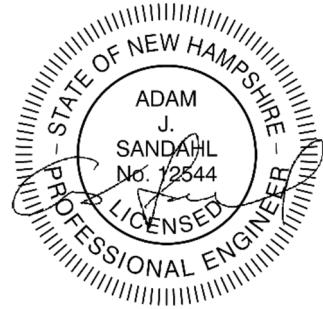


# Moultonborough Transfer Station

253 Holland Street  
Moultonborough, NH 03254

## Feasibility Study

August 2024



*Prepared for:*

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# **Moultonborough Transfer Station Feasibility Study**

*For: Town of Moultonborough*  
August 2024

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## Background

The Town of Moultonborough provides solid waste services for Town residents at its Waste Management Facility (transfer station) located at 253 Holland Street. The Town does not provide curbside collection services, so residents have the option of bringing their household trash and recyclables to the transfer station or hiring a commercial entity to haul waste to a disposal facility separate from the Town's system. The facility currently has four full-time employees, a part-time employee, a seasonal employee, and a facility fleet that includes a front-end loader, skid steer and a forklift.

Moultonborough is a residential community of around 5,000 full-time residents and a significant seasonal population with a Town center located at the intersection of NH Routes 25 and 109 (Holland Street), approximately one mile to the southeast of the transfer station. The facility is open to town residents on Monday, Tuesday, Friday, and Saturday from 8:30 A.M. to 4:30 P.M. and on Sunday from 1 P.M. to 4:30 P.M. In general, the facility is well managed with reasonable space for residents to drop off materials.

According to the NHDES 2023 Annual Facility Report (AFR), the Town generated 1,356 tons of construction and demolition debris (C&D), 498 tons of single stream recyclables (SSR), and 1,335 tons of municipal solid waste (MSW). These tonnages are consistent with historical tonnages over the past several years. We note that the NHDES Biennial Report (November 2022) identifies a per-capita waste disposal rate of 0.80. When considering the Town's full-time population of 5,000 residents and seasonal population, we believe that less than half of the residences are using the facility, with other residents hiring private commercial haulers, which is not uncommon in other similar New Hampshire communities. Commercial haulers are not permitted to use the transfer station.

The Transfer Station is permitted as a Permit-by-Notification facility through the New Hampshire Department of Environmental Services Waste Management Division (Permit # DES-SW-PN-18-004). The permit authorizes management of MSW, household recyclables, bulky waste, white goods, C&D debris, tires, and wood ash from residential stoves. The facility is prohibited from accepting asbestos, explosive wastes, gaseous waste, liquid waste, infectious waste, animal carcasses, contaminated soils and other absorbent media, and out-of-state waste (unless the waste is received for recycling). The permit limits the waste receipt to 30 tons per day on average and the facility is not permitted to store more than 420 tons of material at any one time.

The table below summarizes annual MSW, SSR, and C&D tonnages over the previous five years. These tonnages are presented on a fiscal year basis (July through June), which is how we understand that the Town tracks this data. We note that SSR was managed as MSW at the facility from May to September in 2020 due to the COVID-19 pandemic.

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
<b>MSW (Tons)</b>	1,158	1,384	1,711	1,447	1,357
<b>SSR (Tons)</b>	548	453	383	532	486
<b>C&amp;D (Tons)</b>	1,014	1,142	1,209	1,118	1,230

Table 1 - Annual MSW, SSR, C&D Tonnages

Presented below is the monthly tonnage data for MSW, SSR, and C&D over the previous five fiscal years. The figures depict higher waste and recyclable quantities delivered to the facility during the summer months, when the seasonal population is at its highest. Over the past 5 fiscal years, MSW, SSR, and C&D tonnages are higher during the summer months compared to the winter months on average, respectively.

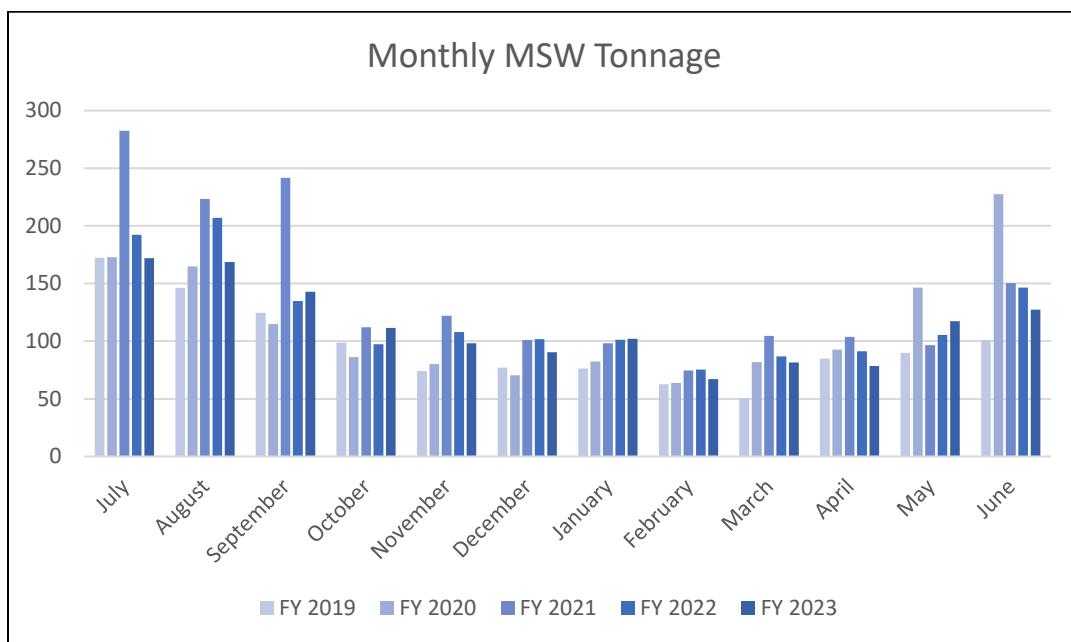


Table 2 – Historical MSW Tonnage (monthly)

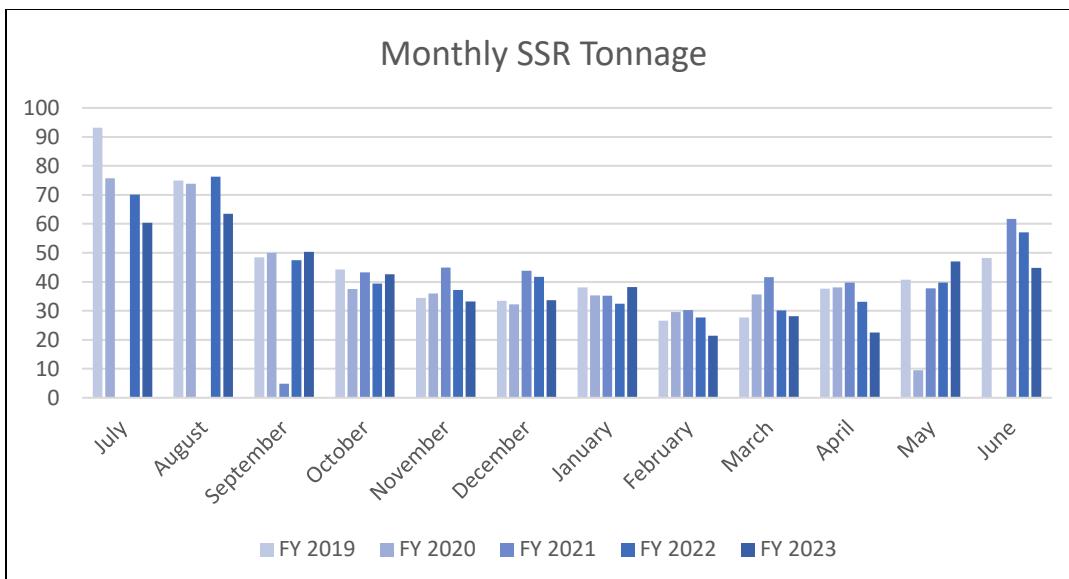


Table 3 – Historical SSR Tonnage (monthly)

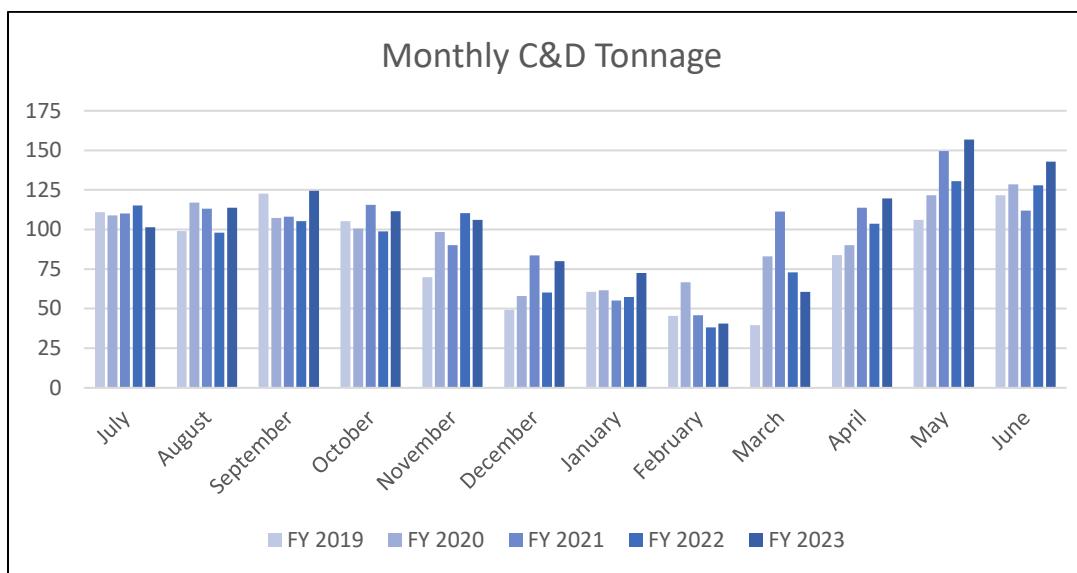


Table 4 – Historical C&D Tonnage (monthly)

Waste Management, Inc. (WM) currently holds the contract for SSR, MSW, and C&D disposal and the Town owns all the compactors and boxes. The Town has the capability of swapping out full containers with their equipment (front-end loader), ensuring that there is available compactor capacity during busy periods. Removal of waste containers from the facility is generally completed during non-operating hours to limit interactions between truck traffic and residents.

The Town manages other materials at the facility in compliance with their permit, including leaf and yard waste, brush, used oil, universal wastes (batteries, light bulbs), electronic waste, bulk metals, asphalt

shingles, bulky waste, mattresses, and bulk Styrofoam. See enclosed [Figure 0 – Existing Conditions Plan](#) for the location of managed materials.

Household hazardous waste is not currently managed at the Transfer Station. The Town holds an annual household hazardous waste collection day in August at 68 Highway Garage Road, which is the Town Department of Public Works.

To the west of the main transfer station area is the reclaimed landfill which is currently a grassed field with approximate dimensions of 400' x 200' and has potential for future expansion opportunities. A geotechnical study of this area would be needed to determine the suitability of this area for future projects. There is also a pre-1981 registered landfill located near the site entrance adjacent to Holland Street.

## Current Operations

Site access is via Holland Street, which is gated during non-operating hours. The site entrance identifies the facility as a transfer station, lists operating hours, provides contact information, and identifies the New Hampshire Department of Environmental Services (NHDES) facility permit number. Residents travel approximately 600' to the site Operations Building and scale. From this location, staff will direct them where to deposit materials if they have questions (typically new or seasonal residents). The Town uses a creative waste area labeling system where they can direct residents to disposal locations displaying colorful signs of Looney Tunes characters (ex: Yellow Sylvester sign for asphalt shingles). The Operations Building is a 40' x 80' metal structure that includes a restroom and offices and is also used to repair equipment and to store and process some waste materials including electronic waste, used oil, and universal waste. Scale transactions for C&D waste also occur at the Operations Building

We noted that several vehicles were passing through the scale/Operations Building area at a high rate of speed during low-traffic periods observed during our January site visit. Transfer station staff indicated that speeding is periodically a problem at the facility. From the Operations Building/scale area, residents can proceed to the MSW/SSR Compactor loop (left) or the C&D/Metals loop (right) as shown in Figure 0.

The following is an operations summary of how waste and recyclable streams are managed at the Transfer Station, organized by loop.

