

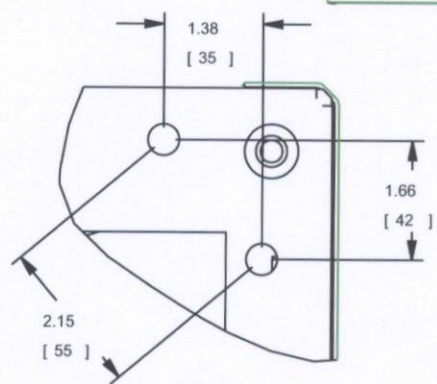
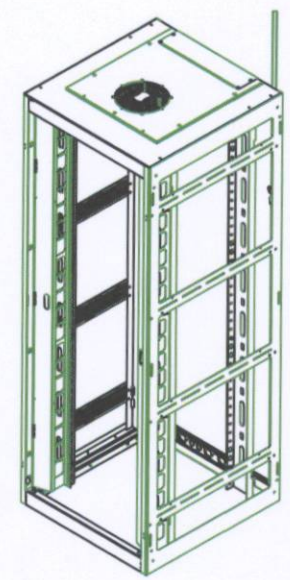
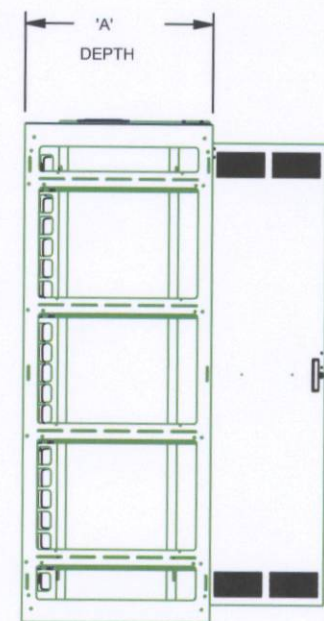
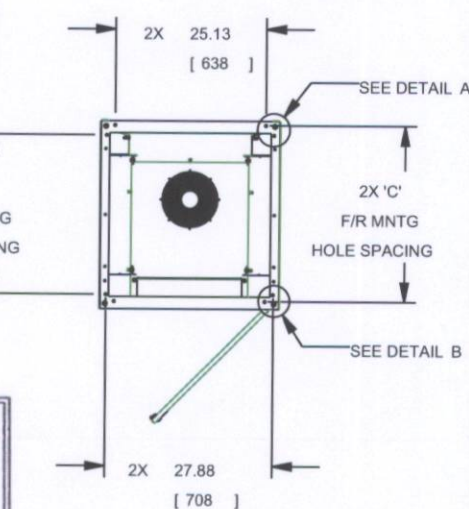
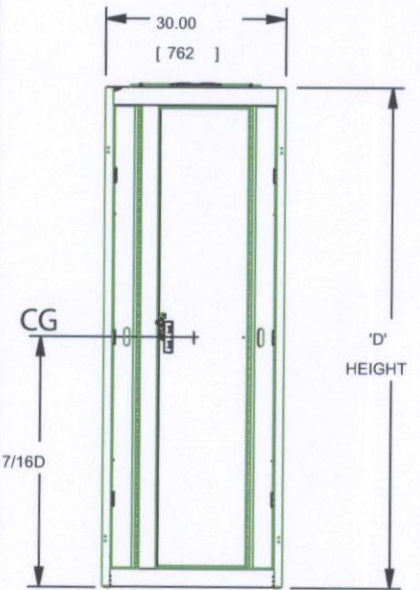
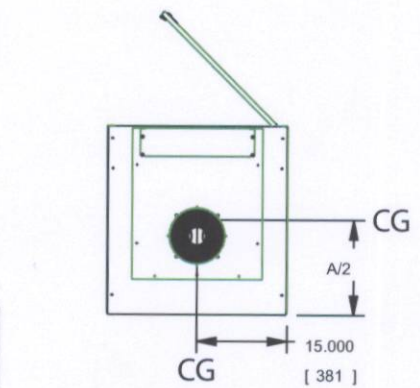
THIS DRAWING CONTAINS TRADE INFORMATION
 DESIGNED TO BE CONFIDENTIAL AND PROPRIETARY
 PROPERTY OF MIDDLE ATLANTIC PRODUCTS, INC.
 AND IS TO BE USED ONLY FOR THE PURPOSES FOR
 WHICH IT IS SUBMITTED AND FURTHER SHALL NOT
 BE COPIED IN WHOLE OR PART WITHOUT WRITTEN
 PERMISSION FIRST OBTAINED FROM MIDDLE
 ATLANTIC PRODUCTS, INC.

