



ENGINEERING REPORT

FOR

**SARATOGA BIOCHAR SOLUTIONS, LLC
CARBON FERTILIZER™ MANUFACTURING FACILITY
MOREAU, NY**

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1.0 INTRODUCTION

Saratoga Biochar Solutions, LLC (SBS) is proposing to construct and operate a solid waste management facility (SWMF) to manufacture Carbon Fertilizer™ from biosolids and wood waste feedstock (hereinafter the “Facility”) with an annual throughput up to 235,200 wet tons of received biosolids and up to 35,280 tons of wood waste. The Facility is designed to be constructed in three phases with each phase consisting of a process line capable of processing up to 10 wet tons per hour of biosolids and up to 1.5 tons per hour of wood waste. Each process line is capable of manufacturing approximately 1 ton per hour of Exceptional Quality (EQ) Class A biosolids product (i.e., “Carbon Fertilizer™”) in accordance with 40 CFR Part 503 and 6 NYCRR 361. The selected location is on 5.89 acres composed of Tax Parcels 50.-4-16 (3.07 acres) and 50.-4-22 (2.82 acres), on Farnan Road within the Moreau Industrial Park in the Town of Moreau, Saratoga County, New York, owned by Moreau Industrial Park, LLC. A Site Location Map on a United States Geological Survey quadrangle map is provided as Figure 1, and a Site Vicinity Map on an aerial image is provided as Figure 2.

The Facility is designed to process biosolids and wood waste feedstock through low-temperature drying and pyrolysis to produce a marketable Carbon Fertilizer™ that meets specific end-use requirements. The Facility is subject to a New York State Department of Environmental Conservation (NYSDEC) SWMF permit under 6 NYCRR 362-1 (Thermal Treatment Facilities). There is no incineration or combustion of feedstock involved in the manufacturing process, and the feedstock is limited to biosolids sourced from wastewater treatment plants and wood waste consisting of land clearing debris and/or unadulterated wood, wood chips, or bark from logging operations, pulp and paper production, and wood products manufacturing. Unauthorized waste that will not be accepted includes municipal solid waste, construction and demolition debris, friable asbestos-containing material (ACM), mercury-added consumer products, radioactive waste, infectious and regulated medical waste, hazardous wastes, and wood products that are painted, chemically treated (e.g., pressure-treated wood or railroad ties), or manufactured with chemicals such as glues or adhesives (e.g., plywood or particle board).

All manufacturing activities are conducted indoors, and the Facility is maintained under negative pressure to mitigate potential fugitive odor emissions. All exhaust air is treated through engineered air pollution control devices for particulate, ammonia, sulfur dioxide, and odor control. The Facility has submitted a Petition for a Case-Specific Beneficial Use Determination (BUD) to NYSDEC that describes the marketing plan for the beneficial use of Carbon Fertilizer™.

1.1 Purpose and Objectives

This Engineering Report and supplemental documentation demonstrates compliance with applicable requirements of 6 NYCRR 360.16 (Permit Application Requirements and Permit Provisions), 6 NYCRR 360.19 (Operating Requirements), and 6 NYCRR Part 362-1 (Thermal Treatment Facilities). Site development is subject to local approval by the Town of Moreau Planning Board. An initial Site Plan Application, including a Full Environmental Assessment Form (EAF), was submitted to the Town of Moreau Planning Board in July 2021. Site Plan Drawings are provided in Appendix A.

Supplemental documentation to this Engineering Report provides operational Facility guidelines for use upon issuance of the Permit to Operate. Supplemental documentation includes the following:

- Facility Manual
 - Waste Control Plan
 - Operations & Maintenance (O&M) Plan

- Training Plan
- Emergency Response Plan
- Noise Monitoring and Control Plan
- Residue Management Plan
- Radioactive Waste Detection Plan
- Closure Plan
- Application for Air Facility Permit
 - Description of Emission Sources
 - Description of Emission Controls
 - Facility Emission Estimates
 - AERSCREEN Stack Dispersion Screening
 - Allowable Emissions Analysis
 - CLCPA Consistency Assessment
- Petition for Case-Specific Beneficial Use Determination
 - Biosolids Supplier Contract
 - Wood Waste Source Letters of Interest
 - End-Use Marketing Plan
 - End-Use Market Letters of Interest
 - Example Product Label

A copy of this Engineering Report, supplements, and design documents will be maintained at the Facility and be made available, upon request, for inspection and review by agencies having jurisdiction over the Facility or aspects of its operation.

2.0 REGULATORY OVERVIEW

2.1 State Environmental Quality Review Act (SEQRA)

As required by SEQRA, all State, regional, and local government agencies have the responsibility of determining whether actions, including issuance of solid waste permits, may have significant impacts on the environment. If the action is determined to possess the potential for adverse environmental impacts, SEQRA requires submission of an Environmental Impact Statement (EIS).

A Generic Environmental Impact Statement (GEIS) was prepared in 1991 during the initial rezoning and establishment of the Moreau Industrial Park. The GEIS examined the potential impacts of the development of the park and a Statement of Findings and Decision to approve the action was issued on February 21, 1991. Section 8 of the Statement established a series of thresholds as a method for measuring individual project impact. If a proposed individual development exceeds 10-15% above the thresholds, the Lead Agency should consider if additional environmental studies are warranted. If a proposed development does not exceed the thresholds, then no additional studies would be required. A copy of the Moreau Industrial Park GEIS Statement of Findings is included in Appendix B.

In August 2021, the Town of Moreau Planning Board voted unanimously to be Lead Agency and undertake a coordinated review with other involved agencies. In March 2022, the Planning Board, as Lead Agency,

completed Part 2 of the Full EAF and issued a Negative Declaration. A copy of the completed Parts 1, 2, and 3 of the Full EAF are provided in Appendix B.

2.2 New York State Historic Preservation Act Review

Section 14.09 of the Parks, Recreation, and Historic Preservation Law requires mandatory review and consultation if a project has potential to cause any change, beneficial or adverse, in the quality of any eligible or registered property. During initial development of the Moreau Industrial Park, the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) was consulted to review the proposed development in accordance with the New York State Historic Preservation Act. Two archaeological sites were identified (Site 1 and Site 2) through a phase 1, 2, and 3 archaeological survey. Both sites were fully excavated to recover artifacts, and OPRHP accepted the final Stage 3 report to authorize construction of the Industrial Park.

A new consultation was initiated for the Facility's specific location on Tax Parcels 50.-4-16 and 50.-4-22. By letter dated November 10, 2021, OPRHP indicated no impacts by the project. Therefore, requirements of 6 NYCRR 621.3(a)(8) are complete and additional review and consultation is not necessary. A copy of OPRHP correspondence is provided in Appendix C.

2.3 Uniform Procedures Act

The Uniform Procedures Act and associated Permit Hearing Procedures (6 NYCRR Parts 621 and 624) establishes timetables for review and approval of environmental permit applications. Under the Uniform Procedures Act, the review process for projects requiring multiple NYSDEC approvals and/or permits is simplified via concurrent review of all applications. The following list identifies NYSDEC environmental approvals and permit:

- Solid Waste Management Facility Permit
- State Facility Air Permit

2.4 Applicability of Part 360

The activities associated with Facility operation are regulated under 6 NYCRR Parts 360 and 362-1, respectively. Revisions to these regulations became effective November 4, 2017.

2.5 State and Local Consistency

The New York State Solid Waste Management Plan encourages reduction, reuse, and recycling of waste over land disposal. The newly enacted New York State Climate Leadership and Community Protection Act (CLCPA) mandates that State agencies consider the climate implications of agency decisions and must consider whether this project is inconsistent with, or will interfere with, the attainment of the statewide greenhouse gas (GHG) emission limits. The CLCPA includes economy-wide requirements to reduce GHG emissions in New York State by 40% below 1990 levels by 2030 and 85% below 1990 levels by 2050. NYSDEC has promulgated GHG emission limits in 6 NYCRR 496. A detailed CLCPA consistency assessment is included in the Application for Air Facility Permit and is prepared consistent with draft NYSDEC Program Policy DAR-21 "The Climate Leadership and Community Protection Act and Air Permit Applications."

The Facility provides an environmentally beneficial alternative to landfill disposal and incineration for the management of biosolids from local and regional wastewater treatment plants, as well as a local recycling option for wood waste. Landfill disposal is currently the most used biosolids management method in New York, and New York is also the largest exporter of biosolids in the United States for management. Specific to this Facility location, a local incinerator recently closed in Glens Falls with more incinerator closures likely in the future, which drives the demand for an alternative biosolids management method. In addition, incinerators produce high levels of nitrous oxide, which is 264 times the carbon dioxide equivalent as a greenhouse gas over an integrated 20 year timeframe as reported in 6 NYCRR 496. This Facility provides a local management option, an effective alternative to incineration, and operates with a negative carbon footprint and lower nitrous oxide emissions.

The carbon manufacturing process enhances nutrient recovery from biosolids to produce a marketable EQ Class A biosolids product as a direct substitute to traditional chemical fertilizers. The Facility provides a local alternative to disposal that decreases consumption of fossil fuel associated with longer hauling distances for current landfill disposal practices. Currently, some biosolids are being hauled out of state to landfills as far as Colorado, Texas, and Georgia by truck and train. However, most significantly, processing biosolids quickly after generation avoids methane production associated with decomposition in landfills or from land application practices, greatly reducing greenhouse gas emissions and climate change contribution from biosolids. Methane is 84 times the carbon dioxide equivalent as a greenhouse gas over an integrated 20 year timeframe as reported in 6 NYCRR 496.

In addition to avoiding greenhouse gas emissions, the process itself generates and recovers renewable energy to reduce natural gas consumption by 85% compared to typical natural gas-fired biosolids dryers. Renewable energy is generated in the form of synthetic gas (syngas), a low-methane gas produced by the pyrolysis reaction in the carbon manufacturing process. The process uses natural gas as fuel for the pyrolysis reactor, which generates sufficient syngas from the feedstock to operate the dryer. The carbon manufacturing process maximizes use of the biosolids' inherent renewable energy to further reduce the greenhouse gas and climate change contribution from biosolids and wood waste while producing a marketable end product with a beneficial use as Carbon Fertilizer™.

Carbon Fertilizer™, when applied to soil, sequesters carbon in soil while substituting for and reducing chemical fertilizer use and their associated greenhouse gas emissions. The use of traditional chemical fertilizers results in soil degradation that contributes to nutrient runoff into waterbodies with local, regional, and global impacts (e.g., aquatic dead zones). Traditional chemical fertilizers are, in essence, nutrients bound by salt, and the salts are corrosive to soils. Carbon Fertilizer™ represents a new class of fertilizer that binds nutrients with carbon, instead of salt. Carbon absorbs water quickly to reduce nutrient runoff and retain nutrients in the soil, which reduces ongoing fertilizer application that is necessary with traditional fertilizers. Replenishing soil carbon after more than 75 years of employing carbon-extractive agrarian techniques helps restore soil's capacity to act as an environmental filter to the benefit of streams, rivers, lakes, and other waterbodies. Carbon Fertilizer™ is needed now, more than ever, and farmers are aware of the need as they continuously try to improve soil carbon levels. This is evidenced through agricultural adoption of no-till, cover crops, and numerous attempts to preserve soil carbon. Carbon Fertilizer™ is the first commercially viable means of carbon sequestration in soils.

In summary, the Carbon Fertilizer™ manufacturing process potentially achieves a negative carbon footprint based on 1) replacing chemical fertilizers, 2) decreasing biosolids hauling, 3) avoiding biosolids decomposition and incineration, 4) generating and using renewable energy in the manufacturing process, and 5) the carbon sequestration benefits associated with using the Carbon Fertilizer™ in soil.

For these reasons, the Facility is consistent with the New York State Solid Waste Management Plan and the New York State Climate Leadership and Community Protection Act by providing carbon negative green infrastructure for biosolids management.

3.0 SITE INFORMATION

3.1 Existing Site Conditions

The Facility is located on 5.89 acres composed of Tax Parcels 50.-4-16 (3.07 acres) and 50.-4-22 (2.82 acres), on Farnan Road in the Town of Moreau, Saratoga County, New York, owned by Moreau Industrial Park, LLC. A regional Site Location Map (Figure 1) depicts the site location on the Hudson Falls New York, USGS 7.5-Minute Topographic Quadrangle. A Site Vicinity Map (Figure 2) depicts the Facility location and surrounding land use on an aerial map of Moreau, New York. The Facility will be the second tenant of the industrial park since the development was approved in 1991.

3.2 Land Use

The Facility property and surrounding land use are zoned General Manufacturing & Industrial (M-I). The immediate surrounding area is currently a mix of residential, commercial, industrial and vacant properties. The closest residential zoned property is approximately 1,500 feet west of the western property line. Surrounding land use includes the following:

- To the South: Vacant forested land available for development within the Industrial Park.
- To the North: Vacant land available for development within the Industrial Park.
- To the West: Vacant forested land, an overhead electric utility corridor, and residential use.
- To the East: Developed industrial property, vacant forested land, and the Hudson River.

As shown in the Site Plan Drawings in Appendix A, the Facility will occupy approximately 3.30 acres of impervious surface (i.e., building and asphalt) upon full buildout of all three process lines. The building will occupy up to approximately 45,000 square feet, which is approximately 17.5% of the parcel area and below the GEIS screening threshold of 23%.

4.0 PROCESS DESCRIPTION

4.1 Carbon Fertilizer™ Manufacturing Facility

The Facility uses low-temperature thermal drying and low-temperature pyrolysis to process biosolids and wood waste into a marketable EQ Class A biosolids product that meets specific end-use requirements contained in 40 CFR Part 503 and 6 NYCRR 361. Wood waste is used as a supplemental minor feedstock component for moisture control. Pyrolysis is a heating process in the absence of oxygen that separates volatile organic compounds (as syngas) from the inorganic solid fraction, which forms the Carbon Fertilizer™. The Facility consists of the following components and processes that are shown on the Site Plan Drawings in Appendix A:

- A. Scale House and Administrative Office – The Scale House and Administrative Office includes a scale operations center, restrooms, showers, and administrative support offices. This area is a specific portion of the Carbon Manufacturing Building that is separated from process equipment.

B. Carbon Manufacturing Building – The Carbon Manufacturing Building is completely enclosed and includes a Biosolids Receiving Area, a Process Input Feed Pit, and a Carbon Manufacturing Area. Attached to the Carbon Manufacturing Building is a partially enclosed, covered Wood Feedstock Receiving, Storage, and Processing Area and an outdoor Carbon Storage and Loading Area. As shown in the Site Plan Drawings, the Facility construction is anticipated to be built out over three phases with each phase capable of processing up to 10 tons per hour of received biosolids and up to 1.5 tons per hour of wood waste. Phases two and three are planned to be constructed over a five year timeframe following completion of Phase one. Descriptions of each area and associated processes are as follows:

1. Biosolids Receiving Area – Biosolids are delivered by licensed haulers using standard hauling trucks with covers that will not require modifications. The Facility will receive biosolids Monday through Saturday at a rate of approximately 240 tons per day per processing line (i.e., approximately 283 cubic yards per day per processing line). Delivered biosolids are received inside the Carbon Manufacturing Building, which minimizes fugitive noise and odor emissions. The receiving area is isolated from the process area and is serviced by the air treatment system. Trucks back into the building through quick opening and closing garage doors and tip the biosolids into a recessed reception pit. The reception pit is equipped with a scalping grate with 8-inch square openings to separate and remove any oversized material that may be in a load (e.g., unauthorized waste). The receiving area is slightly pitched to ensure that any spillage is contained within the enclosed building. A high-pressure water source is available to wash the wheels and tailgate of delivery trucks if needed. Wash water is collected through a trench drain and for disposal to the sanitary sewer. The Facility has contracted with Casella Organics (“Casella”) for an initial 10-year term with two 5-year extensions to source and transport biosolids to the Facility. Since biosolids feedstock is being obtained from a single contracted supplier directly from wastewater treatment plants, the presence of oversized debris is expected to be minimal. If oversized debris is captured on the scalping screens, the first method of removal is manually by personnel with an extension hook. This method of removal is suitable for light debris (e.g., plastics). If large and potentially heavy oversized debris is encountered, a piece of equipment (e.g., excavator or similar) will remove the debris. All removed debris will be washed clean of biosolids using the truck wash and placed in a roll-off container for offsite disposal.
2. Process Input Feed Pit – Following biosolids reception, screw conveyors located at the bottom of the reception pit transfer the biosolids across the receiving pit into the Process Input Feed Pit. The receiving pits and storage silos are sized to provide a combined three-day storage capacity in accordance with NYSDEC regulations (6 NYCRR 362-1.5(b)(3)). The two reception pits provide a combined 855.2 cubic yards of storage capacity for the first process line. The second and third processing lines will each include a biosolids storage silo that each have a capacity of at least 850 cubic yards. Indoor storage of biosolids is necessary to provide sufficient material for continuous operation of the manufacturing process 24 hours per day while only receiving biosolids between 6:00 AM and 6:00 PM Monday through Saturday. Biosolids reception rates and storage requirements at full buildout of all three phases are summarized in the following table:

Facility Biosolids Storage Requirements

Received Wet Tons Per Day	Received CY Per Day	Storage Required (CY)	Storage Provided (CY)
720	850	2,550	2,555

Note: Biosolids unit weight assumed at 0.85 tons per CY (63 pounds per cubic foot)

3. Wood Feedstock Receiving, Storage, and Processing Area – Adjacent to the Biosolids Receiving Area is a covered outdoor receiving and storage area for wood waste feedstock. Wood is used as an optional blending agent with biosolids to control moisture content and to boost both energy and carbon content. Received wood waste will include land clearing debris and/or unadulterated wood, wood chips, or bark from logging operations, pulp and paper production, and wood products manufacturing material. Unauthorized wood waste includes wood products that are painted, chemically treated (e.g., pressure-treated wood or railroad ties), or manufactured with chemicals such as glues or adhesives (e.g., plywood or particle board). Received wood will be stored in bunkers and loaded into the Process Input Feed Pit using a bucket loader or similar piece of mobile equipment. To ensure consistent particle size, all wood waste material is passed through an electric grinder to reduce oversized material. A dust hood is located above the grinder to collect any particulate emissions, and the grinder is locally shielded for noise control. The grinder will only operate during daytime hours.

4. Carbon Manufacturing Area – Biosolids and wood waste feedstock move by conveyor to the manufacturing process equipment that consist of a rotary dryer, a pyrolysis reactor, and a thermal oxidizer, among other system components as shown on the Process Flow Diagram in Figure 4. Drying high-moisture biosolids is the first step in the carbon manufacturing process, which is common in many municipalities throughout the U.S. The drying process is the only point-source of odor emissions from the Facility. Dryer emissions are ducted to the air treatment system, and dry feedstock is collected in a hopper bin for sizing prior to the second step. Sizing the dried feedstock consists of screening and milling. Only properly sized particles (i.e., the under screen fraction) are sent to the pyrolysis reactor. Oversized particles are reduced to fines through the use of a hammermill and returned to the dryer along with process dust to facilitate particle agglomeration and to reduce dust in the final product.

The second step in the carbon manufacturing process is pyrolysis. The dried and sized feedstock is received from the dry hopper bin into an oxygen-free chamber that heats the material without direct exposure to flame. The kiln uses natural gas to indirectly heat the feedstock across four sections of the kiln to ensure uniformity of the pyrolysis process along the length of the kiln. The products of pyrolysis are the manufactured Carbon Fertilizer™ solids and a synthetic gas (i.e., syngas). The solid Carbon Fertilizer™ is cooled by an indirect heat exchanger, hydrated to 10% moisture content, and transferred by conveyor to the product storage area. The generated syngas is ducted to the thermal oxidizer to generate heat for the dryer. The drying process accounts for approximately 83% of the heat energy needed for the Facility and is expected to be supplied from the syngas generated in the pyrolysis process as renewable energy. Exhaust from the thermal oxidizer is ducted to the dryer for thermal efficiency. Additional detail about process emissions and air treatment is included in the supporting documents for the State Facility Air Permit application.

The feedstock is never directly combusted or incinerated inside the kiln, which substantially reduces the potential for air emissions. The organic constituents in the feedstock are separated as a syngas, which contains methane, sulfur, and other odor compounds. The syngas is piped to and combusted in a thermal oxidizer at a temperature that generates heat, destroys odor compounds, and reduces the formation of nitrogen oxide emissions (i.e., NO_x) through the use of low-NO_x burners. The generated syngas is a renewable energy that is burned in the thermal oxidizer to produce heat for continuous operation of the dryer. The thermal oxidizer must initiate operations using natural gas or a blend of syngas and natural gas. However, once fully operational, the drying process achieves auto-thermal operations on the generated syngas from the pyrolysis process. The inorganic solids that remain after separating the syngas from the dried feedstock is the Carbon Fertilizer™ that is cooled and stabilized with water for storage and offsite shipment.

5. Carbon Storage and Loading Area – Manufactured Carbon Fertilizer™ is moved by jacketed cooling conveyor to the Carbon Storage and Loading Area for temporary storage in vertical silos. Each storage silo has a diameter of 24 feet and a height of 44 feet that provides a total storage capacity of approximately 1,230 cubic yards (~615 cubic yards per silo). Each process line has a target production rate of 1 ton of manufactured Carbon Fertilizer™ per hour (i.e., 2.4 cubic yards per hour at a bulk density of 0.41 tons per cubic yard). Therefore, the silos provide approximately 7 days of storage capacity at full buildout, which meets the maximum onsite storage allowed in 6 NYCRR 362.15(d). Each process line will produce up to approximately 7,840 dry tons of Carbon Fertilizer™ annually as agglomerated pellets with a solids content of 95 to 98%. At full buildout, the Facility will produce up to approximately 23,500 tons of Carbon Fertilizer™ per year. Carbon Fertilizer™ will be loaded directly into delivery trucks or into approximately 1 and 2 cubic yard super sacks.

The product bagging area is located outdoors and under roof cover between the process area and storage silos. The bagging line intercepts Carbon Fertilizer™ that is being conveyed from the process area to the storage silos. The Carbon Fertilizer™ will be hydrated to 10% moisture after the jacketed cooling conveyor and prior to storage to eliminate dust throughout. In addition, a dust chute will be used at the end of the bulk loading conveyor for dust control when loading trucks. To mitigate combustion risks from combustible dusts, the process and conveyance equipment include dust ports for dust removal as well as nitrogen purging to eliminate a combustible atmosphere. Recovered dust is fed into the dryer exhaust prior to the dry cyclone for reclamation into the Carbon Fertilizer™ manufacturing process. The entire process area will be outfitted with sprinkler systems as a secondary form of fire control in accordance with fire protection requirements.

The Facility will be licensed as a commercial fertilizer distributor in accordance with Article 10, Section 146 of the New York State Agriculture and Markets (AGM) Law. The Facility has submitted a Petition for a Case-Specific BUD for designation by the NYSDEC as a beneficial use product.

6. Emissions Air Treatment – Process air emissions from the Carbon Fertilizer™ manufacturing process, containing particulates, ammonia, sulfur dioxide, and odors, are treated through air pollution control systems prior to exhaust to the atmosphere. The receiving area, reception pits, and process area are all maintained under negative pressure to mitigate potential for fugitive emissions. The biosolids receiving area and reception pits are ducted directly into the combustion air intake of the thermal oxidizer. Auxiliary air

input into the dryer is ducted directly from the process area. Therefore, all air inside the Carbon Manufacturing Building is maintained under negative pressure induced by the air treatment system fans. When the manufacturing equipment is not operating, air is continuously pulled through the equipment and the air treatment system to ensure proper odor management at all times.

Air treatment begins with high efficiency dry cyclones that recover most of the particulates from the air stream. After the dry cyclones, fine particulates are removed through multiple venturi heads that cool the air stream to the dew point. The cooled air stream passes through a packed bed wet scrubber where caustic or sodium bicarbonate is introduced to remove sulfur dioxide (SO₂) and other odorous compounds. The effluent from the SO₂ scrubber is discharged as wastewater effluent. After SO₂ removal, the air stream passes through a second packed bed wet scrubber that uses sulfuric acid for ammonia removal. The effluent from the ammonia scrubber contains ammonium sulfate, which is either discharged as wastewater effluent or recycled into the Carbon Fertilizer™ to improve nutrient value. The final component of the air treatment system is a bio-scrubber that consists of two beds in series packed with microbes to polish the air by removing residual odors and SO₂ prior to release to the atmosphere.

Process water from the air treatment system that is not recycled is discharged through a direct sewer connection for treatment at the City of Glens Falls publicly owned treatment works (POTW). The air treatment system and associated process emissions are subject to a State Facility Air Permit. Additional details regarding emissions and air treatment are provided in the Air Permit Application narrative.

4.2 Carbon Fertilizer™ Manufacturing Equipment

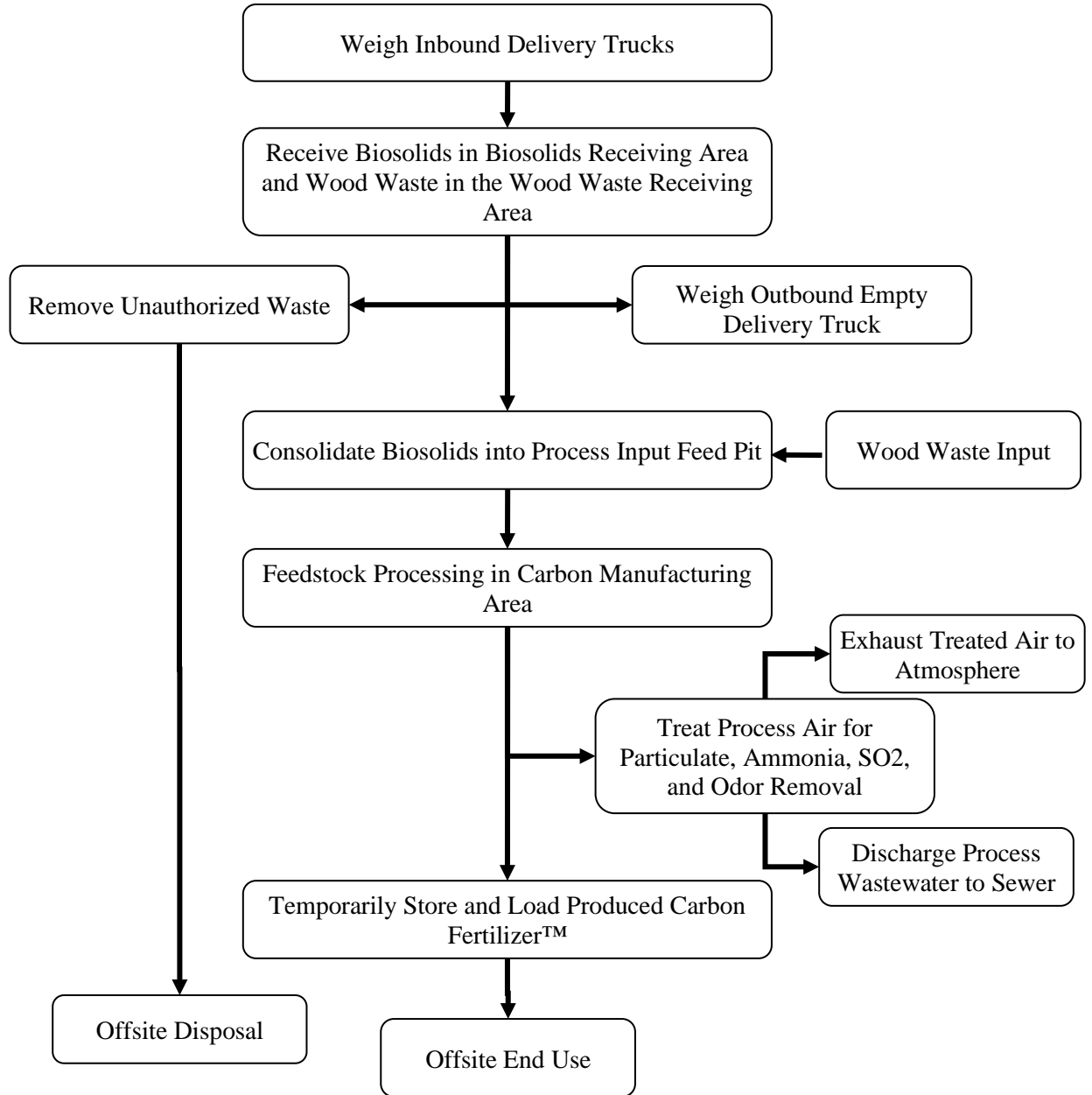
The Carbon Fertilizer™ manufacturing process incorporates the following primary equipment, as shown in the attached Site Plan Drawings and Process Flow Diagram. Equipment drawings and specifications are included in Appendix D. Full construction drawings and specifications will be issued prior to initiating construction of Phase 1 and will be incorporated into this Engineering Report:

1. Receiving pit screw conveyors: Floor mounted screw conveyors transfer received biosolids from the reception pits to the conveying pit. Additional screw conveyors transfer biosolids from the conveying pit to the process input feed pit (i.e., pugmill) for blending.
2. Wood Grinder: An electric ground-mounted wood grinder will resize received wood waste for blending with biosolids in the pugmill.
3. Pugmill: Wet biosolids, ground wood waste, and dry recirculated biosolids are blended in a pugmill to form a consistent feed material into the rotary dryer.
4. Rotary Dryer: The rotary dryer consists of a continuous 9 foot diameter, 50 foot long metal shell equipped with spiral flights to promote mixing during drying. The shell is rotated with an electric motor and is heated by the syngas that is generated by the calciner and combusted by the thermal oxidizer. On initial startup, the dryer heat is obtained from natural gas until sufficient syngas is generated by processed material.
5. Dryer Dual Cyclone: Dryer exhaust gases are sent through the cyclone separators for solids recovery before continuing to the air treatment system and exhausting to the atmosphere. Recovered solids are directed to the screening and resizing equipment. Process emissions require authorization through an Air State Facility Permit issued by NYSDEC.

6. Screening and Resizing Equipment: Dried material is discharged from the dryer through a rotary airlock and conveyed by a bucket elevator to an initial 3/8-inch vibrating screen that separates oversized material. The oversize fraction is directed to a hammermill for resizing and recirculation to the 3/8-inch screen. The undersize fraction is directed to the diversion bin.
7. Diversion Bin: Dried material that passes the 3/8-inch screen enters a diversion bin where a majority of the dried material is recirculated back to the pugmill for blending with wet biosolids. Dried material that is not recirculated is directed to a bucket elevator that conveys the material to the surge bin.
8. Surge Bin: The surge bin collects dried material that passes through the screening and resizing equipment for entry into the rotary calciner.
9. Rotary Calciner: The rotary calciner consists of a continuous 4 foot diameter, 40 foot long metal shell equipped with turning bars to ensure thorough mixing. The shell is rotated by an electric motor and heats the dried material indirectly with natural gas via conductive and radiative heat transfer that drives off the volatile fraction as a syngas. The carbonized solids exit the calciner to the cooling screw and the syngas exits the calciner to the thermal oxidizer. Heating in the calciner occurs in the absence of oxygen. A nitrogen system is used to purge the calciner during startup and shut down.
10. Thermal Oxidizer: Syngas from the calciner is combusted in the thermal oxidizer to destroy volatile compounds and to generate heat for the rotary dryer. At startup, the combustion system will fire completely on natural gas to provide heat to the rotary dryer. As syngas production increases from the calciner, the system will automatically reduce the amount of gas being fired in favor of the syngas.
11. Air Blend Chamber: Ambient air is mixed with exhaust from the thermal oxidizer and the calciner to increase thermal efficiency of the rotary dryer.
12. Emergency Vent: In an emergency situation where the heat value of the syngas is greater than the dryer demand, the calciner exhaust may be vented directly to the atmosphere through the emergency vent.
13. Cooling Screw: The manufactured Carbon Fertilizer™ exits the rotary calciner into a 30-inch diameter, 20 foot long hollow flight cooling screw to reduce the material temperature. The cooling screw continuously rotates to provide efficient heat transfer with the cooling screws. Cooled Carbon Fertilizer™ is directed to one of two onsite temporary bulk storage silos. A portion of the cooled Carbon Fertilizer™ is diverted to a bagging line for loading into 1 to 2 cubic yard super sacks.
14. Control Systems: The process equipment will be controlled by an integrated control and instrumentation system. The system will include a Programmable Logic Controller (PLC), electrical controls, indicator lights, alarm horn, and an emergency stop. The process equipment designer and supplier will provide onsite installation support and training for startup, operation, and shutdown of the system.

4.3 Process Flow Chart

The Facility process is described visually in the following flow chart and Process Flow Diagram included as Figure 4.



4.4 Operational Parameter Monitoring

The process equipment will be controlled by an integrated control and instrumentation system. The process equipment designer and supplier will provide onsite installation support and training for startup, operation, and shutdown of the system. Training documentation and operational resources will be maintained onsite in the Facility Manual. The following parameters will govern the operation of the carbon manufacturing equipment:

- Moisture Content of feedstock exiting process input feed pit into the dryer: 23% target
- Moisture Content of dried feedstock entering the rotary calciner: 5%
- Dryer Inlet Temperature: 1,100°F
- Dryer Exhaust Temperature: 240°F
- Pressure Drop Across Dry Cyclone: 6 in. WC
- Shell Temperature of Rotary Calciner: 1,200 to 1,300°F
- Oxygen Content in Rotary Calciner: <3% O₂ by volume
- Temperature of Thermal Oxidizer: 1,600 to 1,800°F
- Moisture content of the manufactured Carbon Fertilizer™: 10%

5.0 FACILITY DESIGN

The Facility is designed to be entirely enclosed with an annual throughput up to 235,200 wet tons of received biosolids and up to 35,280 tons of wood waste. The Facility is designed to be constructed in three phases with each phase consisting of a process line capable of processing up to 10 wet tons per hour of biosolids and up to 1.5 tons per hour of wood waste. Each process line is capable of manufacturing approximately 1 ton per hour of Exceptional Quality (EQ) Class A biosolids product in accordance with 40 CFR Part 503 and 6 NYCRR 361.

The Facility operates 24 hours per day, 7 days per week with feedstock deliveries limited to between 6:00 AM and 6:00 PM six (6) days per week (i.e., no deliveries on Sundays or holidays). The operational uptime of the process is expected to be 90% (i.e., 7,840 hours per year) with the balance consisting of scheduled downtime for maintenance. Contingency planning for unexpected shutdowns is discussed in the Facility Manual.

5.1 Materials Handled

The Facility has contracted with Casella for an initial 10-year term with two 5-year extensions to source and transport biosolids to the Facility. Casella Organics manages over 450,000 tons per year of biosolids regionally. Contracting directly with Casella Organics is preferred over securing multiple contracts with publicly owned treatment plants prior to being operational. Detailed material acceptance criteria and procedures for detecting and managing unauthorized waste are provided in the Facility Waste Control Plan contained in the Facility Manual.

Biosolids are the nutrient-rich organic byproducts resulting from wastewater treatment. Sourced biosolids will have been treated and tested by the source prior to receipt at the Facility in accordance with 6 NYCRR 361-3.6. The supply contract requires Casella to provide the Facility with required analytical data prior to

be allowed to deliver to the Facility. Based on the regional POTWs, sourced biosolids are anticipated approximately 25% anaerobically digested and 75% aerobically digested and otherwise destined for landfill disposal. The average received solids content is anticipated to be 23%, and the Facility has the ability to reject material that is too wet (i.e., less than 19% solids) or too dry (i.e., more than 32% solids). The supply contract also dictates all required reporting to the EPA and NYSDEC is properly documented and followed for each biosolids source, including the onboarding process for new sources.

Biosolids otherwise destined for landfill disposal must meet criteria contained in 6 NYCRR 363-7.1(j); therefore, the composition of received biosolids will be relatively consistent. Representative compositional data for biosolids feedstock is provided in Appendix D. For each source of biosolids, the Facility will maintain the following information:

- Name of biosolids generator and quantity received at the Facility.
- Description of generator's biosolids treatment method (e.g., aerobic digestion).
- Description of the biosolids quality including information required by 6 NYCRR 361-3.6 and analytical results of the biosolids for the analytes contained in Table 1 of 6 NYCRR 361-3.9.

Biosolids provide nutrients to plants and organic matter to soils. They can also be used to produce renewable energy through digestion and production of methane (i.e., biogas) or by drying and thermal processing (i.e., syngas). 6 NYCRR Part 360 Regulations define “*Biosolids*” as: *the accumulated semi-solids or solids resulting from treatment of wastewaters from publicly or privately owned or operated sewage treatment plants. Biosolids does not include grit, screenings, or ash generated from the incineration of biosolids.*

Wood waste feedstock is an optional minor feedstock component that is not required for processing biosolids. Wood waste is to be sourced from local municipalities, counties, and wood waste generators, and consists only of land clearing debris and/or unadulterated wood, wood chips, or bark from logging operations, pulp and paper production, and wood products manufacturing. 6 NYCRR Part 360 Regulations define “*Unadulterated Wood*” as *wood products, that are not painted, chemically treated (e.g., pressure-treated wood or treated railroad ties), or manufactured with chemicals such as glues or adhesives (e.g., plywood or particle board).*

5.2 Service Area

The primary service area for biosolids includes regional wastewater treatment plants within New York State and western New England west of the Connecticut River as sourced and contracted by the Facility's contracted waste hauler. The service area may increase or decrease as negotiated arrangements change over time. The primary service area for wood waste is a 50-mile radius from the Facility.

5.3 Site Access and Traffic

All truck traffic for biosolids delivery, wood waste delivery, and Carbon Fertilizer™ distribution will access the Facility from Farnan Road within the Moreau Industrial Park and will be restricted to delivery hours of 6:00 AM to 6:00 PM Monday through Saturday. Truck traffic will follow the truck route established in the GEIS for the Moreau Industrial Park, as described below and shown on Figure 3.

- From the north, south, and west: Exit Interstate 87 via Exit 17N onto Route 9 north. Turn right onto Route 197. Turn left onto Fort Edward Road north. Turn right onto Bluebird Road east. Turn right onto Farnan Road at the Moreau Industrial Park entrance. Turn right into the Facility entrance.

Trucks will not travel through residential neighborhoods or on Town roads that are not part of the identified, pre-approved truck route for the Industrial Park. Trucks delivering biosolids are conditioned prior to leaving the source wastewater treatment plant to minimize odors during transport. In addition, trucks hauling biosolids are covered with tight fitting, heavy grade tarps to minimize odors and prevent spillage.

Access into the Facility is through the constructed entrances from Farnan Road as shown on the Site Plan Drawings included in Appendix A. Delivery vehicles enter the Facility and are directed to the weigh-in scale before being directed to the rear of the Carbon Manufacturing Building to the receiving area. Biosolids delivery trucks back into the Carbon Manufacturing Building through fast opening and closing garage doors to unload biosolids into the reception pit that is isolated from the process area and serviced by the air treatment system. A wash station in the unloading area is available to wash any biosolids from the truck and tires as necessary before exiting the building. Wash water is collected in a trench drain for discharge to the sanitary sewer.

Wood waste delivery trucks are received in the covered outdoor wood waste receiving, storage, and processing area. Trucks are tipped onto the concrete floor and visually inspected. Received wood waste is stored in bunkers and loaded into the process input grinder using a wheeled bucket loader or similar piece of mobile equipment. The grinder is locally shielded for noise control and is serviced by an air treatment system for particulate control. After unloading material, empty trucks exit the building and return to the scale to weigh-out. The scale is equipped with a computer system to provide ticket printing and automated recordkeeping.

The first process line is anticipated to require up to 20 trucks per day to support operations: 12 loads of delivered biosolids, 2 loads of delivered wood waste, 1 load of removed Carbon Fertilizer™, and 5 service vehicles. The total anticipated truck traffic to support full buildout of the Facility is approximately 50 trucks per day including 36 loads of biosolids delivery, 6 loads of wood waste delivery, 3 loads Carbon Fertilizer™ distribution, and 5 service vehicles to support operations. Because biosolids deliveries will be through a contracted hauler, trucks will target an even spacing between 6:00 AM and 6:00 PM (i.e., approximately 3-5 trucks per hour). This anticipated trip generation is significantly lower than the GEIS threshold criteria of 10 trips per hour per acre. Based on the Facility parcel size of 5.89 acres, the traffic threshold for additional study is approximately 59 vehicles in the peak hour.

5.4 Environmental Controls

The Facility and process are designed and operated to minimize the potential offsite release of dust, biosolids tracking, leachate, odor, and noise emissions.

5.4.1 Dust and Biosolids Tracking Control

The Facility Manual provides additional details on mitigation of dust and tracking of biosolids. All incoming material is received in covered trucks, and unloading occurs indoors (biosolids) or under cover (wood waste). All vehicle travel surfaces are paved to minimize the potential for fugitive dust. The indoor biosolids receiving area is equipped with a high-pressure water source to wash the wheels and tailgates of delivery trucks if needed to prevent tracking of biosolids out of the Carbon Manufacturing Building. Wash water is collected through a trench drain for discharge to the sanitary sewer.

5.4.2 Leachate Control

The Facility Manual provides additional details on handling and control of Facility leachate. Biosolids are received with solids content of 18 to 32% (average 23% solids content). Trucks permitted to carry biosolids are required to prevent leakage onto driving surfaces. The floor of the reception pit and biosolids storage area is solid concrete to prevent leakage or release of liquids. All liquid associated with the biosolids is evaporated in the carbon manufacturing process and does not require separate management.

5.4.3 Odor Control

The Facility is maintained at a negative air pressure at all times to prevent fugitive odor emissions. Interior air is continuously extracted through the air pollution control devices even if carbon manufacturing is not occurring. Truck doors into the Carbon Manufacturing Building are fast opening/closing and only open during biosolids delivery. A natural gas-powered backup generator provides emergency power in the event of a power service failure to continue operating the manufacturing process and air pollution/odor control equipment.

During daily operations, the Facility is monitored for odors by the operating staff. If odors are detected outside of the Carbon Manufacturing Building that may migrate offsite, the following information will be recorded: Date, time of day, estimated wind speed and direction, type of odor, strength of odor, and duration. If a complaint is received regarding site odor, the following steps will be taken:

1. The complaint and site information will be reviewed to determine if the Facility is the cause of the odor or if the odor is from a different source.
2. If the Facility is determined to be the source, corrective actions will be implemented to eliminate the odor source through process modifications or other controls.
3. The NYSDEC Regional Materials Management Engineer will be notified of all received complaints.

5.5 Noise Assessment

6 NYCRR 360.16 requires SWMF permit applications to include a noise assessment to demonstrate compliance with promulgated maximum sound levels. NYSDEC Program Policy for Assessing and Mitigating Noise Impacts outlines best practices for evaluating the potential for adverse impacts of sound generated and emanating to receptors outside of the Facility. The policy describes that activities contained within an area in which local zoning provides for the intended use (referred to as “right of use”) do not need a noise impact analysis because noise is addressed in the established zoning. The Facility is consistent with current and proposed future zoning designation as “General Manufacturing & Industrial.” This designated zoning allows specific uses and has corresponding performance standards for noise (Town of Moreau Noise Control Local Law Chapter 100). Potential noise impacts were evaluated in the GEIS for the industrial park and concluded that the extensive vegetated buffer surrounding the park will sufficiently attenuate noises associated with the park’s tenants.

