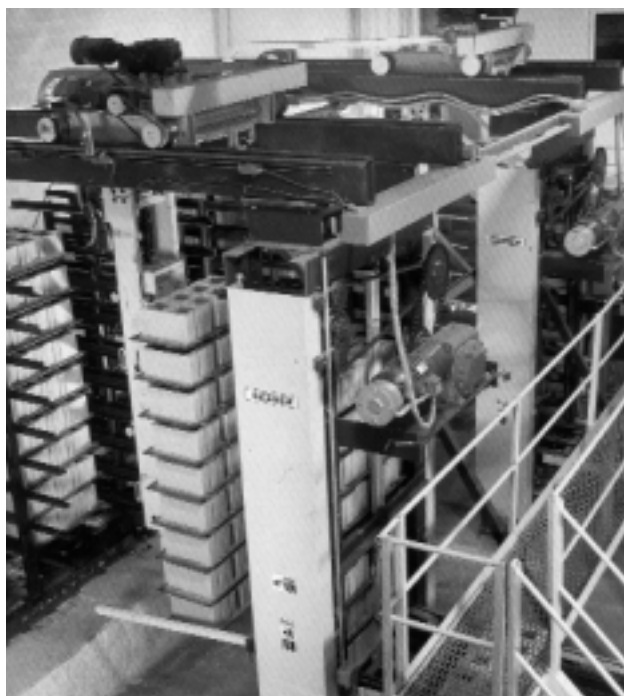




BESSERMATIC

**MODEL MS-12 (18 1/2)
W/LSC-100 SIDE SHIFTER**



**INSTALLATION MANUAL
466372F0001US**

APRIL 2000 • US\$250

BESSER World Headquarters
801 Johnson St. • Alpena, Michigan, 49707 • U.S.A.
Phone (517) 354-4111

BESSER

COMPANY NAME:

SERIAL NUMBER:

ASSEMBLY NUMBER:

WIRING DIAGRAM NUMBER:

INSTALLATION DRAWING NUMBER:

MS-12 W/SIDE SHIFTER

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS	..ii
SAFETY BULLETIN	..iv
SAFETY SIGNS_v	
ELECTRICAL DATA	..ix
SECTION 1 SPECIFICATIONS	..x
SECTION 2 PREPARE SITE	
2.1 ITEMS REQUIRED TO INSTALL AN MS-12 W/SIDE SHIFTER	..2-1
2.2 PREPARE THE LOCATION OF THE MS-12 W/SIDE SHIFTER	..2-2
2.3 PREPARE ELECTRICAL SUPPLY TO THE MS-12 W/SIDE SHIFTER	..2-6
2.4 PREPARE HYDRAULIC SUPPLY TO THE MS-12 W/SIDE SHIFTER	..2-8
2.5 PLACE CONCRETE FLOOR	..2-8
SECTION 3 INSTALLATION	
3.1 INSTALL SIDE SHIFTER AND CRAWLER RAILS	..3-1
3.2 INSTALL ACCUMULATORS ₃₋₇	
3.3 INSTALL BESSER-MATIC FRAME ASSEMBLY	..3-8
3.4 INSTALL STABILIZERS AND LOWER SPADES	..3-12
3.5 INSTALL RACKVEYOR	..3-15
3.6 INSTALL SIDE SHIFTER	..3-16
3.7 INSTALL POWER UNIT AND VALVE STAND	..3-17
3.8 FILL HYDRAULIC POWER UNIT	..3-18
3.9 INSTALL THE CONVEYORS	..3-19
3.10 MAKE ELECTRICAL INSTALLATION	..3-24
3.11 INSTALL SAFETY GATES	..3-26
3.12 SECURE FRAME ASSEMBLY	..3-27
3.13 CHECK LIST	..3-28

LIST OF ILLUSTRATIONS

SECTION 1 SPECIFICATIONS

- 1.0 MS-12 w/Side Shifter Dimensions1-3
- 1.1 Operator Orientation1-4

SECTION 2 SITE PREPARATION

- 2.1 Location of Equipment by Center Lines2-3
- 2.2 MS-12 Besser-matic w/Side Shifter2-4
- 2.3 Accumulator Frame Assemblies2-5
- 2.4 MS-12 Besser-Matic Standard Electrical Panel Location and Loader Stub-ups2-7
- 2.5 MS-12 Besser-Matic Electrical Panel Connections2-7
- 2.6 MS-12 Besser-Matic Hydraulic Installation2-9
- 2.7 Standard Location for Hydraulic Valve Stand and 8 G.P.M. Power Unit2-10
- 2.8 Remote Location for Hydraulic Valve Stand and 8 G.P.M. Power Unit2-10

SECTION 3 INSTALLATION

- 3.1 Rail Anchor with Shims3-1
- 3.2 Anchor Bolt3-2
- 3.3 Stop Block3-2
- 3.4 Notches on Crawler Rails3-3
- 3.5 Side Shifter and Crawler Anchor Plates and Shims Installation3-4
- 3.6 Side Shifter and Crawler Rail Installation3-5
- 3.7 Side Shifter and Crawler Rail Installation (2)3-6
- 3.8 Side Shifter and Crawler Rail Installation (3)3-6
- 3.9 Lift Accumulators Using Crane3-7
- 3.10 Install Frame (1)3-8
- 3.11 Install Frame (2)3-8
- 3.12 Frame Assembly3-9
- 3.13 Anchor Cross Channel Tracks3-10
- 3.14 Anchor Braces, Angle Support with Raceway and Roller Guides3-11
- 3.15 Installing Stabilizers on Frame Tracks3-12
- 3.16 Assembling Lower Spades to Stabilizers3-13
- 3.17 Bolting Spades3-13
- 3.18 Centering Spade Assembly 3-14
- 3.19 Stabilizer Wheel Screws3-14
- 3.20 Position of Rackveyor3-15
- 3.21 Position of Side Shifter and Rackveyor3-16
- 3.22 The Vavle Stand3-17
- 3.23 The Hydraulic Power Unit3-18
- 3-24 Pump Rotation3-18
- 3-25 Splice Plate3-19
- 3-26 Conveyor Bolted to Accumulators3-19
- 3-27 Adjustable Legs3-19
- 3-28 Unloading Conveyor Bolted to Pallet Transfer Stand3-20
- 3.29 Conveyor Bolted to Pallet Transfer3-20

LIST OF ILLUSTRATIONS

3.30	Conveyor on Ms-12 w/Side Shifter	3-21
3.31	Overall Installation Drawing (Top View)	3-22
3.32	Overall Installation Drawing (Elevation View)	3-23
3.33	Graphic Control Station	3-24
3.34	Quick Disconnect	3-24
3.35	Stabilizer Cat Tracks	3-24
3.36	Frame and Accumulator Raceways	3-25
3.37	Safety Gate (R.H Side Shown)	3-26
3.38	Secure Frame Assembly	3-27

SAFETY BULLETIN

This notice is issued to advise you that some previously accepted shop practices may not be keeping up with changing Federal and State Safety and Health Standards. Your current shop practices may not emphasize the need for proper precautions to insure safe operation and use of machines, tools, automatic loaders and allied equipment and/or warn against the use of certain solvents or other cleaning substances that are now considered unsafe or prohibited by law. Since many of your shop practices may not reflect current safety practices and procedures, particularly with regard to the safe operation of equipment, it is important that you review your practices to ensure compliance with Federal and State Safety and Health Standards.

IMPORTANT

The operation of any machine or power-operated device can be extremely hazardous unless proper safety precautions are strictly observed. Observe the following safety precautions:



Always be sure proper guarding is in place for all pinch, catch, shear, crush and nip points.



Always make sure that all personnel are clear of the equipment before starting it.



Always be sure the equipment is properly grounded.



Always turn the main electrical panel off and lock it out in accordance with published lockout/tag-out procedures prior to making adjustments, repairs, and maintenance.



Always wear appropriate protective equipment like safety glasses, safety shoes, hearing protection and hard hats.



Always keep chemical and flammable material away from electrical or operating equipment.



Always maintain a safe work area that is free from slipping and tripping hazards.



Always be sure appropriate safety devices are used when providing maintenance and repairs to all equipment.



Never exceed the rated capacity of a machine or tool.



Never modify machinery in any way without prior written approval of the Besser Engineering Department.



Never operate equipment unless proper maintenance has been regularly performed.



Never operate any equipment if unusual or excessive noise or vibration occurs.



Never operate any equipment while any part of the body is in the proximity of potentially hazardous areas.



Never use any toxic flammable substance as a solvent cleaner.



Never allow the operation or repair of equipment by untrained personnel.



Never climb or stand on equipment when it is operational.



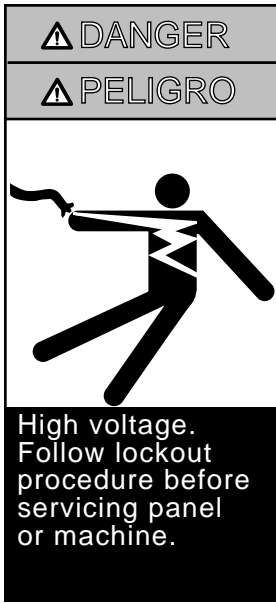
It is important that you review Federal and State Safety and Health Standards on a continual basis. All shop supervisors, maintenance personnel, machine operators, tool operators, and any other person involved in the setup, operation, maintenance, repair or adjustment of Besser-built equipment should read and understand this bulletin and Federal and State Safety and Health Standards on which this bulletin is based.

SAFETY SIGNS

SAFETY SIGNS

Sign	Description	Required
1	Electric Motor	1
2	All Machines	1
	All Panels	1
3	Mixer	4
4	Block Machine	1
	SF-7 Cuber	8
	BTO-6	2
	Overhead Block Transfer	3
	Depalleter	2
	AF-7 Block Pusher	2
5	Concrete Products Machine	1
6	Concrete Products Machine	1
7	Concrete Products Machine	2
8	Besser-Matic	4
9	Besser-Matic	4
10	Pallet Transport System	4
11	LSC-40A	4
	Overhead Block Transfer	4
12	Conveyors	6
13	SF-7 Cuber	8
14	AF-7 Block Pusher	2
	Pallet Transport System	4
15	All Machines	1
	All Panels	1
16	SF-7 Cuber	3
	AF-7 Block Pusher	2
	Slat Conveyors	2

**To order safety decals, contact your local Besser representative
or the Besser Central Order Department.
Thank you!**



- 1** **Large 113236F0409**
High Voltage
Width 4 1/2 inch
Height 9 5/8 inch
Small 113236F0204
High Voltage
Width 2 inch
Height 4 1/8 inch
- 2** **113237F0410**
Mixer Blade Hazard
Width 4 1/2 inch
Height 1/4 inch
- 3** **113240F0307**
Crush Hazard
Width 3 1/2 inch
Height 7 1/2 inch



- 4** **114692F1006**
Nip Points
Width 5 3/4 inch
Height 9 1/2 inch
- 5** **114688F0906**
Crush Hazard
Width 6 1/4 inch
Height 9 1/2 inch
- 6** **114689F0804**
Fall Hazard
Width 4 1/2 inch
Height 7 3/4 inch



7
114690F0805
Falling Objects
Width 4 3/4 inch
Height 8 inch



8
114691F1006
Shear and Fall Hazards
Width 5 3/4 inch
Height 9 3/4 inch



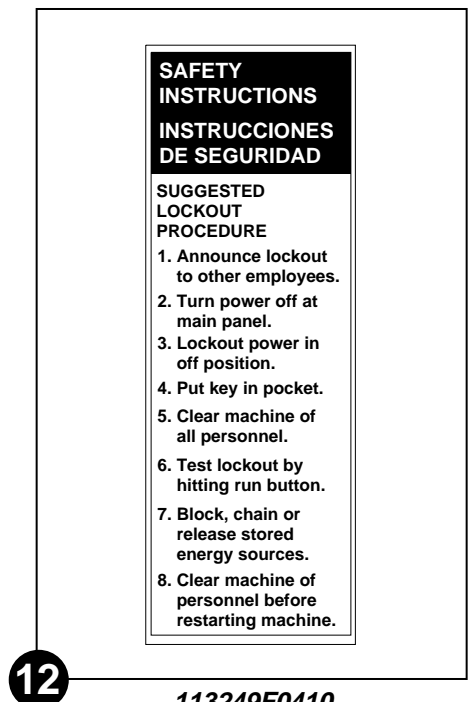
9
113242F0409
Crush Hazard
Width 4 1/2 inch
Height 9 5/8 inch



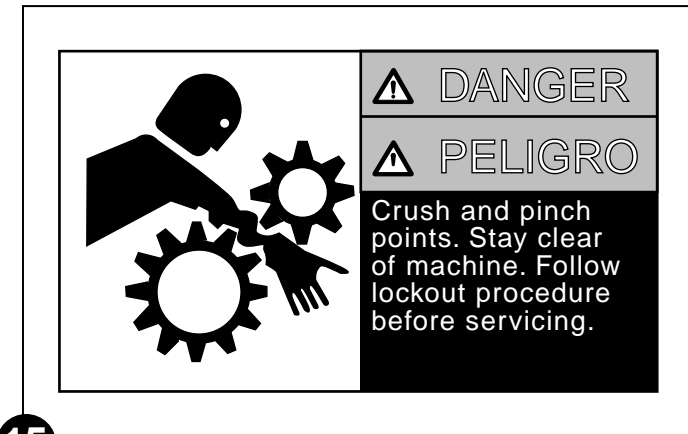
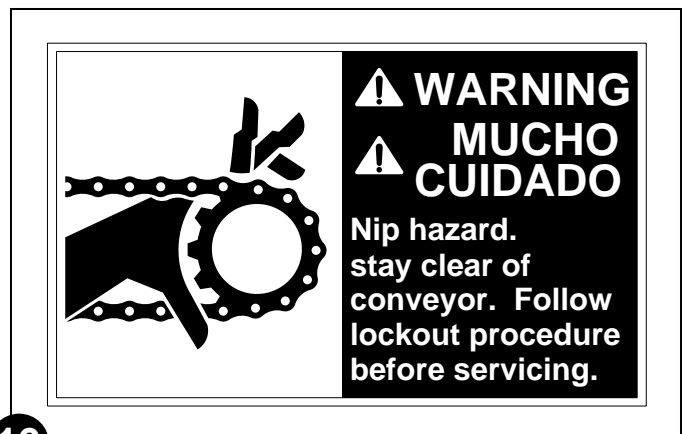
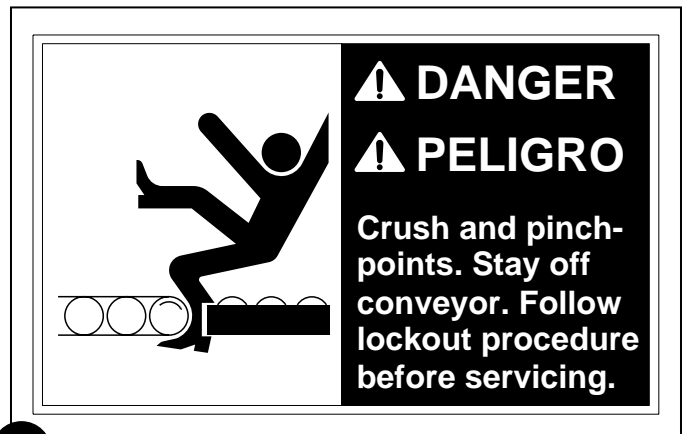
10
113243F0410
Falling Objects
Width 4 1/2 inch
Height 10 inch



11
Vertical: 113245F0704 Horizontal: 113245F1005
Crush Hazard
Vertical: Width 4 1/8 inch
Vertical: Height 7 inch
Horizontal: Width 10 inch
Horizontal: Height 5 3/4 inch



12
113249F0410
*Safety instructions decal-
Suggested Lock-out procedure*
Width 4 inch
Height 10 inch

**13****113238F1005***Crush Hazard**Width 10 inch**Height 5 3/4 inch***14****113239F0604***Crush Hazard**Width 6 5/8 inch**Height 4 inch***15****113241F0605***Crush and Pinch Points**Width 6 5/8 inch**Height 4 inch***16****113246F0704***Nip Hazard**Width 7 inch**Height 4 1/2 inch***17****113247F1006***Crush Hazard**Width 10 inch**Height 6 inch***18****113250F1006***Crush and Pinch Points Hazard**Width 10 inch**Height 6 inch*

ELECTRICAL DATA

Plant Power Supply	460 volt, 3 phase, 60 hz
Total Horsepower	74
Total Kilowatts	55.18
Control Panel Transformer	2000 volt-amps
Total Amp Load	118.53
Recommended Branch Circuit Distribution Switch	200 amp
Recommended Branch Circuit Fuse (FRS-R)	150 amp
Recommended Branch Feeder (THHN)	1/0 AWG (53.5mm ²)
Recommended Branch Circuit Feeder Conduit	1.25 inch [32 mm]
Short Circuit Interrupting Capacity	200,000 AIC

NOTE: Electrical may change from machine to machine. Please consult Installation drawings supplied by Besser.

Electrical Data Notes:

For safety purposes, Besser Company requires that this equipment be connected to a lockable electrical disconnect.

CAUTION:



To comply with Articles 110-9 and 110-10 of the National Electrical Code:

- The customer shall supply a branch circuit protective device to feed this control panel.
- The protective device shall have a short circuit interrupting rating of no less than the available short circuit current. (Besser Company recommends the use of protective devices with interrupting ratings of no less than 200,000 amps rms symmetrical.)
- See table above for the recommended protection.

Failure to comply with these guidelines may result in a rupture of the protective device while attempting to clear a fault.

ELECTRICAL DATA

DEVICE	HORSEPOWER	KILOWATTS	AMPERES
LOADER SPADE ELEVATOR	10.00	7.457	13.50
LOADER SPADE TRANSFER	1.00	0.748	1.70
LOADER SPADE TURN	1.00	0.746	1.70
UNLOADER SPADE ELEVATOR	10.00	7.457	13.50
UNLOADER SPADE TRANSFER	1.00	0.746	1.70
UNLOADER SPADE TURN	1.00	0.746	1.70
LOADER ACCUMULATOR	10.00	7.457	13.50
UNLOADER ACCUMULATOR	10.00	7.457	13.50
FRONT DELIVERY CONVEYOR #1	2.00	1.491	3.20
FRONT DELIVERY CONVEYOR #2	2.00	1.491	3.20
FRONT DELIVERY CONVEYOR #3	2.00	1.491	3.20
UNLOADING CONVEYOR #1	2.00	1.491	3.20
UNLOADING CONVEYOR #2	2.00	1.491	3.20
UNLOADING CONVEYOR #3	2.00	1.491	3.20
UNLOADING CONVEYOR #4	2.00	1.491	3.20
UNLOADING CONVEYOR #5	2.00	1.491	3.20
PALLET CROSSOVER CONVEYOR	1.00	0.746	1.70
PALLET RETURN CONVEYOR	1.50	1.118	2.80
HYDRAULIC POWER UNIT	10.00	7.457	13.50
PRODUCT WASHER WATER PUMP	NA	NA	NA

Table A POWER DATA TABLE

SECTION 1

MS-12 W/SIDE SHIFTER SPECIFICATIONS

TOTAL WEIGHT: 26,840 Lbs [12200 Kg]

APPROXIMATE WEIGHT OF EACH COMPONENT:

Accumulators (2):	2500 Lbs [1134 Kg] each
Frame:	2000 Lbs [900 Kg]
Unloading conveyors (3):	1250 Lbs [568 Kg]
Front delivery conveyors (2)	1250 Lbs [568 Kg]
Loaders / Unloaders (2)	3000 Lbs [1364 Kg] each
Pallet return conveyors (2)	500 Lbs [227 Kg] each
Rackveyor total	5050 Lbs [2295 Kg]
Rackveyor front section:	2250 Lbs [1021 Kg]
Rackveyor center section:	1000 Lbs [455 Kg]
Rackveyor tail section:	1800 Lbs [818 Kg]
Panel assembly:	1400 Lbs [818 Kg]
Graphic control station:	325 Lbs [148 Kg]
Hydraulic power unit:	300 Lbs [136 Kg]
Valve stand assembly:	765 Lbs [347 Kg]
Items shipped loose:	3000 Lbs [Kg]

MINIMUM HYDRAULIC PRESSURE: 850 psi [58 bar]

MACHINE SPEED: Up to 10 cycles per minute

PRODUCTION CAPACITY: Up to 9 pallets high with 26" X 18 1/2" [660mm X 470mm] pallets.

OPERATING CONDITIONS:

Besser machinery and equipment is designed to comply with the essential health and safety regulations (EHSR) that apply to directives which are applicable to an industrial environment.

Buyer shall utilize this equipment in a manner consistent with its design and only in an industrial environment.

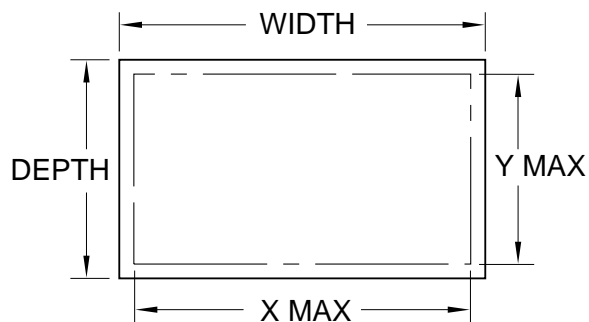
OPERATING RANGES:

Here are the normal operating ranges for machine sensors (limit, proximity) and control devices contained within the control panels.

