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## DRAFT-DGA Sanfo Group-DRAFT 101 Gull Ave South San Francisco

**Task:** Design a waste and recycling system for this nine-story, ~280,000 SF life science office & lab building with a possible cafeteria that minimizes costs, staffing requirements and environmental impacts, while providing convenient trash disposal for the building's tenants.

Please note the word "trash" when used in this plan covers waste (materials to be landfilled), compost (food waste), paper recycling (paper products), container recycling (plastics, metal and glass), and cardboard (OCC). It does not include any chemical, biological, or other hazardous waste generated at the location. Handling and disposal of these wastes is outside of the scope of this plan. Trash volumes are measured in cubic yards (CY).

**Waste and Recycling Removal:** The City of South San Francisco has granted South San Francisco Scavenger Company, Inc. (SSF Scavenger Co.) an exclusive franchise to provide residential and commercial waste and recycling services to the citizens and businesses located within the city. SSF Scavenger Co. provides four types of service: waste, paper recycling, container recycling (paper, cardboard, and containers must be in separate containers) and organics (compost-food & green waste) collection. Recycling is subsidized if the paper, cardboard, and container materials are separated at the collection point otherwise recycling pickup is charged at the waste rates. Compost(Organics) is charged at the waste rates. If any of the recycling containers are contaminated they will be emptied and charged as waste.

Waste rates for residences and businesses are set by the City. The city approved a rate increase effective July 1, 2019.

**State and Local Recycling Mandates:** State of California AB341 and AB1826 requires businesses that generate four cubic yards or more of waste per week to separate recyclable and compostable materials (food waste excluded) from the waste stream. This law directs local jurisdictions to implement recycling and composting regulations and programs. Also, per SB 1383, organic materials (compostable) must be segregated from the waste and collected in a separate container after January 1, 2022.

**South San Francisco Municipal Code - 20.300.014 Trash and Refuse Collection Areas:** All trash and refuse collection enclosures shall comply with the California Fire Code, California Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, the City of South San Francisco Source Control Measures, and the City of South San Francisco Site Design Standards Checklist and shall meet the following requirements unless it is demonstrated that they are infeasible as determined by the Chief Planner.

A. **Applicability.** The standards of this section apply to all new development and additions that expand existing floor area by 10 percent or more.

B. **General Requirements and Alternatives.**

1. **General Requirements.** Solid waste and recycling-container enclosures are required for all new development.

2. **Alternatives.** Projects with ten or fewer residential units may have individual trash and recycling containers for each unit, provided that there is a designated screened location for



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each individual trash container adjacent to the dwelling unit and provided that each unit brings solid waste and recycling containers curbside for regular weekly or bi-weekly collection.

**C. Location.**

1. The solid waste and recycling storage area shall not be visible from a public right-of-way and shall not be located within any required front yard, street side yard, any required parking and landscaped areas, or any other area required by this ordinance to be constructed or maintained unencumbered according to fire and other applicable building and public safety codes.

2. Solid waste and recycling areas shall be consolidated to minimize the number of collection sites and located so as to reasonably equalize the distance from the building spaces they serve. There should be a minimum of one solid waste and recycling enclosure per 50 units.

3. Solid waste and recycling storage areas shall be accessible to haulers. Storage areas shall be located so that the trucks and equipment used by the City of South San Francisco or its contracted solid waste and recycling collector(s) have sufficient maneuvering areas and, if feasible, so that the collection equipment can avoid backing. Project applicants are responsible for procuring current equipment size and turning radius from the City of South San Francisco or its contracted solid waste and recycling collector(s).

**D. Materials, Construction, and Design.**

1. **Minimum Height of Screening.** Solid waste and recycling storage areas located outside or on the exterior of any building shall be screened with at least a six foot high solid enclosure.

2. **Enclosure Material.** Enclosure material shall be solid masonry or concrete tilt-up with decorated exterior-surface finish compatible to the main structure(s).

3. **Gate Material.** Gate material shall be decorative, solid, heavy-gauge metal or a heavy-gauge metal frame with a covering of a view-obscuring material.

4. **Access to Enclosure from Residential Projects.** Each solid waste and recycling enclosure serving a residential project shall be designed to allow walk-in access without having to open the main enclosure gate.

5. **Enclosure Pad.** Pads shall be a minimum of four-inch-thick concrete.

6. **Bumpers.** Bumpers shall be two inches by six inches thick and made of concrete, steel, or other suitable material and shall be anchored to the concrete pad.

7. **Protection for Enclosures.** Concrete curbs or equivalent shall protect enclosures from adjacent vehicle parking and travel ways.

8. **Landscaping.** The perimeter of the recycling and trash enclosure shall be planted, if feasible, with drought resistant landscaping, including a combination of shrubs and/or climbing evergreen vines.

9. **Clear Zone.** The area in front of and surrounding all enclosure types shall be kept clear of obstructions, and shall be painted, striped, and marked "No Parking."

10. **Drainage.** The floor of the enclosure shall have a drain that connects to the sanitary sewer system.

11. **Travel ways and Area in Front of Enclosure.** An adequate base to support a truck weight of 62,000 pounds. (Ord. 1432 § 2, 2010)



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**Logistic Requirements:** The City of South San Francisco loading requirements are established in Chapter 20.330.009 On Site Loading. Below are the pertinent portions of these regulations:

A. **Loading Spaces Required.** Every new building, and every building enlarged by more than 5,000 square feet that is to be occupied by a manufacturing establishment, storage facility, warehouse facility, retail store, eating and drinking, wholesale store, market, hotel, hospital, mortuary, laundry, dry-cleaning establishment, or other use similarly requiring the receipt or distribution by vehicles or trucks of material or merchandise shall provide off-street loading and unloading areas as follows. Such on-site loading space shall be maintained during the existence of the building or use that it is required to serve.

| Square Footage  | Required Loading Spaces                                 |
|---|---|
| 150,001 - 230,000                                       | 4   |
| 230,001   | 1 per additional 100,000 square feet of portion thereof |
| <b>Total required for this development (280,000 SF)</b> | <b>5</b>  |

B. **Reduction in Number of Loading Spaces Required.** The loading space requirement may be waived upon a finding by the Chief Planner and City Engineer that the applicant has satisfactorily demonstrated that due to the nature of the proposed use, such loading space will not be needed.

C. **Minimum Size.** Each on-site loading space required by this chapter shall not be less than 12 feet wide, 50 feet long, and 14 feet high, exclusive of driveways for ingress and egress, maneuvering areas and setbacks. The minimum size requirement may be modified upon a finding by the Chief Planner and City Engineer that the applicant has satisfactorily demonstrated that due to the nature of the proposed use, such size will not be needed.



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**Support for Adjusting the Number of Truck Loading Spaces**

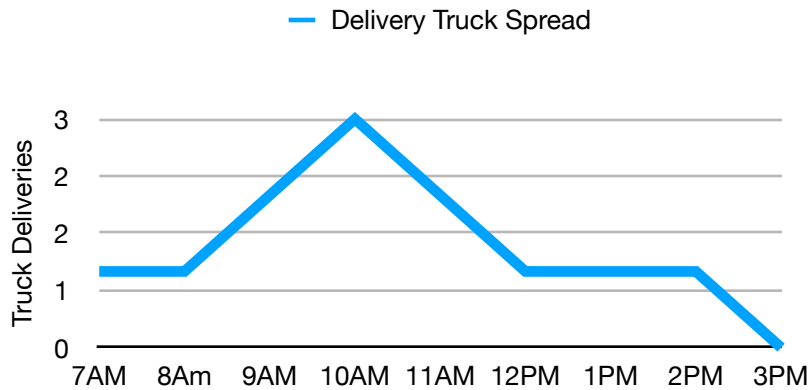
American Trash Management, Inc., (ATM) has determined loading space requirements for similar office projects. To make this determination, ATM uses the following truck delivery model, which assumes significant food-related operations from the potential food service plus the standard steady-stream of daily truck deliveries from Amazon, UPS, FedEx, etc. The model is below:

| Delivery Entity                | Truck Size      | Estimated Time to Offload (minutes) | Frequency of Deliveries PER WEEK | Projected minutes PER DAY |
|--------------------------------|-----------------|-------------------------------------|----------------------------------|---------------------------|
| Sysco                          | Tractor Trailer | 45                                  | 2                                | 18                        |
| Grocery                        | Tractor Trailer | 45                                  | 2                                | 18                        |
| Baked Goods                    | Box Truck       | 15                                  | 2                                | 6                         |
| Specialty Produce              | Truck           | 30                                  | 4                                | 24                        |
| Meat Products                  | Truck           | 30                                  | 2                                | 12                        |
| Food Cooperative               | Truck           | 20                                  | 2                                | 8                         |
| UNFI                           | Truck           | 15                                  | 2                                | 12.5                      |
| Specialty Food                 | Truck           | 15                                  | 4                                | 10                        |
| Baked Goods                    | Van             | 10                                  | 4                                | 8                         |
| Family Farm                    | Truck           | 10                                  | 2                                | 4                         |
| Family Farm                    | Truck           | 15                                  | 2                                | 6                         |
| Knife Shapening                | Van             | 15                                  | 1                                | 3                         |
| Total Minutes Per Day          |                 |                                     |                                  | 129.5                     |
| Delivery Entity                | Truck Size      | Estimated Time to Offload (minutes) | Frequency of Deliveries PER DAY  | Projected minutes PER DAY |
| Package Delivery               | Truck or Van    | 20                                  | 7                                | 140                       |
| Total Delivery MINUTES Per Day |                 |                                     |                                  | 269.5                     |
| Total Delivery HOURS Per Day   |                 |                                     |                                  | 4                         |
| PROJECTED DELIVERIES PER DAY   |                 |                                     |                                  | 12.8                      |
| PROJECTED DELIVERIES PER HOUR: |                 |                                     |                                  | 1.6                       |



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The model projects between 12 - 13 commercial truck deliveries per day, which will be spread out from 7AM to 3PM. Given the number of deliveries and the wide variation in arrival times, on almost all occasions not more than two or three delivery vehicles will be on site at any one time per loading bay.



A building of this size and complexity will require that the building management include a “Loading Dock Manager”. This person will be responsible for the management of the building's loading dock and will inform tenants of the limitations and conditions on the use of the loading docks. They will schedule, assign loading location and limit truck size.

| Use    | Gross SF | Number of Bays | Vehicle Size   | Recommendations   |
|--------|----------|----------------|----------------|---|
| Office | 280,000  | 2              | SU-30<br>WB-40 | If a full-service cafeteria is anticipated, it is recommended that the site accommodates at minimum one larger style vehicle (WB-40). |

Given the anticipated operation requirements of these loading areas we are requesting a variance from Chief Planner and City Engineer to adjust the required spaces to two if the design can be accommodated.

Along with making this adjustment, we also recommend that two loading spaces be approved to accommodate one 30’ long box trucks (SU-30s) and one 40’ long tractor-trailer (WB-40).



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**Comparable Life Science Projects:** The seven projects below are the most recent compatible office buildings with life-science uses that ATM has designed and reviewed. For comparison purposes we are using the gross square footage.

**\*Note: ATM projects 1 loading bay approximately per every 140,000 square feet of gross office space for 101 Gull Avenue.**

| Project Name  | Location                | Developer               | Project Areas  | Number of Bays   | Dock Design                                 |
|---|-------------------------|-------------------------|--|--|---|
| Alexandria Center for Life Science (ACLS)               | San Carlos, CA          | Alexandria Real Estate  | 6 life science office buildings designed with a combined total of 1,525,016 GSF of space (avg of 229,545 SF per building). | <b>2 loading bays per building</b><br>~114,000 SF/bay    | <b>Level Loading Docks in all buildings</b> |
| Brookfield-King Street-Pier 70 Parcel A Life Science-SF | San Francisco, CA       | King Street Properties  | Life science office building w/ possible full service cafeteria designed with a total of 275,000 SF                        | <b>2 loading bays</b><br>~137,500 SF/bay                 | <b>Raised Loading Dock</b>                  |
| WRNS-Bayshore Life Science-Burlingame                   | Burlingame, CA          | BKF                     | 3 life science office buildings designed with a combined total of 1,460,000 GSF of space                                   | <b>3 loading bays per building</b><br>~162,000 SF/bay    | <b>Raised Loading Dock</b>                  |
| 100 E. Grand Avenue - South San Francisco               | South San Francisco, CA | Alexandria Real Estate  | 565,000 GSF of office space with a cafeteria   | <b>3 loading bays for entire site</b><br>~188,000 SF/bay | <b>Level Loading Dock</b>                   |
| Potrero Power Station Block 15                          | San Francisco, CA       | Associate Capital       | ~438,000 GSF of office(with food & beverage) 2 bays  | <b>2 loading bays per building</b><br>~219,000 SF/ bay   | <b>Level Loading Dock</b>                   |
| HDR-Emeryville Public Market BioScience-Emeryville      | Emeryville, CA          | Oxford Properties Group | 431,056 SF life science office project   | <b>2 loading bays per building</b><br>215,000 SF/bay     | <b>Level Loading Dock</b>                   |
| Potrero Power Station Block 11                          | San Francisco, CA       | Associate Capital       | 238,000 GSF of office(with food & beverage) - 1 bay  | <b>1 loading bays per building</b><br>~238,000 SF/ bay   | <b>Level Loading Dock</b>                   |





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**Specific Project Design Issues:** There are several critical trash system design issues:

First, **state law requires the collection of trash in three separate streams: waste, mixed recycling and compost to meet the requirements of AB341, AB1826 and SB1383. The City of South San Francisco requires further separation of mixed recycling into paper, containers and cardboard which is collected at no charge if separated.**

Second, due to the projected trash volumes, **we recommend a communal trash system for use by all areas of the building. Projections for a full-service employee cafeteria are included in this analysis.** In a project of this size ATM would typically collect waste and paper recycling materials in a 10CY to 20CY roll off compactors, however, as designed, the current trash room and limited service area cannot house this equipment. **ATM recommends utilizing an A1000 compactor with 4CY bins to collect waste and A500 compactor with 3CY bins to collect paper recycling and container recycling. A vertical compactor with 2CY receiver container is recommended for collecting compost. Compactors have a 16-month payback period.**

Third, **due to the square footage and anticipated use of the buildings we recommend considering a cardboard baler in the trash area to meet the city's requirement for subsidized recycling. We also recommend a forklift for moving and stacking bales. This forklift can also be used for unloading delivery trucks.**

Fourth, a truck-accessible and properly sized trash collection area must be designed for the development. **It is recommended that on trash days bins be staged just outside of the trash room. Front load service requires 25' height clearance.**

Fifth, **compacting all waste streams will minimize truck trips to the project while reducing the space requirements to store the project's trash.** If the buildings ultimately does not include a cafeteria, the smaller amount of trash projected may indicate different trash handling equipment.

Sixth, **a clear and logical path of travel from the office service elevators to the trash collection area must be determined for trash service and deliveries.** At present, the best path available (through the loading dock) may prove to be very labor and time intensive if deliveries are taking place at the same time that trash bins are being moved. **In addition the loading area would require a lift or ramp to bring carts down from dock height to be transported out of the building.**

Seventh, **to facilitate moving materials from the various trash generating areas, we recommend that staff use material handling or toter style carts.**

Eighth, add 1 CFM/SF mechanical ventilation per CBC, floor drain, hose bib and odor control to the trash collection room.

**Specific Project Design Issues for a Life Sciences Building:**

First, portions of the office building will house wet bench laboratory operations. **The characteristics and volume of trash from this type of operation are similar to that of office/technical/research operations and therefore will not materially alter the overall projections or recommended services in this Trash Management Plan. There will be hazardous materials generated by laboratory work, but these are completely outside municipal solid**





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**waste and must be isolated and disposed of separately utilizing an authorized Haz-Mat disposal service.**

Second, we recommend allocating spaces within the trash or loading areas to accommodate chemical, biological, and other hazardous waste. **Similar offices provide pre-fabricated units for hazardous waste. If a similar approach is followed, one 8 x 8' unit will be required for every 50,000 SF of lab space.**

Third, **given the complicated nature of science buildings and the special and bulky equipment they require we recommend a service elevator within each building with easy access to the loading areas. Elevator Consultant to confirm.**

**Logistic Specific Project Design Issues:** There are several critical loading design issues:

First, **the City of South San Francisco requires five loading bays for a project of this size but ATM estimates with a dock manager to schedule deliveries the project can function with two loading bays. A variance may be requested from the city to reduce the number of loading bays to a number required for standard operations.**

Second, **raised docks are typically not recommended due to the larger loading area required and additional accommodation for smaller trucks (such as USPS and Fedex) too low to use raised docks as well as the transportation of trash from the office to the trash room. One 6' x 10' scissor lift per building is recommended for truck unloading for the trucks that do not have a drop tailgate or raised docks.**

Third, **If a raised dock is ultimately designed, it must be 48" high which is the standard dock height, 60" as currently shown within the plan is far too tall for most trucks.** If slope of the loading area is designed to accommodate the 12" difference, the slope should not exceed 3%.