Operating requirements for noise are subject to the following noise standards contained in 6 NYCRR Part 360.19(j):

The owner or operator of a facility must ensure that noise resulting from equipment or operations at the facility does not exceed the following energy equivalent sound levels beyond the property line owned or controlled by the owner or operator of the facility at locations authorized for residential purposes:

Character of Community (within 1 mile radius)	Leq Energy Equivalent Sound Levels	
	<i>7 a.m.-10 p.m.</i>	<i>10 p.m.-7 a.m.</i>
<i>Rural</i>	<i>57 decibels (A)</i>	<i>47 decibels (A)</i>
<i>Suburban</i>	<i>62 decibels (A)</i>	<i>52 decibels (A)</i>
<i>Urban</i>	<i>67 decibels (A)</i>	<i>57 decibels(A)</i>

Based on the population density of the Town within a 1-mile radius of the Facility, suburban noise restrictions apply, which limit the maximum sound level to 62 decibels (dBA) from 7:00 AM to 10:00 PM and 52 dBA from 10:00 PM to 7:00 AM as measured beyond the Facility property line at the closest location authorized for residential purposes (i.e., closest potential receptor). The Facility property and immediate surroundings is zoned “General Manufacturing & Industrial” and the closest residential zoned property is approximately 750 feet southwest of the southwestern property line (See Figure 2).

5.5.1 Potential Noise Sources

Facility noise sources consist of stationary equipment associated with the carbon manufacturing process. All noise sources are located inside the Carbon Manufacturing Building except for the wood grinder, which is located in wood waste receiving, storage and processing area and is locally shielded for noise abatement.

The individual sound pressure levels for representative noise source are combined to an effective sound pressure level using the following equation:

$$L_{\text{Effective}} = 10 \log[10^{L_1/10} + 10^{L_2/10} + 10^{L_3/10} + \dots + 10^{L_n/10}]$$

Where: $L_{\text{Effective}}$ = Sound pressure level (dBA) of all equipment operating simultaneously.
 L_1, L_2 = Sound pressure level (dBA) of each individual piece of equipment.

The effective sound level for each area assumes all listed equipment is operating simultaneously. Anticipated noise sources and estimated sound levels include the following for the full buildout of the Facility:

Process Equipment Sound Levels (Assumed at 50 feet from Source)

Item	Description	Quantity	Assumed Reference Sound Pressure Level dB(A)
1	Front End Loader	1	79
2	Process Input Conveyor	3	70
3	Wood Grinder	1	84
4	Rotary Dryer	3	85
5	Dryer Fan	3	79
6	Air Pollution Control Extraction Fans	6	85
7	Transfer Conveyor	3	70
8	Pyrolysis Reactor	3	85
9	Product Conveyor	3	70
Sound Level With All Processing Equipment Operating			96.5

5.5.2 First Level Noise Assessment

The initial noise assessment evaluates potential impact to receptors assuming all equipment operates simultaneously and only accounting for attenuation from distance. Sound levels decrease by approximately 6 dBA for each doubling of distance beyond 50 ft. For example, a sound level of 79 dBA at 50 feet from the source would reduce to 73 dBA at 100 ft and 67 dBA at 200 ft. The cumulative sound level with all processing equipment operating is conservatively assumed to occur at a combined central location of the Carbon Manufacturing Building.

Two assessment points were established at the shortest straight-line distance from center of the Carbon Manufacturing Building to the closest residential receptor property line (approximately 750 southwest of the southwest Facility property line) and the shoreline of the Hudson River (approximately 1,200 feet east of the eastern Facility property line). Accounting only for attenuation due to distance, equivalent sound levels at each assessment point are summarized in the following table:

First Level Noise Assessment

Assessment Location	Calculated Sound Level (dBA)	Screening Level (dBA)
Closest Residential Property Line	70.2	62 Daytime / 52 Nighttime
Hudson River Shoreline	68.3	

The first level assessment indicates that resulting noise from the Facility exceeds screening levels at the receptor locations; therefore, a second level noise assessment is necessary.

5.5.3 Second Level Noise Assessment

The second level assessment takes into consideration noise attenuating features. All stationary noise sources will be shielded by a roof and walls or localized shielding providing noise attenuation. Further, vegetative screening is present surrounding the Facility to further attenuate noise from the industrial park toward potential receptors. The Federal Highway Administration (FHWA) provides guidance for noise mitigation from common barriers (e.g., walls, ceilings, and berms) in “The Audible Landscape: A Manual for Highway Noise and Land Use.” Common constructed building walls can provide noise reduction of 35 to 54 dBA.

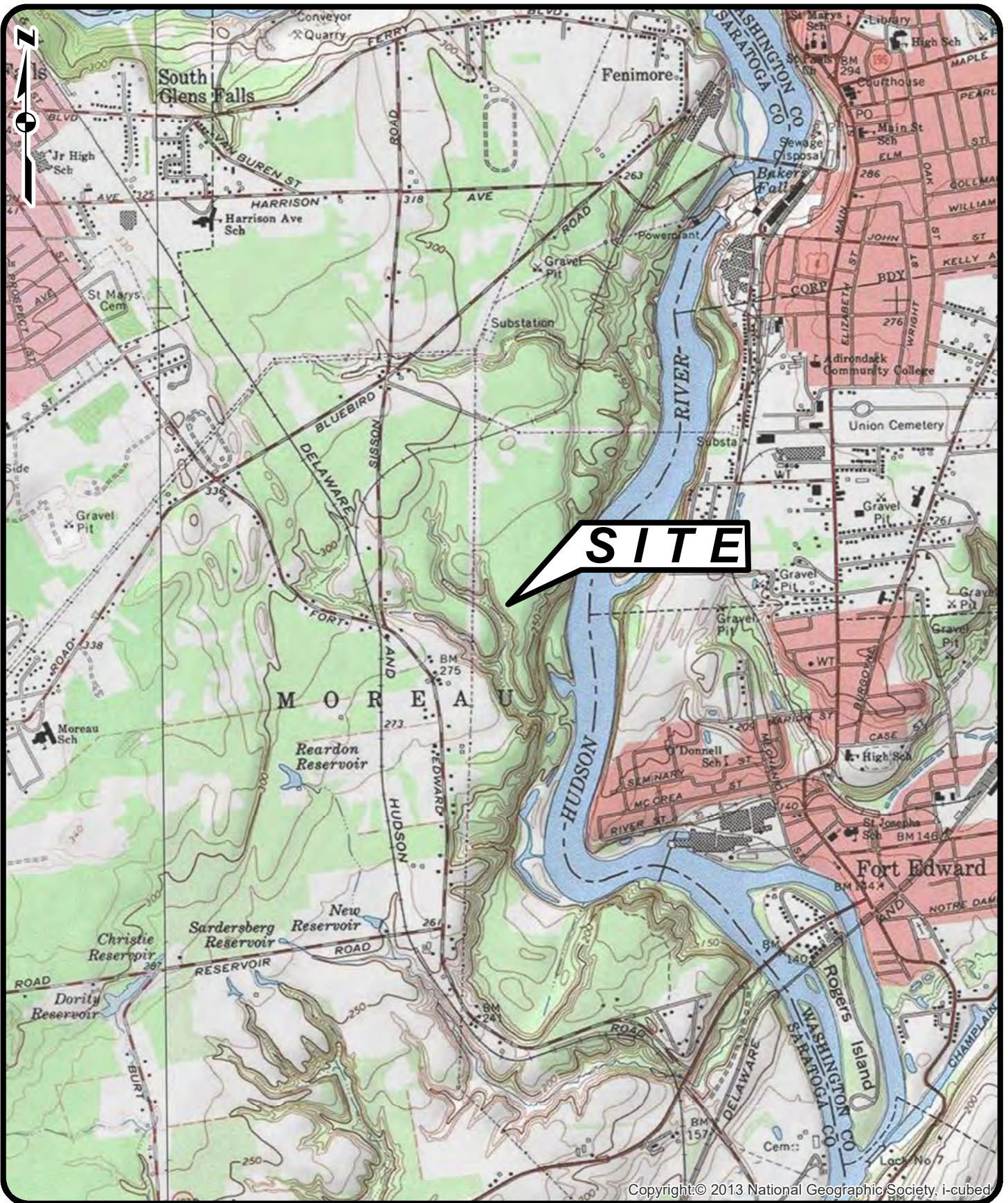
To comply with daytime noise restrictions (62 dBA), a minimum noise reduction of 8.2 dBA is required. To comply with the more restrictive nighttime noise restrictions (52 dBA), a minimum noise reduction of 18.2 dBA is required, which is well within the achievable range for conventional practices. Building materials have an associated “Sound Transmission Class” (STC) that describes the amount of sound transmission loss through the material. A higher STC number is associated with better sound attenuation. The architectural design of the facility will specify wall construction materials that provide at least 20 decibels of noise reduction.

The NYSDEC Program Policy indicates that dense vegetation that is at least 100 feet thick can provide up to 7 dBA noise reduction. This noise assessment conservatively does not take credit from attenuation associated with offsite vegetation. The parcels between the proposed facility and the closest offsite residential receptors to the west are owned and controlled by the electrical utility for a utility corridor and by Moreau Industrial Park, which includes a conservation easement to maintain a vegetated buffer. Therefore, some vegetated buffer can be expected to remain into the future and will provide additional noise attenuation.

Based on this assessment, the Facility is expected to operate in compliance with applicable noise restrictions, and significant adverse impacts to proximate receptors are not anticipated. This noise assessment is for the full buildout of the Facility. Compliance with operational noise restrictions can be verified through a noise study during Facility startup of the initial phase, which is a common NYSDEC permit condition.

FIGURES

S:\Sterling\Projects\2020 Projects\Saratoga Biochar Solutions - 2020-20\Drawings-Maps-Figures\GIS\2020-20001G- FIG 1 SITE LOC MAP.mxd



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STERLING

Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

SITE LOCATION MAP
SARATOGA BIOCHAR SOLUTIONS, LLC
CARBON FERTILIZER MANUFACTURING FACILITY

TOWN OF MOREAU

SARATOGA CO., NY

PROJ.NO. 2020-20

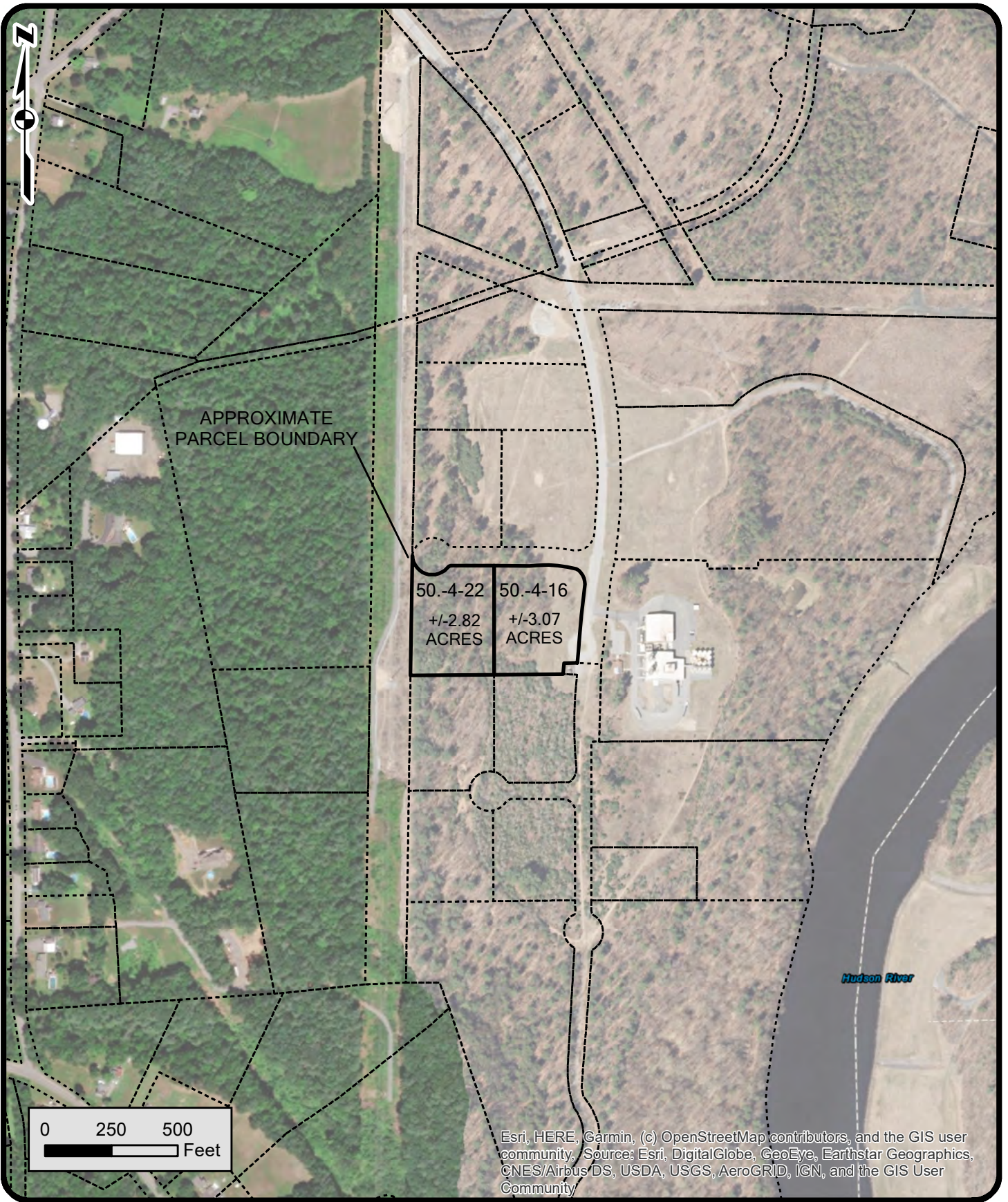
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SCALE: 1" = 2,000'

DWG.NO. 2020-20001G

FIGURE

1



STERLING

Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

SITE VICINITY MAP
SARATOGA BIOCHAR SOLUTIONS, LLC
CARBON FERTILIZER MANUFACTURING FACILITY

TOWN OF MOREAU

SARATOGA CO., NY

PROJ.NO. 2020-20

DATE: 10/14/2021

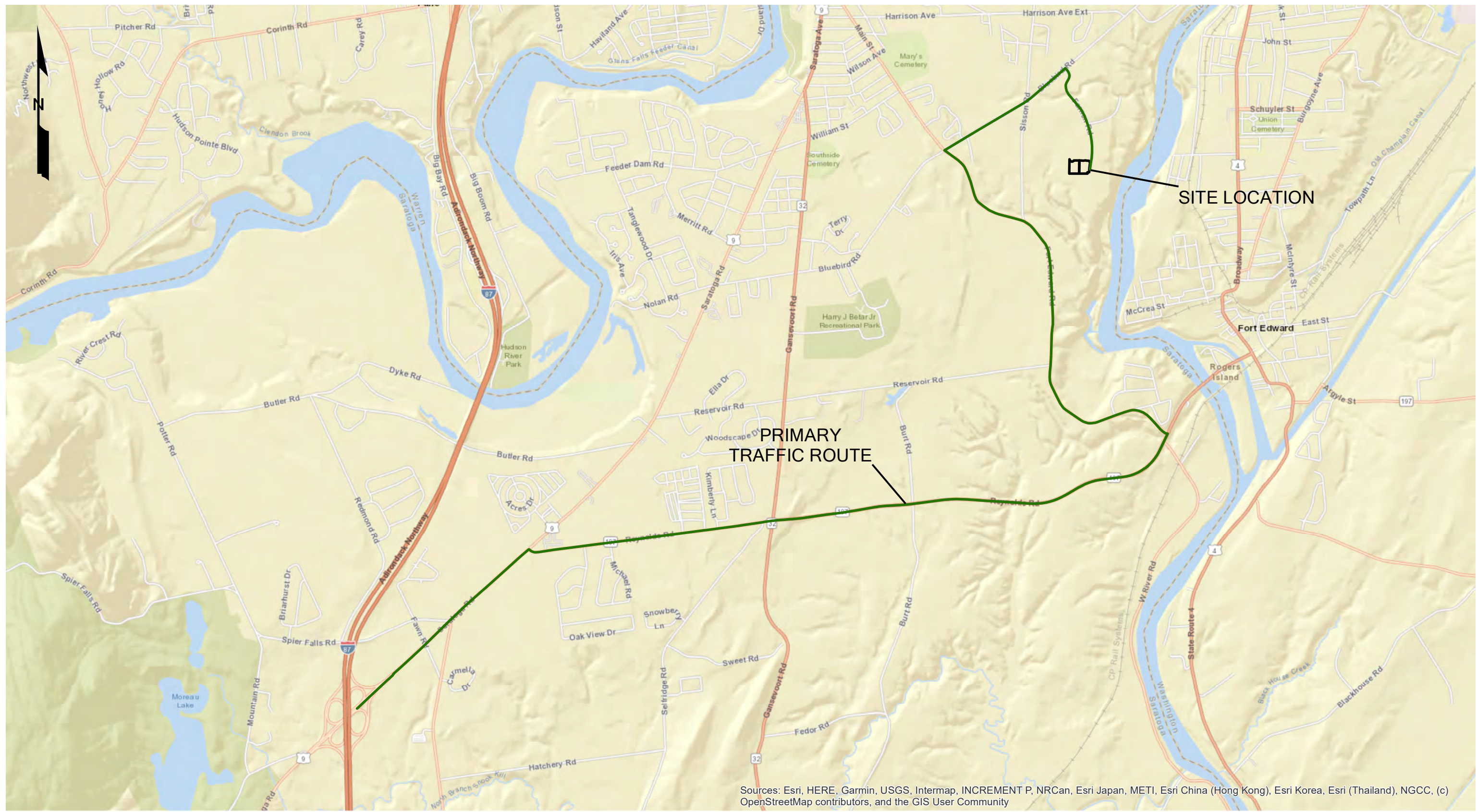
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DWG.NO. 2020-20003G

FIGURE

2

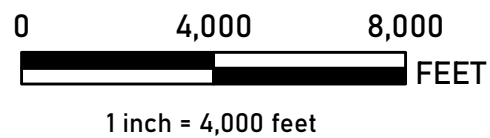
S:\Sterling\Projects\2020 Projects\Saratoga Biochar Solutions - 2020-20\Drawings-Maps-Figures\GIS\2020-20004G-FIG 3 Traffic Route Map.mxd



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

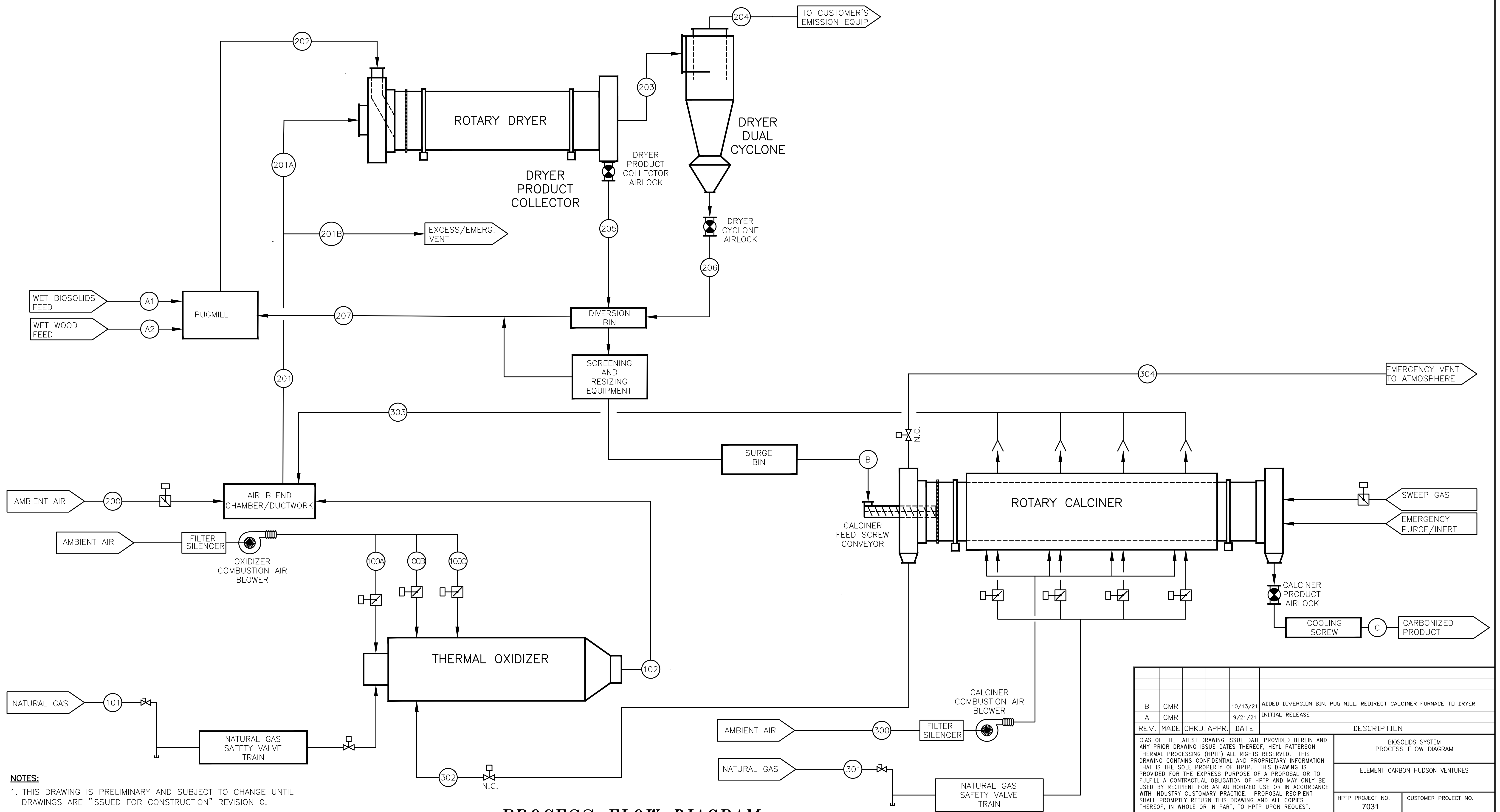
LEGEND

 PRIMARY TRAFFIC ROUTE



STERLING
 Sterling Environmental Engineering, P.C.
 24 Wade Road • Latham, New York 12110

TRAFFIC ROUTE MAP
 SARATOGA BIOCHAR SOLUTIONS, LLC
 CARBON FERTILIZER MANUFACTURING FACILITY
 TOWN OF MOREAU SARATOGA CO., NY

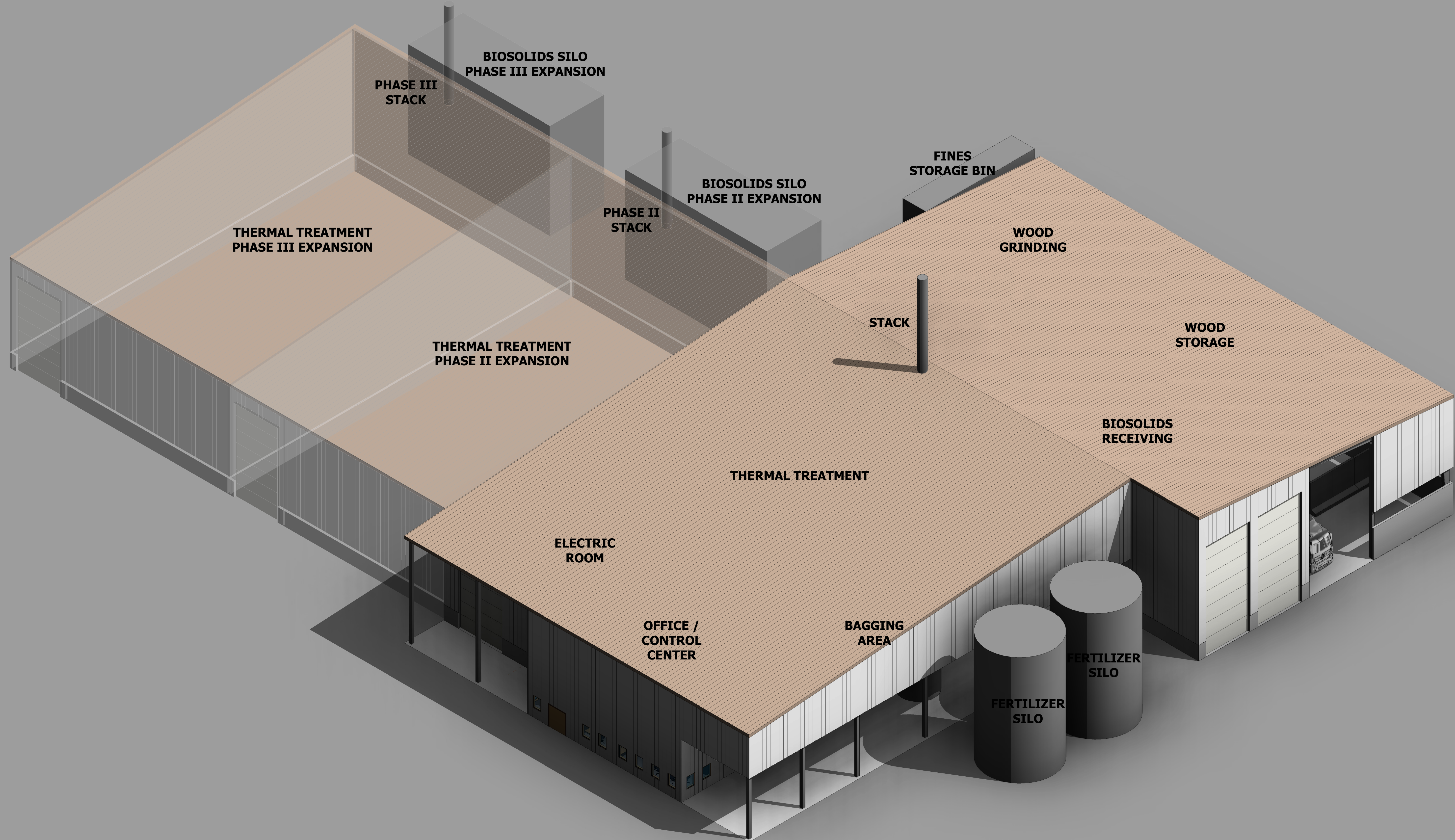


NOTES:
 1. THIS DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE UNTIL DRAWINGS ARE "ISSUED FOR CONSTRUCTION" REVISION 0.
 2. STREAM PROPERTIES AND COMPOSITIONS ARE SHOWN IN EXCEL FILE THAT ACCOMPANIES THIS DRAWING.

PROCESS FLOW DIAGRAM

REV.	MADE	CHKD.	APPR.	DATE	DESCRIPTION
B	CMR			10/13/21	ADDED DIVERSION BIN, PUG MILL. REDIRECT CALCINER FURNACE TO DRYER.
A	CMR			9/21/21	INITIAL RELEASE
<small>© AS OF THE LATEST DRAWING ISSUE DATE PROVIDED HEREIN AND ANY PRIOR DRAWING ISSUE DATES THEREOF, HEYL PATTERSON THERMAL PROCESSING (HPTP) ALL RIGHTS RESERVED. THIS DRAWING CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION THAT IS THE SOLE PROPERTY OF HPTP. THIS DRAWING IS PROVIDED FOR THE EXPRESS PURPOSE OF A PROPOSAL OR TO FULFILL A CONTRACTUAL OBLIGATION OF HPTP AND MAY ONLY BE USED BY RECIPIENT FOR AN AUTHORIZED USE OR IN ACCORDANCE WITH INDUSTRY CUSTOMARY PRACTICE. PROPOSAL RECIPIENT SHALL PROMPTLY RETURN THIS DRAWING AND ALL COPIES THEREOF, IN WHOLE OR IN PART, TO HPTP UPON REQUEST.</small>					BIOSOLIDS SYSTEM PROCESS FLOW DIAGRAM ELEMENT CARBON HUDSON VENTURES
HPTP PROJECT NO.			CUSTOMER PROJECT NO.		
7031			7031		
HEYL PATTERSON <small>THERMAL PROCESSING</small>					DWG. NO. 7031-2401
REV. B					SCALE 12"=1'-0" DIV. NO. 24

**ENGINEERING REPORT
APPENDIX A
SITE PLAN DRAWINGS**



SEAL

PROJECT TITLE

**SARATOGA
BIOCHAR
SOLUTIONS**

2 Electric Drive
South Glens Falls, NY 12803

SHEET
TITLE

AXONOMETRIC

CONSULTANT

DRAWN
BY
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BY
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REVISIONS

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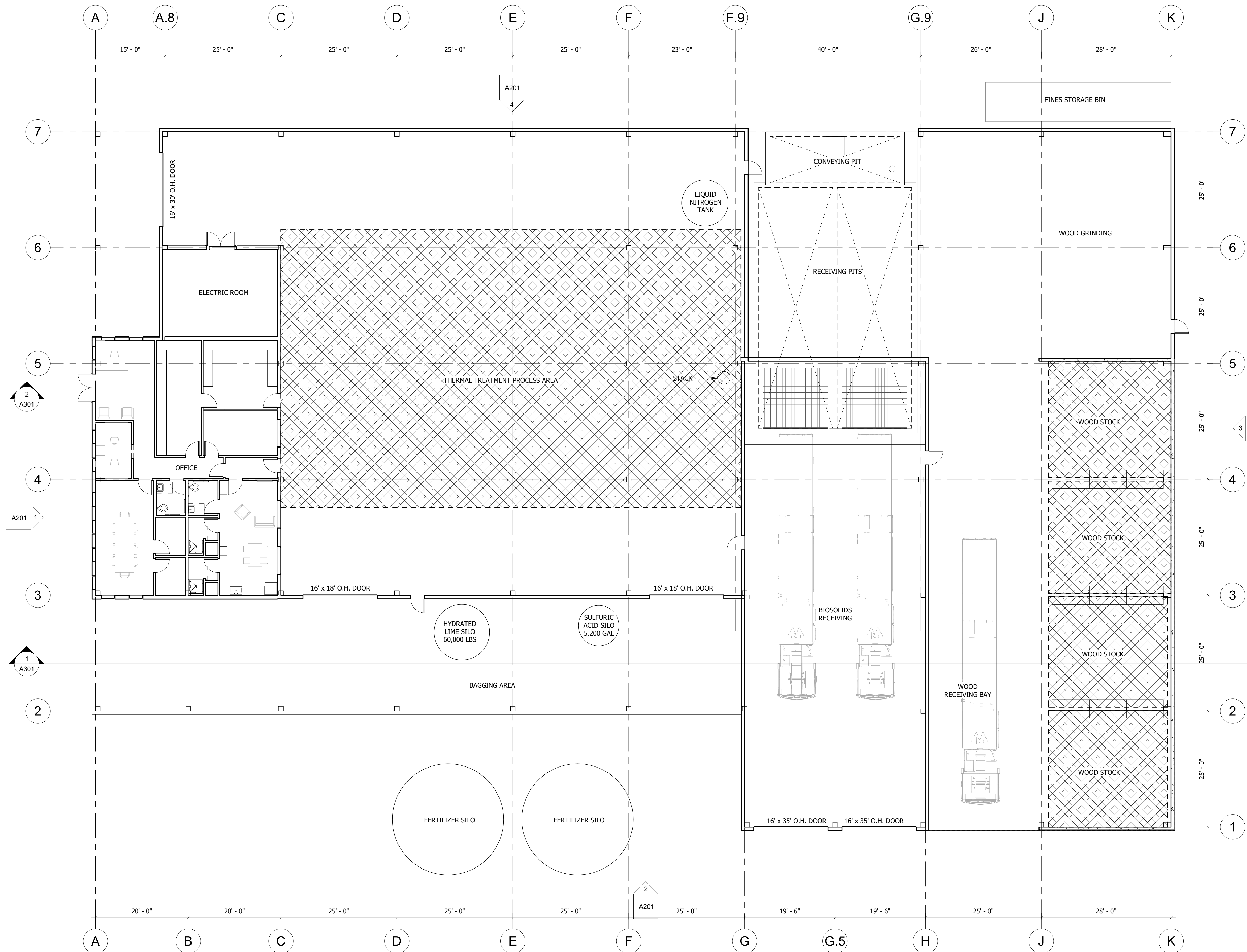
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SEAL

PROJECT TITLE
**SARATOGA
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 SOLUTIONS**
 2 Electric Drive
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SHEET TITLE
PLAN

CONSULTANT

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SEAL

PROJECT TITLE

**SARATOGA
BIOCHAR
SOLUTIONS**

2 Electric Drive
South Glens Falls, NY 12803

SHEET
TITLE

**RECEIVING
BUILDING**

CONSULTANT

DRAWN
BY
CMS

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BY
GLM

DATE

3/30/22

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20-020

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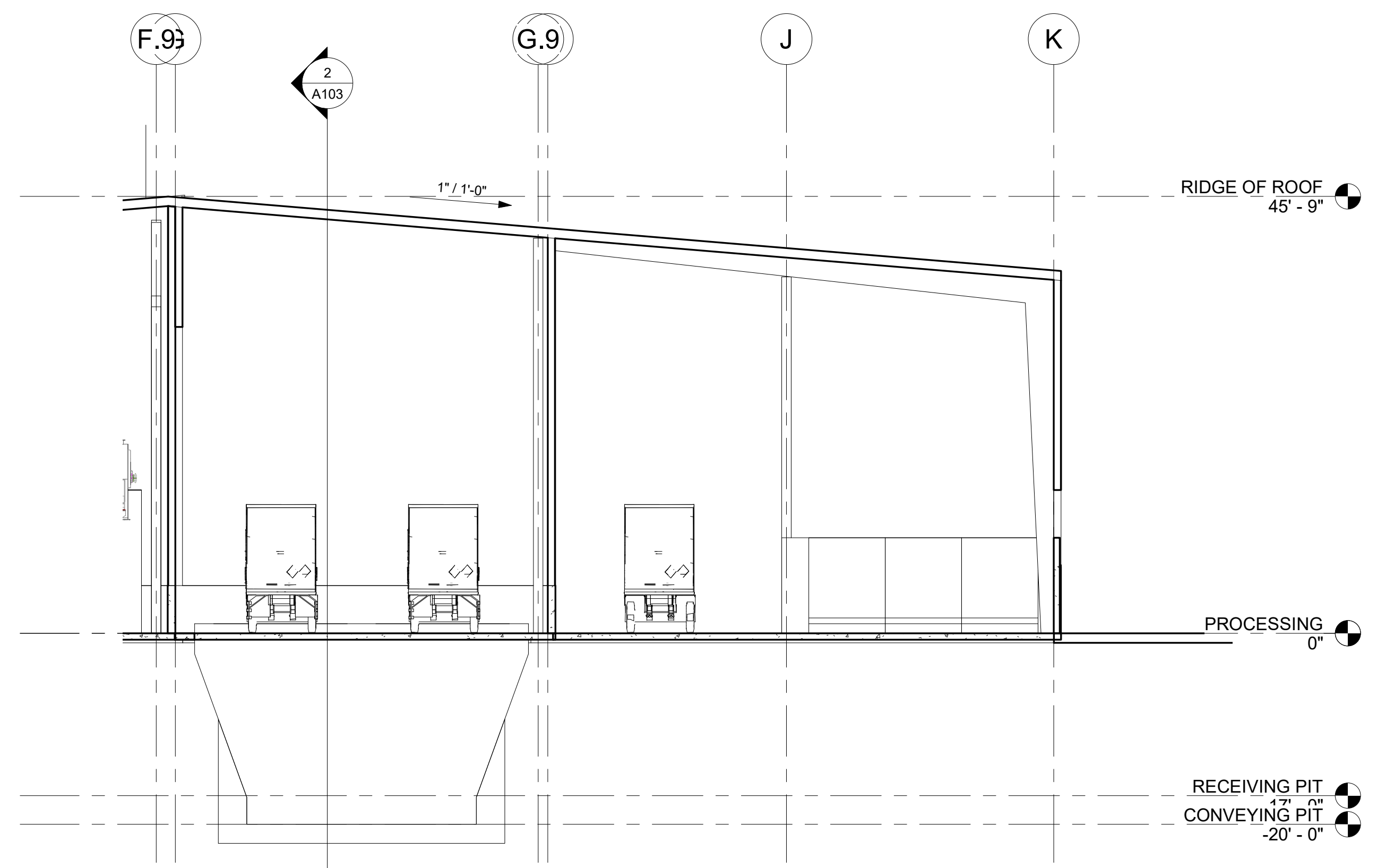
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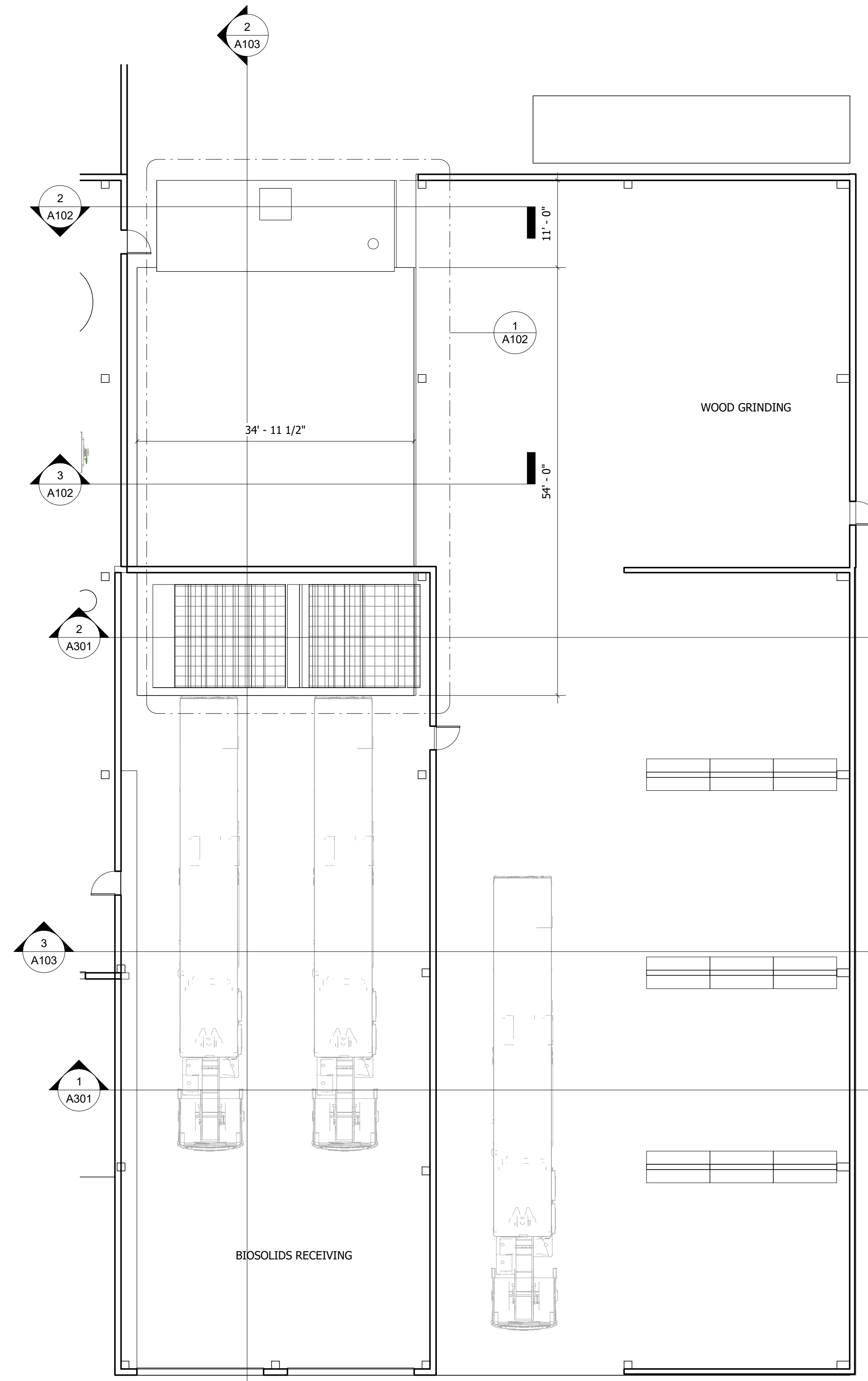
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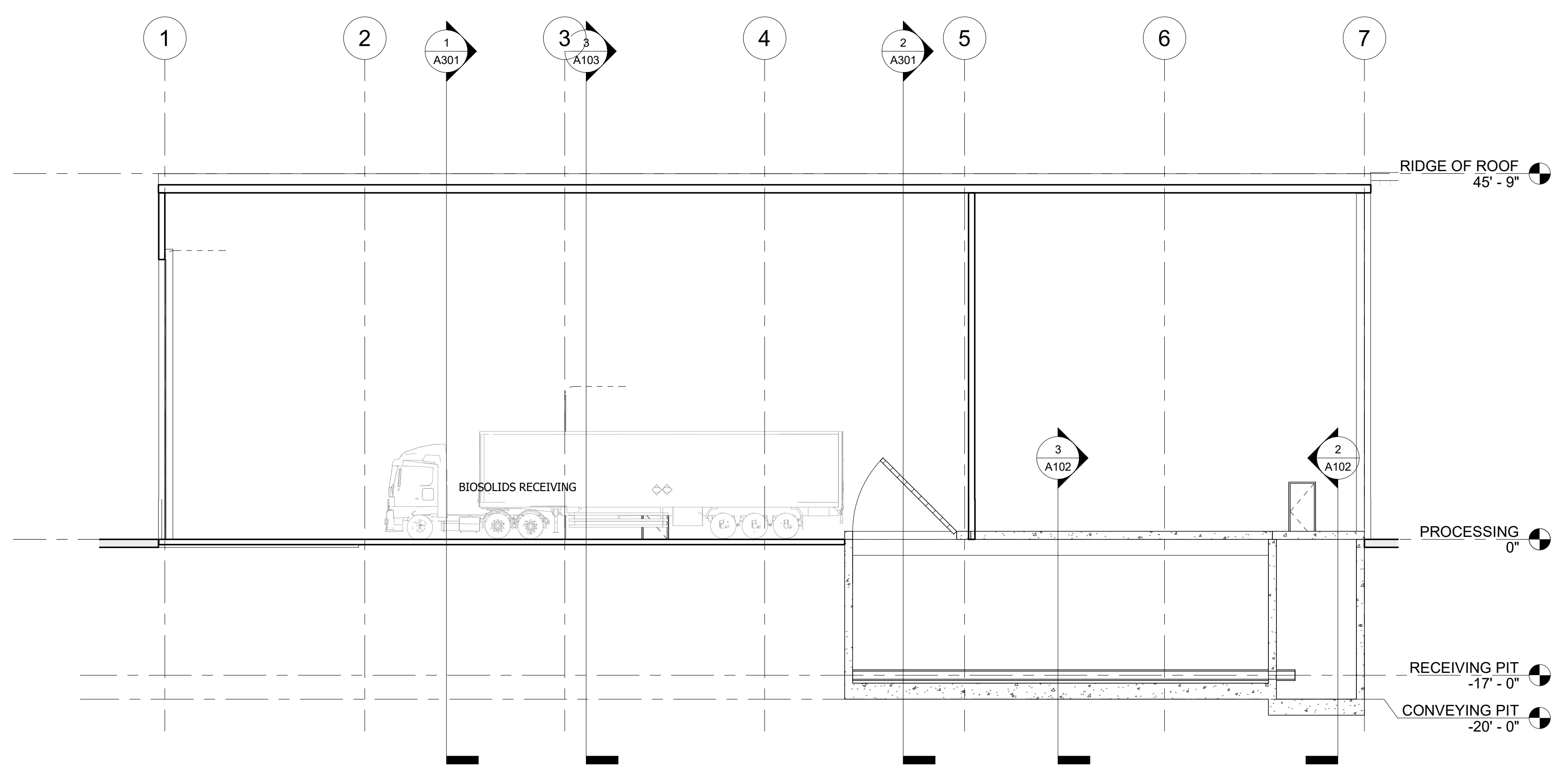
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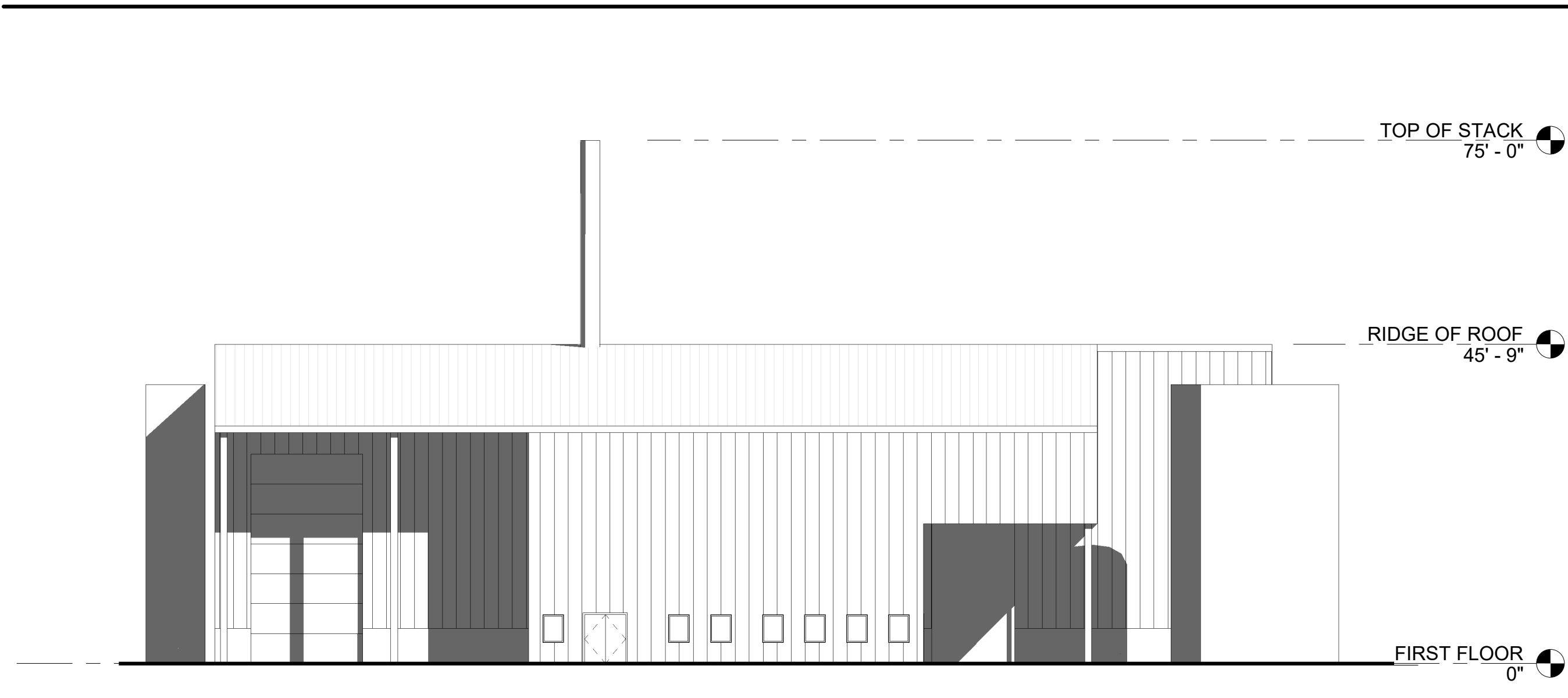
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3/32" = 1'-0"



