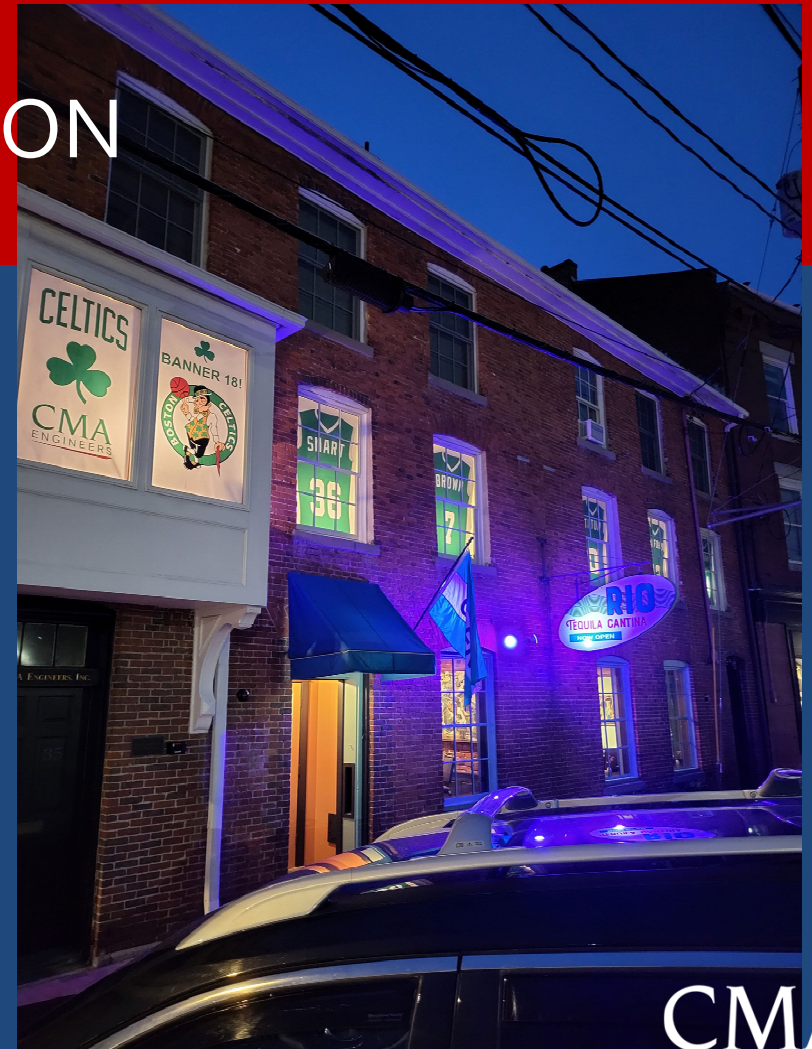


# MOULTONBOROUGH TRANSFER STATION FEASIBILITY STUDY

October 3, 2024

# CMA ENGINEERS INTRODUCTION

- Company founded in 1988
- Based out of Portsmouth, NH with other offices in Manchester, NH and Portland Maine
- 30+ employees
- Firm represents clients in the public and private sector



**CMA**  
ENGINEERS

- Primary Engineering Disciplines
  - Solid Waste/Environmental
  - Civil/Site
  - Transportation
  - Structural
  - Water/Wastewater
  - Geotechnical
  - Solar



