Zero Emission Vehicle Transition Plans

wendel

Agenda

01 Introduction to Wendel

02 Zero Emission Transition Plan Goals

03 Transition Plan Scope of Work

04 Utility Requirements

05 NYSERDA Program & Funding Opportunities

06 Questions/ Discussions

wendel

W

Wendel has a strong practice in the **transportation sector** and provides planning, design and execution services for **Battery Electric Vehicles, charging infrastructure and operation facilities**.

Wendel also has a strong **alternative fuels** group that provides consulting services for propane, compressed natural gas, battery electric vehicles and hydrogen fueled vehicles.

ARCHITECTURE
- INTERIOR DESIGN
- LANDSCAPE ARCHITECTURE

ENGINEERING
- CIVIL
- ELECTRICAL
- ENVIRONMENTAL
- MECHANICAL
- MUNICIPAL
- STRUCTURAL
- TRANSPORTATION
- RAILROAD
- ALTERNATIVE FUEL SOLUTIONS
- WATER/ WASTEWATER RETROFITS
- LAND SURVEYING
- GEOGRAPHIC INFORMATION SYSTEMS (GIS)
- PLANNING

ENERGY EFFICIENCY
- ENERGY AUDITS
- COMMISSIONING
- PROFESSIONALLY ASSISTED PERFORMANCE CONTRACTING
- ALTERNATIVE FUNDING/GRANT PROGRAMS
- RETROFIT AND IMPLEMENTATION DESIGN
- GREEN BUILDING DESIGN
- MEASUREMENT & SAVINGS VERIFICATION (M&V)
- RENEWABLE TECHNOLOGIES

CONSTRUCTION MANAGEMENT
- MASTERBUILDER
- PROGRESSIVE DESIGN/BUILD
- DESIGN/BID/BUILD
- CONSTRUCTION MANAGEMENT AT RISK(CMAR)
- CM AGENT
- GMP DESIGN/BUILD

300+ Employees

16 Offices Nationwide

A Trusted Advisor

Wendel's depth of expertise in alternative fuels has made us a trusted advisor to many companies.

- Former **utility employees** on staff.
- Experts in **fire protection** for lithium-ion battery fires.
- Provide technology and **vendor-neutral options**.
- Work with various agencies to find funding through federal, state, local, and utility **grants and incentives**.

Wendel's John Havrilla presenting an overview of zero-emission transition plans for school districts at a recent NYSERDA/Wendel joint presentation to school superintendents at Lakeshore High School.

Wendel often presents at industry conferences with NYSERDA and school districts on battery electric bus transition issues and initiatives.

ZEB Con
AUG 27-29, 2024 • PHILADELPHIA

New York State School Boards Association

NYAPT
NEW YORK ASSOCIATION FOR PUPIL TRANSPORTATION

wendel

Experienced Technical Partnership

- Currently working with over 135 NYS School districts
- Over 3,700 buses included in current projects
- Projects include:
  - Fleet Electrification Plans (FEPs)
  - Pilot projects
  - FEP implementation design
  - Construction management/support

Zero-Emission Bus Mandate

- By **2027** all new school bus purchases need to be zero-emissions. By **2035** all school buses on the road need to be zero-emissions.
- The Senate is requiring the state to identify barriers to the 100% by **2035** goal so that they may be resolved early.
- New York State Energy Research and Development Authority (NYSERDA) is being tasked to provide technical assistance to school districts as they navigate the transition to 100% electric buses.
- Amendments – **two 2-year extensions** to the 2027 deadline. NYS SED developing application process and qualification criteria by 12/31/2025

wendel

Zero Emission Vehicle Transition Plan Goals

- Provide path towards Zero Emission fleet by 2035 & ensure seamless transition
- Evaluate & recommend infrastructure upgrades
- Provide information to the District in order to make informed decisions regarding design/ implementation
- Reduction of energy loads and assist in conversion to carbon free fuels
- Identify constraints a district may face in meeting the required mandates

wendel

Typical Scope of Work

The Zero Emission Vehicle Transition Plan Consisted of the Following Tasks:

- **TASK 1** – Project Kickoff and Status Meetings
- **TASK 2** – Data Collection
- **TASK 3** – Route Analysis
- **TASK 4** – Conceptual Charging Strategy
- **TASK 5** – Electrical Utility Analysis
- **TASK 6** – Concept Development and Phasing Plan
- **TASK 7** – Transition Plan Cost Estimates
- **TASK 8** – Final Report and Presentation

Battery Electric Bus Options

(NOT ALL INCLUSIVE)