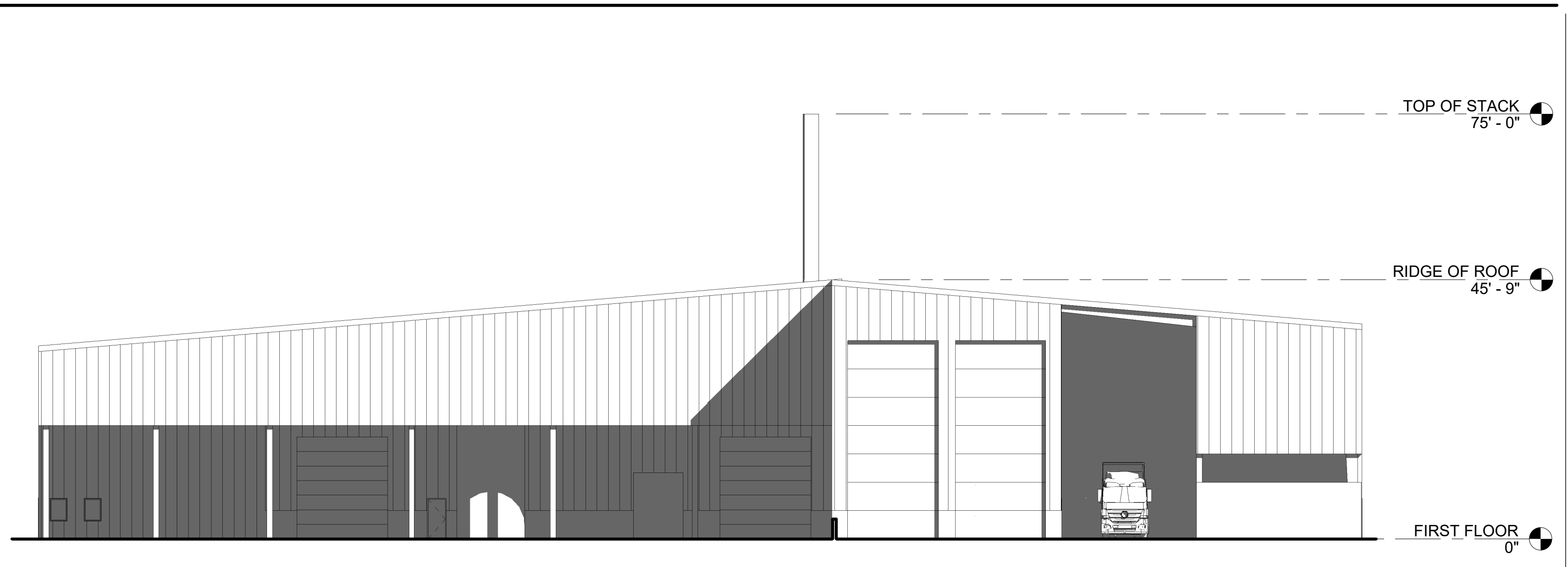
1 RECEIVING AREA PLAN
3/32" = 1'-0"



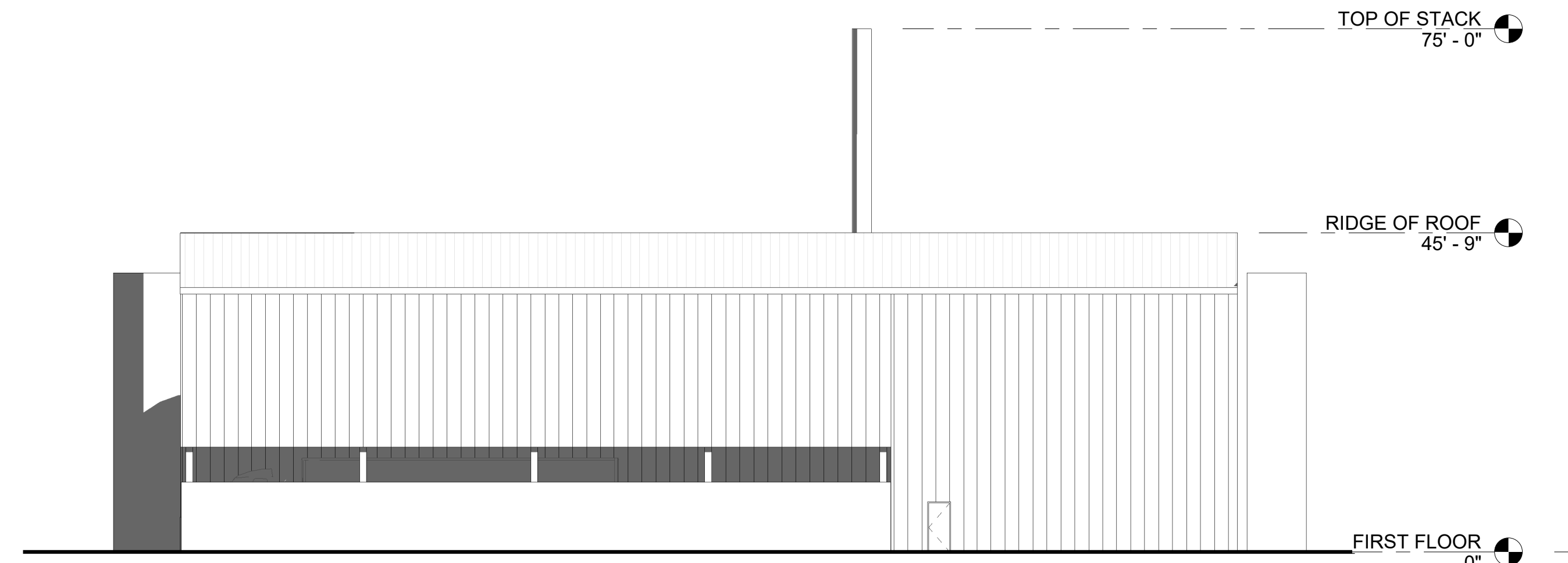
2 LONGITUDINAL SECTION @ BIOSOLIDS RECEIVING
3/32" = 1'-0"



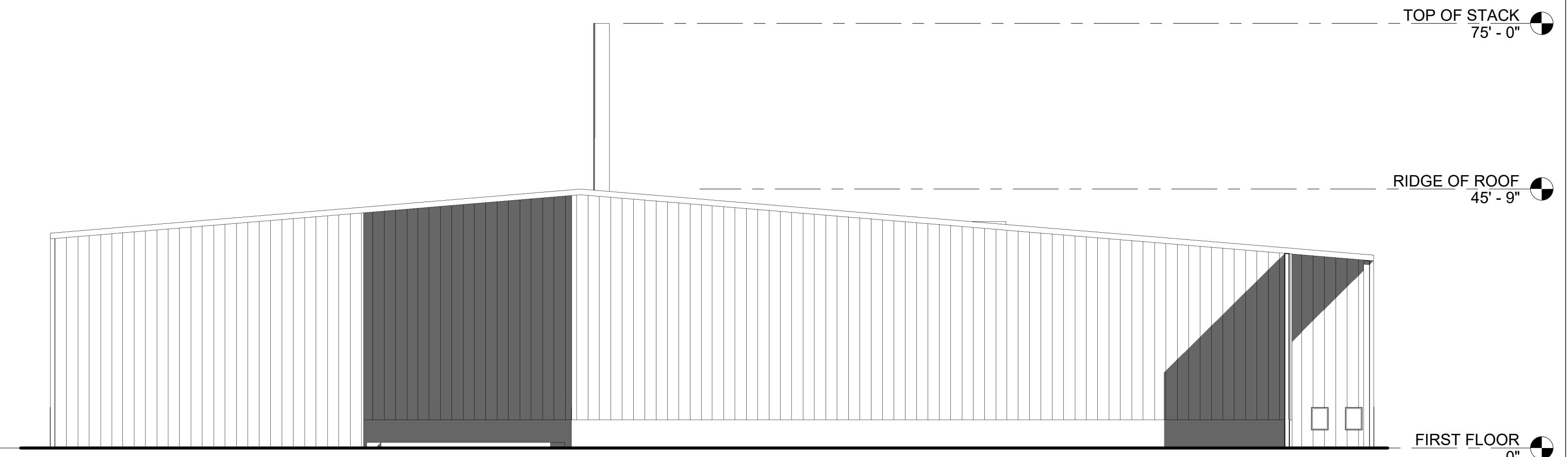
1 EXTERIOR ELEVATION - WEST
1/16" = 1'-0"



2 EXTERIOR ELEVATION - SOUTH
1/16" = 1'-0"



3 EXTERIOR ELEVATION - EAST
1/16" = 1'-0"



4 EXTERIOR ELEVATION - NORTH
1/16" = 1'-0"

SEAL

PROJECT TITLE

**SARATOGA
BIOCHAR
SOLUTIONS**

2 Electric Drive
South Glens Falls, NY 12803

SHEET
TITLE

**EXTERIOR
ELEVATIONS**

CONSULTANT

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REVISIONS

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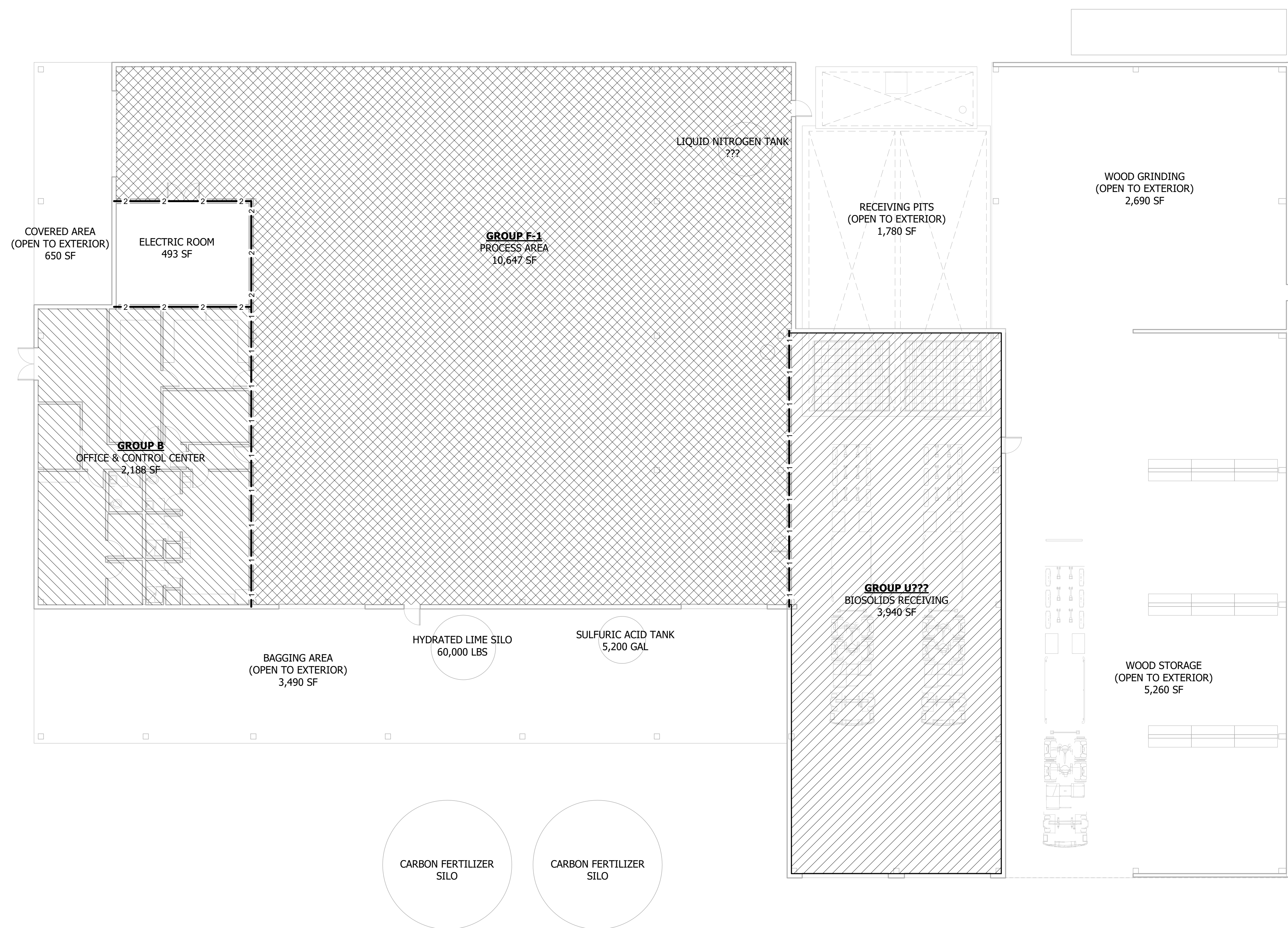
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1 CODE COMPLIANCE PLAN
3/32" = 1'-0"

SEAL

PROJECT TITLE

**SARATOGA
BIOCHAR
SOLUTIONS**

2 Electric Drive
South Glens Falls, NY 12803

SHEET
TITLE

**CODE COMPLIANCE
PLAN**

CONSULTANT

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**ENGINEERING REPORT
APPENDIX B
GEIS FINDINGS STATEMENT
&**

FULL ENVIRONMENTAL ASSESSMENT FORMS PARTS 1, 2, AND 3

THE SARATOGA ASSOCIATES

LANDSCAPE ARCHITECTS, ARCHITECTS, ENGINEERS, AND PLANNERS

File

September 6, 1991

Mr. Mike Sullivan, Supervisor
Town of Moreau
61 Hudson Street
South Glens Falls, New York 12803

RE: Moreau Industrial Park
TSA #89029.32L

Dear Mike:

Enclosed is a copy of the Moreau Industrial Park Findings Statement. Since you have accepted the Final GEIS as complete and have held the corresponding public hearings, including a rezoning hearing, it is now time to consider the Findings Statement.

The applicant is requesting that the Town Board as lead agency, at its regular meeting on September 10, 1991, resolve to accept the enclosed Findings Statement which is consistent the previously accepted FGEIS/DGEIS. Once the Findings Statement has been accepted, it will be circulated to all involved agencies. At that time you are also free to take any other actions that may be appropriate, including rezoning the necessary 163 acres from residential (R-3) to manufacturing (M-1).

Please don't hesitate to call if you have any questions or if I can be of further assistance. Thank you for your consideration in this matter.

Sincerely,


Susan P. Schank

Enclosure

cc: Gary Mattison - Town of Moreau
Ken Green - SEDC
Curt Foreback - NMPC
JDW, JJB, SJH, RJM

**SEQR
FINDINGS STATEMENT**

MOREAU INDUSTRIAL PARK

Pursuant to Article 8 (State Environmental Quality Review Act - SEQR) of the Environmental Conservation Law and 6 NYCRR Part 617, the Moreau Town Board, as Lead Agency, makes the following findings.

Title of Action: Moreau Industrial Park
Project Sponsor: Saratoga Economic Development Corporation

Description of Action: The project involves the rezoning and subdivision of an approximately 243-acre parcel for a proposed industrial park. The proposal is to develop a 24-lot subdivision, with lots ranging in size from approximately 2.7 acres to 26.85 acres. Approximately 88 acres will be preserved as a permanent conservation easement. To develop this industrial park it is necessary to rezone approximately 163 acres from a residential zone (R-3) to an industrial zone (M-1). Approximately 80 acres are currently zoned for manufacturing. The project will be developed in two phases. Phase I will include development of a portion of the main access road and the corresponding utility infrastructure, for the initial development of ten lots.

Assuming full build-out, site development may employ as many as 2,500, earning over \$150 million. The impact on local governments, due to increased tax revenues, will also be significant.

Location: The project site is located in the northeastern corner of the Town of Moreau, Saratoga County. The proposed site access is from Bluebird Road, through the Niagara Mohawk Power Corporation parcel to the north. The Hudson River forms the eastern border of the site. Sisson Road and an unnamed intermittent stream also form portions of the site boundary. The Town and Village of Fort Edward, and the Village of Hudson Falls, in Washington County are located across the river from the project site.

Date Final GEIS Filed: August 13, 1991

Facts and Conclusions in the DGEIS and FGEIS Relied Upon to Support the Decision¹:

- 1) As vegetation is cleared for development, the erosive potential of soils will increase. Due to the generally flat topography of most of the site, this impact will not be significant. Potential impacts will be minimized through implementation of the proposed erosion control plan. A Final Stormwater Management Plan will be submitted for Final Subdivision approval.

¹Refer to DGEIS and FGEIS for complete information.

To reduce the loss of soils and minimize sedimentation in adjacent waterways, all cleared areas will be covered with a layer of hay until revegetation takes place. All disturbed areas will be seeded with grasses as soon as construction permits and silt fencing will be placed down slope of all construction areas, including topsoil stockpiles. Haybales will be utilized around all functioning drain inlets. Two detention basins will intercept flows and allow for settling of sediments before runoff reaches existing watercourses. A riser pipe will be installed in the basins to allow for prolonged detention (and settling) for the duration of the construction period.

The project also proposes to preserve approximately 88 acres as a conservation easement around the entire site. The conservation easement provides a buffer for the Hudson River, the Class C(T) stream (except for the entrance road crossing), a number of intermittent drainageways and the westernmost wetland. Since the easement will only be disturbed for potentially required utility construction, it will further minimize any potential impacts to these resources.

- 2) Construction related activities, including earthmoving, road and utility installation, and associated equipment operations will generate temporary noise, air quality and visual impacts. Since these impacts will be short-term in nature, they are not considered to be significant. Existing vegetation buffers and limiting these activities to normal working hours, five days a week, will minimize any potential impacts.
- 3) A number of water courses will be temporarily disturbed for the construction of roadways and detention basin outlets. Both detention basin outlets and one of the roadway stream crossings will not require NYSDEC streambank disturbance permits. As the main access road enters the project site from Bluebird Road, it crosses a NYSDEC protected stream, Class C(T), for which a permit will be required.

Necessary stream bank disturbance activities will be conducted "in the dry" and flowing water will be temporarily diverted to a downstream location to avoid disturbed areas and to minimize potential downstream impacts. Rip-rap or rock gabions will be utilized to stabilize steep stream banks. Aquatic life will return to normal once construction is complete. A Final Stormwater Management Plan will be included as part of the Final Subdivision Plan submission. The proposed mitigation measures will ensure that potential impacts are not significantly adverse.

- 4) Temporary off-site impacts are likely to occur in conjunction with the extension of municipal sewer and water infrastructure to the project site and off-site roadway improvements. Although a number of water and sewer alternatives have been left open, unless an on-site system is developed off-site, impacts such as the installation of pipes along existing roads will take place. Due to the limited nature of these impacts, they are not considered significant. The impacts associated with off-site construction activities will have the same temporary impacts as those for construction of on-site facilities that are

similar in nature; however, off-site construction activities will be more visible to the community, and may also involve some temporary inconvenience to traffic.

- 5) Although significant areas on site will remain undisturbed (within the conservation easement approximately 88 acres), the overall character of the site will be changed from undisturbed forestland to a built environment with designed landscaped areas. This impact cannot be avoided, although it can be minimized.

It has been estimated that approximately 145 acres on the project site will be disturbed for final build-out. These activities will result in a loss and change in the types of habitat available for wildlife. The proposed mitigation measures, particularly preservation of the conservation easement, will minimize these impacts.

- 6) Of the approximately 145 acres to be cleared, about 80 acres will be transformed to landscaped areas and about 65 acres will become buildings and paved areas, including parking and roadways. The transformation of 65 acres of existing pervious surface area to impervious surface will impact the rate of stormwater runoff and could potentially impact runoff quality.

To mitigate these potential impacts, two detention basins will be developed. These basins will slow down the rate of runoff before it enters existing drainageways. The outflow channels will be lined with filter fabric and rip-rap.

The detention basins have also been designed to infiltrate the "first flush", thereby allowing for settling of sediments. The basins will be utilized for sediment control during construction (with a riser pipe) and will be cleaned when construction is complete. Both basins will require periodic maintenance (*before sediments exceed one-half of the basin's capacity*). A Final Stormwater Management Plan will be submitted for Final Subdivision approval.

- 7) The proposed erosion control and stormwater management plan will minimize any potential impacts to on-site water resources, including wetlands. A very small portion of the northeastern wetland, approximately half an acre, may require disturbance in conjunction with grading activities for the main access road. The disturbed wetland area will be kept to a minimum and undisturbed areas will be protected.
- 8) Since the actual industrial firms that will be locating on the project site are unknown, the DGEIS established a series of thresholds (see table following) as a method for measuring project impact. The thresholds have been established as mean or average development scenarios. If development exceeds a reasonable range, 10-15%, above this threshold special notice should be taken by the lead and involved agencies. A determination should be made whether and to what extent more detailed environmental review should be undertaken.

Selected Resource Impacts for Proposed Action				
Impact	Per Acre Estimate	Phase I	Phase II	Full Buildout
Lot Coverage (building only)	23%	12 acres	19 acres	31 acres
Building Construction	10,000 sq ft	523,000 sq ft	809,000 sq ft	1,332,000 sq ft
Parking Area	23%	12 acres	19 acres	31 acres
Employment	82	1,000	1,500	2,500
Water Use (domestic)	564 gpd	28,760 gpd	46,240 gpd	75,000 ² gpd (ave. daily)
Wastewater Flows (domestic)	564 gpd	28,760 gpd	46,240 gpd	75,000 gpd (ave. daily)
Trip Generation (peak hour)	10	545	690	1,235

Some firms locating at the industrial park will have a smaller resource impact on a per acre basis than that assumed for the site as a whole. Such "low impact" firms will make it possible for other firms to have a greater impact without exceeding the maximum thresholds established in the DGEIS. Each industrial development project will undergo site plan review with the Moreau Planning Board.

Potential project-specific industrial impacts that have not been addressed in the DGEIS/FGEIS, such as industrial process water needs or project-specific air quality impacts, will be required to undergo the complete environmental review process in conjunction with site plan review.

²The average domestic water demand at full project buildout is expected to be 75,000 gpd. The engineering report considers an additional 25,000 gpd as a safety factor, for a total demand of 100,000 gpd.

- 9) The socio-economic impacts of the proposed development will be substantial and beneficial. At full build-out of the industrial park, it is likely that employment may be up to approximately 2,500. The same number will likely be employed in "spin-off" industries throughout New York State, about half of which will be located within the region. The total impact on output (gross state product) is estimated at more than \$600 million, with earnings for direct and indirect employment estimated at over \$150 million.
- 10) Population impacts will depend on the extent to which the existing labor force can meet the increase in employment demand stimulated directly and indirectly by the industrial park development. Assuming that 1,500 workers can be recruited from the existing labor force in Saratoga, Warren and Washington Counties, induced population growth is estimated at over 4,500 persons.
- This expansion of population will increase enrollment of area schools. Since the impact is expected to be diffused across at least six districts, the enrollment will have relatively small impact on any single district.
- 11) The beneficial fiscal impact of the proposed action on the Town of Moreau could be substantial. Given present tax rates in the town, site development would represent annual tax revenue of about \$153,000.

PROPERTY TAX IMPACT OF PROPOSED INDUSTRIAL PARK--FULL BUILDOUT		
Estimated assessed value (AV):		\$32,969,466
TAX JURISDICTION	RATE PER \$1000 AV	INCREASE FROM DEVELOPMENT (EST)
Town	\$3.586	\$118,229
General O/S	\$0.080	\$2,638
Highway	\$0.992	\$32,706
Fire	\$0.596	\$19,650
School (Hudson Falls)	\$19.130	\$630,706
TOTAL		\$803,927

The revenue generated will help to mitigate the increased community service costs experienced by the town.

- 12) The proposed development will also generate an increase in sales tax revenue as new earnings become spending in the community. This beneficial impact has been estimated as follows.

ANNUAL SALES TAX IMPACT FROM PROPOSED DEVELOPMENT--FULL BUILDOUT	
Estimated Earnings Subject to Sales Tax	
Direct Impact	\$27 million
Induced Impact	\$21 million
Total Earnings Subject to Tax	\$48 million
Annual Sales Tax Receipts--County	\$574,055
Share of Receipts to Town of Moreau	\$18,398
Assumes that Saratoga County captures 40% of new sales volume. Also assumes that present distribution system for sales tax remains in place.	
Sales Tax Impact During Construction Period from Proposed Development--Full Buildout	
Estimated Earnings Subject to Sales Tax	
Receipts from Earnings	\$20 million
Total Sales Tax Receipts for County	\$237,072
Share of Receipts to Town of Moreau	\$7,598
Assumes that Saratoga County captures 40% of new sales volume. Also assumes that present distribution system for sales tax remains in place.	

- 13) Initially, up to five lots may be developed utilizing on-site water supply and wastewater disposal systems. Prior to final subdivision plan approval an on-site test well and percolation tests will be conducted to determine on-site utility capabilities. The prospective owners will be required to conduct appropriate testing and well tests before building permits are issued for each of the five projects. The prospective owner of each lot will also be required to conform to all appropriate NYSDEC, NYSDOH and Town of Moreau requirements for individual on-site water supply and wastewater disposal systems. Due to the limited nature of these developments, potential impacts will not be significant. Subsequent to development of the initial five lots, a central water supply system is proposed for the industrial park. All developed lots within the subdivision will be required to connect to central water and sewer systems, when such systems become available.

- 14) Since the project proposes to tie into the City of Glens Falls wastewater treatment facility (for domestic needs), which has ample excess capacity, utilization of the excess capacity will not be an adverse impact. The project sponsor has not made a final determination of how it will connect to the Glens Falls system, either across the river or through the South Glens Falls system. The South Glens Falls alternative is preferred although it may not prove to be feasible and as a result both options have been left open. If due to unforeseen circumstances neither of these alternatives proves feasible, then an on-site system will be developed.

A final determination of wastewater treatment will be included in the Final Engineering Report. Agencies can appropriately rely on this GEIS for decision-making, as long as adequate capacities are available and no additional adverse impacts are identified. If specific issues are not addressed or are inadequately addressed in the GEIS, additional environmental review will be required.

If an off-site wastewater treatment alternative is chosen and required pipelines follow existing roads and rights-of-way, the action will fall within the scope of this GEIS. However if the required pipelines cannot avoid wetlands and other natural and cultural resources, then additional environmental review will be required.

- 15) After up to five lots have been developed with on-site water supplies, no further development may take place until a central water supply for the industrial park has been approved. The central water supply alternative for domestic needs favored by the applicant has been to connect to the Village of South Glens Falls water supply system. If this alternative is available, the proposed industrial park will utilize the majority of the alleged excess capacity of the village system since the daily water usage for the industrial park is estimated at .100 mgd average and .150 mgd maximum.

However, the existing Village of South Glens Falls water supply is a limited resource, and it has not been established that the village system has an excess capacity and use of the village system may or may not prove feasible. As a result, a number of water supply alternatives have been left open, including:

- Fort Edward Supply (located in the Town of Moreau)
- On-site Well Supply System
- Expansion of the South Glens Falls Well Supply
- Potential Regional Water Supply - Town of Queensbury

A Supplemental Draft Generic EIS and a Supplemental Final Generic EIS pursuant to 6 NYCRR 617.8 (g)(1) and 6 NYCRR 617.15 (b) may be required before the town approves a source for the central water supply for the industrial park. The final engineering report will describe and evaluate all options to be implemented. The supplemental GEIS must contain data backed up by engineering information to establish that the village has an excess capacity; an analysis of development proposals under consideration or which have

been approved and are un-built inside the village; additional justifications for the calculations of domestic water usage at the industrial park; additional information to demonstrate that fire flows will be adequate throughout the industrial park; an adequate consideration of alternative sources of water supply such as the Town of Queensbury and Fort Edward and the cost factors on each; proposed contractual terms for allocation of water from South Glens Falls, or Fort Edward, or Queensbury. The environmental review should also consider the effect of the allocation of potential excess in the South Glens Falls water supply on the known need of the town for a source of public water supply for approximately 350 existing houses impacted by contamination from the General Electric Superfund site and undeveloped land in the dead zone of approximately 1100 acres.

Other identified water supply needs of the town include those associated with providing a source of public water supply to the area impacted by the General Electric Superfund Site. It has been estimated that the General Electric Superfund Site has negatively impacted the water supply of approximately 350 houses impacted or potentially impacted in the Willow Street-Jamaica Road areas, and that the plume of contamination prevents development in a dead zone of approximately 1100 acres overlying the contaminated plume (C.A. Rich...). The town should not be financially responsible for providing a clean water supply to the residents whose wells have been damaged by General Electric or to the undeveloped areas where the aquifer has been contaminated by General Electric. The excess capacity from the Village of South Glens Falls water system, if it exists, should be available for beneficial new development and a source of public water supply in the contaminated areas of the town, as well as to allow for full build-out inside the village.

The extent of development approved with the Final Subdivision Plan will be limited by the amount of water proven to be available for supplying the developed industrial park. The allocation of available municipal water resources to serve the domestic needs of the Moreau Industrial Park, as will be considered in the supplemental GEIS, may be an acceptable use of these resources even though other uses have also been identified.

It is understood that public water supply permits will be required by NYSDEC and NYSDOH, and the Town of Moreau. Since the Town Board will be required to sign off on any application to NYSDEC or NYSDOH for a source of public water supply to the industrial park, the Town Board will continue its jurisdiction as lead agency over the Supplemental EIS for the source of public water supply.

- 16) Traffic generated by the proposed industrial park will impact area roadways. The project proposes to mitigate potential traffic impacts by improving area roadways, through signalization and other intersectional improvements that are anticipated to cost approximately \$300,000 and include:

DETAIL OF INTERSECTIONAL ROADWAY IMPROVEMENTS				
INTERSECTION	A - SISSON RD 1-WAY PHASE I,1995 PHASE II,2000		B - SISSON RD 2-WAY PHASE I,1995 PHASE II,2000	
	Site Rd & Bluebird Rd	No Signal EB RTL into Site L=100+50T	Signal EB RTL into Site L=200+50T	No Signal See "A" I
Bluebird Rd & Ft Edward Rd	No Signal WB LTL=100+50T Widen NE Corner	Signal WB LTL=200+50T WB RTL=100+50T SB RTL=125+50T Widen NE Corner	No Signal Widen NE Corner	Signal See "A" II
Ft Edward Rd & Route 197	No Signal SB RTL=100+50T	Signal SB RTL=200+50T EB LTL=200+50T WB RTL=200+50T	No Signal See "A" I	Signal See "A" II
Sisson Rd & Bluebird Rd	No Signal	Signal or Widen Bluebird Rd to site	No Signal	Signal See "A" II
Sisson Rd & Ft Edward Rd	No Signal Clear NE QUAD	No Signal NB RTL=100+50T Clear NE QUAD	Monitor for Signal Clear NE QUAD	Signal NB. RTL=100+50T Clear NE QUAD
RTL=100+50T Means right turn lane 100 feet long with 50 foot taper. LTL=200+50T Means left turn lane 200 feet long with 50 foot taper. EB=Eastbound, WB=Westbound, NB=Northbound, SB=Southbound, QUAD=Quadrant				

The proposed intersectional improvements will bring traffic delays to acceptable levels at most intersections affected. Even though the intersections of Route 9 and Route 197; Sisson Road and Fort Edward Road; Sisson Road and Bluebird Road; and Bluebird and Fort Edward Road are expected to be at Level of Service D (long traffic delays) after improvements, this level or above is considered acceptable for signalized intersections (according to the 1985 Highway Capacity Manual).

The intersections of Route 9 and Fort Edward Road, and Route 197 and Route 4 are expected to be at Levels of Service E and F (very long and extreme delays) respectively, by full build-out of the proposed industrial park. The Route 197 and Route 4 intersection

is expected to be operating at Level of Service F with or without the proposed site development (NYSDOT recently released plans to relocate and realign this intersection, north of the existing location). The Site Drive and Bluebird Road intersection is expected to be at Level of Service B, short traffic delay, at full project build-out.

The above mitigation measures minimize potential impacts to the maximum extent practicable.

- 17) Since the project site is located in an archaeologically sensitive area, there is some potential to impact these resources. However this potential has been minimized, since an archaeological investigation has been conducted of the entire site area. Known archaeological resources have been fenced off to avoid further disturbance and if disturbance is necessary further study will be required.

Also as a mitigation measure, the project has proposed the development of a combined historic/recreational trail system. The trail system, available for jogging and walking to all those within the park, will encircle the site and picnic areas will be developed. A foot path will also lead down to the Indian Hollow area and a historical marker designating the significance of this area and Indian Rock will be developed.

- 18) There will be some impact to air quality as a result of the proposed development. Any construction related impacts will be temporary and short term in nature. Some air quality impacts will be related to increases in traffic, including trucks. However, this increase in traffic will only cause a minor localized increase in air pollutants. Other air quality impacts may be related to specific industries locating on the project site. Industrial related air quality impacts will be addressed as each specific project is presented to the Town of Moreau Planning Board, by each applicable industry.

- 19) Since the project involves rezoning approximately 163 acres from a residential to an industrial zone, there will be some impact to the existing zoning and land uses in the immediate vicinity of the site. Impacting the existing zoning ordinance is unavoidable, if the project is to be implemented. The impact to surrounding land uses has been minimized by proposed mitigation measures, particularly the conservation easement. This easement, which is at least 100 feet deep, surrounds the entire parcel and will minimize project impact. Traffic related mitigation measures and others (identified throughout the findings statement) will further reduce potential impacts.

The Town Board as lead agency has determined not to accept dedication of a proposed conservation easement consisting of approximately 88 acres in the industrial park. The town may reconsider its decision at any time in the future upon receipt of a complete environmental audit, including a subsurface investigation based on independently acquired information, which is certified to the town. The town as lead agency may require a separate environmental review under SEQRA at that time. Since the town will not accept dedication of the proposed conservation easement, the sponsors of the industrial park

should plan for some other form of ownership of these 88 acres, and the plan will be reviewed by the Planning Board in the Final Subdivision Plan.

- 20) There will be some impact to existing views and noise in the vicinity of the site. The most significant impacts will be construction related and they will be temporary and generally limited to normal working hours, five days a week. Other noise and visual impacts will be related to the actual industries that will locate in the park and they will be evaluated on an individual basis. The proposed conservation easement will significantly minimize potential impacts to the surrounding community.

Full Environmental Assessment Form
Part 1 - Project and Setting

Instructions for Completing Part 1

Part 1 is to be completed by the applicant or project sponsor. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification.

Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information; indicate whether missing information does not exist, or is not reasonably available to the sponsor; and, when possible, generally describe work or studies which would be necessary to update or fully develop that information.

Applicants/sponsors must complete all items in Sections A & B. In Sections C, D & E, most items contain an initial question that must be answered either "Yes" or "No". If the answer to the initial question is "Yes", complete the sub-questions that follow. If the answer to the initial question is "No", proceed to the next question. Section F allows the project sponsor to identify and attach any additional information. Section G requires the name and signature of the applicant or project sponsor to verify that the information contained in Part 1 is accurate and complete.

A. Project and Applicant/Sponsor Information.

Name of Action or Project: Saratoga Biochar Solutions, LLC. - Carbon Fertilizer Manufacturing Facility - Moreau Industrial Park		
Project Location (describe, and attach a general location map): Moreau Industrial Park (Parcels 50.-4-16 and 50.-4-22) , Moreau, NY (Map Attached)		
Brief Description of Proposed Action (include purpose or need): The Applicant is proposing to construct and operate a Carbon Fertilizer Manufacturing Facility (the "Facility") within the Moreau Industrial Park (Parcels 50.-4-16 and 50.-4-22) that will manufacture carbon fertilizer (a form of biochar) from biosolids at a rate of 720 tons of received biosolids per day. Construction is proposed in three phases over five years. Each phase will be capable of processing 240 tons of received biosolids per day. The Facility includes a fully enclosed building for receiving and handling biosolids as the feedstock for the carbon fertilizer manufacturing process. The Facility requires Site Plan approval by the Town of Moreau Planning Board and issuance of a Solid Waste Management Facility Permit and Air State Facility Permit from the New York State Department of Environmental Conservation (NYSDEC). The development proposes to merge parcels 50.-4-16 and 50.4-22 into a single parcel with access directly from Faman Road.		
Name of Applicant/Sponsor: Saratoga Biochar Solutions, LLC.		Telephone: 518-391-0566 E-Mail: ray@northeasternbiochar.com
Address: 26F Congress Street #346		
City/PO: Saratoga Springs	State: NY	Zip Code: 12833
Project Contact (if not same as sponsor; give name and title/role): Raymond Apy, CEO Northeastern Biochar Solutions, LLC		Telephone: 518-391-0566 E-Mail: ray@northeasternbiochar.com
Address: 26F Congress Street #346		
City/PO: Saratoga Springs	State: NY	Zip Code: 12833
Property Owner (if not same as sponsor): Moreau Industrial Park, LLC		Telephone: E-Mail:
Address: 269 Ballard Road		
City/PO: Wilton	State: NY	Zip Code: 12831

B. Government Approvals

B. Government Approvals, Funding, or Sponsorship. ("Funding" includes grants, loans, tax relief, and any other forms of financial assistance.)

Government Entity	If Yes: Identify Agency and Approval(s) Required	Application Date (Actual or projected)
a. City Counsel, Town Board, <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No or Village Board of Trustees		
b. City, Town or Village Planning Board or Commission <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Town of Moreau Planning Board - Site Plan Application	August 2021
c. City, Town or Village Zoning Board of Appeals <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
d. Other local agencies <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	City of Glens Falls Wastewater Discharge Permit	September 2021
e. County agencies <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
f. Regional agencies <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
g. State agencies <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	NYSDEC Region 5 - Part 360 SWMF Permit, Air State Facility Permit, Construction SPDES	October 2021
h. Federal agencies <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
i. Coastal Resources. <ul style="list-style-type: none"> i. Is the project site within a Coastal Area, or the waterfront area of a Designated Inland Waterway? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No ii. Is the project site located in a community with an approved Local Waterfront Revitalization Program? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No iii. Is the project site within a Coastal Erosion Hazard Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 		

C. Planning and Zoning

C.1. Planning and zoning actions.

Will administrative or legislative adoption, or amendment of a plan, local law, ordinance, rule or regulation be the only approval(s) which must be granted to enable the proposed action to proceed? Yes No

- If Yes, complete sections C, F and G.
- If No, proceed to question C.2 and complete all remaining sections and questions in Part 1

C.2. Adopted land use plans.

a. Do any municipally- adopted (city, town, village or county) comprehensive land use plan(s) include the site where the proposed action would be located? Yes No

If Yes, does the comprehensive plan include specific recommendations for the site where the proposed action would be located? Yes No

b. Is the site of the proposed action within any local or regional special planning district (for example: Greenway; Brownfield Opportunity Area (BOA); designated State or Federal heritage area; watershed management plan; or other?) Yes No

If Yes, identify the plan(s):
 NYS Heritage Areas: Mohawk Valley Heritage Corridor

c. Is the proposed action located wholly or partially within an area listed in an adopted municipal open space plan, or an adopted municipal farmland protection plan? Yes No

If Yes, identify the plan(s):

C.3. Zoning

a. Is the site of the proposed action located in a municipality with an adopted zoning law or ordinance. Yes No
If Yes, what is the zoning classification(s) including any applicable overlay district?

M1 - Manufacturing 1

b. Is the use permitted or allowed by a special or conditional use permit? Yes No

c. Is a zoning change requested as part of the proposed action? Yes No

If Yes,

i. What is the proposed new zoning for the site? _____

C.4. Existing community services.

a. In what school district is the project site located? South Glens Falls

b. What police or other public protection forces serve the project site?

South Glens Falls Police Department

c. Which fire protection and emergency medical services serve the project site?

Moreau Fire Protection (FD026)

d. What parks serve the project site?

None

D. Project Details

D.1. Proposed and Potential Development

a. What is the general nature of the proposed action (e.g., residential, industrial, commercial, recreational; if mixed, include all components)? Industrial - Manufacturing

b. a. Total acreage of the site of the proposed action? 5.89 acres

b. Total acreage to be physically disturbed? 4.64 acres

c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 5.89 acres

c. Is the proposed action an expansion of an existing project or use? Yes No

i. If Yes, what is the approximate percentage of the proposed expansion and identify the units (e.g., acres, miles, housing units, square feet)? % _____ Units: _____

d. Is the proposed action a subdivision, or does it include a subdivision? Yes No

If Yes,

i. Purpose or type of subdivision? (e.g., residential, industrial, commercial; if mixed, specify types) _____

ii. Is a cluster/conservation layout proposed? Yes No

iii. Number of lots proposed? _____

iv. Minimum and maximum proposed lot sizes? Minimum _____ Maximum _____

e. Will the proposed action be constructed in multiple phases? Yes No

i. If No, anticipated period of construction: _____ months

ii. If Yes:

- Total number of phases anticipated 3
- Anticipated commencement date of phase 1 (including demolition) Dec month 2022 year
- Anticipated completion date of final phase Dec month 2026 year

• Generally describe connections or relationships among phases, including any contingencies where progress of one phase may determine timing or duration of future phases: _____

Following approval, Phase 1 will be constructed to achieve 240 tons per day capacity of received biosolids. Phase 2 and 3 will be constructed over the first 5 years of operation to bring the facility to the target manufacturing capacity of 720 tons per day of received biosolids.

f. Does the project include new residential uses? Yes No

If Yes, show numbers of units proposed.