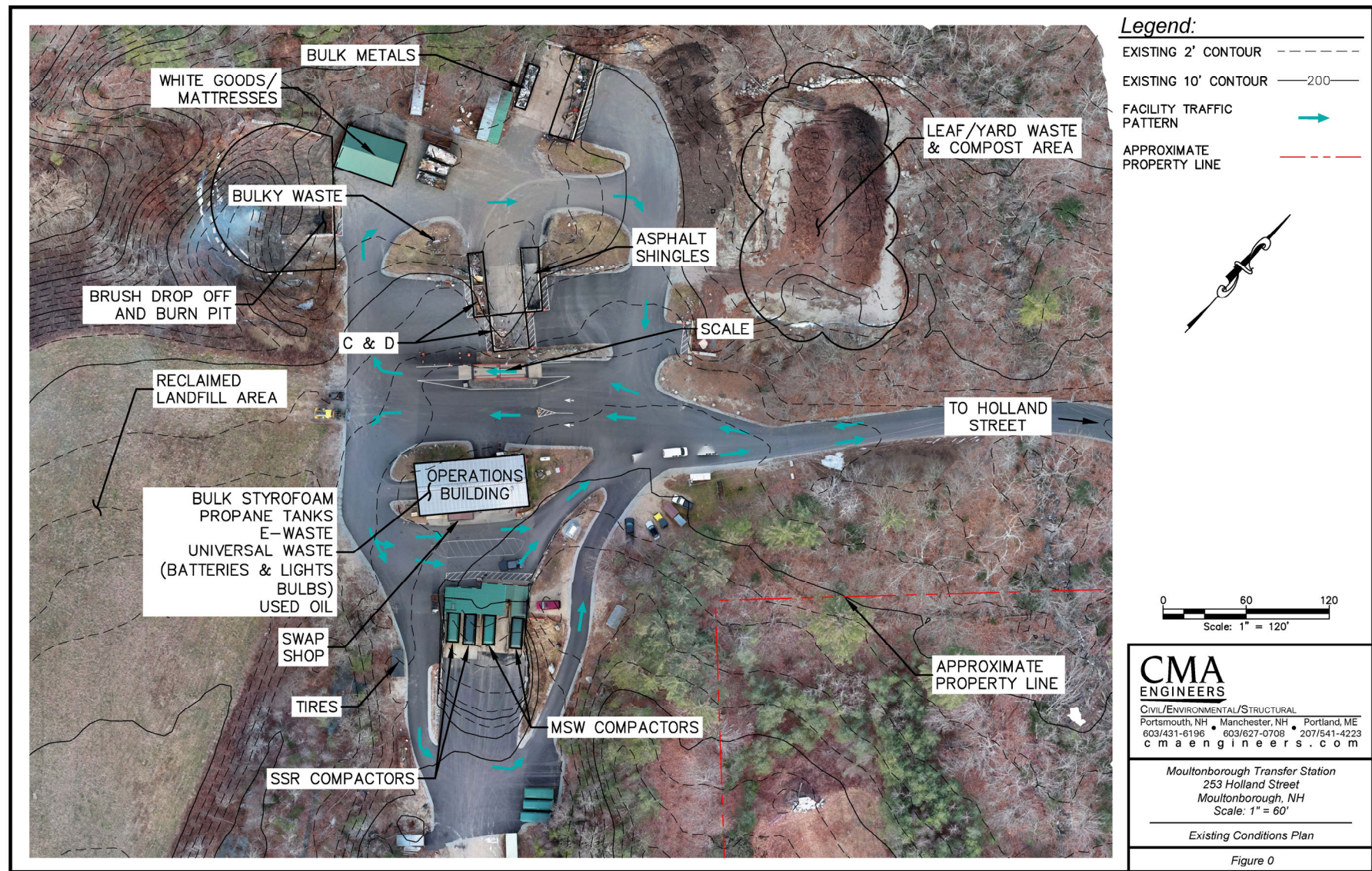


# PROJECT BACKGROUND



- 5,000 Full-Time Residents w/ Significant Seasonal Population
- 1,500 tpy MSW, 500 tpy recyclables, & 1,200 tpy C&D
  - Also manage bulky waste, white goods, bulk metals, tires, Styrofoam, propane tanks, e-waste, universal waste, mattresses, asphalt shingles, used oil, and leaf and yard waste
- MSW/SSR & C&D/Metals Loops







