



August 26, 2022

Board of Selectmen (via email)
Town of Warner
5 East Main Street, P.O. Box 265
Warner, NH 03278

**RE: Town of Warner Transfer Station Evaluation
CMA #1255**

Dear Board:

CMA Engineers is pleased to present this letter report and supporting documents as our evaluation of the Town of Warner Transfer Station. The Town's primary objective with this evaluation is to consider whether a second compactor is warranted as they occasionally need to send out partially full cans at the end of the week in order to have an empty can for the weekend rush. A second compactor will also provide redundancy in the event one of the compactors needs to be taken offline for maintenance or repair. The Town does not swap full cans with their own forces. The Town is also interested in improving overall site efficiencies, waste reduction, and safety. Enclosed as Appendices A, B, and C are figures and cost estimates for the three improvement alternatives developed for the study. The options and budgets presented herein are not intended to be stand-alone and the Town may choose to add or remove components from multiple layouts to achieve the final desired configuration. The options considered in this report include:

- Appendix A – Low-cost alternative which considers leaving the compactor in its current location and making minor enhancements to improve container layout and traffic flow. This alternative depicts a preferred location for a second compactor under this option.
- Appendix B – This layout provides two new compactors at a location that is more practical for municipal solid waste (MSW) management, drop-off of recyclables through window openings in the recycling building, and other improvements.
- Appendix C – Constructing a new larger transfer station and recycling facility that would meet current and future requirements while also allowing for capacity to accept MSW and recyclables from surrounding communities.

In addition, this report also presents discussion of compost area improvements, waste reduction opportunities, and consideration of enhancements to other areas of the site.

We appreciate the opportunity to assist the Town of Warner with this evaluation.

Background

The Town of Warner Transfer Station is located on the north side of Route 103 and to the west of Exit 9 off Interstate 89. The majority of the Town brings their trash and household recyclables to the facility, which is open to the public five days per week (Saturday, Sunday, Tuesday, Wednesday, and Thursday). The transfer station is only open to Town residents and does not accept waste and recyclables from commercial entities. The Town does not currently charge fees for any materials at the facility. The Town of Warner is a residential community of 3,000 year-round residents with a small-town center approximately 1.5 miles to the east of the Transfer Station.

Also utilizing the same driveway off Route 103 is an NHDOT Highway Garage and the Town of Warner Highway Garage. We understand that these facilities do not interfere with operations of the transfer station.

According to the 2021 Annual Facility Report for the Town, Warner generated approximately 1,000 tons of MSW including bulky waste and construction and demolition (C&D) waste, and approximately 250 tons of source separated recyclables including plastics, paper, cardboard, metals, and aluminum. In addition to these materials, the Town manages glass, yard waste, electronic wastes, propane tanks, white goods, fluorescent bulbs, batteries, used oil, and wood ash at the facility.

The Town also manages a swap shop adjacent to the source separated recycling area. The swap shop is fully outdoors and staff periodically review materials in the area and dispose of items that do not appear reusable. Swap shop materials are moved inside the recycling building prior to rain events. Town staff report that managing the swap shop requires significant effort but is an important part of their program and popular with residents. Any future plans for the facility need to include the swap shop. In addition to being a high labor program, the area also appears to be impacting traffic flow and safety.

MSW is deposited by residents in the compactor hopper near the entrance to the site, which can be accessed on two sides. The facility office is located just behind the compactor, which is also utilized as a location to direct transfer station users. There are no dedicated parking spaces for the MSW compactor as it is currently configured as a drive-through feature.

The main recycling building is a 75 foot by 40-foot wooden structure which houses two vertical balers that are used for plastics (HDPE and PET) and a horizontal baler that is used for cardboard, mixed paper, and aluminum. Bales are stored throughout the facility at the following locations:

- Aluminum bales – outdoors, western storage area
- Plastics – building addition behind the main recycle building
- Cardboard and mixed paper – main recycling building

In prior years, residents would drop off recyclables inside the building. However, due to COVID-19 concerns the Town has set up outdoor drop-off areas immediately following the compactor and office. This “train” configuration results in delays during busy periods when users are not efficient when depositing MSW and recyclables while other users need to wait in line. The Transfer Station utilizes dedicated parking spaces for the recycling drop-off area and there appears to be several areas of the site where dangerous pedestrian and vehicle interactions are taking place.

CMA Engineers met with Mr. Varick Proper, transfer station foreman, in October 2021 and again in August 2022 to tour the facility to help gain a better understanding of the site's challenges. The transfer station was open during both visits which occurred on a Wednesday and a Saturday, respectively. The facility is typically busiest on Saturday and Sunday and the August 2022 site visit was conducted on a Saturday morning for the first hour of operations to review traffic conditions. Residents that were present during the visit did not appear to have difficulty using the facility, but it is apparent that delays will exist during busier times. There was one instance where there were two cars at one side of the MSW dropoff for approximately 30 seconds during the one-hour site visit. There appeared to be sufficient parking spaces for the recycling operation as no backups were reported. Town staff also reports that there is a second busy period at the end of the day when residents are rushing to use the facility prior to close.

MSW is compacted into a 40 cubic yard container, with loads typically between 8 and 14 tons. The facility needs to swap containers up to two times per week. We understand that the Town would like to add a second compactor to provide additional capacity during busy periods and to operate as a backup. We also understand that the Town may be amenable to relocating the compactor to a location that will provide for improved access and safety. Recyclables are currently shuttled from the outdoor storage carts using a skid steer to inside the recycling building to be baled. These containers sometimes need to be shuttered during operating hours, which is done during less busy periods to limit interactions between residents and equipment.

Metals and construction and demolition (C&D) debris are deposited by residents in roll-off containers staged along 3-foot-tall concrete block walls to the south of the recycling building. Town staff reports that a resident recently slipped and got their foot trapped between the container and wall and sustained facial injuries from the container. We recommend adding OSHA-height (42") railings along the wall to protect residents. The railings can be designed so that they can be temporarily removed to allow for residents to deposit heavier items with assistance from Town staff.

Similar block retaining walls are sited to the north of the recycling building that are currently being utilized for semi-trailer storage which are currently holding loose aluminum cans and bales. We understand that the trailers are not a preferred method for bale storage as the forklifts used by the Town often damage the trailer interiors.

Adjacent and to the north of these trailers, the Town manages white goods such as old refrigerators and air conditioners, and electronic waste in an enclosed container. To the west of the main transfer station area, the Town manages yard waste including leaves, grass clippings, and brush. Brush is hauled off site and processed by Town personnel at a different location. The leaf and yard waste are processed into compost on-site for Town use, with surplus compost provided to residents at no cost. Farther to the west, the Town operates a wood share program for residents in need of fuel assistance. This area is not managed by transfer station staff, but they monitor it, and it does not add significant traffic for the facility. The Town also stores large aluminum items (including doors), glass, inert construction debris (including bricks and concrete), and aluminum bales in this area. The Town crushes the glass on site, and it is sent to a second location in Town for further processing into processed glass aggregate (PGA). Residents are not permitted in the western storage area.

Traffic flow is in a counterclockwise direction in the following drop-off location order:

- MSW
- Bulk Metals and C&D waste
- Household Recyclables
- White goods and electronic waste
- Leaf, yard waste & brush

Based on our review of the transfer station, solid waste operations appear to be well managed, clean, and well maintained. However, the facility and site constraints result in inefficient operations, poor traffic flow, and several locations for pedestrian/vehicle interaction. Significant traffic backups during busy times were described, which is consistent with observed site constraints but not specifically observed during each of our site visits. Access to the compactor and recycling areas results in poor traffic patterns that can result in potentially dangerous conditions with residents crossing traffic. A properly functioning solid waste facility should minimize hazards, be user friendly from the customer's perspective, and be efficient from the operator's perspective. Despite the operator's best efforts, the existing facility is not currently meeting these goals.