Fourth, **the City of South San Francisco requires a minimum 12'x 50'x 14' loading bays. This size loading bay will allow a WD-40 tractor trailer to make deliveries.** This is adequate for a project of this type though some Life Science buildings have loading areas designed to accommodate the 65' California maximum legal tractor trailer truck or longer STAA tractor and 53' long trailers if the facilities is within one mile of an interstate highway. Note that these are rare deliveries such as cooling tower water treatment salts.

Fifth, **we recommend a 15' deep loading area behind each truck for efficient loading and unloading.** Please note the minimum loading area is 10' but this is inefficient and potentially unsafe.



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**PROJECTED TRASH LEVELS:** Trash volumes are projected based on the size and nature of the project.

Weekly LOOSE Trash Projections. See detailed analysis on pages 30-32

|                 | SF             | Projected Loose Waste Volume CY | Projected Loose Paper Recycling Volume CY | Projected Loose Container Recycling Volume CY | Projected Loose Cardboard Volume CY | Projected Loose Organics Volume CY |
|-----------------|----------------|---------------------------------|---|---|-------------------------------------|------------------------------------|
| Office Building | 280,000        | 28.6                            | 21.8                                      | 8.9   | 32.7                                | 7.6                                |
| Cafeteria       |                | 49.2                            | 6.6                                       | 17.5  | 19.7                                | 19.7                               |
| <b>Total</b>    | <b>280,000</b> | <b>77.8</b>                     | <b>28.4</b>                               | <b>26.4</b>                                   | <b>52.4</b>                         | <b>27.3</b>                        |

|                 | SF             | Projected Loose 4CY Waste Bins/WK | Projected Loose 4CY Paper Recycling Bins/WK | Projected Loose 4CY Container Recycling Bins/WK | Projected Loose 4CY Cardboard Bins/WK | Projected Loose 2CY Organics Bins/WK |
|-----------------|----------------|-----------------------------------|---|---|---------------------------------------|--------------------------------------|
| Office Building | 280,000        | 8                                 | 6   | 3   | 9                                     | 4                                    |
| Cafeteria       |                | 13                                | 2   | 5   | 5                                     | 10                                   |
| <b>Total</b>    | <b>280,000</b> | <b>20</b>                         | <b>8</b>                                    | <b>7</b>  | <b>14</b>                             | <b>14</b>                            |

Weekly COMPACTED Trash Projections. See detailed analysis on pages 30-32

|                 | SF             | Projected Compacted Waste Volume CY | Projected Compacted Paper Recycling Volume CY | Projected Compacted Container Recycling Volume CY | Projected Compacted Cardboard Volume CY <sub>1</sub> | Projected Compacted Organics Volume CY |
|-----------------|----------------|-------------------------------------|---|---|--|--|
| Office Building | 280,000        | 7.1                                 | 5.5   | 2.2   | 8.2  | 1.9                                    |
| Cafeteria       |                | 12.3                                | 1.6   | 4.4   | 4.9  | 4.9                                    |
| <b>Total</b>    | <b>280,000</b> | <b>19.4</b>                         | <b>7.1</b>                                    | <b>6.6</b>  | <b>13.1</b>  | <b>6.8</b>                             |

<sub>1</sub> Equivalent to 5 bales.

|                 | SF             | Projected Compact 4CY Waste Bins/WK | Projected Compact 3CY Paper Recycling Bins/WK | Projected Compact 3CY Container Recycling Bins/WK | Projected Compact 4CY Cardboard Bins/WK | Projected Compact 2CY Organics Bins/WK |
|-----------------|----------------|-------------------------------------|---|---|---|--|
| Office Building | 280,000        | 2                                   | 2   | 1   | 3                                       | 1                                      |
| Cafeteria       |                | 4                                   | 1   | 2   | 2                                       | 3                                      |
| <b>Total</b>    | <b>280,000</b> | <b>5</b>                            | <b>3</b>                                      | <b>2</b>  | <b>4</b>                                | <b>4</b>                               |



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**Projected Trash Levels by use are discussed below:**

**Projecting Trash Levels -- Office Buildings.** Studies cited by CalRecycle estimate office building trash generation at 5.44 lb. of trash per 1000 SF, nearly 70% of which can be diverted. Although past studies had low diversion rates for office buildings, more recent evidence points to large increases in diversion, as firms and their employees become more active recyclers. (This is supported both by outside studies and ATM's data.) It is assumed, therefore, comparable diversion rates for this office space will hold.

Using these metrics, the following levels of waste, recyclables and compost are projected for the office space in this project.

| PROJECTION METRICS      |                           |  |                                |                             |
|-------------------------|---------------------------|--|--------------------------------|-----------------------------|
| lb. per day per 1000 SF | lb/day waste (30%)        | lb/day dry recyclables Paper and Container (30%) | lb/day cardboard (20%)         | lb/day compost (20%)        |
| 5.44                    | 1.63                      | 1.63   | 1.09                           | 1.09                        |
| OFFICE SPACE TRASH      |                           |  |                                |                             |
| Office Square Footage*  | PROJ lb of waste per week | PROJ lb. of dry recyclables per week             | PROJ lb. of cardboard per week | PROJ lb of compost per week |
| 280,000                 | 2,285                     | 2,285  | 1,523                          | 1,523                       |
| Loose Cubic Yards       | 28.6                      | 38.1   | 25.4                           | 7.6                         |

**Assumptions**

- 1 Waste Disposal and Diversion Findings, California Integrated Waste Management Board, 2006.
2. Densities: 80 lb./loose CY of Waste; 60 lb./loose CY of recyclables; 200 lb. per CY of compost.



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**Cafeteria ONLY Projected Trash Levels:** The projected number of meals is based on a full-service, high quality Silicon Valley cafeterias found at Facebook, Apple or Google. The trash levels for the cafeterias are assumed to be similar to other Silicon Valley cafeterias. It should be noted that corporate cafeterias have pioneered aggressive diversion programs, especially with food wastes. It is further assumed this cafeteria will be the same.

| <b>Cafeteria Trash</b>                      |               |  |
|---|---------------|--|
| Total Office Size (less 22500 SF cafeteria) | 280,000       | Square Feet                            |
| SF/Employee                                 | 200           | Square Feet                            |
| Meals/Employee/Day <sup>5</sup>             | 1.5           | Meals                                  |
| Trash/Meal/Day <sup>4</sup>                 | 1             | Pounds                                 |
| Recycling Weight/Cubic Yard                 | 60            | Pounds                                 |
| Recycling Diversion Rate(OCC) <sup>6</sup>  | 25%           |  |
| Compost Diversion Rate                      | 37.5%         | of remainder after recycling diversion |
| Compost Weight/Cubic Yard                   | 200           | Pounds                                 |
| Waste Weight/Cubic Yard                     | 80            | Pounds                                 |
| <b>Total Employees</b>                      | <b>1,400</b>  |  |
| <b>Trash/week</b>                           | <b>10,500</b> | <b>Pounds</b>                          |
| <b>Recycling/week</b>                       | <b>2,625</b>  | <b>Pounds</b>                          |
| <b>Recycling/week-Loose</b>                 | <b>44</b>     | <b>Cubic Yards</b>                     |
| <b>Recycling/week-Compacted<sup>7</sup></b> | <b>11</b>     | <b>Cubic Yards</b>                     |
| <b>Compost/week</b>                         | <b>3,938</b>  | <b>Pounds</b>                          |
| <b>Compost/week-Loose</b>                   | <b>20</b>     | <b>Cubic Yards</b>                     |
| <b>Waste/week</b>                           | <b>3,938</b>  | <b>Pounds</b>                          |
| <b>Waste/week-Loose</b>                     | <b>49</b>     | <b>Cubic Yards</b>                     |
| <b>Waste/week-Compacted<sup>7</sup></b>     | <b>12</b>     | <b>Cubic Yards</b>                     |

1. Industry-standard cafeteria metric.

2. Google in Mountain View, CA 1.5 meals/day/employee. 18000 meals per day for 12000 employees. We used 1 meal per day in this analysis.

