JAQUITH INDUSTRIES INC.

Airport Lighting | bmf Metal Forms | Custom Contract Manufacturing

LIR STRUCTURES INSTRUCTION MANUAL

Syracuse, New York 13210 (315) 478-5700 - sales@jaquith.com www.jaquith.com

INSTRUCTION BOOK

L.I.R. STRUCTURES
(LOW-IMPACT RESISTANT STRUCTURES)

FAA-E-2702 SPECIFICATIONS & D-6155 DRAWING SERIES

MANUFACTURED BY

JAQUITH INDUSTRIES, INC.
600 E. BRIGHTON AVENUE
SYRACUSE, NY 13210-4213

PHONE: (315) 478-5700
FAX: (315) 478-5707
www.Jaquith.com

MADE FOR

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

UNITED STATES AIR FORCE

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LIR STRUCTURES
(LOW-IMPACT RESISTANT STRUCTURES)

SAFETY NOTICE

The attention of operating and maintenance personnel is directed to 6000.15 "Maintenance of Airway Facilities" for instructions on the subject of safety precautions to be observed and FAA Order 3900.9, "Accident Prevention Handbook for Airway Facility Personnel."
This equipment employs voltages that are dangerous and may be fatal if contacted by operating personnel. Extreme caution shall be exercised when working with equipment.
While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS

Operating and maintenance personnel must at all times observe all safety regulations. Do not change plug-in components or make adjustments inside equipment with high voltage supply on. Under certain conditions, dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. To avoid casualties, always remove power, then discharge and ground by use of grounding rod, prior to touching any parts.

RESUSCITATION

Maintenance personnel should familiarize themselves with the technique for resuscitation found in the manual of first aid instructions.

SAFETY EQUIPMENT & "CAUTION" NOTICES

In the field maintenance of this equipment, a hardhat must be worn at all times to provide some measure of protection against the danger of objects falling from LIR Structures. To safely raise and lower LIR Structures, instructions given in this manual should be followed step-by-step. Specific hazards involved in using the equipment supplied under this contract will be brought to the attention of the reader with ***"CAUTION"*** notices at appropriate points.

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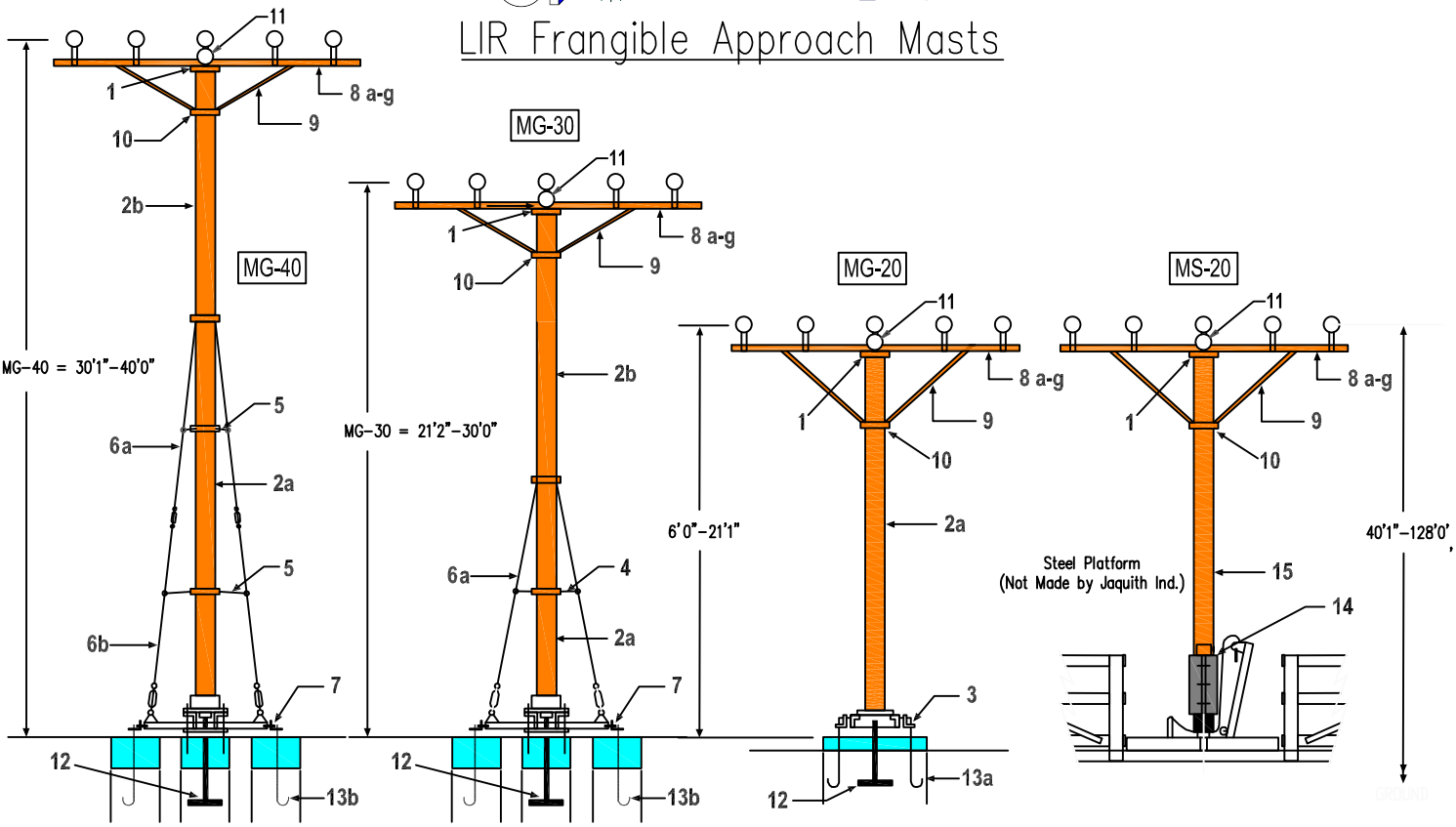
LIR Frangible Approach Masts

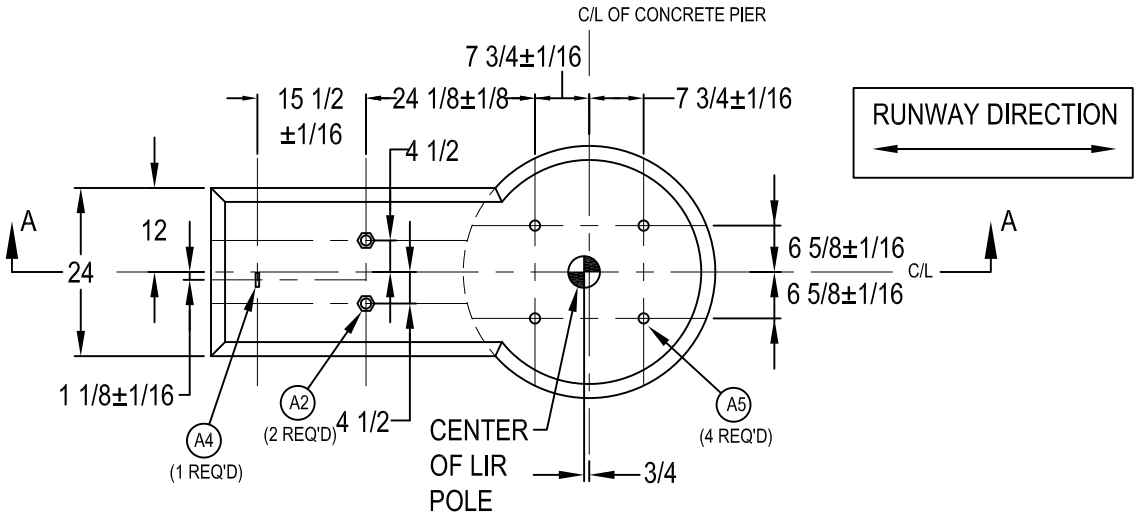


ITEM #	Description	National Stock Number	Jaquith Part No.	MG–20	MG–30	MG–40	MS–20
1	TUBE CAP w/CLAMP	NSN 5445–01–079–7557	L 7557	Y	Y	Y	Y
2a	A TUBE x 10' (MG–30) X 20' (MG–40)	NSN 5445–01–079–9135	L 9135	Y	10'Y	20'Y	
2b	B TUBE x 20'	NSN 5445–01–079–9148	L 9148		Y	Y	
3	MG–20 MOUNTING STAND	NSN 5445–01–079–2763	L 2763	Y			
4	MG–30 HORIZONTAL STABILIZER SET	NSN 5445–01–079–9151	L 9151		Y		
5	MG–40 HORIZONTAL STABILIZER SET	NSN 5445–01–080–3039	L 3039			Y	
6a	MG–30 STABILIZER ROD SET 14'3"	NSN 5445–01–080–5144	L 5144		Y	Y	
6b	MG–40 STABILIZER ROD SET 9'10"	NSN 5445–01–079–4919	L 4919			Y	
7	MG–30/MG–40 MOUNTING FRAME	NSN 5445–01–079–2762	L 2762		Y	Y	
8a*	T–5 CROSSBAR ALSF 5 @ 40.5"	NSN 5445–01–079–3885	L 3885	O	O	O	O
8b	T–4 CROSSBAR ALSF 4 @ 60"	NSN 5445–01–079–3886	L 3886	O	O	O	O
8c	T–3 CROSSBAR ALSF 3 @ 60"	NSN 5445–01–079–9155	L 9155	O	O	O	O
8d	T–M CROSSBAR MALS 5 @ 30"	NSN 5445–01–079–9154	L 9154	O	O	O	O
8e	SINGLE LIGHT CROSSBAR		L 1001	O	O	O	O
8f	SINGLE LIGHT CROSSBAR w/JUNCTION BOX		L 5000	O	O	O	O
8g	MALS JUNCTION BOX w/KULKA		L 5018	O	O	O	O
9	TEE BRACE (2 REQUIRED PER CROSSBAR)	NSN 5445–01–079–9153	L 9153	O	O	O	O
10	TEE BRACE CLAMP ASSEMBLY	NSN 5445–01–079–9152	L 9152	O	O	O	O
11	FLASHER BRACKET w/JUNCTION BOX		L 5017	O	O	O	O
12	ANCHOR PLATE		L 5004	Y	Y	Y	
13a	MG–20 ANCHOR BOLT SET		L 5002	Y			
13b	MG–30/MG–40 ANCHOR BOLT SET		L 5003		Y	Y	
13c	MG–20 FRANGIBLE ANCHOR BOLT SET		L 5023	O			
13d	MG–30/MG–40 FRANGIBLE ANCHOR BOLT SET		L 5024		O	O	
14	MS–20 MAST LIFTING FRAME	NSN 5445–01–079–9133	L 9133				Y
15	A TUBE w/ALUMINUM SOCKET	NSN 5445–01–079–9134	L 9134A***				Y
16	TUBE SPLICE	NSN 5445–01–079–9149	L 9149	O	O	O	
17**	LIFTING/LOWERING DEVICE	NSN 8200–00–300–1728	L 5005	Y	Y	Y	
18**	MG–30/MG–40 JACK ASSEMBLY	NSN 9051–00–206–4698	L 5006		Y	Y	
19a	SPECIAL EPOXY KIT (FOR FIELD BOND)		2 qt L 5008	O	O	O	
19b	SPECIAL EPOXY KIT (FOR FIELD BOND)		4 qt L 5009	O	O	O	

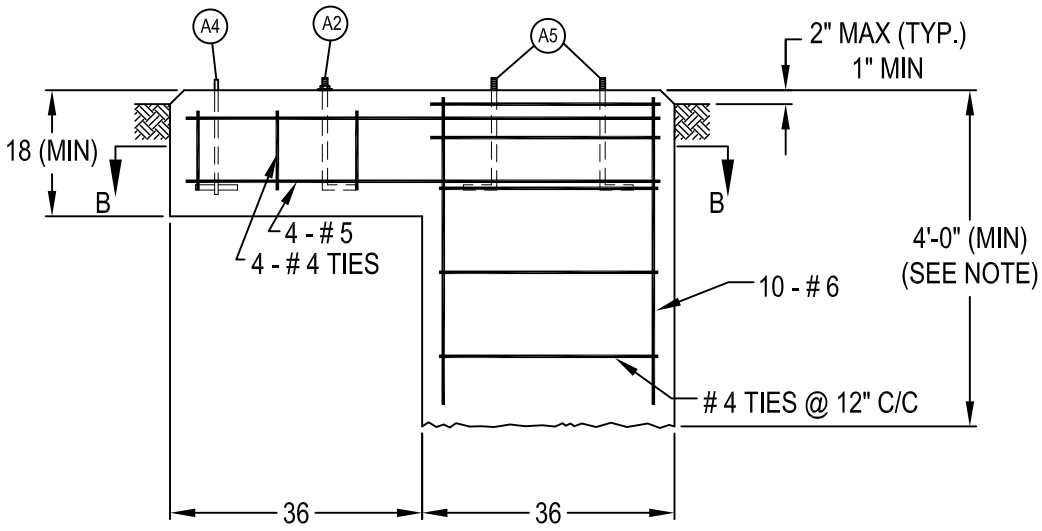
Y = REQUIRED O = OPTIONAL ** ONE REQUIRED PER SYSTEM

* CALVERT CROSSBARS AVAILABLE *** NEW DESIGN VERSION 8/06

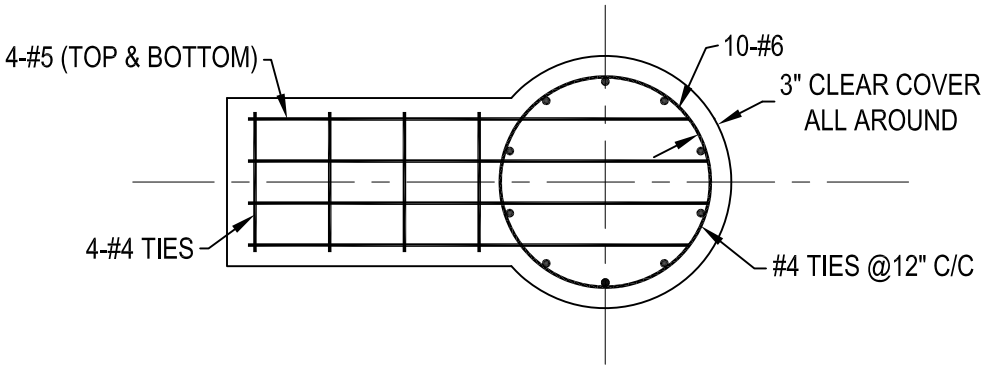
Syracuse, New York 13205 (315) 478–5700 FAX: (315) 478–5707 www.jaquith.com



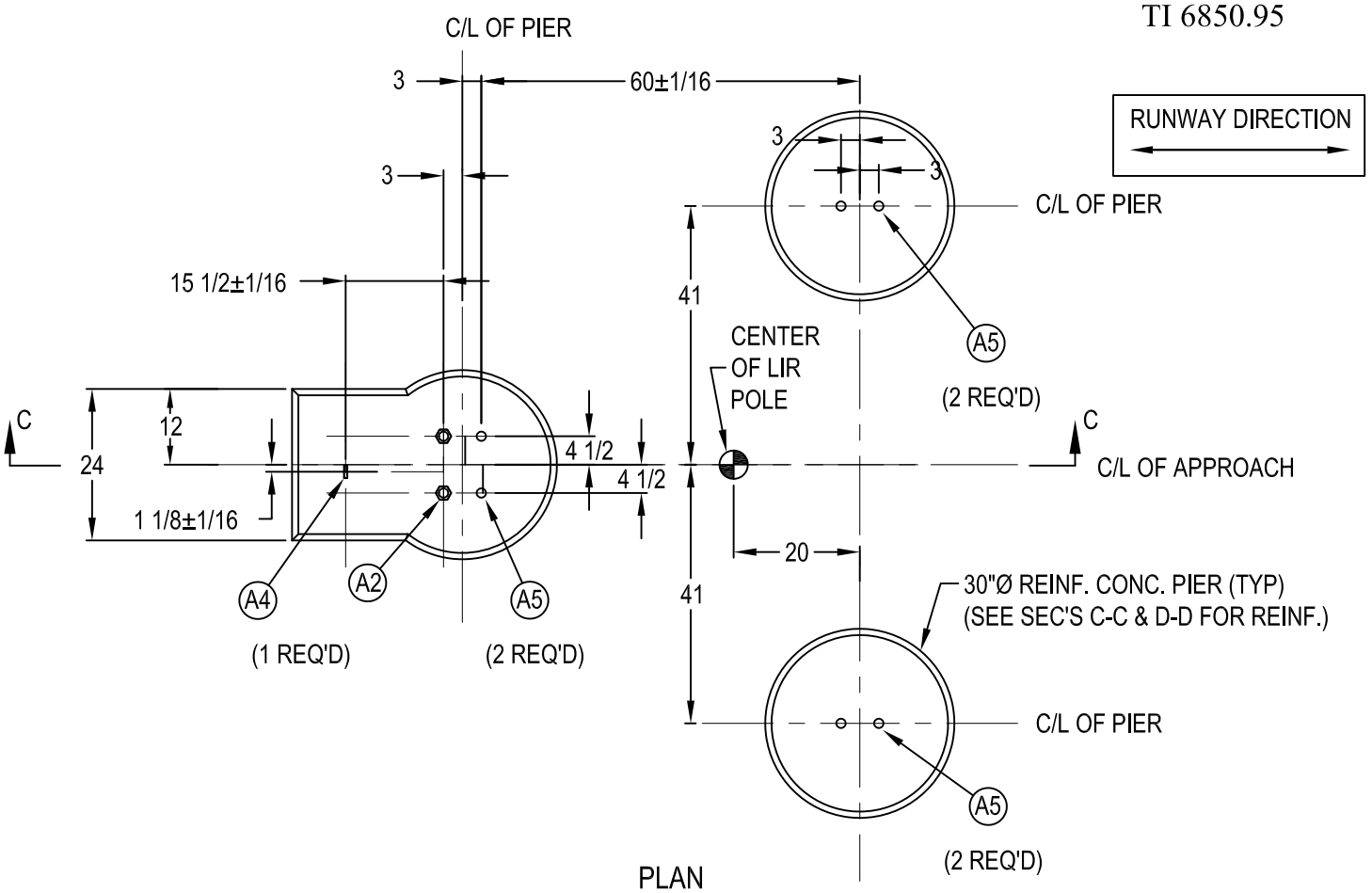
PLAN
FOUNDATION FOR LIR STRUCTURE MG-20



SECTION A-A

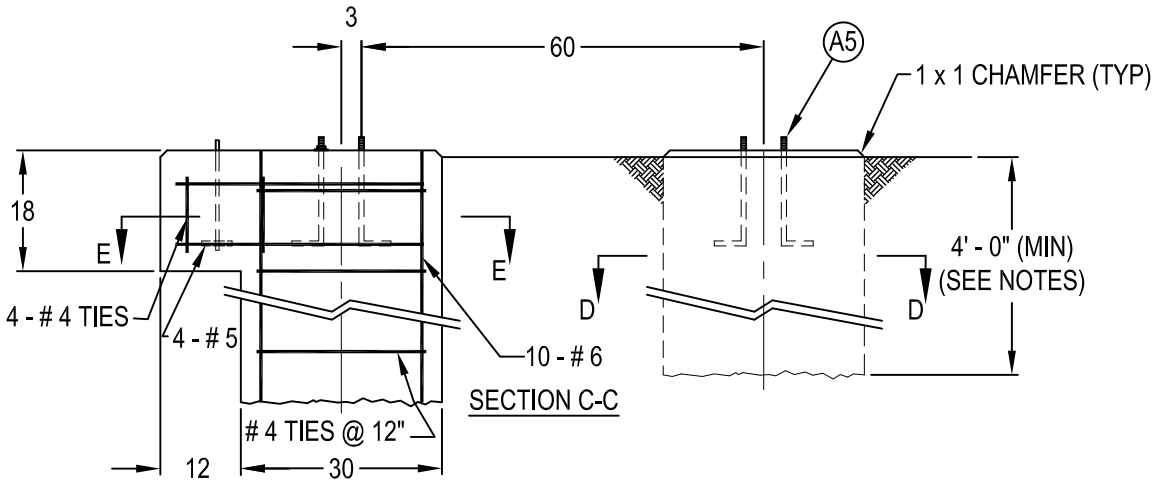


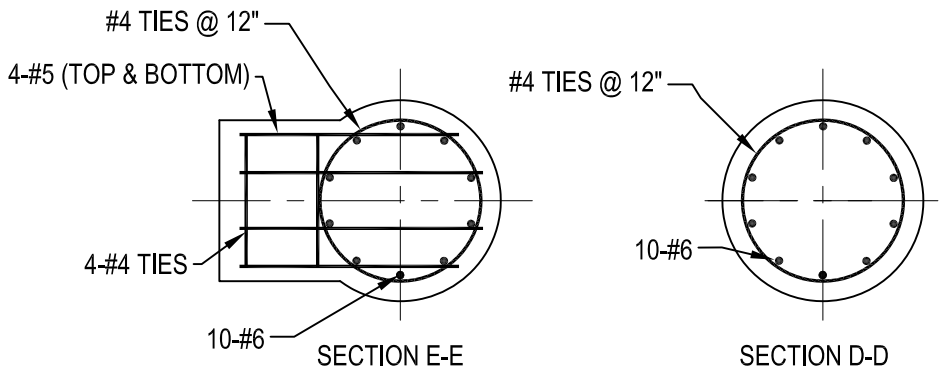
SECTION B-B

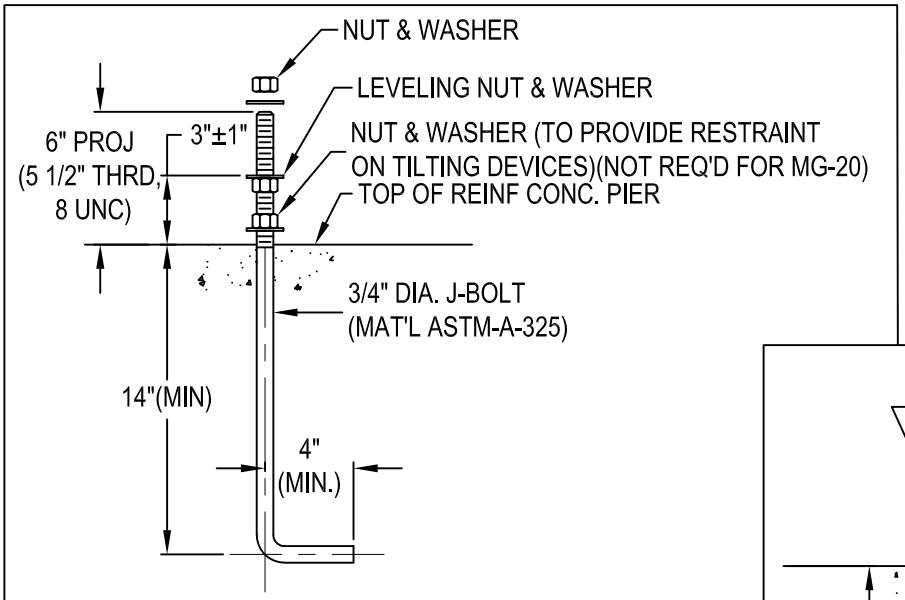


PLAN

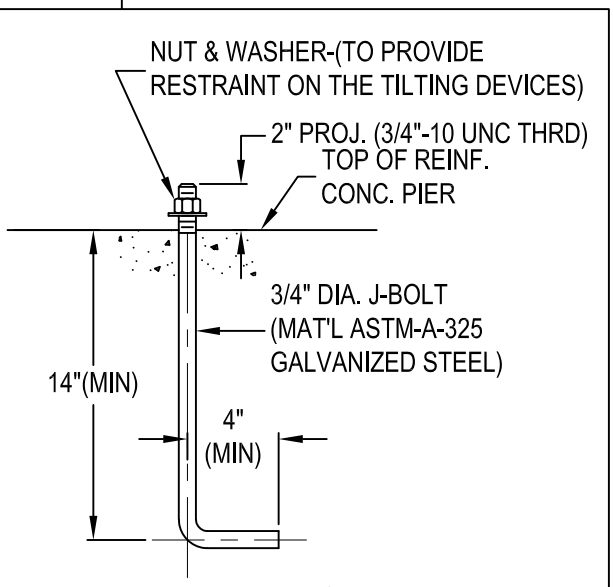
FOUNDATION FOR LIR STRUCTURES MG-30 & MG-40



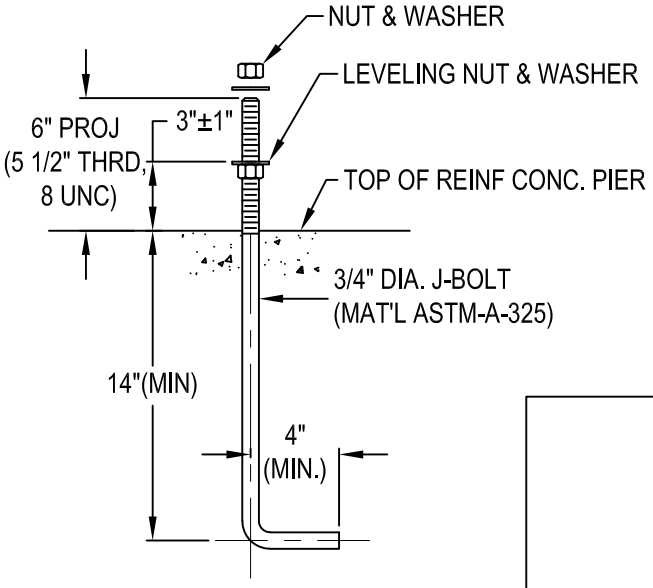




ANCHOR BOLT **A1**



ANCHOR BOLT **A2**



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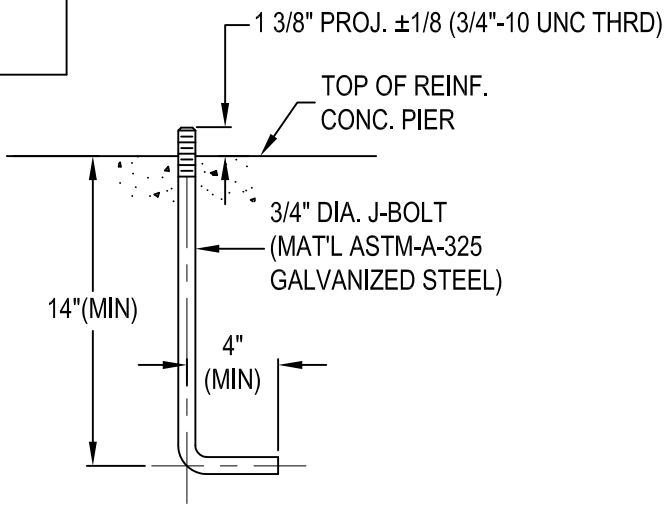

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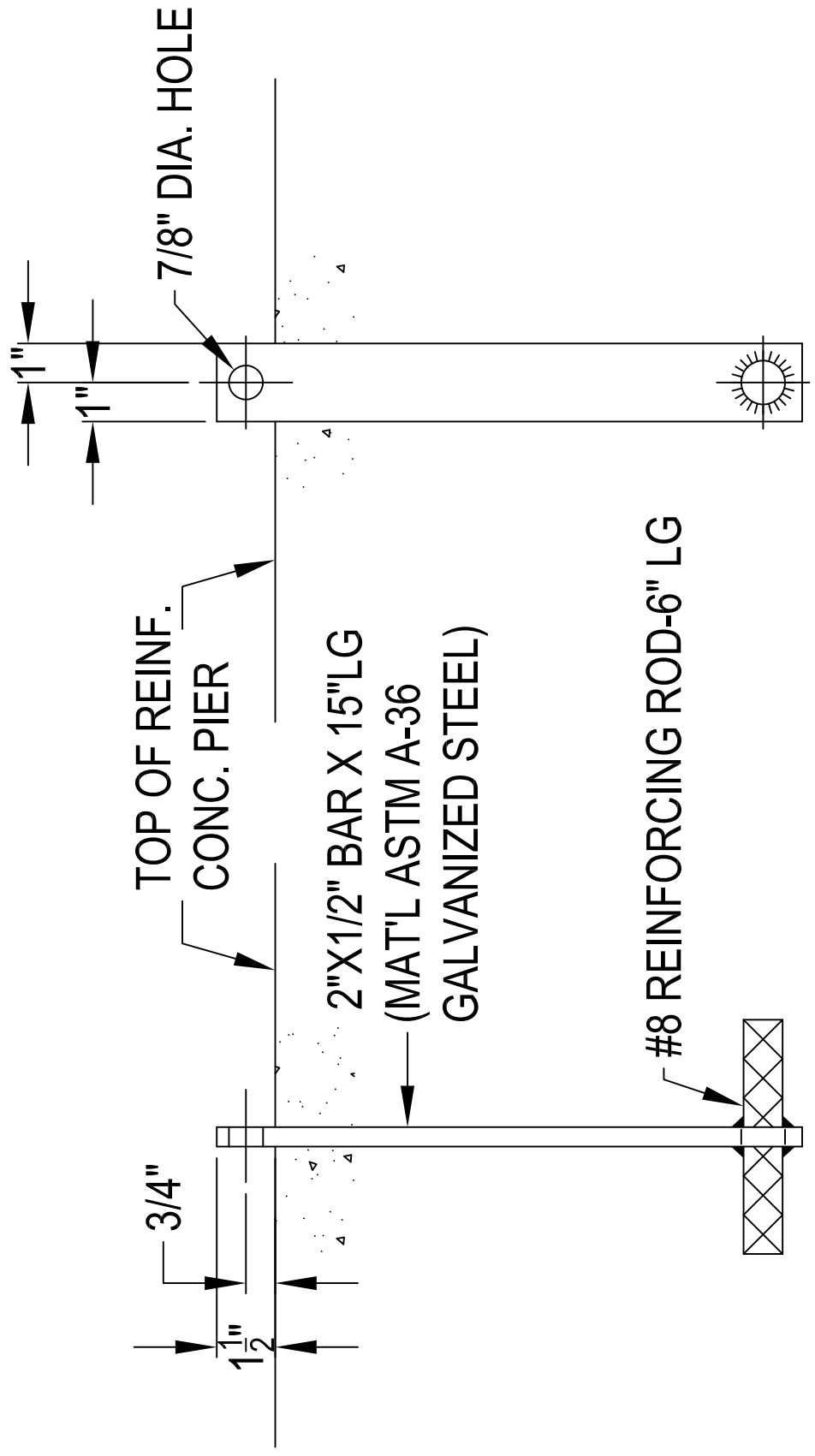
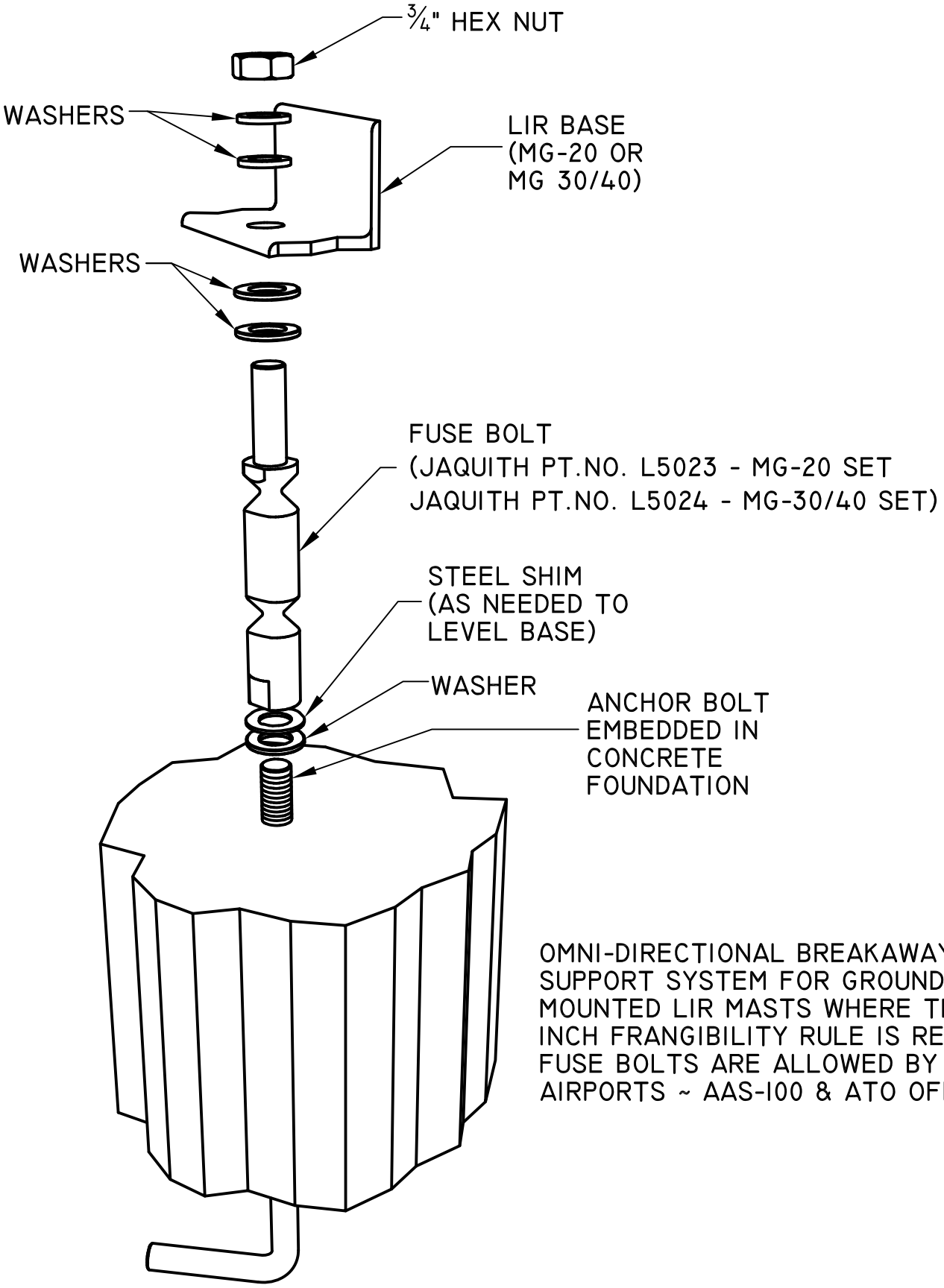
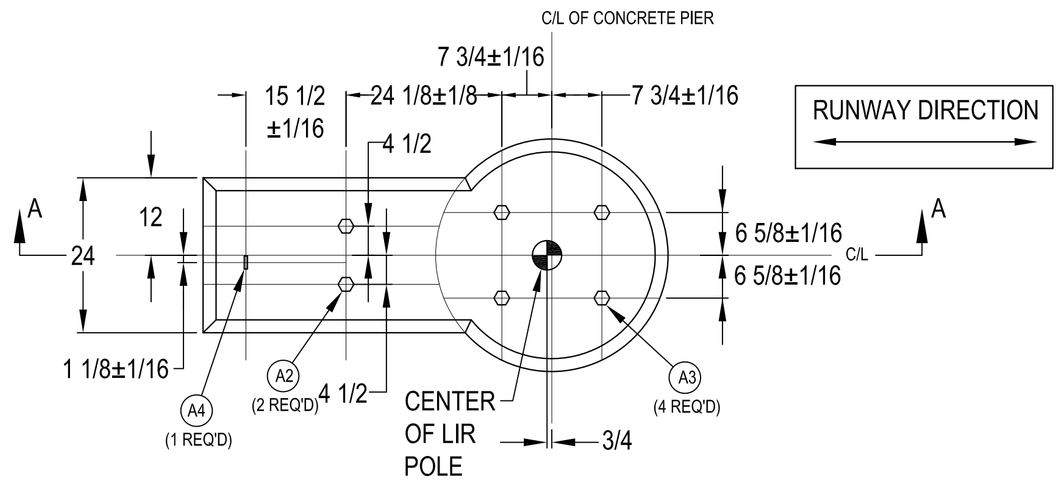


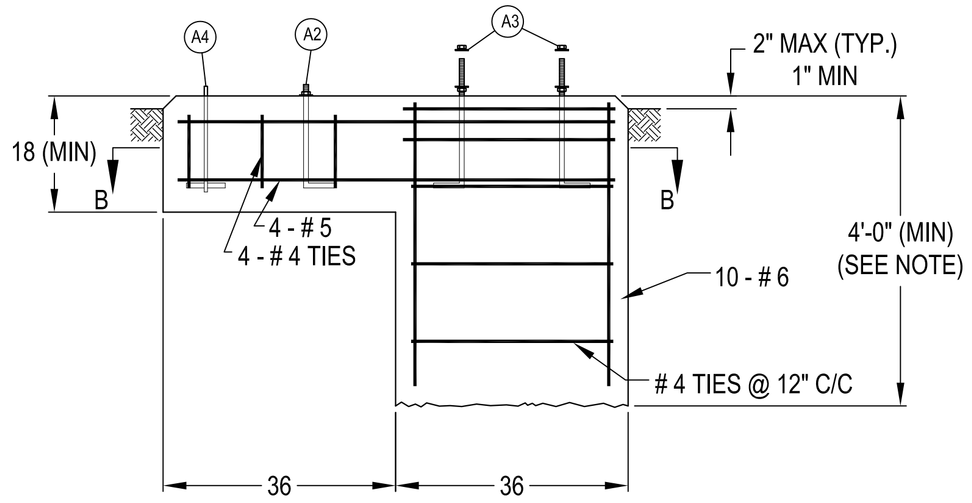
ANCHOR PLATE **A4**



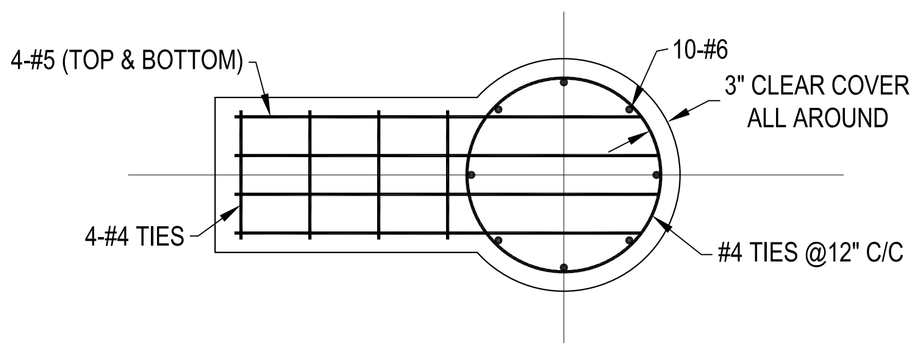
OMNI-DIRECTIONAL BREAKAWAY SUPPORT SYSTEM FOR GROUND MOUNTED LIR MASTS WHERE THE 3 INCH FRANGIBILITY RULE IS REQUIRED. FUSE BOLTS ARE ALLOWED BY FAA AIRPORTS ~ AAS-100 & ATO OFFICE.



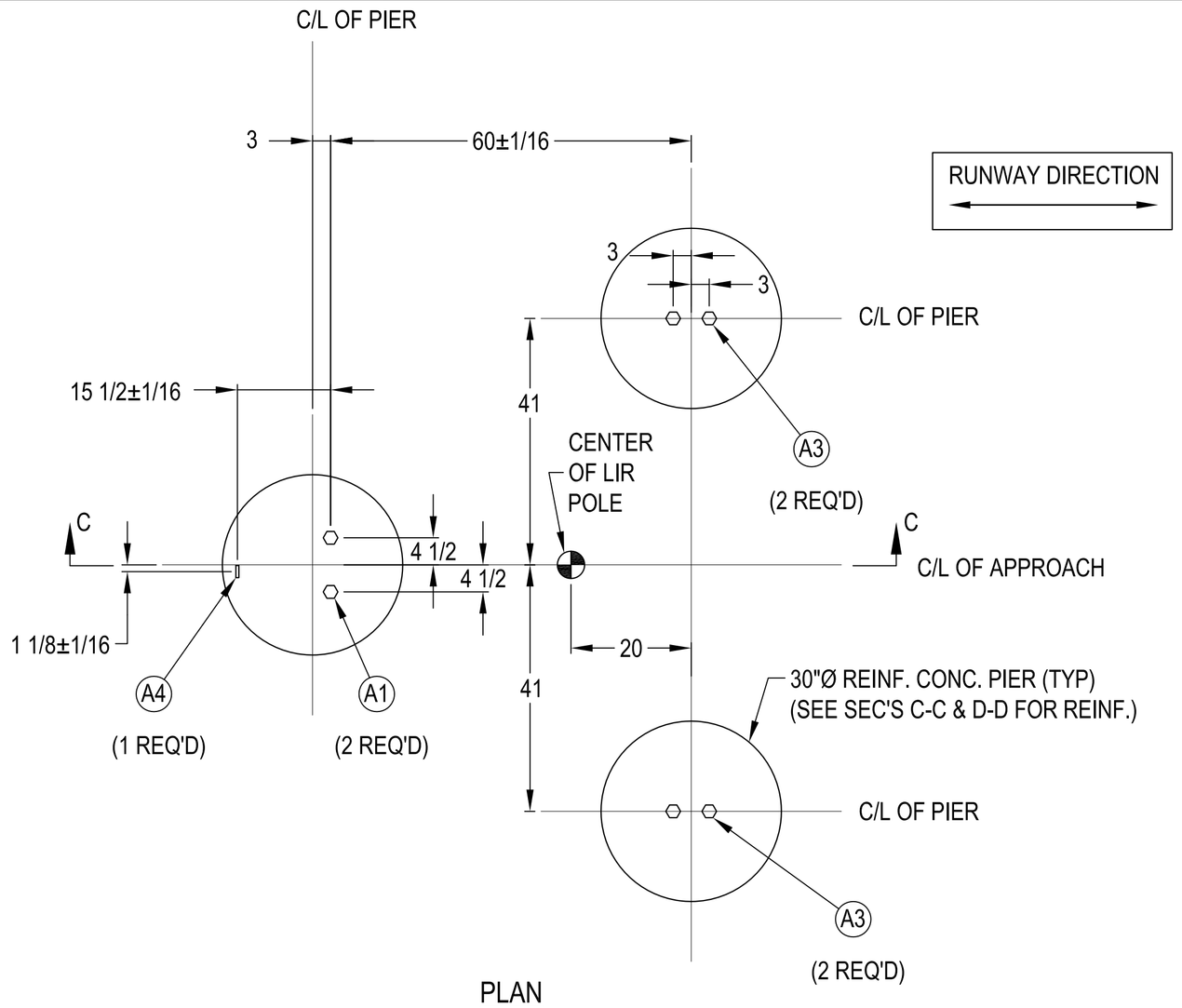
PLAN
FOUNDATION FOR LIR STRUCTURE MG-20



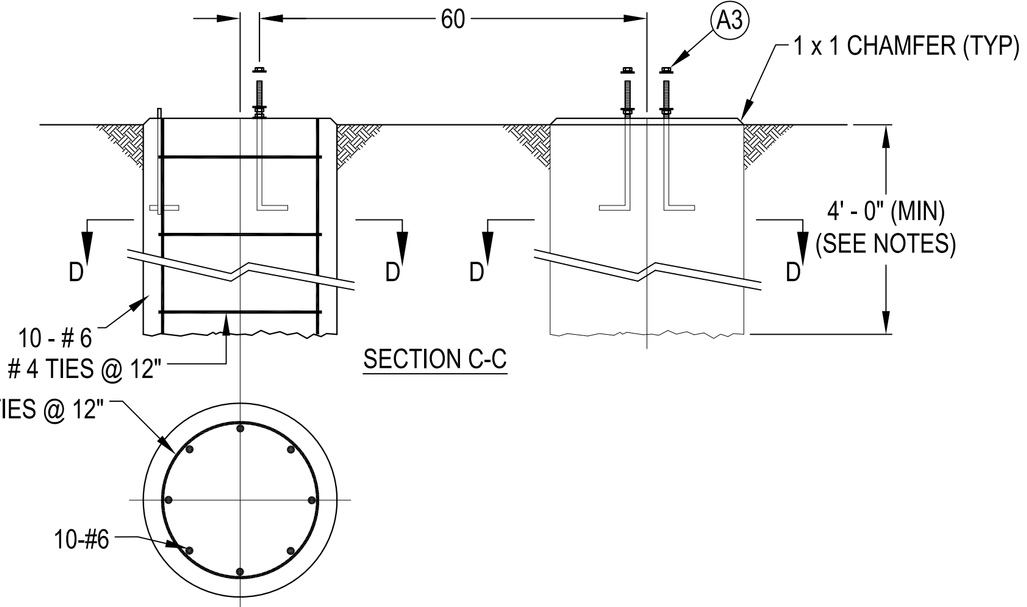
SECTION A-A



SECTION B-B



PLAN
FOUNDATION FOR LIR STRUCTURES MG-30 & MG-40

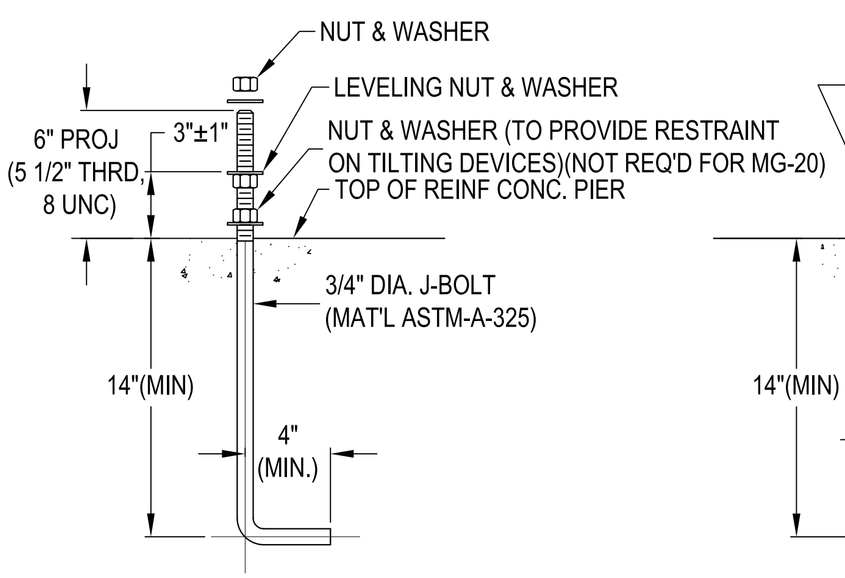


SECTION C-C

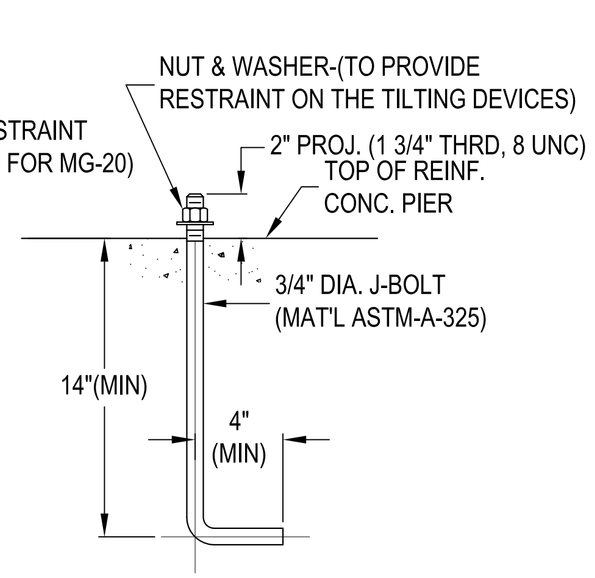
SECTION D-D

NOTES:
1. FOUNDATIONS SHOWN HERE ARE ONLY REPRESENTATIVE & MUST BE SITE ADAPTED, EXCEPT FOR THE LOCATION OF ANCHOR BOLTS. THE FOUNDATION MAY BE CONCRETE PIERS OR ANY OTHER TYPE APPROVED BY FAA REGIONAL ENGINEERS. DESIGN LOAD FOR FOUNDATION: 25 PSF ON EXPOSED AREA OF STRUCTURE. MINIMUM SAFETY FACTOR FOR SOIL BEARING CAPACITY = 2.

2. FOR THE REPRESENTATIVE CONCRETE FOUNDATION SHOWN:
   A. CONCRETE STRENGTH = 3,000 PSI @ 28 DAYS, (MIN)
   B. SOIL BEARING CAPACITY = 3,000 PSF (MIN)
   C. SECURELY PLACE ALL ELECTRICAL CONDUITS & ANCHOR BOLTS PRIOR TO PLACING CONCRETE.
   D. PLACE ALL CONCRETE ON UNDISTURBED SOIL.
   E. MINIMUM DEPTH OF CONCRETE PIERS = 4'–0" OR 1 FT BELOW LOCAL FROST LEVEL, WHICH EVER IS GREATER.
   F. REINFORCEMENT STEEL PER ASTM A615, GR. 40; TIE WIRE TO BE 16 GAUGE OR LARGER ANNEALED IRON.



