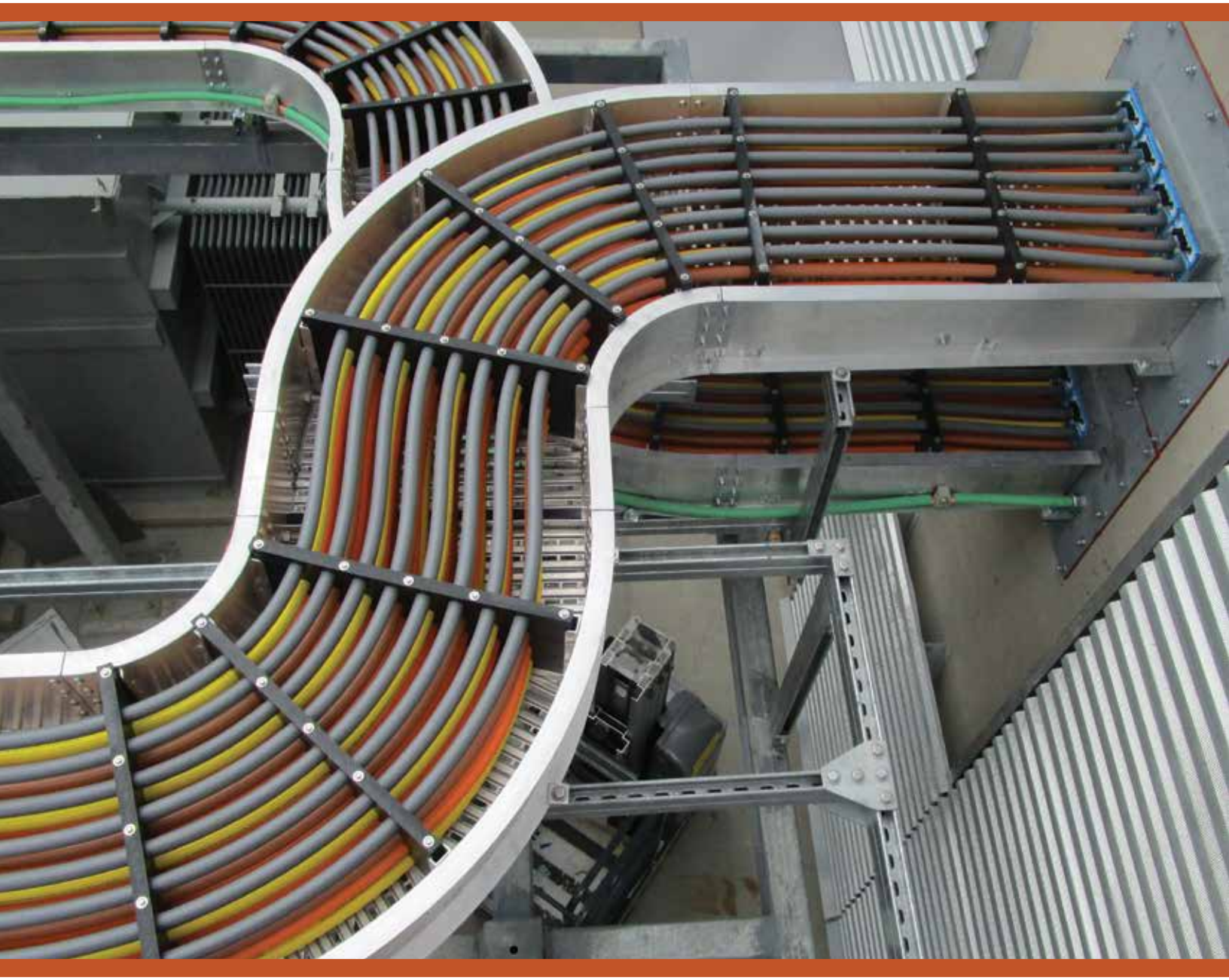
MP HUSKY™
CABLE TRAY & CABLE BUS

INSTALLATION MANUAL



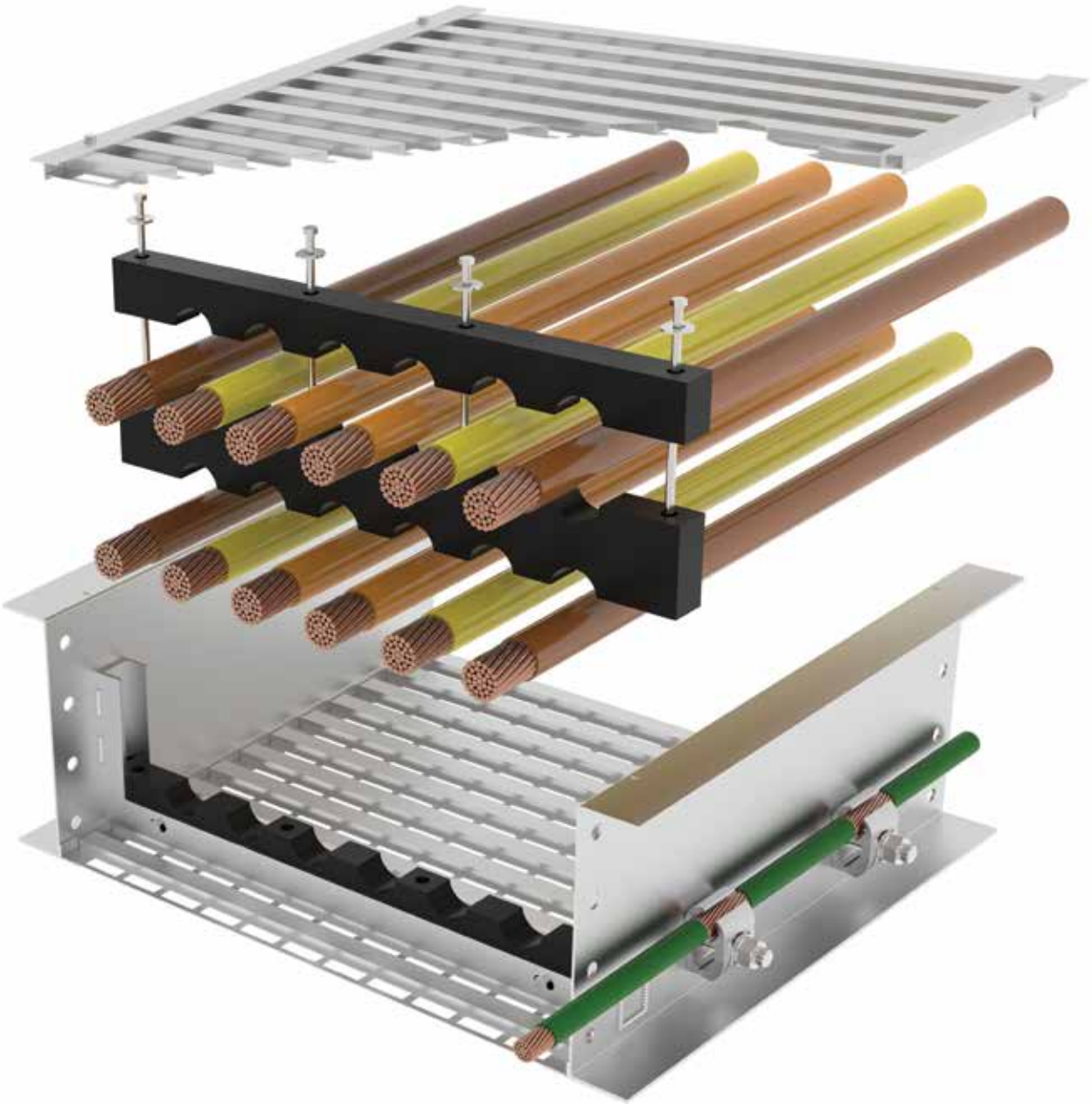
CABLE BUS

ENGINEERED TO OUTPERFORM

ESTABLISHED IN 1955

INTRODUCTION

For over 60 years, MP HUSKY Cable Bus Systems have been engineered and manufactured for superior reliability. We utilize less conductive material to provide significant savings versus non-segregated phase duct, conduit and wire, and other electrical feeders. As copper prices have continued to remain at historically high levels, the savings clients realize are even greater and more important. No matter how you look at it, MP HUSKY Cable Bus outperforms other electrical busways in reliability, cost, and flexibility. See for yourself why more owners, engineers, and buyers choose MP HUSKY cable bus systems over the competition.



Section 1 – General Description

The Cable Bus System supplied has been designed and fabricated to meet your specific job requirements. All of the necessary parts for a complete installation are packaged and marked for easy identification.

The bus enclosure is made from high strength aluminum alloy 6063-T6.

A standard vertical block support (VBS) channel is welded to the inside of the side rail to help the block installation process. The bottom segment of the support block is factory-installed and located every 36" on the horizontal and every 18" on the vertical bus sections. For bus sections 18-1/8" to 24" long and less than 12", a stiffener block (no cable holes) is factory installed in one of the rungs in each piece.

The bus enclosure is made with two solid side members with a factory-installed ventilated bottom section and a removable ventilated top cover. The top cover is held in place with self-drilling fasteners (B-55-SS) located at a maximum spacing of 2 – 3 feet center to center.

The cable support blocks have been custom machined to accept your particular cable only. They have been designed to provide the proper cable spacing and phase balance to meet your system specification.

Layout drawings showing the complete system layout are provided. Refer to section "Layout Drawing". These drawings include match-marked part numbers that correspond to markings on the parts shipped.

Cable Bus straight sections are supplied in standard 12- and 24-foot lengths with the necessary cut-to length pieces required to complete the bus run. Fittings are supplied with the standard 24 inch radius, unless space or cable requires the use of another radius.

All sections and fittings are shipped separate to facilitate ease of installation. Normally, only two people are required to lift a 24-foot section into place.

The following sections of this installation manual are intended to provide a detailed explanation of each part of the total Cable Bus System.

Each section is compiled as a step-by-step outline of recommended procedures. In brief, the following sections will discuss the location of support material, bus enclosure, fittings, junction boxes, tap boxes, etc. and have been arranged in the sequence most closely duplicating actual field installation.

