ANSI Z245.60 - 2008

American National Standard

ANSI Z245.60 - 2008

ENVIRONMENTAL INDUSTRY
ASSOCIATIONS

for Equipment Technology and Operations for Wastes and Recyclable Materials ---

Waste Containers – Compatibility Dimensions

WASTEC

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American National Standard
for Equipment Technology and Operations
for Wastes and Recyclable Materials —

Waste Containers — Compatibility Dimensions

Secretariat
Environmental Industry Associations

Approved January 15, 2008
American National Standards Institute, Inc.

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FOREWORD (This foreword is not part of American National Standard Z245.60 - 2008)

This revised standard replaces ANSI Z245.60 –1999, *Equipment Technology and Operations for Wastes and Recyclable Materials — Waste Containers — Compatibility Dimensions*. For a waste container to be marked as a specific type of container, those containers manufactured after the effective date of this standard, must comply with ANSI Z245.60-2008.

This revision establishes dimensions for refuse containers commonly used in conjunction with mobile equipment used to collect, compact and transport waste and recyclables, and occasionally with stationary waste processing and compaction equipment that use mechanical means to lift and empty these containers into the loading hopper. It is intended to assist manufacturers of truck bodies and lifting equipment in designing devices that can safely accommodate a wide range of commonly used containers. Also, labeling according to this standard will assist the users of such equipment in identifying with certainty that a container so marked is compatible with a lifting device designed to accommodate containers of the same type.

It is recognized that individuals may prefer to use containers that do not conform to these dimensions, and that such specialty designs can be safely handled by certain lifting systems. The standard does not intend to restrict manufacturing or the use of other designs. This standard is intended to encourage widespread use of common dimensions to facilitate interchange of different manufacturers' product lines, and create an easily recognizable means for waste industry workers to safely match containers and lifting devices.

The effective date of this standard will be 18 months after the date of approval by the American National Standards Institute. Containers manufactured prior to the effective date of this standard are subject to the requirements of previous editions of ANSI Z245.60 (1999, 1996, 1990) *For Refuse Collection, Processing, and Disposal Equipment — Waste Containers — Compatibility Dimensions*.

Many containers manufactured prior to this standard may also meet the requirements of the dimensional specifications for the various types of containers. Employers are encouraged to identify and label such containers as described in this standard in order to assist employees in determining compatibility with lifting systems.

To gain access to a larger variety of lifting equipment types, manufacturers may choose to design containers to meet the dimensional requirements of more than one container type. In such a case they may label these containers for each type for which the requirements are met.

This revised standard was developed by the Accredited Standards Committee (ASC) Z245 Subcommittee 6 (Container Compatibility). In addition to the subcommittee members, the original standard was developed by the following organizations: the Transportation and Container Project Working Groups of the Waste Equipment Technology Association (WASTEC) and independent manufacturers of refuse containers.

At the time this revised standard was approved, a number of commonly used types of containers were included for which consensus was reached regarding common dimensions critical to assuring compatibility with lifting systems. The ASC Z245 Committee will include other container types that may be developed in the future, and others for which consensus has not yet been reached on dimensional requirements in future revisions of this standard. Proposals should be forwarded to the Secretary of the ASC Z245 Committee.

Suggested changes, inquiries, and requests for interpretation of this standard should be directed to the Secretary, Accredited Standards Committee Z245, c/o Environmental Industry Associations, 4301 Connecticut Ave., NW, Suite 300, Washington, DC 20008.

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This revised standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Equipment Technology and Operations for Wastes and Recyclable Materials, Z245. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time it approved this revision, the Z245 Committee had the following members:

Gary Satterfield, Chairman
Craig Wallwork, Secretary

Lou Guilmette	City of Rochester
Karon Simoni (Alternate)	City of Rochester
Carl Hursh	Commonwealth of Pennsylvania DEP
Gary Satterfield	Waste Equipment Technology Association
John Gilstrap	Institute of Scrap Recycling Industries, Inc.
Brent Dieleman	Solid Waste Association of North America
Paul Moore	NIOSH
Ralph A. Ford	Waste Industries
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Jerald G. Zanzig	Zantec, Inc.
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Thomas Stevens	Wolverine Recycling Services, Inc.
Denny Pool	SP Industries, Inc.
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David E. Malter	Malter Associates, Inc.
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Jeffrey D. Kaplan	City of Corpus Christi
Mark Johnson (Alternate)	Allied Waste Industries, Inc.
Garry Mosier, CSP	Allied Waste Industries, Inc.
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Dave Carlisle	City of Tacoma

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ASC Z245 Subcommittee 6 (Container Compatibility), which drafted this revised standard, had the following members:

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Phillip Headley, Secretary

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Neil Allison
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Kathy Bolhouse
Joe Bollo
Pamela Brant
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Dale Deist
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American National Standard for
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Waste Containers — Compatibility Dimensions

0 Introduction

This standard was developed by American National Standards Institute Accredited Standards Committee Z245 Subcommittee 6 on Container Compatibility and approved by Accredited Standards Committee Z245.

This standard revises the waste container compatibility dimensions found in ANSI Z245.60-1999 by providing specific dimensions for waste containers.

This standard complements ANSI Z245.30-2008, which details the safety requirements for waste container construction and use.

Exceptions and notes contained in the standard apply to the clause or sub-clause in which they are contained or to which they reference. Exceptions pertain to normative requirements. Notes are informative and provide guidance for the evaluation of a normative requirement.

The units of distance measurement used in this standard are in the inch-pound system. When a value for measurement is followed by a value in other units in parentheses, the second value is only approximate. The first value is the requirement.

1 Scope

1.1 This standard applies to newly manufactured containers that are used in conjunction with the collection, processing and disposal (including the diversion of wastes for recycling) of municipal, commercial and industrial solid wastes by private companies and public entities. Containers may vary widely as to size, design and other characteristics. These containers are used in conjunction with mobile and stationary equipment that use mechanical means to handle the containers. Containers not in conformance with this standard may be safely handled provided the mechanism used is compatible with the dimensions of the specific container.

Figures 1a and 1b illustrate examples of various types of containers which are within the scope of this standard.

1.2 This standard does not apply to containers intended for use by householders for their individual use which are not to be handled by mechanical container lifting and dumping mechanisms.

Figure 2 illustrates examples of various types of containers which are not within the scope of this standard.

1.3 This standard applies to mobile containers usually mounted on casters or wheels; stationary containers with 3 cu. yd.^{3} (2.3 cubic meters) capacity and larger; and specially designed containers

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integral with or detachable from stationary compactors.

NOTE: Containers may have hinged lids or access doors which vary as to the number of panels, size, use and location.

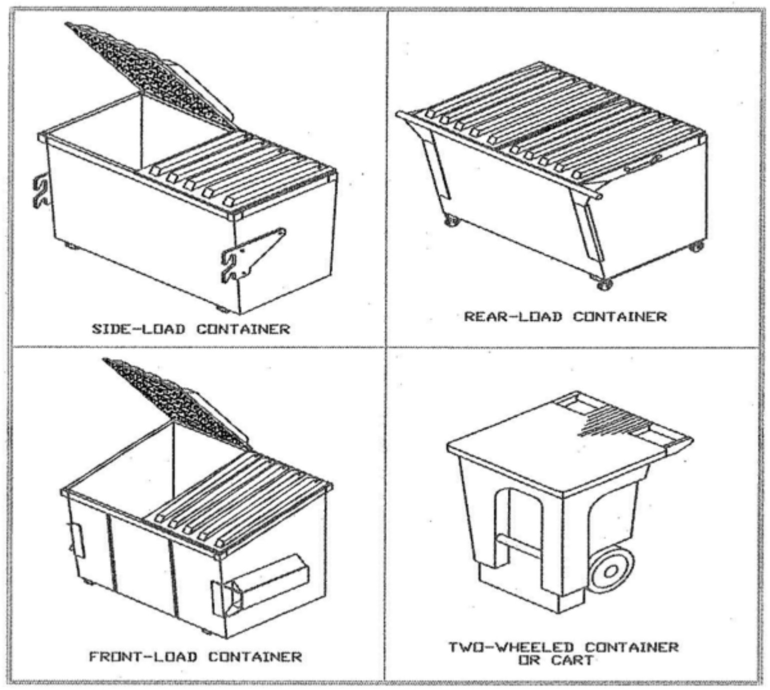

Figure 1a — Typical refuse containers within the scope of this standard

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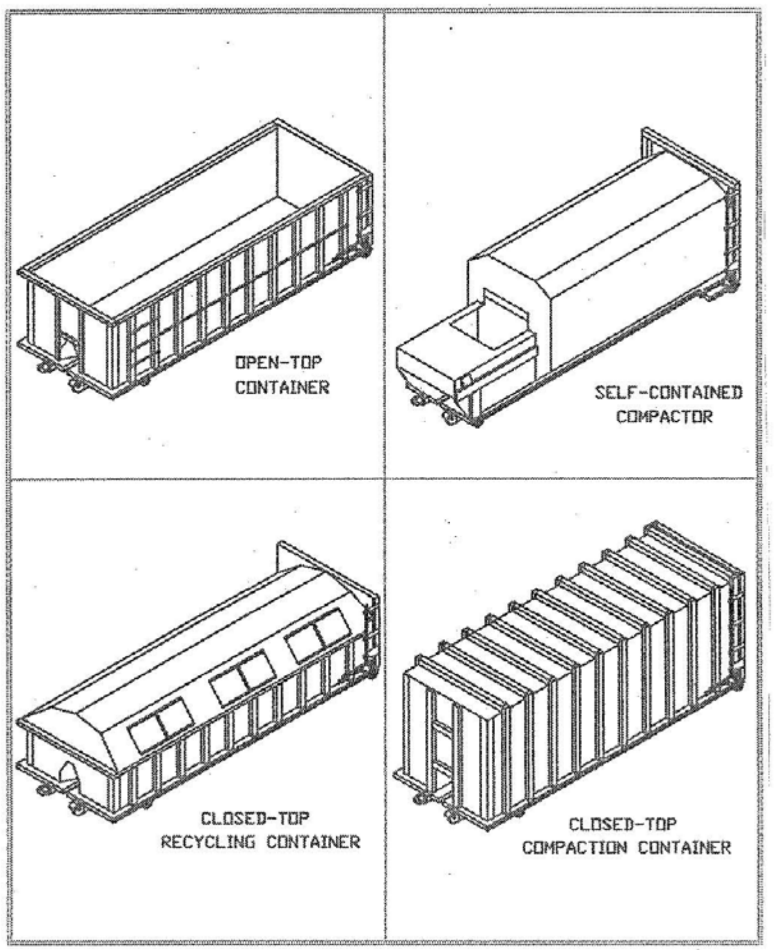

Figure 1b — Typical refuse containers within the scope of this standard

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Figure 2 — Typical refuse containers excluded from this standard

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2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ANSI Z245.1-2008, *Equipment Technology and Operations for Wastes and Recyclable Materials - Mobile Wastes and Recyclable Materials Collection, Transportation and Compaction Equipment - Safety Requirements*

ANSI Z245.21-2008, *Equipment Technology and Operations for Wastes and Recyclable Materials - Stationary Compactors - Safety Requirements*

ANSI Z245.30-2008, *Equipment Technology and Operations for Wastes and Recyclable Materials - Waste Containers - Safety Requirements*

3 Definitions

3.1 General definitions. Except as provided below, terms used in conjunction with this standard are defined in ANSI Z245.30-2008*.*

3.2 Type B container: Type B containers are designed and manufactured to be cycled by a "bar-lock" lifter. Type B containers have geometry in the area where it attaches to a lifter that is functionally equivalent to Figures 3 and 4.

The generic specification for Type B containers is based on the concept of envelopes, cross sections within which the upper attachment point and the lower bar must be confined regardless of the specific configuration of these elements. Certain critical dimensions relate the upper attachment envelope, UAE, and the bar envelope, BE, to each other and to other parts on the container. For a container to qualify as Type B, these critical dimensions must be within the specified range.

NOTE: Any two-wheeled plastic refuse container which is functionally similar to figures 3 and 4 and has dimensions that fall within the limits given in Table 1 may be designated as a Type B container by the container manufacturer.