Blue Bird

Thomas Built

IC Bus

Lion

Standard Battery Size:	155 kWh	244 kWh	210 kWh	126 kWh
Operating Range:	120 miles	150 miles	155 miles	100 - 155 miles
Battery Type:	Li-NMC-G	Li-NMC-G	Lithium-ion	Li-NMC-G
Charge Options:	AC Level 2 & 3	AC Level 2 & 3	AC Level 2 & 3	AC Level 2 & 3
Drive Train:	Cummins	Proterra		
Additional Options:			315 kWh Battery	168 kWh Battery
			Diesel Heater	210 kWh Battery

wendel

Utility Requirements

- Charging battery electric buses requires additional power from the utility.
- New service feed and additional transformer may be required from the local utility.
- Can the local utility supply the required power for this project?
- What are the costs the district will incur to upgrade the utility infrastructure to serve the district? (up to 100% of these costs could be covered by Make Ready Programs)
- Low voltage service (traditional) or medium voltage service

wendel

NYSERDA Fleet Electrification Planning

Fleet Electrification Plan (FEP) Funding Opportunities

NYSERDA provides funding to support the completion of FEPs, amounts depend on the applicant. The following funding percentages, or cost-shares' are provided by NYSERDA:

- 100% of costs covered by NYSERDA for NYSBIP Priority Districts
- 75% of the costs covered by NYSERDA for non-Priority Districts
- A minimum of 50% of the costs covered by NYSERDA for third-party bus operators

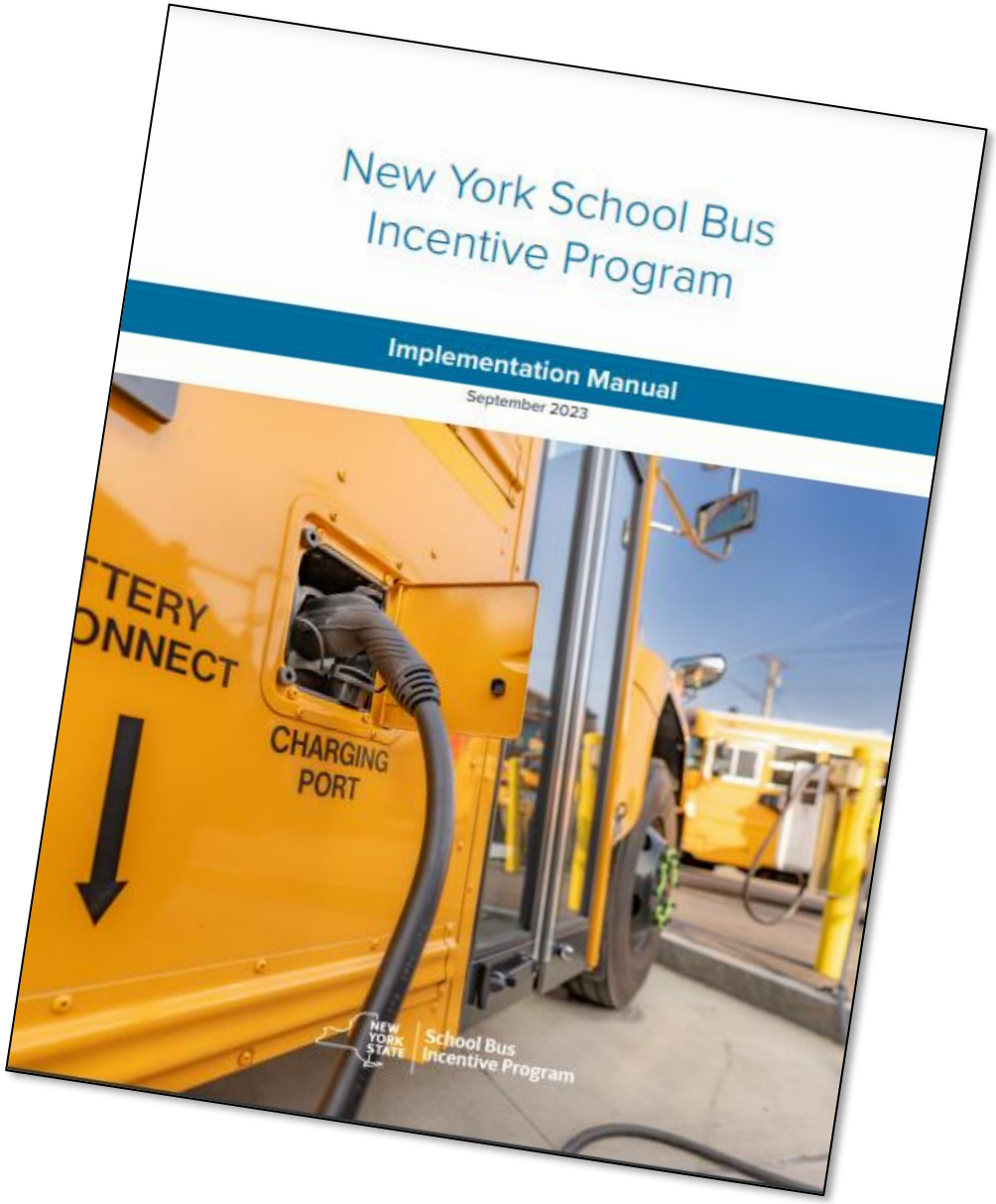
wendel

NYSERDA Programs: Funding

NEW YORK SCHOOL BUS INCENTIVE PROGRAM

The NYSBIP is an incentive program that provides grants to a school district or group of school districts to offset all or a portion of the purchase price of **new or repowered Electric School Bus(es) and associated Charging Infrastructure** .