### MSW/SSR COMPACTOR LOOP

- Municipal Solid Waste (MSW)

MSW is deposited by residents into one of two metal hoppers which drop into compactors that load the waste into a 40 cubic yard compactor box. There is separate access, which is no longer used, to one of the hoppers at a higher elevation for commercial haulers. The Town-owned compactor boxes can be swapped out with empty ones when they are full. Full compactor boxes are hauled to the WM owned and operated Laconia Transfer Station by WM, where they are consolidated into 100 cubic yard transfer trailers which are then hauled to WM's Turnkey Landfill in Rochester, NH. In 2024, WM charges the Town \$236.36/pull plus \$87.79/ton tipping fee per their current contract. In 2023, the

Town averaged about 12 tons per pull for MSW, which is reasonable for a 40 CY box at 0.3 tons/cy.

- Single Stream Recycling (SSR)

Per the Town's agreement with WM, SSR consists of (in general terms) aluminum cans, tin/steel cans, glass, plastic containers (PET #1, HDPE #2 [color & natural], PP #5), cardboard, and mixed paper. Similar to MSW, SSR is deposited by residents or staff into one of two metal hoppers which drop into compactors that load the waste into a 40 cubic yard compactor box. Full compactor boxes are also hauled to the Laconia Transfer Station, where they are consolidated into 100 cubic yard transfer trailers which are then hauled to a WM-owned and operated Materials Recycling Facility (MRF) in Billerica, MA. The Town averaged around 4.5 tons per pull for SSR in 2023. In 2024, WM charges the Town \$236.36/pull plus \$67.53/ton haul to Billerica plus a processing fee of \$115.93/ton. The Town also receives a blended per-ton revenue based on recyclables commodity pricing.

- Bulk Styrofoam

The Town collects bulk Styrofoam in the Operations Building year round. When a sufficient load of Styrofoam is collected, it is hauled by Town staff on a trailer to the Gilford Transfer Station for recycling. Recycling of bulk Styrofoam is uncommon in New Hampshire communities.

- Swap Shop

The Town operates a limited swap shop of mostly books across from the compactor area adjacent to the Operations Building. Access to the swap shop is the left travel lane in the compactor area, which becomes a pinch point if used during busy periods.

- Propane Tanks

Empty propane tanks are accepted at the Operations Building.

- Electronic Waste

e-Waste, including televisions, computers, and smartphones are accepted at the Operations Building and stored in a metal shipping box until sufficient quantities are generated.

- Universal Waste

Universal wastes including light bulbs and batteries are managed in the Operations Building. The date each waste container is started is marked to track compliance with 1-year storage limits.

- Used Oil

Used oil is managed in the Operations Building. Town staff use the waste oil to heat the Operations Building in the winter.

## C&D/METALS LOOP

- Construction and Demolition (C&D) Debris

C&D materials are deposited by residents from above +/- 8' high retaining walls on the northwest side of the scale to a concrete slab below. The Town consolidates and compacts the C&D waste and transfers it to open-top containers. Residents disposing of C&D waste are required to use the scale and check in with the attendant. Currently, the Town is charging residents \$0.10/pound. Under the Town's contract with WM, C&D is hauled by WM in a 30-yard open-top roll-off container for \$236.36/haul and a tipping fee of \$101.30/ton for 2024.

- Bulky Waste

Bulky waste, which is generally large MSW items such as furniture is managed in a designated area near the C&D area. When sufficient quantities are generated, bulky waste is broken down with a loader with a grapple and transferred to an open-top container for hauling by WM as C&D debris.

- Bulk Metals

Bulk metals are dropped off at a similar wall at the north end of the site and transferred to open-top containers.

- White Goods

White goods, including used air conditioners and refrigerators/freezers are stored in a 30' x 40' wood-framed structure at the northwest corner of the site. Once the Freon/refrigerant is removed, these items are managed as bulk metals.

- Mattresses

Mattresses and box springs are managed under cover adjacent to the white goods. They are transferred to open-top containers for disposal when sufficient quantities are generated and hauled to a recycler or for disposal.

- Compost

Brush, leaf and yard waste is managed at the northeast side of the site as part of the Town's composting operation. The Town turns the compost windrows every few weeks and provides finish-product compost to residents free of charge. Brush is burned periodically on the west end of the site, adjacent to the reclaimed landfill area. The brush is required to be less than 5" in diameter.

Food waste is not currently incorporated into the compost program. Some other New Hampshire communities allow private composting firms to maintain food waste deposit containers at transfer stations which are collected regularly for composting of the food waste.

- Asphalt Shingles

Asphalt shingles are managed in a roll-off container at one of the retaining wall locations.

- Tires

Tires are managed in an enclosed trailer adjacent to the compactor area.

## Task 1 – Traffic Patterns

Residential traffic entering the facility would access the scale if they are delivering C&D waste or confer with the attendant if they have questions as to where they will be depositing their waste and recyclables. The majority of traffic will turn left after the Operations Building/Scale to access the MSW/SSR Compactor loop, with lower traffic volumes turning right to the C&D/metals loop which is typically pickup trucks and/or vehicles with trailers. As previously noted, residential traffic sometimes speeds through the scale area. Speed bumps or other traffic calming improvements may be necessary to improve safety in this area.

### MSW/SSR Loop

Traffic utilizing the MSW/SSR drop-off or drop-off for materials that are managed in the Operations Building take a left around the building to the four compactor hoppers which are located on the right side. The Operations Building is on the left, which has a limited swap shop for books. There are two lanes of traffic between the Operations Building and the compactors with a single bypass lane between them (3 total lanes). During less busy times, most residential drop-off is in the right lane, which is closest to the compactors. Residents normally pull as far forward as they can to allow for other residents to use the drop-off behind them but that is not always the case. When the facility is busy, residents begin using the left lane, which requires pedestrian traffic to cross the right lane vehicle traffic. We understand that there have been no known pedestrian incidents with vehicles at the facility. When standing in front of the compactor hoppers, the two MSW hoppers are on the left and the two SSR hoppers are on the right.

The residential drop-off for the MSW compactors is over a wooden platform that is approximately 8 inches higher than the SSR compactors which are at pavement grade. The grade transition from the SSR to MSW compactors is made up of sloped pavement. We understand that there have not been issues with residents using this short but relatively steep transition even in the wintertime when it may be icy. There is a small attendant shed between the two MSW compactors. Bulk Styrofoam is collected inside the Operations Building year round.

During the site visit, we only observed one resident using the swap shop but it was during a time when there was no other traffic in the left lane. There is a bottleneck for vehicles exiting this area as both lanes and the bypass lane neck down to one lane, which we understand is an issue during busy times. We also observed a recently installed generator adjacent to the one-lane exit, which would need to be relocated if the exit is to be widened in that area.

Transfer station staff members assist residents with transferring materials into the Operations Building and occasionally with loads of MSW or SSR. Vehicles with trailers are asked to pull to the side of the compactor area so that they don't take up space in the vehicle queue and to exit around the back of the compactor boxes.

### C&D/Metals Loop

Vehicles exiting the scale with C&D and vehicles dropping off other materials such as asphalt shingles, bulky waste, bulk metals, white goods, mattresses, and leaf/brush/yard waste turn right to enter the C&D/Metals loop.

Designated drop-off locations are marked with colorful Looney Toons characters so that attendants can easily direct residents to the appropriate drop-off location. Waste storage areas in the C&D/metals loop are well-spaced and there's plenty of room for residential drop-off. During the January 2024 site visit, we observed significantly fewer residents using this loop than using the MSW/SSR loop.

Drop-off locations for these materials have significant grade separation – 8 feet or more with no fall protection. Providing OSHA-height (42-inches) railings in these areas would make it significantly more difficult for residents to dispose of materials in these areas. CMA Engineers has designed railing systems that can be removed in the event heavier items need to be deposited in the bins or waste areas but in general, residents and staff don't like them since it requires lifting waste over the railings. We understand that there has been at least one occasion where a user has fallen over a wall based on our review of NHDES database files. During our site visit, we observed one resident disposing of C&D materials unsafely from their pick-up truck where they straddled the wall and container as they transferred contents from the truck.

Compost is also managed on the easternmost side of this loop where residents drop off leaf and yard waste. The Town creates windrows with the yard waste and turns it periodically. Compost generated from these materials is made available to residents at no charge. The Town recently expanded the compost area and added a new gravel pad to improve operations. Brush is managed in an area on the west side of the loop where it is periodically burned. Burning of the brush pile was observed during both site visits.

We understand that the Town is satisfied with the layout and configuration of the C&D/metals loop in terms of vehicle flow and that the focus of this task should primarily be on the MSW/SSR Compactor loop. CMA Engineers agrees that the layout and flow of the C&D/metals loop is well spaced with sufficient room for multiple vehicles to deposit materials at each location.

#### Traffic Review

CMA Engineers completed a second site visit on January 6, 2024, to review site operations on a Saturday morning, which is when transfer stations are typically the busiest. We note that for Moultonborough, traffic counts are significantly higher in the summer months when the seasonal residents utilize the transfer station. Town staff reports that during summer months, traffic can extend to and queue on Holland Street. The facility opened at 8:30 A.M. and no vehicles were waiting at the gate. Traffic counts were observed from approximately 9 AM to 10 AM with the following noted:

- 34 vehicles timed
- Average time from arrival to departure – 171 seconds (2 minutes 51 seconds)
- Four Longest:
  - 363 seconds – with Styrofoam\*, individual delivered foam to building
  - 323 seconds – first vehicle of the day
  - 285 seconds
  - 284 seconds

- Four Shortest:
  - 51 seconds
  - 58 seconds
  - 68 seconds – with Styrofoam\*, staff member took Styrofoam from car, carried it into the building
  - 70 seconds
- Those indicated \* are the only two vehicles delivering Styrofoam this hour – the longest drop-off time, and one of the shortest drop-off times when a staff member took the Styrofoam. There were no drop-offs of waste oil or swap shop books during the time study.

General observations from this review are presented below:

1. A drop-off configuration of MSW-SSR-MSW-SSR would result in shorter walk distances for all current drop-off locations, and slightly lower average drop-off times.
2. Delivery of e-waste (as at present), Styrofoam, and waste oil from a separate stop at a dedicated lane on the opposite side of the building would result in a decrease in delays and average drop-off times on the MSW/recycling side.
3. Front-in parking would not work well on this site since incoming vehicles cannot see the traffic backing up until they clear the back side of the existing building.
4. An average drop-off time of 3 minutes would be appropriate to use for facility planning.
5. The bypass lane in the middle works well and needs to be retained for all alternatives evaluated. Users are accustomed to it, and it reasonably and effectively limits wait times behind vehicles with longer drop-off times.

Monthly traffic count data was provided by the Town; as expected, it shows higher traffic counts in the summer when compared to winter months. For FY19 through FY23, the average monthly traffic count was 9,167 for summer months (June, July, and August) compared to 5,259 for winter months (December, January, and February).

Month	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
<b>July</b>	9,108	9,568	9,750	10,335	12,080
<b>August</b>	7,198	8,888	10,348	10,643	11,608
<b>September</b>	6,402	7,383	8,129	7,701	8,126
<b>October</b>	5,364	5,805	7,221	7,697	7,724
<b>November</b>	4,291	8,953	6,625	6,359	6,576
<b>December</b>	5,240	4,771	7,220	6,378	6,211
<b>January</b>	3,861	4,789	7,018	6,069	5,107
<b>February</b>	3,748	4,434	5,125	4,727	4,186
<b>March</b>	4,844	5,281	6,046	4,999	5,181
<b>April</b>	5,198	5,028	6,805	6,615	6,515
<b>May</b>	6,512	7,727	7,644	7,866	8,300
<b>June</b>	7,503	8,812	8,724	8,176	4,759

#### Improvement Considerations

In general, throughput efficiencies are increased by adding parking spaces. As currently laid out, there should be four parking spots for each lane if everyone is able to pull to the front. A drive-through configuration can be inefficient where each resident does not take the same amount of time to deposit waste and recyclables, periodically leaving gaps in the spaces that residents can't access without parallel parking via the by-pass lane, which should be discouraged.

More parking spaces can usually be designed in a pull-in type configuration, which also eliminates the "gap" issue previously described. Residents generally prefer backing into these spaces so that their trunks are closer to the hoppers and out of the way from vehicle traffic. We note that for this facility, pull-in spaces are not recommended as there is not sufficient space between the compactors and the Operations Building for backing-out motions. Additionally, the line of sight coming around the Operations Building to the compactor area is not adequate to accommodate backup motions into the travel way.

Alternatively, several transfer stations in New Hampshire successfully operate as a three-lane drive-through facility (no by-pass lane). In our opinion, three lanes could increase facility throughput but is not recommended as it can create greater than two-minute wait times behind vehicles that are slow to drop off materials.