3. *Waste Disposal and Diversion Findings*, California Integrated Waste Management Board, 200.

4. Density: 80 lb. per cubic yard for loose trash, 320 lb. per compacted cubic yard for office waste and dry recycling and 500 lb. per compacted yard for food waste.Design 1 Roll-off Compactor on Ground Level



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### **Recommended Trash Handling System**

Class A Office buildings trash streams are mostly dry materials, over half of which is easily recyclable (54%) or potentially recyclable (14%). Recyclable materials are mostly cardboard, white ledger, other paper products and beverage containers. We expect the recycling waste to be 50% of the total trash stream.

To comply with City ordinances the building's trash will be collected in five different streams within waste, recyclables, and compost. Recycling will be further sorted into paper, containers, and cardboard/OCC. We recommend a communal trash system for use by all buildings.

Waste. We recommend that waste and paper recycling be compacted. The projected waste levels are high enough to justify roll-off compactors however do to the limited access within the service/loading area, a single A1000 compactor with 4CY receiver container is proposed for this site. This will allow for streamlining of waste handling operations and reduce the number of trash truck trips to the property.

Paper and Container Recycle. We recommend that paper and container recycling be disposed of in a small stationary compactor equipped with a tipper and a 3CY front load bin.

Compost. We recommend collecting compost in a vertical compactor equipped with a tipper and a 2CY bin. Because of the relatively high volume of food waste in the cafeteria, it is recommended that sufficient toter or material handling carts be placed there on an ongoing basis to be used by cooking staff during prep time to collect compostable materials. These carts should then be transported directly to the loading dock area for emptying into the compost compactor.

Cardboard. This building is projected to generate a large amount of cardboard waste. We recommend diverting cardboard for recycling disposal savings. Under this scheme, cardboard will be deposited into the baler. If a baler is installed we recommend purchasing a forklift for stacking bales.

Compactor Operation. Compactors and baler should only to be operated by trained persons over the age of 18.

Office Trash. The janitorial staff for the office component of the project will be responsible for moving the office trash to the trash compactors for disposal. We recommend toter carts for this purpose. The office janitorial staff will likely be accessing the communal trash compactors in the late evening on weeknights. The path of travel should not be through the office lobbies.

Cafeteria Trash. Cafeteria trash will need to be moved to the communal trash handling room by staff. Cafeteria staff will be accessing the communal trash compactors throughout the day on weekdays.

Compostable Materials in the Cafeteria. Because of the relatively high volume of food waste in the cafeteria, it is required that sufficient toter or material handling carts be placed there on an ongoing basis to be used by cooking staff during prep time to collect compostable materials. These carts should then be transported directly to the loading dock area for emptying into the compost compactor.



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**Noise Levels**

| Location                                | Decibel Levels |
|---|----------------|
| Banging on Bins when Emptying           | 100            |
| Behind Garbage Truck (while compacting) | 89             |

**Odor Control.** To mitigate malodors in the trash room(s), a three-pronged approach is recommended including cleaning, proper ventilation, and installing a deodorizer system.

1. **Mechanical Exhaust of Trash Collection Room.** The mechanical ventilation required rate is CFM/SF, however, ATM recommends increasing this rate as needed, especially in areas with warmer climate. Exhaust should vent through the roof. ATM does not recommend a chilled/refrigerated trash room. A cooled space will only delay decomposition, and will have minimal impacts on odorous trash.

2. **Cleaning the Trash Room.** Trash rooms should be swept clean of debris on a weekly basis. Trash room wash-downs should be scheduled quarterly. These should include cleaning any trash equipment such as compactors, as well as floors and the walls. If possible, bins or compactor receiver containers should be cleaned at the same time, assuming the containers are empty. (Bins should be cleaned by onsite staff. If hauler-provided dumpsters become especially dirty, they should be replaced by the hauler.)

3. **Odor Control Systems.** Odor control systems can be helpful in controlling odors, but most have limited effectiveness or create other problems. Popular low-cost systems that spray a masking agent into the air, only serve to hide odors in the trash room and not eliminate them. Ozone generators are more effective, but the odor-destroying product they create — ozone — can have deleterious effect on human health and can also destroy compactor hoses and seals. One odor control system that avoids these problems is the Piiian Mini Vaporizer. It creates a very fine 50-micron mist that bonds with — and ultimately destroys — odor causing molecules. And unlike ozone, the entirely natural blend of plant extracts, essential oils and emulsifiers which is safe and does not damage equipment.

**SAMPLE COMMERCIAL TENANT TRASH RULES**

Due to the nature of shared trash spaces we recommend implementing the following rules:

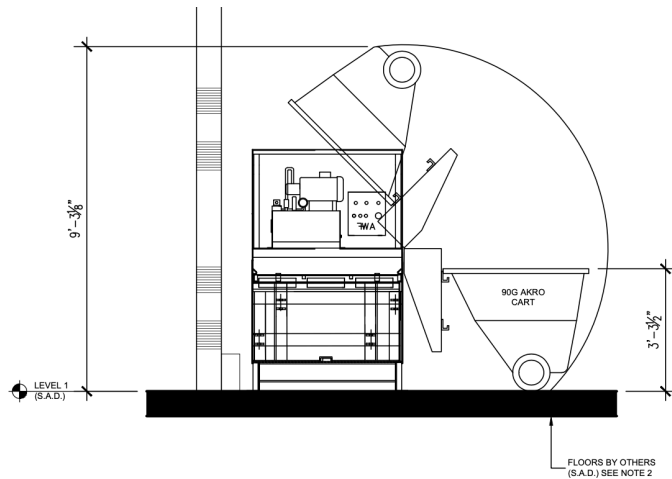
1. **Moving Trash:** Require commercial tenants who have any wet trash to move all solid waste and recycling with wheeled carts. These carts can have plastic liners which will make it easy for tenants to put their waste and recycling into the communal trash bins. No items can be moved in bags only if there is wet items in the bag. This is to avoid leaks. Virtually all tenants fall into this category.
2. **Cleanup:** Tenants will be responsible for keeping these carts clean and common areas clean. They cannot clean the carts in the common areas. Any sewer blockage will be the responsibility of the tenant. All spills if they do happen must be immediately cleaned up or the property management will fine the tenant and arrange for the clean up at the tenants expense. No vent hood filters or floor mats can be cleaned on site.
3. **Cooking Oil & Fat Disposal:** Tenant producing used cooking oil must store, arrange and pay for a service who will collect this used oil. No oil can be moved in open containers on the property. All spills must be immediately cleaned up or the property management will fine the tenant and arrange for the clean up at the tenants expense. Used cooking oil must be removed frequently as dictated by management (used cooking oil stinks).





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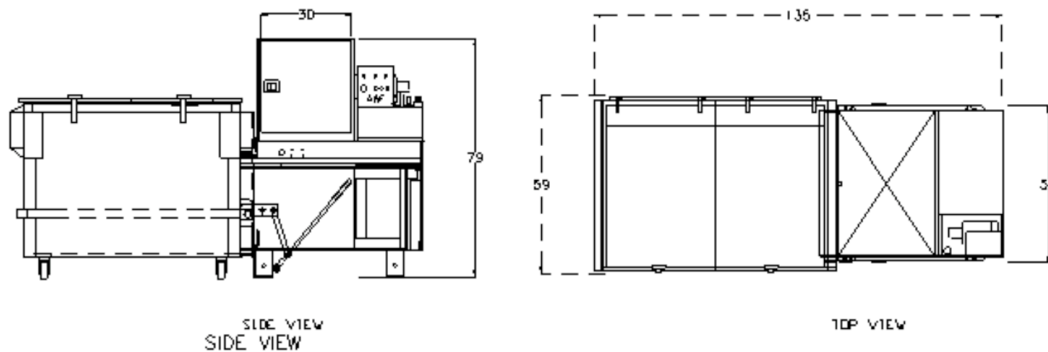
**Clear Height Dimensions for Compactors and Material Handling Carts**