Section 1 – General Description

LAYOUT DRAWINGS – BILL OF MATERIAL

The attached layout drawings and bill of material (master shipping list) will provide the following information:

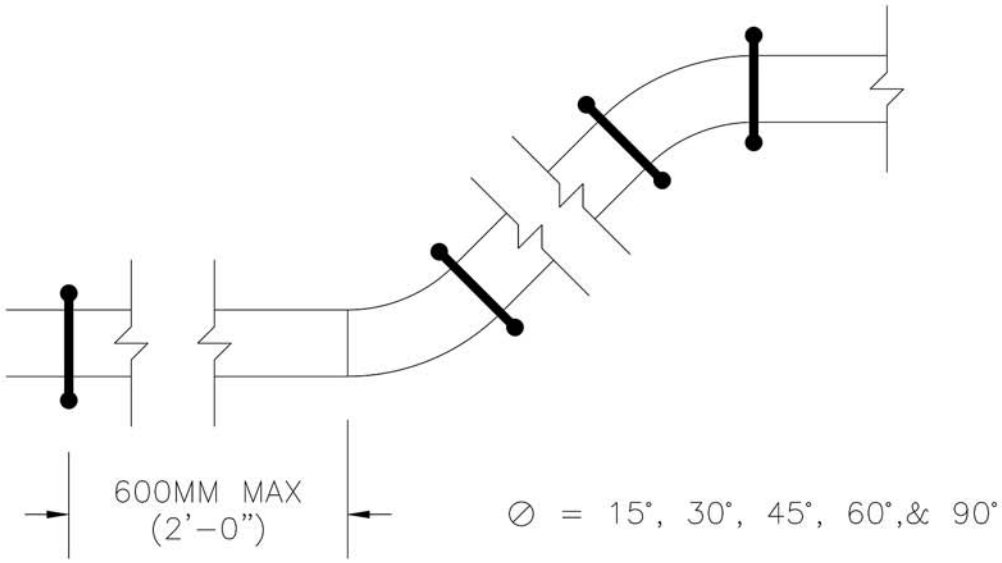
1. Location of bus enclosure sections
2. Quantity and identification of all items.
3. Location and details of supports (when supplied).
4. Cable requirement form

Review these prints carefully before attempting to install your Cable Bus System. See the following sections for installation details of each item.

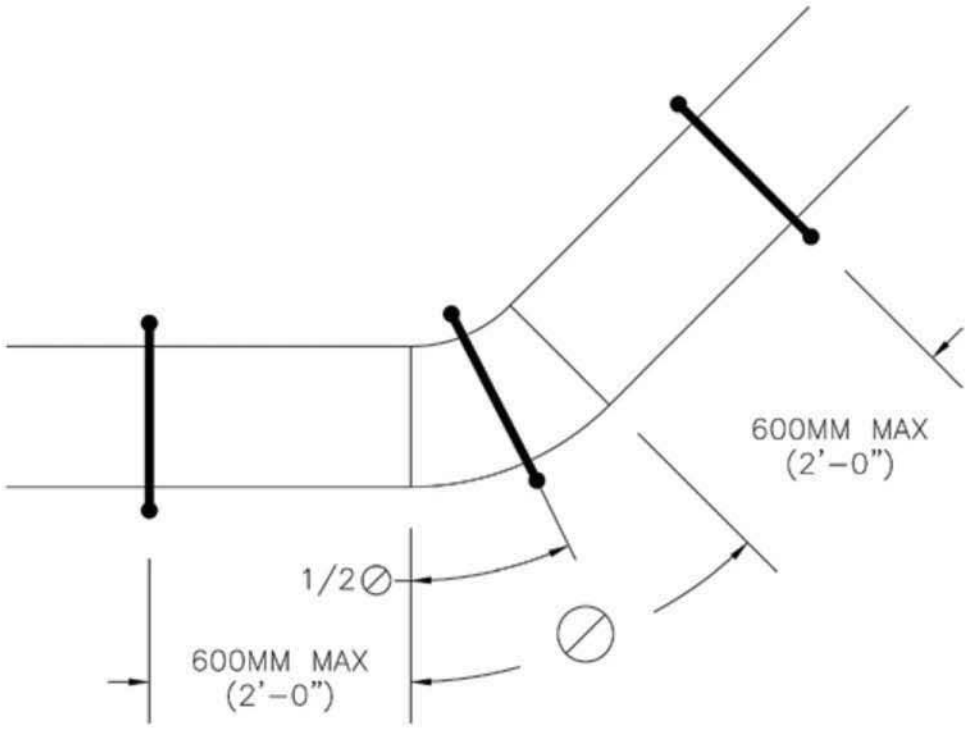
SUPPORT MATERIAL

When support materials are being supplied by MP Husky, refer to the support drawings and details attached.

The support material should be installed in accordance with support points as located on the layout drawings or per recommended support spacing (if applicable).



VERTICAL ELBOW



HORIZONTAL ELBOW

CENTER SUPPORT NOT REQUIRED
ON 12" RADIUS, 30 & 45 FITTINGS

Section 2 -Storage, Handling and Identification

STORAGE OF EQUIPMENT

Recommendations for the storage of MP Husky manufactured equipment are offered as a courtesy to field forces simply to ensure the final integrity of the system.

1. All materials should be stored indoors in dry reasonably tempered quarters.
2. If the material cannot be stored indoors for practical reasons, they should be elevated at least 6" from ground level and properly covered.
3. Hardware must never be stored outdoors. If enclosed in shipping crate upon delivery, they should be moved to an indoor dry location immediately.
4. Covering for material stored outdoors should be such that it is kept dry, but does not allow the inside of the package to sweat due to changes in temperature.
5. Provisions for outdoor storage of MP Husky can be provided by the factory at an additional charge upon consultation with the Cable Bus Sales Department.
6. Packaging and protection for overseas shipment is also available upon request.
7. Cable Bus and parts should be received and unloaded in accordance with NEMA VE-2.