Ambient operating temperature range: 32° to 131°F [0° to 55°C]

Humidity range: 5 to 95% (non-condensing)

Line voltage: 85 to 132 Volts - AC 50/60 Hz



WIDTH	DEPTH	THICK.	X	Y	PALLET NO.
52.0" [1321mm]	18.5" [470mm]	.625" [16mm]	51.0" [1295mm]	17.5" [445mm]	470750F0021
52.0" [1321mm]	19.5" [495mm]	.625" [16mm]	51.0" [1295mm]	18.5" [470mm]	470750F0022
52.0" [1321mm]	20.5" [521mm]	.625" [16mm]	51.0" [1295mm]	19.5" [495mm]	470750F0023
55.0" [1397mm]	18.5" [470mm]	.625" [16mm]	54.0" [1372mm]	17.5" [445mm]	470750F0024
55.0" [1397mm]	20.5" [521mm]	.625" [16mm]	54.0" [1372mm]	19.5" [495mm]	470750F0025
52.0" [1321mm]	18.5" [470mm]	.625" [16mm]	51.0" [1295mm]	17.5" [445mm]	470750F0027
52.0" [1321mm]	20.5" [521mm]	.625" [16mm]	51.0" [1295mm]	19.5" [495mm]	470750F0028
THICKNESS TOLERANCE : -0.010" [0.25mm] / +0.030" [0.76mm]					

Table 1.1 STEEL PALLET SPECIFICATIONS

OVERALL DIMENSIONS (ref. installation print #5):

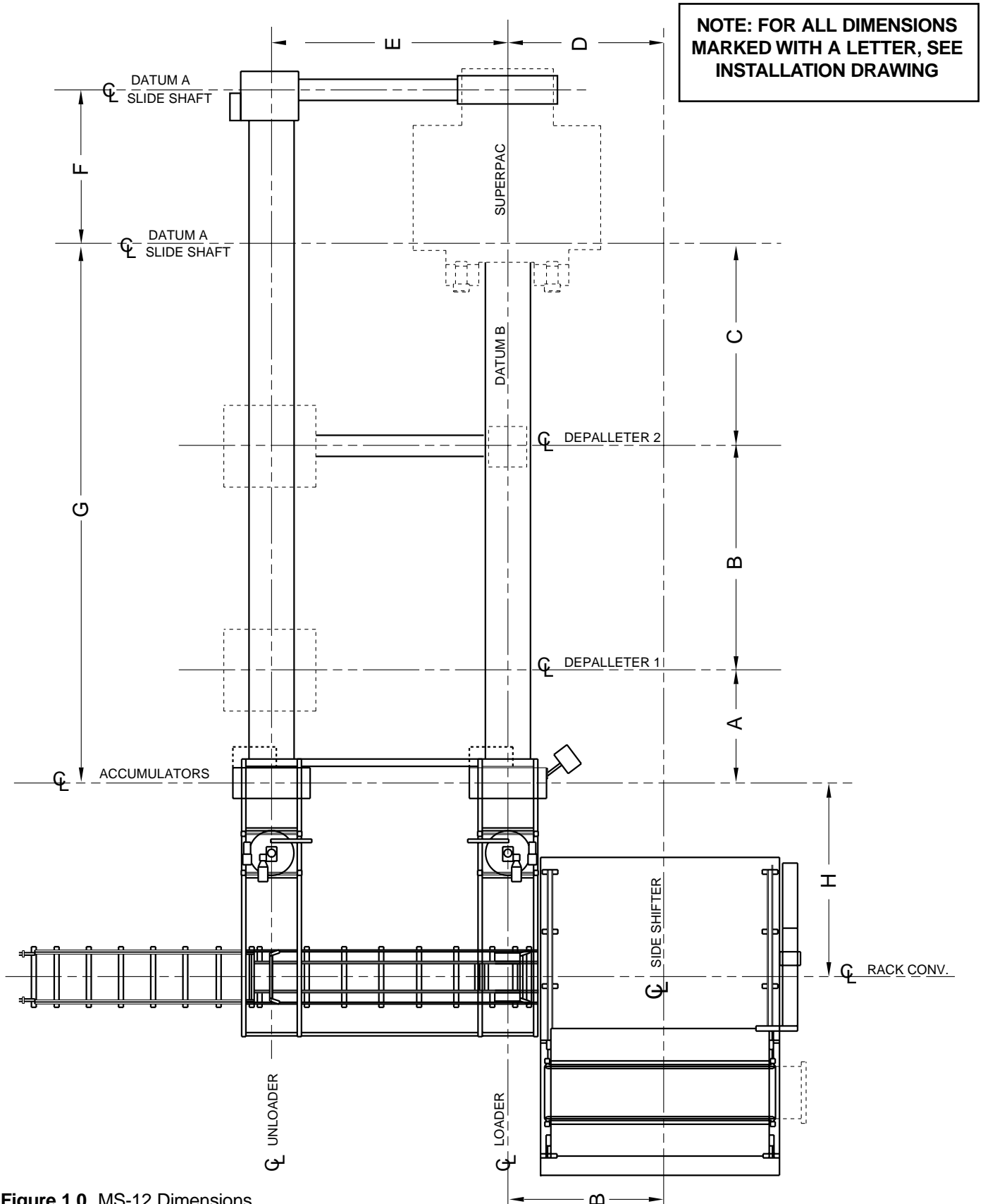


Figure 1.0 MS-12 Dimensions

OPERATOR ORIENTATION:

Seen from behind, facing the Concrete Product Machine, the machine shown below is a right hand machine. This means the loading of new units is done from the right side. The sides loading and unloading, as mentioned throughout this manual, are as shown here.

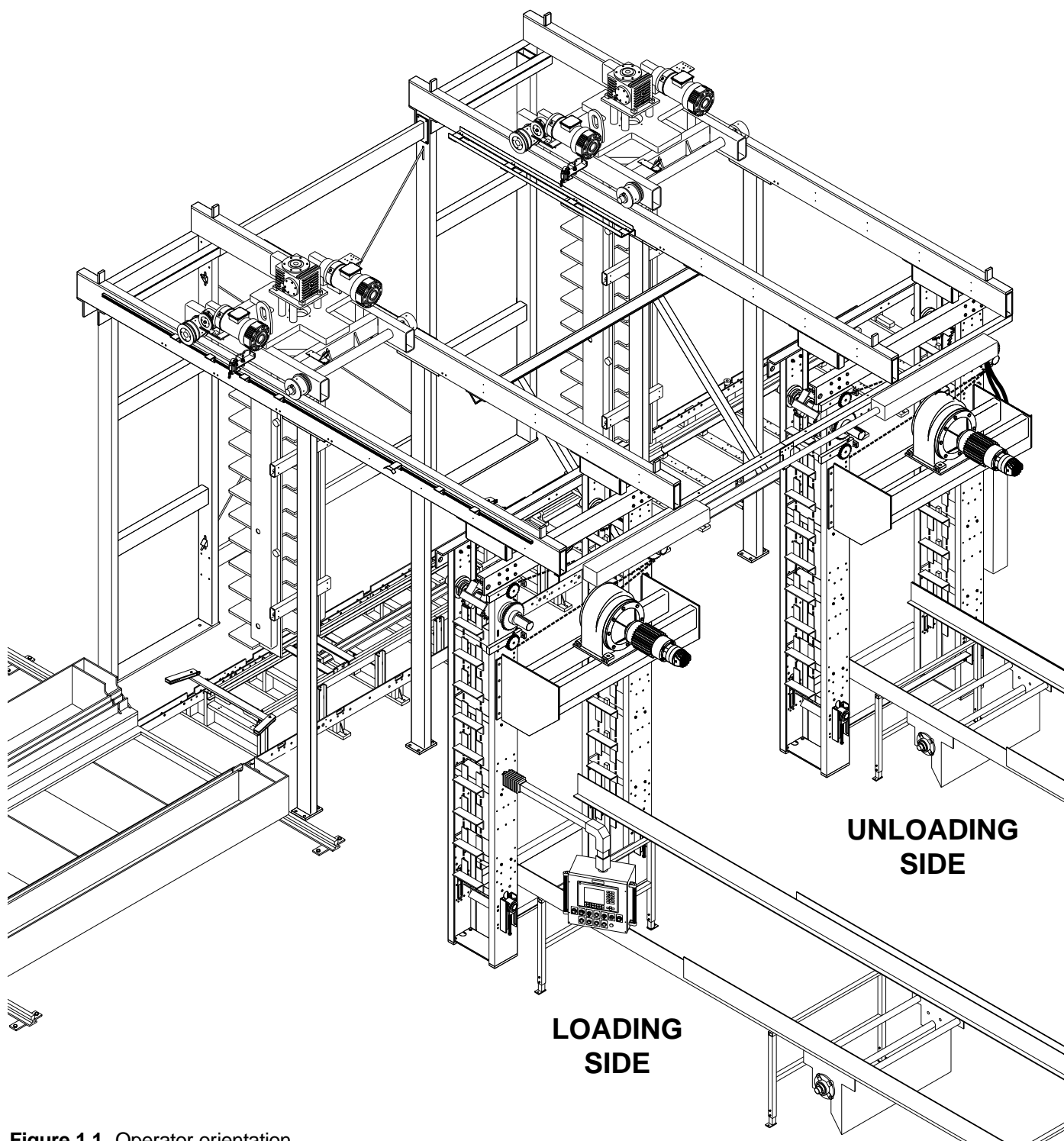


Figure 1.1 Operator orientation

SECTION 2

PREPARE SITE

THE PRESENT SECTION EXPLAINS HOW TO PREPARE THE FOUNDATION FOR THE BESSER-MATIC MULTI-SPADE MS-12. IF YOU ARE ALSO INSTALLING A RACK TRANSPORTER SYSTEM SUCH AS AN LSC-100, YOU SHOULD FOLLOW INSTRUCTIONS FOR BOTH THESE SYSTEMS SIMULTANEOUSLY. INSTRUCTIONS ON THE RACK TRANSPORTER SYSTEM INSTALLATION ARE FOUND IN MANUAL #466364F9601. USE THIS SECTION ALONG WITH THE INSTALLATION DRAWINGS (SHEETS 1 AND 2) TO PREPARE THE LOCATION OF THE BESSER-MATIC MS-12. THIS SECTION IS NOT A REPLACEMENT OF THE DRAWINGS; IT IS PRESENTED HERE AS COMPLEMENTARY INFORMATION.

2.1 ITEMS REQUIRED TO INSTALL AN MS-12

Here is a list of items that are not supplied by Besser Company and that are required to install a Multi-Spade MS-9.

- 5 ton minimum crane. The Besser-matic is made of heavy parts. We recommend you use an overhead crane to install the machine.
- Steel frames under accumulators
- Anchor studs for rails
- Metal shims for rails
- Stop block (Side Shifter rails)
- Electrical conduit in floor and conduit from floor to equipment
- Hydraulic tubing in floor
- Power to panels (fuse box, circuit breakers, disconnect, etc.)
- Temporary or permanent telephone line to panel (convenient for troubleshooting by service personnel)
- Besser-Matic frame support to ceiling
- Supports for box track for festoon cable system
- Rail package:
 - EB50 T rails
 - Anchor plates (#469930)
 - 3/4" hex nut (#87808)
 - 3/4" lockwasher (#87883)
 - Rail splice bars with track bolts
 - K-103 rail clips (#110925)

Note 1: The wire bundle length should be determined at the time of order. If, for unknown reasons, the length needs to change, please let Besser Company know as soon as possible.

Note 2: Please read this manual as well as the installation and foundation prints. If you have any questions or are unsure of anything, please contact Besser Company.

2.2 PREPARE THE LOCATION OF THE MS-9

The plant layout should be prepared according to specifications presented in figure 2.1, 2.2 and 2.3.

1. Locate DATUM A and DATUM B reference centerlines of the BESSER-MATIC (see figure 2.1).
2. Locate centerlines of each piece of equipment. (figures 2.1 and 2.2).
 - a. Mark center of concrete product machine baseplate between slide shafts (point A).
 - b. Stretch a string B across the front of the slide shafts and anchor both ends. This string should be straight, should just touch the slide shafts, and should extend at least 15 feet [4572mm] beyond each side of the slide shaft.
 - c. Locate Point C at least 15 feet [4572mm] on each side of the slide shaft on line B. Swing an arc from each of the C points to intersect at Point D. Point D should be about 30 feet [9144mm] from point A.

Mark the Front Delivery Conveyor (FDC) and Loader centerline by snapping a taut chalkline against the floor between points A and D.

- d. Layout the centerline of the unloader by swinging two arcs E, the same length as the Loader - Unloader center distance, from the FDC centerline. Snap a taut chalkline tangent to these two arcs.
- e. Locate centerline of Accumulators H by measuring from centerline of slide shafts along DATUM B centerline at distance I. (The dimension is on your Besser-Matic installation drawing.) Mark this point F. Locate points G 10 feet [3048mm] on either side of point F. From each of the G points swing two arcs. The intersection of these arcs locates points J. Snap a taut chalkline between the J points to locate the H centerline (Accumulators).

Note: Use a wire line or steel tape to swing arc. The chalkline will stretch.

3. Locate steel frames in the floor as per installation drawing. The MS-12 foundation requires two frame assemblies; one under the Loader Accumulator and one under the Unloader Accumulator. These steel foundations should be made to support 12,000 lbs [5454Kg] each. The Loader Accumulator centerline is the same as the centerline of the FDC. Note that the centerline of the FDC is not the same as the center of the concrete slab. The centerline of the concrete product machine is offset to one side of the foundation (see figure 2.2 in the Ultrapac Installation Manual #F9601). The size of the loader and unloader Accumulator frame assemblies is shown in figure 2.3 and in table 2.4.
4. Once the frame has been welded together, it can be placed in the proper location into the floor at the proper elevation using a transit (refer to figure 2.2).
5. The plant floor grade reference elevation is 100'-0" [30480mm].
6. The area where the Side Shifter travels requires a sub-floor at an elevation of 99'-5 1/2" [30315mm]. Refer to figure 2.2 for Side Shifter sub-floor dimensions and location.
7. The BESSER-MATIC panel can be located either next to the loader Accumulator (standard position) or in a remote location (see plant installation drawing). All conduit from the electrical panel to the BESSER-MATIC are run underground.

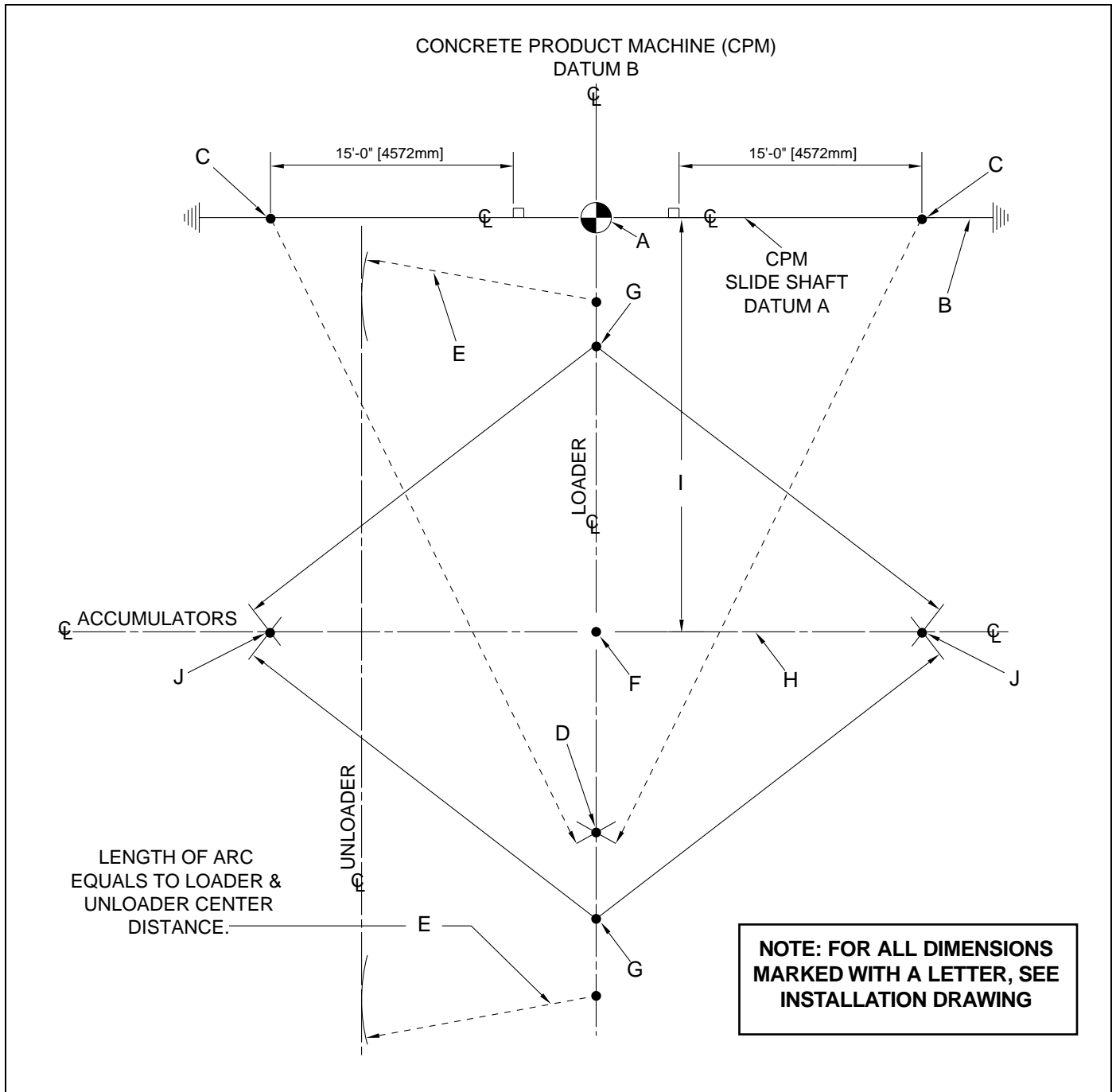


Figure 2.1 LOCATION OF EQUIPMENT BY CENTER LINES.

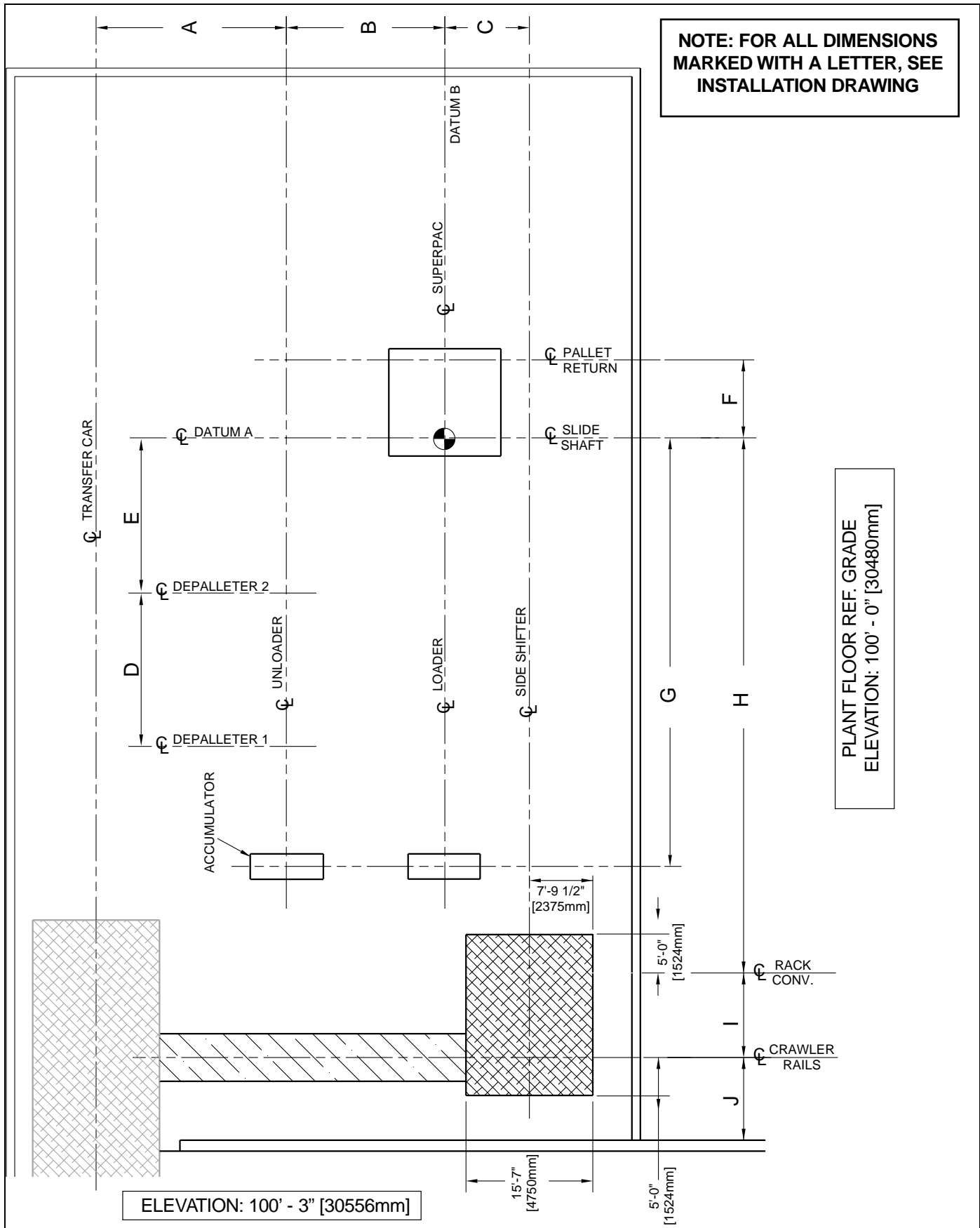


Figure 2.2 MS-12 BESSER-MATIC INSTALLATION (ref. installation print - sheet 1).

ACCUMULATOR STEEL FOUNDATION		
ACCUMULATORS ABOVE FLOOR (A)	I-BEAM	CHANNEL
1" [25mm] OR ON FLOOR	12" [305mm] @ 50.00#	12" [305mm] @ 25.00#
2" [51mm]	12" [305mm] @ 50.00#	12" [305mm] @ 25.00#
3" [76mm]	12" [305mm] @ 50.00#	12" [305mm] @ 25.00#
4" [102mm]	15" [381mm] @ 50.00#	15" [381mm] @ 40.00#
5" [127mm]	15" [381mm] @ 50.00#	15" [381mm] @ 40.00#
6" [152mm]	15" [381mm] @ 50.00#	15" [381mm] @ 40.00#
7" [178mm]	18" [457mm] @ 70.00#	15" [381mm] @ 40.00#
8" [203mm]	18" [457mm] @ 70.00#	15" [381mm] @ 40.00#
FOR DIM. ABOVE FLOOR NOT SHOWN USE NEXT HIGHER NO. AND IF HIGHER THAN 8" [203mm] CONTACT BESSER COMPANY.		

Table 2.1 ACCUMULATOR STEEL FOUNDATION.