3.3 Type C container: Type C containers are designed and manufactured to be cycled by a "comb" type lifter. Type C containers have a cross section in the area where it attaches to the lifter that is functionally similar to Figure 5.

NOTE: Any two-wheeled plastic refuse container which is functionally similar to figure 5 and has dimensions that fall within the limits given in Table 2 may be designated as a Type C container by the container manufacturer.

3.4 Type D container: Type D containers are designed and manufactured to be cycled by a "diamond" type lifter.

Type D containers have geometry in the area where it attaches to the lifter which is functionally equivalent to Figure 6.

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NOTE: Any two-wheeled plastic refuse container which is functionally similar to Figure 6 and has dimensions that fall within the limits given in Table 3 may be designated as a Type D container by the container manufacturer.

3.5 Type G container: Type G containers are designed and manufactured to be cycled by a grab-type lifter.

NOTE 1: Not all grab-type lifters are capable of cycling all Type G containers. The manufacturer or user of the container and/or lifter must determine compatibility of specific combinations.

NOTE 2: Any two-wheeled plastic refuse container which is functionally similar to Figure 7 and has dimensions that fall within the limits given in Table 4 may be designated as a Type G container by the container manufacturer.

3.6 Type T container: (Common nomenclature = “trunnion-bar rear loader” container). A container that is designed to be unloaded by mechanical means (typically into the hoppers of rear-loading collection vehicles) that utilizes a latching device to capture the container trunnion bar. Type T containers 3 yd^3 (2.30 cubic meters) or less may also be lifted by the trunnion bar and two cables or other means to engage the sides of the container, or a bar system to engage the leading edge of the container (see Figure 8). Some Type T containers are designed with a sloping side to facilitate use with compactor vehicle hopper configurations as well as for emptying of the contents. For such containers, the slope differs markedly and is not standardized since degree of the slope depends on the size of the container. Small containers of this type, 2 yd^3 (1.53 cubic meters) or less, may have a minimal slanting front side, commonly called a “straight” front container. Type T containers greater than 3 yd^3 (2.30 cubic meters) engage a single cable at the trailing edge of the container.

NOTE: Any container that is functionally similar to Figure 9 and has dimensions that fall within the limits given in Tables 5 and 6 may be designated as a Type T container by the container manufacturer.

3.7 Type U container: (Common nomenclature = “cable-hook outside rail roll-off” container). A container that is designed to be loaded onto and unloaded from the frames of transport vehicles by mechanical means where the long rail of the container rides along the outside of the rail of the transporter. A hook on the lower front center of the container is engaged by the lifting mechanism on the transport vehicle. Containers not in conformance with this specification may be able to be loaded and unloaded safely provided the lifting mechanism used is compatible with the specific container dimensions. Containers of this type may vary widely as to size, design and other characteristics.

NOTE: Any container that is functionally similar to Figure 10 and has dimensions that fall within the limits given in Table 7 may be designated as a Type T container by the container manufacturer.

3.8 Type */C container: (Common nomenclature = “detachable compactor-container”). A specially designed container, compatible with a stationary compactor, used to load, store, and transport compacted refuse to an unloading site.

NOTE: Any container that is functionally similar to Figure 11 and has dimensions that fall within the limits given in Table 8 may be designated as a Type */C container by the container manufacturer.

3.9 Type H container: (Common nomenclature = “dead lift roll-off” container). A container that is designed to be loaded onto and unloaded from the frames of transport vehicles by mechanical means where the long rail of the container rides along the outside of the rail of the transport vehicle.

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A receiver on the lower front center of the container accepts the knuckle of the transport vehicle. Containers of this type may vary widely as to size, design and other characteristics.

NOTE: Any container that is functionally similar to Figure 12 and has dimensions that fall within the limits given in Table 9 may be designated as a Type H container by the container manufacturer.

3.10 Type I container: (Common nomenclature = “bail and hook” container). A container that is designed to be loaded onto and unloaded from the frames of transport vehicles by mechanical means. A series of bail stations on the lower center length of the container undercarriage is engaged by the bail of the lifting mechanism on the transport vehicle. Containers of this type may vary widely as to size, design and other characteristics.

NOTE: Any container that is functionally similar to that shown in Figure 13 and 14 and has dimensions that fall within the limits given in Table 10 may be designated as a Type I container by the container manufacturer.

3.11 Type L container: (Common nomenclature = "hook-lift" container). A container that is designed to be loaded onto and unloaded from the frames of transport vehicles by hydraulic means where the long rail of the container rides along the outside of the rail of the transporter. A specific receiver (lift bar) on the front center of the container accepts the lifting hook of the hoisting vehicle. Containers of this type may vary widely as to size, design and other characteristics; however, Type L containers are manufactured primarily in three different size categories: Type L-1, L-2 and L-3 (L-3 being the largest).

NOTE: Any container that is functionally similar to Figure 15 and has dimensions that fall within the limits given in Table 11 may be designated as a Type L container by the container manufacturer.

3.12 Type S container: (Common nomenclature = side-fork front loader container). A container that is designed to be unloaded by mechanical means (typically into the hoppers of front-loading collection vehicles) that utilizes a fork system to engage the sides of the container. Containers of this type may vary widely as to size, design and other characteristics.

NOTE: Any container that is functionally similar to Figure 16 and has dimensions that fall within the limits given in Table 12 may be designated as a Type S container by the container manufacturer.

4 Safety requirements

4.1 General safety requirements. Refuse containers shall be manufactured, maintained and used in accordance with ANSI Z245.30 - 2008

4.2 Containers for mobile collection, compaction and transport vehicles. Containers used with mobile equipment shall comply with ANSI Z245.1 - 2008

4.3 Containers for stationary compactors. Containers used with stationary compaction equipment shall comply with ANSI Z245.21 - 2008

5 Markings

5.1 Containers shall be marked as required by ANSI Z245.30-2008.

5.2 Containers designated as “Type _” which comply with the dimensional requirements of this

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standard for the specific type of containers as described in clause 7 shall be clearly marked with "Type (insert designation)" and the designation of this standard (ANSI Z245.60).

NOTE: A container which meets the specifications of more than one type may be designated and marked with multiple types such as a Type B/G or Type C/G container.

6 Responsibilities

6.1 Manufacturer responsibility. Containers marked in accordance with clause 5.2 shall be manufactured in conformance with the specifications of clause 7 for the specific type container being manufactured.

NOTE: Two-wheeled plastic refuse containers (carts) are unloaded by a mechanical device called a lifter. Lifter manufacturers are required to designate the type containers that their lifters are able to cycle. Lifter manufacturers may designate their lifters as being capable of cycling all containers conforming to the specifications for one or more types of containers.

6.2 Retrofitter responsibility. Persons who retrofit or modify refuse containers that are marked in conformance with clause 5.2 shall do so in conformance with the specifications for the specific container type as described in clause 7.

6.3 Owner responsibility. The owner of containers shall ensure that containers manufactured in accordance with this standard are maintained so as to remain in compliance with this standard.

6.4 Customer responsibility. The customer shall inform the owner of refuse bins of any damage, defects or malfunction of any container provided for the customer's use.

6.5 Employee responsibilities

6.5.1 The employee shall lift only containers that are compatible with the lifting equipment available.

6.5.2 Any damage, defect or malfunction of refuse containers or lifting equipment shall be reported by the employee to the employer.

6.6 Employer responsibilities

6.6.1 The employer, if different than the owner of the container, shall notify the owner of any damage, defect or malfunction of the container.

6.6.2 The employer shall be responsible for ensuring compatibility of the container and lifting equipment that are used or encountered in that company's operation.

6.6.3 The employer shall ensure compatibility of the detachable compactor-containers and the compactors to which they are mated.

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7 Dimensional requirements

7.1 Requirements for Type B containers (see Figures 3 and 4). Type B containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 1.

Table 1 — Dimensional requirements for Type B containers

Dimension	Specification	Description
a	Min: 32-1/2 in (825 mm) Max: 33-1/2 in (851 mm)	Height of lowest point of UAE above the ground
c	Min: 14-1/2 in (368 mm) Max: 15-1/4 in (387 mm)	Shortest distance between bottom surface of upper attachment detail and top surface of bottom attachment detail
d	7 in (178 mm)	Distance between bottom of UAE and bottom of No Protrusion Zone “step”
e	Max: 2-1/2 in (65 mm)	Distance between outer surface of UAE and outer surface of container No Protrusion Zone
f	Max: 1-1/4 in (32 mm)	Horizontal width of BE cross-section
g	Max: 1-1/2 in (38 mm)	Vertical height of BE cross-section
h	Min: 1 in (25 mm) Max: 2-1/4 in (57 mm)	Distance between rear vertical plane of upper attachment point and container surface
j	Min: 1/2 in (13 mm) Max: 1-1/2 in (38 mm)	Distance between rear vertical plane of lower attachment point (bar) and container surface
k	Min: 1/2 in (13 mm)	Distance between front plane of UAE and front plane of BE (also known as “draft”)
l	Min: 8 in (203 mm)	Width of upper attachment point
m	Min: 5 in (127 mm)	Width of lower attachment point
n	Max: 1/2 in (13 mm)	Distance between front plane of BE and outer container surface
p	Min: 1-7/8 in (48 mm)	Clearance between top of lower attachment point recess area and top of BE
l -(minus) m	Max: $\leq$ 6 in (152 mm)	Difference between upper attachment width and lower attachment (bar) width

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The UAE is defined as a rectangular cross section, 1-1/2 in horizontal x 1-1/4 in vertical (38 mm horizontal x 32 mm vertical) with its inner and outer edges perpendicular to the ground and its upper and lower edges parallel to the ground. The lower innermost corner of the UAE is drawn on a 3/8 in (10 mm) radius (see Figure 4). Point A is defined as the lowest, outermost point within the UAE.

NOTE: For many containers, Point A will not be on the surface of the container itself.

The BE is a rectangular cross section 1-1/4 in horizontal x 1-1/2 in vertical (32 mm horizontal x 38 mm vertical) with its edges oriented parallel and perpendicular to the ground. Point B is the lowest, innermost point on the BE and may or may not actually be on the container surface.

To ensure that Type B containers and lifters do not interfere with each other, a Type B container shall have a no-protrusion zone as described below (see Figure 4):

a) No protrusion into a space defined with reference to the upper attachment point:

b) Lower surface: Horizontal surface through Point A;

c) Upper step surface: Horizontal surface, 7 in (178 mm) above Point A;

d) Inner surface: Surface including an extension of the line through Points A & B;

e) Side surfaces: Vertical surfaces through the ends of the upper attachment point; and

f) Outer surface: Surface through a vertical line 2.56 in (65 mm) in front of Point A.