	<u>One Family</u>	<u>Two Family</u>	<u>Three Family</u>	<u>Multiple Family (four or more)</u>
Initial Phase	_____	_____	_____	_____
At completion	_____	_____	_____	_____
of all phases	_____	_____	_____	_____

g. Does the proposed action include new non-residential construction (including expansions)? Yes No

If Yes,

- i. Total number of structures 1
- ii. Dimensions (in feet) of largest proposed structure: 50 height; 303 width; and 222 length
- iii. Approximate extent of building space to be heated or cooled: 7,560 ~~8,000~~ square feet

h. Does the proposed action include construction or other activities that will result in the impoundment of any liquids, such as creation of a water supply, reservoir, pond, lake, waste lagoon or other storage? Yes No

If Yes,

- i. Purpose of the impoundment: _____
- ii. If a water impoundment, the principal source of the water: Ground water Surface water streams Other specify: _____
- iii. If other than water, identify the type of impounded/contained liquids and their source. _____
- iv. Approximate size of the proposed impoundment. Volume: _____ million gallons; surface area: _____ acres
- v. Dimensions of the proposed dam or impounding structure: _____ height; _____ length
- vi. Construction method/materials for the proposed dam or impounding structure (e.g., earth fill, rock, wood, concrete): _____

D.2. Project Operations

a. Does the proposed action include any excavation, mining, or dredging, during construction, operations, or both? (Not including general site preparation, grading or installation of utilities or foundations where all excavated materials will remain onsite) Yes No

If Yes:

- i. What is the purpose of the excavation or dredging? _____
- ii. How much material (including rock, earth, sediments, etc.) is proposed to be removed from the site?
 - Volume (specify tons or cubic yards): _____
 - Over what duration of time? _____
- iii. Describe nature and characteristics of materials to be excavated or dredged, and plans to use, manage or dispose of them. _____
- iv. Will there be onsite dewatering or processing of excavated materials? Yes No
If yes, describe. _____
- v. What is the total area to be dredged or excavated? _____ acres
- vi. What is the maximum area to be worked at any one time? _____ acres
- vii. What would be the maximum depth of excavation or dredging? _____ feet
- viii. Will the excavation require blasting? Yes No
- ix. Summarize site reclamation goals and plan: _____

b. Would the proposed action cause or result in alteration of, increase or decrease in size of, or encroachment into any existing wetland, waterbody, shoreline, beach or adjacent area? Yes No

If Yes:

- i. Identify the wetland or waterbody which would be affected (by name, water index number, wetland map number or geographic description): _____

ii. Describe how the proposed action would affect that waterbody or wetland, e.g. excavation, fill, placement of structures, or alteration of channels, banks and shorelines. Indicate extent of activities, alterations and additions in square feet or acres:

iii. Will the proposed action cause or result in disturbance to bottom sediments? Yes No

If Yes, describe: _____

iv. Will the proposed action cause or result in the destruction or removal of aquatic vegetation? Yes No

If Yes:

- acres of aquatic vegetation proposed to be removed: _____
- expected acreage of aquatic vegetation remaining after project completion: _____
- purpose of proposed removal (e.g. beach clearing, invasive species control, boat access): _____
- proposed method of plant removal: _____
- if chemical/herbicide treatment will be used, specify product(s): _____

v. Describe any proposed reclamation/mitigation following disturbance: _____

c. Will the proposed action use, or create a new demand for water? Yes No

If Yes:

i. Total anticipated water usage/demand per day: _____ 30,079 gallons/day

ii. Will the proposed action obtain water from an existing public water supply? Yes No

If Yes:

- Name of district or service area: Moreau Water District #3
- Does the existing public water supply have capacity to serve the proposal? Yes No
- Is the project site in the existing district? Yes No
- Is expansion of the district needed? Yes No
- Do existing lines serve the project site? Yes No

iii. Will line extension within an existing district be necessary to supply the project? Yes No

If Yes:

- Describe extensions or capacity expansions proposed to serve this project: _____
- Source(s) of supply for the district: _____

iv. Is a new water supply district or service area proposed to be formed to serve the project site? Yes No

If Yes:

- Applicant/sponsor for new district: _____
- Date application submitted or anticipated: _____
- Proposed source(s) of supply for new district: _____

v. If a public water supply will not be used, describe plans to provide water supply for the project: _____

vi. If water supply will be from wells (public or private), what is the maximum pumping capacity: _____ gallons/minute.

d. Will the proposed action generate liquid wastes? Yes No

If Yes:

i. Total anticipated liquid waste generation per day: _____ 29,456 gallons/day

ii. Nature of liquid wastes to be generated (e.g., sanitary wastewater, industrial; if combination, describe all components and approximate volumes or proportions of each): _____

Sanitary Wastewater - 35 gph, Truck Wash - 75 gph, and Processing - 1,284 gph

iii. Will the proposed action use any existing public wastewater treatment facilities? Yes No

If Yes:

- Name of wastewater treatment plant to be used: City of Glens Falls Wastewater Treatment Plant
- Name of district: Sewer District #1
- Does the existing wastewater treatment plant have capacity to serve the project? Yes No
- Is the project site in the existing district? Yes No
- Is expansion of the district needed? Yes No

- Do existing sewer lines serve the project site? Yes No
- Will a line extension within an existing district be necessary to serve the project? Yes No

 If Yes:

- Describe extensions or capacity expansions proposed to serve this project: _____

iv. Will a new wastewater (sewage) treatment district be formed to serve the project site? Yes No
 If Yes:

- Applicant/sponsor for new district: _____
- Date application submitted or anticipated: _____
- What is the receiving water for the wastewater discharge? _____

v. If public facilities will not be used, describe plans to provide wastewater treatment for the project, including specifying proposed receiving water (name and classification if surface discharge or describe subsurface disposal plans):

vi. Describe any plans or designs to capture, recycle or reuse liquid waste: _____

e. Will the proposed action disturb more than one acre and create stormwater runoff, either from new point sources (i.e. ditches, pipes, swales, curbs, gutters or other concentrated flows of stormwater) or non-point source (i.e. sheet flow) during construction or post construction? Yes No
 If Yes:

- i. How much impervious surface will the project create in relation to total size of project parcel?
 _____ Square feet or 3.07 acres (impervious surface)
 _____ Square feet or 5.89 acres (parcel size)
- ii. Describe types of new point sources. N/A

iii. Where will the stormwater runoff be directed (i.e. on-site stormwater management facility/structures, adjacent properties, groundwater, on-site surface water or off-site surface waters)?
on-site stormwater management facility/structures and groundwater

- If to surface waters, identify receiving water bodies or wetlands: _____
- Will stormwater runoff flow to adjacent properties? Yes No

iv. Does the proposed plan minimize impervious surfaces, use pervious materials or collect and re-use stormwater? Yes No

f. Does the proposed action include, or will it use on-site, one or more sources of air emissions, including fuel combustion, waste incineration, or other processes or operations? Yes No
 If Yes, identify:

- i. Mobile sources during project operations (e.g., heavy equipment, fleet or delivery vehicles)
Delivery vehicles during operation.
- ii. Stationary sources during construction (e.g., power generation, structural heating, batch plant, crushers)
None.
- iii. Stationary sources during operations (e.g., process emissions, large boilers, electric generation)
Process Emissions from manufacturing process requiring air permit.

g. Will any air emission sources named in D.2.f (above), require a NY State Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V Permit? Yes No
 If Yes:

- i. Is the project site located in an Air quality non-attainment area? (Area routinely or periodically fails to meet ambient air quality standards for all or some parts of the year) Yes No
- ii. In addition to emissions as calculated in the application, the project will generate:
 - 96,232 Tons/year (short tons) of Carbon Dioxide (CO₂)
 - 0 Tons/year (short tons) of Nitrous Oxide (N₂O)
 - 0 Tons/year (short tons) of Perfluorocarbons (PFCs)
 - 0 Tons/year (short tons) of Sulfur Hexafluoride (SF₆)
 - 0 Tons/year (short tons) of Carbon Dioxide equivalent of Hydrofluorocarbons (HFCs)
 - 12.7 Tons/year (short tons) of Hazardous Air Pollutants (HAPs)

h. Will the proposed action generate or emit methane (including, but not limited to, sewage treatment plants, landfills, composting facilities)? Yes No

If Yes:

i. Estimate methane generation in tons/year (metric): 0

ii. Describe any methane capture, control or elimination measures included in project design (e.g., combustion to generate heat or electricity, flaring): Methane generation eliminated through thermal oxidizer

i. Will the proposed action result in the release of air pollutants from open-air operations or processes, such as quarry or landfill operations? Yes No

If Yes: Describe operations and nature of emissions (e.g., diesel exhaust, rock particulates/dust):

j. Will the proposed action result in a substantial increase in traffic above present levels or generate substantial new demand for transportation facilities or services? Yes No

If Yes:

i. When is the peak traffic expected (Check all that apply): Morning Evening Weekend
 Randomly between hours of _____ to _____.

ii. For commercial activities only, projected number of truck trips/day and type (e.g., semi trailers and dump trucks): _____
Up to 50 truck trips per day (90% rear dump semi trailers; <5% roll-off trucks; <5% single unit box truck)

iii. Parking spaces: Existing 0 Proposed 22 Net increase/decrease 22

iv. Does the proposed action include any shared use parking? Yes No

v. If the proposed action includes any modification of existing roads, creation of new roads or change in existing access, describe:
No new roads proposed.

vi. Are public/private transportation service(s) or facilities available within 1/2 mile of the proposed site? Yes No

vii. Will the proposed action include access to public transportation or accommodations for use of hybrid, electric or other alternative fueled vehicles? Yes No

viii. Will the proposed action include plans for pedestrian or bicycle accommodations for connections to existing pedestrian or bicycle routes? Yes No

k. Will the proposed action (for commercial or industrial projects only) generate new or additional demand for energy? Yes No

If Yes:

i. Estimate annual electricity demand during operation of the proposed action: _____
1,500 kW/hr (500 kW/hr per phase)

ii. Anticipated sources/suppliers of electricity for the project (e.g., on-site combustion, on-site renewable, via grid/local utility, or other):
Local Utility Provider.

iii. Will the proposed action require a new, or an upgrade, to an existing substation? Yes No

l. Hours of operation. Answer all items which apply.

i. During Construction:		ii. During Operations:	
• Monday - Friday:	<u>7 AM - 5 PM</u>	• Monday - Friday:	<u>24/7 Ops, Deliveries 6 AM-6PM</u>
• Saturday:	<u>7 AM - 5 PM</u>	• Saturday:	<u>24/7 Ops, Deliveries 6 AM-6PM</u>
• Sunday:	<u>NA</u>	• Sunday:	<u>24/7 Ops, No Deliveries</u>
• Holidays:	<u>NA</u>	• Holidays:	<u>24/7 Ops, No Deliveries</u>

m. Will the proposed action produce noise that will exceed existing ambient noise levels during construction, operation, or both? Yes No

If yes:
i. Provide details including sources, time of day and duration:
Construction equipment during workday hours will temporarily exceed ambient noise levels during construction.
Noise sources during operations will be indoors and operations are not expected to result in offsite exceedances of ambient noise levels.

ii. Will the proposed action remove existing natural barriers that could act as a noise barrier or screen? Yes No
Describe: _____

n. Will the proposed action have outdoor lighting? Yes No

If yes:
i. Describe source(s), location(s), height of fixture(s), direction/aim, and proximity to nearest occupied structures:
Lighting will be used to illuminate onsite driving areas consisting of LED wallpack and pole mounted fixtures. Lights will be shielded and directed to prevent offsite dispersion. The nearest building is located approximately 225 feet east of parcel 50.-4-16 across Faman Road.

ii. Will proposed action remove existing natural barriers that could act as a light barrier or screen? Yes No
Describe: _____

o. Does the proposed action have the potential to produce odors for more than one hour per day? Yes No
If Yes, describe possible sources, potential frequency and duration of odor emissions, and proximity to nearest occupied structures:
Biosolids deliveries (6 days/week) during receiving hours (6 AM-6 PM). Manufacturing operations occur 24/7. All biosolids receipt and manufacturing operations occur indoors with advanced odor control systems. The nearest occupied structure is located approximately 225 feet east of parcel 50.-4-16.

p. Will the proposed action include any bulk storage of petroleum (combined capacity of over 1,100 gallons) or chemical products 185 gallons in above ground storage or any amount in underground storage? Yes No

If Yes:
i. Product(s) to be stored Sulfuric Acid
ii. Volume(s) 216 Gal per unit time _____ day (e.g., month, year)
iii. Generally, describe the proposed storage facilities:
5,000 gallon sulfuric acid tank located within secondary containment and accessible for truck loading. Requires NYSDEC CBS Registration.

q. Will the proposed action (commercial, industrial and recreational projects only) use pesticides (i.e., herbicides, insecticides) during construction or operation? Yes No

If Yes:
i. Describe proposed treatment(s):

ii. Will the proposed action use Integrated Pest Management Practices? Yes No

r. Will the proposed action (commercial or industrial projects only) involve or require the management or disposal of solid waste (excluding hazardous materials)? Yes No

If Yes:
i. Describe any solid waste(s) to be generated during construction or operation of the facility:
• Construction: _____ TBD tons per _____ Week (unit of time)
• Operation : _____ TBD tons per _____ Week (unit of time)

ii. Describe any proposals for on-site minimization, recycling or reuse of materials to avoid disposal as solid waste:
• Construction: Recycling containers will be maintained during construction to collect recyclables for recycling.

• Operation: Recycling containers will be maintained during operations to collect recyclables for recycling.

iii. Proposed disposal methods/facilities for solid waste generated on-site:
• Construction: Waste containers will be maintained onsite during construction that will be serviced weekly by a local hauling company for landfill disposal.

• Operation: Waste containers will be maintained onsite during operations that will be serviced weekly by a local hauling company for landfill disposal.

s. Does the proposed action include construction or modification of a solid waste management facility? Yes No

If Yes:

- i. Type of management or handling of waste proposed for the site (e.g., recycling or transfer station, composting, landfill, or other disposal activities): Receiving and thermally treating biosolids to manufacture a "beneficial use" carbon fertilizer.
- ii. Anticipated rate of disposal/processing:
 - N/A Tons/month, if transfer or other non-combustion/thermal treatment, or
 - 30 Tons/hour, if combustion or thermal treatment
- iii. If landfill, anticipated site life: N/A years

t. Will the proposed action at the site involve the commercial generation, treatment, storage, or disposal of hazardous waste? Yes No

If Yes:

- i. Name(s) of all hazardous wastes or constituents to be generated, handled or managed at facility: _____
- ii. Generally describe processes or activities involving hazardous wastes or constituents: _____
- iii. Specify amount to be handled or generated _____ tons/month
- iv. Describe any proposals for on-site minimization, recycling or reuse of hazardous constituents: _____
- v. Will any hazardous wastes be disposed at an existing offsite hazardous waste facility? Yes No

If Yes: provide name and location of facility: _____

If No: describe proposed management of any hazardous wastes which will not be sent to a hazardous waste facility: _____

E. Site and Setting of Proposed Action

E.1. Land uses on and surrounding the project site

a. Existing land uses.

i. Check all uses that occur on, adjoining and near the project site.

- Urban Industrial Commercial Residential (suburban) Rural (non-farm)
- Forest Agriculture Aquatic Other (specify): _____

ii. If mix of uses, generally describe:

The proposed development is located within the Moreau Industrial Park consisting of industrial use. Undeveloped land within the industrial park and immediate surrounding area is predominantly forest.

b. Land uses and covertypes on the project site.

Land use or Covertype	Current Acreage	Acreage After Project Completion	Change (Acres +/-)
• Roads, buildings, and other paved or impervious surfaces	0	3.07	+3.07
• Forested	2.6	0.38	-2.22
• Meadows, grasslands or brushlands (non-agricultural, including abandoned agricultural)	3.29	2.44	-0.85
• Agricultural (includes active orchards, field, greenhouse etc.)	0	0	0
• Surface water features (lakes, ponds, streams, rivers, etc.)	0	0	0
• Wetlands (freshwater or tidal)	0	0	0
• Non-vegetated (bare rock, earth or fill)	0	0	0
• Other Describe: _____			

c. Is the project site presently used by members of the community for public recreation? Yes No
 i. If Yes: explain: _____

d. Are there any facilities serving children, the elderly, people with disabilities (e.g., schools, hospitals, licensed day care centers, or group homes) within 1500 feet of the project site? Yes No
 If Yes,
 i. Identify Facilities: _____

e. Does the project site contain an existing dam? Yes No
 If Yes:
 i. Dimensions of the dam and impoundment:
 • Dam height: _____ feet
 • Dam length: _____ feet
 • Surface area: _____ acres
 • Volume impounded: _____ gallons OR acre-feet
 ii. Dam's existing hazard classification: _____
 iii. Provide date and summarize results of last inspection: _____

f. Has the project site ever been used as a municipal, commercial or industrial solid waste management facility, or does the project site adjoin property which is now, or was at one time, used as a solid waste management facility? Yes No
 If Yes:
 i. Has the facility been formally closed? Yes No
 • If yes, cite sources/documentation: _____
 ii. Describe the location of the project site relative to the boundaries of the solid waste management facility: _____
 iii. Describe any development constraints due to the prior solid waste activities: _____

g. Have hazardous wastes been generated, treated and/or disposed of at the site, or does the project site adjoin property which is now or was at one time used to commercially treat, store and/or dispose of hazardous waste? Yes No
 If Yes:
 i. Describe waste(s) handled and waste management activities, including approximate time when activities occurred: _____

h. Potential contamination history. Has there been a reported spill at the proposed project site, or have any remedial actions been conducted at or adjacent to the proposed site? Yes No
 If Yes:
 i. Is any portion of the site listed on the NYSDEC Spills Incidents database or Environmental Site Remediation database? Check all that apply: Yes No
 Yes – Spills Incidents database Provide DEC ID number(s): _____
 Yes – Environmental Site Remediation database Provide DEC ID number(s): _____
 Neither database
 ii. If site has been subject of RCRA corrective activities, describe control measures: _____
 iii. Is the project within 2000 feet of any site in the NYSDEC Environmental Site Remediation database? Yes No
 If yes, provide DEC ID number(s): 546031
 iv. If yes to (i), (ii) or (iii) above, describe current status of site(s): _____

Site 546031 is the Hudson River PCB Sediments, a Class 2 State Superfund Site. The Hudson River is located approximately 1,300 feet east of parcel 50.-4-16.

v. Is the project site subject to an institutional control limiting property uses? Yes No

- If yes, DEC site ID number: _____
- Describe the type of institutional control (e.g., deed restriction or easement): _____
- Describe any use limitations: _____
- Describe any engineering controls: _____
- Will the project affect the institutional or engineering controls in place? Yes No
- Explain: _____

E.2. Natural Resources On or Near Project Site

a. What is the average depth to bedrock on the project site? _____ >6.5 feet

b. Are there bedrock outcroppings on the project site? Yes No
 If Yes, what proportion of the site is comprised of bedrock outcroppings? _____ %

c. Predominant soil type(s) present on project site: Loamy Sand (WnB) _____ 100 %
 _____ %
 _____ %

d. What is the average depth to the water table on the project site? Average: _____ >6.5 feet

e. Drainage status of project site soils: Well Drained: _____ 100 % of site
 Moderately Well Drained: _____ % of site
 Poorly Drained _____ % of site

f. Approximate proportion of proposed action site with slopes: 0-10%: _____ 100 % of site
 10-15%: _____ % of site
 15% or greater: _____ % of site

g. Are there any unique geologic features on the project site? Yes No
 If Yes, describe: _____

h. Surface water features.

i. Does any portion of the project site contain wetlands or other waterbodies (including streams, rivers, ponds or lakes)? Yes No

ii. Do any wetlands or other waterbodies adjoin the project site? Yes No

If Yes to either *i* or *ii*, continue. If No, skip to E.2.i.

iii. Are any of the wetlands or waterbodies within or adjoining the project site regulated by any federal, state or local agency? Yes No

iv. For each identified regulated wetland and waterbody on the project site, provide the following information:

- Streams: Name _____ Classification _____
- Lakes or Ponds: Name _____ Classification _____
- Wetlands: Name _____ Approximate Size _____
- Wetland No. (if regulated by DEC) _____

v. Are any of the above water bodies listed in the most recent compilation of NYS water quality-impaired waterbodies? Yes No
 If yes, name of impaired water body/bodies and basis for listing as impaired: _____

i. Is the project site in a designated Floodway? Yes No

j. Is the project site in the 100-year Floodplain? Yes No

k. Is the project site in the 500-year Floodplain? Yes No

l. Is the project site located over, or immediately adjoining, a primary, principal or sole source aquifer? Yes No
 If Yes:
 i. Name of aquifer: Principal Aquifer _____

m. Identify the predominant wildlife species that occupy or use the project site: _____
 Typical suburban wildlife _____

n. Does the project site contain a designated significant natural community? Yes No
 If Yes:
 i. Describe the habitat/community (composition, function, and basis for designation): _____

 ii. Source(s) of description or evaluation: _____
 iii. Extent of community/habitat:
 • Currently: _____ acres
 • Following completion of project as proposed: _____ acres
 • Gain or loss (indicate + or -): _____ acres

o. Does project site contain any species of plant or animal that is listed by the federal government or NYS as endangered or threatened, or does it contain any areas identified as habitat for an endangered or threatened species? Yes No
 If Yes:
 i. Species and listing (endangered or threatened): _____

p. Does the project site contain any species of plant or animal that is listed by NYS as rare, or as a species of special concern? Yes No
 If Yes:
 i. Species and listing: _____

q. Is the project site or adjoining area currently used for hunting, trapping, fishing or shell fishing? Yes No
 If yes, give a brief description of how the proposed action may affect that use: _____

E.3. Designated Public Resources On or Near Project Site

a. Is the project site, or any portion of it, located in a designated agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? Yes No
 If Yes, provide county plus district name/number: _____

b. Are agricultural lands consisting of highly productive soils present? Yes No
 i. If Yes: acreage(s) on project site? _____
 ii. Source(s) of soil rating(s): _____

c. Does the project site contain all or part of, or is it substantially contiguous to, a registered National Natural Landmark? Yes No
 If Yes:
 i. Nature of the natural landmark: Biological Community Geological Feature
 ii. Provide brief description of landmark, including values behind designation and approximate size/extent: _____

d. Is the project site located in or does it adjoin a state listed Critical Environmental Area? Yes No
 If Yes:
 i. CEA name: _____
 ii. Basis for designation: _____
 iii. Designating agency and date: _____

e. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places? Yes No

If Yes:

i. Nature of historic/archaeological resource: Archaeological Site Historic Building or District

ii. Name: _____

iii. Brief description of attributes on which listing is based: _____

f. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory? Yes No

g. Have additional archaeological or historic site(s) or resources been identified on the project site? Yes No

If Yes:

i. Describe possible resource(s): _____

ii. Basis for identification: _____

h. Is the project site within five miles of any officially designated and publicly accessible federal, state, or local scenic or aesthetic resource? Yes No

If Yes:

i. Identify resource: Mohawk Valley Corridor

ii. Nature of, or basis for, designation (e.g., established highway overlook, state or local park, state historic trail or scenic byway, etc.): NYS Designated Heritage Area

iii. Distance between project and resource: 0 (includes entire county) miles.

i. Is the project site located within a designated river corridor under the Wild, Scenic and Recreational Rivers Program 6 NYCRR 666? Yes No

If Yes:

i. Identify the name of the river and its designation: _____

ii. Is the activity consistent with development restrictions contained in 6NYCRR Part 666? Yes No

F. Additional Information

Attach any additional information which may be needed to clarify your project.

If you have identified any adverse impacts which could be associated with your proposal, please describe those impacts plus any measures which you propose to avoid or minimize them.

G. Verification

I certify that the information provided is true to the best of my knowledge.

Applicant/Sponsor Name RAYMOND APY Date 2-22-2022

Signature [Handwritten Signature] Title CEO

Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.

B.i.i [Coastal or Waterfront Area]	No
B.i.ii [Local Waterfront Revitalization Area]	No
C.2.b. [Special Planning District]	Yes - Digital mapping data are not available for all Special Planning Districts. Refer to EAF Workbook.
C.2.b. [Special Planning District - Name]	NYS Heritage Areas: Mohawk Valley Heritage Corridor
E.1.h [DEC Spills or Remediation Site - Potential Contamination History]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Listed]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Environmental Site Remediation Database]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.iii [Within 2,000' of DEC Remediation Site]	Yes
E.1.h.iii [Within 2,000' of DEC Remediation Site - DEC ID]	546031
E.2.g [Unique Geologic Features]	No
E.2.h.i [Surface Water Features]	No
E.2.h.ii [Surface Water Features]	No
E.2.h.iii [Surface Water Features]	No
E.2.h.v [Impaired Water Bodies]	No
E.2.i. [Floodway]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.2.j. [100 Year Floodplain]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.2.k. [500 Year Floodplain]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.2.l. [Aquifers]	Yes

E.2.l. [Aquifer Names]	Principal Aquifer
E.2.n. [Natural Communities]	No
E.2.o. [Endangered or Threatened Species]	No
E.2.p. [Rare Plants or Animals]	No
E.3.a. [Agricultural District]	No
E.3.c. [National Natural Landmark]	No
E.3.d [Critical Environmental Area]	No
E.3.e. [National or State Register of Historic Places or State Eligible Sites]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.3.f. [Archeological Sites]	Yes
E.3.i. [Designated River Corridor]	No

Full Environmental Assessment Form
Part 2 - Identification of Potential Project Impacts

Agency Use Only [If applicable]
 Project : Saratoga Bio Char
 Date : March 7, 2022

Part 2 is to be completed by the lead agency. Part 2 is designed to help the lead agency inventory all potential resources that could be affected by a proposed project or action. We recognize that the lead agency's reviewer(s) will not necessarily be environmental professionals. So, the questions are designed to walk a reviewer through the assessment process by providing a series of questions that can be answered using the information found in Part 1. To further assist the lead agency in completing Part 2, the form identifies the most relevant questions in Part 1 that will provide the information needed to answer the Part 2 question. When Part 2 is completed, the lead agency will have identified the relevant environmental areas that may be impacted by the proposed activity.

If the lead agency is a state agency **and** the action is in any Coastal Area, complete the Coastal Assessment Form before proceeding with this assessment.

Tips for completing Part 2:

- Review all of the information provided in Part 1.
- Review any application, maps, supporting materials and the Full EAF Workbook.
- Answer each of the 18 questions in Part 2.
- If you answer "Yes" to a numbered question, please complete all the questions that follow in that section.
- If you answer "No" to a numbered question, move on to the next numbered question.
- Check appropriate column to indicate the anticipated size of the impact.
- Proposed projects that would exceed a numeric threshold contained in a question should result in the reviewing agency checking the box "Moderate to large impact may occur."
- The reviewer is not expected to be an expert in environmental analysis.
- If you are not sure or undecided about the size of an impact, it may help to review the sub-questions for the general question and consult the workbook.
- When answering a question consider all components of the proposed activity, that is, the "whole action".
- Consider the possibility for long-term and cumulative impacts as well as direct impacts.
- Answer the question in a reasonable manner considering the scale and context of the project.

	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> YES	
1. Impact on Land			
Proposed action may involve construction on, or physical alteration of, the land surface of the proposed site. (See Part 1. D.1)			
<i>If "Yes", answer questions a - j. If "No", move on to Section 2.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may involve construction on land where depth to water table is less than 3 feet.	E2d	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may involve construction on slopes of 15% or greater.	E2f	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may involve construction on land where bedrock is exposed, or generally within 5 feet of existing ground surface.	E2a	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may involve the excavation and removal of more than 1,000 tons of natural material.	D2a	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may involve construction that continues for more than one year or in multiple phases.	D1e	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may result in increased erosion, whether from physical disturbance or vegetation removal (including from treatment by herbicides).	D2e, D2q	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. The proposed action is, or may be, located within a Coastal Erosion hazard area.	B1i	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h. Other impacts: <u>None.</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

2. Impact on Geological Features
 The proposed action may result in the modification or destruction of, or inhibit access to, any unique or unusual land forms on the site (e.g., cliffs, dunes, minerals, fossils, caves). (See Part 1. E.2.g) NO YES
If "Yes", answer questions a - c. If "No", move on to Section 3.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Identify the specific land form(s) attached: _____	E2g	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may affect or is adjacent to a geological feature listed as a registered National Natural Landmark. Specific feature: _____	E3c	<input type="checkbox"/>	<input type="checkbox"/>
c. Other impacts: _____		<input type="checkbox"/>	<input type="checkbox"/>

3. Impacts on Surface Water
 The proposed action may affect one or more wetlands or other surface water bodies (e.g., streams, rivers, ponds or lakes). (See Part 1. D.2, E.2.h) NO YES
If "Yes", answer questions a - l. If "No", move on to Section 4.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may create a new water body.	D2b, D1h	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in an increase or decrease of over 10% or more than a 10 acre increase or decrease in the surface area of any body of water.	D2b	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may involve dredging more than 100 cubic yards of material from a wetland or water body.	D2a	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may involve construction within or adjoining a freshwater or tidal wetland, or in the bed or banks of any other water body.	E2h	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may create turbidity in a waterbody, either from upland erosion, runoff or by disturbing bottom sediments.	D2a, D2h	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may include construction of one or more intake(s) for withdrawal of water from surface water.	D2c	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed action may include construction of one or more outfall(s) for discharge of wastewater to surface water(s).	D2d	<input type="checkbox"/>	<input type="checkbox"/>
h. The proposed action may cause soil erosion, or otherwise create a source of stormwater discharge that may lead to siltation or other degradation of receiving water bodies.	D2e	<input type="checkbox"/>	<input type="checkbox"/>
i. The proposed action may affect the water quality of any water bodies within or downstream of the site of the proposed action.	E2h	<input type="checkbox"/>	<input type="checkbox"/>
j. The proposed action may involve the application of pesticides or herbicides in or around any water body.	D2q, E2h	<input type="checkbox"/>	<input type="checkbox"/>
k. The proposed action may require the construction of new, or expansion of existing, wastewater treatment facilities.	D1a, D2d	<input type="checkbox"/>	<input type="checkbox"/>

I. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>
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4. Impact on groundwater
 The proposed action may result in new or additional use of ground water, or may have the potential to introduce contaminants to ground water or an aquifer. (See Part 1. D.2.a, D.2.c, D.2.d, D.2.p, D.2.q, D.2.t)
If "Yes", answer questions a - h. If "No", move on to Section 5.

NO YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may require new water supply wells, or create additional demand on supplies from existing water supply wells.	D2c	<input type="checkbox"/>	<input type="checkbox"/>
b. Water supply demand from the proposed action may exceed safe and sustainable withdrawal capacity rate of the local supply or aquifer. Cite Source: _____	D2c	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may allow or result in residential uses in areas without water and sewer services.	D1a, D2c	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may include or require wastewater discharged to groundwater.	D2d, E2l	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may result in the construction of water supply wells in locations where groundwater is, or is suspected to be, contaminated.	D2c, E1f, E1g, E1h	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may require the bulk storage of petroleum or chemical products over ground water or an aquifer.	D2p, E2l	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed action may involve the commercial application of pesticides within 100 feet of potable drinking water or irrigation sources.	E2h, D2q, E2l, D2c	<input type="checkbox"/>	<input type="checkbox"/>
h. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

5. Impact on Flooding
 The proposed action may result in development on lands subject to flooding. (See Part 1. E.2)
If "Yes", answer questions a - g. If "No", move on to Section 6.

NO YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in development in a designated floodway.	E2i	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in development within a 100 year floodplain.	E2j	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may result in development within a 500 year floodplain.	E2k	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may result in, or require, modification of existing drainage patterns.	D2b, D2e	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may change flood water flows that contribute to flooding.	D2b, E2i, E2j, E2k	<input type="checkbox"/>	<input type="checkbox"/>
f. If there is a dam located on the site of the proposed action, is the dam in need of repair, or upgrade?	E1e	<input type="checkbox"/>	<input type="checkbox"/>

g. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>
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6. Impacts on Air The proposed action may include a state regulated air emission source. <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES (See Part 1. D.2.f., D.2.h, D.2.g) <i>If "Yes", answer questions a - f. If "No", move on to Section 7.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. If the proposed action requires federal or state air emission permits, the action may also emit one or more greenhouse gases at or above the following levels: i. More than 1000 tons/year of carbon dioxide (CO ₂) ii. More than 3.5 tons/year of nitrous oxide (N ₂ O) iii. More than 1000 tons/year of carbon equivalent of perfluorocarbons (PFCs) iv. More than .045 tons/year of sulfur hexafluoride (SF ₆) v. More than 1000 tons/year of carbon dioxide equivalent of hydrochloroflourocarbons (HFCs) emissions vi. 43 tons/year or more of methane	D2g D2g D2g D2g D2g D2h	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
b. The proposed action may generate 10 tons/year or more of any one designated hazardous air pollutant, or 25 tons/year or more of any combination of such hazardous air pollutants.	D2g	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may require a state air registration, or may produce an emissions rate of total contaminants that may exceed 5 lbs. per hour, or may include a heat source capable of producing more than 10 million BTU's per hour.	D2f, D2g	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. The proposed action may reach 50% of any of the thresholds in "a" through "c", above.	D2g	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. The proposed action may result in the combustion or thermal treatment of more than 1 ton of refuse per hour.	D2s	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Other impacts: <u>None</u> _____		<input checked="" type="checkbox"/>	<input type="checkbox"/>

7. Impact on Plants and Animals The proposed action may result in a loss of flora or fauna. (See Part 1. E.2. m.-q.) <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES <i>If "Yes", answer questions a - j. If "No", move on to Section 8.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may cause reduction in population or loss of individuals of any threatened or endangered species, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2o	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in a reduction or degradation of any habitat used by any rare, threatened or endangered species, as listed by New York State or the federal government.	E2o	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may cause reduction in population, or loss of individuals, of any species of special concern or conservation need, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2p	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may result in a reduction or degradation of any habitat used by any species of special concern and conservation need, as listed by New York State or the Federal government.	E2p	<input type="checkbox"/>	<input type="checkbox"/>

e. The proposed action may diminish the capacity of a registered National Natural Landmark to support the biological community it was established to protect.	E3c	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may result in the removal of, or ground disturbance in, any portion of a designated significant natural community. Source: NYS DEC Mapper and applicant site plan.	E2n	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. The proposed action may substantially interfere with nesting/breeding, foraging, or over-wintering habitat for the predominant species that occupy or use the project site.	E2m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h. The proposed action requires the conversion of more than 10 acres of forest, grassland or any other regionally or locally important habitat. Habitat type & information source: NYS DEC Mapper and applicant site plan.	E1b	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i. Proposed action (commercial, industrial or recreational projects, only) involves use of herbicides or pesticides.	D2q	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j. Other impacts: <u>None.</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

8. Impact on Agricultural Resources			
The proposed action may impact agricultural resources. (See Part 1. E.3.a. and b.)		<input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES
<i>If "Yes", answer questions a - h. If "No", move on to Section 9.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may impact soil classified within soil group 1 through 4 of the NYS Land Classification System.	E2c, E3b	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may sever, cross or otherwise limit access to agricultural land (includes cropland, hayfields, pasture, vineyard, orchard, etc).	E1a, E1b	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may result in the excavation or compaction of the soil profile of active agricultural land.	E3b	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may irreversibly convert agricultural land to non-agricultural uses, either more than 2.5 acres if located in an Agricultural District, or more than 10 acres if not within an Agricultural District.	E1b, E3a	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may disrupt or prevent installation of an agricultural land management system.	E1 a, E1b	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may result, directly or indirectly, in increased development potential or pressure on farmland.	C2c, C3, D2c, D2d	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed project is not consistent with the adopted municipal Farmland Protection Plan.	C2c	<input type="checkbox"/>	<input type="checkbox"/>
h. Other impacts: _____		<input type="checkbox"/>	<input type="checkbox"/>

9. Impact on Aesthetic Resources The land use of the proposed action are obviously different from, or are in sharp contrast to, current land use patterns between the proposed project and a scenic or aesthetic resource. (Part 1. E.1.a, E.1.b, E.3.h.) <i>If "Yes", answer questions a - g. If "No", go to Section 10.</i>				<input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur		
a. Proposed action may be visible from any officially designated federal, state, or local scenic or aesthetic resource.	E3h	<input type="checkbox"/>	<input type="checkbox"/>		
b. The proposed action may result in the obstruction, elimination or significant screening of one or more officially designated scenic views.	E3h, C2b	<input type="checkbox"/>	<input type="checkbox"/>		
c. The proposed action may be visible from publicly accessible vantage points: i. Seasonally (e.g., screened by summer foliage, but visible during other seasons) ii. Year round	E3h	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>		
d. The situation or activity in which viewers are engaged while viewing the proposed action is: i. Routine travel by residents, including travel to and from work ii. Recreational or tourism based activities	E3h E2q, E1c	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>		
e. The proposed action may cause a diminishment of the public enjoyment and appreciation of the designated aesthetic resource.	E3h	<input type="checkbox"/>	<input type="checkbox"/>		
f. There are similar projects visible within the following distance of the proposed project: 0-1/2 mile 1/2 -3 mile 3-5 mile 5+ mile	D1a, E1a, D1f, D1g	<input type="checkbox"/>	<input type="checkbox"/>		
g. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>		

10. Impact on Historic and Archeological Resources The proposed action may occur in or adjacent to a historic or archaeological resource. (Part 1. E.3.e, f. and g.) <i>If "Yes", answer questions a - e. If "No", go to Section 11.</i>				<input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur		
a. The proposed action may occur wholly or partially within, or substantially contiguous to, any buildings, archaeological site or district which is listed on the National or State Register of Historical Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places.	E3e	<input type="checkbox"/>	<input type="checkbox"/>		
b. The proposed action may occur wholly or partially within, or substantially contiguous to, an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory.	E3f	<input type="checkbox"/>	<input type="checkbox"/>		
c. The proposed action may occur wholly or partially within, or substantially contiguous to, an archaeological site not included on the NY SHPO inventory. Source: _____	E3g	<input type="checkbox"/>	<input type="checkbox"/>		

d. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>
e. If any of the above (a-d) are answered "Moderate to large impact may occur", continue with the following questions to help support conclusions in Part 3:			
i. The proposed action may result in the destruction or alteration of all or part of the site or property.	E3e, E3g, E3f	<input type="checkbox"/>	<input type="checkbox"/>
ii. The proposed action may result in the alteration of the property's setting or integrity.	E3e, E3f, E3g, E1a, E1b	<input type="checkbox"/>	<input type="checkbox"/>
iii. The proposed action may result in the introduction of visual elements which are out of character with the site or property, or may alter its setting.	E3e, E3f, E3g, E3h, C2, C3	<input type="checkbox"/>	<input type="checkbox"/>

11. Impact on Open Space and Recreation The proposed action may result in a loss of recreational opportunities or a reduction of an open space resource as designated in any adopted municipal open space plan. <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES (See Part 1. C.2.c, E.1.c., E.2.q.) <i>If "Yes", answer questions a - e. If "No", go to Section 12.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in an impairment of natural functions, or "ecosystem services", provided by an undeveloped area, including but not limited to stormwater storage, nutrient cycling, wildlife habitat.	D2e, E1b, E2h, E2m, E2o, E2n, E2p	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in the loss of a current or future recreational resource.	C2a, E1c, C2c, E2q	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may eliminate open space or recreational resource in an area with few such resources.	C2a, C2c, E1c, E2q	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may result in loss of an area now used informally by the community as an open space resource.	C2c, E1c	<input type="checkbox"/>	<input type="checkbox"/>
e. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

12. Impact on Critical Environmental Areas The proposed action may be located within or adjacent to a critical environmental area (CEA). (See Part 1. E.3.d) <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES <i>If "Yes", answer questions a - c. If "No", go to Section 13.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in a reduction in the quantity of the resource or characteristic which was the basis for designation of the CEA.	E3d	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in a reduction in the quality of the resource or characteristic which was the basis for designation of the CEA.	E3d	<input type="checkbox"/>	<input type="checkbox"/>
c. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

13. Impact on Transportation
 The proposed action may result in a change to existing transportation systems. NO YES
 (See Part 1. D.2.j)
 If "Yes", answer questions a - f. If "No", go to Section 14.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Projected traffic increase may exceed capacity of existing road network.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in the construction of paved parking area for 500 or more vehicles.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action will degrade existing transit access.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action will degrade existing pedestrian or bicycle accommodations.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may alter the present pattern of movement of people or goods.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
f. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

14. Impact on Energy
 The proposed action may cause an increase in the use of any form of energy. NO YES
 (See Part 1. D.2.k)
 If "Yes", answer questions a - e. If "No", go to Section 15.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action will require a new, or an upgrade to an existing, substation.	D2k	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. The proposed action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two-family residences or to serve a commercial or industrial use.	D1f, D1q, D2k	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may utilize more than 2,500 MWhrs per year of electricity.	D2k	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may involve heating and/or cooling of more than 100,000 square feet of building area when completed.	D1g	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Other Impacts: <u>None.</u> _____ _____		<input checked="" type="checkbox"/>	<input type="checkbox"/>

15. Impact on Noise, Odor, and Light
 The proposed action may result in an increase in noise, odors, or outdoor lighting. NO YES
 (See Part 1. D.2.m., n., and o.)
 If "Yes", answer questions a - f. If "No", go to Section 16.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may produce sound above noise levels established by local regulation.	D2m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in blasting within 1,500 feet of any residence, hospital, school, licensed day care center, or nursing home.	D2m, E1d	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may result in routine odors for more than one hour per day.	D2o	<input type="checkbox"/>	<input checked="" type="checkbox"/>

d. The proposed action may result in light shining onto adjoining properties.	D2n	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may result in lighting creating sky-glow brighter than existing area conditions.	D2n, E1a	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Other impacts: <u>None.</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

16. Impact on Human Health			
The proposed action may have an impact on human health from exposure to new or existing sources of contaminants. (See Part 1.D.2.q., E.1. d. f. g. and h.)		<input type="checkbox"/> NO	<input checked="" type="checkbox"/> YES
<i>If "Yes", answer questions a - m. If "No", go to Section 17.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action is located within 1500 feet of a school, hospital, licensed day care center, group home, nursing home or retirement community.	E1d	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. The site of the proposed action is currently undergoing remediation.	E1g, E1h	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. There is a completed emergency spill remediation, or a completed environmental site remediation on, or adjacent to, the site of the proposed action.	E1g, E1h	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. The site of the action is subject to an institutional control limiting the use of the property (e.g., easement or deed restriction).	E1g, E1h	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may affect institutional control measures that were put in place to ensure that the site remains protective of the environment and human health.	E1g, E1h	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. The proposed action has adequate control measures in place to ensure that future generation, treatment and/or disposal of hazardous wastes will be protective of the environment and human health.	D2t	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. The proposed action involves construction or modification of a solid waste management facility.	D2q, E1f	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h. The proposed action may result in the unearthing of solid or hazardous waste.	D2q, E1f	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i. The proposed action may result in an increase in the rate of disposal, or processing, of solid waste.	D2r, D2s	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j. The proposed action may result in excavation or other disturbance within 2000 feet of a site used for the disposal of solid or hazardous waste.	E1f, E1g E1h	<input checked="" type="checkbox"/>	<input type="checkbox"/>
k. The proposed action may result in the migration of explosive gases from a landfill site to adjacent off site structures.	E1f, E1g	<input checked="" type="checkbox"/>	<input type="checkbox"/>
l. The proposed action may result in the release of contaminated leachate from the project site.	D2s, E1f, D2r	<input checked="" type="checkbox"/>	<input type="checkbox"/>
m. Other impacts: <u>None.</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

17. Consistency with Community Plans

The proposed action is not consistent with adopted land use plans.
(See Part 1. C.1, C.2. and C.3.)