CMA Engineers presents for the Town's consideration three options to improve facilities and operations at the transfer station that take into consideration:

- Safety improvements
- Operational efficiencies
- User enhancements
- Cost

A conceptual site plan and cost estimate for each improvement option considered as part of this evaluation are provided in Appendices A through C and described in further detail below. Concepts were developed using aerial photography and LIDAR topography.

Low-Cost Option

The low-cost alternative layout, as presented in Appendix A, considers traffic flow improvements to enhance facility safety and user efficiency. The current facility layout has several locations where pedestrian/vehicle conflicts can occur, primarily around the facility's single compactor which is located in the center of the site and is the first stop for most residents using the facility. Residents access the compactor from two lanes as a "drive-through" facility. Traffic queues behind the compactor as residents wait for users to deposit their refuse, increasing overall time that residents spend at the facility. Residents then park in a designated area immediately to the north of the compactor to deposit recyclables in bins in front of the transfer station building or utilize the swap shop which is sited immediately prior to the recycling bins. We understand that the Town intends to continue utilizing the outdoor bins long term as they prefer to keep residents out of the building.

The parking area was originally designed to consist of 11 spots in two lanes with travel ways between each. The current configuration removes 4 spots to accommodate recycling containers and the swap shop. Opportunities for distractions in this area are high as drivers are focused on looking for parking spaces and pedestrians are often carrying multiple recycling containers across a travel way or rummaging through items in the swap shop.

This option removes the “drive-through” component of the compactor access. The facility would be re-stripped to remove resident access to the compactor on the west side, which would now be the dedicated facility driveway. Residents would park in designated spaces along the building and deliver refuse to the compactor at the east opening via a designated walkway (depicted in red) between the parking spaces and the recycling building. Parking spaces are shown against the outdoor recycling bins but should be moved closer to the building if the Town decides to move recycling back indoors at a later date. A handicap space would be provided closest to the compactor. The swap shop area has been relocated to the north side of the site. These minor revisions should eliminate most of the pedestrian traffic conflicts and improve overall efficiencies of the facility as residents would no longer need to wait in the queuing line.

Parking spaces are oriented such that residents can back into the spaces with their trunks closer to the recycling drop-off area. We have found that this is safer as residents are further removed from vehicle traffic.

The only costs associated with this option are driveway partitions to separate metals/C&D traffic from the MSW/recycling area and removal of the existing pavement markings and restriping the lot. This work should be accomplished for under \$10,000. A \$100,000 budget for a new pre-fabricated garage style structure for a new swap shop can be assumed if that’s a feature that the Town is interested in. This would include site work/prep, slab, electrical/lighting, and a 24x24 prefabricated metal structure.

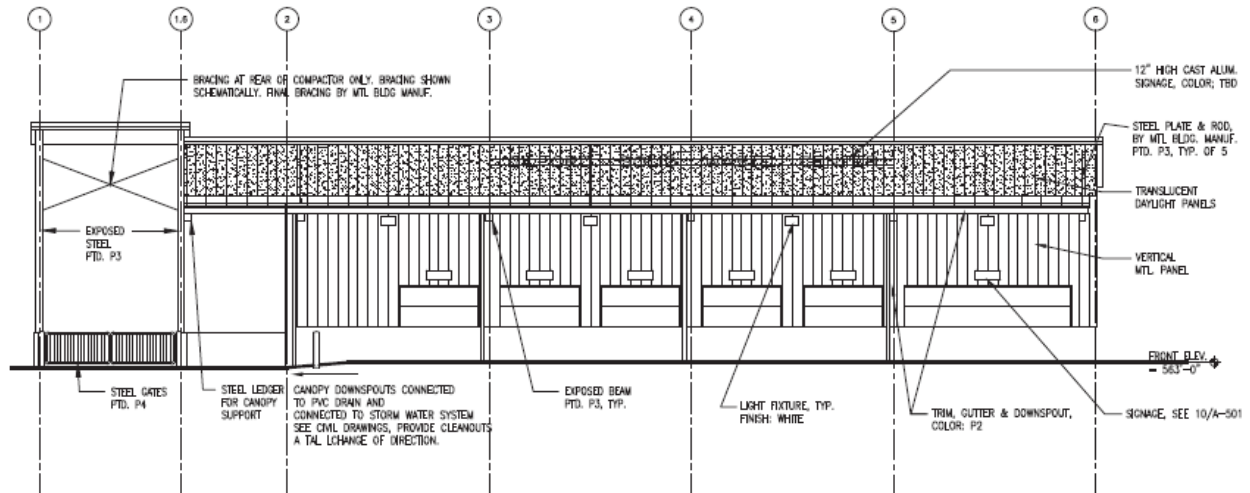
Low-Cost Option for New Compactor

If the Town wishes to add a second compactor with the current configuration, we would recommend adding to the east side of the existing compactor and staggered them such that access is maintained to both compactors. The figure in Appendix A depicts this conceptual layout. Adding a second compactor in this manner could likely be done for between \$70,000 and \$400,000 depending on whether the new compactor would be above-grade equipment or have a similar down ramp to match existing with significant concrete work and grading. The benefit to the below-grade option would allow residents the option to deposit waste at grade compared to needing to lift the waste to get it inside the compactor hopper.

New Compactor Option

The new compactor option is the mid-range alternative presented in this report and considers demolishing the current compactor and associated retaining walls and installing two new compactors at a new location. A conceptual layout and cost estimate for this option is presented in Appendix B.

Similar to the low-cost option, the new compactor option aims to minimize conflicts between pedestrians and vehicles and utilizes pull-in parking spaces versus diagonal spaces. This alternative considers the option of retrofitting the transfer station building with windows along the front face for residents to drop recyclables directly into the building without the need to enter the building. We note that there are several potential safety hazards associated with having residents enter the building including coming in contact with equipment and wastes and potentially interfering with facility operations. An example of how the drop-off window may look is depicted in the image below.



The new MSW compactors are proposed to be sited at the eastern block retaining walls where the Town currently manages metals and construction debris in open-top containers. We would propose that new waste block-style walls be constructed to the east of the bunker block wall area, where there appears to be sufficient grade to allow for the two metals containers that had previously been sited in the proposed compactor location.

The Appendix B figure also depicts an alternative above-grade compactor location along the outbound access road, which was taken from a conceptual layout prepared by Varick Proper. This configuration creates a new drive-through type drop-off operation that would alternate between the two compactors as one may be full or down for maintenance. This version of a drive-through compactor scenario is an improvement over existing conditions in that there would always be at least one by-pass lane for residents that do not have MSW to exit the facility without having to wait in line.

We understand that the Town has been working with Todd Hager of Atlantic Recycling Equipment and has received cost estimates for new compactors. We have worked with Mr. Hager to develop the compactor components of the report's layouts and estimates.

CMA Engineers estimates that the new compactor option could be constructed between \$300,000 and \$500,000.

New Building Option

The final option considers the addition of a new transfer station building to accept and process MSW and source separated recyclables from residents. The facility would also include a high-production horizontal baler. CMA Engineers has extensive experience in the design and permitting of these types of buildings, most recently the Derry Transfer Station in 2015 and the Gilford Transfer Station in 2018. A conceptual site layout and cost estimate are presented in Appendix C.