We note that there is sufficient space to relocate the compactor area to the north, which would allow for improved visibility and safety of this area while also allowing for the incorporation of pull-in spaces if this is something that the Town desires. Such a relocation would come at a significant cost as it would require demolition of the compactor area, including significant retaining walls, slabs, and structures to site reconfigured facility.

A significant queuing loop could also be constructed over the reclaimed landfill area that would provide queuing for up to 35 vehicles. This loop could be used when the Transfer Station experiences very high traffic volumes that would otherwise back up onto Holland Street.

The eastern retaining wall along the vehicle exit route could be shifted farther to the east to create an additional space such that there would be five designated parking slots in each lane instead of four. This

shift in the retaining wall would also accommodate a wider exit from this area, eliminating the previously described single-lane exit pinch point. Each of the parking slots could also be designated with paint and signage added to encourage users to pull to the front-most slot.

#### Secondary Egress

Options for secondary egress from the transfer station main access road are limited as the town parcel narrows near Holland Street and there are no abutting properties owned by the Town. We note that the pre-1981 landfill is located near the site entrance to the north of the transfer station access road. An easement would be needed from and abutting property owner(s) for a new secondary egress road from the transfer station to Holland Street. Internal to the site, the new retaining wall design could accommodate an emergency egress to the eastern “upper road”, which would be reconstructed at a lower elevation. The new wall configuration would also allow for a fifth parking spot. Emergency egress from the main transfer station is also available via the compactor box loadout area.

#### Adequacy of Operating Hours

Operating hours of the facility are Monday, Tuesday, Friday, and Saturday from 8:30 A.M. to 4:30 P.M. and on Sunday from 1 P.M. to 4:30 P.M. While the facility provides a high level of service being open for most days of the week, 8 hours a day including open hours on the weekend, it may be beneficial to have a longer day when the transfer station is open earlier and later so that residents would be able to use the facility before or after work (e.g. 7 a.m. to 7 p.m.). To keep the hours the same, the Town may consider reducing hours on another day or eliminating a day altogether.

The enclosed Figure 1 – Enhanced Traffic Plan (Appendix A) depicts the improvements described above and a preliminary cost estimate for each of the components is presented in Appendix B.

At a minimum, we recommend relocating the swap shop operation away from this high-traffic area. Ideally, swap shops are sited in locations that are removed from primary travel ways as swap shop users tend to take a fair amount of time. They should have designated parking and be located in areas that can be easily viewed by staff to help residents if items are reusable or should be disposed of as waste, which is a common issue among swap shops. If the swap shop can be relocated, its scope could be expanded beyond books if the Town desires. A proposed location for the swap shop is shown within the proposed queuing loop area in Figure 2. Cost estimates for these improvements are provided in Appendix B.

## **Task 2 – MSW and Recycling Deposit Area**

The Town is interested in adding a roof structure between the Operations Building and the compactor area to provide residents with a sheltered area where waste and recyclables are deposited. Ideally, this structure would fully span both the travel lanes and the bypass lane. We note that there are several challenges involved with the design and construction of this type of structure including connections to or abutting existing buildings and managing stormwater runoff and snow drifts.

Our initial assessment of the existing Operations Building is that it would not be able to incorporate structural support for such a roof, so the new structure would need to be fully self-supported with its own

piers. Review of this building and conversations with facility staff indicated that this structure was built in the 80s and is a pre-engineered metal building consisting of steel moment frames. CMA Engineers frequently sees these structures utilized for transfer station facilities and commercial spaces where large interior open spaces are required. These structures are typically highly cost effective because they are designed very efficiently for site and facility specific loads. The drawback to this efficiency is that there is typically little reserve capacity in the structural members. The limited spare capacity and the nature of the moment frame system makes retrofitting these structures challenging and often expensive.

Similarly, the timber roof structure over the compactor area would not be able to accommodate additional loading from structural components of a new roof over the unloading area. CMA Engineers' full assessment of this structure is included in the narrative under Task 3.

Since all three lanes are utilized, there can be no center piers to support the structure along the span, so larger piers and steel support members would be needed at the edges. These supports would need to be installed immediately adjacent to the Operations Building so that the piers are outside of existing travel ways as much as practical. While there does appear to be sufficient space along the east side of the Operations Building and the paved travel lanes, the addition of several support piers along each side of this zone would further confine the area and may limit free space for opening vehicle doors, pedestrian travel, and accessing adjacent buildings. A similar issue also exists along the east side of the drop off lanes along the MSW / recycle structure.

A significant challenge with the proposed roof structure between the Operations Building and the compactor area is the management of snow loads on the existing structures. The position of the existing operations building indicates that it would have been designed for conventional snow loads on an independent structure. A roof structure over the drop off area would likely have a top of roof elevation equal to or higher than that of the existing Operations Building. This would result in an area of aerodynamic shade on the existing structure; this would result in significant snow drift loads developing in that area. Snow drift loads can increase snow loads on roofs by a factor of 2-4 times. This means that even if the new roof was supported independently from the existing buildings, the existing adjacent buildings would still require significant strengthening to be able to handle the increased snow loads. The magnitude of the costs for these retrofits would be significant and would potentially require full reconstruction of the structure over the MSW / recycling compactors. It is anticipated that the costs to retrofit both existing structures for snow loading could increase costs for this task by a factor of 1.5 to 2.0. This cost is currently not included in the cost estimate but should be considered once the outcome of Task 3 is determined and once a detailed evaluation of the existing Operations building can be completed.

Utilizing our site observations and conceptual structural evaluations of the proposed roof structure, we have determined that these modifications are likely not feasible. Based on the feasibility and the conceptual cost estimate for this work, it is our recommendation that Town funds would be better utilized on a new roof structure for the building over the MSW/recycling compactors. As discussed under Task 3, those improvements could incorporate a partial covering of the existing drop-off area, through the use of a cantilevered awning, providing rain and snow cover for the lane nearest the compactors.

The Town may also consider some minor grading modifications in front of the recycling compactors to bring

the grade of the drop-off area to the same elevation as the MSW compactors. This would involve:

- Extending the height of the recycling compactor retaining wall by several inches
- Filling, grading, and paving such that the platforms for accessing the MSW and recycling compactors are at the same elevation

The enclosed [Figure 2.1 – MSW and Recycling Deposit Area Improvement Plan](#) depicts a plan view figure of a proposed roof structure and [Figure 2.2 – Drop-Off Area Structure Elevation](#) depicts the proposed roof line of the new structure.

Cost estimates for these proposed improvements are provided in Appendix B.

### Task 3 – MSW and Recycling Hauling/Removal Area

This task considers adding a new larger roof structure over the existing compactor area such that it completely covers the compactor boxes and as much area as practical over the residential drop-off area. This roof structure would be a separate structure to the feature evaluated in Task 2. Under this scenario, the existing roof structure over the compactors would be removed and replaced with this new structure.

Review of this area and conversations with facility staff indicated that this roof structure was reconstructed approximately 10 years ago and that it consists primarily of timber framing. A visual inspection of the structure identified several members and connections that do not appear to utilize standard framing conventions and likely do not meet current building codes. Based on these observations, it is assumed that no portion of the existing roof structure would be suitable for incorporation into a larger structure covering the entire compactor area.

While onsite, CMA Engineers also assessed the existing concrete foundation walls in this area which create the grade separation required to access the compactors. Visible portions of the concrete walls appeared to be in serviceable condition and of reasonable quality. The existing foundation walls are assumed to not be sufficient to support the clear span metal frames for this proposed structure. However, they may be able to be left in place with new reinforced concrete pedestals added along the outside of the walls. The new pedestals would be tied into the existing wall system but would be designed to fully carry the load of the proposed building. The addition of new foundations to support the proposed enclosure would require that subsurface borings and a geotechnical evaluation be completed for this area.

The primary goal of the new roof is to fully cover the compactor boxes such that snow does not need to be removed above and between them. The roof would need to provide sufficient overhead clearance for vehicles to retrieve the compactor boxes via the concrete access ramp at the southeast side of this area. The roof system would also need to be compatible with the significant grade differential between the northeast and southwest limits of this area. To achieve this, a monoslope roof (shed style) would be utilized and would slope down to the southwest side of the building. The additional benefit of this roof configuration is that it would not shed snow or water towards the northwest side of the building where residents drop off materials.

CMA Engineers believes that the Task 3 structure could also partially meet the objectives of the Task 2 structure, as the roofline can be designed to cantilever over the residential drop-off area as much as 10-15 feet. The current compactor area has a small overhang which does not appear to provide much shelter from the elements for residents and staff. We envision this structure having approximate dimensions of 62' x 60', exclusive of the proposed cantilevered awning.

Design of a new roof system for the compactors would allow for potential reconfiguration of the access points to the existing containers, with the goal of improving drop off efficiency and reducing wait times. The facility currently has two MSW compactors and two compactors for recycling, all of which are accessed from the northwest side of the building, via the two drop off lanes.

Construction of improvements to the compactor area will result in disturbances to the drop off lanes and will require that the compactors be temporarily relocated. Design of selected improvements would need to include development of a temporary operations plan to allow for continued use of the facility during construction.

The enclosed Figure 3.1 – MSW and Recycling Hauling/Removal Area Improvement Plan depicts a plan view figure of a proposed roof structure and Figure 3.2 – Compactor Area Structure Elevation depicts the proposed roof line of the new structure over existing travel ways and against existing structures.

Cost estimates for these proposed improvements are provided in Appendix B.

## Task 4 – Truck Scale

The existing truck scale is aging, and the Town intends to replace it over the next few years. This task considers the installation of a structure over the scale to protect it from the elements and so that snow would not need to be removed on and around it. The structure presented in this task is one that fully encloses the scale to protect it from the elements. Because the scale would be enclosed, a camera and intercom system would be necessary so that attendants can view the scale from the Operations Building.

The scope of this task does not include evaluating options for a new scale, but costs to replace the current 40-foot scale should be expected in the range of \$100,000 to \$200,000 depending on options selected.

We anticipate that the structure would be either a metal building or a wooden pole-barn style structure with approximate dimensions of 45 feet long, by 21 feet wide, by 14 feet tall (interior clear height). Field measurements taken during the site visit indicate that there is approximately 9 feet of clearance between the existing scale and the concrete pit to the west, and approximately 7 feet from the scale to the nearest travel lane to the east. While construction would likely result in temporary impacts to pit access and paved travel lanes, there does appear to be sufficient space to construct a scale enclosure. Timber posts or concrete foundations for a steel structure would extend below grade to provide required frost cover. Similar to the Operations Building, the proposed siding and roofing material would likely be a standing seam metal panel system. These systems perform well and have the benefit of requiring limited periodic maintenance. We note that in most locations in New England, truck scales are operated without cover.

The enclosed Figure 4 – Truck Scale Structure Elevation depicts the proposed roof line of the new structure

over the truck scale. A preliminary cost estimate for the new structure is presented in Appendix B.

## Task 5 – Phone/Internet Service Upgrade

The lack of internet and phone connectivity at the Moultonborough Transfer Station has limited the facility's operational efficiency, particularly concerning financial transactions. This connectivity issue has required that the facility operate as a cash-only facility, a significant inconvenience in our digital and cashless economy. Additionally, the lack of connectivity limits the ability of fire and police departments to monitor the transfer station effectively. This poses potential risks to the transfer station's security and the public's safety.

The town contacted Charter Communications (Spectrum) in December 2021 to extend its existing internet infrastructure down Holland Street. Following a site survey by Spectrum's construction team, the projected cost for establishing the connection was quoted at \$12,802.32, which is above Spectrum's installation limit of \$10,000, requiring the town to cover the full cost of the installation out of pocket.

We analyzed four options to provide connectivity to the transfer station site. Spectrum, a hard-wired coax connection; Starlink, a low Earth orbit (LEO) satellite connection; ViaSat, a high Earth orbit (GEO) satellite connection; and AlwaysOn, a 4G LTE cellular "hotspot" connection. After exploring these options, we found that AlwaysOn's service was unsuitable due to inconsistent coverage in the area and concerns about service speed throttling. Similarly, ViaSat was excluded because of its noticeable latency issues and pricing. While a Spectrum connection would deliver the most reliable and consistent service among the options considered, the high upfront investment needed is not a reasonable allocation of the town's financial resources. Therefore, we believe that a Starlink connection presents the most advantageous solution for the transfer station.