# TASK 1 – TRAFFIC PATTERNS

C&D/metals loop well laid out,  
plenty of space

MSW-SSR-MSW-SSR configuration  
change

Residents to access Operations  
Building from north end

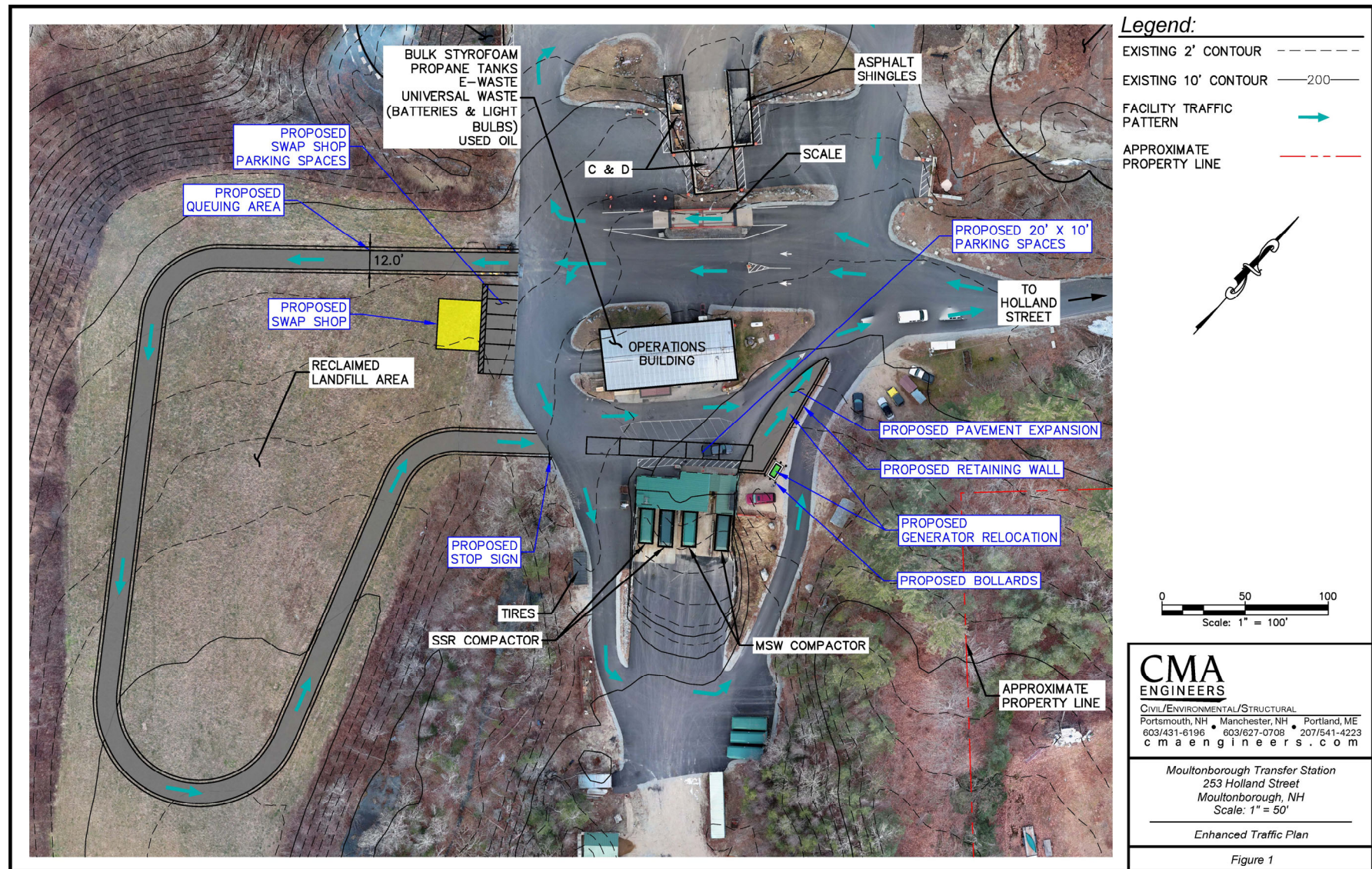
Swap Shop Relocation

Queuing loop


Wall Improvements









 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
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**Task 1 - Enhanced Traffic Plan**

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
Contractor's General Conditions					
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
				General Conditions Subtotal	\$27,000.00
Queuing Loop					
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
				Site Work Subtotal	\$67,800.00
Buildings					
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
				Building Subtotal	\$133,900.00
Retaining Wall Relocation					
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
				Retaining Walls and Slabs Subtotal	\$68,228.00

<b>SUBTOTAL:</b>	<b>\$296,928.00</b>
<b>PROJECT CONTINGENCY (15%):</b>	<b>\$44,600.00</b>
<b>ENGINEERING &amp; PERMITTING (15%):</b>	<b>\$44,600.00</b>
<b>TOTAL:</b>	<b>\$386,128.00</b>



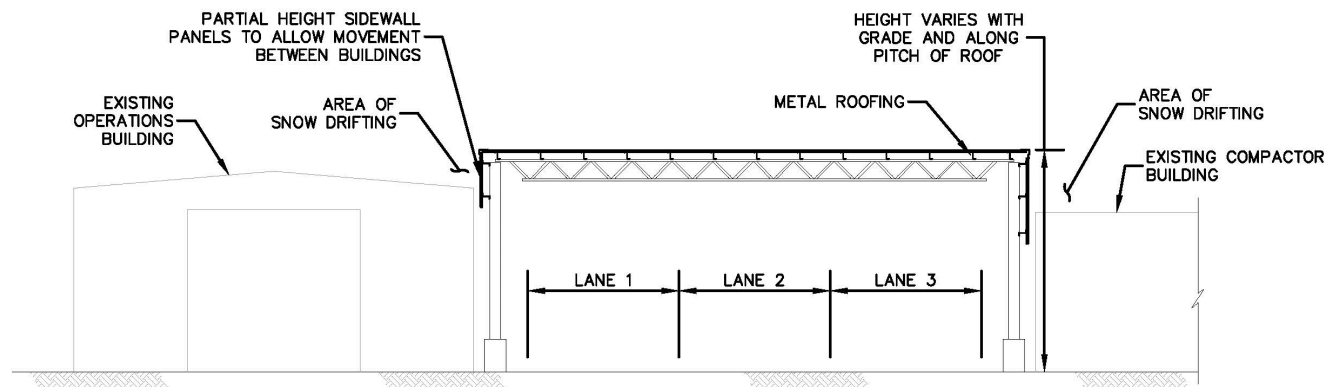
## TASK 2 – MSW AND RECYCLING DEPOSIT AREA

