

DRAFT
PRELIMINARY

SOLID WASTE CONVENIENCE CENTER STUDY

CRAIG COUNTY, VIRGINIA

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COMMISSION NO. 2958C

MATTERN & CRAIG
ENGINEERS • SURVEYORS
701 FIRST STREET, S.W.
ROANOKE, VA 24016

DESIGN COORDINATOR: STEVEN A. CAMPBELL, P.E.

(540) 345-9342

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I. PROJECT PURPOSE AND NEED

The purpose of this study is to evaluate the existing conditions at the Craig County Route 42 Convenience Center and to develop recommendations for potential site and building modifications to accommodate the installation of a solid waste compactor and compaction container. The County has requested a preliminary engineering study to evaluate several compactors and make a recommendation of the preferred model for installation at the existing site. The study is based on the costs necessary to convert the existing facility to compactor operation as well as the estimated costs to operate the facility once installation is complete. A return on investment calculation was also performed in order to determine how quickly the potential cost savings will begin to have an impact on the County's annual operating costs.

The existing Convenience Center facility is located off of Route 42 in the Simonsville area of southwest Craig County. It accommodates up to three 22'-long open top roll-off solid waste containers which are picked up on a regular schedule. To reduce the number of trips required, the hauling company stores an empty container at their site until it is exchanged for the full container at pickup and the newly empty container is then stored at their site. Since trash in the open top containers is not compacted, existing solid waste volumes necessitate 307 annual hauling trips (from July 1, 2016 to July 31, 2017). Hauling and tipping costs are paid on a per trip basis resulting in an annual cost of \$79,820. (See Appendix A)

To maximize the amount of solid waste that can be transferred on an individual hauling trip, the solid waste must be compacted. The expected compaction ratio for compactible, mixed waste is 4 to 1 according to literature available from multiple compaction manufacturers. Therefore, compacting the waste reduces the cost of transporting refuse to the disposal site by 75% by eliminating 3 out of 4 trips. By installing a single compactor at the Route 42 Convenience Center site, the County could save approximately \$59,800 per year on hauling refuse to the disposal site. For the purpose of this report, it is assumed that the waste will be hauled to the current location at the current hauling and tipping rate. It is also assumed that two compaction containers will be purchased, allowing the hauling company to continue to store an empty container at their site until it is exchanged for the full container at pickup. Taking into account the added cost of operating and monitoring the compactor, the expected annual savings is approximately \$38,400. With an estimated project cost of \$87,600 for the recommended compactor and site configuration, the payback time on the initial investment is 28 months. (See Appendix F)

Existing facility conditions, methods of operation and rehabilitation recommendations are based on site visits that occurred during construction of the existing facility as well as on February 15, 2017 and March 27, 2017. Input from the operator and other county employees and evaluations of the existing Route 42 Convenience Center were also taken into consideration.

II. EXISTING CONDITIONS

A. Roll-Off Container Area

Access to the site is provided by a paved driveway connecting to Route 42. The existing site consists of a fenced and gated area approximately 80' wide x 100' long. The area is paved with an approximately 28' x 33' depressed concrete pad at the center of the site (see Appendix B, Photo 1). The existing concrete pad accommodates up to three 22'-long open top roll-off solid waste containers. A retaining wall runs along the short sides and rear of the concrete pad allowing the pad to be depressed relative to the paved area behind the wall. This configuration provides customers with easy access to the top of the open containers, many of which are quite tall. Construction of the existing site, including the concrete pad for the roll-off containers, retaining wall, surrounding pavement, and fence, was completed in 2016. The existing facilities are in good condition (see Appendix B).

It should be noted that storing waste in the existing open top containers becomes problematic during windy conditions resulting in a significant quantity of wind-blown trash both within the convenience center site as well as strewn about the surrounding area (see Appendix B, Photo 7). This can result in the need for additional cleanup costs. In addition, the open-top containers can attract insects, bears, and rodents due to easy access to waste materials.

B. Hauling Operation

The Route 42 Convenience Center currently trips (from July 1, 2016 to July 31, 2017) requires a total of 307 annual hauling trips, an average of 5 to 6 hauling trips per week, to transport waste in 22'-long open top roll-off containers. The hauling company transports an empty container to the site and exchanges it for the full container, which is then hauled to the Transfer Station in Roanoke and emptied. The newly empty container is stored at their site until called to transport the next full container. Having two containers reduces the total number of trips required. For the purpose of this report, it is assumed that two compaction containers will be purchased, allowing the hauling operation to operate under similar conditions, with an empty container stored on the hauler's site so that it is available to exchange with the full container. It is assumed that any cost associated with having the hauling company store the containers will be similar to the existing cost.

In order to transport the waste to the disposal site, a roll-off hoist truck is utilized to haul the open top containers. The operator of the hoist must get the vehicle into the proper position so that he can load and unload the roll-off containers. In order to turn around, the hoist operator typically enters the site and then circles around the concrete pad in the center, coming full-circle to the entrance. Once he has turned around he then backs into position in front of the container area.

C. Site Monitoring

The Route 42 Convenience Center is currently unmanned. The site is monitored through spot checks by County staff. There is no remote monitoring of the location at this time. As such, the current open top containers have become an illegal dropping off spot for items such as construction debris, fence posts, and wire. The ability to implement remote monitoring is complicated by the lack of electrical and telecommunications services at the site.

D. Electrical and Telecommunications Service

The existing site does not have electrical or telecommunications services. There are existing single-phase electrical lines that run parallel to Route 42, about 300' away from the back of the Convenience Center. These lines provide power to the adjacent Simonsville Volunteer Fire Station. New electrical service must be installed in order to accommodate a compactor. There is also no existing telephone or internet service at the site. The adjacent Simonsville Volunteer Fire Station currently uses dial-up internet service through Pentel but reports that they also offer DSL internet service along Route 42. While electrical service would have to be provided for a compactor to operate at the site, the additional cost of telephone or internet service is not necessarily required.

III. ELECTRICAL POWER ALTERNATIVES

The existing site cannot accommodate a waste compactor due to the lack of electrical service to the site. New electrical service must be installed. The existing electrical lines that run parallel to Route 42 are single-phase power lines. Most compactors, as manufactured, require three-phase electrical service to operate. In order to operate a three-phase compactor at the site, modifications to the standard configuration will need to be made in order to make a three-phase compactor work with the available single-phase power.

The alternatives for installing electrical service to the site are evaluated below. Ongoing usage costs are based on the schedule found on the Botetourt-Craig Electrical Coop page for commercial and small business customers (see Appendix H).

A. **Option A:** Install single-phase electrical service to the site and select a compactor that operates using single-phase power.

Pros:

- Compactor does not need modifications to operate as designed
- Lowest cost of installation

Cons:

- Severely limits compactor options since most compactors use three-phase power
- Compaction force may be reduced from the other manufacturers three-phase models

Cost: At least \$1,200 for installation

B. **Option B:** Install single-phase electrical service to the site. Install a three-phase compactor with the factory-standard motor and a rotary phase converter to convert the single-phase power to three-phase power.

Pros:

- Allows the installation of a wider variety of models
- Proven track record as reported by Botetourt County
- Allows compactor to operate at its full capabilities for maximum force and ram pressure
- Rotary phase converter could be sized to accommodate a future second compactor

Cons:

- Increased costs

Cost: At least \$6,800 total cost (includes at least \$1,200 for installation and \$5,600 for a rotary phase converter)

C. **Option C:** Install single-phase electrical service to the site. Install a three-phase compactor with a smaller motor and an in-line inverter to convert the single-phase power to three-phase power for use by the smaller motor.

Pros:

- Recommended by a compactor sales representative due to significantly reduced costs when compared to rotary phase converter
- Proven track record as reported by the compactor sales representative and Botetourt County

Cons:

- Lower horsepower compactor motor results in reduced force and ram pressure; Botetourt County reported that any reduction did not noticeably affect performance
- Installation of the required inverter results in a slightly shorter life expectancy for the motor
- Installation of a future second compactor would require purchase of an additional inverter

Cost: At least \$3,500 total cost (includes \$1,200 for installation and \$2,300 for a static in-line inverter)

D. **Option D:** Install electrical service at the site with an additional transformer to mimic three-phase electrical service to the site. Install a three-phase compactor with the standard motor.

Pros:

- Minimal cost increase for the second transformer installed by Botetort-Craig Electrical Coop

Cons:

- Solution may not be feasible pending further review and analysis from Botetort-Craig Electrical Coop

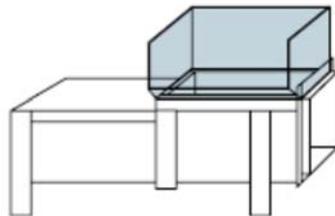
Cost: At least \$2,200 total cost (includes \$1,200 for installation and \$1,000 for a second transformer)

IV. COMPACTOR MODEL ALTERNATIVES

In order to examine how different compactor alternatives might operate in Craig County, a survey of the surrounding counties was performed. Each County was asked which compactor models they currently have installed, how long they have had them, how the compactors have performed, and their level of satisfaction with the compactors' performance. The survey also inquired about the performance of the compactors in areas where three-phase power is not available. The survey area included Botetourt County, Montgomery County, Bedford County, Franklin County, and Giles County.

The survey concluded that compactors manufactured by Marathon Equipment were the most commonly utilized. Marathon compactors are in operation in Botetourt and Bedford Counties and are planned for installation in Franklin County. Galbreath (now WasteQuip) compactors are in operation in Montgomery County. Bakers Waste compactors were recently installed in Giles County, which has a variety of compactors in operation due to their implementation of a low bid selection process. The results of the survey are incorporated into the discussion of each option presented below.

For this project, the optimal size compactor is 3 cubic yards and comparably sized unit from each manufacturer listed above has been selected for evaluation. For all of the models evaluated, it is assumed that a custom 3-sided hopper will be provided (Figure 1). The hopper funnels trash into the charge chamber and blocks users from reaching into the charge chamber. A custom hopper that is taller than the standard hopper can effectively increase the charge chamber volume allowing additional waste to be stacked within the hopper so that the compactor does not need to be run as frequently. A custom hopper also provides additional protection from the wind and helps to prevent blowing trash from becoming a problem. As previously discussed, wind-blown trash is a significant problem at the existing site.



*Figure 1 – Stationary Compactor with Side Feed Hopper
(Source: www.bestcompactors.com)*

It is assumed that two 40-cubic-yard octagonal compaction containers will be purchased for all compactor alternatives as discussed in the Existing Conditions section. Octagonal compaction containers generally meet industry standards and will fit 90% of compactors regardless of make or model, according a Marathon sales representative. As such, the 40

cubic yard Marathon RJ-40-OC/XHD compaction containers currently used at the Transfer Stations will be compatible with the Marathon compactor evaluated in this report. These containers are also likely to be compatible with the Bakers Waste and Wastequip compactors evaluated in this report, however, the potential for incompatibility cannot be ruled out.

The life expectancy for the compactors is expected to be 15-20 years at the Route 42 Convenience Center site due to the lower volume demands at this location, according to the a Marathon sales representative. The return on investment calculations presented in Appendix E assume that the compactor and containers will be fully replaced every 15 years. The Marathon RJ-325, Bakers Waste Pinnacle S300 Stationary, and Wastequip 345IP Precision compactors are evaluated below:

A. Option A: Marathon RJ-325

Pros:

- Readily available troubleshooting assistance from local counties, including Botetourt and Bedford Counties; Botetourt County has this specific model in operation
- Strong track record of reliable performance in similar operating conditions over more than 10 years
- Little to no major maintenance requirements or costs reported over more than 10 years in local area
- Performance not noticeably affected by installation in a variety of electrical conditions (three-phase vs single-phase power) in local area
- Compactor is self-contained and would not require any permits from the Virginia Department of Environmental Quality
- Guaranteed compatibility with Marathon compaction containers currently in use at transfer stations
- Reliable cost estimate based on invoice provided by Bedford County

Cons:

- Model requires 3-phase power or installation of an inverter at additional cost
- Base model is more expensive than other alternatives

Cost: Approximately \$52,900 including delivery and installation, in-line inverter, and two octagonal compaction containers

B. Option B: Bakers Waste Pinnacle S300 Stationary

Pros:

- Readily available troubleshooting assistance from Giles County
- Performance not noticeably affected by installation in a variety of electrical conditions (three-phase vs single-phase power) in local area

- Cost estimate based on verbal quote provided by Refuse Equipment Corporation in Vinton, the supplier for Giles County

Cons:

- Reduced availability of troubleshooting assistance. Giles County is the only locality in the area with Bakers Waste compactors installed.
- Limited track record of reliable performance in the region
- Limited first-hand knowledge of long-term maintenance requirements and costs in the region
- Model requires 3-phase power or installation of an inverter at additional cost
- Compactor is not self-contained and could potentially require additional permits from the Virginia Department of Environmental Quality
- Potential for incompatibility with Marathon compaction containers currently in use at transfer stations
- Base model is slightly more expensive than other alternatives

Cost: Approximately \$50,750 including delivery and installation, in-line inverter, and two octagonal compaction containers

C. Option C: Wastequip 345IP Precision Series

Pros:

- Troubleshooting assistance available from local supply and maintenance providers
- Compactor can be installed with single phase power without requiring any additional equipment such as an inverter
- Cost estimate based on quote prepared specifically for Craig County by National Equipment Solutions

Cons:

- Reduced availability of troubleshooting assistance; Montgomery County operates outdated Galbreath compactors which were installed over 8 years ago before Galbreath was rebranded as WasteQuip
- No track record of reliable performance in the region
- No first-hand knowledge of long-term maintenance requirements and costs in the region
- Compactor is not self-contained and could potentially require additional permits from the Virginia Department of Environmental Quality
- Potential for incompatibility with Marathon compaction containers currently in use at transfer stations

Cost: Approximately \$47,250 including delivery and installation and two octagonal compaction containers

V. COMPACTOR LOCATION ALTERNATIVES

The existing site cannot accommodate a waste compactor and 40 cubic yard compaction container in its current condition. Installation of the compactor and compaction container will require the following site improvements:

1. Construction of a 10' x 42.5' concrete pad for the compactor and container. The pad must be positioned to allow 2' of clearance between the compactor and any adjacent fence or wall in order to allow adequate space for operation and maintenance of the compactor. 45' of clearance in front of the end of the pad is also required to provide sufficient clear space for the container handling vehicle. Additional space is required near the clear top opening of the compactor to allow customer access for waste disposal. This pad will accommodate all compactor options.
2. Installation of new electrical service to the site. Alternatives for the new electrical service are discussed in Section III.