REV	DESCRIPTION	REV BY	REV DATE	APP'D BY	DATE APP.
1	PRODUCTION RELEASE	MM	MM/00	/	/

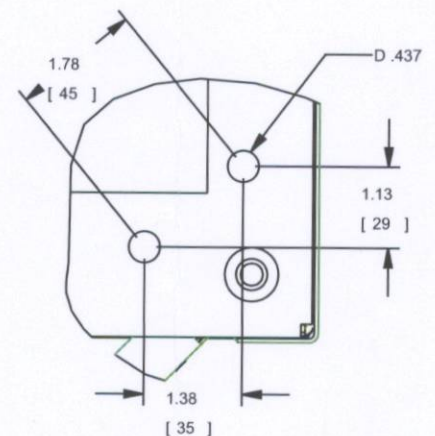
NOTES:
 1. FOR SEISMIC COMPLIANCE RACKS MUST BE INSTALLED USING SEISMIC FLOOR ANCHOR BRACKETS MRK-Z4.
 2. SEE PAGE 2 FOR ALL APPLICABLE OSHPD NOTES.

PART NUMBER	'A' DEPTH	'B' SIDE MTNG HOLE	'C' F/R MTNG HOLE	'D' HEIGHT
DRK19-40-31*	31.40 (798)	26.51 (673)	29.29 (744)	76.20 (1936)
DRK19-40-36*	36.00 (914)	31.11 (790)	33.89 (861)	76.20 (1936)
DRK19-40-42*	42.00 (1067)	37.11 (943)	39.89 (1013)	76.20 (1936)
DRK19-40-48*	48.00 (1219)	43.11 (1095)	45.89 (1166)	76.20 (1936)
DRK19-44-31*	31.40 (798)	26.51 (673)	29.29 (744)	83.20 (2113)
DRK19-44-36*	36.00 (914)	31.11 (790)	33.89 (861)	83.20 (2113)
DRK19-44-42*	42.00 (1067)	37.11 (943)	39.89 (1013)	83.20 (2113)
DRK19-44-48*	48.00 (1219)	43.11 (1095)	45.89 (1166)	83.20 (2113)
DRK23-40-31*	31.40 (798)	26.51 (673)	29.29 (744)	76.20 (1936)
DRK23-40-36*	36.00 (914)	31.11 (790)	33.89 (861)	76.20 (1936)
DRK23-40-42*	42.00 (1067)	37.11 (943)	39.89 (1013)	76.20 (1936)
DRK23-40-48*	48.00 (1219)	43.11 (1095)	45.89 (1166)	76.20 (1936)
DRK23-44-31*	31.40 (798)	26.51 (673)	29.29 (744)	83.20 (2113)
DRK23-44-36*	36.00 (914)	31.11 (790)	33.89 (861)	83.20 (2113)
DRK23-44-42*	42.00 (1067)	37.11 (943)	39.89 (1013)	83.20 (2113)
DRK23-44-48*	48.00 (1219)	43.11 (1095)	45.89 (1166)	83.20 (2113)

* PART NUMBERS MAY BE SUFFIXED FOR CUSTOM CONFIGURATIONS:
 K = KITTED/CONFIGURED RACK
 PRO = SQUARE HOLE (CAGE NUT STYLE) RACK RAIL
 LRD = LESS REAR DOOR
 EX: DRK-44-31PROLRD



DETAIL A
 FRONT CORNER
 2 PLACES
 SCALE 3/8



DETAIL B
 REAR CORNER
 2 PLACES
 SCALE 3/8



USED ON	APPROVALS	DATE
-	MODELED JJP	06/06/01
-	DRAWN NC	02/10/09

CIRCLED DIMENSIONS ARE CRITICAL UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES GENERAL TOLERANCES: DEC: 1 PLACE ±0.1 ANGLE: ±2° 2 PLACE ±0.03 FRAC: ±1/32 3 PLACE ±0.010 HOLE SIZE: ±0.002		TITLE DRK19-44-XX
MATERIAL: SEE COMPONENTS	PART NO. 96-967_DRK19-44-31	PART REV E
FINISH: -- --	SIZE B	DXF NO. NONE
SCALE = 1/8 SHEET 1 OF 2	DWG NO. DRK_OSHPD_1	DWG REV -

THIS DRAWING CONTAINS TRADE INFORMATION DEEMED TO BE CONFIDENTIAL AND PROPRIETARY PROPERTY OF MIDDLE ATLANTIC PRODUCTS, INC. AND IS TO BE USED ONLY FOR THE PURPOSES FOR WHICH IT IS SUBMITTED AND FURTHER SHALL NOT BE COPIED IN WHOLE OR PART WITHOUT WRITTEN PERMISSION FIRST OBTAINED FROM MIDDLE ATLANTIC PRODUCTS, INC.