- Evaluate a roof structure between Operations Building and Compactor Area
- Needs to be a stand-alone structure
- No center piers if 3 lanes
- Snow loads/drifts are a concern on adjacent structures, which complicates design
- Grading modifications around recycling compactors









0 10 20  
Scale: 1" = 10'

PROPOSED MSW AND RECYCLING DEPOSIT AREA ELEVATION

**CMA**  
**ENGINEERS**


Civil/Environmental/Structural

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cmaengineers.com

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

MSW and Recycling Deposit Area Elevation

Figure 2.2

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

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
Contractor's General Conditions					
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
			General Conditions Subtotal		\$42,000.00
Site Work					
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
			Site Work Subtotal		\$22,300.00
Canopy Structure					
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
			Transfer Station Building and Retaining Walls Subtotal		\$381,400.00

<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>



## TASK 3 – MSW AND RECYCLING HAULING/REMOVAL AREA



Evaluate a roof structure that covers compactor area

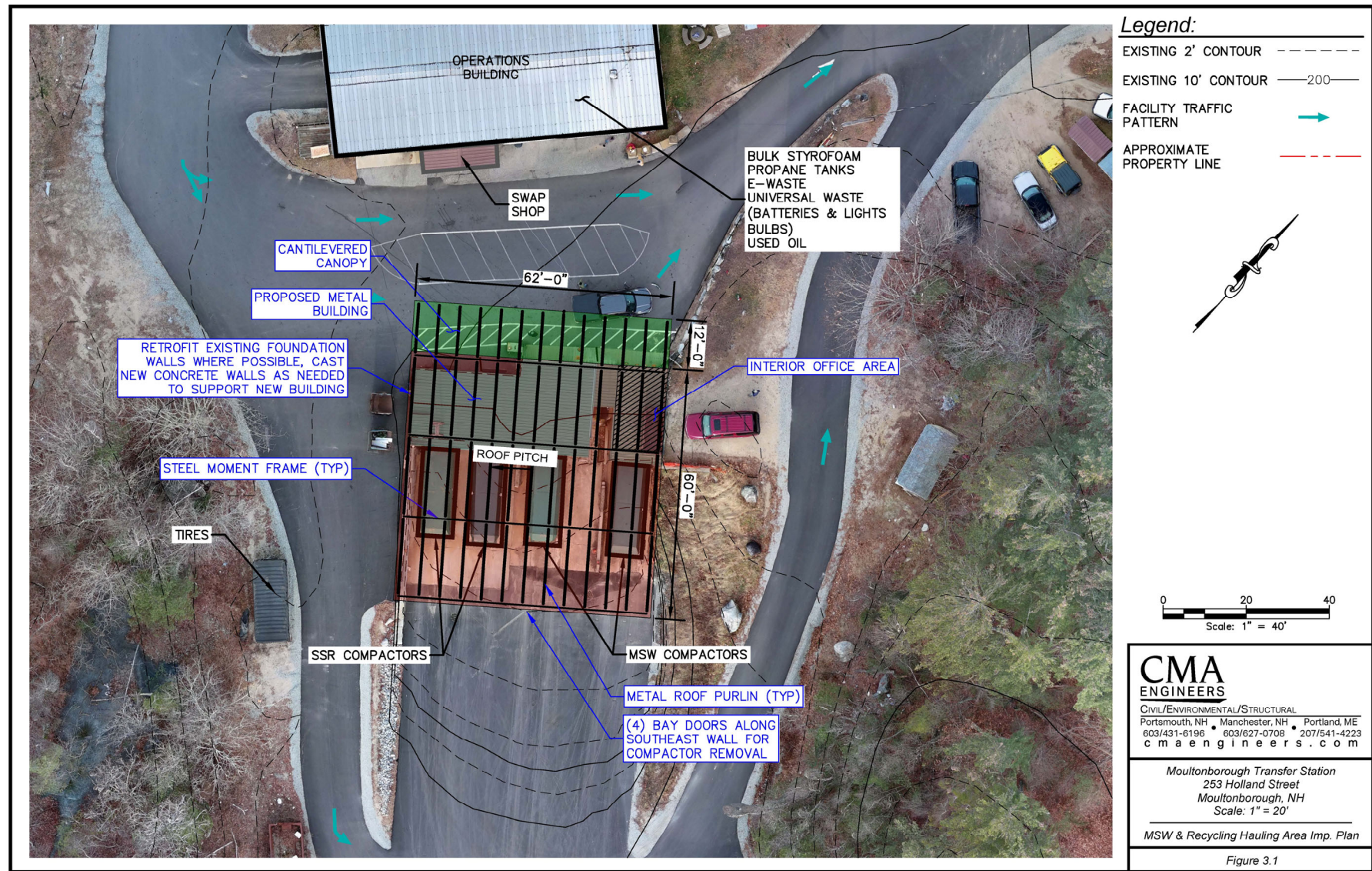
Requires sufficient overhead clearance for compactor removal