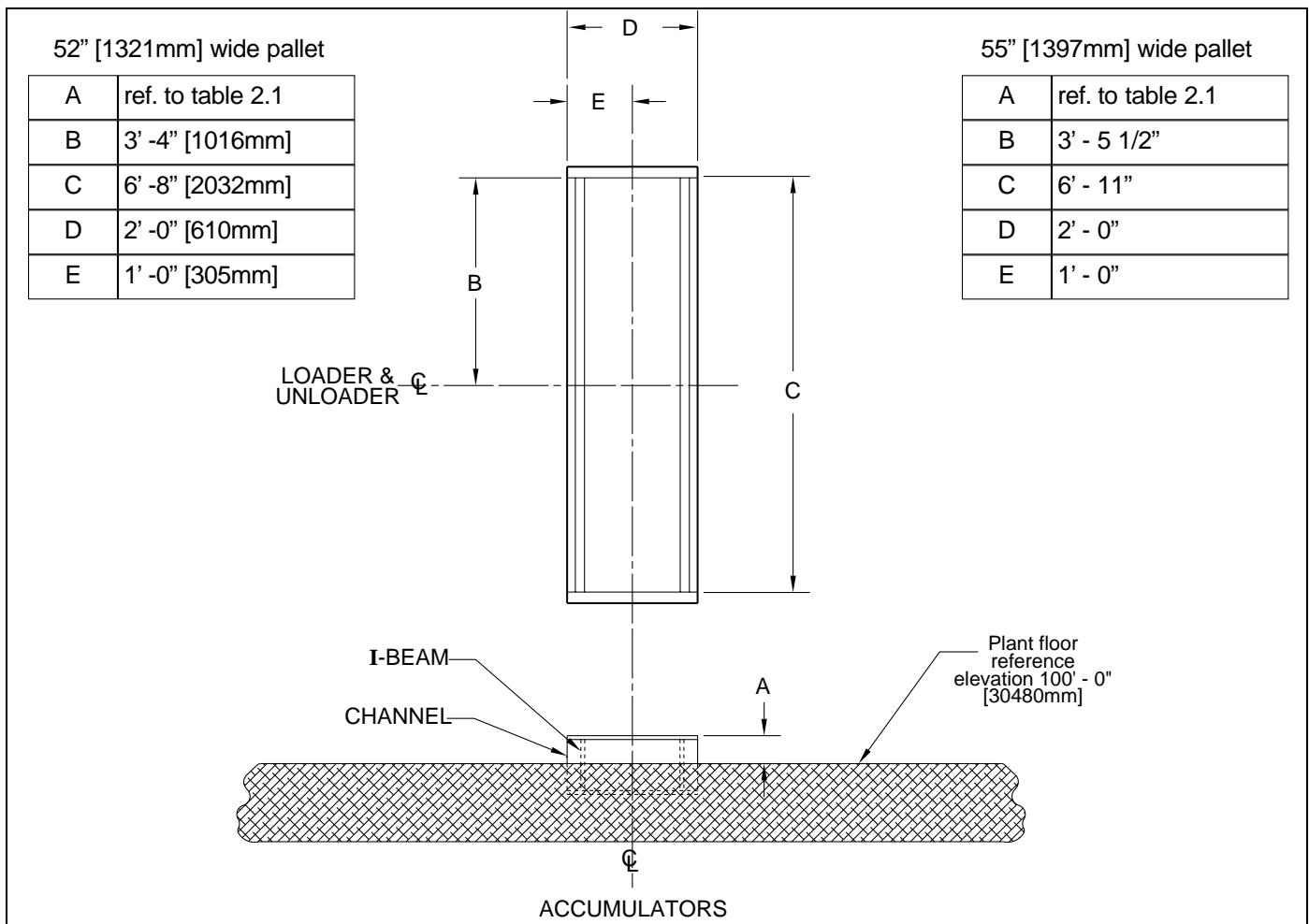


Figure 2.3 ACCUMULATOR FRAME ASSEMBLIES.

2.3 PREPARE ELECTRICAL SUPPLY TO THE MS-12

Refer to figure 2.4 and Installation drawing sheet 2 for electrical installations.

1. Locate position of all electrical stub-ups and position of panel.

Note: All stub-up locations are shown in figure 2.4 and on the BESSER-MATIC installation print sheet 2. See the BESSER-MATIC foundation print for exact location under the panel and exact locations of the accumulators.

- a. Temporary or permanent telephone line or extension required for start up and future service. To be located near panel.
- b. Bring power to the right hand side either by dropping from ceiling or coming through floor. If power comes from floor, it must enter panel at top. Make connection using "quick disconnects" as described below:

Note: Numbers 1 through 10 below refer to numbers in figures 2.4, and 2.5 and installation drawing sheet 2.

1. 3/4" [19mm] conduit from the panel to the Rackveyor
2. 1 1/4" [31.8mm] conduit from the panel to the valve stand.
3. 2" [50.8mm] conduit for control wiring from panel to loader Accumulator location.
4. 3/4" [19mm] conduit for communication cable from the panel to Control Station.
5. 1 1/2" [38.1mm] conduit for power wiring from panel to loader Accumulator.
6. 1 1/4" [31.8mm] conduit for wiring from the panel to the Depalletter 1.
7. 1 1/4" [31.8mm] conduit for wiring from the panel to the pallet return/rollover.
8. 1 1/4" [31.8mm] conduit for wiring from the panel to the Depalletter 2.
9. 1 1/4" [31.8mm] conduit for wiring from the panel to lowerator.

10. 1/2" [12.7mm] conduit for wiring panel to the 70 GPM power unit.

Notes on the electrical panel:

Service for the panel can be provided from overhead using the conduit size in the electrical table.

The wire bundle length should be determined at the time of order. If, for unknown reasons the length needs to change, please let Besser Company know as soon as possible.

Note: You may use straight lines instead of the rectangular coordinates shown in figure 2.4.

ATTENTION!

To comply with articles 110-9 and 110-10 of the national electrical code, American customers shall supply a branch circuit protective device to feed this control. The protective device shall have a short circuit interrupting rating of no less than the available short circuit current. Failure to do so could result in a rupture of the protective device while attempting to clear a fault. Besser Company recommends the use of protective devices with interrupting ratings of no less than 200,000 AMPS RMS symmetrical. See the electrical data chart on page 1-2 for recommended protection. [for customers outside the US, please check with your country's electrical codes and make sure you comply with all laws concerning electrical devices.]

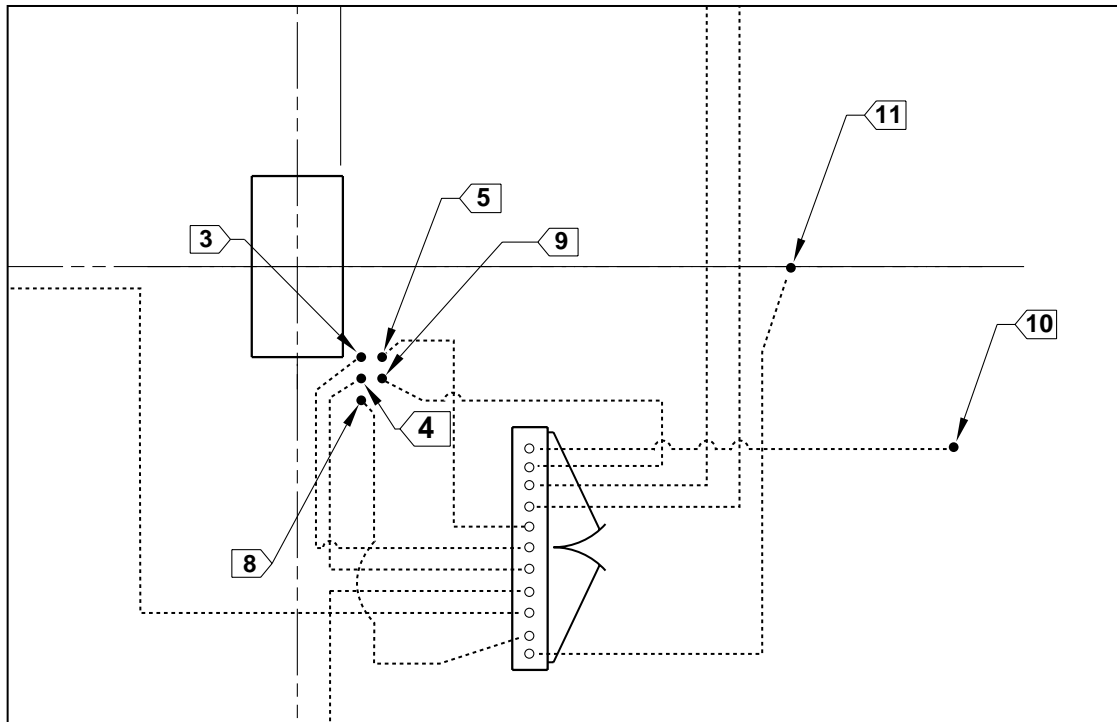


Figure 2.4 MS-12 BESSER-MATIC ELECTRICAL INSTALLATION (ref. installation sheet 2).

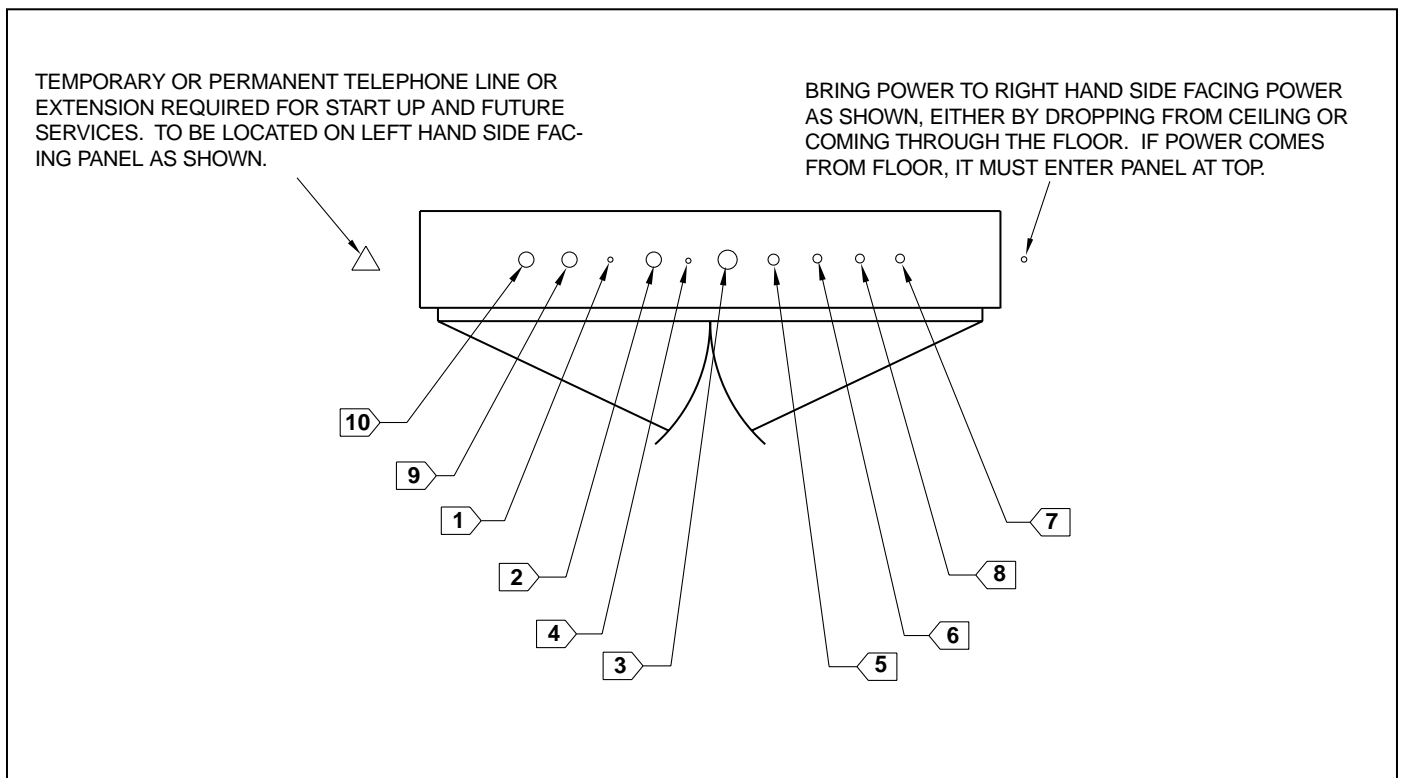


Figure 2.5 MS-12 BESSER-MATIC ELECTRICAL PANEL CONNECTIONS (ref. installation sheet 2).

2.4 PREPARE HYDRAULIC SUPPLY TO THE MS-12

Refer to installation drawing sheet 2 for hydraulic installations. There are two power units on the MS_12. The main power unit is a 70 G.P.M. The second power unit is a 20 G.P.M and serves for the Rack Conveyor only.

1. Locate position of all hydraulic stub-ups and position of hydraulic power units. 70 G.P.M Power unit may be installed in standard location.
 - a. All stub-up locations are shown in figure 2.6 and on the BESSER-MATIC installation prints sheet 2.
 - b. All hydraulic tubing to be below concrete and stub up 3" [76mm] above floor. We recommend underground runs, but overhead is possible.
 - c. Tubing, conduit and conduit from stub-ups to equipment not supplied by Besser company.
 - d. Recommended hydraulic pressure is 850 P.S.I.
2. Numbers 51 to 54 below refer to numbers in figures 2.6 and in installation prints sheet 2
 51. 20 G.P.M POWER UNIT:
3/4" [19.1mm] O.D. hydraulic tubing with 0.120 wall, tube nut, and ferrule at each end. From valve stand to unloader rail locks.
 52. 70 G.P.M POWER UNIT:
1" [25.4mm] O.D. hydraulic tubing with 0.120 wall, tube nut and ferrule at each end. From 70 G.P.M power unit to depalleter #1.
 53. 70 G.P.M POWER UNIT:
3/4" [19.1mm] O.D. hydraulic tubing with 0.120 wall, tube nut and ferrule at each end. From 70 G.P.M power unit to lowerator.
 54. 70 G.P.M POWER UNIT:
1" [25.4mm] O.D. hydraulic tubing with 0.120 wall, tube nut and ferrule at each end. From 70 G.P.M power unit to depalleter #2.

2.5 PLACE CONCRETE FLOOR

The area around the BESSER-MATIC is at elevation 100'-0" [30480mm] (plant grade) except for the Side Shifter pit.

First layer of concrete thickness varies according to local soil conditions. Must carry a load of 32,000 lbs [14545Kg] under each rail support and shim. Do not place second layer of concrete until rail gauge has been confirmed subsequent to fully loaded trial run. Refer to section 3 of this manual and to sheets 7, 8 and 9 of the Installation drawings.

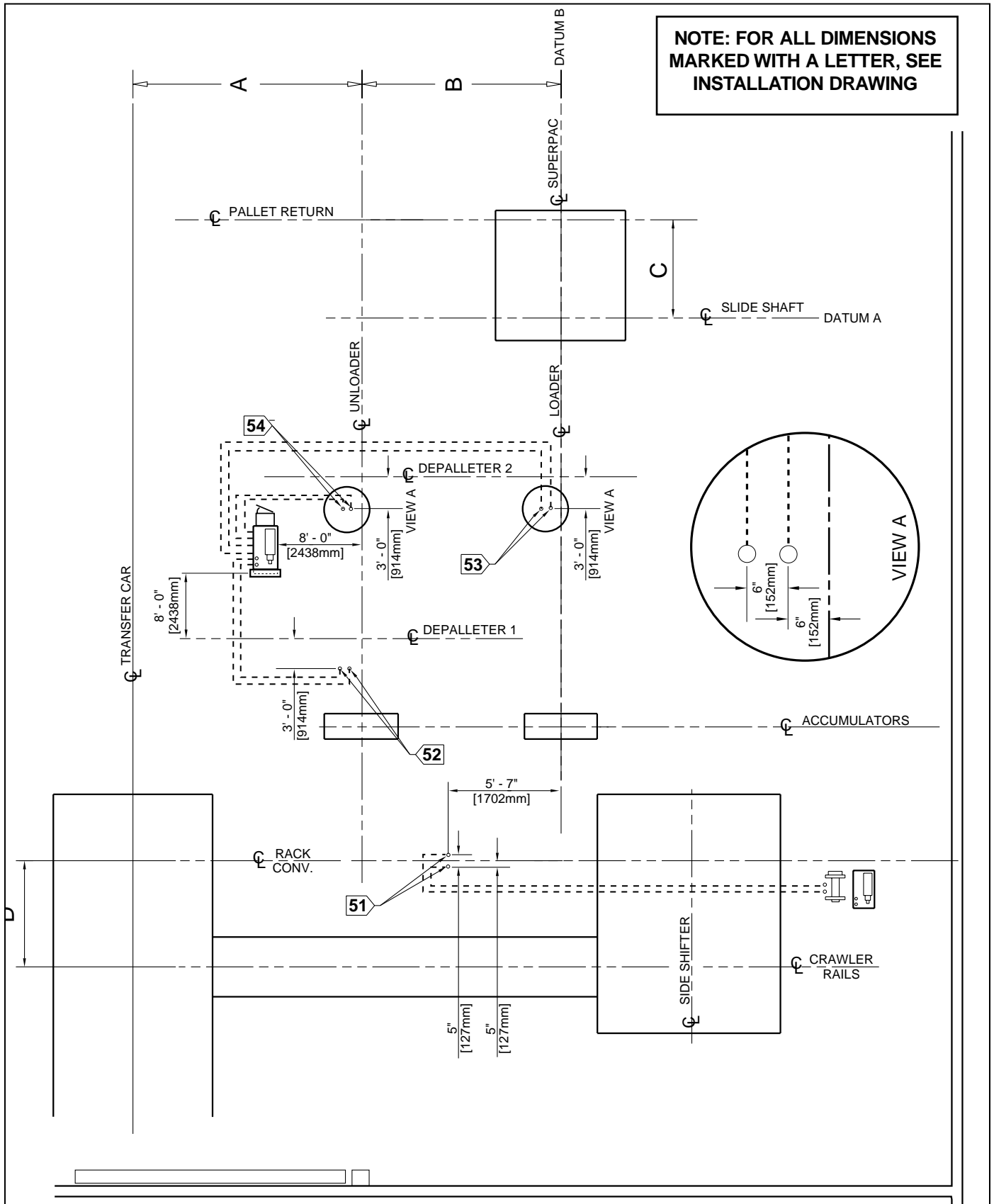


Figure 2.6 MS-12 BESSER-MATIC HYDRAULIC INSTALLATION (ref. installation print sheet 2).

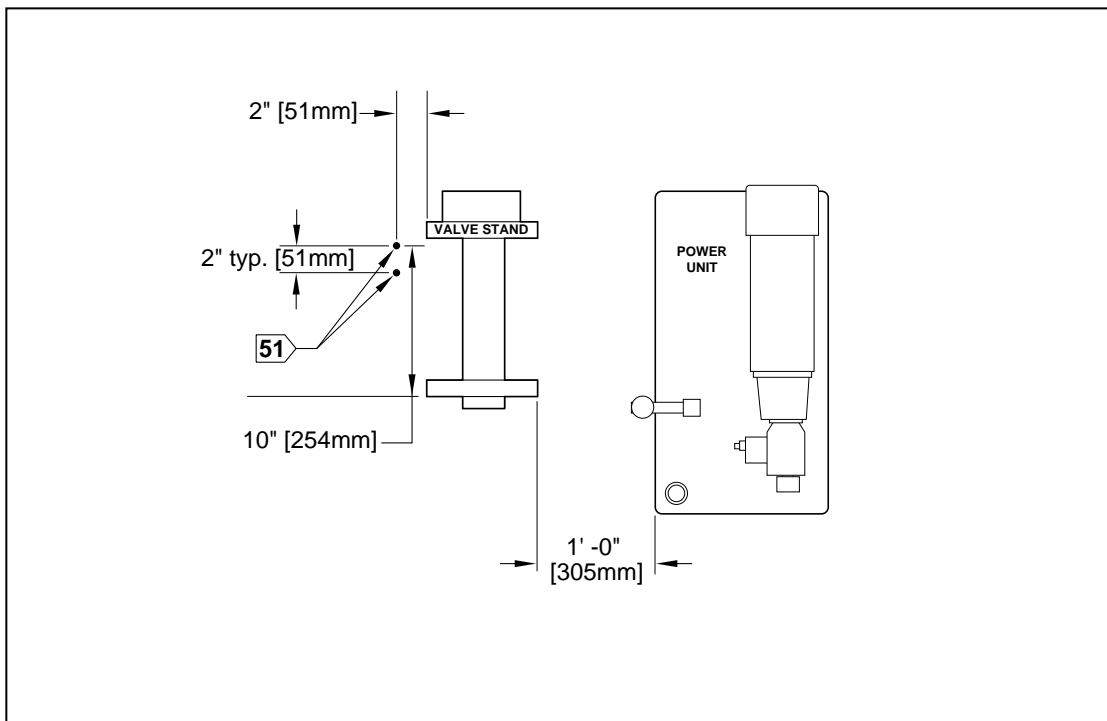


Figure 2.7 STANDARD LOCATION FOR HYDRAULIC VALVE STAND AND 20 G.P.M. POWER UNIT FOR RACK CONVEYOR (SEE INSTALLATION DRAWING FOR LOCATION).