We understand that if a new building would be provided that it would be utilized to serve Warner and surrounding communities in a Cooperative-type arrangement. Since the new building would be proposed to manage both source separated recyclables and MSW, we would propose that a building with two separate tipping floors be provided, with the ability to load 100 CY transfer trailers similar to the Derry facility. A centralized trailer loading bay would allow the opportunity for the Town to load single stream recyclables in the event that market becomes favorable in the future. The existing building would continue to be used during construction of the new facility and could be used for bale storage and a swap shop post construction.

The new-building option figure depicts the building on the north side of the site, where the necessary grade differential exists. We envision a building that would be at a higher elevation at the residential drop-off at the front side of the building. Recyclables would be dropped from openings in the building at OSHA height (42 inches) to a concrete slab typically 6-feet below grade. Recyclables are separated inside the building by movable concrete walls. When sufficient quantities are available to make a bale, recyclables are transferred from their storage area into a horizontal baler.

MSW would be managed separate from the recycling area and would accept loads from smaller waste vehicles (sizes ranging up to MSW packers) and consolidated into 100 cubic yard transfer trailers at an elevation approximately 10 feet below the MSW tipping floor. MSW is compacted against 10-foot-high push walls inside the building before being deposited in the transfer trailer with a loader. Note that there would be a 3.5-foot (OSHA height) push wall between the MSW tipping floor and the trailer loading bay to get to the 13-foot height of the transfer trailer. This option would eliminate the need for compactors. The 100 CY transfer trailers also provide additional MSW capacity when compared to the 40 CY compactor boxes that the Town currently utilizes.

Sizing of the building is primarily determined by vehicle turning motions inside the building. Material processed through the building is determined by efficiency of recycling baling and loading of MSW into transfer trailers.

The rear of the building would require several retaining walls to provide access at different elevations. The lowest elevation of the building would be the transfer trailer bay, which could be centrally located between the MSW and recycling areas of the building such that it could be accessed from both areas. Assuming a base elevation of 0, we anticipate the following building levels:

- Elevation 0 – Transfer trailer bay
- Elevation 1.5 – Recycling area semi-truck loading dock pavement elevation
- Elevation 5.5 – Recycling area floor and at-grade access
- Elevation 9.5 – MSW tipping floor with at-grade access
- Elevation 15.5 – Residential access (front of building)

The new transfer station building would separate residential and commercial traffic by routing residents to the front of the building and MSW and recycling truck traffic to the rear of the building. The new building would create some challenges for siting existing storage areas such as metals and C&D wastes as the site would be more constrained. We did not grade the site due to its complexity and the preliminary nature of this evaluation. Site grading would be completed during the final design process which may present additional challenges and potential costs including new retaining walls or steep slopes.

The building depicted in the Appendix C site plan is shown 25 feet from the northern property line. The Town Zoning regulations stipulate that buildings must have at least a 50-foot property line setback in the Open Conservation District (OC-1), which the facility is located.

While the building depicted in the figure could be utilized to process single stream recyclables at a later date, we understand that the Town would like to continue with their source separated recycling program. We note that a smaller cost-effective building could be designed that would manage single stream recyclables and MSW on the same tipping floor (at separate corners of the building) and loaded into a 100 CY transfer trailer at a lower elevation. We estimate that this building and associated sitework could be constructed for around \$4 million.

Stormwater

Stormwater is managed in a low, vegetated area in the center of the transfer station loop. A concrete culvert at the low point of the area conveys stormwater under the transfer station to the northern woods line. The pipe is approximately 150 feet long. Options 1 and 2 would not necessitate stormwater upgrades as transfer station improvements would be mostly over previously developed areas. New stormwater infrastructure, potentially including stormwater swales and a pond would be designed to manage runoff from the new building and associated pavement. We would also recommend evaluating runoff from other areas of the site – primarily from the compost operation if those functions are expanded and whether the new stormwater facilities can incorporate these areas. We do not anticipate that the new building option will trigger NHDES-Alteration of Terrain (AoT) permit requirements, which begin at 100,000 square feet of disturbance. The AoT permitting process would include specific requirements for management and treatment of stormwater. Absent these requirements, we would recommend a new stormwater detention pond to provide flow attenuation and sedimentation.

This proposed new building layout did not evaluate if wetlands are present in the project footprint. Upon visual inspection, the area appears dry but we note that surface water levels are lower in the summer making wetland areas less apparent. Some of the options presented in this evaluation include taking up areas of the center vegetated area/pond, where it is not clear if there are wetlands present. A determination of the presence of wetlands would be made by a certified wetland scientist. If present in the project area, the new building would require an NHDES wetlands permit.

Waste Reduction Concepts

The NHDES Waste Management Division has recently issued a draft update to their Solid Waste Management Plan dated August 2022. Draft comments on the plan were to be received by August 26, 2022. The plan outlines the State of New Hampshire solid waste goals and is generally consistent with the goals of the previous plan, last updated in 2003. One of the primary objectives of the plan is to establish solid waste management goals and the draft plan proposes to reduce the state's quantities of MSW and construction and demolition (C&D) waste by 25% by 2030 and 45% by 2050. The State has created a waste management hierarchy, from most preferred to least preferred as follows:

- Source reduction
- Recycling and reuse
- Composting
- Waste to Energy
- Incineration (no energy recovery)
- Landfilling

Section 6 of the Town's Solid Waste Ordinance makes recycling mandatory for the Town. We understand that the Town's MSW goes to the Penacook waste-to-energy facility.

The Town desires to maximize the quantity of materials that can be removed from the MSW stream. According to the Town's 2021 Annual Facility Report, the Town has a recycling rate of 19% calculated as the total recyclables received (236.73 tons) divided by the total waste and recyclables (1,261.39 tons). The Draft 2022 NHDES Solid Waste Management Plan reports that the State's average municipal recycling rate is estimated to be 26% based on 2020 numbers. The 2020 AFR for Warner reports a similar recycling rate as the 2021 data at 21% with similar quantities.

The US Environmental Protection Agency (EPA) reported in 2018 that the major components of MSW disposed in landfills nationwide are:

- Food waste (24.14%)
- Plastics (18.46%)
- Paper and paperboard (11.78%)
- Metals (8.32%)
- Textiles (7.73%)

The Town transfer station segregates all of the materials in EPA's MSW component list except food waste and textiles but we understand that there are textile drop-off locations in Town. We recommend adding a bin at the transfer station. The Town's recycling rate increases as recyclables from the MSW are diverted.

Source Reduction

The State's most preferred waste management method is source reduction. Source reduction can be achieved through education programs targeted at residents and businesses. Reducing the amount of packaging and single use items is an effective way to reduce waste.

Educational Programs

Educational programs can include flyers, posters at the transfer station, online resources, and presentations/development of programs at schools and Town offices. Educational programs may also be offered to transfer station operators to develop inspection skills. Programs include the NHDES Solid Waste Operator Training program and programs offered by the New Hampshire Municipal Association and the Northeast Resource Recovery Association (NRRRA).

Organics

The Town does not currently segregate organic waste (food waste) from the MSW stream. Most municipalities in New Hampshire do not separately manage organics at their transfer stations, although there are some companies which provide for collection and management of organic waste which is commonly used as a component of compost. We have provided a separate discussion in this evaluation for potential modification to the Town's compost program that includes the inclusion of food waste. Residents may be interested in town-supplied residential compost bins which would allow for residents to manage their own organic waste at their residence.

Pay-as-You-Throw

Many municipalities in New Hampshire have implemented pay-as-you-throw programs which charge residents a fee for a town-supplied trash bag or sticker to affix to their own trash bag and allowing for drop-off of recyclables for free. The concept is that residents would choose to not fill bags with items that can be recycled for free, and therefore be more motivated to recycle. Oftentimes, transfer station will periodically open bags to check for recyclables and inform residents of the municipal recycling policy.