Starlink offers a competitive, flexible pricing structure that aligns well with the transfer station's needs. The Fixed Standard Service has initial setup, installation, and device fees amounting to \$599.00, followed by a monthly charge of \$90.00. Over a 3-year period, the total cost of the service adds up to \$3,839.00, which is significantly more affordable than the quoted Spectrum installation cost. In terms of performance, Starlink delivers upload speeds ranging from 12 to 23 Mbps and download speeds between 80 and 148 Mbps, with latency ranging from 32 to 37 milliseconds. These speeds and latency levels are sufficient for the transfer station's operational needs, including financial transactions and security monitoring. Moreover, the service can support more than 250 devices simultaneously, ensuring the transfer station can scale its operations without encountering connectivity limitations. If the Fixed Standard Service does not meet the transfer station's requirements, Starlink also offers a Fixed Priority Service at a higher monthly cost, which prioritizes traffic over the Standard service, providing faster and more consistent download and upload speeds. Starlink's service is a no-contract service, which includes a 30-day free trial period, allowing the transfer station to test the service before committing to a long-term agreement. This flexibility, combined with the cost-effectiveness and reliable performance, makes Starlink the most suitable solution for addressing the transfer station's connectivity needs.

Service	Setup/Install/Device Fees	Monthly Charge	3-year Total	Upload (Mbps)	Download (Mbps)	Latency (ms)
<b>Starlink Standard</b>	\$599.00	\$90.00	\$3,839.00	12-23	80-148	32-37
<b>Starlink Priority</b>	\$2,500.00	\$140.00	\$7,540.00	15-25	100-220	25-37
<b>Spectrum Business</b>	\$12,802.32	\$129.99	\$17,481.96	600	35	0
<b>Spectrum Edge</b>	\$2,509.00	\$849.99	\$33,108.64	600	35	0
<b>AlwaysOn 4G LTE</b>	\$129.00	\$100.00	\$3,729.00	25-50	75	50
<b>ViaSat Internet</b>	\$500.00	\$240.00	\$9,140.00	4	~100-200	600-800

## Task 6 – Household Hazardous Waste Collection

The Town performs an annual household hazardous waste collection day, which was most recently performed on August 5<sup>th</sup>, according to the Town website. The Town serves as a host site for the Lakes Region Regional Planning Commission which includes twenty-four area communities. The collection day is held at the Town highway garage and not the transfer station. The Town is exploring options to manage hazardous waste at the facility on a regular basis during normal operating hours. Household hazardous wastes are common household items that would otherwise be considered hazardous waste if managed by commercial or industrial businesses. Examples include paints, solvents, chemicals, and pesticides. This task evaluates collection, storage area, and management needs to accommodate this operation.

Incorporating household hazardous waste management at the facility will require that staff be appropriately trained. We have consulted with Tim Prosprt, who is the administrator of the NHDES-Hazardous Waste Technical Assistance Section to determine the applicable requisites for managing an in-house program. The NHDES requirements that apply will depend on how much hazardous waste is collected at the facility. Regulations are applied in a tiered approach where the more waste a facility collects, or “generates”, the more regulations that apply. All generators of hazardous waste are subject to the NH Hazardous Waste Rules, Env-Hw 100-1300. The chapters that are most applicable to managing a household hazardous waste program are 400, 500, 800 and 1100, with Chapter 500 providing the storage requirements.

Facilities that collect < 220 lbs. in each and every month have the fewest regulations and are generally easy to follow. These facilities must store household hazardous wastes in compatible containers in good condition that are kept closed and sealed, on an impervious surface, and protected from the elements. If a facility generates less than 220 pounds in every month but accumulates more than 220 pounds on-site, there are a few extra requirements which include emergency preparedness standards and weekly inspections. Both of these situations require completion and submittal of a SQG self-certification form every three years, which is a self-inspection form. For reference, 220 pounds roughly equates to 25 gallons of liquid waste.

Facilities that collect more than 220 pounds of hazardous waste in any month have significantly more rules

to follow. In addition to the basic requirements described above, the facilities must have a formal contingency plan specific to hazardous waste and a formal training plan that guides a program for ensuring all staff with hazardous waste-related duties are trained annually. Additionally, the site must have at least one person on staff at the facility for 75% of a normal work week that is a certified hazardous waste coordinator. A person becomes certified by attending a state-run full day of training hosted by NHDES. These facilities must have their hazardous wastes removed within 90 days (with exception for some specific wastes) by using a NH-registered hazardous waste transporter.

Any site that generates/collects household hazardous waste must complete a "RCRA C Site Identification Form" to inform NHDES of their hazardous waste activities and information about the site.

If the Town decides to manage household hazardous waste as a regularly managed material, we recommend implementing a limited program on an initial basis under 220 pounds per month. This program could be managed in the Operations Building over a spill pallet and appropriate fire suppression systems. If warranted, the Town may consider an expanded program and a new building which could potentially be sited over the reclaimed landfill area in or near the location of the future swap shop depicted on Figure 1. If warranted, the Town could decide to construct a larger building to house both the swap shop and household hazardous waste and other features including a new office.

NHDES indicated that Hooksett, Goffstown, and Wolfeboro (area facility) either have previously or are currently managing similar household hazardous waste programs.

Goffstown's program is now only available to Town residents but used to be state-wide until recently. We reached out to Bill Holt with Goffstown Public Works to discuss their program which started around 15 years ago. Goffstown's HHW program is managed at their Transfer Station but in a separate structure and is periodically above the 220 lb threshold. They accept paints, pesticides, herbicides, gasoline, and oils. They do not accept asbestos or medical waste. All liquid waste is stored above appropriately sized spill containment pallets. The HHW structure does not provide for fire suppression, but there are fire extinguishers nearby. The Town requires that residents fill out a form to set up appointments, which describes the type of HHW and quantity and the facility accepts HHW from 2 or 3 residences every Wednesday. HHW is removed from the facility every 90 days at a minimum by a licensed hauler. Mr. Holt reports that in general, the facility generates the following per 90-day shipment:

- 2-3 gaylord boxes of paints, chemicals, miscellaneous
- 1 35-gallon bag of pesticides and herbicides (each)
- 2 55-gallon drums of gasoline

We also reached out to Shawn Dumont, who is the Transfer Station Crew Chief for the Town of Hooksett to discuss their HHW program. Mr. Dumont described a limited program for Town residents that falls below the 220 lb/month threshold. Their program is limited to paints, oil, and gasoline. Paints are solidified using speedy-dri or similar and disposed with the MSW. Gasoline, oil based paints and stains, and similar are stored in 55-gallon drums over spill pallets for a maximum of 90 days before they are shipped by Safety Kleen to a permitted disposal facility. Hooksett staff receive the NHDES-required training.

Lakes Region Household Hazardous Product Facility (LRHHPF) represents two New Hampshire Municipalities – Wolfeboro and Alton who have been working cooperatively since 2002. According to Wolfeboro's Town website, the LRHHPF was a joint venture between the Lakes Region Regional Planning Commission and the New Hampshire Department of Environmental Services (NHDES) along with founding municipalities Wolfeboro, Alton, and Tuftonboro. In addition to household hazardous waste, the LRHHPF also accepts medical prescription waste. The Wolfeboro facility operates on the 3<sup>rd</sup> Saturday May through October from 8:30 a.m. to noon. The Alton location operates at the Town Transfer Station during the months of July and September from 8 a.m. to noon. The LRHHPF charges residents \$50 per 5-gallons of household hazardous waste. Small quantity generators of hazardous waste are also served under agreed-upon terms.

In 2023, the LRHHPF served 663 households. Of this, 379 were from Wolfeboro and 154 were from Alton representing a combined 80% of the total. The remaining 20% is accepted from non-member municipalities, including Moultonborough. In 2023, 8 of the households served were from Moultonborough, representing 1.2% of the total. From 2017 and 2023, the LRHHPF served between 8 and 21 residences per year. The split between Wolfeboro and Alton is not presented, but it is believed that most of the Moultonborough residents would utilize the Wolfeboro facility since it is closer.

We spoke with Sarah Silk, who has been the site coordinator for LRHHPF since its inception. She described that the Wolfeboro facility is located on Town property adjacent to the Transfer station at the site of the Town brush dump. The facility operates within a 40' x 40' fenced area that includes three structures – a 10' x 12' wooden shed that serves as the office, a second 10' x 12' wooden shed that is used to store empty drums and containers, and a modular hazmat storage trailer which is used to store partially filled HHW containers. The modular trailer has a fire suppression system.

HHW collection days for both Alton and Wolfeboro are run by Clean Harbors under agreement with LLHHPF. The facilities don't operate without Clean Harbors on site, who take ownership of the HHW once it is delivered. Full containers are removed from the site by Clean Harbors at the end of each HHW day and partially filled containers are stored in the HHW modular trailer. Ms. Silk completes weekly inspections of the wastes in the modular trailer and receives the required NHDES training. The facility also serves small quantity generators of hazardous waste by appointment, but only on days that Clean Harbors is operating the facility.

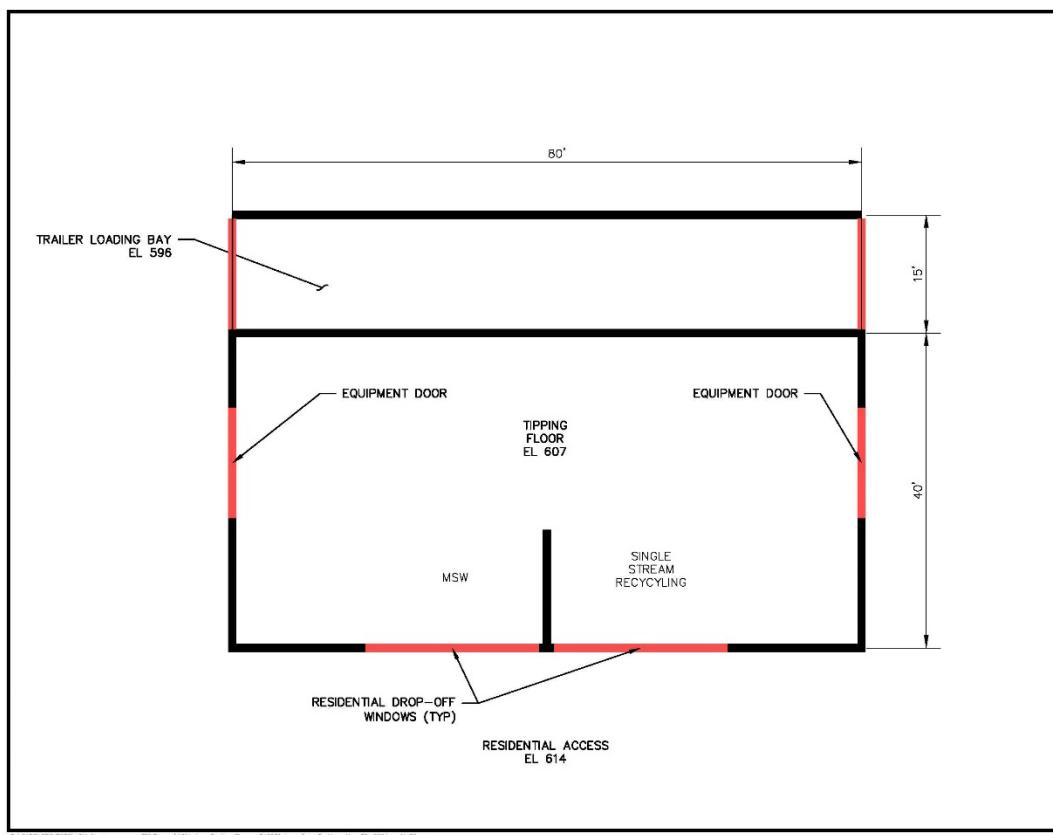
## Task 7 – Tipping Floor/ 100-Yard Open-Top Trailer Transfer Station

This task considers a new transfer station building for the Town that would allow for loading of MSW and single stream recyclables into 100-cubic-yard open-top transfer trailers, which are significantly larger than the 40-cubic-yard compactor boxes that are currently being utilized. The larger hauling vehicles would allow for more economical hauling to remote disposal and recycling facilities that may have lower tipping fees.

Facilities such as these require significant grade differential. Normally there is a minimum 6-foot drop between the residential drop-off location/window openings and the tipping floor and 8 to 12 feet between the tipping floor and the bottom of the trailer loading bay. There does not appear to be a location on-site

that naturally has this amount of grade separation so significant fill would be needed to create it.