NO

YES

If "Yes", answer questions a - h. If "No", go to Section 18.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action's land use components may be different from, or in sharp contrast to, current surrounding land use pattern(s).	C2, C3, D1a E1a, E1b	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action will cause the permanent population of the city, town or village in which the project is located to grow by more than 5%.	C2	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action is inconsistent with local land use plans or zoning regulations.	C2, C2, C3	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action is inconsistent with any County plans, or other regional land use plans.	C2, C2	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may cause a change in the density of development that is not supported by existing infrastructure or is distant from existing infrastructure.	C3, D1c, D1d, D1f, D1d, E1b	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action is located in an area characterized by low density development that will require new or expanded public infrastructure.	C4, D2c, D2d D2j	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed action may induce secondary development impacts (e.g., residential or commercial development not included in the proposed action)	C2a	<input type="checkbox"/>	<input type="checkbox"/>
h. Other: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

18. Consistency with Community Character

The proposed project is inconsistent with the existing community character.
(See Part 1. C.2, C.3, D.2, E.3)

NO

YES

If "Yes", answer questions a - g. If "No", proceed to Part 3.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may replace or eliminate existing facilities, structures, or areas of historic importance to the community.	E3e, E3f, E3g	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may create a demand for additional community services (e.g. schools, police and fire)	C4	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may displace affordable or low-income housing in an area where there is a shortage of such housing.	C2, C3, D1f D1g, E1a	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may interfere with the use or enjoyment of officially recognized or designated public resources.	C2, E3	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action is inconsistent with the predominant architectural scale and character.	C2, C3	<input type="checkbox"/>	<input type="checkbox"/>
f. Proposed action is inconsistent with the character of the existing natural landscape.	C2, C3 E1a, E1b E2g, E2h	<input type="checkbox"/>	<input type="checkbox"/>
g. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

Full Environmental Assessment Form
Part 3 - Evaluation of the Magnitude and Importance of Project Impacts
and
Determination of Significance

Part 3 provides the reasons in support of the determination of significance. The lead agency must complete Part 3 for every question in Part 2 where the impact has been identified as potentially moderate to large or where there is a need to explain why a particular element of the proposed action will not, or may, result in a significant adverse environmental impact.

Based on the analysis in Part 3, the lead agency must decide whether to require an environmental impact statement to further assess the proposed action or whether available information is sufficient for the lead agency to conclude that the proposed action will not have a significant adverse environmental impact. By completing the certification on the next page, the lead agency can complete its determination of significance.

Reasons Supporting This Determination:

To complete this section:

- Identify the impact based on the Part 2 responses and describe its magnitude. Magnitude considers factors such as severity, size or extent of an impact.
- Assess the importance of the impact. Importance relates to the geographic scope, duration, probability of the impact occurring, number of people affected by the impact and any additional environmental consequences if the impact were to occur.
- The assessment should take into consideration any design element or project changes.
- Repeat this process for each Part 2 question where the impact has been identified as potentially moderate to large or where there is a need to explain why a particular element of the proposed action will not, or may, result in a significant adverse environmental impact.
- Provide the reason(s) why the impact may, or will not, result in a significant adverse environmental impact
- For Conditional Negative Declarations identify the specific condition(s) imposed that will modify the proposed action so that no significant adverse environmental impacts will result.
- Attach additional sheets, as needed.

Determination of Significance - Type 1 and Unlisted Actions

SEQR Status: Type 1 Unlisted

Identify portions of EAF completed for this Project: Part 1 Part 2 Part 3

Upon review of the information recorded on this EAF, as noted, plus this additional support information

and considering both the magnitude and importance of each identified potential impact, it is the conclusion of the _____ as lead agency that:

A. This project will result in no significant adverse impacts on the environment, and, therefore, an environmental impact statement need not be prepared. Accordingly, this negative declaration is issued.

B. Although this project could have a significant adverse impact on the environment, that impact will be avoided or substantially mitigated because of the following conditions which will be required by the lead agency:

6 IMPACTS ON AIR MITIGATED BY NYS DEC ISSUANCE OF AIR EMISSION PERMIT AND PERIODIC 3RD PARTY MONITORING.

* 15 IMPACT ON NOISE, ODOR AND LIGHT MITIGATED BY BUILDING ENCLOSURE, SCRUBBING AND BEING UNDER NEGATIVE AIR PRESSURE AND BIO FILTERS

NIG HUMAN HEALTH - HAZARDOUS WASTE NOT RECEIVED NOR PROCESSED AT SITE IN ACCORD WITH SOLID WASTE PERMIT.

There will, therefore, be no significant adverse impacts from the project as conditioned, and, therefore, this conditioned negative declaration is issued. A conditioned negative declaration may be used only for UNLISTED actions (see 6 NYCRR 617.7(d)).

C. This Project may result in one or more significant adverse impacts on the environment, and an environmental impact statement must be prepared to further assess the impact(s) and possible mitigation and to explore alternatives to avoid or reduce those impacts. Accordingly, this positive declaration is issued.

Name of Action: SARATOGA BIO CHAR SOLUTIONS

Name of Lead Agency: TOWN OF MOREAU PLANNING BOARD

Name of Responsible Officer in Lead Agency: PETER JENSEN

Title of Responsible Officer: CHAIR PERSON

Signature of Responsible Officer in Lead Agency:

Date:

Signature of Preparer (if different from Responsible Officer)

Date: 3/07/2020

For Further Information:

Contact Person: JAMES MARTIN, ZONING ADMINISTRATOR

Address: 357 REYNOLDS ROAD, MOREAU, N.Y. 12828

Telephone Number: 518/792-4762

E-mail: zoningadministrator@townofmoreau.org.

For Type 1 Actions and Conditioned Negative Declarations, a copy of this Notice is sent to:

Chief Executive Officer of the political subdivision in which the action will be principally located (e.g., Town / City / Village of)

Other involved agencies (if any)

Applicant (if any)

Environmental Notice Bulletin: <http://www.dec.ny.gov/enb/enb.html>

**ENGINEERING REPORT
APPENDIX C**

OPRHP CORRESPONDENCE



**Parks, Recreation,
and Historic Preservation**

KATHY HOCHUL
Governor

ERIK KULLESEID
Commissioner

November 10, 2021

Timothy Clark
Geologist
Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, NY 12110

Re: DEC
Saratoga Biochar Solutions, LLC Carbon Manufacturing Facility
Town of Moreau, Saratoga County, NY
21PR06254

Dear Timothy Clark:

Thank you for requesting the comments of the Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the submitted materials in accordance with the New York State Historic Preservation Act of 1980 (section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8) and its implementing regulations (6NYCRR Part 617).

OPRHP has reviewed the prior project review for the Moreau Industrial Park (1989-2002). The OPRHP letter dated August 11, 2000 states that it is the opinion of OPRHP that no further work was warranted, and the Industrial Park project (95PR01690) can proceed to construction. I am hereby rescinding my recommendation for a Phase IA/IB Archaeological Survey.

It is the opinion of the OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project.

If you have any questions, I can be reached at Jessica.Schreyer@parks.ny.gov.

Sincerely,

Jessica Schreyer
Scientist Archaeology



Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189

618-237-8643

August 11, 2000

Jay I. Kalter
Vice President
Moreau Park, Inc.
200 Erie Boulevard West, B-1
Syracuse, New York 13202

Dear Mr. Kalter:

Re: SEORA
Moreau Industrial Park
Moreau, Saratoga County
95PR1690

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the end-of-field letter summarizing the archeological investigations for the Moreau Industrial Park project in accordance with the New York State Parks, Recreation and Historic Preservation Law, Section 14.09.

Based upon this review, the OPRHP approves the end-of-field letter. No further archeological fieldwork is warranted and in the opinion of the OPRHP the project can proceed to construction. This determination is based upon the understanding that a final report of the archeological work will be submitted to the OPRHP no later than August, 2001, and that subsequent to that date arrangements will be made for the appropriate curation of the archeological collections from the sites.

When responding please be sure to refer to the OPRHP project review (PR) number noted above. If you have any questions, please feel free to call me at (518) 237-8643 ext. 3255.

Sincerely

Robert D. Kuhn
Assistant Director

RDK:bsd

cc: Harry Gutheil, Jr.
Edward Curtin



New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643

January 7, 2002

Jon A. Kelley
Senior Vice President
Saratoga Economic Development Corp.
28 Clinton Street
Saratoga Springs, New York 12866-2110

Dear Mr. Kelley:

Re: SEORA
Moreau Industrial Park
Moreau, Saratoga County
95PR1690

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have received the Final Report for the Moreau Industrial Park Archaeological Data Recovery Project from Consulting Archaeologist Edward V. Curtin and reviewed the report in accordance with the New York State Parks, Recreation and Historic Preservation Law, Section 14.09.

Based upon this review, the OPRHP accepts and approves the final report. This work represents a major contribution to the archaeology of the upper Hudson region. The consultant should be commended for the quality of the work. Moreau Park, Inc., the Saratoga Economic Development Corporation, and the Town of Moreau also deserve recognition for their commitment and support for this project. OPRHP will be distributing the additional copies of the report to the New York State Library and other college and university libraries across the state so that this research will be available to the general public, archaeologists, and other researchers.

OPRHP concurs with the recommendations of the report. It would be unfortunate if this important archaeological investigation were allowed to go unnoticed and we certainly support efforts to disseminate this information to the public. Local presentations of the project results within the school system or in conjunction with a town or local historical society event would be highly recommended. In addition, the artifact collection should be professionally curated at an appropriate museum or institution. OPRHP would recommend either the New York State Museum or Skidmore College.

If you have any questions, please feel free to call me at (518) 237-8643 ext. 3255.

Sincerely,

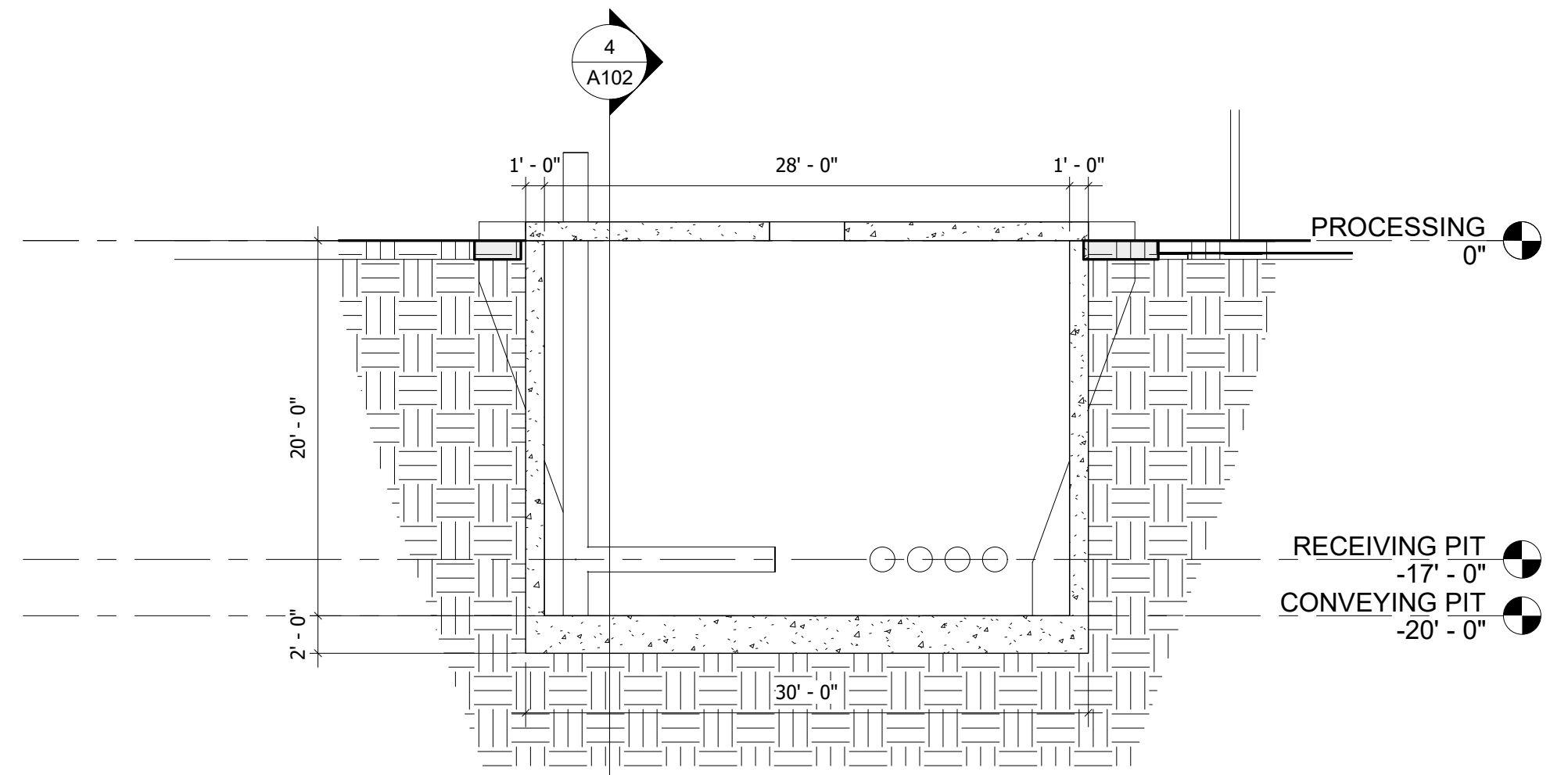
Robert D. Kuhn
Assistant Director

RDK:bsd

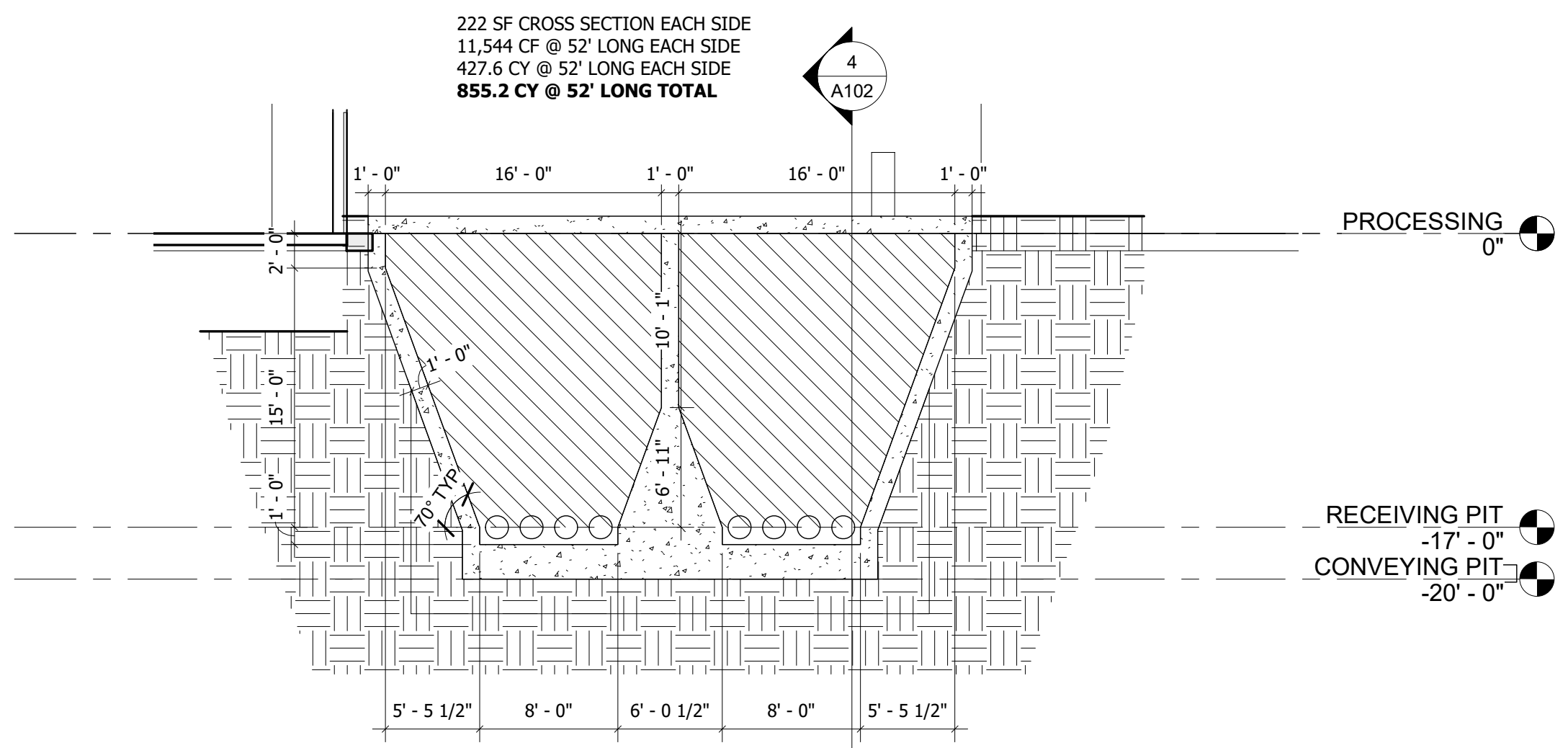
cc: E. Curtin
J. Kalter, Moreau Park
H. Gutheil, Town of Moreau

**ENGINEERING REPORT
APPENDIX D**

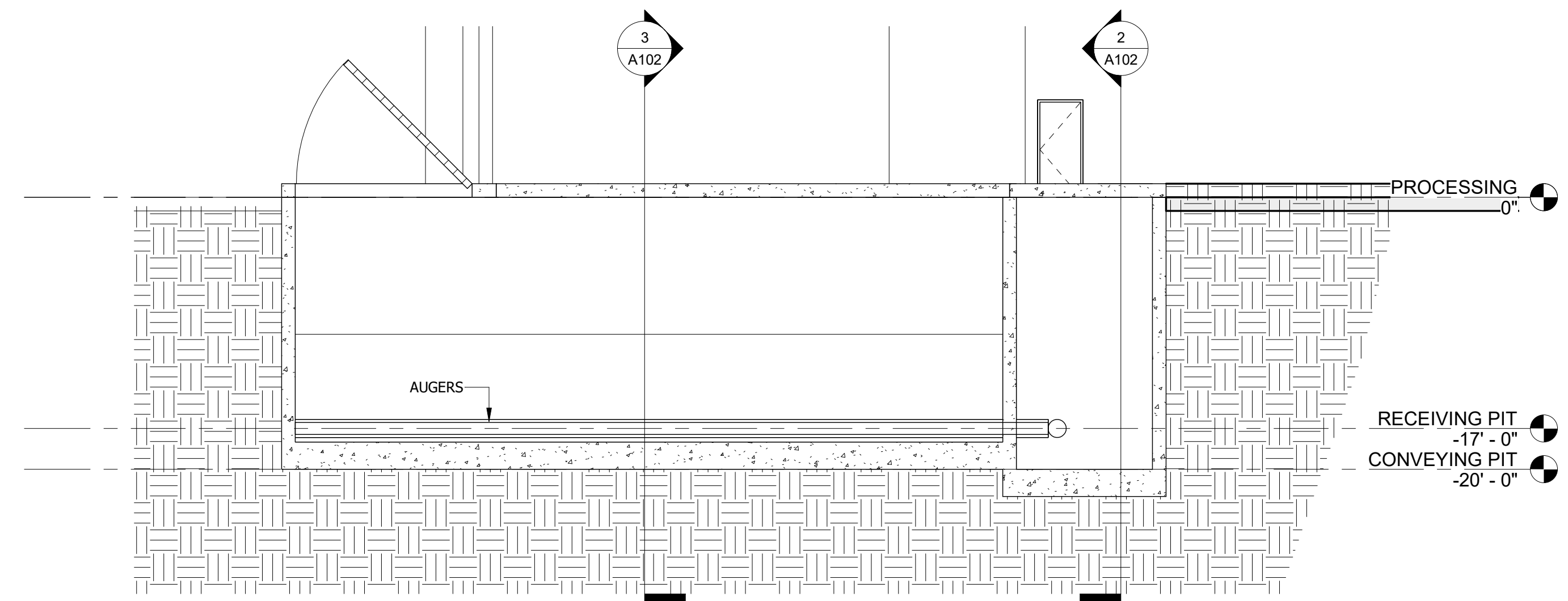
EQUIPMENT DRAWINGS AND SPECIFICATIONS



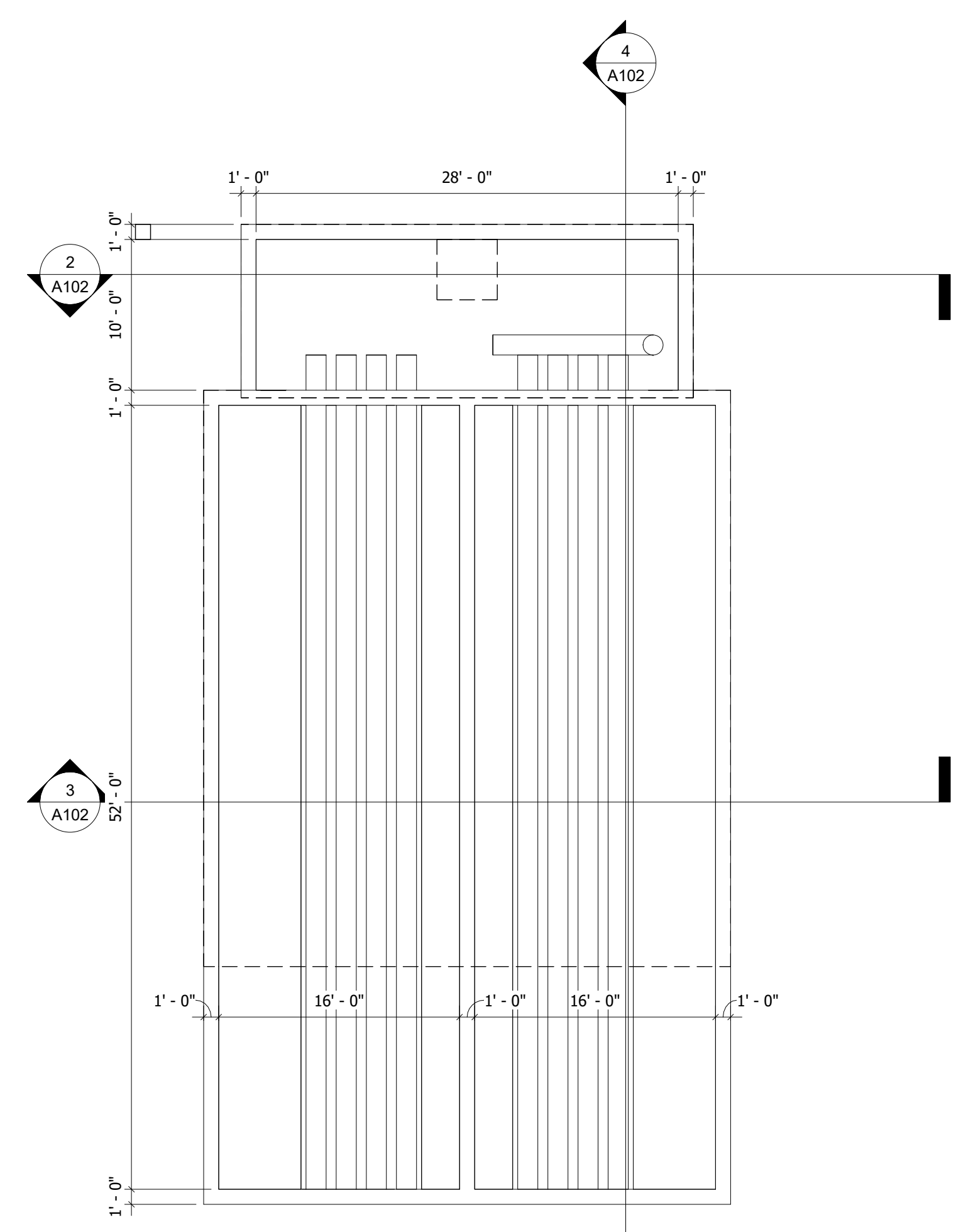
2 CROSS SECTION @ DEEP PIT
1/8" = 1'-0"



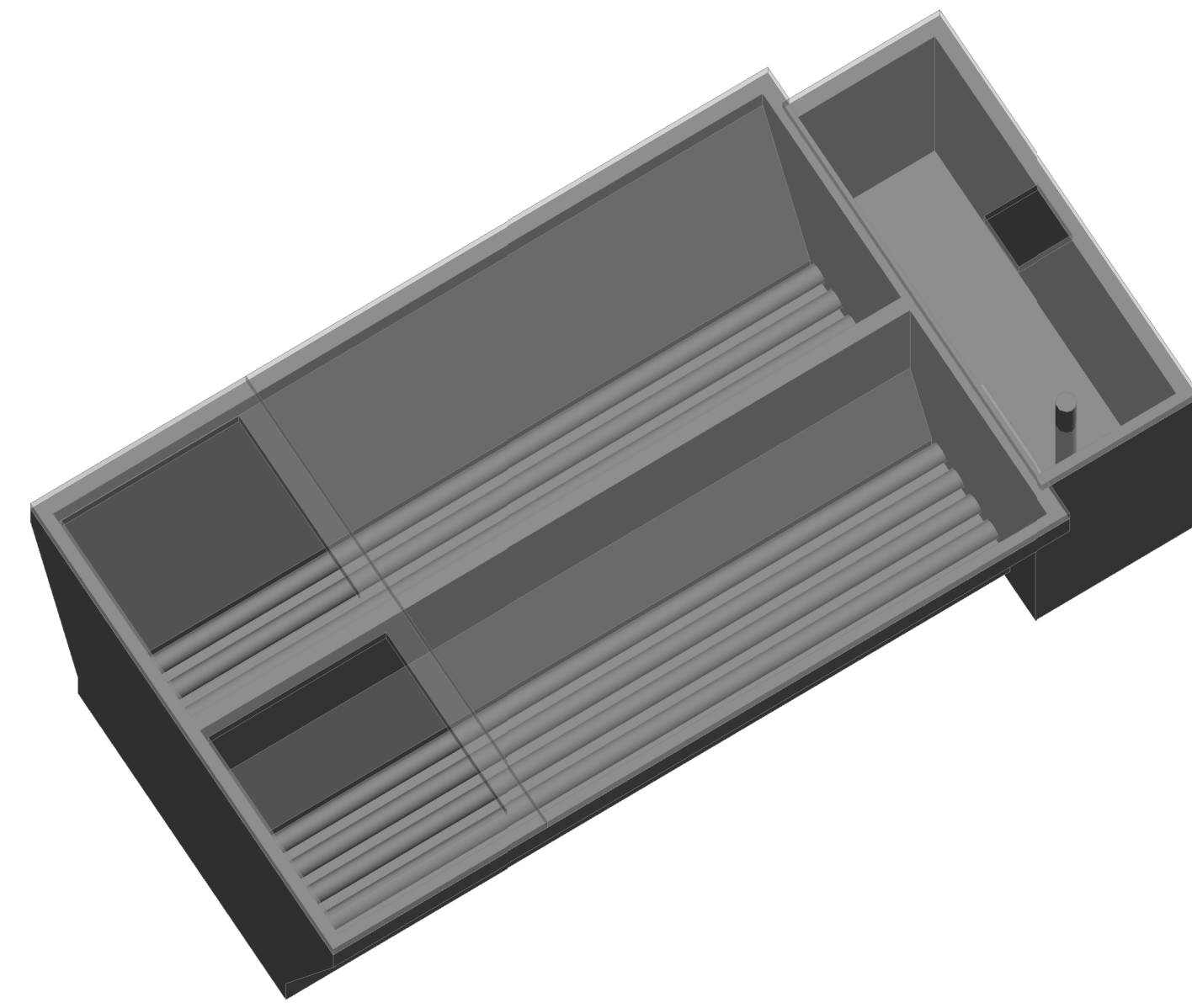
3 CROSS SECTION @ SHALLOW PIT
1/8" = 1'-0"



4 LONGITUDINAL SECTION @ PITS
1/8" = 1'-0"



1 PIT PLAN
1/8" = 1'-0"



5 PIT AXO

SEAL

PROJECT TITLE

**SARATOGA
BIOCHAR
SOLUTIONS**

2 Electric Drive
South Glens Falls, NY 12803

SHEET
TITLE

PIT DETAILS

CONSULTANT

DRAWN
BY
CMS

CHECKED
BY
GLM

DATE

3/30/22

PROJECT NO.

20-020

REVISIONS

NO.	DESCRIPTION	DATE

PRINTED 3/30/2022 11:15:23 AM
ON:



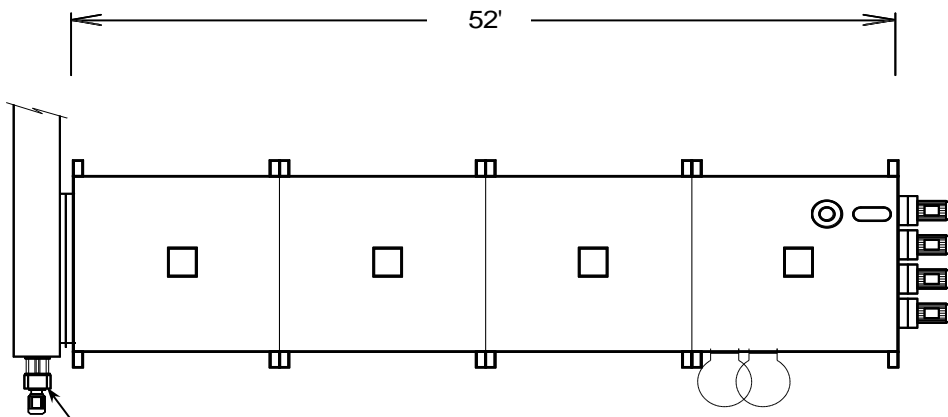
3tarchitects.com

283 RIVER STREET • TROY, NY • 12180
PH 518 618 0900 FX 518 618 0901

SHEET
NO.

A102

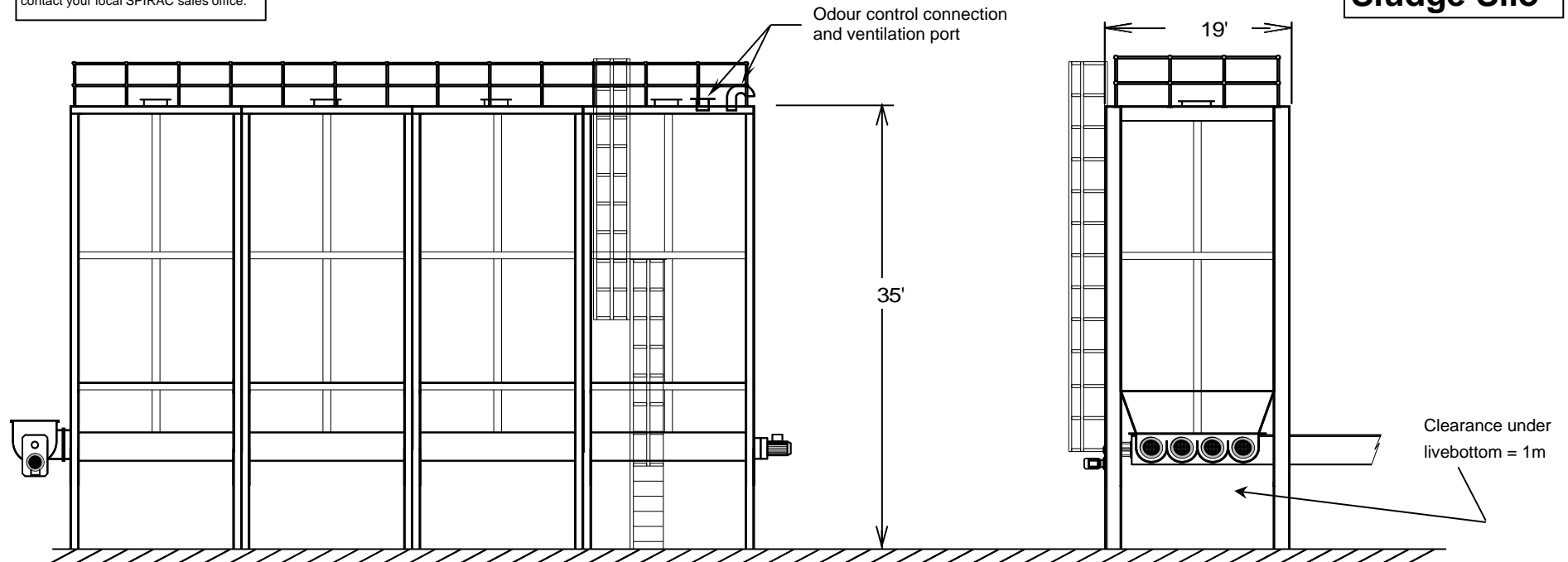
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Note:
Drawing is diagrammatic only and not to scale. For scaled, detailed drawings contact your local SPIRAC sales office.

SPIRAC Silo System Technical Details		
Effective Volume (m3)	659	Paint Spec - Interior
Total Volume (m3)	659	Sandblast Class 3.0, white metal 38-50 microns
Outloading Cap (m3/hr)	20	1st coat - 2-pack epoxy mastic DFT 175 microns
Dry Weight (T)	69.2	2nd coat - 2-pack epoxy mastic DFT 175 microns
Operating Weight (T)	729	Colour - white
Qty Legs/Load Ea (T)	16 / 45.5	
Sludge Maximum DS	20%	Paint Spec - Exterior
Sludge Density (T/m3)	1.0	Sandblast Cl2.5, near white metal 38-50 microns
Conveyor Drive Motors	4x 4 kW	1st - epoxy zinc phosphate primer, 2 pack, 75-100
Drive Manufacturer	Bonfiglioli	2nd coat-2-pack epoxy high build DFT 100-150
Drive Model	309 L4 D112M4	3rd coat-2-pack polyurethane enamel DFT 75-125
RPM	2.1	4th coat-2-pack polyurethane enamel DFT 75-125
Knifegates	None	Colour - G66 Environmental Green

SPIRAC Sludge Silo



Model:	Silo-659-1-LB41-U500-H
General Arrangement Drawing	
Scale: NTS	
	v1.29

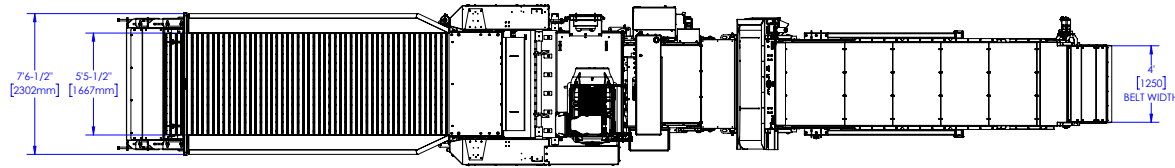
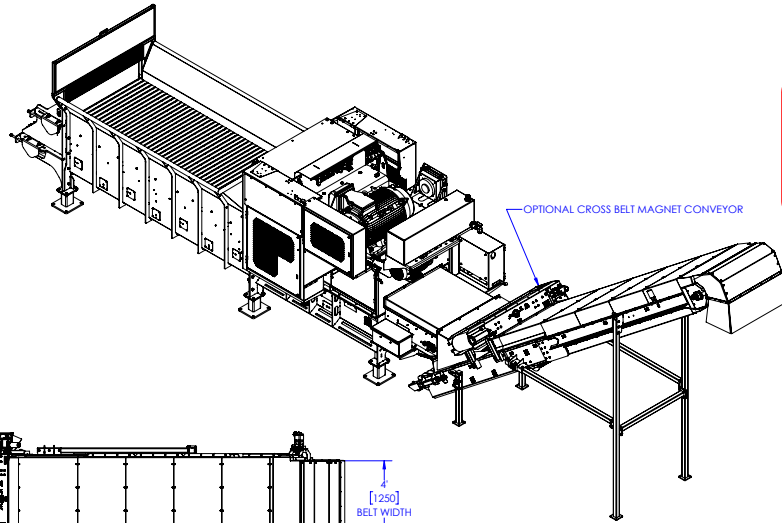


SPIRAC Inc.
75 Jackson Street, Suite 300
Newnan
Georgia 30263 USA

Project:	Element Carbon Hudson	
Customer:		
Date:	30-Mar-21	Item No. 2
Quotation No.	99-2109 R	

REVISIONS			
REV.	BY	DESCRIPTION	DATE
01	DB	INITIAL RELEASE	11/17/2020

ROTOCHOPPER ROTOCHOPPER Inc.
 Signed: _____
 Date: _____
 Customer Approval



GENERAL NOTES:

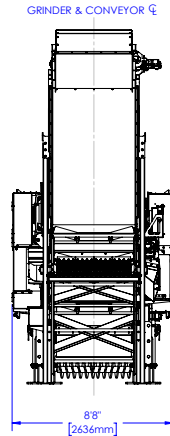
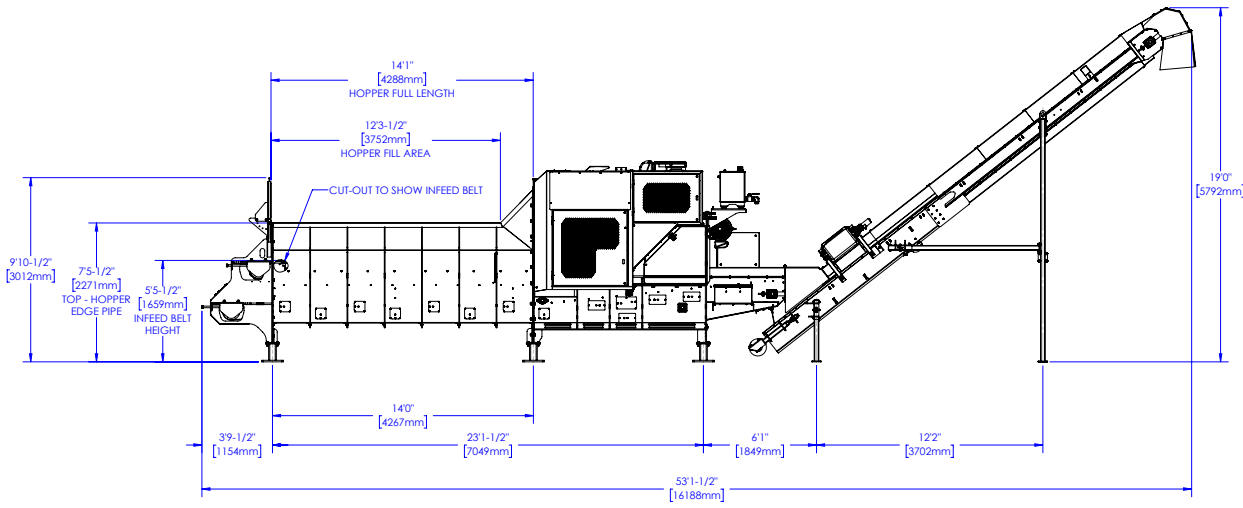
1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS ON THE DRAWING BEFORE STARTING WORK AND SHALL NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY DISCREPANCIES.
2. DO NOT SCALE THE DRAWING FOR DIMENSIONS, SIZES OR LOCATIONS

FOUNDATION NOTES:

1. ROTOCHOPPER INC. ASSUMES NO RESPONSIBILITY OR LIABILITY FOR FOUNDATION, FLOOR SLAB DESIGN OR CONSTRUCTION.
2. IT IS THE RESPONSIBILITY OF THE OWNER TO VERIFY THE FOUNDATION ANCHORAGE REQUIREMENTS.
3. FOUNDATIONS MUST BE DESIGNED FOR THE APPLICABLE REACTIONS AS THEY APPLY TO EACH SPECIFIC LOCATION AND MUST BE ABLE TO RESIST ALL CRITICAL LOAD COMBINATIONS AS LISTED IN THE TABLE SUPPLIED BY THE APPROVING ENGINEER.
4. THE REQUIRED LENGTH OF EMBEDMENT OF THE ANCHORS IN THE CONCRETE IS THE RESPONSIBILITY OF THE FOUNDATION DESIGNER.
5. BASE PLATES FOR MACHINE HAVE BEEN DESIGNED FOR 3/4\"/>

STRUCTURAL STEEL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION 13th EDITION, AND THE 2010 CBC.
2. STRUCTURAL BEAMS SHALL BE ASTM A-992.50KSI
3. STRUCTURAL STEEL EXCEPT BEAMS, PIPES AND HSS SHAPES SHALL BE ASTM A36.
4. HSS SHAPES (STEEL TUBES) SHALL BE ASTM A500, GRADE B.
5. PIPE SHALL BE ASTM A53, GRADE B, TYPE E.

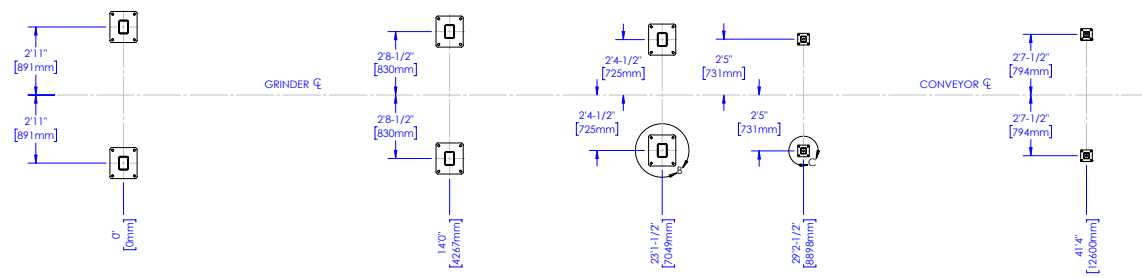


ROTOCHOPPER Inc.	TITLE: EC366 Stationary Electric Grinder, Straight Truck Loading Conveyor
<small>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF ROTOCHOPPER INC. AND IS TO BE USED ONLY FOR THE PROJECT AND LOCATION SPECIFICALLY IDENTIFIED HEREIN. ALL INFORMATION IS SUBJECT TO CHANGE WITHOUT NOTICE.</small>	MACHINE: EC366 APPROXIMATE WEIGHT: N/A DRAWN: DB 11/17/2020 SIZE: D SCALE: 1:40 SHEET 1 OF 2

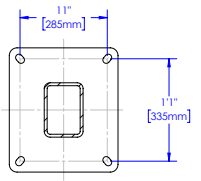
ROTOCHOPPER ROTOCHOPPER Inc.

