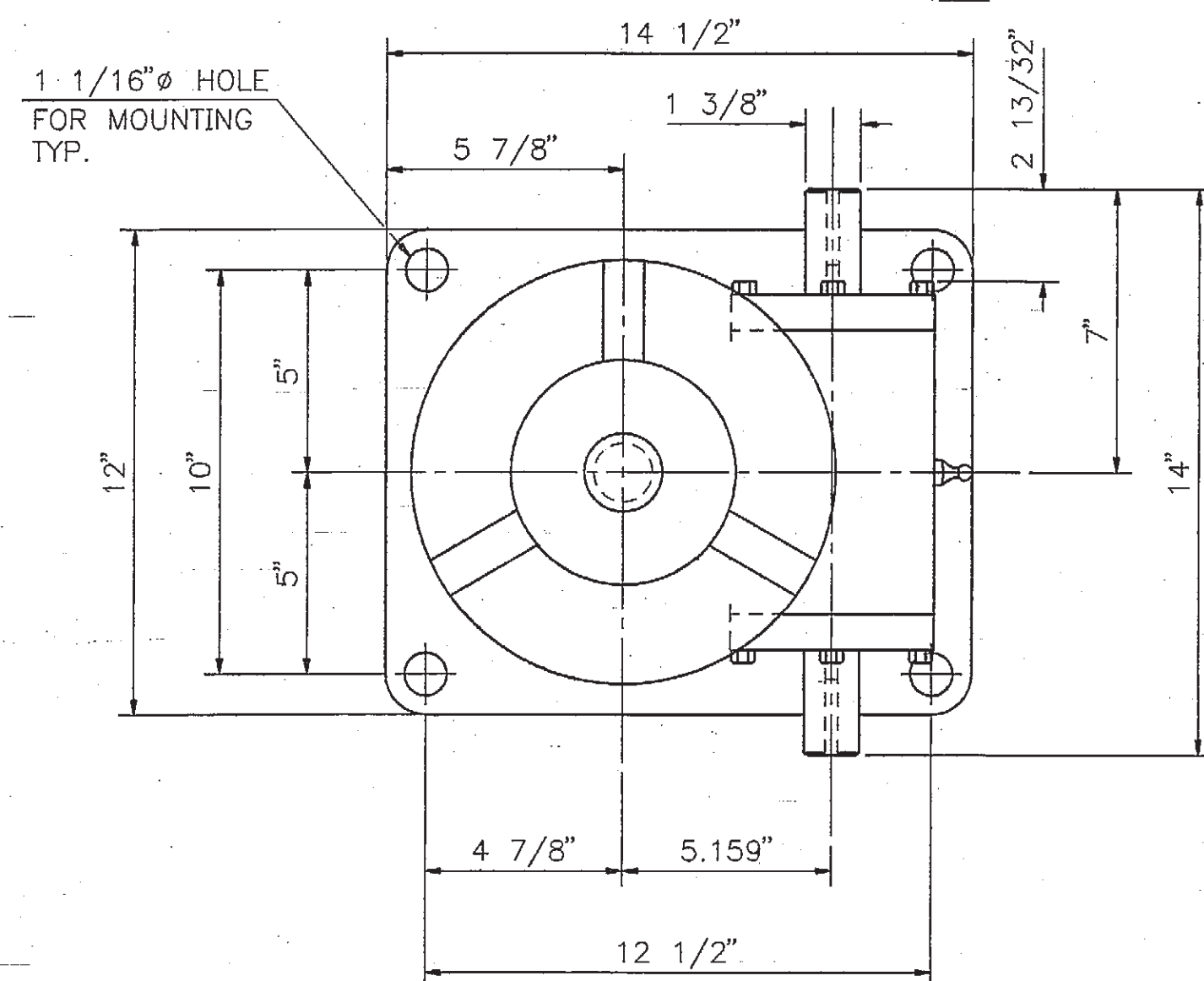
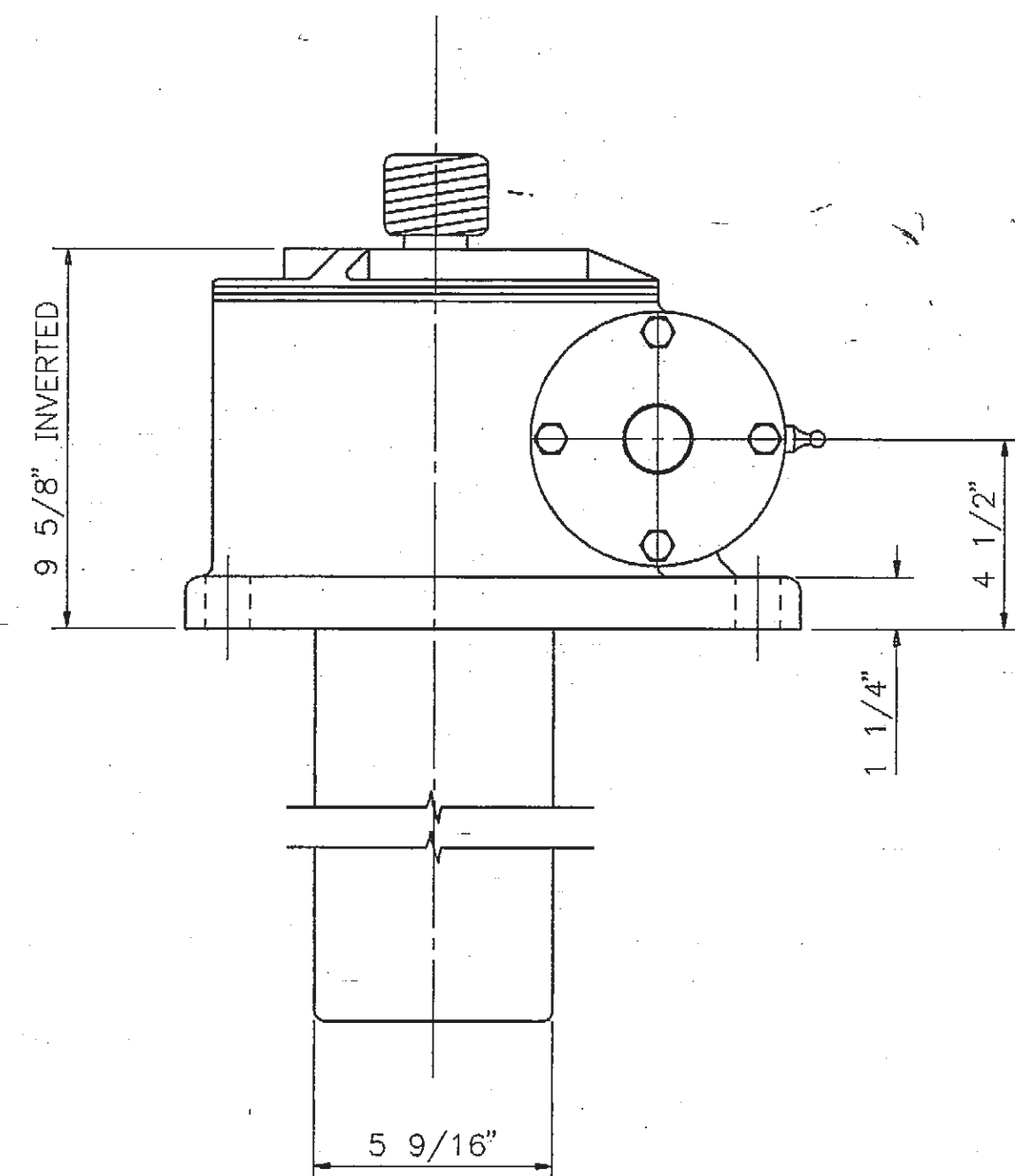
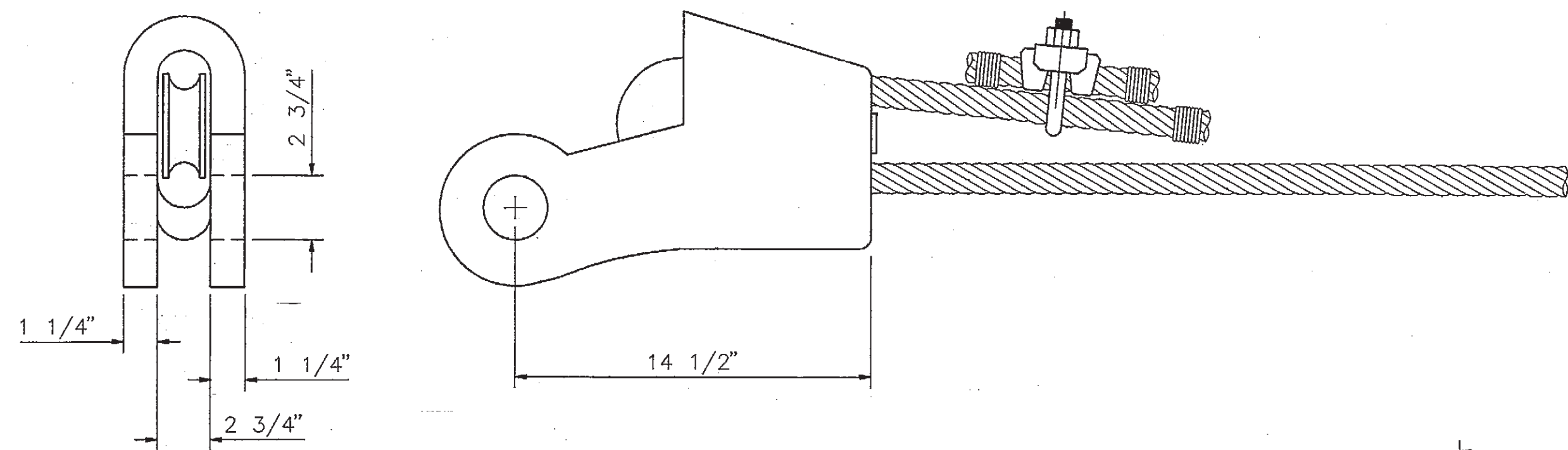




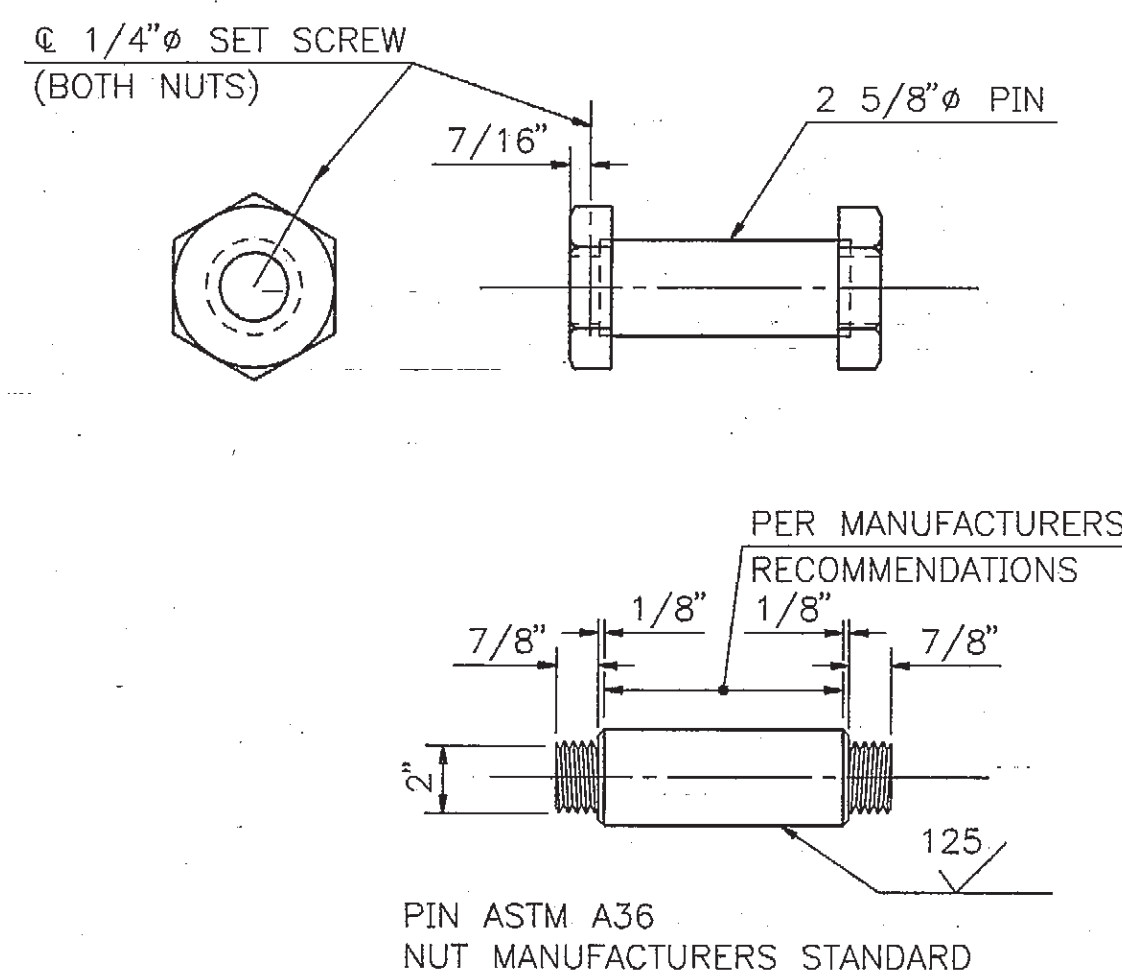
1M-8 PLAN - ACTUATOR
M-8 NO SCALE



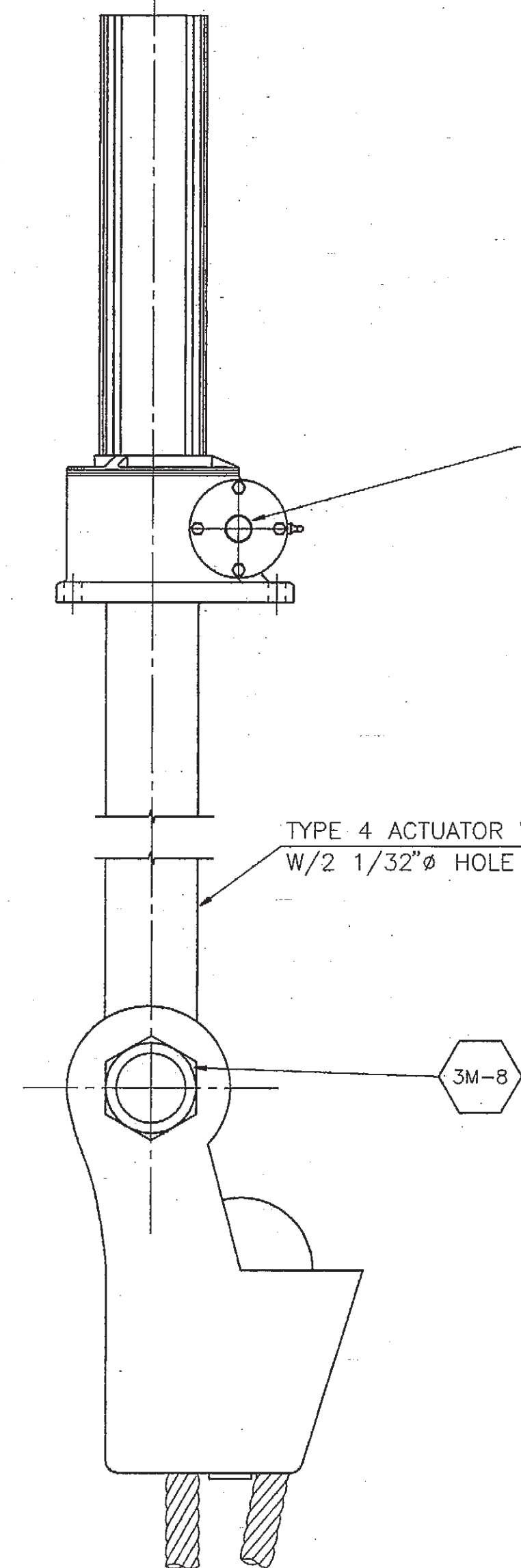
2M-8 ELEVATION - ACTUATOR
M-8 NO SCALE



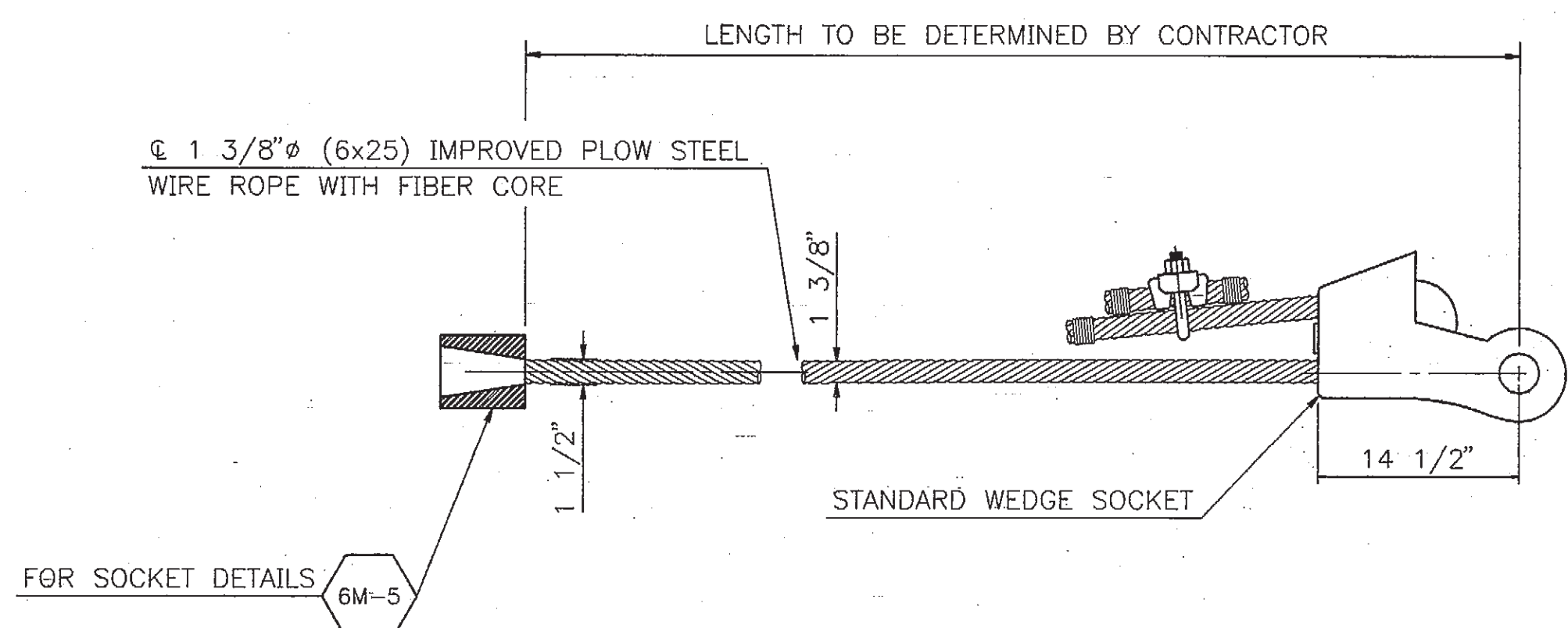
5M-8 ROPE AND SOCKETS
M-8 NO SCALE



3M-8 PIN AND RECESSED PIN NUT
M-8 SCALE: 3" = 1'-0"