We envision a building that would be located over the reclaimed landfill area, with residential parking in the front and commercial access in the rear. The building would have push walls for compacting and storing MSW and single stream recyclables. Recyclables and MSW would be dropped by residents from openings in the building at OSHA height (42 inches) to a concrete slab typically 6-feet below grade to provide for material storage. Figures for a proposed facility are presented as [Figure 7.1 – New Facility Plan](#) and [Figure 7.2 - New Facility Elevation](#). A preliminary cost estimate for the facility is provided in Appendix B. We estimate that this building and associated sitework could be constructed for around \$3 million. A conceptual floor plan for the facility is presented below:



Sizing of the building is primarily determined by vehicle turning motions inside the building. Material processed through the building is determined by efficiency-loading MSW and single stream recyclables into transfer trailers. At current MSW and recycling rates, it is anticipated that between 1 and 2 loads of each material would be needed per week. In general, MSW loads should be removed on a daily basis, so to justify a facility of this size the Town would need to generate over twice the amount of MSW currently managed at the facility. According to the State of New Hampshire Office of Planning and Development Population Projections (September 2022), Moultonborough's population is only projected to increase

from 4,918 residents (2020 Census) to 5,231 residents by 2050. We note that the exit lanes for the proposed facility would likely require wetland permitting based on visual observations and a review of aerial imagery.

## Task 8 – Transfer Station Permits

Currently, residents can acquire Transfer Station permits (stickers) at the Town Hall, the Transfer Station itself, or by mail, with each vehicle needing its unique non-transferable sticker priced at \$20 for a 2-year term. Payments are accepted via cash or check only. The Transfer Station also has a structured fee schedule for disposing of various items, ranging from demolition materials and bulky items to appliances and electronics. This fee schedule can be found on the Town website. The Town has brought a few concerns to our attention regarding the current permit system, specifically, the need to limit the number of permits per household and accurately manage and monitor access to the facility.

Potential Improvements:

- Digital Permit System: Transition from stickers to barcode system (easier tracking and management of permits per household) / create database of permits
- Barcoded Stickers: monitor access to the facility/enforce permit limits/record actionable data (visits/types of waste/weight/etc.)
- Additional Payment Options: Credit/debit cards or online payments to accommodate more residents or those who vacation for the summer
- Household Permit Limits: limit the number of permits issued per household to prevent overuse and potential out-of-town users
- Online Application and Renewal: online permit applications/renewals will streamline the process and reduce admin work
- Variable Permit Tiers: Full time residents vs summer, etc /household size, waste volume, or types of waste, allow customization to resident needs
- Permit Expiration Alerts

## Recommendations

CMA Engineers has reviewed the Town of Moultonborough Transfer Station layout and operations and has summarized our findings in this Feasibility Study and enclosed figures and cost estimates. In general, the site is very well managed.

Our focus for the Feasibility Study was primarily the southern side of the site, which includes the MSW and SSR compactor area, Operations Building, scale area, and the potential of the reclaimed landfill area. The north side of the site, consisting of C&D waste, bulk metals, white goods, bulky waste, and yard waste/composting is well laid out with lots of space for residential drop off, commercial pick-up, and

associated turning motions. We note that the management of waste streams is well configured as most residents deliver MSW and SSR on a weekly basis and utilizing the northern (MSW/SSR) loop on a less frequent basis, which minimizes congestion in the southern loop (C&D/Metals).

Our overall recommendations are summarized below:

- Relocate compactor area retaining wall and generator to create an additional compactor parking space and expanded exit lanes
- Reconfigure and clearly label compactors to an MSW-SSR-MSW-SSR configuration to minimize walk distances
- Create a dedicated drop-off lane on north side of Operations Building for Stryofoam and waste oil
- Relocate swap shop area to either inside Operations Building (with parking on north side) or to a new location away from the compactor area
- Consider a new queuing loop over the reclaimed landfill area to keep vehicles off Holland Street during busy periods
- New roof structures over the compactor area (Tasks 2 and 3) are considered convenience items that would better protect workers and residents from weather and improve snow removal efficiencies
- Similarly an enclosure over the scale would improve snow removal efficiency and is not recommended due to cost and visibility issues (camera system would be needed)
- Consider using Starlink for reliable internet service for the facility
- Consider a limited household hazardous waste program in the Operations Building for quantities less than 220 lb per month
- Town should confer with NHDES- Hazardous Waste Technical Assistance Section to confirm project training and storage requirements for the Transfer Station
- A new tipping floor transfer station facility is not recommended at this time due to the high cost
- Consider implementing electronic means of transfer station permit tracking;
- Provide “Slow Down” signage, portable speed bumps, and/or pavement markings to encourage residents to slow down as they approach the facility on the north side of the Operations Building
- Consider installing a railing system for C&D loop retaining walls

The Town should consider the above options that they would like to proceed with further and develop them through preliminary design which will provide more detailed cost estimates that could be utilized to support a future warrant article.



## *Appendix A*

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# **FIGURES**

Figure 0 – Existing Conditions Plan

Figure 1 – Enhanced Traffic Plan

Figure 2.1 – MSW and Recycling Deposit Area Improvement Plan

Figure 2.2 – Drop Off Area Structure Elevation

Figure 3.1 – MSW and Recycling Hauling/Removal Area Improvement Plan

Figure 3.2 – Compactor Area Structure Elevation

Figure 4 – Truck Scale Structure Elevation

Figure 7.1 – New Facility Plan

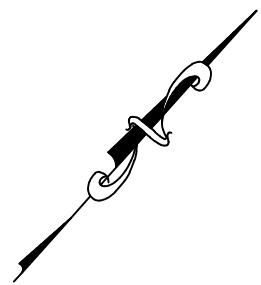
Figure 7.2 – New Facility Elevation





### Legend:

- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR 200
- FACILITY TRAFFIC PATTERN
- APPROXIMATE PROPERTY LINE



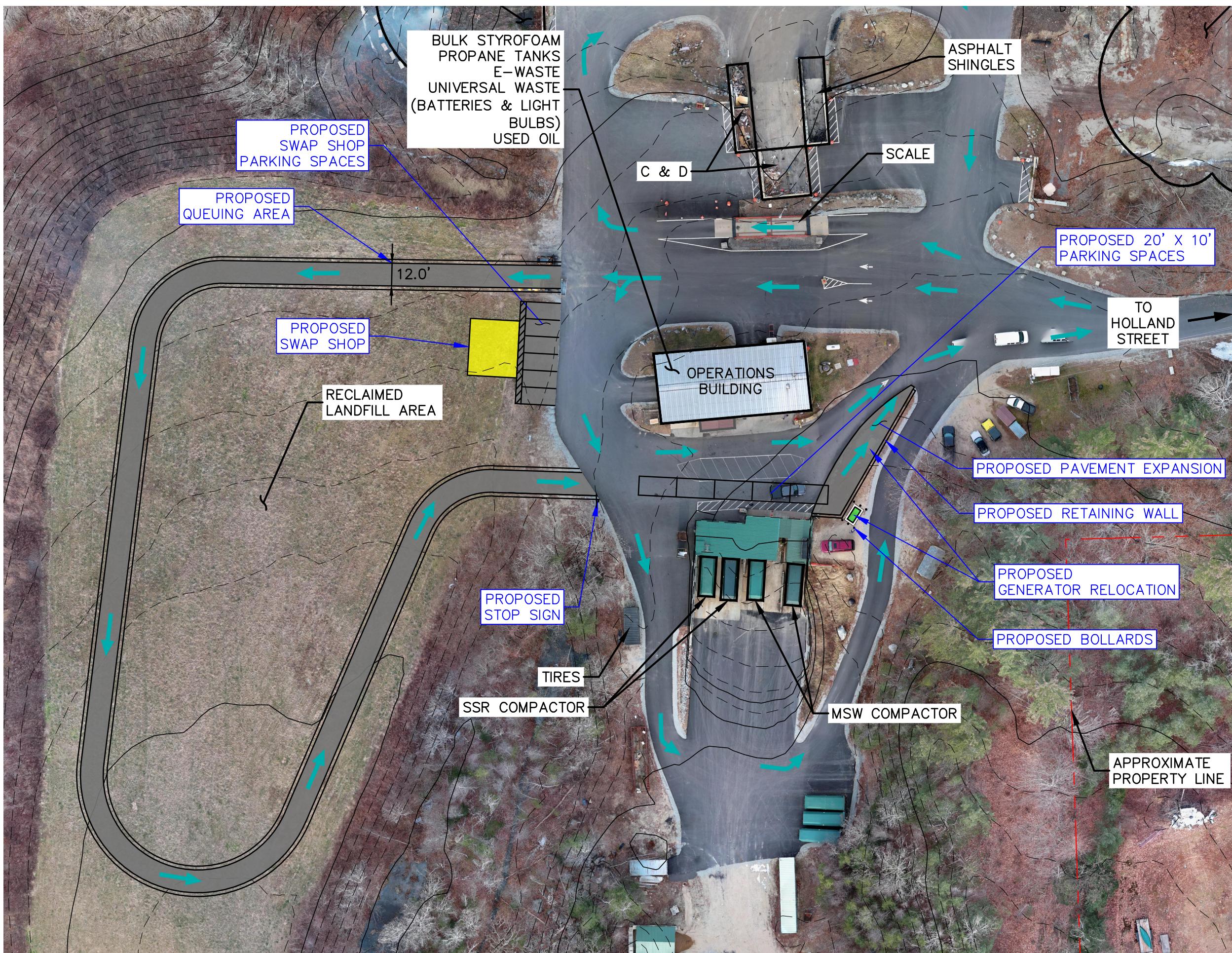
0 60 120  
Scale: 1" = 120'

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cmaeengineers.com

Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 60'

Existing Conditions Plan

Figure 0



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cmaeengineers.com

Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 50'

Enhanced Traffic Plan

Figure 1



## Legend:

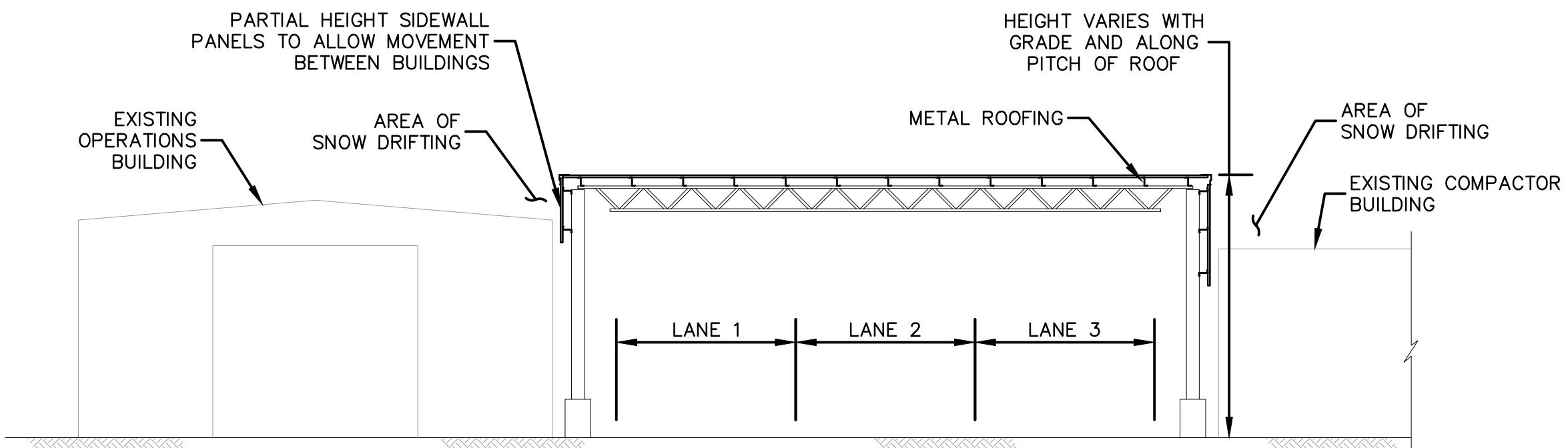
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- FACILITY TRAFFIC PATTERN
- APPROXIMATE PROPERTY LINE

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**Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH**  
Scale: 1" = 20'