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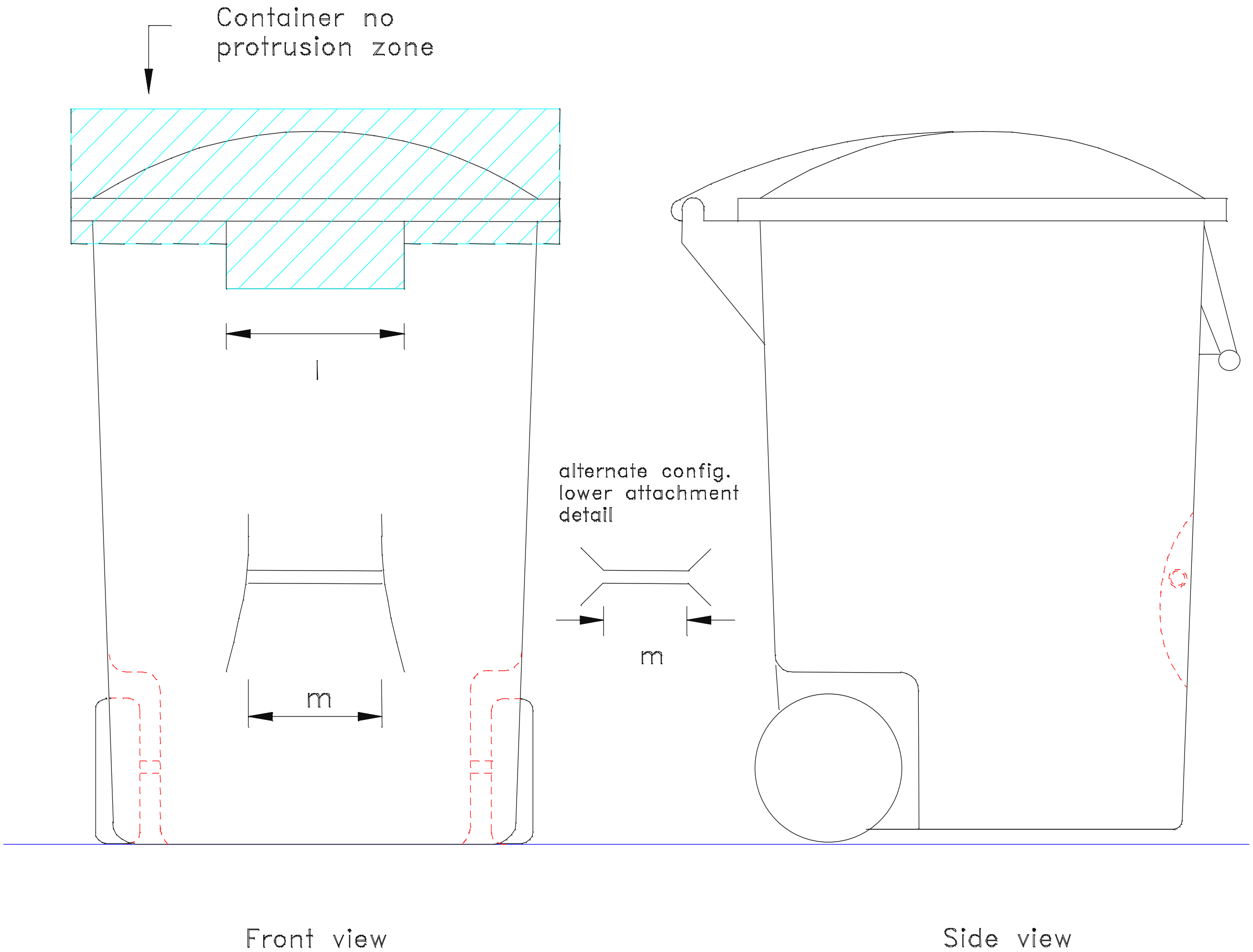

Figure 3 — Type B container

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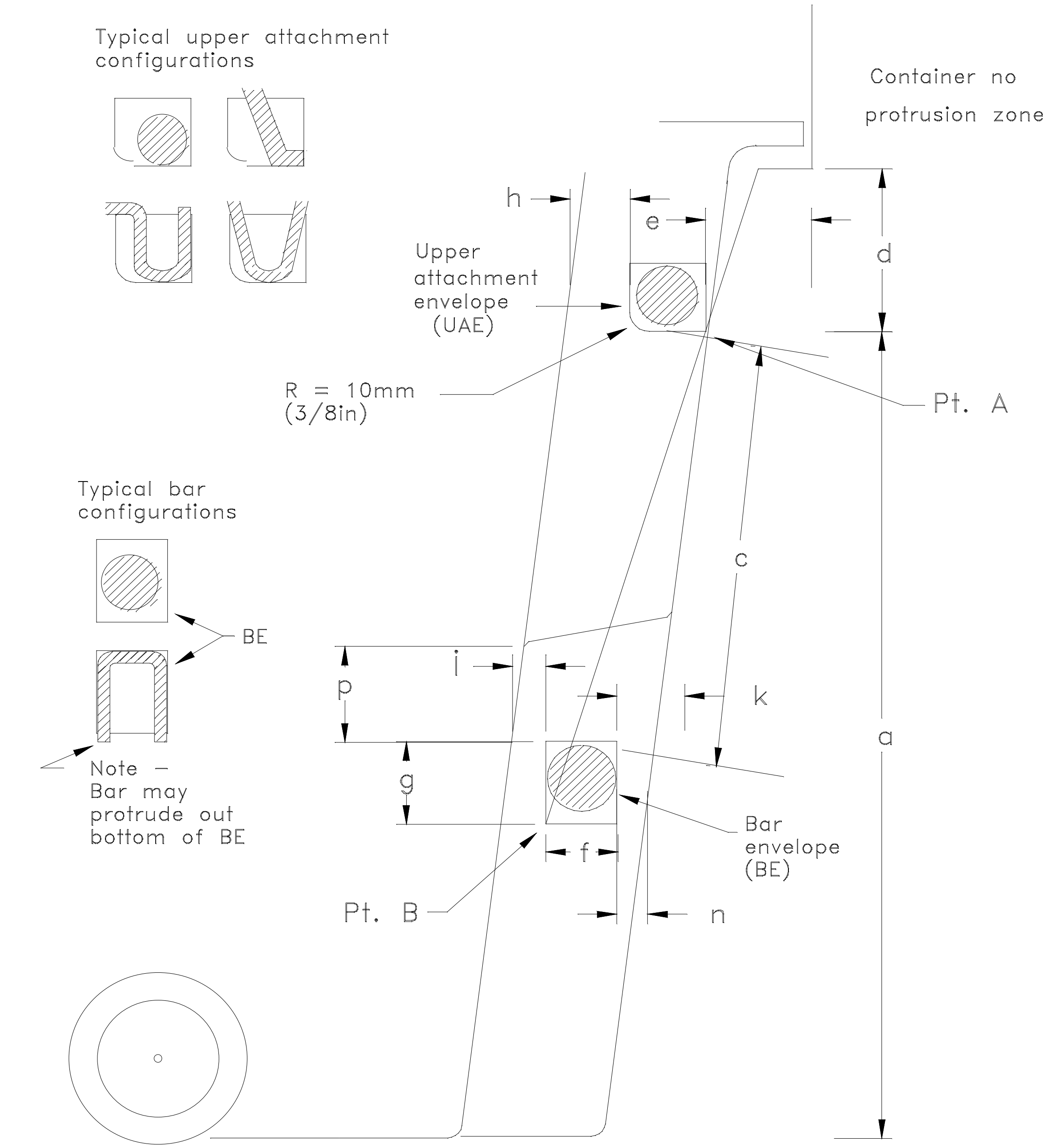

Figure 4 — Type B container lifter attachment points

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7.2 Requirements for Type C containers (see Figure 5). Type C containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 2.

Table 2 — Dimensional requirements for Type C containers

Dimension	Specification	Description
b	Min: 31 in (787 mm) Max: 43 in (1092 mm)	Height of Point A from ground
c	Min: 3/4 in (18 mm) Max: 7/8 in (23 mm)	Height from Point A to surface which rests on comb
d	Min: 7/8 in (23 mm) Max: 1-1/4 in (31 mm)	Height from Point A to lifting rim flange, if any
e	Min: 3/8 in (10 mm) Max: 3/4 in (19 mm)	Distance between outer restrainer surface and outermost lip surface
f	Min: 3/4 in (19 mm)	Distance from Point A to lid in closed position
g	Min: 1-1/4 in (33 mm) Max: 1-3/4 in (44 mm)	Width of comb support surface.
h	Min: 2 in (52 mm) Max: 2-1/4 in (58 mm)	Height from Point A to bottom of lifting rim flange, if any
j	Max: 5-1/8 in (130 mm)	Height from comb support surface to bottom of gusset
k	5-7/8 in (150 mm)	Distance from container centerline to gusset centerline
l	Max: 2-7/8 in (74 mm)	Width of gusset

If gussets are used, they shall lie within spaces that are 2.9 in (75 mm) wide whose centerlines are 5.9 in (150 mm) apart.

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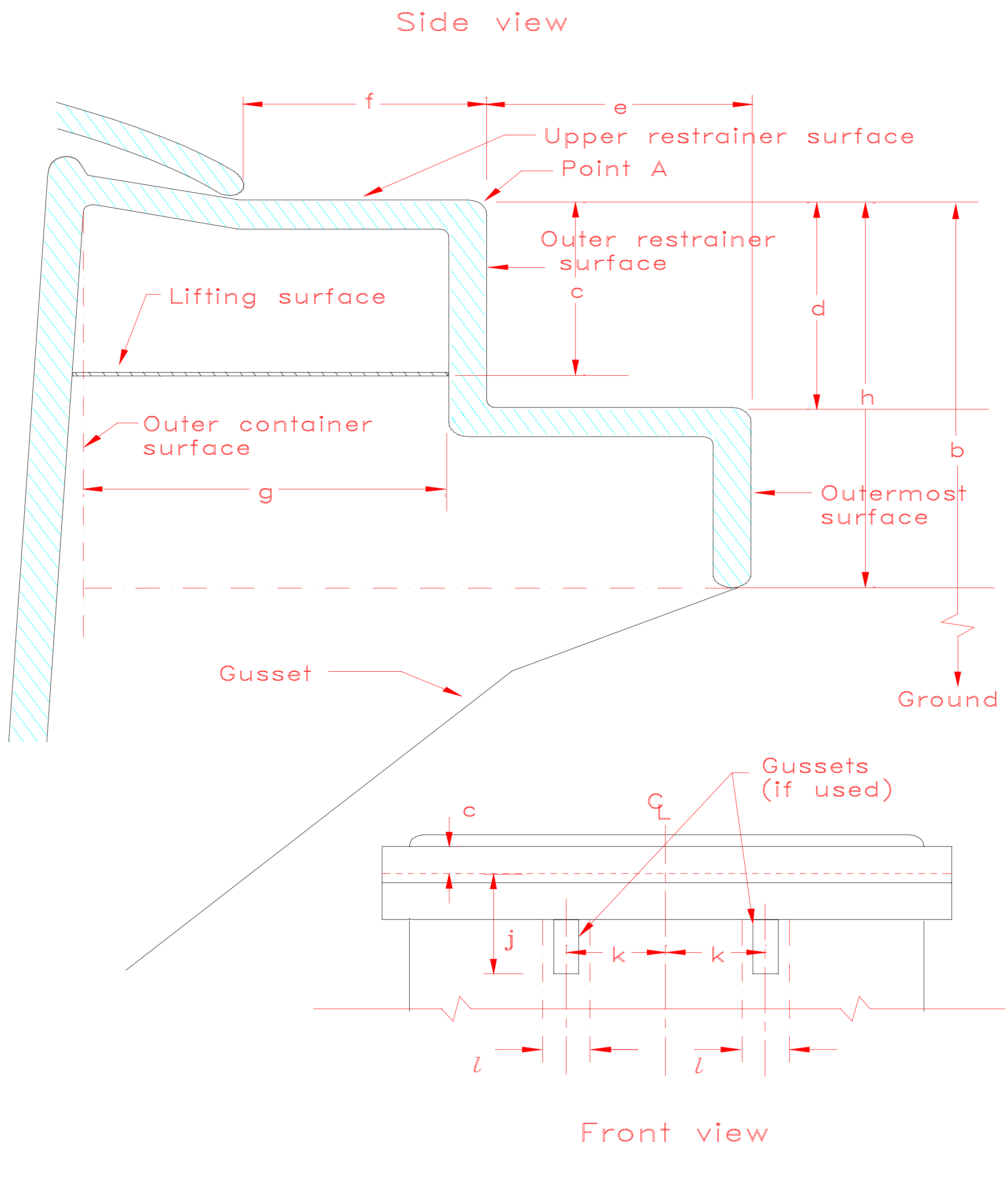

Figure 5 – Type C container

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7.3 Requirements for Type D containers (see Figure 6). Type D containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 3.

Table 3 — Dimensional requirements for Type D containers

Dimension	Specification	Description
A	Min: 1 in (25 mm) Max: 1-1/2 in (38 mm)	Projection of pocket from front of clamp-down flange
B	Min: 4 in (102 mm) Max: 5-1/2 in (140 mm)	Projection of outside of pocket from tipping face on container
C	Min: 27-1/2 in (698 mm)	Height of lower edge of pocket from ground
D	Min: 1-3/4 in (45 mm) Max: 2-1/4 in (57 mm)	Clearance above bottom edge of pocket at center of pocket
E	16-1/2 in (419 mm)	Overall height of diamond lifting device
F	23 in (584 mm)	Width of diamond side support flange
G	9 in (227 mm)	Height of diamond detail above support flange.
H	4 in (102 mm)	Overall thickness of diamond lifting device

NOTE: Mating internal dimensions to the “diamond” should be made off of a master.