$500M allocation from the Environmental Bond Act



https://www.nyserda.ny.gov/All-Programs/Electric-School-Buses/NY-School-Bus-Incentive-Program-Overview

Grants and Incentives: School Buses

School Bus Type Base	Base Voucher	Priority District Bonus	Scrappage Bonus	Wheelchair Add-on
New Type A	$114,000	$28,500	$47,500	$8,000
New Type C	$147,000	$36,750	$61,250	$8,000
New Type D	$156,000	$39,000	$65,000	$8,000
Repowered A	$105,000	$21,000	N/A	N/A
Repowered C	$135,000	$27,000	N/A	N/A

State: New York School Bus Incentive Program – School Bus Voucher

Federal: Inflation Reduction Act Commercial Clean Vehicle Tax Credit (45W)

- Up to $40,000 per vehicle

wendel

Grants and Incentives: Chargers

Type	Base Voucher Amount per Bus	Fleet Electrification Plan Bonus per Bus
Non-Priority District	$25,000	$55,000
Priority District	$35,000	$65,000

State: New York School Bus Incentive Program – Charging Voucher

State: Joint Utilities of New York Medium- and Heavy-Duty EV Make-Ready Pilot

- 100% of the utility-side infrastructure costs covered (Cap at $100,000)
- Up to 20% of customer side costs covered for Non-DAC or (Cap at $50,000).

Federal: Inflation Reduction Act Funding Alternative fuel vehicle refueling property credit (30c)