The following options were investigated for this study. An exhibit of each configuration is included in Appendix C.

A. **Option A:** Modify the existing concrete pad and retaining wall to accommodate the compactor and container.

Pros:

- Utilizes portions of the existing retaining wall and existing concrete pad
- Can accommodate potential future 2nd compactor with full-width concrete pad extension

Cons:

- Increased design and construction costs
- More site work/earthwork required
- Significant interruption in service during construction. The convenience center would need to be closed during demolition of the back portion of the existing retaining wall and construction of the concrete pad extension and new retaining wall.
- Eliminates ability of most vehicles to circle around the site. This could be partially mitigated by expanding the paved area and fence along the northwest perimeter of the fence. However, there is not sufficient room to move the fence back by 18' to compensate for the full depth of the concrete pad extension.
- AutoCad's AutoTurn function shows that truck maneuvers are complicated

Cost: Approximately \$44,000 (includes \$17,800 for site improvements and \$26,200 for electrical service installation, contingency, and engineering).

B. Option B: Install a new concrete pad in the area of existing AC pavement.

Several locations for the proposed concrete pad were considered. Those that met the recommended clearance requirements were evaluated using AutoTurn to determine whether the hoist truck should be able to maneuver into the proper position for container retrieval. Of the locations evaluated under this option, the location shown in Exhibit: Option B (see Appendix C) provides the most maneuvering room for the hoist and requires the fewest site improvements.

Pros:

- Lower construction costs
- Allows passenger vehicles to continue to circumnavigate the site in order to turn around and leave the facility
- The existing storage area can remain in place. If needed, an open-top roll-off container can still be utilized in the existing storage area as a backup system
- Minimizes disruption to existing service during construction because existing storage area can remain in place
- Minimal site work/earthwork required
- Can accommodate potential future 2nd compactor with additional future site improvements

Cons:

- Eliminates ability of haul truck operator to circumnavigate the site in order to position the haul vehicle and reduces space for maneuvering vehicles

Cost: Approximately \$34,700 (includes \$8,500 for site improvements and \$26,200 for electrical service installation, contingency, and engineering).

C. Option C: No Build. Continue current operations without installing the compactor.

Pros:

- No construction costs
- Existing service continues uninterrupted

Cons:

- Excessive annual hauling costs may result in closure of the facility

Cost: Implied cost of \$38,400 per year, which is the annual cost savings if a compactor were to be installed on this site.

VI. SITE MONITORING ALTERNATIVES

Virginia regulations classify a convenience center as a collection point for individual generators of household waste. As such, the proposed compactor type is designed to handle household refuse. The potential disposal of non-household items is concerning because the current open top containers at the existing site have allowed the illegal disposal of construction debris, fence posts, and wire. The County currently has limited recourse options available due to the lack of monitoring of the unmanned site, which is currently open 24 hours a day, 7 days a week.

In order to ensure proper use of the convenience center, signage clearly listing acceptable and unacceptable items must be posted at the site. The policy must be implemented through enforcement of the criminal laws against illegal dumping by charging and prosecuting violators. Upon conversion to a compactor operation, the convenience center site would no longer be open 24/7 and would maintain set operating hours. The gates at the site would be locked when the site is closed. Several part-time employees, collectively working 40 hours per week, would be hired to staff the convenience center. These employees would operate the compactor as well as assist in providing site monitoring. However, the operating hours of the site would be such that there would be periods of time during which the site is open and unmanned such as during lunch breaks. The County requested an evaluation of the options available to provide site monitoring coverage during those times.

It is assumed for the purposes of this report that four cameras would be installed at the site for all options. The options available for monitoring at the site during unmanned operating hours are discussed below:

A. **Option A:** Install battery-operated gaming cameras that store data on SD cards. Costs include purchase of cameras and ongoing battery and memory card replacement.

Pros:

- Proven track record with Bedford County, which currently uses this system. Tickets are issued to offending persons who can be identified from the video footage.
- Battery operation and lack of data transmission wiring allows for greatest flexibility in positioning camera.
- Craig County's existing computer resources could be utilized for data download and storage.
- Lowest cost for installation and annual maintenance. Significantly reduced costs would allow for full replacement of the entire system on an annual basis at less than the annual cost of maintenance alone for other options.

Cons:

- Cannot be monitored remotely.
- Requires a person to physically access the SD card and download the video data.
- Camera functionality is dependent on battery life.

Cost: Approximately \$1,040 the first year and \$500 each subsequent year.

B. Option B: Install an outdoor security camera that transmits data over the internet using Wi-Fi. Costs include purchase of cameras and a computer, installation of the system, installation of internet service to the site, and ongoing internet service costs as well as ongoing computer maintenance and troubleshooting costs.

Items designated with an asterisk (*) may or may not be relevant, depending on the camera model selected.

Pros:

- Can be monitored remotely. 24/7 live video possible.
- Phone app may allow remote monitoring from anywhere*.
- Built-in speaker and microphone may let you listen and talk to people at the site*.
- Cloud recording may be available (at an additional cost)*.
- Wired power only: camera functionality not limited due to battery life.
- Battery power only: allows flexibility in positioning cameras with respect to power source.

Cons:

- Requires installation of an internet connection for data transmission. DSL is available through Pemtel along the street and would need to be installed to the site. DSL data speeds are not guaranteed and may not be sufficient to provide live streaming of video or may result in degraded video quality.
- Requires the purchase and installation of a computer with the appropriate software and a Wi-Fi DSL modem that is within range of the camera and sheltered from the elements. Without climate control in the shelter, there may be issues with the modem due to extreme temperatures during summer and winter.

The adjacent Simmonsville Volunteer Fire Department has offered to allow the County to install DSL in the station for the purposes of monitoring the dump site as long as the County covers the associated costs. The cinderblock and metal construction of the Fire Station facility may impede Wi-Fi transmission in the direction of the site thereby limiting possible camera positions. This could possibly be mitigated by using a Wi-Fi extender but that

would result in slower data transmission rates which, as noted previously, may already be insufficient to transmit live video over DSL.

- Ongoing monthly internet costs. For upload speeds of up to 1 Mbps, monthly Pemetel DSL costs range from \$63 to \$90, not including taxes and fees. DSL data speeds are not guaranteed and may not be sufficient to provide live streaming of video or may result in degraded video quality.
- Wired power only: 25' cord length limits ability to position camera with respect to power source.
- Battery power only: camera functionality is dependent on battery life.

Cost: Approximately \$3,500 the first year and \$1,700 each subsequent year. Additional costs would be incurred if a battery operated model is selected or if a Wi-Fi extender is required.

D. Option C: Install an outdoor security camera that transmits data over the internet using cables. Costs would be similar to those listed for Option B, above.

Items designated with an asterisk (*) may or may not be relevant, depending on the camera model selected.

Pros:

- Can be monitored remotely. 24/7 live video possible.
- Phone app may allow remote monitoring from anywhere*.
- Built-in speaker and microphone may let you listen and talk to people at the site*.
- Camera functionality not limited due to battery life.
- Eliminates problems with Wi-Fi transmission.

Cons:

- Requires installation of an internet connection for data transmission. DSL is available through Pemetel along the street and would need to be installed to the site. DSL data speeds are not guaranteed and may not be sufficient to provide live streaming of video or may result in degraded video quality.
- Requires the installation of a computer with the appropriate software and a DSL modem that are located in the vicinity of the cameras and sheltered from the elements. Without climate control in the shelter, there may be issues with the modem and computer due to extreme temperatures during summer and winter. The adjacent Simonsville Volunteer Fire Department has offered to allow the County to install DSL in the station for the purposes of monitoring the dump site as long as the County covers the associated costs.
- Ongoing monthly internet costs. For upload speeds of up to 1 Mbps, monthly Pemetel DSL costs range from \$63 to \$90, not including taxes and fees. DSL data speeds are not guaranteed and may not be sufficient to provide live streaming of video or may result in degraded video quality.

- Camera position must accommodate Ethernet cable connection to the DSL modem.

Cost: Approximately \$3,500 the first year and \$1,700 each subsequent year.

D. Option D: Install an outdoor security camera that transmits data over cell phone data networks. Costs would include purchase of the camera system. It is assumed that the software could be run on existing County computer resources. The Arlo Go is currently the only camera available that does this. (The MSRP is \$490 per camera).

Pros:

- No internet connection required. Data is transmitted over the cellular data network
- Nearby computer not required
- Camera positioning not restricted by Wi-Fi signal availability
- Battery operation allows flexibility in positioning camera with respect to power source

Cons:

- This option is not viable. Camera positioning is dependent on cellular network signal availability. The Arlo Go operates only on the AT&T network, which does not appear to provide service to this location based on coverage maps. If, at a later date, the Arlo Go is able to roam onto other cellular networks, U.S. Cellular does have 4G-LTE data coverage at this location and this option should be reconsidered.
- Camera functionality is dependent on battery life

Cost: Approximately \$2000 plus ongoing cellular data costs**

** - This service is not available at this location at this time.

VII. RECOMMENDATIONS

We recommend that Craig County proceed with installing a Marathon RJ-325 compactor for use at their site. Though Marathon manufacturers their compactors at a slightly higher price than their competitors, many of the surrounding counties have utilized this brand for an extended period of time. The counties are satisfied with the performance of the large number of RJ-325, and the similar RJ-425, compactors they have in operation and have continued to purchase and install them as recently as this year. The widespread use of compactors in various sizes means help with troubleshooting will be readily available. The longevity of the track record of the Marathon compactors proves that this investment will pay off in the long run. The other counties have reported that they have not had any major issues with maintenance. Since many of them have also been adapting to their power supply, they were able to provide feedback on the Marathon compactor's performance with an altered power supply, reporting that there is no notable effect. This gives the Marathon RJ-325 an advantage when considering reliable long-term use, and based on our analysis will be the best fit for Craig County.

At this time, the only permits required for installation of a self-contained compactor at a convenience center are typical construction permits from the County. No VPDES permits are required for the addition of the Marathon compactor, since it is leak proof. The convenience center also must not accept waste from hauling vehicles that take refuse from more than one real property owner. As long as the convenience center with the compactor fulfills those two requirements, no solid waste permit will be required. However, the Baker Waste and Wastequip compactors are not self-contained, and if they are chosen they could potentially require additional permits.

As far as site location, we recommend compactor location Option B, which is to install a new concrete pad in the area of existing AC pavement at the Route 42 Convenience Center (see Appendix C, Option B). This configuration allows for the least complicated access for the hauling trucks as well as passenger vehicles. In addition to lower construction costs, construction can occur with minimal disruption to services at the existing facility. Once installation is complete, the existing storage container area can be used as a backup method should the need arise. There would be an additional future cost for site improvements if a second compactor is added as this option cannot accommodate two compactors.

In addition to the reduction in hauling costs, further cost savings will be realized due to lower site maintenance costs. Cleanup needs at the site will be reduced because the compactor will help prevent odors and wind-blown trash. Wear and tear on the parking surface by heavy collection vehicles will be reduced by 75% resulting in extended pavement life. Any potential extermination or bear deterrent costs will be reduced by reducing insect/rodent/bear access to the solid waste storage container.

With respect to the electrical power alternatives, we recommend implementing Option C based on the assertions by Marathon sales representative that similar procedures have been put in place in other counties, and since it is purported to have a lower cost of operation. Though another inverter would have to be purchased if an additional compactor was installed at the site, the cost of another inverter as compared to the cost of the additional compactor would be a minor expense in light of the additional savings that would be achieved.

With respect to the site monitoring alternatives, we recommend implementing Option A and installing battery operated game cameras at the site for monitoring. The existing conditions at the site do not lend themselves to the feasibility of the other options due to significantly increased installation and maintenance costs for minimal additional benefit given that the site would be manned most of the time that it is open. Four game cameras positioned around the site as well as appropriate signage should be sufficient to discourage illegal behavior when staff is not present. Bedford County has used this monitoring systems at its unmanned sites and has recommended it as a low-cost, yet effective method of monitoring.

Bedford County has also advised that their Marathon RJ-325 compactors, which they operate at both manned and un-manned sites, are able to handle a wide variety of refuse from recyclables to furniture, and have rarely encountered an item the compactor was unable to handle. This proven track record reduces concerns about the potential for compactor damage due to illegal dumping during the times when the compactor site is unmanned. The proposed compactor will be installed with a lock box that restricts access to the push-to-run button so that only staff can actuate the compactor. Staff should be trained to inspect the refuse for unacceptable items and remove them if necessary before running the compactor in order to minimize any potential for damage.

Based on the selections outlined above, a preliminary return on investment calculation was performed, the details of which can be seen in Appendix E. Taking into account an investment of approximately \$87,600 and a total annual cost savings of \$38,400, it has been determined that the county will see a return on their investment, and subsequently start to make a profit after 28 months of operations. Although the Bakers Waste and Wastequip Models evaluated offer a small savings in the initial investment, the difference in the payback period is minimal at 1 month and 2 months, respectively. With a life expectancy of 15 years for the compactor, this return on investment for compactor conversion is excellent, and barring any drastic changes in cost estimates or hauling capacities, a compactor would be a profitable investment for Craig County.