4M-8 ACTUATOR ASSEMBLY
M-8 NO SCALE



6M-8 OPERATING ROPE AND SOCKETS
M-8 SCALE: 1 1/2" = 1'-0"

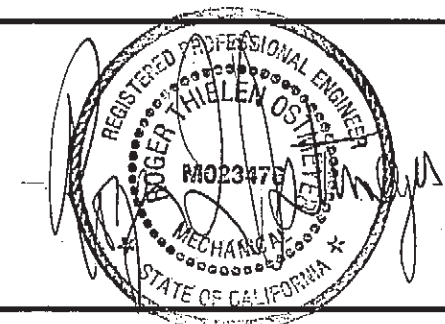
NOTE: THE COST OF FURNISHING THE UPHAUL AND DOWNHAUL ROPE ANCHOR SUPPORTS, ROPE TAKE-UP SUPPORTS AND SHEAVE ANCHORAGES SHALL BE INCLUDED IN THE STRUCTURAL METAL WORK FOR PAYMENT.
ALL MATERIAL SHALL BE ASTM A709 GRADE 36 UNLESS OTHERWISE NOTED.

OPERATING ROPE TAKE-UP NOTES:
OPERATING DRUM ROPE SOCKETS SHALL BE ANNEALED FORGING CONFORMING TO THE REQUIREMENTS OF ASTM A668 CLASS D.
ROPE TAKE-UPS SHALL BE A WORM GEAR ACTUATOR AS SHOWN WITH THE FOLLOWING REQUIREMENTS:
THREADED SCREW END, 2" Ø.
MINIMUM TRAVEL OF 4'-0".
PROTECTOR PIPE.
PROTECTION BOOT WITH ADAPTERS (8 REQUIRED).
DUAL INPUT SHAFT FOR HAND CRANK AND LOCK.
KEYED SCREW TO PREVENT ROTATION.
ROLLER THRUST BEARINGS AND A STOP PIN.

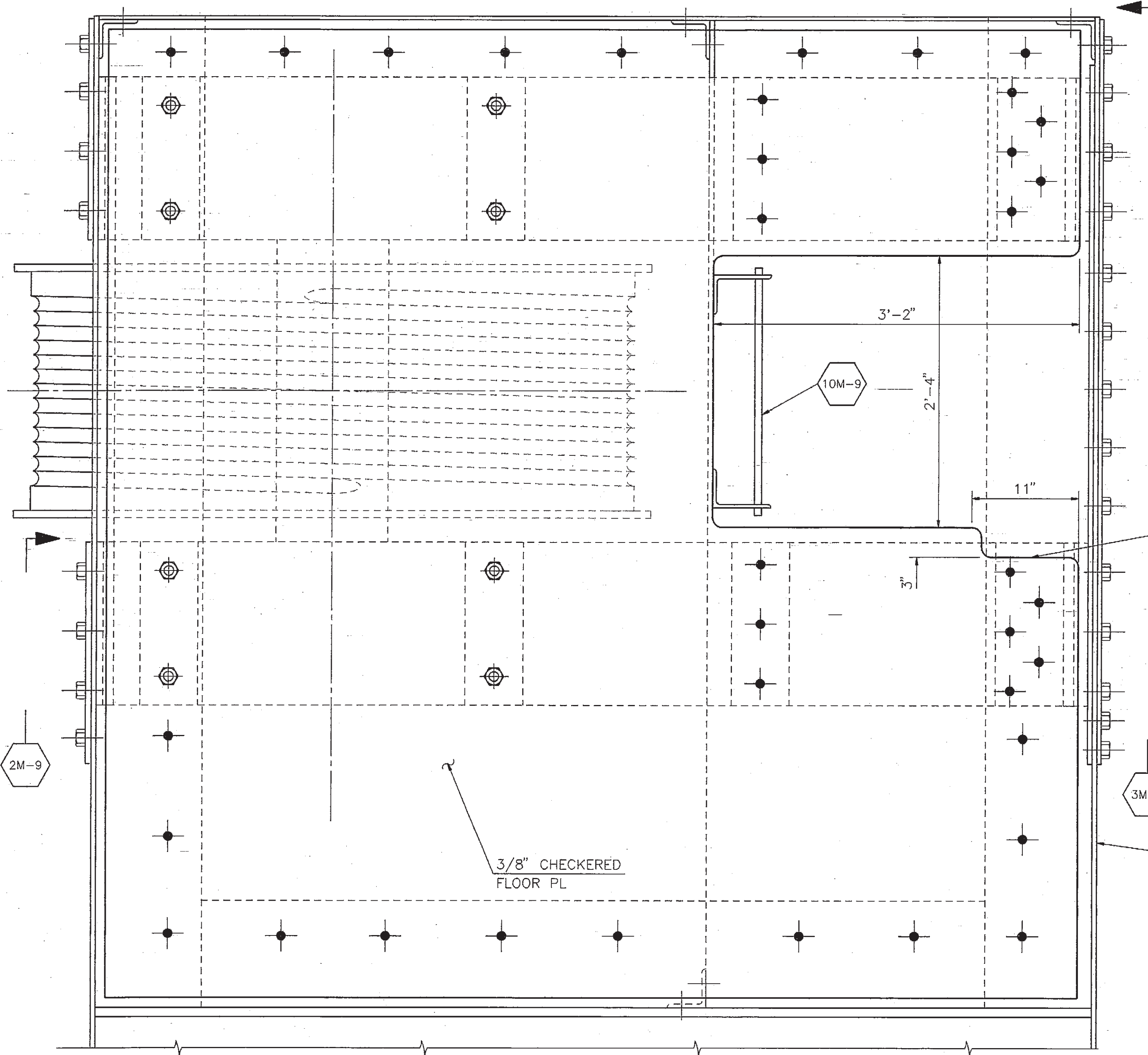
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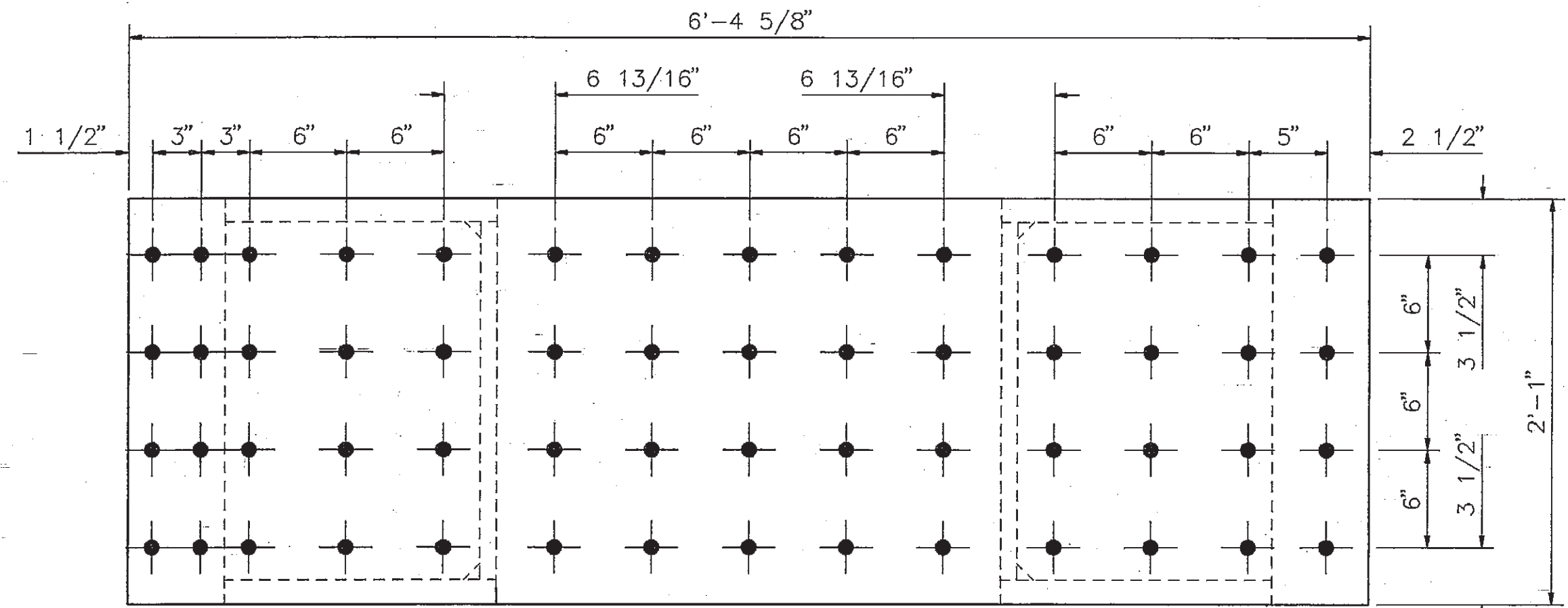
SCALE: AS SHOWN	DATE: 9-93	PLANS PREPARED BY:
DRAWN BY: SGF	CHECKED BY: HWL	HNTB
DESIGNED BY: MCH	PROJECT MGR. WILLIAM R. HUGHES	HOWARD NEEDLES TAMMEN & BERGENDOFF
		36 EXECUTIVE PARK
		SUITE 200
		IRVINE, CALIFORNIA 92714



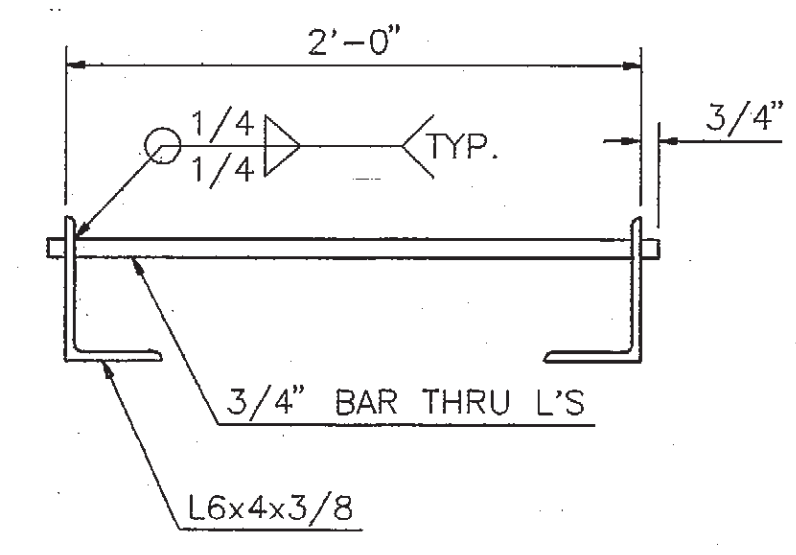
BADGER AVENUE BRIDGE REPLACEMENT - PHASE II	
OPERATING ROPE TAKE-UP & SUPPORT DETAILS	
WORLDPORT L.A.	DRAWING NUMBER
ENGINEERING DIVISION P.O. BOX 151 SAN PEDRO, CALIF.	1-1991 M-8



1M-9
M-6
PLAN
1 1/2" = 1'-0"



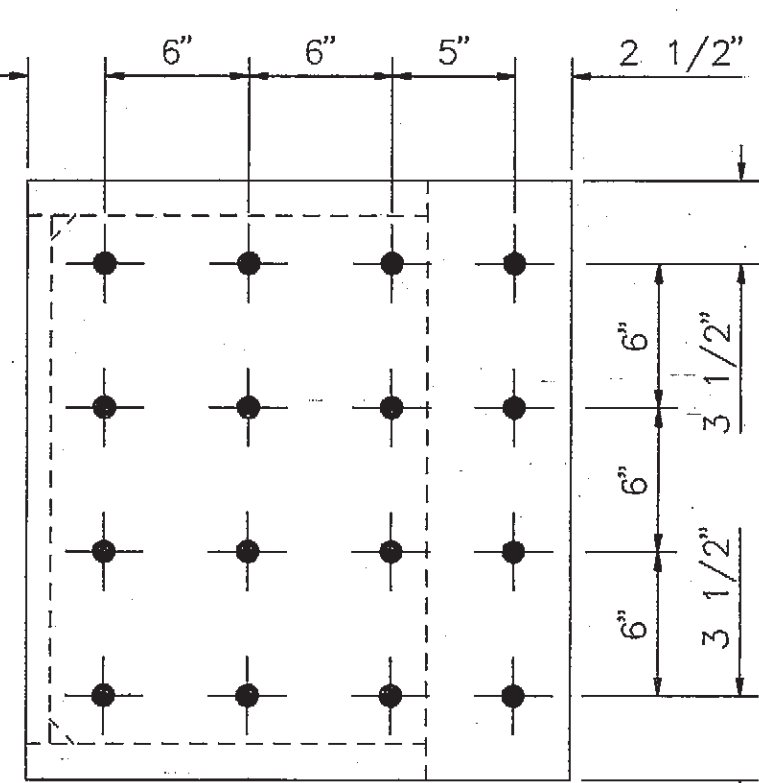
3M-9
1M-9
DETAIL
1 1/2" = 1'-0"



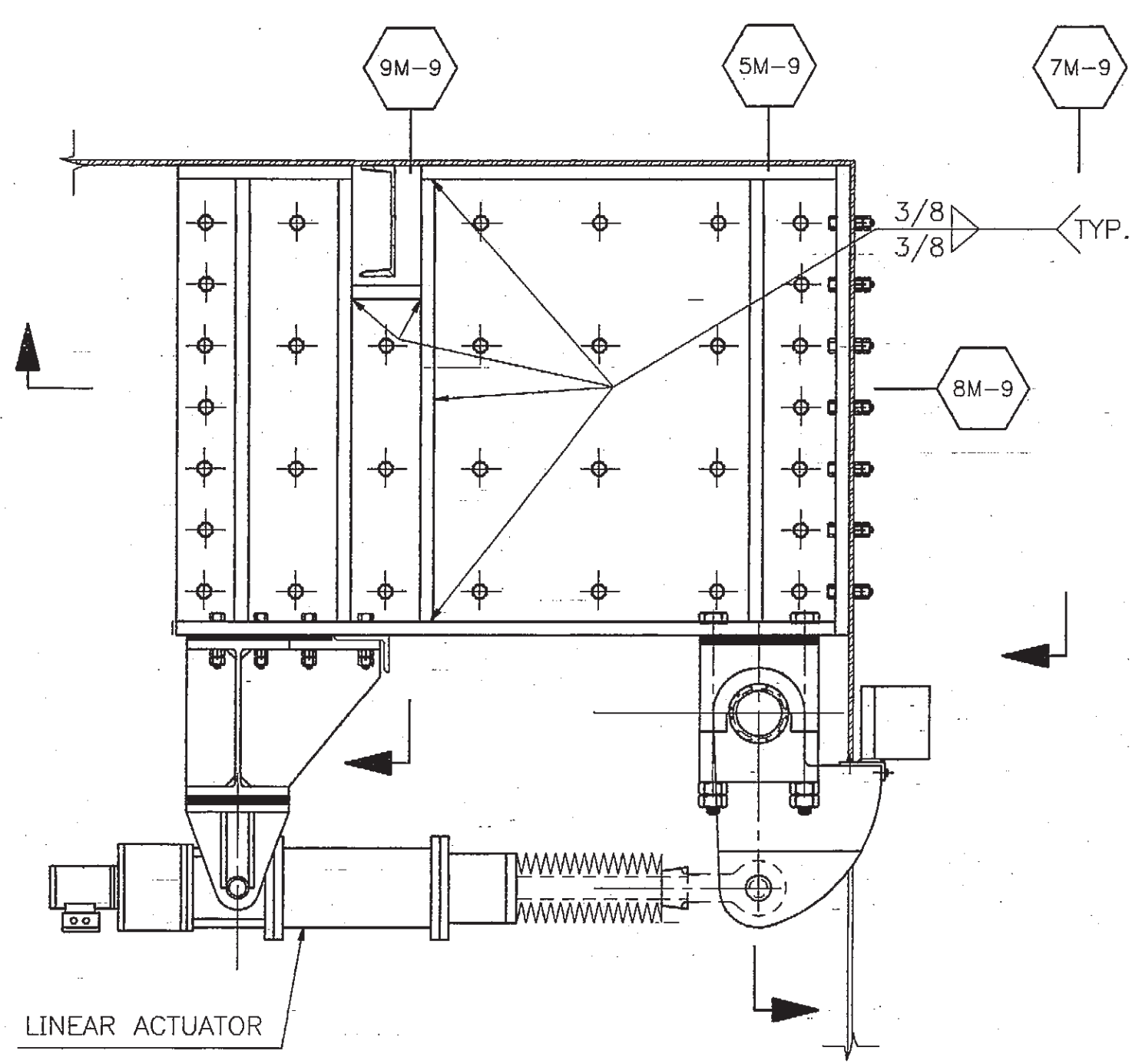
10M-9
1M-9
DETAIL
1 1/2" = 1'-0"