- 30% (up to $100,000 per property item) for alternative fuel charging stations

wendel

Proposed Bus Facility

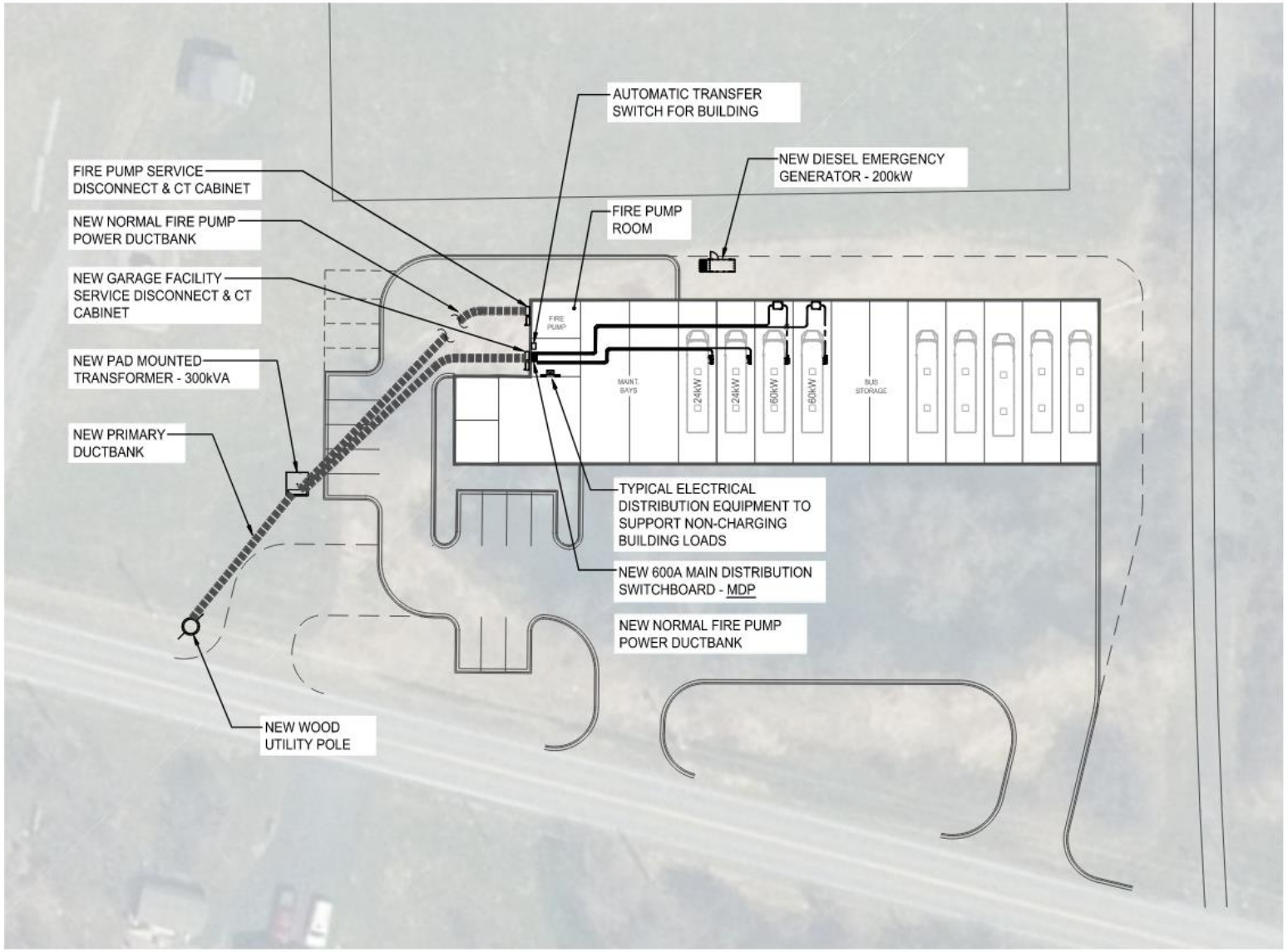
wendel

8-8-2024

N

0 20 40

SCALE: 1" = 20'



CHARGER QUANTITY

PHASE 1	24kW PLUG-IN	2
	60kW PLUG-IN	2
	120kW PLUG-IN (# OF DISP.)	-
	-	-
	TOTAL AFTER PHASE 1	4
	TOTAL CHARGING POSITIONS AFTER PHASE 1	4

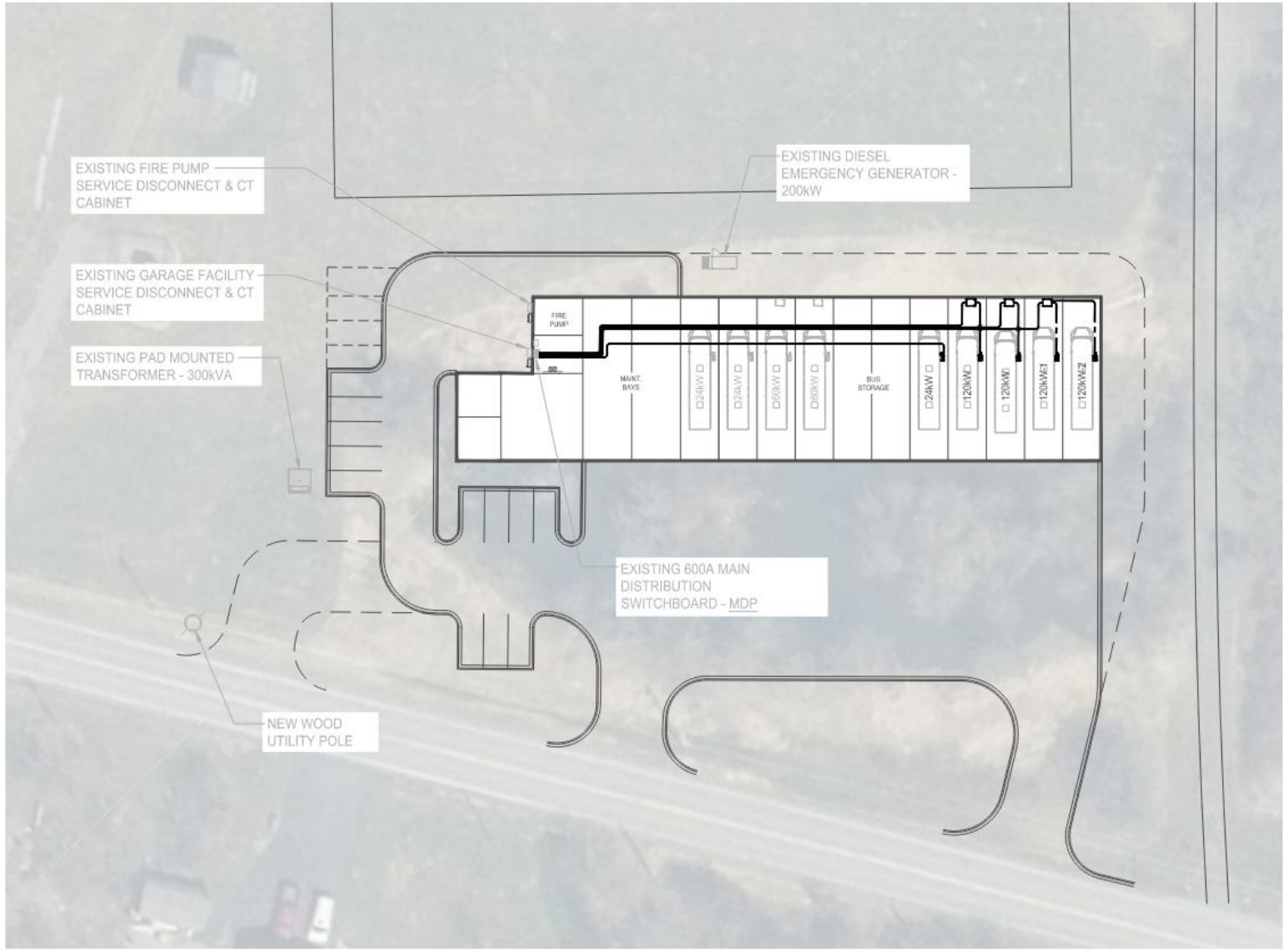
1 SITE PLAN LAYOUT - PHASE 1
SCALE: 1"=40'-0"