Signed: _____
 Date: _____

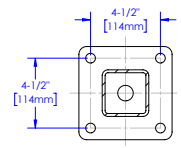
Customer Approval



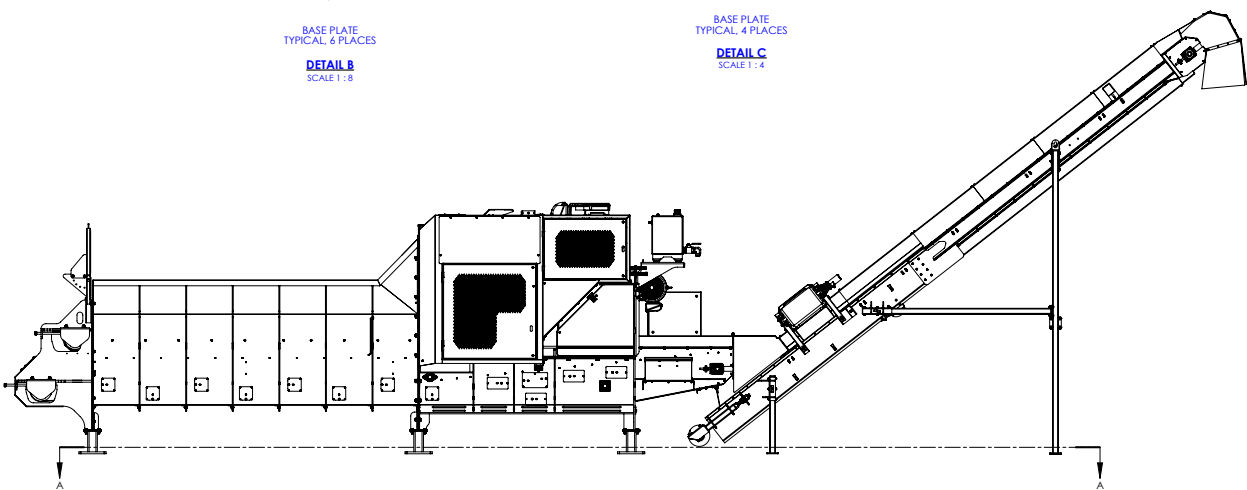
SECTION A-A
ANCHOR BOLT LOCATION PLAN
 -DIMENSIONS ARE FOR REFERENCE ONLY-
 DO NOT PRE-PLACE ANCHORS



BASE PLATE
 TYPICAL, 6 PLACES
DETAIL B
 SCALE 1 : 8



BASE PLATE
 TYPICAL, 4 PLACES
DETAIL C
 SCALE 1 : 4



GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS ON THE DRAWING BEFORE STARTING WORK AND SHALL NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY DISCREPANCIES.
2. DO NOT SCALE THE DRAWING FOR DIMENSIONS, SIZES OR LOCATIONS

FOUNDATION NOTES:

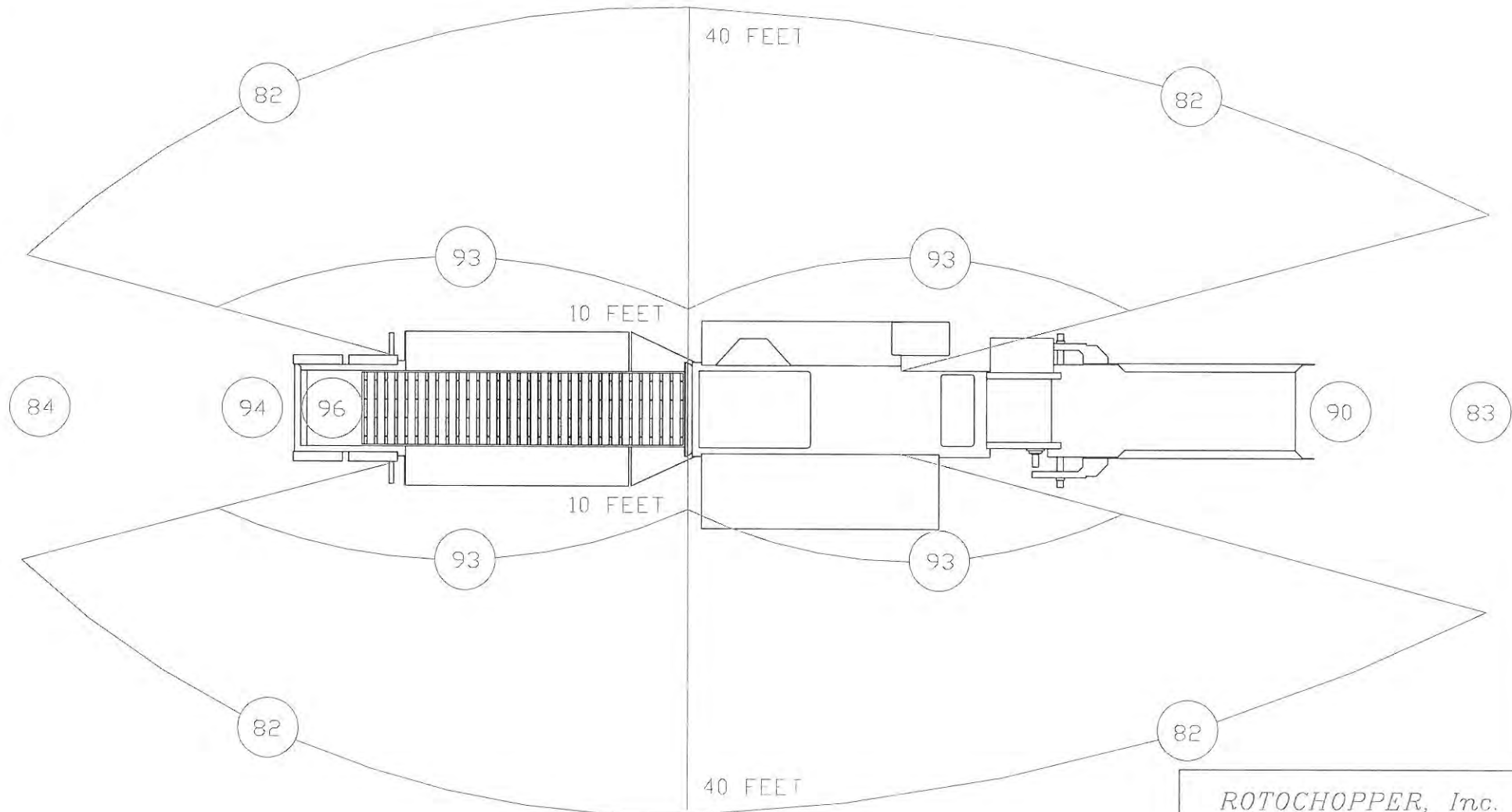
1. ROTOCHOPPER INC. ASSUMES NO RESPONSIBILITY OR LIABILITY FOR FOUNDATION, FLOOR SLAB DESIGN OR CONSTRUCTION.
2. IT IS THE RESPONSIBILITY OF THE OWNER TO VERIFY THE FOUNDATION ANCHORAGE REQUIREMENTS.
3. FOUNDATIONS MUST BE DESIGNED FOR THE APPLICABLE REACTIONS AS THEY APPLY TO EACH SPECIFIC LOCATION AND MUST BE ABLE TO RESIST ALL CRITICAL LOAD COMBINATIONS AS LISTED IN THE TABLE SUPPLIED BY THE APPROVING ENGINEER.
4. THE REQUIRED LENGTH OF EMBEDMENT OF THE ANCHORS IN THE CONCRETE IS THE RESPONSIBILITY OF THE FOUNDATION DESIGNER.
5. BASE PLATES FOR MACHINE HAVE BEEN DESIGNED FOR 3/4"Ø ASTM A307 OR EQUAL ANCHORS. THIS CONFORMS TO ROTOCHOPPERS DESIGN ASSUMPTIONS BASED ON THE ALLOWABLE STRESSES GIVEN IN THE AISC MANUAL OF STEEL CONSTRUCTION.
6. BASE PLATES FOR CONVEYORS HAVE BEEN DESIGNED FOR 1/2"Ø ASTM A307 OR EQUAL ANCHORS. THIS CONFORMS TO ROTOCHOPPERS DESIGN ASSUMPTIONS BASED ON THE ALLOWABLE STRESSES GIVEN IN THE AISC MANUAL OF STEEL CONSTRUCTION.
7. CONCRETE / GROUT ARE TO BE FURNISHED BY OTHERS.
8. FOUNDATION MUST BE LEVEL, SQUARE AND SMOOTH. ANCHOR BOLTS MUST BE ACCURATELY PLACED AS SHOWN.

STRUCTURAL STEEL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION 13th EDITION, AND THE 2010 CBC.
2. STRUCTURAL BEAMS SHALL BE ASTM A-992.50KSI
3. STRUCTURAL STEEL EXCEPT BEAMS, PIPES AND HSS SHAPES SHALL BE ASTM A36.
4. HSS SHAPES (STEEL TUBES) SHALL BE ASTM A500, GRADE B.
5. PIPE SHALL BE ASTM A53, GRADE B, TYPE E.

ROTOCHOPPER, Inc. HAS TAKEN THESE SOUND LEVEL READINGS UNDER THE CONDITIONS LISTED BELOW. PRODUCT MIX, BUILDING LOCATIONS, WEATHER CONDITIONS AND EQUIPMENT MAINTENANCE MAY AFFECT THE SOUND LEVELS.

REV	REVISION DESCRIPTION	DATE
A	NEW METER READINGS	11/27/01
B		
C		



CONDITIONS:

OUTSIDE CALM DAY, 65°F
 BUILDINGS ON LEFT SIDE 25 YDS.
 FULL THROTTLE, GRINDING PALLET WASTE

SOUND LEVEL METER:

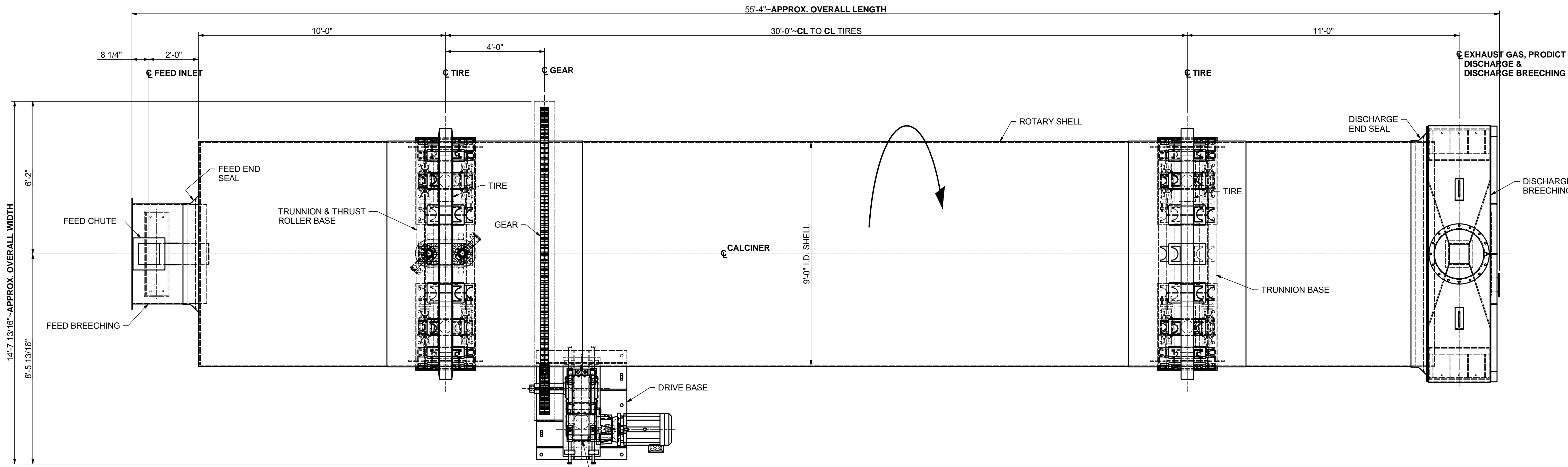
RadioShack MODEL: 33-2055
 WEIGHTING SCALE: A-CURVE FREQUENCY
 RESPONSE: SLOW (0.5 SECOND INTERVAL)

ROTOCHOPPER, Inc.

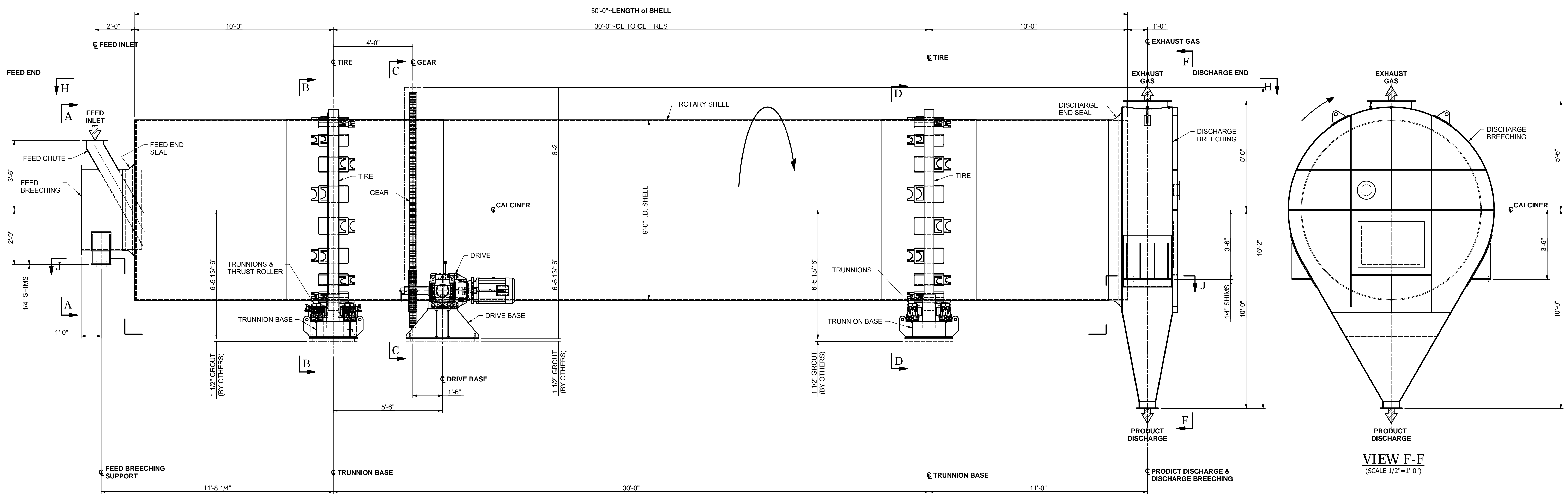
DRAWN BY: BW
 DATE: 4/25/01

TITLE: SOUND LEVEL CHART
 EC166 300 BUILDINGS

SCALE: NONE
 DRAWING NO.: DEC_EC166 BLDGS



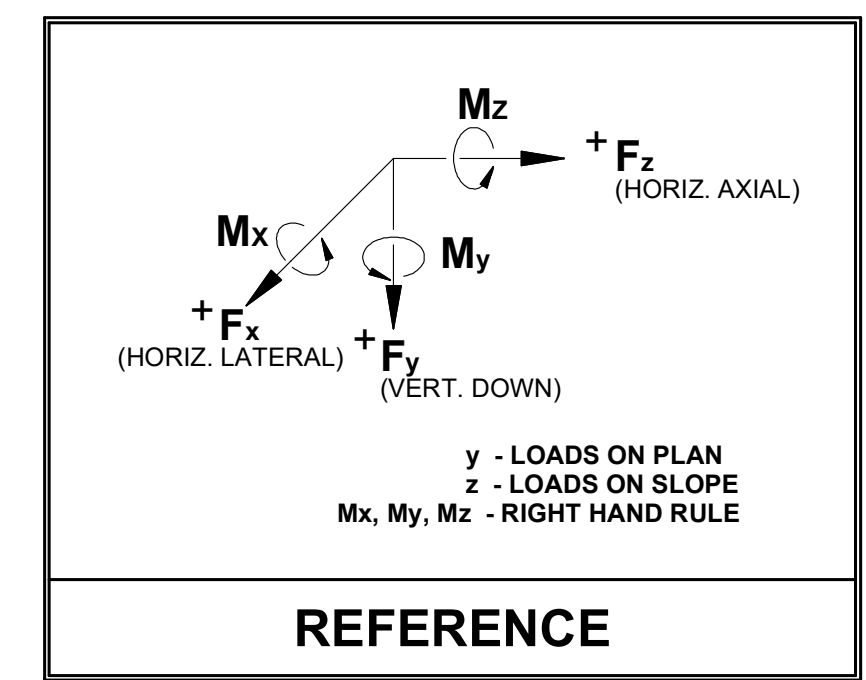
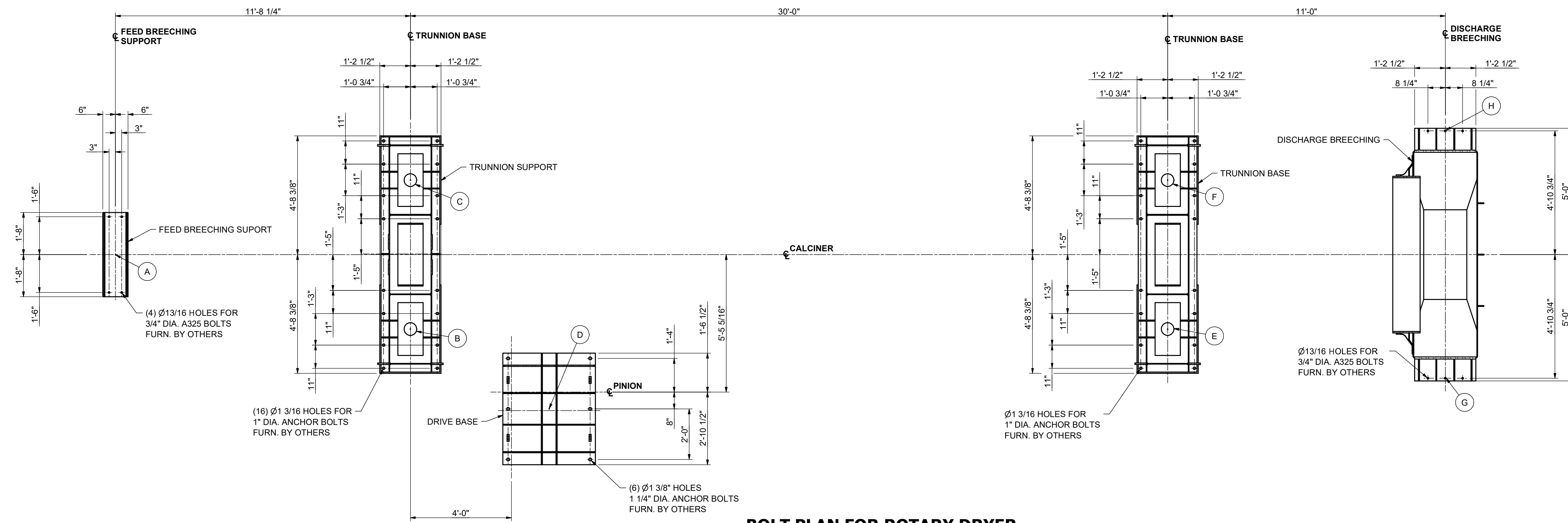
PLAN VIEW H-H
(SCALE 1/2"=1'-0")



ELEVATION VIEW of ROTARY DRYER
 DRYER SHOWN IN HORIZONTAL POSITION~ DRYER TO BE MOUNTED
 ON .XXX DEGREE SLOPE DOWNWARD TOWARD DISCHARGE END
 (SCALE: 1/2"=1'-0")

- NOTES:**
- 1.) ALL DIMENSIONS ARE PRELIMINARY AND SUBJECT TO CHANGE UNTIL DRAWINGS ARE "ISSUED FOR CONSTRUCTION".
 - 2.) LOCATION, SUPPLY, DESIGN & INSTALLATION OF ALL CONCRETE, STRUCTURAL STEEL, EQUIPMENT SUPPORTS, ACCESS WALKWAYS, PLATFORMS, LADDERS ETC. ARE BY OTHERS, NOT BY HPTP.
 - 3.) EQUIPMENT SUPPORTS NOT SHOWN.
 - 4.) TEMPORARY PROPPING, CRIBBING, BRACING ETC. WHERE REQUIRED FOR STABILITY OF THE STRUCTURES & EQUIPMENT DURING ERECTION IS BY OTHERS, NOT BY HPTP.
 - 5.) ALL EQUIPMENT RESTING ON CONCRETE TO BE FULLY GROUTED UNDER BASE PLATES. ALL EQUIPMENT RESTING ON STRUCTURAL STEEL TO BE FULLY SUPPORTED WITH STEEL SHIMS FOR FIELD ADJUSTMENT.
 - 6.) UNIT TO BE PLACED ON SLOPE TOWARD DISCHARGE END.
 - 7.) WORK THIS DWG. WITH DWG. 21-HSTL-74-1023-00-2 & 21-HSTL-74-1023-00-3.

A	DMS		9/21/21	ISSUED FOR REVIEW	
REV.	MADE	CHKD	APPR.	DATE	DESCRIPTION
					ROTARY DRYER
					G.A. of ROTARY DRYER, ELEV, PLAN, SECTIONS & ANCHOR BOLT PLAN
					ELEMENT CARBON HUDSON VOLVENTS
					SCALE AS NOTED
					SHEET 1 OF 3
					SHEET SIZE 30 x 42 (inches)
HEYL PATTERSON THERMAL PROCESSING				DWG. NO.	REV.
				7031-0101	A

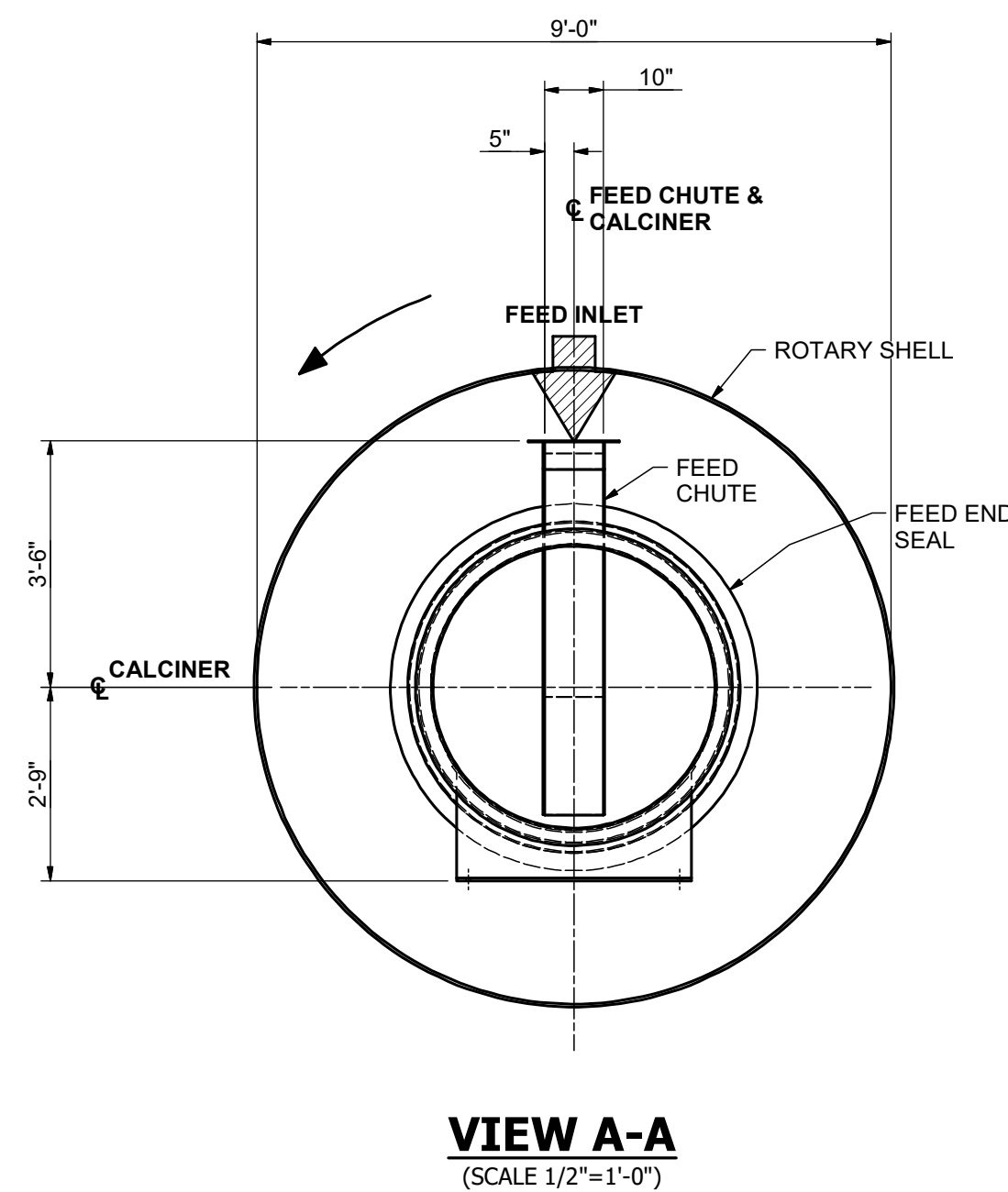


BOLT PLAN FOR ROTARY DRYER
SECTION J-J
 (SCALE: 1/2"=1'-0")

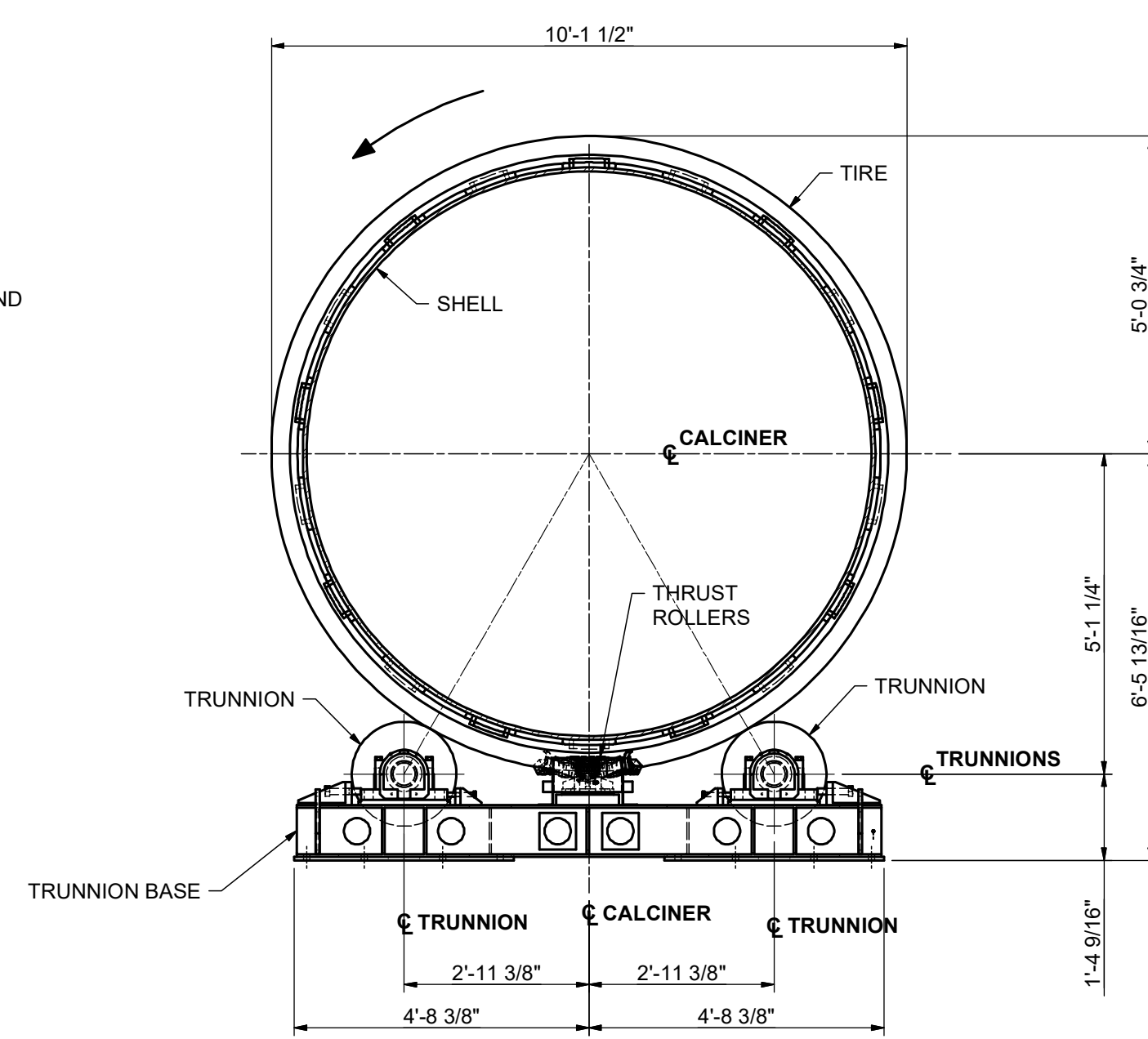
Units: X,Y,Z units are in Kips..... Mx, My, Mz Units are in Ft-Kips
 Notation: +/- X (horiz)
 +/- Z (horiz)
 +Y is Vertical (UP); -Y is Vertical (DOWN)

7031 - Dryer System Anchor Forces

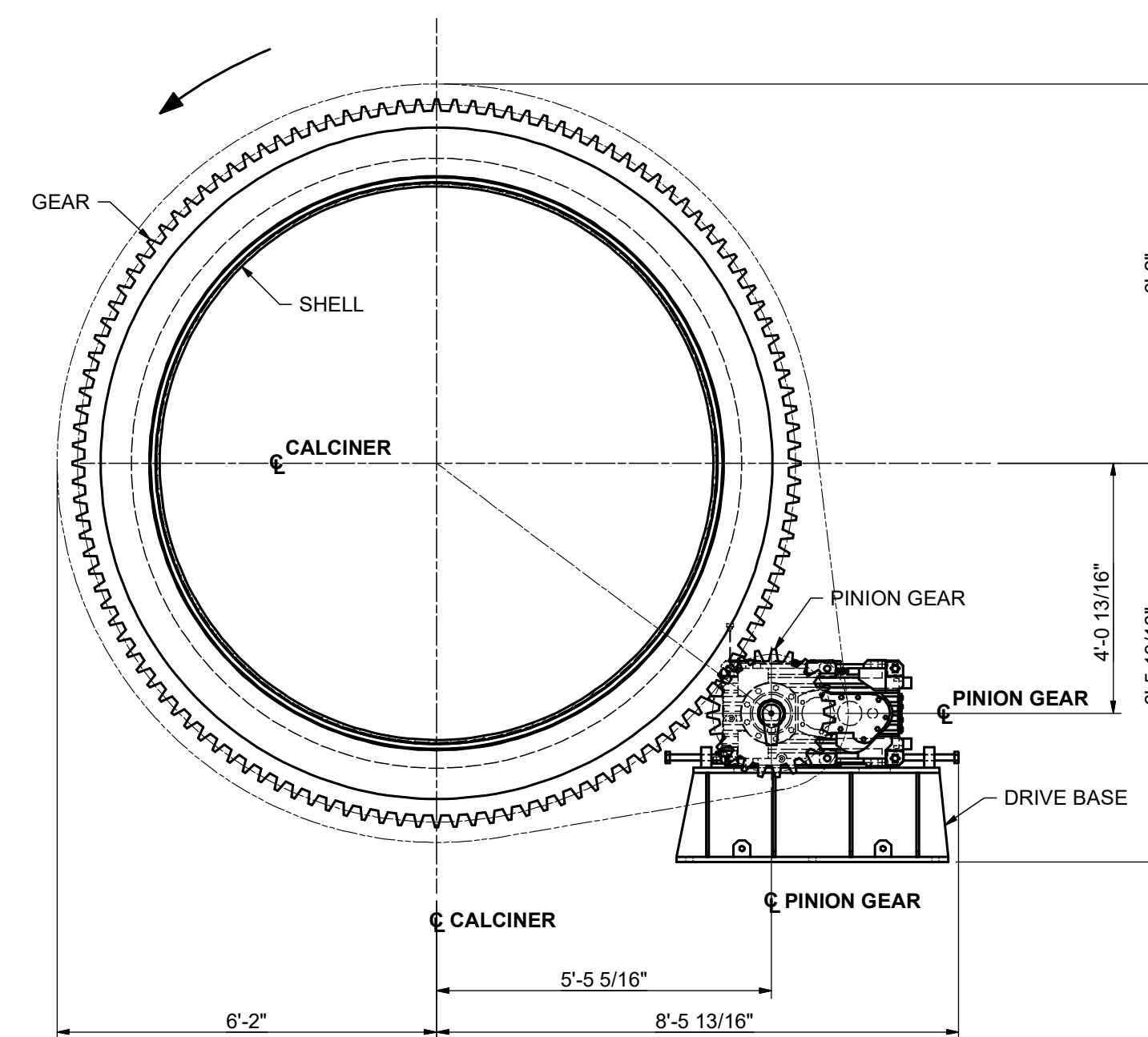
Support	Dead Load (Normal)				Static Live Load				Dynamic Live Load				
	X	Y	Z	Mz	X	Y	Z	Mz	X	Y	Z	Mz	
A	0.0	-4.0	0.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	-4.3	-11.6	-4.6	-4.1	0.1	-1.7	-4.2	-2.1	-4.1	-16.6	-36.4	0.0	0.0
C	4.3	-11.6	-4.6	-4.1	-0.1	1.7	-4.2	-2.1	-4.1	2.1	-7.6	0.0	0.0
D	0.0	-3.5	0.0	1.0	-1.0	0.0	0.0	0.0	0.0	4.6	-9.7	0.0	14.2
E	-4.0	-10.3	4.6	4.1	0.1	-1.8	-4.2	2.1	1.9	-15.6	-42.0	0.0	0.0
F	4.0	-10.3	4.6	4.1	-0.1	1.8	-4.2	2.1	1.9	2.2	-5.3	0.0	0.0
G	0.0	-4.4	0.0	0.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0
H	0.0	-4.4	0.0	0.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0



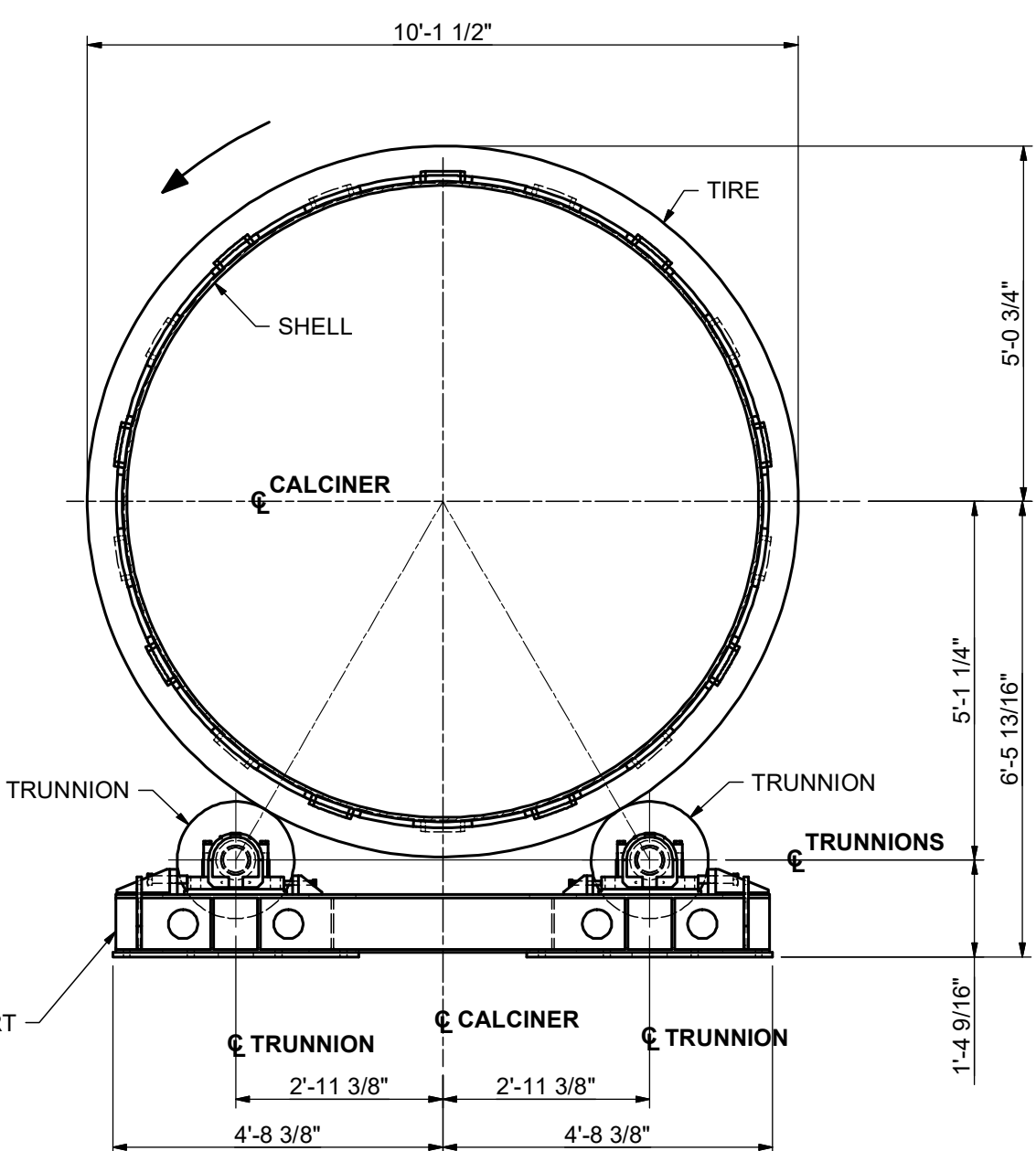
VIEW A-A
 (SCALE 1/2"=1'-0")



SECTION B-B
 TRUNNION GUARDS NOT SHOWN
 (SCALE: 1/2"=1'-0")



SECTION C-C
 GEAR GUARD NOT SHOWN
 (SCALE: 1/2"=1'-0")



SECTION D-D
 TRUNNION GUARDS NOT SHOWN
 (SCALE: 1/2"=1'-0")

REV.	MADE	CHKD	APPR	DATE	DESCRIPTION
B	DMS			10/13/21	ADDED LOADS
A	DMS			9/21/21	ISSUED FOR REVIEW

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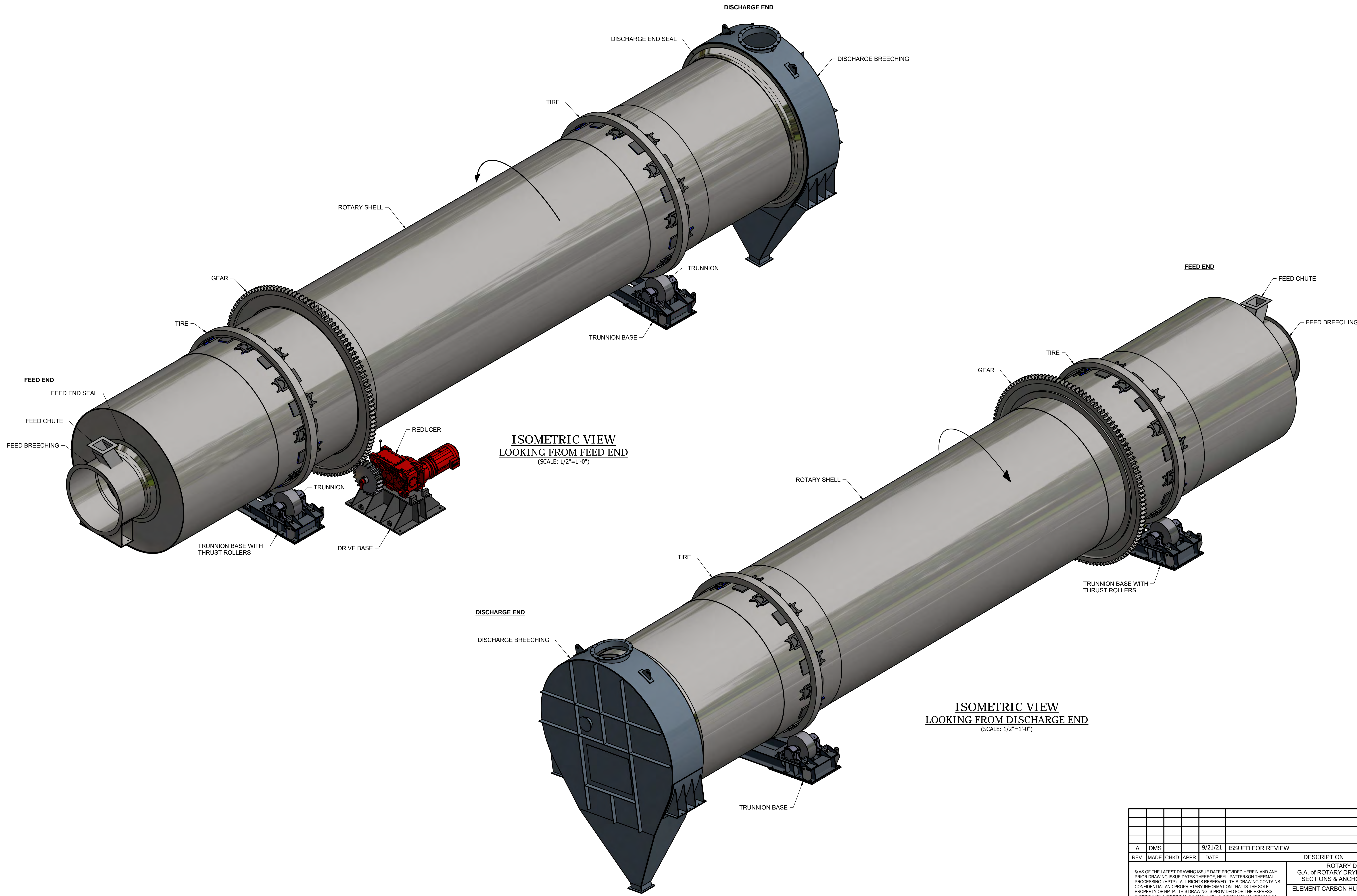
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AS NOTED	2 OF 3	30 x 42 (inches)

DWG. NO. **7031-0102**

NOTES:
 WORK THIS DWG. WITH DWG. 21-HSTL-74-1023-00-1 & 21-HSTL-74-1023-00-3.