TRIM AROUND VERT.
STIFFENER

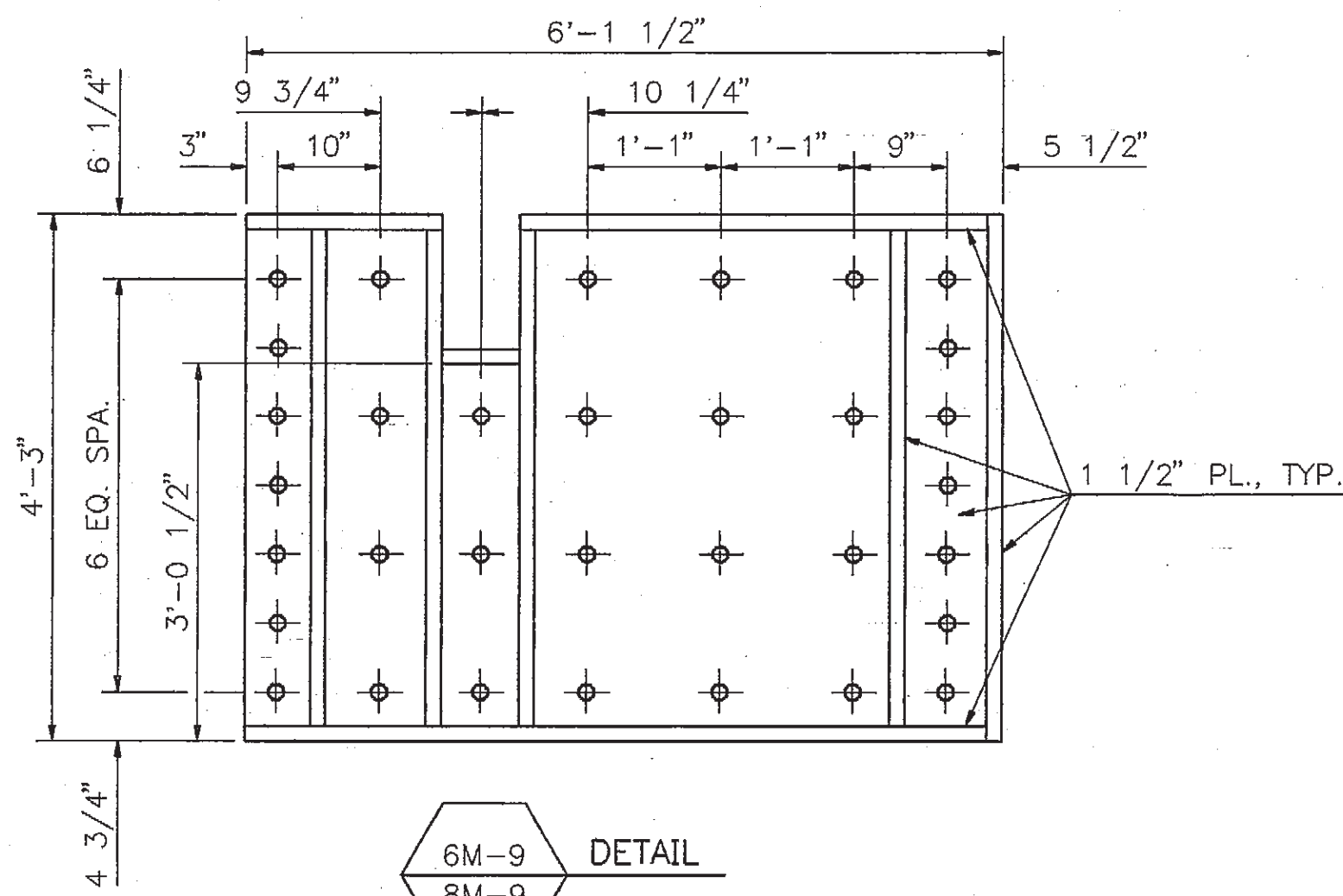
1/2" SKIN PL



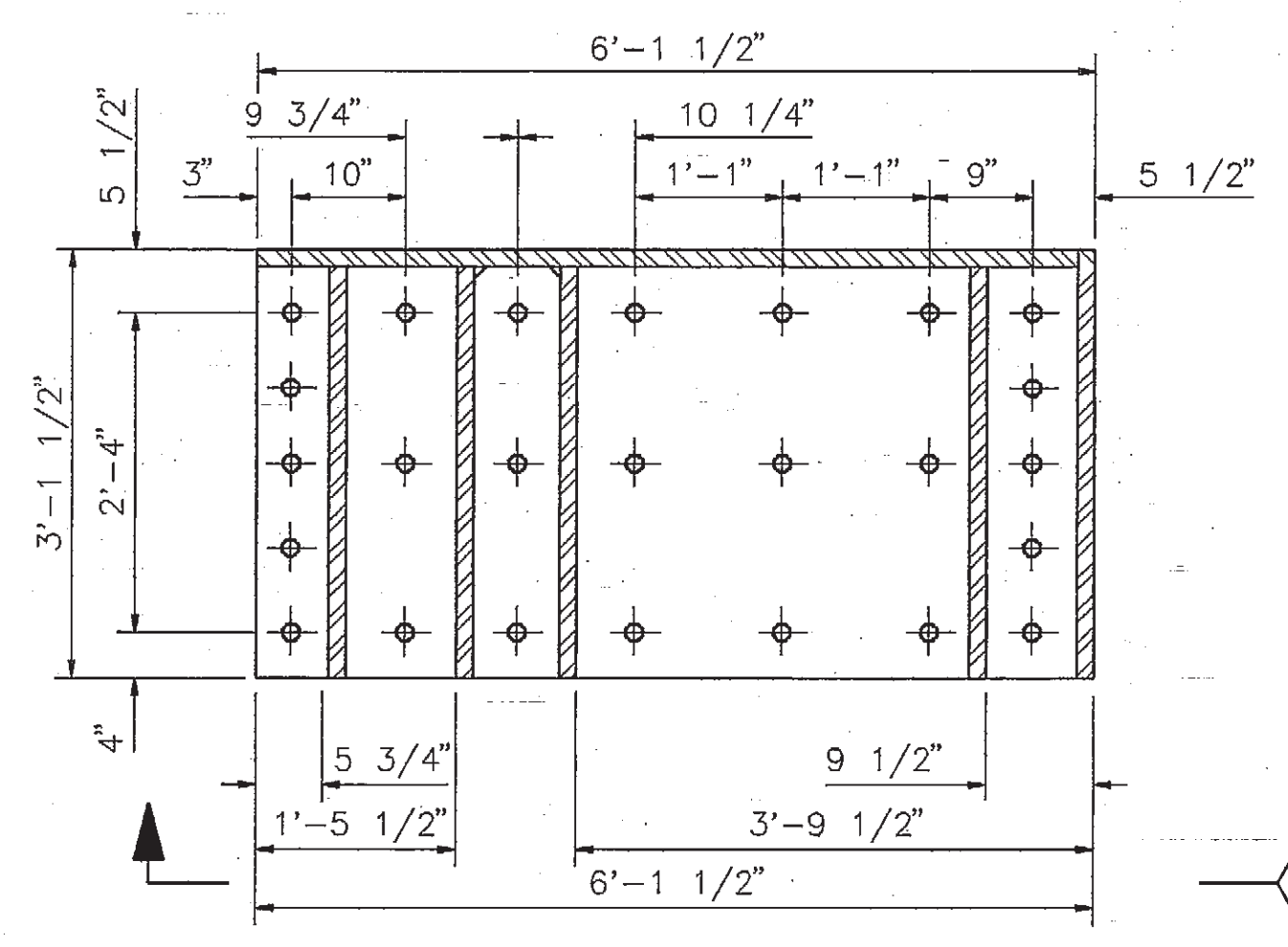
2M-9
M-9
DETAIL
1 1/2" = 1'-0"



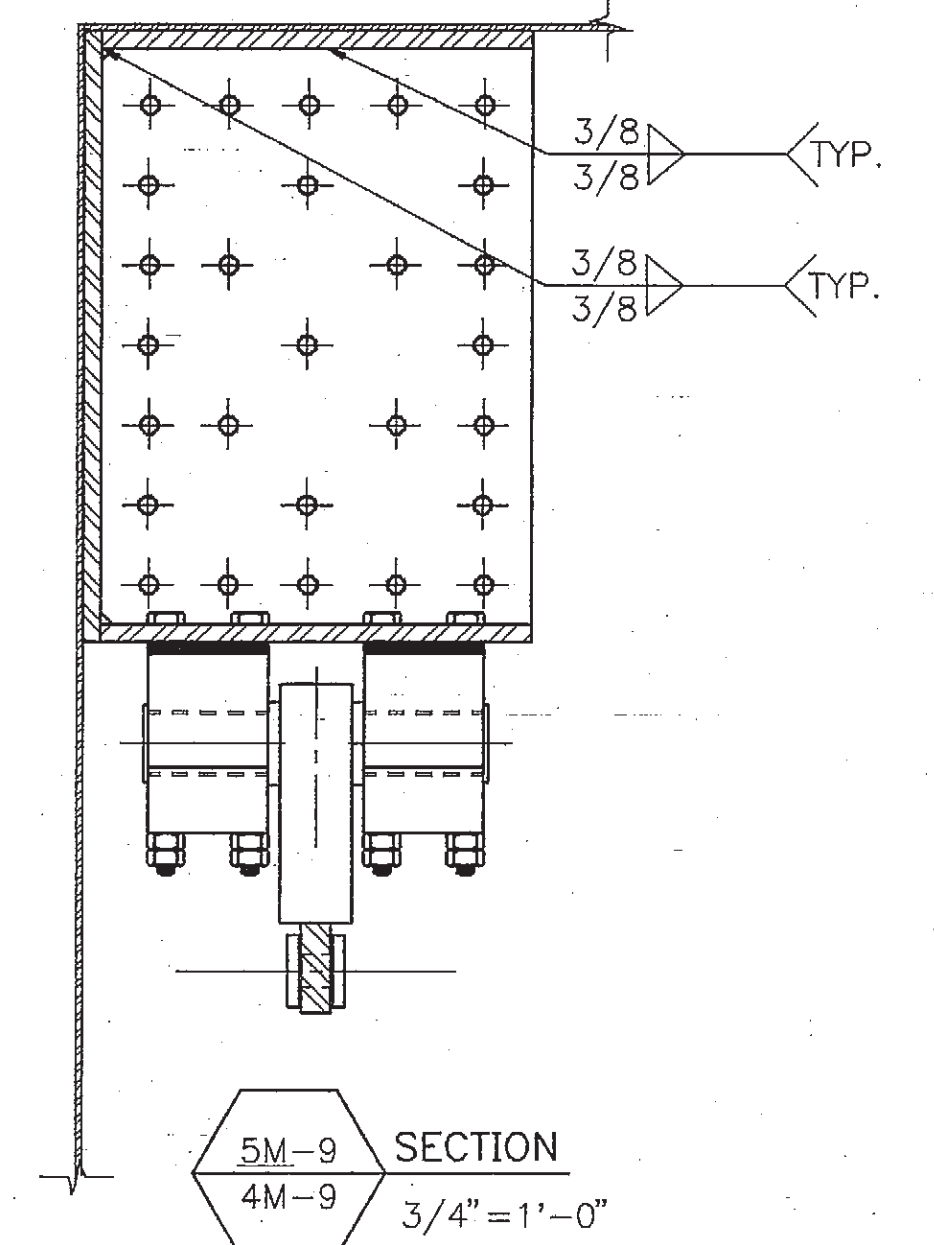
4M-9
4S-43
SPAN LOCK/SEATING DEVICE - ELEVATION
3/4" = 1'-0"



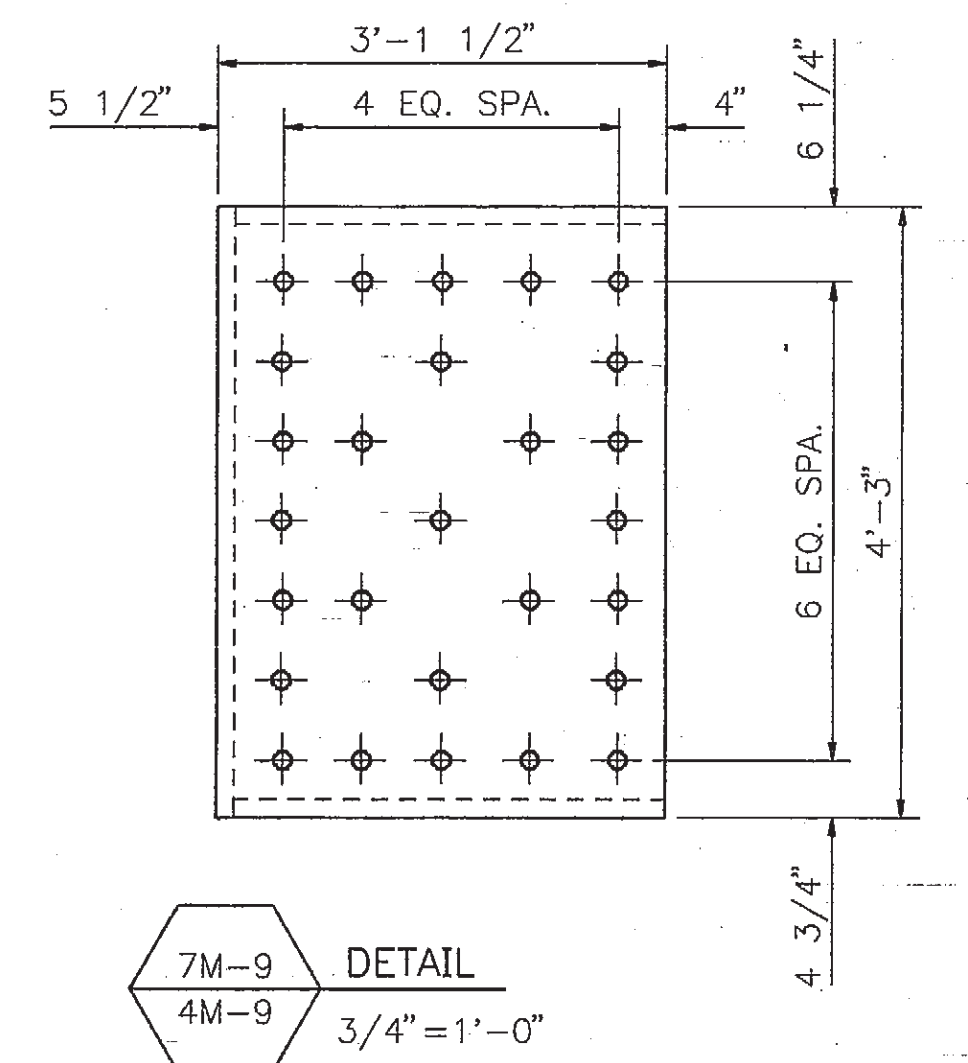
6M-9
8M-9
DETAIL
3/4" = 1'-0"