CONCEPTUAL - NOT FOR CONSTRUCTION

wendel
www.wendelccompanies.com

Charging Equipment Layout - Phase 1

Proj. No.	632401
Date	10/07/2024
Drawing Number	E1



CHARGER QUANTITY

PHASE 1	24kW PLUG-IN	2
	60kW PLUG-IN	2
	120kW PLUG-IN (# OF DISP.)	-
PHASE 2	24kW PLUG-IN	1
	60kW PLUG-IN	-
	120kW PLUG-IN (# OF DISP.)	1(2)
	120kW PLUG-IN (# OF DISP.)	2(1)
	TOTAL AFTER PHASE 2	8
	TOTAL CHARGING POSITIONS AFTER PHASE 2	9

1 SITE PLAN LAYOUT - PHASE 2
SCALE: 1"=40'-0"

CONCEPTUAL - NOT FOR CONSTRUCTION

wendel
www.wendelccompanies.com

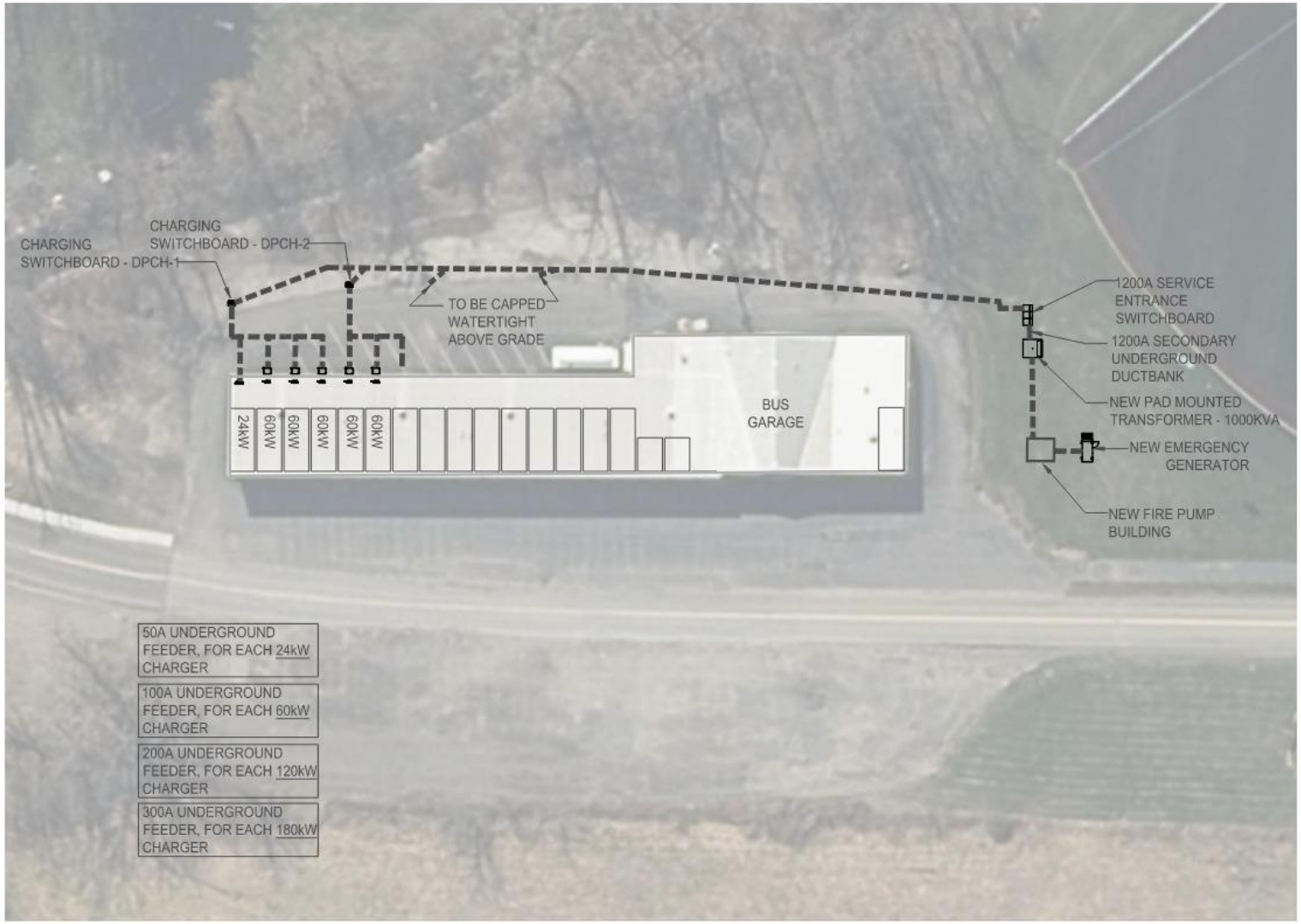
Charging Equipment Layout - Phase 2