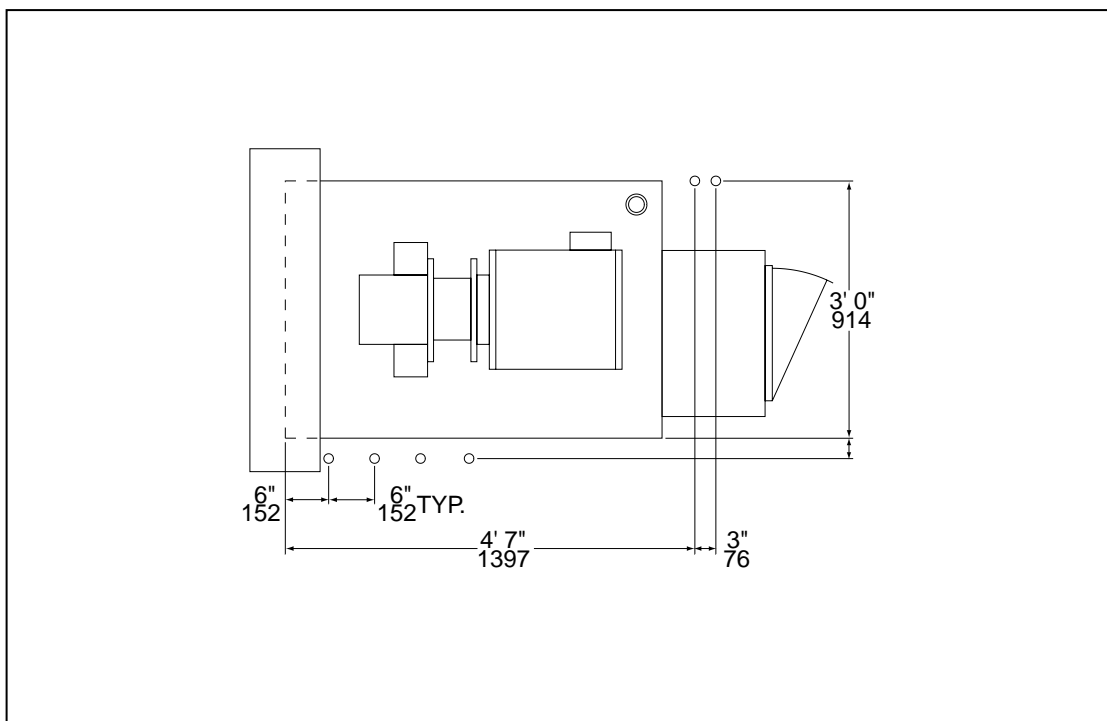


Figure 2.8 REMOTE LOCATION FOR HYDRAULIC VALVE STAND AND 20 G.P.M. POWER UNIT FOR RACK CONVEYOR (SEE INSTALLATION DRAWING FOR LOCATION).

SECTION 3 INSTALLATION

THE PRESENT SECTION EXPLAINS HOW TO INSTALL BESSER-MATIC MULTI-SPADE MS-12. IF YOU ARE ALSO INSTALLING A RACK TRANSPORTER SYSTEM SUCH AS A LSC-100, YOU SHOULD FOLLOW INSTRUCTIONS FOR BOTH THESE SYSTEMS SIMULTANEOUSLY. INSTRUCTION ON THE RACK TRANSPORTER SYSTEM INSTALLATION ARE FOUND IN MANUAL #466364F9601. USE THIS SECTION CONJOINTLY WITH THE INSTALLATION DRAWING - (SHEETS 3 TO 10) TO INSTALL THE BESSER-MATIC MS-12. THIS SECTION IS NOT A REPLACEMENT OF THE DRAWINGS LISTED ABOVE; IT IS PRESENTED HERE AS COMPLEMENTARY INFORMATION.



WARNING: Use extreme care when handling heavy equipment. The MS-12 Besser-Matic is made of large and heavy parts that can become very dangerous when out of balance. Always use professional riggers for moving and installing Besser-Matic frame and components. Also, any personnel working or standing in the installation area should wear approved safety boots, hard hat and goggles. Work safely, think safety!

3.1 INSTALL SIDE SHIFTER AND CRAWLER RAILS

The Side Shifter and Crawler rails should be installed according to specifications presented in figures 3.1 to 3.9 along with installation drawing sheets 3, 4 and 9.

3.1.1 Install rail anchors

Rail anchors (item 1 in figure 3.6) should be secured with 3/4" X 4-3/4" [19mm X 121mm] L. anchor stud, 3/4" [19mm] lockwasher and 3/4" [19mm] hex. nut. Rail anchors should be installed at 4 foot [1219mm] intervals along all rail paths. Figure 3.1 shows the rail anchor assembly and figure 3.2 shows the depth and placement using the anchor plate as a template, for drilling anchor bolt holes. Mark and drill anchor bolt holes with care and precision. In order for rail gauge to be accurate, the holes for rail anchors must be located within a tolerance of $\pm 1/16$ inches [2mm].

3.1.2 Install shims

Spacer shims (2" X 6" [51mm X 152mm]) (item 2 in figure 3.6) should be placed halfway between each anchor plate to support rails. Tackweld shims to rails after rails have been located. Optional shims may be used to obtain the correct elevation of the rails but are not required for correct support. Shim thickness may vary according to floor elevations.

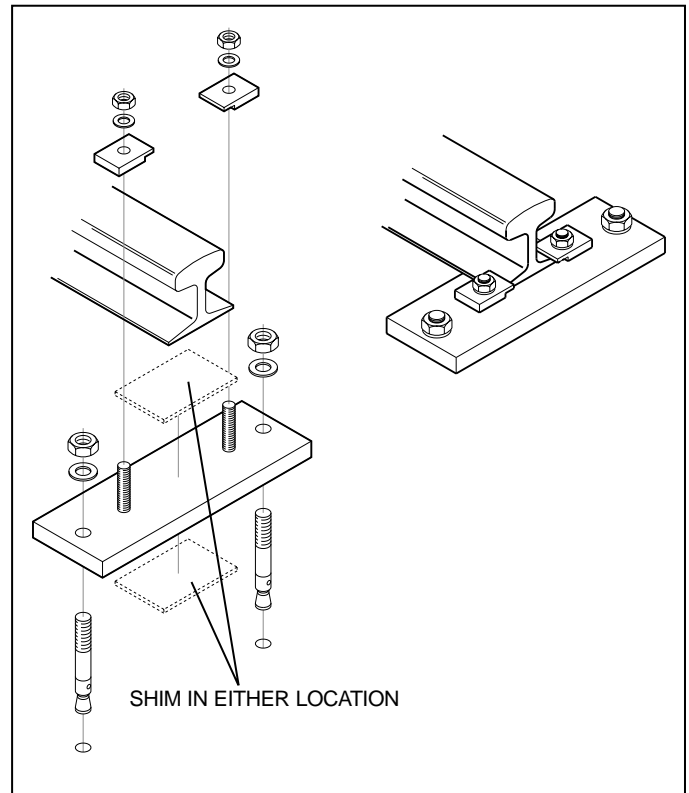


Figure 3.1 RAIL ANCHOR WITH SHIMS

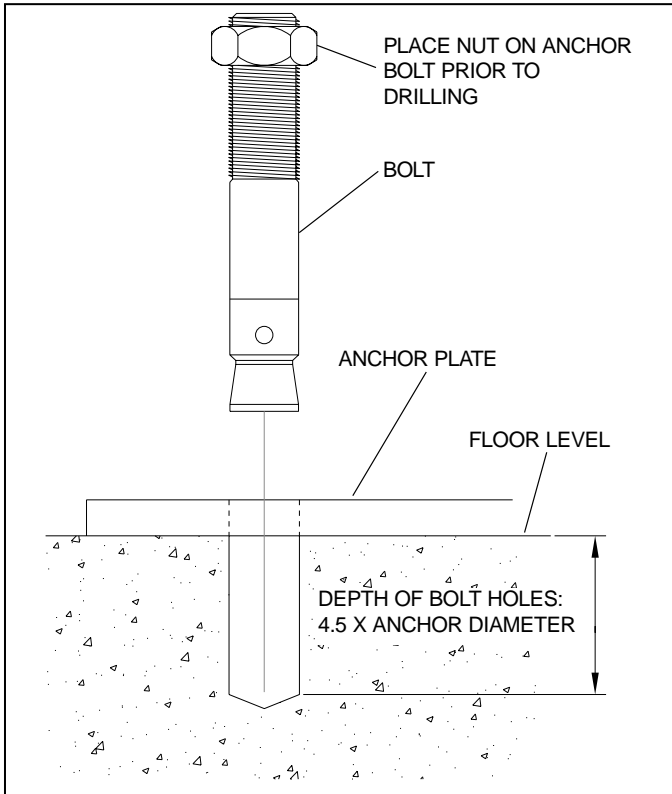


Figure 3.2 ANCHOR BOLT

3.1.3 Install rails

3.1.3.1 Side shifter rails. Side shifter rails are EB50T. Shim rails to an elevation of 100'-0-1/4" [30486mm]. Refer to item 1 in figure 3.6.

3.1.3.2 Crawler rails. Crawler rails are EB50T. Shim to an elevation of 100'-9-3/4" [30728mm]. Refer to item 2 in figure 3.6.

3.1.3.3 Crawler rail curbs. Curbs have an elevation of 101'-1 1/4" [30817mm]. Refer to item 3 in figure 3.6.

3.1.3.4 Side Shifter actuators. They should be secured with 1/2" X 3 3/4" L. [13mm X 95mm L.] anchor stud, 1/2" lockwasher and 1/2" hex. nut. Refer to item 4 in figure 3.6

3.1.4 Install stop blocks

Weld stop blocks (figure 3.3)(4 required - 1" high X 2" wide X 3" long) [25.4mm X 51mm X 76mm]; one on each end of Side Shifter rails to prevent Side Shifter from leaving rails. Refer to item 5 in figure 3.6.

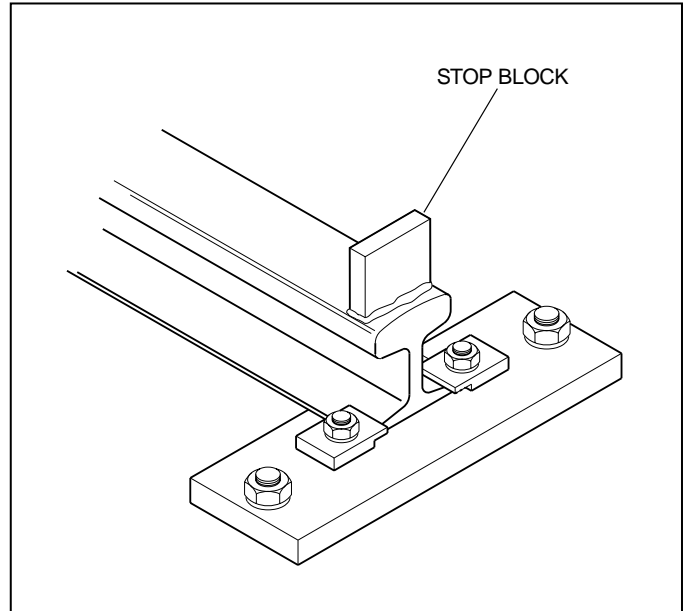


Figure 3.3 STOP BLOCK

3.1.5 Install cable & hose carrier

Locate cable & hose carrier bracket and hose support bracket (refer to item 6 in figure 3.6). Secure with 3/8" X 2 3/4" L. [9.5mm X 70mm L.] anchor studs, 3/8" lockwasher and 3/8" hex. nut.

3.1.6 Notch crawler rails

Notch and shim crawler rails to match rails on Rackveyor front section as shown below (also see item 12 in figure 3.6). Then weld to front section.

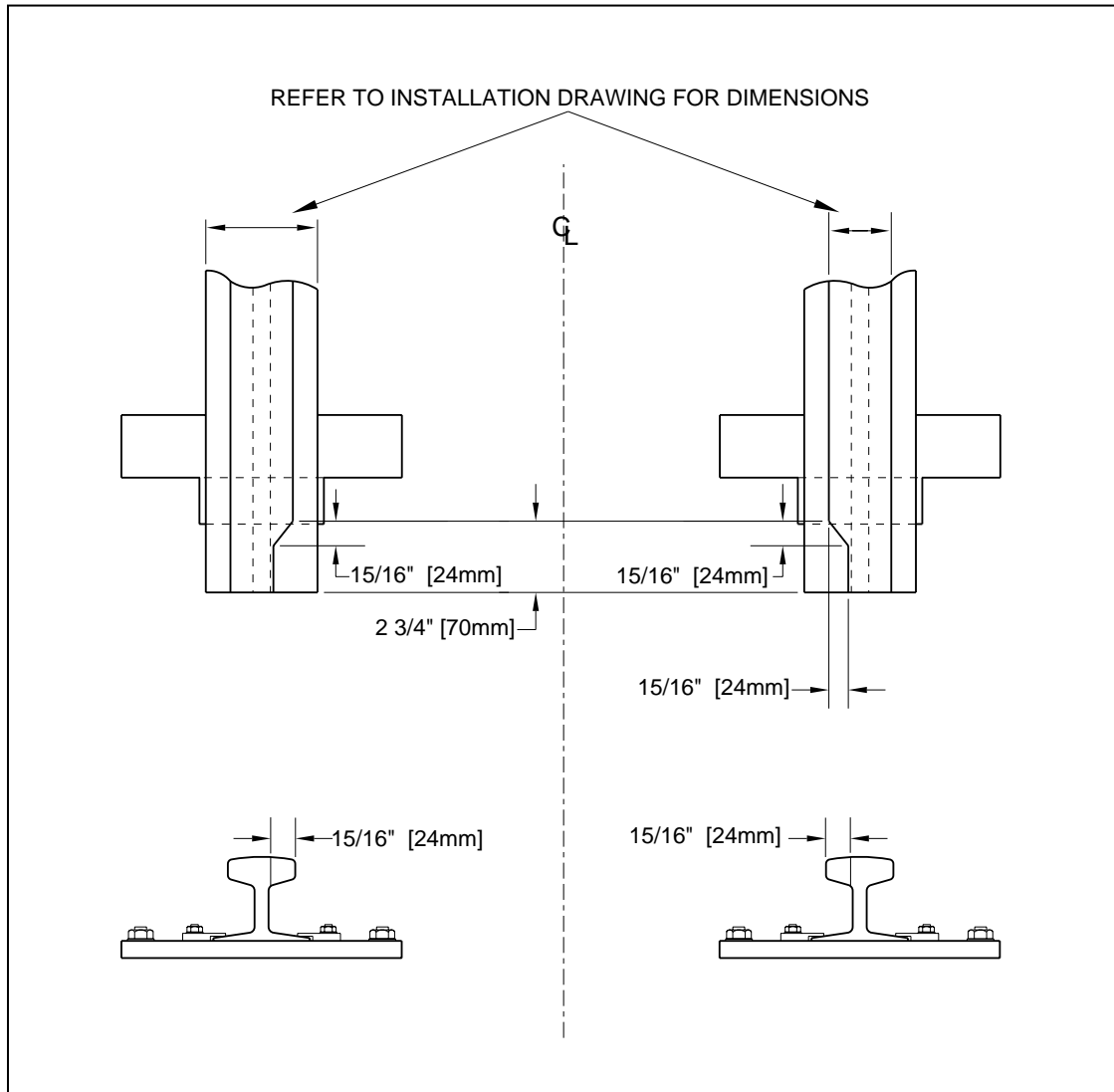


Figure 3.4 NOTCHES ON CRAWLER RAILS

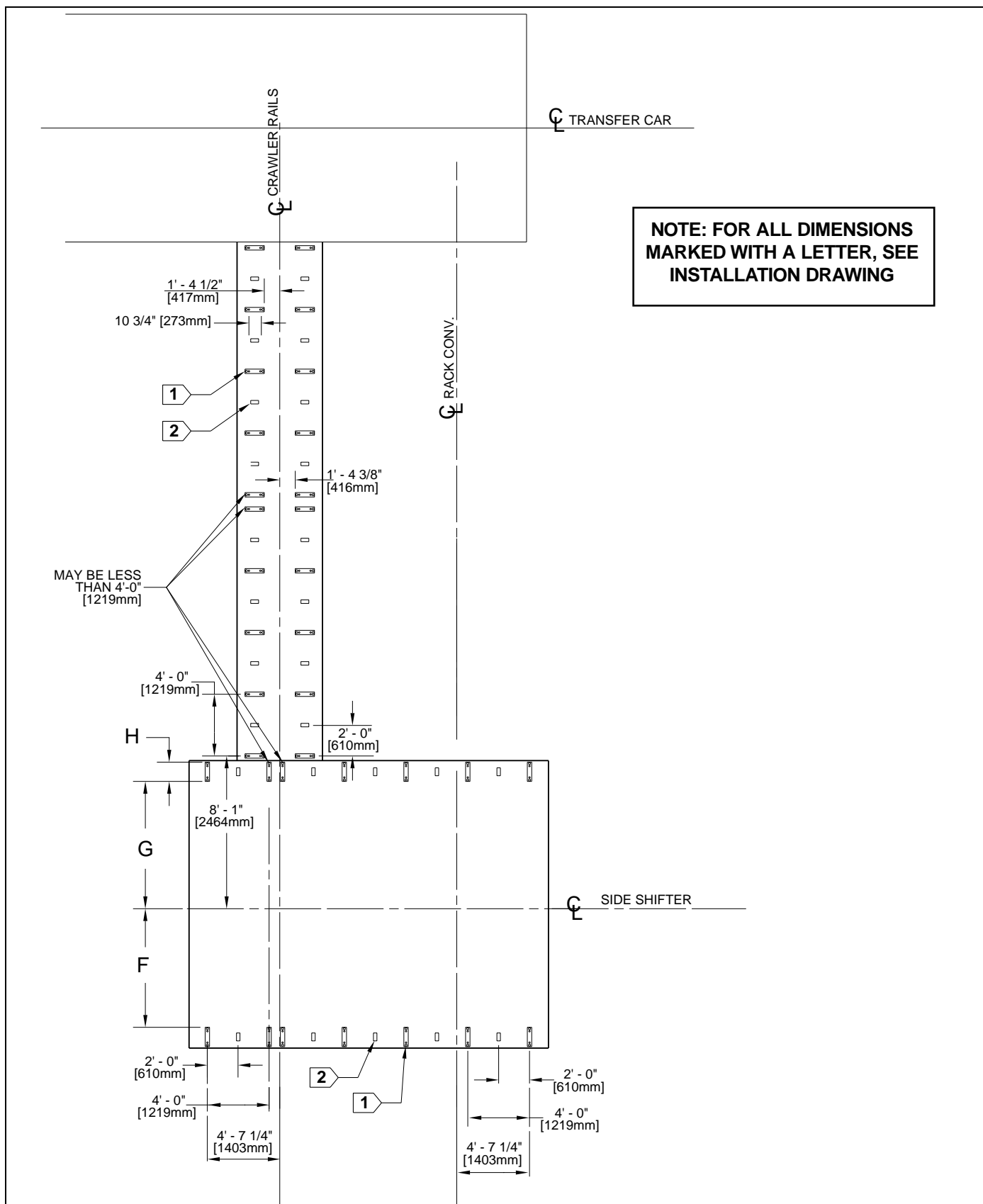


Figure 3.5 SIDE SHIFTER AND CRAWLER ANCHOR PLATES AND SHIMS INSTALLATION.

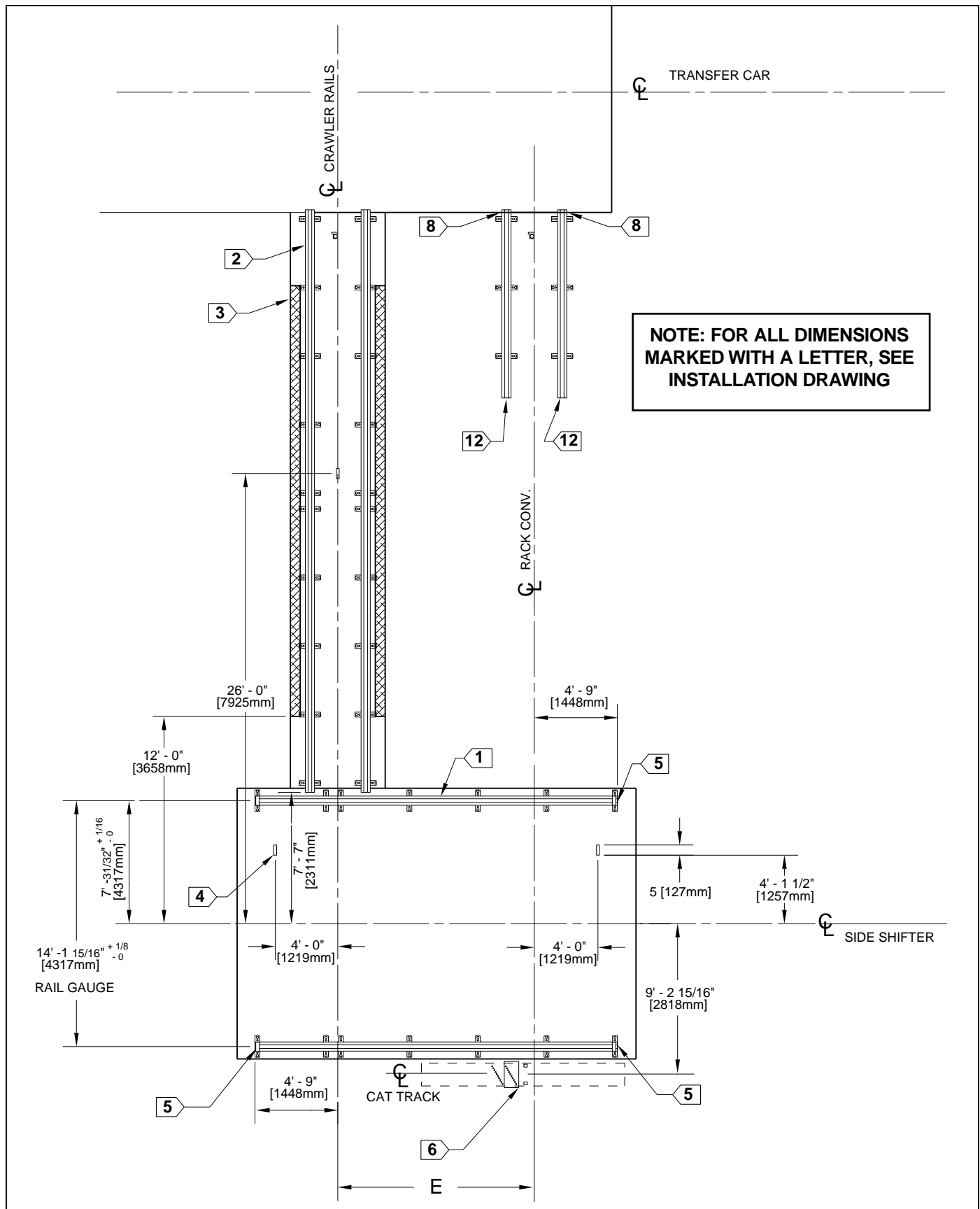


Figure 3.6 SIDE SHIFTER AND CRAWLER RAIL INSTALLATION.

3.1.7 Shim crawler rails

After transfer car is in position, shim the leading ends of all crawler rails to match crawler rails on transfer car, within .030" [0.75mm], then tackweld shims to rails. Shim thickness may vary according to floor elevations. Refer to item 10 in figure 3.7 and items 8 in figure 3.6.

Note: Do not pour second layer of concrete until rail gauge and elevation has been reconfirmed subsequent to fully loaded trial run. See item 11 in figure 3.7.

