APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0569 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Berg Electric

Manufacturer's Technical Representative: Brock Knowles

Mailing Address: 1935 Deere Avenue, Irvine, CA 92606

Telephone: (310) 912-7082 Email: bknowles@bergelectric.com

Product Information

Product Name: C & D Technologies 4-Tier Battery Rack and Micro ARE-M Series Ferroresonant Charger

Product Type: Backup Battery System

Product Model Number: Varies, see Attachment A
(List all unique product identification numbers and/or part numbers)

General Description: 4-Tier Battery rack with (20) Lead Acid Batteries and Ferroresonant Charger. Seismic enhancements made to the test units to address anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Charger: Rigid wall mounted.

Battery rack: Rigid Base Mounted. ***Battery Rack must be CD Technologies Rack Model #RDO1266.***

Applicant Information

Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Contact Person: Andrew M. Coughlin, SE

Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

Telephone: 844-878-0200 Email: acoughlin@structint.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant: Andrew M Coughlin Date: 5/31/2018

Title: Director, TRU Compliance Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Name: Andrew M. Coughlin California License Number: S6082

Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

Telephone: 844-878-0200 Email: acoughlin@structint.com

Supports and Attachments Preapproval

☐ Supports and attachments are preapproved under OPM-
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)

☒ Supports and attachments are not preapproved

Certification Method

☒ Testing in accordance with: ☒ ICC-ES AC156

☐ Other (Please Specify):

Testing Laboratory

Company Name: National Technical Systems (NTS)

Contact Name: Ratish Rao

Mailing Address: 1536 East Valencia Drive, Fullerton, CA 92831

Telephone: (714) 879-6110 Email: ratish.rao@nts.com

Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = 0.76

S_{DS} (Design spectral response acceleration at short period, g) = 1.681

a_p (In-structure equipment or component amplification factor) = 1

R_p (Equipment or component response modification factor) = 2.5

Ω_0 (System overstrength factor) = 2

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 0

Equipment or Component Natural Frequencies (Hz) = See Attachment A

Overall dimensions and weight (or range thereof) = See Attachment A

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: ☐ Yes ☒ No

Design Basis of Equipment or Components (V/W) =

S_{DS} (Design spectral response acceleration at short period, g) =

S_{D1} (Design spectral response acceleration at 1 second period, g) =

R (Response modification coefficient) =

Ω_0 (System overstrength factor) =

C_d (Deflection amplification factor) =

I_p (Importance factor) = 1.5

Height to Center of Gravity above base =

Equipment or Component Natural Frequencies (Hz) =

Overall dimensions and weight (or range thereof) =

Tank(s) designed in accordance with ASME BPVC, 2015: ☐ Yes ☒ No

List of Attachments Supporting Special Seismic Certification

☒ Test Report(s) ☐ Drawings ☐ Calculations ☒ Manufacturer's Catalog

☒ Other(s) (Please Specify): Attachment A

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature: _____ Date: October 5, 2018

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to : S_{DS} (g) = 1.681 z/h = 0

Condition of Approval (if applicable): ***Battery Rack must be CD Technologies Rack Model #RDO1266***

SPECIAL SEISMIC CERTIFICATION
CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 1800053

TRU COMPLIANCE

Manufacturer:	Berg Electric
Model Line:	Modular Battery Rack and Charger

TABLE 1

Certified Product Construction Summary:

Battery rack is constructed of painted carbon steel. The NEMA 1 enclousure for the battery charger is powder coated carbon steel.

Certified Options Summary:

Mounting Configuration:

Battery Rack - Rigid Base Mounted; Charger - Rigid Wall Mounted

Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2016 ***Seismic Certification Limits:*** S_{DS}= ***1.681 g*** ***z/h=0.0*** I_P= ***1.5***

Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Modular Battery Rack	RD01266	20.25	43.5	60.44	2220	Qty: 20 Lead Acid Batteries	1
Micro ARE Charger	M13035A	19	20.5	30	460		2

SPECIAL SEISMIC CERTIFICATION
CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 1800053