HEYL PATTERSON
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REV. **B**

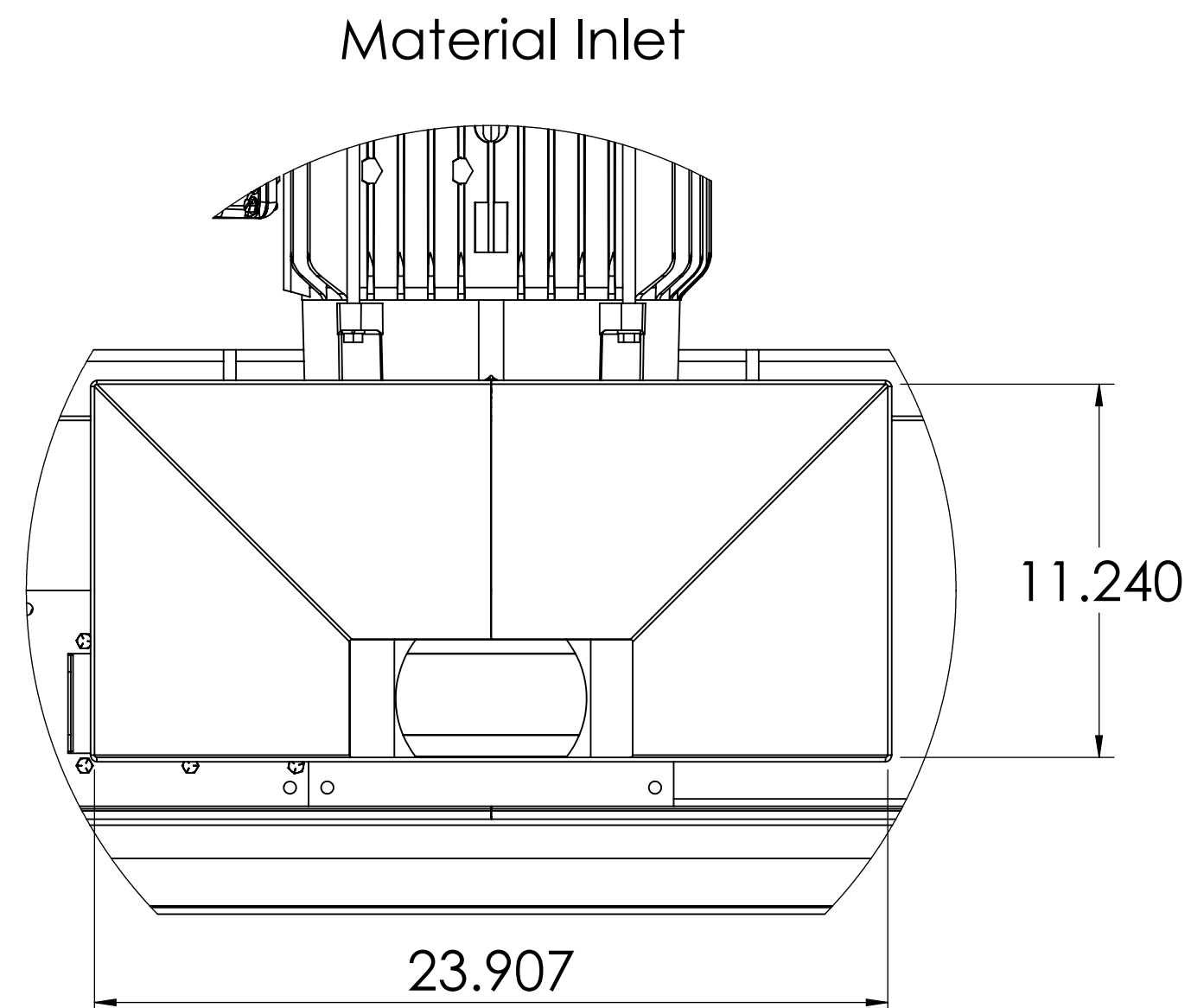
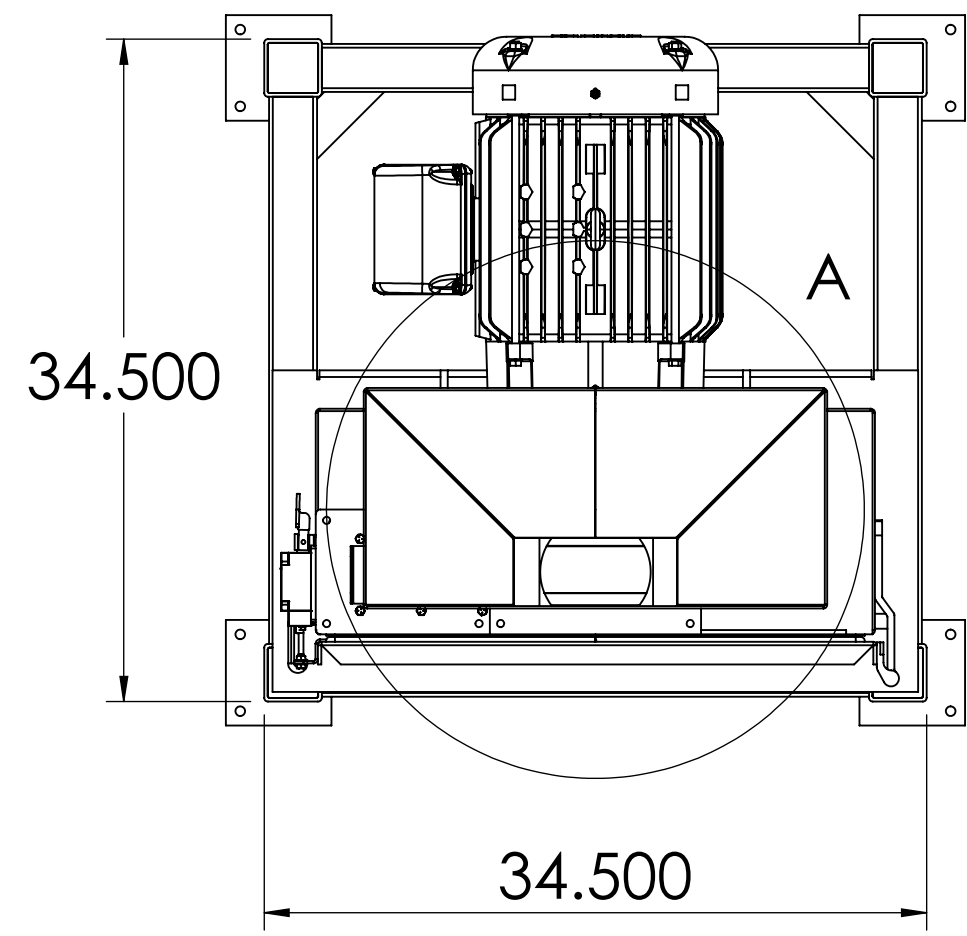


**ISOMETRIC VIEW
LOOKING FROM FEED END**
(SCALE: 1/2"=1'-0")

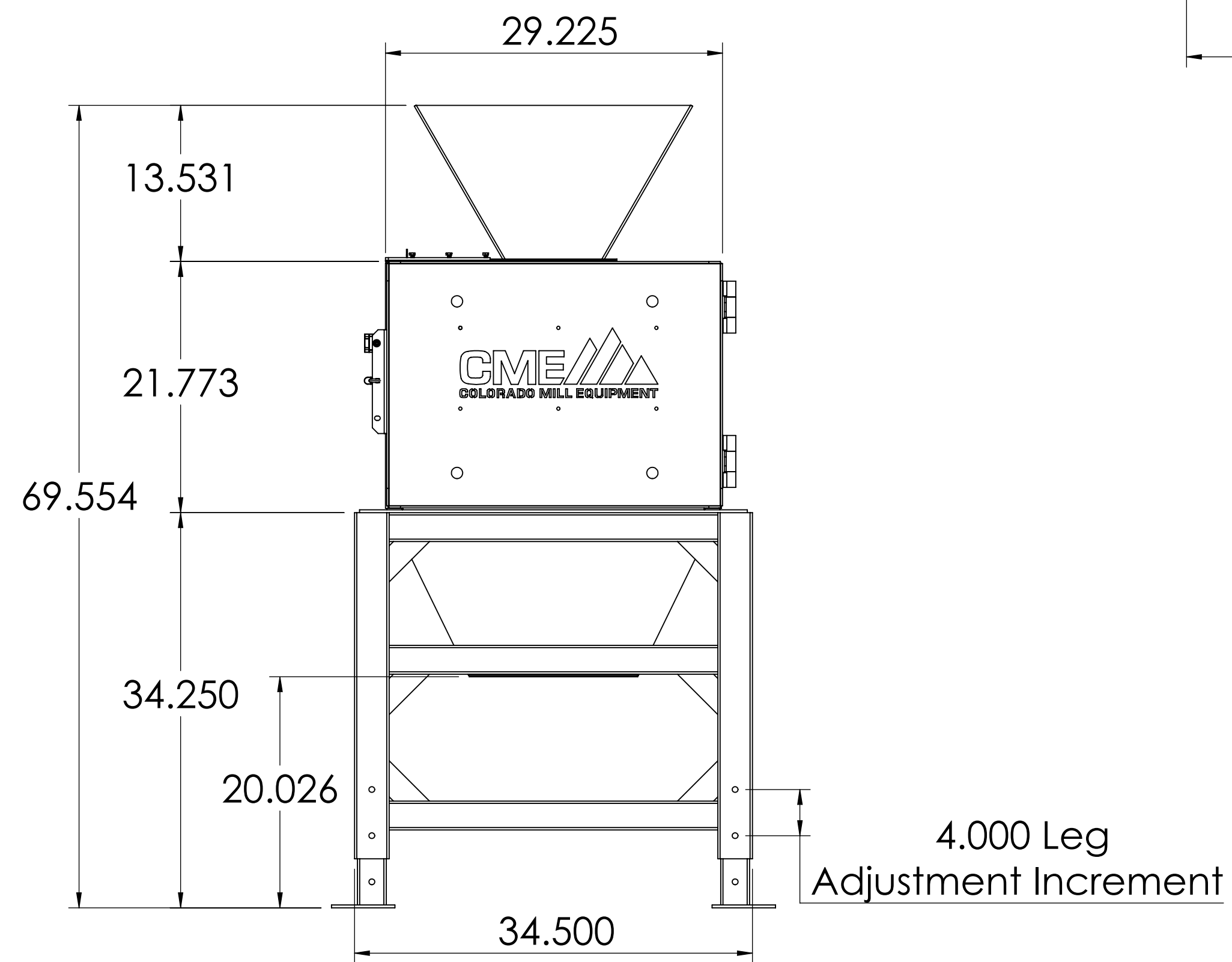
**ISOMETRIC VIEW
LOOKING FROM DISCHARGE END**
(SCALE: 1/2"=1'-0")

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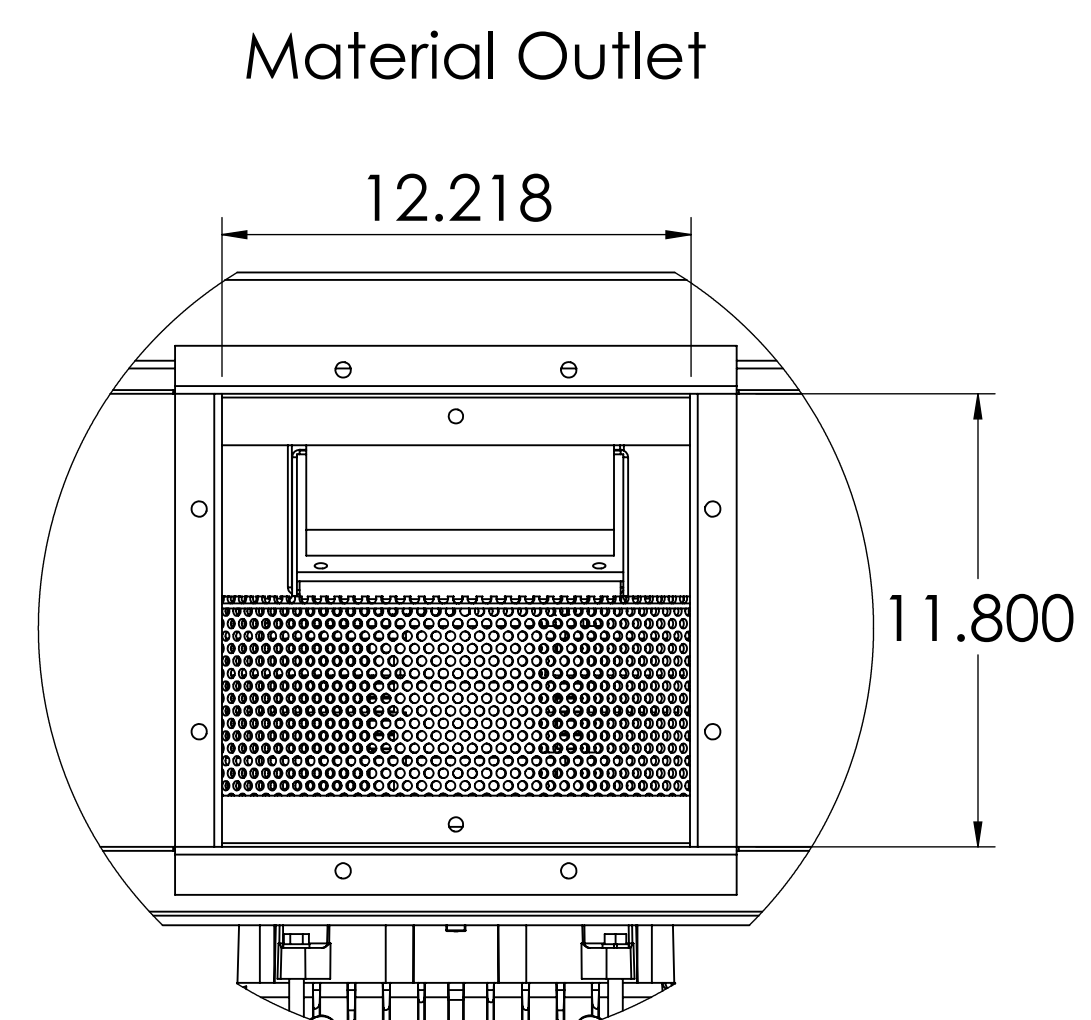
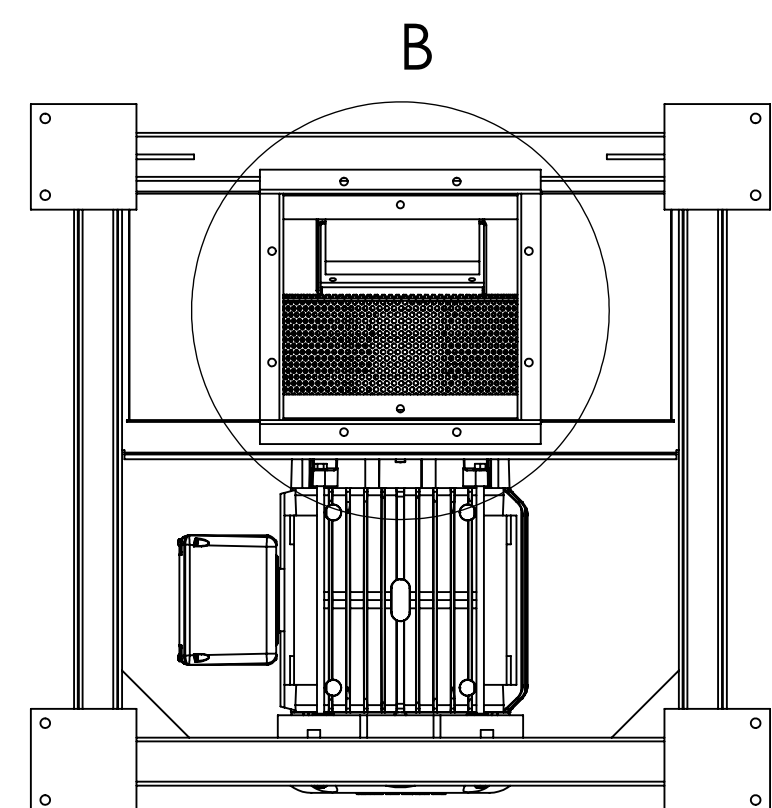
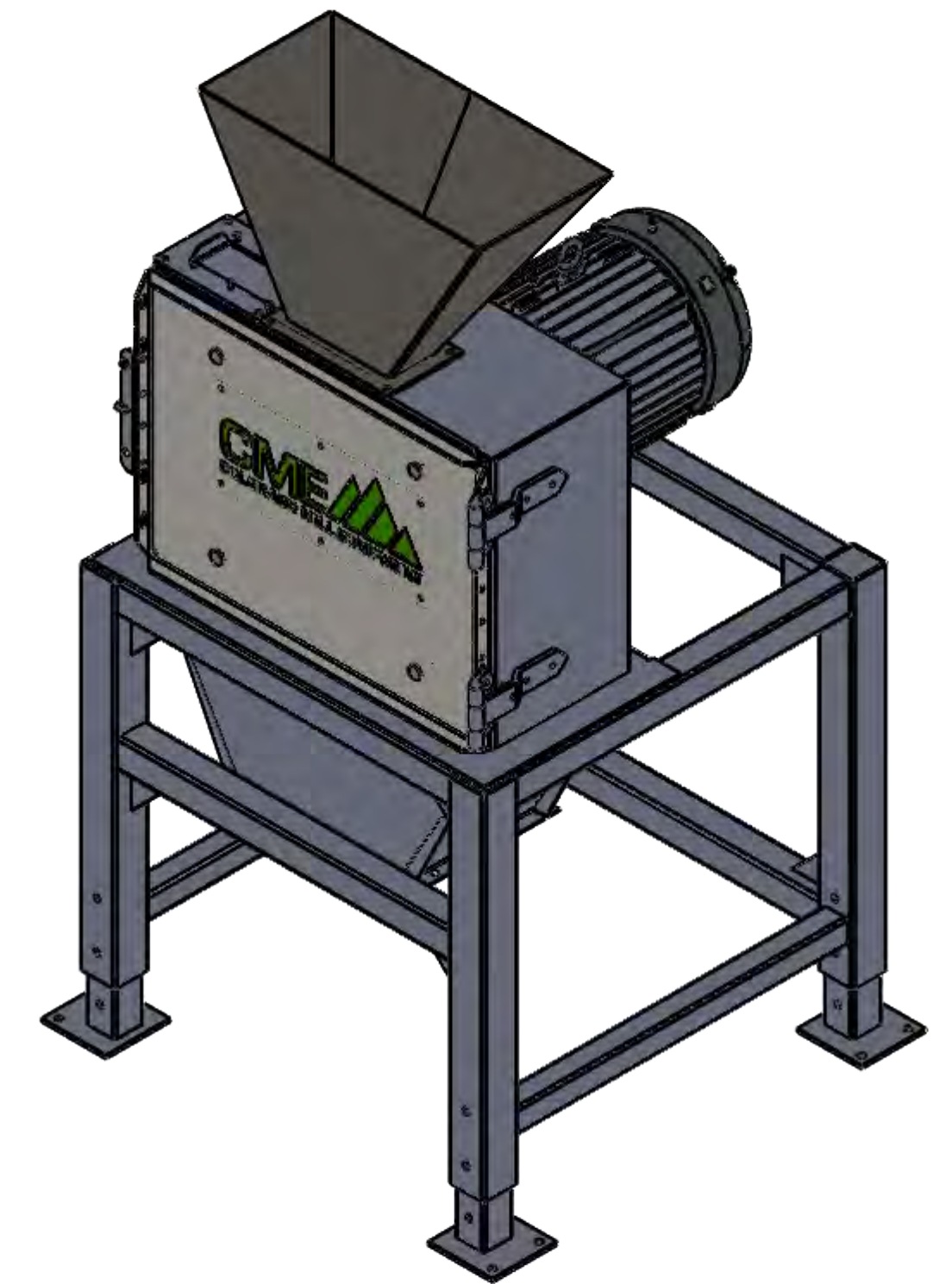
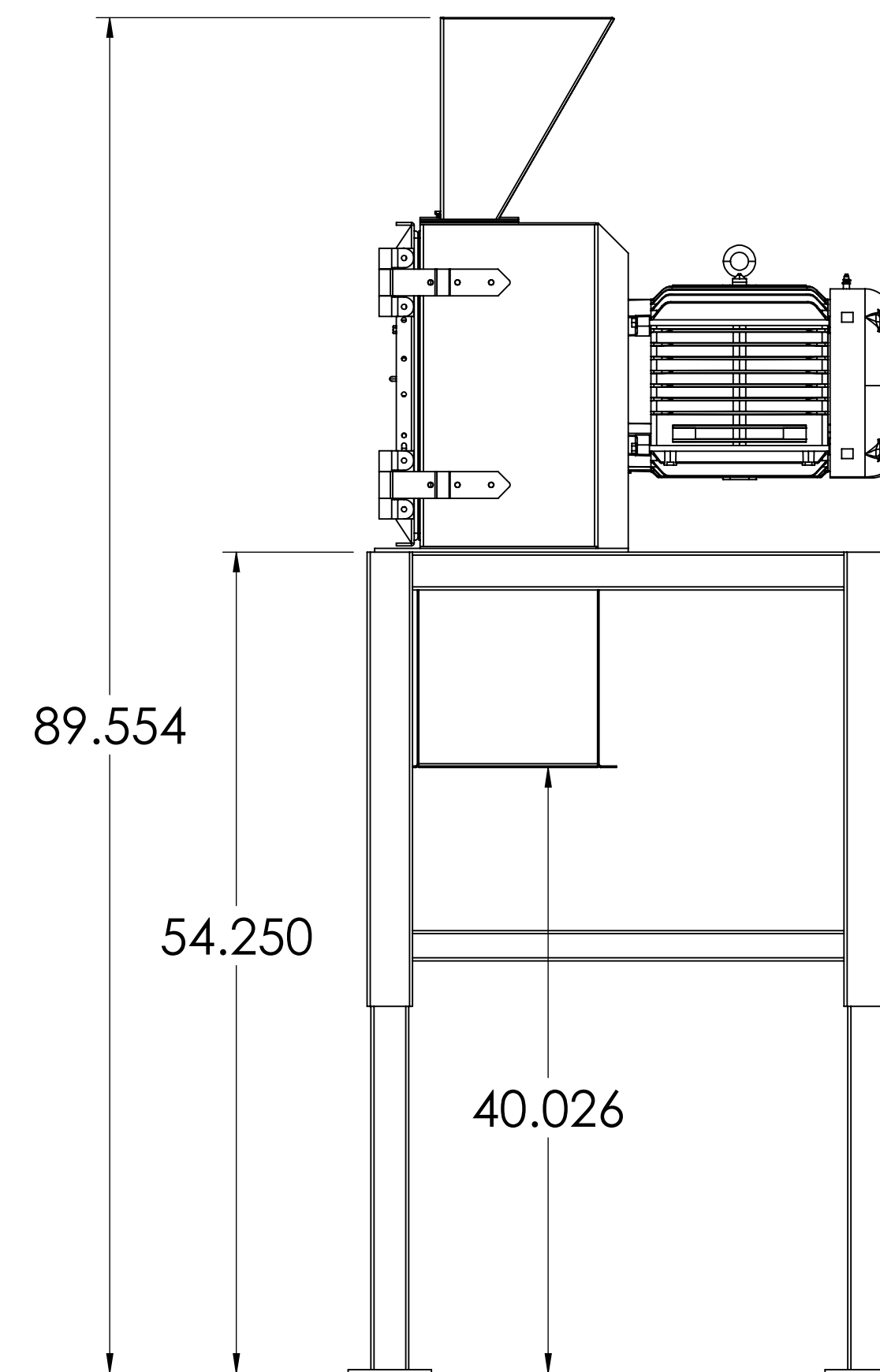
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REV.	MADE	CHKD	APPR.	DATE					DESCRIPTION
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									ELEMENT CARBON HUDSON VENTURES
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									SCALE AS NOTED
									SHEET 3 OF 3
									SHEET SIZE 30 x 42 (inches)
									DWG. NO. 7031-0103
									REV. A
									HEYL PATTERSON THERMAL PROCESSING



DETAIL A
SCALE 1 : 5



Legs Fully Extended

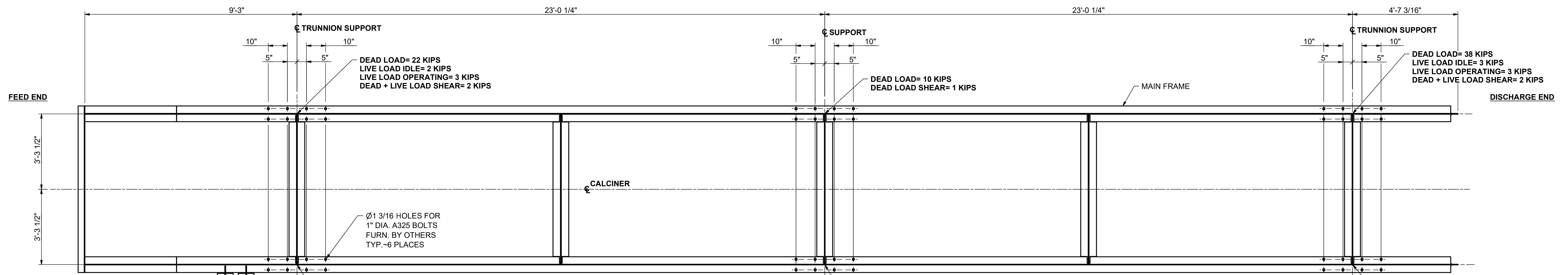


DETAIL B
SCALE 1 : 5

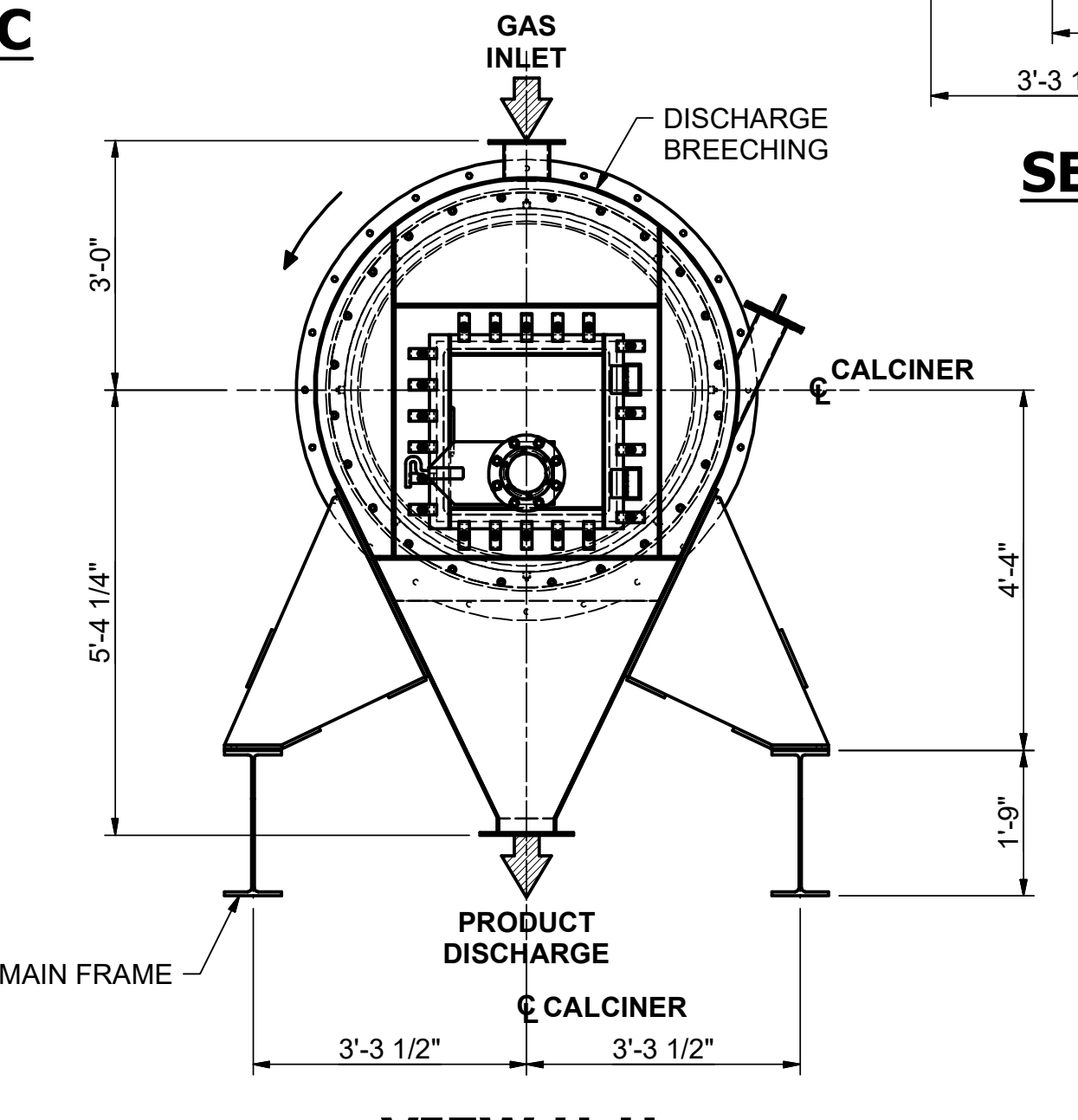
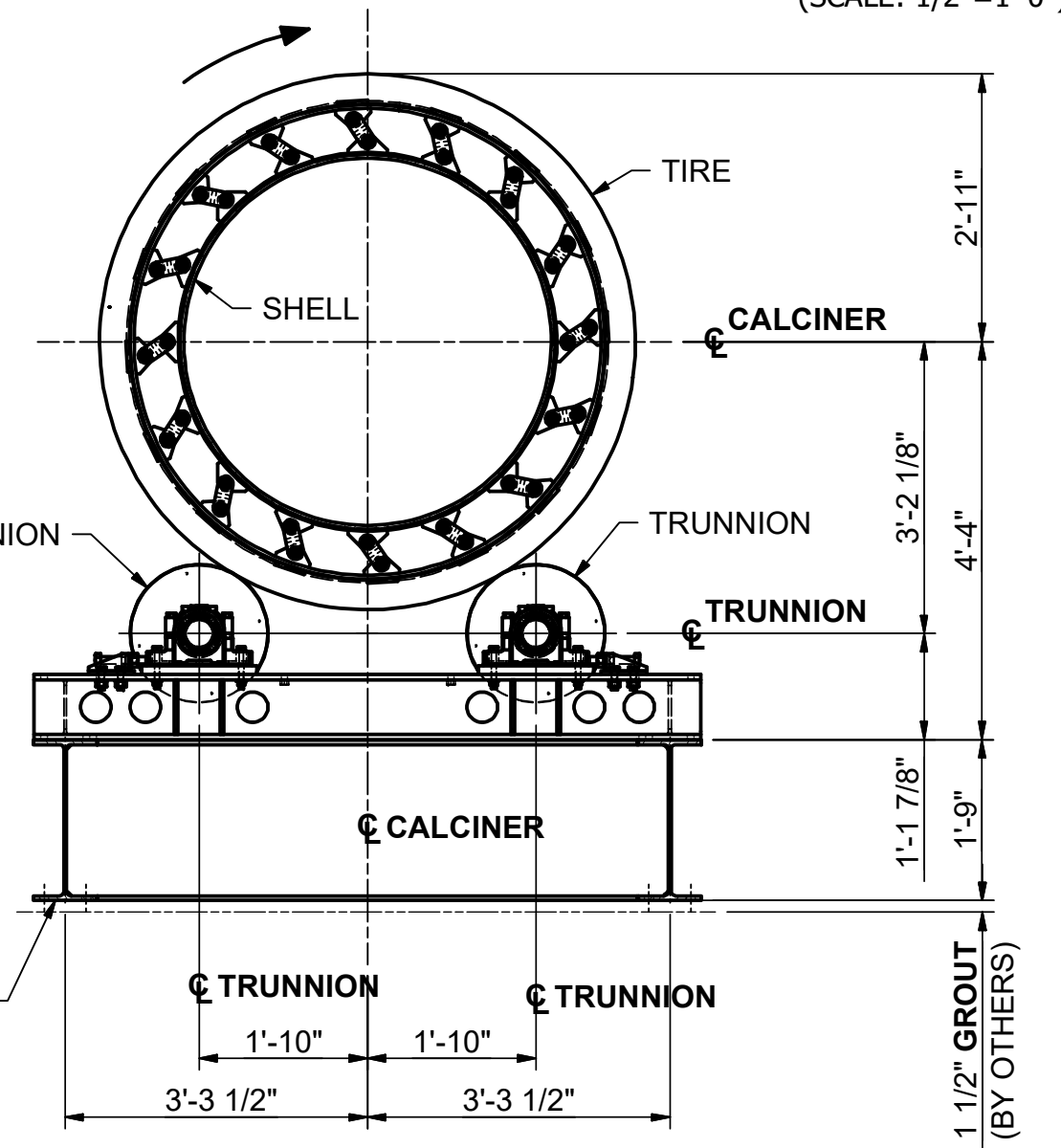
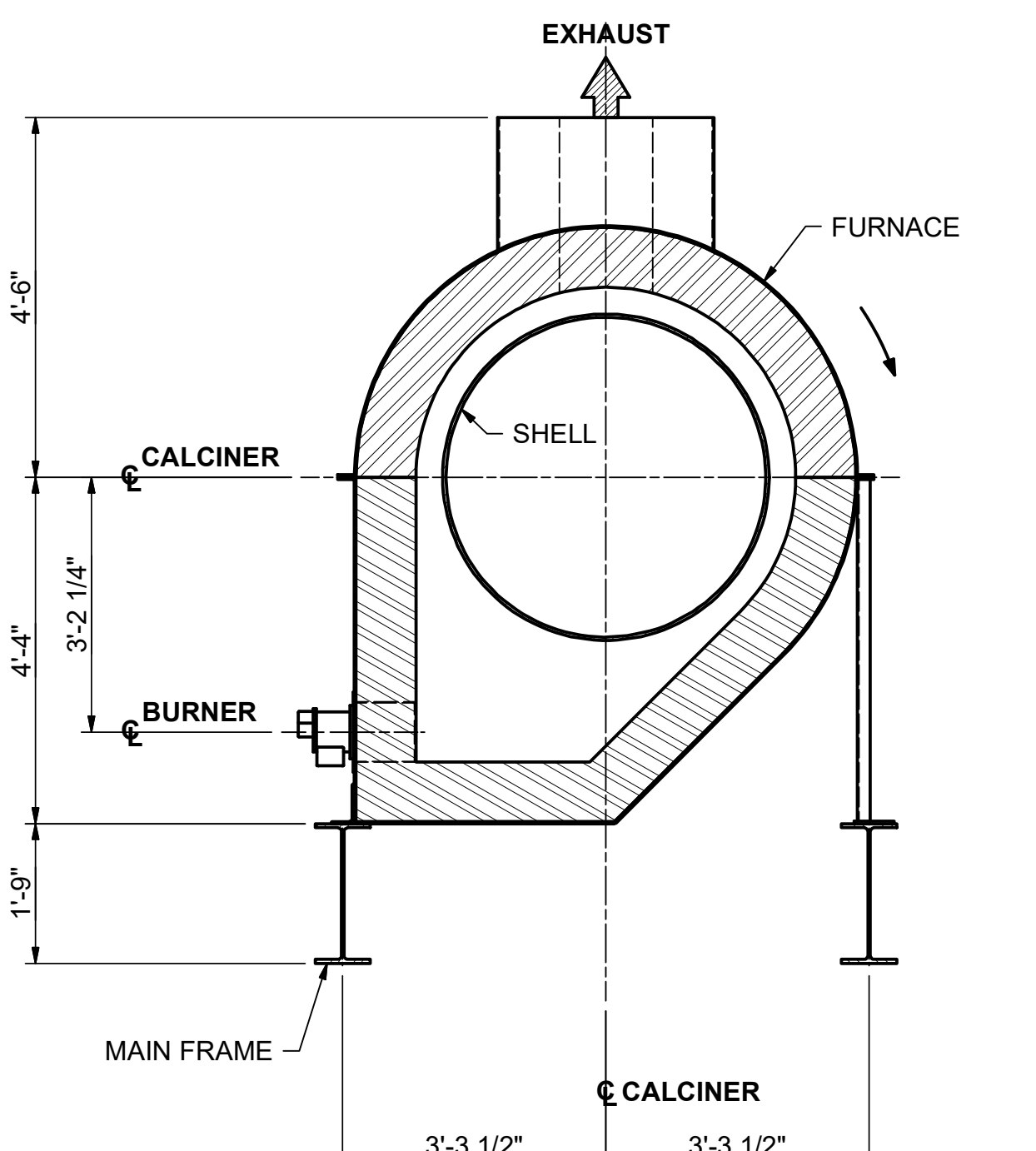
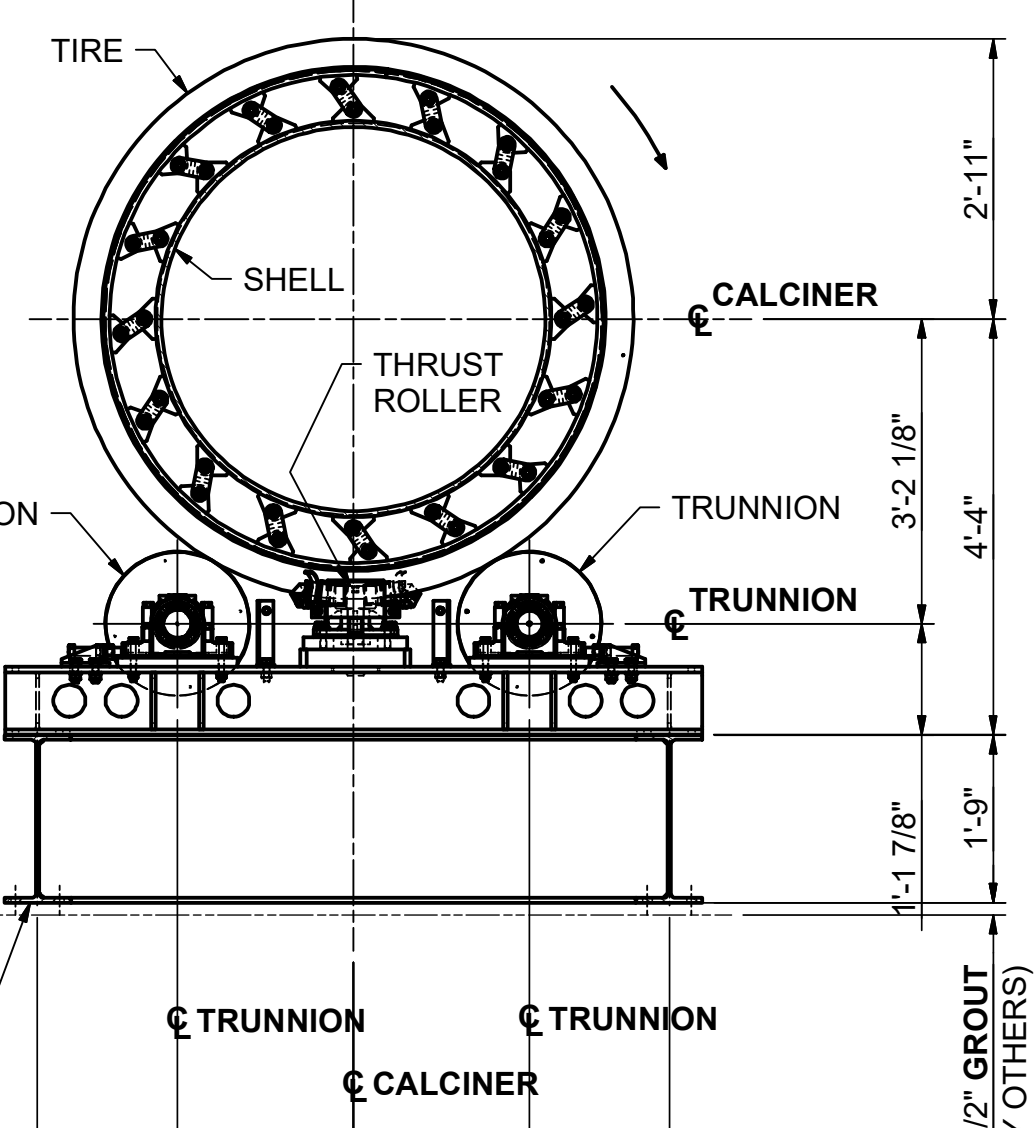
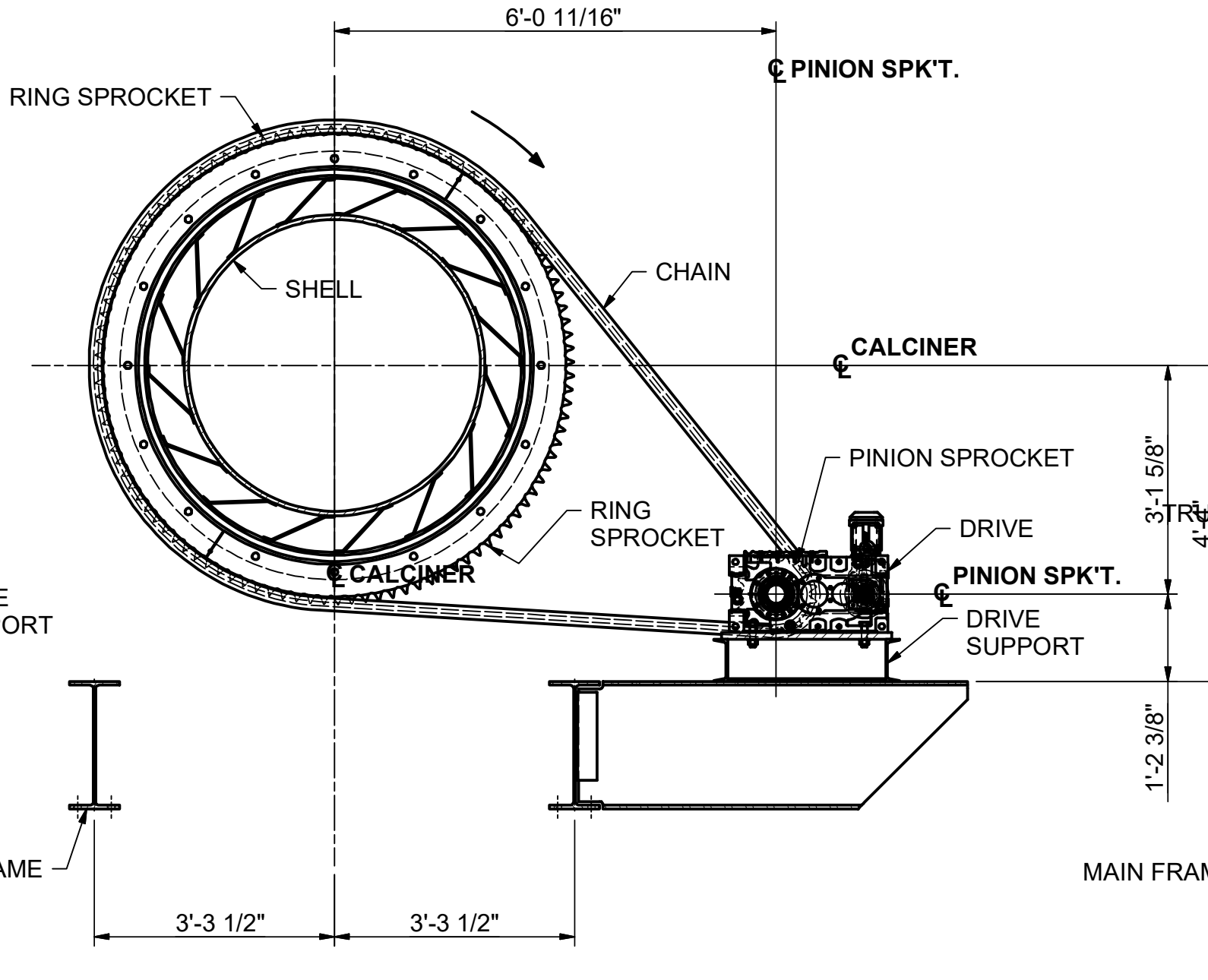
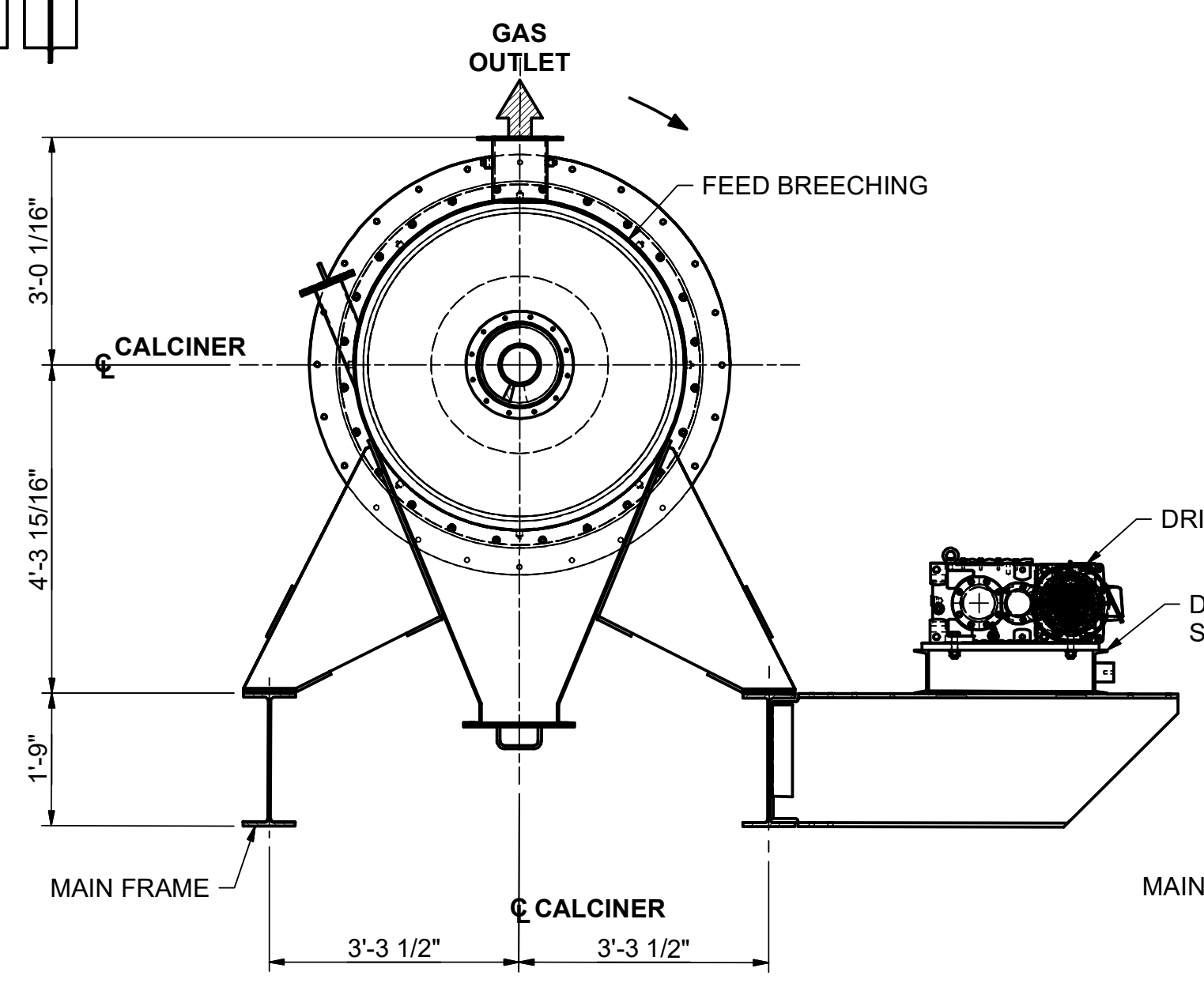
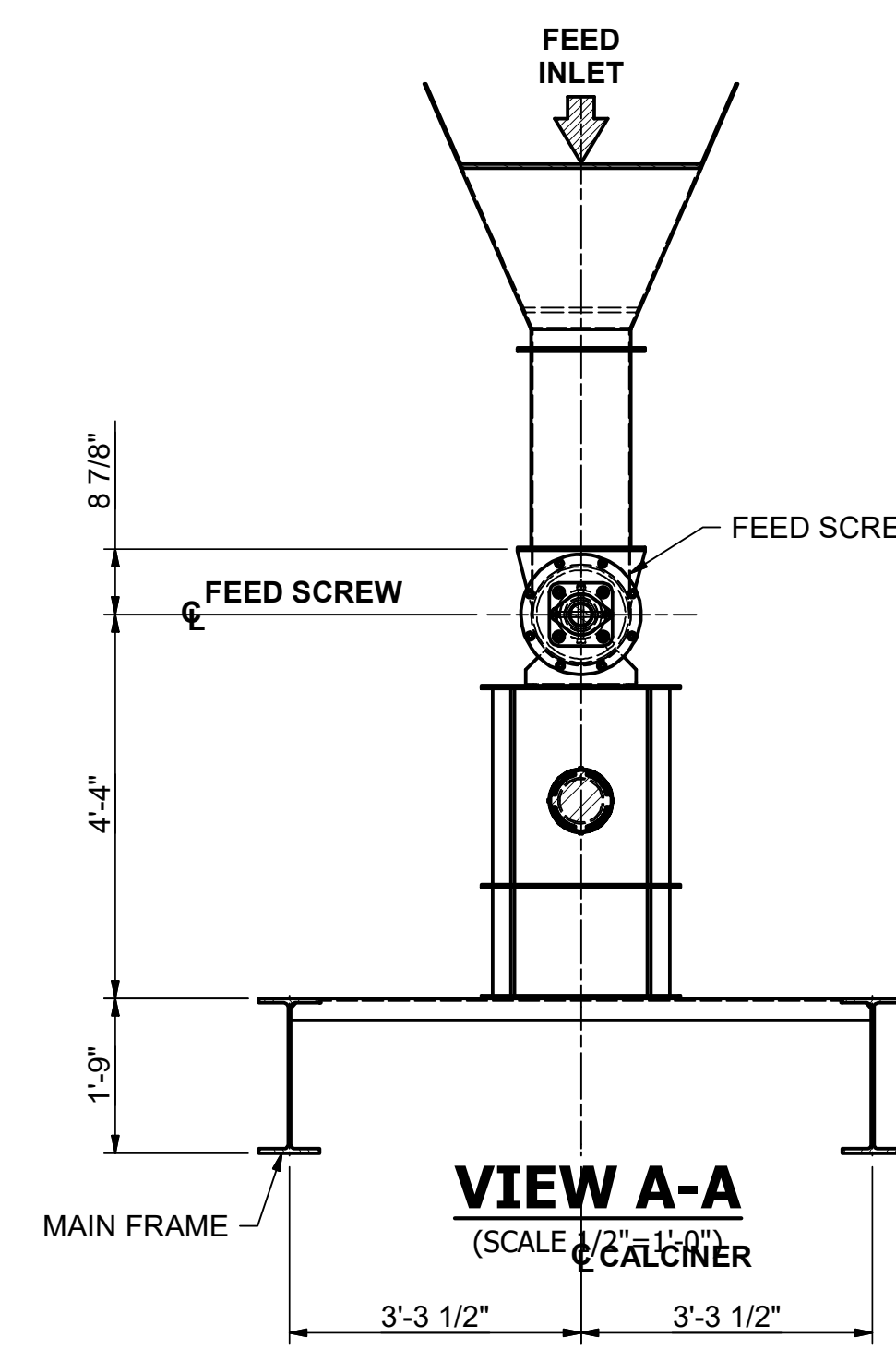
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UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	J. BELING	3-19-19
TOLERANCES:	CHECKED		
FRACTIONAL ±1/32	ENG APPR.		
ANGULAR: MACH ±.005 BEND ±.010	MFG APPR.		
TWO PLACE DECIMAL ±.010	Q.A.		
THREE PLACE DECIMAL ±.005	COMMENTS:		
INTERPRET GEOMETRIC TOLERANCING PER: ASME Y14.5-2009			
MATERIAL			
FINISH			
DO NOT SCALE DRAWING			