Single Stream Recycling

Many municipalities in New Hampshire have implemented a single stream recycling program. Single stream recycling allows for co-mingling of several types of recyclables into one container for ease of use. Single stream recycling is popular in high-density residential and commercial areas where municipalities provide curbside collection. Recycling rates with single stream recycling programs increase when switching from source separated programs like Warner's since it's easier and doesn't require residents to separate the different types of recyclables. Residents would also require less time at the transfer station to drop-off single stream recyclables since they are being collected at a single point, typically a compactor, as opposed to several locations for source separated recyclables. There's an argument that less staff is needed when a transfer station manages its recyclables as single stream since segregated materials have to be baled and residents require more assistance with where to deposit their separated recyclables.

The revenue generated by single stream recyclables is significantly less than processed source separated recyclables due to the cost of segregating the recyclables at a materials recovery facility (MRF) and decreases in revenue associated with selling a lower quality product with a higher level of contaminants. According to the NRRRA, as of August 2022, single stream recyclables are being accepted at MRFs in Massachusetts at a cost tipping fee of \$80 to \$125/ton. If there's no glass in the material, the MRFs commonly take off \$5/ton. This pricing is in-line with trash tipping fees. Hauling costs for single stream recyclables are also higher than MSW as the compaction rates are lower and MRFs are generally farther away than landfills. There is currently no MRF in New Hampshire – the closest are in Massachusetts and Portland, ME.

For comparison purposes, source separated recyclables are generating net profits according to NRRRA. August 2022 pricing is presented below:

- Cardboard (\$115 to \$120/ton baled)
- Mixed paper (-\$40/ton to \$0/ton loose, -\$20/ton to \$0/ton baled)
- Newspaper (\$210/ton loose, \$120/ton to \$235/ton baled)
- Sorted office paper (\$260/ton loose, \$290/ton baled)
- Glass (-\$40/ton)
- #1 PET plastics, baled (\$0.035/lb to \$0.10/lb)
- #2 HDPE plastics, clear, baled (\$0.35/lb to \$0.36/lb)
- #2 HDPE plastics, mixed color, baled (\$0.10/lb to \$0.12/lb)
- #1 through #7 plastics, mixed, baled (\$0.05/lb to \$0.08/lb)
- Scrap metal, loose or baled (\$75 to \$85/ton)
- Steel Cans (\$45/ton to \$60/ton loose, \$55/ton to \$60/ton baled, \$133/ton baled for full trailer loads)
- Aluminum cans (\$0.28/lb to \$0.55/lb loose, \$0.37 to \$0.63/ton baled)

We recommend that the Town continue managing recyclables as source separated.

Composting Improvements

We understand that the Town would like to consider opportunities to improve the quality of their compost, including options that would incorporate food waste. Currently the Town collects leaf and yard waste in an area that is approximately 4,000 square feet. Material from this area is moved periodically to a single compost row with approximate dimensions of 70' by 12'. The Town periodically turns the compost row to introduce air which helps to further break the compost down.

In general, the optimal compost recipe consists of 50% organics such as food waste and manures and 50% carbon materials such as leaves, grass, and small brush. Any contaminants such as plastics and metal items are removed and disposed or recycled as necessary. Commercial compost firms will grind and blend input materials at the approximate 50/50 ratio prior to placement into windrows. The compost needs to be turned periodically in order to introduce air to the materials, which aids the decomposition process. Air introduction can be enhanced by adding supplied air through the bottom of the piles. This is typically done with a ½ HP blower motor that pushes air through perforated PVC pipes. This aeration is completed in concert with windrow turning. Temperature also needs to be monitored and windrow covers may need to be incorporated to retain and manage heat.

By adding additional materials to the Town's compost program, the area that the Town utilized for composting would need to increase. In concept, if the Town wishes to blend compost at the 50/50 ratio described above, they would need to double the area necessary to compost. There may be sufficient space within the compost area with some clearing and grading.

Adding organic waste to the compost stream adds challenges such as managing odors and vectors. Leachate (compost juice) also needs to be managed, commonly by incorporating back into the piles. Higher quality compost can be generated if the windrows are managed under a roof, which creates a more climate-controlled environment and allows for controlled water inputs for optimal moisture control. Since a Town program would be fully outdoors, water input from rain events would need to be carefully monitored.

If the Town is interested in pursuing adding organics to their program, we recommend that they reach out to a local commercial organics operator for assistance with starting and managing a program. Over time and with training we would expect that the Town could fully take over this program, which we anticipate would be labor intensive.

Project Economics

We understand that the Town's primary goal of this evaluation is to review the inefficiency of sending partial MSW loads in order to have an empty 40 CY can for the weekend rush. Varick Proper has provided us with MSW hauling data from 2019 to determine the extent of these inefficiencies. In general, tonnage ranged from 5 to 14 tons. As reported in 2019, the Town was charged a haul fee of \$225/pull, but we understand that costs are now in the \$300/pull range.

In 2019, the Town shipped 49 cans at an average load of 12.8 tons on Monday through Thursday. We assume that those containers were shipped full. We estimate that the Town shipped 30 cans on Friday at a lower rate of 9.7 tons. If those 30 cans could have been shipped full, the total number of trips needed could have been reduced by 7, resulting in an annual savings to the Town of \$2,100. This represents a relatively nominal cost in relation to the costs of the improvements presented in this proposal. We also note that the Town could look into options to swap cans with Town forces to reduce the hauling of partially full containers. Swapping cans using Town forces is practiced at some other similarly sized New Hampshire transfer stations. We understand that there is potentially equipment available at the adjacent highway garage that could be used to swap out full cans for empty ones.

Recommendations

CMA Engineers has reviewed the Town of Warner Transfer Station layout and operations and has summarized our findings in this letter report and enclosed figures and cost estimates. In general, the site is very well run as Mr. Proper is a capable manager of the facility. Our primary concern with the current facility layout is pedestrian safety as there are several locations where pedestrians and vehicles can interact. Secondly, the drive through MSW drop-off at the compactor can create backups as residents need to wait for residents ahead of them to deposit their own waste in the compactor resulting in longer trip times. Our overall recommendations are summarized below:

- The low-cost option should be considered to immediately improve safety and traffic flow at the site
- Evaluate options to swap out full waste cans with Town equipment
- Provide OSHA-height railings at the eastern block retaining wall areas for metals and C&D waste
 - These can be designed so that they can be temporarily removed to deposit heavier items
- A second compactor could be installed to allow the Town the ability to maintain and repair equipment and continue to provide service to residents
 - Minor cost savings can be realized by not shipping full loads
- A larger new building is not warranted unless the Town wants to consider siting a regional facility
- The Town should consider enhancing educational programs in schools and businesses
- The facility should add a textile collection service
- The Town may consider implementing a pay-as-you-throw program to further encourage residents to recycle
- The Town should not consider making a switch to single stream recycling at this time
- The Town may consider working with local composters if desired to enhance their current program
- A program that provides household composters to residents should be considered
- Provide a permanent, covered location for the swap shop that limits traffic flow disruptions
- We do not recommend changing the size of the recycling bins at this time as they are appropriately sized for a skid steer to shuttle from the recycling area into the building

It has been a pleasure to prepare this evaluation of the Town's Transfer Station. If you have questions, comments, or would like to discuss our findings further, please feel free to contact us.