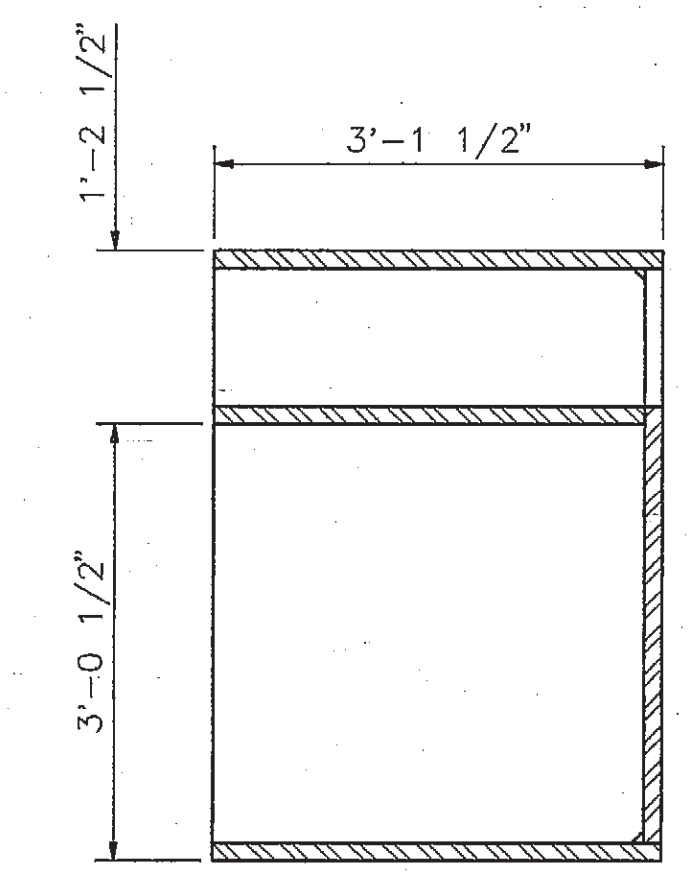
8M-9
4M-9
SECTION
3/4" = 1'-0"



5M-9
4M-9
SECTION
3/4" = 1'-0"



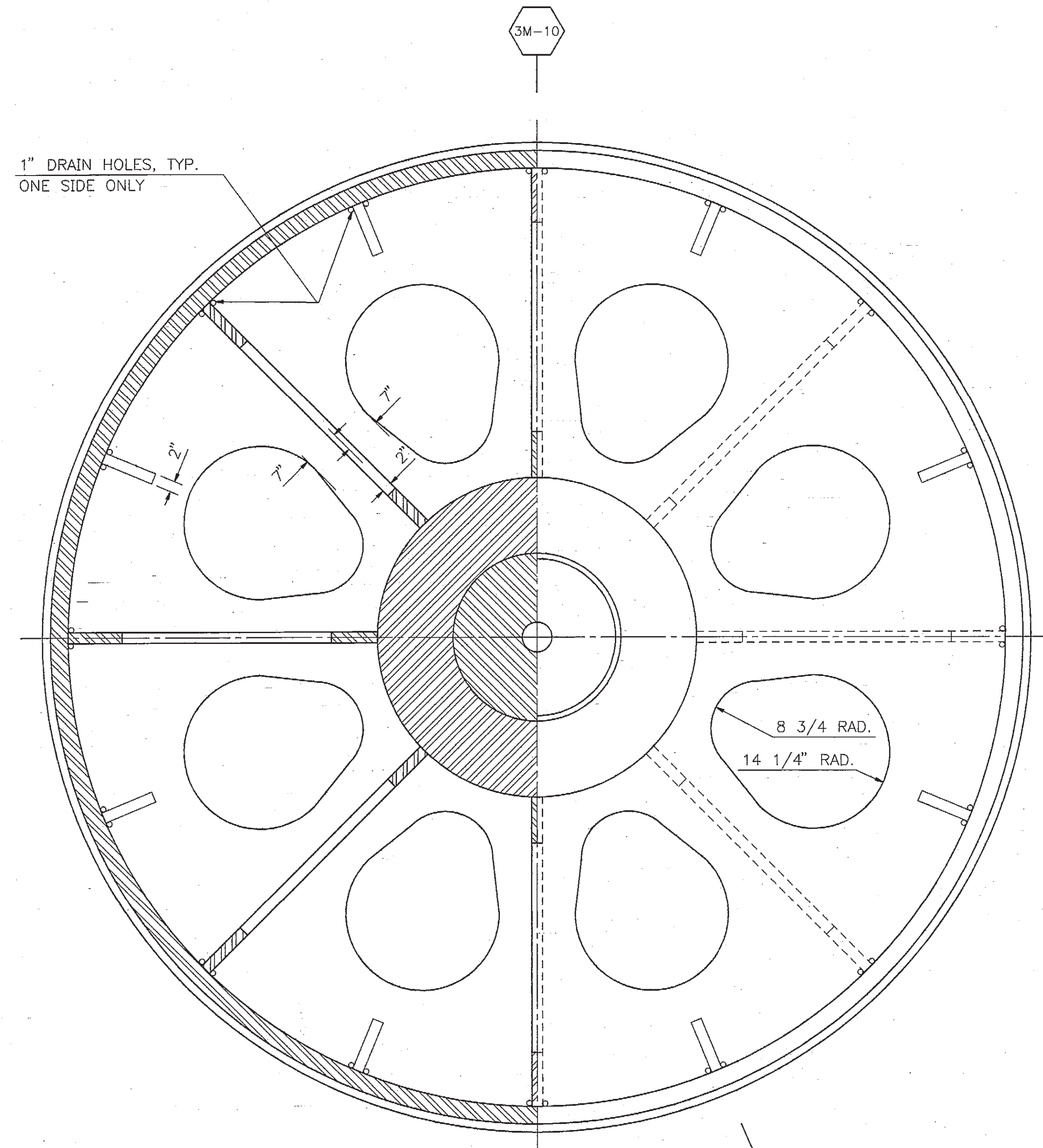
7M-9
4M-9
DETAIL
3/4" = 1'-0"



9M-9
4M-9
SECTION
3/4" = 1'-0"

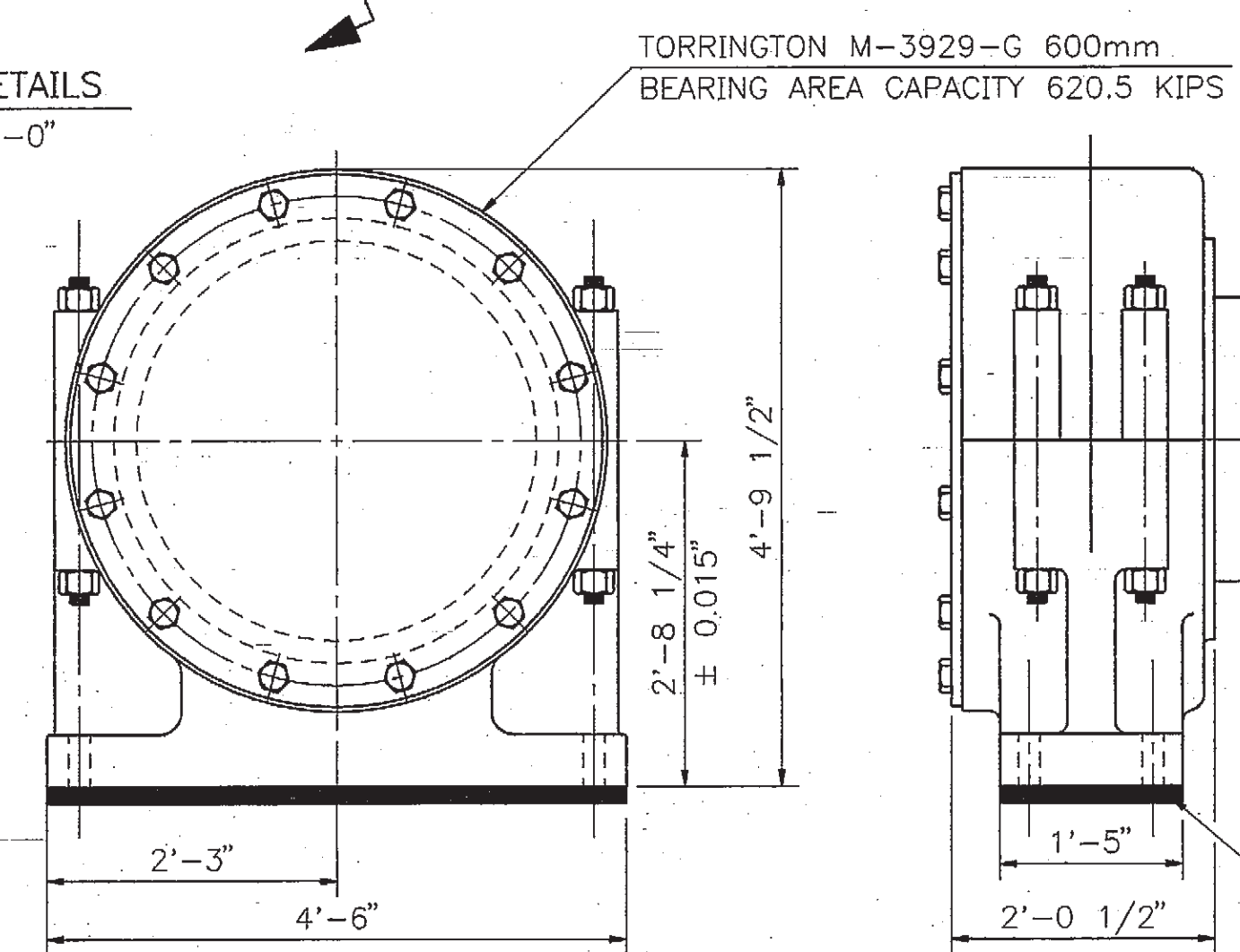
NO. DATE DRAWN REVISIONS				APP'D P.O.L.A.				NO. DATE DRAWN REVISIONS				APP'D P.O.L.A.				SCALE: AS SHOWN DATE				PLANS PREPARED BY:				BADGER AVENUE BRIDGE REPLACEMENT - PHASE II				OPERATING ROPE DRUM SUPPORT DETAILS				WORLDPORT L.A.				DRAWING NUMBER				1-1991 M-9			
																1				HNTB				ENGINEERING DIVISION																			
																2				HOWARD NEEDLES TAMMEN & BERGENDOFF				P.O. BOX 151																			
																3				36 EXECUTIVE PARK				SAN PEDRO, CALIF.																			
																4				SUITE 200																							
																5				IRVINE, CALIFORNIA 92714																							
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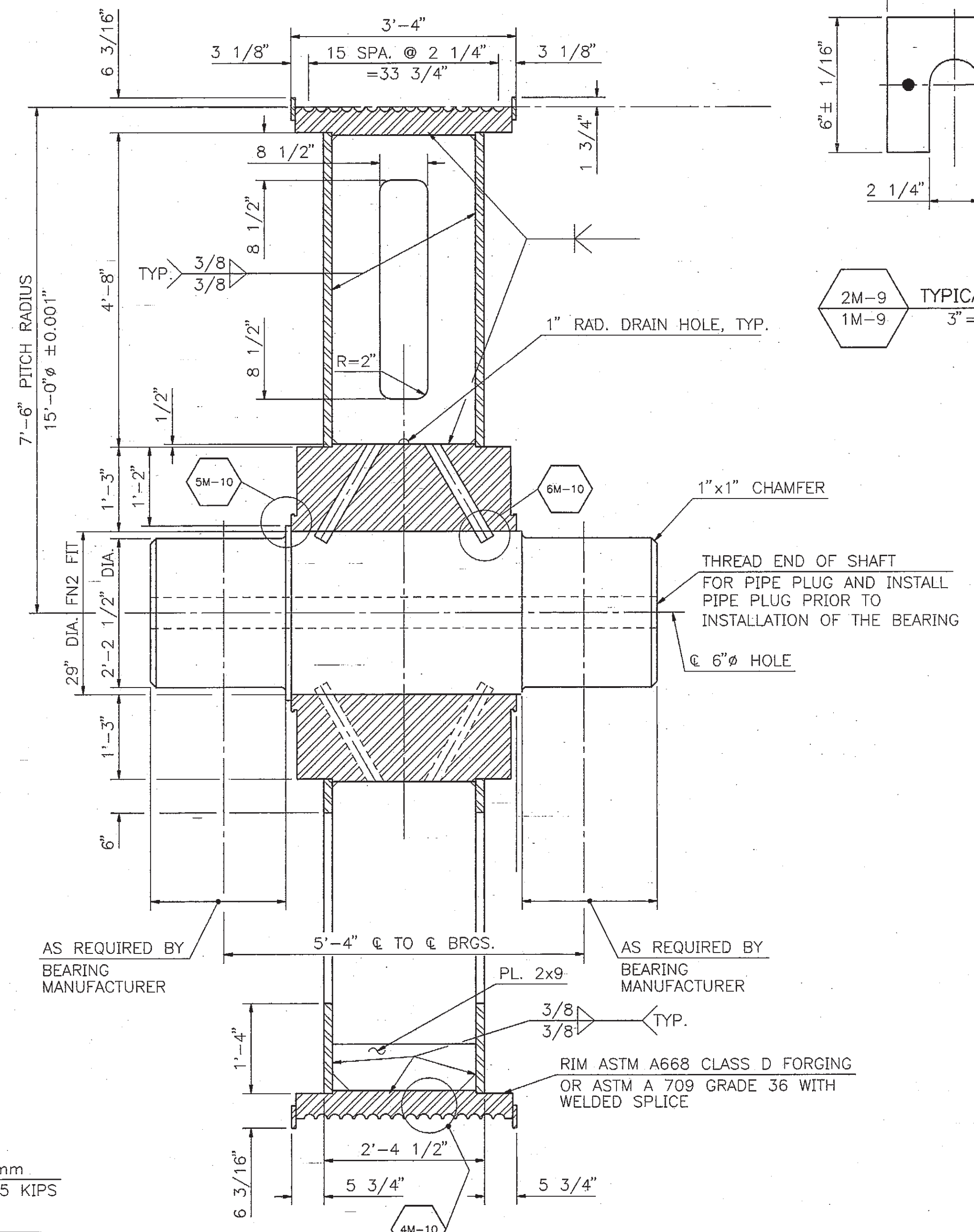
1" DRAIN HOLES, TYP.
ONE SIDE ONLY

1M-10 TOWER SHEAVE DETAILS
M-10 SCALE: 3/4"=1'-0"



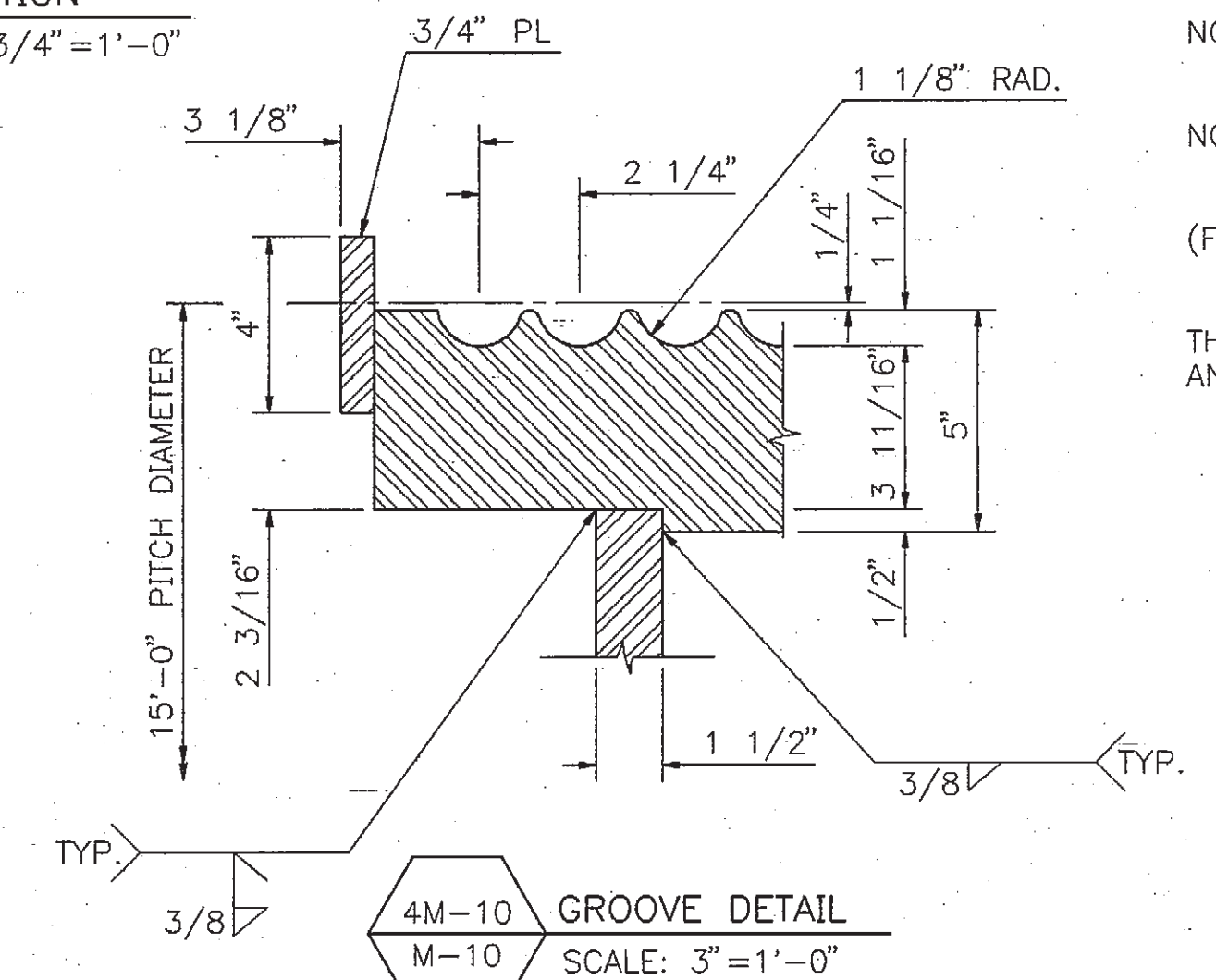
TORRINGTON M-3929-G 600mm
BEARING AREA CAPACITY 620.5 KIPS

2M-10 TOWER SHEAVE BEARINGS
M-10 SCALE: 3/4"=1'-0"