SIZE	DWG. NO.	REV
D	HMS Complete Assembly	
SCALE: 1:10 WEIGHT:		SHEET 1 OF 1

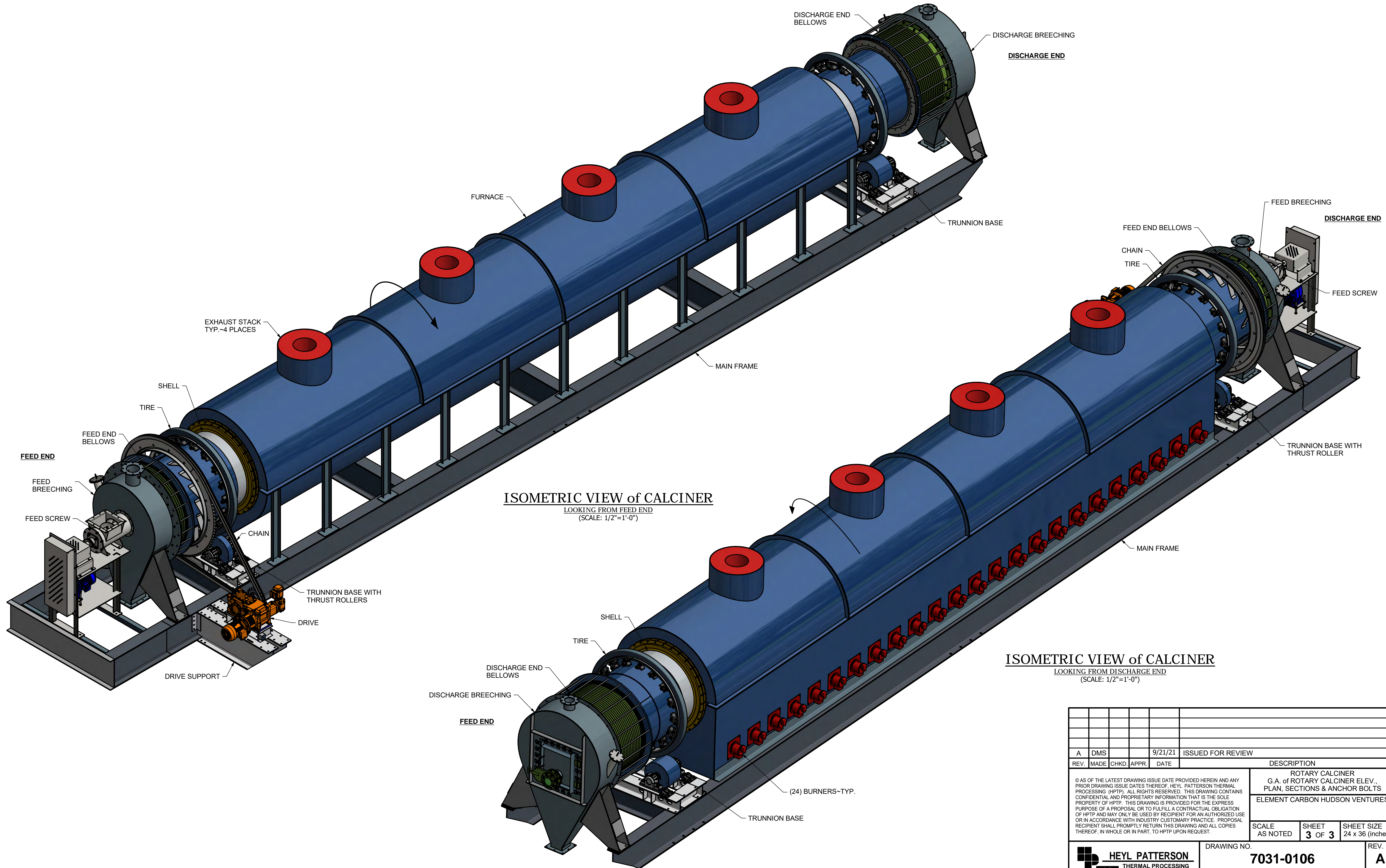


BOLT PLAN FOR ROTARY CALCINER
SECTION K-K
 (SCALE: 1/2"=1'-0")



NOTES:
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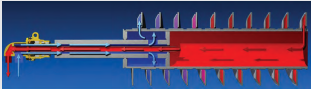
B	DMS	10/13/21	ADDED LOADS	
A	DMS	9/21/21	ISSUED FOR REVIEW	
REV.	MADE	CHKD.	APPR.	DATE
DESCRIPTION				
ROTARY CALCINER				
G.A. of ROTARY CALCINER ELEV.,				
PLAN, SECTIONS & ANCHOR BOLTS				
ELEMENT CARBON HUDSON VENTURES				
SCALE		SHEET	SHEET SIZE	
AS NOTED		2 OF 3	24 x 36 (inches)	
DRAWING NO.			REV.	
HEYL PATTERSON THERMAL PROCESSING			7031-0105	B



ISOMETRIC VIEW of CALCINER
 LOOKING FROM FEED END
 (SCALE: 1/2"=1'-0")

ISOMETRIC VIEW of CALCINER
 LOOKING FROM DISCHARGE END
 (SCALE: 1/2"=1'-0")

A	DMS		9/21/21	ISSUED FOR REVIEW	
REV.	MADE	CHKD.	APPR.	DATE	DESCRIPTION
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					ELEMENT CARBON HUDSON VENTURES
					SCALE AS NOTED
					SHEET 3 OF 3
					SHEET SIZE 24 x 36 (inches)
				DRAWING NO.	REV.
				7031-0106	A



Hollow Flight

KWS Hollow Flight Screw Processor

KWS Hollow Flight Screw Processors are a new era of technology in thermal processing for bulk materials that need to be heated, cooled or maintained at a constant temperature. Thermal media enters the rotary union and flows through the hollow flights over the entire length of the screw before returning through the center pipe, syphon tube and out the rotary union again. The continuous rotation of the screw causes bulk materials to tumble, increasing the surface area contact with the thermal processor. As a result, heat transfer is very efficient. The screw rotates at a slow speed allowing accurate temperature control and creating uniform thermal processing while eliminating hot spots.

The construction of the KWS hollow flight processor consists of flat flights on the carrying side welded to a helicoid wrap with cupped flights that are welded to the existing flat lights and helicoid wrap. The helicoid wrap is continuous around the center pipe for the entire length of the screw. The hollow flights are not welded directly to the center pipe and operate as a free floating unit. The hollow flights and center pipe expand and contract independently, decreasing stress and increasing overall equipment life.

Features

Hollow Flights– Hollow flights provide a path for the thermal media to flow through the full length of the thermal processor, utilizing every available square inch of heat transfer area. The center pipe also provides surface area for heat transfer.

Drive Unit– The motor and gear reducer are located in line with the thermal processor. The low speed coupling isolates the gear reducer from the heat source. The in-line drive has a large torque capacity for the low speeds at which thermal processors operate.

Rotary Union – The rotary union is attached to the tail shaft of the screw processor, allowing the thermal media to enter and exit the screw and hollow flights while the entire assembly is rotating. Each rotary union is specifically designed for the application based on rotational speed as well as heat transfer media type, temperature and pressure.

Wide Variety of Construction Materials – KWS Hollow Flight Screw Processors are available in many different materials of construction. Standard industrial applications with operating temperatures below 700-degrees F are typically constructed from carbon steel. 304, 316, Inconel, or duplex stainless steels are available for high temperature, corrosive, or food-grade applications.

Benefits

Compact Design – KWS Hollow Flight Screw Processors provide more thermal processing per volume of equipment than any other technology on the market. The hollow flight design provides maximum surface area for heat transfer. Multiple hollow flight screws can be placed in parallel providing even more surface area for heat transfer within a relatively small equipment footprint.

Efficient Heat Transfer – KWS Hollow Flight Screw Processors transfer heat through direct conduction. The thermal media is in direct contact with the inside surfaces of the hollow flights while the material being heated or cooled is in direct contact with the outside surfaces of the hollow flights, providing an efficient path for heat transfer. Compared to most technologies which utilize indirect convection heat transfer, KWS Hollow Flight Screw Processors offer a tremendous increase in efficiency.



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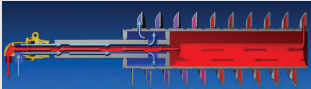
3041 Conveyor Drive
Burluson, Texas 76028

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Phone: (817) 295-2247

Fax: (817) 447-8528

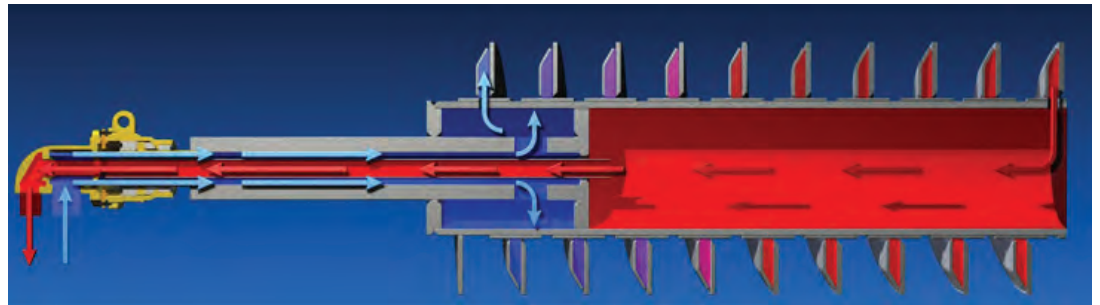
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Hollow Flight

KWS Hollow Flight Screw Processor

Drive In-line with Screw – In-line helical gear reducers provide maximum torque output, lower cost, and a smaller footprint when compared to parallel shaft or right angle gear reducers. Since the gear reducer is directly coupled to the thermal processor, there are no chain and sprocket drives to maintain and lubricate.



Hollow Flight



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Jacketed Trough



Jacketed Trough Assembly

KWS Jacketed Troughs

KWS jacketed troughs increase process efficiencies, reduce wasted energy and shrink equipment footprints. It is very common in today's industry for a piece of equipment to serve more than one function. KWS jacketed troughs provide thermal processing while conveying a bulk material, sometimes eliminating another piece of process equipment. Even small improvements in efficiency can result in huge cost savings over time.

KWS jacketed troughs are used in a variety of applications. Whether cooling a bulk material exiting a dryer, preheating a powder with waste heat, maintaining the temperature of a delicate bulk material or even acting as a thermal insulator to protect personnel from heat, KWS jacketed troughs serve many useful functions.

KWS jacketed troughs are pressure vessels built on the outside of screw conveyor troughs. Hot oil, steam, cooling water and/or refrigerant can be used to heat or cool a bulk material as it is conveyed. KWS jacketed troughs are custom designed and manufactured in accordance with the ASME Boiler and Pressure Vessel Code for years of long, safe and reliable operation.

Features

FEA Designed– The proper design of jacketed troughs is important to meet process expectations. Many companies use “rule of thumb” guides or crude calculations to design jacketed troughs. Improperly designed jacketed troughs can fail and cause a serious safety concern. KWS uses Finite Element Analysis (FEA) on every jacketed trough design to ensure safe operation at the required pressure and temperature. FEA is a computer method for calculating stresses in 3-Dimensional parts. Unlike hand calculations, FEA can account for a wide range of parameters with exacting precision.

ASME Coded – KWS is certified to design and manufacture pressure vessels in accordance with the ASME Boiler and Pressure Vessel Code. You can be confident that every KWS jacketed trough exceeds the highest industry standards.

Wide Variety of Construction Materials– KWS jacketed troughs are available in many different materials of construction. Standard industrial applications with operating temperatures below 700-degrees F are typically constructed from carbon steel. 304, 316, Inconel, or duplex stainless steels are available for high temperature, corrosive, or food-grade applications.

Benefits

Cost Savings– Being able to cool or heat a bulk material as it is conveyed is very cost efficient and can eliminate the need for another piece of process equipment resulting in reduced capital and operating costs as well as shrinking the overall footprint. Using a KWS jacketed trough provides a lean process and years of reduced operating costs.

Safety – Proprietary heat transfer calculations, the use of FEA and designing in accordance with the ASME Boiler and Pressure Vessel Code ensures that every KWS jacketed trough is designed and manufactured for maximum heat transfer and reliable and safe operation

Cooling – Using process water or refrigerant is an efficient and cost effective method for cooling bulk materials at elevated temperatures exiting a dryer, kiln or boiler to a safe temperature for conveying throughout the remainder of the process. Personnel hazards due to high temperatures and thermal damage of downstream equipment are eliminated.



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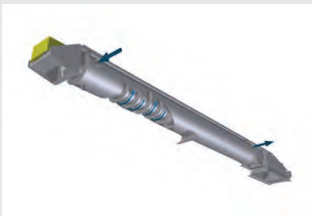


KWS Jacketed Troughs

Whether cooling, heating or providing a thermal barrier, KWS jacketed troughs provide increased process efficiency, a safe work environment and lower operating cost. Knowing that each KWS jacketed trough is designed and manufactured in accordance with the ASME Boiler and Pressure Vessel Code allows for peace of mind. Contact KWS today to find out more about this versatile product.



Jacketed Trough



Jacketed Trough
Assembly



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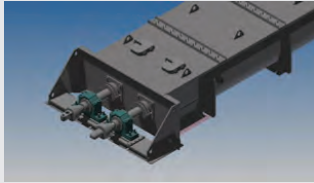
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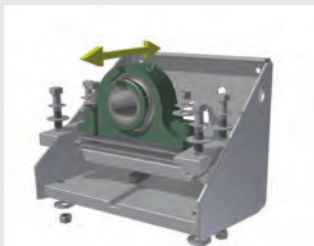


KWS Slider Base Trough End

The KWS slider base trough end allows for thermal expansion in high temperature applications. If not accounted for, thermal expansion causes excessive stress and fatigue loading, leading to premature failure.



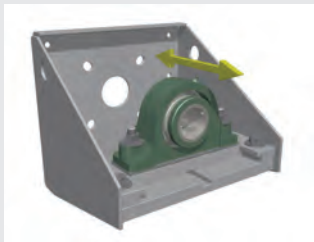
Expansion and contraction is common in every high temperature application. Expansion occurs axially along the length of the screw and trough in screw-type thermal processors. The KWS slider base trough end is designed for thermal expansion and can account for axial expansion up to 4-inches.



The KWS slider base trough end uses an innovative slider ridge to ensure precise alignment of the shaft and end bearings as thermal expansion occurs. Alignment is critical to proper operation of a thermal processor.

Features

Controlled Expansion – The KWS slider base trough end allows travel axially along the length of the thermal processor. Using our proprietary thermal expansion calculator, Engineers at KWS are able to accurately calculate the thermal expansion requirements of the application. If thermal expansion is not properly accounted for, the shaft and screw will be subjected to cyclical bending loads causing premature failure of the thermal processor.



Pedestal Design – The pillow block bearings on the KWS slider base trough end are located on a pedestal away from the heat source, allowing the bearings to stay cool under extreme conditions. KWS utilizes heavy-duty, spherical pillow block bearings for high radial load capabilities and long life. These bearings are readily available as replacements, if required. A variety of shaft seal options are available depending on process requirements such as split gland seals, flanged gland seals or mechanical seals.

Spherical Roller Bearing – Each KWS slider base trough end uses spherical roller bearings. Spherical roller bearings are heavy-duty pillow block bearings with spherical rollers for superior load capacity and durability. The spherical bearing design allows for shaft run-out while reducing eccentric loading on the bearings and shafts. The spherical bearing housing allows for thermal expansion in addition to the slider base.

Benefits

Compact Design – The compact design of the KWS slider base trough end creates a smaller overall footprint for the KWS Thermal Processor while still allowing for full functionality and ease of maintenance.

Versatile and Rugged – The KWS slider base trough end accounts for axial thermal expansion with a versatile and rugged design. Heavy-duty $\frac{3}{4}$ -inch thick bearing base plates and 1-inch thick pedestal slider plates ensure years of reliable service in even the harshest environments.

Ease of Maintenance – The removable slider base hold downs allow for smooth linear travel and ease of maintenance. The hold downs are simply removed by unbolting which allows full access to the bearings for maintenance.



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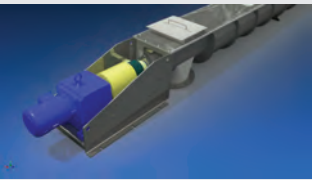
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KWS Drive Pedestal

The KWS drive pedestal is designed to protect the gear reducer and motor from heat and shock loads in a high temperature KWS screw conveyor, feeder or thermal processor. The gear reducer and motor can only withstand 210-degrees F of constant heat before failures begin to occur. The gear reducer and motor are located several feet away from the heat source with the KWS drive pedestal and operate at ambient temperature.

KWS thermal processors operate between 1 and 5-rpm for proper material retention causing the gear reducer to generate large amounts of torque. Many screw conveyor and feeder applications require low speed operation as well. A low-speed coupling directly connects the output shaft of the gear reducer to the input shaft of the conveyor, feeder or processor. Angular misalignment, vibration and shock loads are absorbed by the low-speed coupling prolonging the life of the gear reducer and motor. The KWS drive pedestal is a compact design that houses the motor, gear reducer, bearings, low-speed coupling, seals and shafts. All rotating parts are guarded with OSHA compliant guards.

Features

Wide Variety of Materials – The KWS drive pedestal is available in many different materials of construction. Standard industrial applications with operating temperatures below 700-degrees F are typically constructed from carbon steel. 304, 316, Inconel, or duplex stainless steels are available for high temperature, corrosive, or food-grade applications.

Wide Variety of Seal and Bearing Options – The KWS drive pedestal is designed to accept flanged gland seals, split gland seals, air or nitrogen purged seals, food grade seals or mechanical seals depending on application requirements. Tapered or spherical roller pillow block bearings from nearly all manufacturers can be mounted on KWS drive pedestals for commonality of spare parts. Split housing pillow blocks are also available to minimize bearing maintenance and replacement.

Low Speed Coupling – The KWS drive pedestal utilizes low-speed flexible couplings to connect the gear reducer to the screw conveyor, feeder or thermal processor. Low-speed flexible couplings can withstand temperatures up to 210-degrees F, angular misalignment up to 4-degrees and parallel misalignment up to .012-inches.

Benefits

Protect Drive from Heat and Contamination – The KWS drive pedestal locates the motor and gear reducer away from the trough end and potential damage from either elevated material temperatures or abrasive or corrosive products.

Protect Drive from Shock and Vibration – The low-speed coupling absorbs any shock and vibrations from the conveyor, feeder or thermal processor, increasing the operating life of the motor and gear reducer.

Ease of Maintenance – The shaft seal, motor, gear reducer, low-speed coupling and pillow block bearings can be easily accessed for maintenance and replacement. The KWS drive pedestal allows for replacement of seal packing and bearing lubrication and inspection.

Drive In-Line with Screw – The motor and gear reducer are located in line with the conveyor, feeder or thermal processor. Inline helical gear reducers provide maximum torque output, lower cost, and a smaller footprint when compared to parallel shaft or right angle gear reducers. Since the gear reducer is directly coupled to the conveyor, feeder or thermal processor, there are no chain and sprocket drives to maintain and lubricate.



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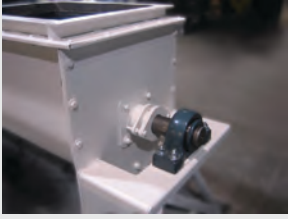
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Phone: (817) 295-2247

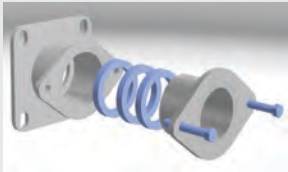
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Flanged Gland Seals

Flanged gland seals are shaft seals that mount to the outside of pedestal trough ends and are used to prevent bulk materials from leaking out of a screw conveyor or feeder.



Standard Seal

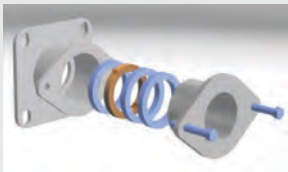
Flanged gland seals consist of an outer housing, multiple rings of packing and a follower. The packing material is ½-inch square braided rope that fits tightly in the outer housing and around the shaft diameter. The follower is used to compress the packing and create a seal between the shaft and housing.

Features

Wide Variety of Construction Materials – The outer housing and follower can be made from carbon steel, stainless steel or high-nickel alloys for corrosion resistance or high-temperature applications

Multiple Rings of Packing – Each ring of packing acts as a seal. Up to five rings of packing can be used create a seal around the shaft.

Wide Variety of Packing Materials – The ½-inch square braided rope packing is available in many different materials. Graphite impregnated packing is used in most industrial applications. Teflon packing is used in the chemical industry and ceramic fiber packing is used for high temperature applications.



Purgeable Seal

Purge Option is Available – Flanged gland seals can be purged with air, nitrogen, grease or other purging medium to prevent bulk materials from leaking out. An air or nitrogen purge can create a positive pressure in the seals to overcome an internal pressure in the conveyor or feeder.

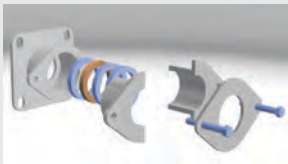
Benefits

Creates Positive Seal Around Shaft – A positive seal is created as the packing material is compressed around the shaft. Tightening the follower can increase the compression force.

Protects Personnel and Equipment – Bulk materials that are hazardous, corrosive or combustible are contained within the conveyor or feeder preventing safety issues or equipment failure.

Ease of Maintenance – The braided rope packing can be replaced in minutes. The follower can be removed to allow access to the packing.

Very Cost Effective – Other seals on the market cost up to ten times more than a flanged gland seal. Also, most require a purge in order to operate.



Purgeable Split Follower Seal



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KWS Manufacturing

3041 Conveyor Drive
Burlleson, Texas 76028

Toll Free: (800) 543-6558
Phone: (817) 295-2247
Fax: (817) 447-8528

www.kwsmfg.com



Shrink Fit Shafts



Typical Screw for Pulp & Paper Industry with Shrink-Fit Shafts on Both Ends



Drive Shaft is Permanently Fastened to Center Pipe of Screw

CEMA standard screws utilize internal collars, sometimes referred to as bushings, to effectively reduce the inside diameter of the center pipe. The purpose is to match standard CEMA shaft sizes and to increase the torque rating of the CEMA bolted connection. Special applications require the drive and end shafts to be permanently fastened to the center pipe of the screw, thus eliminating the need for coupling bolts. KWS Manufacturing offers custom shrink-fit shafts that provide a stronger connection and longer life for the screw.

KWS designs the shrink-fit connection between the inside diameter of the center pipe and the outside diameter of the shafts to have an interference fit of 0.002 to 0.005-inches, depending upon pipe size. Instead of plug welding the bushing inside the mating surface, the pipe and shafts are machined to exact tolerances before starting the shrink-fit operation. The pipe is carefully heated and shafts inserted to the specified depth. The pipe is then allowed to air-cool essentially "shrinking" the pipe to form a tight seal around the shaft. KWS certified welders then weld a continuous bead at the end of the pipe to form a water-tight seal and solidify the connection.

For example, food grade applications require that no pits or crevices be present and therefore, the standard CEMA bolted connection is not allowed. Also, in highly corrosive applications such as are present in the pulp & paper and chemical industries, the complete screw assembly must be sealed and shrink fit shafts provide additional protection from the corrosive chemicals.

In addition to the many quantifiable advantages, the torque rating of the shrink-fit shaft-to-pipe connection is stronger than a standard CEMA bolted connection, providing less chance for failure. Prior to shipment, all KWS screws with shrink-fit shafts are straightened to within 0.015-inches TIR at the bearing area of the shafts.

Features

Variety of Applications – KWS shrink-fit shafts are designed for the food processing, chemicals and pulp & paper industries where there is a requirement for no pits or crevices.

Variety of Designs – KWS shrink-fit shafts are designed and constructed for pipe sizes up to 20-inch diameter with shaft sizes as large as 10-inch diameter using stainless, carbon steel, or many special alloys.

Benefits

Elimination of Contamination or Corrosion – In sanitary or corrosive applications, shrink-fit shafts eliminate crevices where mold, mildew or corrosive chemicals can accumulate.



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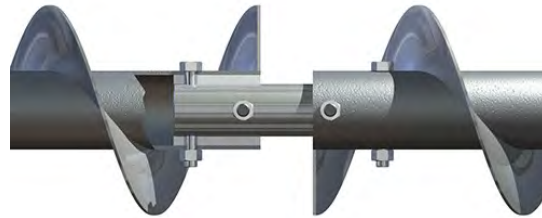
High Torque Applications – KWS shrink-fit shafts are designed to handle high torque loading for difficult applications such as Lime Mud Feed Screws for the pulp & paper industry.



Typical Screw for Pulp & Paper Industry with Shrink-Fit Shafts on Both Ends



Drive Shaft is Permanently Fastened to Center Pipe of Screw



CEMA Standard Screws Utilize Internal Collars and Coupling Bolts



Section View Shows Shrink-Fit Connection



Shafts are Machined to Very Close Tolerances for Shrink Fit



Pipe is Carefully Heated and Shafts Inserted to Specified Depth



**Design
Engineering
Manufacturing**

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Straightening the Screw

Minimal screw deflection and shaft run-out are keys to successful long-term screw conveyor operation. A bent screw can lead to excessive flight wear or damage, excessive shaft run-out and failure of seals, bearings, and drive components.

After welding the flights to the center pipe, screws must be routed back to the shop for straightening. Heat from the welding process introduces stresses and can distort the screw. KWS checks and straightens each screw section to exacting standards.

Features

Dial Indicators – Dial indicators are used to measure the run-out in the bearing area of the shaft.

Total Run-Out – Run-out is a measurement of shaft movement. KWS straightens each screw for a maximum run-out of 0.015-inch T.I.R. at the bearing area.

Process – A combination of heat and mechanical leverage is used to straighten the screw.

Benefits

Extended Life – Having a straight screw will extend the life of the screw by removing excess deflection that can cause extra wear on the flights. Having a straight screw will extend the life of bearings, seals and drive components.

Reduced Stress – Having a straight screw will put less stress on the pipe and shafts reducing potential fatigue fractures and breaks, as well as reducing stress on the bearings, seals, and drive components.

Reduced Vibration – For high-speed applications, the straightening process minimizes screw deflection. The result is smoother running, less vibration, and longer component life.



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KWS Safety Bolt Has Special Head That Requires Special Tool for Removal

Safety Bolts

Safety is a primary concern for all employers, especially in manufacturing facilities. Bulk material handling equipment with rotating components present risk of injury to workers. Every person working in a manufacturing environment must be trained in safe practices by their employer. Even with safety training, there is still a chance for an accident to occur. KWS provides solutions to minimize risk of injury with the use of safety bolts for conveyor covers.

With over 45 years' experience in the bulk material handling industry, KWS is at the forefront of safe equipment design. KWS safety bolts satisfy the requirements of both OSHA and MSHA (Mine Safety & Health Administration). While standard cover bolts require a tool to remove, KWS safety bolts require a specific tool for access by only trained maintenance personnel.

Features

Variety of Construction Materials: KWS safety bolts are provided in either zinc plated carbon steel or 18-8 stainless steel.

Universal Implementation: Screw clamps are a common method of fixing a conveyor cover in place but allow for the cover to be easily removed. KWS provides safety bolts even on assembled conveyors utilizing screw clamps.

Benefits

Efficient Installation: Two KWS safety bolts are installed on every cover in opposite corners to prevent access to moving components. Locating the safety bolts on opposite corners maximizes the safety benefit without delaying access to the equipment by trained maintenance personnel.

Safe Operation: KWS safety bolts require a specific tool for removal, restricting access to only trained maintenance personnel. KWS ships the special tools with each assembled conveyor, enclosed in a packet with additional safety and operation information.



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KWS Special Tool is Required to Properly Remove Covers



Bolted Covers Restrict Access to Only Qualified Maintenance Personnel

Application

Duffle Top Bulk Bag (Super Sack) loading frame

Design

Constructed of a heavy-duty structural steel frame, and a stainless steel two-piece fill spout. The BagPak 2100-ST bulk bag filler offers dust-controlled filling of spout top bags up to 4,400#. The air expanded natural rubber boot seals the bag spout to the filling machine during the filling cycle, providing dust tight filling. Other features include FormPak's exclusive one-man "easy adjust" holder arms and independently adjustable fill head for quick bag size change

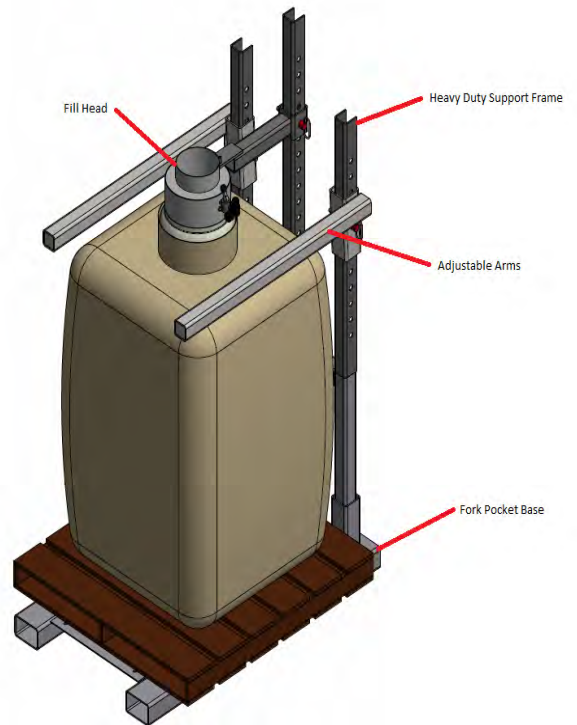
This equipment conforms to ASME standards regarding structural design and operator safety.

Controller: (see separate data sheet)

Standard design includes an Allen-Bradley On/Off switch in NEMA 12 J-box. When densification option is added.

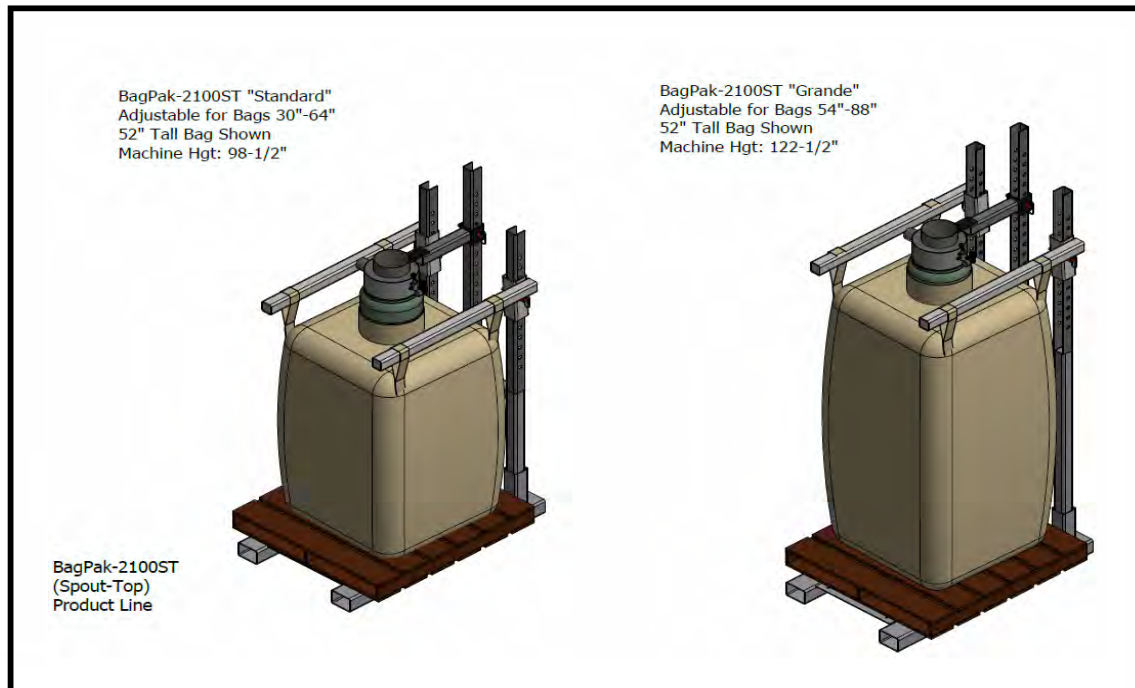
BagShaker Vibrator: (see separate data sheet)

1,500# Max Force, 0-100% adjustable force eccentrics, 1 HP, motor speed 1,800 RPM, TENV



CUSTOM - CONFIGURATION

Items below are custom designed around application requirements



**ENGINEERING REPORT
APPENDIX E**

BIOSOLIDS BENCH TEST COMPOSITION DATA

SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

Account #: 1050509-1/1-10865
Group: May21C #56
Reporting Date: June 4, 2021

Element Carbon Hudson Ventures, LLC
20 Riviera Lane
Sunrise Beach, MO 65079
Attn: Bryce Meeker

Date Received: 21 May. 21
Sample Identification: Zion Dried Biosolids
Sample ID #: 1050509 - 1/1

Nutrients-Primary + Secondary	Units	Wet wt. Basis	Dry wt. Basis	TMECC Method
Total Nitrogen:	%	5.5	5.8	4.02-D
Ammonia (NH ₄ -N):	mg/kg	730	760	4.02-C
Nitrate (NO ₃ -N):	mg/kg	7.2	7.6	4.02-B
Organic Nitrogen (Org.-N):	%	5.4	5.7	Calc.
Phosphorus (as P ₂ O ₅):	%	4.3	4.5	Calc.
Phosphorus (P):	mg/kg	19000	20000	4.03-A
Potassium (as K ₂ O):	%	0.49	0.52	Calc.
Potassium (K):	mg/kg	4100	4300	4.04-A
Calcium (Ca):	%	1.6	1.7	4.05
Magnesium (Mg):	%	0.47	0.49	4.05
Sulfate (SO ₄):	mg/kg	220	230	4.12-D/IC
Nutrients - Trace elements				
Copper (Cu):	mg/kg	230	240	4.05-Cu
Zinc (Zn):	mg/kg	380	400	4.05-Zn
Iron (Fe):	mg/kg	7500	7900	4.05-Fe
Manganese (Mn):	mg/kg	400	420	4.05-Mn
Boron (B):	mg/kg	7.9	8.3	4.05-B
Salts, pH, Bulk Density, Carbonates				
Sodium (Na):	%	0.11	0.11	4.05-Na
Chloride (Cl):	%	0.064	0.067	04.05/IC
pH Value:	units	5.86	NA	04.11-A
Electrical Conductivity (EC5 dw):	mmhos/cm	NA	3.3	04.10-A
Bulk Density :	lb/cu ft	42	40	SCL
Carbonates (as CaCO ₃) :	lb/ton	9.9	10	04.08-A
Organic Matter:	%	80.5	84.2	05.07-A
Organic Carbon:	%	43	45	4.01
Ash:	%	15.1	15.8	3.02
C/N Ratio	ratio	7.76	7.76	calc.
Moisture:	%	4.36	0	3.09
AgIndex	ratio	> 10	> 10	SCL

To Calculate lbs/ton: (%Nutrient) x (20)
To Calculate lbs/ton: (mg/kg Nutrient/10,000) x (20)
To Calculate lbs/cu yd: (%Nutrient/100) x B.D. x 27
To Calculate lbs/cu yd: (mg/kgNutrient/1,000,000) x B.D. x 27

Analyst: Assaf Sadeh



SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
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Account #: 1050509-1/1-10865
Group: May21C #56
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Element Carbon Hudson Ventures, LLC
20 Riviera Lane
Sunrise Beach, MO 65079
Attn: Bryce Meeker

Date Received: 21 May. 21
Sample Identification: Zion Dried Biosolids
Sample ID #: 1050509 - 1/1

Metals

Metals		Results	Units	MDL	% Recovery	Date Tested
Arsenic (As):		8.3	mg/kg dw	1.0	85.8	27 May. 21
Cadmium (Cd):	Less than	1.0	mg/kg dw	1.0	87.3	27 May. 21
Chromium (Cr):		12	mg/kg dw	1.0	82.7	27 May. 21
Copper (Cu):		240	mg/kg dw	1.0	79.6	27 May. 21
Lead (Pb):		11	mg/kg dw	1.0	91.3	27 May. 21
Mercury (Hg):	Less than	1.0	mg/kg dw	1.0	83.5	27 May. 21
Molybdenum (Mo):		7.7	mg/kg dw	1.0	82.2	27 May. 21
Nickel (Ni):		15	mg/kg dw	1.0	83.0	27 May. 21
Selenium (Se):		2.8	mg/kg dw	1.0	87.5	27 May. 21
Zinc (Zn):		400	mg/kg dw	1.0	80.8	27 May. 21
Cobalt (Co)		2.1	mg/kg dw	0.50	83.1	27 May. 21
Total Solids (TMECC 03.09)		96	%	0.05	NA	21 Jul. 21

Pollutant Loading Rate:

Multiply mg/kg dry weight values times 0.0956 to give you kilograms pollutant per 100 metric ton compost as-received based on a moisture content of 4.36 percent.

Method (metals): EPA 3050B / EPA 6010
Method (metals): TMECC 04.12-B / 04.14-A
Method (Mercury Hg) TMECC 04.06 / EPA 7471
Method (Fecal Coliform): Standard Methods 9221E
Method (Salmonella): TMECC 07.02-A

Analyst: Assaf Sadeh