Appendix A
Current Operating Costs

Current Cost Model for Convenience Center Site

Route 42 Annual Hauling Trips	307
Current Cost for Hauling and Tipping Charges	\$260 / Trip
Projected Annual Cost	\$79,820

Appendix B
Existing Conditions

Photo 1 – 7/7/2016: Preliminary site under construction



Photo 2 - 2/15/2017: Preliminary site as-is condition



Photo 3 - 2/15/2017: Side view of site



Photo 4 - 2/15/2017: Current open top dumpster configuration



Photo 5 - 2/15/2017: View of retaining wall around pad for dumpsters



Photo 6 - 2/15/2017: Dirt/debris scattered around retaining wall for dumpster pad



Photo 7 – 3/27/2017: Debris scattered due to wind blowing trash out of open top dumpsters



Appendix C
Site Plans

NOTE:

CONTRACTOR SHALL CONTACT:

THE MISS UTILITY OF VIRGINIA ONE CALL CENTER
 TEL# 1-800-552-7001 FOR LOCATION OF ALL
 UTILITIES AT LEAST 72 HRS PRIOR TO BEGINNING
 CONSTRUCTION.

EROSION AND SEDIMENT CONTROL NOTES/SEQUENCE

SITWORK SHALL PROCEED IN THE FOLLOWING MANNER AND
 IN ACCORDANCE WITH THE SWPPP:

THE CONTRACTOR SHALL INSTALL BOTH STABILIZED
 CONSTRUCTION ENTRANCES AND PERMANENT SEEDING. INLET
 AND OUTLET PROTECTION MEASURES SHALL BE
 INSTALLED IMMEDIATELY AFTER THE INSTALLATION OF THE
 OUTLET CONTROL STRUCTURE.

AS FILL IS PLACED AT THE NORTHERN END OF THE
 CONCRETE PAD, THE CONTRACTOR SHALL MAINTAIN A SILT
 FENCE ALONG THE BOTTOM OF THE CUT SLOPE.
 TEMPORARY AND PERMANENT SEEDING SHALL BE PLACED
 AFTER CUT AND FILL FOR MASS GRADE IS COMPLETE.
 SITE EQUIPMENT, FOUNDATIONS, AND PAVING SHALL BE
 CONSTRUCTED AS REQUIRED. IF NECESSARY DURING
 CONSTRUCTION, STOCKPILE AREAS SHALL BE PROTECTED
 WITH SEDIMENT CONTROL MEASURES SUCH AS SILT FENCE.
 TEMPORARY SEEDING IS REQUIRED WITHIN 7 DAYS ON
 STOCKPILES THAT WILL REMAIN MORE THAN 30 DAYS.

UPON FINAL SITE STABILIZATION SILT AND SEDIMENTATION
 SHALL BE REMOVED FROM ALL TEMPORARY MEASURES PRIOR
 TO THEIR REMOVAL.

ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE
 INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE
 REQUIREMENTS OF THE VIRGINIA DEPARTMENT OF
 CONSERVATION AND RECREATION'S DIVISION OF SOIL AND
 WATER CONSERVATION AS CONTAINED IN THE VIRGINIA
 EROSION AND SEDIMENT CONTROL HANDBOOK AND
 REGULATIONS.

EROSION AND SEDIMENT CONTROL SEEDING NOTES:

TEMPORARY SEEDING:

ALL DENUDED AREAS AND ALL SLOPES WHICH ARE NOT
 GRADED TO FINAL GRADE WITHIN 7 WORKING DAYS SHALL
 BE TEMPORARILY SEED BY MANUAL OR HYDROSEEDING
 METHODS. APPLY LIME INTO TOP 4-6 INCHES OF SOIL
 UNIFORMLY AT A RATE OF 1 TO 1 1/2 TONS/ACRE.
 FERTILIZE TOPO 4-6 INCHES OF SOIL WITH 10-10-10
 GRADE FERTILIZER AT 700-1000 LB/ACRE.

PERMANENT SEEDING:

STABILIZE ALL DENUDED AREAS AT FINAL GRADE WITHIN
 7 WORKING DAYS OR 90 CALENDAR DAYS. ALL SLOPES
 SHALL BE STABILIZED WITHIN 15 WORKING DAYS OR 30
 CALENDAR DAYS. APPLY LIME AND FERTILIZER INTO TOP
 4-6 INCHES OF SOIL UNIFORMLY AT A RATE OF 4000
 LB/ACRE LIME AND 1000 LB/ACRE 5-10-10 GRADE
 FERTILIZER.

MULCH WITH STRAW AT 4000 LB/ACRE. ANCHOR AS
 REQUIRED. REFERTILIZE AS REQUIRED UNTIL GRASS IS
 WELL ESTABLISHED. RESEED, FERTILIZE, AND MULCH
 IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

PERMANENT SEEDING MIXTURES: PER III-302

FEBRUARY 1 - JULY 1

GENERAL SLOPE (3:1 OR LESS)
 KENTUCKY 31 FESCUE @ 128 LB/ACRE
 ENGLISH RYE @ 2 LB/ACRE
 KOREAN LESPEDEZA @ 20 LB/ACRE

LOW-MAINTENANCE SLOPE (STEEPER THAN 3:1)

KENTUCKY 31 FESCUE @ 128 LB/ACRE
 ENGLISH RYE @ 2 LB/ACRE
 KOREAN LESPEDEZA @ 20 LB/ACRE
 SERICEA LESPEDEZA @ 20 LB/ACRE

JUNE 1 - AUGUST 15

GENERAL SLOPE (3:1 OR LESS)
 KENTUCKY 31 FESCUE @ 100 LB/ACRE
 ENGLISH RYE @ 25 LB/ACRE
 KOREAN LESPEDEZA @ 15 LB/ACRE
 GERMAN MILLET @ 10 LB/ACRE

JUNE 1 - AUGUST 15

LOW-MAINTENANCE SLOPE (STEEPER THAN 3:1)

KENTUCKY 31 FESCUE @ 90 LB/ACRE
 ENGLISH RYE @ 25 LB/ACRE
 KOREAN LESPEDEZA @ 15 LB/ACRE
 SERICEA LESPEDEZA @ 15 LB/ACRE
 GERMAN MILLET @ 10 LB/ACRE

AUGUST 1 - DECEMBER 1

GENERAL SLOPE (3:1 OR LESS)
 KENTUCKY 31 FESCUE @ 115 LB/ACRE
 ENGLISH RYE @ 25 LB/ACRE
 WHITE CLOVER @ 10 LB/ACRE

LOW-MAINTENANCE SLOPE (STEEPER THAN 3:1)

KENTUCKY 31 FESCUE @ 100 LB/ACRE
 ENGLISH RYE @ 25 LB/ACRE
 WHITE CLOVER @ 10 LB/ACRE
 SERICEA LESPEDEZA @ 15 LB/ACRE

TEMPORARY SEEDING MIXTURES:

JULY 15 - JANUARY 1
 BALBOA RYE @ 100 LB/ACRE
 ITALIAN RYE @ 70 LB/ACRE

JANUARY 1 - MAY 1
 ITALIAN RYE @ 70 LB/ACRE
 KOREAN LESPEDEZA @ 40 LB/ACRE
 SUMMER OATS @ 40 LB/ACRE

MAY 1 - JULY 15
 SUDAN - SORGHUM CROSS @ 150 LB/ACRE
 OR
 STARR MILLET @ 150 LB/ACRE

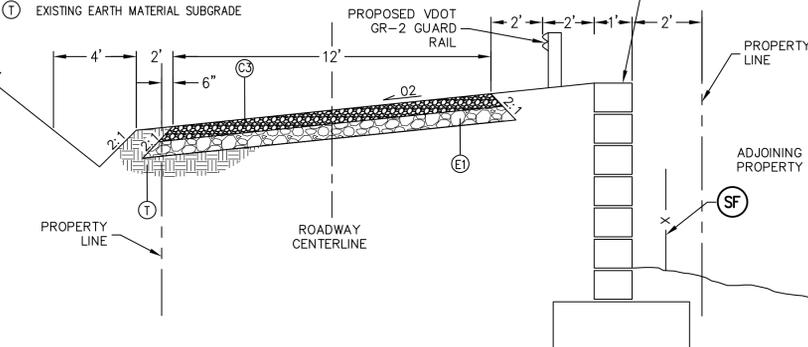
MAINTAIN BY MOWING NO MORE THAN ONCE A
 YEAR. REFERTILIZE IN SECOND YEAR UNLESS
 GROWTH IS FULLY ADEQUATE. RESEED,
 FERTILIZE AND MULCH DAMAGED AREAS
 IMMEDIATELY.

**EROSION AND SEDIMENT
 CONTROL SYMBOLS**

- LIMITS OF DISTURBANCE (0.63 ACRES)
- CD CHECK DAM
- CE CONSTRUCTION ENTRANCE/EXIT
- CIP CULVERT INLET PROTECTION
- PS PERMANENT SEEDING
- SF SILT FENCE

PAVEMENT SCHEDULE

- C3 PROPOSED APPROX. 3.0" VDOT #21A STONE
- E1 PROPOSED APPROX. 10.0" AGGREGATE BASE COURSE
- T EXISTING EARTH MATERIAL SUBGRADE

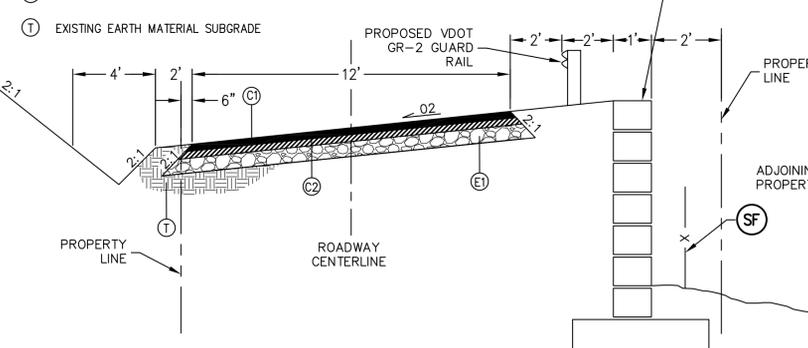


BASE BID - TYPICAL SECTION & RETAINING WALL/PROPERTY LINE PROXIMITY DETAIL

SCALE: NOT TO SCALE

PAVEMENT SCHEDULE

- C1 PROPOSED APPROX. 1.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B,
 AT AN AVERAGE RATE OF 112 LBS PER SQ. YD. PER INCH.
- C2 PROPOSED APPROX. 2.0" ASPHALT BASE COURSE, TYPE B25.0B
 AT AN AVERAGE RATE OF 114 LBS PER SQ. YD. PER INCH.
- E1 PROPOSED APPROX. 8.0" AGGREGATE BASE COURSE
- T EXISTING EARTH MATERIAL SUBGRADE



BID ALT. #1 - TYPICAL SECTION & RETAINING WALL/PROPERTY LINE PROXIMITY DETAIL

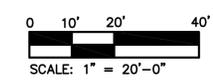
SCALE: NOT TO SCALE

PROPERTY OF
 ROBERT K. HUFFMAN AND
 ALMA M. HUFFMAN
 DEED BOOK 43, PAGE 269
 TAX No. 105-A-28

PROPERTY OF
 JAMES MORRIS CAMPBELL
 DEED BOOK 179, PAGE 261
 TAX No. 105-A-29

PROPERTY OF
 SIMMONSVILLE VOLUNTEER
 FIRE DEPARTMENT
 DEED BOOK 55, PAGE 709
 TAX No. 105-4-5

Option C: No Build



Date	
Revisions	

Issue Date:	10/30/2013
Drawn By:	ASH
Designed By:	GSQ
Checked By:	SAC
Date:	

Mattern & Craig
 CONSULTING ENGINEERS • SURVEYORS
 701 FIRST STREET
 ROANOKE, VIRGINIA
 (540) 986-9922
 FAX (540) 345-1681

**ROUTE 42 CONVENIENCE CENTER
 GRADING STORMWATER &
 EROSION CONTROL PLAN
 CRAIG COUNTY, VA**

Vertical Scale:
 N/A

Horizontal Scale:
 AS SHOWN

Commission No.:
 29588B

Sheet No.:
5

Appendix D
Cost Savings Summary

Projected Cost Savings for the installation of a compactor at the 42 site

Current Cost Model	
Route 42 Annual Hauling Trips	307
Current cost per trip for hauling and tipping charges	\$260
Current annual hauling cost	\$79,820
Add a compactor to site 42	
4 to 1 compaction rate reducing hauling trips	77
Current cost per trip for hauling and tipping charges	\$260
Projected annual hauling cost with compactor	\$20,020
Annual hauling cost savings	\$59,800

Projected Cost Model: Annual Compactor Operating Costs	
Add: Annual part-time personnel cost 40 hours per week at \$7.25 per hour	\$15,080
Add: Annual surveillance cost using battery operated gaming cameras \$100 per camera (4) + battery & SD card costs	\$ 1,040.00
Add: Annual compactor maintenance costs based on contract example from Bedford	\$1,500
Add: Annual electric costs based on info from Co-op	\$ 3,815
Total Projected Additional Cost of Compactor Operation	\$21,435
Projected annual hauling cost with compactor	\$20,020
Projected Annual Total Cost after installing a compactor	\$41,455
Projected TOTAL Annual Savings: Compactor Operation	\$38,365