BUS HANDLING

1. Field forces are to be responsible for proper handling of the bus section during removal from carrier and installation on site.
2. Handling of long or oddly configured sections should be accomplished with spreader bars and slings.
3. Slings should be nylon or equal so as to prevent damage to the housing. In no case are steel slings or chains recommended, or approved as alternates.
4. Cable reels should be stored indoors on a dry surface or, if stored outdoors, placed on suitable dunnage of sufficient size to support the reel weight without sinking or allowing the reels to come in contact with moisture. All cable reels should be stored in the up-right position (do not lay flat).
5. Any unusual conditions existing should and will be noted on drawings or particular orders involved. If said situation is factory-created or, if brought to the attention of MP Husky before shipment, drawings will be changed to facilitate installation.

IDENTIFICATION

Cable Identification Labels (CIL's) are provided and should be attached to the enclosure housing at all wall (both sides) and equipment penetrations. Labels are made of self-adhesive products and contain the following information; factory order number, number of conductors, conductor material, conductor size, shielded or non-shielded cable, maximum amps, maximum volts, system design and approximate O.D. of cable. The enclosure should be wiped free of all dirt and oil before application to ensure a good adhesion.

Section 3 –Components and Testing

INSTALLATION BUS ENCLOSURE

The bus enclosure is referred to generally as the basic cable carrier excluding junction boxes, entrance compartments, tap boxes, etc. Refer to appropriate sections elsewhere in this manual if boxes are furnished.

1. After the support materials are in place, Cable Bus sections can be attached to the supports using hold-down clips or clamps.

2. Bus enclosure sections are securely joined together using the high pressure splice plates (ASP-L1/D1) provided. Plated steel hardware is supplied with each splice plate consisting of splice bolts (B-100) and nuts with captive star washers (N-100). The recommended nominal tightening torque is 300 lbs-in. (25 lbs-ft). The splice bolts are assembled from the inside of the enclosure with the splice plate, nut and washer on the outside, to provide a smooth surface on the inside of the enclosure. Refer to the typical enclosure construction drawing included with this manual for details.

After the bus enclosure and other associated components have been installed, the system is ready for cable installation.

INDOOR EQUIPMENT FLANGES

Equipment Flanges are used indoors at the end of the bus runs (where designated) to terminate the bus enclosure to the switchgear cubicles, motor control centers, panels, and floor penetrations, etc.

The equipment flange firmly secures the bus run to the equipment enclosure.

After affixing the equipment flange to the designed equipment, slide the bus enclosure over it. Secure the bus enclosure to the equipment flange, using the splice bolts (B-100) and nuts with captive star washers (N-100), supplied with the material.

ENVIRONMENTAL SEALS

This series of flanges are used to provide an environmental seal where the Cable Bus makes a transition through a wall, floor, roof, or where Cable Bus is terminated on an outdoor enclosure as required by specification. See drawings ESF-004,005 or 007 for the proper equipment seal installation instructions.

Section 3 –Components and Testing

FIRESTOPS

If firestops have been supplied with this Cable Bus System, please refer to the general installation instructions from the manufacturer and to the firestop detailed drawings for specific installation data.

TERMINATION BOX

Termination Boxes are generally furnished for two specific uses:

1. To provide adequate space at equipment terminations for cable transpositions, phase collections, and working space for electrical connector installation.

2. As a transition enclosure in lieu of standard vertical or horizontal fittings to facilitate handling of cables at change of direction points.

Refer to attached layout drawings for location and individual prints for details. Note that gasket material should be applied along mating surfaces of the box or equipment surface. Wipe the metal surface clean with an appropriate cleaner, i.e. alcohol and then apply the self-adhesive gasket.

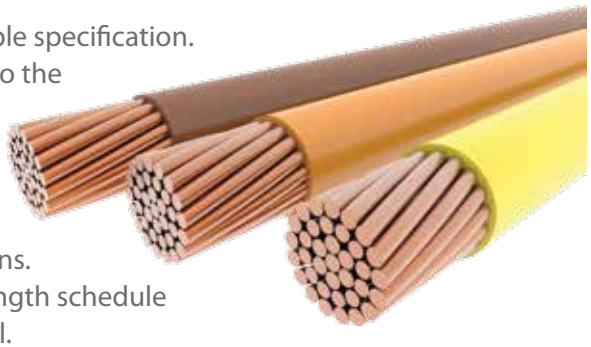
TAP BOX

Tap Boxes are of the bus-bar type and are generally furnished completely assembled and ready for installation in the bus run.

Each box has removable access panels as indicated on Tap Box drawings. All bars are pre-drilled to match hole patterns on other electrical connectors furnished for this project.

Refer to attached layout drawings for location and individual prints for details.

CABLE



The cable supplied on your system meets the required cable specification. For information concerning the exact size and type, refer to the Cable Bus cross section drawing or detail shown on the layout drawings.

The cable has been supplied on reels, which contain sufficient lengths to avoid cable splicing within the bus runs. Care should be taken to adhere to the attached cutting length schedule on the Cable Requirement Form at the back of this manual.

Section 3 - Components and Testing

CABLE *(continued)*

Care should be taken to phase the individual cables as indicated on the layout drawings.

Transposition of cable in the bus run is not necessary. All cable can be pulled in straight with the collection of phase conductors at termination points, in accordance with MP Husky recommendation or as modified by the layout drawings.

Prior to cable pulling operations, the proper pulling tools should be selected and installed along the bus run.