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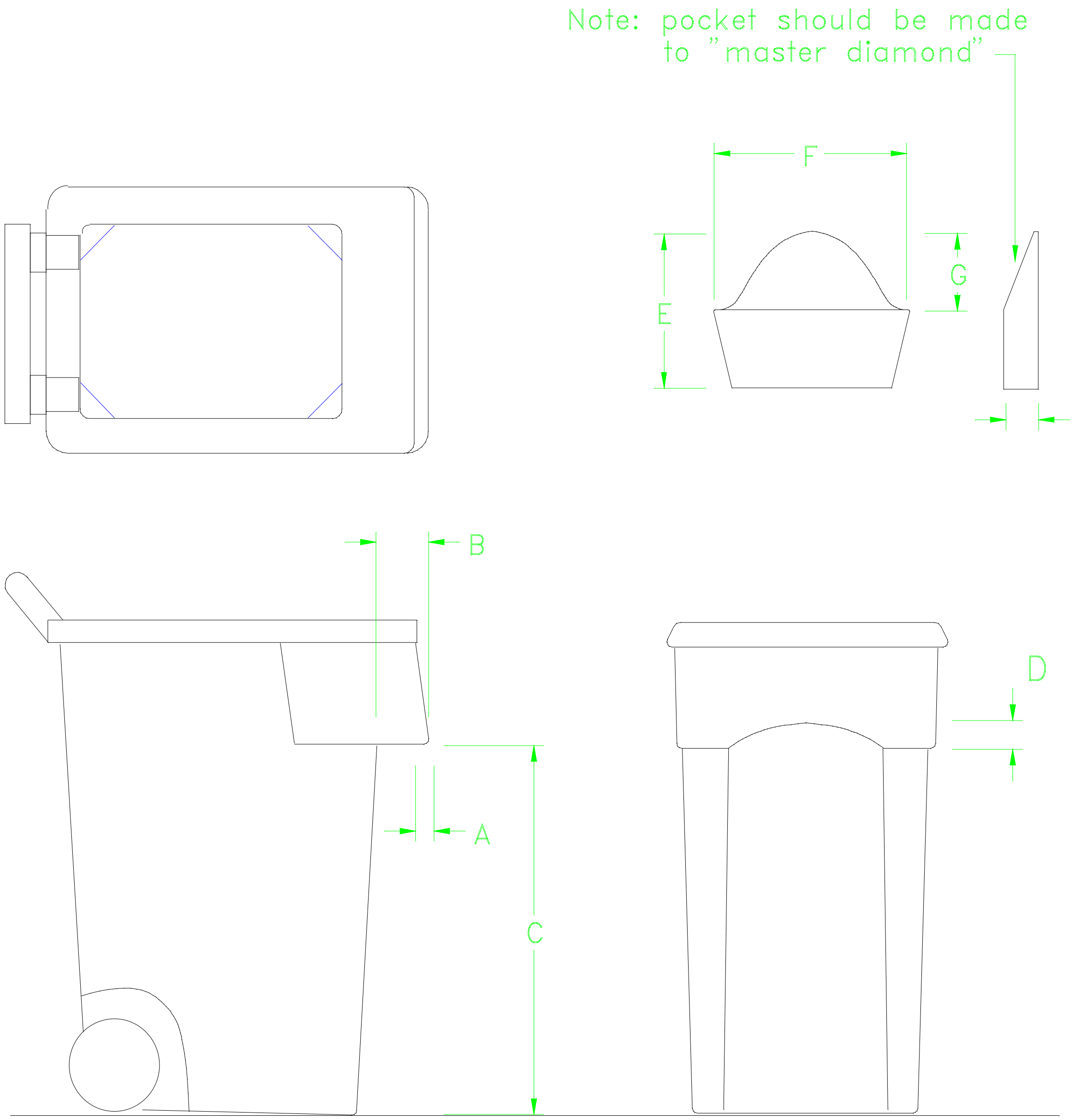

Figure 6 — Type D container

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7.4 Requirements for Type G containers (see Figure 7). Type G containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 4.

Table 4 — Dimensional requirements for Type G containers

Dimension	Specification	Description
A	Min: 15 in (381 mm)	Vertical section height, where the lifting device is connected, measured from just above the top of the wheels to the top section of the container
B	Min: 20 in (508 mm) Max: 35 in (889 mm)	Horizontal dimension of the vertical lifting section measured as the diameter of the smallest circle whose circumference will enclose the entire container, excluding protrusions such as frames, handles, wheels, etc.

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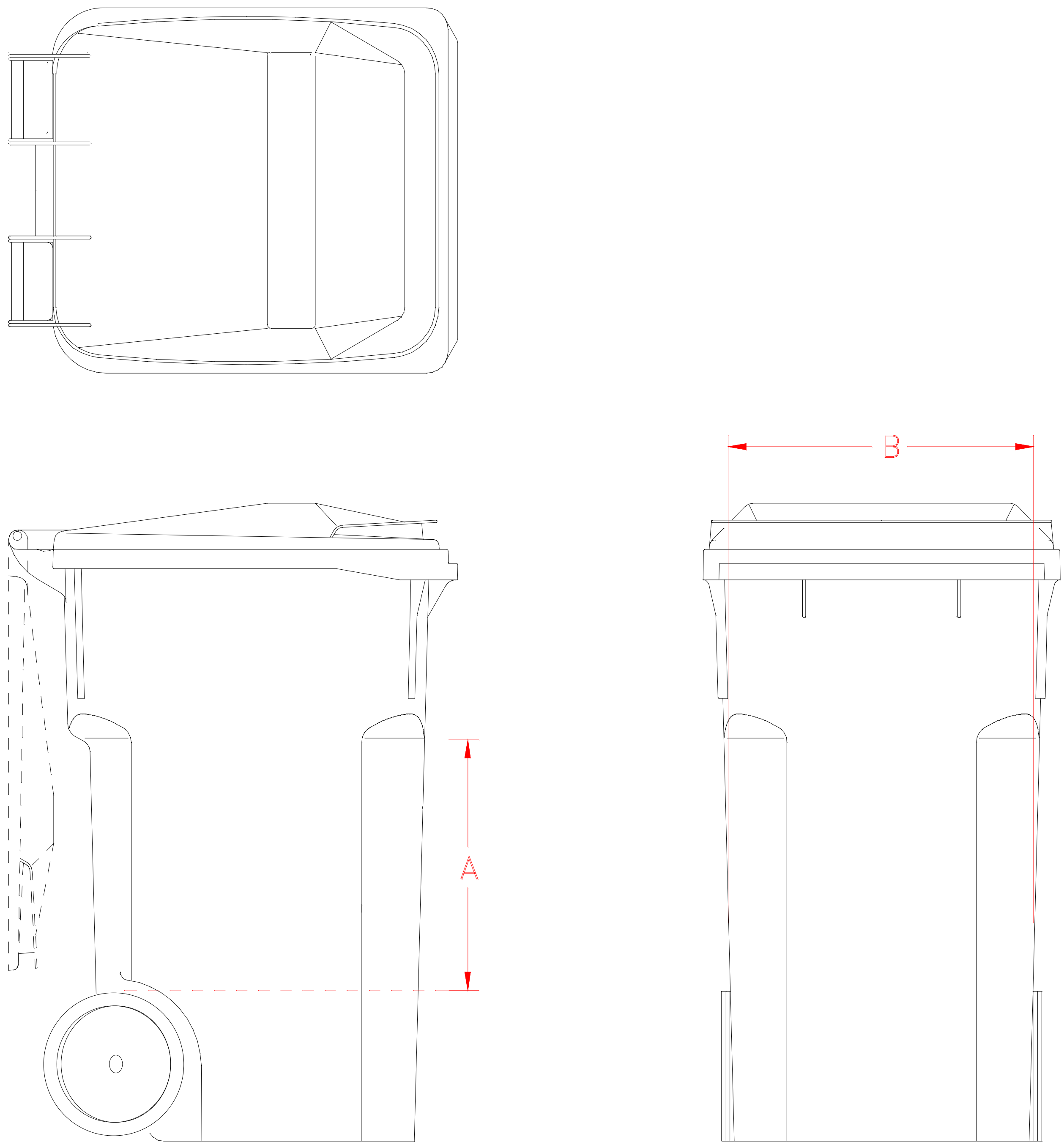

Figure 7 — Type G container

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7.5 Requirements for Type T containers

7.5.1 Type T containers with capacities of 3 yd^3 (2.30 m^3) or less (see Figure 8) shall be designed and manufactured in accordance with dimensional requirements listed in Table 5.

Table 5 — Dimensional requirements for Type T containers of 3 yd^3 (2.30 m^3) or less capacity. (Used in conjunction with trunnion-bar-lifting systems)

Dimension	Specification	Description
A	Min: 77-1/2 in (196.8 cm) Max: 78 in (198.1 cm)	Total length of the trunnion bar including washers if provided. NOTE - If washers are provided, the diameter should be 2-1/4 in (57 mm)
B	Max: 72 in (182.9 cm)	Width of the container and all supporting gussets attached to the trunnion bar. Handles located on container sides are also included
C	Max: 66 in (167.6 cm)	Width of container body including structural supporting side members (side rails). NOTE - This dimension excludes handles and gusset supports
D	Min: 1-1/4 in (32 mm) Max: 1-3/4 in (45 mm)	The diameter of the trunnion bar at latch-up points
E	Min: 45 in (114.3 cm) Max: 49 in (124.5 cm)	Distance from the centerline of the trunnion bar to the ground. The top of the trunnion bar should coincide with top of the container on the side where the trunnion bar is located
F	Min: 2 in (51 mm)	Horizontal distances from the lower front edge of the container body to a perpendicular originating at the upper front edge of the container (excluding the trunnion bar). NOTE - This distance is to be measured at ground level
G	Max: 3 in (76 mm)	Vertical distance between the uppermost part of the handle on the side of the container and the centerline of the trunnion bar
H	Min: 10 in (25.4 cm) Max: 17 in (43.2 cm)	The distance between the centerline of the trunnion bar and the front of the lift point. NOTE - Lift points should not extend beyond dimension B out from the side of the container
J	Max: 1-1/4 in (32 mm)	The maximum diameter (thickness) of an attachment through which a cable may be hooked to the container
K	Min: 2 in (51 mm)	The distance from inside of side handle to the outside of the container