Very truly yours,

CMA ENGINEERS, INC



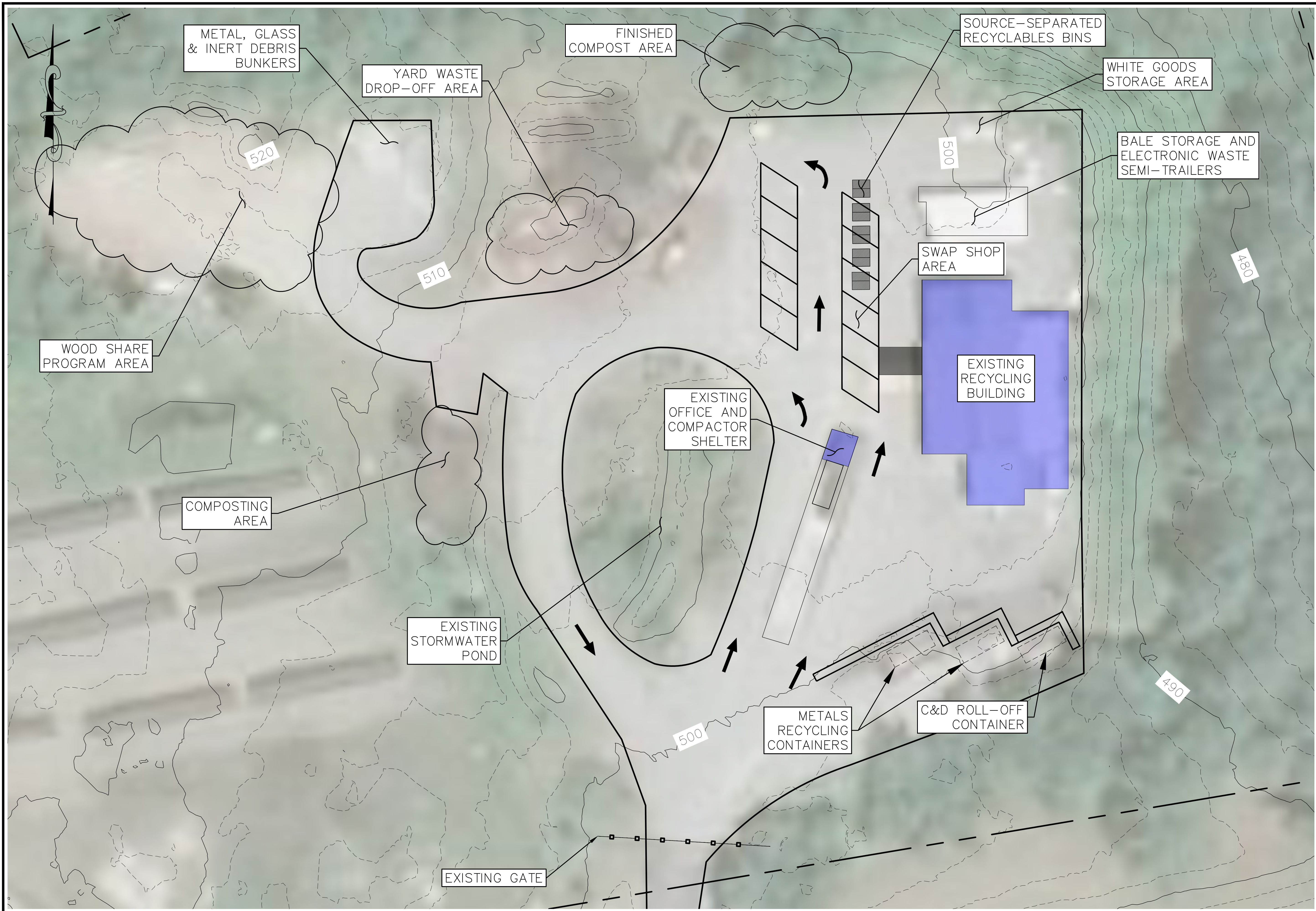
Adam J. Sandahl, P.E., BCEE
Project Manager

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Enclosures:

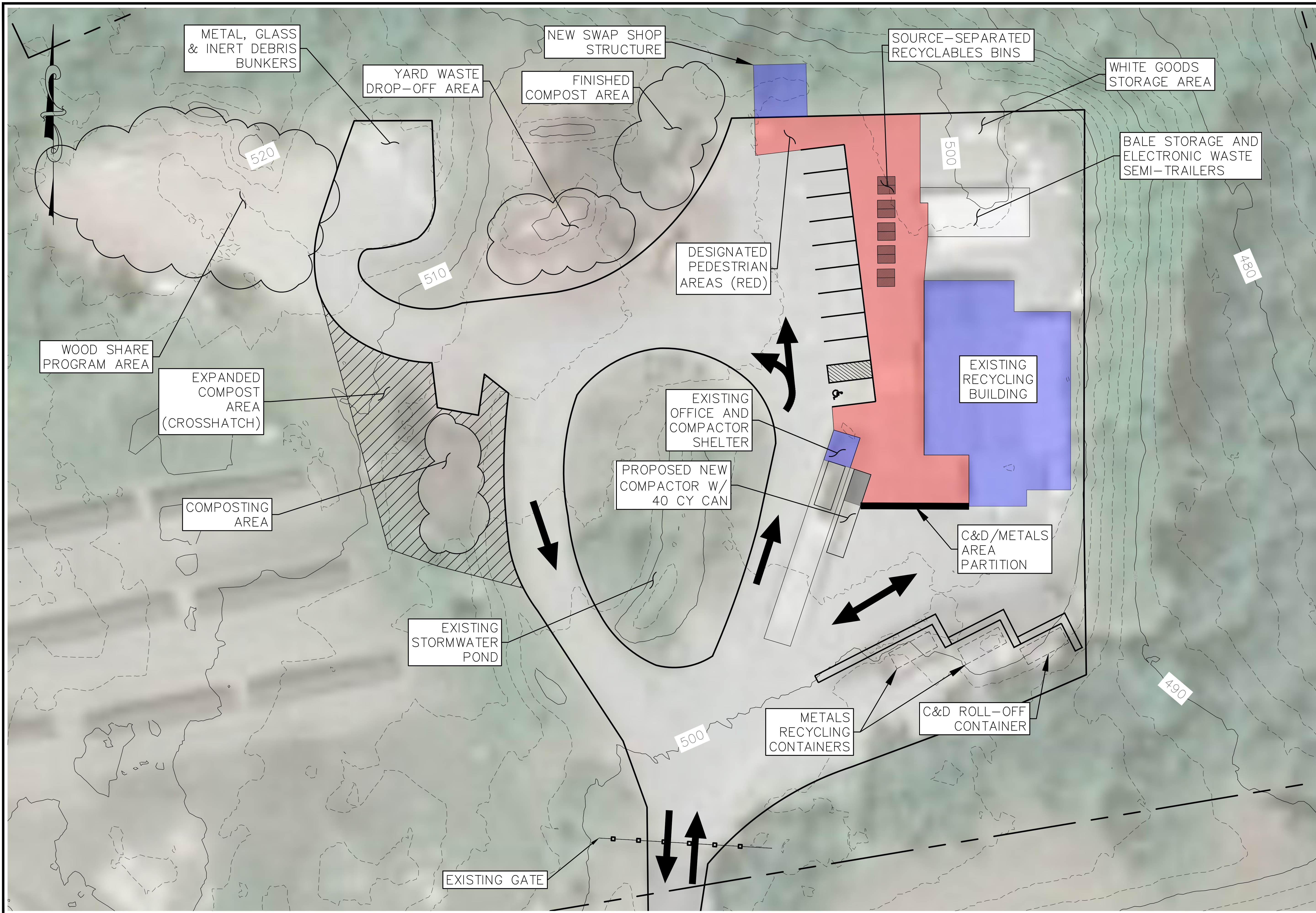
- Figure 1 – Existing Conditions Site Plan*
- Appendix A – Low-Cost Option Figure and Cost Estimate*
- Appendix B – New Compactor Option Figure and Cost Estimate*
- Appendix C – New Building Figure and Cost Estimate*
- Appendix D – Site Photos and Photo Plan*

cc: Varick Proper, Town of Warner (via email)