TRU COMPLIANCE

Manufacturer: Berg Electric
Model Line: Modular Battery Rack and Charger

TABLE 2

Building Code: CBC 2016 ***Seismic Certification Limits:*** S_{DS} = 1.681 g z/h = 0.0 I_P = 1.5

Model Line (Manufacturer)	Model	Dimension (in)			Weight (lb)	Material	Notes	UUT
		Depth	Width	Height				
Battery (Liberty)	LS6-200	6.84	16.58	8.95	95	6V lead-acid (VRLA), 200 Ah		1

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1800053

UUT 1

Manufacturer: Berg Electric
Model Line: Modular Battery Rack and Charger
Model Number: RD01266 ***Serial Number:*** NTS1

Product Construction Summary:
Steel rack with acid-resistant, scratch-resistant, and chip proof paint.

Options/Subcomponent Summary:
Twenty (20) Liberty LS6-200 batteries

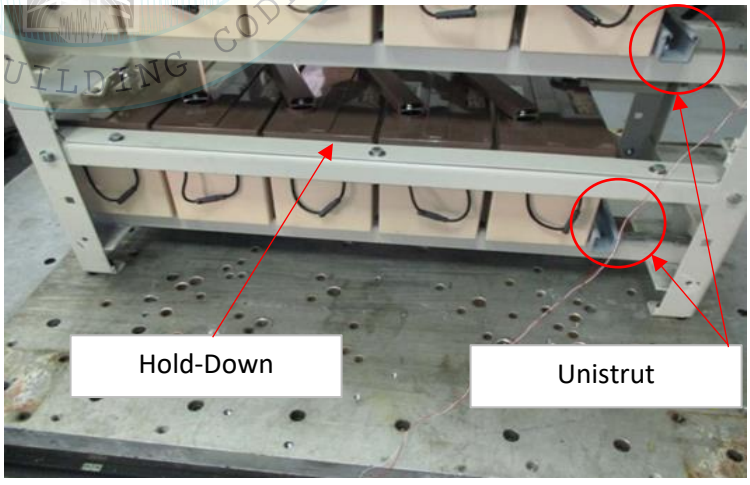
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2220	20.25	43.5	60.44	8.25	7.72	>33.3

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS} (g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC156	1.681	0.0	1.5	1.68	0.67	1.12	0.45

Test Mounting Details:



Rigid base mounted with four (4) 1/2" Grade 8 bolts with lock washer and flat washer. Unistrut was fastened on each tier at end of battery row to retain batteries in the side-to-side direction. Manufacturer provided RD01371 hold downs were installed at the top of the long sides of each tier to restrain the batteries in the vertical direction.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1800053

UUT 2

Manufacturer: Berg Electric
Model Line: Modular Battery Rack and Charger
Model Number: ARE-M13035A ***Serial Number:*** BPS1876633

Product Construction Summary:
NEMA 1, steel with baked powder coat finish

Options/Subcomponent Summary:
Input 240V /Output 130V

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
460	19	20.5	30	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS} (g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC156	1.681	0.0	1.5	1.68	0.67	1.12	0.45

Test Mounting Details:

Rigid wall mounted with four (4) 3/8" Grade 8 bolts with lock washer and flat washer.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

C&D TECHNOLOGIES
Power Solutions

12-380

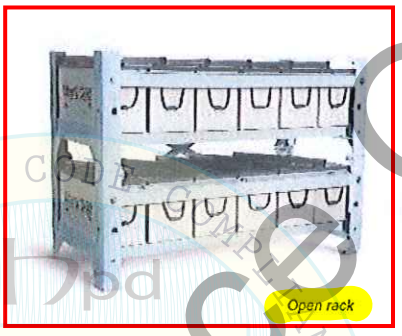
C&D TECHNOLOGIES® Liberty

RETURN RECYCLE LEAD

MODULAR BATTERY RACKS

FOR LIBERTY SERIES 1000®

C&D Technologies modular battery racks are designed to be flexible, durable, and easy to install. Engineered for use with C&D's Liberty Series 1000® batteries, these modular racks fit virtually any requirements.