**MSW & Recycling Deposit Area Imp. Plan**

Figure 2.1



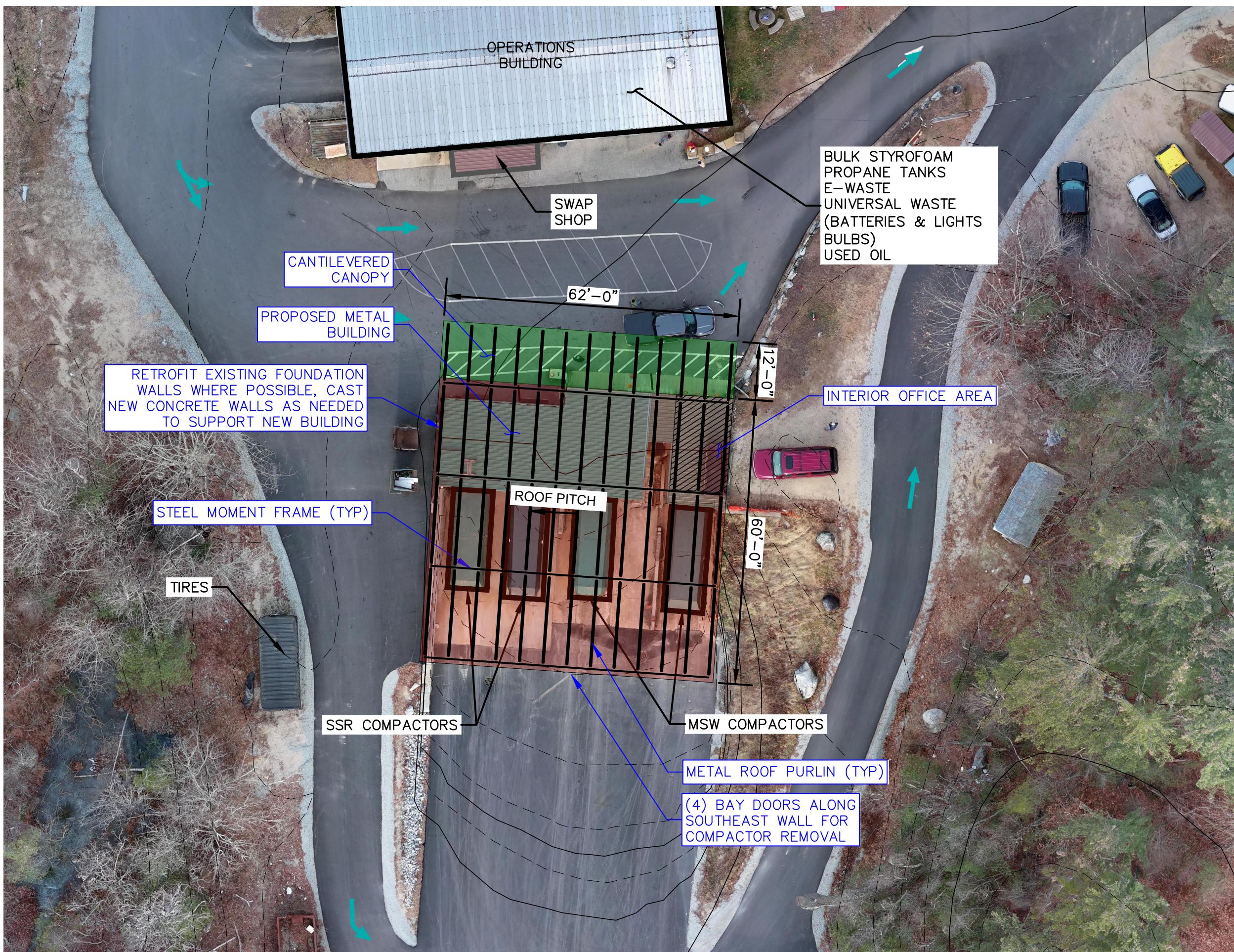
PROPOSED MSW AND RECYCLING DEPOSIT AREA ELEVATION

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cmae@engineers.com

Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 10'

MSW and Recycling Deposit Area Elevation

Figure 2.2

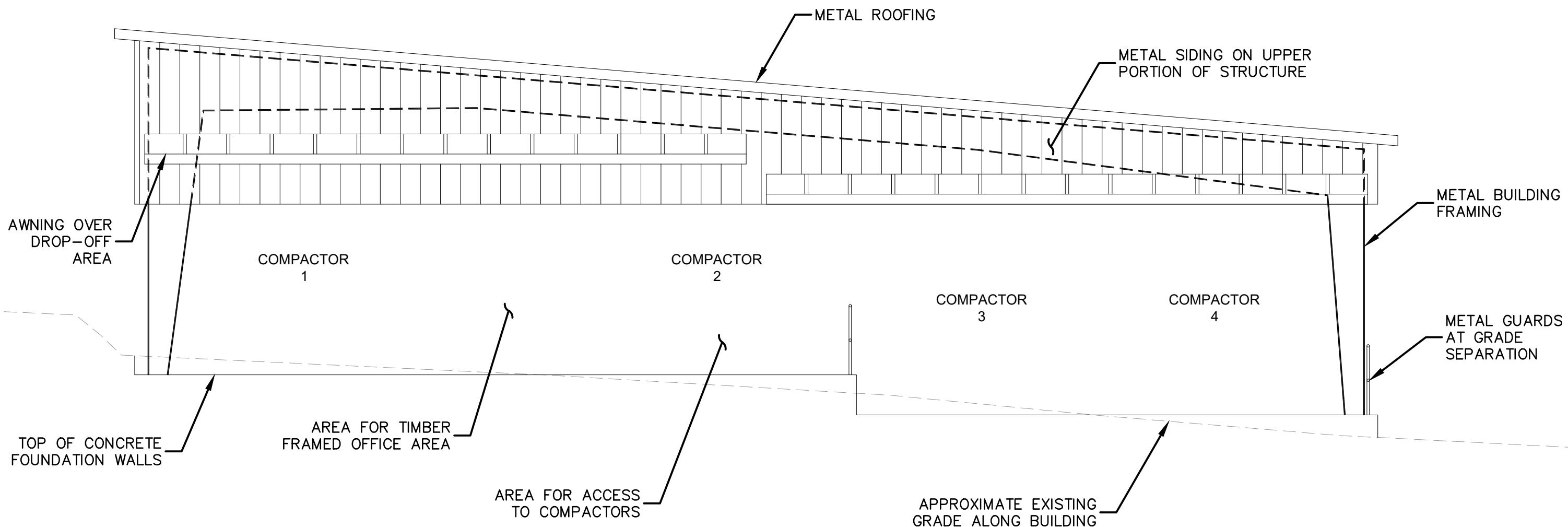


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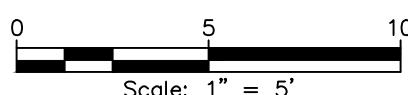
Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 20'

MSW & Recycling Hauling Area Imp. Plan

Figure 3.1



COMPACTOR STRUCTURE ELEVATION

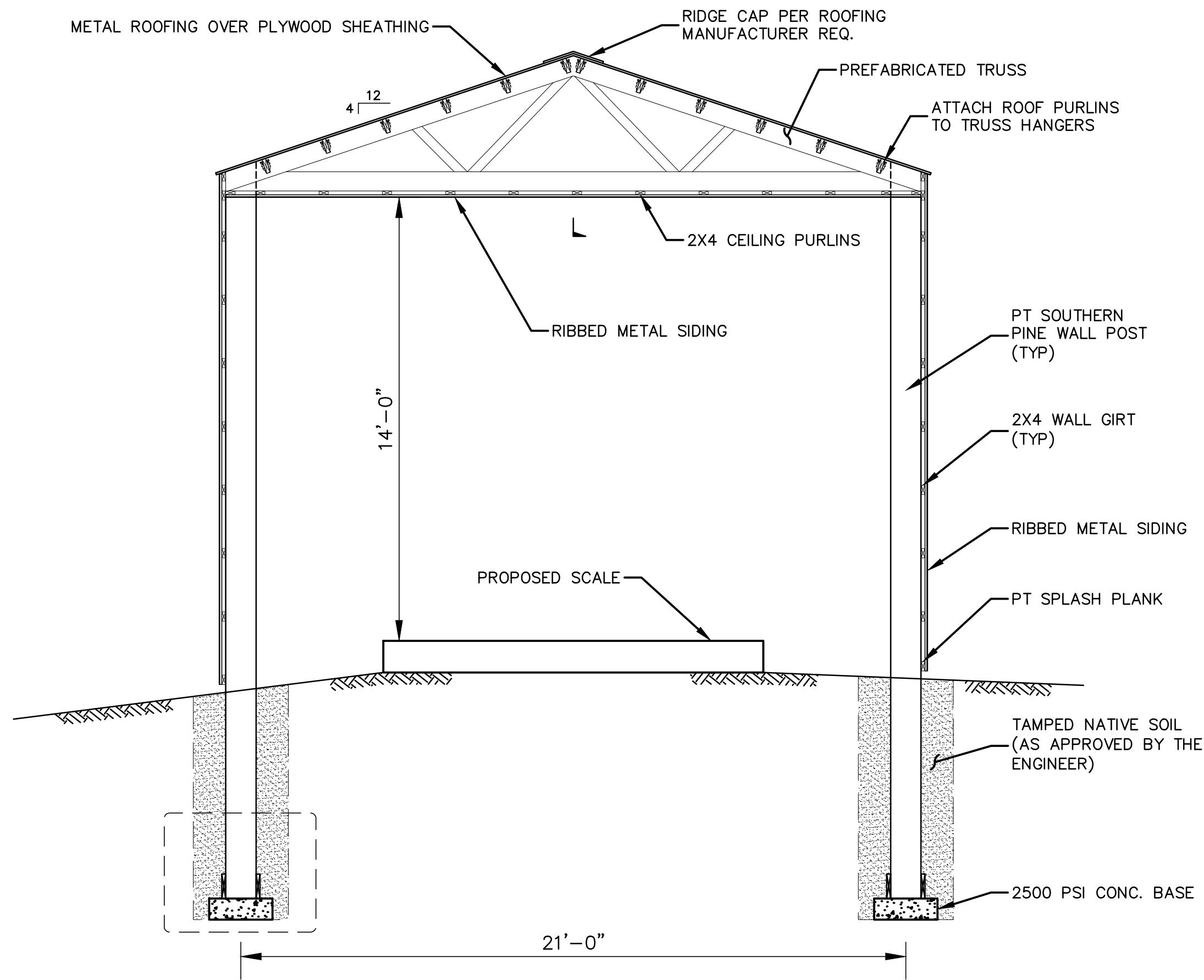


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cmae.com

Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 5'

Compactor Structure Elevation

Figure 3.2



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Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 40'

Truck Scale Structure Elevation

Figure 4

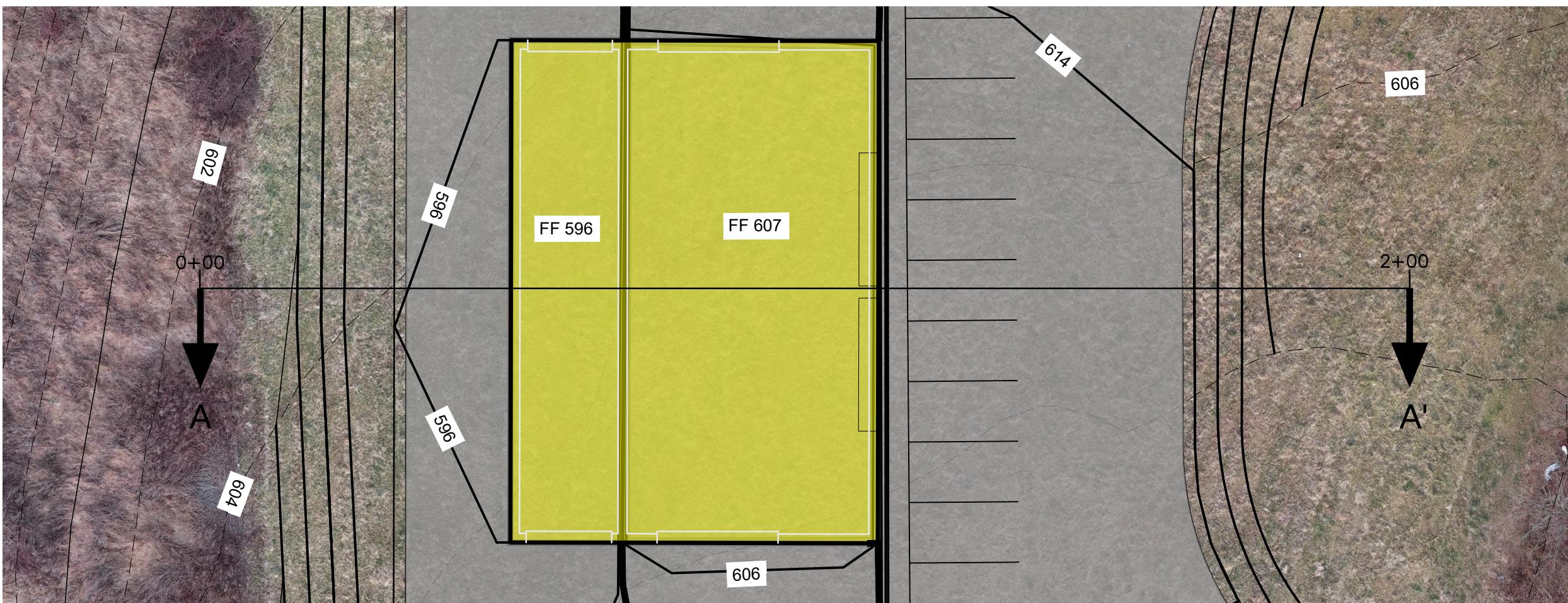


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Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 50'