CMA ENGINEERS CIVIL/ENVIRONMENTAL/STRUCTURAL Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/641-4223 c m a e n g i n e e r s . c o m						
date: August 2022	designed by: ECT	project no: 1255	drawn by: ECT/AMK	checked by: AJS	approved by: AJS	scale: 0 20' 40' Scale: 1" = 20'
Town of Warner, New Hampshire Warner Transfer Station Transfer Station Evaluation			Site Plan Existing Conditions			
drawing no. E-1						sheet: 1 of 4

Appendix A – Low-Cost Option Figure and Cost Estimate



CMA ENGINEERS CIVIL/ENVIRONMENTAL/STRUCTURAL Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/641-4223 c m a e n g i n e e r s . c o m	
date: August 2022 project no: 1255 checked by: AJS	designed by: ECT drawn by: ECT/AMK approved by: AJS
scale: 0' 20' 40' Scale: 1" = 20'	
Town of Warner, New Hampshire Warner Transfer Station Transfer Station Evaluation	
drawing no. Option 1	
sheet: 2 of 4	



Civil/Environmental Engineers
 35 Bow Street
 Portsmouth, NH 03801

File: Warner TS Cost Estimates
 Solid Waste Evaluation - Transfer Station Layouts
 CMA #1255
 August 11, 2022
 By: AJS

Low Cost Option

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price

Site Work

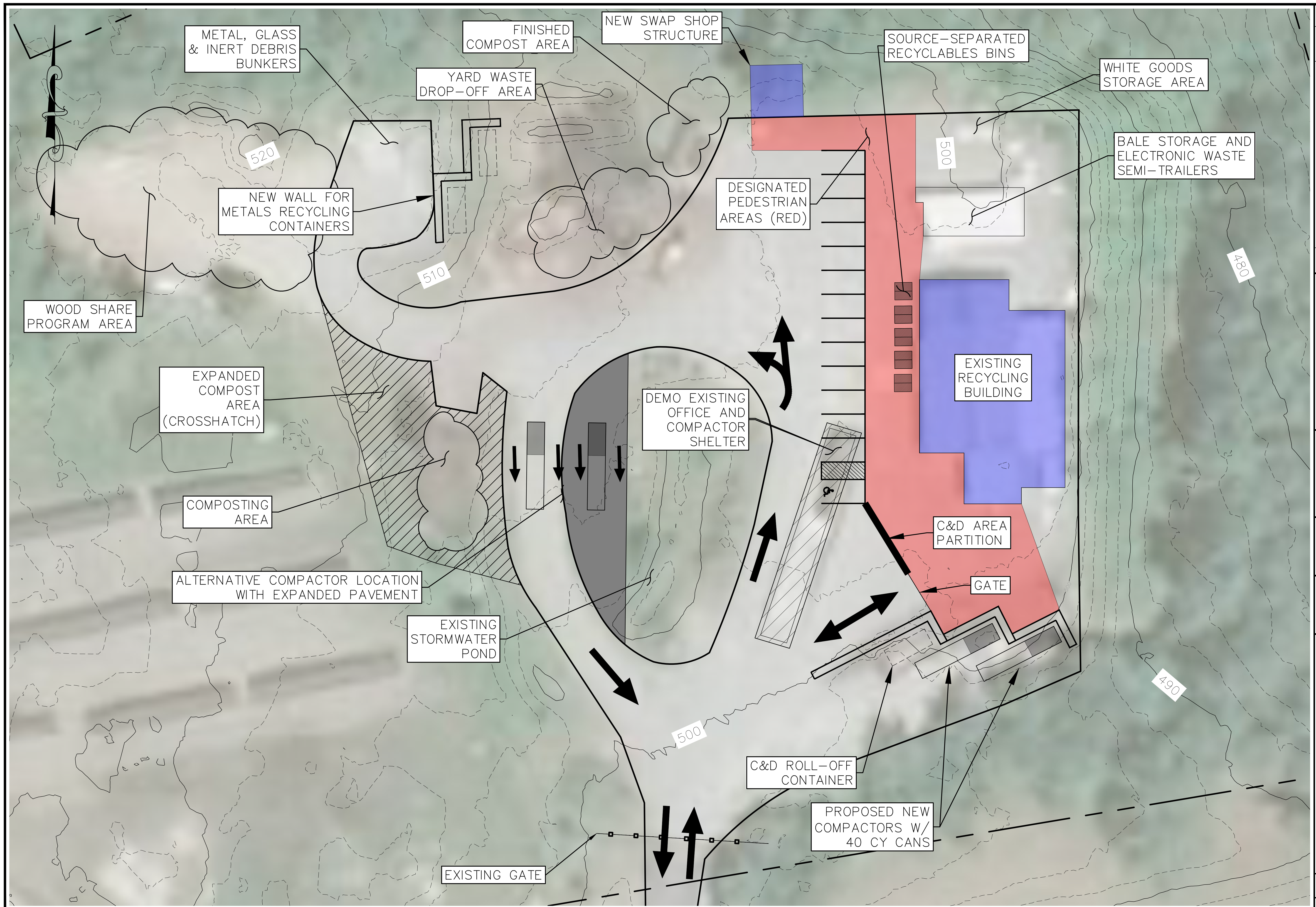
	Striping Removal	LF	2,000	\$ 0.50	\$ 1,000.00
	Lot Striping	LF	2,000	\$ 0.20	\$ 400.00
	Driveway Partitions	LS	1	\$ 5,000.00	\$ 5,000.00
Site Work Subtotal:					\$ 6,400.00

New Compactor

	445 HD Stationary Compactors w/Hopper	EA	1	\$ 42,000.00	\$ 42,000.00
	Concrete Pad	EA	1	\$ 10,000.00	\$ 10,000.00
	Canopy Structure	EA	1	\$ 15,000.00	\$ 15,000.00
New Compactor Subtotal:					\$ 67,000.00

TOTAL CONSTRUCTION COST (Rounded):	\$ 74,000.00
PROJECT CONTINGENCY (10%):	\$ 8,000.00
TOTAL:	\$ 82,000.00

*Appendix B – New Compactor Option Figure and Cost
Estimate*



designed by: ECT		drawn by: ECT/AMK		approved by: AJS	
date: August 2022		project no: 1255		checked by: AJS	
scale: 0 20' 40' Scale: 1" = 20'					
Town of Warner, New Hampshire Warner Transfer Station Transfer Station Evaluation					
Site Plan Compactor Option					
drawing no. Option 2					
sheet: 3 of 4					

CMA ENGINEERS	CIVIL/ENVIRONMENTAL/STRUCTURAL	Portland, ME	no.	revision	date	by
Portsmouth, NH	Manchester, NH	603/627-0708	207/641-4223			
603/431-6196						
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Civil/Environmental Engineers
35 Bow Street
Portsmouth, NH 03801

File: Warner TS Cost Estimates
Solid Waste Evaluation - Transfer Station Layouts
CMA #1255
August 11, 2022
By: AJS

New Compactor Option

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price

Contractor General Conditions (Not Including Compact

	General Conditions (5% of Construction Costs)	LS	1	NA	\$ 11,010.00
	Mobilization (5% of Construction Costs)	LS	1	NA	\$ 11,010.00