GENERAL

- THE WORK SHOWN ON THESE DRAWINGS IS FOR THE SEISMIC ANCHORAGE OF THE SUBJECT RACK ENCLOSURES. MAXIMUM CONTENT CAPACITIES FOR VARIOUS HEIGHTS WITHIN THE BUILDING ARE PROVIDED.
- THE WORK SHOWN HAS BEEN PRE-APPROVED BY OSHPD UNDER NUMBER OPA-2185.
- ANCHORAGE DESIGN HAS BEEN DONE IN ACCORDANCE WITH THE 2007 EDITION OF THE CALIFORNIA BUILDING CODE, VOLUME 2A. USING THE FOLLOWING PARAMETERS:
 $I_p = 1.5$ (ESSENTIAL FACILITY INSTALLATIONS)
 $S_{MS} = F_a S_s = 2.85G$ (SITE CLASS D)
 $S_{ps} = 2/3 * S_{MS} = 1.90G$
 $A_p = 1.0$ AND $R_p = 1.5$ (ASCE TABLE 13.6-1)
Z, H = VARIES

LATERAL FORCE, $F_{p,H} = (0.4 A_p S_{ps} I_p W_p) / R_p(1 + 2 Z/H)$
VERTICAL FORCE, $F_{p,V} = 0.2 S_{ps} W_p$

INSTALLATION NOTES

- THE MAXIMUM SEISMIC CONTENT CAPACITY OF THE RACK ENCLOSURE IS PROVIDED IN THE CAPACITY TABLE PROVIDED ON THESE DRAWINGS. THE STRUCTURAL ENGINEER-OF-RECORD (SEOR) SHALL VERIFY THAT THE WEIGHT OF RACK ENCLOSURE CONTENTS DOES NOT EXCEED THE APPROVED CAPACITY FOR THE LOCATION OF INSTALLATION.
- THE SEOR SHALL VERIFY THAT THE EXISTING STRUCTURE IS ADEQUATE TO SUPPORT THE LOADS AND REACTIONS IMPOSED BY THE ANCHORED RACK ENCLOSURE IN ADDITION TO ALL OTHER LOADS AND FORCES.
- RACK ENCLOSURES MAY BE ANCHORED TO EITHER A LIGHT- OR NORMAL-WEIGHT, REINFORCED CONCRETE FLOOR OR SLAB WITH A MINIMUM CONCRETE COMPRESSIVE STRENGTH (F'c) OF 3,000 PSI.
- REINFORCED CONCRETE FLOOR SLABS SHALL HAVE A MINIMUM THICKNESS BASED ON THE ANCHOR TYPE AS NOTED BELOW:
- HILTI HDA-P UNDERCUT ANCHORS OF 0.394" DIA - MINIMUM SLAB THICKNESS OF 6-3/4"
- HILTI KWIK BOLT TZ EXPANSION ANCHORS OF 0.375" - MINIMUM SLAB THICKNESS OF 4"
- DOCUMENTATION VERIFYING CONCRETE COMPOSITION, STRENGTH, AND THICKNESS SHALL BE SUBMITTED TO THE ENFORCEMENT AGENCY.
- INSTALLATION OF THE RACK ENCLOSURES IS LIMITED TO INTERIOR OR ENVIRONMENTALLY PROTECTED LOCATIONS.

RACK ENCLOSURE CAPACITY TABLES

MAXIMUM CONTENT CAPACITY (POUNDS) (1),(2),(3)
HILTI HDA-P ANCHORS IN NORMAL- AND LIGHT-WEIGHT CONCRETE

RACK ENCLOSURE	MAX EMPTY WEIGHT	LOCATION IN BUILDING (Z/H)		
		GROUND	1/3	2/3 ROOF
DRK19-XX-31	200	750	750	750
DRK19-XX-36	220	750	750	750
DRK19-XX-42	250	750	750	750
DRK19-XX-48	260	750	750	750
DRK23-XX-31	220	750	750	750
DRK23-XX-36	240	750	750	750
DRK23-XX-42	250	750	750	750
DRK23-XX-48	270	750	750	750