Proj. No. 632401
Date 10/07/2024
Drawing Number E2

wendel

CHARGER QUANTITY

24kW PLUG-IN	1
60kW PLUG-IN	5
120kW PLUG-IN	-
180kW PLUG-IN	-
-	-
TOTAL AFTER PHASE 1	6



1 SITE PLAN LAYOUT - PHASE 1 (2027-2030)
SCALE: 1"=50'-0"

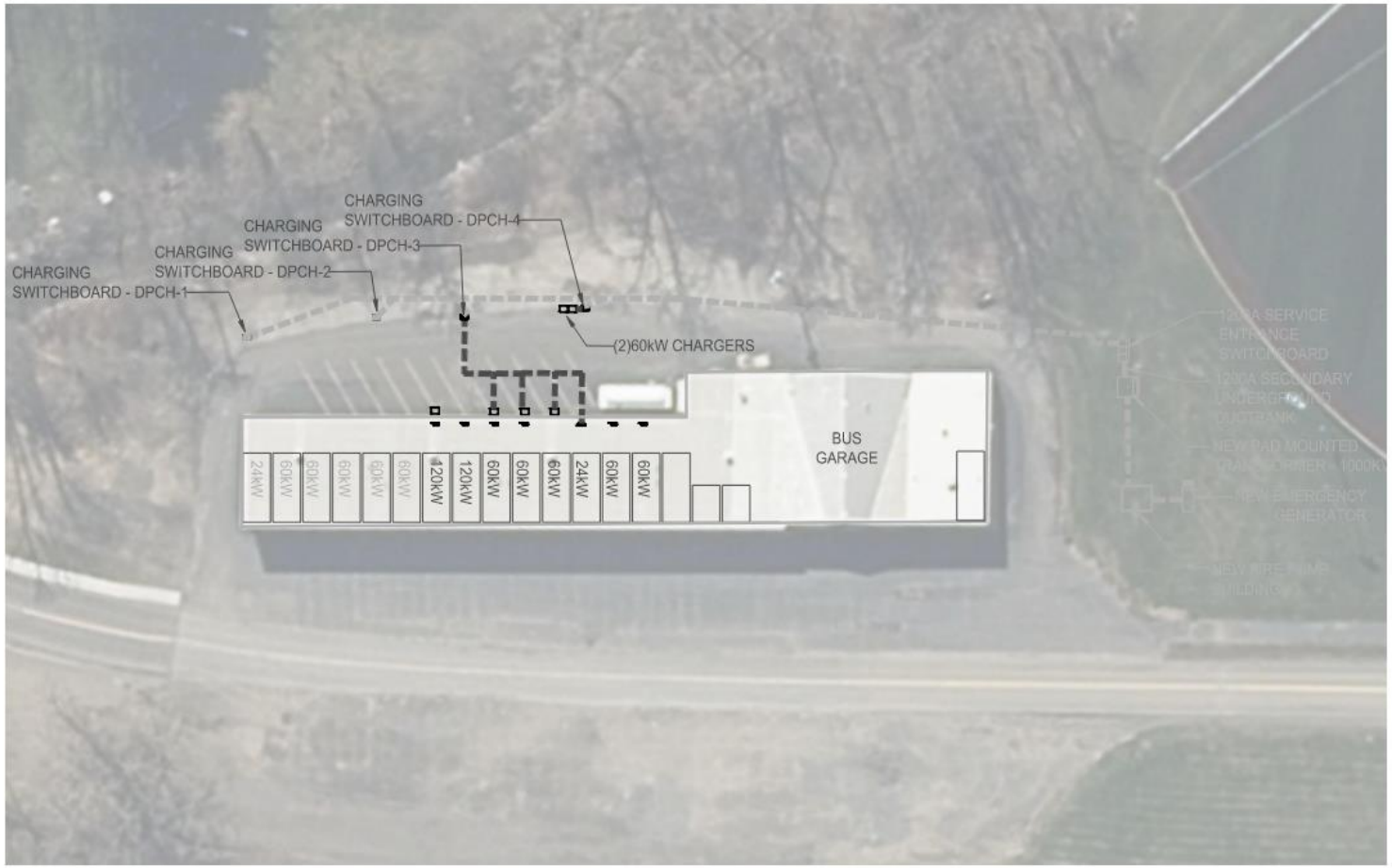
CONCEPTUAL - NOT FOR CONSTRUCTION

wendel
www.wendelcompanies.com

Charging Equipment Layout - Phase 1

Proj. No.	633501
Date	07/31/2024
Drawing Number	E1

wendel



50A UNDERGROUND FEEDER, FOR EACH 24kW CHARGER
100A UNDERGROUND FEEDER, FOR EACH 60kW CHARGER
200A UNDERGROUND FEEDER, FOR EACH 120kW CHARGER
300A UNDERGROUND FEEDER, FOR EACH 180kW CHARGER