Open rack

Enclosed rack with panels

APPLICATIONS

- **Telecommunications**
  - Private Branch Exchange (PBX)
  - Fiber Optic & Microwave sites
  - Outside Plant Facilities
- **UPS**
  - Data Centers
  - Industrial Process Control Facilities
  - Emergency 911 Response Centers
  - Air Traffic Control Centers
- **Switchgear & Control**
  - Portable Battery Trailers for Substation Battery Testing
  - Monitoring & Control Systems

FEATURES & BENEFITS

FLEXIBLE
- Stackable modules easily accommodate system expansion.
- Optional panels are available to completely enclose rack, providing a cabinet like appearance.
- Rack modules can be arranged end-to-end, back-to-back, and in tiered configurations.

DURABLE
- High-quality construction guarantees longer life.
- Acid-resistant paint is scratch-resistant and chip proof.

EASY TO INSTALL
- Rack can be ordered to ship fully assembled, requiring only onsite battery installation.
- Rack can ship unassembled as lower cost option.
- Racks are free standing, however floor-anchoring holes are provided (anchor bolts not supplied).

ACCESSIBLE
- Open rack allows easy maintenance and service.
- Optional panels remove easily to provide four-side access.

SEISMIC ZONE 4
- Standard modules vertically stacked and properly anchored meet 1994 UBC Zone 4 requirements (0.9g) up to four tiers.
- Five-tier modular rack with panels available for lower seismic applications (Zone 3, 0.675g).
- Special five-tier rack with bolt-on bracing is available that meets UBC Zone 4 requirements (panels not available).

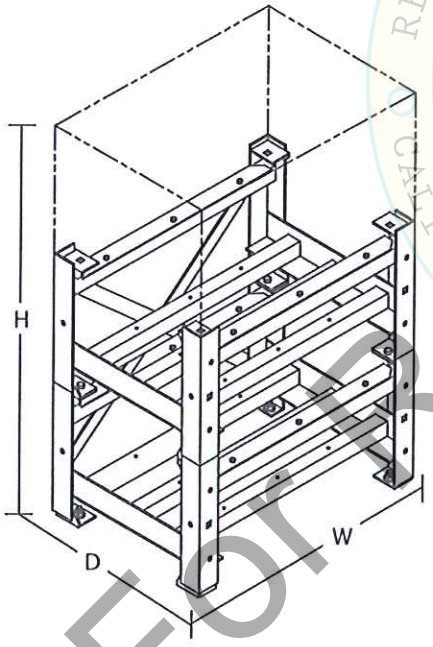
RACK SPECIFICATIONS

Model	Seismic Zone	Number of Tiers	Width in (mm)	Depth in (mm)	Height in (mm)	Weight* lbs (kgs)	Optional panels lbs (kgs)
29.00-In Racks							
RD01615	4	1	29.00 (736)	20.25 (514)	15.44 (392)	65 (30)	50 (23)
RD01616	4	2			30.44 (773)	130 (59)	80 (36)
RD01617	4	3			45.44 (1154)	195 (89)	112 (51)
RD01618	4	4			60.44 (1535)	260 (118)	144 (65)
RD01678**	4	5		25.25 (641)	75.44 (1916)	400 (181)	N/A
RD01623	3	5		20.25 (514)	75.44 (1916)	325 (148)	176 (80)
43.50-In Racks							
RD01263	4	1	43.50 (1105)	20.25 (514)	15.44 (392)	80 (36)	62 (28)
RD01264	4	2			30.44 (773)	160 (72)	102 (46)
RD01265	4	3			45.44 (1154)	240 (109)	142 (64)
RD01266	4	4			60.44 (1535)	320 (145)	182 (83)
RD01670**	4	5		25.25 (641)	75.44 (1916)	475 (216)	N/A
RD01262	3	5		20.25 (514)	75.44 (1916)	400 (181)	222 (101)

*Does not include the weight of the batteries, strictly empty rack weight

**Panels not available for this model

For racks with panels, use suffix "WP" with model number (Example: RD01263WP specifies single tier rack with panels.) Add 2.50 inches for each end panel, 0.75 inches for each front or rear panel, and 0.81 inches for the top panel.