MAXIMUM CONTENT CAPACITY (POUNDS) (1),(2),(3)
HILTI KWIK BOLT TZ ANCHORS IN NORMAL-WEIGHT CONCRETE

RACK ENCLOSURE	MAX EMPTY WEIGHT	LOCATION IN BUILDING (Z/H)		
		GROUND	1/3	2/3 ROOF
DRK19-XX-31	200	750	750	625
DRK19-XX-36	220	750	750	625
DRK19-XX-42	250	750	750	625
DRK19-XX-48	260	750	750	625
DRK23-XX-31	220	750	750	625
DRK23-XX-36	240	750	750	625
DRK23-XX-42	250	750	750	625
DRK23-XX-48	270	750	750	625

MAXIMUM CONTENT CAPACITY (POUNDS) (1),(2),(3)
HILTI KWIK BOLT TZ ANCHORS IN LIGHT-WEIGHT CONCRETE

RACK ENCLOSURE	MAX EMPTY WEIGHT	LOCATION IN BUILDING (Z/H)		
		GROUND	1/3	2/3 ROOF
DRK19-XX-31	200	750	525	275
DRK19-XX-36	220	750	525	275
DRK19-XX-42	250	750	525	275
DRK19-XX-48	260	750	525	275
DRK23-XX-31	220	750	525	275
DRK23-XX-36	240	750	525	275
DRK23-XX-42	250	750	525	275
DRK23-XX-48	270	750	525	275

TABLE FOOTNOTES:

- INCLUDES ALL DRK SERIES RACK ENCLOSURES UP TO A HEIGHT OF 44 SPACES.
- ENCLOSURES SHALL BE ANCHORED WITH MRK-Z4 MOUNTING KIT.
- ENCLOSURE CONTENTS SHALL BE DISTRIBUTED WITHIN THE RACK SUCH THAT 50% OF THE TOTAL WEIGHT IS LOCATED WITHIN THE BOTTOM THIRD OF THE RACK ENCLOSURE HEIGHT, 25% IN THE MIDDLE THIRD, AND 25% IN THE TOP THIRD.

CONCRETE ANCHOR NOTES

- CONCRETE ANCHORS SHALL BE ONE OF THE FOLLOWING TWO TYPES MANUFACTURED BY HILTI, INC. OF CARBON STEEL WITH DIAMETER, EMBEDMENT, AND SPACING AS SHOWN ON THE DRAWINGS.
- HILTI HDA-P (PRESET CONFIGURATION) UNDERCUT ANCHORS (ICC ESR 1546)
- HILTI KWIK BOLT TZ (KB-TZ) EXPANSION ANCHORS (ICC ESR 1917)
- THE DISTANCE FROM THE ANCHOR TO THE EDGE OF CONCRETE SLAB SHALL BE GREATER THAN OR EQUAL TO THE LARGER OF:
- 1.5 TIMES THE ANCHOR EMBEDMENT DEPTH OR
- 10 TIMES THE NOMINAL ANCHOR DIAMETER
- LOCATE ALL EXISTING REINFORCING BARS WITHIN 12 INCHES OF PROPOSED ANCHOR LOCATIONS PRIOR TO DRILLING FOR CONCRETE ANCHORS. DO NOT CUT, CORE, OR DRILL THROUGH EXISTING REINFORCING BARS WITHOUT PRIOR APPROVAL FROM THE SEOR.
- ALL CONCRETE ANCHORS SHALL BE INSTALLED WITH PROPER TOOLS AND PROCEDURES IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ICC EVALUATION SERVICE REPORTS REFERENCED ABOVE.
- TENSION TESTING SHALL OCCUR 24 HOURS OR MORE AFTER INSTALLATION OF THE CONCRETE ANCHORS.

- APPLY TENSION TEST LOADS TO THE CONCRETE ANCHORS WITHOUT REMOVING THE NUT. IF NUT REMOVAL IS REQUIRED, REMOVE THE NUT AND INSTALL A THREADED COUPLER TO THE SAME TORQUE AS THE ORIGINAL NUT USING A TORQUE WRENCH AND THEN APPLY THE TEST LOAD.
- REACTION LOADS FROM TEST FIXTURES MAY BE APPLIED IN CLOSE PROXIMITY TO THE ANCHOR BEING TESTED PROVIDED THE ANCHOR IS NOT RESTRAINED FROM WITHDRAWING BY THE FIXTURES.
- TEST EQUIPMENT SHALL BE CALIBRATED BY AN APPROVED TESTING LABORATORY IN ACCORDANCE WITH STANDARD RECOGNIZED PROCEDURES.
- ONE HALF (50%) OF EACH APPLICATION OF CONCRETE ANCHORS SHALL BE TESTED IN TENSION FOR 3 MINUTES ACCORDING TO THE TEST LOADS SHOWN BELOW. ONE APPLICATION OF ANCHORS SHALL BE DEFINED AS THOSE ANCHORS INSTALLED BY A SINGLE CREW IN A SINGLE DAY. IF ANY ANCHOR FAILS, IT SHALL BE REPLACED, RE-TESTED, AND ALL ANCHORS IN THE SAME APPLICATION SHALL BE TESTED. IF ANY ANCHOR FAILS, ALL PREVIOUSLY UNTESTED ANCHORS INSTALLED BY THAT CREW SHALL BE TESTED UNTIL TWENTY (20) CONSECUTIVE ANCHORS PASS, THEN RESUME 50% TESTING.

