ROAD & HEMION ROAD, SECTION 55.22, BLOCK 1, LOT 1, VILLAGE OF SUFFERN, ROCKLAND COUNTY, NEW YORK," DATED MAY 26, 2023.  
 STRUCTURAL ENGINEER: ADB STRUCTURAL ENGINEERING  
 STRUCTURAL PLANS: "ROCKLAND LOGISTICS CENTER BLDG 2," PERMIT SET DATED FEBRUARY 9, 2024.  
 "ROCKLAND LOGISTICS CENTER BLDG 3," PERMIT SET DATED FEBRUARY 9, 2024.  
 STRUCTURAL LOADS: "20231208 SEI085-23 RLC B2 FOUNDATION LOADS.PDF," PROVIDED BY ADB STRUCTURAL ENGINEERING, DATED DECEMBER 8, 2023.  
 "20231208 SEI085-23 RLC B3 FOUNDATION LOADS.PDF," PROVIDED BY ADB STRUCTURAL ENGINEERING, DATED DECEMBER 8, 2023

##### IMPACT PIER DESIGN PARAMETERS

IMPACT PIER CALCULATIONS: "DESIGN CALCULATIONS FOR IMPACT PIER FOUNDATION SUPPORT SYSTEM" IFC, DATED MARCH 29, 2024.  
 IMPACT PIER DIAMETER: 16 INCHES  
 IMPACT PIER LENGTH: VARIES  
 MODULUS TEST LOCATION: BORING B-110 AREA

- BORING LOCATIONS ARE SHOWN FOR INFORMATION ONLY AND ARE APPROXIMATE LOCATIONS TAKEN FROM THE ABOVE-REFERENCED REPORT. SEE THE BORING LOGS INCLUDED IN THE ABOVE-REFERENCED REPORT. GEOSTRUCTURES, INC. SHALL BE NOTIFIED IMMEDIATELY IF SUBSURFACE OR SITE CONDITIONS VARY FROM THOSE USED FOR DESIGN.
- FOOTING LOCATIONS AND ORIENTATIONS SHOWN ON THESE PLANS ARE FOR INFORMATION ONLY. GEOSTRUCTURES, INC. ACCEPTS NO RESPONSIBILITY FOR LOCATIONS OR DIMENSIONS OF FOOTINGS SHOWN ON THESE PLANS. GEOSTRUCTURES, INC. SHALL BE NOTIFIED IMMEDIATELY IF INFORMATION ON THESE PLANS OR STRUCTURAL LOADS CONFLICTS WITH STRUCTURAL OR ARCHITECTURAL DRAWINGS.
- IMPACT PIER ELEMENTS HAVE BEEN DESIGNED FOR SETTLEMENT CONTROL DUE TO COMPRESSIVE VERTICAL LOADING ONLY. FOOTING UPLIFT, SLIDING RESISTANCE AND FOOTING TILT DUE TO ECCENTRIC LOADING HAVE NOT BEEN CONSIDERED AND SHOULD BE VERIFIED BY OTHERS.
- GEOSTRUCTURES, INC. IS ONLY RESPONSIBLE FOR SETTLEMENT CONTROL OF THE FOOTINGS AND SLABS SUPPORTED BY IMPACT PIER ELEMENTS AS INDICATED ON THESE PLANS. SETTLEMENT AND BEARING CAPACITY OF FOOTINGS AND SLABS NOT SUPPORTED BY IMPACT PIER ELEMENTS, AS WELL AS DIFFERENTIAL SETTLEMENT BETWEEN IMPACT PIER SUPPORTED AND NON-SUPPORTED FOOTINGS AND SLABS, IS THE RESPONSIBILITY OF OTHERS.
- THE IMPACT PIER SUPPORT SYSTEM HAS BEEN DESIGNED TO CONTROL SETTLEMENTS UNDER THE APPLIED FOOTING AND SLAB CONTACT PRESSURES RESULTING FROM THE STRUCTURE LOADS ON THE FOOTINGS AND SLABS AND FOOTING AND SLAB SIZES PROVIDED (REFER TO DESIGN CALCULATIONS). THESE APPLIED CONTACT PRESSURES MAY BE LESS THAN THE ALLOWABLE BEARING PRESSURE OF 3.0 KSF USED FOR STRUCTURAL DESIGN OF THE FOOTINGS AND SLABS. FOOTING AND SLAB CONTACT PRESSURES SHALL NOT BE INCREASED WITHOUT A COMMENSURATE REVIEW/REVISION OF THE IMPACT PIER DESIGN.
- STRESS ATTENUATION UNDER IMPACT PIER-SUPPORTED FOOTINGS AND SLABS IS SIMILAR TO ATTENUATION UNDER FOOTINGS AND SLABS SUPPORTED ON UNIMPROVED GROUND. THE EFFECTS OF FOOTING AND SLAB PRESSURE ON ADJACENT EXISTING STRUCTURES (FOOTINGS, SUBGRADE WALLS, VAULTS, ETC.) SHOULD BE ANALYZED BY THE GEOTECHNICAL AND STRUCTURAL ENGINEERS OF RECORD.