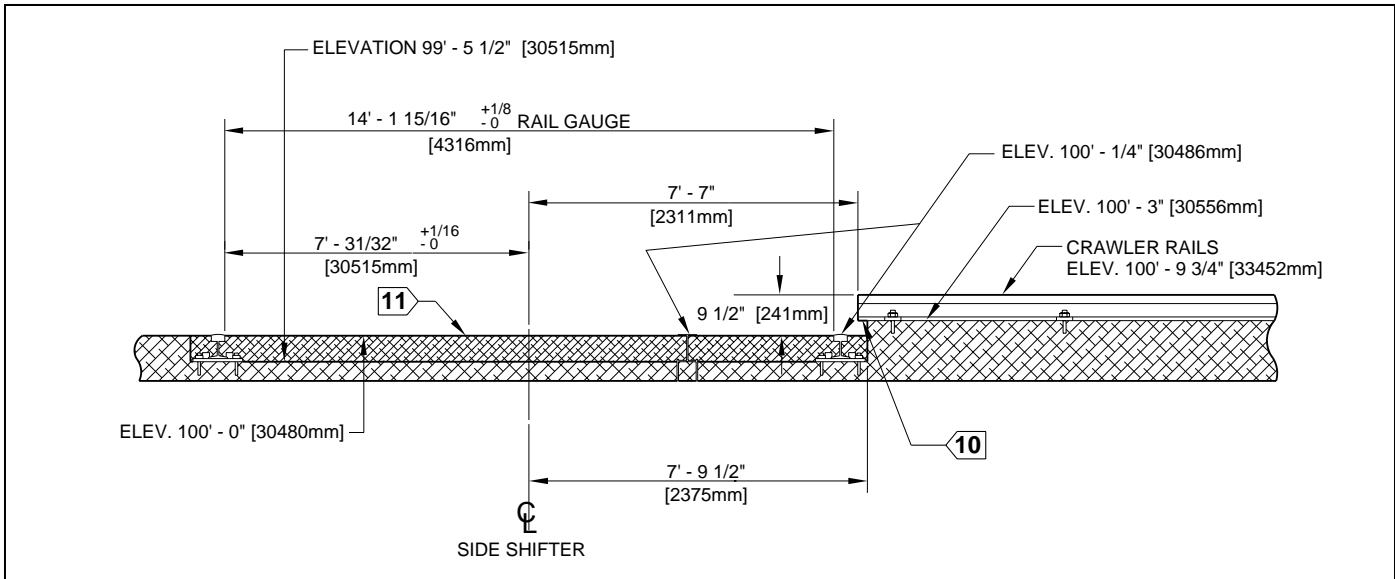


Figure 3.7 SIDE SHIFTER AND CRAWLER RAIL INSTALLATION.

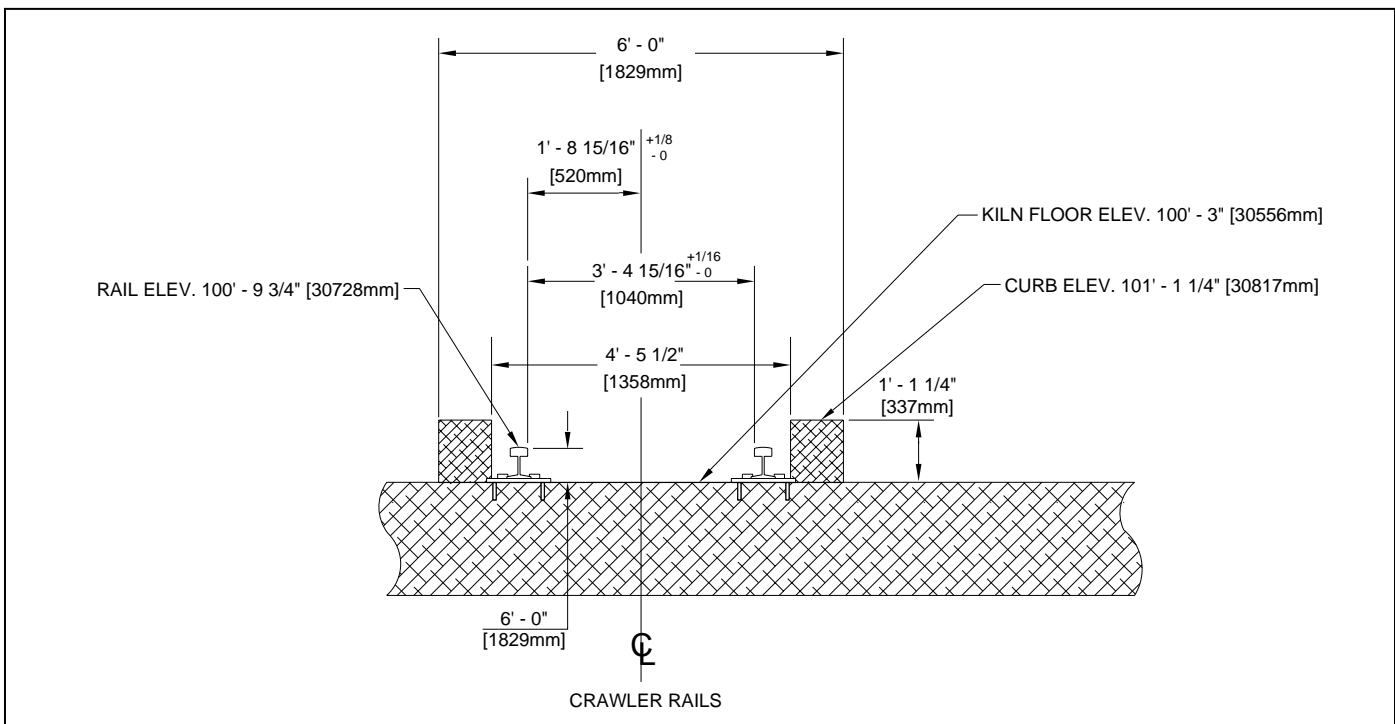


Figure 3.8 SIDE SHIFTER AND CRAWLER RAIL INSTALLATION.

3.2 INSTALL ACCUMULATORS

Locate Accumulators on steel foundation. Ensure that Accumulators are plumb and straight before welding to steel foundation. To lift Accumulators up, attach top of Accumulators to crane with chain. Keep in mind accumulators are heavy, approximately 3600 Lbs [1636 Kg] each. To do so, bolt lift plates (A) to top of Accumulators. See figure 3.9.

Note: Remove lift plates (A) before resuming instal-

lation.



WARNING: Accumulators are heavy! Inappropriate handling of this piece of equipment could lead to serious injuries! Always use professional riggers.

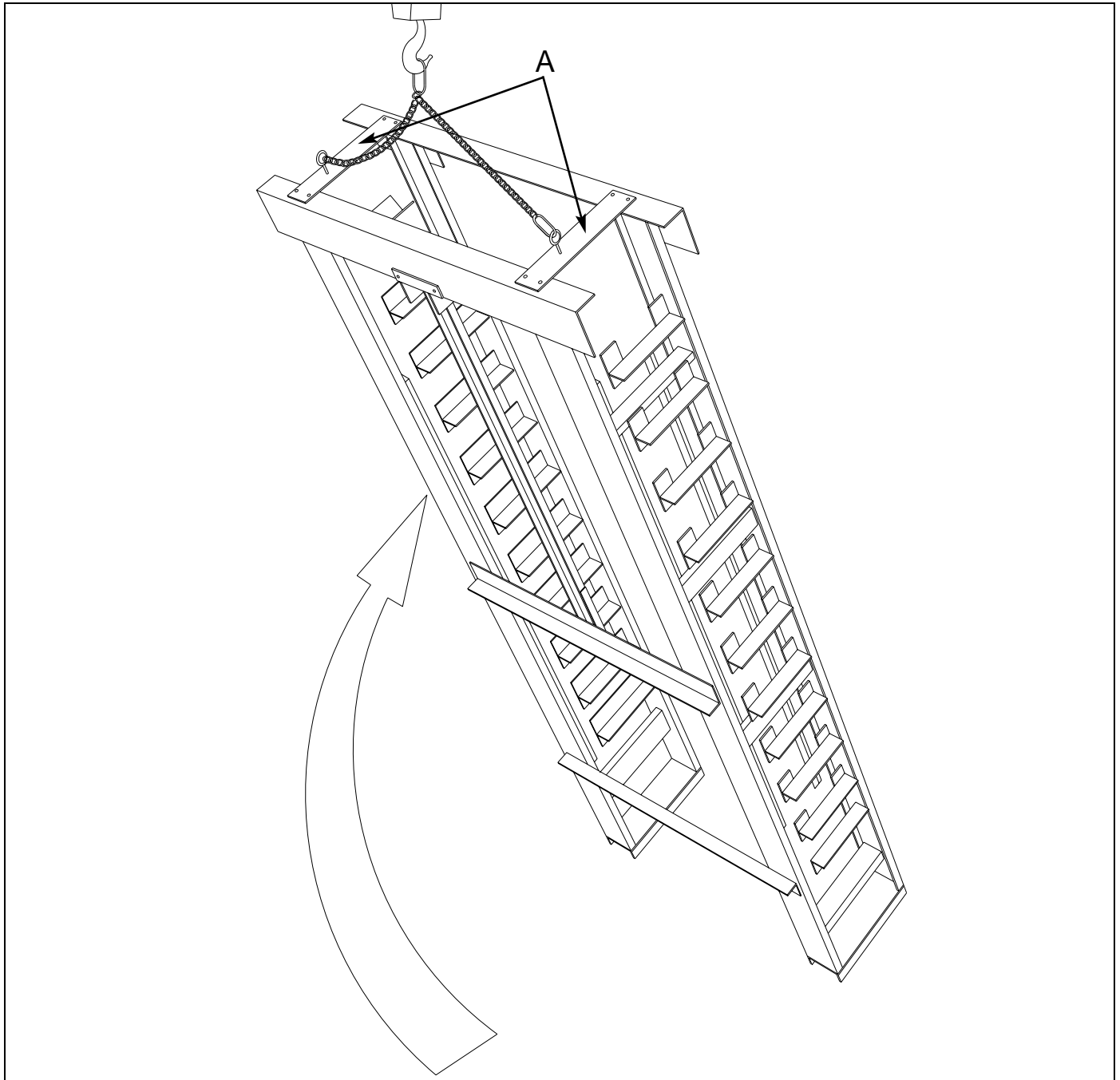
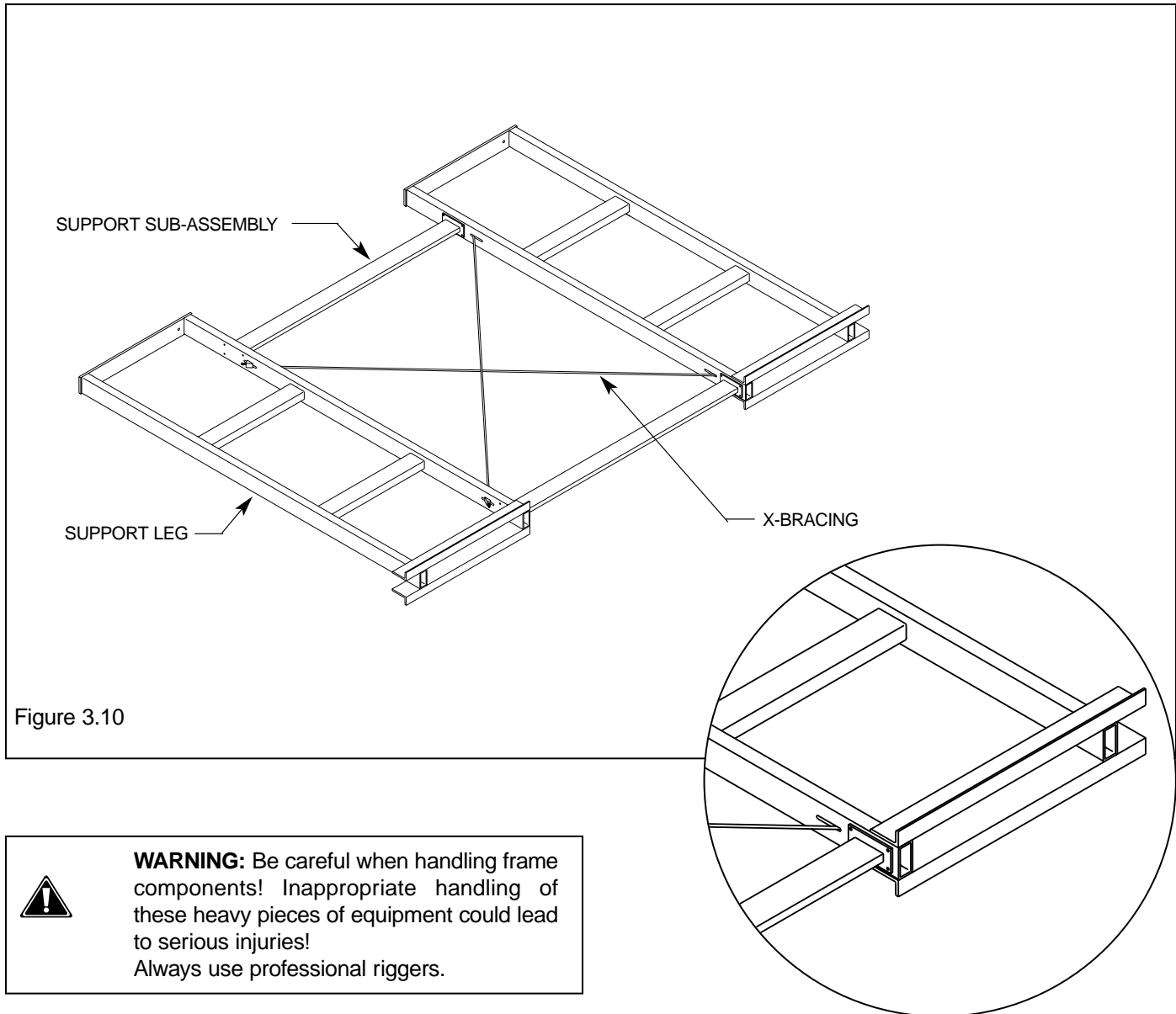


Figure 3.9 LIFT ACCUMULATORS USING CRANE.

3.3 INSTALL BESSER-MATIC FRAME ASSEMBLY

1. Bolt the 4 support legs to cross member as shown in illustrations below.
2. Bolt "X" bracings and angle support to support legs as shown below.
3. Anchor frame legs to floor with braces (see figure 3.12 on next page).



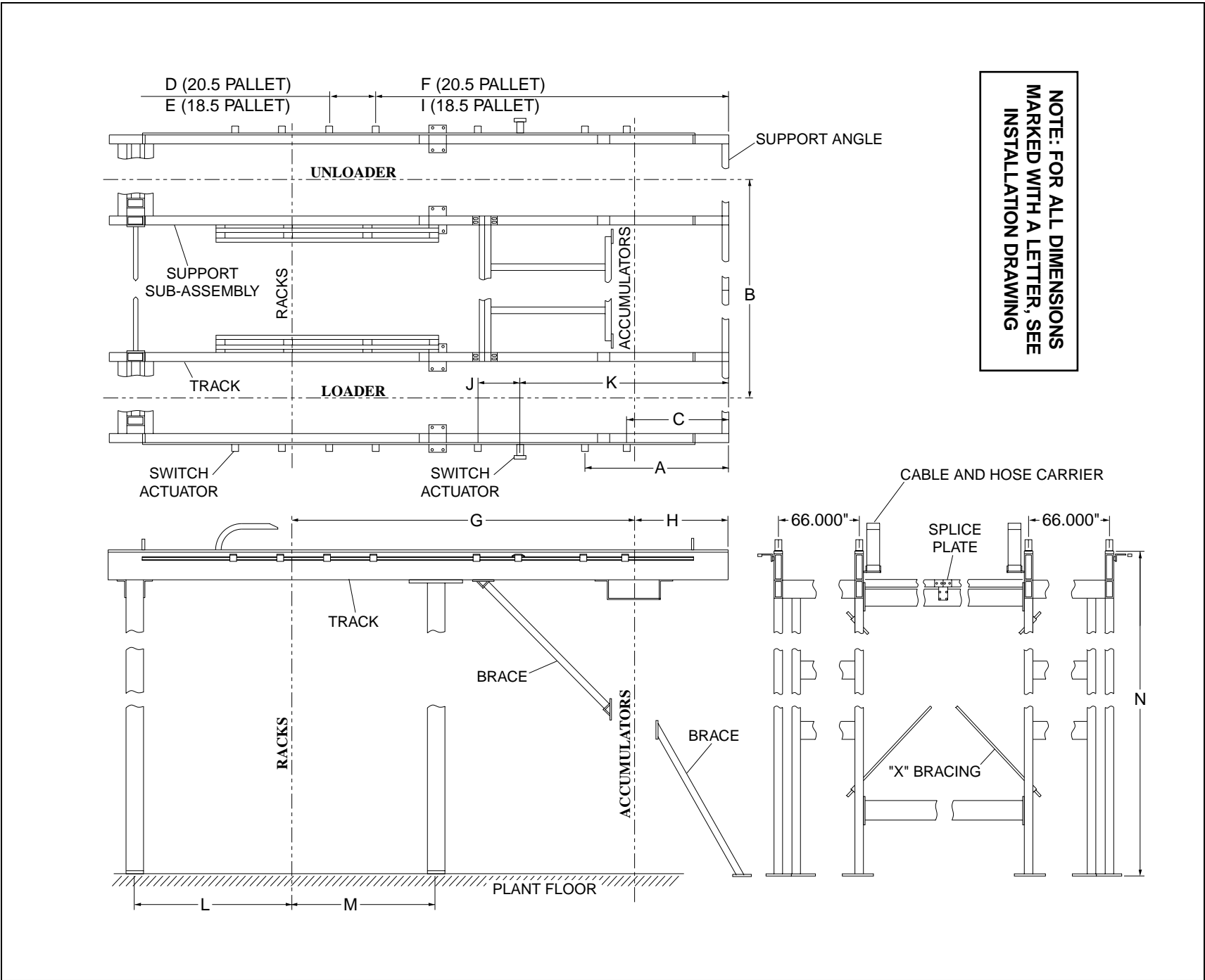


Figure 3.12 FRAME ASSEMBLY.

4. Bolt tracks to frame legs and Accumulators as shown below.
5. Anchor brace (figure 3.14).
6. Anchor angle support with raceway (figure 3.14).
7. Secure roller guides to Accumulator frames as shown in figure 3.14.



WARNING: Be careful when handling frame components! Inappropriate handling of these pieces of equipment could lead to serious injuries! Always use professional riggers.

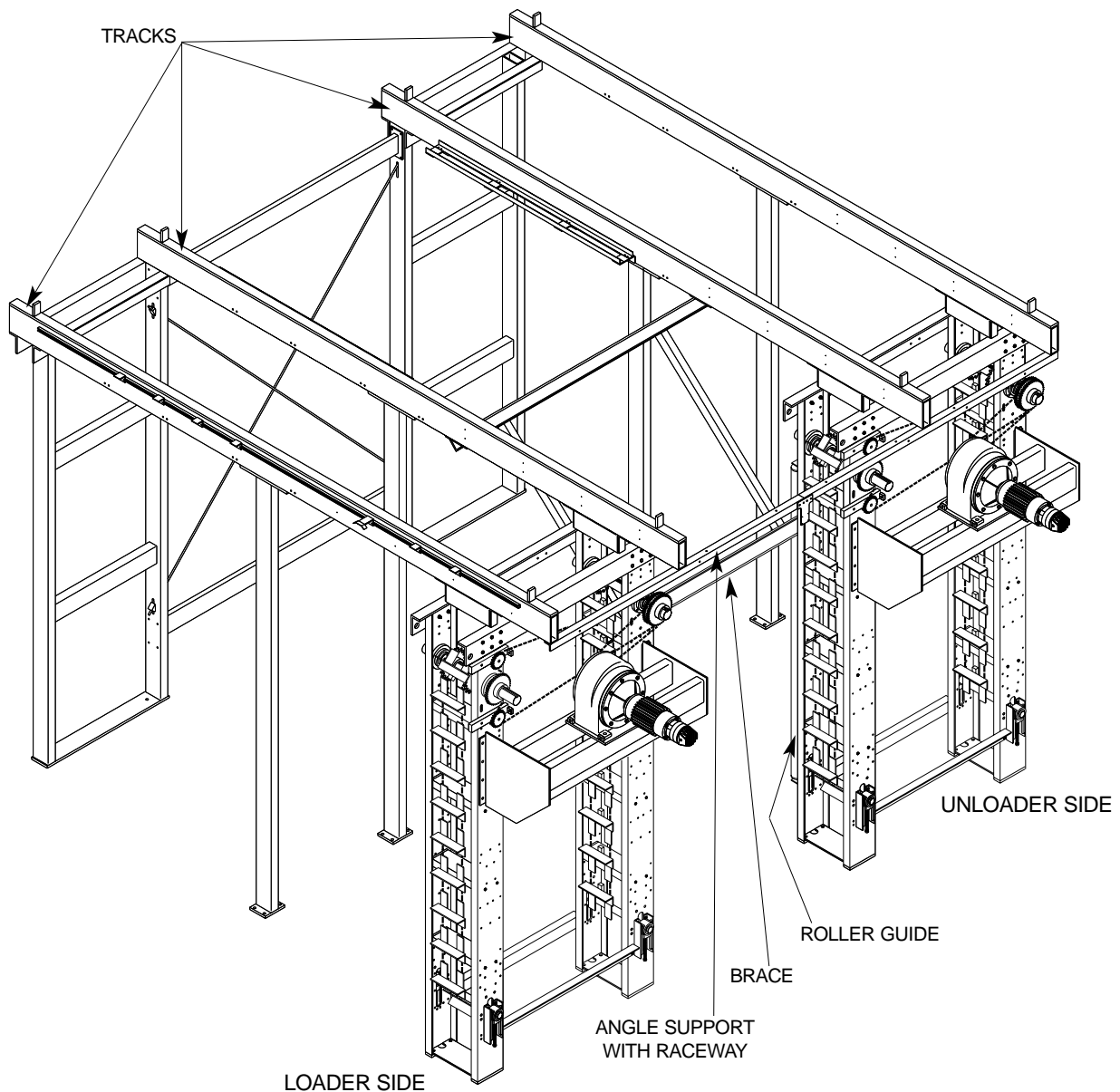


Figure 3.13 ANCHOR CROSS CHANNEL TRACKS, ANCHOR BRACES, ANGLE SUPPORT WITH RACEWAY AND ROLLER GUIDES.