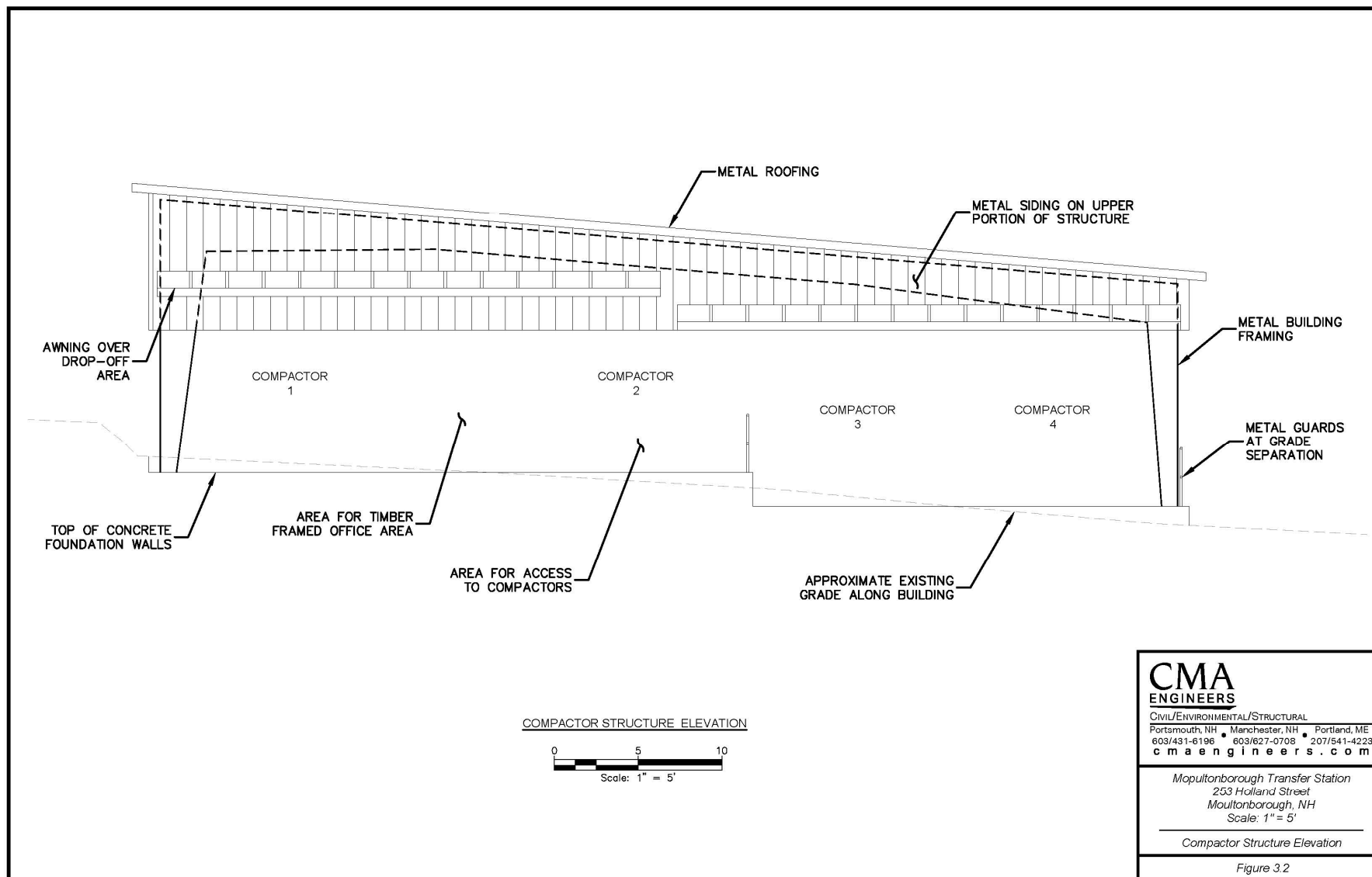
Eliminates snow removal off compactor boxes and surrounding area

Roof structure to extend over residential drop-off area as much as practical











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 3 - MSW and Recycling Hauling/Removal Area

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
Contractor's General Conditions					
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
			General Conditions Subtotal		\$26,000.00
Site Work					
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
			Site Work Subtotal		\$37,300.00
Canopy Structure					
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
			Transfer Station Building and Retaining Walls Subtotal		\$206,400.00