Isometric Rack View

MAXIMUM RACK LOADING (NUMBER OF UNITS)

Model	LS12-100 (J) thru LS2-600 (J)
	29.00-In Racks
RD01615	4
RD01616	8
RD01617	12
RD01618	16
RD01678**	20
RD01623	20
	43.50-In Racks
RD01263	6
RD01264	12
RD01265	18
RD01266	24
RD01670**	30
RD01262	30

Note: Will fit LS12-100 through LS2-600 standard batteries and those with jackets.

For information on the Liberty Series 1000 batteries, please refer to brochure 12-373.

C&D TECHNOLOGIES, INC.
1400 Union Meeting Road
P.O. Box 3053 • Blue Bell, PA19422-0858
(215) 619-2700 • Fax (215) 619-7899 • (800) 543-8630
customersvc@cdtechno.com
www.cdtechno.com

GRIDS: 4 3 2 1

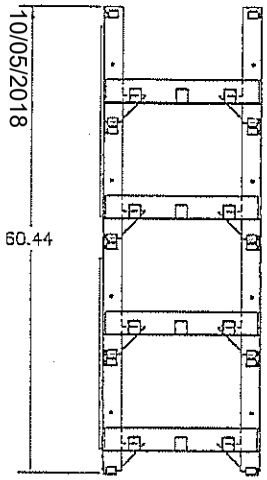
ORIGINAL

REVISION HISTORY							
ZONE	REV	DESCRIPTION	ECN #	REV'D	CHK'D	DATE	APPROVED
	15	REMOVED HOLD DOWN BARS; UPDATED FORMAT	10992	EJL	TPY	11/6/18	

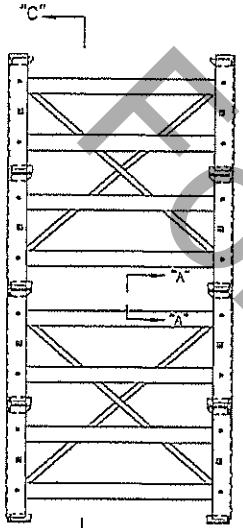
NOTES:
1. FLOOR MOUNTING HOLES ARE 0.594" SQUARE.
2. FLOOR MOUNTING BOLTS ARE NOT FURNISHED BY C&D.
3. STANDARD COLOR OF RACK IS DRIFTWOOD JP00539.
4. ANCHOR BOLT SIZE & TYPE SHALL BE DETERMINED BY INSTALLER TO COMPLY WITH BUILDING CODES.
5. FOR SAFETY & STABILITY, THE MANUFACTURER RECOMMENDS THAT RACKS BE ANCHORED TO THE FLOOR.
6. TORQUE ALL BOLTS (RACK ONLY) TO 300 IN-LBS.
7. REFER TO RS-990 FOR RECEIVING, HANDLING & INSTALLATION INSTRUCTIONS.
8. RACK WELDMENT (ITEM 1), SIDE RAILS (ITEM 2) & BUMPERS (ITEM 3) ARE ASSEMBLED FOR SHIPMENT. BRACES AND REMAINING HARDWARE SHIP LOOSE. SEE DWG. M09326 FOR SHIPPING SPECIFICATIONS.
9. ONE THRU FIVE TIER RACK ASSEMBLIES ARE DESIGNED FOR USE IN 1994 UBC ZONE 4 INSTALLATIONS.
10. OVERALL DIMENSIONS OF RACKS WITH PANELS ARE 48.50" x 22.00".