3.4 INSTALL STABILIZERS AND LOWER SPADES

3.4.1 Install stabilizers.

Install both Stabilizers on frame track. To do so, place Stabilizer on crane. Stabilizer can be lifted over frame then placed on tracks. See figure 3.15.



WARNING: Be careful when handling stabilizers! Inappropriate handling of these pieces of equipment could lead to serious injuries! Always use professional riggers.

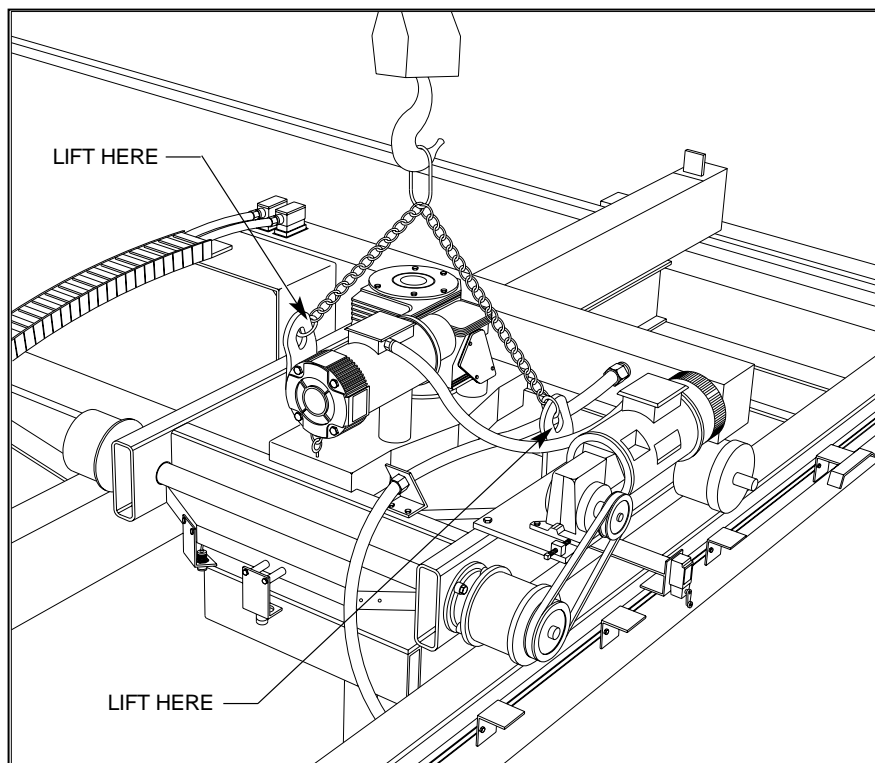


Figure 3.15 INSTALLING STABILIZERS ON FRAME TRACKS.

3.4.2 Assemble lower spades.

Before assembling each lower spade, carefully remove paint from all mating surfaces between stabilizers and spades. Assemble lower spade assemblies to stabilizers. To do so, place two 4" X 7.25 lbs X 36" channels [102mm X 3.3 Kg X 914mm] (figure 3.16 item A) between ball screw nut and carriage side plate. Let bars stick out on both sides of spade as shown in figure 3.18. Pick up spade sideways with fork lift truck, one fork on both sides of spade, picking up on bars. It is **important** to chain the lower spade to the fork lift to ensure the lower spade does not tip over. Use a chain binder to tighten the chain. Care should be taken not to get too close to limit switch or ball screw with forks of lift truck.



WARNING: Be careful when handling spades! Inappropriate handling of these pieces of equipment could lead to serious injuries! Always use professional riggers.

3.4.3 Bolt Spade.

Bolt Spade to Stabilizer with 6 bolts on each side at point B in figure 3.17 below.

3.4.4 Weld spade.

Obtain 90° angle between lower and upper unit of spade and weld at points C in figure 3.17 below. Use 1/4" [6.35mm] welds.

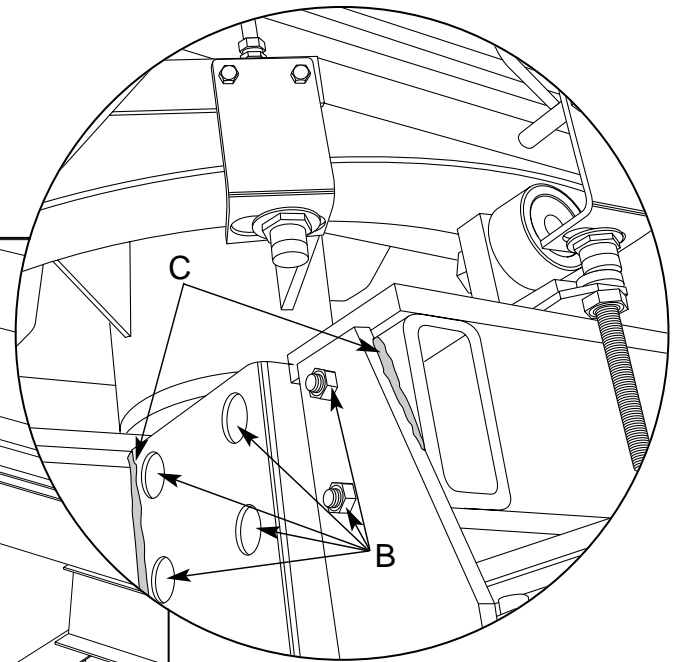
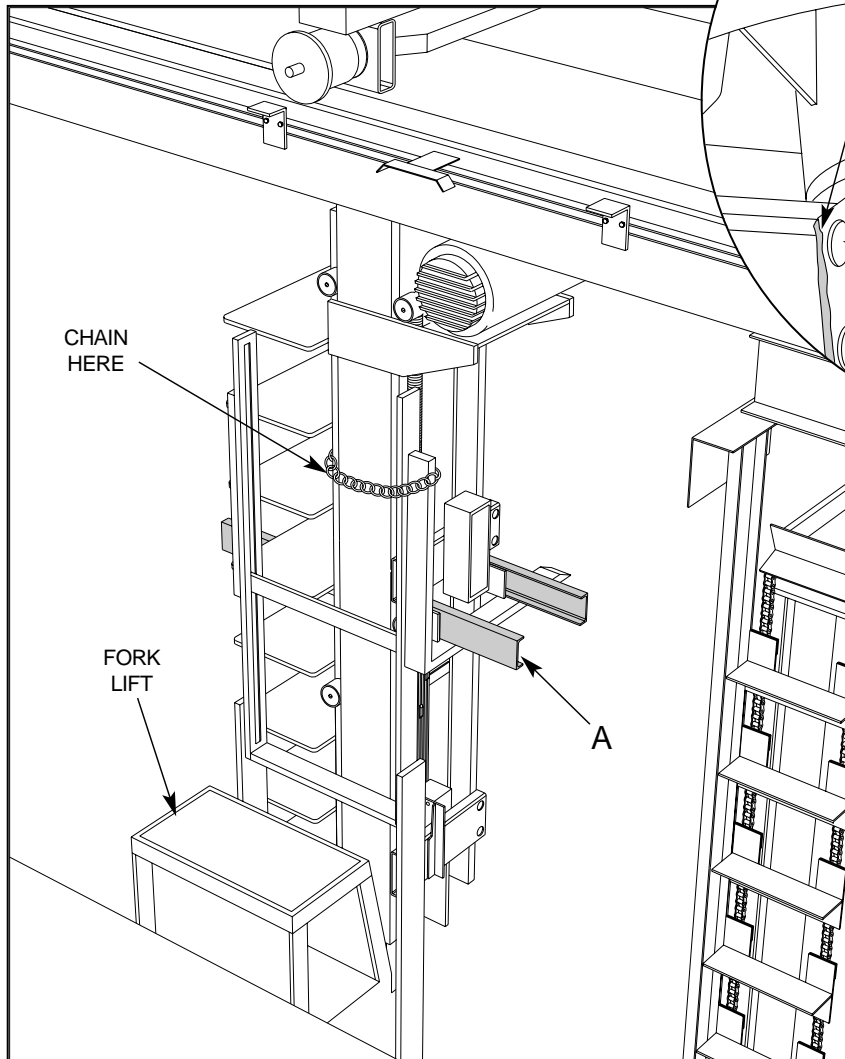


Figure 3.17 BOLTING SPADES.

Figure 3.16 ASSEMBLING LOWER SPADES TO STABILIZERS.

3.4.5 Center spades

Center both spade assemblies with Accumulators as shown in figure 3.18. The shelves on the lower spades have to be centered with Accumulators. To adjust:

3.4.5.1 On all 4 wheels of each stabilizer, loosen set screw which holds the stabilizer wheel (figure 3.19) to the wheel shaft.

3.4.5.2 Move the stabilizer sideways until lower spade shelves are centered with Accumulator. Wheels will not move here, only stabilizer frame.

3.4.5.3 Tighten set screws in all 4 stabilizer wheels.

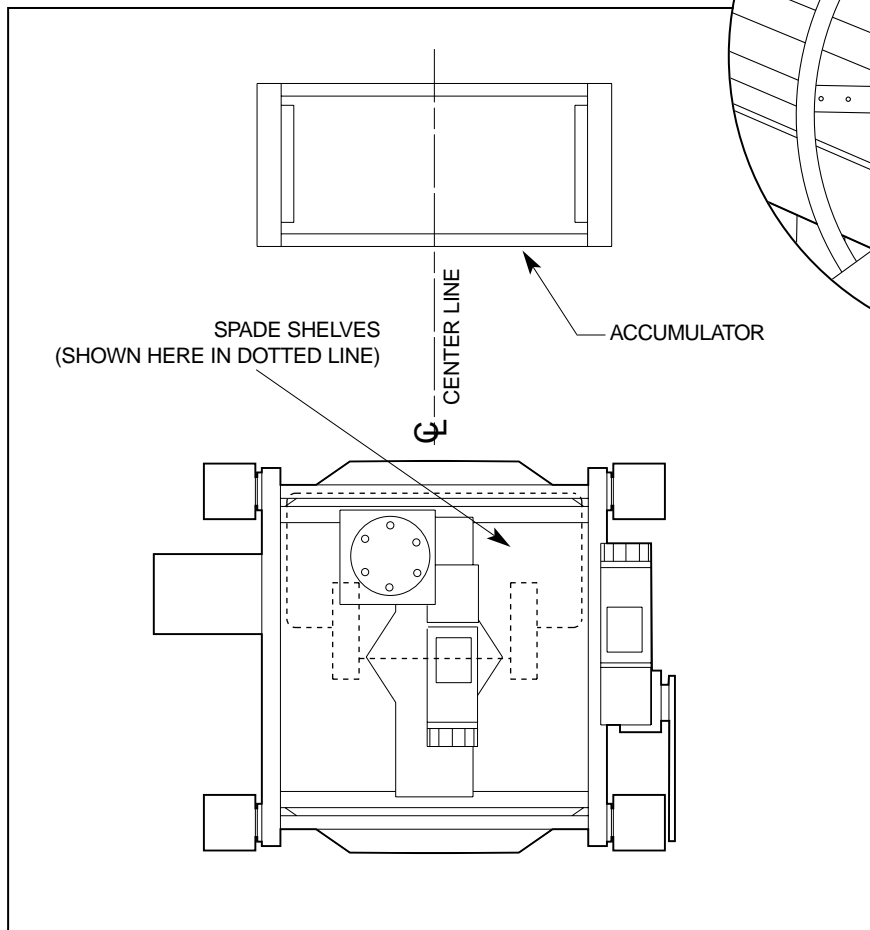


Figure 3.18 CENTERING SPADE ASSEMBLY.

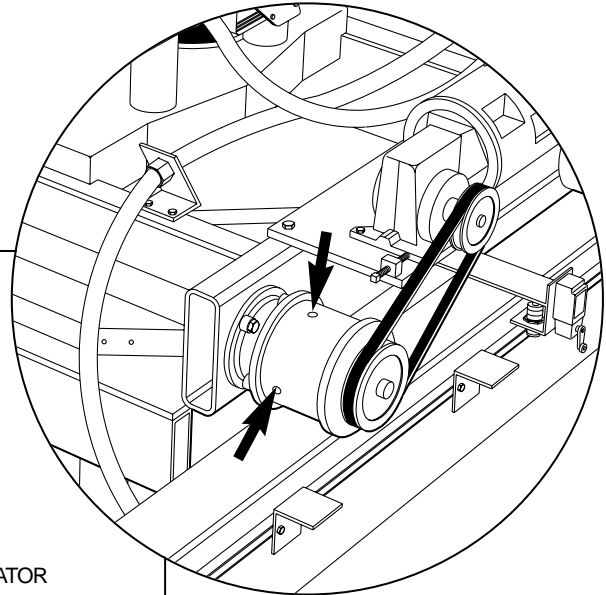


Figure 3.19 STABILIZER
WHEEL SCREWS.

3.5 INSTALL RACKVEYOR

3.5.1 Position Rackveyor

Locate and position Rackveyor. First support frame must be aligned with center line of loader as shown in figure 3.20. Square up Rackveyor to centerlines and shim Rackveyor (under support frame) so that top of rollers are at 13-1/4" [337mm] from floor and match rails on Side Shifter (elevation 100'-9-3/4" [30728mm]). Also the rails on Rackveyor must be the same height as crawler rails (100'-9-3/4" [30728mm]).

3.5.2 Secure Rackveyor

Secure Rackveyor to floor with 3/4" X 7" L. [19mm X 178mm] anchor studs, 3/4" lockwasher and 3/4" hex. nuts.

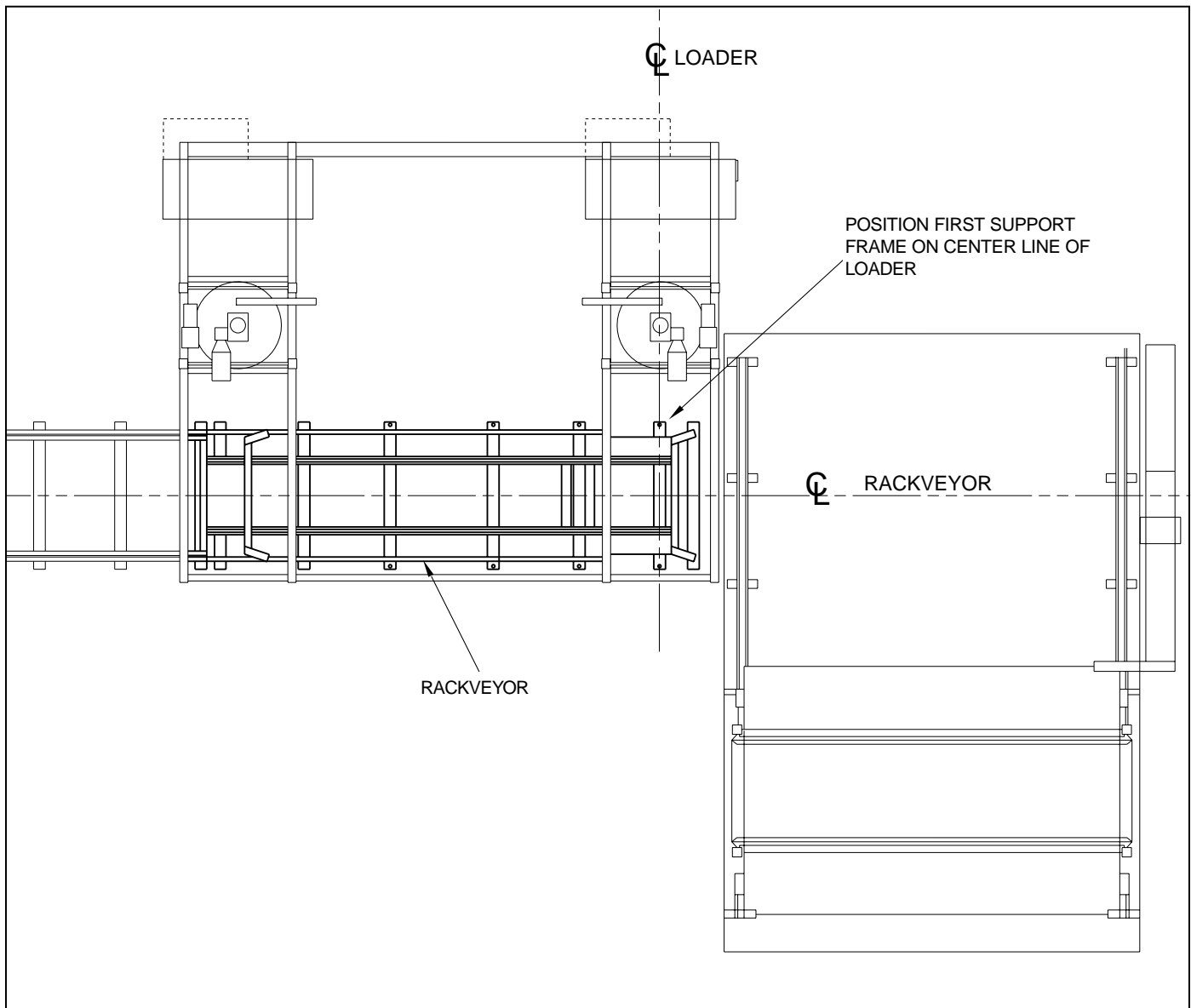


Figure 3.20 POSITION OF RACKVEYOR.

3.6 INSTALL SIDE SHIFTER

3.6.1 Position Side Shifter

Position Side Shifter on rails with rail locks towards Besser-Matic as shown in figure 3.21.

3.6.2 Install cat track

Secure cable and hose carrier to floor with 1/2" X 2 3/4" L. [13mm X 70mm L.] anchor studs, 1/2" lockwasher and 1/2" hex. nut. as shown in figure 3.21.

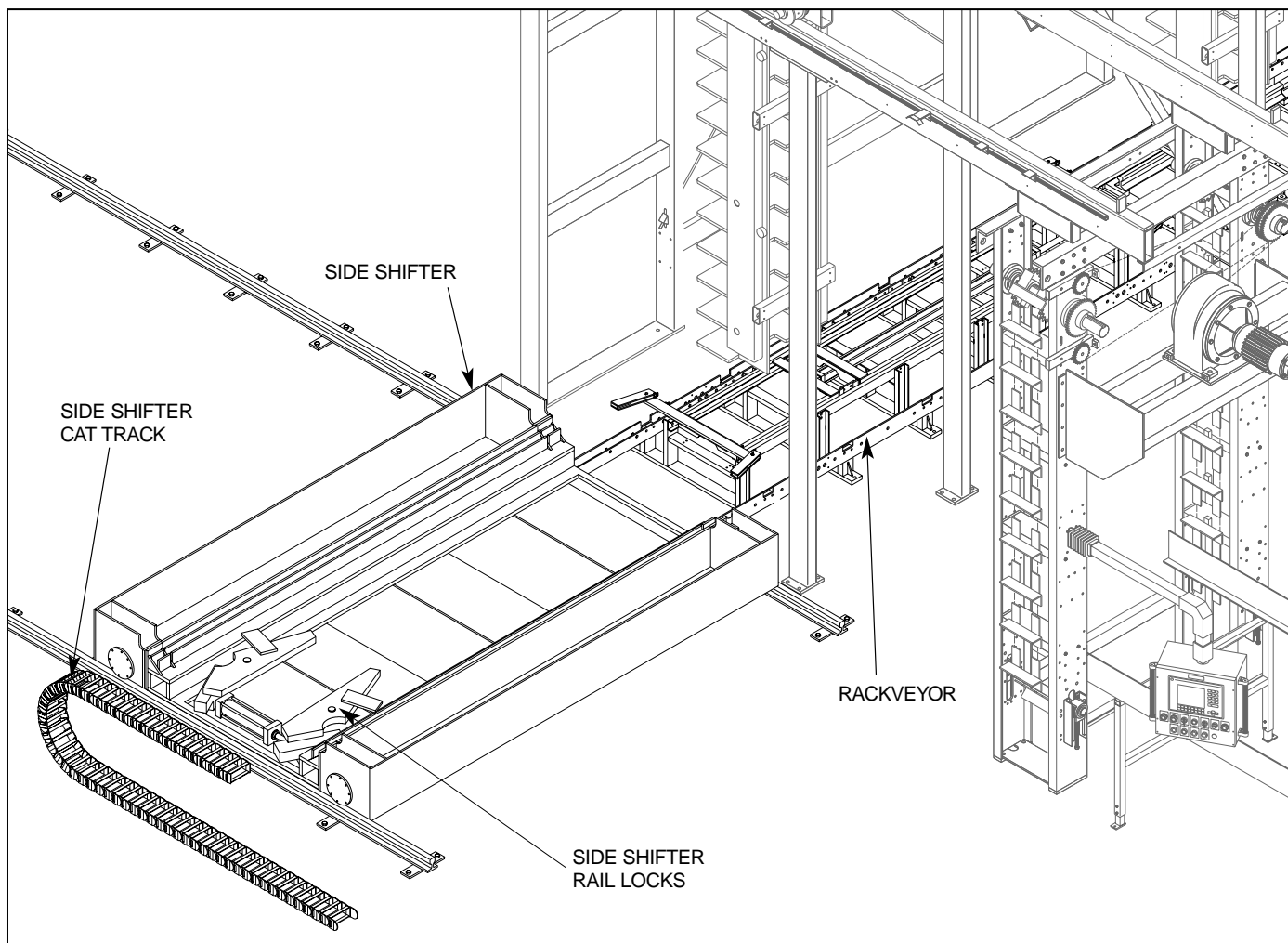


Figure 3.21 POSITION OF SIDE SHIFTER AND RACKVEYOR.

3.7 INSTALL POWER UNIT AND VALVE STAND

3.7.1 Position power unit and valve stand

Locate Rackveyor power unit and valve stand (item 12 in figure 3.31). Secure to floor with 1/2" X 3 3/4" L. [12.7mm X 95.25mm L.] anchor studs, 1/2" lockwasher and 1/2" hex. nut.

3.7.2 Make hydraulic connections

Make all hydraulic connections to valve stand (figure 3.22), power unit (figure 3.23), Side Shifter and Rackveyor.

3.7.2.1 3/4" [19.1mm] o.d. hydraulic tubing with .120 wall. tube nut and ferrule at each end from valve stand to cat track locks.

3.7.2.2 3/4" [19.1mm] o.d. hydraulic tubing with .120 wall-tube nut and ferrule at each end from valve stand to Side Shifter cat track.