Appendix E
Return on Investment

Marathon RJ-325 Stationary Compactor Return on Investment

Return on Investment (ROI)	
Current Costs	
Annual Hauling Costs	\$ (79,820)
Proposed Costs (for Marathon RJ-325)	
Initial Investment: Installation and Construction	\$ (87,594)
Equipment Replacement Cost	\$ (52,894)
Life Expectancy (years)	15
Annual Costs	
Annual Hauling Cost	\$ (20,020)
Annual Personnel Cost	\$ (15,080)
Annual Maintenance Cost	\$ (1,500)
Annual Surveillance cost (gaming cameras)	\$ (1,040)
Annual Electric cost	\$ (3,815)
Total Cost Yr 1	\$ (129,049)
Total Annual Cost Past Yr 1	\$ (41,455)
Savings	
Annual Hauling Cost Savings	\$ 38,365

Payback Period

28 months

Year	Equipment Cost	Cummulative Savings	ROI	
1	\$ (87,594)	\$ 38,365	\$ (49,229)	-56%
2	\$ -	\$ 76,730	\$ (10,864)	-12%
3	\$ -	\$ 115,095	\$ 27,501	31%
4	\$ -	\$ 153,460	\$ 65,866	75%
5	\$ -	\$ 191,825	\$ 104,231	119%
6	\$ -	\$ 230,190	\$ 142,596	163%
7	\$ -	\$ 268,555	\$ 180,961	207%
8	\$ -	\$ 306,920	\$ 219,326	250%
9	\$ -	\$ 345,285	\$ 257,691	294%
10	\$ -	\$ 383,650	\$ 296,056	338%
11	\$ -	\$ 422,015	\$ 334,421	382%
12	\$ -	\$ 460,380	\$ 372,786	426%
13	\$ -	\$ 498,745	\$ 411,151	469%
14	\$ -	\$ 537,110	\$ 449,516	513%
15	\$ (52,894)	\$ 575,475	\$ 434,986	557%
16	\$ -	\$ 613,840	\$ 526,246	601%
17	\$ -	\$ 652,205	\$ 564,611	645%
18	\$ -	\$ 690,570	\$ 602,976	688%
19	\$ -	\$ 728,935	\$ 641,341	732%
20	\$ -	\$ 767,300	\$ 679,706	776%
21	\$ -	\$ 805,665	\$ 718,071	820%
22	\$ -	\$ 844,030	\$ 756,436	864%
23	\$ -	\$ 882,395	\$ 794,801	907%
24	\$ -	\$ 920,760	\$ 833,166	951%
25	\$ -	\$ 959,125	\$ 871,531	995%
26	\$ -	\$ 997,490	\$ 909,896	1039%
27	\$ -	\$ 1,035,855	\$ 948,261	1083%
28	\$ -	\$ 1,074,220	\$ 986,626	1126%
29	\$ -	\$ 1,112,585	\$ 1,024,991	1170%
30	\$ (52,894)	\$ 1,150,950	\$ 1,010,461	1214%

Baker Pinnacle S-300 Stationary Compactor Return on Investment

Return on Investment (ROI)	
Current Costs	
Annual Hauling Costs	\$ (79,820)
Proposed Costs (for Baker Pinnacle S-300)	
Initial Investment: Installation and Construction	\$ (85,431)
Equipment Replacement Cost	\$ (50,731)
Life Expectancy (years)	15
Annual Hauling Cost	\$ (20,020)
Annual Personnel Cost	\$ (15,080)
Annual Maintenance Cost	\$ (1,500)
Annual Surveillance cost (gaming cameras)	\$ (1,040)
Annual Electric cost	\$ (3,815)
<u>Total Cost Yr 1</u>	\$ (126,886)
<u>Total Annual Cost Past Yr 1</u>	\$ (41,455)
Savings	
Annual Hauling Cost Savings	\$ 38,365

Payback Period

27 months

Year	Equipment Cost	Cummulative Savings	ROI	
1	\$ (85,431)	\$ 38,365	\$ (49,229)	-56%
2	\$ -	\$ 76,730	\$ (10,864)	-12%
3	\$ -	\$ 115,095	\$ 27,501	31%
4	\$ -	\$ 153,460	\$ 65,866	75%
5	\$ -	\$ 191,825	\$ 104,231	119%
6	\$ -	\$ 230,190	\$ 142,596	163%
7	\$ -	\$ 268,555	\$ 180,961	207%
8	\$ -	\$ 306,920	\$ 219,326	250%
9	\$ -	\$ 345,285	\$ 257,691	294%
10	\$ -	\$ 383,650	\$ 296,056	338%
11	\$ -	\$ 422,015	\$ 334,421	382%
12	\$ -	\$ 460,380	\$ 372,786	426%
13	\$ -	\$ 498,745	\$ 411,151	469%
14	\$ -	\$ 537,110	\$ 449,516	513%
15	\$ (50,731)	\$ 575,475	\$ 437,150	557%
16	\$ -	\$ 613,840	\$ 526,246	601%
17	\$ -	\$ 652,205	\$ 564,611	645%
18	\$ -	\$ 690,570	\$ 602,976	688%
19	\$ -	\$ 728,935	\$ 641,341	732%
20	\$ -	\$ 767,300	\$ 679,706	776%
21	\$ -	\$ 805,665	\$ 718,071	820%
22	\$ -	\$ 844,030	\$ 756,436	864%
23	\$ -	\$ 882,395	\$ 794,801	907%
24	\$ -	\$ 920,760	\$ 833,166	951%
25	\$ -	\$ 959,125	\$ 871,531	995%
26	\$ -	\$ 997,490	\$ 909,896	1039%
27	\$ -	\$ 1,035,855	\$ 948,261	1083%
28	\$ -	\$ 1,074,220	\$ 986,626	1126%
29	\$ -	\$ 1,112,585	\$ 1,024,991	1170%
30	\$ (50,731)	\$ 1,150,950	\$ 1,012,625	1214%

Wastequip 345IP, 3-yard Stationary Compactor Return on Investment

Return on Investment (ROI)	
Current Costs	
Annual Hauling Costs	\$ (79,820)
Proposed Costs (for Wastequip 345IP)	
Initial Investment: Installation and Construction	\$ (81,943)
Equipment Replacement Cost	\$ (47,243)
Life Expectancy (years)	15
Annual Hauling Cost	\$ (20,020)
Annual Personnel Cost	\$ (15,080)
Annual Maintenance Cost	\$ (1,500)
Annual Surveillance cost (gaming cameras)	\$ (1,040)
Annual Electric cost	\$ (3,815)
Total Cost Yr 1	\$ (123,398)
Total Annual Cost Past Yr 1	\$ (41,455)
Savings	
Annual Hauling Cost Savings	\$ 38,365

Payback Period

26 months

Year	Equipment Cost	Cummulative Savings	ROI	
1	\$ (81,943)	\$ 38,365	\$ (49,229)	-56%
2	\$ -	\$ 76,730	\$ (10,864)	-12%
3	\$ -	\$ 115,095	\$ 27,501	31%
4	\$ -	\$ 153,460	\$ 65,866	75%
5	\$ -	\$ 191,825	\$ 104,231	119%
6	\$ -	\$ 230,190	\$ 142,596	163%
7	\$ -	\$ 268,555	\$ 180,961	207%
8	\$ -	\$ 306,920	\$ 219,326	250%
9	\$ -	\$ 345,285	\$ 257,691	294%
10	\$ -	\$ 383,650	\$ 296,056	338%
11	\$ -	\$ 422,015	\$ 334,421	382%
12	\$ -	\$ 460,380	\$ 372,786	426%
13	\$ -	\$ 498,745	\$ 411,151	469%
14	\$ -	\$ 537,110	\$ 449,516	513%
15	\$ (47,243)	\$ 575,475	\$ 440,637	557%
16	\$ -	\$ 613,840	\$ 526,246	601%
17	\$ -	\$ 652,205	\$ 564,611	645%
18	\$ -	\$ 690,570	\$ 602,976	688%
19	\$ -	\$ 728,935	\$ 641,341	732%
20	\$ -	\$ 767,300	\$ 679,706	776%
21	\$ -	\$ 805,665	\$ 718,071	820%
22	\$ -	\$ 844,030	\$ 756,436	864%
23	\$ -	\$ 882,395	\$ 794,801	907%
24	\$ -	\$ 920,760	\$ 833,166	951%
25	\$ -	\$ 959,125	\$ 871,531	995%
26	\$ -	\$ 997,490	\$ 909,896	1039%
27	\$ -	\$ 1,035,855	\$ 948,261	1083%
28	\$ -	\$ 1,074,220	\$ 986,626	1126%
29	\$ -	\$ 1,112,585	\$ 1,024,991	1170%
30	\$ (47,243)	\$ 1,150,950	\$ 1,016,112	1214%

Appendix F
Preliminary Cost Estimates

Marathon RJ-325 Stationary Compactor Installation Costs

Based on Bedford, VA Invoice dated 12/28/2016				
Item				
No.	Description	Unit Price	QTY	Ext Price
1	Marathon RJ-325 with standard features	\$ 18,806.40	1	\$ 18,806.40
2	208 Volt, 3 Phase 5 & 10 HP Power Unit	\$ -	1	\$ -
3	Multi-Cycle Timer	\$ -	1	\$ -
4	Side mounted power pack	\$ -	1	\$ -
5	Controls on 20' Sealtite (in lieu of 13')	\$ 122.88	1	\$ 122.88
6	VIP Style Key Switch	\$ 201.60	1	\$ 201.60
7	"Hold to Run" Type Start Button	\$ 156.48	1	\$ 156.48
8	Container Guide - 5'L x 3.5" H	\$ 357.12	1	\$ 357.12
9	Build and install custom feed hopper on site	\$ 3,750.00	1	\$ 3,750.00
A	Stationary Compactor Installation	\$ 1,500.00	1	\$ 1,500.00
B	Estimated Freight to site	\$ 800.00	1	\$ 800.00
C	Delivery & Offload (includes forklift)	\$ 500.00	1	\$ 500.00
D	In-line Inverter	\$ 2,300.00	1	\$ 2,300.00
E	Storage Container - 40 c.y.	\$ 12,200.00	2	\$ 24,400.00
	New Electrical Line / installation	\$ 1,200.00	1	\$ 1,200.00
	Site Improvements (construction)	\$ 8,500.00	1	\$ 8,500.00
	Contingency	\$ 9,400.00	1	\$ 9,400.00
	Engineering Fee	\$ 15,600.00	1	\$ 15,600.00
Compactor Price - Delivered & Installed				\$ 26,194.48
Total Equipment Price (Compactor, Inverter, Containers)				\$ 52,894.48
Federal Excise Tax				\$ -
Sales Tax				\$ -
Construction price including electrical				\$ 34,700.00
TOTAL				\$ 87,594.48

Baker Pinnacle S-300 Stationary Compactor Installation Costs

Based on quote for compactor provided by Refuse Equipment Corporation 11/8/17				
Item				
No.	Description	Unit Price	QTY	Ext Price
1	Baker Pinnacle S-300 Stationary with standard features	\$ 14,915.00	1	\$ 14,915.00
2	Additional estimated at 40% of unit price <i>(Additional include custom hopper, motor, other options)</i>	\$ 5,966.00	1	\$ 5,966.00
A	Estimated Stationary Compactor Installation	\$ 1,500.00	1	\$ 1,500.00
B	Estimated Freight to site	\$ 1,150.00	1	\$ 1,150.00
C	Estimated Delivery & Offload	\$ 500.00	1	\$ 500.00
D	In-line Inverter	\$ 2,300.00	1	\$ 2,300.00
E	Storage Container - 40 c.y.	\$ 12,200.00	2	\$ 24,400.00
	New Electrical Line / installation	\$ 1,200.00	1	\$ 1,200.00
	Site Improvements (construction)	\$ 8,500.00	1	\$ 8,500.00
	Contingency	\$ 9,400.00	1	\$ 9,400.00
	Engineering Fee	\$ 15,600.00	1	\$ 15,600.00
Compactor Price - Delivered & Installed				\$ 24,031.00
Total Equipment Price (Compactor, Inverter, Containers)				\$ 50,731.00
Federal Excise Tax				\$ -
Sales Tax				\$ -
Construction price				\$ 34,700.00
TOTAL				\$ 85,431.00

Wastequip 345IP, 3-yard Stationary Compactor Installation Costs

Based on quotes provided by National Equipment solutions, regional compactor dealer for Wastequip 11/14/17				
Item				
No.	Description	Unit Price	QTY	Ext Price
1	Wastequip 345IP, 3-yard stationary compactor	\$ 13,592.00	1	\$ 13,592.00
2	Single Phase motor/5 HP or 10 HP	\$ 1,484.00	1	\$ 1,484.00
3	Pressure gauge color coded and numeric on	\$ 363.20	1	\$ 363.20
4	Guide rails- 5' standard with stops	\$ 284.00	1	\$ 284.00
5	Side Feed Hopper - 3 Sided (RH Side Feed)	\$ 1,560.00	1	\$ 1,560.00
	Price increase for Custom Hopper (100%)	\$ 1,560.00	1	\$ 1,560.00
7	Stationary Compactor Installation	\$ 2,500.00	1	\$ 2,500.00
6	Estimated Freight to site	\$ 1,500.00	1	\$ 1,500.00
12	Delivery & Offload (includes forklift)	\$ -	1	\$ -
	Inverter - not needed			
	Storage Container - 40 c.y.	\$ 12,200.00	2	\$ 24,400.00
	New Electrical Line / installation	\$ 1,200.00	1	\$ 1,200.00
	Site Improvements (construction)	\$ 8,500.00	1	\$ 8,500.00
	Contingency	\$ 9,400.00	1	\$ 9,400.00
	Engineering Fee	\$ 15,600.00	1	\$ 15,600.00
Compactor Price - Delivered & Installed				\$ 22,843.20
Total Equipment Price (Compactor, Inverter, Containers)				\$ 47,243.20
Federal Excise Tax				\$ -
Sales Tax				\$ -
Construction price				\$ 34,700.00
TOTAL				\$ 81,943.20