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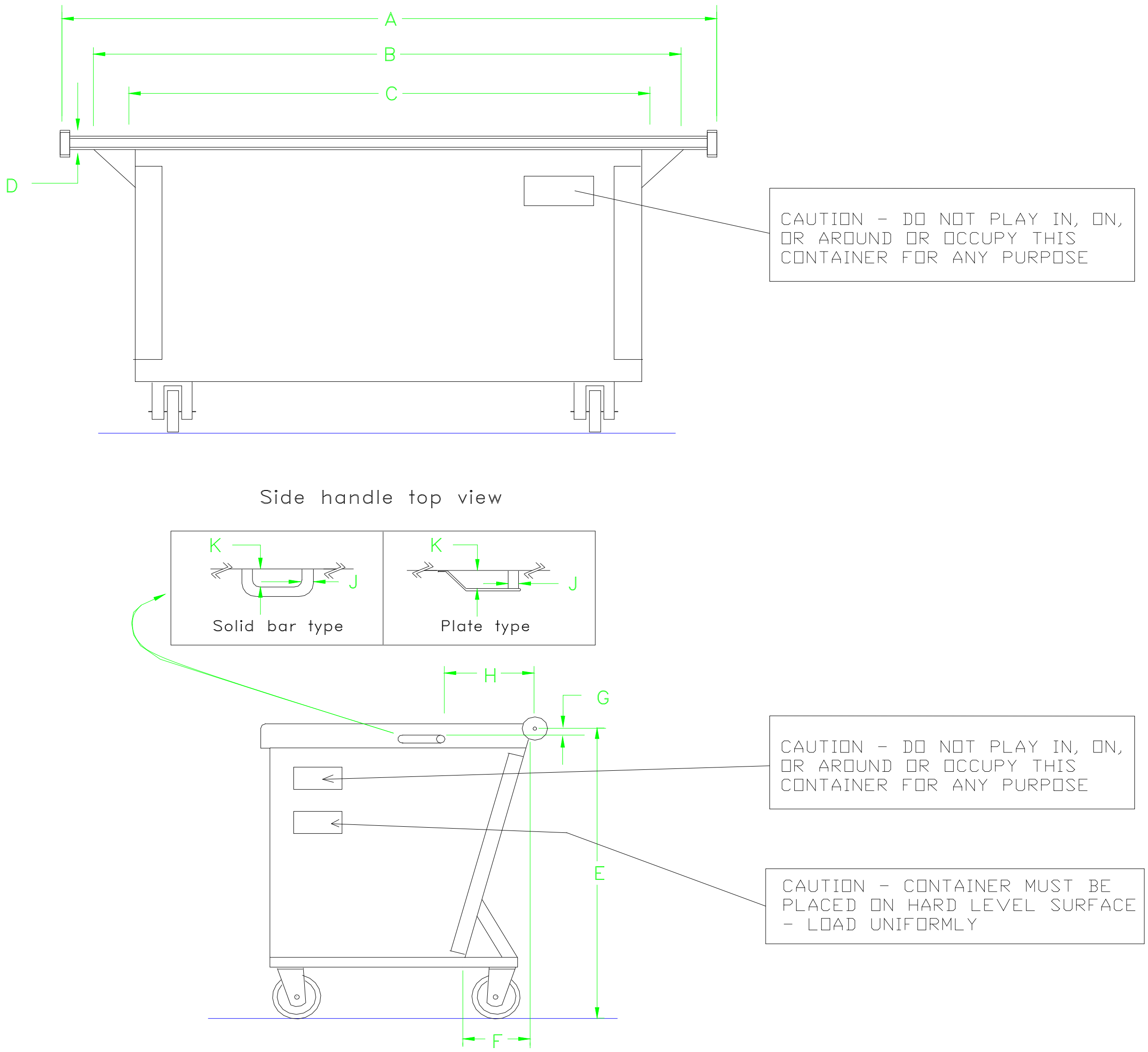

Figure 8 — Type T container (3 yd^3 [2.3 m^3] or less)

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7.5.2 Type T containers with capacities greater than 3 yd^3 (2.30 m^3) through 10 yd^3 (7.65 m^3) (Figure 9) shall be designed and manufactured in accordance with the dimensional requirements listed in Table 6.

Table 6 — Dimensional requirements for Type T containers of more than 3 yd^3 (2.30 m^3) and less than or equal to 10 yd^3 (7.65 m^3) capacity. (Used in conjunction with trunnion-bar-lifting systems)

Dimension	Specification	Description
A	Min: 77-1/2 in (196.8 cm) Max: 78 in (198.1 cm)	Total length of the trunnion bar including washers if provided. NOTE - If washers are provided, their diameter should be 2-1/4 in (5.7 cm)
B	Max: 72 in (182.9 cm)	Width of the container and all the supporting gussets attached to the trunnion bar
C	Max: 66 in (167.6 cm)	Width of the container body including structural supporting side members (side rails). NOTE - This dimension excludes gusset supports
D	Min: 1-1/4 in (32 mm) Max: 1-3/4 in (44 mm)	Diameter of trunnion bar at latch-up points
*****E	Max: 1-1/4 in (32 mm)	The maximum diameter (thickness) of an attachment through which a cable may be hooked to the container
*****F	Min: 2 in (51 mm) Max: 3 in (76 mm)	The inside width of an attachment through which a cable may be hooked to the container
G	Min: 45 in (114.3 cm) Max: 49 in (124.5 cm)	Distance from the centerline of the trunnion bar to the ground. The top of the trunnion bar should coincide with the top of the container on the side where the trunnion bar is located.

* NOTE: Illustrations shown and dimensions given are intended to depict compatibility of the engaging hook of the lifting device and the attachment point of the container. Alternative attachment point designs may be acceptable as long as the resulting hooking ability is comparable to the illustration shown, and without restricting the lift device hook and its safety latching ability. In addition, all designs must be compatible with the weight design of the container.

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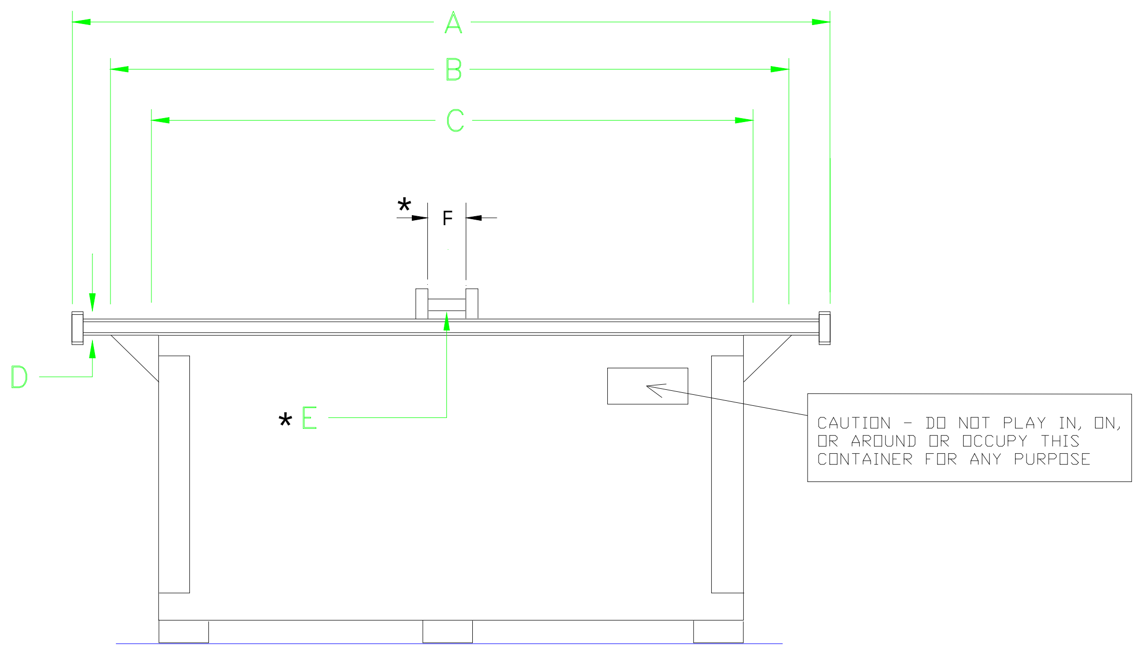
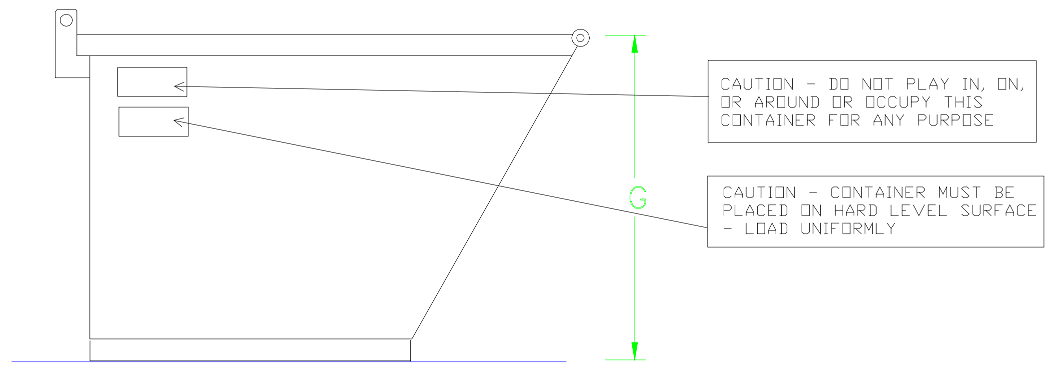


*For dimensions E & F see Note 1



Note 1: Illustrations shown and dimensions given are intended to depict compatibility of the engaging hook of the lifting device and the attachment point of the container. Alternative attachment point designs may be acceptable as long as the resulting hooking ability is comparable to the illustration shown, and without restricting the lift device hook and its safety latching ability. In addition, all designs must be compatible with the weight design of the container.

Figure 9 — Type T container (more than 3 yd^3 (2.3 m^3), but less than or equal to 10 yd^3 (7.65 m^3)

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7.6 Requirements for Type U containers (see Figure 10). Type U containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 7.

Table 7 — Dimensional requirements for Type U containers (Used in conjunction with transport vehicles)

Dimension	Specification	Description
A	Min: 36 in (91.4 cm)	Distance between the inside surfaces of the long rails
B	Max: 41 in (104.1 cm)	Distance between the outside surfaces of the long rails
C	Min: 3-1/2 in (89 mm)	Height of the clear area between the long rails, aft of lead-in or guide rollers to the rear of the container
D	Min: 58 in (147.3 cm)	Width of the clear area, excluding the long rails, lead-in or guide rollers and rear holddowns, between the inside surfaces of the rear ground rollers or other features mounted on the underside of the container body
E	Max: 3 in (76 mm)	Vertical distance between the bottom of ground wheels or other features to the bottom surfaces of the rails
F	Min: 4 in (102 mm) Max: 6-1/2 in (165 mm)	Dimension from the inside vertical surface of the long rail to the inside edge of the lead-in or guide roller
G	Min: 3-1/2 in (89 mm) Max: 4 in (102 mm)	Diameter of each lead-in or guide roller
H	Min: 3-3/8 in (86 mm) Max: 3-5/8 in (92 mm)	Vertical distance from the bottom of the lead-in or guide roller to the bottom surface of the long rail
I	Min: 18-1/2 in (47 cm)	Horizontal distance from the leading edge of the lead-in or guide roller to the forward-most pull point of the lifting mechanism receiver
J	Min: 6 in (152 mm) Max: 10-1/2 in (267 mm)	Vertical distance from the bottom of the long rail to to the forward-most pull point of the pick-up hook
K		Horizontal distance from the leading edge of the lead-in or guide roller to the forward edge of the rear holddown device, based on the length of the long rail

K = 147-1/2 in + 1 in, - 0 in (374.6 cm + 2.5 cm, - 0 cm) for long-rail length $\geq$12 ft (3.66 m) and <18 ft. (5.49 m)

K = 193 in +1 in, - 0 in (490.2 cm + 2.5 cm, - 0 cm) for long-rail length $\geq$18 ft (5.49 m) and $\leq$ 24 ft. (7.32 m)

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Dimension	Specification	Description
L	Max: 2-1/8 in (54 mm)	Vertical distance from the bottom of the long rail to the top of the rear holddown device
M	Min: 45 in (1143 mm) Max: 50 in (1270 mm)	Width of the rear holddown device measured between the outside edges of the holddown devices on both long rails
N	Max: 5 in (127 mm)	Outer radius of pick-up hook measured from the outside back of the hook, opposite the hook point
O	Min: 7/8 in (22 mm)	Inner radius of pick-up hook measured from the inside back of the hook, opposite the hook point
P	Max: 1-1/2 in (38 mm)	Width of hook at the widest cross-section
Q	Max: 36 in (91.4 cm)	Distance between leading edge of lead-in roller and trailing edge of front ground wheel (if installed)
R	Max: 14 in (35.6 cm)	Distance between leading edge of rear ground wheel and rear end of long rail
S	Min: 72 in (182.9 cm)	Distance between trailing edge of front ground wheel (if installed) and leading edge of rear ground wheel
T	Max: 24 in (609 mm)	Length of rear holddown device

NOTE 1: Dimensions A, B, and D are measured centered on the container centerline.

NOTE 2: Measurements I and J reference a key point in relation to the leading edge of the guide roller. The key point remains the same for other receiver types, such as either a knuckle-end or safety hook-end lifting device.

NOTE 3: Dimension K varies by the length of the container. It is the responsibility of the hoist manufacturer to provide a mating receiver for the rear holddown on the vehicle hoist/tilt frame. In compactor-container combinations, measurement of long-rail length for dimension K is inclusive of the compactor assembly.