The spacing of rollers depends on the weight of conductor to be pulled. In general the spacing of rollers should range between approximately ten feet for conductor, weighing over eight pounds per foot, and sixteen feet for conductor, weighing no more than two pounds per foot.

The following practice is suggested to pull conductors in the Cable Bus when using installation tools:

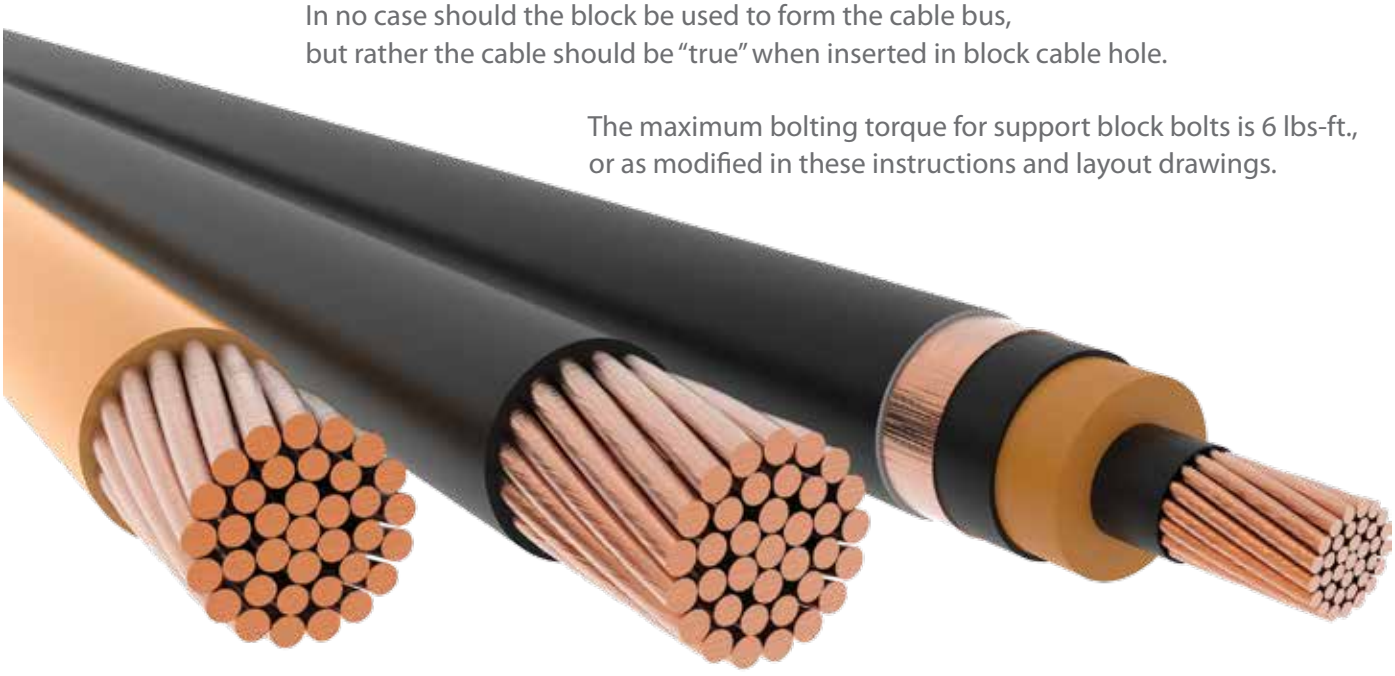
1. Short lengths can be laid in place and small diameter medium length conductors may be pulled with a basket grip only, providing tensions do not elongate or damage the insulation.

2. Best results for installing long lengths of conductor up to 1000 feet, with as many as a dozen bends, are obtained by pulling the conductor in one continuous operation at a speed of 20 to 25 feet per minute. It may be necessary to employ a braked reel to reduce sagging of the conductor between rollers.

3. As the conductors are pulled in, it will be necessary to install the intermediate and upper support block segments.

In no case should the block be used to form the cable bus,
but rather the cable should be "true" when inserted in block cable hole.

The maximum bolting torque for support block bolts is 6 lbs-ft.,
or as modified in these instructions and layout drawings.



Section 3 –Components and Testing

ELECTRICAL CONNECTORS

The Electrical Connectors, when supplied, are manufactured to NEMA and UL specifications. Long barrel compression connectors are normally provided to assure the user of a low resistance connection.

Should you have questions relating to the proper die index, contact MP Husky.

TERMINATION KITS

If required, cable termination kits have been provided with this Cable Bus System. Refer to the manufacturer's instructions packaged with each kit for installation details.

CABLE TESTING

MP Husky recommends that all cable be tested after installation and prior to equipment connections and/or energizing. The purpose of this testing is to reveal any damage to the cable during the pulling process or substandard termination applications.

For low voltage (600V) and 2.4kV non-shielded cable, the use of a megger for checking the cable reliability is a general practice. However, for medium voltage shielded power cable, the use of high voltage direct current (D.C) testing is standard. The field test voltages are directly proportional to the cable insulation thickness in mils. Please see the following table for actual test voltage levels.

High Voltage Field Acceptance Test

(prior to cable being placed in service)

Rated Voltage Phase to Phase	D.C. Hi-Pot Test Walls-Mills	kV	D.C. Hi-Pot Test Walls-Mills	kV
5000	90	25	115	35
8000	115	35	140	45
15000	175	55	220	65
25000	260	80	320	95
28000	280	85	345	100
35000	345	100	420	125
46000	445	130	580	170

Note: Test should be conducted for 15 minutes. If leakage current quickly stabilizes, the test duration may be reduced to 10 minutes.