SURVEILLANCE COSTS

Option A - Battery Powered Gaming Cameras

\$ 400.00	Cameras	4 Cameras at	\$ 100.00	per camera
\$ 100.00	SD Cards	4 SD Cards at	\$ 25.00	per SD card
\$ 60.00	Batteries	4 Battery sets at	\$ 15.00	per battery set
\$ -	Computer			
\$ -	Computer & Camera Installation			
\$ -	DSL Connection Installation			
\$ 560.00	TOTAL Surveillance Installation			
\$ 300.00	Replacement SD Cards (annual)	12 SD Cards at	\$ 25.00	per SD card
\$ 180.00	Replacement Batteries (annual)	12 Battery sets at	\$ 15.00	per battery set
\$ -	Monthly Internet service			
\$ -	Annual Internet service			
\$ -	Annual computer maintenance and troubleshooting			
\$ 480.00	TOTAL Annual Maintenance Costs			
\$ 1,040.00	TOTAL Annual Installation and maintenance (allows for annual camera replacement)			

Options B & C - wired power cameras

\$ 800.00	Cameras	4 Cameras at	\$ 200.00	per camera
\$ -	SD Cards	0 SD Cards at	\$ 25.00	per SD card
\$ -	Batteries	0 Battery sets at	\$ 15.00	per battery set
\$ 500.00	Computer			
\$ 500.00	Computer & Camera Installation			
\$ 300.00	DSL Connection Installation			
\$ 1,800.00	TOTAL Surveillance Installation			
\$ -	Replacement SD Cards (annual)	0 SD Cards at	\$ 25.00	per SD card
\$ -	Replacement Batteries (annual)	0 Battery sets at	\$ 15.00	per battery set
\$ 90.00	Monthly Internet service			
\$ 1,080.00	Annual Internet service			
\$ 500.00	Annual computer maintenance and troubleshooting			
\$ 1,670.00	TOTAL Annual Maintenance Costs			
\$ 3,470.00	TOTAL Installation and 1st year of maintenance			

Appendix G

Technical Data

Mid-Atlantic Waste Systems



Division of THC Enterprises, Inc.
 Easton, MD * Clinton, MD * Chesapeake, VA * Salem, VA *
 New Castle, DE * Cheswick, PA
 Phone 800-338-7274 Fax 410-820-8916
 Visit us on the web! www.mawaste.com

INVOICE

Remittance Address
 P.O. Box 417882
 Boston, MA 02241-7882

SOLD TO
 Sheldon Cash
 Bedford County
 122 East Main Street
 Bedford, VA 24523

SHIP TO
 Sheldon Cash
 Bedford County
 122 East Main Street
 Bedford, VA 24523

540-586-7656

540-586-7656

Sales Rep Kevin Odenwelder

Invoice #	M33775
Account	54504
Date	12/28/16
Terms	Net 30 Days
PO #	N/A

QTY	DESCRIPTION	UNIT PRICE	EXT PRICE
<p><i>NJPA Awarded Contract#: 060612-ESG</i> <i>Category: Waste & Recycling</i> <i>Description: Waste & Recycling Collection Containers & Compactors</i> <i>Maturity Date: 07/17/2016</i></p>			
1.00	Marathon RJ-325 Stationary 3 Yard Compactor <i>Stewartsville</i> Totally UL Listed; RH Side-Mounted Power Pack (3/60 - 230/460 Volt); Push Button Control Station Mounted on 13' Sealtite; Ratchets with Grab Claws; External Reset Button In Panel Box Face; Paint of Standard Color - Brown SERIAL NUMBER: 51528956	\$18,806.40	\$18,806.40
1.00	208 Volt, 3 Phase (Tri-Volt Option - 208, 230, 460) 5 and 10 HP Non-Submerged Power Units <i>Fixed Asset</i>		
1.00	Multi-Cycle Timer <i>12-19-16</i>		
1.00	Side Mounted Power Pack (Right Side)		
1.00	Controls on 20' Sealtite (in lieu of 13 ft.) <i>SS-42585-8165-000</i>	\$122.88	\$122.88
1.00	VIP Style Key Switch <i>Q25,880.81</i>	\$201.60	\$201.60
1.00	"Hold to Run" Type Start Button <i>1-517</i>	\$156.48	\$156.48
1.00	Container Guide - 5' L x 3-1/2" H <i>(initials)</i>	\$357.12	\$357.12
1.00	Estimated Freight from Marathon to Bedford, VA	\$611.33	\$611.33
1.00	Build and install feed hopper on site <i>TA</i>	\$3,750.00	\$3,750.00
1.00	Stationary Compactor Installation	\$1,500.00	\$1,500.00
1.00	Delivery and Offload (includes forklift) (must be within 60 mile radius of branch)	\$375.00	\$375.00
		Subtotal	\$25,880.81
		Federal Excise Tax	\$0.00
		Sales Tax	\$0.00
		TOTAL	\$25,880.81

Thank you for your business!
 Make all checks payable to Mid-Atlantic Waste Systems.
 Remember to reference the invoice number on your check.

Mid-Atlantic Waste System



INVOICE

Division of THC Enterprises, Inc.
 Easton, MD * Clinton, MD * Chesapeake, VA * Salem, VA *
 New Castle, DE * Cheswick, PA

Phone 800-338-7274 Fax 410-820-9916
 Visit us on the web! www.mawaste.com

Remittance Address
 P.O. Box 417882
 Boston, MA 02241-7882

SOLD TO
 Sheldon Cash
 Bedford County
 122 East Main Street
 Bedford, VA 24523

SHIP TO
 Sheldon Cash
 Bedford County
 122 East Main Street
 Bedford, VA 24523

Invoice #	M33772
Account	54504
Date	03/29/16
Terms	Net 30 Days
PO #	N/A

540-586-7656

540-586-7656

Sales Rep Kevin Odenwelder

QTY	DESCRIPTION	UNIT PRICE	EXT PRICE
<i>NJPA Awarded Contract#: 060612-ESG</i> <i>Category: Waste & Recycling</i> <i>Description: Waste & Recycling Collection Containers & Compactors</i> <i>Maturity Date: 07/17/2016</i>			
1.00	Marathon RJ-225 Stationary 2 Yard Compactor <i>Falling Creek</i> Totally UL Listed; RH Side-Mounted Power Pack (3/60 - 230/460 Volt) (with 10 HP non-submergerd Power Unit; Push Button Control Station Mounted on 13' Sealtite; Ratchets with Grab Claws; External Reset Button In Panel Box Face; Paint Color - Green SERIAL: 51528943	\$14,717.76	\$14,717.76
1.00	Lefthand Power Unit	\$230.40	\$230.40
1.00	Multi-Cycle Timer		
1.00	Side Mounted Power Pack (Left Side)		
1.00	Controls; Keylock Start Remote 13 Ft of Sealtite		
1.00	VIP Style Key Switch	\$201.60	\$201.60
1.00	Side Feed Hopper - 3-Sided (RH side Feed) - Assembled Only <i>★</i>	<i>★</i> \$1,488.00	\$1,488.00
1.00	"Hold to Run" Type Start Button	\$156.48	\$156.48
1.00	Hinged Breaker Bar Teeth - Mounted	\$426.24	\$426.24
1.00	Container Guide - 5' L x 3-1/2" H	\$337.92	\$337.92
1.00	Mount Side Feed Hopper - 3-Sided <i>★</i>	<i>★</i> \$465.60	\$465.60
1.00	Estimated Freight from Marathon to Bedford, VA	\$1,087.00	\$1,087.00
1.00	Arco Rotary Phase Converter	\$4,354.03	\$4,354.03
1.00	Shipping Rotary Phase converter	\$400.00	\$400.00
1.00	MAWS installation Rotary Phase Converter	\$830.00	\$830.00
1.00	Stationary Compactor Installation	\$1,500.00	\$1,500.00

\$5,600

\$4,354.03
\$400.00
\$830.00
\$1,500.00

QTY	DESCRIPTION	UNIT PRICE	EXT PRICE
1.00	Delivery and Offload (includes forklift) (must be within 60 mile radius of branch)	\$375.00	\$375.00
	Subtotal		\$26,570.03
	Federal Excise Tax		\$0.00
	Sales Tax		\$0.00
	TOTAL		\$26,570.03

Thank you for your business!
 Make all checks payable to Mid-Atlantic Waste Systems.
 Remember to reference the invoice number on your check.

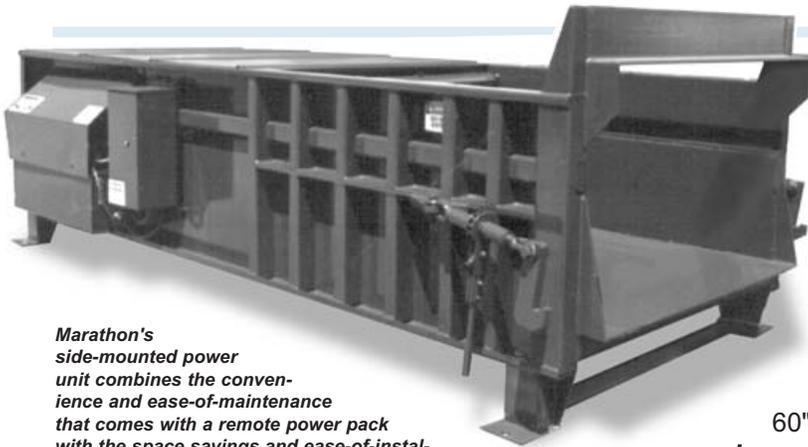
TERMS & CONDITIONS - Payments Accepted: Cash, Checks, ACH & Wires. Credit Card will ONLY be Accepted on Orders of \$4,000 or Less.

1.5% charge per month or 18% per year on accounts over 30 days will be added. ALL CLAIMS MUST BE MADE WITHIN 10 DAYS OF INVOICE. MID-ATLANTIC WASTE SYSTEMS shall retain ownership of and title to the above merchandise covered by this order until fully paid for in cash and until any note given in evidence of indebtedness, and any renewals thereof, have been fully paid. If any such note is not paid in full at its maturity, all other notes and obligations given in evidence of indebtedness herof shall at once become due, and the said MID-ATLANTIC WASTE SYSTEMS shall have the right to take possession of said machinery wheresoever it may be situated and sell the same pursuant to the conditional sales status of Talbot County, Maryland. The said machinery is ordered and will be purchased subject to written contract only, and are not affected by any verbal representations of agreements, nor is this order subject to cancellations by the purchaser without the seller's consent. The delivery date herein specified is subject to labor disputes, Acts of God, and all other causes beyond the

As PROVIDED BY THE PURCHASER Fixed Asset
 Date Shipped 10-1-16
 Invoice # 55-4258-S-81165-000
 Amount \$26,570.03
 Shipping 1-5-17
 Approving Signature 
 AP 



RJ-325 & RJ-325HD Commercial Compactors



Marathon's side-mounted power unit combines the convenience and ease-of-maintenance that comes with a remote power pack with the space savings and ease-of-installation of an integrated power pack.

RJ-325 Heavy Commercial Compactor

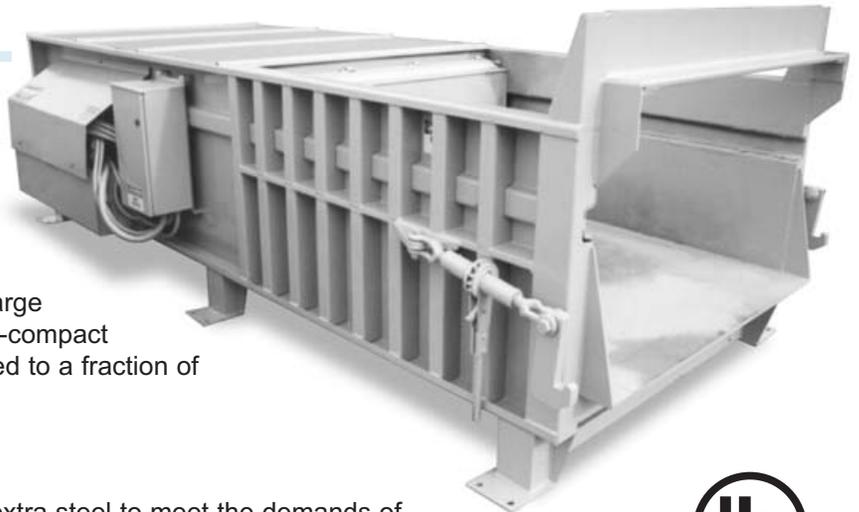


Marathon's RamJet **RJ-325** is a real work horse! Its proven capability assures top performance in heavy commercial and industrial applications. The **RJ-325** is unique to other compactors in its class, providing a large 60"W x 67 1/2"L **clear top opening** and a 33" deep **charge box**—a feature greatly appreciated at peak loading times or when compacting bulky items!

Engineering...

The **RJ-325** is stress engineered for durability. That means the strength is where it belongs—like the 1/2" charge box floor reinforced with seven heavy duty steel channels, 1/2" steel plate ram face backed with 10" structural channels and extra rugged reinforced sides.

RJ-325HD Heavy Duty Compactor



The large 59 1/2"W x 67 1/2"L clear top opening and superior strength of the **RJ-325HD** make it just right for large volumes of crates, skids, and other hard-to-compact industrial refuse and trash. Waste is crushed to a fraction of their original bulk!

Engineering...

Marathon's **RJ-325HD** is engineered with extra steel to meet the demands of heavy-duty industrial use. Cylinder supports, 1" thick breaker bar, 3/8" ram top and extra side supports are added for superior endurance. Also standard on the **RJ-325HD** are 1/4" thick steel charge box liners and a 1/2" thick abrasion resistant steel plate on the charge box floor.