3.7.2.3 3/4" [19.1mm] o.d. hydraulic tubing with .120 wall-tube nut and ferrule at each end from valve stand to cat track case drain.

3.7.3 Adjust speed

Refer to section 6.2.6 for adjusting speed of Side Shifter, and Rackveyor

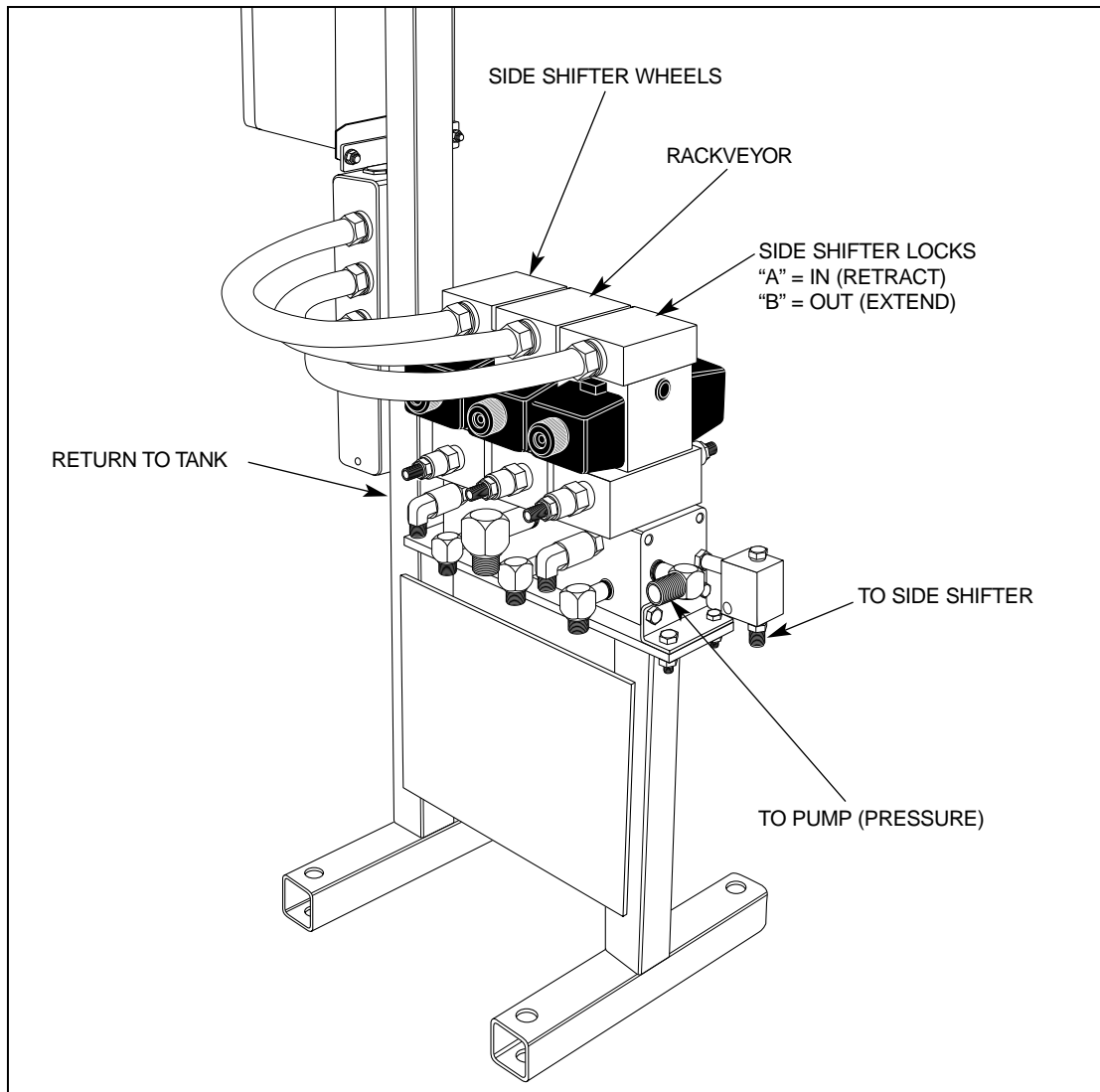


Figure 3.22 THE VALVE STAND.

3.8 FILL HYDRAULIC POWER UNIT

The hydraulic power unit capacity is 40 gallons [151 liters]. Use Shell Tellus 46 or equivalent. In order to fill the tank, power must be available to operate the different hydraulic movement. Fill the system as follows:

1. Fill tank.
2. Check pump rotation, as shown in figure 3.24, by pushing starter in panel .
3. Manually operate controls to fill the tank.
 - Forward and reverse direction, side shifter;
 - Forward and reverse on Indexer;
 - Rail locks extend and retract.
4. Fill tank again and repeat until the full 40 gallon [151 liters] capacity is reached.

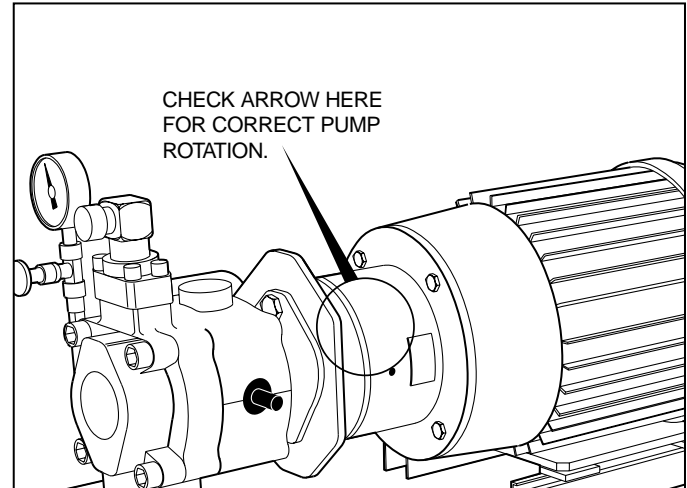


Figure 3.24 PUMP ROTATION.

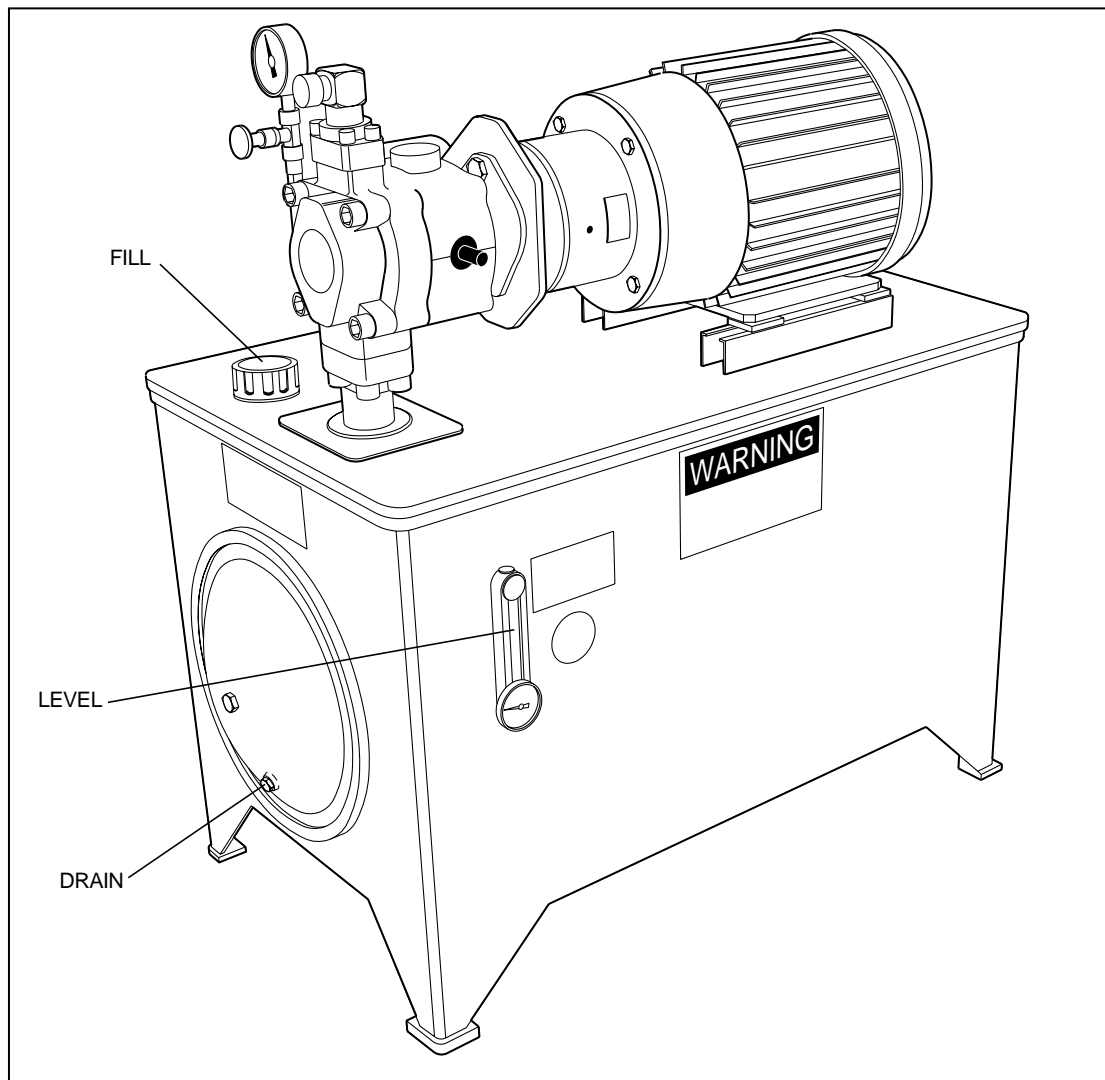


Figure 3.23 THE HYDRAULIC POWER UNIT.

3.9 INSTALL THE CONVEYORS

Note: Use figure 3.30 to locate conveyors.

3.9.1 Install front delivery conveyor.

3.9.1.1 Depending on conveyor length, it may be necessary to assemble conveyor together. If this is the case, locate splice plates and assemble conveyor together.

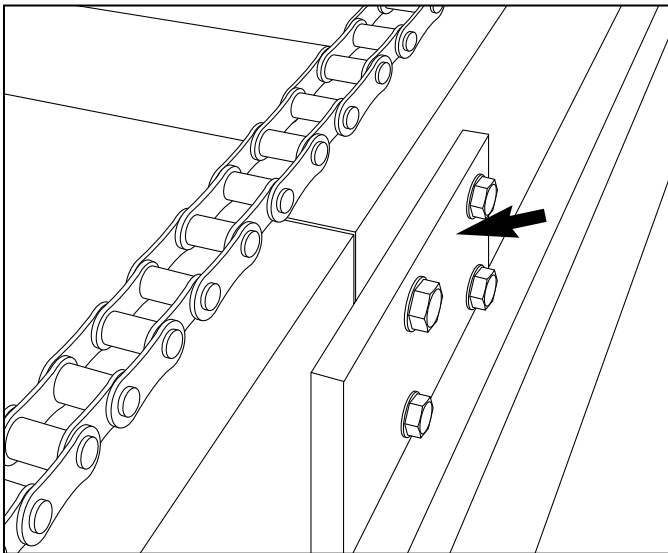


Figure 3.25 SPLICE PLATE.

3.9.1.2 Position conveyor in line with Concrete Product Machine (see item 1 in figure 3.31).

3.9.1.3 Bolt conveyor to loader Accumulator.

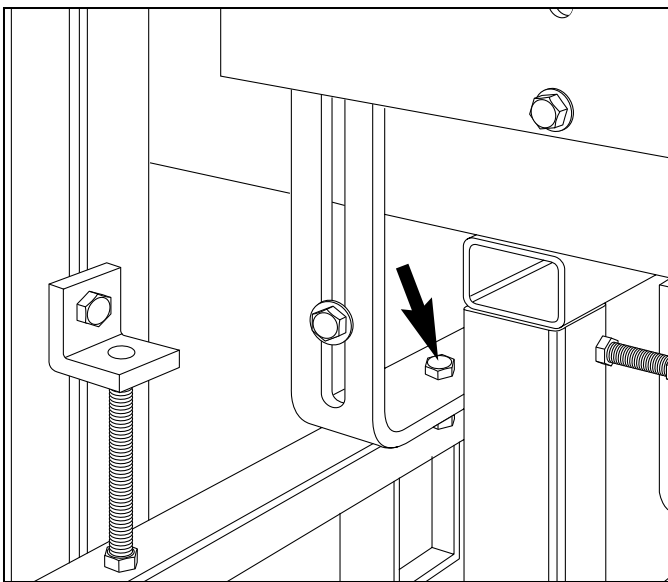


Figure 3.26 CONVEYOR BOLTED TO ACCUMULATOR

3.9.1.4 Bolt conveyor to floor (figure 3.27).

3.9.1.5 If necessary, hook up conveyor chains and tighten chains (for short conveyors, chains are not removed from the conveyor).

3.9.1.6 Adjust height of conveyor. Refer to figure 3.32, measurement H. **Important:** Height should be taken from floor to top of chain. Use adjustment bolts to adjust conveyor height as shown in figure 3.30.

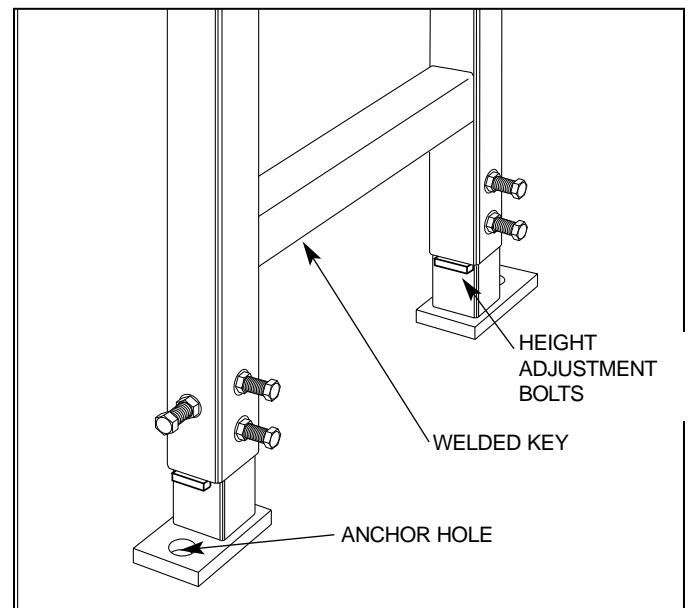


Figure 3.27 ADJUSTABLE LEGS.

3.9.1.7 Weld 1/2" sq. X 3" [13mm² X 76mm] key to secure legs (figure 3.27).

3.9.2 Install unloading conveyor

3.9.2.1 Depending on conveyor length, it may be necessary to assemble conveyor together. If this is the case, locate splice plates (figure 3.25) and assemble conveyor together.

3.9.2.2 Position conveyor in line with unloader center line (see item 4 in figure 3.31).

3.9.2.3 Bolt conveyor to unloader Accumulator as shown in figure 3.26.

3.9.2.4 Bolt conveyor to floor as shown in figure 3.27.

3.9.2.5 If necessary, hook up conveyor chains and tighten chains (on short conveyors, chains are not removed from the conveyor). **3.9.2.6** Adjust height of conveyor. Refer to figure 3.32, measurement H. **Important:** Height should be taken from floor to top of chain.

3.9.2.6 Weld 1/2" sq. X 3" [13mm² X 76mm] key to secure legs (figure 3.26).

3.9.3 Install pallet transfer stand

3.9.3.1 Locate pallet transfer stand (item 4 in figure 3.31). on center line of unloader and center line of pallet return.

3.9.3.2 Adjust height so top of transfer conveyor rollers are the same height as unloading conveyor.

3.9.3.3 Weld 1/2" sq. X 3" [13mm² X 76mm] key to secure legs (figure 3.26).

3.9.3.4 Bolt pallet transfer stand to unloading conveyor as shown in figure 3.28.

3.9.3.5 Anchor pallet transfer stand to floor (figure 3.27).

3.9.4 Pallet rollover

3.9.4.1 Connect rollover to hydraulic lines coming from cuber. Refer to hydraulic diagram.

3.9.5 Install pallet return conveyor

3.9.5.1 Assemble pallet return section of conveyor (item 7 in figure 3.31) and locate on center line of pallet magazine of Concrete Product Machine.

3.9.5.2 Bolt pallet return section to pallet transfer stand as shown in figure 3.29.

3.9.5.3 Bolt pallet return conveyor to Concrete Product Machine.

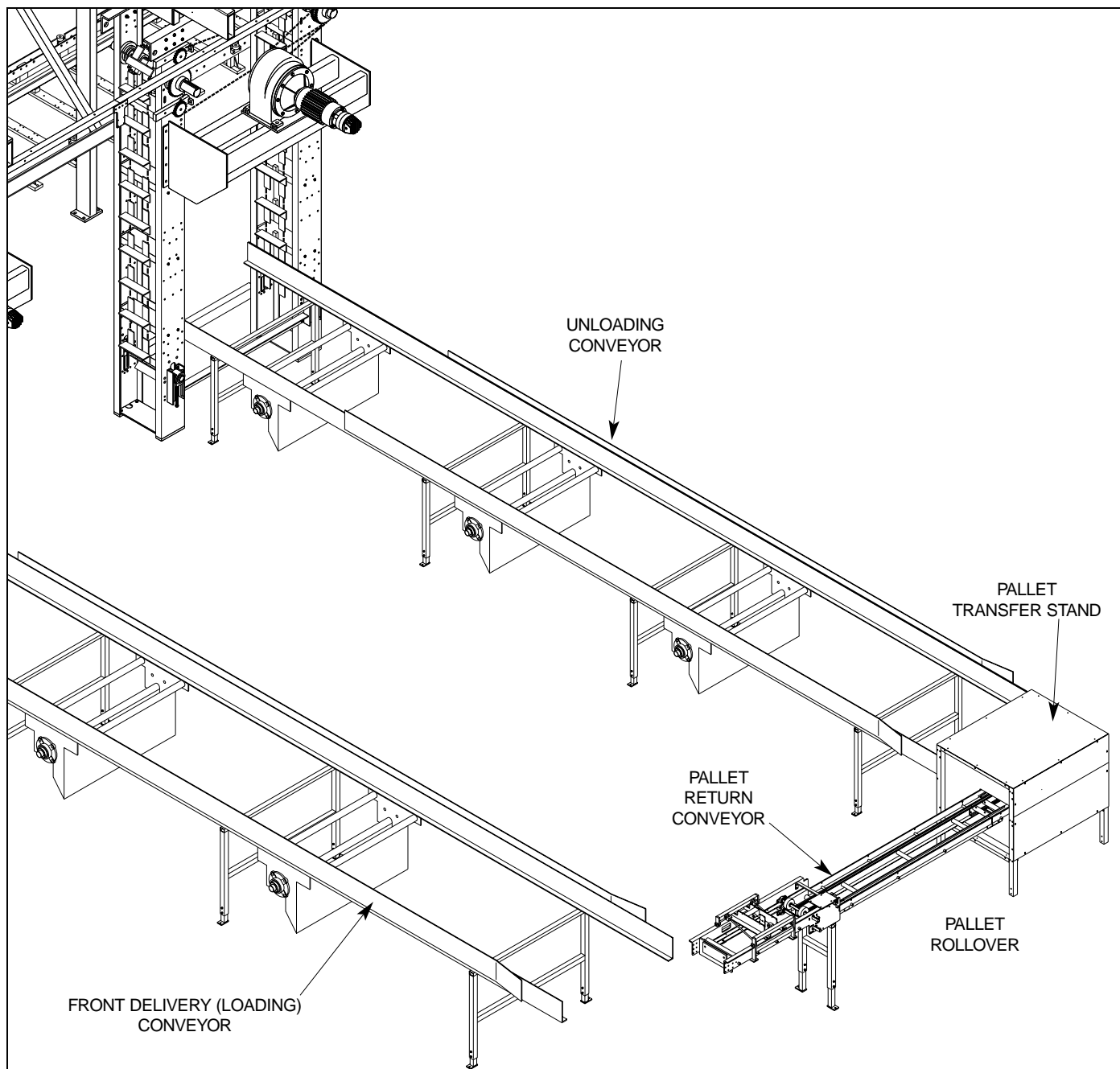


Figure 3.30 CONVEYORS ON MS-12. (Note that some drives are not shown on this illustration)

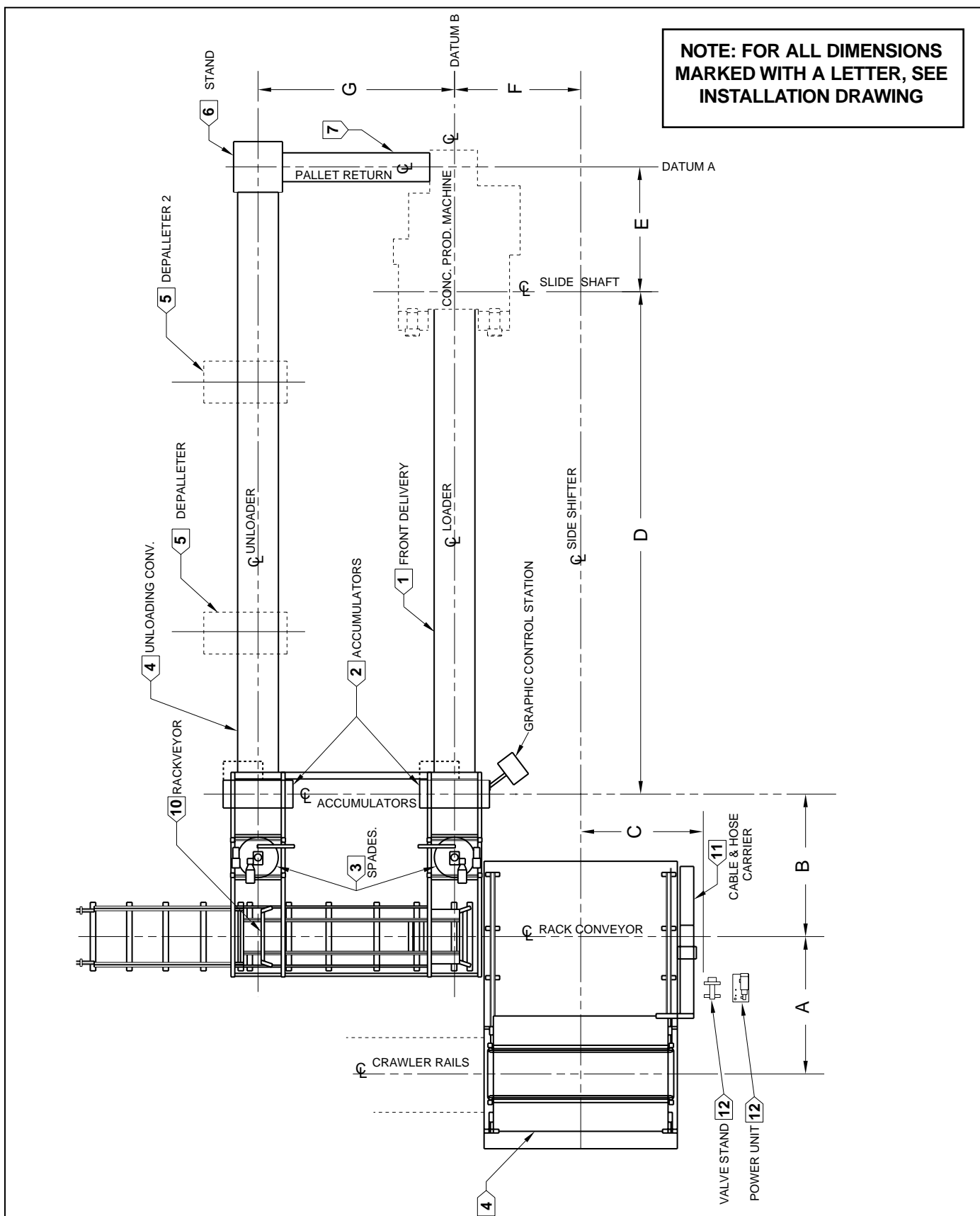


Figure 3.31 OVERALL INSTALLATION DRAWING (TOP VIEW).