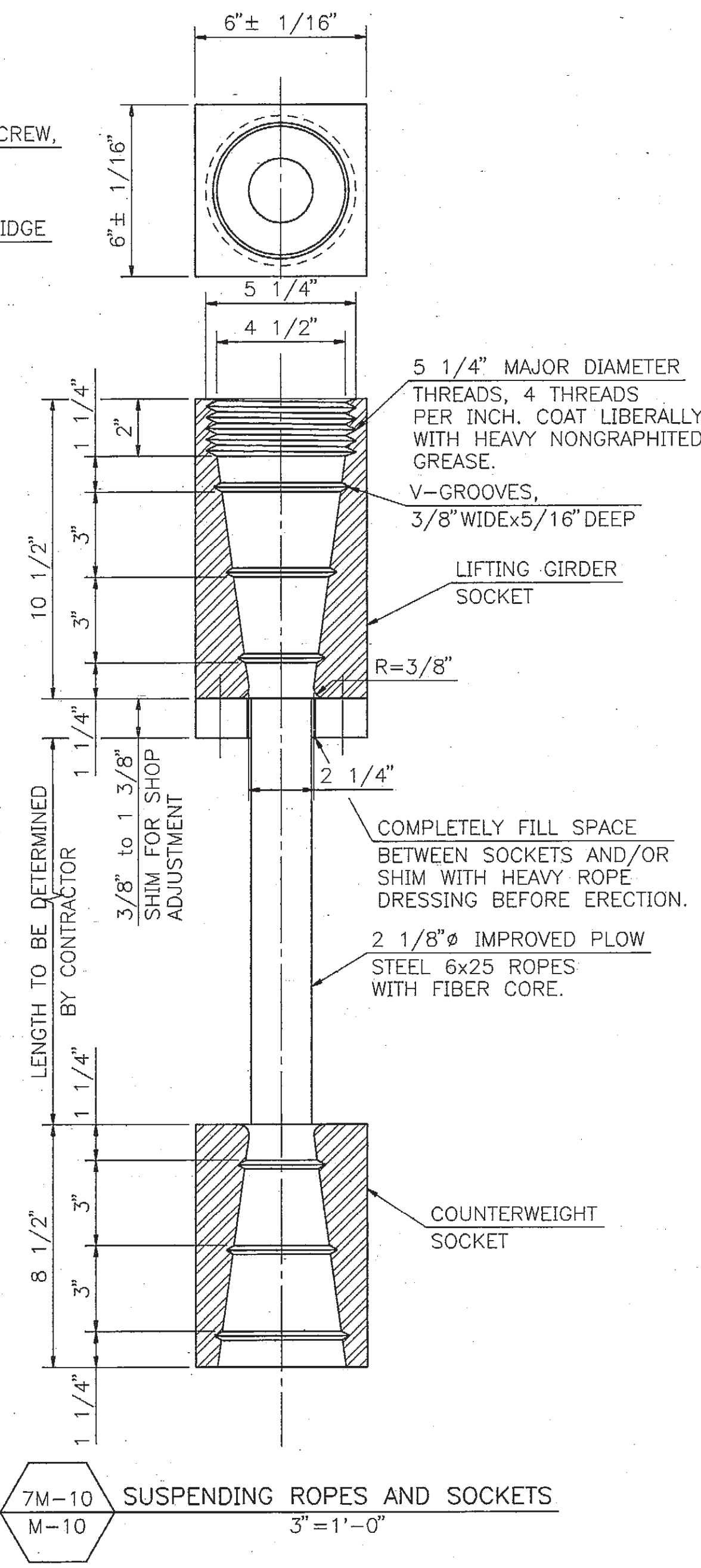


2M-9 TYPICAL SHIM
1M-9 3"=1'-0"

3M-10 SECTION
1M-10 SCALE: 3/4"=1'-0"

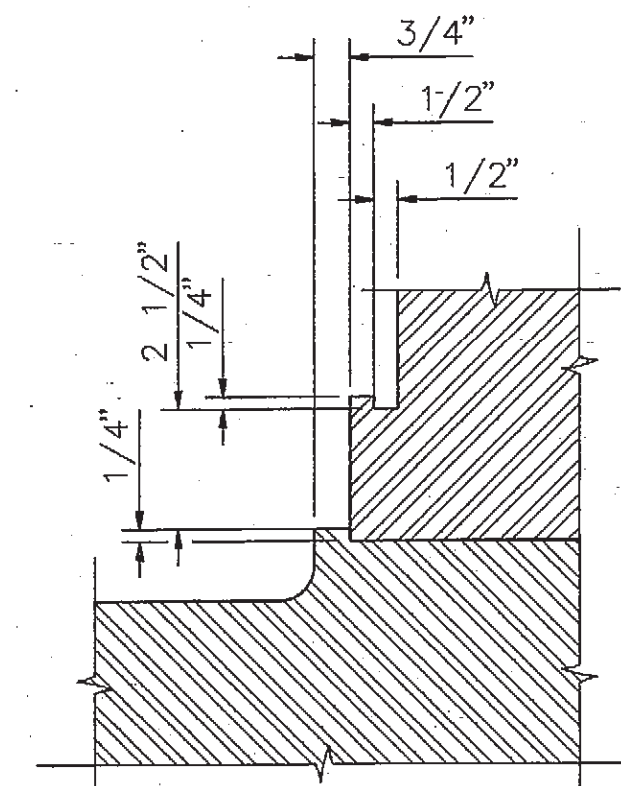


4M-10 GROOVE DETAIL
M-10 SCALE: 3"=1'-0"

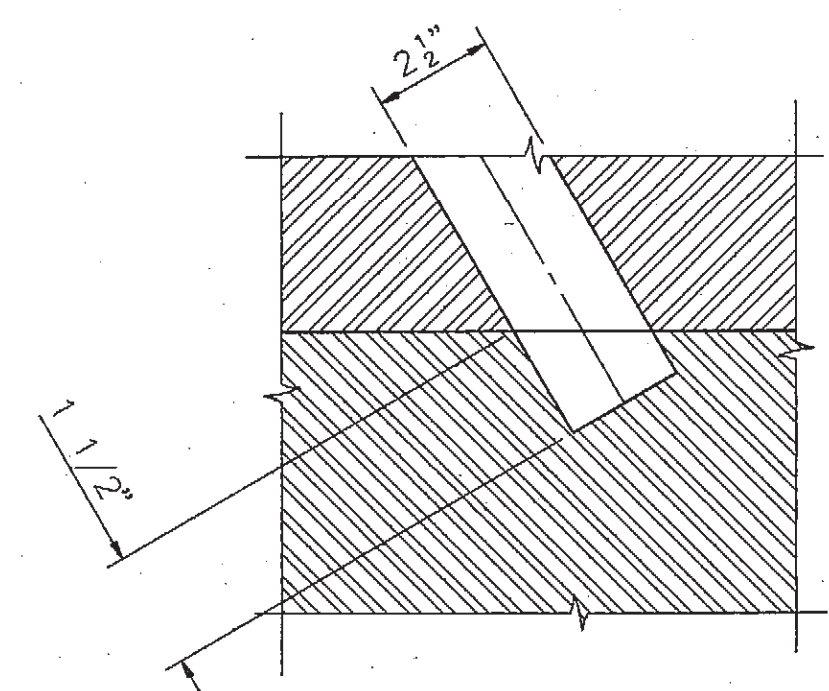


7M-10 SUSPENDING ROPES AND SOCKETS
M-10 3"=1'-0"

NOTE:
THE TOWER SHEAVES SHALL BE MADE OF ASTM A 709 GRADE 36 STEEL UNLESS NOTED, SEE THE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
THE SHEAVES SHALL BE DOWELLED TO THE SHAFT 2 1/2" DIAMETER DOWEL PINS (FN-2 FIT) AFTER THE SHAFT HAS BEEN INSTALLED.
THE SHEAVE SHAFT AND SHEAVE HUB SHALL BE A FORGING CONFORMING TO THE MINIMUM REQUIREMENTS OF ASTM A 668 CLASS D. THE SHAFT SHALL BE TURNED AND BORED TO FIT THE SHEAVE BEARING MANUFACTURERS REQUIREMENTS.
SHEAVE BEARING DESIGN LOADS BASED ON AREA.
FLOAT BEARING LOADING OF 620 KIPS @ 1.5 RPM.
FIXED BEARING LOADING OF 620 KIPS @ 1.5 RPM

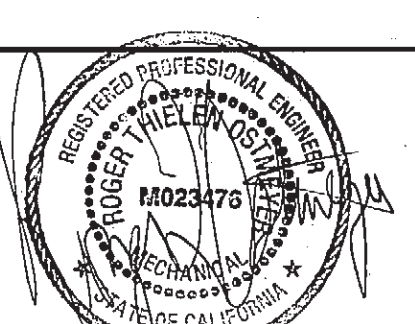


5M-10 DETAIL
3M-10 SCALE: 3"=1'-0"

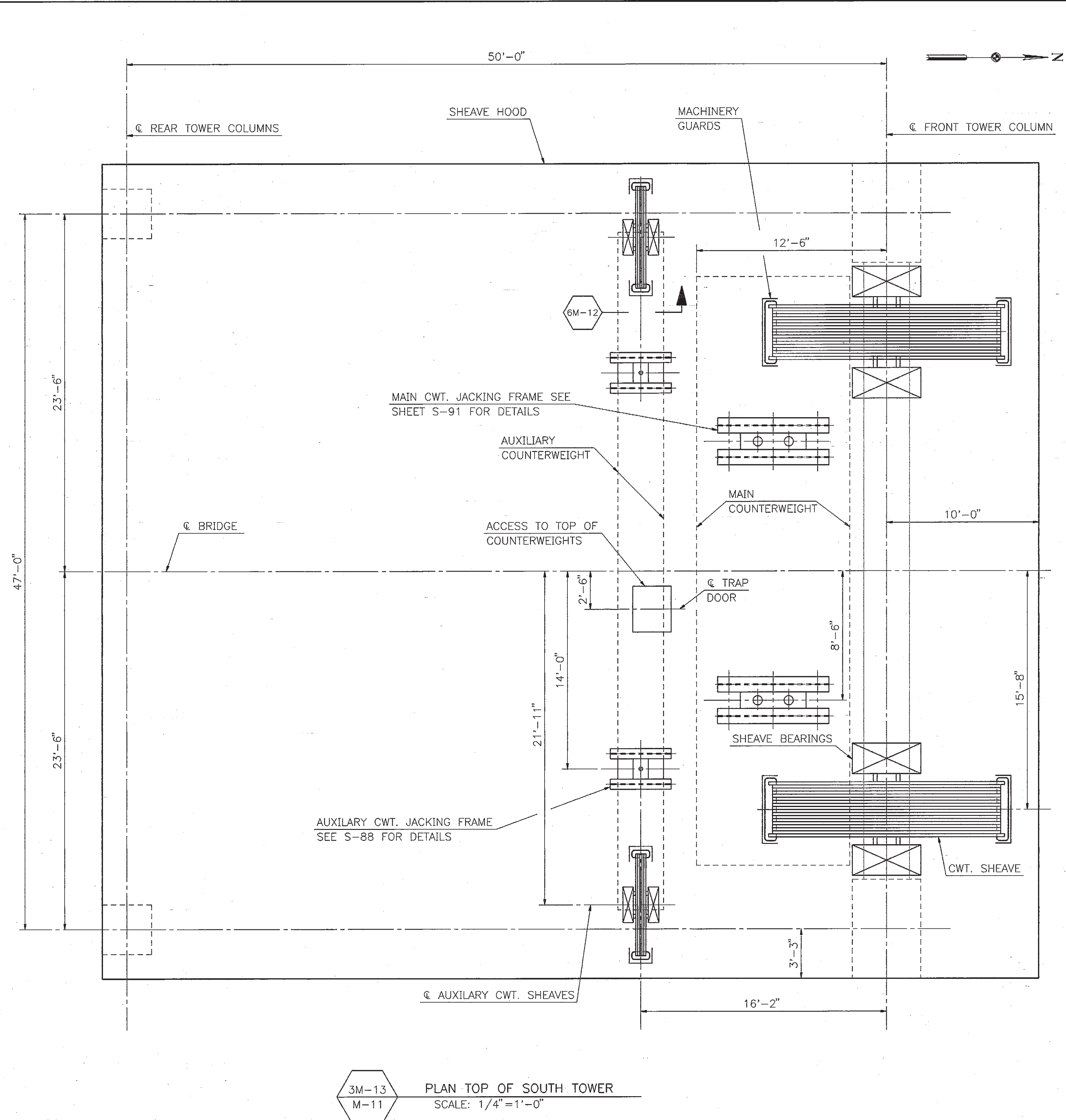
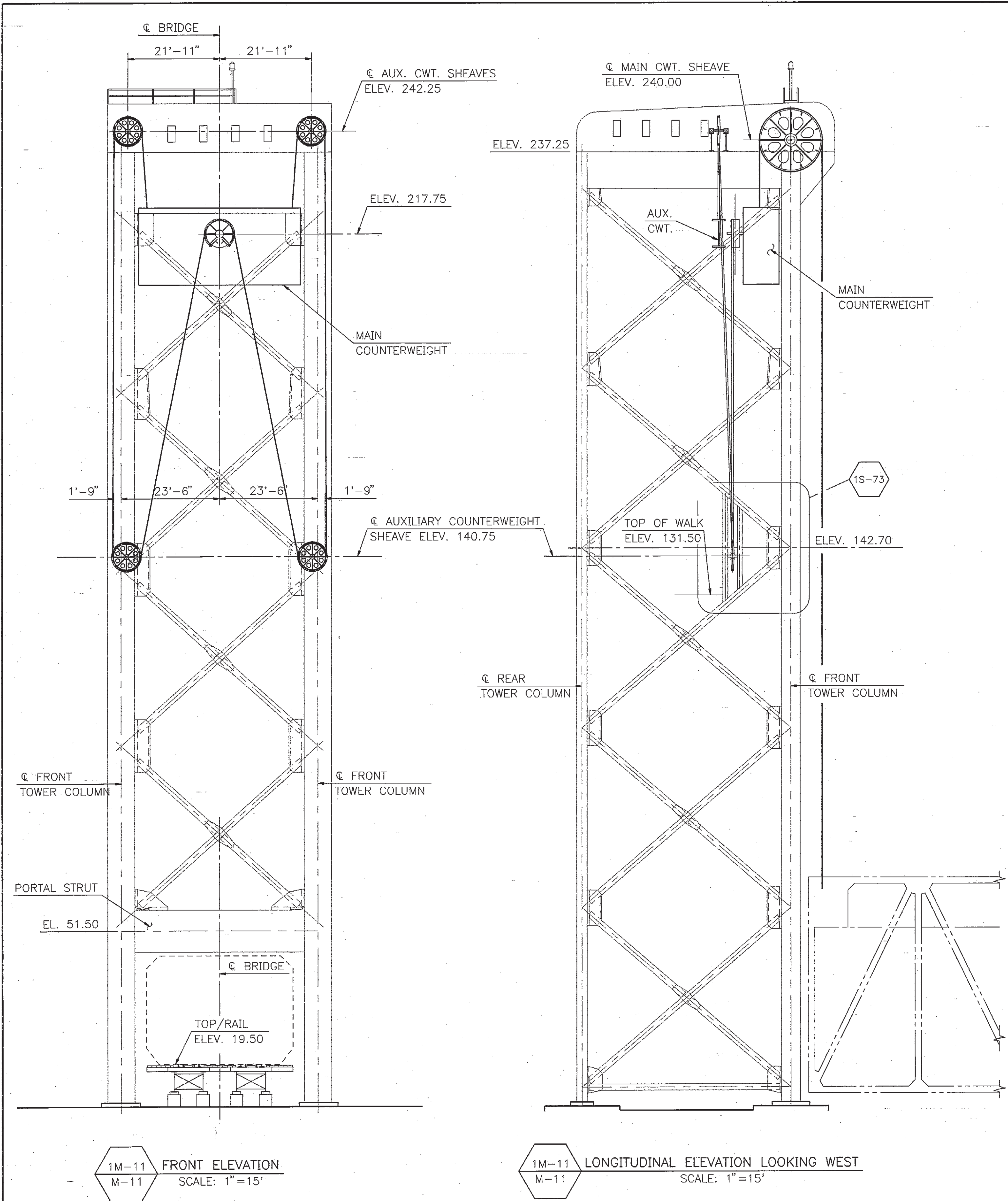


6M-10 DETAIL
3M-10 SCALE: 3"=1'-0"

NO DATE DRAWN REVISIONS				APP'D P.O.L.A.				NO DATE DRAWN REVISIONS				APP'D P.O.L.A.				SCALE: AS SHOWN DATE				PLANS PREPARED BY:				BADGER AVENUE BRIDGE REPLACEMENT - PHASE II			
																DRAWN BY: NAC 9-94				HNTB				TOWER SHEAVE AND BEARINGS			
																CHECKED: HWL 11-94				HOWARD NEEDLES TAMMEN & BERGENDOFF				WORLDPORT L.A.			
																DESIGNED: MCH 9-94				36 EXECUTIVE PARK				ENGINEERING DIVISION			
																PROJECT MGR.				WILLIAM R. HUGHES				P.O. BOX 151			
																IRVINE, CALIFORNIA 92714								SAN PEDRO, CALIF.			
																								DRAWING NUMBER			
																								1-1991 M-10			