DIE SELECTION CHART

Copper

Selected Conductor Sizes	Burndy Die no.	Burndy Color	Thomas & Betts Die No.	Thomas & Betts Color
4/0 kcmil	15	Purple	54H	Purple
250 kcmil	16	Yellow	62	Yellow
350 kcmil	18 or 324	Red	71H	Red
500 kcmil	20 or 299	Brown	87H	Brown
750 kcmil	24 or 473	Black	106	Black

Aluminum

Selected Conductor Sizes	Burndy Die no.	Burndy Color	Thomas & Betts Die No.	Thomas & Betts Color
4/0 kcmil	298	White	66	White
250 kcmil	324	Red	71H	Red
350 kcmil	299	Brown	87H	Brown
500 kcmil	300	Pink	99H	Pink
750 kcmil	301	Red	115H	Yellow
1000 kcmil	302	Brown	140H	N/A

Additional information available upon request.

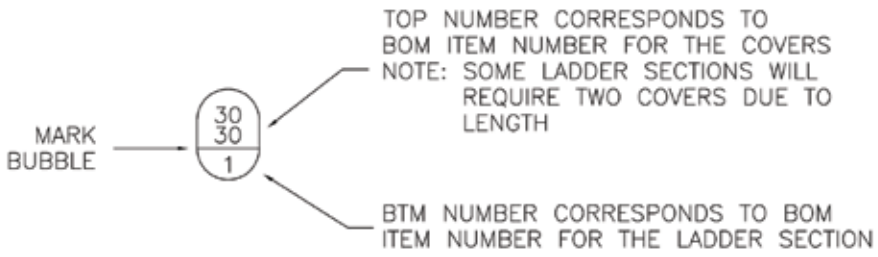
Standard Cable Bus Hardware List

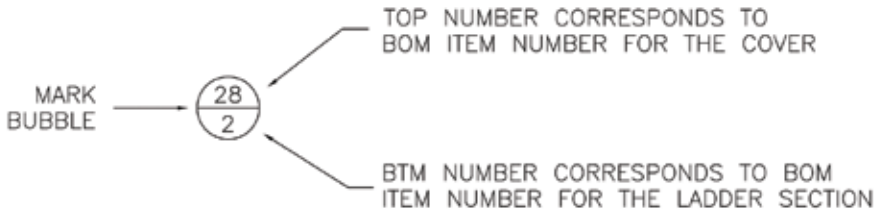
Part	Description	Material	Use	Torque Value
B-100	3/8-16X7/8 Knurled Shank Mach. Screw	Plated Steel	Standard Splice	25 lbs.-ft.
B-61	1/2-13X1-1/2 Hex Head Screw	Zinc Plated	Fire Stop Plate Hold Down Clips	40 lbs.-ft.
B-20-6S	1/4-20-X1-3/4 Hex Head Bolt	Stainless Steel	Environmental Seal Block	75 lbs.-ft.
B-TB25-L-SS	1/4-20XL Hex Head Bolt	Stainless Steel	Cable Support Block	6 lbs.-ft.
B-55-SS	NO. 10-16X5/8 Self Drilled Tap Screw	Stainless Steel	Cover Hold Downs	23 lbs.-ft.
B-5-SS	1/4-20X5/8 Slot Truss HD Mach. Screw	Stainless Steel	Expansion Splice	75 lbs.-ft.
W-8-SS	1/4" Flat Washer	Stainless Steel	Cable Support Block	N/A
W-7	1/4" Rubber Bonded Washer	Stainless Steel	Environmental Seal Block	N/A
W-9	1/2" Split Loc-Washer	Zinc Plated	Fire Stop Plate Hold Down Clips	N/A
W-12	1/2" Flat Washer	Zinc Plated	Fire Stop Plate Hold Down Clips	N/A
N-100	3/8-16 Hex Nut w/ Loc-Washer	Plated Steel	Standard Splice	N/A
N-12	1/2-13 Hex Nut	Plated Steel	Fire Stop Plate Hold Down Clips	N/A
N-17	3/8-16 Hex Nut	Stainless Steel	Expansion Splice	N/A

Cable Termination Hardware

Part	Description	Material	Use	Torque Value
B-49-SB	1/2-13X2 1/2 Hex Head Bolt	Silicone Bronze	Cable Terminations	43 lbs.-ft.
W-35-SB	1/2" Flat Washer	Silicone Bronze	Cable Terminations	N/A
W-36-SB	1/2" Split Loc-Washer	Silicone Bronze	Cable Terminations	N/A
N-45-SB	1/2-13 Hex Nut	Silicone Bronze	Cable Terminations	N/A

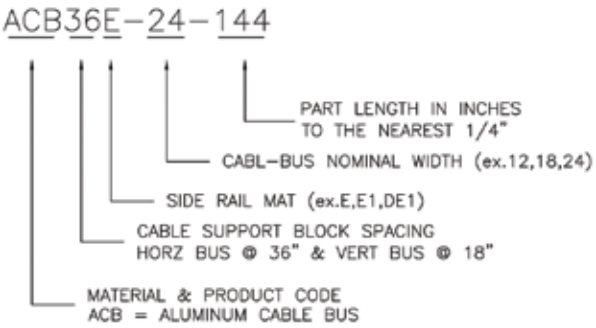
Note: The torque values listed are for the bolts only and these values may vary depending upon application.