**SECTION C-C**

**Stationary Compactor (for waste)**

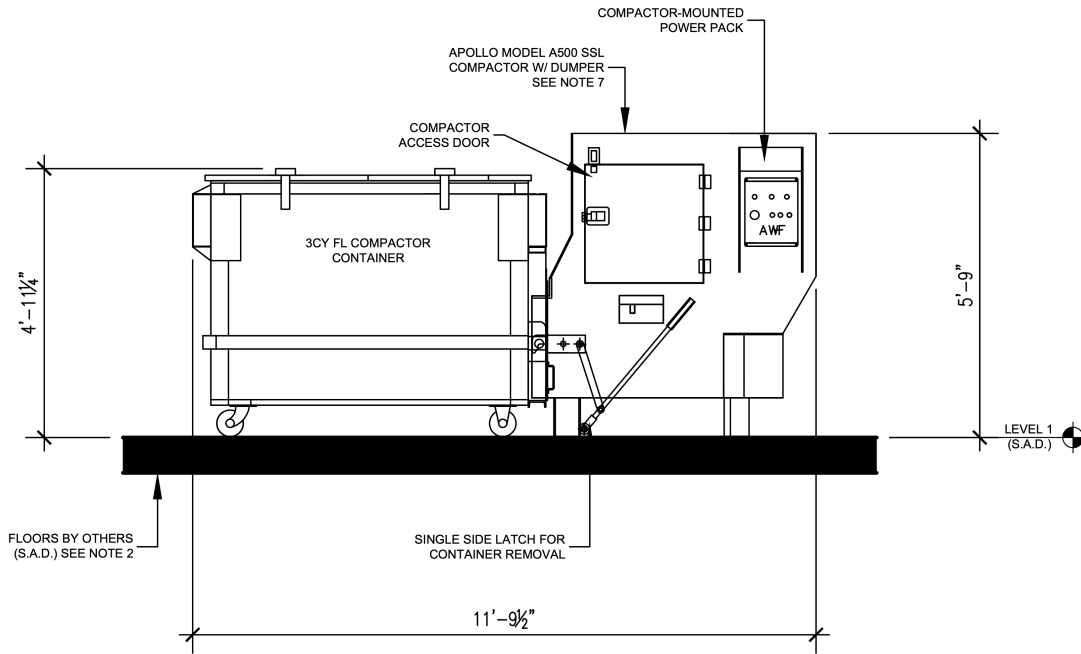
APOLLO A1000  
 STATIONARY COMPACTOR



TYPICAL LAYOUT W/ 4CY CONTAINER - END ENTRY



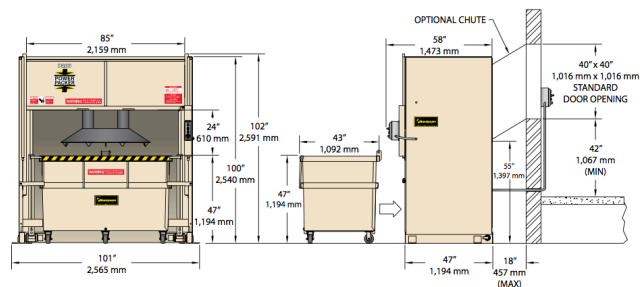
## Stationary Compactor (for container and paper recycling)



### SECTION A-A

## Vertical Compactor (for compost)

### P200 Power Packer





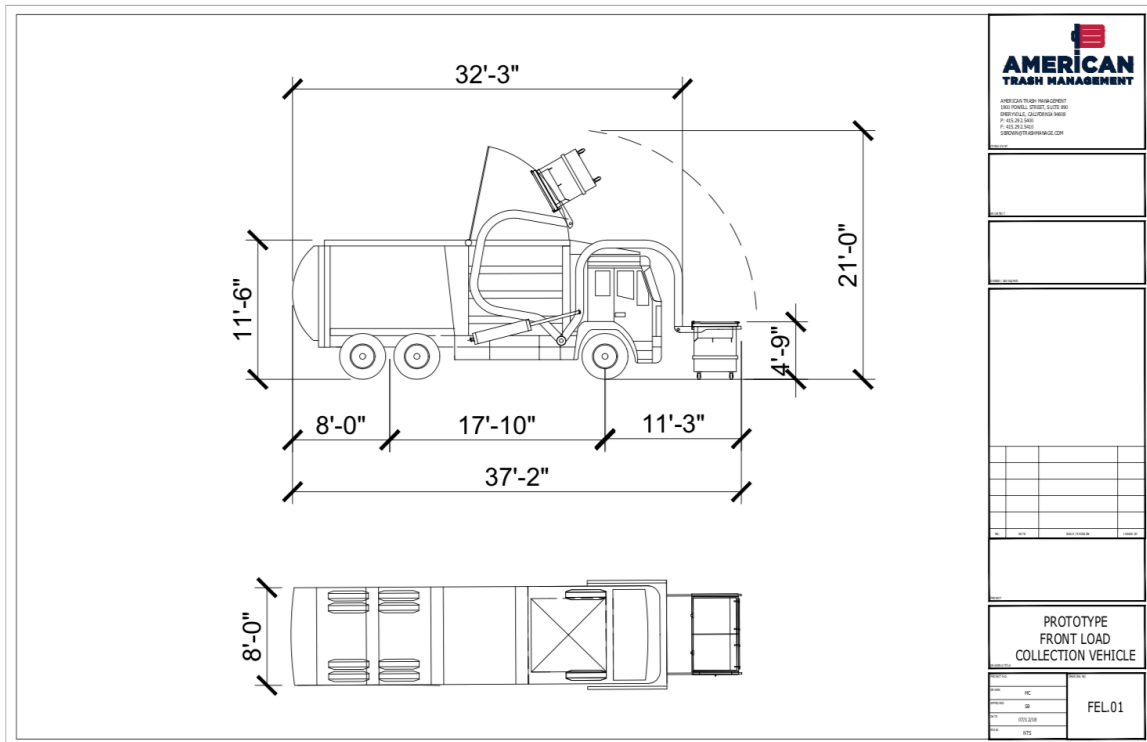
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### Front-Load Trash Staging

We recommend designating a staging area in front of the loading areas. Bins will need to be staged by building staff on service days and returned to the compactors promptly after servicing. Front Load service requires 25 feet vertical clearance height.

### Front Load Trash Truck Noise Levels

| Location                                | Decibel Levels |
|---|----------------|
| Banging on Bins when Emptying           | 100            |
| Behind Garbage Truck (while compacting) | 89             |





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60" Downstroke Baler (for cardboard)

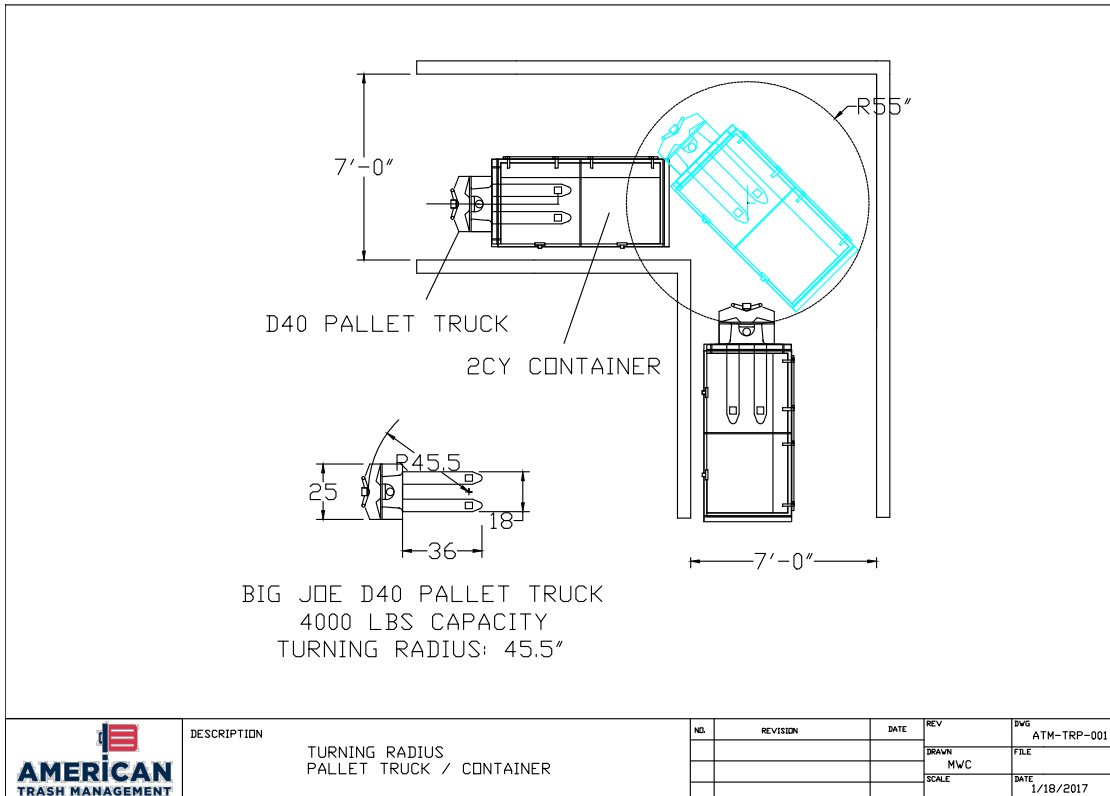




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## Compactor Bin Moving Turning Radius





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## Material Handling Carts

### Akro-Tilt Trucks

*Easy-to-use tip trucks for waste handling systems*

- Heavy-duty trucks built with fully welded, reinforced tubular frames
- Works with automatic dumpers and standard forklift models



MADE IN THE USA



UP TO 2000 LBS.