CHARGER QUANTITY

PHASE 1	24kW PLUG-IN	1
	60kW PLUG-IN	5
	120kW PLUG-IN	-
	180kW PLUG-IN	-
	-	-
PHASE 2	24kW PLUG-IN	1
	60kW PLUG-IN	5
	120kW PLUG-IN	1(2:1)
	180kW PLUG-IN	-
	-	-
	TOTAL AFTER PHASE 2	13

1 SITE PLAN LAYOUT - PHASE 2 (2031-2033)

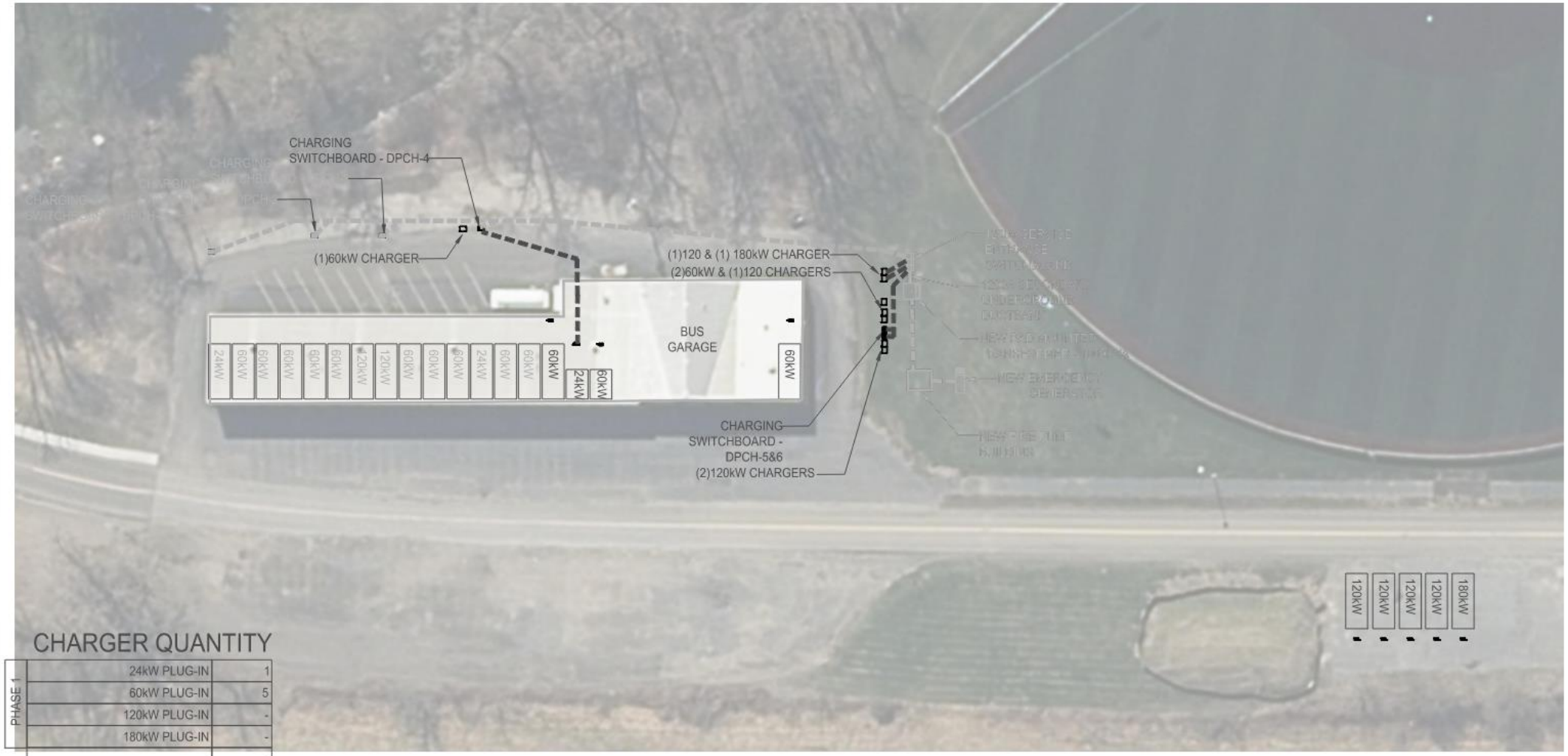
SCALE: 1"=50'-0"

CONCEPTUAL - NOT FOR CONSTRUCTION

wendel
www.wendelccompanies.com

Charging Equipment Layout - Phase 2

Proj. No.	633501
Date	07/31/2024
Drawing Number	E2



CHARGER QUANTITY

PHASE 1	24kW PLUG-IN	1
	60kW PLUG-IN	5
	120kW PLUG-IN	-
	180kW PLUG-IN	-
	-	-
PHASE 2	24kW PLUG-IN	1
	60kW PLUG-IN	5
	120kW PLUG-IN	1(2:1)
	180kW PLUG-IN	-
	-	-
PHASE 3	24kW PLUG-IN	1
	60kW PLUG-IN	3
	120kW PLUG-IN	4
	180kW PLUG-IN	1
	-	-
	TOTAL AFTER PHASE 3	22