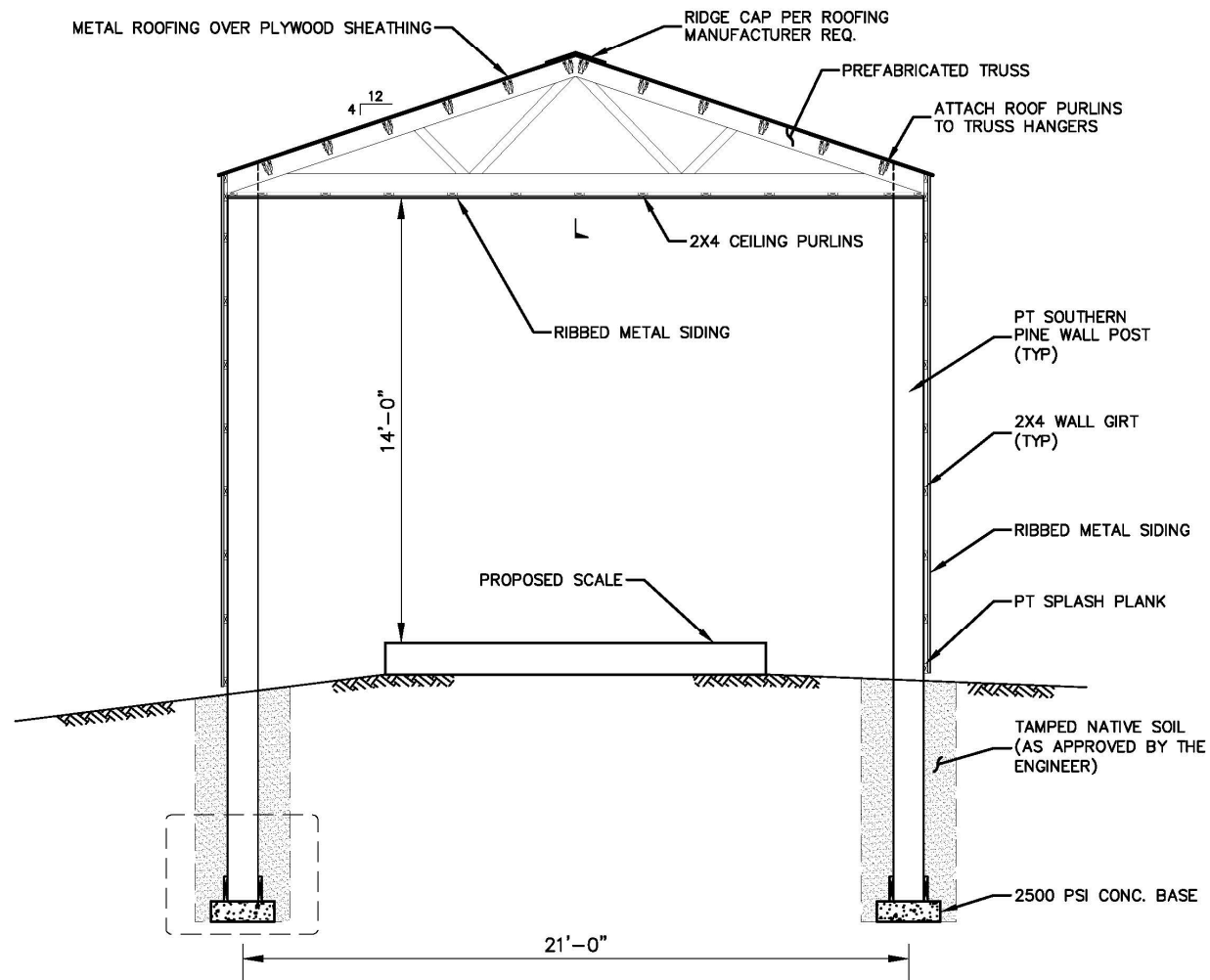
SUBTOTAL: \$269,700.00  
PROJECT CONTINGENCY (15%): \$40,500.00  
ENGINEERING & PERMITTING (15%): \$40,500.00  
TOTAL: \$350,700.00



# TASK 4 – TRUCK SCALE

- Evaluate a structure over the truck scale
- Keep snow/weather off scale and residents
- Metal building or wooden pole barn structure
- Coincide with scale replacement
- Camera options/kiosk system for remote operation





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cmaengineers.com

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

Truck Scale Structure Elevation

Figure 4





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 4 - Truck Scale Structure

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
Contractor's General Conditions					
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
			General Conditions Subtotal		\$14,000.00
Site Work					
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
			Site Work Subtotal		\$6,800.00
Scale Structure					
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
	Transfer Station Building and Retaining Walls Subtotal				\$132,875.00

SUBTOTAL: \$153,675.00  
PROJECT CONTINGENCY (15%): \$23,100.00  
ENGINEERING & PERMITTING (15%): \$23,100.00  
TOTAL: \$199,875.00