#### CONSTRUCTION NOTES:

##### IMPACT PIER FOUNDATIONS

- IMPACT PIER (IP) ELEMENTS SHALL BE INSTALLED IN THE FIELD WITHIN 6 INCHES OF LOCATIONS SHOWN ON THESE PLANS.
- IMPACT PIER ELEMENT DESIGN SHALL BE CONFIRMED BY A FULL-SCALE MODULUS TEST PERFORMED AT THE SITE.
- A QUALIFIED, FULL-TIME QUALITY CONTROL (QC) REPRESENTATIVE PROVIDED BY THE IMPACT PIER ELEMENT INSTALLER (INSTALLER) SHALL BE RESPONSIBLE FOR INSTALLATION OF THE IMPACT PIER ELEMENTS IN ACCORDANCE WITH THE DESIGN AND THE QUALITY CONTROL MANUAL FOR IMPACT PIER ELEMENTS. THE QC REPRESENTATIVE SHALL REPORT ALL IMPACT PIER ELEMENT CONSTRUCTION ACTIVITIES TO GEOSTRUCTURES, INC. IF AUTHORIZED BY THE OWNER, THE QC REPRESENTATIVE SHALL COORDINATE QC ACTIVITIES WITH THE TESTING AGENCY HIRED BY THE OWNER. THE TESTING AGENCY SHALL NOT DIRECT IMPACT PIER ELEMENT INSTALLATION PROCEDURES.
- IMPACT PIER ELEMENTS SHALL BE ACCEPTED BASED ON THE FOLLOWING CRITERIA UNLESS OTHERWISE APPROVED IN WRITING BY GEOSTRUCTURES, INC.
  - PENETRATION DEPTH SHALL BE WITHIN 3 INCHES OR DEEPER THAN THE DEPTHS SHOWN ON THE PLANS.
  - IMPACT PIER ELEMENTS SHALL BE CONSTRUCTED BY RAISING THE MANDREL THEN DRIVING THE MANDREL USING VERTICAL IMPACT ENERGY AND CROWD PRESSURE TO CONSTRUCT AN APPROXIMATE 2-FOOT-THICK LIFT. OTHER METHODS USED TO CONSTRUCT IMPACT PIER ELEMENTS SHALL BE THE SAME AS USED IN A SUCCESSFUL FULL-SCALE MODULUS TEST OR AS REQUIRED BY FIELD CONDITIONS AND APPROVED BY GEOSTRUCTURES, INC.
  - IMPACT PIER ELEMENT AGGREGATE SHALL BE THE SAME AS USED IN A SUCCESSFUL FULL-SCALE MODULUS TEST. TYPICAL AGGREGATE CONSISTS OF OPEN-GRADED, 3/4-INCH MINUS CRUSHED STONE (AASHTO #57 STONE OR SIMILAR).
- IMPACT PIER ELEMENTS NOT MEETING THE REQUIREMENTS DEFINED IN THE DESIGN AND MODULUS TEST SHALL BE REINSTALLED TO MEET PROJECT REQUIREMENTS UNLESS OTHERWISE APPROVED IN WRITING BY GEOSTRUCTURES, INC.
- FOOTING ELEVATIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPORTED IN WRITING TO THE INSTALLER'S QC REPRESENTATIVE PRIOR TO INSTALLING IMPACT PIER ELEMENTS.
- UTILITY LOCATIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR. GEOSTRUCTURES, INC. SHOULD BE NOTIFIED OF ANY CONFLICTS WITH IMPACT PIER ELEMENT LOCATIONS SHOWN ON THE PLANS. ALL EXISTING AND PROPOSED UTILITIES WITHIN AND ADJACENT TO THE PROPOSED BUILDING FOOTPRINT SHALL BE FIELD VERIFIED BY THE GENERAL CONTRACTOR AND COORDINATED WITH THE IMPACT PIER FOUNDATION INSTALLER BEFORE IMPACT PIER INSTALLATION SHALL PROCEED.
- IMPACT PIER ELEMENTS ARE LOCATED AT THE CENTERLINE OF STRIP FOOTINGS UNLESS DIMENSIONED OTHERWISE.
- ANY ENGINEERED FILL REQUIRED FOR THE PROJECT SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER OF RECORD'S (GER) REQUIREMENTS.
- ALL SETTLEMENT AS A RESULT OF FILL PLACEMENT SHALL BE COMPLETE AS DETERMINED BY THE GER PRIOR TO SUPERSTRUCTURE INSTALLATION.
- ALL IMPACT PIER ELEMENTS SHALL EXTEND THROUGH FILL MATERIAL TO NATURAL SOIL.
- IMPACT PIER ELEMENTS THAT CANNOT BE INSTALLED TO THEIR PLANNED BOTTOM OF IMPACT PIER ELEVATIONS WILL BE EVALUATED AND DESIGN ADJUSTMENTS WILL BE MADE ON A CASE-BY-CASE BASIS.