COLOR  
 Gray/Gray



| Akro-Tilt Trucks |                              |                      | Dimensions (In.) |    |    | Accessories   |                   | Wheels         |             | Capacity |          |         |             |
|------------------|------------------------------|----------------------|------------------|----|----|---------------|-------------------|----------------|-------------|----------|----------|---------|-------------|
| Model No.        | Model No. with Fork Channels | Description          | W                | D  | H  | Lid Model No. | Towbar Model No.† | Wheel Diameter | Wheel Type* | Gallons  | Cu. Yds. | Cu. Ft. | Load Rating |
| 77405GRAY        | 77405FGRAY                   | Medium-Duty 100      | 27               | 54 | 36 | —             | 18048             | 12             | SP          | 100      | 1/2      | 13.5    | 600 lbs.    |
| 77410GRAY        | 77410FGRAY                   | Medium-Duty 200      | 33               | 66 | 42 | 77002         | 18048             | 12             | SP          | 200      | 1        | 27      | 600 lbs.    |
| 77505GRAY        | 77505FGRAY                   | Heavy-Duty 100       | 27               | 54 | 36 | —             | 18048             | 10             | MR          | 100      | 1/2      | 13.5    | 1000 lbs.   |
| 77510GRAY        | 77510FGRAY                   | Heavy-Duty 200       | 33               | 66 | 42 | 77002         | 18048             | 10             | MR          | 200      | 1        | 27      | 1000 lbs.   |
| 77610GRAY        | 77610FGRAY                   | Super-Heavy-Duty 200 | 33               | 66 | 42 | 77002         | 18048             | 12             | MR          | 200      | 1        | 27      | 2000 lbs.   |
| 77710GRAY        | 77710FGRAY                   | Heavy-Duty 300       | 39               | 85 | 51 | —             | 18049             | 12             | MR          | 300      | 1 1/2    | 40.5    | 2000 lbs.   |
| 77810GRAY        | 77810FGRAY                   | Heavy-Duty 400       | 48               | 85 | 51 | —             | 18050             | 12             | MR          | 400      | 2        | 54      | 2000 lbs.   |

\*SP – Semi-Pneumatic MR – Mold-On Rubber †Towbars can only be ordered with a unit; they are a welded frame component.



**Lid Model 77002**  
 A full-width, heavy-duty piano hinge in the middle of the lid allows it to flip open during use.



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*Wide mouth and low profile for easy loading*

- Transport waste, bulk materials or work-in-process components
- Rugged, rotational-molded polyethylene construction



**NEW Heavy Wall Tub**  
 Heavy-duty, extra-thick tub walls for increased durability.



**COLORS**  
 Blue/Gray, Green/Gray, Gray/Gray  



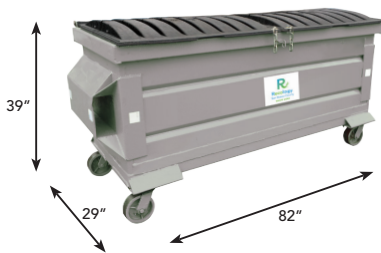
| Ako-Carts              |                    | Dimensions (in.)         |        |    | Wheels |              | Center         | Frame                     | Load Rating  |             |
|------------------------|--------------------|--------------------------|--------|----|--------|--------------|----------------|---------------------------|--|-------------|
| Model No. without Lid* | Model No. with Lid | Description              | W      | D  | H      | Wheel Size   | Wheel Type     | Center                    | Frame  | Load Rating |
| 76460                  | 76461              | Medium-Duty 60 Gal. Cap. | 30 1/2 | 48 | 33 1/2 | 12" x 2"     | Solid Rubber   | 3 x 1 1/4" Thermo-Plastic | 1" O.D. x 16 ga. galvanized w/ 5/8" solid axle       | 300 lbs.    |
| 76490                  | 76491              | Medium-Duty 90 Gal. Cap. | 30 1/2 | 47 | 39 1/2 | 12" x 2"     | Solid Rubber   | 3 x 1 1/4" Thermo-Plastic | 1" O.D. x 16 ga. galvanized w/ 5/8" solid axle       | 350 lbs.    |
| 76590                  | 76591              | Heavy-Duty 90 Gal. Cap.  | 30 1/2 | 47 | 39 1/2 | 10" x 2 1/4" | Semi-Pneumatic | 4 x 2 Mold-on Rubber      | 1.05" O.D. x 13 ga. powder-coated w/ 5/8" solid axle | 450 lbs.    |

Please specify colors when ordering. \*Carts without lids cannot have lids added after production. Single units are shipped completely assembled. When multiple units are ordered, lids are shipped separately and require assembly.

Bin Sizes. Note the hauler uses similar bin dimensions.

## Front Load Bins

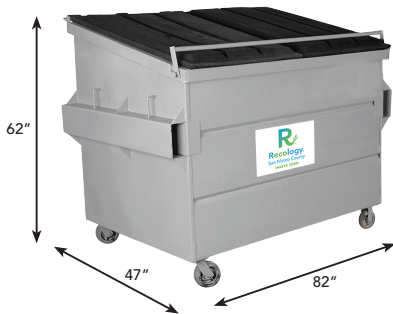
1-yard



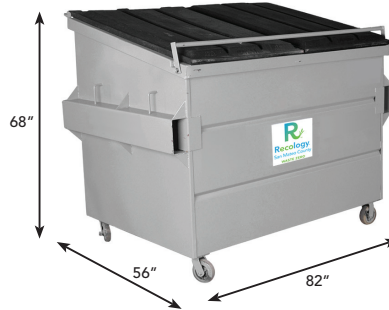
2-yard



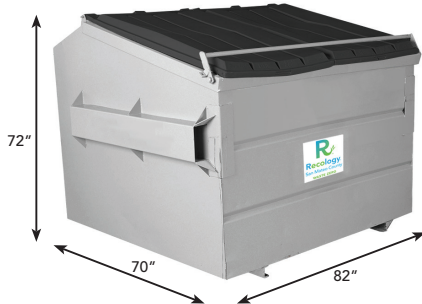
3-yard



4-yard



6-yard



8-yard



Dimensions may vary slightly. Measurements shown are exterior dimensions.  
 Not all bins are available with wheels.