ANCHOR BOLT (A1)



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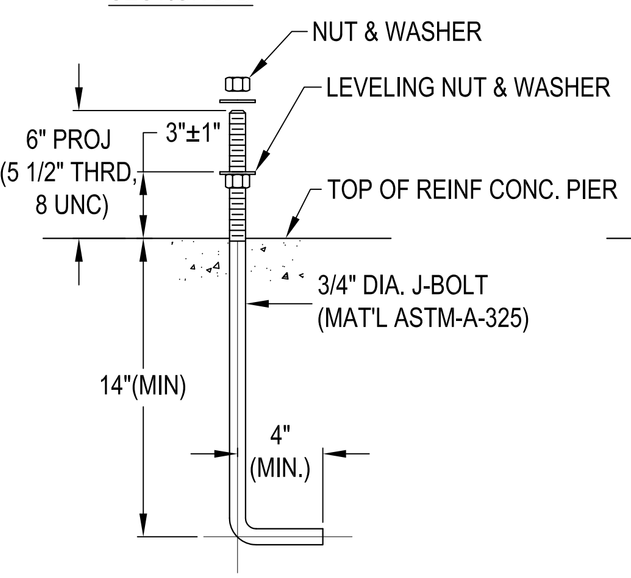

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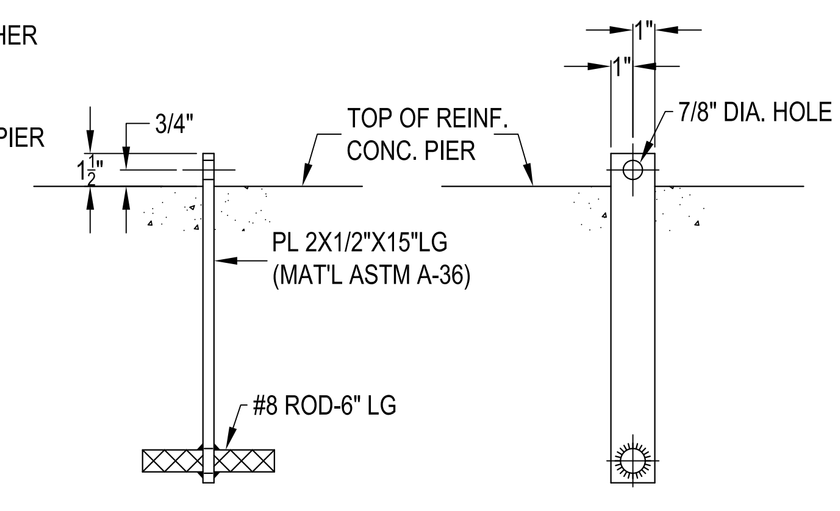


ANCHOR PLATE (A4)

JAQUITH INDUSTRIES INC.
PO BOX 780
600 E. BRIGHTON AVE.
SYRACUSE, NEW YORK 13205
www.jaquith.com 315–478–5700

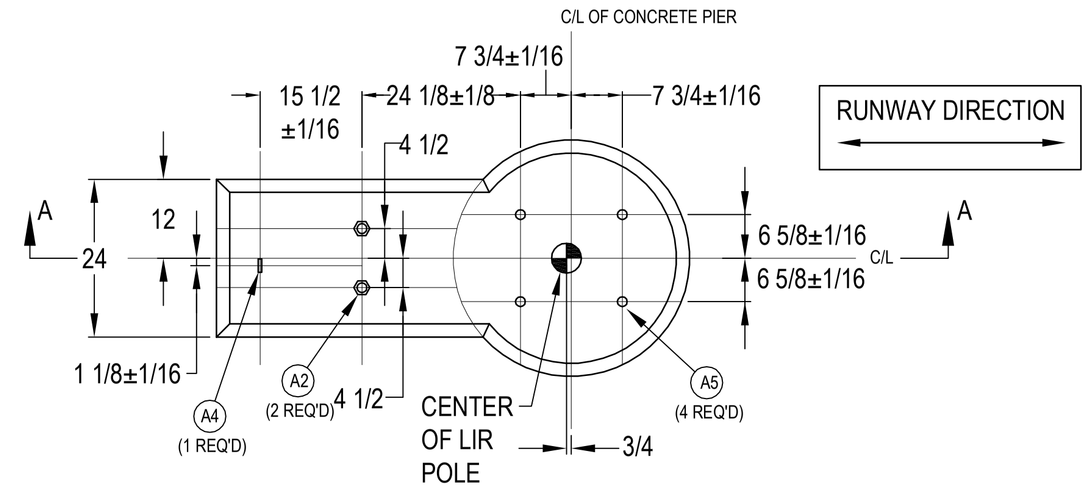
REV.LTR.	DATE	DESCRIPTION	CHECKED	APPROVED
A	11/26/01	REDRAWN IN AUTOCAD FORMAT		

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20591

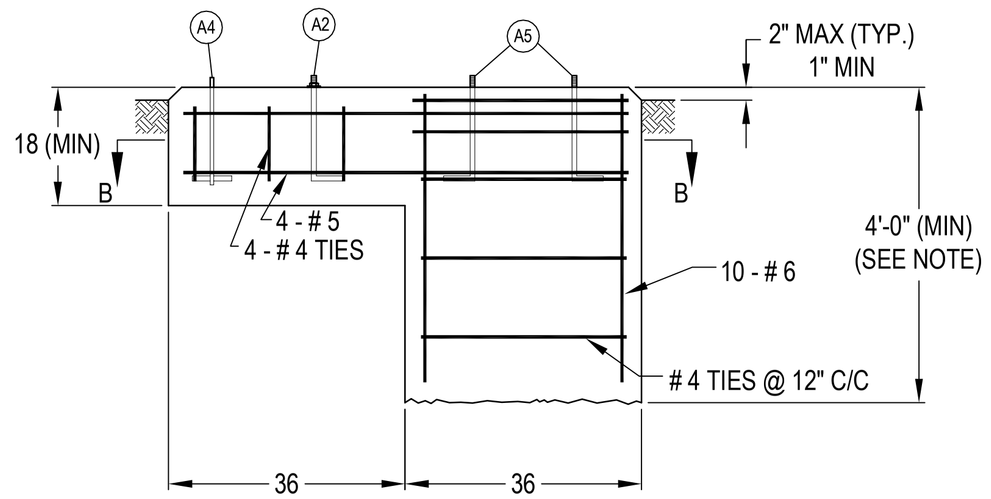
ALSF–2 (6' – 128') & MALSR (40' – 128')
L.I.R. STRUCTURES
LIGHT MOUNTING HEIGHT 6'–1" TO 40'–0"
FOUNDATIONS FOR LIR STRUCTURES
MG–20, MG–30, & MG–40

REVIEWED BY	SUBMITTED BY	APPROVED BY
		TECHNICAL OFFICER

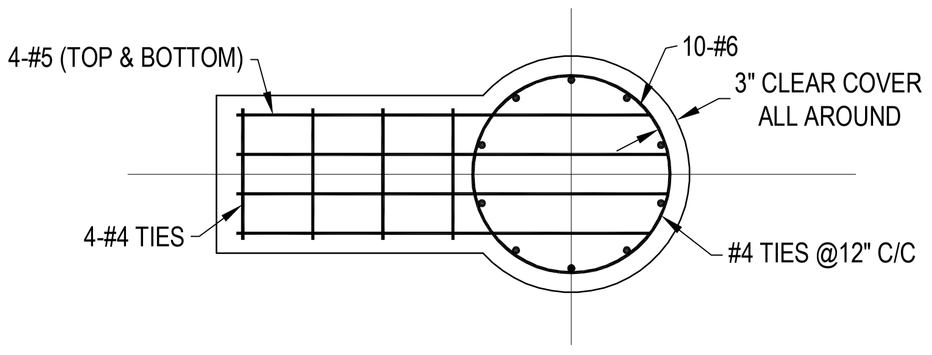
DESIGNED BY	ISSUED BY	DATE– 04/14/80	REV. LTR.
DRAWN BY		DRAWING NO. D–6155–19	A
CHECKED BY			



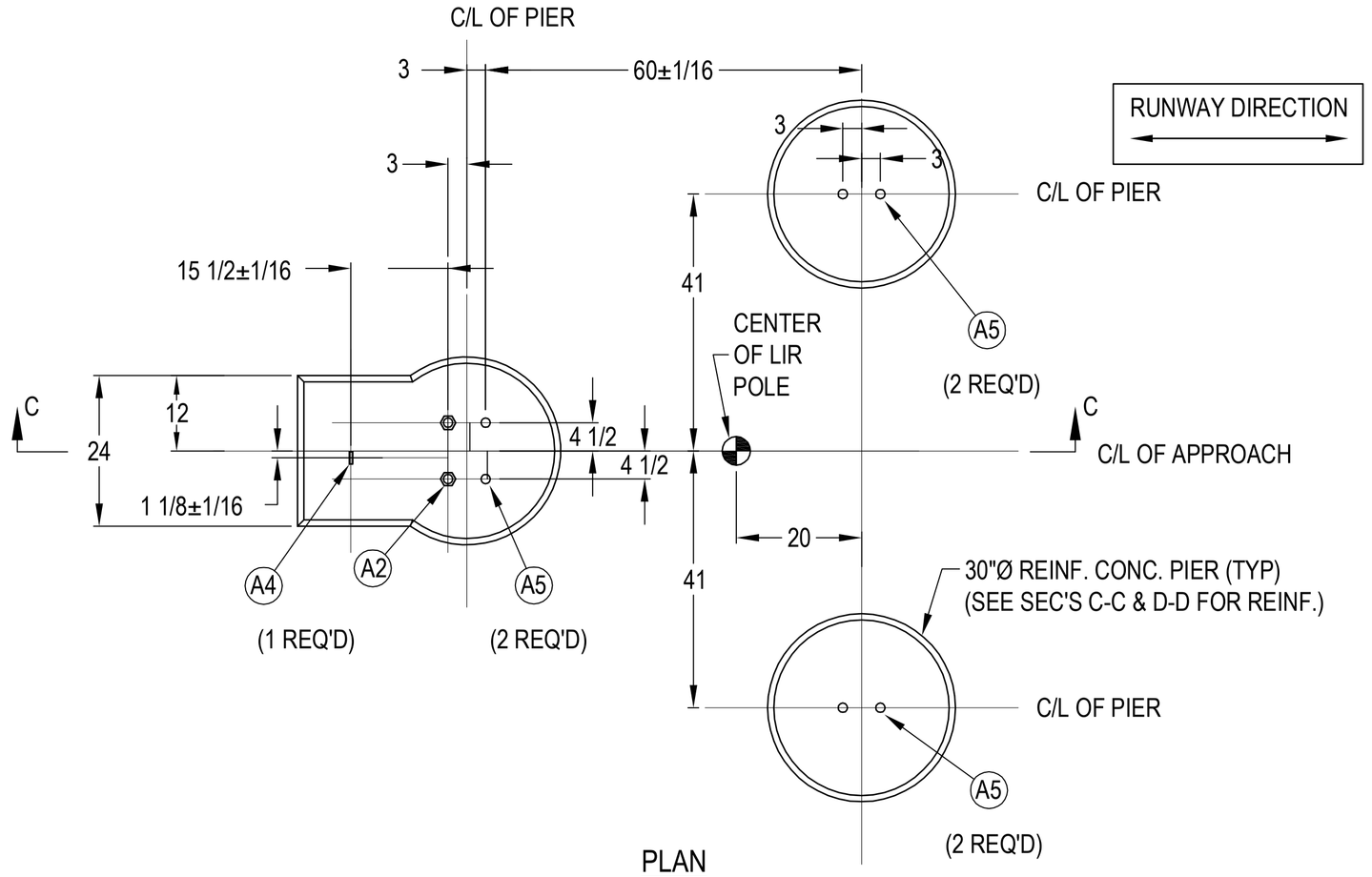
PLAN
FOUNDATION FOR LIR STRUCTURE MG-20



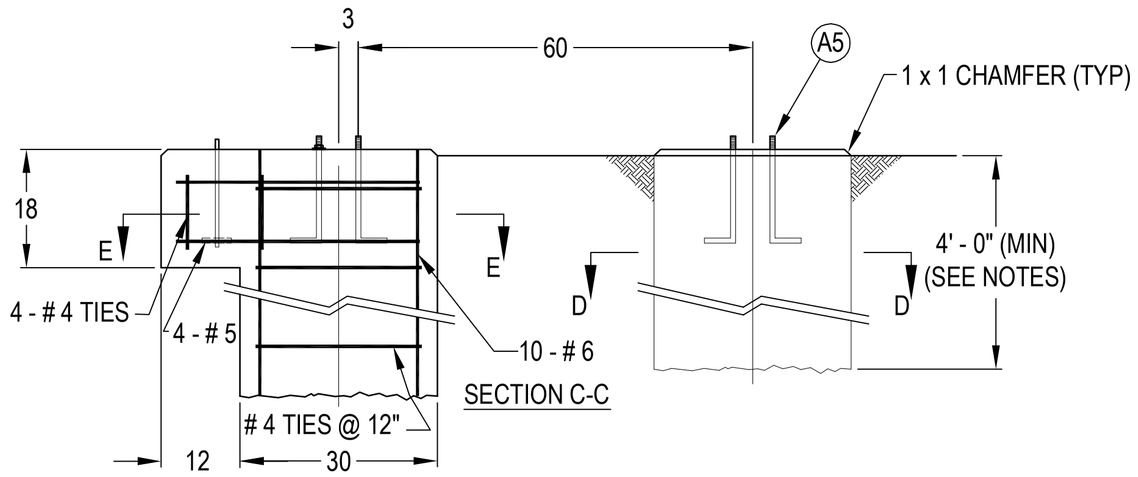
SECTION A-A



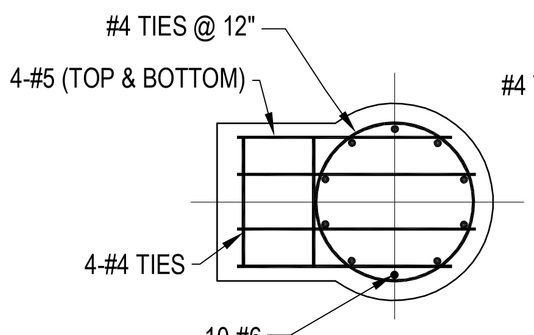
SECTION B-B



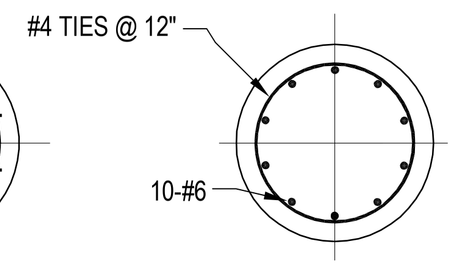
PLAN
FOUNDATION FOR LIR STRUCTURES MG-30 & MG-40



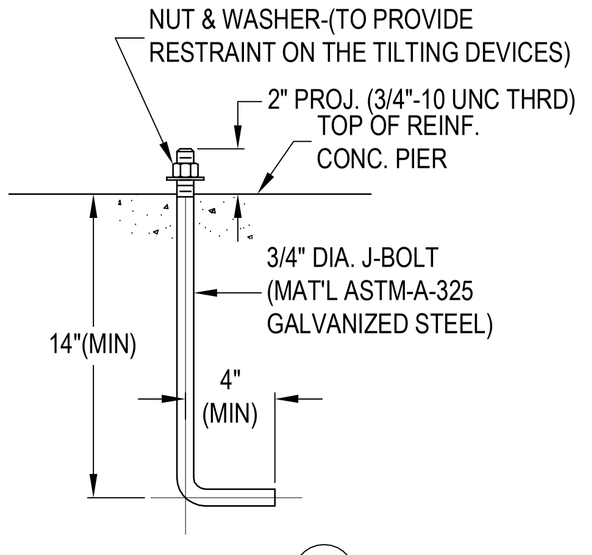
SECTION C-C



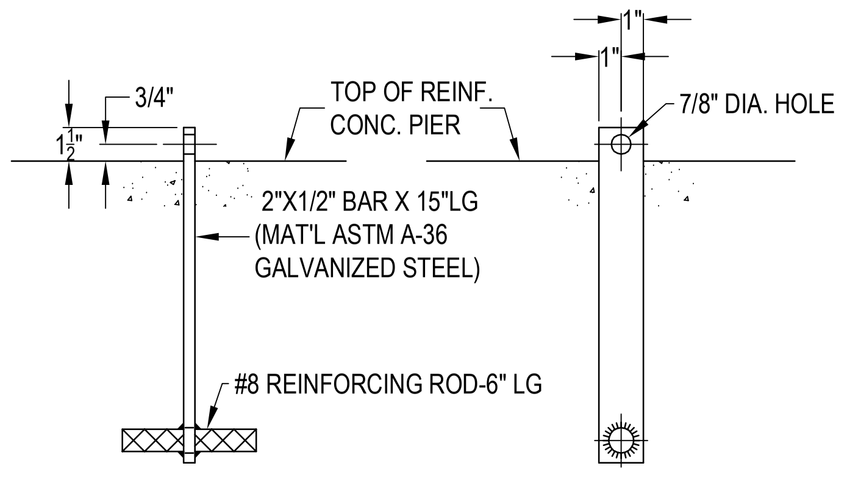
SECTION E-E



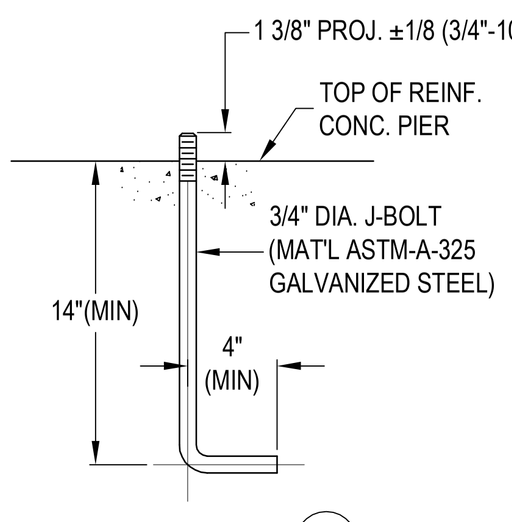
SECTION D-D



ANCHOR BOLT (A2)



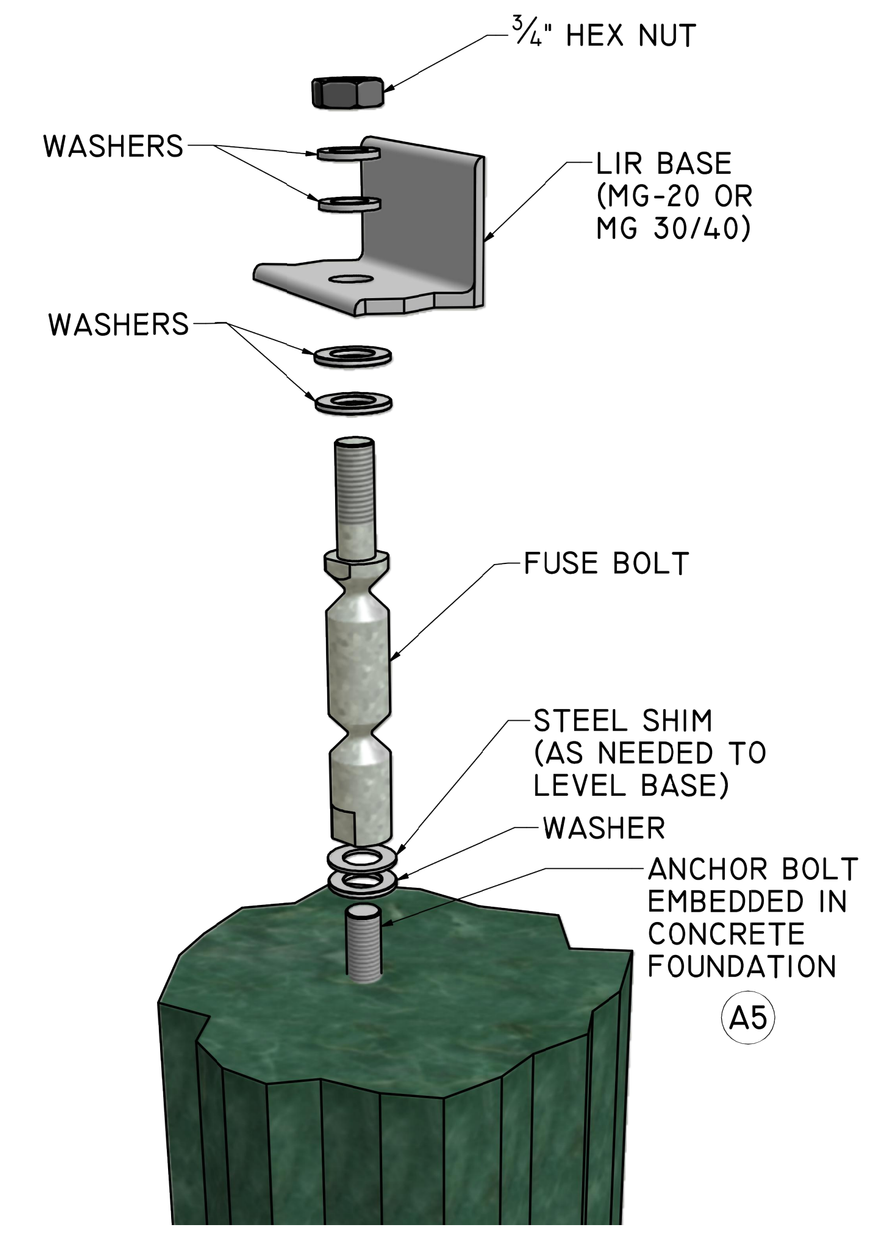
ANCHOR PLATE (A4)



ANCHOR BOLT (A5)

NOTES:
1. FOUNDATIONS SHOWN HERE ARE ONLY REPRESENTATIVE & MUST BE SITE ADAPTED, EXCEPT FOR THE LOCATION OF ANCHOR BOLTS. THE FOUNDATION MAY BE CONCRETE PIERS OR ANY OTHER TYPE APPROVED BY FAA REGIONAL ENGINEERS. DESIGN LOAD FOR FOUNDATION: 25 PSF ON EXPOSED AREA OF STRUCTURE. MINIMUM SAFETY FACTOR FOR SOIL BEARING CAPACITY = 2.

2. FOR THE REPRESENTATIVE CONCRETE FOUNDATION SHOWN:
   A. CONCRETE STRENGTH = 3,000 PSI @ 28 DAYS, (MIN)
   B. SOIL BEARING CAPACITY = 3,000 PSF (MIN)
   C. SECURELY PLACE ALL ELECTRICAL CONDUITS & ANCHOR BOLTS PRIOR TO PLACING CONCRETE.
   D. PLACE ALL CONCRETE ON UNDISTURBED SOIL.
   E. MINIMUM DEPTH OF CONCRETE PIERS = 4'–0" OR 1 FT BELOW LOCAL FROST LEVEL, WHICH EVER IS GREATER.
   F. REINFORCEMENT STEEL PER ASTM A615, GR. 40; TIE WIRE TO BE 16 GAUGE OR LARGER ANNEALED IRON.



TYPICAL FUSEBOLT (BREAKAWAY SUPPORT) ASSEMBLY

REV.LTR.	DATE	DESCRIPTION	CHECKED	APPROVED
A	8/10/10	FOUNDATIONS DRAWN TO ACCOMODATE FUSE BOLTS		

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20591

ALSF–2 (6' – 128') & MALSR (40' – 128') L.I.R. STRUCTURES LIGHT MOUNTING HEIGHT 6'–1" TO 40'–0" FOUNDATIONS FOR LIR STRUCTURES MG–20, MG–30, & MG–40 WITH FUSE BOLTS

REVIEWED BY	SUBMITTED BY	APPROVED BY
		TECHNICAL OFFICER
DESIGNED BY	ISSUED BY	DATE– 04/14/80
DRAWN BY		DRAWING NO. D–6155–19FB
CHECKED BY		REV. LTR. A

JAQUITH INDUSTRIES INC.
PO BOX 780
600 E. BRIGHTON AVE.
SYRACUSE, NEW YORK 13205
www.jaquith.com 315–478–5700

SECTION 1. GENERAL INFORMATION AND REQUIREMENTS

1.1 INTRODUCTION:

1.1.1 Purpose. – This instruction book describes procedures for the installation, maintenance and supply support of Low-Impact Resistant structures used to support lights of approach lighting systems.

1.1.2 Scope. – The book covers equipment manufactured to the specification FAA-E-2702

1.1.3 Applicability. – The material presented herein is applicable only to such equipment made by the **JAQUITH INDUSTRIES, INC. 600 E. BRIGHTON AVENUE, SYRACUSE, NEW YORK 13210-4213**

1.2 LOGISTICS CONCEPT:

1.2.1 Standard Structural Parts. – The standard structural parts of the LIR structures are listed in Table 1-1. Various combinations of these standard parts are required to make different types of LIR structures. To make the proper height of an LIR structure for a particular light station, it requires cutting and bonding of the vertical member (6" I.D. fiberglass tube) of the structure. When lengths are not specified cutting, bonding and assembling of the standard structural parts is done in the field, in conformance with the installation instructions furnished. Adhesives for bonding are **not** part of the standard structural items, but are locally procured and are also available from Jaquith Industries, Inc.

1.2.2 Equipment National Stock Number. – The national stock number (NSN's) for the standard structural parts of the LIR structures, are listed in Table 1-1.

1.3 DESCRIPTION OF LIR STRUCTURES:

1.3.1 Use of LIR Structures. – The Low-Impact Resistant (LIR) structures are used to support lights of approach systems in a fixed alignment and orientation. Since the height of the support structure required varies for each light station, three different types of LIR structures are provided, which can be tailored in the field to a specific height. These three types of LIR structures are designated as MG-20, MG-30, MG-40; a typical of each is shown in Figure 1-1 through 1-3. Note that MG stands for Mounted on Ground and the numbers 20, 30, & 40 indicate the approximate maximum height of the structure in feet. The range of the light mounting height for each type of LIR structure is as follows:

MG-20 - From 6’1” to 21’1” above concrete foundation (Fig. 1-1)
MG-30 - From 21’2” to 30’0” above concrete foundation (Fig. 1-2)
MG-40 - From 30’1” to 40’0” above concrete foundation (Fig. 1-3)
MS-20 – From 40’0” to 128’0” above concrete foundation (Fig. 1-4)

All of the LIR Structures require cutting and bonding of the main vertical tube members.

1.3.2 **Functional Relationship of Parts.** – The standard structural parts of the LIR structures are listed in Table 1-1 and shown in Figures 8-1 thru 8-16. Various combinations of the standard structural parts, after proper cutting and bonding, (See Section 1.5 for cutting and bonding schedule instructions) are assembled to make different types of LIR structure

The basic structural component of the LIR structure is a 6” I.D. (Inside Diameter) fiberglass tube with factory built, breakaway joints at 42” intervals through its length. This 6” I.D. fiberglass tube is the main vertical member of each LIR structure type.

For the MG-20, a proper length of the 6” I.D. fiberglass tube “A” (Item #7) is bonded in the field to the mounting stand assembly (Item #17) to act as a vertical cantilever structure. The mounting stand assembly is hinged and allows the LIR structure to be lowered to the horizontal position for the required maintenance.

For the MG-30, the 6” I.D. fiberglass tube “A” (10’) (Item #7) and a proper length of tube “B” (Item #8) are cut and bonded together in the field to make a tube of proper height. For the MG-40, the 6” I.D. fiberglass tube “A” (20’) (Item #7) and proper length of tube “B” (Item #8) are cut and bonded together in the field to make a tube of proper height. Both MG-30 and MG-40 6” I.D. fiberglass tubes are then bonded in the field to the mounting frame assembly (Item #16) and then guyed to the mounting frame assembly with the stabilizer rod assemblies (Item #12 for MG-30; Item #12 and #13 for MG-40). To prevent excessive vibrations in the stabilizer rods, horizontal stabilizer assemblies (Item #10 or #11 for MG-30 or MG-40 respectively) are attached to the stabilizer rod and to the 6” I.D. fiberglass tube. The mounting frame assembly is hinged and allows the LIR structure to be lowered to a horizontal position for required maintenance.

To facilitate the mounting of lights at the top of the LIR structure, a tube cap assembly (Item #6) is clamped to the 6” I.D. fiberglass tube during field assembly. The tube cap assembly is designed to allow mounting of a flasher unit and any of five different types of tee-bar assemblies. The five Types of tee-bar assemblies are: T-1 (Item #1), TM MALS 5 light (Item #2), T-3 ALS 3 light (Item #3), T-4 ALS 4 light (Item #4) and T-5 ALS 5 light (Item #5). When a tee-bar assembly is to be mounted, on an LIR structure, two tee-brace assemblies (Item #15) and one tee-brace clamp (Item #14) are required (with the exception of

Item #1, does not require tee-braces or tee-clamp). The tee-brace assemblies are the diagonal members that connect the tee-bar assembly to the 6" I.D. fiberglass tube, with the use of the tee-brace clamp. The tee-brace assemblies provide support for the tee-bars. They attach to the tee-bars at a point 57" on either side of the tube cap and attach to the tee-brace clamp at a point 24" down from the centerline of the tee-bar.

When a flasher unit alone is to be mounted on a MG type LIR structure, the tube cap assembly is all that is required to facilitate mounting.

LINE ITEM COMPONENT DESCRIPTIONS

Item #'s from Table 1-1:

Item 5: T-1 TEE BAR: T-1 single light crossbar for RAIL flasher. Pultruded tube 1.75" square by 0'-7" long. (Note JI P/N L5000 is the same as this item except that it also includes a junction box) (NSN: none) FAA P/N: None; JI P/N: L1001.

Item 4: 2TM TEE BAR: MALS crossbar 5 @ 30". Pultruded (fiberglass) tube 1.75" square by 10'-05" long. (NSN: 5445-01-079-9154) FAA P/N: D6155-1-4; JI P/N: L9154.

Item 3: 2T3 TEE BAR: ALSF crossbar 3 @ 60" Pultruded (fiberglass) tube 1.75" square by 10'05" long. (NSN: 5445-01-079-9155) FAA P/N: D6155-1-3; JI P/N: L9155.

Item 2: 2T4 TEE BAR: ALSF crossbar 4 @ 60". Pultruded (fiberglass) tube 1.75" square by 15'-05" long. (NSN: 5445-01-079-3886) FAA P/N: D6155-1-2; JI P/N: L3886.

Item 1: 2T5 TEE BAR: ALSF crossbar 5 @ 40.5". Pultruded (fiberglass) tube 1.75" square by 13'11" long. (NSN: 5445-01-079-3885) FAA P/N: D6155-1-1; JI P/N: L3885.

Item 6: TUBE CAP ASSEMBLY: Aluminum cap (6.25" diameter by 4.688" high) for the top of LIR tube "A" (MG-20) or "B" (MG-30/40) along with a tube cap clamp. (NSN: 5445-01-079-7557-1) FAA P/N: D6155-1-5; JI P/N: L7557.

Item 7: TUBE "A": Fiberglass tube "A" (6A20ft) overall dimension 6.000" inside diameter by 6.250" outside diameter, 20' long with helix ring joints spaced at 42" intervals for frangible joint. (NSN: 5445-01-079-9135) FAA P/N: D6155-1-12; JI P/N: L9135.

Item 8: TUBE "B": Fiberglass tube "B" (6B20ft) includes tube splice bonded joint protruding 4" from one end (used as the top tube). Splice joint 6.00" outside diameter has a hoop wound ring 7.250" outside diameter by 1.500" wide at a point 60" from the splice joint end. Overall dimension 6.000" inside diameter (plus 0.005 minus 0.000) by 6.250" outside diameter, 20'-04" long with helix ring joints spaced at 42.00" intervals for frangible joint. (NSN: 5445-01-079-9148) FAA P/N: D6155-1-13; JI P/N: L9148.

Item 9: TUBE "A" BONDED 20': Tube "A" is factory bonded to a Mounting Socket Assembly (Aluminum) with mounting socket dimension 0'-6.25" outside diameter by 0'-5.75" inside diameter by 3'0" long. Flanged frame for pivot base with ball bearing pivot. Reference FAA drawing D-6155-6; Item 4 (NSN: 5445-01-079-9134) FAA P/N: D6155-1-14; JI P/N: L9134.

Item 10: HORIZONTAL STABILIZER, MG-30: Horizontal brace clamp with three (3) each stabilizing rods 1'-7.812" long. (NSN: 5445-01-079-9151) FAA P/N: D6155-1-8; JI P/N: L9151.

Item 11: HORIZONTAL STABILIZER, MG-40: Set of two (2) horizontal brace clamps (upper/lower) for MG-40 structures only. (NSN: 5445-01-079-3039) FAA P/N: D6155-1-9; JI P/N: L3039.

Item 12: STABILIZER ROD ASSEMBLY, MG-30: Kit consisting of one set of three (3) each stabilizer rods 14' 3" long. (Note: Used for the MG-30 or the upper rod of the MG-40.) (NSN: 5445-01-079-5144) FAA P/N: D6155-1-10; JI P/N: L5144.

Item 13: STABILIZER ROD ASSEMBLY, MG-40: Kit consisting of one set of three (3) each stabilizer rod sections, 0.750" diameter by 9'10" long. Note: Used **only** for the MG-40. (NSN: 5445-01-079-4919-1) FAA P/N: D6155-1-11; JI P/N: L4919.

Item 14: TEE BRACE CLAMP ASSEMBLY: Aluminum clamp; overall dimension 6.250" inside diameter by 8.90" long by 6.625" wide by 2.500" high. (NSN: 5445-01-079-9152) FAA P/N: D6155-1-7; JI P/N: L9152.

Item 15: TEE BRACE ASSEMBLY: Assembly of 1" by 1" by 0.125" thick wall tubing attached to two (2) 1" wide by 0.188" plates for an overall length of 4'-10.750". Note: This item typically used in pairs since two are required for each steady burning approach crossbar. (NSN: 5445-01-079-9153) FAA P/N: D6155-1-6; JI P/N: L9153.

Item 16: MOUNTING STAND D-6155-15: Tee shaped pivoting mounting frame assembly for MG-30 and MG-40 LIR structures only. Overall dimensions 8'-0.25" long by 5'-05" wide by 1'-2.25" height (galvanized steel). Reference drawing D-6155-15 (NSN: 5445-01-79-2762) FAA P/N: D6155-1-16; JI P/N: L2762.

Item 17: MOUNTING STAND ASSEMBLY: Tilt down (galvanized steel) mounting stand for MG-20 LIR structures only. Overall dimensions 18.5" long by 15.5" wide by 09.5" high. (NSN: 5445-01-079-2763) FAA P/N: D6155-1-15; JI P/N: L2763.

Item 18: LIFT FRAME: MS-20 Mast Lifting Frame Assembly used only for LIR masts mounted on rigid towers. Galvanized steel frame 36" long by 18" wide by 37" high with a triangular shaped base and winch assembly with cable hook-up to raise and lower the LIR mast through the mast sleeve. (NSN: 5445-01-079-9133) FAA P/N: D6155-1-17; JI P/N: L9133.

Item 19: EMT 2-INCH FRANGIBLE COUPLINGS: Reference FAA drawing C-6046 for details of frangible coupling, Type 1 & 1A. (NSN: 6210-00-055-5659-1)
FAA P/N: none; JI P/N: L5659.

Item 20: TRAILER JACK: MG30/40 trailer jack assembly with 400 pound capacity and self-locking worm gear. (NSN: 5120-01-098-7375-1) FAA P/N: none; JI P/N: L5006.

Item 21: TILT DEVICE: Lifting device for ground mounted (MG-20/30/40) LIR structures. Reference FAA Drawing D-6155-20. (NSN: 8200-00-300-1728-1) FAA P/N: none; JI P/N: L5005R

Item 22: STABILIZER ROD ASSEMBLY, MG-40 COMBINED: Combined (upper & lower rod) kit consisting of three (3) each stabilizer rod sections, 0.750" diameter by 14'3" long; as well as three (3) each stabilizer rod sections 0.750" diameter by 9'10" long. Note: This is equivalent to L5144 & L4919 together. (NSN: 5445-01-079-9132-1) FAA P/N: D6155-1-10 & 11; JI P/N: L9132.

Item 24: FLASHER BRACKET & JUNCTION BOX: Flasher support bracket with an aluminum junction box for ALSF and MALSF sequence flasher installations. (NSN: none) FAA P/N: none; JI P/N: L5017.

Item 25: JUNCTION BOX WITH TERMINAL BLOCK: Aluminum junction splice box with kukla (spade connector) terminal block inside used with MALS Crossbar. (NSN: none) FAA P/N: none; JI P/N: L5018.

Item 26: ANCHOR BOLT SET, MG-20: (NSN: none) FAA P/N: none; JI P/N: L5002.

Item 27: ANCHOR BOLT SET, MG-30/40: (NSN: none) FAA P/N: none; JI P/N: L5003.

Item 28: ANCHOR BOLT SET, Z BASE: (NSN: none) FAA P/N: none; JI P/N: L5021.

Item 29: ANCHOR PLATE: (NSN: none) FAA P/N: none; JI P/N: L5004.

Item 30: EPOXY KIT, SPECIAL: Two (2) quarts: (NSN: none) FAA P/N: none; JI P/N: L5008.

Item 31: EPOXY KIT, SPECIAL: Four (4) quarts: (NSN: none) FAA P/N: none, JI P/N: L5009.

Item 32: MAINTENANCE STAND, VERTICAL: (NSN: none) FAA P/N: none; JI P/N: L5016.

Item 33: REPAIR TUBE SPLICE: Used for repair of Tube "A" or "B" repair when required. Fiberglass material with overall dimensions 5.995" (plus 0.000 or minus 0.003) outside diameter by 5.75" inside diameter (12" long). (NSN: 5445-01-079-9149) FAA P/N: D6155-1-18; JI P/N: L9149.

Item 34: T-1 BAR KIT: T-1 single light crossbar with junction box for the RAIL flasher component of a MALSR system. Pultruded (fiberglass) tube 1.75" square by 0'7" long. (NSN: none) FAA P/N: none; JI P/N: L5000.

Item 35: TM BAR KIT: Consists of a single TM bar with a pair of (2) tee braces and (1) clamp. (NSN: none) FAA P/N: none; JI P/N: L1006.

Item 36: T-3 BAR KIT: Consists of a single T-3 bar with a pair of (2) tee braces and (1) clamp. (NSN: none) FAA P/N: none; JI P/N: L1003)

Item 37: T-4 BAR KIT: Consists of a single T-4 bar with a pair of (2) tee braces and (1) clamp. (NSN: none) FAA P/N: none; JI P/N: L1004.

Item 38: T-5 BAR KIT: Consists of a single T-5 bar with a pair of (2) tee braces and (1) clamp. (NSN: none) FAA P/N: none; JI P/N: L1005.

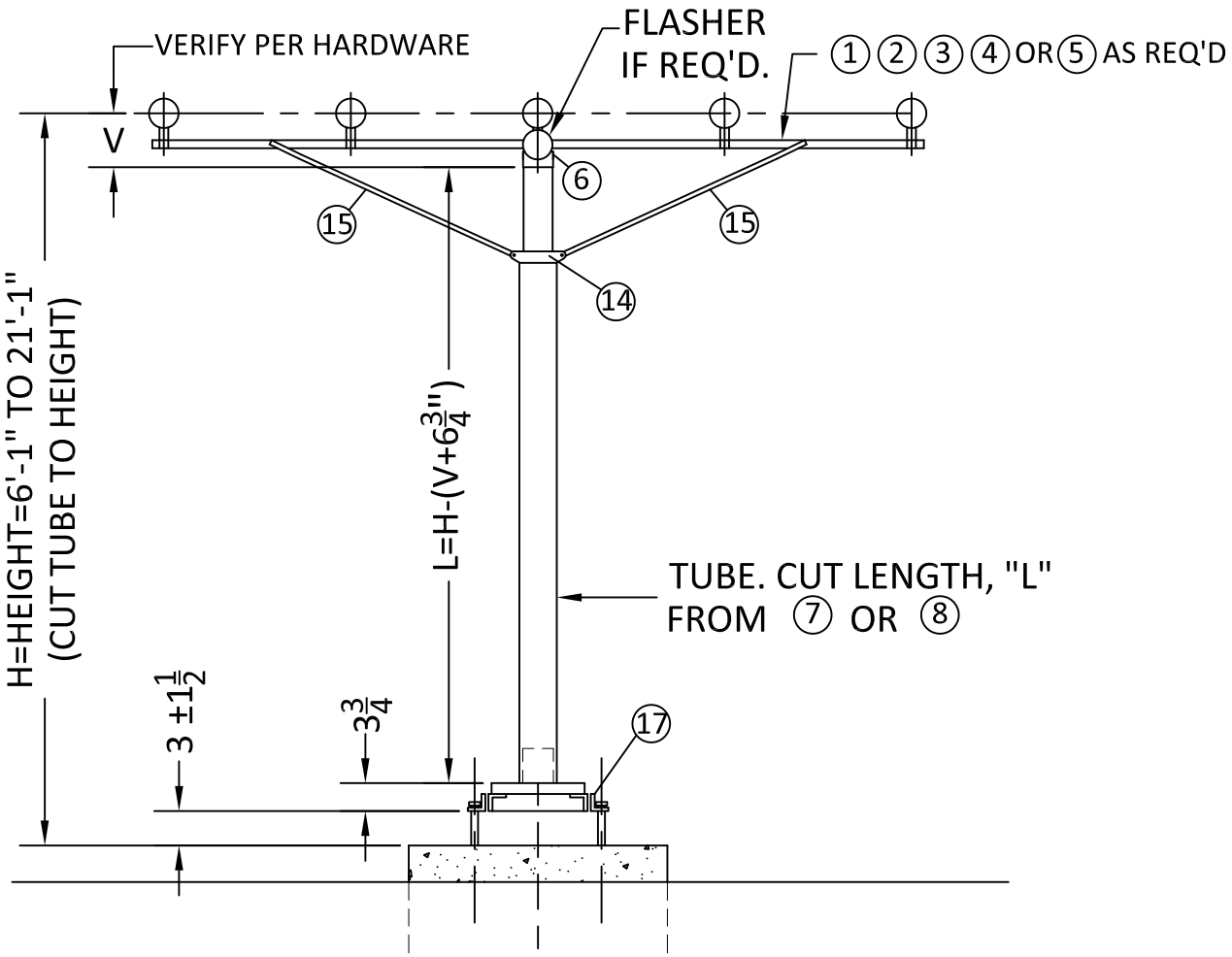
Item 39: SLOTTING & DRILLING TOOL: Jig kit for preparing "A" & "B" tubes (slotting and drilling). (NSN: none) FAA P/N: none; JI P/N: L5012.

Item 40: PAINT KIT: One (1) gallon orange touch up paint kit for fiberglass poles (tubes "A" & "B"). (NSN: none) FAA P/N: none; JI P/N 90915003

Item 41: Z BASE, MG-20: The "Z base" is a non-tilt design for a short (MG-20 type) LIR pole. (NSN: none) FAA P/N: none; JI P/N: L5020.

TABLE 1-1 EQUIPMENT FOR LIR STRUCTURES

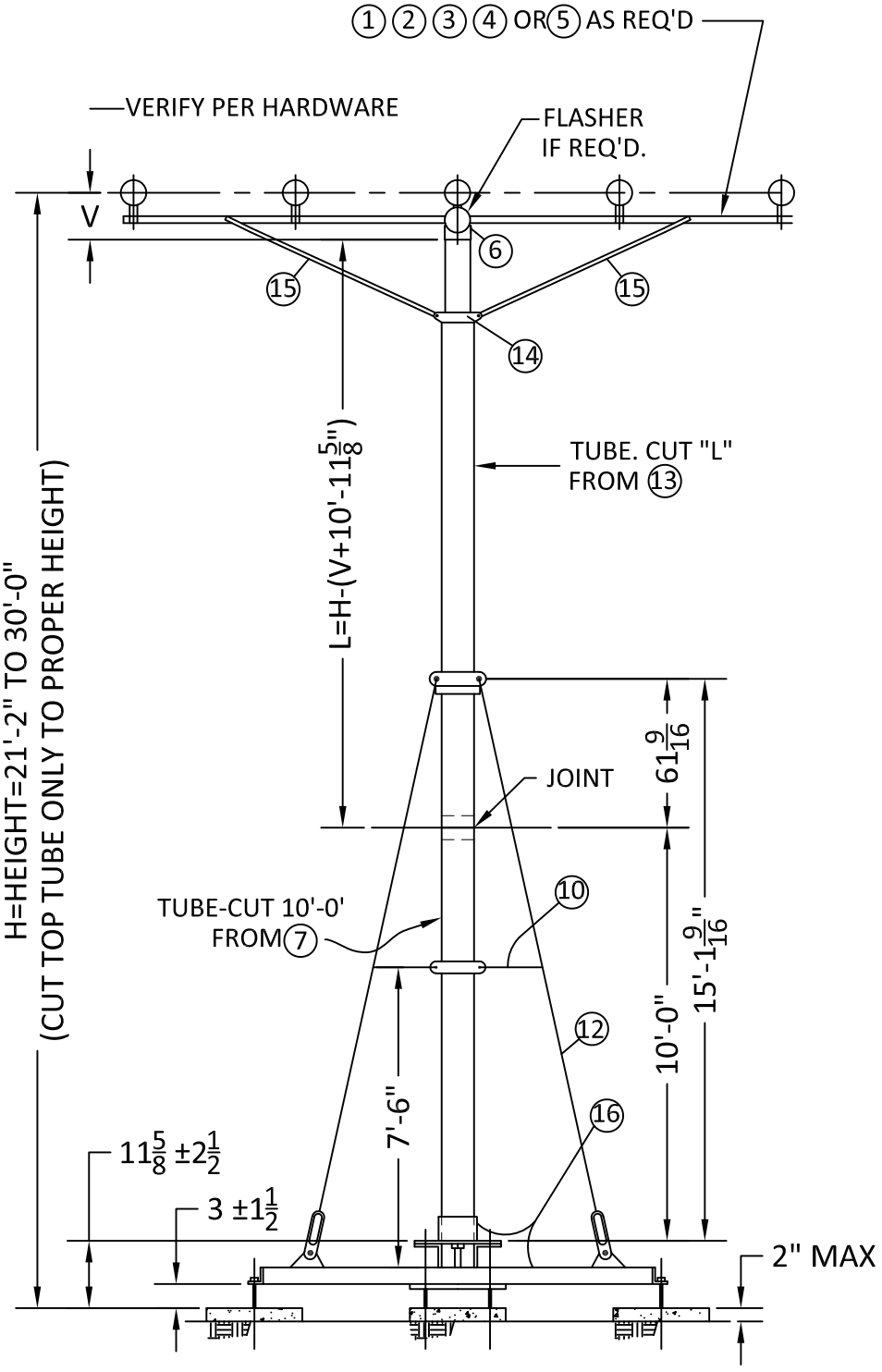
ITEM NO.	DESCRIPTION	JAQUITH PART NO.	NSN NO.
5	T-1 CROSSBAR ASSEMBLY	L1001	5445-01-633-4925-N
4	TM MALS CROSSBAR ONLY	L9154	5445-01-079-9154
3	T-3 ALS CROSSBAR ONLY	L9155	5445-01-079-9155
2	T-4 ALS CROSSBAR ONLY	L3886	5445-01-079-3886
1	T-5 ALS CROSSBAR ONLY	L3885	5445-01-079-3885
6	TUBE CAP ASSEMBLY	L7557	5445-01-079-7557-1
7	"A" TUBE 20'	L9135	5445-01-079-9135
8	"B" TUBE 20'	L9148	5445-01-079-9148
9	"A" TUBE BONDED TO ALUMINUM SOCKET	L9134	5445-01-079-9134
10	MG30 HORIZONTAL STABILIZER	L9151	5445-01-079-9151
11	MG40 HORIZONTAL STABILIZER	L3039	5445-01-079-3039
12	MG30 STABILIZER ROD SET	L5144	5445-01-079-5144
13	MG40 STABILIZER ROD SET	L4919	5445-01-079-4919-1
14	T-BRACE CLAMP	L9152	5445-01-079-9152
15	T-BRACE ASSEMBLY (2 REQUIRED)	L9153	5445-01-079-9153
16	MG30/40 MOUNTING FRAME	L2762	5445-01-079-2762
17	MG20 MOUNTING STAND	L2763	5445-01-079-2763
18	MS20 LIFTING FRAME	L9133	5445-01-079-9133
19	2" EMT FRANGIBLE COUPLING	L5659	6210-00-055-5659-1
20	MG30/40 TRAILER JACK	L5006	5120-01-098-7375-1
21	TILT DEVICE	L5005R	8200-00-300-1728-1
22	COMBINED STABILIZER ROD SET MG40	L9132	5445-01-079-9132-1
24	FLASHER BRACKET with JUNCTION BOX	L5017	NONE
25	JUNCTION BOX with KUKLA TERMINAL BLOCK	L5018	NONE
26	MG20 ANCHOR BOLTS	L5002	0000-10-000-2744-N
27	MG30/40 ANCHOR BOLTS	L5003	NONE
28	Z BASE ANCHOR BOLTS	L5021	NONE
29	ANCHOR PLATE	L5004	0000-10-000-2741-N
30	EPOXY 1 QUART EA FUSER 304 A & B	L5008	8030-01-599-6796-N
31	EPOXY 2 QUART EA FUSER 304 A & B	L5009	NONE
32	VERTICAL MAINTENANCE STAND	L5016	0000-10-001-9788-N
33	TUBE SPLICE KIT	L9149	5445-01-079-9149
34	T-1 XBAR ASSEMBLY with JUNCTION BOX MALSR	L5000	0000-10-002-2680-N
35	CALVERT (2) LIGHT AT 2.7M SPACING	SPECIAL	NONE
36	CALVERT (3) LIGHT AT 1.75M SPACING	SPECIAL	NONE
37	CALVERT (4) LIGHT AT 1M SPACING	SPECIAL	NONE
38	CALVERT (5) LIGHT AT 1M SPACING	SPECIAL	NONE
39	SLOTTING & DRILLING TOOL	L5012	NONE
40	PAINT 1 GALLON ORANGE	90915003	NONE
41	Z BASE NON-TILT	L5020	NONE



LOW-IMPACT-RESISTANT STRUCTURE MG-20
(REF. SECTION 1.3.1)

(FIG. 1-1)

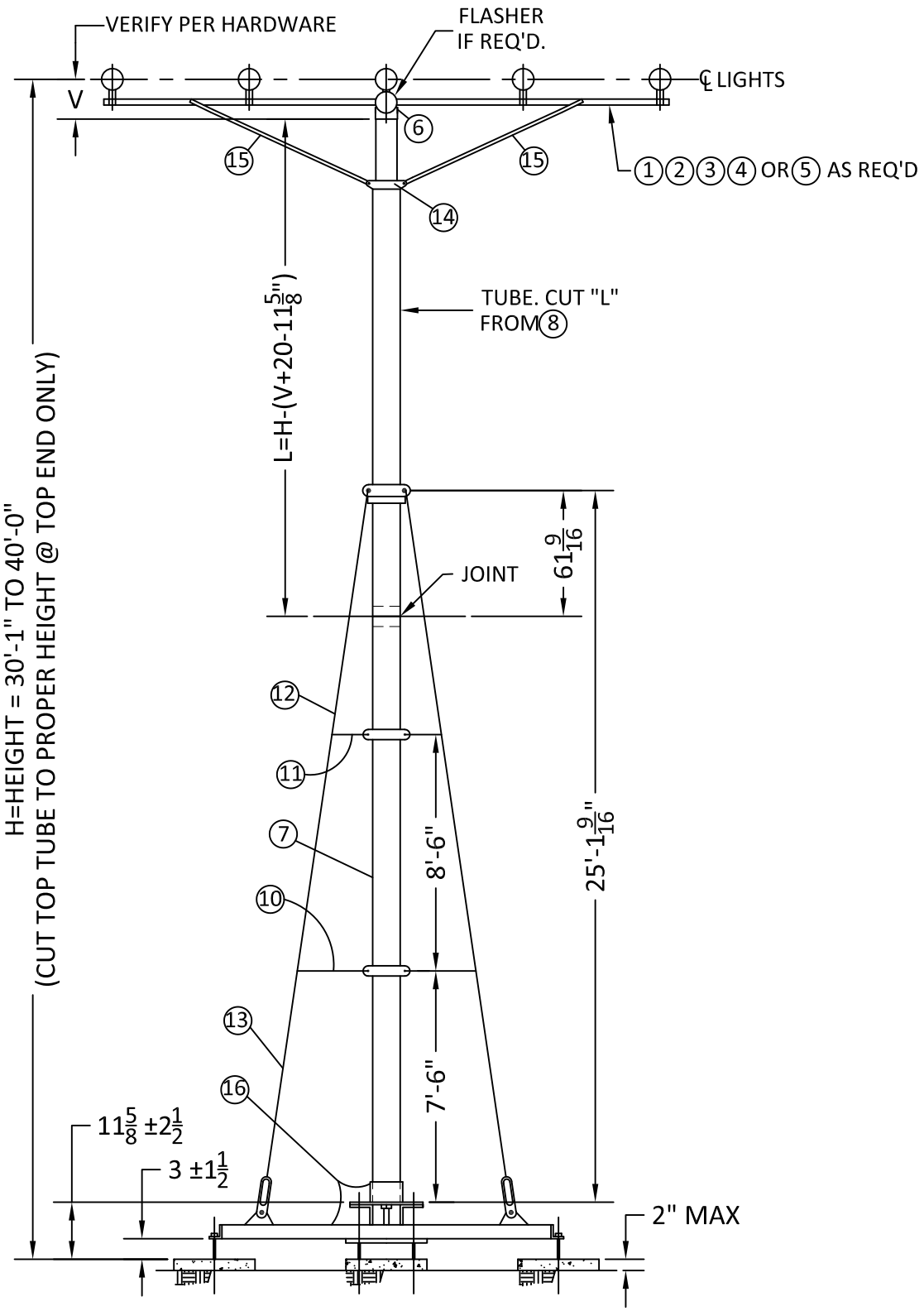
CIRCLED NUMBERS REFER TO ITEM NUMBERS IN TABLE 1.1



LOW-IMPACT-RESISTANT STRUCTURE MG-30
(REF. SECTION 1.3.1)

(FIG. 1-2)

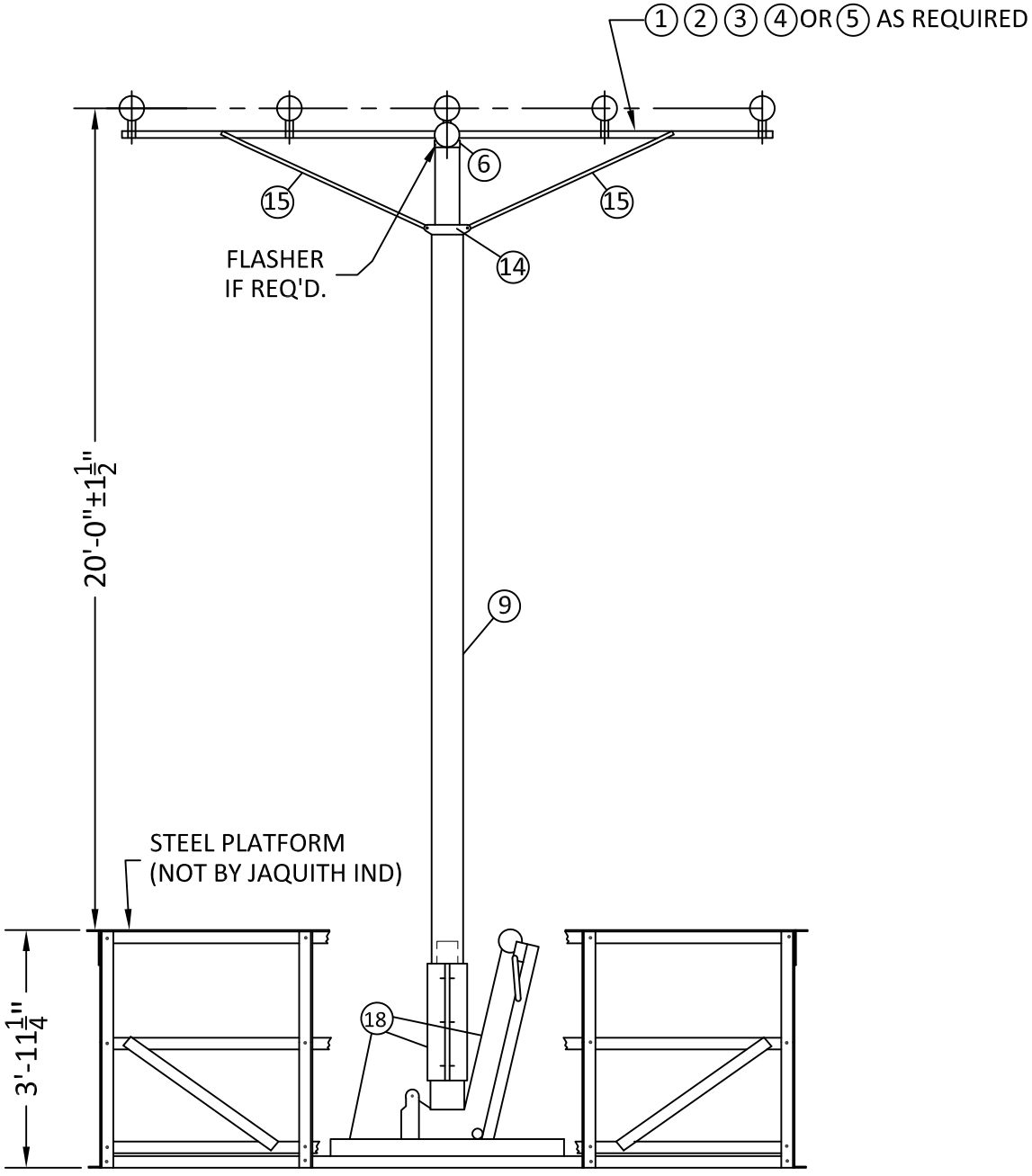
CIRCLED NUMBERS REFER TO ITEM NUMBERS IN TABLE 1.1



LOW-IMPACT-RESISTANT STRUCTURE MG-40
(REF. SECTION 1.3.1)

(FIG. 1-3)

CIRCLED NUMBERS REFER TO ITEM NUMBERS IN TABLE 1.1



LOW-IMPACT-RESISTANT STRUCTURE MS-20 40'-0" TO 128'-0"
(REF. SECTION 1.3.1)

(FIG. 1-4)

CIRCLED NUMBERS REFER TO ITEM NUMBERS IN TABLE 1.1

1.3.3 Raising and Lowering. – All LIR structures are able to be lowered to a height which makes them accessible for maintenance purposes. The LIR structures mounted on the ground, i.e. all MG type structures, are provided with hinged bases which allow them to be lowered or raised by tilting the LIR structure on its hinged base. The hinged base for the MG-20 is called the mounting stand assembly (Item #17). MG-20 structures which are 12'0" high or less, are easily lowered by "manually walking the structure down". For MG-20 structure greater that 12'0" in height, the use of a tilt device (p/n L5005R NSN: 8200-00-300-1728-1) is recommended for lowering purposes.