50A UNDERGROUND FEEDER, FOR EACH 24kW CHARGER

100A UNDERGROUND FEEDER, FOR EACH 60kW CHARGER

200A UNDERGROUND FEEDER, FOR EACH 120kW CHARGER

300A UNDERGROUND FEEDER, FOR EACH 180kW CHARGER

1 SITE PLAN LAYOUT - PHASE 3 (2034-2035)

SCALE: 1"=50'-0"

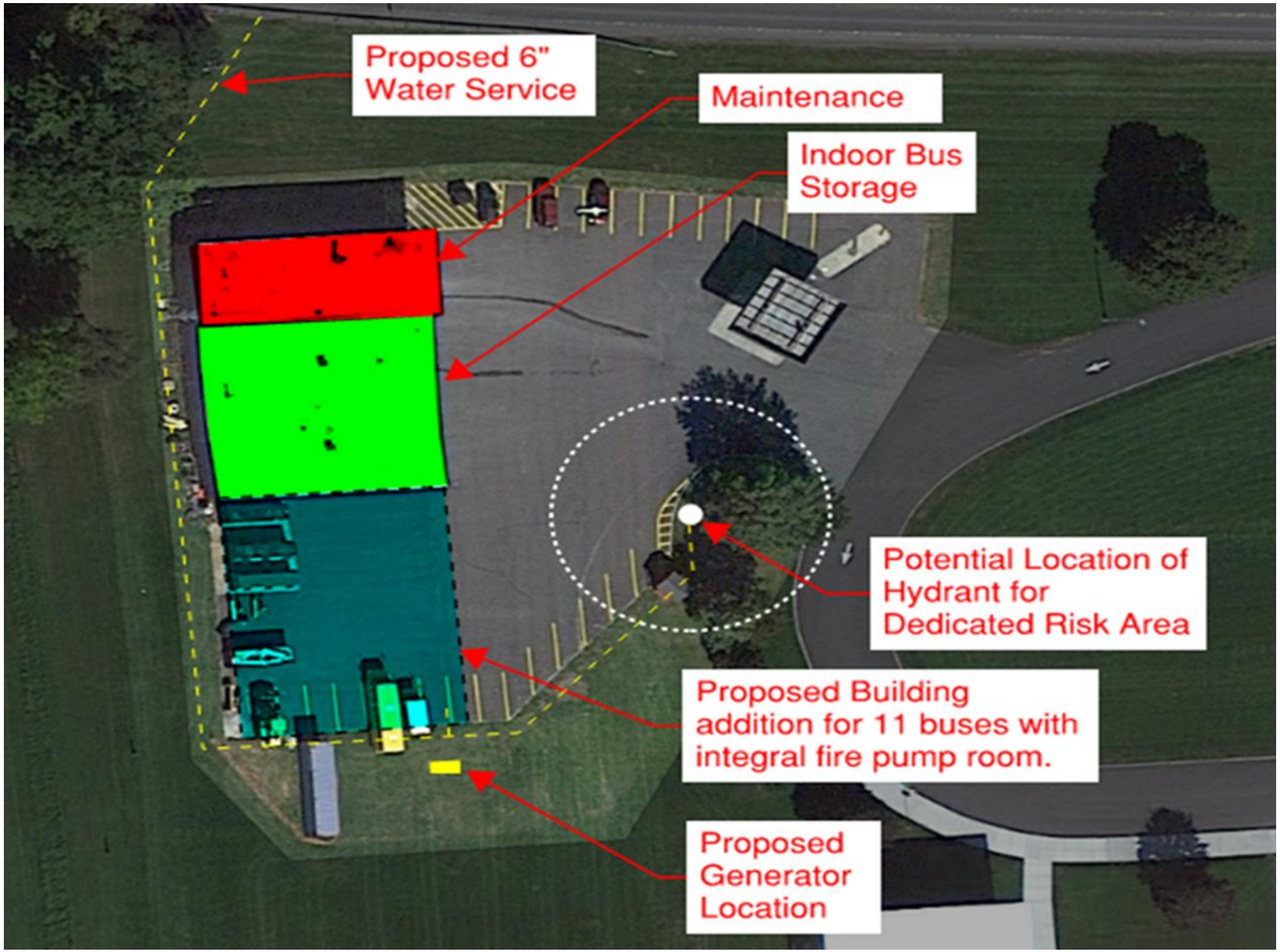
CONCEPTUAL - NOT FOR CONSTRUCTION

wendel
www.wendelccompanies.com

Charging Equipment Layout - Phase 3

Proj. No.	633501
Date	07/31/2024
Drawing Number	E3

Phase 1: Fire Protection



Questions

wendel

Thank you.

John Havrilla
Director of Alternative Fuels
Jhavrilla@wendelccompanies.com

Adam Kaufman
Energy Engineer
akaufman@wendelccompanies.com

Brad Flanagan
Energy Engineer
bflanagan@wendelccompanies.com

www.wendelcompanies.com

wendel