# TASK 5 – PHONE/INTERNET SERVICE UPGRADE

- Provide reliable phone and internet services for the Transfer Station
- Ability to upgrade financial transactions
  - Cash only facility
- Starlink provides the needed services at lowest cost
  - Satellite based service
- Spectrum would provide most reliable service

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





## TASK 6 – HOUSEHOLD HAZARDOUS WASTE COLLECTION

- Evaluate providing full-time household hazardous waste collection at the transfer station
- Town currently hosts and annual HHW collection day in the summer
  - Host site for Lakes Region Regional Planning Commission
    - 24 area municipalities
    - Collection day operated by Clean Harbors
- >220 lb/month (about 25 gallons) requires higher level of training, inspections and reporting

### HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL  
IF FOUND CONTACT THE NEAREST POLICE OR PUBLIC SAFETY  
AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATOR INFORMATION:

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_ PHONE \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

EPA / MANIFEST  
ID NO. / DOCUMENT NO. \_\_\_\_\_

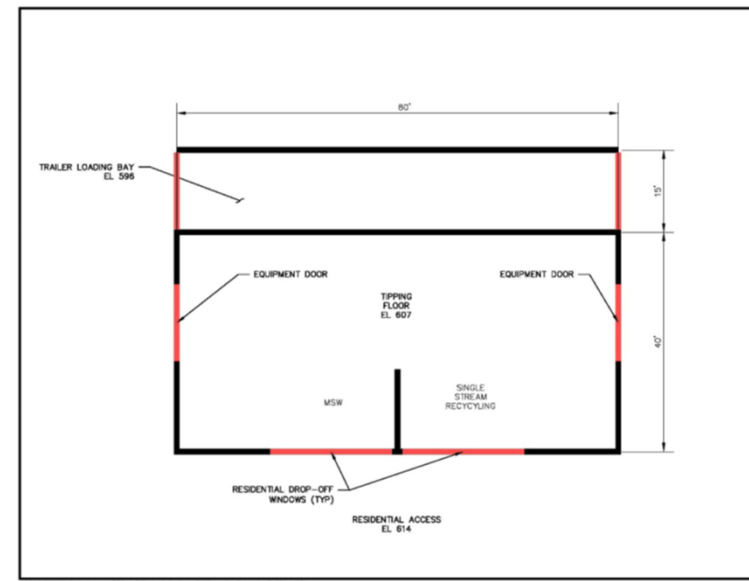
ACCUMULATION  
START DATE \_\_\_\_\_ WASTE NO. \_\_\_\_\_

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

### HANDLE WITH CARE!

# TASK 7 – TIPPING FLOOR TRANSFER STATION

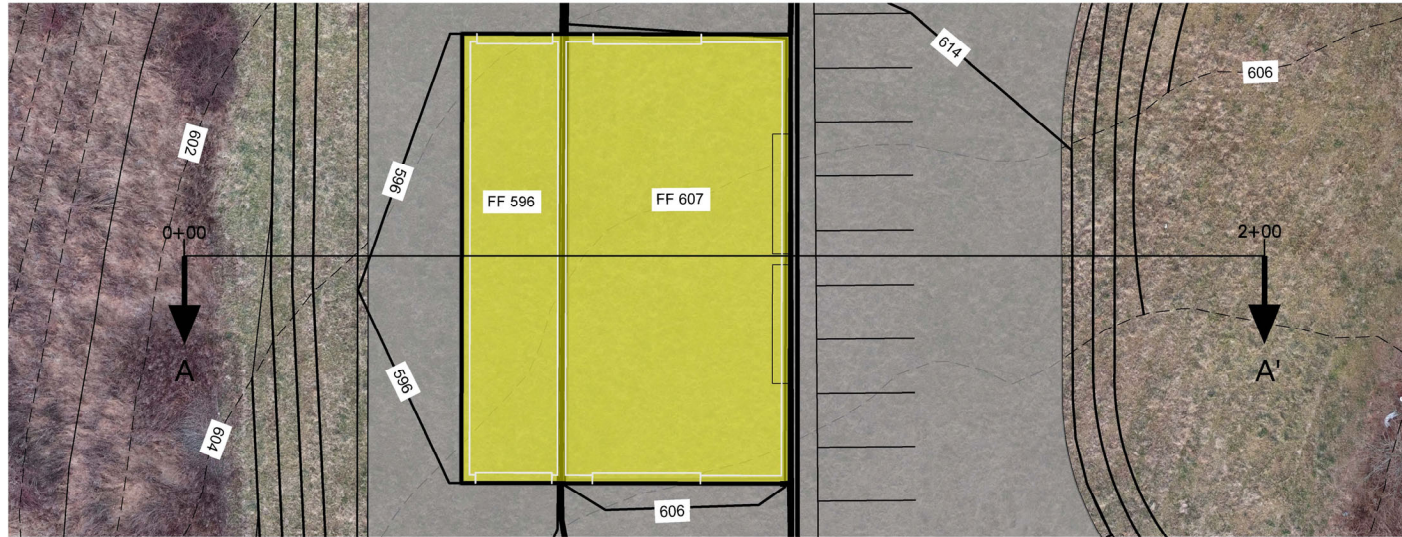
- Consider new Transfer Station building for higher capacity
  - Load MSW and single stream recyclables into 100 cy trailers
- Requires significant grade differential
- Lots of concrete and site work – high cost
- Resident access in front, commercial in rear
- MSW removed on daily basis – approximately 20 tons
- Consolidation facility for future town-wide curbside collection program
- Potentially constructed over reclaimed landfill area