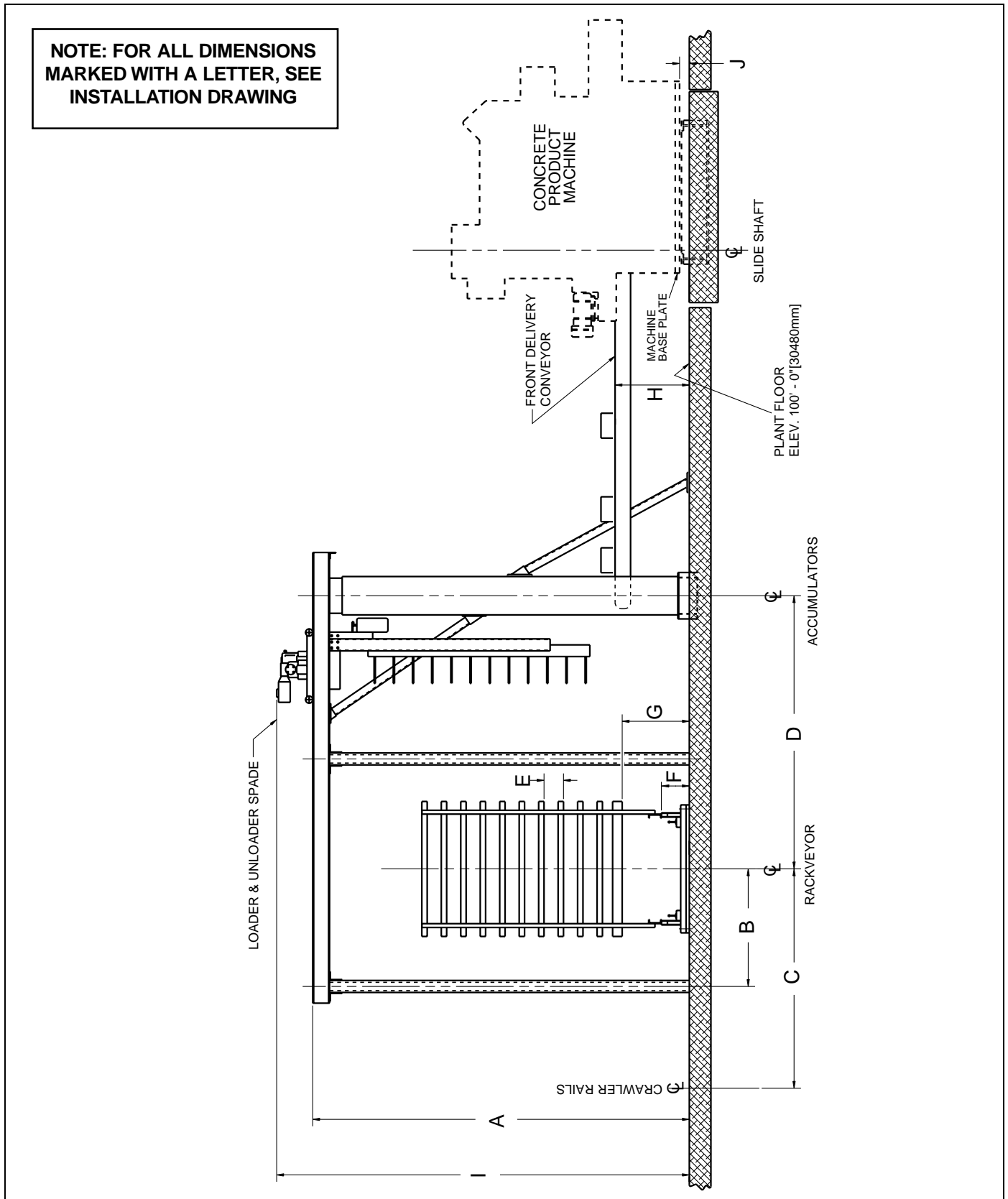


Figure 3.32 OVERALL INSTALLATION DRAWING (ELEVATION VIEW).

3.10 MAKE ELECTRICAL INSTALLATION

Note: Use electrical wiring diagram #469279 to properly wire MS-12.

3.10.1 Install graphic control station

3.10.1.1 Install Graphic Control Station to loader Accumulator as shown.

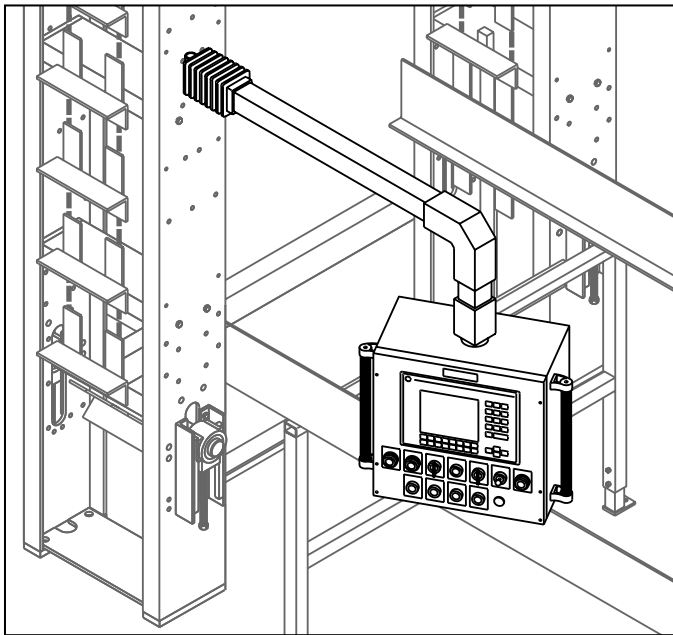


Figure 3.33 GRAPHIC CONTROL STATION.

3.10.1.2 Wire Graphic Control Station to panel (Quick disconnect).

3.10.2 Wire spades, Accumulators and conveyors

Note: All quick disconnects (figure 3.34) have to be properly wired prior to being connected.

3.10.2.1 Install stabilizer cat tracks. One end of cat track must be connected to the stabilizer's electrical box; the other end must be connected to the raceway in front of frame (see figure 3.35).

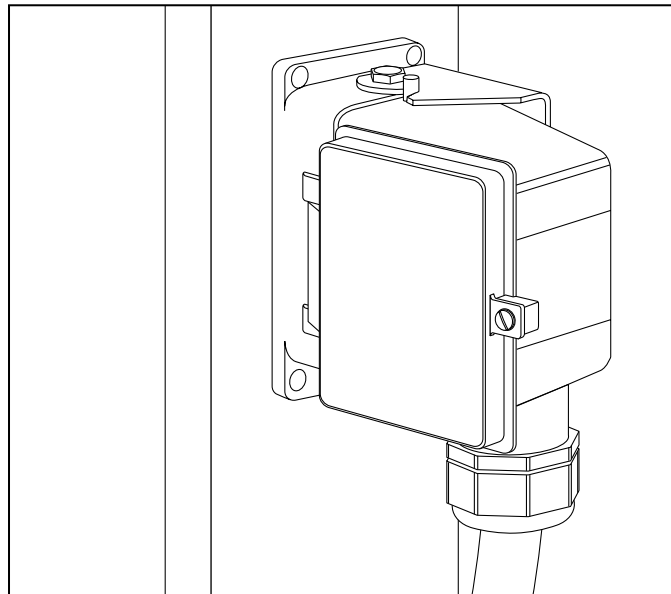


Figure 3.34 QUICK DISCONNECT.

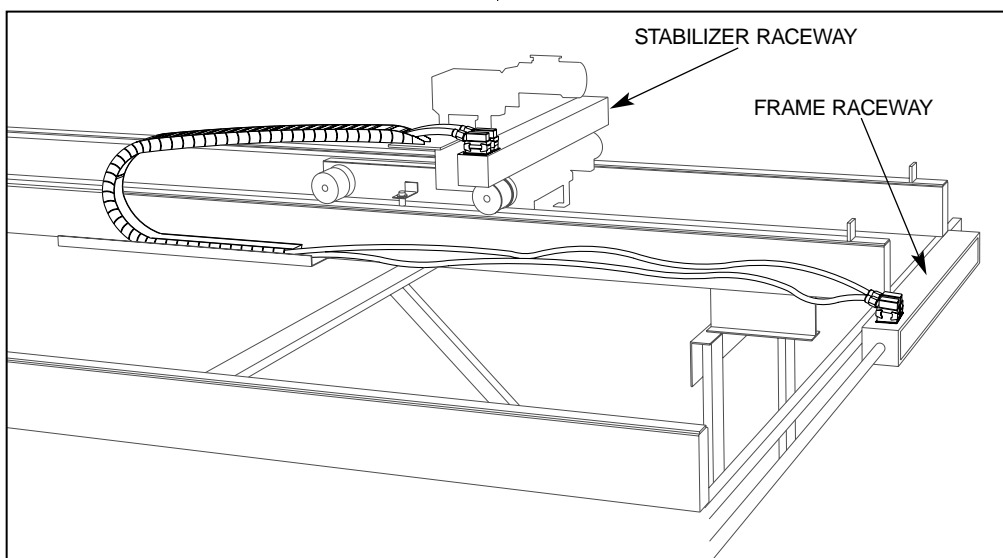


Figure 3.35 STABILIZER CAT TRACKS.

3.10.2.2 Wire frame raceways(A) to Accumulator raceway (B) (see figure 3.36).

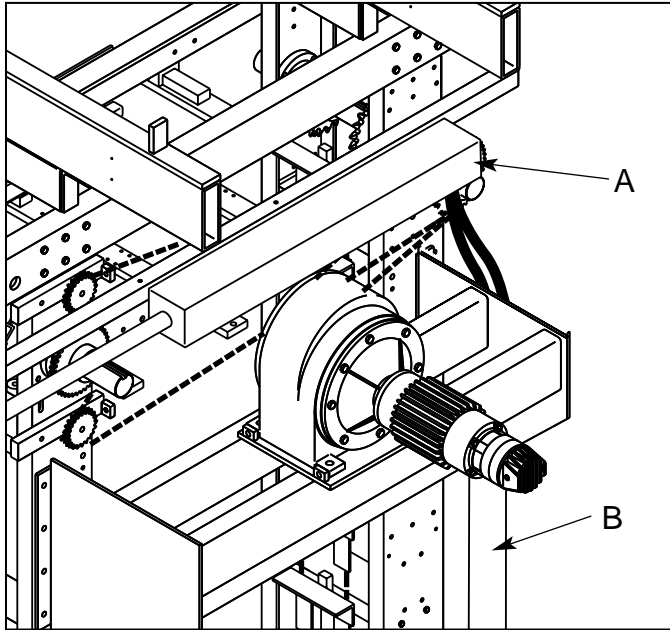


Figure 3.36 FRAME AND ACCUMULATOR RACEWAYS.

- 3.10.2.3** Connect loader Accumulator to stub ups (4 quick disconnects).
- 3.10.2.4** Hard wire front delivery conveyor to Accumulator and unloading conveyor to Accumulator
- 3.10.2.5** Wire all conveyors to stub-ups (quick disconnects and/or hard wiring).
- 3.10.2.6** Connect depalletter to stub-ups (quick disconnect).
- 3.10.2.7** Connect transfer conveyor (mounted in stand) to stub ups. (quick disconnect).
- 3.10.2.8** Wire pallet return conveyor to pallet transfer.

3.10.3 Wire Rackveyor

- Note 1:** Use electrical wiring diagram #469279 to properly wire MS-12.
- Note 2:** All quick disconnects have to be properly wired prior to being connected.

- 3.10.3.1** Connect Rackveyor indexer to stub ups.
- 3.10.3.2** Hard wire rack indexer to PRS-125.
- 3.10.3.3** Hard wire Rackveyor front section to emitter 100 located on center line of Rackveyor.
- 3.10.3.4** Hard wire Rackveyor front section to emitter 101 located on center line of Crawler rails.
- 3.10.3.5** Connect panel to valve stand.
- 3.10.3.6** Hard wire power unit to valve stand.
- 3.10.3.7** Hard wire valve stand to cat track on Side Shifter.
- 3.10.3.8** Optional: Hard wire Besser-Matic panel to parameter guarding panel, if required.

3.11 INSTALL SAFETY GATES.

Refer to figures below for safety gate locations.



WARNING: NEVER operate the Besser-Matic without the safety guards and safety gates properly installed and in working condition.

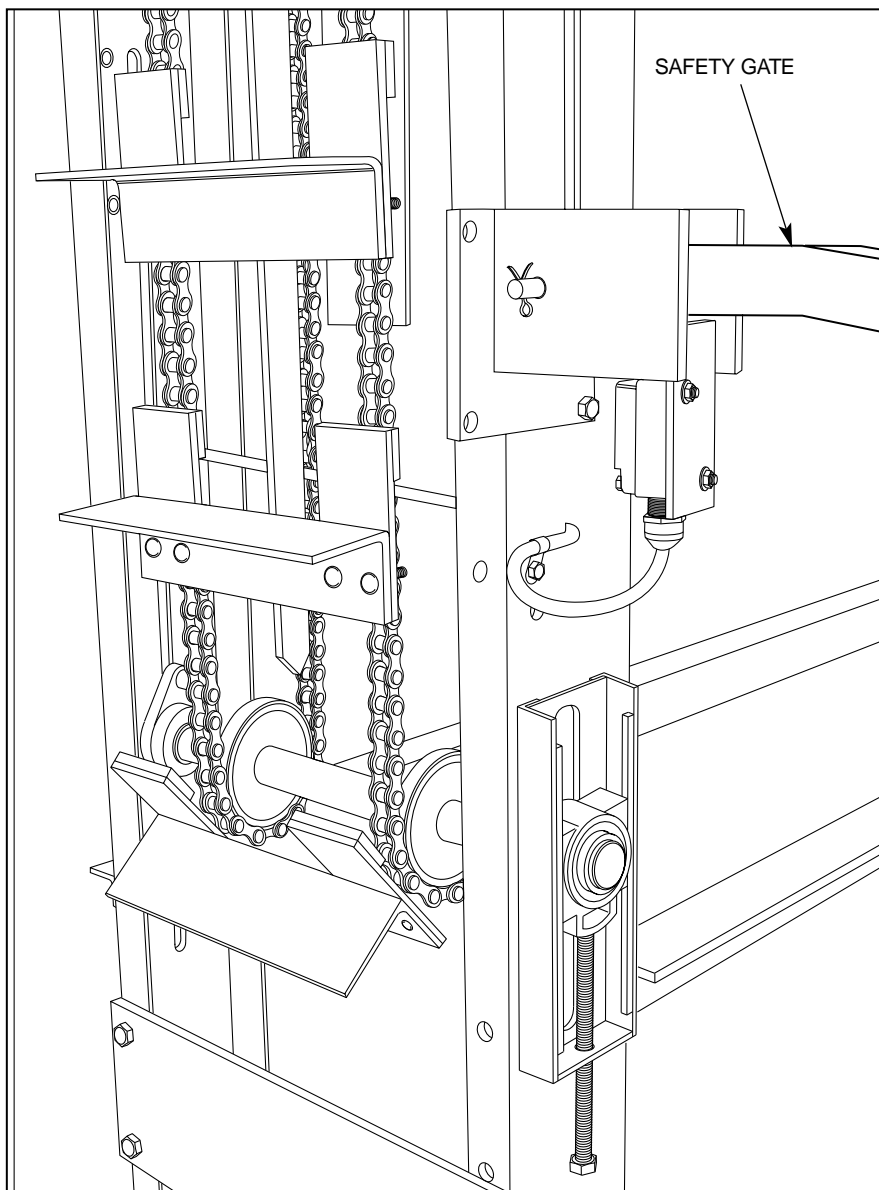


Figure 3.37 SAFETY GATE (R.H. SIDE SHOWN).

3.12 SECURE FRAME ASSEMBLY

After the installation is complete and frame is levelled to proper dimensions, frame assembly must be secured as follows:

3.12.1 Anchor frame.

Anchor frame to plant structure with 4 angles ("Z"). Also, install brace and anchor to floor at point "S" and weld at point "R".

3.12.2 Weld frame

Frame and actuators should be straight and plumb and welded at points "W" as shown in figure 3.38 below.

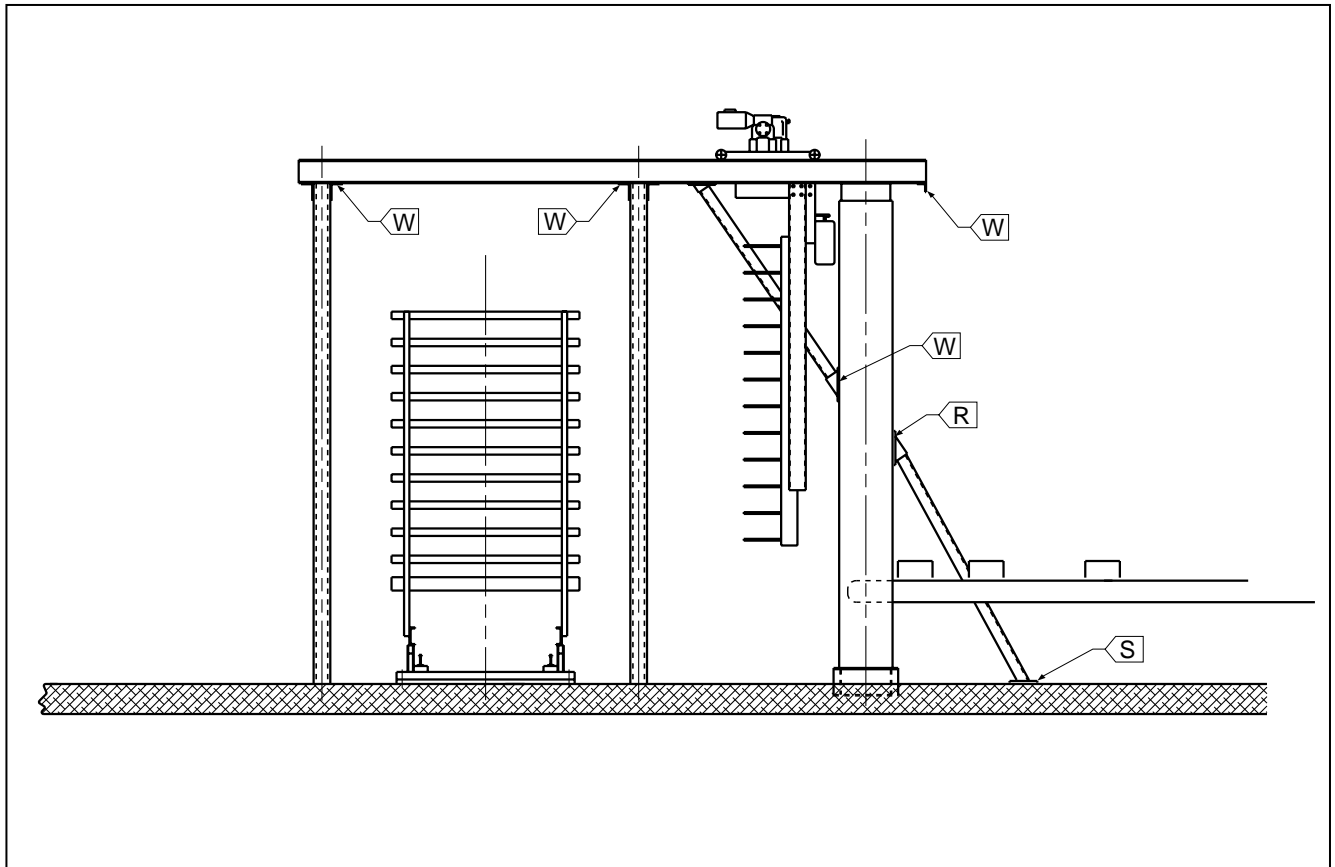


Figure 3.38 SECURE FRAME ASSEMBLY.

3.13 CHECK LIST

After installation is complete, use the list below to verify all components on the Besser-Matic.

- ☐ Machines should be properly installed according to section 3.1 to 3.9 of this manual.
- ☐ Machines should be aligned, square and leveled.
- ☐ Leg extension on conveyors should be welded and anchored to floor at correct elevation.
- ☐ Power unit should be wired, filled up and ready to function.
- ☐ All hydraulic fittings/hoses should be tightened.
- ☐ All reducers should be filled with oil (see maintenance section).
- ☐ Check all bolts and chains. They should be tightened to proper tension.
- ☐ Verify electrical panel is wired.
- ☐ Graphic Control Station should be wired and working properly (section 5).
- ☐ Verify all switches are wired and working properly (section 5).
- ☐ Make sure safety gates and guards are in place.
- ☐ Turn power ON
- ☐ Verify all motors are running in correct direction.
- ☐ Verify inputs and outputs. Use Graphic Control Station - section 5.