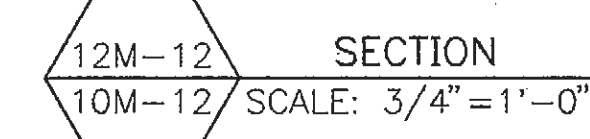
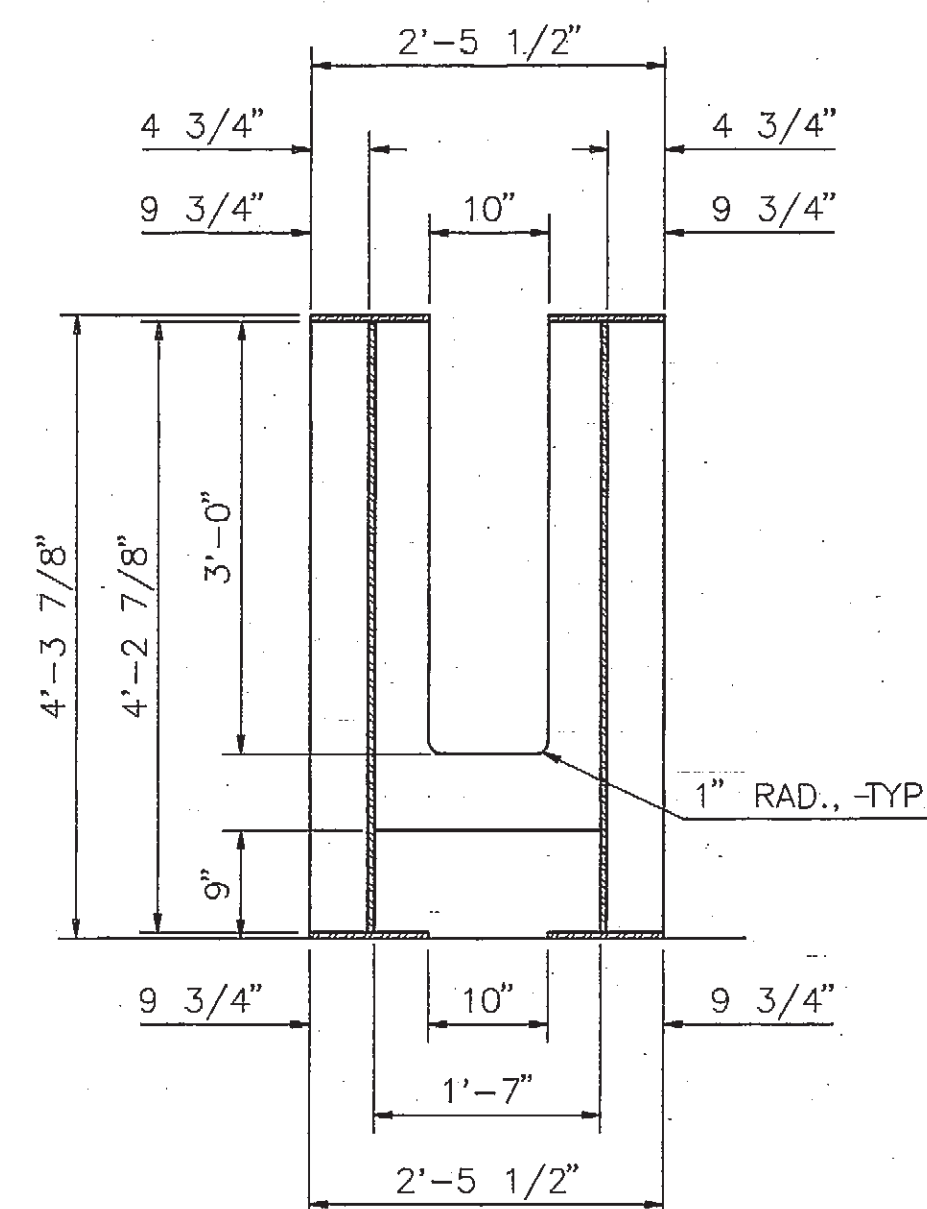
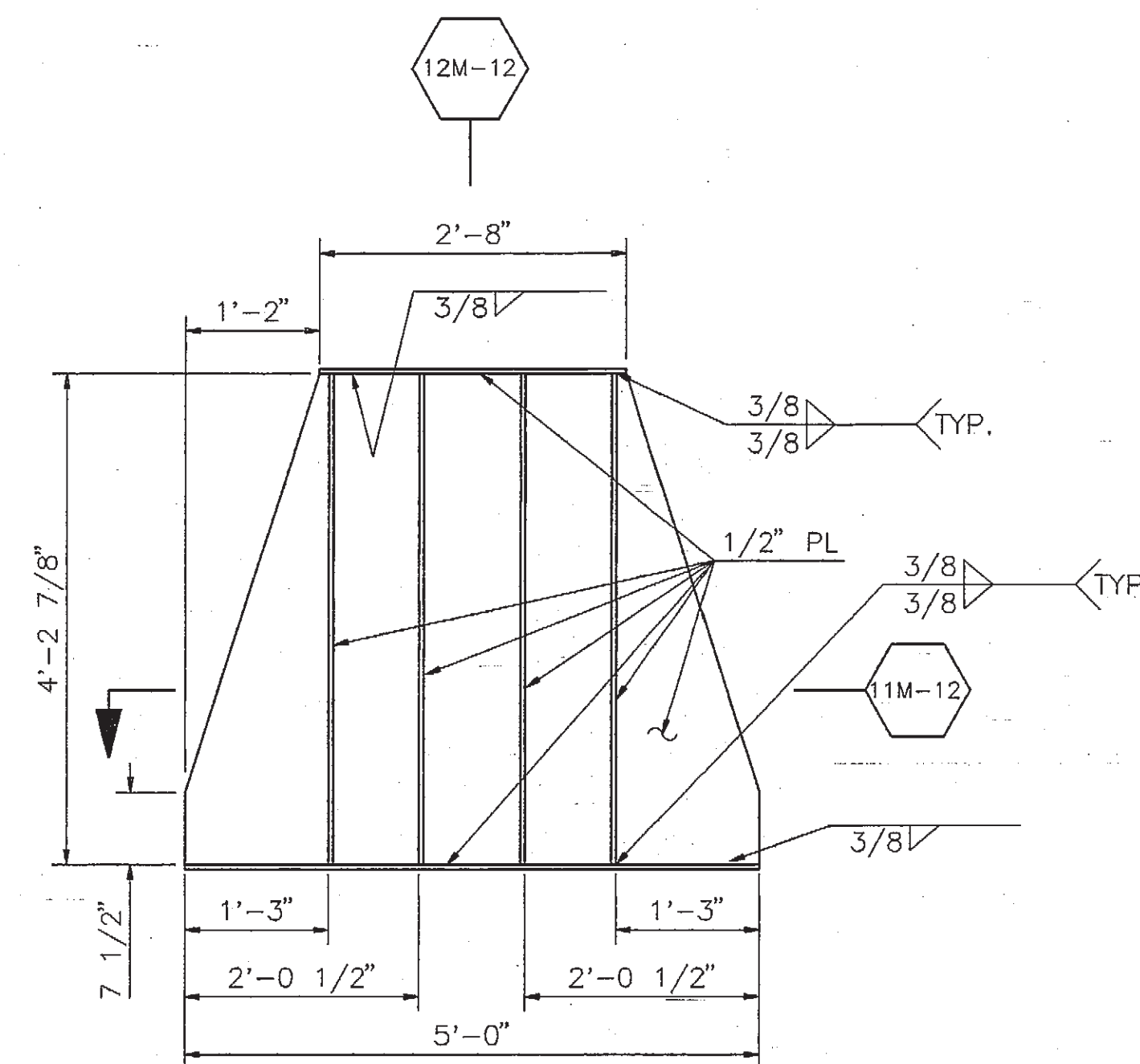
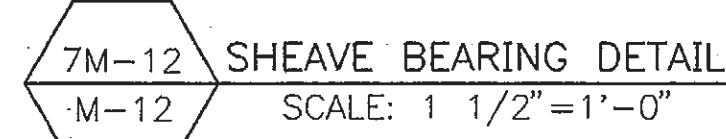
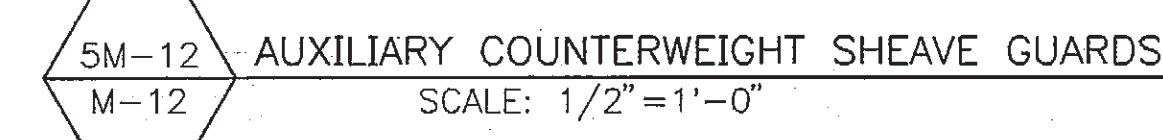
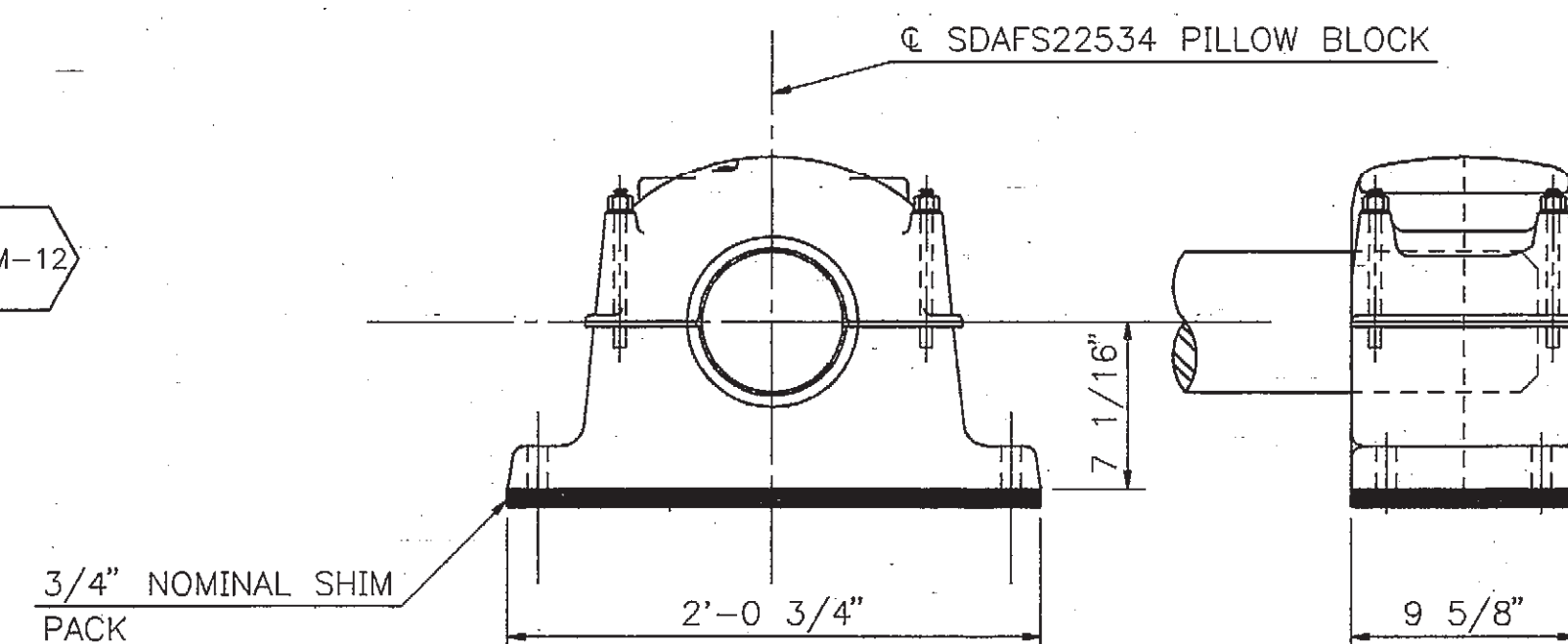
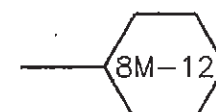
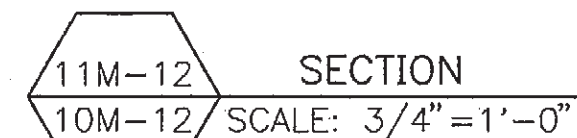
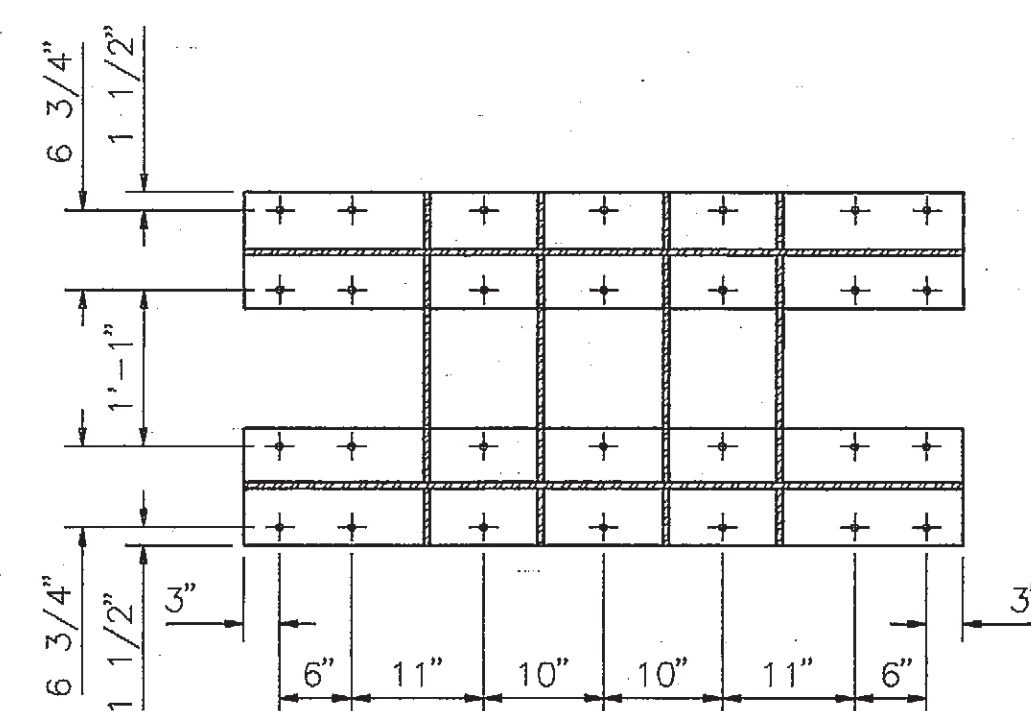
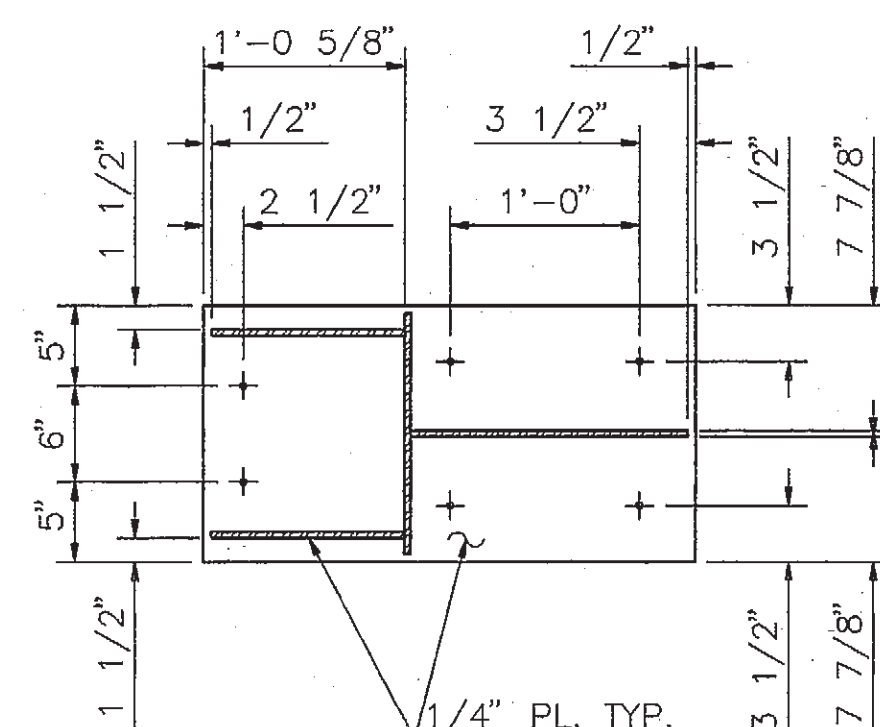
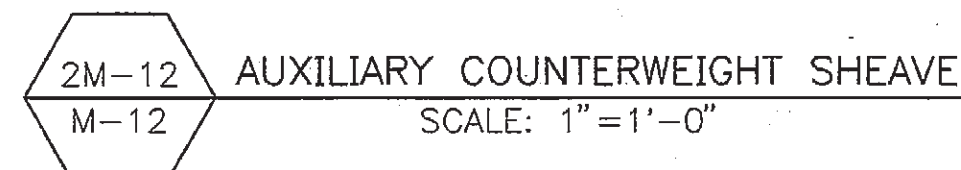
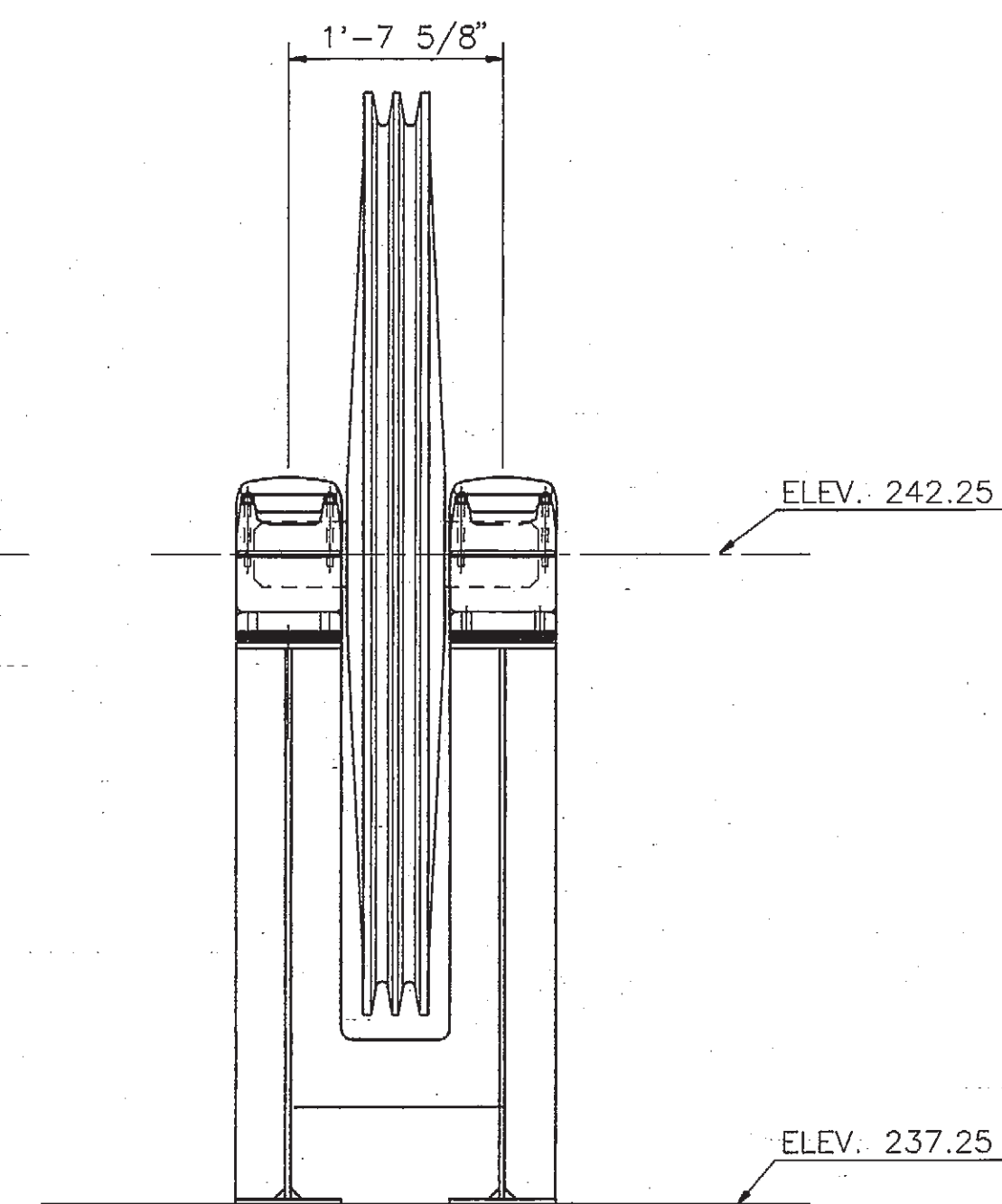
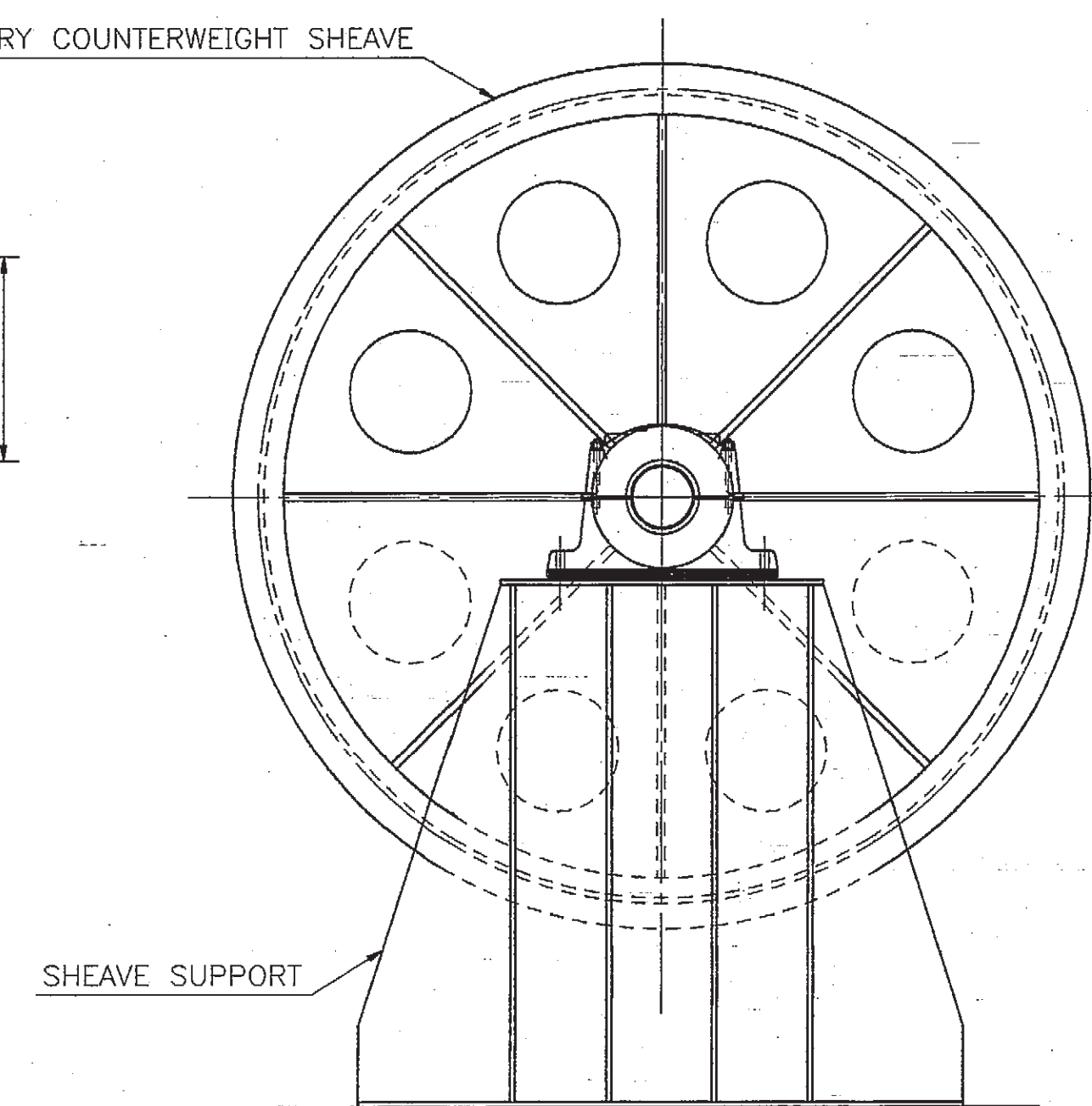
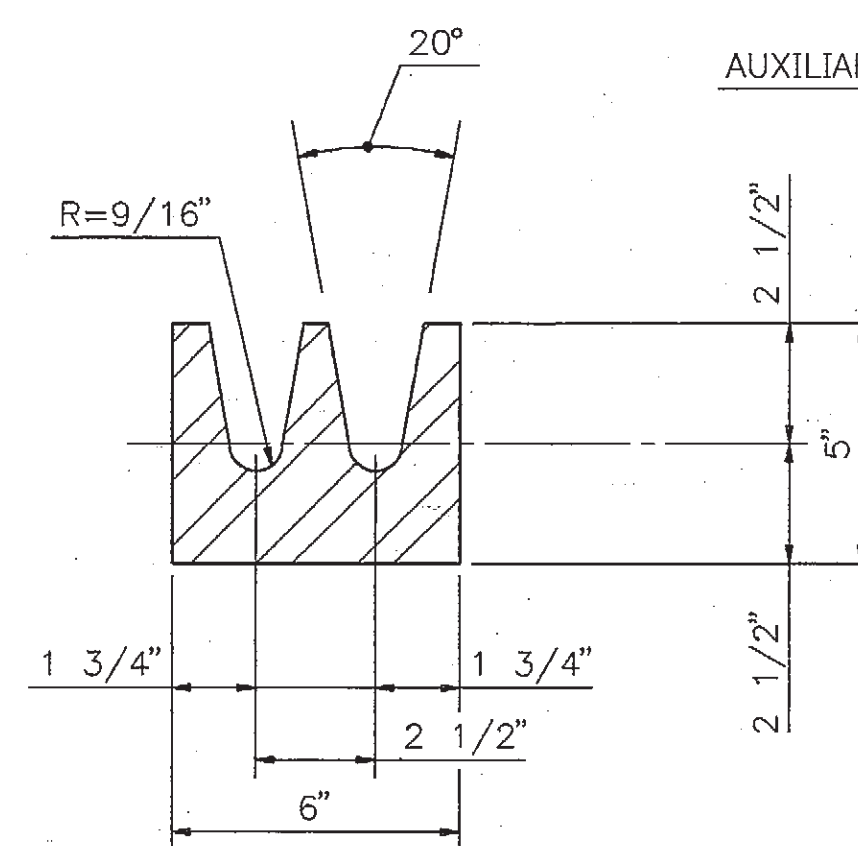
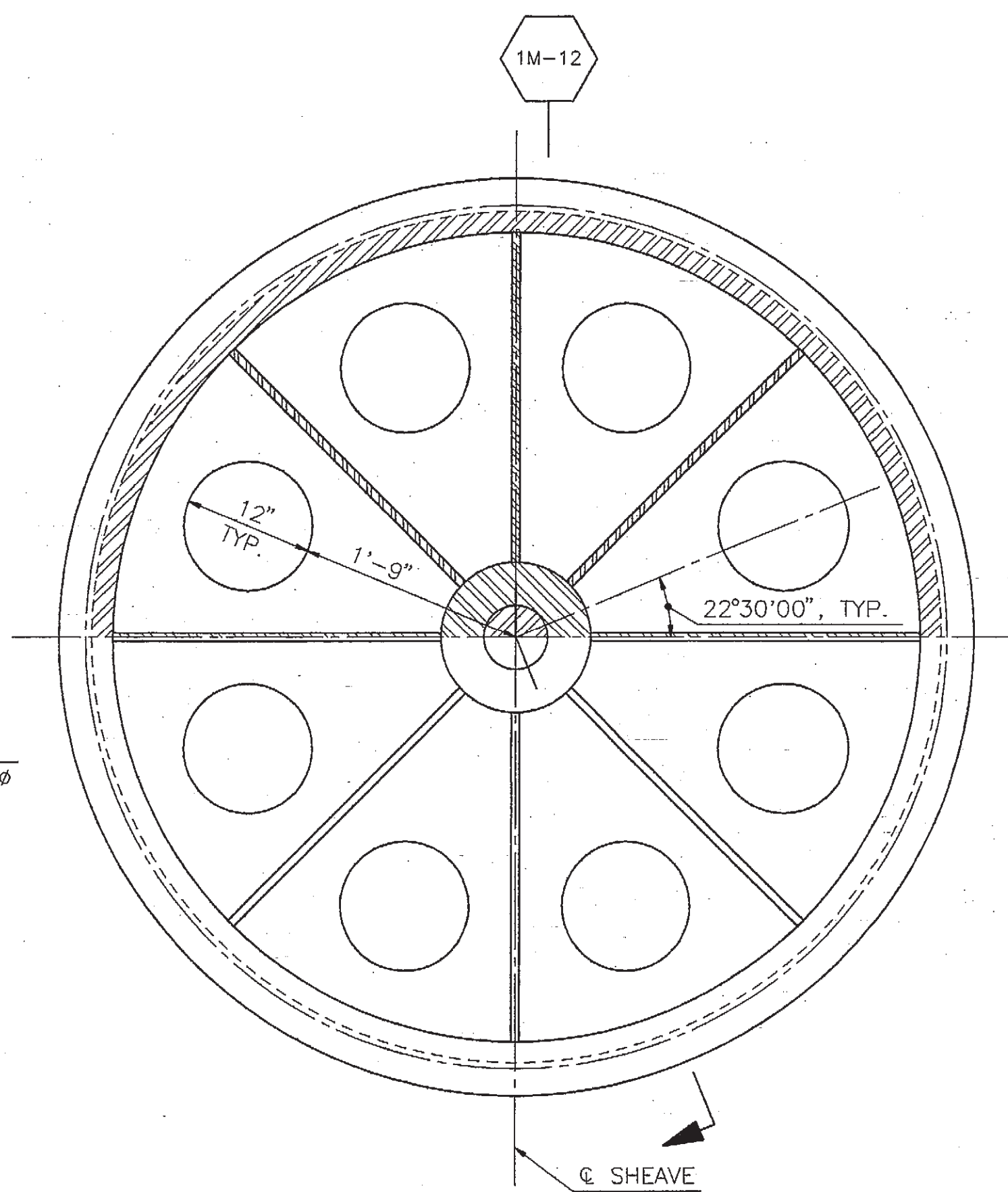
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NOTE:
AUXILIARY COUNTERWEIGHT, ELEVATORS, CABLE CHASE AND
WALKWAYS NOT SHOWN FOR CLARITY.