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**Sample Pickup Schedules** (actual schedules to be determined by hauler, building management, and trash levels)

**Communal Trash System - Roll-off Compacted**

| Pickups                         | Monday   | Tuesday  | Wednesday | Thursday | Friday     | Saturday |
|---------------------------------|----------|----------|-----------|----------|------------|----------|
| Waste 20CY Compactor            |          |          |           |          | 1          |          |
| Paper Recycle 10CY Compactor    |          |          |           |          | 0.8        |          |
| Container Recycle 3CY Compacted | 1        |          |           |          | 1          |          |
| Compost Compacted 2CY           | 1        | 1        |           | 1        | 1          |          |
| <b>Total</b>                    | <b>2</b> | <b>1</b> | <b>0</b>  | <b>1</b> | <b>3.8</b> | <b>0</b> |
| <b>Bales</b>                    |          |          |           |          |            | <b>5</b> |

**Communal Trash System - Front Load Compacted (SHOWN IN PLANS)**

| Pickups                         | Monday   | Tuesday  | Wednesday | Thursday | Friday   | Saturday |
|---------------------------------|----------|----------|-----------|----------|----------|----------|
| Waste 4CY Compactor             | 1        | 1        | 1         | 1        | 1        |          |
| Paper Recycle 3CY Compactor     | 1        |          | 1         |          | 1        |          |
| Container Recycle 3CY Compacted | 1        |          |           |          | 1        |          |
| Compost Compacted 2CY           | 1        | 1        |           | 1        | 1        |          |
| <b>Total</b>                    | <b>4</b> | <b>2</b> | <b>2</b>  | <b>2</b> | <b>4</b> | <b>0</b> |
| <b>Bales</b>                    |          |          |           |          |          | <b>5</b> |





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**Trash System Equipment**

| Compactor Count | Bin Type                               | # of Bins  | Bin Size Cubic Yards   |
|-----------------|--|--|--|
| 4               | Front Load -<br>(W,PR,CR &<br>Compost) | 1 -Waste<br>1 -Paper Recycle<br>1 -Container Recycle<br>1 -Compost | 4CY for Waste<br>3CY for Paper Recycle<br>3CY for Container Recycle<br>2CY for Compost |

**Trash System Specifications (Documentation provided separately)**

- Section 11 82 26 - Vertical Trash Compactors (Harmony P200)
- Section 11 82 26 - Waste & Recycling Compactors
- Section 41 63 23 - Electric Pallet Jack
- Section 44 53 63 - Vertical Baler
- Section 44 51 29 - Material Handling Cart
- Section 44 31 00 - Odor Control



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**Waste, Recycling and Compost Analysis** (Rates reflect the rate increase effective July 1, 2022)

Below is a comparative analysis of the disposal and labor costs of handling waste and recycling in loose versus compacted bins. Please note that the projections below are estimates derived from actual audits of comparable office San Francisco Bay area. They are not guaranteed. They are to be used for planning purposes only and may be higher or lower than projected.

**TOTAL WASTE & RECYCLING ANALYSIS**

|              |                                     |         |                                   |
|--------------|-------------------------------------|---------|-----------------------------------|
| ASSUMPTIONS: | Square Feet                         | 280,000 |                                   |
|              | % office recycling = OCC            | 60%     |                                   |
|              | % cafeteria recycling = OCC         | 75%     |                                   |
|              | Compaction Ratio                    | 4       | to 1                              |
|              | Recycling Credit                    | 50%     | Reduction in Waste Disposal Costs |
|              | Compost Credit                      | 10%     | Reduction in Waste Disposal Costs |
|              | Compacted Waste Service             | 4       | cubic yard front load bins        |
|              | Compacted Recycling Service         | 3       | cubic yard front load bins        |
|              | Compacted Compost Service           | 2       | cubic yard front load bins        |
|              | Loose Waste Service                 | 4       | cubic yard front load bins        |
|              | Loose Recycling Service             | 4       | cubic yard front load bins        |
|              | Loose Compost Service               | 2       | cubic yard front load bins        |
|              | Compacted RO Waste Service          | 20      | cubic yard roll-off compactor     |
|              | Compacted RO PaperRecycling Service | 10      | cubic yard roll-off compactor     |

| <b>COST BENEFIT CALCULATIONS:</b>         | <b>OFFICE</b> | <b>TOTAL</b> | <b>TOTAL</b>     | <b>TOTAL</b>     | <b>TOTAL</b>        |
|---|---------------|--------------|------------------|------------------|---------------------|
| SERVICE-Waste                             | Loose         | Loose        | Compacted FL     | Compacted RO     | <b>Compacted RC</b> |
| SERVICE-Paper Recycling                   | Loose         | Loose        | Compacted FL     | Compacted RO     | <b>Compacted RC</b> |
| SERVICE-Container                         | Loose         | Loose        | Compacted FL*    | Compacted FL     | <b>Compacted FL</b> |
| SERVICE-Compost                           | Loose         | Loose        | Compacted FL     | Compacted FL     | <b>Compacted FL</b> |
| SERVICE-OCC                               | Loose         | Loose        | <b>OCC Baler</b> | <b>OCC Baler</b> | <b>OCC Baler</b>    |
| Loose Waste Volume - CY                   | 77.8          | 77.8         |                  |                  |                     |
| Compacted Waste Volume - CY               |               |              | 19.4             | 19.4             | 19.4                |
| Loose Paper Recycling Volume - CY         | 32.3          | 32.3         |                  |                  |                     |
| Compacted Paper Recycling Volume - CY     |               |              | 8.1              | 8.1              | 8.1                 |
| Loose Container Recycling Volume -        | 26.4          | 26.4         |                  |                  |                     |
| Compacted Container Recycling Volume - CY |               |              | 6.6              | 6.6              | 6.6                 |
| Loose Compost Volume - CY                 | 27.3          | 27.3         |                  |                  |                     |
| Loose OCC Volume CY                       | 48.5          | 48.5         | 48.5             | 48.5             |                     |
| Compacted Compost Volume - CY             |               |              | 6.8              | 6.8              | 6.8                 |
| Waste Bins/week                           |               | 20           | 5                | 1.0              | 1.0                 |
| Paper Recycle Bins/week                   |               | 9            | 3                | 0.8              | 0.8                 |
| Container Recycle Bins/week               |               | 7            | 2                | 2                | 2                   |
| Compost Bins/week                         |               | 14           | 4                | 4                | 4                   |
| Cardboard Containers/Week                 |               | 13           | 0                |                  |                     |
| Containers/week/trash room                |               | 63           | 14               | 8                | 8                   |
| Cardboard Bales/Week                      |               | 0            | 5                | 5                | 5                   |
| SYSTEM CAPITAL COST                       |               | \$0.00       | \$182,346.24     | \$245,320.08     | \$29,000.00         |
| WASTE COST/MONTH                          |               | \$14,495.40  | \$5,597.80       | \$8,157.28       |                     |
| RECYCLING COST/MONTH                      |               | \$0.00       | \$0.00           | \$0.00           |                     |
| COMPOST COST/MONTH                        |               | \$5,072.90   | \$2,239.12       | \$2,239.12       |                     |
| TRASH COST/MONTH                          |               | \$19,568.30  | \$7,836.92       | \$10,396.40      |                     |
| COMPACTION SAVINGS/MONTH                  |               | \$0.00       | \$11,731.38      | \$9,171.90       |                     |
| NET MONTHLY TRASH COSTS                   |               | \$19,568.30  | \$7,836.92       | \$10,396.40      |                     |
| PAYBACK-MONTHS**                          |               | n/a          | 16               | 26.7             |                     |

\*Compacted # of Container bins per week rounded down to due short overage



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**TOTAL BUILDING WASTE & RECYCLING ANALYSIS**

|              |                                |         |                               |
|--------------|--------------------------------|---------|-------------------------------|
| ASSUMPTIONS: | Square Feet                    | 280,000 |                               |
|              | % office recycling = OCC       | 40%     |                               |
|              | Compaction Ratio               | 4       | to 1                          |
|              | Compacted Waste Service        | 4       | cubic yard front load bins    |
|              | Compacted Recycling Service    | 4       | cubic yard front load bins    |
|              | Compacted Compost Service      | 2       | cubic yard front load bins    |
|              | Loose Waste Service            | 4       | cubic yard front load bins    |
|              | Loose Recycling Service        | 4       | cubic yard front load bins    |
|              | Loose Compost Service          | 2       | cubic yard front load bins    |
|              | Compacted RO Waste Service     | 22      | cubic yard roll-off compactor |
|              | Compacted RO Recycling Service | 22      | cubic yard roll-off compactor |
|              | Compacted RO Recycling Service | 20      | cubic yard roll-off compactor |

|   |        |       |              |
|---|--------|-------|--------------|
| <b>COST BENEFIT CALCULATIONS:</b>           | OFFICE | TOTAL | TOTAL        |
| SERVICE-Waste                               | Loose  | Loose | Compacted FL |
| SERVICE-Paper Recycling                     | Loose  | Loose | Compacted FL |
| SERVICE-Container                           | Loose  | Loose | Compacted FL |
| SERVICE-Compost                             | Loose  | Loose | Compacted FL |
| Loose Waste Volume - CY                     | 77.8   | 77.8  |              |
| Compacted Waste Volume - CY                 |        |       | 19.4         |
| Loose OCC & Paper Recycling Volur           | 80.8   | 80.8  |              |
| Compacted OCC & Paper Recycling Volume - CY |        |       | 20.2         |
| Loose Container Recycling Volume -          | 26.4   | 26.4  |              |
| Compacted Container Recycling Volume - CY   |        |       | 6.6          |
| Loose Compost Volume - CY                   | 27.3   | 27.3  |              |
| Compacted Compost Volume - CY               |        |       | 6.8          |