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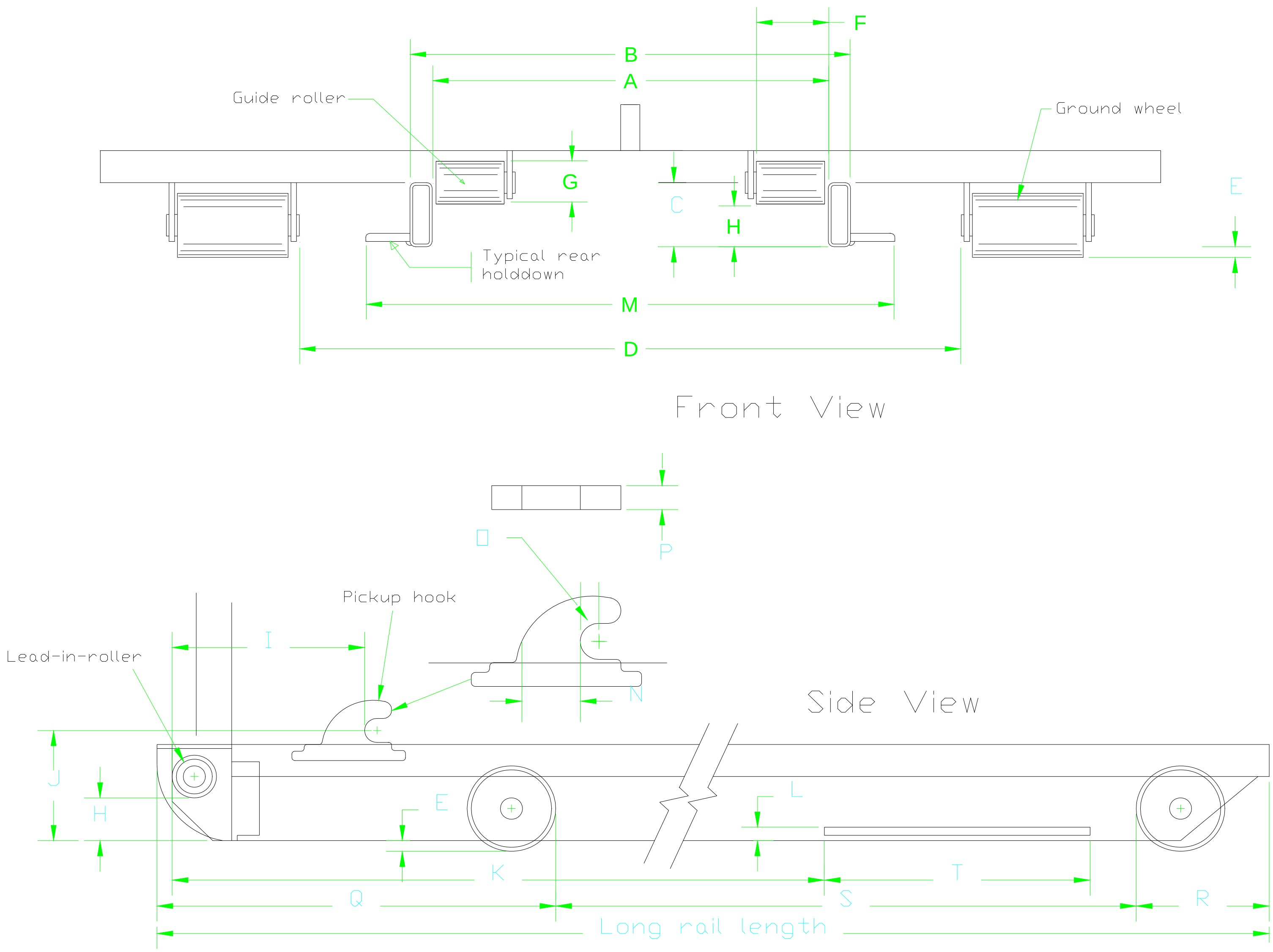

Figure 10 — Type U container

7.7 Requirements for Type */C detachable compactor-container (see Figure 11). Type */C detachable compactor-containers shall be designed and manufactured in accordance with the additional features according to dimensional requirements listed in Table 8.

Table 8 — Dimensional requirements for Type */C detachable compactor-containers

Dimension	Specification	Description
A	Min: 12 in (30.5 cm) Max: 14 in (35.6 cm)	Height of the container opening above ground level, measured from the top of the lower sill
B	Min: 45 in (114.3 cm) Max: 48 in (121.9 cm)	Height of the compactor opening
C	Min: 63 in (160.0 cm) Max: 65 in (165.1 cm)	Width of the compactor opening
D	Min: 29 in (73.7 cm) Max: 32 in (81.3 cm)	Height above ground of the center point of the container lock envelope
E	Min: 9 in (22.9 cm) Max: 14 in (35.6 cm)	Horizontal distance from the front vertical mating surface of the compactor opening to the center point of the container lock envelope
F	Min: 4 in (10.2 cm) Max: 5 in (12.7 cm)	Height of the container lock envelope
G	Min: 4 in (10.2 cm) Max: 7 in (17.8 cm)	Depth of the container lock envelope

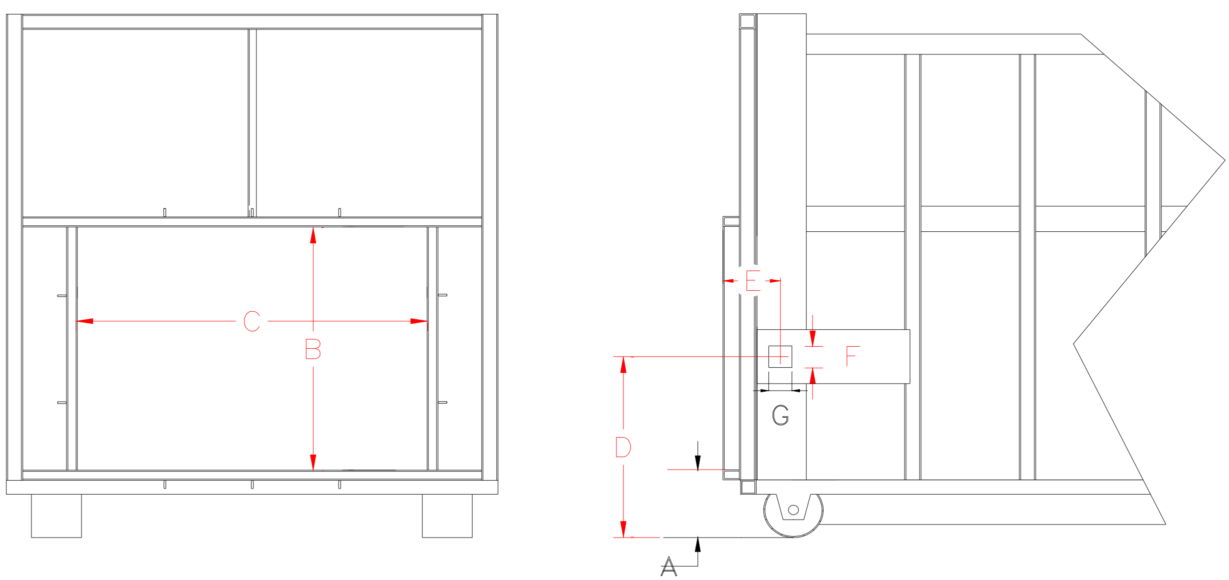

Figure 11 — Type */C container

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7.8 Requirements for Type H containers (dead lift roll-off) (see Figure 12). Type H containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 9.

Table 9 — Dimensional requirements for Type H containers (Used in conjunction with transport vehicles)

Dimension	Specification	Description
A	Min: 36 in (91.4 cm)	Distance between inside surfaces of long rails (I.D.)
B	Max: 43 in (109.2 cm)	Distance between outside surfaces of long rails (O.D.)
C	Min: 46 in (116.8 cm)	Height of the front vertical guide tubes
D	Max: 4 in (10.2 cm)	Distance from the bottom of the ground wheel to the bottom of the long rail
E	Min: 12 in (30.5 cm) Max: 12-1/4 in (31.2 cm)	Front stop location (bottom of long rail to top of front container stop)
F	Min: 58 in (147.3 cm)	Distance between inner edges of ground wheels
G	Min: 3 in (7.6 cm) Max: 6 in (15.2 cm)	Width of roller (O.D.)
H	Min: 3.5 in (9.0 cm) Max: 4 in (10.2 cm)	Roller diameter
I	Min: 3 in (7.6 cm) Max: 6 in (15.2 cm)	Depth of front uprights
J	Min: 8-3/8 in (21.3 cm) Max: 9-7/8 in (25.1 cm)	Centerline of bottom radius of receiver to bottom of long rail
K	Min: 3-3/8 in (9.2 cm) Max: 3-5/8 in (9.6 cm)	Bottom of front roller to bottom of long rail

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L	Min: 8-7/8 in (22.6 cm) Max: 9-1/8 in (23.2 cm)	Front edge of the main rail bull nose aft to roller centerline. NOTE - 9 in (229 mm) are required for positive latching of roller
M	Min: 163-1/4 in (414.6 cm) Max: 163-3/4 in (415.9 cm)	Leading edge of the lead in roller rearward to the front edge of the rear holddown
Q	Min: 36 in (91.4 cm) Max: 41 in (104.1 cm)	Distance between leading edge of the lead-in roller and trailing edge of front ground wheel (if installed)
R	Max: 18 in (45.7 cm)	Distance from leading edge of rear ground wheel to rear end of long rail
S	Min: 72 in (182.9 cm)	Distance between trailing edge of front ground wheel (if installed) and leading edge of rear ground wheel
T	Min: 2 in (5.1 cm) Max: 4 in (10.2 cm)	Top surface of rear holddown to bottom of long rail
U	Min: 12-1/2 in (31.7 cm) Max: 13-1/2 in (34.3 cm)	Distance from inside surface of left long rail (viewed from the rear forward) to the centerline of the rear hold down bracket
V	Max: 4 in (10.2 cm)	Spacing between the hold-down brackets

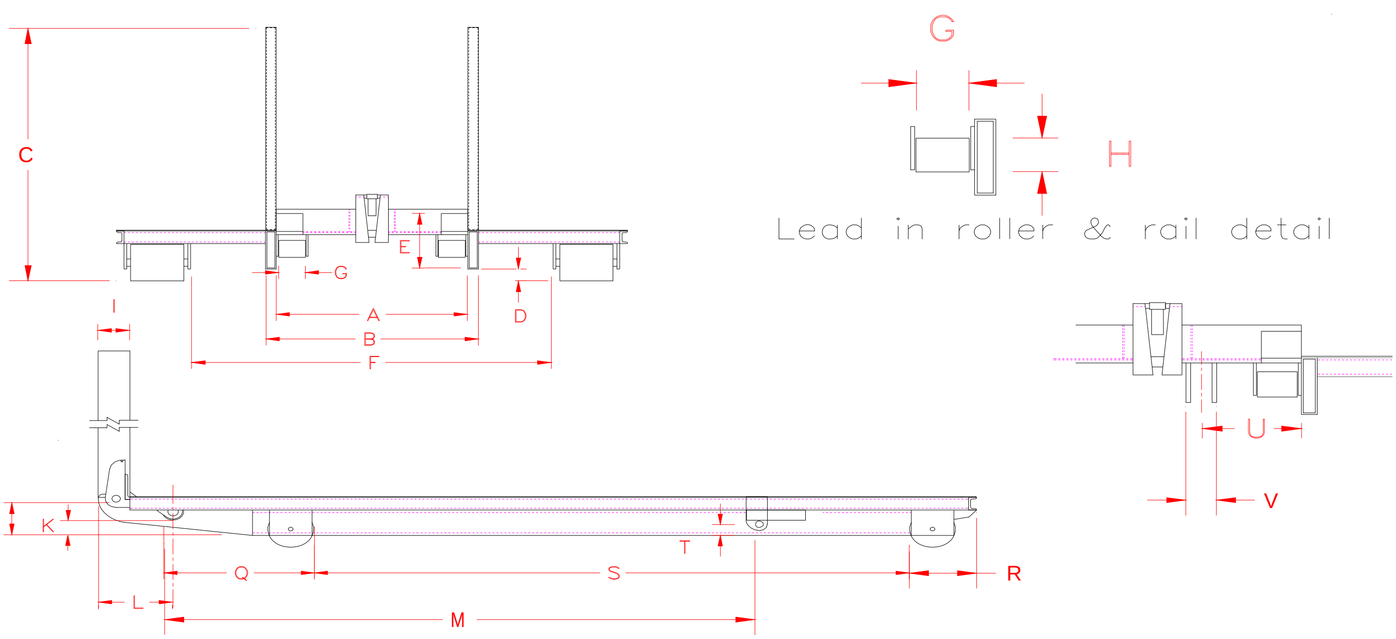

Figure 12 — Type H container

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7.9 Requirements for Type I (bail and hook) containers (see Figures 13 and 14). Type I containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 10.