10/05/2018

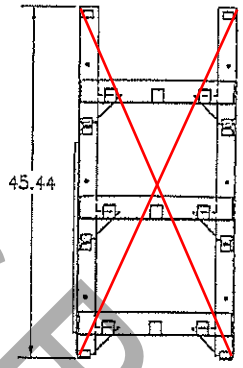
OSP-0569-10



SECTION "C-C"



FOUR TIER RD01266



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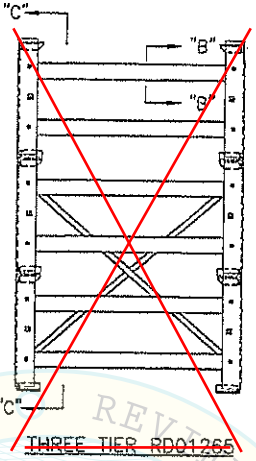
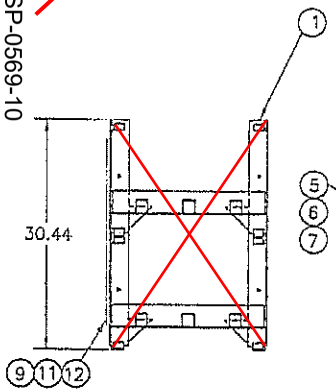
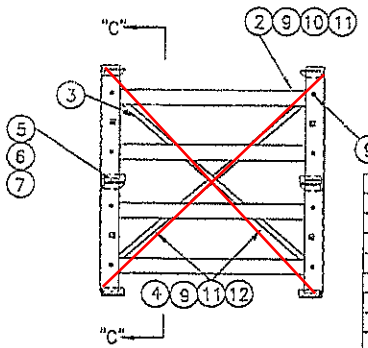


THREE TIER RD01265

BILL OF MATERIAL FOR RACKS ONLY						
QUANTITIES RD01266	RD01265	RD01264	RD01263	NAME	DESCRIPTION	PART NUMBER	ITEM
4	3	2	1	FRAME	STEEL WELDMENT	RD01297	1
8	6	4	2	RAIL	STEEL, 1.62 X 1.75 X 42.00" LG.	RD01370	2
40	30	20	10	BUMPER	RUBBER	JH01797	3
4	2	2	–	BRACE	STEEL, 1.50 X .188 X 48.00" LG.	RE00292	4
12	8	4	–	BOLT	STEEL, 1/2-13 X 1.00" LG.	PH01982P	5
12	8	4	–	NUT	STEEL, 1/2-13 (HEX)	PH01984P	6
24	16	8	–	WASHER	STEEL, 1/2 EXTERNAL TOOTH	JH00284	7
–	–	–	–	–	–	–	8
20	14	10	4	BOLT	STEEL, HEX 3/8-16 X 1.25" LG.	PH01482P	9
16	12	8	4	NUT	STEEL, CAPTURED 3/8-16	JH01897	10
24	16	12	4	WASHER	STEEL, STD. LOCK 3/8	PH00798P	11
4	2	2	–	NUT	STEEL, 3/8-16 (HEX)	PH00797P	12

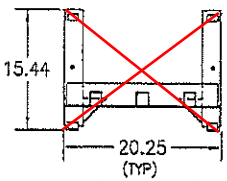


SECTION "C-C"



TWO TIER RD01264

BILL OF MATERIAL FOR RACK WITH PANELS							
QUANTITIES RD01266WP	RD01265WP	RD01264WP	RD01263WP	NAME	DESCRIPTION	PART NUMBER	ITEM
–	–	–	1	RACK	1 TIER	RD01263	14
–	–	1	–	RACK	2 TIER	RD01264	15
–	1	–	–	RACK	3 TIER	RD01265	16
1	–	–	–	RACK	4 TIER	RD01266	17
8	6	4	2	PANEL	FRONT AND REAR	RD01307	18
8	6	4	2	PANEL	END	RD01310	19
2	2	2	2	PANEL	TOP (END)	RD01312	20
1	1	1	1	PANEL	TOP (CENTER)	RD01311	21
16	12	8	4	BOLT	STEEL, HEX 3/8-16 x 1.00" LG.	PH00796P	22
4	4	4	4	SCREW	STEEL, HEX HD CAP 3/8-16 x 2.00" LG.	JH00230	23
20	16	12	8	NUT	3/8-16 CAPTURED	JH01897	24
1	1	1	1	LABEL	C&D LOGO	PH01989	25
16	12	8	4	WASHER	3/8 FLAT - .75 O.D.	PH01538	26



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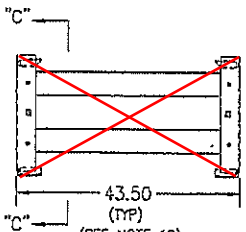