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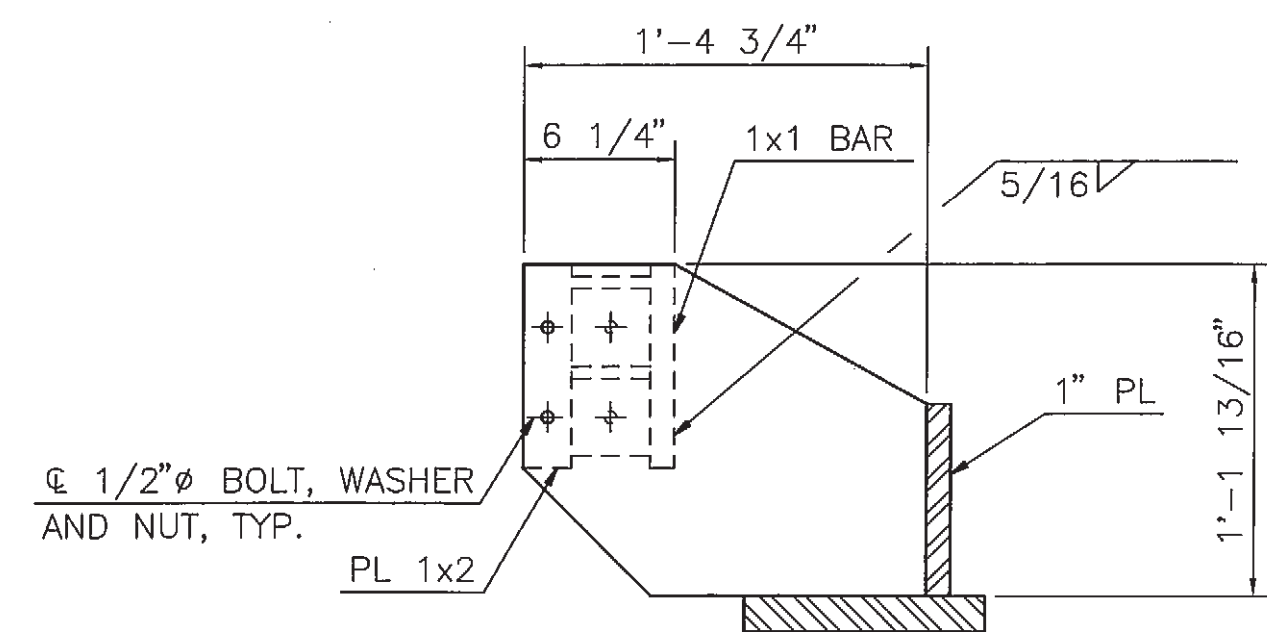
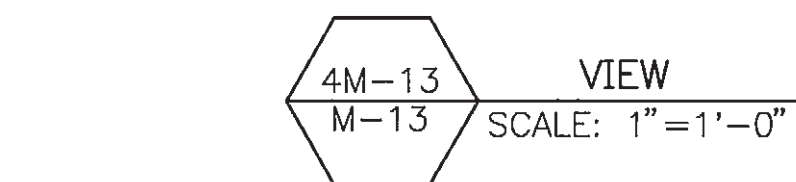
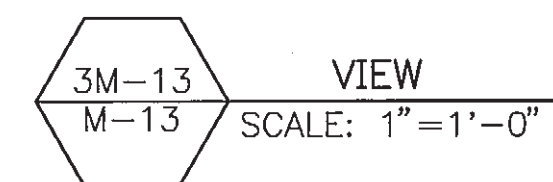
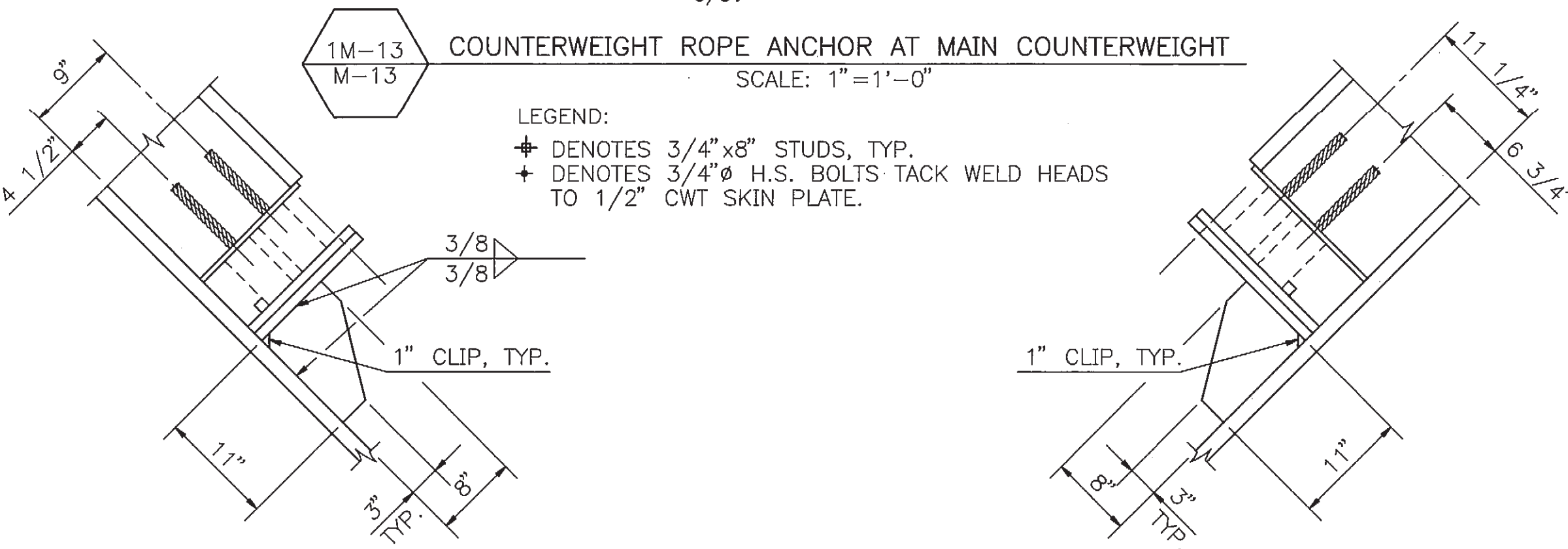
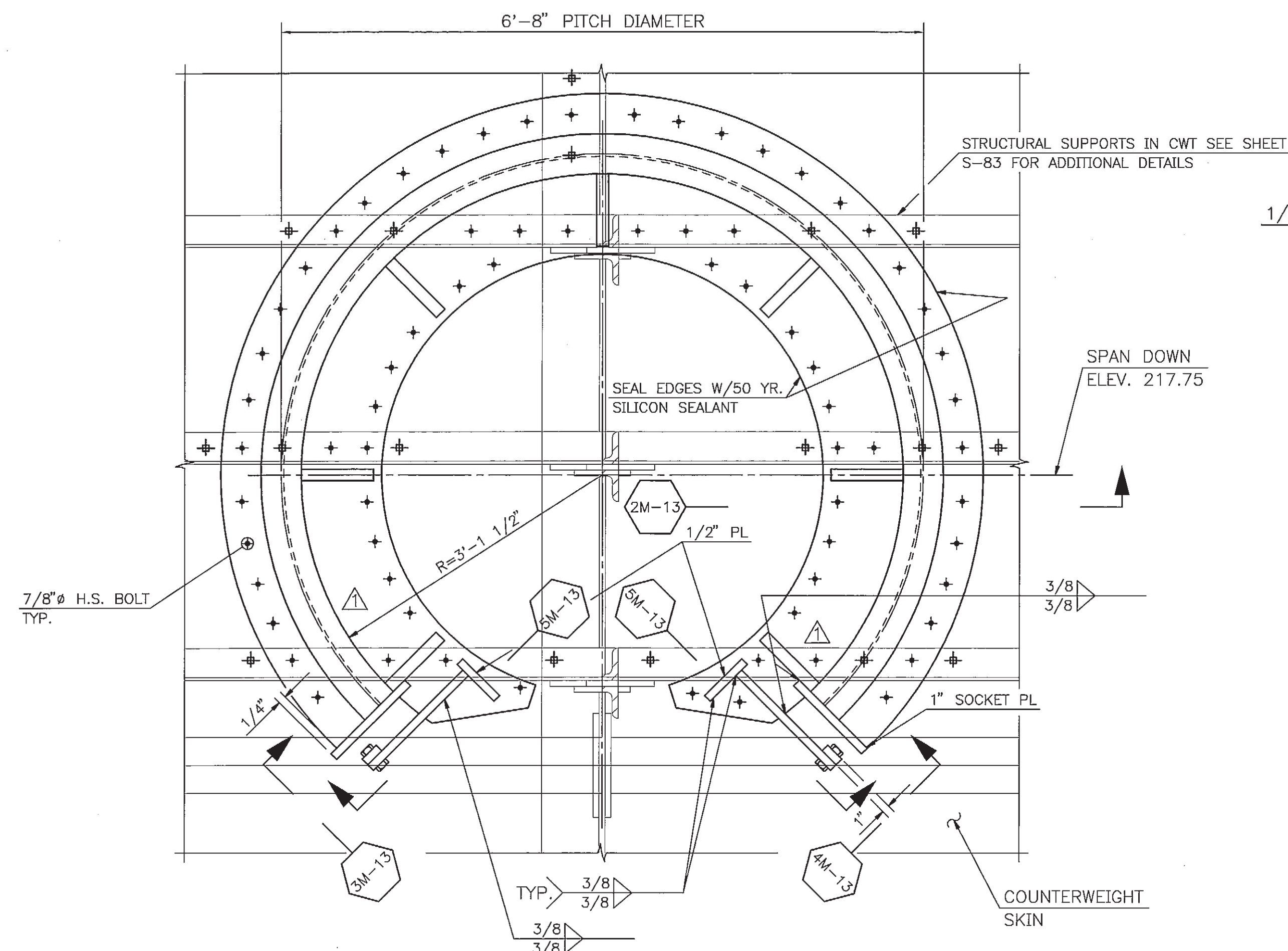
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												DRAWN BY: NCA	3-94	HNTB	AUXILIARY COUNTERWEIGHT LAYOUT	
												CHECKED: MCH	3-94	HOWARD NEEDLES TAMMEN & BERGENDOFF	WORLDPORT L.A.	
												DESIGNED: MCH	3-94	36 EXECUTIVE PARK	DRAWING NUMBER	
												PROJECT MGR.		SUITE 200	1-1991 M-11	
												WILLIAM R. HUGHES		IRVINE, CALIFORNIA 92714	ENGINEERING DIVISION P.O. BOX 151 SAN PEDRO, CALIF.	