The hinged base for the MG-30 and MG-40 is called the mounting frame assembly (Item #16). Lowering is accomplished by the use of a tilt device (same as above) and a trailer jack (P/N L5006 NSN: 5120-01-098-7375-1).

1.4 ILLUSTRATION OF EQUIPMENT REQUIRED:

After a field survey has been performed to determine the light mounting heights required at each specific ALSF-2 site, a list of the LIR structure parts required can be prepared. Table 1-3 show an example of a hypothetical ALSF-2 site with a prepared list of LIR parts required. The correct number of 20 foot standard lengths of 6" I.D. fiberglass tubes for MG type LIR structures is calculated by using a cutting and bonding schedule (See Section 1.5).

1.5 CUTTING & BONDING SCHEDULE INSTRUCTIONS:

Tube "A" (Item #7) and tube "B" (Item #8) are supplied in standard 20' lengths. These 6" I.D. fiberglass tubes are intended for use in MG-20, MG-30 and MG-40 LIR structures (See Figures 1-1 thru 1-3). To build an approach lighting system requiring various height towers (between 6'0" to 40'0") a cutting and bonding schedule (CBS) for tube "A" and "B" is required. A CBS shall aim to achieve maximum use of standard length tubes and minimize waste of remaining tube lengths. For example, a tube "A" may be cut into a 10' and an 8' length for two MG-20 LIR structures of appropriate height and the remaining 2' length may be bonded to a tube "B" to build an MG-30 LIR structure of suitable height. For an illustration of a CBS, see Table 1-4.

Both tube "A" and tube "B" are 6" I.D. fiberglass tubes with breakaway joints, located 42" apart, factory built into the tubes during fabrication. Tube "B" has a "Hoop Wound Ring" (HWR) located at 60" from one end factory built on the tube during fabrication. The HWR provides a seat for the stabilizer rod anchor support. Also, on tube "B", a length of tube splice is factory bonded to the end which is closest to the HWR. The tube splice is used to make towers over 21'1" in height. An MG-20 LIR structure requires a proper length of the 6" I.D. fiberglass tube. The required length of 6" I.D. fiberglass tube may be a piece remaining from the cutting of a tube "A" or tube "B" from another LIR

structure. To construct a proper height of MG-30 LIR structure, a tube "A" (10') is field bonded to a suitable length of tube "B" (ensure that the cut length of tube "B" includes the HWR from one end to set the stabilizer rod anchor support). The required length of 6" I.D. fiberglass tube may be a piece remaining from the cutting of a tube "A" or tube "B" from another LIR structure. To build a proper height MG-40 LIR structure, a tube "A" (20') is field bonded to a suitable length of tube "B" (ensure that the cut length of tube "B" includes the HWR from one end to set the stabilizer rod anchor support).

1.5.1 The length of 6" I.D. fiberglass tube required for an MG-20 is determined by the following simple formula: (See Section 1.5)

$$L = H - V - 6\frac{3}{4}"$$

Where:

- L is the length of 6" I.D. fiberglass tube required
- H is the light mounting height as determined by the field survey (For range of 6'-0" to 21'-1")
- V is the distance from the center line of the light to the top of the 6" I.D. fiberglass tube. This distance is determined by the field contractor using the hardware that is to be mounted at the top of the LIR structure (See Figure 1-5)

1.5.2 For the MG-30 LIR structure a tube "B" and, in most cases, a length of 6" I.D. fiberglass tube is bonded together to attain the required structure height. The length of 6" I.D. fiberglass tube required for this purpose is 10'0" long. Use the following formula to figure overall tube length. (See Figure 1-2)

$$L = H - V - 11\frac{5}{8}"$$

Where:

- L is the overall length of 6" I.D. fiberglass tube required.
- H is the light mounting height as determined by a field survey (for range of 21'2" to 30'0"
- V is the distance from the center line of the light to the top of the 6" I.D. fiberglass tube. This distance is determined by the field contractor using the hardware that is to be mounted at the top of the LIR structure (See Figure 1-6)

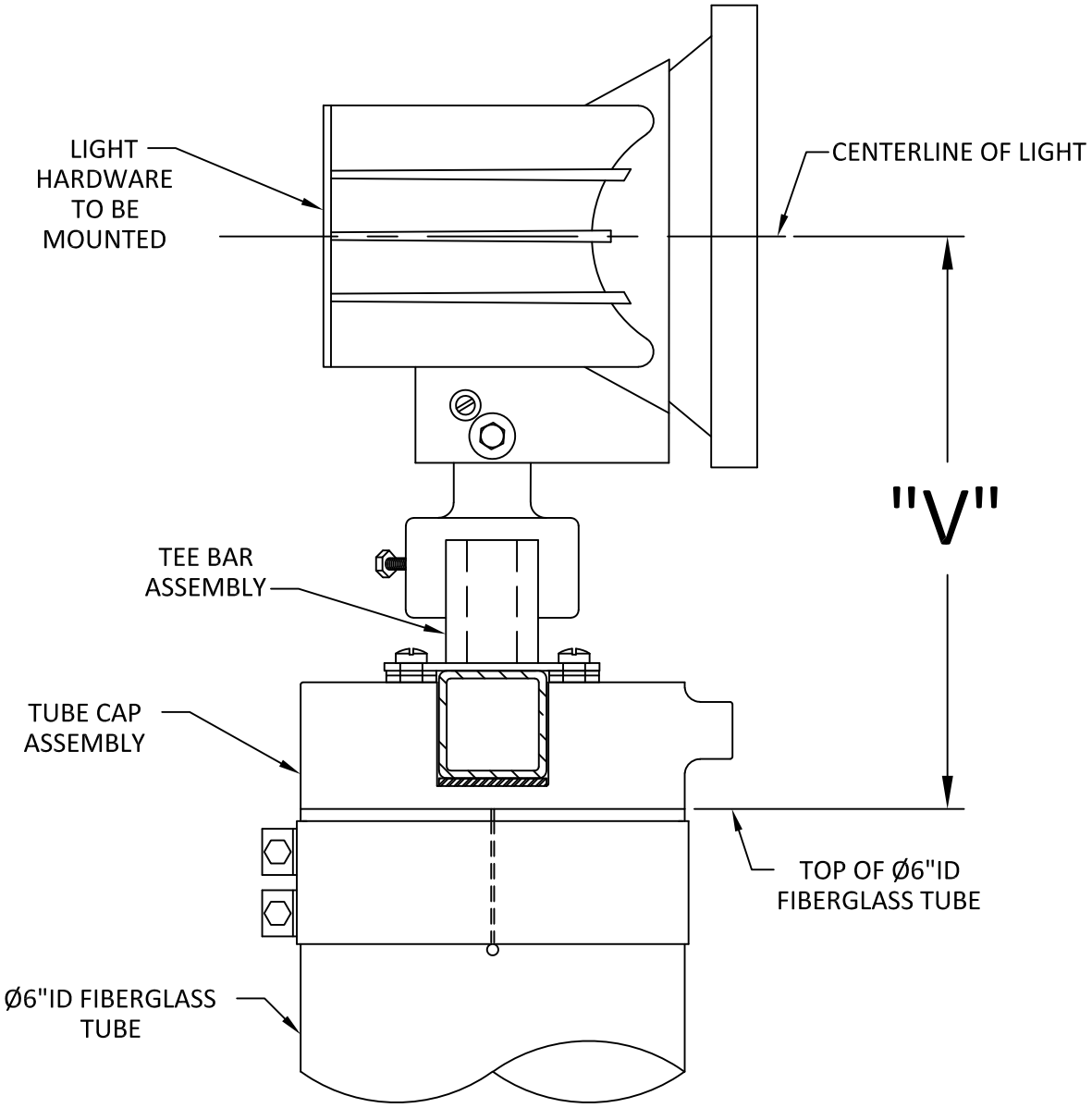
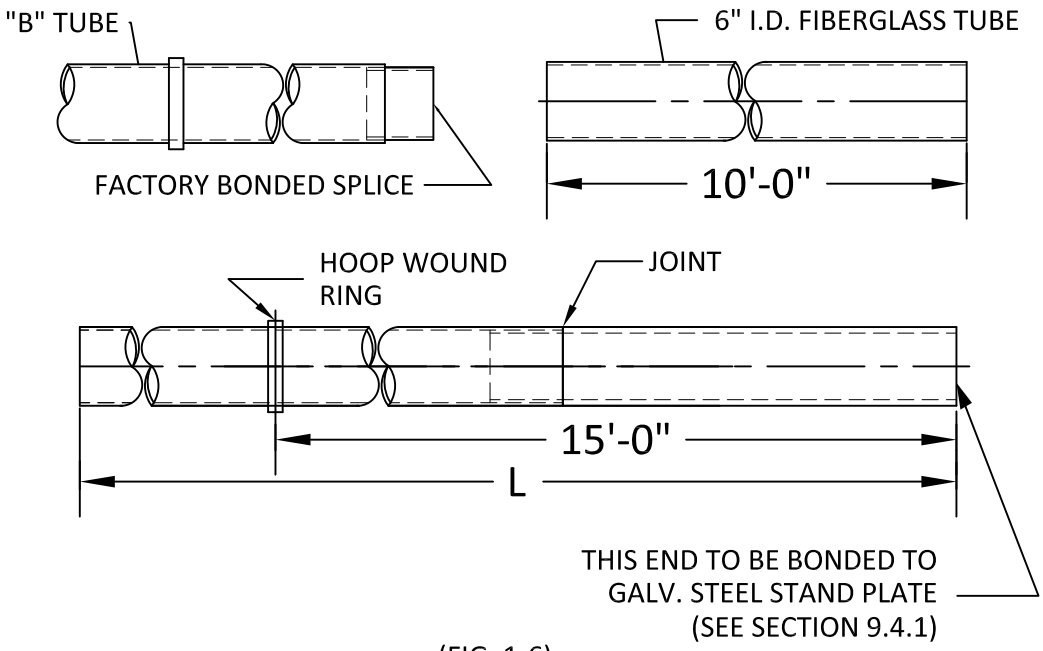


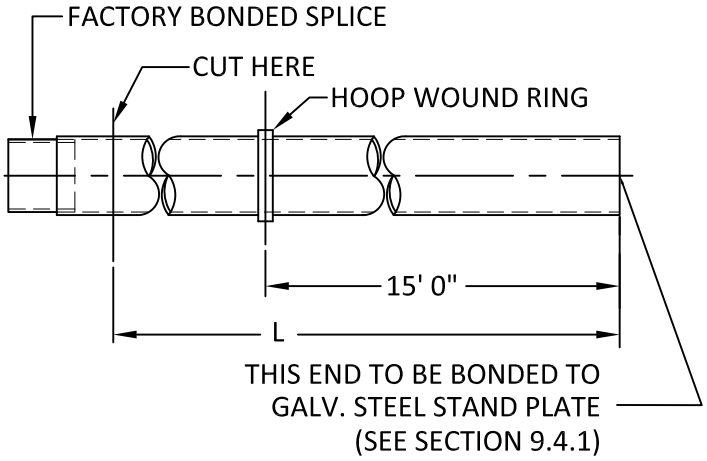
FIG. 1-5

FIELD DETERMINATION OF "V"



(FIG. 1-6)

CUTTING AND BONDING FOR MG-30 STRUCTURE WHEN "L" IS GREATER THAN 19'-10"



(FIG. 1-7)

CUTTING AND BONDING FOR MG-30 STRUCTURE WHEN "L" IS LESS THAN OR EQUAL TO 19'-10"

1.5.2.1 When the "L" value computed by the formula given in Section 1.5.2 is greater than 19' – 10", then a section of 6" I.D. fiberglass tube 10' 0" long is cut. This 10' 0" long section is then bonded to the factory bonded splice end of a "B" tube. This bonded assembly is then cut to length "L", taking care to cut the end opposite the bonded 6" I.D. fiberglass tube. (See Figure 1-6)

1.5.3 For the MG-40 LIR structure a tube "A" (20') and a section of tube "B" are bonded together to attain the required structure height. The section length of tube "B" is determined by this simple formula:

$$L = H - V - 20' - 11\frac{5}{8}"$$

Where:

. L is the length of tube "B" required. This length is measured from the tube splice end and must include a hoop wound ring.

. H is the light mounting height as determined by the field survey (30'-1" to 40'-0")

. V is the distance from the centerline of the light to the top of the 6" I.D. fiberglass tube. This distance is determined by the field contractor using the hardware that is to be mounted at the top of the LIR structure (See Figure 1-5).

TABLE 1-2 LIR STRUCTURE MS-20 REQUIRED FOR A HYPOTHETICAL MALSR SYSTEM

STATION NUMBER	DISTANCE FROM LANDING THRESHOLD	LIGHT MOUNTING HEIGHT	LIR STRUCTURE TYPE REQUIRED	ITEM NO. (PER TABLE 1-1) APPLICABLE TO A MALSR SYSTEM					
				35	6	15	14	9	18
1	200'	3'-1"	FRANGIBLE COUPLING with 2" EMT - ARE SUPPLIED UNDER THIS CONTRACT						
2	400'	5'-10"							
3	600'	14'-11"	STRUCTURES REQUIRED PER SPEC. FAA E-2702 ARE SUPPLIED UNDER THIS CONTRACT						
4	800'	24'-3"							
5	1000'	31'-7"							
6	1000'	31'-9"							
7	1000'	31'-7"							
8	1200'	42'-9"	MS-20 (FOR MALS)	1	1	2	1	1	1
9	1400'	54'-2"	MS-20 (FOR MALS)	1	1	2	1	1	1
10	1600'	58'-6"	MS-20 (FOR RAIL)		1			1	1
11	1800'	62'-2"	MS-20 (FOR RAIL)		1			1	1
12	2000'	66'-5"	MS-20 (FOR RAIL)		1			1	1
13	2200'	68'-9"	MS-20 (FOR RAIL)		1			1	1
14	2400'	72'-3"	MS-20 (FOR RAIL)		1			1	1
			TOTAL:	2	7	4	2	7	7

TABLE 1-3 LIR STRUCTURE REQUIRED FOR A HYPOTHETICAL ALSF-2 SYSTEM

STATION NUMBER	DISTANCE FROM LANDING THRESHOLD	LIGHT MOUNTING HEIGHT	LIR STRUCTURE TYPE REQUIRED	ITEM NO. (PER TABLE 1-1) APPLICABLE TO AN ALSF-2 SYSTEM																
				38	37	36	6	15	14	10	11	12	22	7	8	9	17	16	18	33
1	100'	0'-4"	FRANGIBLE COUPLING with EMT IS SUPPLIED UNDER THIS CONTRACT											*	*					
2	100'	0'-6"												*	*					
3	100'	0'-5"												*	*					
4	200'	0'-11"												*	*					
5	200'	1'-2"												*	*					
6	200'	1'-0"												*	*					
7	300'	1'-10"												*	*					
8	300'	2'-0"												*	*					
9	300'	1'-11"												*	*					
10	400'	4'-3"												*	*					
11	400'	4'-5"												*	*					
12	400'	4'-3"												*	*					
13	500'	6'-2"	MG20			1	1	2	1					*	*		1			
14	500'	6'-4"	MG20		1		1	2	1					*	*		1			
15	500'	6'-5"	MG20	1			1	2	1					*	*		1			
16	500'	6'-3"	MG20		1		1	2	1					*	*		1			
17	500'	6'-2"	MG20			1	1	2	1					*	*		1			
18	600'	10'-7"	MG20			1	1	2	1					*	*		1			
19	600'	10'-9"	MG20	1			1	2	1					*	*		1			
20	600'	10'-6"	MG20			1	1	2	1					*	*		1			
21	700'	16'-1"	MG20			1	1	2	1					*	*		1			
22	700'	16'-4"	MG20	1			1	2	1					*	*		1			
23	700'	16'-0"	MG20			1	1	2	1					*	*		1			
24	800'	23'-11"	MG30			1	1	2	1	1		1		*	*			1		1/2
25	800'	23-11"	MG30	1			1	2	1	1		1		*	*			1		1/2
26	800'	23'-9"	MG30			1	1	2	1	1		1		*	*			1		1/2
27	900'	29'-5"	MG30			1	1	2	1	1		1		*	*			1		
28	900'	29'-7"	MG30	1			1	2	1	1		1		*	*			1		
29	900'	29'-4"	MG30			1	1	2	1	1		1		*	*			1		
30	1000'	36'-3"	MG40		1		1	2	1		1		1	*	*			1		
31	1000'	36'-5"	MG40		1		1	2	1		1		1	*	*			1		
32	1000'	36'-6"	MG40	1			1	2	1		1		1	*	*			1		
33	1000'	36'-4"	MG40		1		1	2	1		1		1	*	*			1		
34	1000'	36'-2"	MG40		1		1	2	1		1		1	*	*			1		
35	1100'	39'-7"	MG40	1			1	2	1		1		1	*	*			1		
36	1200'	42'-6"	MS20	1			1	2	1					*	*	1			1	
37	1300'	46'-1"	MS20	1			1	2	1					*	*	1			1	
38	1400'	49'-7"	MS20	1			1	2	1					*	*	1			1	
39	1500'	52'-2"	MS20	1			1	2	1					*	*	1			1	
40	1600'	54'-5"	MS20	1			1	2	1					*	*	1			1	
41	1700'	57'-11"	MS20	1			1	2	1					*	*	1			1	
42	1800'	61'-1"	MS20	1			1	2	1					*	*	1			1	
43	1900'	66'-9"	MS20	1			1	2	1					*	*	1			1	
44	2000'	70'-10"	MS20	1			1	2	1					*	*	1			1	
45	2100'	74'-3"	MS20	1			1	2	1					*	*	1			1	
46	2200'	79'-0"	MS20	1			1	2	1					*	*	1			1	
47	2300'	84'-4"	MS20	1			1	2	1					*	*	1			1	
48	2400'	90'-7"	MS20	1			1	2	1					*	*	1			1	
			TOTAL:	20	6	10	36	72	36	6	6	6	6			13	11	12	13	####

* TO BE DETERMINED BY A TUBE CUTTING AND BONDING SCHEDULE - SEE SECTION 1-6

TABLE 1-4 CUTTING AND BONDING SCHEDULE EXAMPLE

STATION NUMBER	LIR STRUCTURE TYPE REQUIRED	EQUATION VALUES		RESULTS	TUBE "A"	TUBE "B"	TUBE LENGTH REMAINING	USE TUBE REMAINING FROM THIS STATION
		H	V	L				
1	MG-20	DETERMINED BY FIELD SURVERY	DETERMINED IN FIELD USING HARDWARE TO BE INSTALLED	7'-1"			0'-2"	STATION 9
2	MG-20			12'-3"	1		7'-9"	
3	MG-20			16'-9"	1		3'-3"	
4	MG-20			19'-1"	1		0'-11"	
5	MG-30			2'-2"		1	1'-7"	STATION 11
6	MG-30			4'-8"		1	0'-5"	STATION 10
7	MG-30			7'-7"		1	0'-2"	STATION 2
8	MG-30			9'-3"	1	1	10'-7"	
9	MG-40			12'-7"	1	1	7'-3"	
10	MG-40			14'-11"	1	1	5'-1"	
11	MG-40			16'-3"	1	1	3'-9"	
12	MG-40			18'-5"	1	1	1'-7"	
13	MS-20*							
14	MS-20*							
			TOTAL		8	8		

SECTION 3 - OPERATIONS (Lowering & Raising)

3.1 INTRODUCTION:

All LIR structures can be lowered to any appropriate height to allow maintenance functions to be performed. This section of the instruction book provides step-by-step procedures for the lowering and raising of all LIR structures. These procedures shall be followed a step at a time and in the order in which they are written. Caution notices are noted at various points to bring out specific dangers or hazards.

3.2 MG-20 LOWERING AND RAISING:

Tools and equipment required for lowering and raising the MG-20 LIR structure are as follows:

A. Tilt Device (NSN-8200-00-300-1728-1)(JI P/N L5005R)

B. 1-1/8" or 1-1/4" open end wrench (size depends on whether standard hex nuts or heavy hex nuts are used on anchor bolts in field)

C. 15/16" combination wrench

STEP-BY-STEP LOWERING INSTRUCTIONS
(To Be Followed in Order as Written)

A. Attach tilt device to concrete pier by sliding it under the nut on the two anchor bolts and over the tab provided in the concrete pier. (See Figure 3-1). Tighten the nuts on the anchor bolts with the 1-1/8" or 1-1/4" open end wrench. Insert the pin, attached to the tilt device, through the hole in the tab. The tilt device should now be solidly secured to the concrete pier.

B. Attach the cable hook from the tilt device to the steel loop on the lifting bar of the MG-20 mounting stand assembly. Turn handle of winch to play out enough cable to reach lifting bar shackle. After the cable is attached to the lifting bar, take up cable slack with winch. (See Figure 3-1)

CAUTION

Make sure that tilt device is solidly secured to the concrete pier and slack in cable has been taken up on the winch before proceeding further.

C. Remove the two 5/8" bolts on the mounting stand which are located on either side of the lifting bar. Use the 15/16" combination wrench for this purpose. The MG-20 LIR structure is now free to hinge on the mounting stand assembly. To lower the LIR structure, push the 6" I.D. fiberglass tube with one hand while letting cable out from the tilt device winch with the other hand. (See Figure 3-2) Once the MG-20 structure

has tilted far enough to provide tension on the cable, hand pressure may be discontinued. The LIR structure is then lowered by continuing to turn the winch until the desired height for the work to be performed is reached.

D. To raise LIR structure, reverse order of lowering procedure.

3.3 MG-30 AND MG-40 LOWERING AND RAISING:

Tools and equipment required for lowering and raising the MG-30 and MG-40 LIR structure are as follows:

A. Tilt device (NSN-8200-00-300-1728-1) (JI P/N L5005R)

B. Trailer Jack (NSN-5120-01-098-7375-1)(JI P/N L5006)

C. 1-1/8" or 1-1/4" open end wrench (size depends on whether standard hex nuts or heavy hex nuts are used on anchor bolts in field)

D. 9/16" combination wrench

STEP-BY-STEP LOWERING INSTRUCTIONS
(To Be Followed in Order as Written)

A. Attach tilt device to concrete pier by sliding it under the lower nuts on the two anchor bolts and over the tab provided in the concrete pier. (See Figure 3-3). Tighten the lower nuts on the anchor bolts with the 1-1/8" or 1-1/4" open end wrench. Insert the pin, attached to the tilt device, through the hole in the tab. The tilt device should now be solidly secured to the concrete pier.

B. Attached the cable hook from the tilt device to the slotted plate on the mounting frame assembly. Turn handle of winch, on tilt device, to play out enough cable to reach the slotted plate. After the cable is attached to the slotted plate, take Up cable slack with winch. (See figure 3-3)

C. Attach trailer jack to mounting frame assembly. Position it close enough to the tilt device to enable one man to operate the tilt device winch and trailer jack simultaneously. The trailer jack must be positioned over the concrete pier. Make sure that trailer jack handle is located on the same side as the rigidly mounted winch handle of the tilt device. Use the four long carriage bolts and the mounting plate, supplied with the trailer jack, to secure the trailer jack to the mounting frame assembly tube. (See Figure 3-4) Tighten all nuts on trailer jack carriage bolts.

CAUTION
Make certain that tilt device is solidly secured to the concrete pier and slack in cable has been taken up on the winch before proceeding further.

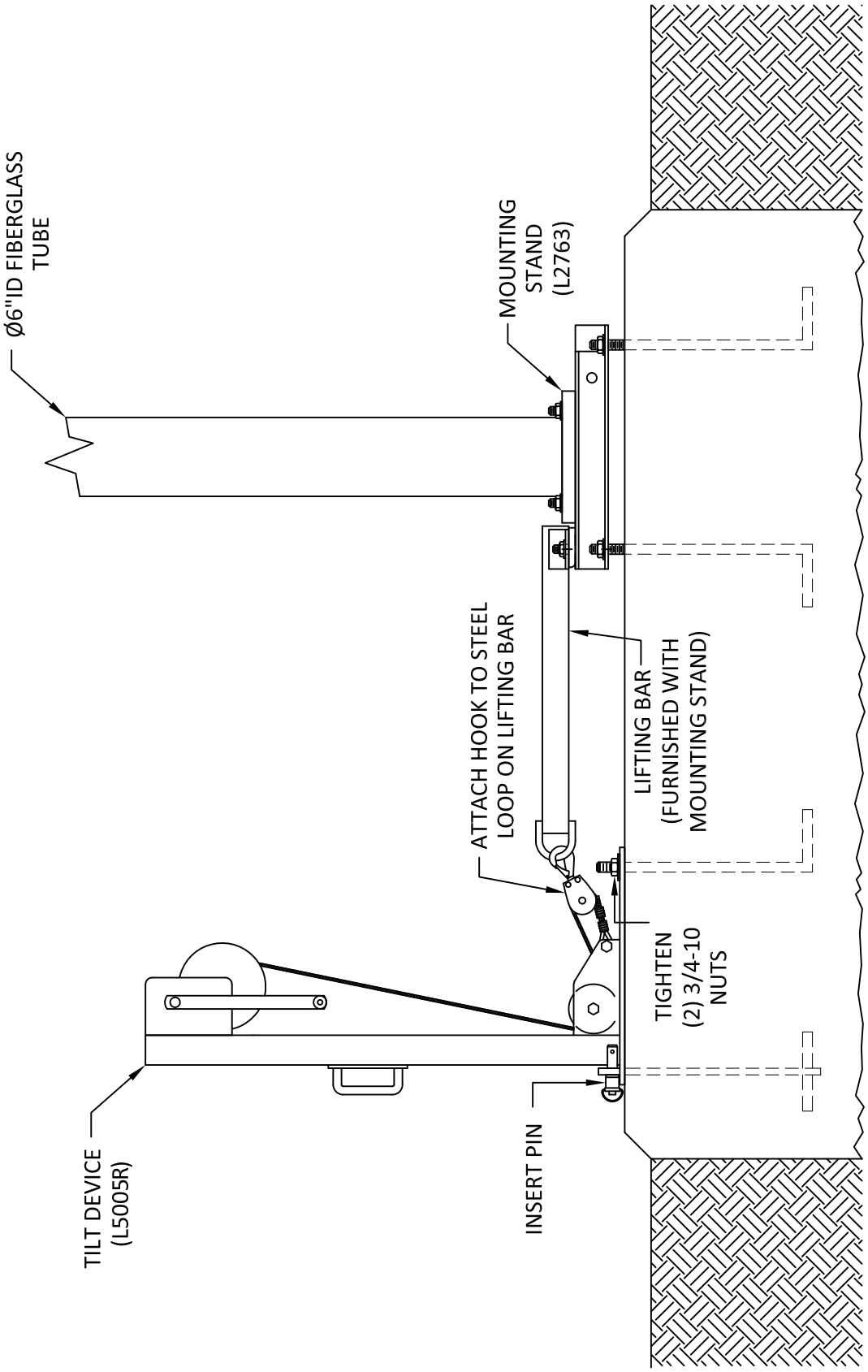


FIG. 3-1

TILT DEVICE ATTACHED FOR LOWERING MG-20 STRUCTURE
(REF §3.2)

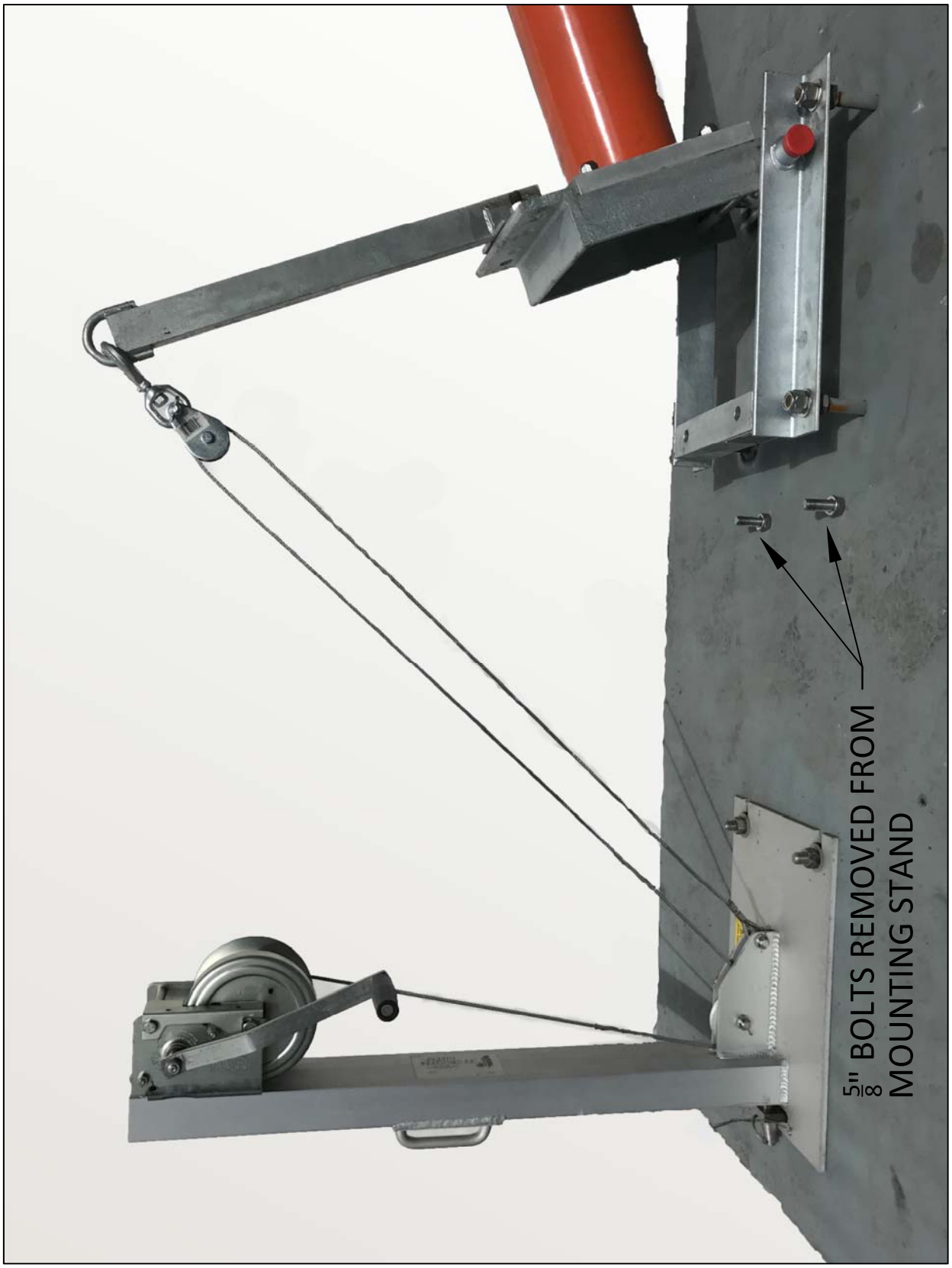


FIGURE 3-2
LOWERING MG-20 STRUCTURE
(Ref. Section 3.2)

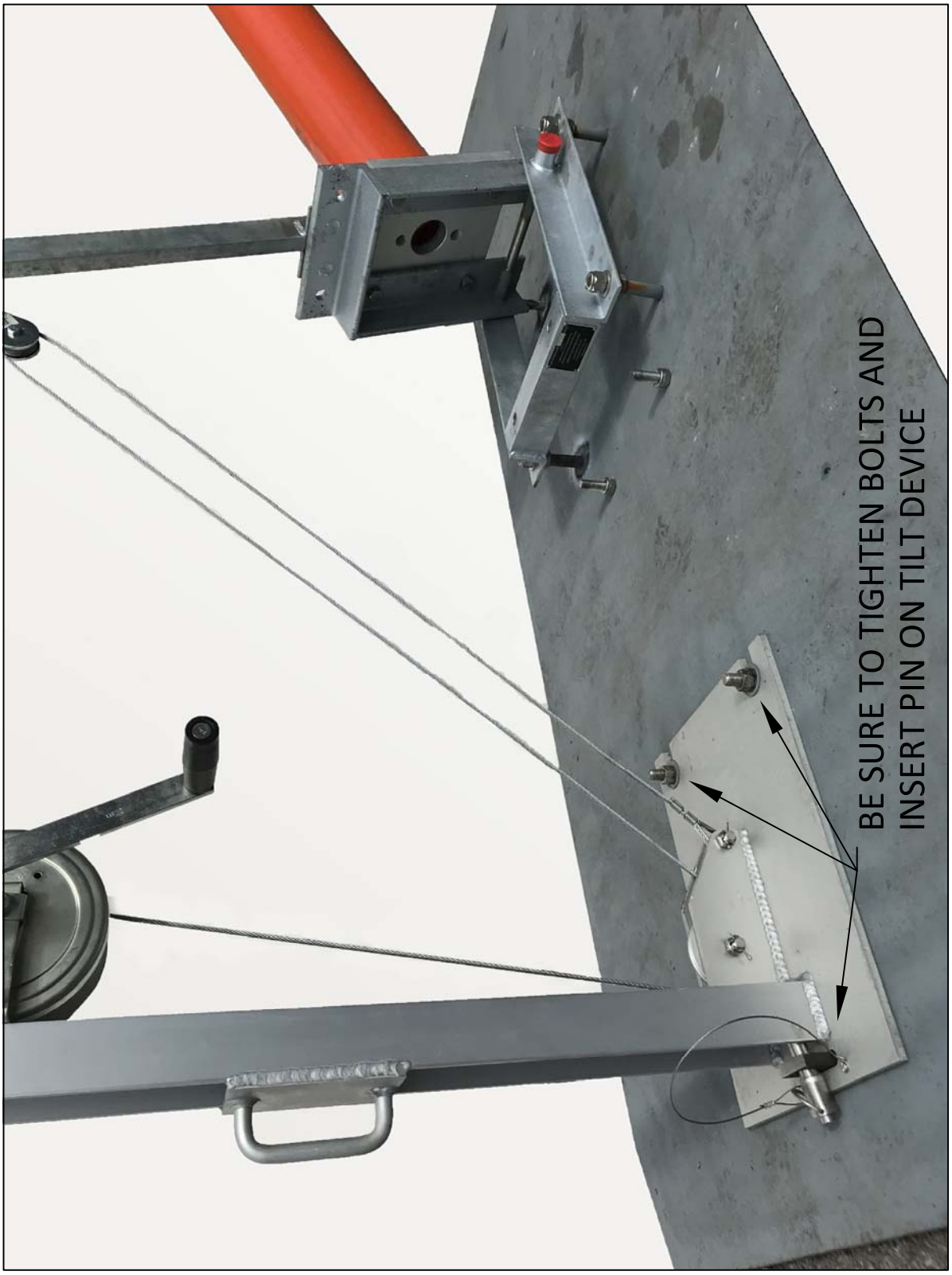


FIGURE 3-2A
LOWERING MG-20 STRUCTURE
(Ref. Section 3.2)

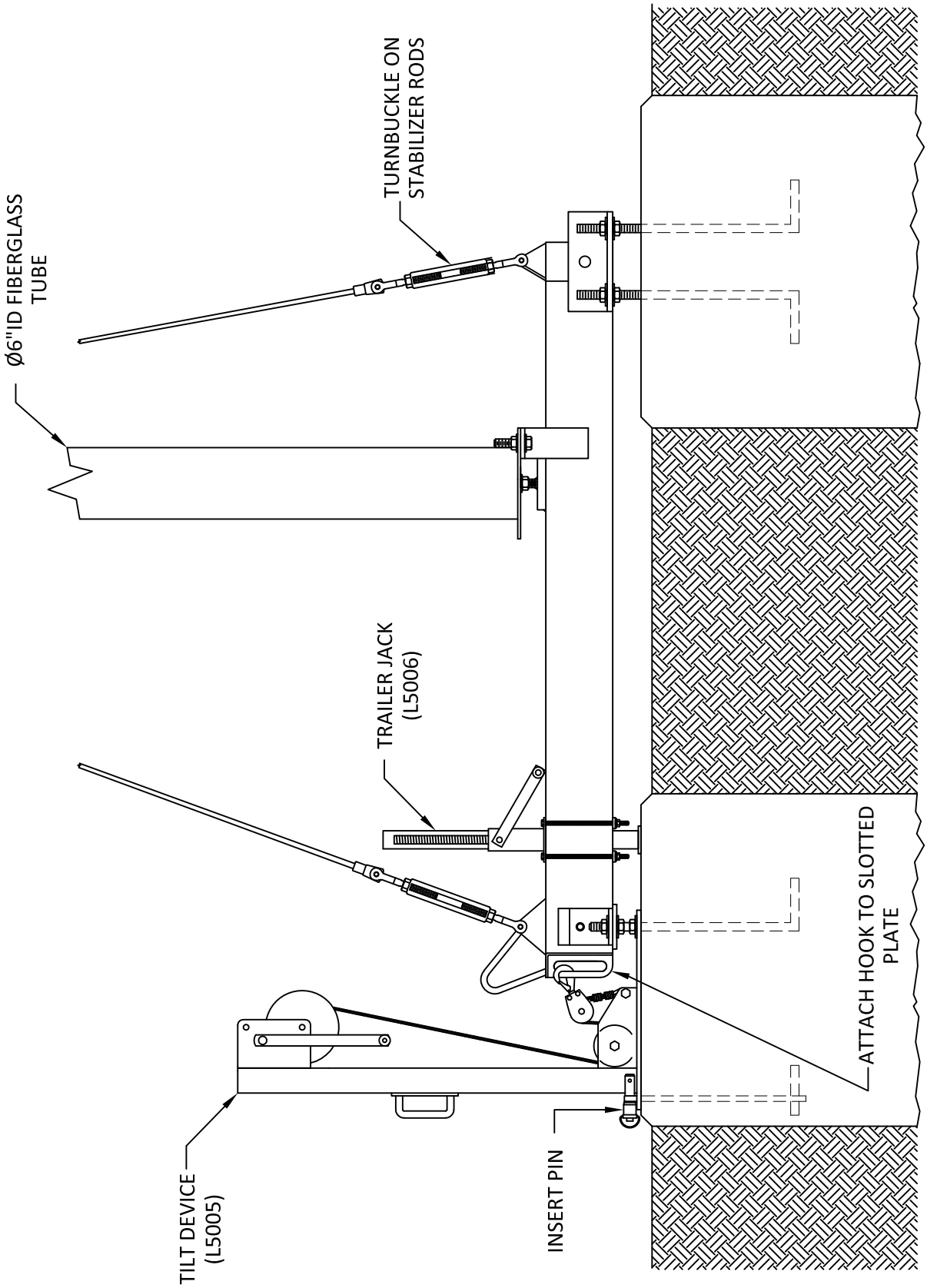


FIG. 3-3
TILT DEVICE & TRAILER JACK ATTACHED FOR LOWERING MG-30/40 STRUCTURE
(REF §3.3)

D. Remove hold down pin from mounting frame assembly by first removing padlock and then withdrawing pin. The MG-30 and MG-40 LIR structure is now free to hinge on the mounting frame assembly. To lower the LIR structure, turn the trailer jack handle until the jack and tube assembly contacts the surface of concrete pier. Now turn the trailer jack handle and at the same time release cable from the tilt device winch so that the cable stays taut. (See Figure 3-5) Continue this procedure until the trailer jack has been turned all the way down. The LIR structure should now be tilted far enough to provide tension on the cable. Continue lowering, by turning tilt device winch, until the LIR structure is at the desired height. (See Figure 3-6)

CAUTION

Make certain that LIR structure is lowering as winch is turned.
Do not allow cable to go slack at any time.

E. To raise MG-30 and MG-40 LIR structure, reverse order of lowering procedure.

3.4 MS-20 LOWERING AND RAISING:

STEP-BY-STEP LOWERING INSTRUCTIONS
(To Be Followed in Order as Written)

A. Remove cover from winch, located on mast lifting frame assembly (See Figure 3-7). Check cable to make sure that it is engaged in mounting socket sheave and secured to the shackle of the mast lifting frame assembly. If cable is not tight, take up slack with winch. Check to make sure that alignment pin is securely in place on the mast lifting frame sleeve.

B. Shut off power to MS-20 LIR structure. Disconnect cables that run up LIR structure to power lights. The LIR structure must be free to be lowered through the support platform.

C. Loosen the three ½"-13x3" long hex head bolts that are located on the mast lifting frame sleeve. Loosen each bolt a few turns at a time and alternate back and forth to allow the sleeve to open uniformly. **DO NOT REMOVE NUTS FROM BOLTS.** Loosen nuts to within two threads of the end of the bolt.

CAUTION

Make certain that winch cable is engaged in mounting socket sheave and make certain that cable is securely attached to mast lifting frame before proceeding further. Also, make certain that all power to MS-20 LIR structure has been shut off and cable assemblies have been disconnected.

D. Remove alignment pin from mast lifting frame sleeve. MS-20 structure should now be free to lower. Turn winch to lower LIR structure. Make certain cable engages guide sheave as LIR structure is lowered. (See figure 3-8) Continue using winch to lower LIR structure until the desired height is obtained. MS-20 LIR structures can be lowered only to the point at which the tee-brace clamp contacts the winch drum. (See Figure 3-9)

CAUTION

Make certain that LIR structure is lowering as winch is turned and that cable is always engaged in mounting socket sheave. Do not allow cable to go slack at any time.

E. To raise MS-20 structure, reverse order of lowering procedure.

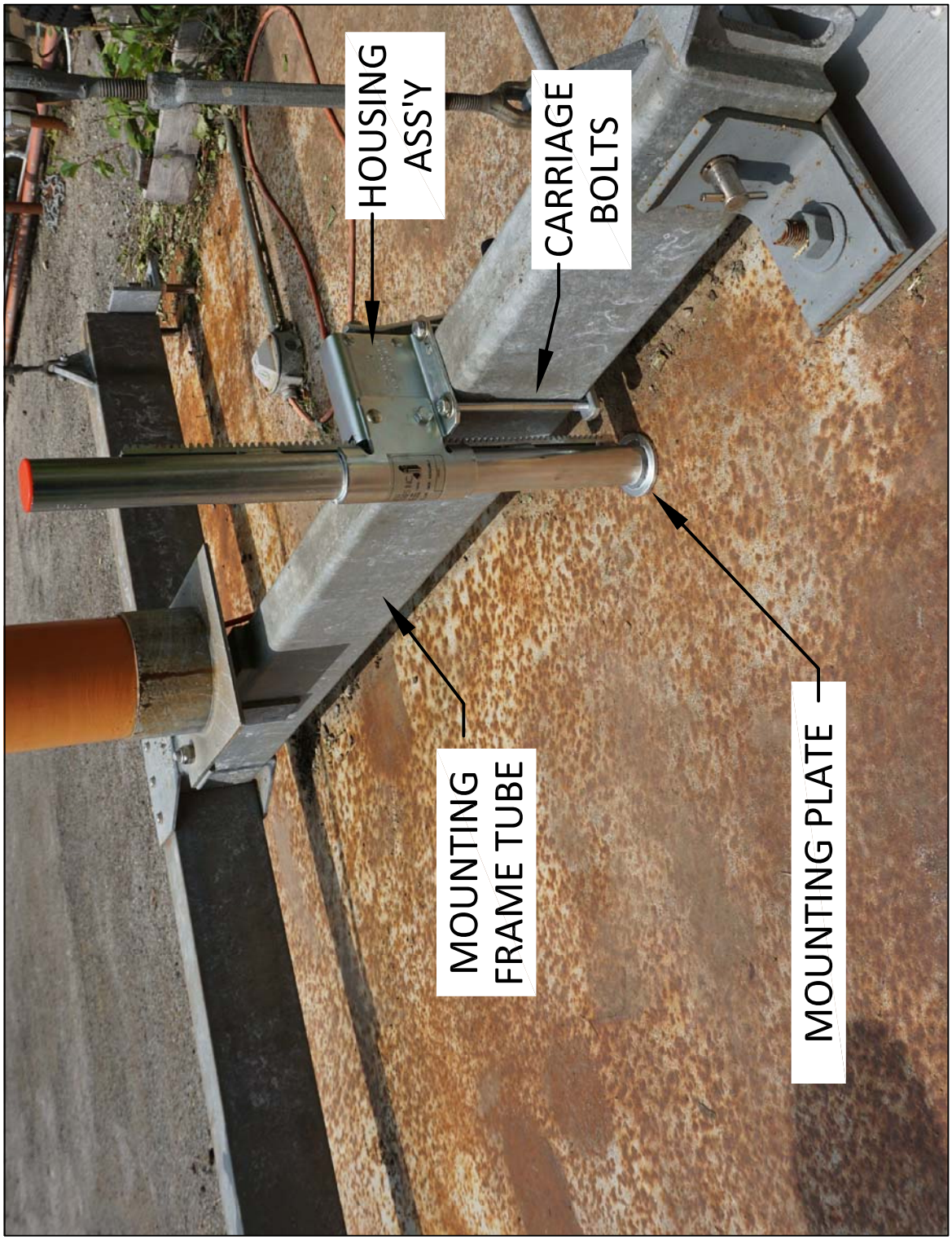


FIGURE 3-4
TRAILER JACK ATTACHED TO MOUNTING FRAME ASSEMBLY
(Ref. Section 3.3)

FIGURE 3-5
LOWERING MG-30/40 STRUCTURE
(Ref. Section 3.3)

FIGURE 3-6
LOWERING MG-30/40 STRUCTURE
(Ref. Section 3.3)

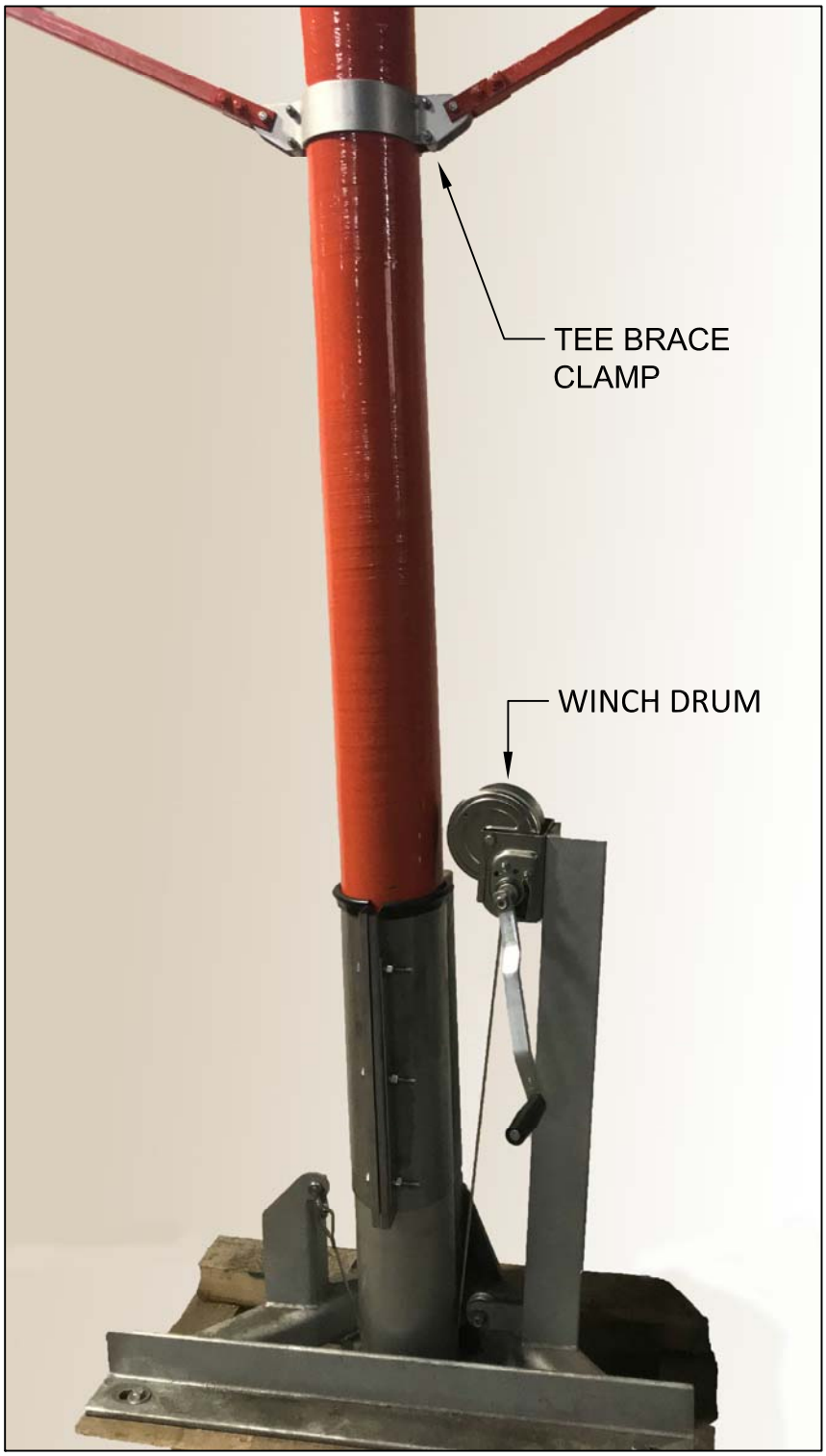


FIGURE 3-7
MS-20 STRUCTURE IN LOWERED POSITION
(Ref. Section 3.4)

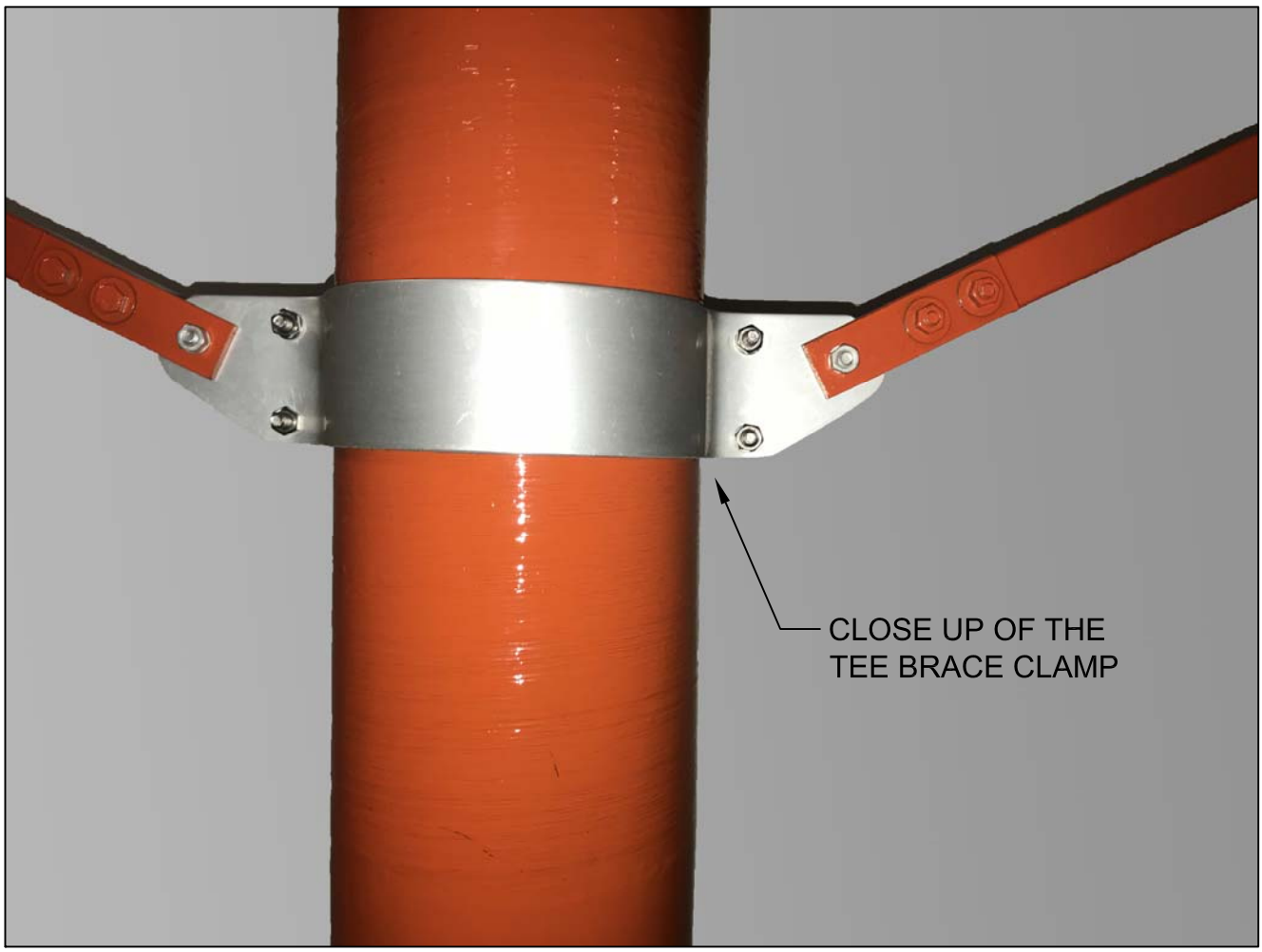


FIGURE 3-7A
MS-20 STRUCTURE IN LOWERED POSITION
(Ref. Section 3.4)

FIGURE 3-7B
CLOSE UP OF ALUMINUM SLEEVE & WINCH DRUM
(Ref. Section 3.4)

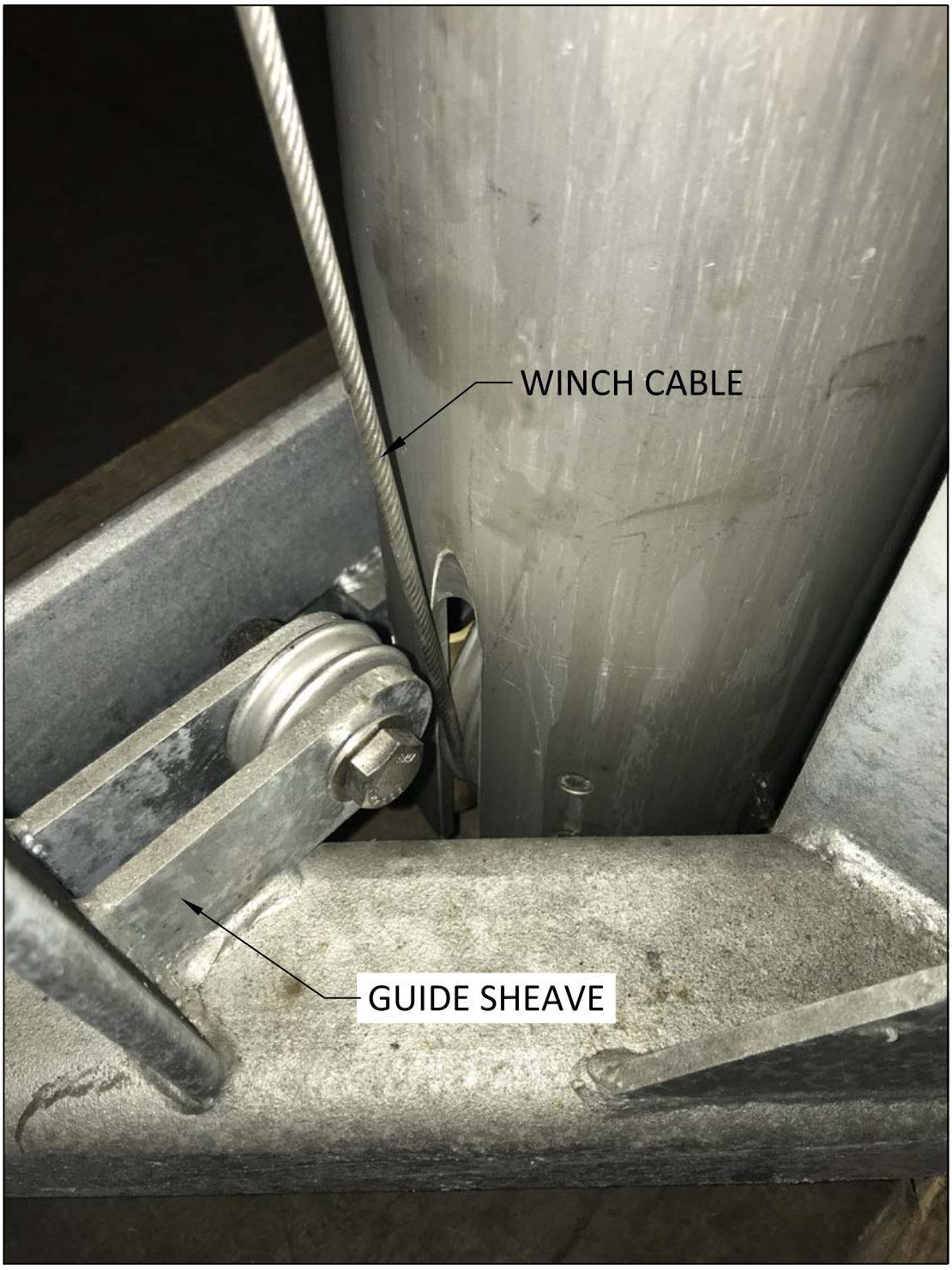


FIGURE 3-8
LOWERING MS-20 STRUCTURE - ENGAGING
WINCH CABLE IN GUIDE SHEAVE
(Ref. Section 3.4)

SECTION 4. STANDARDS AND TOLERANCES

4.1 SCOPE AND GENERAL INFORMATION:

LIR structures are constructed with superior materials and manufactured to exacting standards. In order that they perform their function in an optimum manner, they must be assembled correctly and maintained to within certain criteria. Table 4-1 is a list of the criteria that are essential in maintaining LIR structures in the field. These criteria are referred to in subsequent sections.