SINGLE TIER RD01263

Page 10 of 11

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. ± TOLERANCE ON: FRACTIONS ±1/32, .X ±.1, .XX ±.02, .XXX ±.005, ANGLES ±1°, .12 MAX. THIRD ANGLE PROJECTION. MATERIAL

DRAWN	C.H. HOUSTON	11/2/90
CHECKED	R. YODER	11/2/90
APPROVED	D. HEIMER	11/8/90
APPROVED		

FILE: M9254A

ALL SHEETS ARE THE SAME REVISION STATUS

C&D TECHNOLOGIES, INC.
1400 UNION MEETING ROAD, BLUE BELL, PA 19422-0853
www.cdtechno.com

TITLE: ASSY, 43.5" MODULAR RACK 1 - 5 TIER, EP, LIBERTY 1000

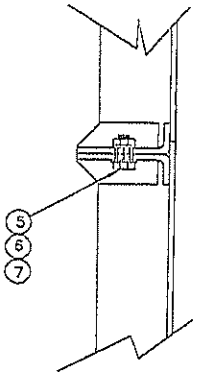
SIZE	CAGE CODE	DRAWING NUMBER	REVISION
C		M09254	15

SCALE NTS SHEET 1 OF 3

1277000

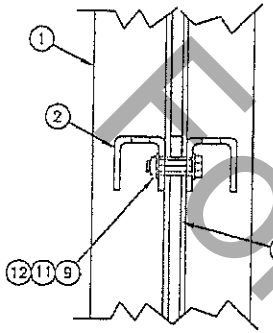
ORIGINAL

REVISION HISTORY							
ZONE	REV	DESCRIPTION	ECN#	REV'D	CHK'D	DATE	APPROVED
	15	REMOVED HOLD DOWN BARS; UPDATED FORMAT	10992	EJL	DDH	5/5/16	



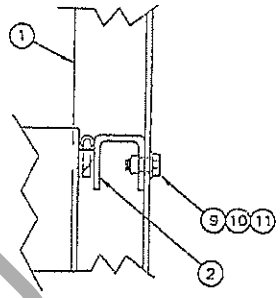
DETAIL "A–A"

TYPICAL OF BOLTING OF TIERS TOGETHER TO MAKE ONE UNIT



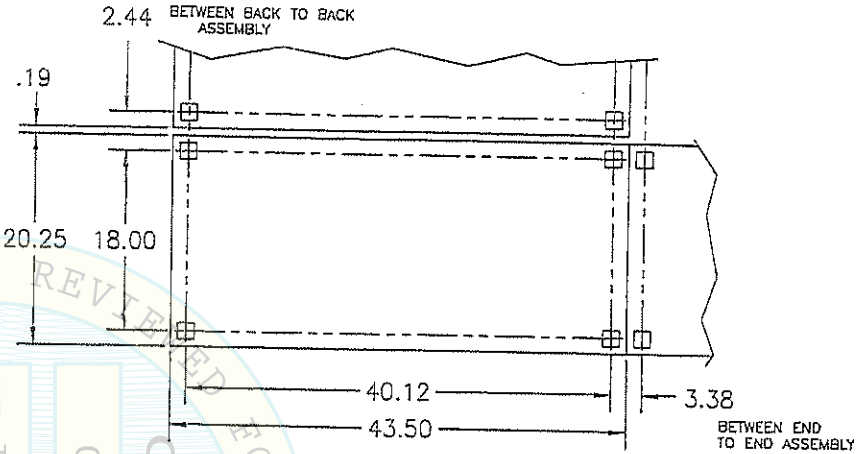
BRACE INSTALLATION

FOR BACK TO BACK ASSEMBLY DISCARD BRACES ON ONE RACK AND USE BRACES FROM ONE RACK ONLY.