RJ-325

RJ-325HD

Specifications:

Charge Box Capacity		
[Mfrs. Rating]	3.15 cy (2.41 m ³)	3.15 cy (2.41 m ³)
[WASTEC Rating]	2.55 cy (1.95 m ³)	2.53 cy (1.93 m ³)
Clear Top Opening.....	67 1/2" x 60"	67 1/2" x 59 1/2"
	(1715 mm x 1524 mm)	(1715 mm x 1511 mm)
Capacity Per Hour.....	184 cy (141 m ³)	183 cy (140 m ³)

Performance Characteristics:

Cycle Time.....	50 sec.	50 sec.
Total Normal Force	46,700 lb (208 kN)	46,700 lb (208 kN)
Total Maximum Force	55,100 lb (245 kN)	55,100 lb (245 kN)
Normal Ram Face Pressure	26.8 psi (185 kPa)	27.1 psi (187 kPa)
Maximum Ram Face Pressure	31.7 psi (219 kPa)	31.9 psi (220 kPa)
Ram Penetration	13" (330 mm)	13" (330 mm)

Electrical Equipment:

TEFC Electrical Motor		
3/60-208/230/460	15 hp (11 kW)	15 hp (11 kW)
Electrical Control Voltage.....	120 VAC	120 VAC

UL Labeled Panel Box: NEMA Type, All Circuits Fused
Standard Controls: Keylock Start & Stop, Connected to 13' Sealtite

Hydraulic Equipment:

Hydraulic Pump Capacity	18.5 gpm (70 L/min.)	18.5 gpm (70 L/min.)
Normal Pressure	1650 psi (114 bar)	1650 psi (114 bar)
Maximum Pressure	1950 psi (134 bar)	1950 psi (134 bar)
Hydraulic Cylinder Bore	6" (152 mm)	6" (152 mm)
Hydraulic Cylinder Rod.....	4" (102 mm)	4" (102 mm)
Reservoir Capacity	20 gal. (76 L)	30 gal. (114 L)

Structural Characteristics:

Packer Body: Side Plates.....	1/4" (6.35 mm)	1/4" (6.35 mm)
Charge Box Liners	N/A	1/4" (6.35 mm)
Charge Box Floor	1/2" (12.7 mm)	1/2" (12.7 mm) Abrasion Resistant Plate (A514)
Ram Face Plate.....	1/2" (12.7 mm)	1/2" (12.7 mm)
Ram Bottom	3/8" (9.53 mm)	3/4" (19.05 mm)
Ram Sides.....	1/4" (6.35 mm)	1/4" (6.35 mm)
Ram Top.....	3/8" (9.53 mm)	3/8" (9.53 mm)

Weight6700 lbs. (3038 kg).....7375 lbs. (3345 kg)

RAMJET

RJ-325/325HD



Ram Guide System

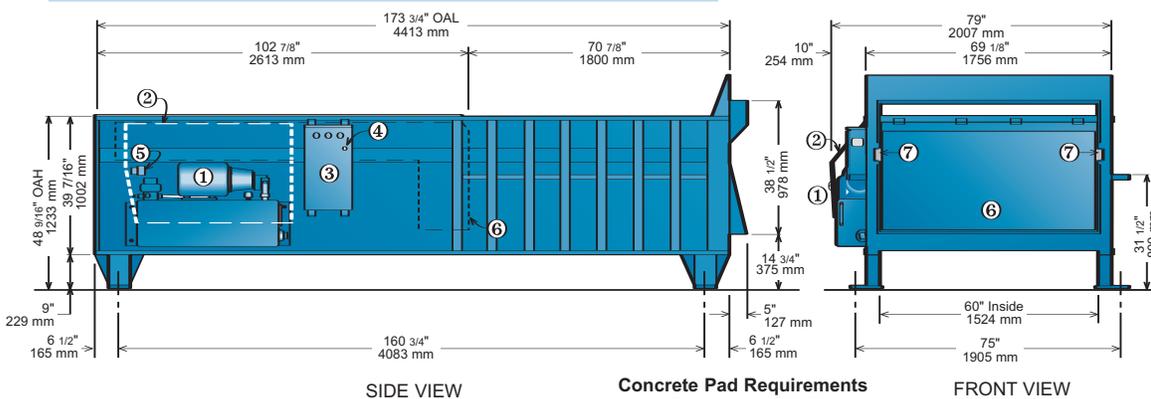
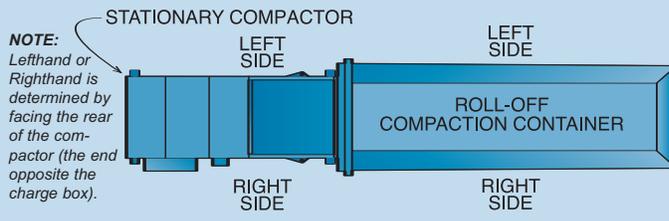
▼ The packing ram is supported by specially formulated cast iron shoes which ride on replaceable wear strips. This exclusive design protects the charge box floor from the full force of the packing ram, extending its life and dramatically reducing compaction-robbing friction.

Industrial Grade Systems

▼ The **RJ-325 & 325HD** have industrial grade electrical and hydraulic components—all **UL Listed!** The controls are contained in an NEMA 4 enclosure and connected to the power unit with 13 ft. of Sealtite.



Top View of Typical Compactor & Container Configuration



- ① Side-Mount Power Unit
- ② Power Unit Weather Cover
- ③ Control Panel Box
- ④ Motor Starter Reset Button
- ⑤ Limit Switch
- ⑥ Ram
- ⑦ Ram Guide Shoes with Replaceable Wear Strips

Authorized Distributor:

Visit our web site: MarathonEquipment.com



MARATHON EQUIPMENT COMPANY

P.O. Box 1798 • Vernon, AL 35592-1798 USA • (205) 695-9105 fax (205) 695-7250 1-800-633-8974

130 Hwy. 339 • Yerington, NV 89447 USA • (775) 463-4030 fax (775) 463-4531 1-800-624-5724

1102 Industrial Park Rd. • Clearfield, PA 16830 USA • (814) 765-0200 fax (814) 765-2072 1-800-922-7062

Pictures in this literature are illustrative only. Specifications are subject to change without notice in order to accommodate improvements to the equipment. Certified in compliance with ANSI Regulation Z245.2, all OSHA standards, and certified under WASTEC's Stationary Compactor Certification Program. Products must be used with safe practice and in accordance with said regulations and standards.



RJ-325 & RJ-325HD Stationary Compactors

Dimensions and Specifications

Specifications:	RJ-325		RJ-325HD	
Charge Box Capacity				
[Mfr. Rating]	3.15 cu. yd.	2.41 m ³	3.15 cu. yd.	2.41 m ³
[NSWMA Rating]	2.55 cu. yd.	1.93 m ³	2.55 cu. yd.	1.93 m ³
Clear Top Opening (L x W)	67.5" x 60"	1715mm x 1524mm	67.5" x 59.5"	1715mm x 1511mm
Performance:				
Cycle Time	50 sec.	?	50 sec.	50 sec
Total Normal Force	46,700 lbs.	21,183 kg	46,700 lbs.	21,183 kg
Total Maximum Force	55,100 lbs.	24,993 kg	55,100 lbs.	24,993 kg
Normal Ram Face Pressure	26.8 psi	1.88 bar	27.1 psi	1.86 bar
Maximum Ram Face Pressure	31.7 psi	2.18 bar	31.9 psi	2.19 bar
Ram Penetration	13"	330mm	13"	330mm
Electrical Equipment:				
Electrical Motor 3/60-208/230/460	15 hp	11 kw	15 hp	11 kw
Electrical Control Voltage	120 VAC	120 VAC	120 VAC	120 VAC
UL® and CUL® Listed Panel Box: NEMA Type, All Circuits Fused				
2-Button Controls: Keylock Start/Stop				
Hydraulic Equipment:				
Pump Capacity	18.5 gpm	70 liters/min	18.5 gpm	70 liters/min
Normal Pressure	1,650 psi	114 bar	1,650 psi	114 bar
Maximum Pressure	1,950 psi	134 bar	1,950 psi	134 bar
Hydraulic Cylinder (Bore)	6"	152mm	6"	152mm
Hydraulic Cylinder (Rod)	4"	102mm	4"	102mm
Hydraulic Cylinder (Stroke)	82"	2083mm	82 in.	2083mm
Structural Characteristics:				
Charge Box Sides	1/4"	6.4mm	1/4"	6.4mm
Charge Box Floor	1/2"	12.7mm	1/2"	12.7mm
Ram Face Plate	1/2"	12.7mm	1/2"	12.7mm
Ram Face Size	60"-29"	1524mm-737mm	60"-29"	1524mm-737mm
Ram Bottom	3/8"	9.5mm	3/4"	18.1mm
Ram Top	3/8"	9.5mm	3/8"	9.5mm
Breaker Bar	8" x 6" x 3/4"	203mm x 152mm x 19mm	8" x 6" x 1"	203mm x 152mm x 25mm
Weight	6,700 lbs.	3038 kg	7,375 lbs.	3345 kg

Compactor Rental and Leasing Programs Available

For detailed specifications, recommendations, or free economic studies comparing various systems, contact Marathon Customer Care at **1-800-633-8974**.



Stationary and self-contained compactors.

Authorized Dealer:

MARATHON
 A DOVER COMPANY
 Marathon Equipment Company
 P.O. Box 1798
 Vernon, AL 35592-1798
 800.633.8974
 www.marathonequipment.com
 NJPA Contract #060612-ESG



Environmental Solutions Group
 A DOVER COMPANY
 www.doveresg.com



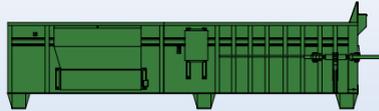
Pictures in this literature are illustrative only. Specifications are subject to change without notice in order to accommodate improvements to the equipment. Certified in compliance with ANSI standard Z245.2, applicable OSHA Regulations, and certified under WASTE's Stationary Compactor Certification Program. Products must be used with safe practice and in accordance with said regulations and standards.



You can add the Pandora Remote Monitoring System to many of our most popular compactors. Pandora enables you to measurably reduce your waste management costs. To find out more, contact your Marathon representative today.

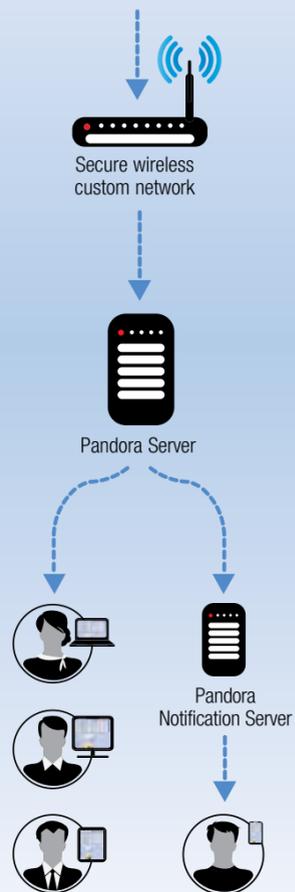
Pandora Platform Functionality

Optional on all RJ-325 and RJ-325HD Compactors



RJ-325

Compactor with PLC and wireless modem



- ✓ Pandora can display daily equipment status on a desktop or mobile PC, tablet, or smart phone
- ✓ Staff can login from any desktop or wireless device
- ✓ Pandora can send notifications to superintendent or directly to haulers



RJ-325 & RJ-325HD Stationary Compactors



RJ-325



RJ-325HD

Designed to handle heavy-duty waste streams

Ideal for small transfer stations or municipal drop-off centers

Heavy-duty design and high compaction force yield excellent volume reduction with MSW and light C&D waste streams

User-friendly 48-inch (1219mm) deck height keeps installation costs down



Mini transfer stations

Municipal recycling drop off enters

Large warehouses

Distribution centers

Manufacturing facilities

RJ-325 Compactor

Marathon's Ramjet RJ-325 is a proven workhorse with excellent capability ensuring top performance in heavy commercial and industrial applications. The RJ-325 is unique to other compactors in its class, providing a large 60-inch wide by 67 1/2-inch (1715mm) clear top opening and a 33-inch (838mm) deep charge box—a feature peak loading times or when compacting bulky items.



Engineered for Durability

The RJ-325 is stress engineered for durability. That means the strength is where it belongs—like the 1/2-inch (12.7mm) charge box floor reinforced with seven heavy-duty steel channels, 1/2-inch (12.7mm) steel plate ram face backed with 10-inch (254mm) structural channels and extra-rugged reinforced sides.

RJ-325HD Heavy-Duty Compactor

The large 59 1/2-inch (1511mm) wide by 67 1/2-inch (1715mm) long clear top opening and superior strength of the RJ-325HD make it just right for large volumes or crates, skids, and other hard-to-compact industrial refuse and trash. Waste is crushed to a fraction of the original bulk.



Heavy-Duty Design

Marathon's RJ-325HD is engineered with extra steel to meet the demands of heavy-duty industrial use. Cylinder supports, a 1-inch (25.4mm) thick breaker bar, a 3/8-inch (9.52mm) ram top, and extra side supports are added for superior endurance. Also standard on the RJ-325HD are 1/4-inch (6.35mm) thick steel charge box liners and a 1/2-inch (12.7mm) thick abrasion-resistant steel plate on the charge box floor.

Cart Dumpers, Chutes, and Hoppers

The RJ-325 and RJ-325HD can be fitted with a variety of material handling equipment such as chutes, hoppers, and dumpers. The compactor shown is fitted with a side fed hopper and a ground level dumper. Cart dumpers can be custom built to your specifications to accommodate existing cart systems.



Images shown with optional equipment



Ram Guide System

The packing ram is supported by specially formulated cast iron shoes which ride on replaceable wear strips. This

exclusive design protects the charge box floor from the full force of the packing ram, extending its life and dramatically reducing compaction-robbing friction.