4.2 DEFINITION OF TERMS:

The terms used in Table 4-1 are defined in the FAA-D-2494/B and are briefly described here for user convenience.

4.2.1 Standard. – The standard is the optimum value assigned to an essential parameter of the LIR structure and is compatible with the system as a whole and the design capability of the equipment involved.

4.2.2 Initial Tolerance/Limit. – The initial tolerance/limit is the maximum deviation from the standard value of the parameter, or the range, which is permissible when the equipment is accepted for use in the National Airspace System at the time of initial commissioning, or after any readjustment, modification or modernization.

4.2.3 Operating Tolerance/Limit. – The operating tolerance/limit is the maximum deviation from the standard value of the parameter, or the range, within which the LIR structure may continue to operate on a commissioned basis without adjustment or corrective maintenance and beyond which remedial action by maintenance personnel is mandatory.

PARAMETER	REFERENCE PARAGRAPH	STANDARD	TOLERANCE/LIMIT	
			INITIAL	OPERATING
A. Torque on Nuts, Bolts & Screws				
1. 1/4-20 Alum. Nuts & Bolts		70 in. lb.	+5 in. lb. -0 in. lb.	±5 in. lb.
2. 1/4-20 SS Nuts & Bolts		120 in. lb.	+5 in. lb. -0 in. lb.	±5 in. lb.
3. 3/8-16 St'l & SS Nuts, Bolts, & Screws		25 ft. lb	+2 ft. lb. -0 ft. lb.	±2 ft. lb.
4. 5/8-11 St'll & SS Nuts & Bolts		75 ft. lb.	+2 ft. lb. -0 ft. lb.	±2 ft. lb.
5. 3/4-10 St'l & SS Nuts & Bolts		120 ft. lb.	+2 ft. lb. -0 ft. lb.	±2 ft. lb.
B. Plumbness of LIR Structure		Plumb	1/4 deg. out of plumb (1/2" per 120")	1/2 deg. out of plumb (1" per 120")
C. Alignment of Tee Bar		Perpendicular To Runway Centerline	±1" at the end of Tee Bar	±1" at the end of Tee Bar

TABLE 4-1 STANDARDS AND TOLERANCES
(Ref. Section 4)

SECTION 5. PERIODIC MAINTENANCE

5.1 INTRODUCTION:

The periodic maintenance required by LIR structures should consume a very small portion of the total airport facilities maintenance time. In most cases the required periodic maintenance can be combined with other maintenance functions such as replacing bulbs and checking functions of electrical components. Lowering and raising of LIR structures for the replacement of bulbs should afford an opportunity to perform periodic maintenance which requires access to the upper portions of the LIR structure. The frequency of the periodic maintenance inspections listed in Table 5-1 are maximum permissible intervals. It is suggested that the frequency of these inspections be increased when conditions are especially unfavorable. Example: increase corrosion inspections if LIR structures are located near ocean.

5.2 PERIODIC MAINTENANCE SCHEDULE:

Table 5-1 lists the regular and unscheduled inspections required for LIR Structures.

TABLE 5-1 LIR STRUCTURE PERIODIC MAINTENANCE SCHEDULE

TASK	REQUIREMENT	Weekly	Biweekly	Monthly	Bimonthly	Quarterly	SemiAnnual	Annually	Unsched.	EQUIPMENT/ TOOLS REQUIRED
1	Visual inspection				X				X	
2	Clear area around LIR structure and maintain accessibility						X		X	
3	Inspect winch rope (MS-20 only)						X			1-1/8" open end wrench
4	Check tension on stabilizer rods (MG-30/40 only)						X		X	
5	Check and lubricate moving parts						X			
6	Inspect LIR structure base for corrosion or rusting						X			
7	Check torque or tightness of all bolts, screws & nuts						X		X	As listed in Section 6.1.7
8	Inspect LIR structure for scraped or peeling paint and for superficial damage to fiberglass components						X			
9	Check plumbness of LIR structure and perpendicularity of Tee Bar							X		15" min. precision level
	*As far as practicable, all the structure maintenance tasks should be combined with maintenance tasks for the electrical components of the Approach Ligthing Systems.									

SECTION 6. MAINTENANCE PROCEDURES

6.1 LIR STRUCTURE MAINTENANCE PROCEDURES:

The following maintenance tasks are taken from those listed in Table 5-1.

6.1.1 Maintenance Task No. 1. – Visual Inspection. – The visual inspection is intended to alert the maintenance sector of any obvious conditions that might cause or contribute to an early failure of the LIR structure. A visual inspection of the LIR structure should be performed at a minimum of once a month and also immediately after extreme or violent weather conditions. Extreme or violent weather conditions would be winds of 50 MPH or over, ice storms with significant buildup of ice (1/4" or over), tornadoes, flooding, etc.

PROCEDURE:

A. Observe LIR structure from a distance to determine whether it appears plumb in relation to other nearby LIR structures. Observe Tee-Bar to determine whether it appears perpendicular to runway centerline. If either of these parameters are visibly out of tolerance, Maintenance Task No. 9 (Section 6.1.9) should be performed to check on the condition.

B. Observe LIR structure at close range and check for any apparent damage to LIR structure components (Tee-Brace, Tee-Bars, etc.) Now grasp 6" I.D. fiberglass tube, at about shoulder level, with both hands and lightly shake LIR structure. If rattling or looseness is observed in the LIR structure, Maintenance Task No. 7 (Section 6.1.7) should be performed to rectify the condition.

CAUTION

Wearing of a hard hat is mandatory when performing a visual inspection of an LIR structure, since there may be a danger of objects falling from damaged LIR structure when shaken.

6.1.2 Maintenance Task No. 2 – Clear area around LIR structure and Maintain Accessibility. - Keeping the area around the LIR structure clear and free from obstructions is an integral part of the total LIR structure maintenance program. LIR structures are designed to be easily and rapidly lowered and raised. Anything that will restrict the lowering and raising or prevent accessibility to the LIR structure will impair its maintainability. Since a wide range of climates and terrain are encountered, the judgment and ingenuity of each facility's own maintenance people should be employed to develop the optimum solution to this maintenance function. The following instructions contain suggested procedures and should be adhered to wherever possible.

PROCEDURE:

A. During the growing season, vegetation should be kept down below 2 ft. high for an area of at least 3 ft. on all sides of the LIR structure and concrete pier. All dirt, sand and debris should be cleaned from around LIR structure base. The ground profile of the LIR structure when it is in the lowered position should be determined and vegetation kept below 2ft. high for a distance of 3 ft. on all sides of this profile. Markers can be placed to indicate the areas to be maintained. (This does not apply to MS-20 LIR structures, See Figure 6-1) Access roads or paths should be kept in a usable condition.. Methods of discouraging growth of vegetation can be utilized in areas where prolific growth may pose a problem. 4" concrete slab or 2 ft. of crushed stone is effective for this purpose. Defoliants are also a possible solution to excess vegetation around LIR structures. However,where the growth of unwanted vegetation poses less of a problem, simple hand or machine cutting is usually the simplest solution.

B. During winter, in areas where snow may pose a problem, accessibility of LIR structures may be maintained as determined by field personnel. Access roads and paths may be kept plowed. LIR structure bases may be dug out for an area of 3 ft. on all sides and ice and snow buildups removed from base. The snow level of the ground profile, for the lowered LIR structure, may be kept below 2 ft. high for 3 ft. on all sides of the profile. (This does not apply to MS-20 LIR structures See Figure 6-1)

6.1.3 Maintenance Task No. 3 – Inspect Winch Cable (MS-20 Only). – The cable used for the MS-20 winch is steel cable with clear vinyl cover.

PROCEDURE:

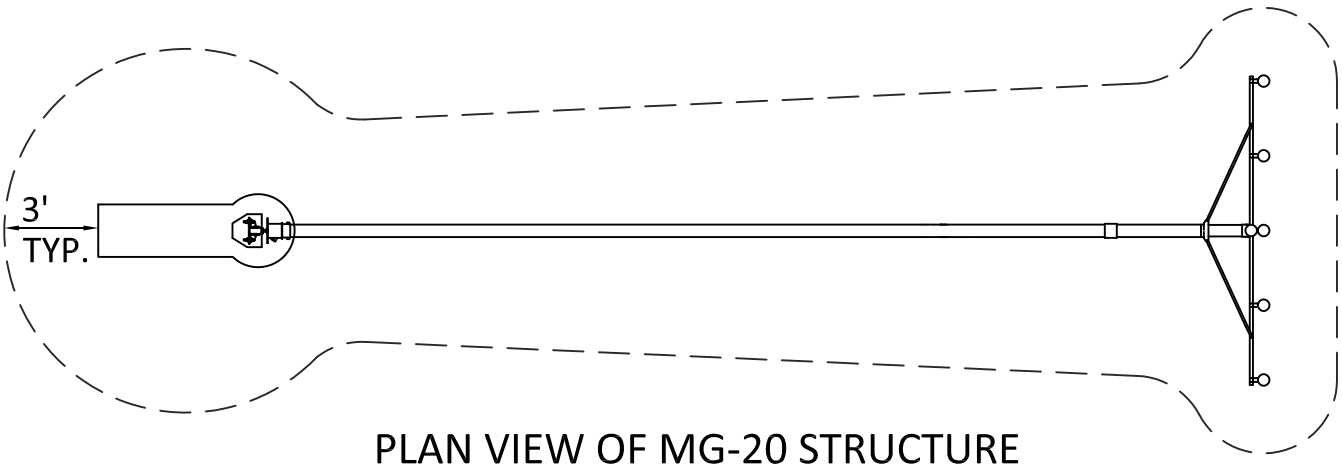
A. While lowering MS-20 LIR structure, inspect cable for damage, fraying and discoloration (lowering and raising instructions are contained in Section 3.4).

B. Replace cable if either of these conditions were noted. Refer to Section 7.1.1 for winch cable replacement instructions.

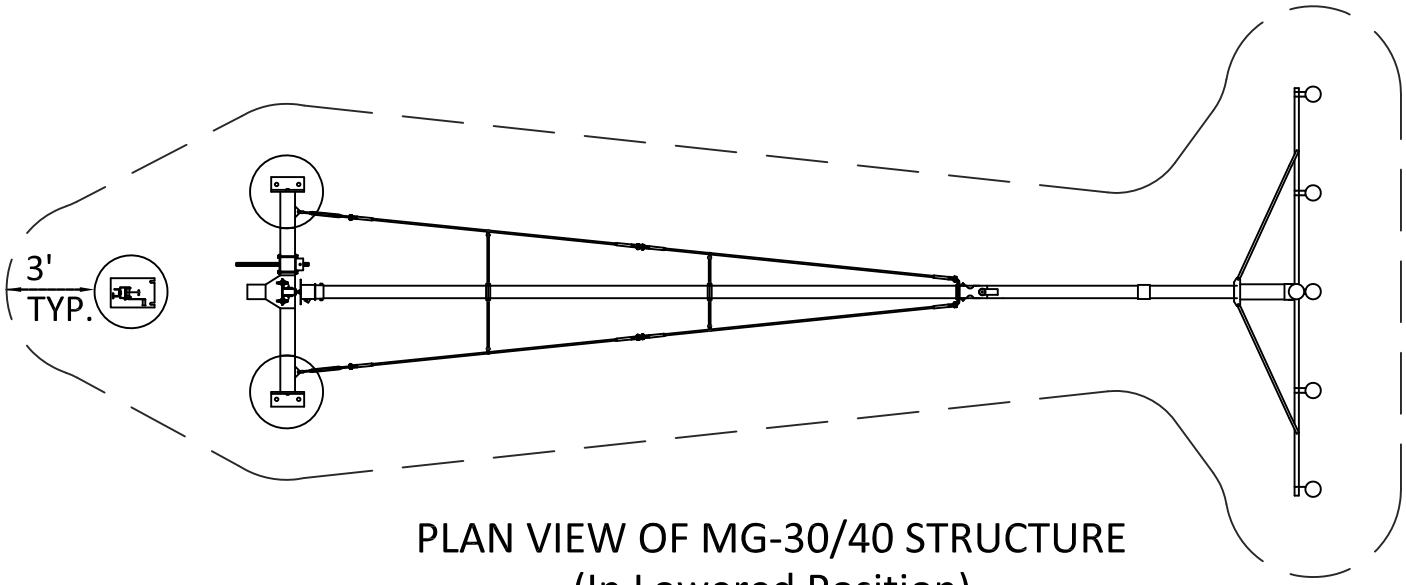
6.1.4 Maintenance Task No. 4 – Check Tension of Stabilizer Rods (MG-30/40 Only). – On the MG-30/40 LIR structures the stabilizer rods are the prime supporting members. They must be regularly checked and carefully maintained. If the stabilizer rods are allowed to lose tension or are given too much tension, then an early failure may result.

PROCEDURE:

The stabilizer rods must be checked when the LIR structure is plumb and in the raised position. If MG-30/40 structure is visibly out of plumb, then Maintenance Task No. 9 should be performed prior to proceeding further.



PLAN VIEW OF MG-20 STRUCTURE
(In Lowered Position)



PLAN VIEW OF MG-30/40 STRUCTURE
(In Lowered Position)

FIGURE 6-1
CLEAR AREA TO PROVIDE FREE ACCESS TO LIR STRUCTURE
(Ref. Section 6.1.2)

A. Check tension in stabilizer rods by grasping the rod in one hand at shoulder level, and apply a small force to create a back and forth motion. The tension in the stabilizer rods should allow them to be moved back and forth for a distance of 1 to 2 inches. If they can be moved by more than 2 inches, then more tension is required. If they cannot be moved more than 1 inch, then the tension should be reduced.

B. Tension adjustments are made with the ¾" nut located under the stand plate. (See Figure 6-2) Turn the nut a half turn clockwise to increase tension. Use a 1-1/8" open end wrench.

C. Recheck stabilizer rods and adjust again if required until tension is sufficient to allow only 1 inch of stabilizer rod movement.

6.1.5 Maintenance Task No. 5 – Check and Lubricate Moving Parts. – LIR structures have few moving parts and require a minimal amount of lubrication. MG-20 LIR structures have a sealed hinge and require no lubrication. MG30/40 LIR structures require lubrication at two hinges. MS-20 LIR structures require lubrication of the winch and a check of the mounting socket sheave.

PROCEDURE:

A. MG-30/40 LIR structure base should be lubricated at the two hinges with a good grade of lithium grease (See Figure 6-3)

B. The MS-20 LIR structure base has a winch attached to it (See Figure 6-4). This winch should be lubricated as follows: All gears should have a film of Grease on them. Use a good grade of lithium grease. The following should be wet with oil at all times; 2 bushings (Items 9 & 11); both ends of the drum shaft (Item 18); the ratchet pawl (Item 23); threads on pinion shaft (Item 7); steel handle disc (Item 4). Use a good grade of light machine oil (10 w). Perform a brake disc inspection to check the wear on the brake discs (Item 6). To physically measure the ware on these parts, they must be removed from the winch. Tools required for the brake disc inspection are: one ½" combination wrench, one 9/16" combination wrench, one adjustable crescent wrench and one flat blade screw driver. Remove the drum assembly by disassembling the drum bolt (Item 12) and nut (Item 17). Remove the handle (Item 3). Remove the retaining ring (Item 8). This will allow the pinion shaft (Item 7) to be disassembled and the brake disc removed for inspection. Measure the disc for wear and if it is worn to less than 1/16 of an inch thick, replace it. Do not get oil or grease on the fiber brake disc faces (Item 6). The winch may be reassembled by reversing the procedure for disassembly. Care must be taken to insure that all parts are installed correctly for proper operation. A brake face kit, or a new winch, may be ordered through Jaquith Industries, Inc., see Section 8 for ordering information.

C. The MS-20 LIR structure mounting socket sheave should be checked for free rotation. With the MS-20 structure secured in the raised position (the three ½" sleeve

bolts must be tightened and the alignment pin must be in place), loosen the winch cable by turning the winch and disengage cable from mounting socket sheave. (See Figure 6-5) Now carefully run your hand across the mounting socket sheave and determine if it is free to rotate. If sheave is free to rotate, then engage cable on sheave and take up slack with winch. If sheave binds, then mounting socket sheave assembly must be removed and a new assembly installed. Refer to Section 7.1.2 for mounting socket sheave assembly replacement instructions.

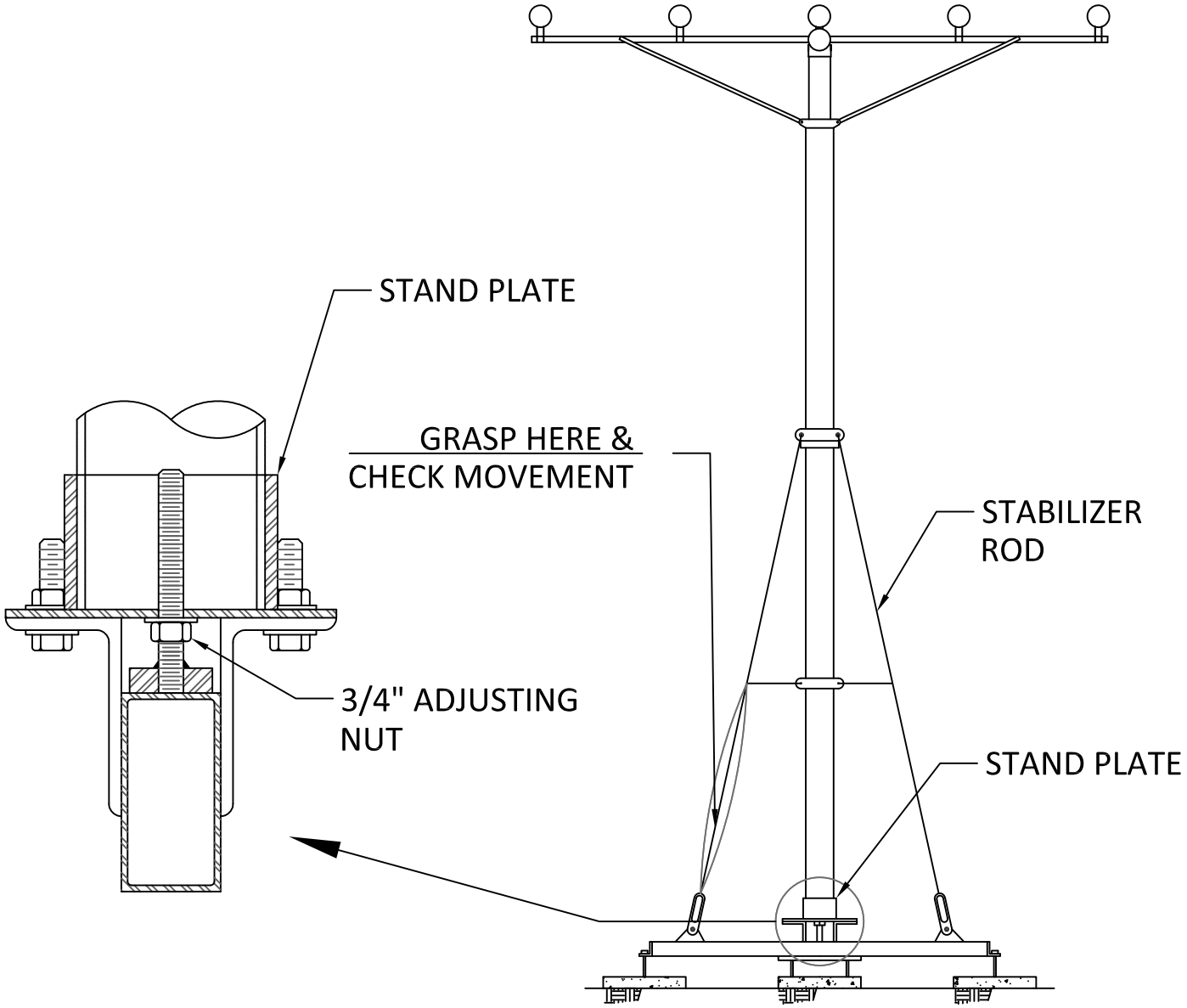


FIGURE 6-2
ADJUSTING TENSION IN STABILIZER RODS
(Ref. Section 6.1.3)

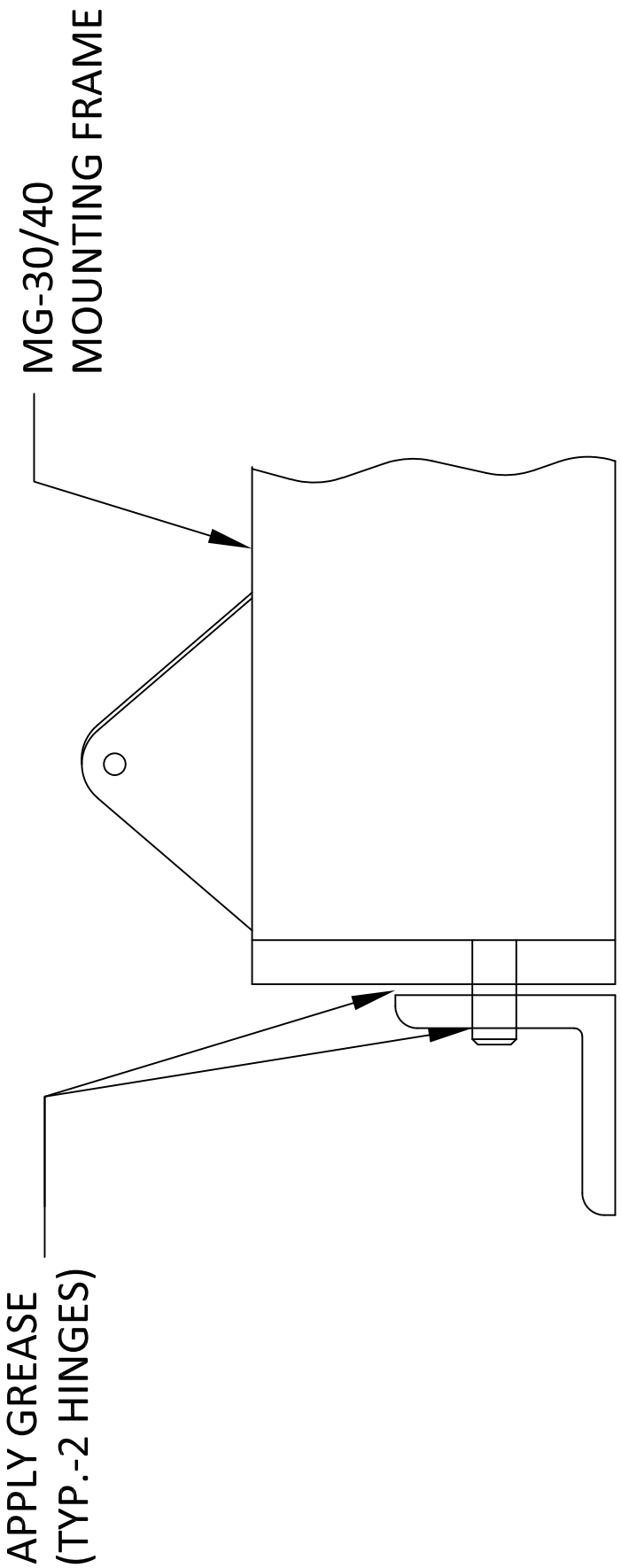
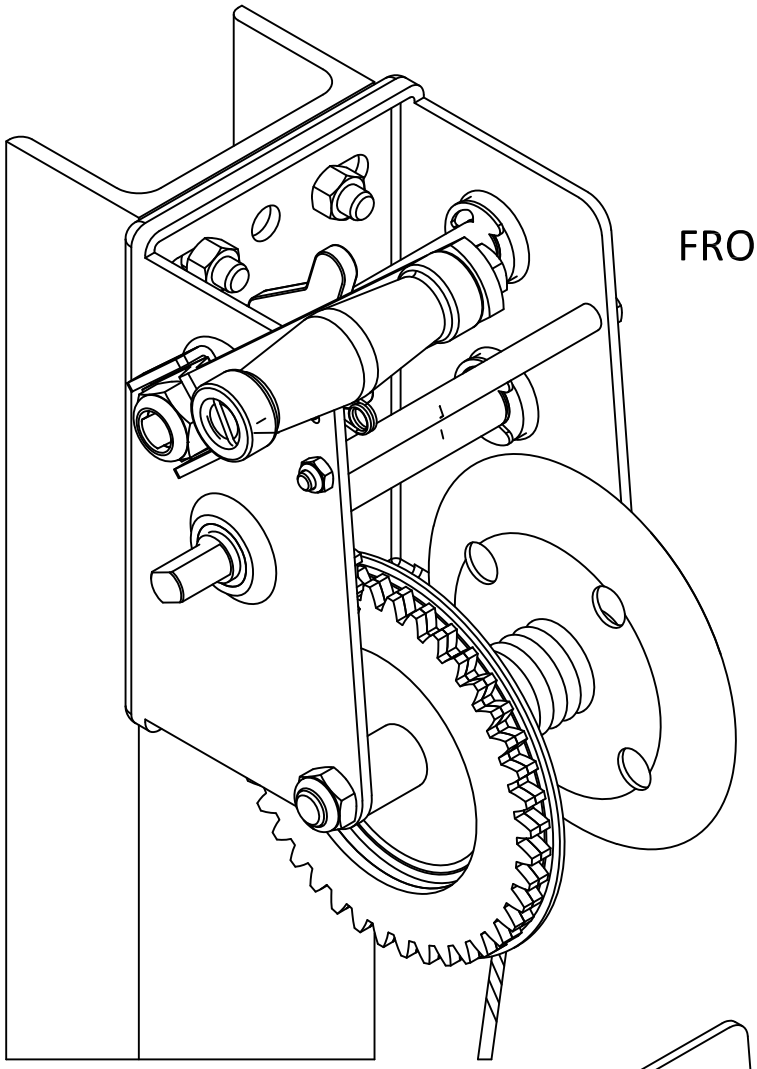
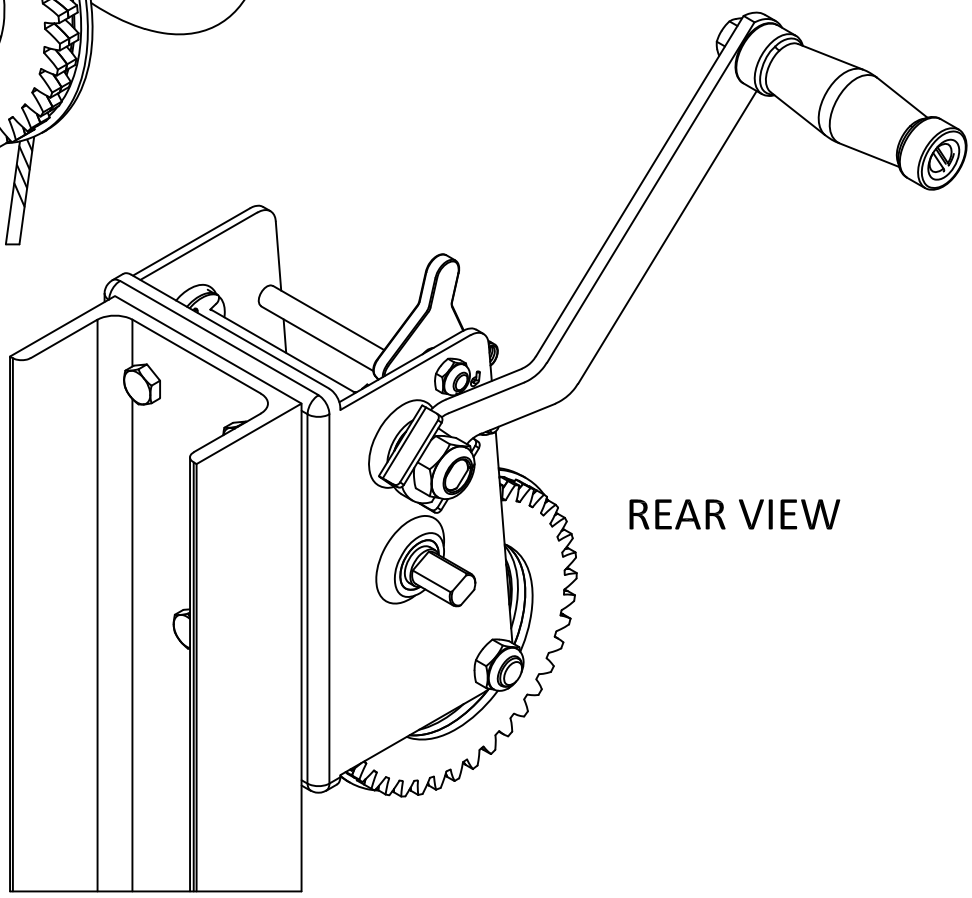


FIG. 6-3
LUBRICATING MG-30/40 MOUNTING FRAME
(Ref. Section 6.1.4)



FRONT VIEW



REAR VIEW

FIGURE 6-4
WINCH ASSEMBLY
(Ref. Section 6.1.5)

6.1.6 Maintenance Task No. 6 – Inspect LIR Structure Bases for Rusting. – All LIR structure bases (Items 16, 17, and 18 in Table 1-1 and shown in Fig. 8-15, 8-16 and 8-17 are hot dip galvanized to ASTM-A-123. They should provide many years of rust-free operation even under adverse conditions. However, areas which are scratched or worn will produce rust which may damage or possibly cause early failure of the LIR structure bases. Thorough and regular inspection of these structure bases will allow repairs to be made at the earliest possible time and keep rust damage to a minimum.

PROCEDURE:

A. MG-20 and MG-30/40 structure bases must be inspected in the lowered and raised positions. MS-20 structure bases can be inspected in the raised position. Instructions and equipment required for lowering and raising MG-20 and MG-30/40 structures is contained in Sections 3.2 and 3.3 respectively.

B. Closely inspect all visible surfaces of the LIR structure base. Pay special attention to surfaces that lie against each other or rub against each other. The galvanized surface should appear dull gray in color. Rust is easily spotted on these surfaces. If rust is observed on any LIR structure base, it should be repaired in the field at the earliest possible time. The instructions for repair of rusted areas on LIR structure bases are contained in Section 7.1.3.

6.1.7 Maintenance Task No. 7 – Check Torque or Tightness of all Bolts, Screws and Nuts. – Standard torques for various size bolts are listed in Table 4-1.

PROCEDURE:

A. Tighten the ¾" nuts on the anchor bolts which hold the LIR structure base to the concrete pier or steel tower platform. Use a 1-1/8" or 1-1/4" open end wrench.

B. B. With the MG-20 LIR structure in the raised position, tighten the (4) 5/8" nuts that hold the aluminum stand plate to the MG-20 base. Also, tighten the (2) 5/8" nuts that hold the lighting bar to the MG-20 base (See Fig. 6-6). Use a 1 5/16" combination wrench. With the MG-30 or MG-40 LIR Structure in the raised position, tighten the (2) 5/8" nuts and bolts that attach the stand plate angles to the stand plate (See Fig. 6-7). Also check tightness of the (3) 5/8" nuts and bolts that are located on the upper end of the turnbuckle (See Fig. 6-8) Do not apply excess torque to these (3) 5/8" turnbuckle bolts. Just check that they are snug against the sides of the aluminum anchor fitting. Use two 15/16" combination wrenches for tightening the 5/8" nuts and bolts. Now tighten the (6) 3/8" nuts and bolts that attach the splice plate to the channel member on the LIR structure base. (See Fig 6-7) Also check tightness of the (3) 3/8" nuts and bolts on the lower end of the turnbuckle (See Fig. 6-8). . Use two 9/16" combination wrenches for tightening the 3/8" nuts and bolts.

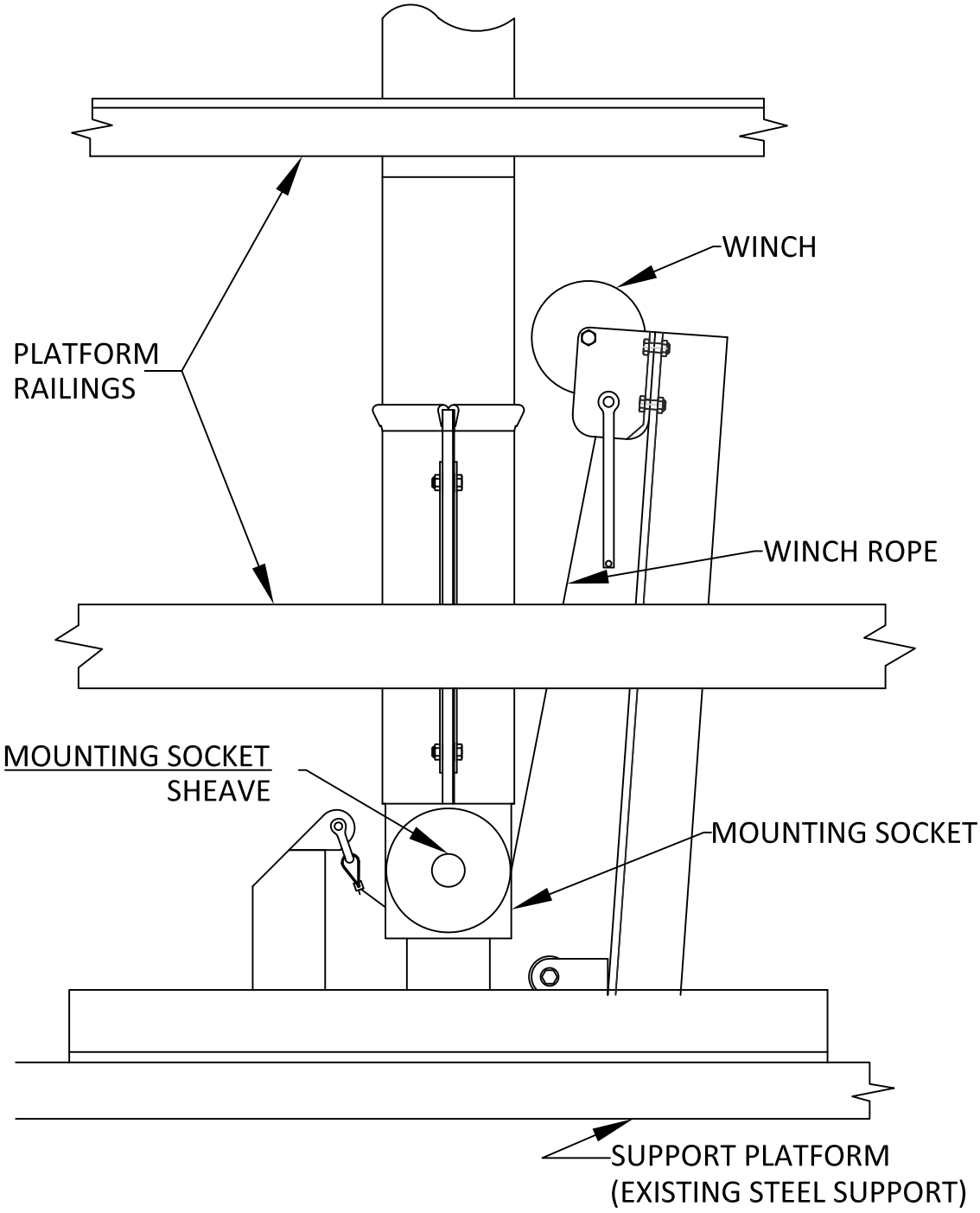


FIGURE 6-5
CHECK MOUNTING SOCKET SHEAVE FOR FREE ROTATION
(Ref. Section 6.1.7)

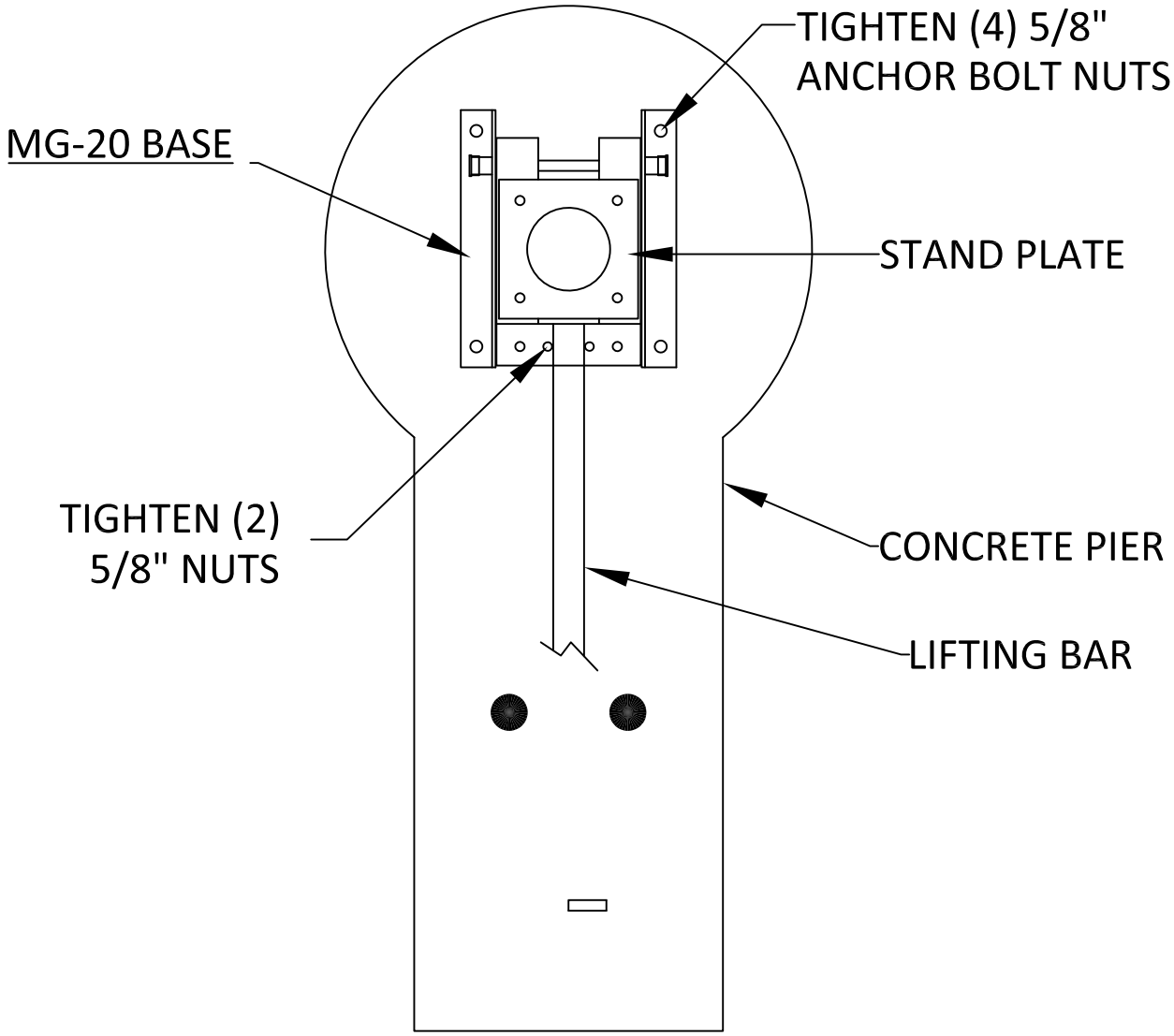


FIGURE 6-6
CHECK FOR TIGHTNESS OF NUTS & BOLTS ON MG-20 STRUCTURE BASE
(Ref. Section 6.1.7)

With the MS-20 structure in the raised position (the three ½" sleeve bolts must be tightened and the alignment pin must be in place) tighten the (2) 3/8" nuts and bolts that secure the winch to the MS-20 base. Also check tightness of the 3/8" drum bolt on the winch itself (See Fig. 6-9). Use two 9/16" combination wrenches for tightening the 3/8" nuts and bolts. Now check tightness of the ½" guide sheave nut and bolt. Now tighten the shackle bolt on the screw pin shackle which attaches the winch cable to the MS-20 base. Use pliers to tighten shackle bolt. Also tighten the ¼" splice bolt on the cable splice. (See Fig. 6-9) Use a 7/16" combination wrench to tighten the ¼" splice bolt. With a flat blade screw driver check tightness of flat head machine screw in aluminum mounting socket. Tighten if required (See Fig. 6-9)

C. Lower the LIR structure. Lowering instructions and required equipment are listed in Section 3.

D. All LIR structures: With a 3/16" Allen wrench check tightness of ¼" cap screws on the tube cap clamp (See Fig 6-10).

a. LIR structures with Tee Bars: Using a torque wrench (120 in. lb. min. range), 7/16" socket (to fit torque wrench) and a 7/16" combination wrench tighten all ¼" nuts and bolts on the Tee Bar, Tee Brace and Tee Brace Clamp. Torque ¼" nuts and bolts to 70 or 120 in. lb. + 5 in. lb. – 0 in. lb. (See Fig. 6-11). Check tightness of hex socket set screws in Par lamp supports with a 1/8" Allen wrench.

b. MG-30/40 LIR Structures: With the MG-30/40 LIR structure still in the lowered position check tightness of all ¼" nuts and bolts on the horizontal stabilizers.(See Fig. 6-12) Use a torque wrench, 7/16" socket and 7/16" combination wrench to torque these nuts and bolts to 70 in. lb. + 5 in. lb. – 0 in. lb. The ¼" nuts on the aluminum rods should be tightened with two 7/16" combination wrenches. Also check the tightness of the (3) 5/8" nuts and bolts at the upper end of the stabilizer rod. Do not apply excess torque to these nuts and bolts. Just insure that they are snug against the sides of the aluminum anchor fitting. (See Fig. 6-8) Tighten the (3) 5/8" nuts and bolts on the anchor support. Use two 15/16" combination wrenches for tightening these 5/8" nuts and bolts. Now tighten ¼" cap screw on horizontal brace clamps with a 3/16" Allen wrench. (See Fig. 6-8)

E. Raise LIR structure and secure. See Section 3 for lowering and raising instructions and equipment.

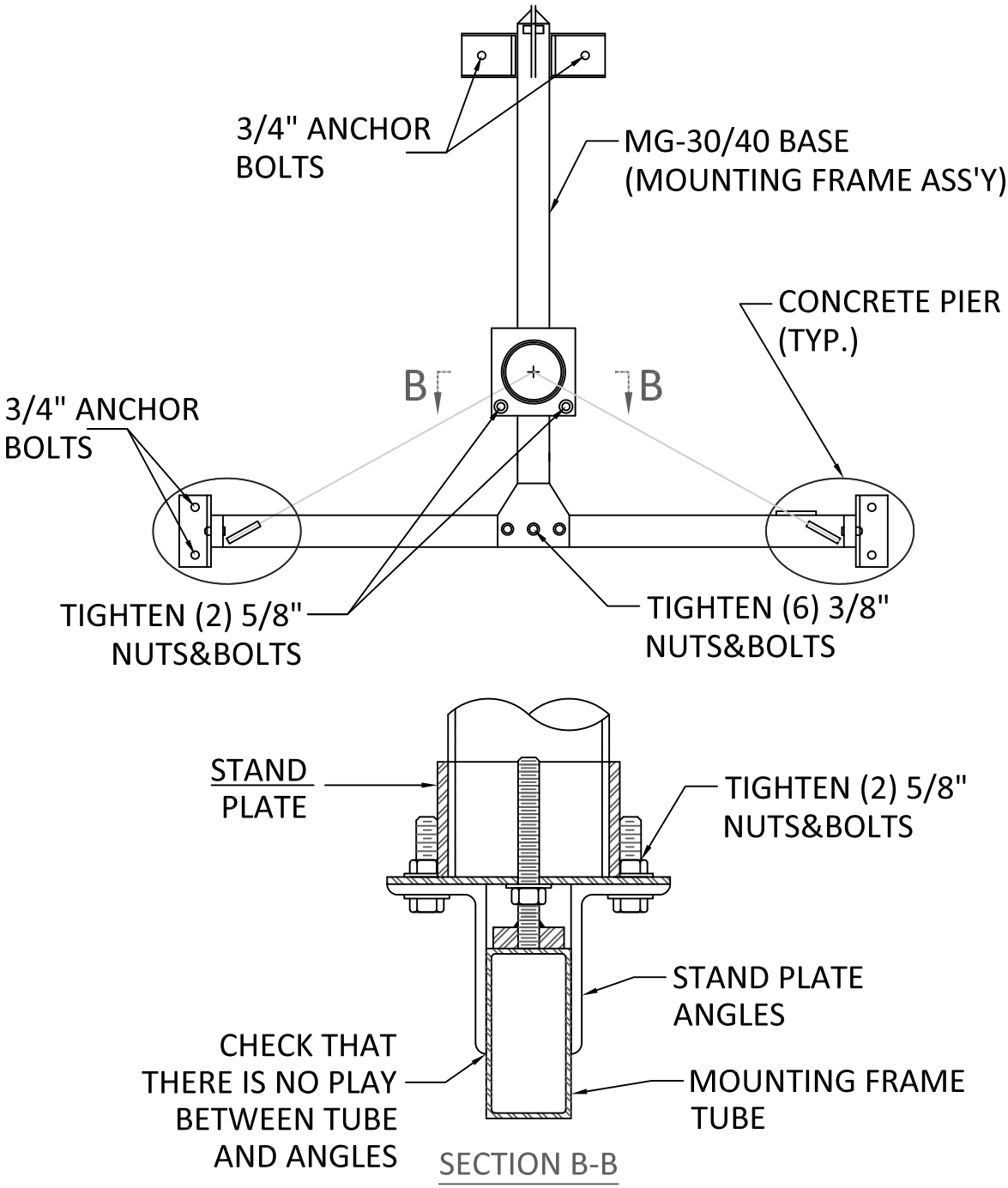


FIGURE 6-7
CHECK TIGHTNESS OF NUTS & BOLTS ON MG-30/40 BASE
(Ref. Section 6.1.7)

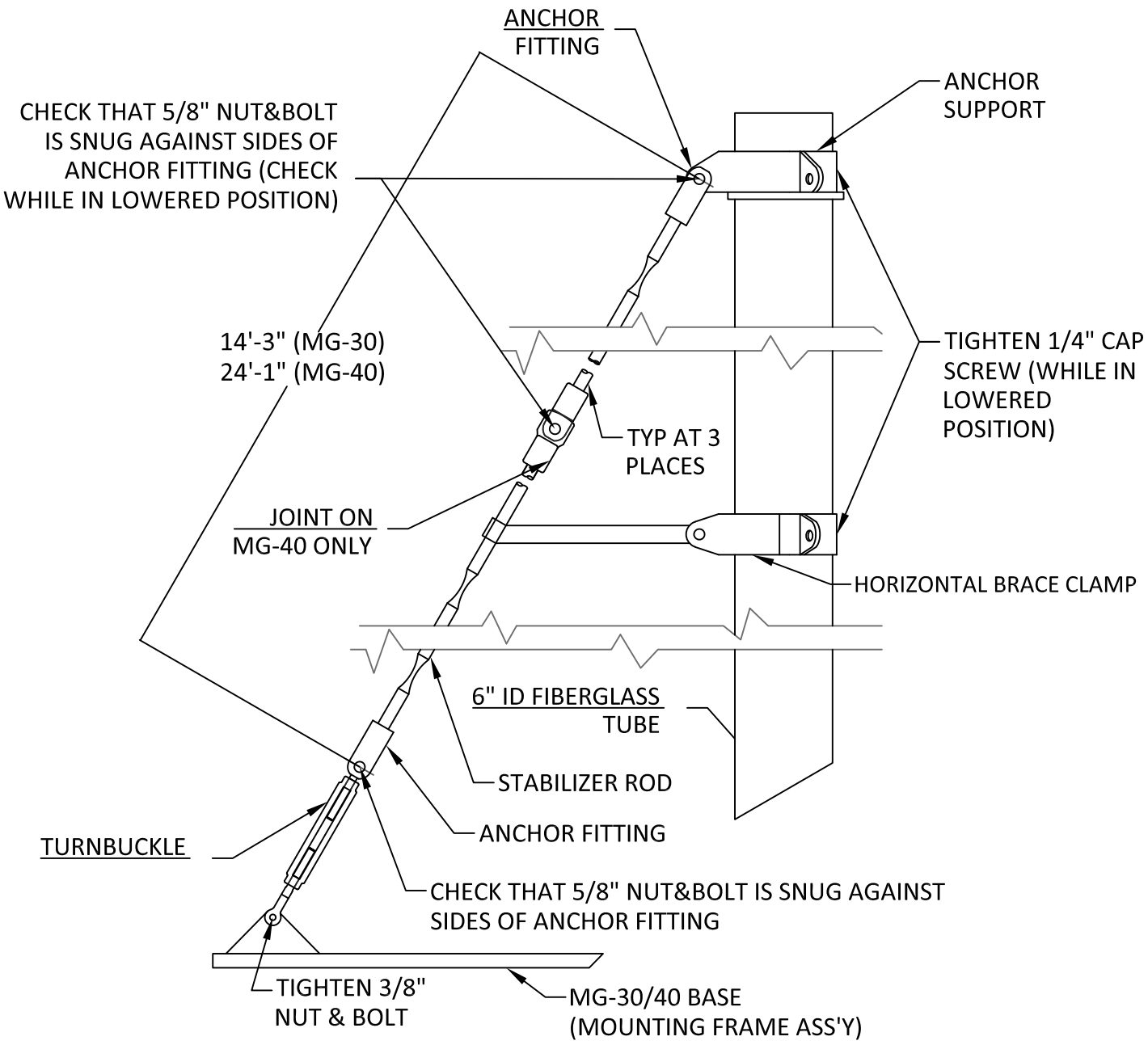


FIGURE 6-8
CHECK TIGHTNESS OF NUTS&BOLTS ON MG-30/40 STRUCTURE
(Ref. Section 6.1.7)