General Conditions Subtotal: \$ 22,020.00

Site Work

	General Demolition	LS	1	\$ 25,000.00	\$ 25,000.00
	Erosion Control	LS	1	\$ 500.00	\$ 500.00
	Fill	CY	2,000	\$ 10.00	\$ 20,000.00
	Excavation	CY	500	\$ 5.00	\$ 2,500.00
	Paving	Ton	100	\$ 100.00	\$ 10,000.00
	Crushed Gravel (6")	CY	100	\$ 23.50	\$ 2,350.00
	Gravel (12")	CY	190	\$ 28.50	\$ 5,415.00
	Lot Striping	LF	2,000	\$ 0.20	\$ 400.00
	Bollards	EA	8	\$ 500.00	\$ 4,000.00
	Site Electrical/Lighting	LS	1	\$ 10,000.00	\$ 10,000.00
	New Waste Block Retaining Walls (Metals Containers)	LS	1	\$ 100,000.00	\$ 100,000.00
	Other Site Work	LS	1	\$ 10,000.00	\$ 10,000.00

Site Work Subtotal: \$ 190,200.00

Recycling Building Retrofit

	Structural Improvements	LS	1	\$ 50,000.00	\$ 50,000.00
	Window Openings	LS	1	\$ 10,000.00	\$ 10,000.00
	New Rolling Windows	LS	6	\$ 5,000.00	\$ 30,000.00

Recycling Building Retrofit Subtotal: \$ 30,000.00

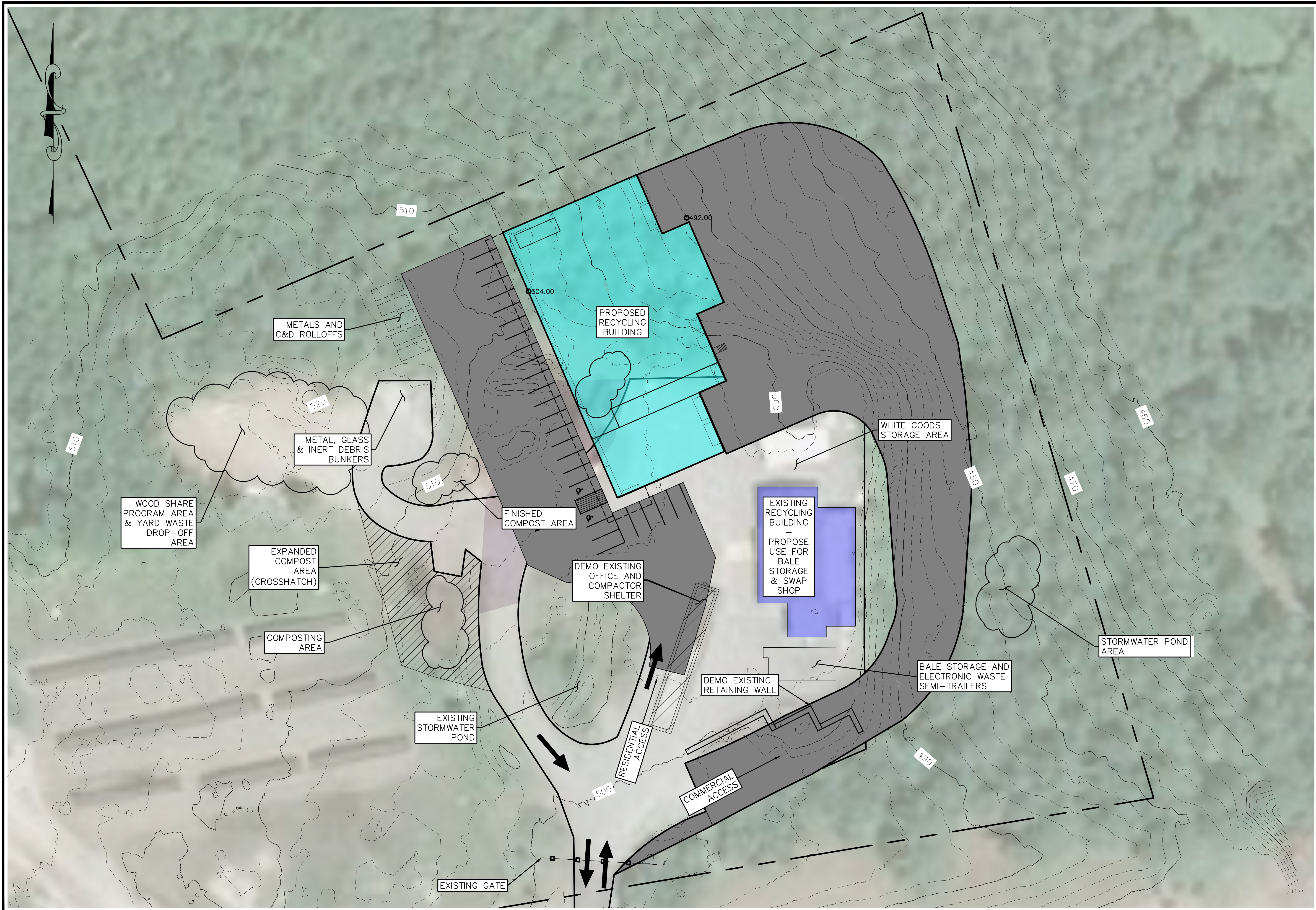
New Compactors

	445 HD Stationary Compactors w/Hopper	EA	2	\$ 42,000.00	\$ 84,000.00
	Concrete Pad	EA	2	\$ 10,000.00	\$ 20,000.00
	Canopy Structure	EA	2	\$ 15,000.00	\$ 30,000.00

New Compactor Subtotal: \$ 134,000.00

TOTAL CONSTRUCTION COST (Rounded):	\$ 377,000.00
ENGINEERING FINAL DESIGN AND PERMITTING (10%):	\$ 37,700.00
PROJECT CONTINGENCY (10%):	\$ 38,000.00
TOTAL:	\$ 453,000.00

*Appendix C – New Building Option Figure and Cost
Estimate*



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date: August 2022 project no: 1255 checked by: AJS	designed by: ECT drawn by: ECT/AMK approved by: AJS	scale: 1" = 30' 0 30' 60'
Town of Warner, New Hampshire Warner Transfer Station Transfer Station Evaluation		Site Plan New Building Option
drawing no. Option 3		sheet: 4 of 4



Civil/Environmental Engineers
35 Bow Street
Portsmouth, NH 03801

File: Warner TS Cost Estimates
Solid Waste Evaluation - Transfer Station Layouts
CMA #1255
August 11, 2022
By: AJS

New Building Option

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price

Contractor General Conditions

	General Conditions (5% of Construction Costs)	LS	1	NA	\$ 139,750.00
	Mobilization (5% of Construction Costs)	LS	1	NA	\$ 139,750.00

General Conditions Subtotal: \$ 279,500.00

Site Work

	General Demolition	LS	1	\$ 20,000.00	\$ 20,000.00
	Clearing and Grubbing	AC	1.0	\$ 11,500.00	\$ 11,500.00
	Erosion Control	LS	1	\$ 1,000.00	\$ 1,000.00
	Fill	CY	20,000	\$ 10.00	\$ 200,000.00
	Excavation	CY	10,000	\$ 5.00	\$ 50,000.00
	Paving	Ton	1,500	\$ 100.00	\$ 150,000.00
	Crushed Gravel (6")	CY	1,300	\$ 23.50	\$ 30,550.00
	Gravel (12")	CY	2,600	\$ 28.50	\$ 74,100.00
	Topsoil (4")	CY	500	\$ 43.00	\$ 21,500.00
	Turf Establishment	AC	0.25	\$ 3,000.00	\$ 750.00
	Stormwater Improvements	LS	1	\$ 25,000.00	\$ 25,000.00
	Lot Striping	LS	1	\$ 2,000.00	\$ 2,000.00
	Granite Curb	LF	400	\$ 34.00	\$ 13,600.00
	Handicap Ramps	EA	2	\$ 2,500.00	\$ 5,000.00
	Bollards	EA	20	\$ 500.00	\$ 10,000.00
	Site Electrical/Lighting	LS	1	\$ 20,000.00	\$ 20,000.00
	Other Site Work	LS	1	\$ 10,000.00	\$ 10,000.00