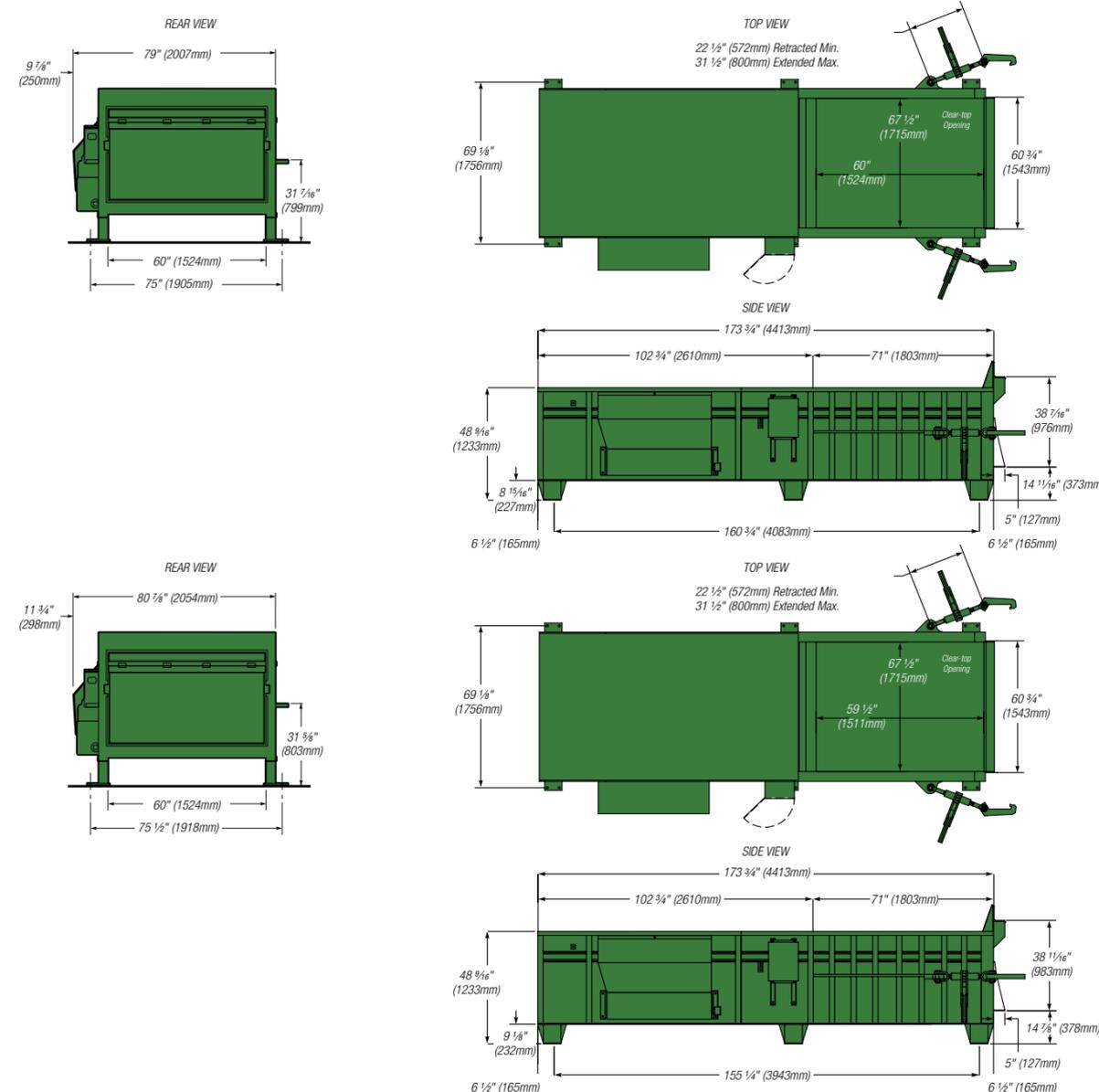
Control Station

The RJ-325 and RJ-325HD feature an advanced, simplified 2-button control system. It is a key-operated, fully automatic and contained in a weatherproof NEMA 4 enclosure. Connected to the power pack with 13-foot (3.96m) of Sealtite®, the controls can be located for operator convenience.



Dimensions

RJ-325 and RJ-325HD



Pandora Remote Monitoring System

The revolutionary Pandora Remote Monitoring System from Marathon enables you to monitor your compaction and baling equipment remotely, right from your desktop or mobile device using integrated wireless communications. The Pandora system combines onsite factory built-in or external add-on hardware with an industry-leading software platform – Pandora Intelligent Networks™ - to give you, real-time compactor and baler data, 24 hours per day, seven days per week.

Pandora gives you the tools to optimize your equipment and measurably reduce your waste management costs. You can eliminate unnecessary pickups, service your equipment to prevent downtime, and substantially reduce your overall carbon footprint.

View the Compactor

- ✓ Check performance
- ✓ Monitor fullness
- ✓ Identify misuse

Manage the Network

- ✓ Automate the scheduling of pickups and service calls
- ✓ Track performance trends
- ✓ Identify and address areas of inefficiency

Stay Connected

- ✓ Receive email or text alerts on your mobile device
- ✓ Communicate important decisions from any location
- ✓ Automatically escalate missed pickups or service call notifications

Repairs

- ✓ Schedule service before costly breakdowns
- ✓ Keep equipment operating at peak efficiency
- ✓ Receive malfunction and online alerts
- ✓ Reduce service and replacement costs

Metrics

- ✓ Create a custom dashboard to view equipment data and analyze operating trends
- ✓ Identify ways to enhance performance

Pickups

- ✓ Automatically notify the hauler when compactors reach their desired fullness level
- ✓ Pay only for necessary pickups



(<http://bwe-nc.com/>)



PINNACLE STATIONARY COMPACTORS

Home (<http://bwe-nc.com>) > Products (<http://bwe-nc.com/products/>) >

Pinnacle Stationary Compactors

OUR OFFICE



Lenoir Plant
1808 Norwood Street SW, Lenoir, NC 28645



[828/726-3001](tel:8287263001)



[800/221-4153](tel:8002214153)



828/726-3010



info@bwe-nc.com (<mailto:info@bwe-nc.com>)

CONTACT US ([HTTP://BWE-NC.COM/](http://BWE-NC.COM/))

Product Documents

Pinnacle Compactors (<http://bwe-nc.com/wp-content/uploads/2016/09/Pinnacle-Brochure-PDF-100915.pdf>)



Stationary 1_1



PINNACLE STATIONARY COMPACTORS

Pinnacle Stationary Compactors offer exceptional structural integrity for many years of dependable service.

All compactors are designed to provide reliable performance in standard and custom heavy duty applications.

Sizes (1/2 – 15 cubic yard)

Custom load options and container lifts

Applications include solid waste, recycling, scrap metal, cardboard, and more.

Delivered and installed by BWE Transport and Pinnacle service technicians

Sales, Service, Manufacturing, Technical Support, Delivery, Installation, and Parts... Pinnacle is your one stop shop for all your compactor needs.

Benefits

- High Quality Designs
- Custom Load Options Available
- Standard And “Shortys”
- “Seal Pack” And Precrushers
- Transfer Stations And Apartment “Mini’s”
- BWE Makes Them All!

Features

Industry Standard and Heavy Duty Designs

Standard Sizes: 2yd to 5yd capacities

Specialty Sizes: 1/2 yd apartment / condo compactors up to 15yd transfer station compactors

Engineered load options and container lifts are built by Pinnacle as turnkey options

Optional features such as Oil Heaters, Odor Control, Auto Cycles, Multi Cycles, Remote Controls, Trash Monitoring Systems, Pin Offs, Phase Converters, and more!

Compactor equipment personally delivered by BWE Transport providing extra attention to this heavy duty asset

Installation and service work by Pinnacle service technicians

Pinnacle Technical Service provides turnkey assistance before, during, and after the sale

All compactor equipment is built to ANSI Z245 specifications and OSHA requirements

Compactor power unit are UL Listed

Specifications

S-200 (2yd) Stationary Compactor:	
Size	1.58 cubic yards (NSWMA 2yd Equivalent)
Overall Dimensions	120” long x 48” high x 66” wide

Clear Top Chamber Opening	46" long x 60" wide
Ram Discharge Opening	37" high x 60" wide
Ram Penetration	11" long
Ram Face	29" high x 60" wide
Ram Cylinder	6" bore x 2.5" rod x 56" stroke
Cycle Time	60 seconds
Power Unit Operating System	PLR (Programmable Logic Relay)
Power Unit Motor	15HP Tri-volt (3 phase standard)
Power Unit Pump	12 GPM
Standard Controls	Key Start Switch, Emergency Stop, Reverse (120V)
Normal Pressures / Force	58,400 lbs @ 2050 psi
Maximum Pressures / Force	71,000 lbs @ 2550 psi
Paint Finish	2mil primer coat + 2mil industrial enamel paint finish

S-300 (3yd) Stationary Compactor:

Size	2.31 cubic yards (NSWMA 3yd Equivalent)
Overall Dimensions	168" long x 48" high x 66" wide
Clear Top Chamber Opening	61" long x 60" wide
Ram Discharge Opening	37" high x 60" wide
Ram Penetration	14" long

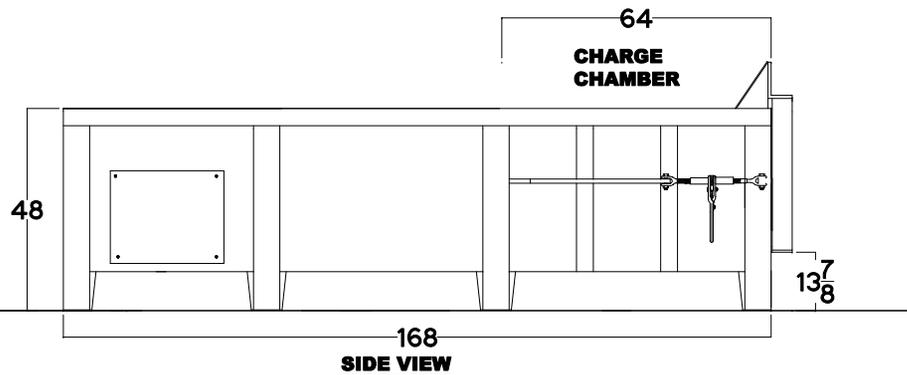
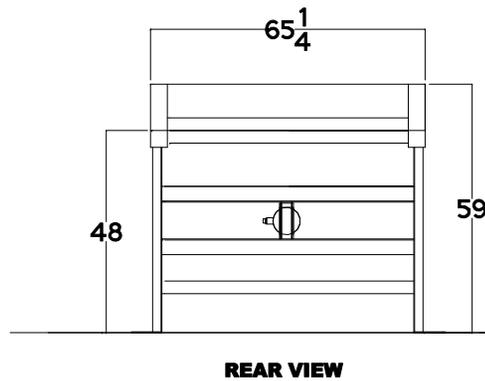
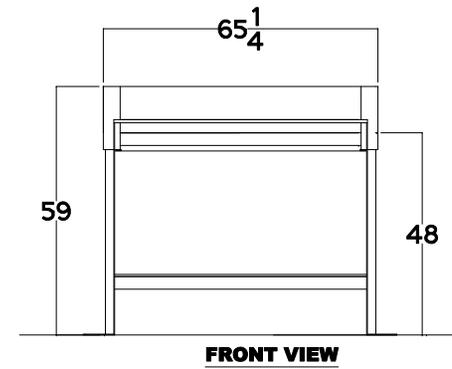
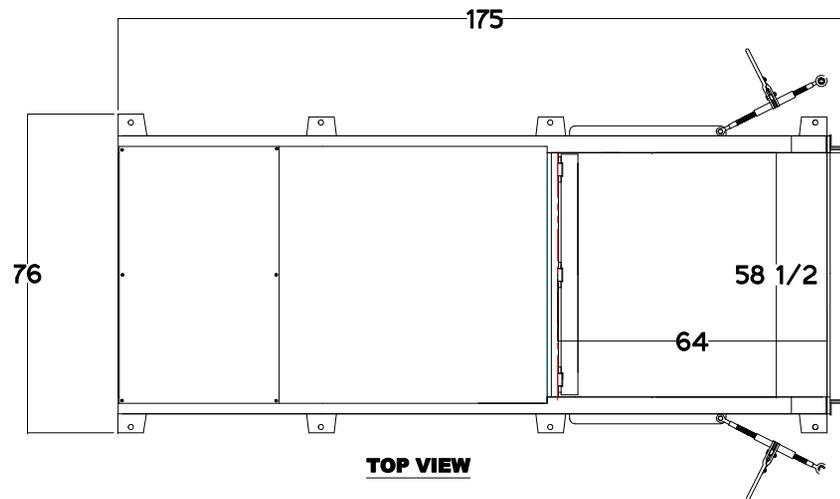
Ram Face	29" high x 60" wide
Ram Cylinder	6" bore x 4" rod x 78" stroke
Cycle Time	60 seconds
Power Unit Operating System	PLR (Programmable Logic Relay)
Power Unit Motor	15HP Tri-volt (3 phase standard)
Power Unit Pump	15 GPM
Standard Controls	Key Start Switch, Emergency Stop, Reverse (120V)
Normal Pressures / Force	48,400 lbs @ 1700 psi
Maximum Pressures / Force	59,000 lbs @ 2100 psi
Paint Finish	2mil primer coat + 2mil industrial enamel paint finish

S-400 (4yd) Stationary Compactor:

Size	2.71 cubic yards (NSWMA 4yd Equivalent)
Overall Dimensions	168" long x 54" high x 66" wide
Clear Top Chamber Opening	61" long x 60" wide
Ram Discharge Opening	41" high x 60" wide
Ram Penetration	14" long
Ram Face	34" high x 60" wide
Ram Cylinder	6" bore x 4" rod x 78" stroke
Cycle Time	60 seconds

S-300

(NO FABRICATED LOAD OPTION)



NOTE: DIMENSIONS ARE NOMINAL. THEY ARE A CLOSE REPRESENTATION OF ACTUAL WELDED ASSEMBLIES AND MAY CHANGE WITHOUT NOTICE.