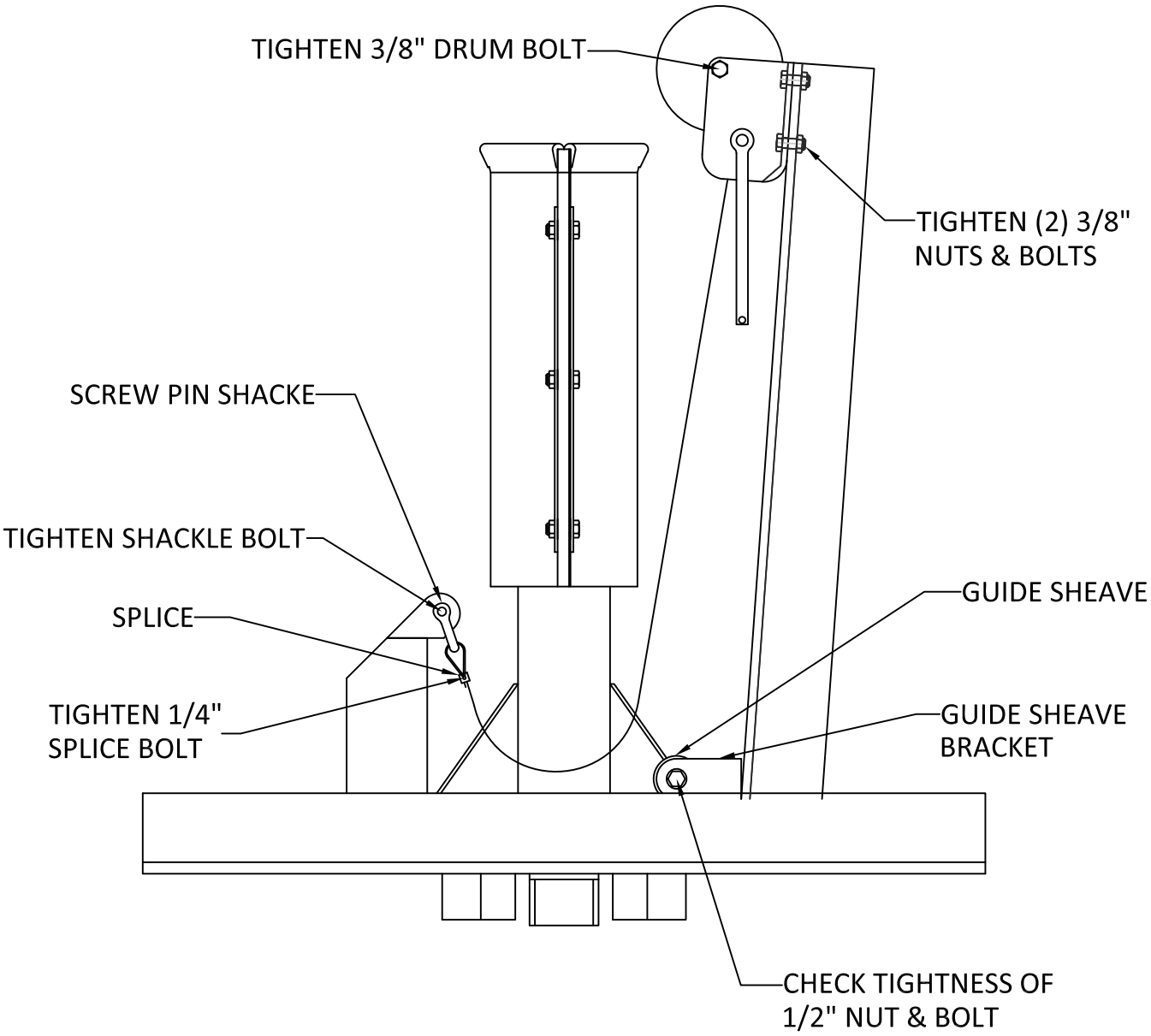


FIGURE 6-9
CHECK TIGHTNESS OF MS-20 STRUCTURE BASE
(Ref. Section 6.1.7)

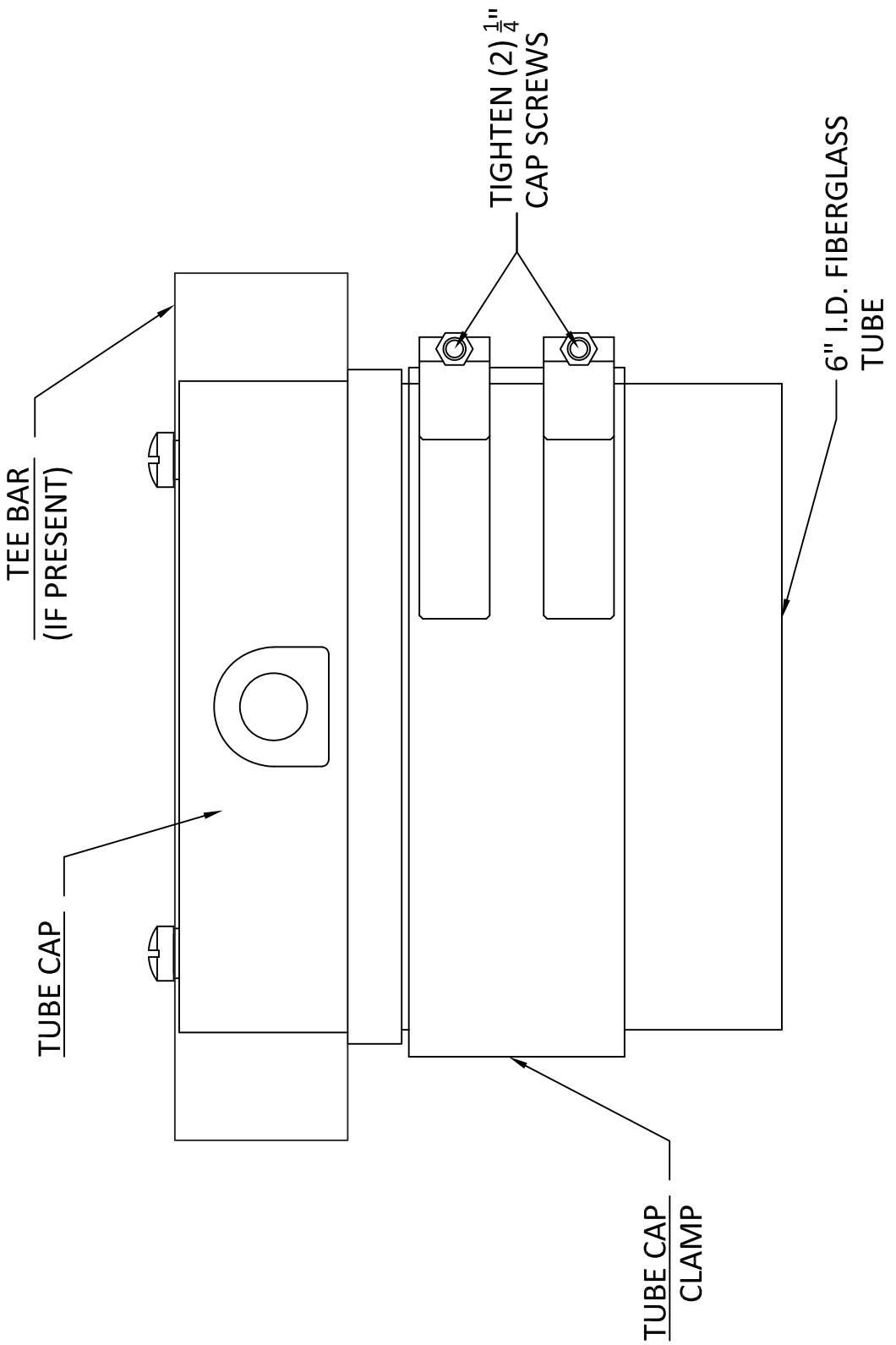


FIGURE 6-10
CHECK TIGHTNESS OF TUBE CAP CLAMP
(Ref. Section 6.1.7)

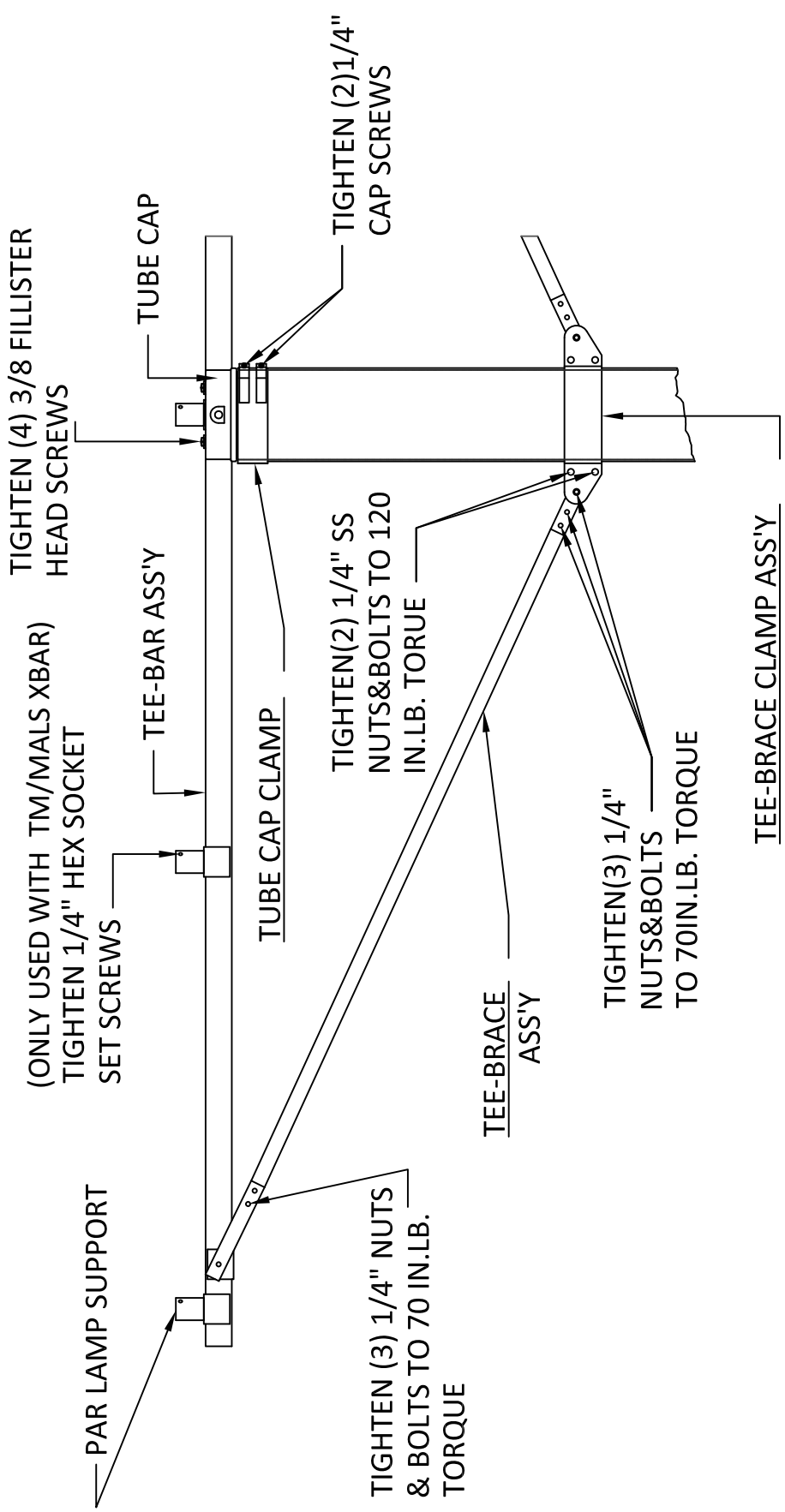


FIGURE 6-11
CHECK TIGHTNESS OF NUTS & BOLTS ON LIR STRUCTURE WITH TEE BAR
(Ref. Section 6.1.7)

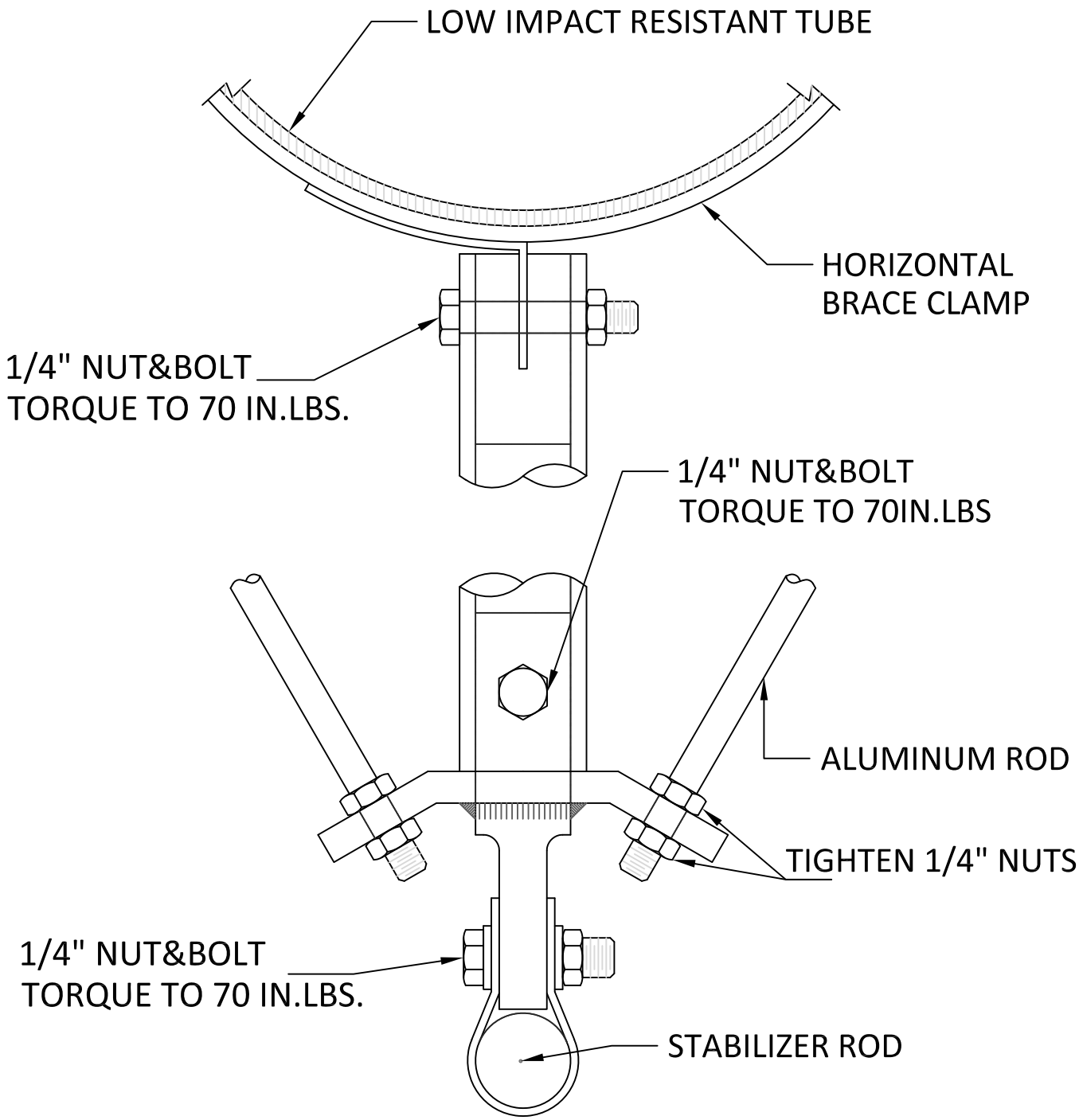


FIGURE 6-12
CHECK TIGHTNESS OF HORIZONTAL STABILIZER ASSEMBLY NUTS & BOLTS
(Ref. Section 6.1.7)

6.1.8 Maintenance Task No. 8 – Inspect LIR structure for scraped or peeling paint and for superficial damage to fiberglass components. - Since fiberglass is subject to deterioration due to the ultraviolet rays of the sun, a protective coating of paint must be kept on all fiberglass surfaces. As an added protection, UV absorber has been added in the resin systems. Fiberglass surfaces which are damaged may be subject to weathering deterioration. Thorough and regular inspections of fiberglass surfaces are critical in detecting problem areas so that repairs can be made before significant deterioration has occurred.

PROCEDURE:

A. Carefully inspect all fiberglass surfaces on the LIR structure for scraped or peeling paint and for superficial damage. MG-20 and MG-30/40 structures must be lowered before inspection so that all surfaces are accessible. MS-20 structures must be inspected as they are being lowered. (See Section 3 for lowering and raising instructions) Both the unpainted fiberglass surface and the paint which coats it are orange in color. Therefore, a close check of the surface is required to determine the absence of paint. Fiberglass surfaces which require painting should be painted according to the instructions in Section 7.1.4. Damage to fiberglass surfaces will appear as nicks, cuts or bruises which break the surface and expose the fiberglass strands or mats. Instructions for repair to these damaged surfaces are also located in Section 7.1.4. Repairs to painted and damaged surfaces should be undertaken in the field as soon as possible.

6.1.9 Maintenance Task No. 9 – Check plumbness of LIR structure and perpendicularity of Tee Bar. – Periodic checks of LIR structure plumbness and perpendicularity of Tee Bar are necessary to offset the effects of settling concrete piers or support structures. A properly aligned Approach Lighting System is essential in providing proper visual guidance to aircraft.

PROCEDURE:

A. With LIR structure in raised position place 15" (min.) precision level against 6" I.D. fiberglass tube at about shoulder height. Take readings with level on four sides approximately 90 degrees apart. If precision level indicates that LIR structure is plumb then go on to next procedure step. If precision level indicates that LIR structure is not plumb, then adjust LIR structure per instructions in Section 7.1.5.

B. To check the perpendicularity of Tee Bars, lower LIR structure (See Section 3 for lowering and raising instructions). For MG-20 and MG-30/40 LIR structures with Tee Bars, place a 15" (min.) precision level on the Tee Bar near the Tube Cap (see Fig. 6-13). For Mg-20 and MG-30/40 LIR structures without Tee Bars, place a straight 3 ft. length of wooden 2 x 2 across the tube cap slot and then place the precision level on the wooden 2 x 2. Near the tube cap (See Fig. 6-13) check levelness on both sides of tube cap. For MS-20 LIR structures check that mark on tube cap is aligned with mark on 6" I.D. fiberglass tube. Alignment of marks indicates that tube cap is correctly positioned (See fig. 6-14). To adjust tube cap

simply loosen the two ¼” cap screws on the tube cap clamp with a 3/16” Allen wrench (See fig. 6-14). Adjust tube cap to desired position and tighten the ¼” cap screws on the tube cap clamp.

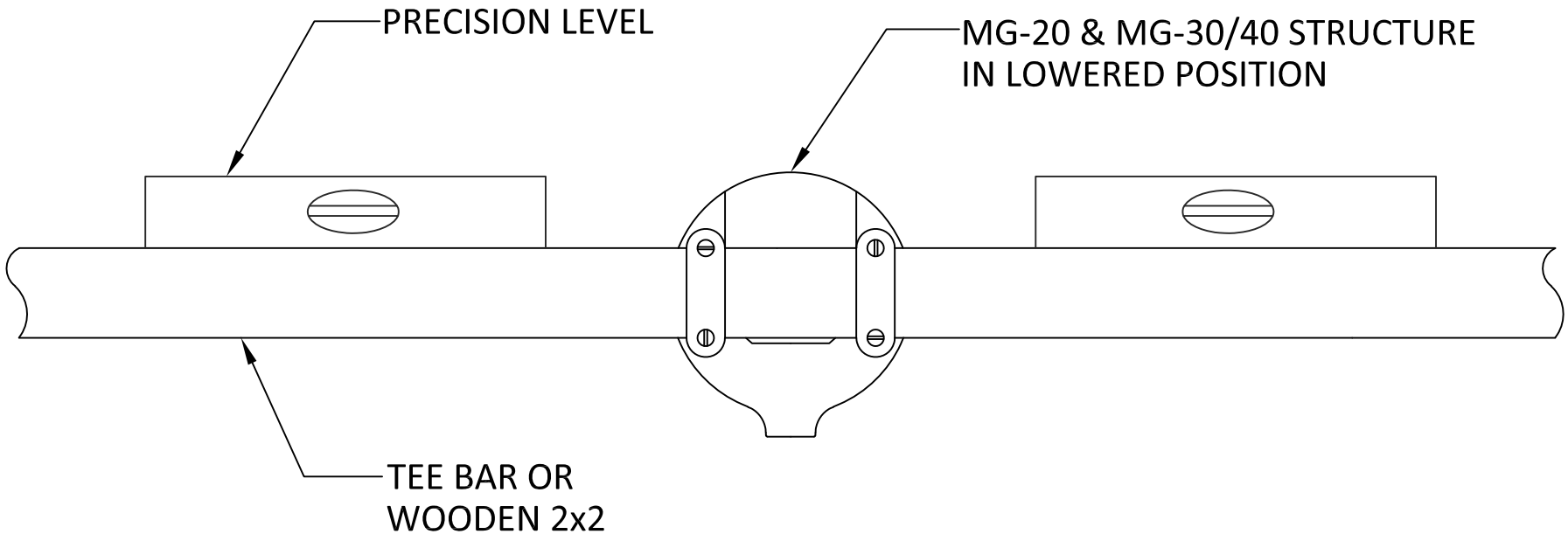


FIGURE 6-13
CHECKING LEVELNESS OF TEE BAR & ALIGNMENT OF
TUBE CAP (Ref. Section 6.1.9)
FOR MG-20 & MG-30/40 STRUCTURES

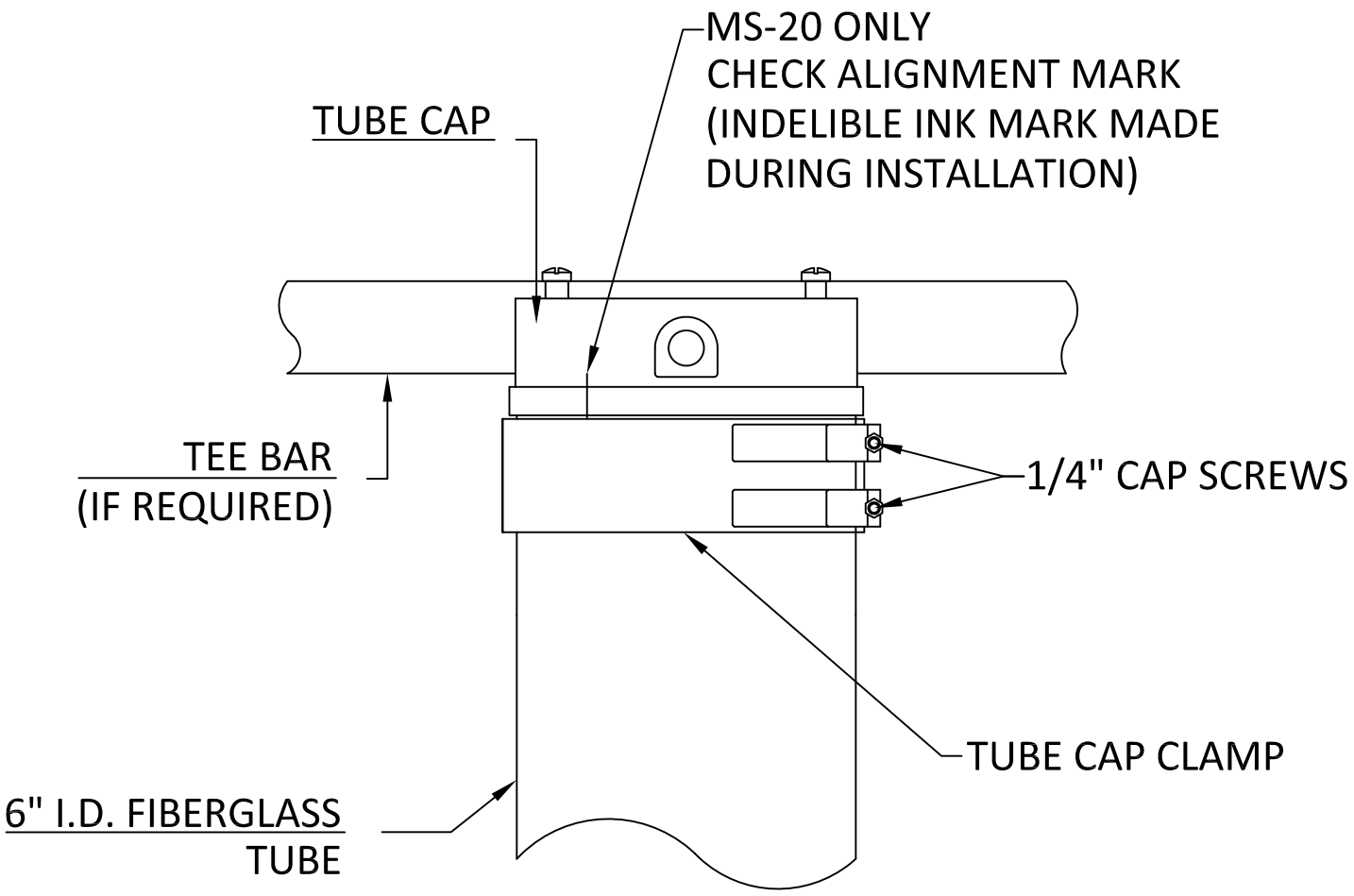


FIGURE 6-14
CHECKING ALIGNMENT OF TUBE CAP FOR MS-20 STRUCTURES
(Ref. Section 6.1.9)

SECTION 7. CORRECTIVE MAINTENANCE

7.1 CORRECTIVE MAINTENANCE:

Corrective maintenance instructions are provided to permit repair, replacement or adjustment of LIR structure parts in the field. Replacement parts and repair materials referenced in these instructions are available from Jaquith Industries, Inc. and are listed in Section 8.

7.1.1 Replacing Winch Cable - The winch cable must be replaced if it is found to be frayed or deteriorated. The replacement cable must be 1/8" x 40' stainless steel wire cable with clear vinyl coating. (7 x 19 strand core) A replacement cable with thimble and splice fittings attached is available from Jaquith Industries, Inc. Part No. 60901923

To replace winch cable, first make sure that MS-20 LIR structure is secured in the raised position (the three ½" sleeve bolts must be tightened and alignment pin must be in place). Now disconnect cable from screw pin shackle by removing the screw pin. (See Figure 7-1) Remove all the cable from the winch drum by applying tension on the cable with one hand and turning winch handle with the other hand. Using a 3/8" combination wrench, detach the cable keeper by removing the two #10-24 hex nuts and carriage bolts from the winch drum. (See Fig. 7.2) Remove old cable from winch.

Prepare replacement cable for installation by forming a loop and clamping. Install thimble and splice, from old cable, to the replacement cable. (Replacement cable ordered from Jaquith Industries, Inc. come with new thimble and splice installed on cable). Thread loose end of replacement cable through hole in side of winch drum. Clamp in place with cable keeper and two #10-24 hex nuts and carriage bolts. Now attach end of cable with thimble and splice to screw pin shackle by inserting screw pin through thimble and tightening. Wind cable onto winch drum by winding winch with one hand and applying constant tension to cable with the other hand. Wind cable so that it is evenly distributed on winch drum. Engage cable in mounting socket sheave and take up slack with winch.

7.1.2 Mounting Socket Sheave Assembly Replacement Instructions. – The mounting socket sheave assembly must be replaced if the sheave does not rotate freely when it is disengaged from the winch cable. If the MS-20 structure is lowered and raised when the sheave is not free to rotate, then greater effort will be needed to operate the winch and the winch cable will wear out prematurely. To replace the mounting socket sheave assembly, the MS-20 LIR structure must be secured in the raised position. (The three ½" sleeve bolts must be tightened and the alignment pin must be in place). Disengage winch cable from mounting socket sheave by removing the (2) pins that keep cable engaged to the sheave, then by turning several windings of cable off of the winch drum so that the slack cable down below the sheave hangs. Now, with a flat blade screw driver, remove the eight ¼" flat head machine screws that hold the mounting socket sheave assembly in place. (See Fig. 7-3) Remove the mounting socket sheave assembly by grasping the sheave and sliding it out through the bottom of the mounting socket.

Insert the replacement mounting socket sheave assembly (Jaquith No. 4562) into the mounting socket and engage the eight ¼" flat head machine screws into the threaded holes. (See Fig. 7-4) Do not tighten the ¼" screws until all eight have been started into their appropriate threaded holes on the mounting socket sheave assembly. When all eight ¼" screws have been started, tighten them with a flat bladed screw driver by alternating back and forth between screws to provide an even tightening action. When the mounting socket sheave assembly has been secured, check for free rotation of the sheave. Wind the slack cable back onto the winch drum while guiding the cable so that it engages the sheave. MS-20 LIR structure is now ready for lowering and raising.

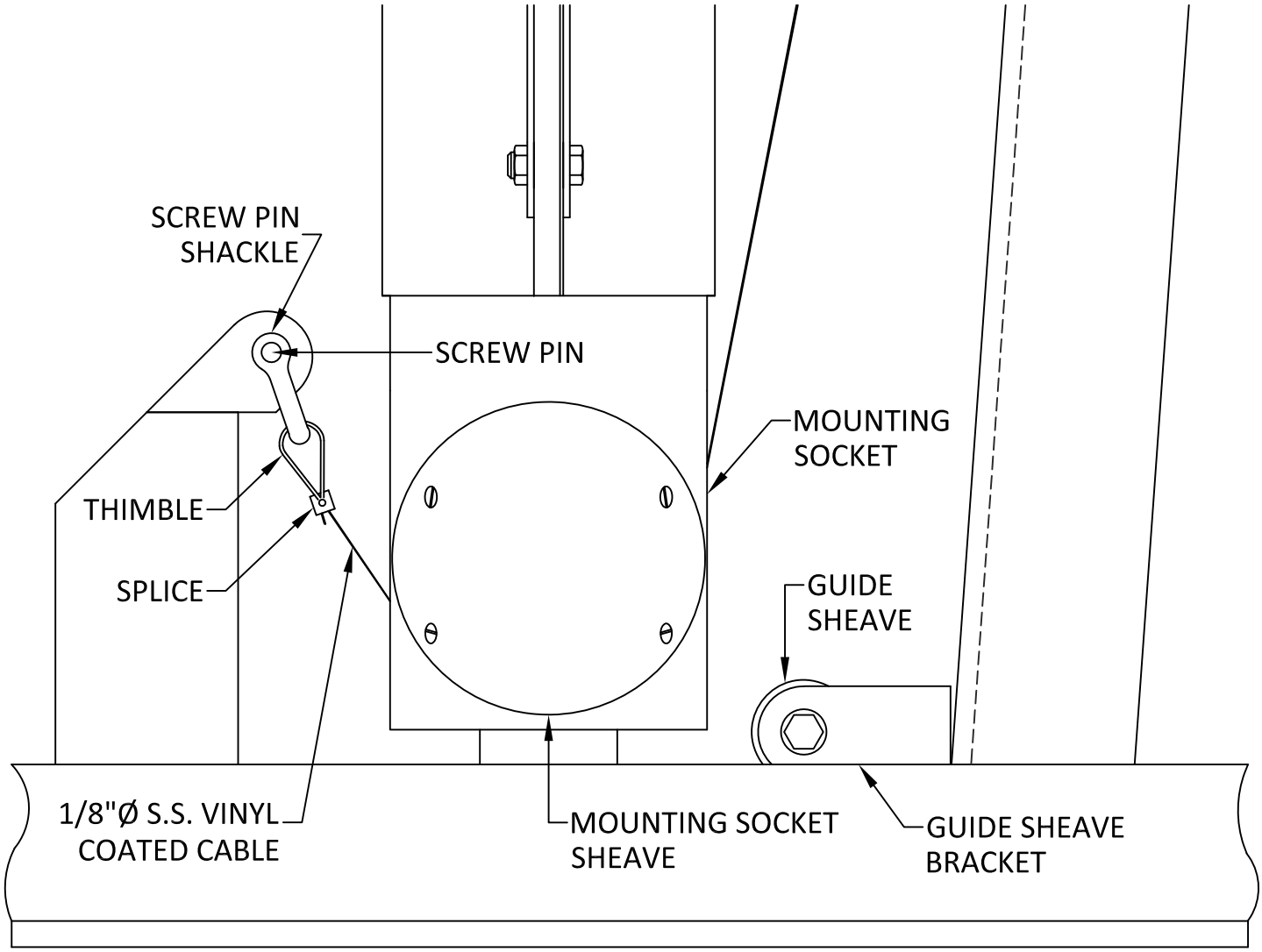


FIGURE 7-1
REPLACING WINCH ROPE
(Ref. Section 7.1.1)

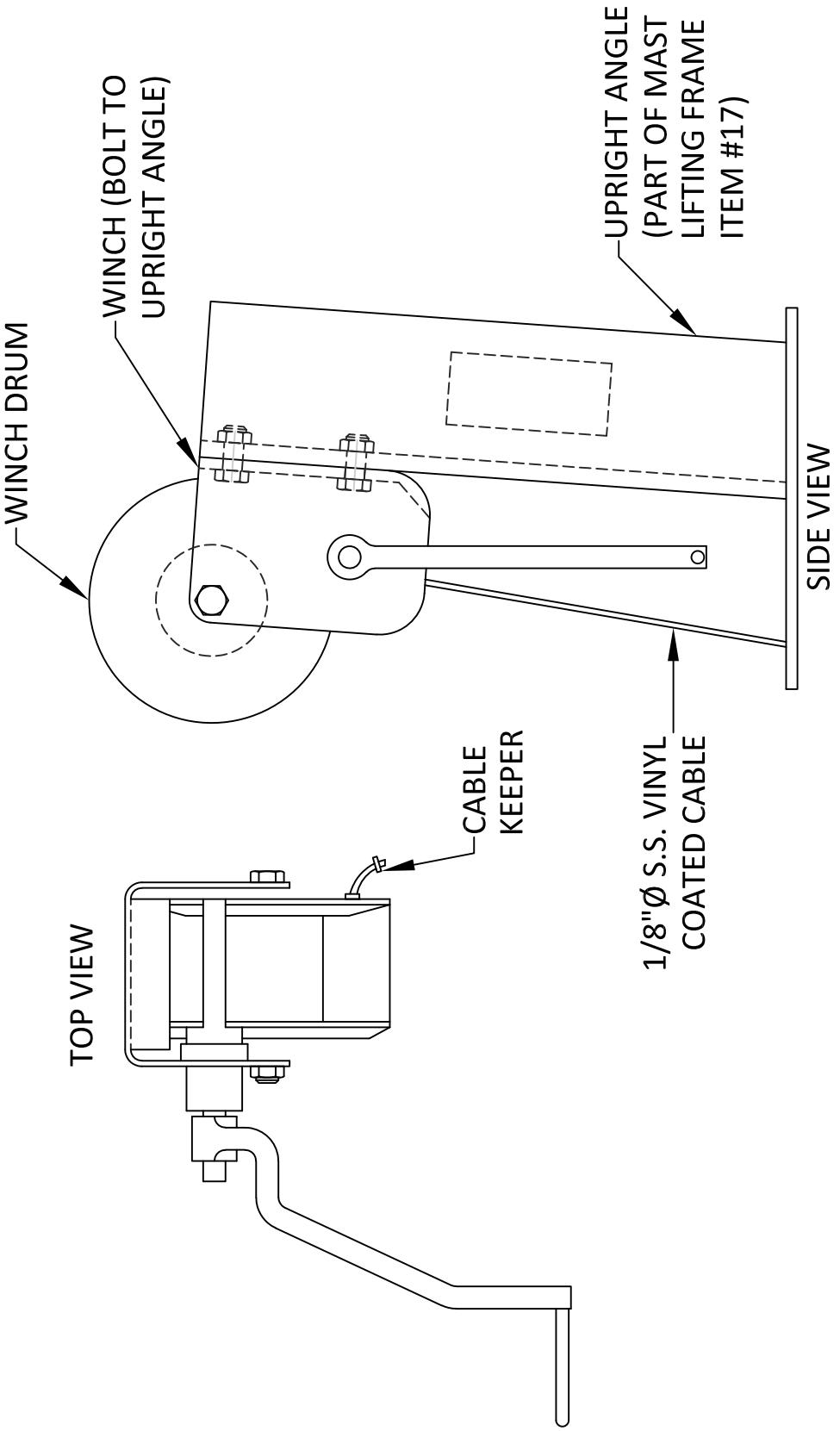


FIGURE 7-2
REPLACING WINCH ROPE
(Ref. Section 7.1.1)

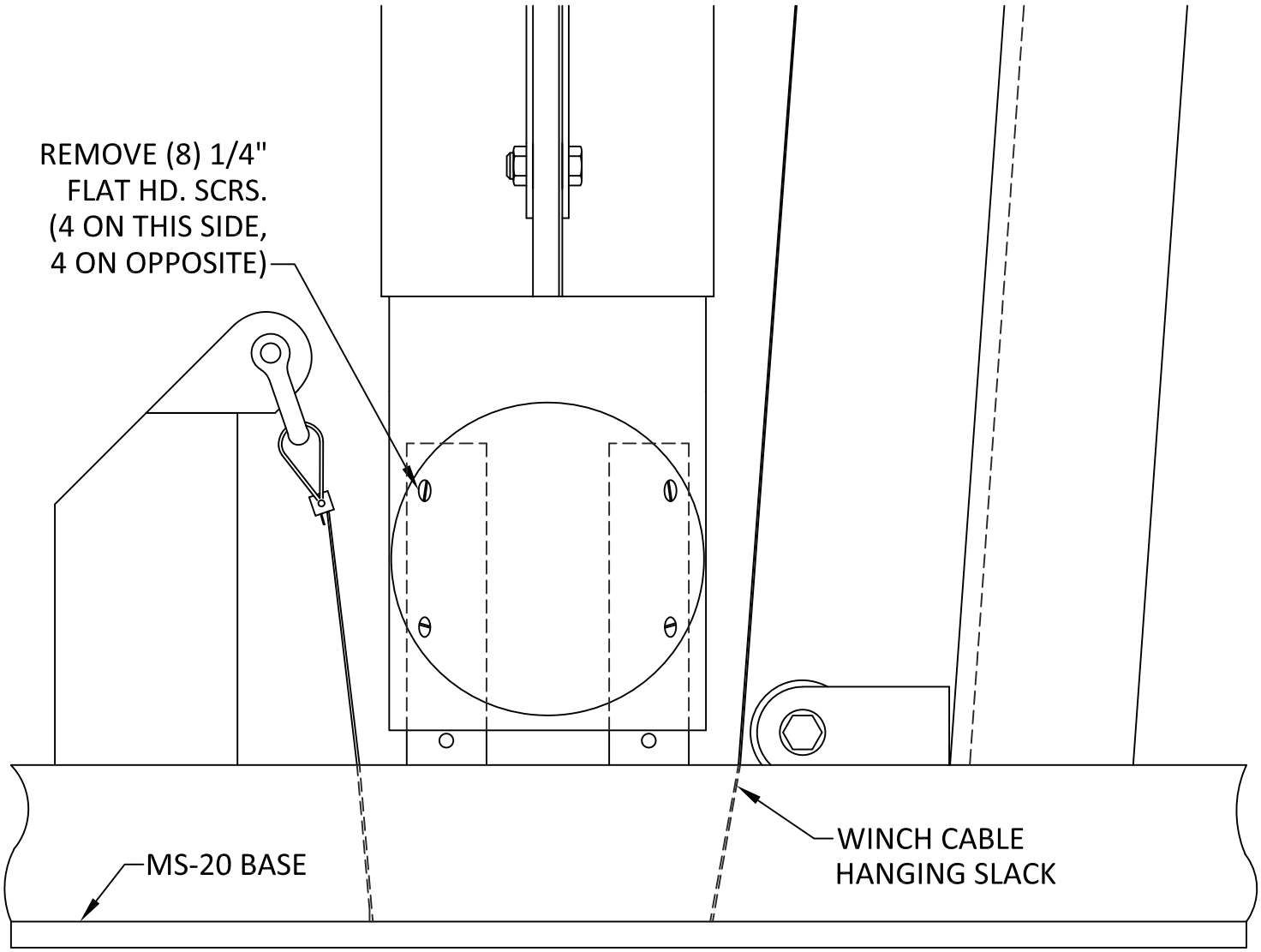


FIGURE 7-3
REPLACING MOUNTING SOCKET SHEAVE ASSEMBLY
(Ref. Section 7.1.2)

Note: $\frac{1}{4}$" Pins used to keep cable in place when raising/lowering mast.

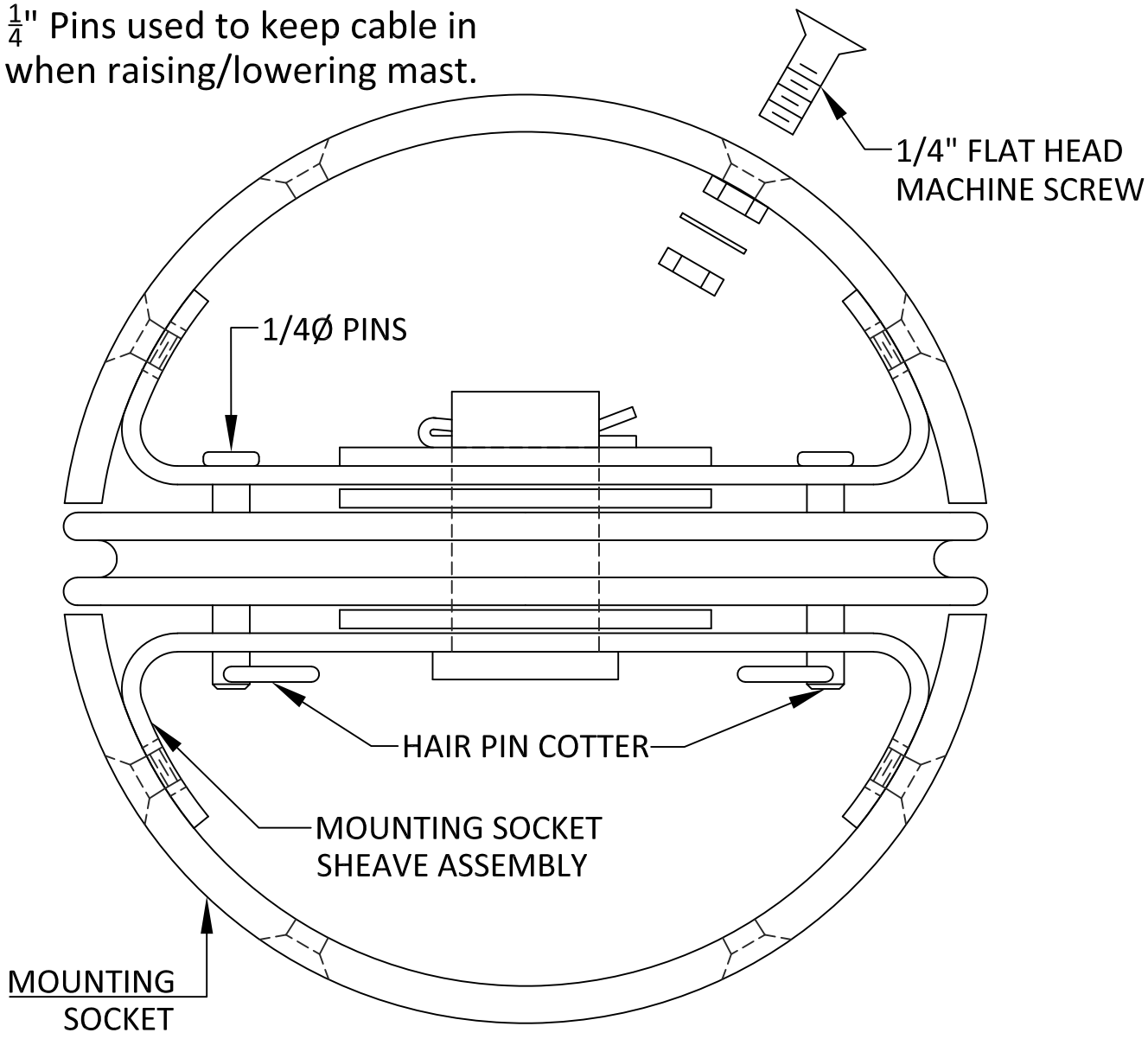


FIGURE 7-4
REPLACING MOUNTING SOCKET ASSEMBLY
(Ref. Section 7.1.2)

7.1.3 **Repair of Rusted Areas on LIR Structure Bases. –** Rusted areas found on LIR structure bases should be repaired, in the field, as soon as weather permits to minimize damage due to rust. Weather suitable to allow repairs must be above 40 degrees and dry. These conditions may be artificially created by providing lean-to type rain protection over the LIR structure base and by applying heat to the repair area with a portable space heater.

Areas to be repaired must first be brushed with a stiff wire brush to remove loose rust and scale. Next, the area must be cleaned with a strong detergent or alkali wash, to remove all dirt, oil and grease. Allow area to dry completely before proceeding further. An application of Zincilate 810C, Galvanize and Metal Primer or equal, should now be applied over the prepared surface. Mix Zincilate thoroughly and brush on as with ordinary paint. Apply uniformly with first coat; do not work over, or disturb coating once it has dried. Allow 4 hours for drying at 70 degrees F and 8 hours at 40 degrees F. Protect from rain and moisture during period.

7.1.4 **Repairs to Painted Surfaces and Superficial Damage to Fiberglass. –** Fiberglass surfaces that have scraped or peeling paint should first be sanded with 100 grit sandpaper to roughen surface and remove loose paint. Fiberglass surfaces that are bruised or scratched past the painted coating, so that fiberglass strands or mats are exposed, should first be sanded with 100 grit sandpaper to roughen the surface and to remove loose paint and fiberglass. Then the area should be finish-sanded with 160 grit sandpaper in order to produce a smooth burr-free surface.

When sanding is completed, all sanded surfaces should be wiped down with MEK (Methyl Ethyl Ketone) or Acetone to remove dust, oil and grease. The surface is now ready for repainting.

The paint to be used is Sherwin Williams High Solids Polane, or equal, Color 23297 per Fed. Std. 595. It is available from Jaquith Industries, Inc. Part No. 90915003 . High Solids Polane is a three component system consisting of the Intermix color, catalyst and reducer. It is mixed in a ratio of 2 parts by volume intermix color, 1 part catalyst and 1 part reducer. The intermix color and catalyst are first thoroughly mixed and then the reducer is added and mixed to provide a thinner consistency. Working pot life is 2 – 3 hours after catalyst is added.

SAFETY PRECAUTION

POLANE catalyst contains Isocyanates. People who have chronic (long-term) lung or breathing problems or have a reaction to Isocyanates must not be in the area where this product is being applied. In spray application where overspray is not totally controlled, air-supplied respirators are recommended to prevent exposure. Where air-supplied respirators are not available, a chemical cartridge/particulate combination respirator, recommended by the respirator manufacturer for protection against isocyanate spray paints, must be used.

High Solids Polane should be applied with paint spraying apparatus if large areas are to be covered. However, if small areas are to be touched up, a brush may be used for applying the paint. When spraying High Solids Polane, apply one wet coat on the area to be covered. This should result in a 1-1/2 to 2 mil, dry film thickness. When brushing on High Solids Polane apply a thin brushed-on coating and avoid build-ups and runs. Drying time for High Solids Polane will vary greatly depending on the temperature and humidity at the time of application. Some approximate estimates at 60% relative humidity are 24 hours at 70 degrees F or 48 hours at 60 degrees F. Heating of painted area with portable space heaters is suggested if rapid drying is desired. At 180 degrees F, drying time is 30 minutes. Do not heat surface above 200 degrees F. The painted area must be kept free of moisture during the drying period.

One coat of High Solids Polane is sufficient to replace paint which has peeled or been scraped off. Two coats of High Solids Polane are required over areas where the fiberglass has been exposed due to a bruise or scratch. If heat has been used to cure the first coat on High Solids Polane, allow the fiberglass to cool before applying a second coat. Do not apply High Solids Polane to a hot surface.

7.1.5 Adjusting LIR Structure to Plumb Position.

MS-20 and MG-20 LIR structures are rigidly connected to their respective bases.They are plumbed by adjusting the nuts on the anchor bolts which secure the base to the concrete pier (MG-20) or support steel tower platform (for MS-20). To adjust these nuts use a 1-1/8" or 1-1/4" open end wrench and loosen the top nuts. Now adjust the bottom nuts up or down to bring the LIR structure to a plumb condition. Use a 15" (min.) precision level to check the LIR structure. Check at least four sides, 90 degrees apart on the 6" I.D. fiberglass tube. LIR structure should be plumb within ¼ degrees which is equivalent to ½" in 10 ft. Now tighten top nuts and re-check with level. (See Fig. 7-5).

MG-30 and MG-40 LIR structures are adjustable on their bases, and can be plumbed by adjusting the turnbuckles on the stabilizer rods. First check the base for levelness. Use a 1 5" (min.) precision level and check base by laying level on the hinged channel member, to check left to right levelness, and by laying level on the tube member, to check front to back levelness. (See Fig. 7-6) If base is not level then adjust by loosening the top nuts on the anchor bolts of the side which requires adjusting. Now adjust up or down by turning the bottom nuts. When proper adjustment has been reached, tighten the top nuts (See Fig. 7-7) and recheck with level. Check plumbness of 6" I.D. tube by taking readings with level on four sides approximately 90 degrees apart. LIR structure should be plumb within ¼ degree which is equivalent to ½" in 10 feet. If further adjustment is required to plumb the LIR structure, then the turnbuckles on the stabilizer rods must be used. Using a 1-1/8" open end wrench turn the ¾" nut under the stand plate one full turn in a clockwise direction. (See fig. 7-8) This takes most of the tension off of the stabilizer rods and turnbuckles to be more easily adjusted. Now, determine which turnbuckle(s) must be tightened to bring the 6" I.D. fiberglass tube into a plum condition. Loosen the turnbuckle(s), opposite the one(s) that have to be tightened, by a maximum of ½ turn, Now tighten the appropriate turnbuckle(s) until stabilizer rods are

taut, to bring the 6” I.D. fiberglass tube closer to a plumb condition. Recheck with level and repeat adjusting procedure if required. LIR structure should be plumb within ¼ degree which is equivalent to ½” in 10 feet. When a plumb condition within tolerance is reached, turn the 3/4"’ nut under the stand plate by one full turn in a counterclockwise direction to put full tension back in the stabilizer rods. Recheck plumbness with the level.