CONCRETE ANCHORS TEST LOADS FOR NORMAL-WEIGHT CONCRETE

ANCHOR TYPE	ANCHOR DIAMETER (INCHES)	MINIMUM EMBEDMENT (INCHES)	TENSION TEST LOAD (LBS)
HDA-P	0.394	4	6681
KB-TZ	3/8	2	1732

*WHEN USED IN LIGHT-WEIGHT CONCRETE, ANCHOR TEST LOADS ARE MULTIPLIED BY 0.60.

*TEST LOADS ARE BASED ON OSHPD 'CODE APPLICATION NOTICE' 2-1916A.8 METHOD 2; 2 TIMES THE MAXIMUM ALLOWABLE TENSION LOAD BUT NOT TO EXCEED 80% OF NOMINAL ANCHOR YIELD STRENGTH.

- TENSION TESTING OF THE CONCRETE ANCHORS SHALL BE DONE IN THE PRESENCE OF THE INSPECTOR-OF-RECORD AND A REPORT OF THE TEST RESULTS SHALL BE SUBMITTED TO THE ENFORCEMENT AGENCY.
- THE TENSION TEST OF AN ANCHOR SHALL BE ACCEPTED IF THERE IS NO OBSERVABLE MOVEMENT DURING THE APPLICATION OF THE TEST LOAD. A PRACTICAL WAY TO DETECT OBSERVABLE MOVEMENT IS WHETHER THE WASHER UNDER THE NUT BECOMES LOOSE.

HOW TO USE THIS PRE-APPROVAL

- THE SEOR SHALL DETERMINE THE FOLLOWING:
 - THE MODEL NUMBER OF THE UNIT TO BE USED.
 - THE ELEVATION OF THE ROOF, H.
 - THE ELEVATION OF THE FLOOR WHERE THE UNIT WILL BE INSTALLED ON, Z.
- THE SEOR SHALL THEN DETERMINE THE RATIO OF Z/H AND CONSULT THE APPLICABLE TABLE TO DETERMINE THE MAXIMUM WEIGHT OF THE CONTENTS THAT CAN BE STORED ON THE RACK.
- SEOR SHALL VERIFY THAT A PLACARD IS PLACED ON THE RACK STATING THE FOLLOWING:
 - UNIT MODEL NUMBER.
 - NAME OF THE BUILDING IN WHICH IT WILL BE INSTALLED.
 - HIGHEST FLOOR WHERE IT CAN BE USED.
 - MAXIMUM WEIGHT OF THE CONTENTS THAT CAN BE STORED ON THE RACK.
 - A PROMINENT WARNING TO STORE THE HEAVIEST ITEMS ON THE LOWER LEVELS OF THE RACK.
- SEOR SHALL VERIFY THAT THE CONCRETE FLOOR MEETS THE REQUIREMENTS OF THIS PRE-APPROVAL.
- SEOR SHALL VERIFY THAT THE EXISTING STRUCTURE IS ADEQUATE TO SUPPORT THE LOADS AND FORCES IMPOSED ON IT BY THIS UNIT IN ADDITION TO ALL OTHER LOADS AND FORCES.



USED ON: -	APPROVALS		DATE	
	MODELED	JJP	06/06/01	
	DRAWN	NC	02/10/09	
NEXT ASSY: -	CIRCLED DIMENSIONS ARE CRITICAL INSPECTION DIMENSIONS			TITLE
MATERIAL: SEE COMPONENTS	UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES			DRK19-44-XX
	GENERAL TOLERANCES:			
	DEC: 1 PLACE ±0.1	ANGLE: ±2°		
FINISH: - -	2 PLACE ±.03		FRAC: ±1/32	PART NO.
	3 PLACE ±.010			96-967_DRK19-44-31
	HOLE SIZE: ±0.002			PART REV E
	SCALE = 1/32	PROJECTION: 3° ANGLE	SIZE B	DXF NO.
	SHEET ? OF ?		NONE	DWG NO.
				DRK_OSHPD_2
				DWG REV