**OFFICE WASTE AND RECYCLING SYSTEM ANALYSIS**

|              |                               |         |      |
|--------------|-------------------------------|---------|------|
| ASSUMPTIONS: | Square Feet                   | 280,000 |      |
|              | Lbs/day per 1000 SF           | 5.44    |      |
|              | % waste                       | 30%     |      |
|              | % paper recycling & cardboard | 43%     |      |
|              | % container recycling         | 7%      |      |
|              | % compost                     | 20%     |      |
|              | waste lb/CY                   | 80      |      |
|              | recycling lb/CY               | 60      |      |
|              | compost lb/CY                 | 200     |      |
|              | Compaction Ratio              | 4       | to 1 |

|   |           |           |
|---|-----------|-----------|
| <b>COST BENEFIT CALCULATIONS:</b>           | PROJECTED | PROJECTED |
| SERVICE-Waste                               | Loose     | Compacted |
| SERVICE-Recycling                           | Loose     | Compacted |
| Loose Waste Volume - CY                     | 28.6      |           |
| Compacted Waste Volume - CY                 |           | 7.1       |
| Loose OCC & Paper Recycling Volur           | 54.6      |           |
| Compacted OCC & Paper Recycling Volume - CY |           | 13.6      |
| Loose Container Recycling Volume -          | 8.9       |           |
| Compacted Container Recycling Volume - CY   |           | 2.2       |
| Loose Compost Volume - CY                   | 7.6       |           |
| Compacted Compost Volume - CY               |           | 1.9       |



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**CAFETERIA WASTE AND RECYCLING SYSTEM ANALYSIS**

ASSUMPTIONS:

|                               |         |
|-------------------------------|---------|
| Square Feet                   | 280,000 |
| Square Feet per Employee      | 200     |
| Meals per Employee Per Day    | 1.5     |
| lb. per meal                  | 1       |
| % waste                       | 37.5%   |
| % paper & cardboard recycling | 15%     |
| % container recycling         | 10%     |
| % compost                     | 37.5%   |
| waste lb/CY                   | 80      |
| recycling lb/CY               | 60      |
| compost lb/CY                 | 200     |
| Compaction Ratio              | 4 to 1  |

COST BENEFIT CALCULATIONS: PROJECTED PROJECTED

| SERVICE-Waste                               | Loose | Compacted |
|---|-------|-----------|
| SERVICE-Recycling                           | Loose | Compacted |
| Loose Waste Volume - CY                     | 49.2  |           |
| Compacted Waste Volume - CY                 |       | 12.3      |
| Loose OCC & Paper Recycling Volur           | 26.3  |           |
| Compacted OCC & Paper Recycling Volume - CY |       | 6.6       |
| Loose Container Recycling Volume -          | 17.5  |           |
| Compacted Container Recycling Volume - CY   |       | 4.4       |
| Loose Compost Volume - CY                   | 19.7  |           |
| Compacted Compost Volume - CY               |       | 4.9       |



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**WASTE AND RECYCLING RATES (PARTIAL) CURRENT RATES - REFLECT CHANGES EFFECTIVE 7/1/22**

**City:** South San Francisco **RATES SUBJECT TO CHANGE**  
**Franchise:** SSF Scavenger

**Commercial Waste & Compost Loose Front Load Rates:**

| Frequency/Size: x/wk-CY Size | 1         | 2         | 3          | 4          |
|------------------------------|-----------|-----------|------------|------------|
| Bin Rental                   | \$49.39   | \$53.61   | \$57.54    | \$61.73    |
| 1                            | \$241.66  | \$362.35  | \$543.60   | \$724.77   |
| 2                            | \$483.32  | \$724.70  | \$1,087.20 | \$1,449.54 |
| 3                            | \$724.98  | \$1087.05 | \$1,630.80 | \$2,174.31 |
| 4                            | \$966.64  | \$1449.40 | \$2,174.40 | \$2,899.08 |
| 5                            | \$1208.30 | \$1811.75 | \$2,718.00 | \$3,623.85 |

**Commercial Waste & Compost Compacted Front Load Rates:**

| Frequency/Size: x/wk-CY Size | 2         | 3         | 4          |
|------------------------------|-----------|-----------|------------|
| 1                            | \$559.78  | \$836.67  | \$1,119.56 |
| 2                            | \$1119.56 | \$1673.34 | \$2,239.12 |
| 3                            | \$1679.34 | \$2510.01 | \$3,358.68 |
| 4                            | \$2239.12 | \$3346.68 | \$4,478.24 |
| 5                            | \$2798.90 | \$4183.35 | \$5,597.80 |

|  |            |
|--|------------|
| 30 CY WASTE COMPACTOR<br>Pickup Charge | \$1,937.70 |
| 20 CY WASTE COMPACTOR<br>Pickup Charge | \$1,291.80 |
| 10 CY COMPOST<br>Pickup Charge         | \$645.90   |

South San Francisco Scavenger offers no-charge collection of properly sorted cardboard, paper, and recyclable containers. Organics collection at the same charge as garbage service. Service can be provided up to five times per week.

|                                  |             |   |
|----------------------------------|-------------|---|
| <b>Stationary Compactor Cost</b> | \$48,513.08 | A1000, 2-4CY bins, tax, ship Install          |
| <b>Vertical Baler Cost</b>       | \$29,000.00 | VB-60 downstroke baler                        |
| <b>Hand Fed Compactor Cost</b>   | \$41,801.90 | A500, 2-2CY Towable bins, tax, ship Install   |
| <b>Vertical Compactor Cost</b>   | \$36,807.00 | P200, 1-2CY front load bin, tax, ship Install |
| <b>Roll-off Compactor Cost</b>   | \$80,000.00 | JV SC-XX (sized to project)                   |

The system capital costs above are estimates to be utilized for planning purposes only. Pricing includes tax, shipping and install costs. Due to frequently changing values, do not use these estimates for any other purpose.



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**Appendix: Projected Waste and Recycling Levels:**

**Restaurants.** CalRecycle (*Waste Disposal and Diversion Findings for Selected Industry Groups, 2006*), estimates restaurants generate 6,537 lb. of trash per employee per year. Using this information, the following are projected waste and recycling levels for restaurant tenants.

**Diversion levels, conservative (50%) vs. optimal (75%).** The CalRecycle study estimated 2/3s of restaurant materials are disposed of as municipal solid waste (MSW) (66% for fast food restaurants and 68% for standard restaurants). Their study also shows that potentially a very high percentage of these non-diverted materials (68% for fast food and 83% for other food retailing establishments) are recyclables.

**Restaurant employee assumptions** are based on the Restaurant Industry Operations Report, compiled by Deloitte for the National Restaurant Association in 2010.

| Food Services Retailer | Employees | PROJ trash per week (lb.) | Waste (35% of trash) | Recycling (40% of trash) | Compost (25% of trash) |
|------------------------|-----------|---------------------------|----------------------|--------------------------|------------------------|
| Restaurant Large       | 30        | 3,771                     | 1,320                | 1,509                    | 943                    |
| Restaurant Moderate    | 23        | 2,891                     | 1,012                | 1,157                    | 723                    |
| Restaurant Small       | 18        | 2,263                     | 792                  | 905                      | 566                    |
| Restaurant QSR         | 15        | 1,886                     | 660                  | 754                      | 471                    |
| Restaurant Cafe        | 10        | 1,257                     | 440                  | 503                      | 314                    |

Because the descriptive terms in the industry report are vague and difficult to apply to each individual restaurant space in a project, for the purposes of our analysis we have assumed that a 'large' restaurant is 3,000 square feet or one employee per 100 square feet of F&B space. Using the 6,537 lb/trash/year/employee metric, this results in a proxy metric of 1.25 lb/day/square foot. This estimate, however, is only a tool and is not guaranteed. Actual trash generation may be higher or lower.

Other assumptions: waste 125 lbs/cubic yard, recycle 84 lbs/cubic yard, compost 200 lbs/cubic yard