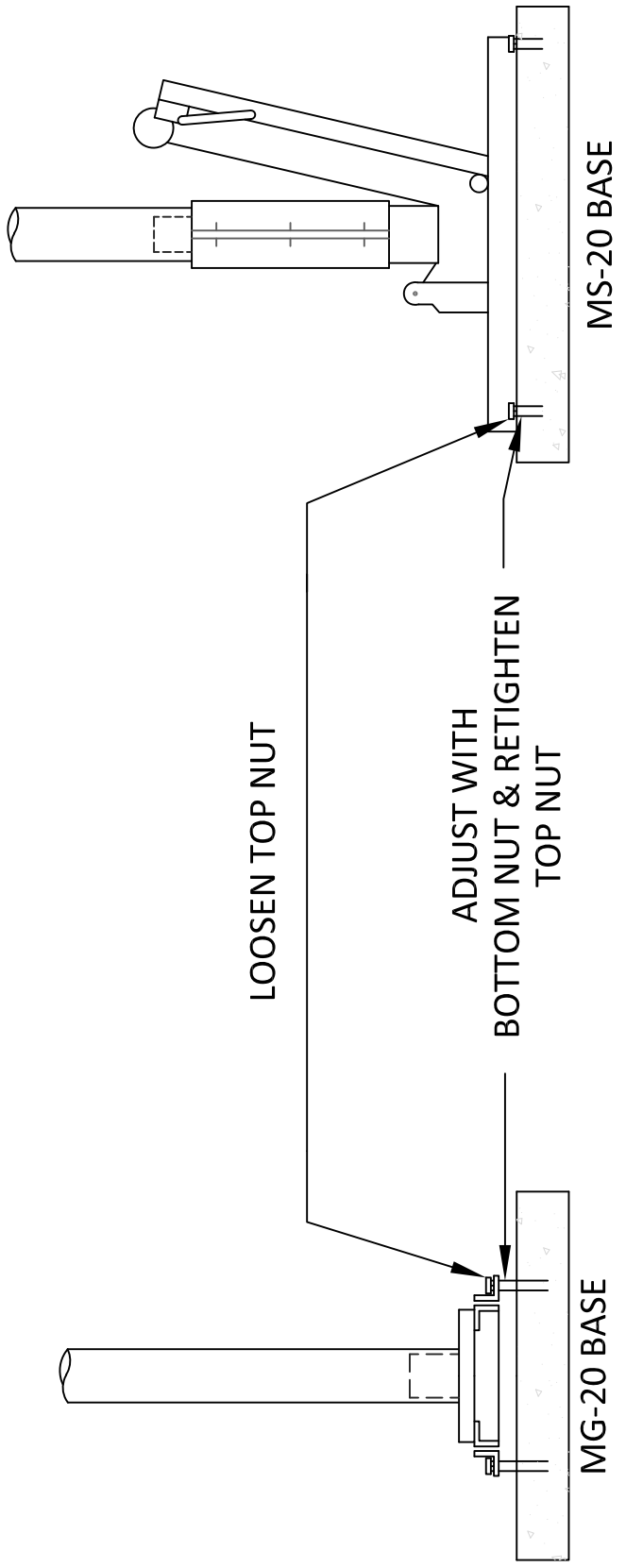


FIGURE 7-5
ADJUSTING MG-20 & MS-20 BASES TO PLUMB STRUCTURE
(Ref. Section 7.1.5)

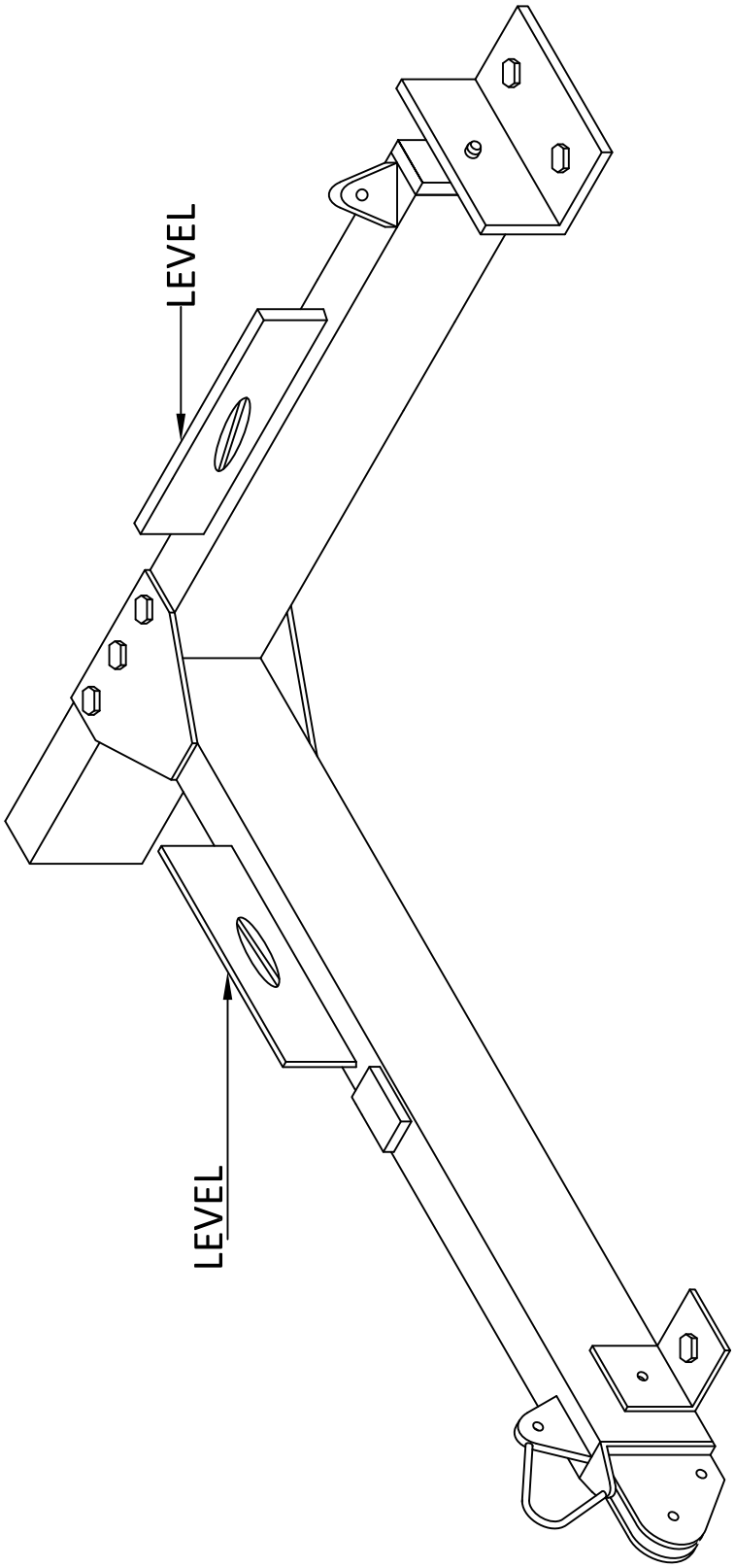


FIGURE 7-6
ADJUSTING MG-30/40 BASE TO LEVEL POSITION
(Ref. Section 7.1.5)

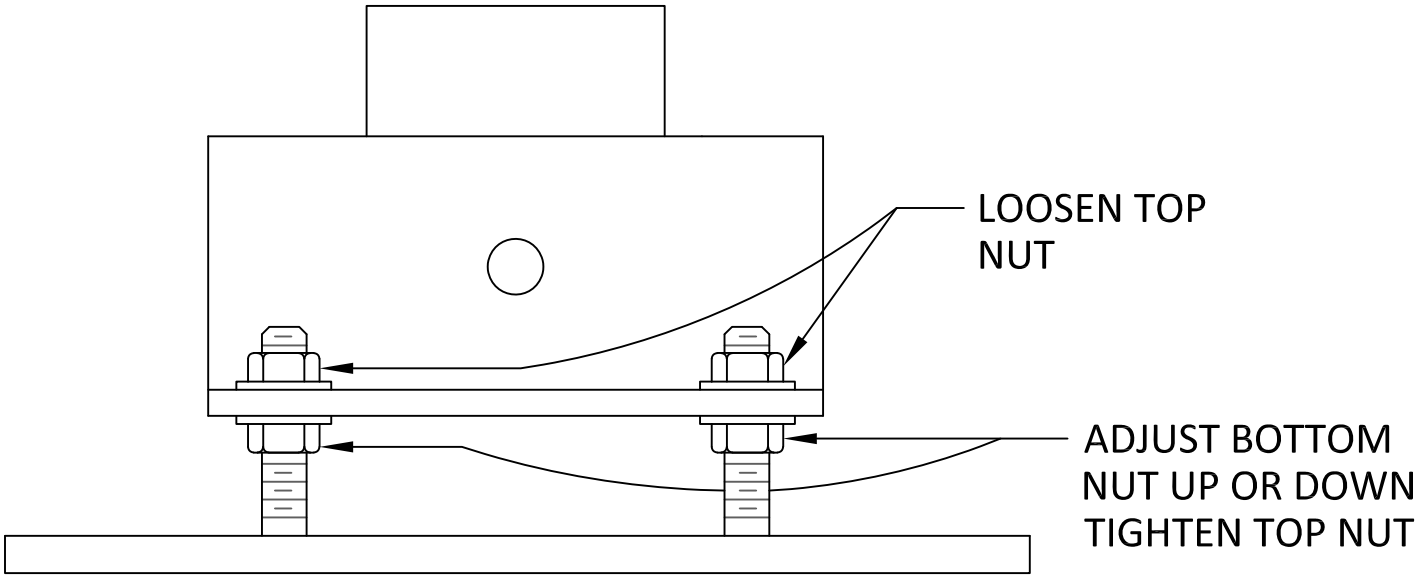


FIGURE 7-7
ADJUSTING BASE FOR MG-30/40 STRUCTURE
(Ref. Section 7.1.5)

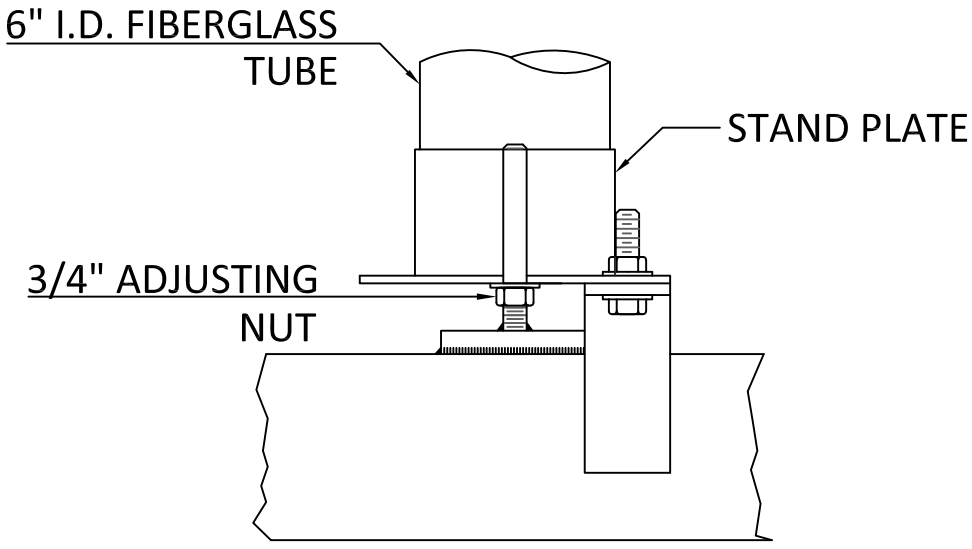


FIGURE 7-8
ADJUSTING TENSION ON STABILIZER RODS
(Ref. Section 7.1.5)

SECTION 8. PARTS LIST

8.1 PARTS LISTS & ITEM SKETCHES:

8.1.1 Scope. – Figures 8-1 through 8-17 provide dimensional sketches of items 2 through 18 along with an individual parts list for each item. These standard structural parts (Item 2 through 18) are also listed in Table 1-1.

8.1.2 Arrangement. – The parts lists included with Figure 8-1 through 8-17 contain a list of parts that are included with each item. The Ref. Des. (Reference Designation) refers to a letter identifying the part on the adjacent sketch unless it is a piece of hardware, in which case it may not be identified on the sketch. The Quantity column lists the number of each part required for that particular item. The Description and Material columns provide the general terminology for each part and the substance which makes up the majority of the part. The Jaquith Pt. No. column lists the identifying number to be used when ordering parts through Jaquith Industries, Inc. These Jaquith Part Numbers are given only to parts which, it has been determined, would commonly be ordered as replacements and would not be readily available through local sources. Table 8-1 lists these commonly ordered parts.

8.2 MAINTENANCE MATERIALS LIST & REPLACEMENT ASSEMBLIESS LIST:

8.2.1 Scope. – Table 8-2 lists several materials needed for corrective maintenance of LIR structures and several replacement assemblies that may be ordered through Jaquith Industries, Inc

8.2.2 Arrangement. – The Ref. Des. (Reference Designation) column refers to the section, in this instruction book, where use of the material or replacement of the assembly is explained. The description and the Jaquith part number are required when ordering from Jaquith Industries, Inc.

PARTS LIST			
Jaquith Pt. #	DESCRIPTION	Ref. Figure	NOTES
60531365	Weather Proof Plug	8-1; 8-2; 8-3	
60901299	Cable Tie, 4"	8-4	
4585	Clamp, Horizontal Stabilizer	8-8; 8-9	
60881286	Pipe Plug, 1/2" NPT	8-4	
4567	Clamp, Tube Cap	8-4	
60901268	Hold-down pin	8-14	

TABLE 8-1
COMMON REPLACEMENT PARTS LIST
(Ref. Section 8.1)

PARTS LIST			
Ref. Des.	DESCRIPTION	Jaquith Pt. #	
7.1.1	Zincilate, 1 Qt. Can (1 yr. shelf life)		AVAILABLE LOCALLY
7.1.2	Paint Kit, (1 gal. mxd)	L5010	

TABLE 8-2
MAINTENANCE MATERIALS LIST
(Ref. Section 8.2)

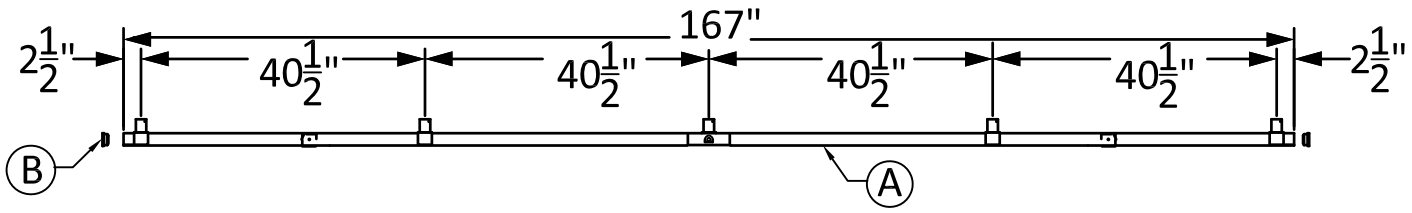


FIGURE 8-1

ITEM 1 T-5 TEE BAR ASSEMBLY NSN 5445-01-079-3885-1

PARTS LIST - JAQUITH L3885					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	T-5 Tee Bar W/ Lamp Sockets Attached	Fiberglass	4597	
B	2	Weather Proof Plug	Neoprene	60531365	
C	10	1/4-20 x 3/4 Hex Sec. Set Screw, Cup Pt.	SS	60671264	

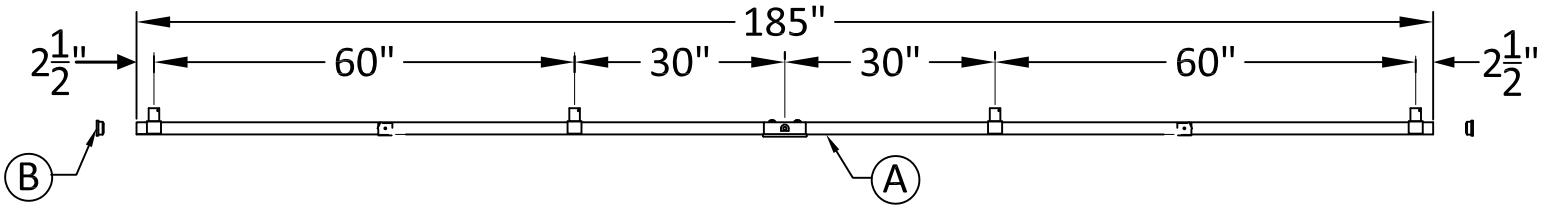


FIGURE 8-2

ITEM 2 T-4 TEE BAR ASSEMBLY NSN 5445-01-079-3886-1

PARTS LIST - JAQUITH L3886					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	T-4 Tee Bar W/ Lamp Sockets Attached	Fiberglass	4598	
B	2	Weather Proof Plug	Neoprene	60531365	
C	8	1/4-20 x 3/4 Hex Sec. Set Screw, Cup Pt.	SS	60671264	

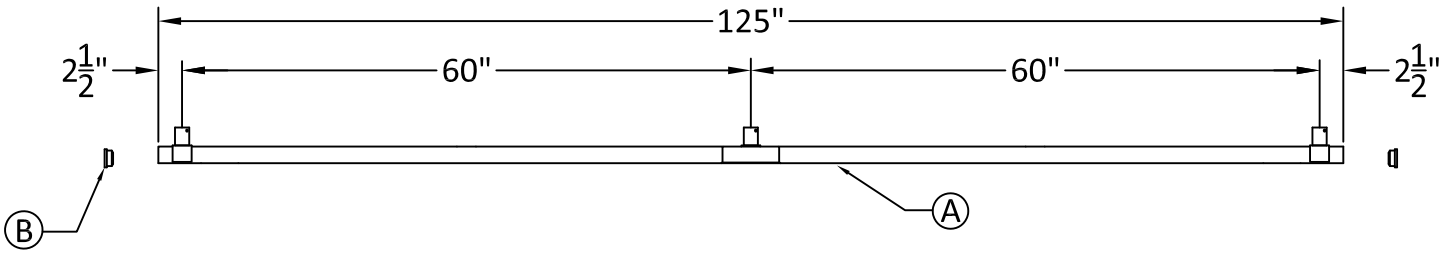


FIGURE 8-3

ITEM 3 T-3 TEE BAR ASSEMBLY NSN 5445-01-079-9155-1

PARTS LIST - JAQUITH L9155					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	T-3 Tee Bar W/ Lamp Sockets Attached	Fiberglass	4599	
B	2	Weather Proof Plug	Neoprene	60531365	
C	6	1/4-20 x 3/4 Hex Sec. Set Screw, Cup Pt.	SS	60671264	

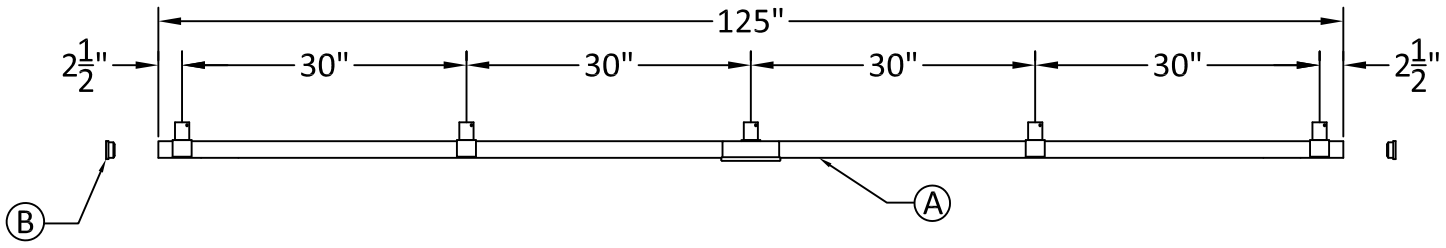


FIGURE 8-4

ITEM 4 T-M TEE BAR ASSEMBLY NSN 5445-01-079-9154-1

PARTS LIST - JAQUITH L9154					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	T-M Tee Bar W/ Lamp Sockets Attached	Fiberglass	4600	
B	2	Weather Proof Plug	Neoprene	60531365	
C	10	1/4-20 x 3/4 Hex Sec. Set Screw, Cup Pt.	SS	60671264	

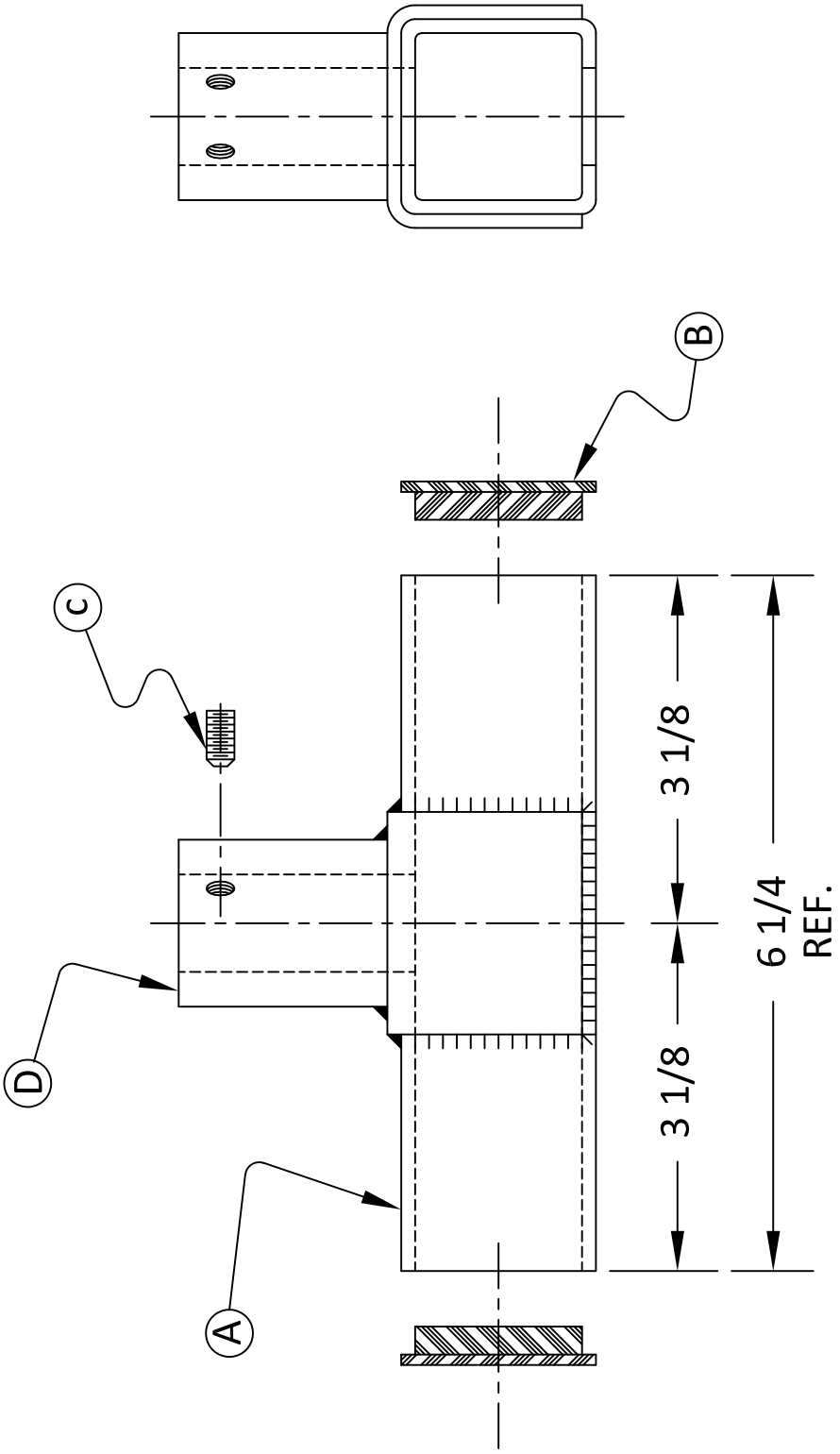


FIGURE 8-5

ITEM 5 T-1 TEE BAR ASSEMBLY

PARTS LIST - JAQUITH L1001

Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	T-1 TEE BAR	Fiberglass	4672	
B	2	WEATHER PROOF PLUG	Neoprene	60531365	
C	2	1/4-20 x 3/4 Hex Sec. Set Screw, Cup Pt.	SS	60671264	
D	1	LAMP SUPPORT	Fiberglass	4576	

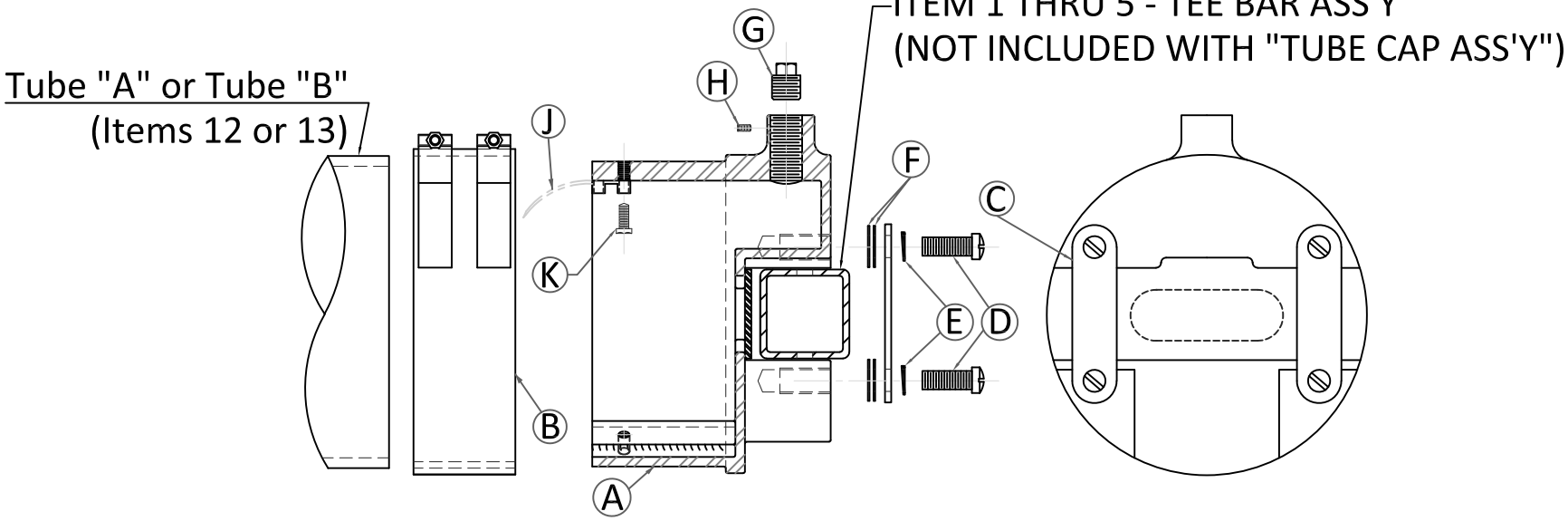


FIGURE 8-6

ITEM 6 TUBE CAP ASSEMBLY NSN-5445-01-079-7557-1

PARTS LIST JAQUITH L7557					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	Tube Cap	Aluminum	4565	
B	1	Clamp	S.S.	4567	
C	2	Hold Down Plate	Aluminum	4566	
D	4	3/8-16 x 1 Fillister Head Screw	S.S.	60671396	
E	4	Lockwasher 3/8	S.S.	20680110	
F	8	Flat Washer, SAE 3/8	Aluminum	60681484	
G	1	Pipe Plug 1/2 NPT	Plastic	60881286	
H	1	Set Screw Soc. HD 1/4-20 x 1/2 LG	S.S.	60671421	
J	3	Cable Tie 4"	Nylon	60901299	
K	3	Scr. #10-24 x 1/2 Lg. Slotted Hex Hd.	S.S.	60671460	

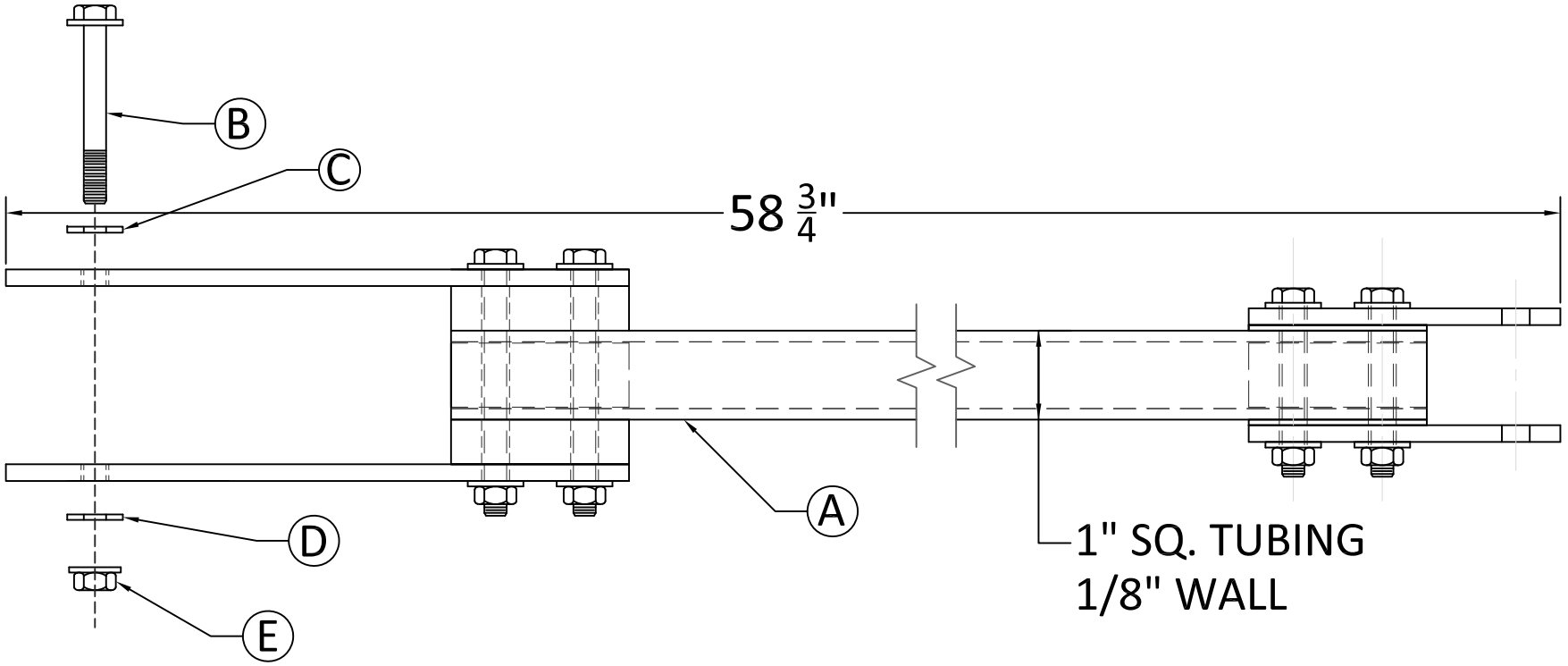
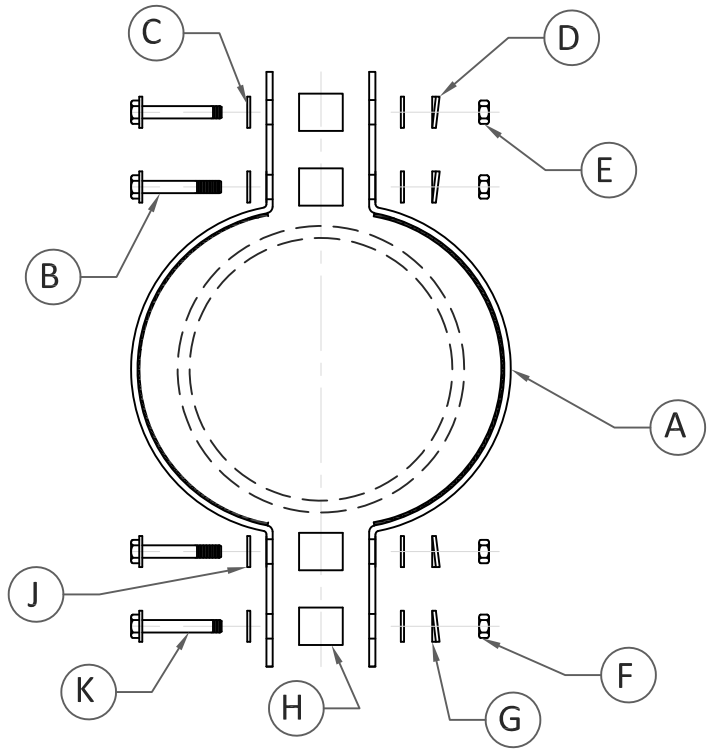


FIGURE 8-7

ITEM 7 TEE BRACE NSN 5445-01-079-9153-1

[NOTE: (2) REQUIRED WITH EACH ITEM 1 THRU 4 - TEE BAR ASS'Y]

PARTS LIST JAQUITH L9153					
Ref. Des.	Quantity	DESCRIPTION	MAT'L	Jaquith Pt #	NOTES
A	1	Tee-Brace Assembly	Fiberglass	4601	
B	1	Hex Hd. Bolt 1/4-20 x 3" Long	Aluminum	60641394	
C	1	Flat Washer 1/4"	Aluminum	60681430	
D	1	Lock Washer 1/4"	Aluminum	60681395	
E	1	Hex Nut 1/4-20	Aluminum	60681259	



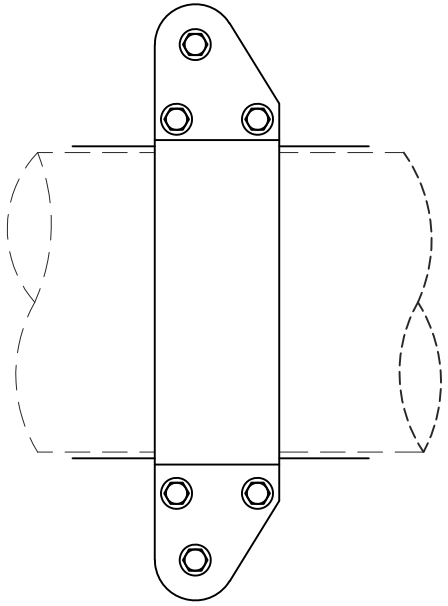


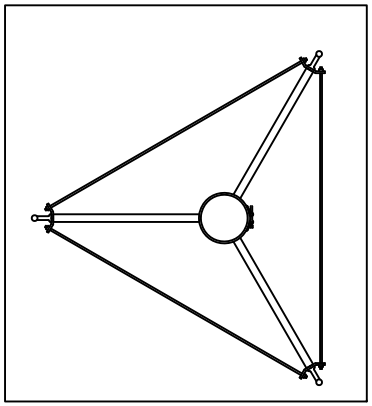
FIGURE 8-8

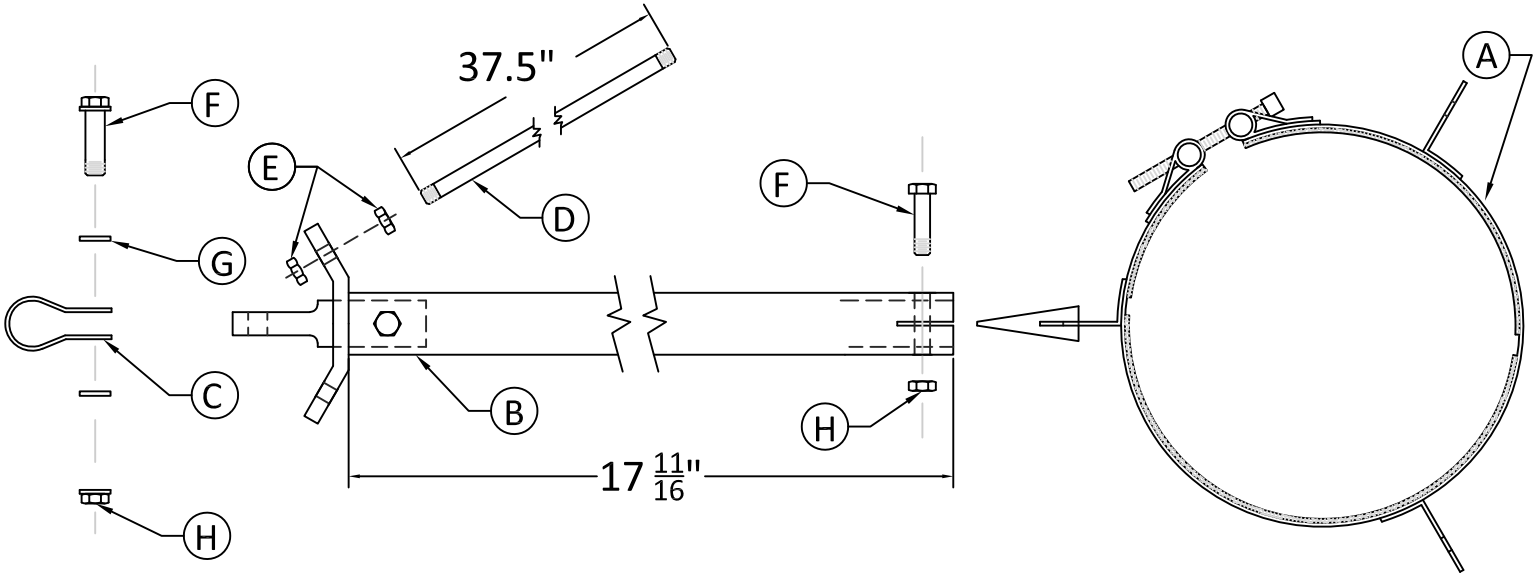
ITEM 8 TEE BRACE CLAMP NSN-5445-01-079-9152-1

[NOTE: (1) REQUIRED WITH EACH ITEM 1 THRU 4 - TEE BAR ASS'Y]

PARTS LIST JAQUITH L9152					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	2	Clamp W/ Liner	Aluminum	4568	
B	4	Hex Hd. Bolt 1/4-20 x 2" Long	S.S.	10650999	HARDWARE PACKUP PART # 4647
C	8	Flat Washer 1/4"	S.S.	10680992	
D	4	Lockwasher 1/4"	S.S.	20681023	
E	4	Hex Nut 1/4-20	S.S.	20681022	
F	2	Hex Nut 1/4-20	Aluminum	60681259	
G	2	Lockwasher 1/4"	Aluminum	60681395	
H	6	Spacer	Aluminum	4570	
J	4	Flat Washer 1/4"	Aluminum	60681430	
K	2	Hex Hd. Bolt 1/4-20 x 2" Long	Aluminum	60641393	

FIGURE 8-9

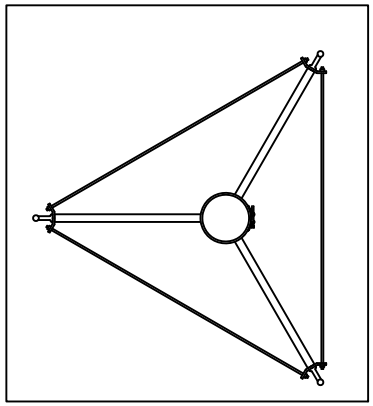


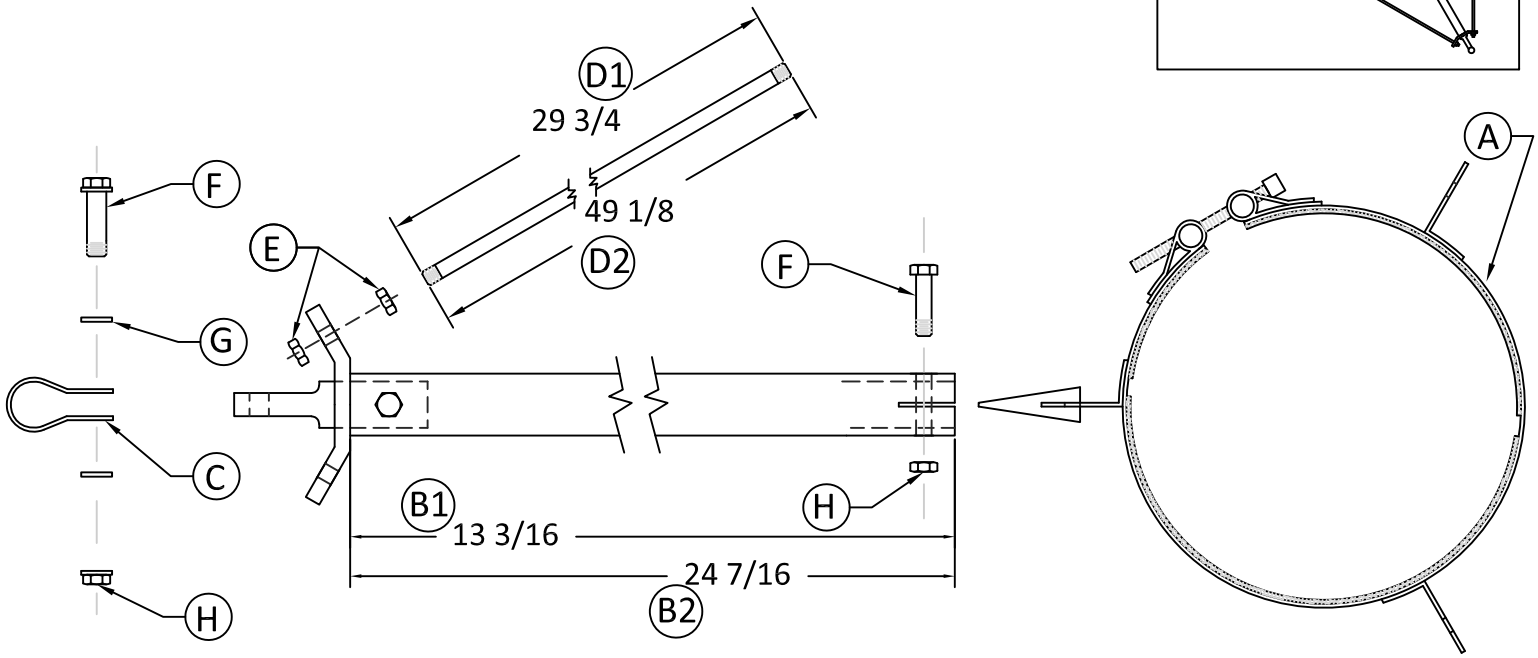


ITEM 9 HORIZONTAL STABILIZER MG-30 NSN 5445-01-079-9151-1

PARTS LIST JAQUITH L9151					
Ref. Des.	Quantity	DESCRIPTION	MAT'L	Jaquith Pt #	NOTES
A	1	Clamp	S.S.	4585	
B	3	Horizontal Stabilizer Tube x 17-11/16	Aluminum	4578	
C	3	Clamp	S.S.	4583	INCLUDED IN PACKUP
D	3	Aluminum Rod 1/4 Dia. X 37-1/2"	Aluminum	4582	
E	6	Hex Nut 1/4-20	Aluminum	60681259	HARDWARE PACKUP PART # 4648
F	3	Hex Head Bolt 1/4-20 x 1-1/4"	Aluminum	60641433	
G	6	Flat Washer 1/4	Aluminum	60681430	
H	6	Locknut 1/4-20	Aluminum	60681432	

FIGURE 8-10





ITEM 10 HORIZONTAL STABILIZER MG-40 NSN-5445-01-080-3039-1

PARTS LIST JAQUITH L3039					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	2	Clamp	S.S.	4585	
B1	3	Horizontal Stabilizer Tube x 13-1/6		4586	
B2	3	Horizontal Stabilizer Tube x 24-7/16		4587	
C	6	Clamp	S.S.	4583	
D1	3	Aluminum Rod 1/4 x 29-3/4"		4588	
D2	3	Aluminum Rod 1/4 x 49-1/8"		4589	
E	12	Hex Nut 1/4-20	Aluminum	60681259	
F	6	Hex Head Bolt 1/4-20 x 1-1/4"	Aluminum	60641433	
G	12	Flat Washer 1/4"	Aluminum	60681430	
H	12	Locknut 1/4-20	Aluminum	60681432	

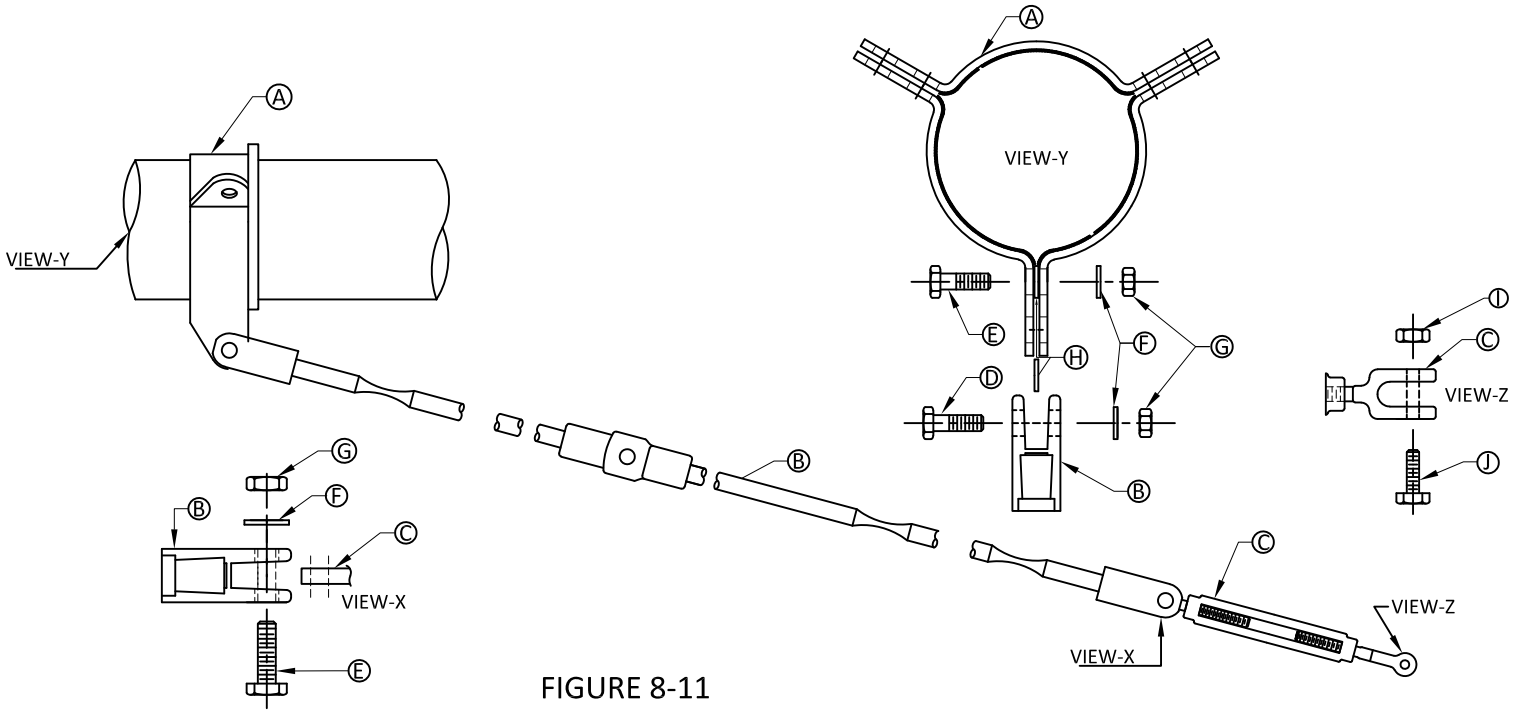


FIGURE 8-11

ITEM 11 STABILIZER ROD ASSEMBLY MG-30 & MG-40 NSN 5445-01-080-5144-1

PARTS LIST JAQUITH L5144					
Ref. Des.	Quantity	DESCRIPTION	MAT'L	Jaquith Pt #	NOTES
A	3	Anchor Support	Aluminum	4571	
B	3	Stabilizer Rod 14'3"	Fiberglass	4637	
C	3	Jaw and Eye Turnbuckle	Steel	60901302	
D	3	Hex Head Bolt 5/8-11 x 2-1/2" Long	S.S.	60651422	HARDWARE PACKUP PART # 4638
E	6	Hex Head Bolt 5/8-11 x 2" Long	S.S.	60651423	
F	9	Lockwasher 5/8"	S.S.	60681424	
G	9	Locknut 5/8-11	S.S.	60691409	
H	6	Flat Washer 5/8 x 1/8 thk.	S.S.	60681261	
I	3	Locknut 3/8"	S.S.	60681413	
J	3	Hex Head Bolt 3/8-16 x 1-1/2	S.S.	10651875	

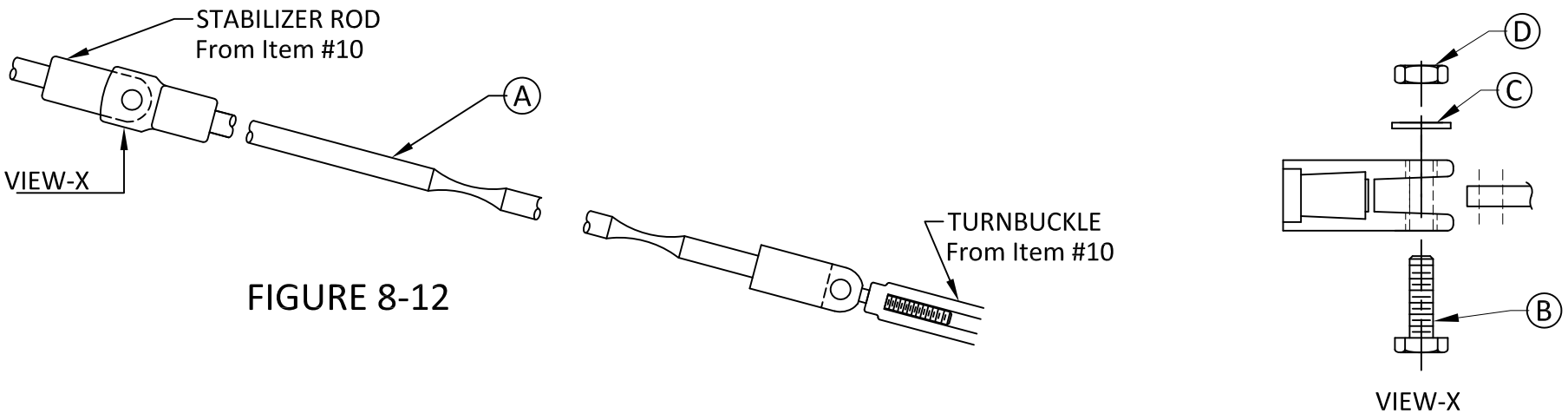


FIGURE 8-12

ITEM 12 STABILIZER ROD ASSEMBLY MG-40 ONLY NSN-5445-01-108-4919-1

PARTS LIST JAQUITH L4919					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Part #	NOTES
A	3	Stabilizer Rod 9'10"	Fiberglass	4639	
B	3	Hex Head Bolt 5/8-11 x 2.5" Long	S.S.	60651422	
C	3	Lockwasher 5/8"	S.S.	60681424	
D	3	Locknut 5/8-11	S.S.	60681409	

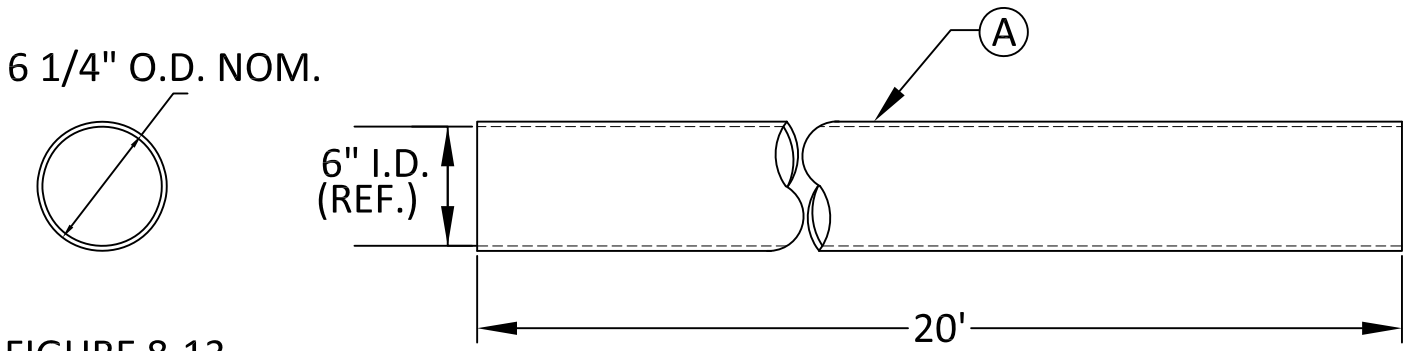


FIGURE 8-13

ITEM 13 TUBE "A" X 20 Ft. NSN-5445-01-079-9135-1

PARTS LIST JAQUITH L9135					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Part #	NOTES
A	1	Tube "A" x 20 Ft.	Fiberglass	L9135	

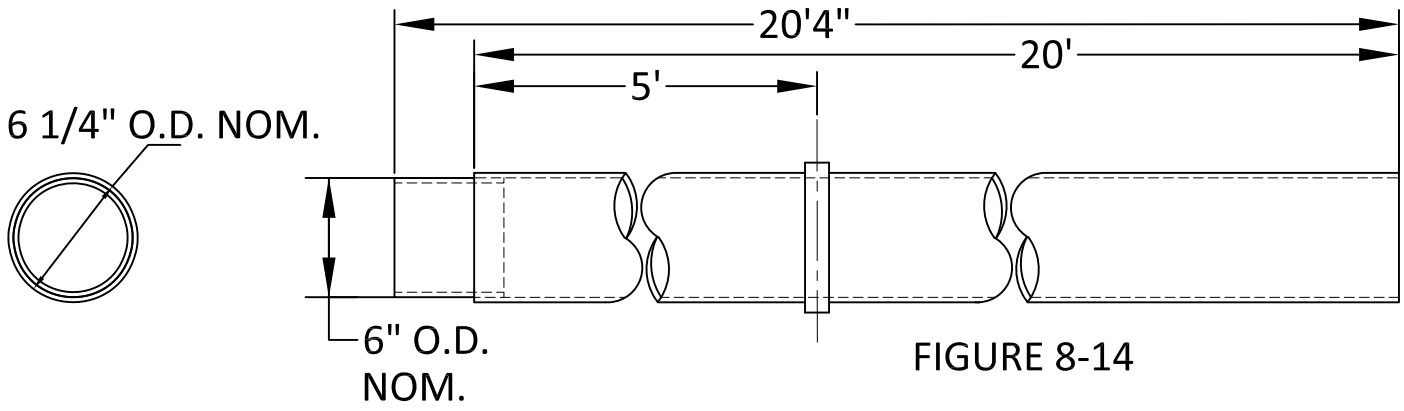
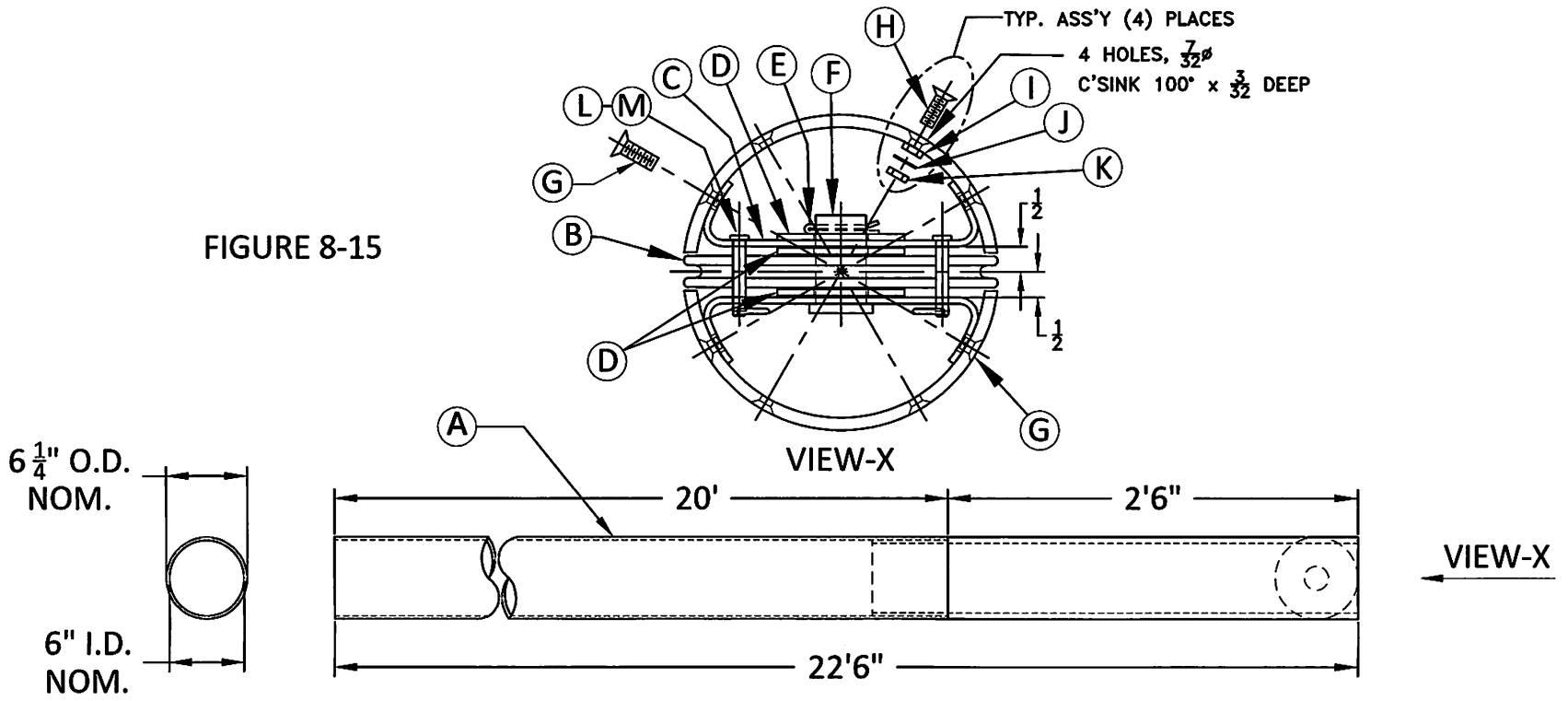


FIGURE 8-14

ITEM 14 TUBE "B" X 20 Ft. BONDED TO TUBE SPLICE NSN-5445-01-079-9148-1

PARTS LIST JAQUITH 9148					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Part #	NOTES
A	1	Tube "B" x 20' Bonded to Tube Splice	Fiberglass	L9148	