##### CONCRETE FOOTING EXCAVATION PREPARATION

- EXCAVATION AND SURFACE COMPACTION OF ALL FOOTING SUBGRADES SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
- OVEREXCAVATION BELOW THE BOTTOM OF THE FOOTING SHALL BE LIMITED TO 3 INCHES. THIS INCLUDES LIMITING THE TEETH OF EXCAVATORS FROM OVEREXCAVATION BEYOND THREE INCHES BELOW THE FOOTING ELEVATION.
- WATER SHALL NOT BE ALLOWED TO ACCUMULATE IN THE FOOTING EXCAVATIONS PRIOR TO CONCRETE PLACEMENT.
- PRIOR TO PLACING FOOTING CONCRETE OR MUD MAT, THE FOOTING SUBGRADE AND PIER AGGREGATE SHALL BE COMPACTED WITH A WALK-BEHIND IMPACT-TYPE COMPACTOR. COMPACTION SHALL BE PERFORMED OVER THE ENTIRE FOOTING SUBGRADE TO COMPACT ANY LOOSE SURFACE SOIL AND LOOSE SURFACE IMPACT PIER AGGREGATE.
- THE TESTING AGENCY SHALL INSPECT EACH FOOTING SUBGRADE AND APPROVE IT IN WRITING ON THE SAME DAY THAT THE CONCRETE OR MUD MAT IS PLACED IN THE FOOTING EXCAVATION. THE APPROVAL SHALL STATE THAT ALL FOOTING SUBGRADES INCLUDING MATRIX SOILS AND IMPACT PIER TOPS HAVE NOT BEEN OVEREXCAVATED MORE THAN 3 INCHES BELOW THE BOTTOM OF THE FOOTING, HAVE BEEN KEPT FREE OF WATER ACCUMULATION, AND HAVE BEEN COMPACTED WITH A WALK-BEHIND IMPACT-TYPE COMPACTOR ON THE SAME DAY THAT THE CONCRETE OR MUDMAT WAS PLACED.
- FOOTING CONCRETE SHALL BE PLACED THE SAME DAY AS FOOTING EXCAVATIONS ARE COMPLETED. IF IMMEDIATE PLACEMENT IS NOT POSSIBLE, THEN A MUD MAT CONSISTING OF A 3-INCH MINIMUM THICKNESS OF LEAN CONCRETE SHALL BE PLACED OVER THE FOOTING SUBGRADE.
- FOOTING CONCRETE/MUD MAT SHALL BE PLACED DIRECTLY ON TOP OF EXPOSED IMPACT PIER ELEMENTS. FOOTINGS SHOULD BE WIDENED AS NECESSARY TO COVER ENTIRE IMPACT PIER ELEMENT WITH FOOTING CONCRETE/MUD MAT.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR MEASURING TOP-OF-FOOTING ELEVATIONS TO ACCURACY OF 1/8-INCH. MEASUREMENTS SHALL BE TAKEN BY A LICENSED PROFESSIONAL SURVEYOR BEFORE LOADS ARE APPLIED TO THE FOOTINGS.
- FOOTING STEP LOCATIONS SHALL BE COORDINATED WITH THE IMPACT PIER ELEMENTS.
- FOOTINGS BEARING DIRECTLY ON ENGINEERED FILL OR APPROVED SUBGRADE SOILS SHALL BE EXCAVATED AND PLACED IN ACCORDANCE WITH THE GER'S REQUIREMENTS.

#### SHEET INDEX

SHEET NO.	DESCRIPTION
IP-1	COVER SHEET / GENERAL NOTES
IP-2 TO IP-5	IMPACT PIER ELEMENT LAYOUT - PLAN VIEW - BUILDING 2
IP-6 TO IP-7	IMPACT PIER ELEMENT LAYOUT - PLAN VIEW - BUILDING 3
IP-8	IMPACT PIER ELEMENT DETAILS

IN ACCORDANCE WITH NEW YORK STATE EDUCATION LAW, THESE DESIGN DOCUMENTS HAVE BEEN PREPARED BY GEOSTRUCTURES FOR THE SOLE USE BY GEOCONSTRUCTORS FOR THIS PROJECT. NO ENGINEERING SERVICES RELATED TO THIS PROJECT HAVE BEEN PERFORMED FOR ANY OTHER ENTITY OR THE PUBLIC.

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GFC PROJECT NUMBER P23-GCA-03825

REVISIONS			
REV.	DATE	COMMENT	BY

ISSUED FOR CONSTRUCTION

PROJECT No.:	15240IP
DRAWN BY:	JH
CHECKED BY:	JFN
DATE:	03/29/2024
SCALE:	AS SHOWN
CAD I.D.:	15240IP_BLDG 2&3_IFC

PROJECT: ROCKLAND LOGISTICS CENTER BUILDINGS 2 & 3  
 LOCATION: SUFFERN, NEW YORK



SHEET TITLE: COVER SHEET / GENERAL NOTES  
 SHEET NUMBER: IP-1  
 1 OF 8

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