Table 10 — Dimensional requirements for Type I containers (Used in conjunction with transport vehicles)

Dimension	Specification	Description
A	Min: 26-1/2 in (67.3 cm)	Distance between inside surfaces of long rails (I.D.)
B	Max: 33-1/2 in (85.1 cm)	Distance between outside surfaces of long rails (O.D.)
C	Min: 2-1/2 in (6.3 cm) Max: 3 in (7.6 cm)	Width of detent
C1	Min: 20-1/2 in (52.1 cm) Max: 22-1/2 in (57.2 cm)	For front shuttle assembly only! Distance from center of bail hook to rear of detent stop
C2	Min: 16 in (40.6 cm) Max: 18 in (45.7 cm)	For all remaining shuttle assemblies! Distance from center of bail hook to rear of detent stop
D	Min: 27-3/4 in (70.5 cm) Max: 29 in (73.7 cm)	Distance from the shuttle assembly centerline to outside of detent
E	Min: 77 in (196 cm) Max 80 in (203.2 cm)	Distance between rear skids
F	Max: 3-1/2 in (8.9 cm)	Width of long rail
G	Min: 11-5/8 in (29.5 cm)	Centerline of shuttle assembly to inside of rail stop
H	Max: 1 in (2.5 cm)	Distance from base of long rail to bottom of detent
I	Min: 5-1/2 in (14.0 cm) Max: 7 in (17.8 cm)	Distance of front pick-up hook to base of long rail
J	Max: 67 in (170.2 cm)	Distance from center of first (front) shuttle only to center of adjacent shuttle.
J1	Max: 67 in (170.2 cm)	Distance from centerline of remaining shuttles to centerline of adjacent shuttles.
K	Min: 8 in (20.3 cm) Max: 9 in (22.9 cm)	For front shuttle assembly only! Distance from center of bail hook to center of flipper
K1	Min: 2-3/4 in (7.0 cm) Max: 5 in (12.7 cm)	For front shuttle assembly only! Distance from center of flipper to center of rear section of bail hook
L	Min: 4 in (10.2 cm) Max: 5 in (12.7 cm)	For all remaining shuttle assemblies! Distance from center of bail hook to center of flipper

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Dimension	Specification	Description
L1	Min: 4 in (10.2 cm) Max: 5 in (12.7 cm)	For all remaining shuttle assemblies! Distance from center of flipper to center of rear section of bail hook
M	Min: 3 in (7.6 cm) Max: 4 in (10.2 cm)	Distance from bottom of main rail to the bottom of the hook
N	Min: Set by container length Max: 78 in (198 cm)	Distance from the centerline of the front shuttle hook to the front of the container stop
O	Max: 2 in (5.1 cm)	Distance from the bottom of the main rail to the top of the container stop

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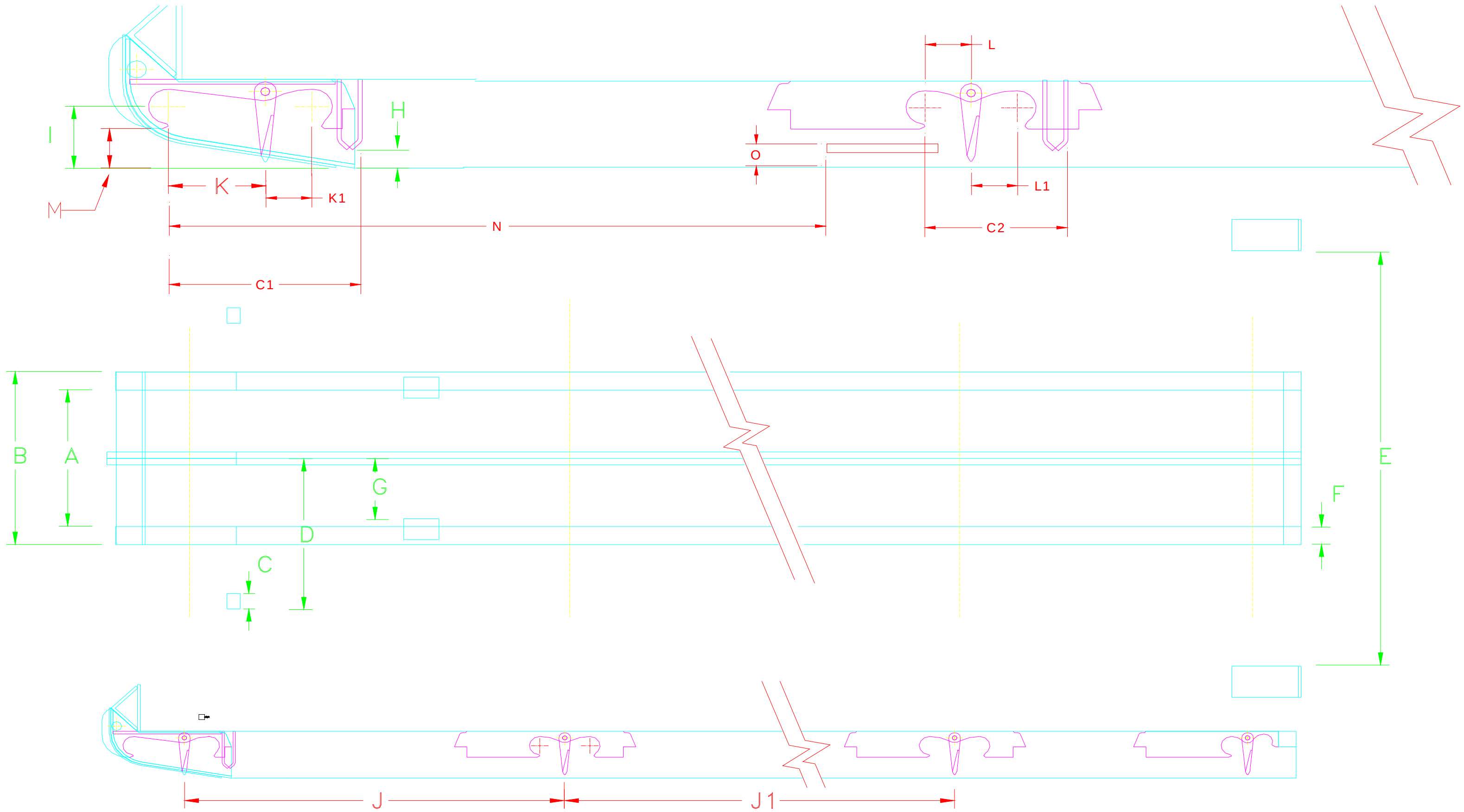

Figure 13 — Type I container

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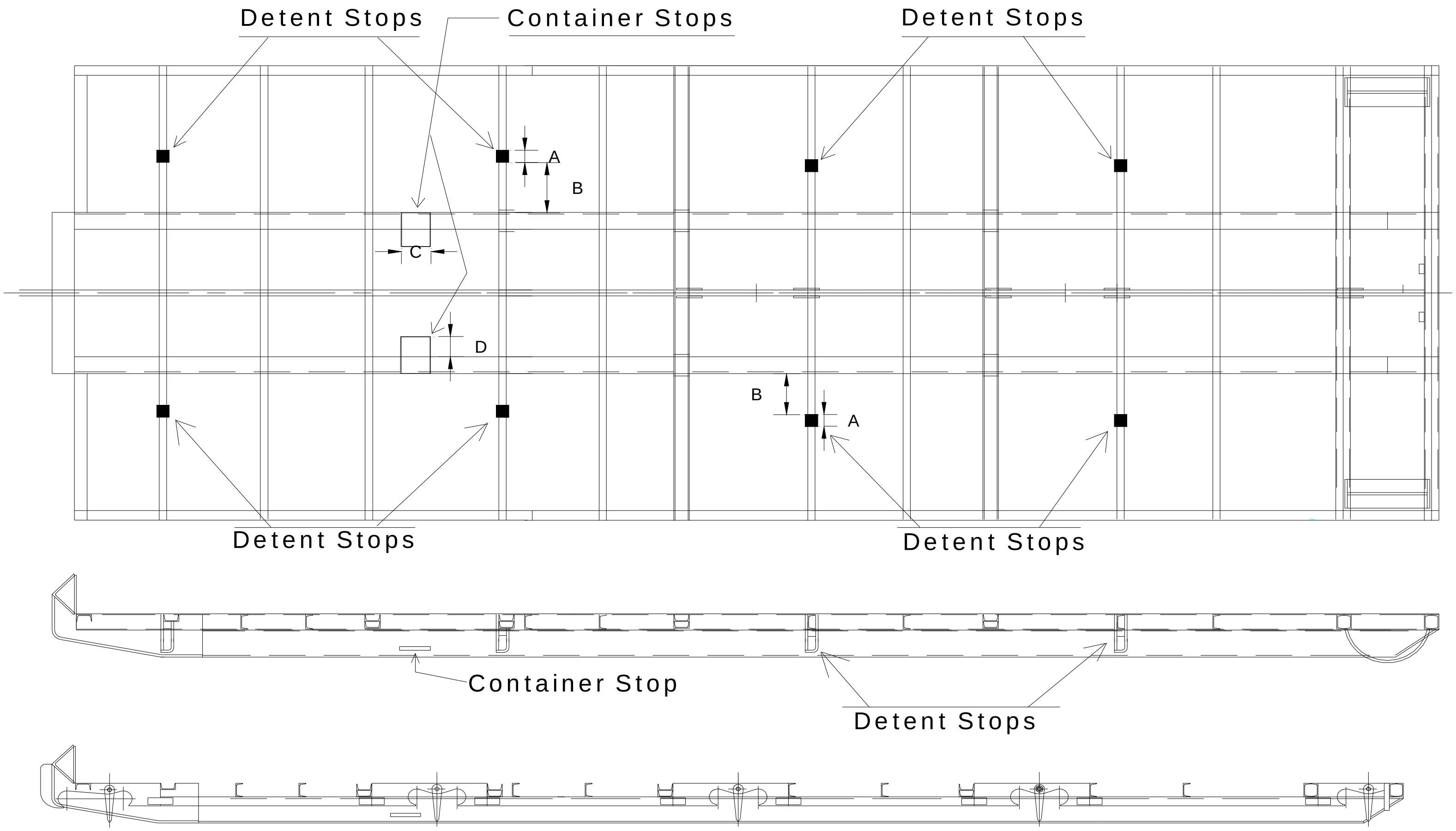

A = Container stop width = 6.4 cm (2-1/2 in) Min.
B = Container stop distance from side rail = 21.6 cm (8-1/2 in) Min.
C = Container stop width = 15.2 cm (6 in)
D = Container stop depth = 7.6 cm (3 in)

Figure 14 – Type I container stops and detents detail

7.10 Requirements for Type L containers (see Figure 15). Type L containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 11.