FIGURE 8-15



ITEM 15 TUBE "A" X 20 FT. BONDED TO MOUNTING SOCKET ASSEMBLY NSN-5445-01-079-9134-1

PARTS LIST JAQUITH L9134					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaqutith Part #	NOTES
A	1	Tube "A" x 20' Bonded to Mntg. Soc. Assembly	Fiberglass/Aluminum	L9134	
B	1	Sheave 6-1/4 O.D. x 5/8	Aluminum	4562	HARDWARE PACK PART # 4616
C	2	Bent Plt. 1/8 x 4 5/8 x 7-3/4	Aluminum	4564	
D	3	Spacer 1/8 x 1-1/16 I.D.	S.S.	4593	
E	1	Cotter Pin 5/32 x 2"	S.S.	60671461	
F	1	Axle Pin 1" Dia. x 1-3/8 Grip	S.S.	4563	
G	8	Flat Head Screw 1/4-20 x 3/4	S.S.	60671466	
H	4	Flat Head Mach. Screw #10 - 24 x 3/4	S.S.	60644060	
I	4	Cable Tie	Nylon	60901299	
J	4	Flat Washer #10	S.S.	60684061	
K	4	Hex Nut #10-24	S.S.	60684062	
L	2	Clevis Pin 1/4" Dia. x 1 1/2" LG	S.S.	60671780	
M	2	Hairpin Cotter .059" Dia. X 1 1/8" LG	S.S.	60672762	

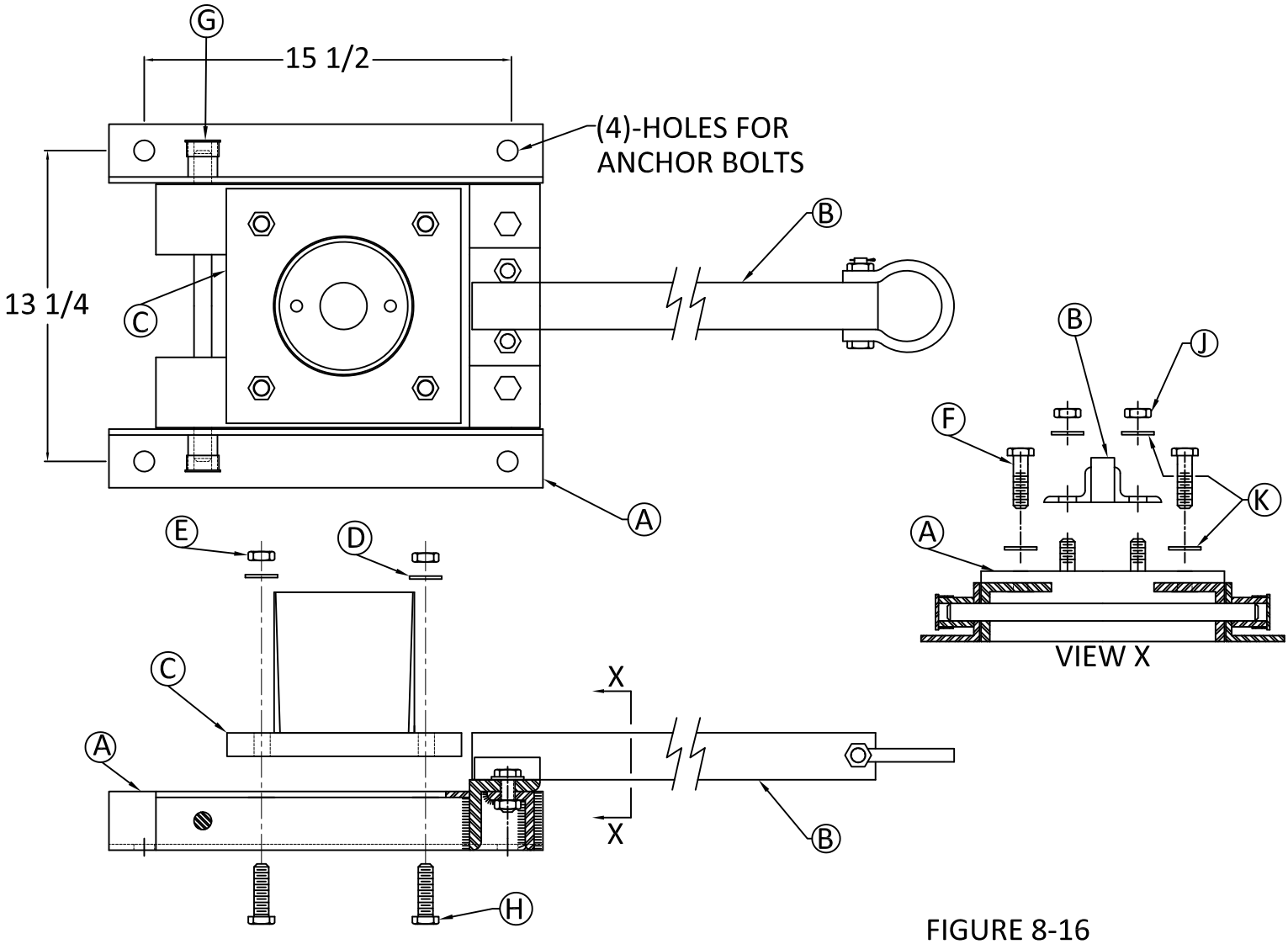


FIGURE 8-16

ITEM 16 MG-20 MOUNTING STAND ASSEMBLY NSN-5445-01-080-2763-1

PARTS LIST JAQUITH L2763					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaqutith Part #	NOTES
A	1	Mounting Stand	Gal. Stl.	4501	
B	1	Base Lifting Bar	Gal. Stl.	4541	
C	1	Stand Plate	Gal. Stl.	4511	
D	4	Flat Washer 5/8	S.S.	60681261	
E	4	Deformed Locknut 5/8-11	S.S.	60681409	
F	2	Hex Head Bolt 5/8-11 x 1-3/4	S.S.	60651467	
G	2	Hinge End Cap	Plastic	60881527	
H	4	Hex Head Bolt 5/8-11 x 2-1/4	S.S.	60651263	
J	2	Hex Nut 5/8-11	S.S.	60681260	
K	4	Lockwasher 5/8	S.S.	60681424	

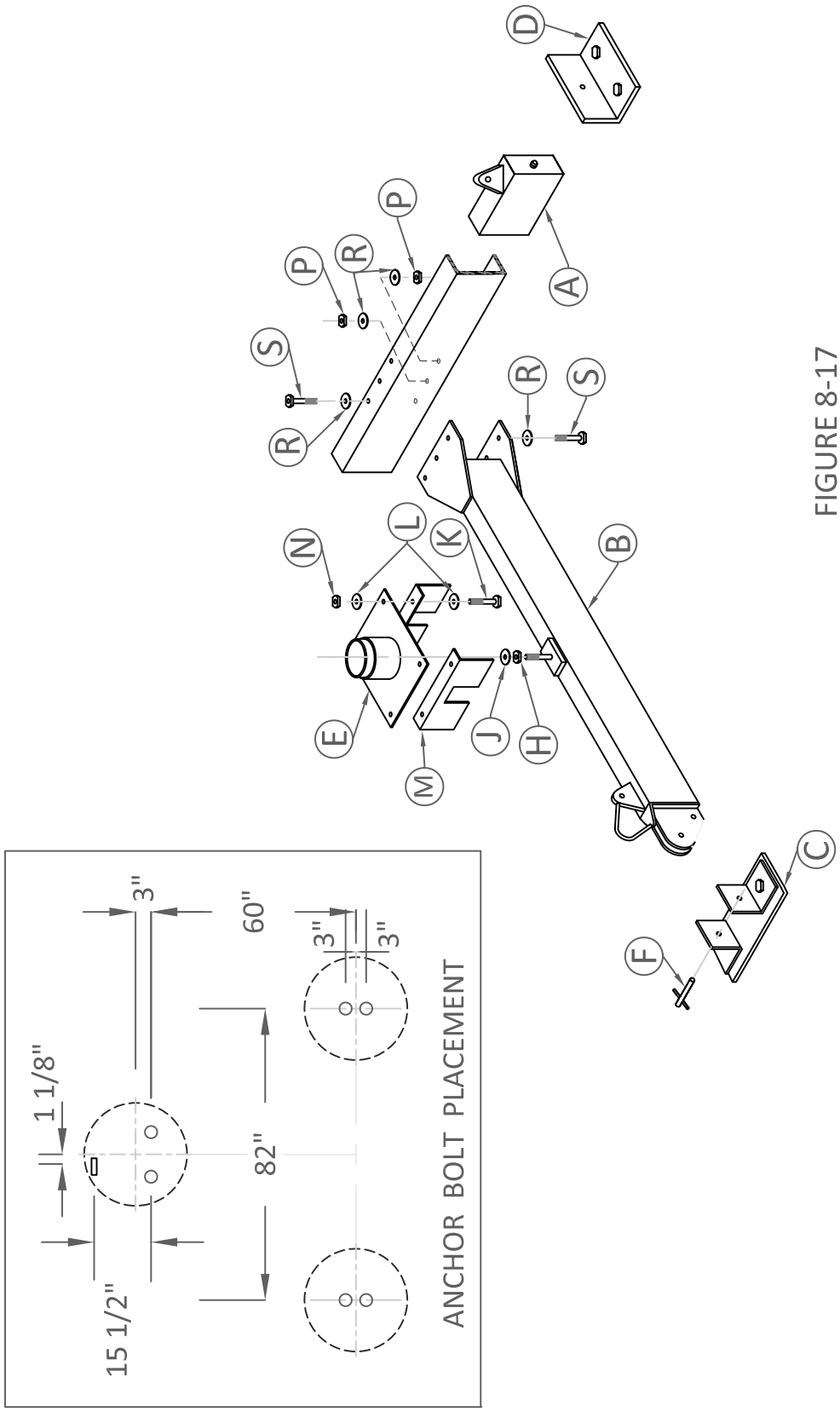
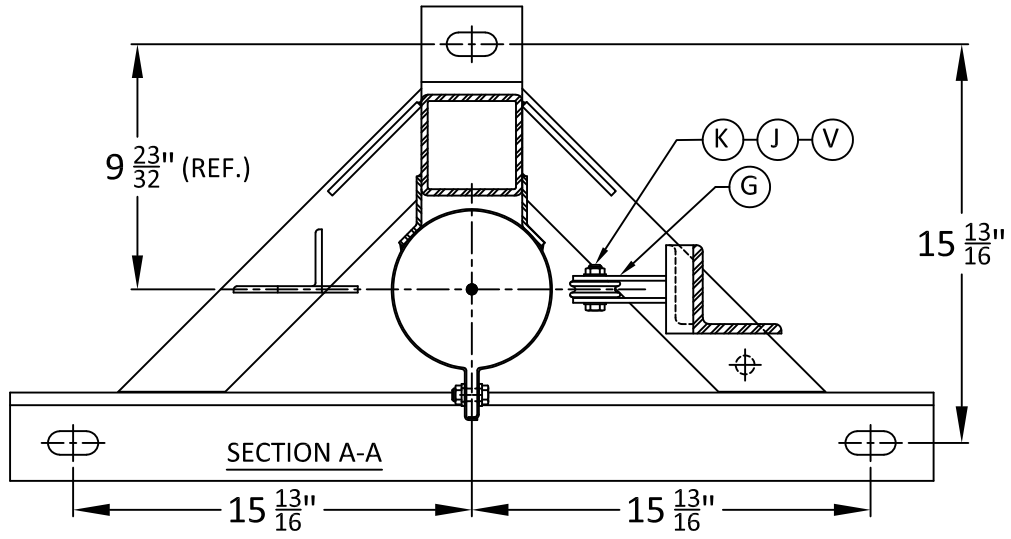

ANCHOR BOLT PLACEMENT
3"
60"
3"
3"
1 1/8"
82"
15 1/2"
A
B
C
D
E
F
H
J
K
L
M
N
P
P
R
R
R
S
S

FIGURE 8-17

ITEM 16 MG-30/MG-40 MOUNTING FRAME ASSEMBLY NSN-5445-01-080-2762-1

PARTS LIST - JAQUITH L2762					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaqutith Part #	NOTES
A	1	Hinge Plate Channel	Gal. Stl.	4539	
B	1	Tube Plate	Gal. Stl.	4540	
C	1	Guide Plate	Gal. Stl.	4537	
D	2	Hinge Angle Mounting Frame	Gal. Stl.	4519	
E	1	Stand Plate	Gal. Stl.	4524	
F	1	Hold Down Pin	S.S.	60901268	HARDWARE PACK PART # 4651
G		NOT USED			
H	1	Hex Nut 3/4-16	S.S.	60681411	
J	1	Flat Washer 3/4	S.S.	60681425	
K	2	Hex. Head Bolt 5/8-11 x 2-1/4	S.S.	60651263	
L	4	Flat Washer 5/8	S.S.	60681261	
M	2	Angle Base Mounting Frame	Gal. Stl.	4532	
N	2	Deformed Locknut 5/8-11	S.S.	60681409	HARDWARE PACK PART # 4651
P	6	Deformed Locknut 3/8-16	S.S.	60681413	
R	12	Flat Washer 3/8	S.S.	20681034	
S	6	Hex Head Bolt 3/8-16 x 1-1/2	S.S.	10650205	

FIGURE 8-16 (CONTINUED)


9 23/32" (REF.)
K
J
V
G
15 13/16"
SECTION A-A
15 13/16"
15 13/16"

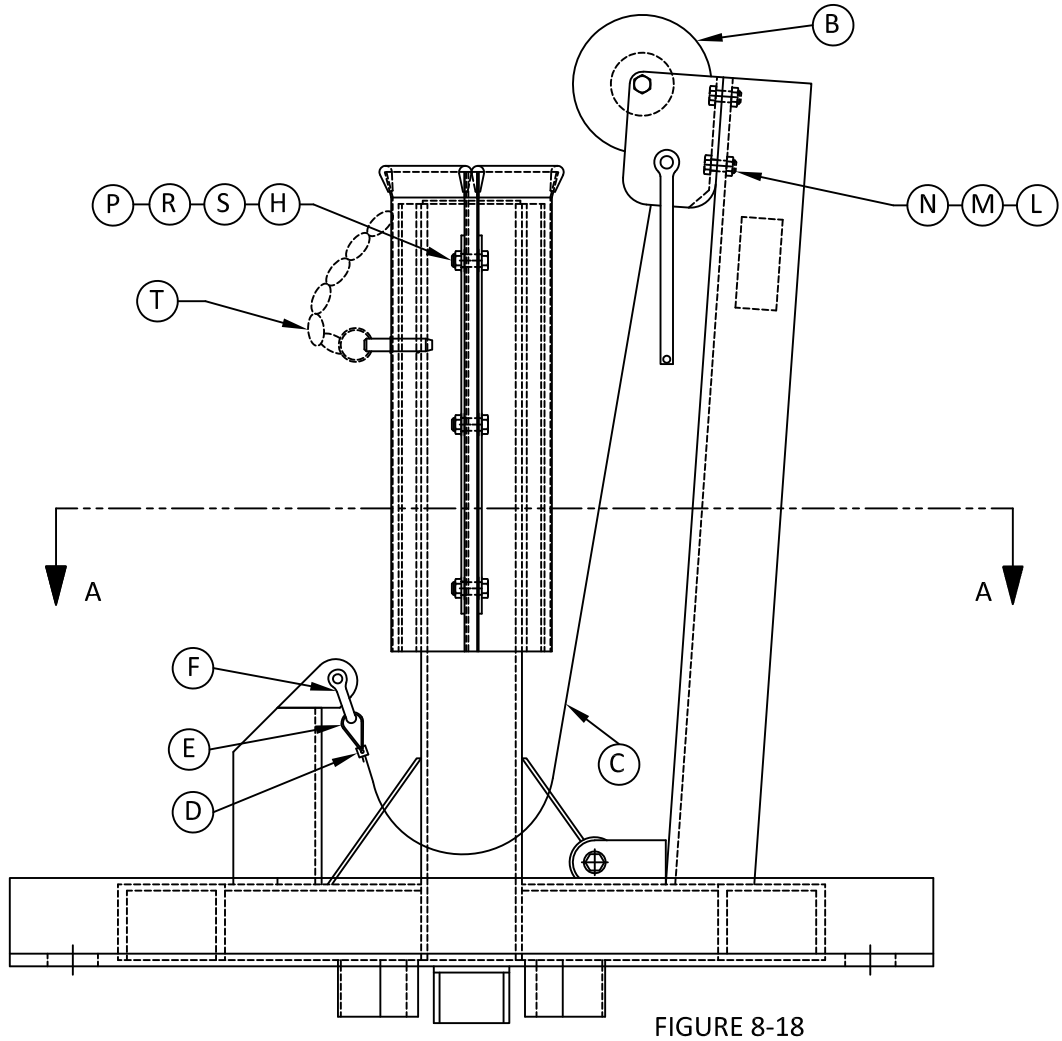

B
P
R
S
H
N
M
L
T
A
A
F
E
D
C

FIGURE 8-18

ITEM 18 MAST LIFTING FRAME ASSEMBLY NSN-5445-01-079-9133-1

PARTS LIST - JAQUITH L9133					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Part #	NOTES
A	1	Lifting Frame	S.S.	4542	
B	1	Winch	Steel	20901004	
C	1	Wire Rope W/ Clear Vinyl Coating-1/8 Ø x 40 ' Long	S.S.	60901923	CABLE ASSEMBLY
D	1	Splice	S.S.		
E	1	Thimble	S.S.		
F	1	Screw Pin Shackle	S.S.	60901342	
G	1	Sheave 2" Dia.	ALUMINUM	4556	
H	3	Hex Nut 1/2-13	S.S.	60680043	
J	1	Flatwasher 1/2"	S.S.	60681469	
K	1	Hex. Head Bolt 1/2-13 x 2" Long	S.S.	60651470	
L	2	Hex Nut 3/8-16	S.S.	10680719	
M	2	Lock Washer 3/8"	S.S.	20680110	
N	2	Hex Head Bolt 3/8-16 x 1-1/4" Long	S.S.	10650202	
P	2	Reinf. Str. 12 ga. x 1-1/2 x 15" Long	S.S.	4557	
R	3	Hex Head Bolts 1/2-13 x 3" Long	S.S.	60651468	
S	3	Lockwasher 1/2"	S.S.	60681471	
T	1	Alignment Pin	S.S.	60901269	
U	1	Weatherproof Winch Cover (Not Shown)	Canvas	60901333	
V	1	Deformed Locknut 1/2-13	S.S.	60681531	

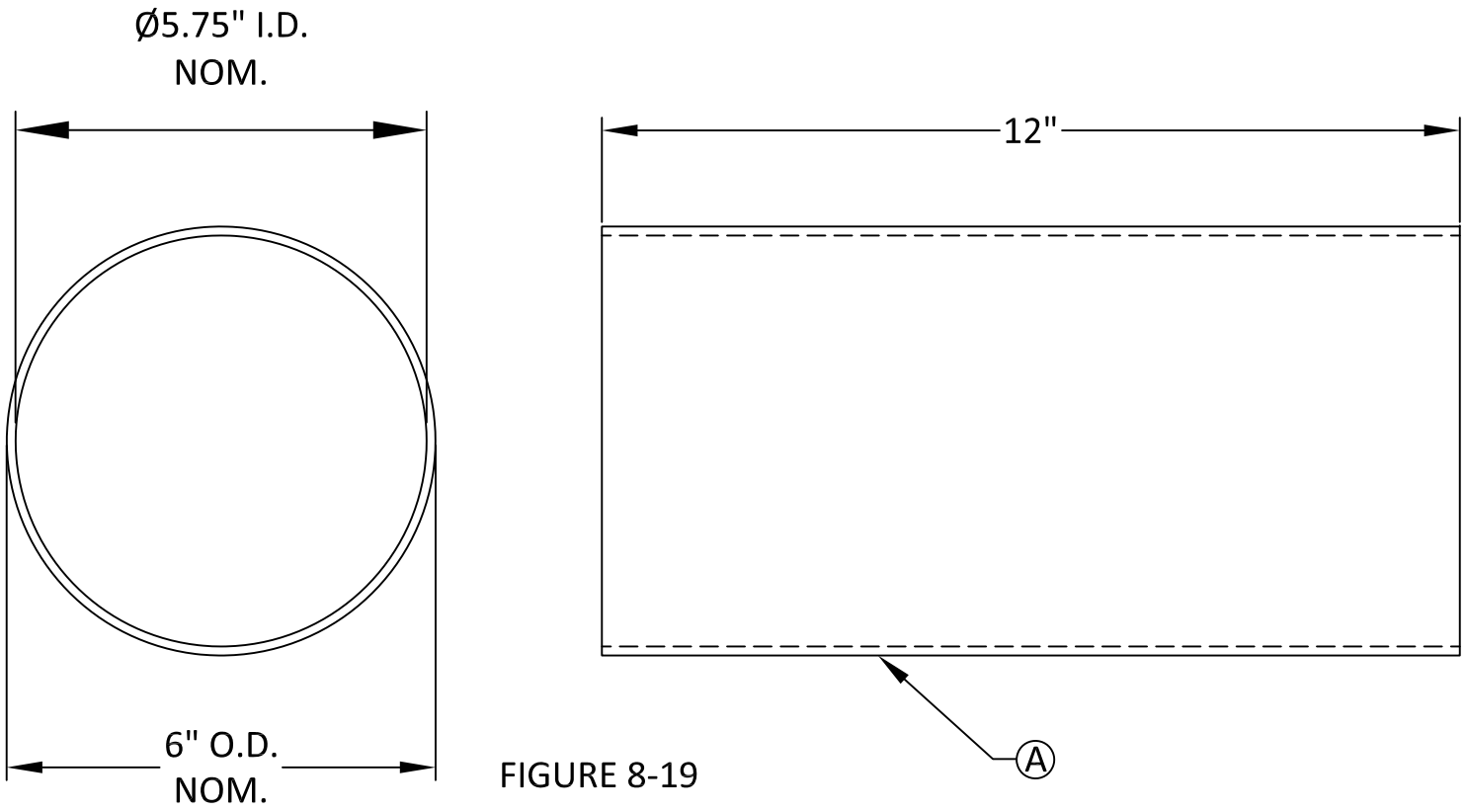


FIGURE 8-19

ITEM 19 REPAIR TUBE SPLICE NSN 5445-01-079-9149-1

PARTS LIST - JAQUITH L9149					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Part #	NOTES
A	1	Repair Tube Splice	Fiberglass	L9149	

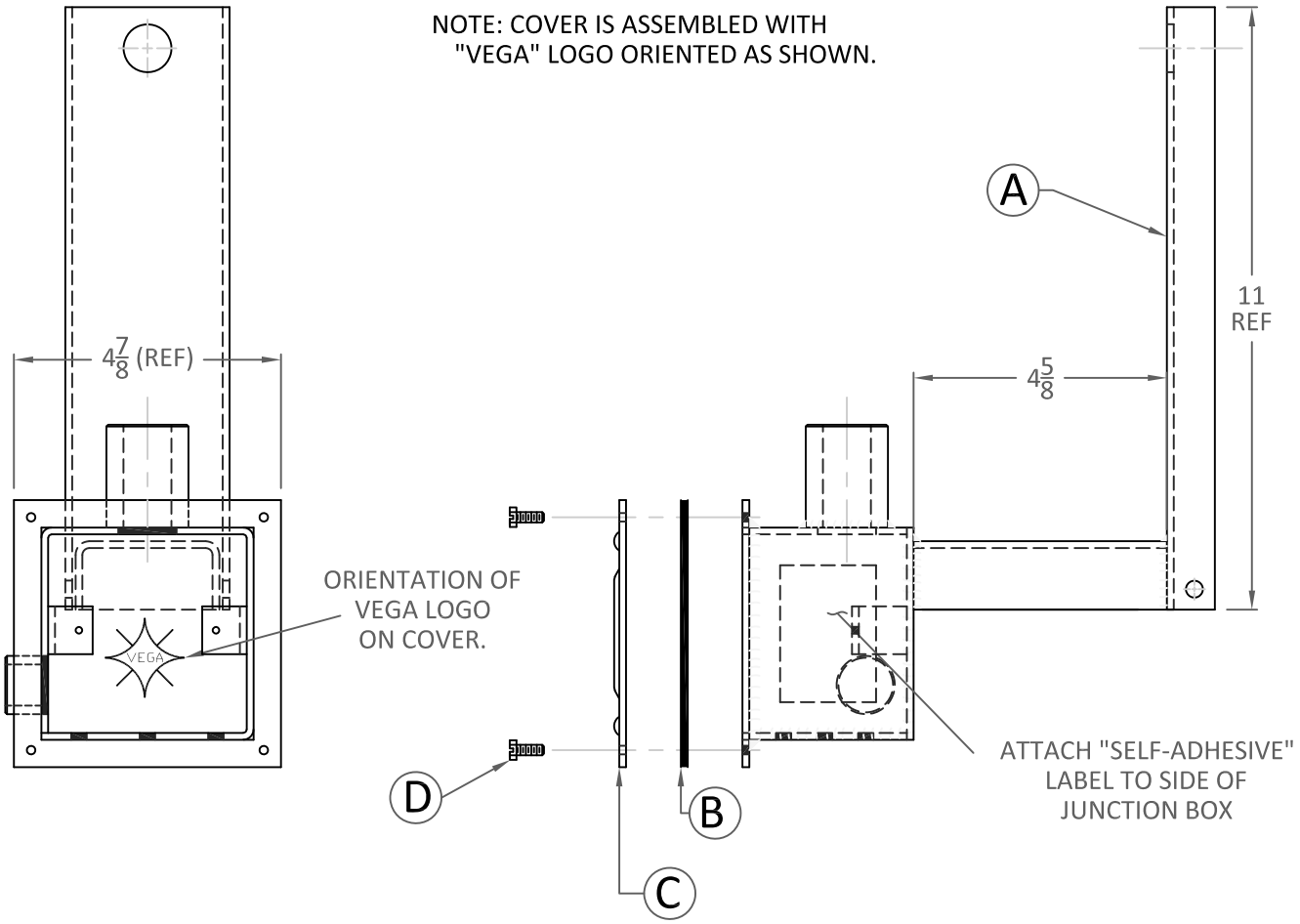


FIGURE 8-24

ITEM 24 FLASHER BRACKET W/ JUNCTION BOX

PARTS LIST - JAQUITH L5017					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	FLASHER BRACKET/JUNCTION BOX SUB ASS'Y	Aluminum	4743	
B	1	GASKET	Aluminum	20530076	
C	1	COVER	Aluminum	8904	
D	4	#10-24 X 1/2" SELF-TAPPING SCREW	Aluminum	20671878	

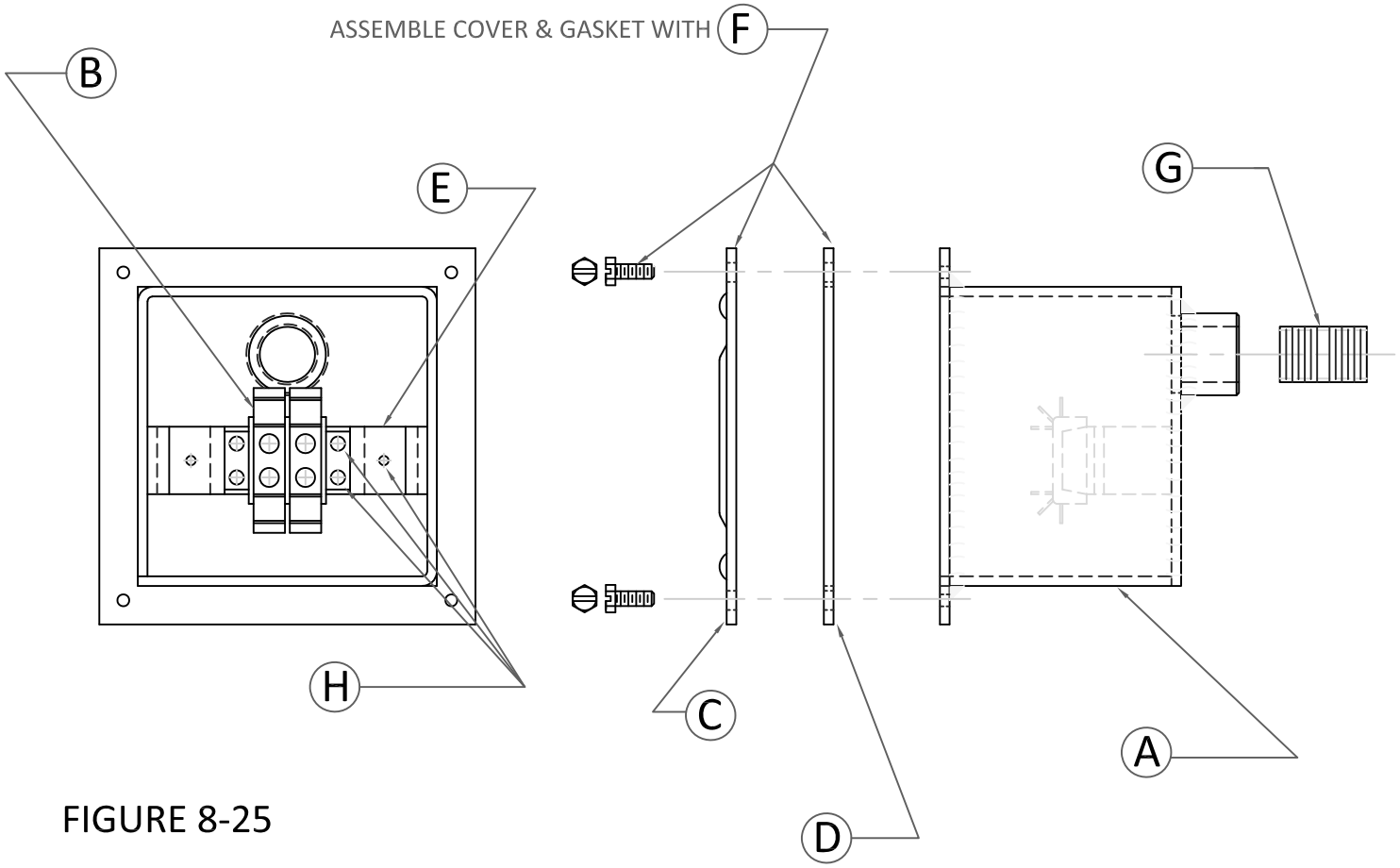


FIGURE 8-25

ITEM 25 JUNCTION BOX W/ KUKLA TERMINAL BLOCKS

PARTS LIST - JAQUITH L5018					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	JUNCTION BOX SUB ASS'Y	Aluminum	4750	
B	1	KUKLA TERMINAL BLOCK	Aluminum	20900098	
C	1	COVER	Aluminum	8904	
D	1	GASKET	Aluminum	20530076	
E	1	BRACKET	Aluminum	8924	
F	4	#10-24 X 1/2" LG HEX HEAD SSTS	SS	20671878	
G	1	1/2" NPT CLOSE NIPPLE	Aluminum	60703049	
H	6	SSPH TYPE "F" SELF TAPPIN #8-32 X 1/2"	SS	20670049	

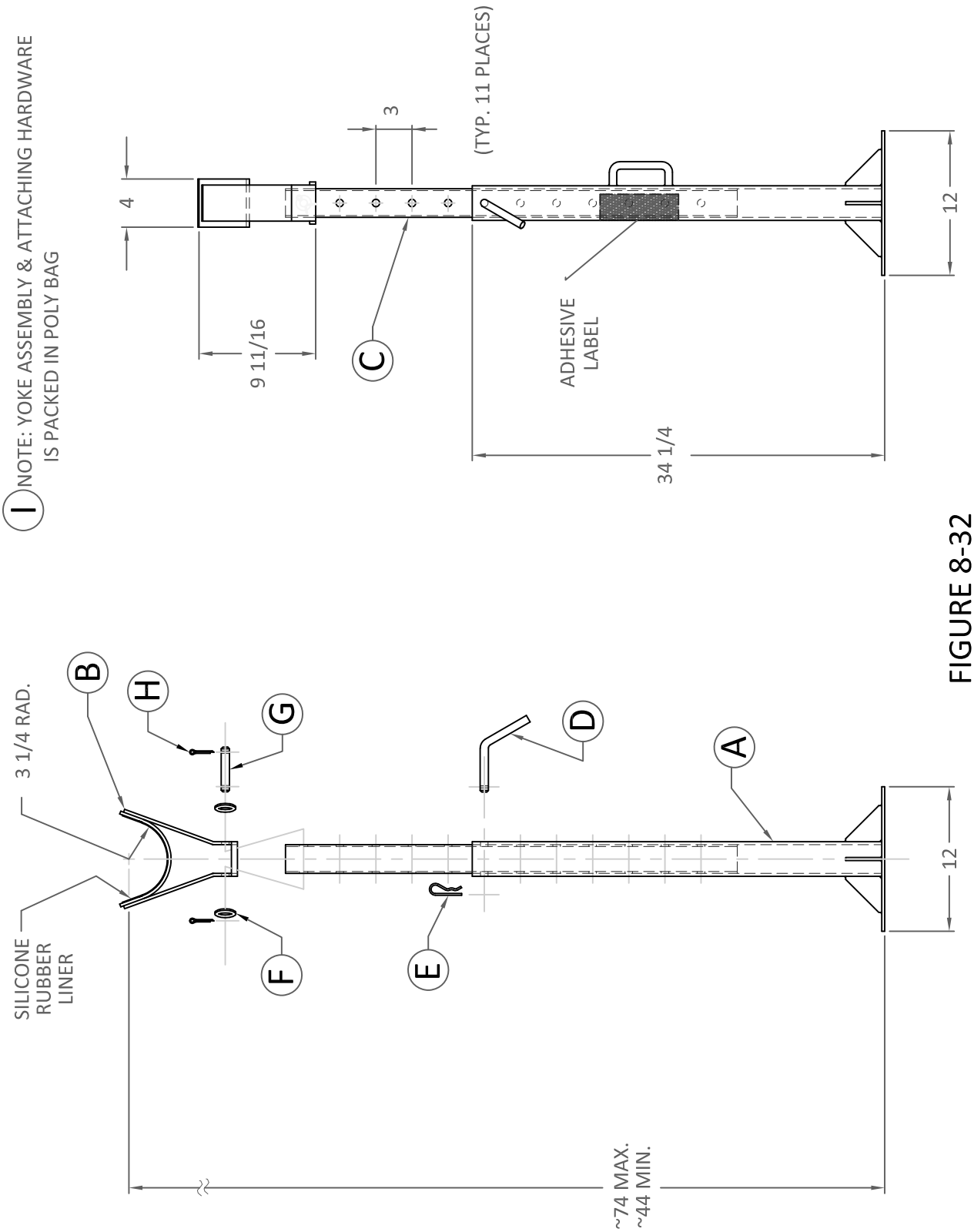

I NOTE: YOKE ASSEMBLY & ATTACHING HARDWARE IS PACKED IN POLY BAG
4
3
(TYP. 11 PLACES)
9 11/16
C
ADHESIVE LABEL
34 1/4
12
3 1/4 RAD.
B
H
G
D
A
SILICONE RUBBER LINER
F
E
12
~74 MAX.
~44 MIN.

FIGURE 8-32

ITEM 32 VERTICAL MAINTENACE STAND

PARTS LIST - JAQUITH L5016					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	BASE/TUBE ASSEMBLY	Aluminum	4930	
B	1	YOKE ASSEMBLY	Aluminum	4929	
C	1	UPPER STAND TUBE	Aluminum	4933	
D	1	5/8" BENT PULL PIN	Aluminum	4938	
E	1	HAIRPIN COTTER	SS	60672050	
F	2	5/8" FLAT WASHER	SS	60681261	
G	1	HINGE PIN	Aluminum	4937	
H	2	1/8" X 1" COTTER PIN	SS	60672049	
I	1	POLY BAG 13 1/2 X 14		10880380	

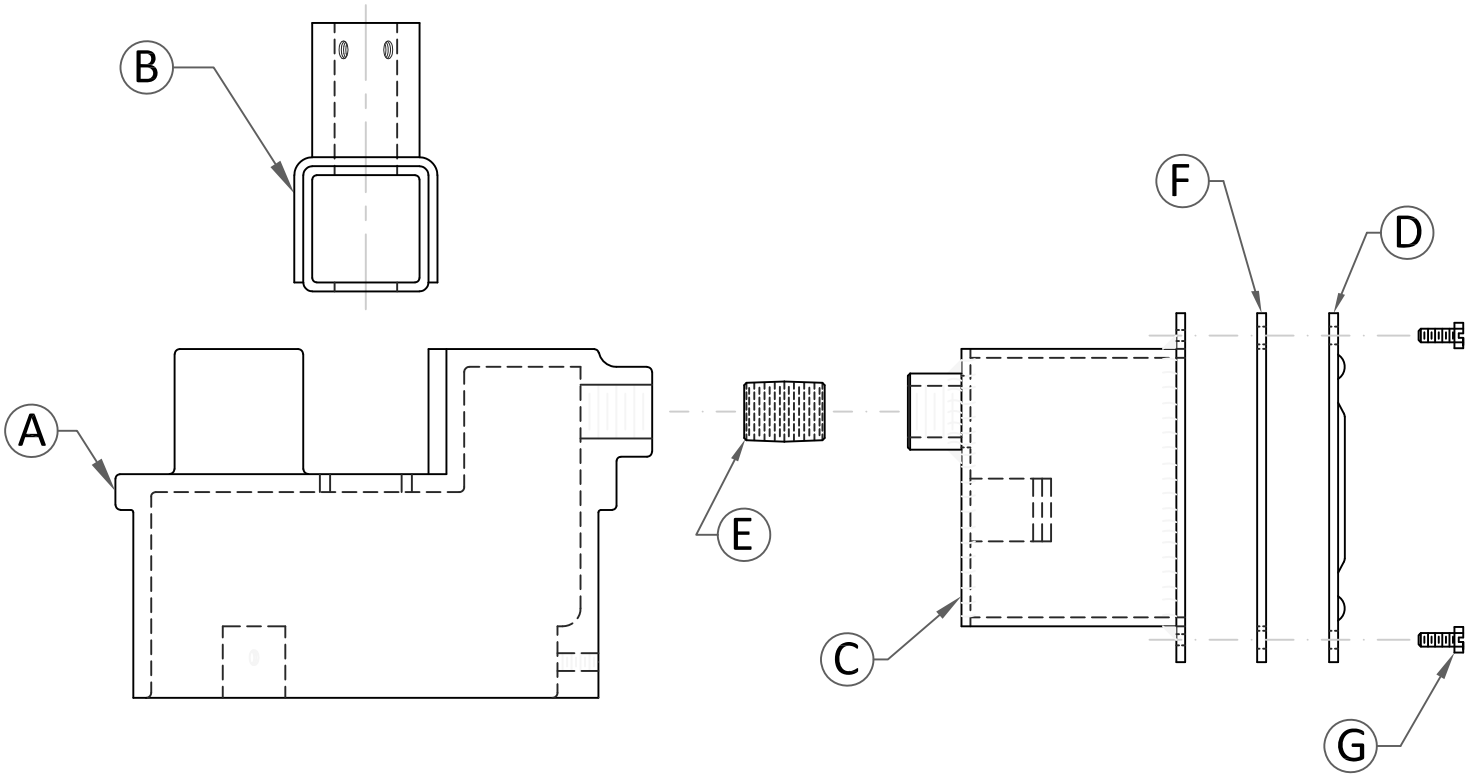


FIGURE 8-34

ITEM 34 T-1 XBAR ASSEMBLY W/ JUNCTION BOX MALSR

PARTS LIST - JAQUITH L5000					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	TUBE CAP	SS	L7557	MUST BE ORDERED SEPARATELY
B	1	T-1 TEE BAR	Fiberglass	L1001	
C	1	JUNCTION BOX ASSEMBLY	SS	L5018	
D	1	JUNCTION BOX COVER	SS	8904	
E	1	CLOSE NIPPLE	Aluminum	60703049	
F	1	1/8" GASKET	Neoprene	20530076	
G	4	#10-24 X 1/2" SELF-TAPPING SCREWS	SS	20671878	

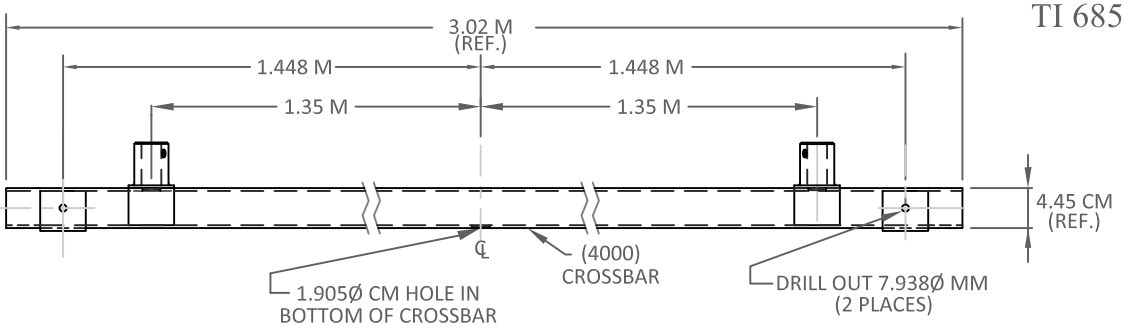


FIGURE 8-35 - CALVERT (2) LIGHT AT 2.7M SPACING

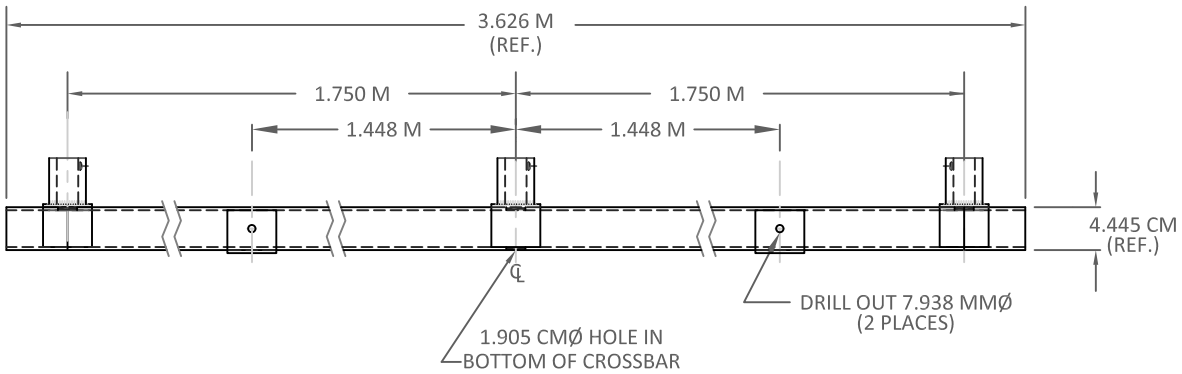


FIGURE 8-36 - CALVERT (3) LIGHT AT 1.750M SPACING

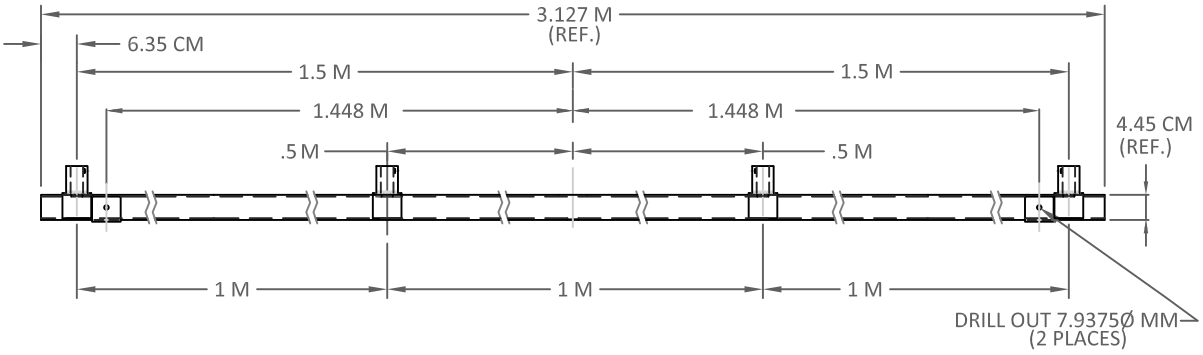


FIGURE 8-37 - CALVERT (4) LIGHT AT 1.0M SPACING

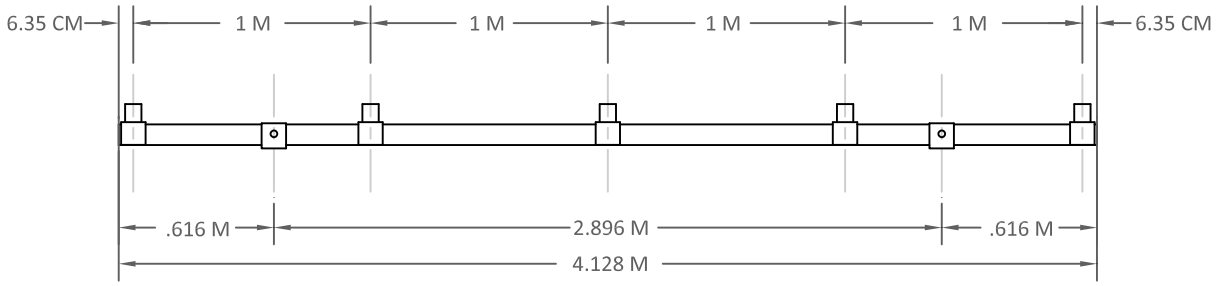


FIGURE 8-38 - CALVERT (5) LIGHT AT 1.0M SPACING

NOTE:
SPECIAL CALVERT CROSSBAR ASSEMBLIES
MODIFIED TO CUSTOMERS REQUIRED DIMENSIONS
WHEN REQUESTED DURING ORDERING

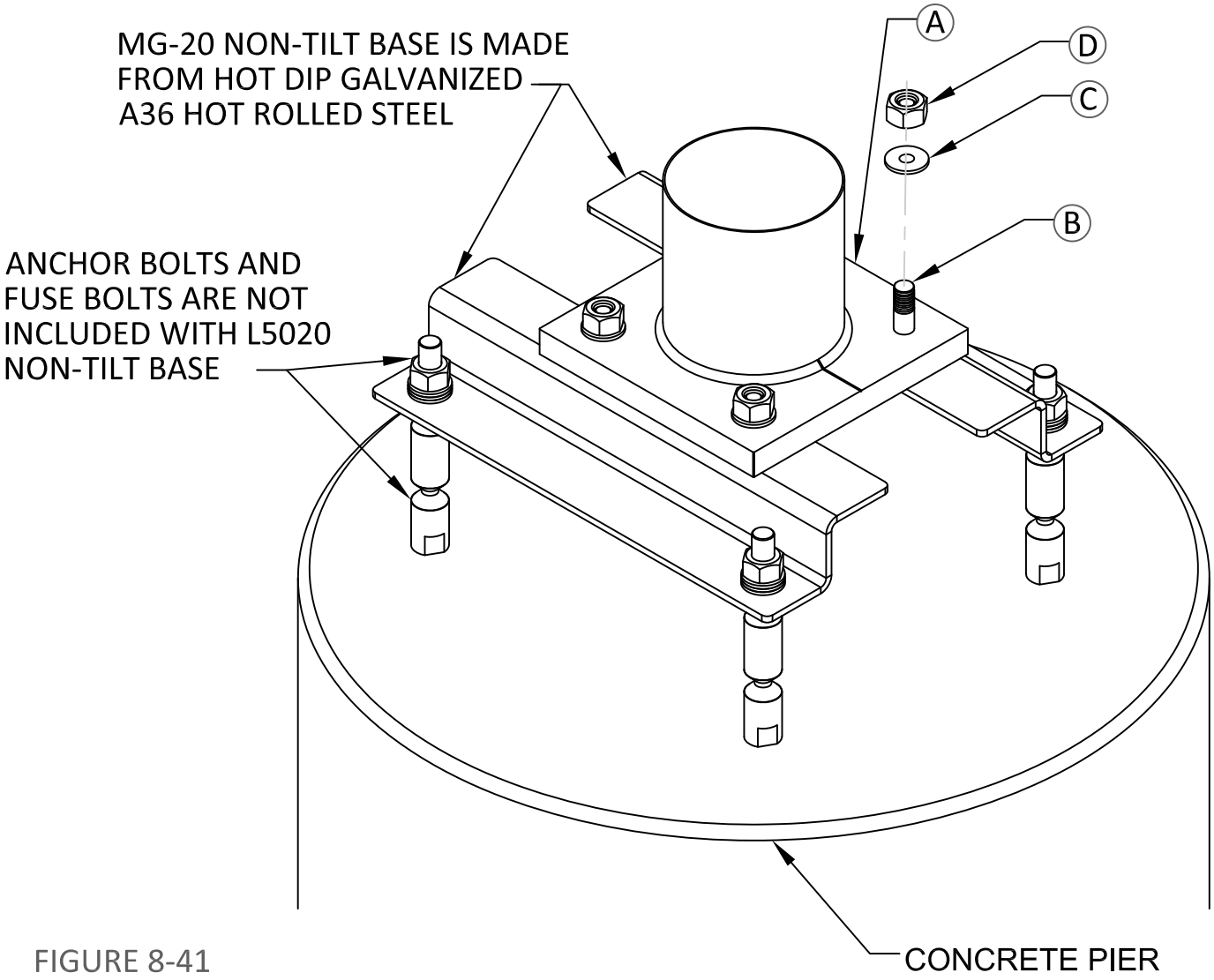


FIGURE 8-41

ITEM 41 Z-BASE NON-TILT

PARTS LIST - JAQUITH L5020					
Ref. Des.	Quantity	DESCRIPTION	Mat'l	Jaquith Pt. #	NOTES
A	1	MG20 STANDPLATE	Aluminum	4511	
B	4	HHCS 5/8 - 11 X 2 1/4	SS	60651263	
C	4	WASHER FL 5/8 SAE	SS	60681261	
D	4	NUT NYLOCK 5/8 - 11	SS	60681409	

SECTION 9. INSTALLATION INSTRUCTIONS

9.1 SITE INFORMATION:

9.1.1 Use of LIR structures. – The (Fiberglass) LIR structures are used as support structures in the FAA Order 6850.22.

9.1.2 Basic Site Information. – Basic site information is provided in FAA Handbook. 6850.2 and 6850.3

9.1.3 Specific Site Information. – Site information is provided in the Project Plans and Specifications developed for each installation.

9.2 TOOLS AND INSTALLATION MATERIALS REQUIRED:

In addition to the equipment furnished under this contract, the following installation materials are generally required as needed.

ALL LIR STRUCTURES

(2) 1-1/8" or 1-1/4" combination or open end wrenches
(1) 3/16" Allen Wrench
(1) Precision Level (15" min.)

LIR STRUCTURES WITH TEE BARS

(1) ¼" Drive Ratchet Wrench w/ 7/16" socket
(1) 7/16" Combination Wrench
(1) ¼" Drive Torque Wrench w/ 7/16" socket (120 in. lb. Capacity)
(1) Large flat blade screw driver
(1) Utility knife

MG-20 STRUCTURES

(1) 15/16" Combination Wrench
(1) Hacksaw w/ fine tooth blade
(1) ¼" electric hand drill w/ 3/32 dia. drill bit
A supply of 80 or 100 grit emery cloth (2 sheets per structure)
(1) Table Saw w/ diamond or carbide abrasive blade
A supply of Chemlok 304-1 & 304-2 Epoxy adhesive (approx. 2 oz. of each per structure)
A tube of Dow Corning #732 Silicone Adhesive
A supply of MEK (Methyl Ethyl Ketone) Solvent

MG30/40 STRUCTURES

(1) ¼" Drive Ratchet Wrench w/ 7/16" socket
(1) 7/16" Combination Wrench
(1) ¼" Drive Torque Wrench w/ 7/16" socket (120 in. lb. capacity)
(2) 15/16" Combination Wrenches
(2) 9/16" Combination Wrenches
A supply of 80 or 100 grit emery cloth (4 sheets per structure)
A supply of Chemlok 304-1 and 304-2 Epoxy Adhesive (approx. 4 oz. of each per structure)
(1) Hacksaw w/ fine tooth blade
(1) ¼" Electric Hand Drill w/ 3/32 Dia. Drill Bit
A supply of MEK (Methyl Ethyl Ketone) Solvent
(1) Table Saw w/ diamond or carbide abrasive blade
A tube of Dow Corning #732 Silicone Adhesive

MS-20 STRUCTURES

(1) ½" Drive Ratchet Wrench w ¾" Socket (Deep Socket preferred)
(1) ¾" Combination Wrench

9.3 UNPACKING EQUIPMENT:

9.3.1 Packages and Contents. – The equipment and accessories furnished for a (Fiberglass) LIR Approach Lighting System will vary depending on the type of system to be installed (ALSF-2, MALSR, etc.) and the mounting heights required (determined by field survey). Quantities of Items 1 through 18 (as listed in Table 1-1) will be furnished for each installation. T able 9-1 lists each item and the measurements, volume and weight of each packaged item.

9.3.2 Unpacking Equipment. – Unpack all cartons upon receipt and check contents and their condition. Note any exterior damage to the package which might lead to detection of equipment damage. It is suggested that at least one box of each type together with all inserts and braces be preserved for possible reshipment for any reason.

9.3.3 Damage. – If damage to any equipment is noted, a claim form should be filed with the carrier as soon as possible. Inspection of equipment by the carrier may be necessary.