DESCRIPTION: S-300 COMPACTOR	
	THIS DRAWING CONTAINS CONFIDENTIAL & PROPRIETARY INFORMATION AND SHALL NOT BE DISCLOSED OR COPIED WITHOUT THE EXPRESSED, WRITTEN PERMISSION OF BAKER WASTE EQUIPMENT.
DRAWN BY: M. CARLIN	DATE: 10/28/15
APPROVED BY:	DATE:
	PAGE: 1
FILE NAME: S300-001-S	REV.:



November 14, 2017

Mattern & Craig
 Attn: Cyan Miller
 701 First St SW
 Roanoke, VA 24016

RE: Stationary Compactor

Dear Cyan,

Thank you for allowing National Equipment Solutions this opportunity to propose these Stationary Compactor solutions.

Recommended Equipment: 1-NEW, Wastequip 345IP, 3-yard Stationary Compactor

Standard Features:

- Heavy duty ratchet binders with 1-1/4" hooks
- 57-second cycle time
- Full Container Light
- Multi-cycle timer
- Charge Box: 50" Length x 60" Width
- Controls in panel face
- Operational & Service Manual
- Automatic Maintenance Tracking
- Low Temperature Oil
- NEMA 4 control panel
- Precision guided ram
- Painted standard color of choice

Warranty:

- 3-year structural, 1-year parts, 1-year labor

Option 1: Basic Setup with no hopper

Description	Quote
345IP Precision Series Stationary Compactor	\$13,592.00
Single Phase Motor/5HP or 10HP motor	\$1,484.00
Pressure Gauge-color coded and numeric-on 15' pendent	\$363.20
Guide Rails-5' standard-with stops	\$284.00
Equipment Total	\$15,723.20
Freight	\$1,500.00
NES Installation	\$2,500.00
Total	\$19,723.20

Option 2: 3-sided hopper, right or left side feed

Description	Quote
345IP Precision Series Stationary Compactor	\$13,592.00
Single Phase Motor/5HP or 10HP motor	\$1,484.00
3-sided hopper-side feed-left or right-ANSI	\$1,560.00
Pressure Gauge-color coded and numeric-on 15' pendent	\$363.20
Guide Rails-5' standard-with stops	\$284.00
Equipment Total	\$17,283.20
Freight	\$1,500.00
NES Installation	\$2,500.00
Total	\$21,283.20

Option 3: Fully enclosed doghouse

Description	Quote
345IP Precision Series Stationary Compactor	\$13,592.00
Single Phase Motor/5HP or 10HP motor	\$1,484.00
Doghouse-fully enclosed, single door, frame & locking hasp	\$1,374.40
Magnetic door interlock switch-mounted	\$365.60
Pressure Gauge-color coded and numeric-on 15' pendent	\$363.20
Guide Rails-5' standard-with stops	\$284.00
Equipment Total	\$17,463.20
Freight	\$1,500.00
NES Installation	\$2,500.00
Total	\$21,463.20

Pricing is pending final National Equipment Solutions site survey. Pricing will change as options change.

Let me know should you have any questions regarding this proposal.

Best regards,

National Equipment Solutions, LP

Chris Blake

Cell: 410-707-3489

Email: cblake@nescompactor.com

IMPORTANT NOTE ON RENTALS AND RENTAL MAINTENANCE PLAN...

Our "Performance Guarantee" – To assure that you receive the proper technical service during our rental plan, NES will guarantee that your machine will be fixed within 48 hours from the time your repair order is placed. If the machine is not running properly by that time we will pay for the transportation costs for a temporary service. (I.e. 20cy open top container) until the machine is fixed. Bear in mind that NES selects only the finest equipment on the marketplace to keep downtime to a minimum. Combined with our performance guarantee, you can be certain that your operations will run smoothly and efficiently as long as the unit is in place.

Optional Maintenance Contract \$1,100 per year or \$100 per month.

Compactor downtime can wreak havoc on your operations and result in costly repair bills. **NES rentals include full service.** However, if you prefer to own the compactor or lease to own, we highly recommend taking good care of the unit to prevent untimely breakdowns. Following is an overview of the 35 –Point Preventative Maintenance Service Work that will help keep your compactor performing properly:

- Insure proper fuses in main fuse box, check fuse clips, correct bulbs, inspect terminals, inspect magnetic starter contacts for wear, assure wire and cable is free from breaks and wear on insulation and secured properly, check relays for proper position and continuity, inspect switch buttons for proper alignment and tightness, assure function of switch disconnect, inside and outside of box, reset up-stop switch, reset door close micro, reset pressure switch micro, reset safety gate closed door micro where applicable, remove foreign materials, check for excessive wear of frictional parts, lubricate track, lubricate inner walls, lubricate platen and guide, lubricate door hinges and handles, lubricate gate arms, lubricate safety gate, lubricate door stop, check baler eject hooks, cables, welded eye, check for loose lock nuts on gate arms, inspect safety shield on door handle, inspect piston packing, check upper cylinder connections, check bottom cylinder connections, inspect 4-way valve connections, pressure valve connections, and flow valve connections, check all intake connections and return connections, assure proper tightness of oil line brackets, inspect coupling connecting motor to pump, check for hose wear, check pressure settings, test oil.
- Drain Oil, flush, screen, and replace.
- Replace Oil Filter
- Test run, Training.

Unless otherwise noted in writing by NES, the following conditions of sale apply:

1. Taxes, Permits are responsibility of customer.
2. Removal of existing equipment may result in additional fees unless otherwise noted by NES.
3. Rental Terms: 60-month plan, 1-month down, 1-month security, credit approval.
4. Lease Terms: 60-months, \$1 buyout, 1-month down, 1-month security, \$250 doc fee, credit approval.
5. Purchase Terms: 50% down with signed sales order/50% upon installation.
6. Electrical requirements – 3phase, 208/230/460
7. Concrete requirements – 10' w x 40' l x 6" deep, 4000psi reinforced.
8. Allow 6-8 weeks for delivery unless otherwise confirmed by NES.
9. Neither repair nor maintenance plans include fuses, electrical issues relative to the power to the motor (black-outs, brown-outs, surges, etc.), abuse, or misuse of the equipment.
10. Phase converters are not acceptable power sources for compactors. NES will not be held responsible for electrical failure if phase converters are utilized for power sources.

STATIONARY COMPACTORS

345IP Precision Series 3-Yard Model

With our very own Guardian™ Control System and precision-guided ram, Wastequip's stationary compactors are ideal for handling dry waste.



Precision-guided ram engineered for improved performance and durability.



Guardian™ Control System

- New user-friendly controls
- Automatic Maintenance Tracking
- Superior 24-volt control
- NEMA 4 rated enclosure
- Remote power unit with weather protection cover

Heavy-Duty Ratchet Binders

- 1-1/4" thick hooks
- Greasable fittings

Precision-Guided Ram

- Glides smoothly above compactor floor on long-lasting UHMW guides
- 14" ram penetration minimizes spring-back of material

Large-Access Openings for Maintenance and Service

- Removable rear panel
- Removable side panels



Easy-to-use 24-volt Guardian Control System (optional remote pendant shown)



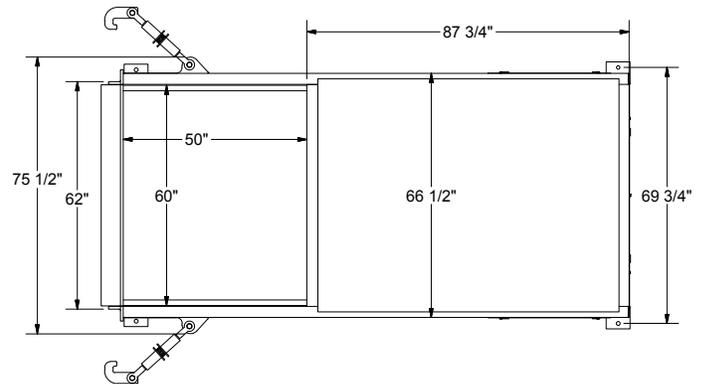
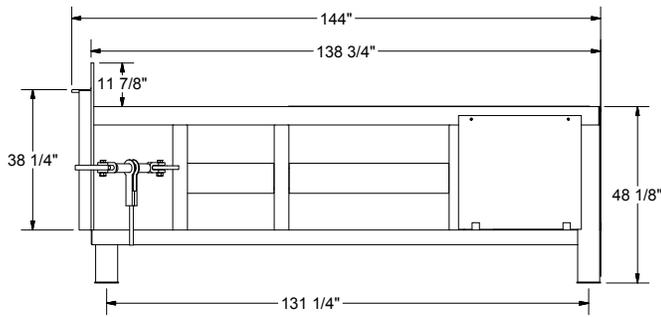
Heavy-duty ratchet binders with 1-1/4" thick hooks are standard.

* Use of an oil heater or extreme cold weather hydraulic oil is recommended in extreme cold conditions.



STATIONARY COMPACTORS

345IP Precision Series 3-Yard Model



Standard Features

- Heavy-duty ratchet binders with 1-1/4" hooks
- 58-second cycle time
- Controls in panel face
- Automatic Maintenance Tracking
- Full container light
- Low temperature oil
- Multi-cycle timer
- NEMA 4 control panel protects against windblown dust, splashing water, and hose-directed water
- Operation and service manual
- Primed and painted in multiple colors
- Remote power unit with weather cover

Optional Features

- Advance warning light
- Color-coded pressure gauge
- Guide rails with stops
- Oil heater
- Photo electric eye
- Odor control system
- Cart dumper

Warranty

- 3-1-1 warranty (3-year structural, 1-year parts, 1-year labor)



Replacement parts available online at www.gotoparts.com.

Specifications

Charge Box	Wastequip rating	3.00 cu. yds.
	Wastec rating	2.00 cu. yds.
	Clear top opening	50" length x 60" width
	Compactor weight with power unit	5,500 lbs.
Ram	Ram height	30-1/2"
	Ram penetration	14"
	Face plate	1/2" steel with 3/4" stiffener plates
	Base plate	3/8" steel plate with 10 ga. formed stiffeners
	Top plate	1/4" steel plate with 10 ga. formed stiffeners
Compactor Head	Side plates	1/4" formed plate
	Floor	3/8" steel plate with channels at 12" spacing
	Sides	1/4" steel plate sheets with 4" x 3" vertical stiffeners
	Breaker bar	6" x 8" x 3/4" angled steel
Electrical	Top deck	12 gauge steel (standard)
	Electric motor, fan cooled	10 hp
	Voltage	208/230/460, 3 phase 60 Hz
Hydraulic Performance	Power box	UL rated, TEFC housing
	Automated cycle operation	Push-button-start extends, retracts, and stops automatically
	Pump	14.1 gpm
	Pump type	Fixed gear
	Hydraulic oil tank	25 gallon reservoir
	Cylinder bore/rod/stroke	6" bore, 2.5" rod, 65" stroke
	Normal ram face pressure	48,000 lbs at 1,700 psi
Maximum ram face pressure	56,500 lbs at 2,000 psi	
Normal ram psi	26.23 psi	
Maximum ram psi	30.87 psi	
Cubic yard per hour	105	
Power unit location	Remote	
Cycle time	58 seconds	

Standard Color Choices



Colors shown are as accurate as printing allows. The actual color is subject to variation from the printed color sample. Color choices vary by plant location. Please contact your local sales representative for available colors. Custom colors are available upon request and are subject to an additional charge.



Tel: 877.468.9278 | sales@wastequip.com | www.wastequip.com

Wastequip is the leading North American manufacturer of waste and recycling equipment for collecting, processing, and transporting recyclables and solid or liquid waste.

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Appendix H
Electric Cost Schedule

ESTIMATED ELECTRICAL COSTS

Based on rate information from
Craig-Botetourt Electric Cooperative

11 kW
2684 kW-h

Draw of compactor
Estimated monthly usage
@ (8hrs a day, 30.5days)

\$ 0.02268 [per kWh] Purchase Power Demand

\$ 0.03658 [per kWh] Purchase Power Energy

\$ 0.04809 [per kWh] Distribution Demand

\$ 0.10735 TOTAL Cost per kWh

\$ 288.13 Monthly cost of estimated power used

\$ 29.80 Monthly consumer delivery charge - Single-phase service

\$ 317.93 TOTAL estimated monthly electrical cost

\$ 3,815.13 TOTAL estimated annual electrical cost

CRAIG-BOTETOURT ELECTRIC COOPERATIVE

COMMERCIAL AND SMALL POWER SERVICE SCHEDULE "CS-11-U"

AVAILABILITY

Available to single-phase and poly-phase commercial consumers with demand of 15kW or less. Service hereunder is subject to the Cooperative's established Terms and Conditions for Electric Service.

CHARACTER OF SERVICE

Single-phase, 60 cycles, at available secondary voltages.

MONTHLY RATE

I. Distribution Delivery Service:

Consumer Delivery Charge:

Single-Phase Service	@	\$29.80	per month
Multi-Phase Service	@	\$34.00	per month

II. Energy Charges:

Purchase Power Demand	@	\$.02268	per kWh
Purchase Power Energy	@	\$.03658	per kWh
Distribution Demand	@	\$.04809	per kWh

MINIMUM MONTHLY CHARGE

The minimum monthly charge for service under the above rate shall be \$29.80 for single-phase service and \$34.00 for multi-phase service.

WHOLESALE POWER COST ADJUSTMENT CLAUSE

The amount of charges calculated at the above rate is subject to increase or decrease under provisions of the Cooperative's Wholesale Power Cost Adjustment Clause, Schedule "PAC".

Effective: July 1, 2016