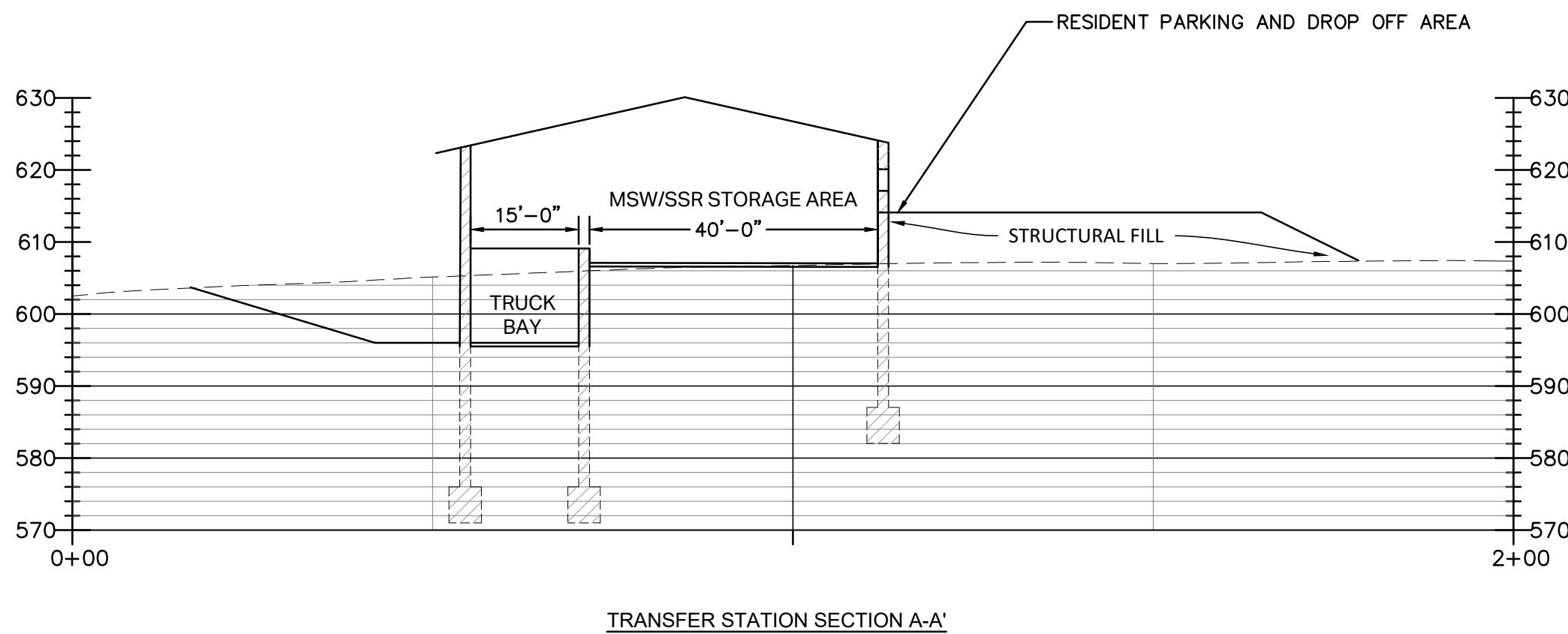
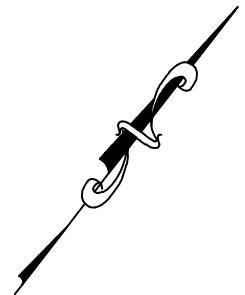
New Facility Plan

Figure 7.1



Legend:

EXISTING 2' CONTOUR  
EXISTING 10' CONTOUR 200



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Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 20'

New Facility Section View

Figure 7.2



*Appendix B*

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**COST ESTIMATES**





Civil/Environmental Engineers  
35 Bow Street  
Portsmouth, NH 03801

File: Moultonborough TS Cost Estimates  
Feasibility Study - Transfer Station Layouts  
CMA #1311  
May 1, 2024  
By: AJS

### Task 1 - Enhanced Traffic Plan

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
<b>Contractor's General Conditions</b>					
1	General Conditions (5% of Construction Costs)	LS	1	NA	\$13,500.00
2	Mobilization (5% of Construction Costs)	LS	1	NA	\$13,500.00
				<b>General Conditions Subtotal</b>	<b>\$27,000.00</b>
<b>Queuing Loop</b>					
1	Erosion Control	LS	1	\$ 2,000.00	\$2,000.00
2	12" Gravel (Base)	CY	400	\$ 42.00	\$16,800.00
3	6" Crushed Gravel	CY	200	\$ 38.00	\$7,600.00
4	General Paving	SF	10,660	\$ 2.00	\$21,320.00
5	General Site/Earthwork	LS	1	\$ 20,000.00	\$20,000.00
				<b>Site Work Subtotal</b>	<b>\$67,800.00</b>
<b>Buildings</b>					
1	Swap Shop Structure	SF	780	\$ 150.00	\$117,000.00
2	12" Gravel (Base)	CY	42	\$ 42.00	\$1,764.00
3	6" Crushed Gravel	CY	21	\$ 38.00	\$798.00
4	General Paving	SF	1,134	\$ 2.00	\$2,268.00
5	Striping	LS	1	\$ 2,000.00	\$2,000.00
6	General Site/Earthwork	LS	1	\$ 10,000.00	\$10,000.00
				<b>Building Subtotal</b>	<b>\$133,900.00</b>
<b>Retaining Wall Relocation</b>					
1	Boulder Retaining Wall Demo	LF	75	\$70.00	\$5,250.00
2	Reconstruct Boulder Wall	LF	75	\$300.00	\$22,500.00
5	Generator Relocation and Fitup	LS	1	\$ 25,000.00	\$25,000.00
2	12" Gravel (Base)	CY	39	\$ 42.00	\$1,638.00
3	6" Crushed Gravel	CY	20	\$ 38.00	\$760.00
4	General Paving	SF	1,040	\$ 2.00	\$2,080.00
5	Striping	LS	1	\$ 1,000.00	\$1,000.00
6	General Site/Earthwork	LS	1	\$ 10,000.00	\$10,000.00
				<b>Retaining Walls and Slabs Subtotal</b>	<b>\$68,228.00</b>

SUBTOTAL: **\$296,928.00**  
 PROJECT CONTINGENCY (15%): **\$44,600.00**  
 ENGINEERING & PERMITTING (15%): **\$44,600.00**  
 TOTAL: **\$386,128.00**



Civil/Environmental Engineers  
35 Bow Street  
Portsmouth, NH 03801

File: Moultonborough TS Cost Estimates  
Feasibility Study - Transfer Station Layouts  
CMA #1311  
May 1, 2024  
By: AJS

**Task 2 - MSW and Recycling Deposit Area (NOT RECOMMENDED DUE TO SNOW LOADING OF ADJECNT STRUCTURES)**

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
<b>Contractor's General Conditions</b>					
1	General Conditions (5% of Construction Costs)	LS	1	NA	\$21,000.00
2	Mobilization (5% of Construction Costs)	LS	1	NA	\$21,000.00
				<b>General Conditions Subtotal</b>	<b>\$42,000.00</b>
<b>Site Work</b>					
1	Erosion Control	LS	1	\$2,500.00	\$2,500.00
2	Demolition/Excavation	LS	1	\$5,000.00	\$5,000.00
3	General Paving	SF	5,000	\$2.00	\$10,000.00
4	Striping	LS	1	\$2,000.00	\$2,000.00
5	Bollards	EA	4	\$700.00	\$2,800.00
				<b>Site Work Subtotal</b>	<b>\$22,300.00</b>
<b>Canopy Structure</b>					
1	Crushed Stone (footings)	CY	10	\$60.00	\$600.00
2	Structural Fill	CY	20	\$40.00	\$800.00
3	Canopy Structure/Footings	SF	3,300	\$50.00	\$165,000.00
4	Site Electrical/Lighting	LS	1	\$5,000.00	\$5,000.00
5	General Site/Earthwork	LS	1	\$10,000.00	\$10,000.00
6	Snow Load Reinforcement to Adjacent Structures (Est.)	LS	1	\$200,000.00	\$200,000.00
	<b>Transfer Station Building and Retaining Walls Subtotal</b>				<b>\$381,400.00</b>

<b>SUBTOTAL:</b>	<b>\$445,700.00</b>
<b>PROJECT CONTINGENCY (15%):</b>	<b>\$66,900.00</b>
<b>ENGINEERING &amp; PERMITTING (15%):</b>	<b>\$66,900.00</b>
<b>TOTAL:</b>	<b>\$579,500.00</b>



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### Task 3 - MSW and Recycling Hauling/Removal Area

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
<b>Contractor's General Conditions</b>					
1	General Conditions (5% of Construction Costs)	LS	1	NA	\$13,000.00
2	Mobilization (5% of Construction Costs)	LS	1	NA	\$13,000.00
				<b>General Conditions Subtotal</b>	<b>\$26,000.00</b>
<b>Site Work</b>					
1	Erosion Control	LS	1	\$2,500.00	\$2,500.00
2	Demolition/Excavation	LS	1	\$20,000.00	\$20,000.00
3	General Paving	SF	5,000	\$2.00	\$10,000.00
4	Striping	LS	1	\$2,000.00	\$2,000.00
5	Bollards	EA	4	\$700.00	\$2,800.00
				<b>Site Work Subtotal</b>	<b>\$37,300.00</b>
<b>Canopy Structure</b>					
1	Crushed Stone (footings)	CY	10	\$60.00	\$600.00
2	Structural Fill	CY	20	\$40.00	\$800.00
3	Canopy Structure/Footings	SF	3,000	\$60.00	\$180,000.00
4	Site Electrical/Lighting	LS	1	\$5,000.00	\$5,000.00
5	General Site/Earthwork	LS	1	\$20,000.00	\$20,000.00
	<b>Transfer Station Building and Retaining Walls Subtotal</b>				<b>\$206,400.00</b>

<b>SUBTOTAL:</b>	<b>\$269,700.00</b>
<b>PROJECT CONTINGENCY (15%):</b>	<b>\$40,500.00</b>
<b>ENGINEERING &amp; PERMITTING (15%):</b>	<b>\$40,500.00</b>
<b>TOTAL:</b>	<b>\$350,700.00</b>



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#### Task 4 - Truck Scale Structure

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
<b>Contractor's General Conditions</b>					
1	General Conditions (5% of Construction Costs)	LS	1	NA	\$7,000.00
2	Mobilization (5% of Construction Costs)	LS	1	NA	\$7,000.00
				<b>General Conditions Subtotal</b>	<b>\$14,000.00</b>
<b>Site Work</b>					
1	Erosion Control	LS	1	\$1,000.00	\$1,000.00
3	General Paving	SF	1,000	\$2.00	\$2,000.00
4	Striping	LS	1	\$1,000.00	\$1,000.00
5	Bollards	EA	4	\$700.00	\$2,800.00
				<b>Site Work Subtotal</b>	<b>\$6,800.00</b>
<b>Scale Structure</b>					
1	Crushed Stone (footings)	CY	20	\$60.00	\$1,200.00
2	Structural Fill	CY	20	\$40.00	\$800.00
3	Scale Structure/Footings	SF	945	\$75.00	\$70,875.00
4	Site Electrical/Lighting	LS	1	\$10,000.00	\$10,000.00
5	General Site/Earthwork	LS	1	\$20,000.00	\$20,000.00
6	Camera/Intercom/Software/Appurtenances	LS	1	\$30,000.00	\$30,000.00
				<b>Transfer Station Building and Retaining Walls Subtotal</b>	<b>\$132,875.00</b>

<b>SUBTOTAL:</b>	<b>\$153,675.00</b>
<b>PROJECT CONTINGENCY (15%):</b>	<b>\$23,100.00</b>
<b>ENGINEERING &amp; PERMITTING (15%):</b>	<b>\$23,100.00</b>
<b>TOTAL:</b>	<b>\$199,875.00</b>