TABLE 9-1 PACKAGED EQUIPMENT INFORMATION

ITEM NO.	LOW-IMPACT RESISTANT STRUCTURES	NSN	PACKAGE INFORMATION		
	STANDARD STRUCTURAL PARTS	5445-01-	WEIGHT (LBS)	LxWxH (inches)	VOLUME (Cu. Ft)
1	T-5 Tee Bar Assembly	079-3885-1	16	158.5 x 3.5 x 5	1.7
2	T-4 Tee Bar Assembly	079-3886-1	16	186.5 x 3.5 x 5	1.9
3	T-3 Tee Bar Assembly	079-9155-1	12.5	126.5 x 3.5 x 5	1.3
4	T-M Tee Bar Assembly	079-9154-1	12.5	126.5 x 3.5 x 5	1.3
5	Tube Cap Assembly	079-7557-1	5	7.5 x 7 x 6.5	0.2
6	Tee Brace Assembly	079-9153-1	3	61 x 1.5 x 4	0.3
7	Tee Brace Clamp Assemly	079-9152-1	2	13 x 4.5 x 3.5	0.1
8	Horizontal Stabililzer/MG-30	079-9151-1	6	40 x 4 x 8.25	0.7
9	Horizontal Stabilizer (Upper & Lower) for MG-40	080-3039-1	9	51.5 x 4 x 8.25	0.9
10	Stabilizer Rod Assembly for MG-30/MG-40	080-5144-1	55	179 x 7.25 x 8	5.8
11	Stabilizer Rod Assembly for MG-40 only	108-4919-1	34	126 x 7.25 x 8	4.4
12	Tube "A" x 20 feet long	079-9135-1	77	243 x 7.25 x 8	8
13	Tube "B" x 20 feet long Bonded to	079-9148-1	80	247 x 8.25 x 8.75	10.4
14	Tube "A" x 20 feet long Bonded to Mounting Socket Ass'y	079-9134-1	95	273 x 7.25 x 8	8.9
15	Mounting Stand Assembly	080-2763-1	78	24.75 x 17 x 12	2.9
16	Mounting Frame Assembly	080-2762-1	254	81 x 11 x 17.5	8.3
17	Mast Lifting Frame Assembly	079-9133-1	208	38 x 21 x 44	20.7
18	Repair Tube Splice x 12" long	079-9149-1	3	13.25 x 7 x 6.75	0.4

9.4 INSTALLATION PROCEDURE:

The installation instructions contained in this section shall be followed by the Field Contractor when installing all LIR structures.

9.4.1 MG-20, MG-30 and MG-40 Installation Procedure.

A. For each LIR structure MG20, MG-30 and MG-40, determine the required Tube length "L", as described in Section 1.6 of this Instruction Book and as furnished in a schedule.

B. Cutting and Bonding Schedule: See Figures 9-1 through 9-3. Cut tube lengths from Tube "A" or Tube "B" (Item 7 or Item 8 respectively) as required, using a table saw with a diamond or carbide abrasive blade. All saw cuts shall be at a right angle to the tube axis. Deburr saw cut edges with a file. For bonding, roughen surfaces to be bonded, as shown in Figures 1, 2, and 3, using 80 or 100 grit emery cloth. Clean roughened surfaces thoroughly with a solvent (methyl ethyl ketone or acetone). Mix equal parts of Chemlok 304-1 Epoxy Resin and 304-2 Hardener, mix thoroughly but avoid air inclusion. (Chemlok 304-1 resin and Chemlok 304-2 hardener are available through Jaquith Industries, Inc. Part No. L5008) For each joint to be bonded, spread a thin coat of mixed adhesive on both surfaces to be bonded.

For MG-20: Slowly slide proper length of tube **onto** stand plate while rotating it to exclude air. Excess adhesive will be forced out at joint of tube and stand plate. Remove excess, but leave a fillet of adhesive at the joint. Cure for 48 hours at room temperature (above 65 degrees F).

For MG-30 and MG-40: Bond the two tubes together **first**. Slowly slide one tube into the other while rotating it. Remove excess adhesive from the joint. Cure for 48 hours at room temperature (above 65 degrees F). Next, bond the spliced tube to the stand plate as for MG-20, except the spliced tube is slowly slid **into** the stand plate. For reference purposes, the tube bonded to stand plate is called a mast (E.G. MG-20 Mast, MG-30 Mast, and MG-40 Mast).

C. Erection Instructions:

IMPORTANT – All LIR structures are to be assembled in a horizontal position. (See Fig. 9-5 & 9-7) Electrical work is not shown here.

MG-20: Use mounting stand assembly shown in Fig. 9-4 and detailed on Drawing D-6155-37. Set mounting stand on anchor bolts, shim or adjust to level using a 15" (min.) precision level. Secure with four ¾" hex nuts. Remove two 5/8" bolts at rear of mounting stand assembly and pivot inner section up to a vertical position. Place stand plate (Bottom of MG-20 mast) over the four 5/8" studs in the mounting stand and fasten with the four 5/8" hex nuts and flat washers provided. Note: Position stand plate onto

mounting stand assembly with the tapped holes oriented as shown in Fig. 9-4.

Using Jaquith drilling and slotting fixture (JI P/N L5012) cross-cut end of tube using a hack saw and drill a 3/32 dia. hole at base of each slot if tube does not have slots. (See Fig. 9-9) For attaching tee-assembly, refer to Drawing D-6155-24 and Figure 9-8.

MG-30 and MG-40: Use mounting frame assembly shown in Fig. 9-6 and detailed on Drawing D-6155-39. Insert hinge pins which are attached to base channel, into left and right anchor plates. Place front anchor plate and left and right anchor plates over ¾" anchor bolts. Connect base tube to base channel (See fig. 9-6). Make sure mounting frame assembly swings freely on hinge pins. Adjust or shim to level and secure on anchor bolts with six ¾" hex nuts and flat washers. Raise mounting frame arm to absolute vertical (check with level). Attach the guy anchor support (See fig. 9-7) above the hoop wound ring with three 5/8" hex head bolts and hex nuts provided. Attach stabilizer rods to three guy anchor ends (See Fig. 9-7). Bolt two guide brackets (Fig. 9-6) to bottom of mast stand plate with two 5/8" x 2-1/4" SS hex head bolts and hex nuts. Do not tighten. Note: Position stand plate with tapped holes aligned as shown in Fig. 9-6. Set stand plate over adjusting post; post slides into hole in center of stand plate. Adjust nut for proper height (2-1/2" from bottom of stand plate to top of base tube). Support upper end of mast so that it is approximately parallel with ground. Clamp guide brackets against sides of base tube and tighten the two 5/8" bolts. Fasten eye end of turnbuckles to stabilizer rod fittings with 5/8" x 2-1/2" SS hex head bolts and hex nuts. Fasten clevis end of turnbuckles to guy brackets "X" and "Y" on mounting frame. Adjust turnbuckle at guy bracket "X" until mast is exactly perpendicular to mounting frame. Tighten the other two turnbuckles at guy brackets "Y". Attach horizontal stabilizer assembly at midway between the guy anchor support and the guy bracket, for MG-30. For MG-40, attach two horizontal stabilizer assemblies equal distances apart and between the guy bracket and guy anchor supports. Using Jaquith drilling and slotting fixture (JI P/N L5012) cross-cut end of tube using a hack saw and drill a 3/32 dia. hole at base of each slot if tube does not have slots. (See fig. 9-9) for attaching tee-assembly, refer to Drawing D-6155-24 and Figure 9-8.

9.4.2 MS-20 Installation Procedure

A. Mount mast lifting frame on anchor bolts located on support platform (See Fig. 9-10) and secure with three ¾" hex nuts.

B. Prior to installing mast into the mast lifting frame, attach tee brace clamp assembly to mast (See fig. 9-11) and attach tube cap assembly to mast. Align tube cap and tee brace assembly as shown in Fig. 9-8. Be sure the fiberglass tube has slots when installing the tube cap.

C. Expand stainless steel sleeve on mast lifting frame (See Fig. 9-10) by loosening the ½" nuts on the sleeve flange. Insert mast tube into sleeve, sheave end first, until sheave end protrudes from bottom of sleeve by about one foot. Engage winch cable to sheave and lower mast tube to its lowest point, but releasing cable from winch.

D. Assemble Tee-Assembly to top of mast, if required. (See Figure 9-8) Install lights as required. Use Figure 9-8 in conjunction with appropriate electrical installation drawings.

E. Raise mast with winch until hole in aluminum mounting socket is aligned with mating hole in mast lifting frame sleeve. Insert alignment pin and tighten bolts in sleeve flange.

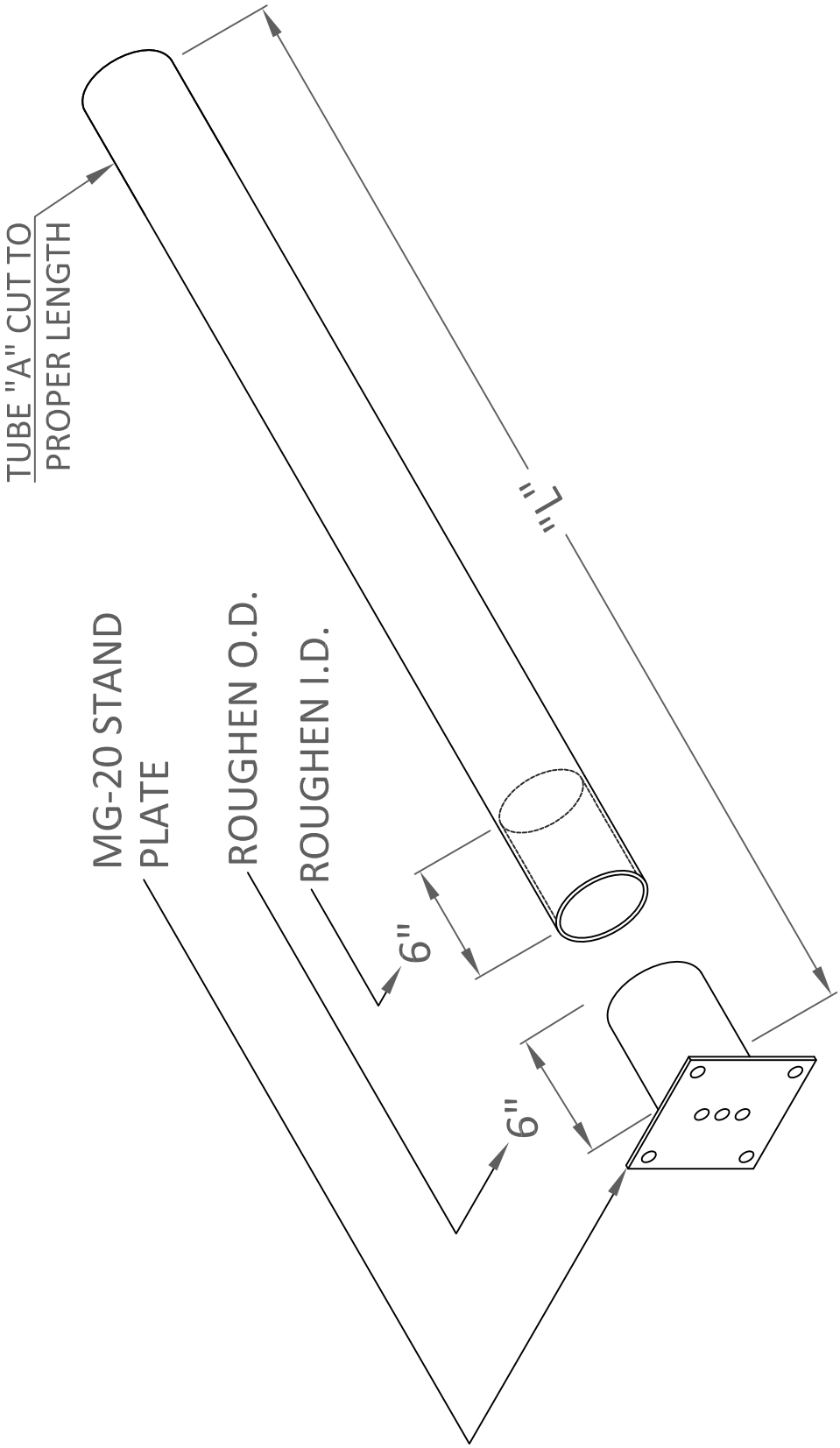


FIGURE 9-1
ASSEMBLING MG-20 MAST
(Ref. Section 9.4.1)

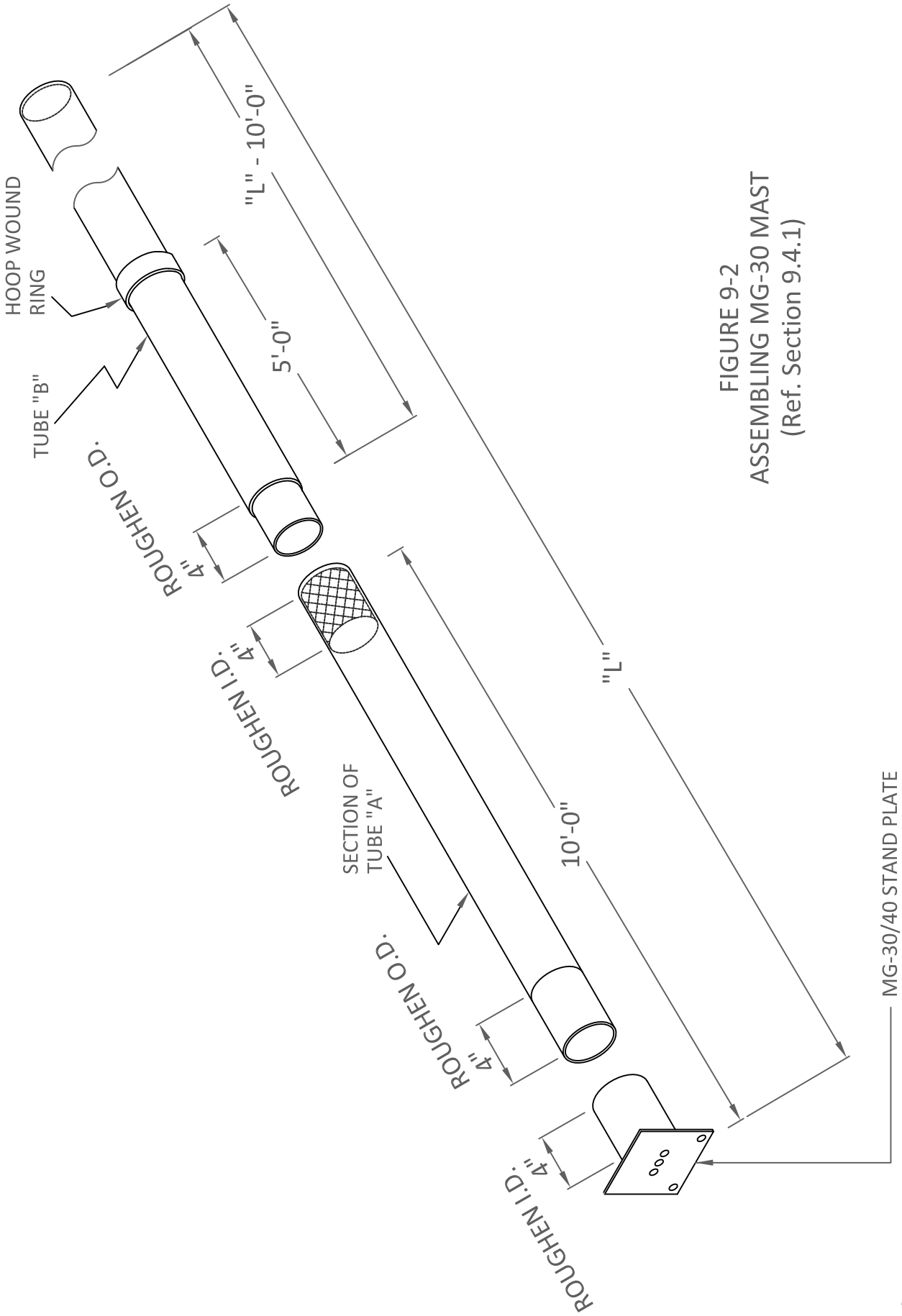


FIGURE 9-2
ASSEMBLING MG-30 MAST
(Ref. Section 9.4.1)

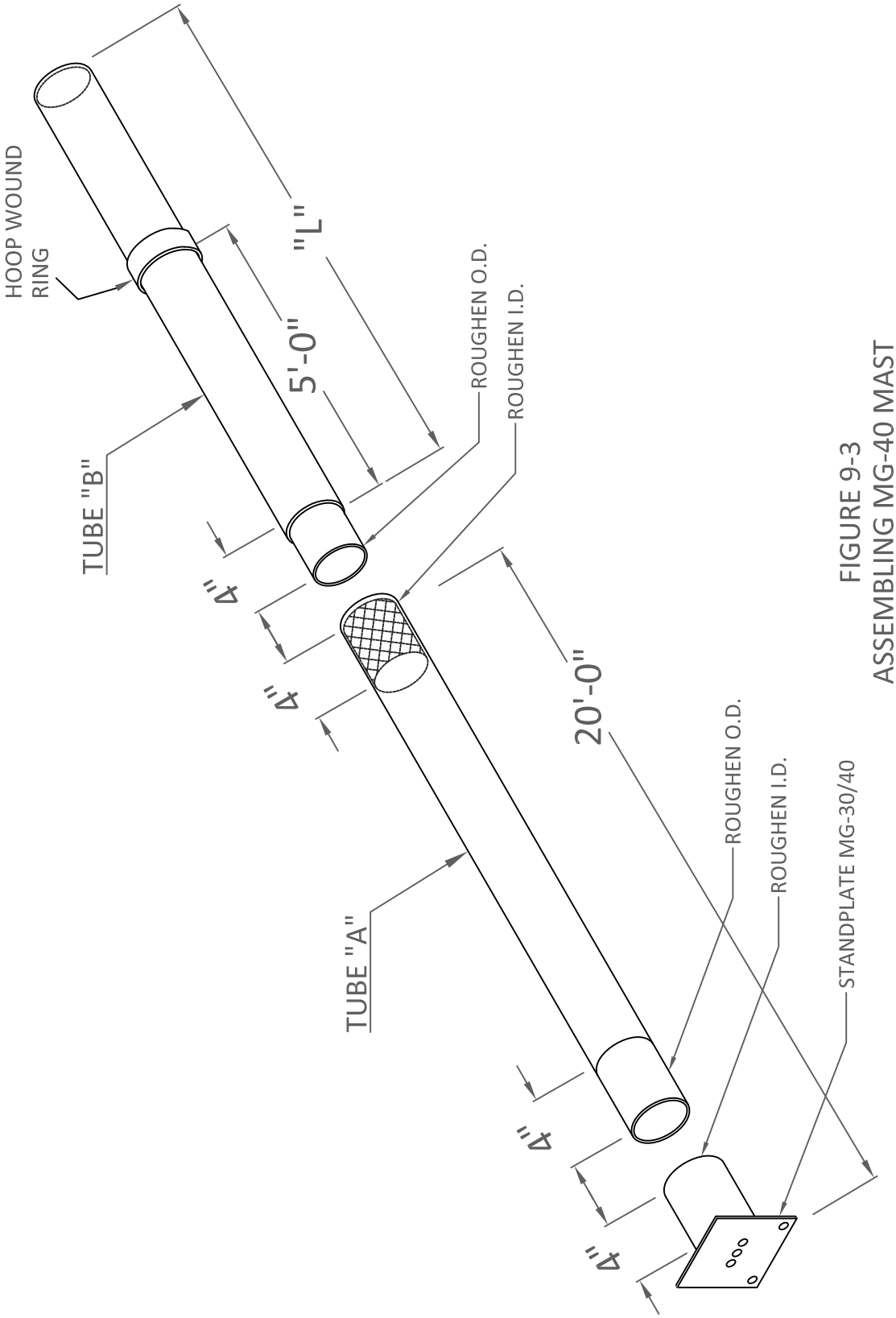
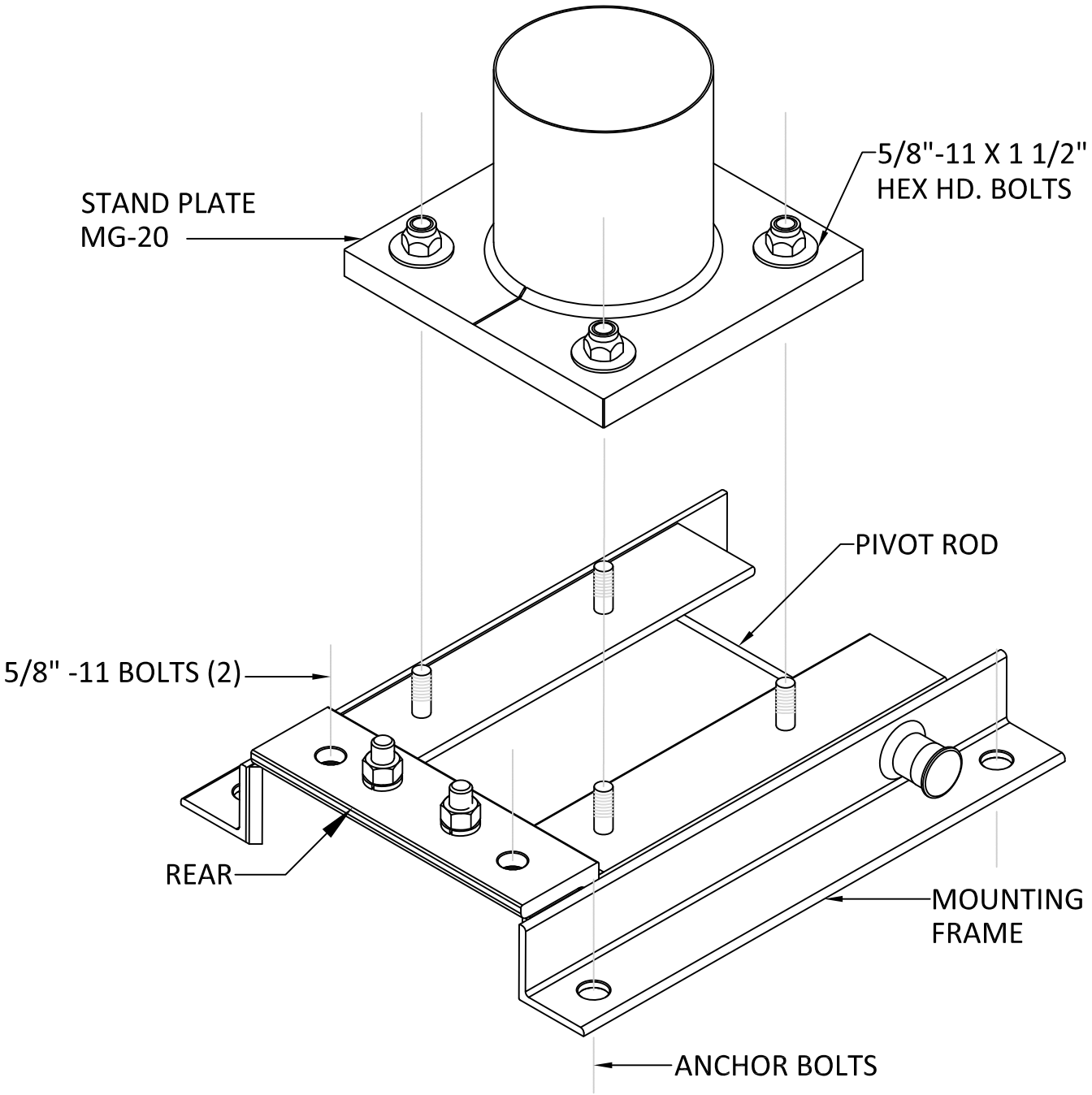


FIGURE 9-3
ASSEMBLING MG-40 MAST
(Ref. Section 9.4.1)

FIGURE 9-4
ASSEMBLING MG-20 BASE TO CONCRETE PAD
(Ref. Section 9.4.1)



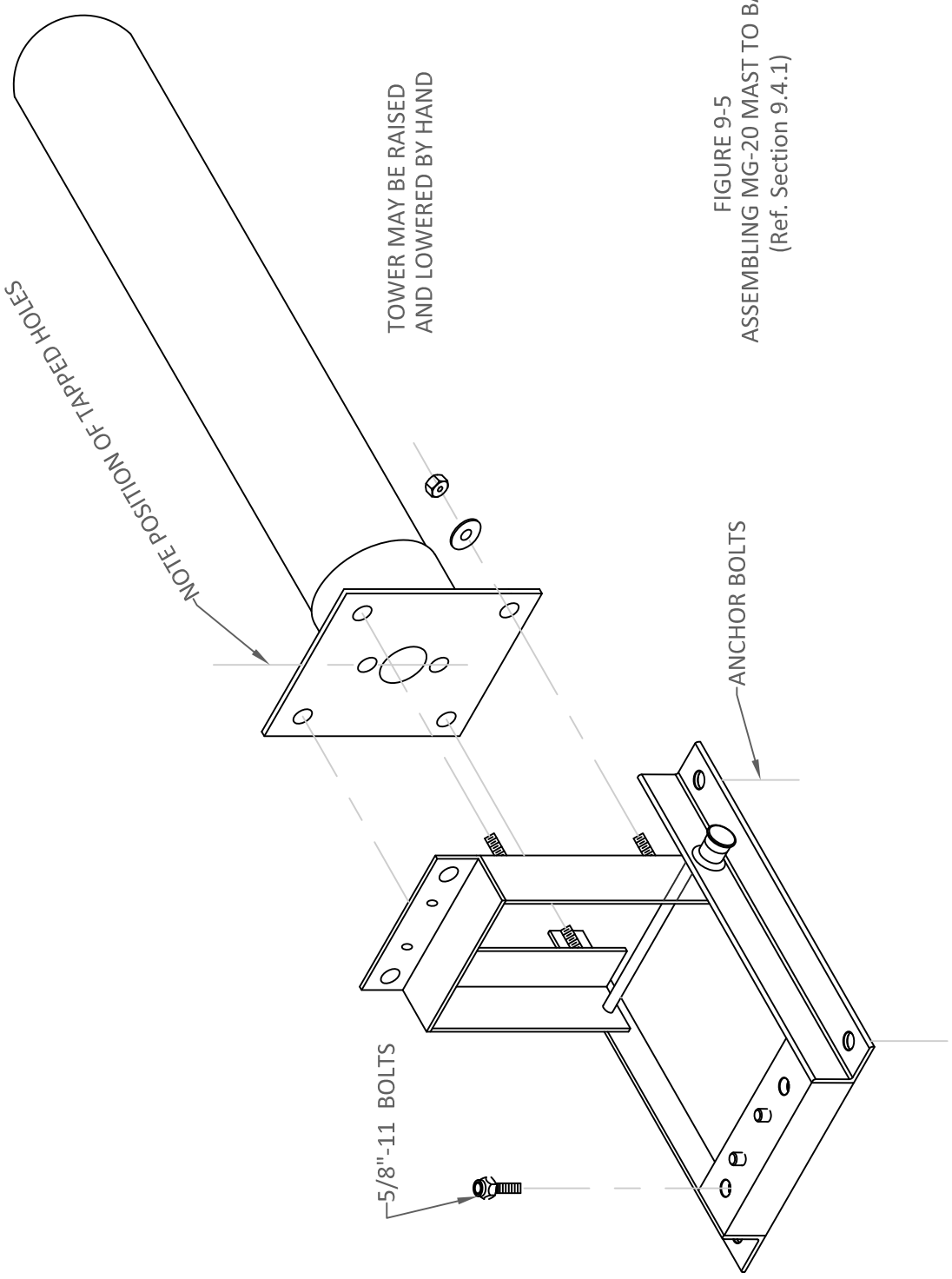


FIGURE 9-5
ASSEMBLING MG-20 MAST TO BASE
(Ref. Section 9.4.1)

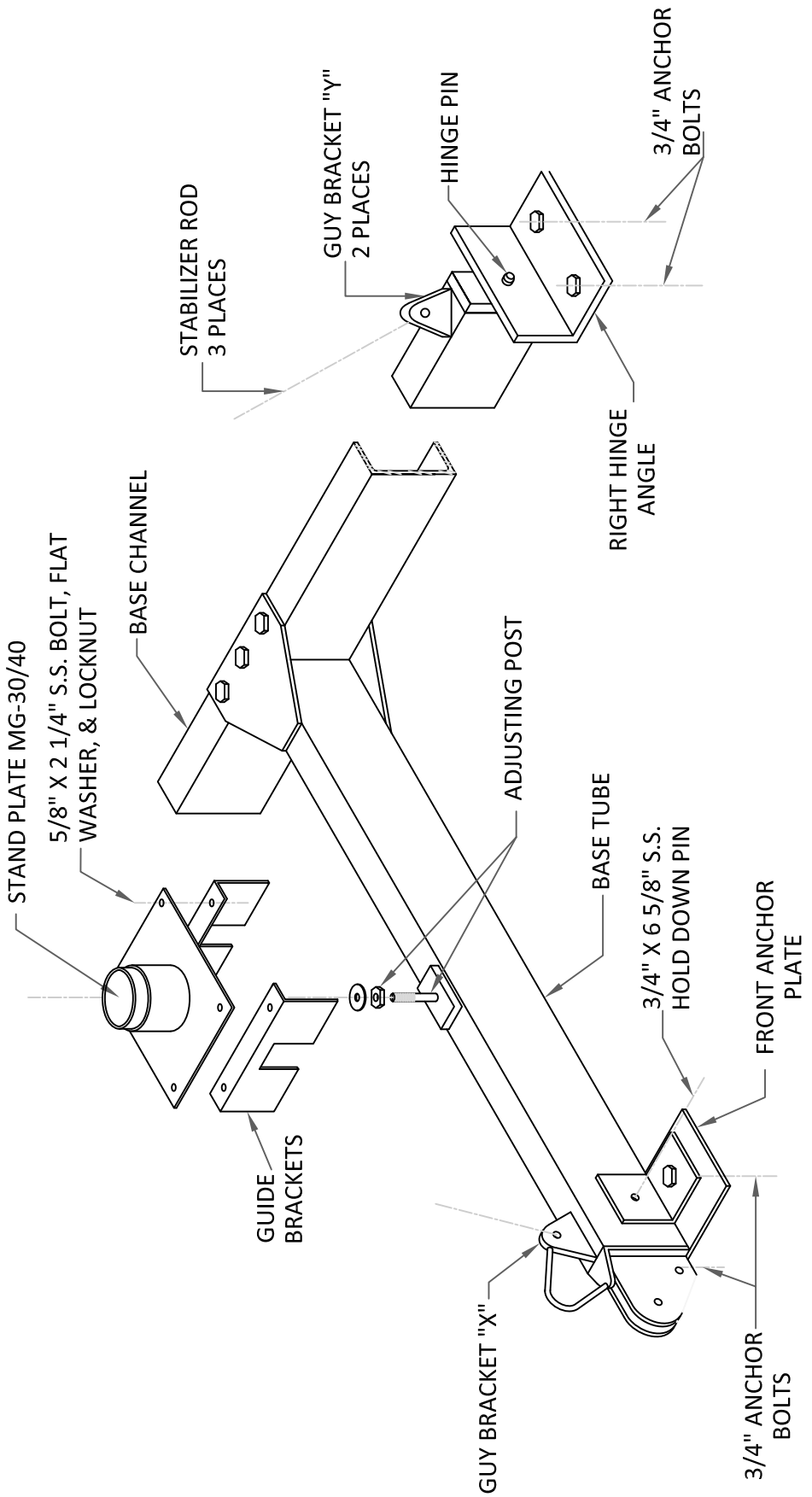


FIGURE 9-6
ASSEMBLING MG-30/40 BASE
(Ref. Section 9.4.1)

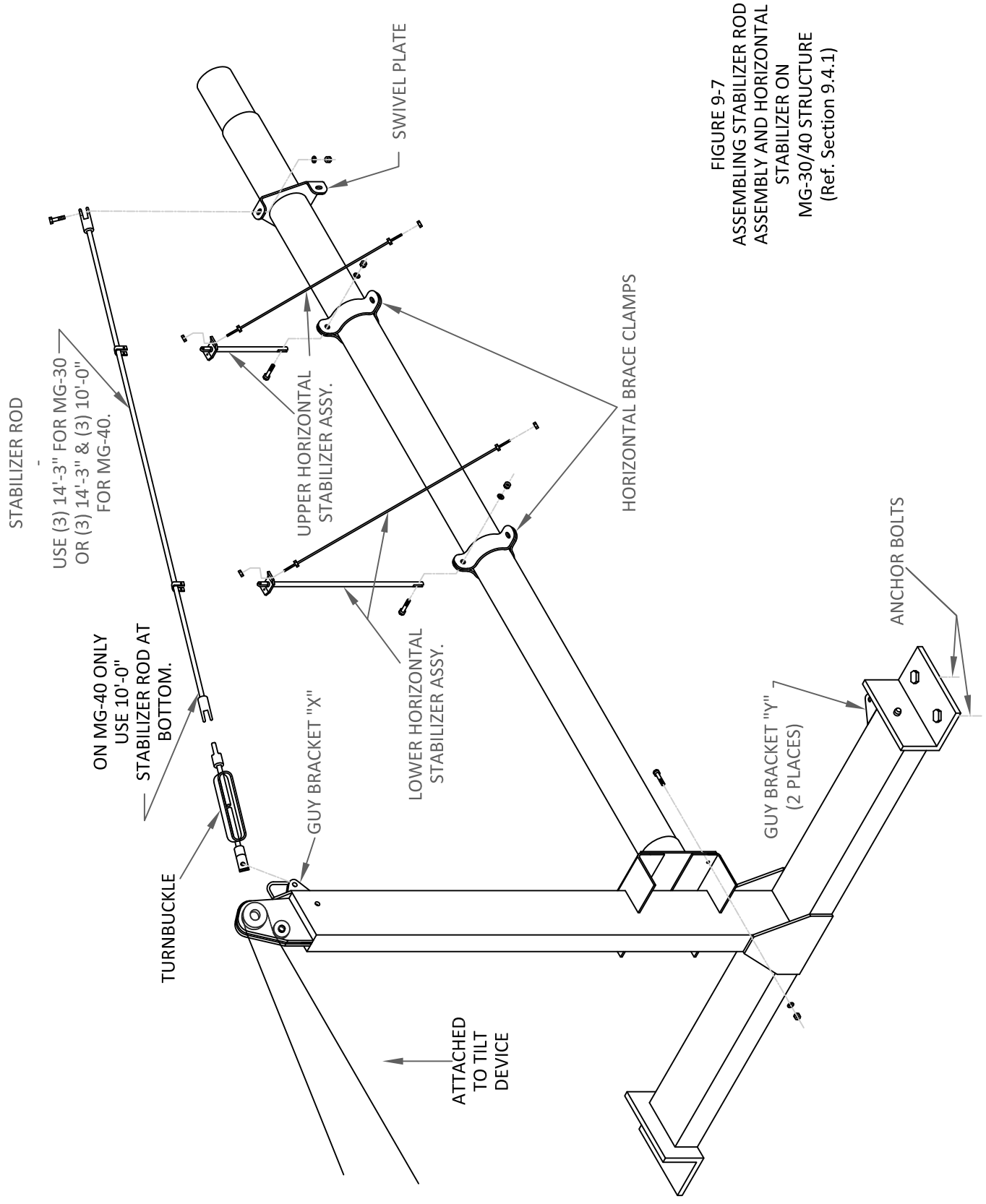


FIGURE 9-7
ASSEMBLING STABILIZER ROD
ASSEMBLY AND HORIZONTAL
STABILIZER ON
MG-30/40 STRUCTURE
(Ref. Section 9.4.1)

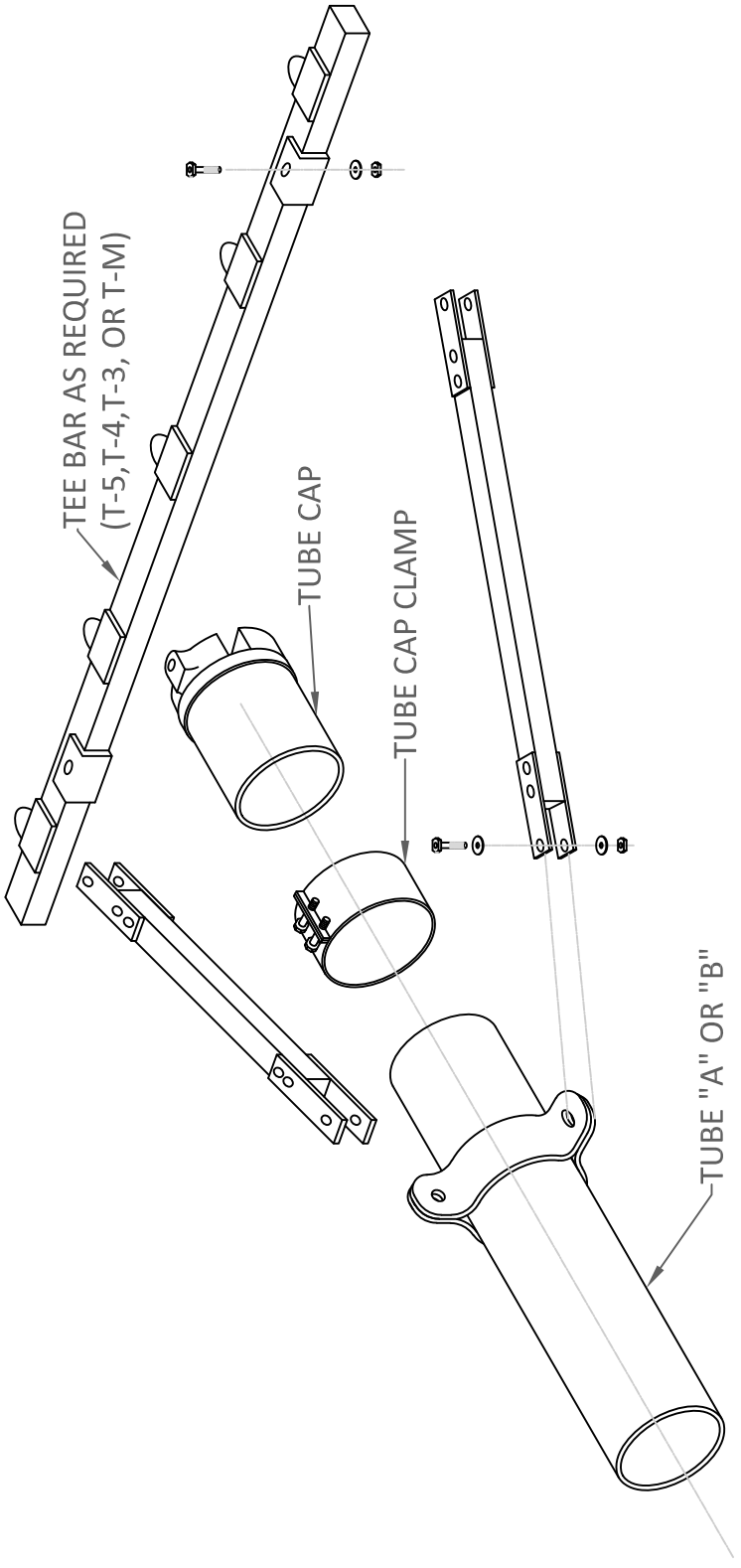


FIGURE 9-8
ATTACHING TUBE CAP ASSEMBLY AND TEE-BAR
ASSEMBLY (If required)
(Ref. Section 9.4.1 & 9.4.2)

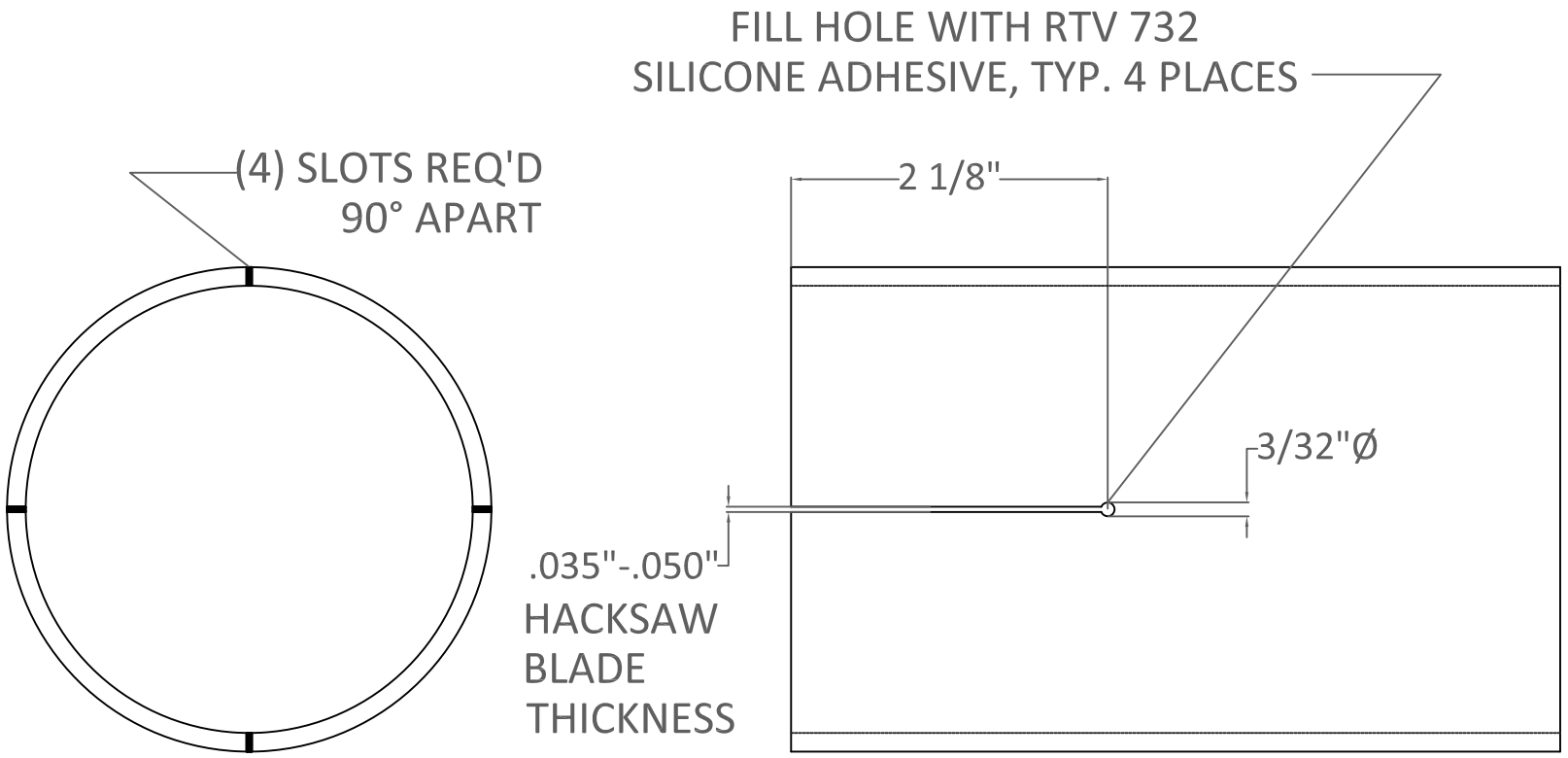


FIGURE 9-9
SLOT & DRILL UPPER END OF MG-20 AND MG-30/40 MAST TUBE
(Ref. Section 9.4.1)

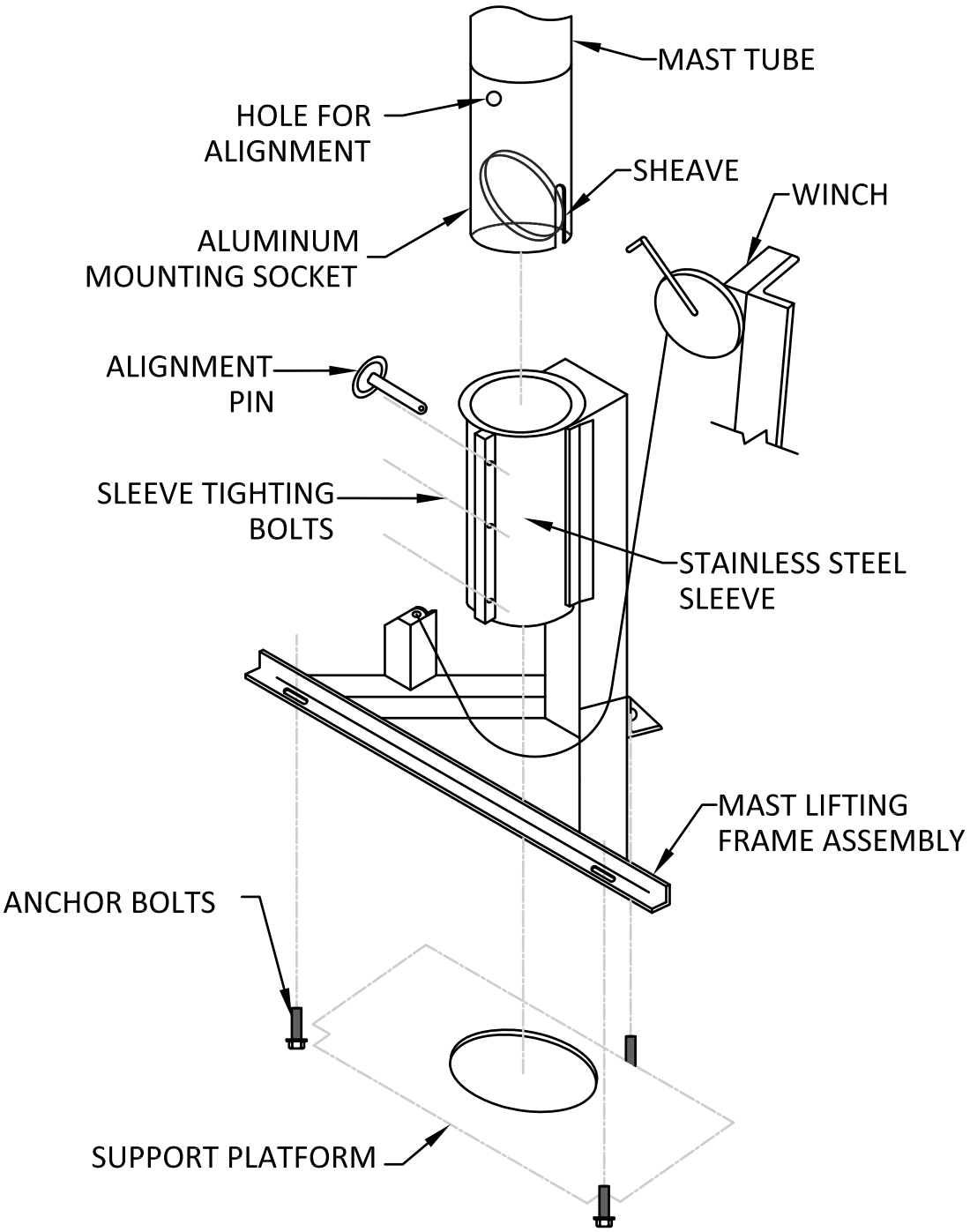


FIGURE 9-10
ATTACH MAST LIGHTING FRAME TO SUPPORT PLATFORM
(Ref. Section 9.4.2)

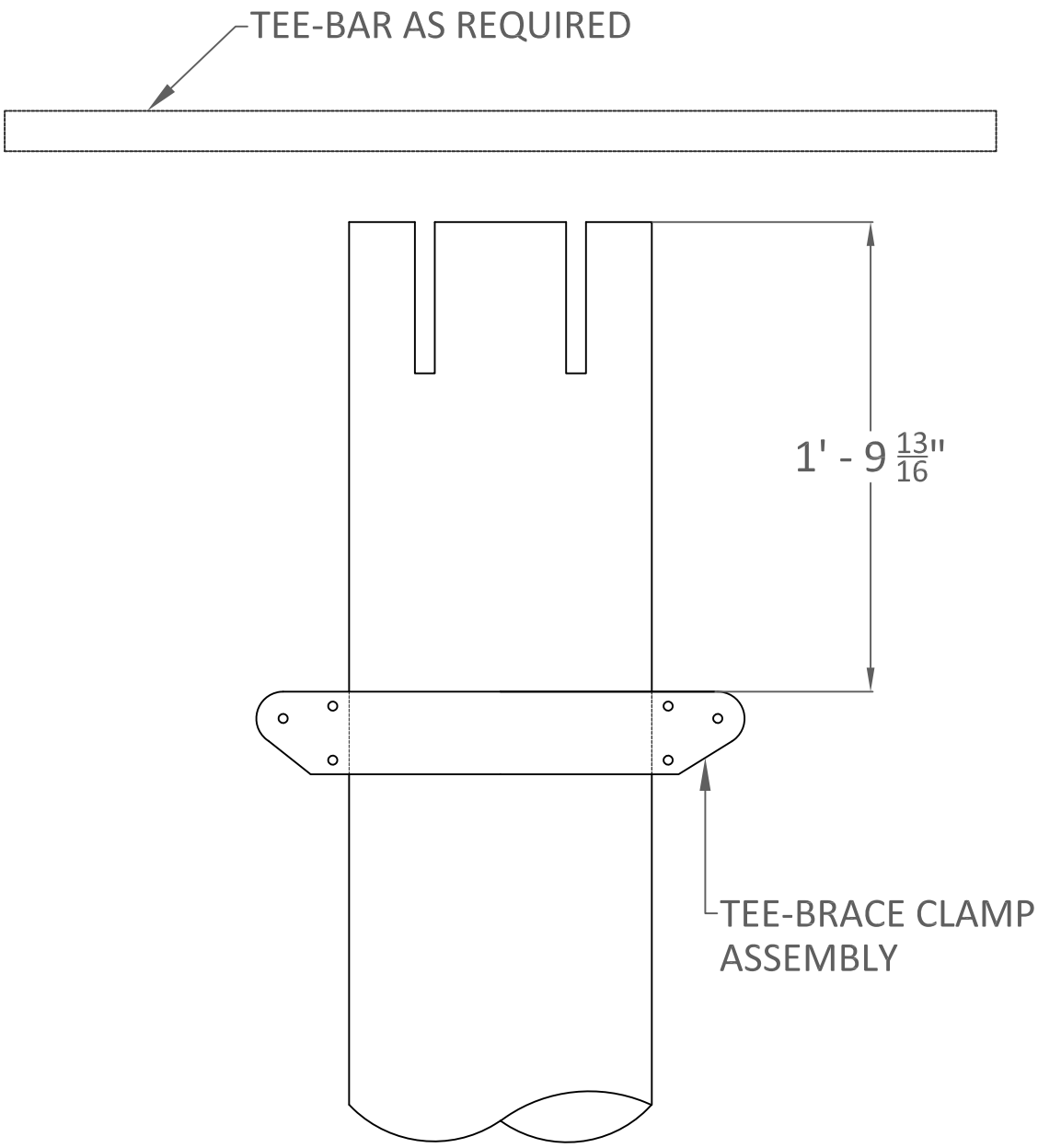


FIGURE 9-11
ATTACH TEE-BRACE CLAMP ASSEMBLY TO MS-20 MAST
(Ref. Section 9.4.2)

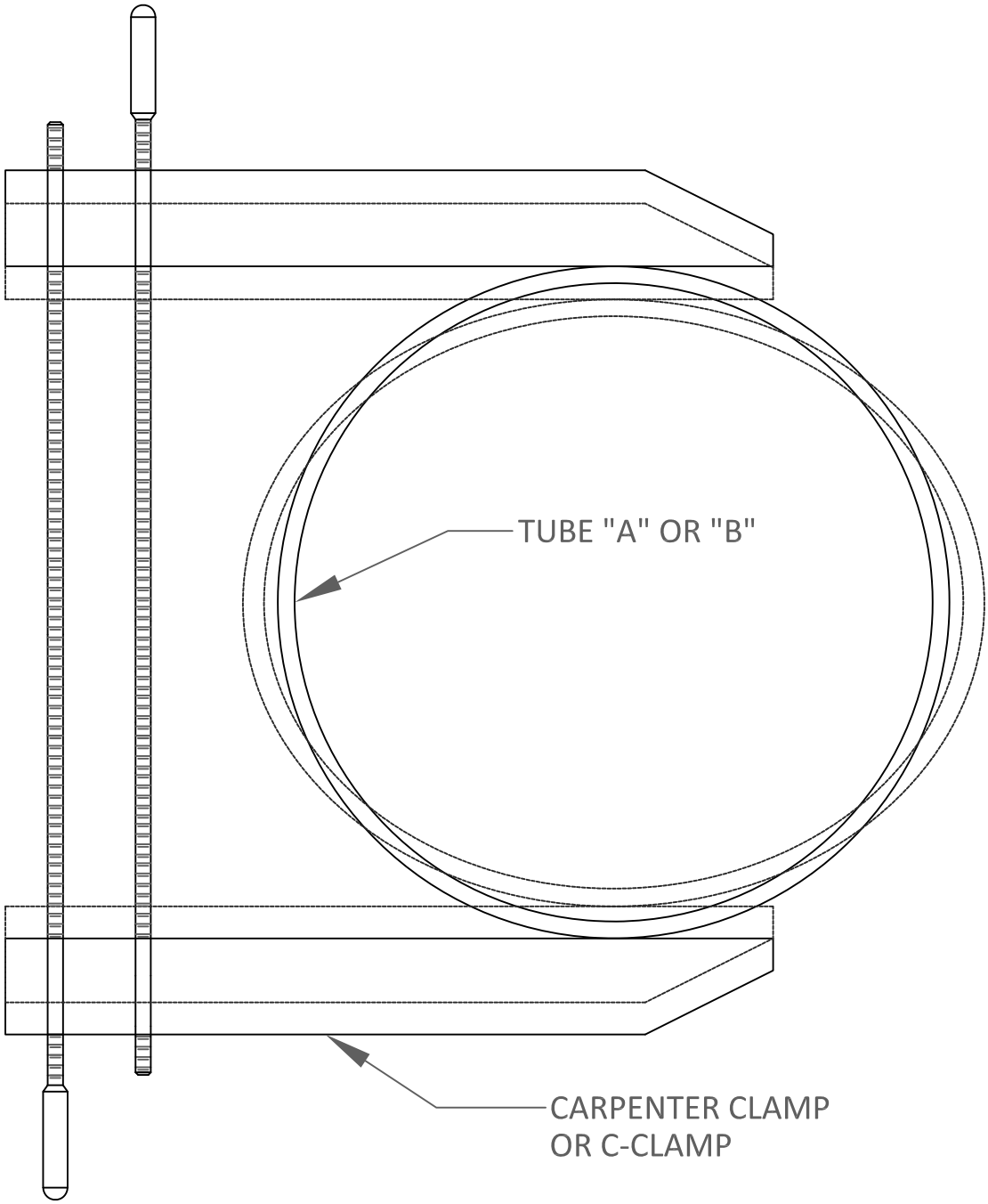


FIGURE 9-12
BRING 6" I.D. FIBERGLASS TUBE INTO ROUND FOR INSERTION OF TUBE CAP, TUBE SPLICE, OR STAND PLATE - IF REQUIRED