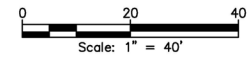
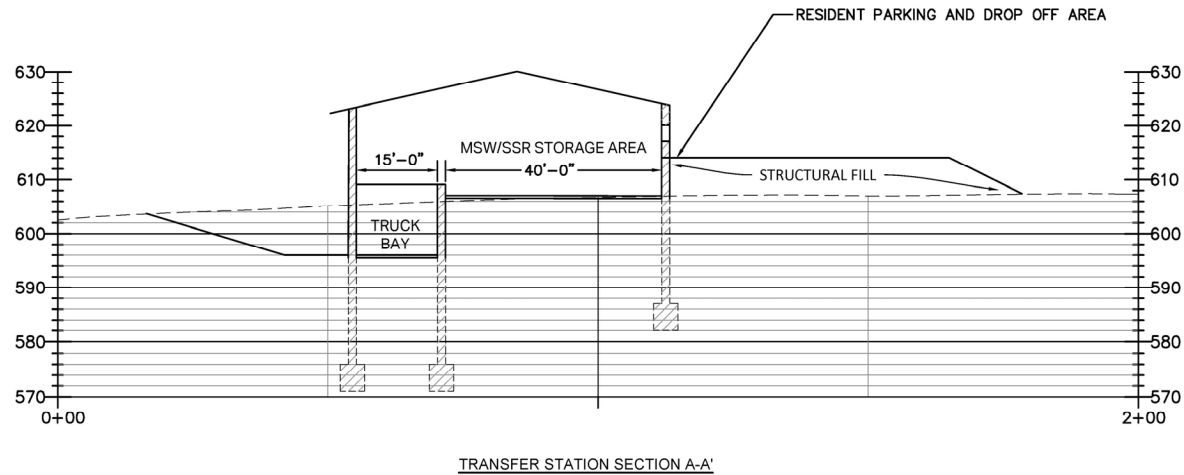
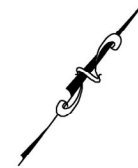






**Legend:**

EXISTING 2' CONTOUR - - - - -  
EXISTING 10' CONTOUR ———



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c m a e n g i n e e r s . c o m

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

New Facility Section View

Figure 7.2



 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
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**Task 7 - Tipping Floor**

Item No.	Item	Unit	Est. Qty.	Construction Cost	
				Unit Price	Total Price
Contractor's General Conditions					
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
			General Conditions Subtotal		\$200,000.00
Site Work					
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
			Site Work Subtotal		\$728,800.00
Transfer Station Building and Retaining Walls					
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
			Transfer Station Building and Retaining Walls Subtotal		\$1,255,200.00

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



## TASK 8 – TRANSFER STATION PERMITS

Limit the amount per household

Town charges \$20 for a 2-year permit term

Non-transferrable

Consider transition for stickers to barcode system

Database of permits

Additional payment options

- Credit/debit cards to better accommodate seasonal residents

Consider online purchase of permits

Permit expiration alerts

Variable permit tiers

- Full time vs. seasonal

# MAIN RECOMMENDATIONS

- C&D/Metals loop is well spaced and organized
  - Consider removable OSHA height railings above walls
- Relocate compactor wall to create an additional parking space and more efficient egress
- Relocate swap shop to inside Operations Building or a new structure away from main transfer station area
- Consider new queuing loop over reclaimed landfill area
- A new roof structure over compactor area is preferred over a new structure over the drop-off area
- Consider Starlink for internet service for the facility
- Electronic means of permit tracking





# NEXT STEPS

- Town to consider options to push to preliminary design including those presented in the Feasibility Study
  - Potentially others that could arise from the study
- Provide more detailed cost estimates for proposed improvements



QUESTIONS?

Adam Sandahl, P.E., BCEE  
Project Manager  
[asandahl@cmaengineers.com](mailto:asandahl@cmaengineers.com)