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### Task 7 - Tipping Floor

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
<b>Contractor's General Conditions</b>					
1	General Conditions (5% of Construction Costs)	LS	1	NA	\$100,000.00
2	Mobilization (5% of Construction Costs)	LS	1	NA	\$100,000.00
				<b>General Conditions Subtotal</b>	<b>\$200,000.00</b>
<b>Site Work</b>					
1	Erosion Control	LS	1	\$5,000.00	\$5,000.00
2	Excavation	CY	10,000	\$5.00	\$50,000.00
3	Processing of Cut Material for Fill	CY	10,000	\$5.00	\$50,000.00
4	Structural Fill (incl. replacement of waste fill)	CY	5,000	\$40.00	\$200,000.00
5	12" Gravel (Base)	CY	1,700	\$42.00	\$71,400.00
6	6" Crushed Gravel	CY	850	\$38.00	\$32,300.00
7	General Paving	SF	40,000	\$2.00	\$80,000.00
8	4" Topsoil & Seed	CY	238	\$80.00	\$19,040.00
9	Striping	LS	1	\$10,000.00	\$10,000.00
10	Bollards	EA	15	\$700.00	\$10,500.00
11	Granite Curbing	LF	100	\$75.00	\$7,500.00
12	Handicap Ramps	EA	2	\$2,500.00	\$5,000.00
13	Guardrail	LF	200	\$40.00	\$8,000.00
14	Stormwater Ponds and Drainage Features	LS	1	\$100,000.00	\$100,000.00
15	Site Electrical/Lighting/Plumbing	LS	1	\$60,000.00	\$60,000.00
16	General Site/Earthwork	LS	1	\$20,000.00	\$20,000.00
				<b>Site Work Subtotal</b>	<b>\$728,800.00</b>
<b>Transfer Station Building and Retaining Walls</b>					
1	Crushed Stone (slab/footings)	CY	200	\$60.00	\$12,000.00
2	8" Slab on Grade	SF	4,200	\$16.00	\$67,200.00
3	Structural Concrete, Building Walls/Footings	CY	400	\$1,600.00	\$640,000.00
4	Reinforcing Steel, Building Walls/Footings	LB	30,000	\$2.50	\$75,000.00
5	Railings	LF	100	\$100.00	\$10,000.00
6	Trailer Loading Bay	LS	1	\$200,000.00	\$200,000.00
7	Metal Building	SF	4,200	\$30.00	\$126,000.00
8	Doors (Overhead, Roll-Up)	LS	1	\$60,000.00	\$60,000.00
9	Ventilation System	LS	1	\$30,000.00	\$30,000.00
10	Electrical	LS	1	\$15,000.00	\$15,000.00
11	Other building costs	LS	1	\$20,000.00	\$20,000.00
				<b>Transfer Station Building and Retaining Walls Subtotal</b>	<b>\$1,255,200.00</b>

SUBTOTAL: \$2,184,000.00  
PROJECT CONTINGENCY (15%): \$327,600.00  
ENGINEERING & PERMITTING (15%): \$327,600.00  
TOTAL: \$2,839,200.00



*Appendix C*

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**PHOTOGRAPHS**





**CMA**  
ENGINEERS  
CIVIL/ENVIRONMENTAL/STRUCTURAL  
Portsmouth, NH • Manchester, NH • Portland, ME  
603/431-6196 • 603/627-0708 • 207/541-4223  
cmae n g i n e e r s . c o m

Moultonborough Transfer Station  
253 Holland Street  
Moultonborough, NH  
Scale: 1" = 60'

Photo Log

Figure 0



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 1: Drone Imagery of Site (North is Up)



Photo 2: Transfer Station Entrance, Gate, and Signage – Looking Southwest



Moultonborough Transfer Station Feasibility Study  
Photo Log



Photo 3: Transfer Station Signage



Photo 4: Approach to Scale (Left) – Looking Northeast



Moultonborough Transfer Station Feasibility Study

Photo Log



Photo 5: Operations Building (Right), Reclaimed Landfill Area (Left) – Looking North



Photo 6: Reclaimed Landfill Area – Looking Southwest



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 7: Operations Building (Left), MSW/SSR Compactors (Right) – Looking Northeast



Photo 8: MSW Compactors and Attendant Shed – Looking Southeast



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 9: SSR Compactors and Attendant Shed (Left) – Looking Southeast



Photo 10: Attendant Shed – Looking Northeast



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 11: SSR Compactors – Looking Southeast



Photo 12: Operations Building/Swap Shop Area (Books) – Looking Northwest



## Moultonborough Transfer Station Feasibility Study

### Photo Log

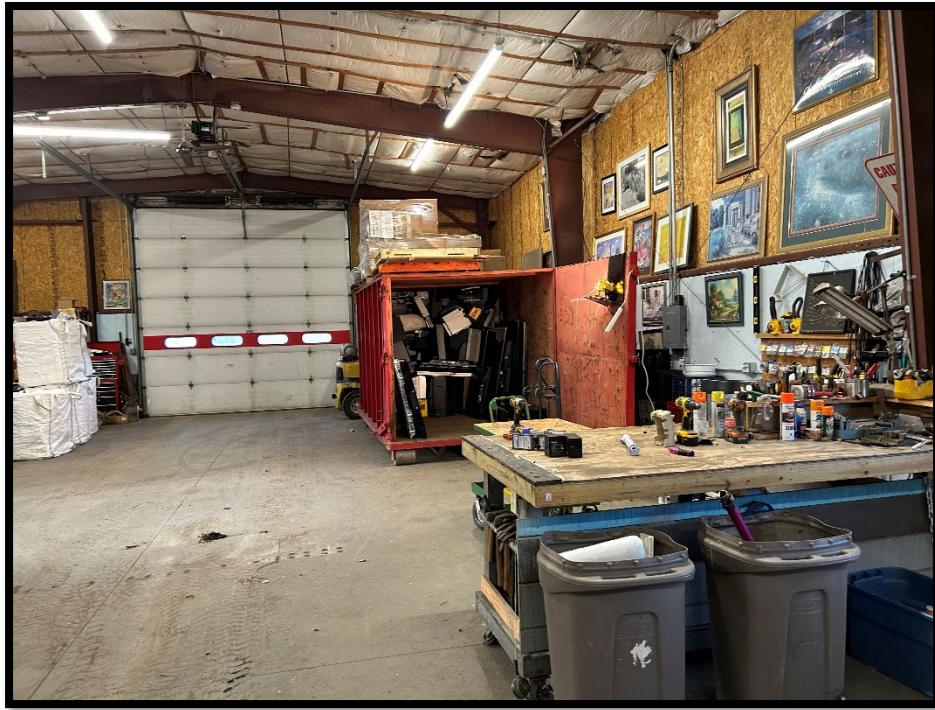


Photo 13: Inside Operations Building (Red e-waste Trailer on Right)

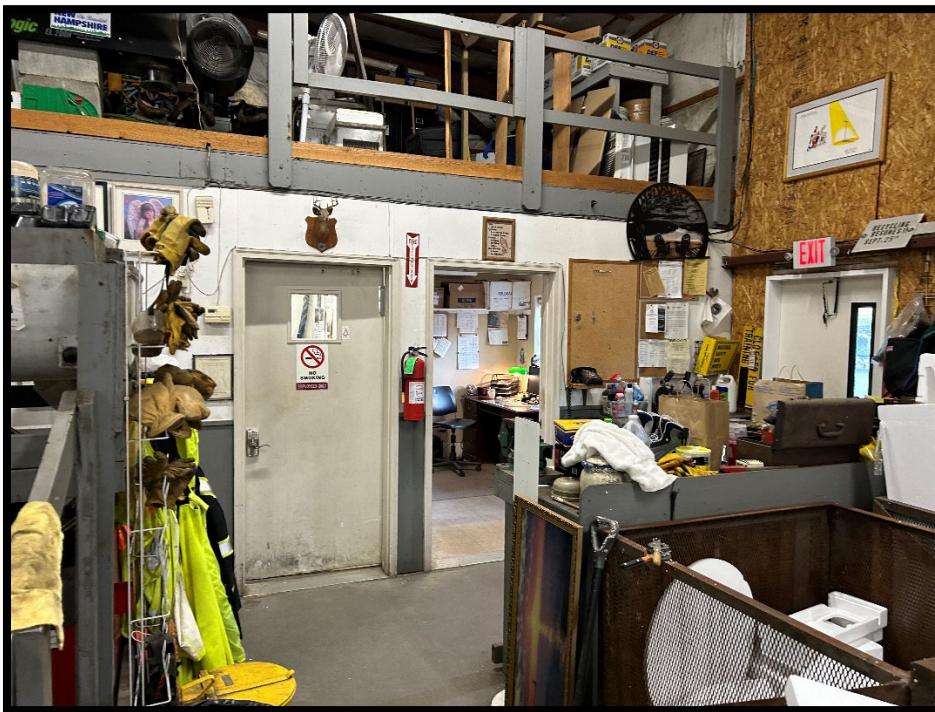


Photo 14: Inside Operations Building (Bulk Styrofoam on Right, Office in Rear)



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 15: Inside Operations Building (Used Oil in Front, Restroom in Rear)



Photo 16: Inside Operations Building (Oil Drums on Spill Pallet)



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 17: Inside Operations Building (Batteries)



Photo 18: Southwest of Compactor Area



Moultonborough Transfer Station Feasibility Study

Photo Log



Photo 19: Compactor Boxes – Looking North



Photo 20: Compactor Boxes – Looking Northwest



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 21: Internal Signage



Photo 22 – Clothing and Shoe Bins



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 23: C&D Drop-Off Wall



Photo 24: Yard Waste Drop-off Wall



Moultonborough Transfer Station Feasibility Study

Photo Log



Photo 25: Asphalt Shingle Wall – Looking Northwest



Photo 26: Signage



Moultonborough Transfer Station Feasibility Study

Photo Log

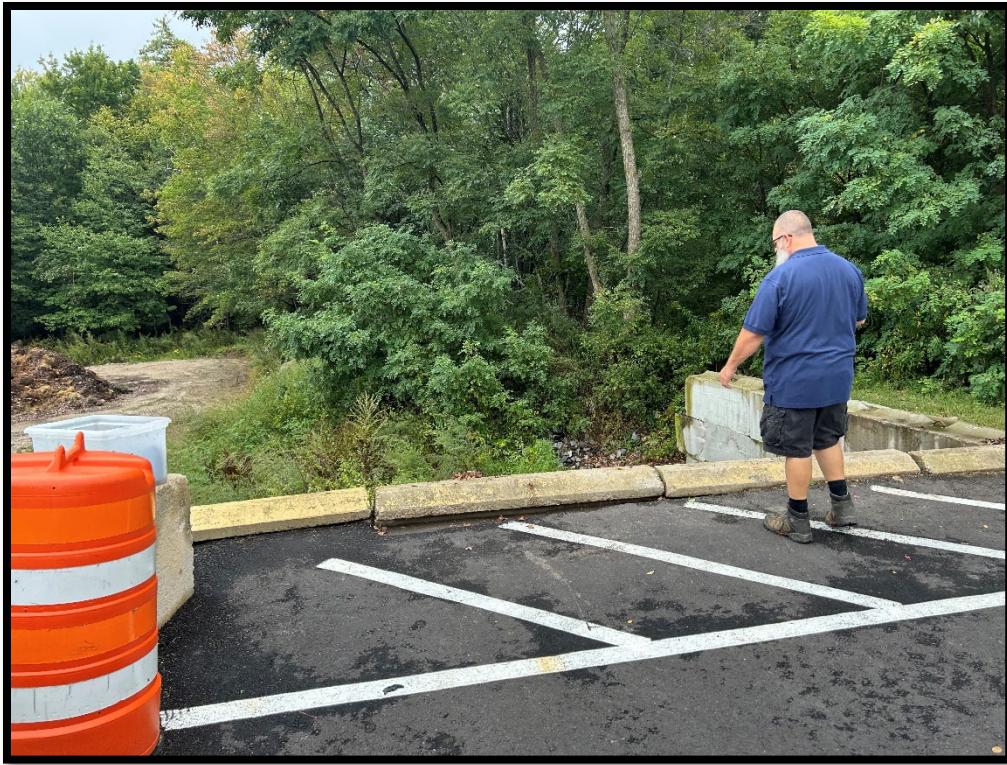


Photo 27: Yard Waste Drop Off - Looking Northeast



Photo 28: Compost Area – Looking Northeast



Moultonborough Transfer Station Feasibility Study

Photo Log



Photo 29: Compost Area – Looking North



Photo 30: Metals Wall – Looking North



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 31: Metals Wall – Looking Southeast



Photo 32: Metals Wall – Looking North



## Moultonborough Transfer Station Feasibility Study

### Photo Log



Photo 33: White Goods Area – Looking Northwest



Photo 34 – White Goods/Mattresses – Looking North



Moultonborough Transfer Station Feasibility Study

Photo Log



Photo 35: Brush Burning Area – Looking Southwest



Photo 36: Operations Building – Looking Southeast