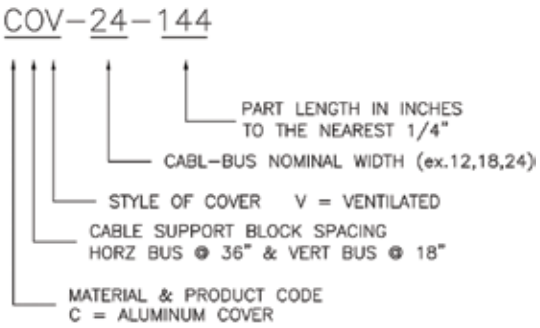


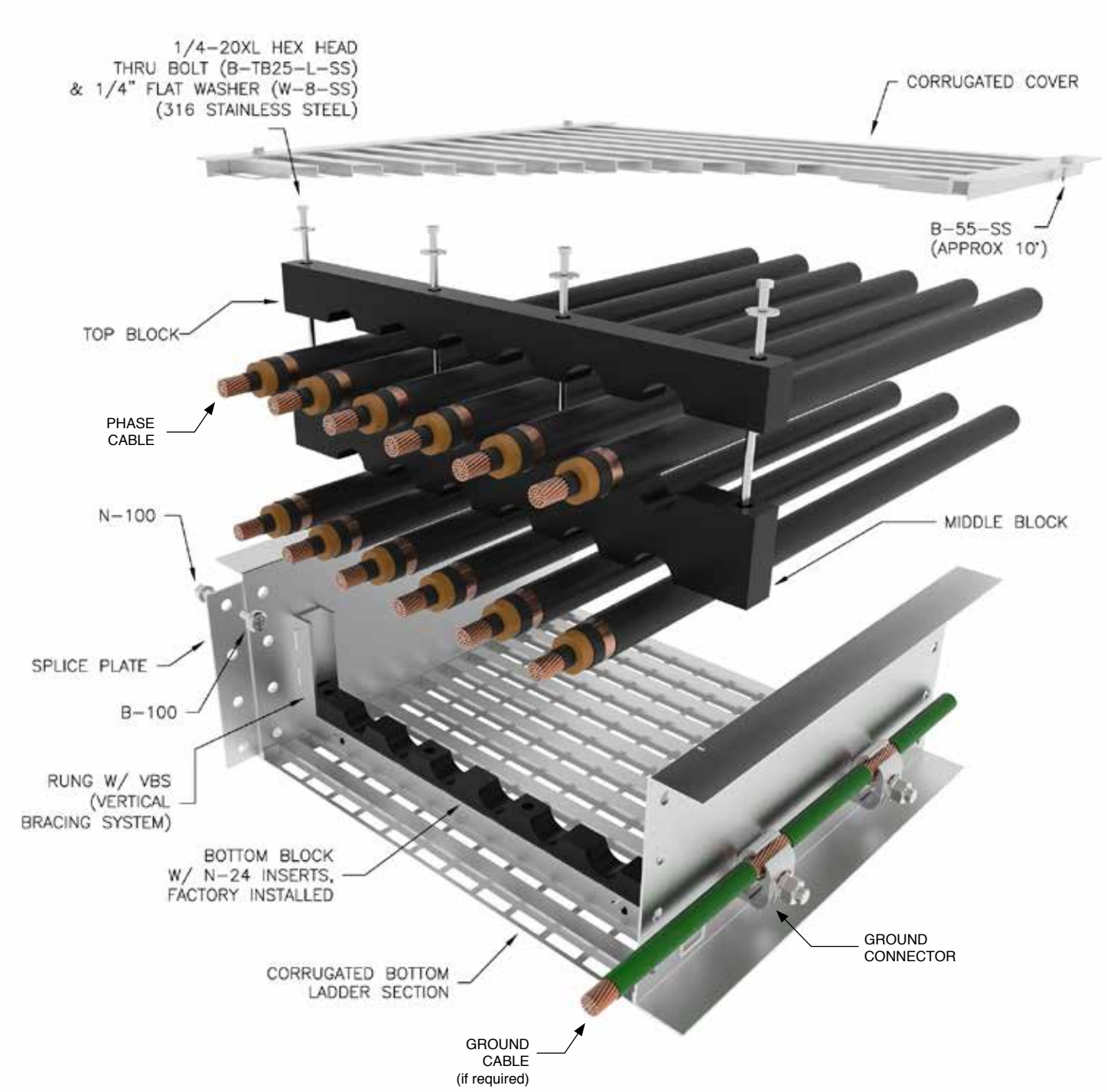


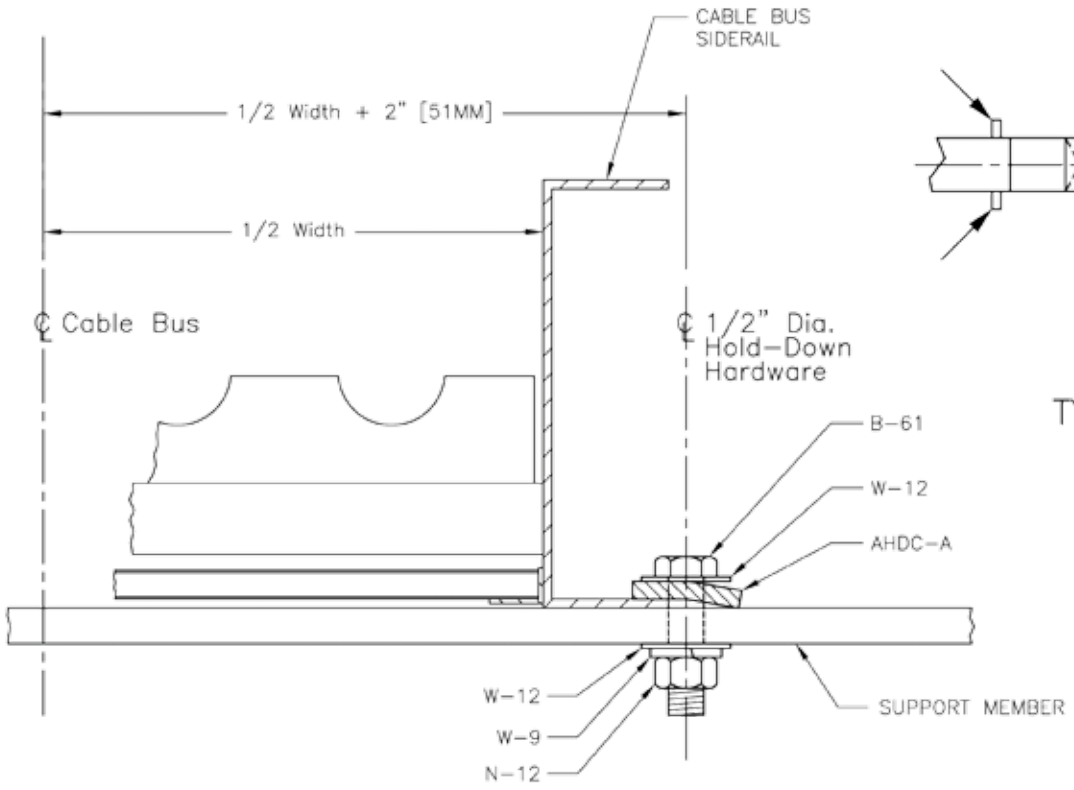
Cable Bus Bill of Material			
Item Number	Quantity	Catalog Number	Description
1	20	ACB36L1-24-240	STRAIGHT LADDER SECTION
2	6	ACB36L1-24-144	STRAIGHT LADDER SECTION
3	1	ACB36L1-24-132-1/4	STRAIGHT LADDER SECTION
4	3	ACB36L1-24-120	STRAIGHT LADDER SECTION
28	6	C0V-24-144	STRAIGHT COVER
29	1	C0V-24-132-1/4	STRAIGHT COVER
30	43	C0V-24-120	STRAIGHT COVER

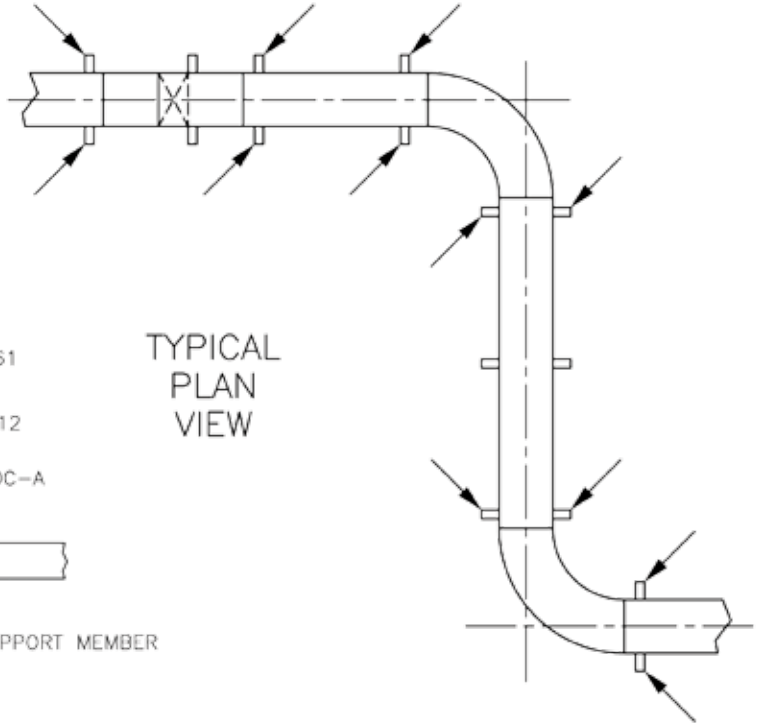
CATALOG NUMBER DETAILS:






1/4-20XL HEX HEAD
THRU BOLT (B-TB25-L-SS)
& 1/4" FLAT WASHER (W-8-SS)
(316 STAINLESS STEEL)
CORRUGATED COVER
B-55-SS
(APPROX 10')
TOP BLOCK
PHASE
CABLE
N-100
MIDDLE BLOCK
SPLICE PLATE
B-100
RUNG W/ VBS
(VERTICAL
BRACING SYSTEM)
BOTTOM BLOCK
W/ N-24 INSERTS,
FACTORY INSTALLED
GROUND
CONNECTOR
CORRUGATED BOTTOM
LADDER SECTION
GROUND
CABLE
(if required)





Location Of Use

Used At First Hold-Down Points Before & After Horizontal Fittings And At End Of Straight Runs Of Enclosure In The Horizontal Plane. See Typical Plan View For Typical Locations.

DR. TDD	REV. A
DATE: 5-6-09	

MPHUSKY CABL-BUS™
Hold-Down Detail
AHDC-A

DWG. SK-AHDC-A