Table 11 — Dimensional requirements for type L containers (includes Type L-1 (see NOTE), L-2, and L-3 containers) (Used in conjunction with transport vehicles)

Dimension	Specification	Description
A	All: Min 36 in. (91.4 cm)	Distance between inside surfaces of long rails (I.D.)
B	All: Max 41 in. (104.1 cm)	Distance between outside surfaces of long rails (O.D.)
C	All: Min 2 in. (5.1 cm)	Long rail width
D	L-2 & L-3: Min 6 in. (15.2 cm)	Long rail height (bottom of deck frame to bottom of rail)
E	L-2 & L-3: 2 -1/2 in. (6.4 cm)	Lift bar diameter
F	L-2 & L-3: Min 10 in. (25.4 cm)	Length of lift bar at longest dimension between A-frame open ends (I.D.)
G	L-2: Min 54 in. (137.2 cm) L-2: Max 541/2 in. (138.4 cm) L-3: Min 61-3/4 in. (156.8 cm) L-3: Max 62- 1/4 in. (158.1 cm)	Distance from bottom of lift bar to bottom of long rails.
H	L-2: Min 7-3/4 in (19.7 cm) L-2: Max 8-1/4 in (21.0 cm) L-3: Min 7-3/4 in (19.7 cm) L-3: Max 8-1/4 in (21.0 cm)	Back of lift bar to rear of A-frame
J	L-2: Min 150 in. (381 cm) L-2: Max 150-1/2 in. (382.3 cm) L-3: Min 195-1/2 in. (496.6 cm) L-3: Max 196 in. (497.8 cm)	Distance between back of lift bar and front of rear holddowns
K	Min: 1-5/8 in (4.1 cm) Max: 2-1/8 in (5.4 cm)	Top of hold downs to bottom of skid rail
L	Min 2 in. (5.1 cm)	Clearance from bottom of long rails to bottom of gussets, if any
M	L-2 & L-3: Min 6 in. (15.2 cm)	Free tunnel height

The lift bar shall have a minimum bend at the center point of 125 degrees, 135 degrees maximum.

The lift bar shall be installed at a 45-degree angle from the vertical.

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Although holddown position may be determined by the user, some type of holddown shall be provided.

If gussets are used, they shall be a maximum of 45 degrees mounted on the inside of the long rails.

NOTE 1: It is preferable to leave the outside of the long rails free from gussets.

NOTE 2: At this time dimensions for size L-1 will not be issued. It was determined that size L-1 containers are not actively used in the waste industry. If, at a future time L-1 size containers become active in the waste industry, the appropriate compatible dimensions will be supplied.

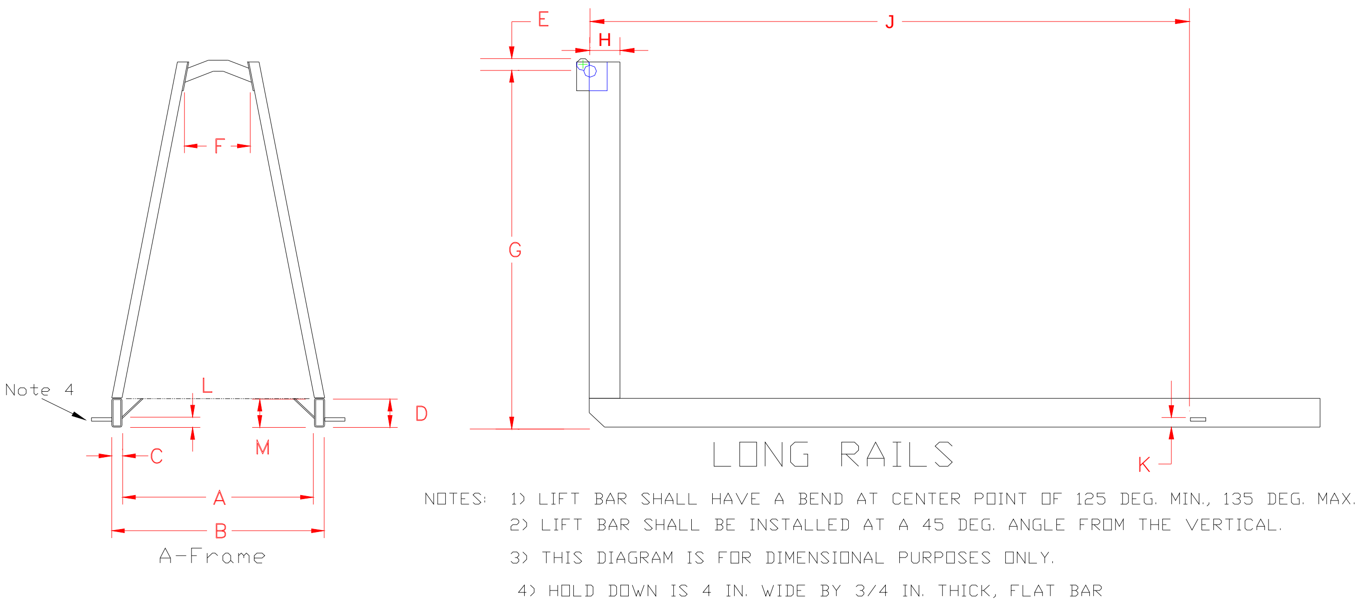

Figure 15—Type L (L-1, L-2, and L-3) hook lift containers used with transport vehicles

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7.11 Requirements for Type S containers. Type S containers shall be designed and manufactured in accordance with dimensional requirements listed in Table 12.

Table 12: Dimensional requirements for Type S containers of up to, and including 8 yd^3 [6.12 m^3] capacity. (Used in conjunction with side-fork type lifting systems)

Dimension	Specification	Description
Key Points	2 each	The points located at the forward vertical surface of the bump plates (or front panel of the container if no bump plates are used), on a horizontal line ahead of the front top inside corner of the pocket, exclusive of any lead-in gussets
A	Max: Dim. “C” plus 4-1/2 in. (11.4 cm)	Width of the top of the container, at the widest point, including all lids, hinges and hinge rods
B	Min 79 in. (200.7 cm) Max 80 in. (203.2 cm)	Width of the fork receiver area at the inside surface of the outboard pocket walls (See note 3.)
C	Max 73- 1/2 in. (186.7 cm)	Width of the fork receiver area at the inside surface of inboard pocket wall, including bump plates
D	Min 7- 1/2 in. (19.1 cm) Max 9 in. (22.9 cm)	Height of the pocket between the inside surfaces of the top and bottom walls
E	Min 4 in. (10.2 cm)	Extension of the bump plates below the inside surface of the bottom pocket wall (See note 6.)
F	Min 25 in. (63.6 cm)	Height above ground of the pocket at the inside surface of the top wall
G	Max 89 in. (226.1 cm)	Swing radius, measured from reference H key point (side view) to Point GR
Arc g	(See note 4.)	The arc defined by the swing radius (side view) around the key point
Point GR	(See note 4.)	The top rearmost point of the container (side view), over all lids and hinges
H	Max 48 in. (121.9 cm)	Vertical height from the key point to the top leading edge of the container, over all lids and hinges (also, see dimension L.)
Angle i	Min 45 degrees	Set-back angle of the top of the container, over all lids and hinges from the vertical, measured from point IF (See note 4.)
Point IF		The top forward-most point of the container (side view), over all lids and hinges

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Dimension	Specification	Description
J	Max 34 in. (86.3 cm)	Vertical height from the key point to the bottom of the container, including any skid plates, except when a beveled front lower leading edge is used (See note 1.)
Angle j	Min 45 degrees	Set-back angle of the beveled leading edge of the container from the vertical plane of the front container wall (See note 1.)
K	Min 28- 1/2 in. (72.4 cm) Max 42- 1/2 in. (107.9 cm)	Depth of the pocket measured from the front of the bump plate along the inside surface of the top wall. Pocket length not to exceed the full depth of the container.
L	Max 8 in. (20.3 cm)	The horizontal limit that point IF may extend ahead of the key point (side view)
M	Min 3 in. (7.6 cm) Max 8 in. (20.3 cm)	Set back of the vertical leading edge of the pocket from the key point, exclusive of any lead-in gussets (See note 5.)
N	Min 2 in. (5.1 cm)	The vertical extension of the clear sidewall area above the inside surface of the top pocket wall (See note 2.)

NOTE 1: If the height of the front wall of the container below the key point is greater than 34 in. (86.3 cm), a beveled front lower leading edge must be used to provide clearance over the truck cab and cab shield when the container is lifted.

NOTE 2: In general the area adjacent to the side wall of the container behind the pocket to the rear of the container, corresponding in dimension to the inside dimensions of the pocket plus dimension N in height, is required to accommodate the lifting device forks and fork ends. If a pocket with a dimension K of greater than 42 ½ in. (107.9 cm) is used, the top wall must be cut out or extended upward by dimension N for any span beyond 42 ½ in. (107.9 cm).

NOTE 3: The pocket may be either a four-sided sleeve or a series of brackets, which are closed on four sides. Flared gussets may be used at the leading edge of the pocket to assist in mating the lifting device forks and the pockets and if used may not reduce the minimum dimension to less than 78 in (198.1 cm). If the lateral movement of the container body is controlled and centered on the forks by the inboard sides of the fork pockets versus the outboard sides of the fork pockets, then an 81 in. (205.7 cm) maximum is acceptable.

NOTE 4: The maximum height and depth of the top of the container are determined by the arc g and the line, with origin at point IF and set back of angle i, which intersects arc g, when viewed from the side. This is necessary to provide clearance between the container and the back of the hopper of the collection vehicle when the container is dumped.

NOTE 5: The area adjacent to the container sidewall ahead of the pocket to the front of the bump plate, corresponding in dimension to the inside dimensions of the pocket, must be kept clear to accommodate the forks.

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NOTE 6: The area of the front wall of the container ahead of and between the pockets and bump plates must be kept clear to accommodate the lifting device. The bump plates (if used) must extend below the inside surface of the bottom walls of the pockets by a minimum of dimension E, which assures that the minimum dimension of M can be maintained by preventing the torque tube of the lifter from riding below the bump plates.

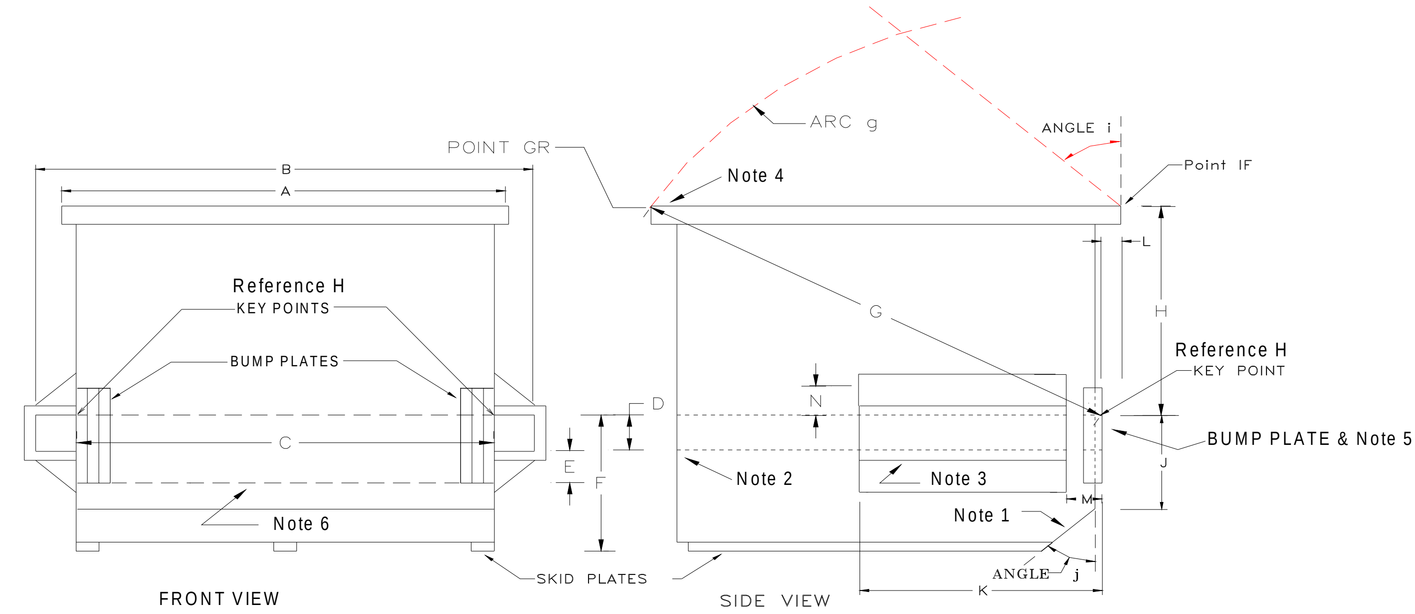

Figure 16 – Type S - Compatibility dimensions for containers up to, and including 8yd^3 (6.12 m^3) used with side fork lifting systems on front loader waste collection vehicles

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