Site Work Subtotal: \$ 645,000.00

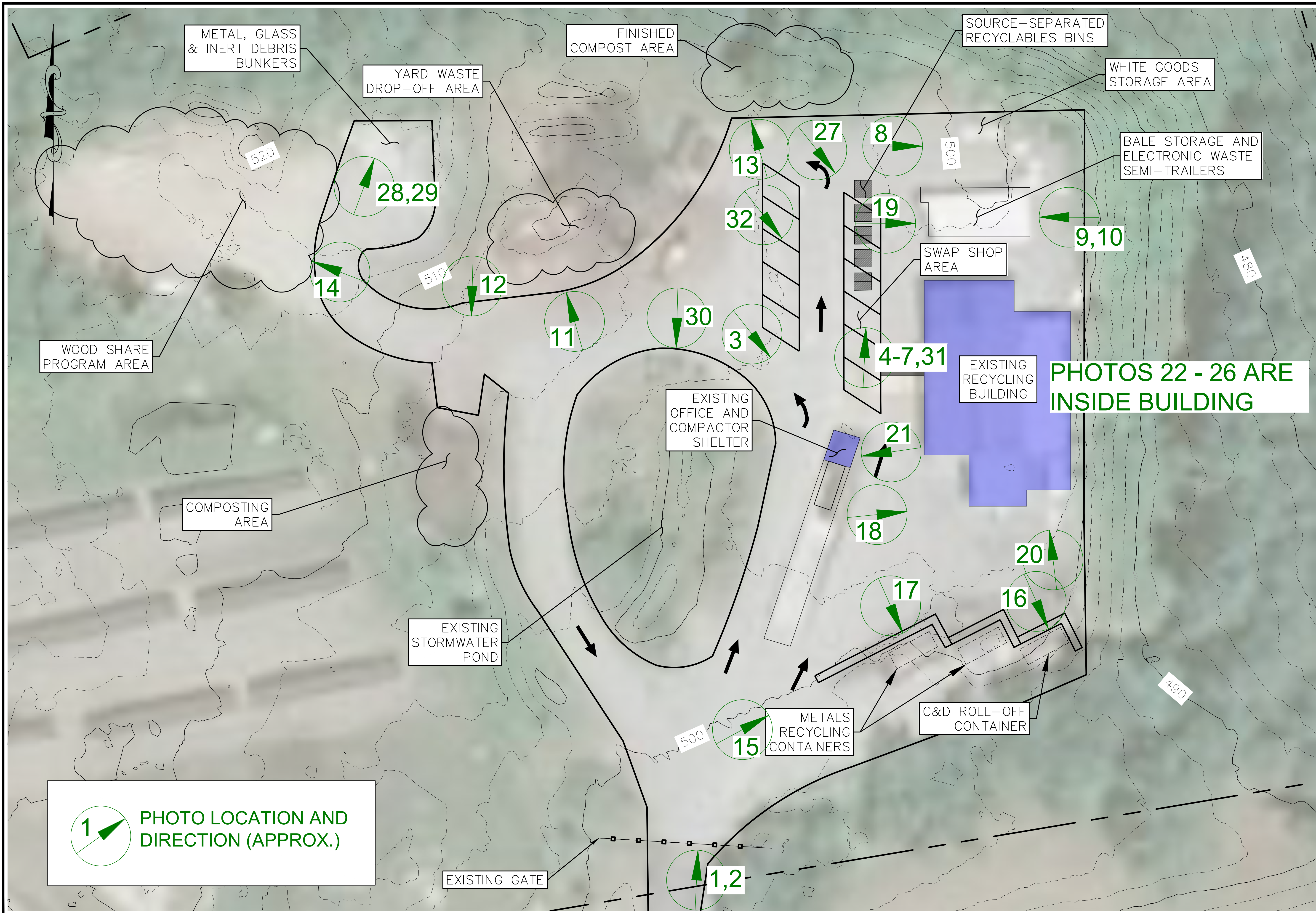
Recycling Building

	Crushed Stone (slab/footings)	CY	500	\$ 40.00	\$ 20,000.00
	Slab on Grade	SF	20000	\$ 20.00	\$ 400,000.00
	Structural Concrete, Building Walls/Footings	CY	600	\$ 1,000.00	\$ 600,000.00
	Structural Steel, Building Walls/Footings	LB	50000	\$ 2.00	\$ 100,000.00
	Canopy	SF	2000	\$ 15.00	\$ 30,000.00
	Metal Building	SF	20000	\$ 40.00	\$ 800,000.00
	Doors (Overhead, Roll-Up)	LS	1	\$ 75,000.00	\$ 75,000.00
	Concrete Block Partition Walls	LS	1	\$ 10,000.00	\$ 10,000.00
	Ventilation System	LS	1	\$ 40,000.00	\$ 40,000.00
	Electrical	LS	1	\$ 50,000.00	\$ 50,000.00
	Other building costs	LS	1	\$ 25,000.00	\$ 25,000.00
	New Horizontal Baler and Fitup	LS	1	\$ 200,000.00	\$ 200,000.00

Transfer Station Building Subtotal: \$ 2,150,000.00

TOTAL CONSTRUCTION COST (Rounded): \$ 3,075,000.00
ENGINEERING FINAL DESIGN AND PERMITTING (10%): \$ 307,500.00
ENGINEERING CONSTRUCTION ADMINISTRATION (12%): \$ 369,000.00
PROJECT CONTINGENCY (10%): \$ 308,000.00
TOTAL: \$ 4,060,000.00

Appendix D – Site Photos and Photo Plan



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date: August 2022 project no: 1255 checked by: AJS	designed by: ECT drawn by: ECT/AMK approved by: AJS	scale: 1" = 20' 0 20' 40'
Town of Warner, New Hampshire Warner Transfer Station Transfer Station Evaluation Existing Conditions Site Plan Photo Plan		
drawing no. 1		sheet: 1 of 1

Photo 1: Transfer Station Signage and Gate – Looking North



Photo 2: Site Entrance – Looking North



Photo 3: Office and MSW Hopper – Looking Southeast



Photo 4: Mixed Paper bin



Photo 5: Cardboard bin



Photo 6: HDPE bin



Photo 7: Glass bin



Photo 8: White Goods Area – Looking West



Photo 9: Electronic Waste Trailer



Photo 10: Loose Aluminum Can Trailer



Photo 11: Yard Waste Drop-off Area – Looking North



Photo 12: Compost Area Windrows – Looking South



Photo 13: Finished Compost Pile Area – Looking North



Photo 14: Wood Share Program Area – Looking West



Photo 15: Metals & C&D Roll-off Container Wall – Looking East



Photo 16: Construction and Demo Debris Roll-off



Photo 17: Metals Roll-off – Looking South



Photo 18: Bulky Waste Area



Photo 19: Storage Trailers – Looking East



Photo 20: South Recycling Building Elevation – Looking North



Photo 21: MSW Compactor Hopper



Photo 22: Horizontal Balers



Photo 23: Mixed Paper Storage



Photo 24: Horizontal Baler



Photo 25: Bale Storage



Photo 26: Used Oil



Photo 27: Recycling Container Train – Looking Southeast



Photo 28: Recycling Bunker Area – Looking North



Photo 29: Recycling Bunker Area – Looking North



Photo 30: Transfer Station Island/Pond Area



Photo 31: Swap Shop Area



Photo 32: Swap Shop Area – Looking Southeast