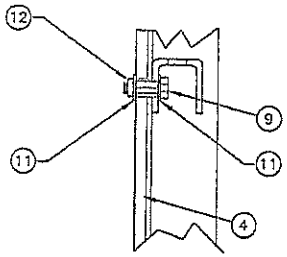


SECTION "B–B"

SIDE RAIL ASSEMBLY



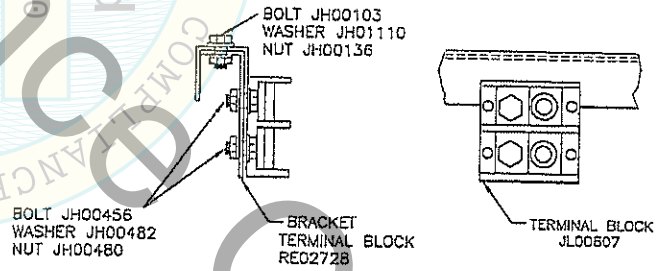
MOUNTING HOLE PATTERN



BRACE INSTALLATION

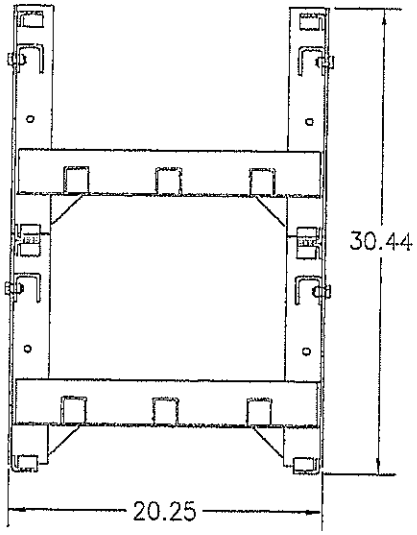
USE TWO LOCK WASHERS FOR BRACE CONNECTIONS WITH HEX NUT

OPTIONAL TERMINAL BLOCK & SUPPORT BRACKET ASSY. RT00202



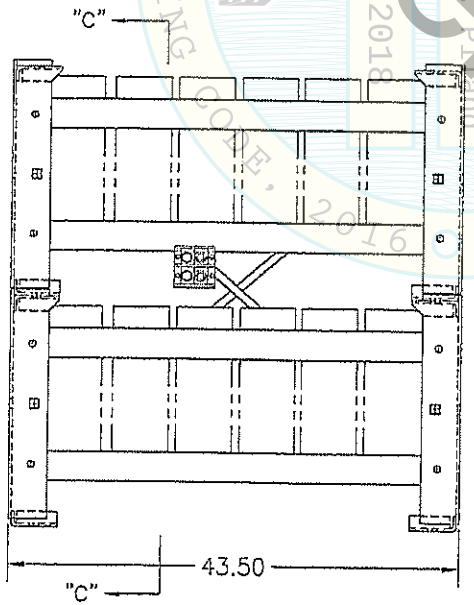
FOR LS 100/200/300/600

THIS BRACKET IS TO BE INSTALLED ON TOP TIER 10.59" FROM LEFT HAND EDGE OR OF RAIL TO CL OF BRACKET. THE TWO BUMPERS WILL BE OMITTED WHEN BRACKET IS INSTALLED. TERMINAL BLOCK & SUPPORT BRACKET ASSY RT00202



SECTION "C–C"

VIEW WITH BATTERIES REMOVED



TYPICAL RACK (2 TIER SHOWN) WITH BATTERIES IN PLACE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. ± TOLERANCES ON: DECIMALS .XX ±.010, .XXX ±.005, ANGLES ±1°, .12 RADIUS

THIRD ANGLE PROJECTION

MATERIAL

DRAWN	C.H. HOUSTON	11/2/90
CHECKED	R. YODER	11/7/90
APPROVED	D. HEIMER	11/8/90
APPROVED		

FILE: M9254B

ALL SHEETS ARE THE SAME REVISION STATUS

C&D TECHNOLOGIES, INC.

1400 UNION MEETING ROAD, BLUE BELL, PA 19422-0858

www.cdtechno.com

TITLE: ASSY, 43.5" MODULAR RACK 1 – 5 TIER, EP, LIBERTY 1000

SIZE	CAGE CODE	DRAWING NUMBER	REVISION
C		M09254	15

SCALE NTS SHEET 2 OF 3