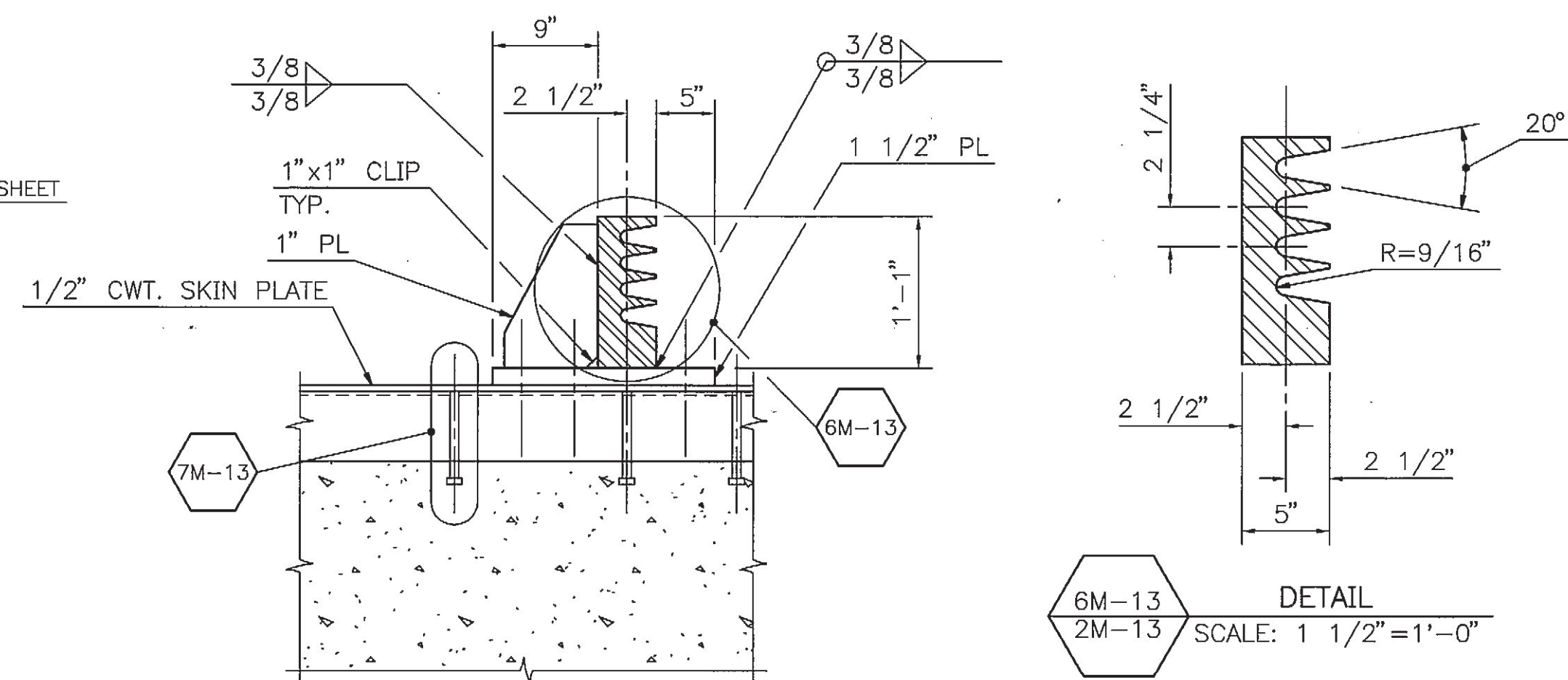
1-1991 M-12

SCALE: AS SHOWN	DATE:	PLANS PREPARED BY:
DRAWN BY: NCA	2-94	 HOWARD NEEDLES TAMMEN & BERGENDOFF 36 EXECUTIVE PARK SUITE 200 IRVINE, CALIFORNIA 92714
CHECKED: HWL	11-94	
DESIGNED: MCH	2-94	
PROJECT MGR.		
WILLIAM R. HUGHES		

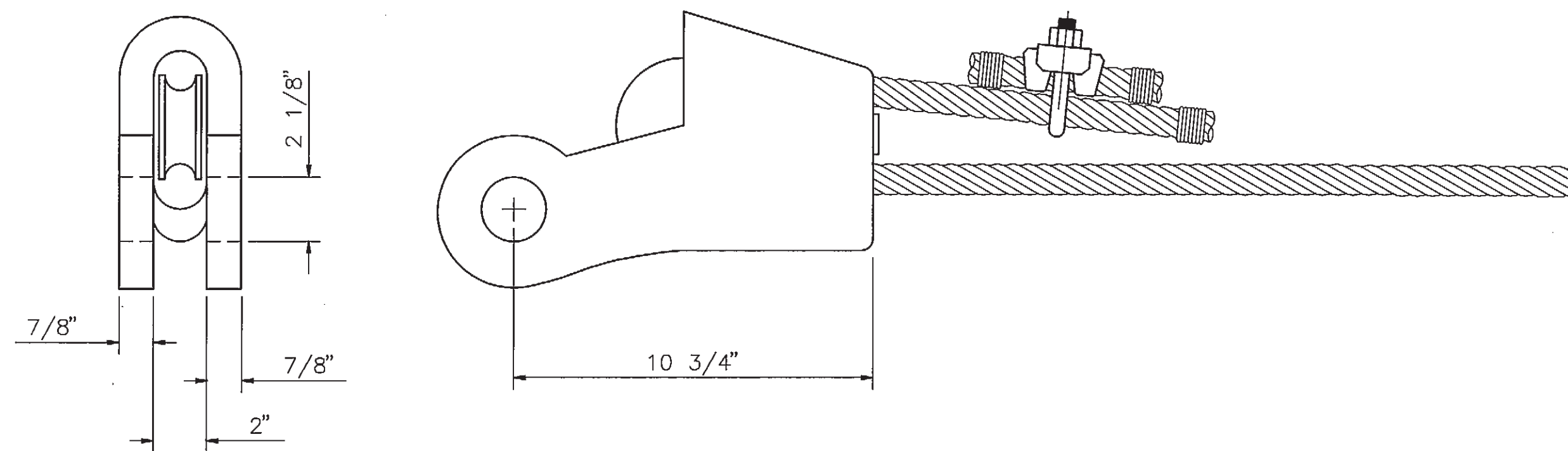




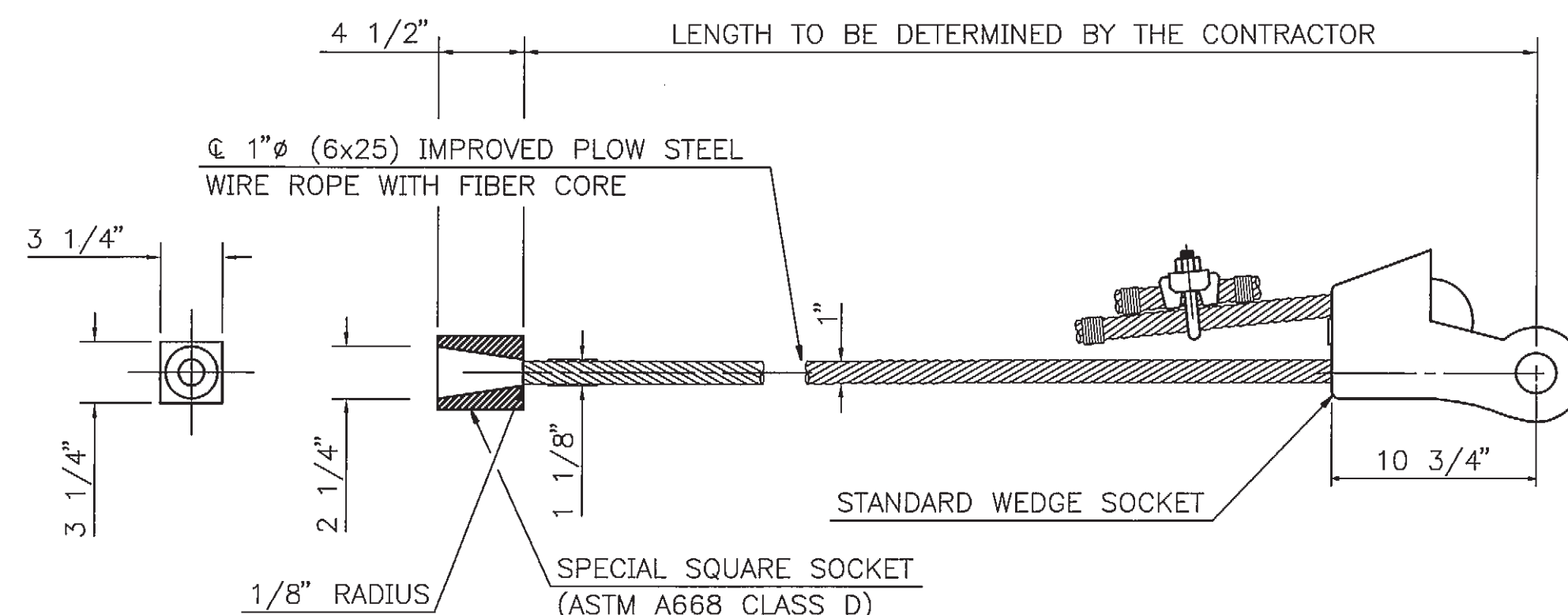
5M-13 SECTION C-C
M-13 SCALE: 1 1/2"=1'-0"



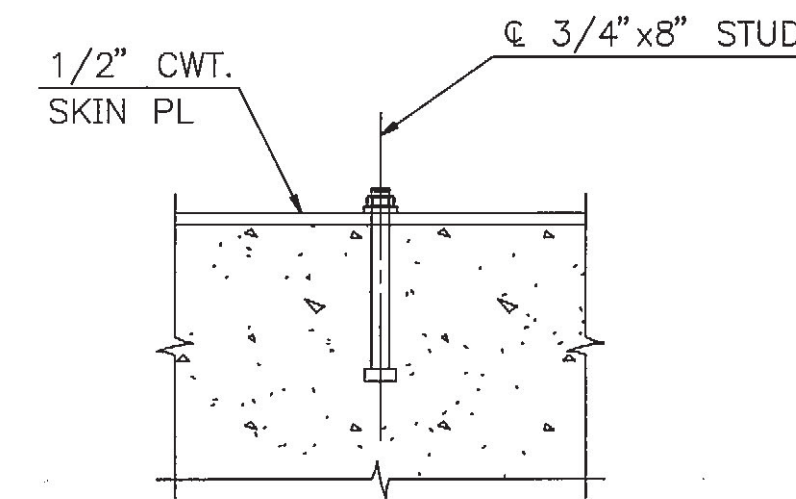
2M-13 SECTION
M-13 SCALE: 1"=1'-0"



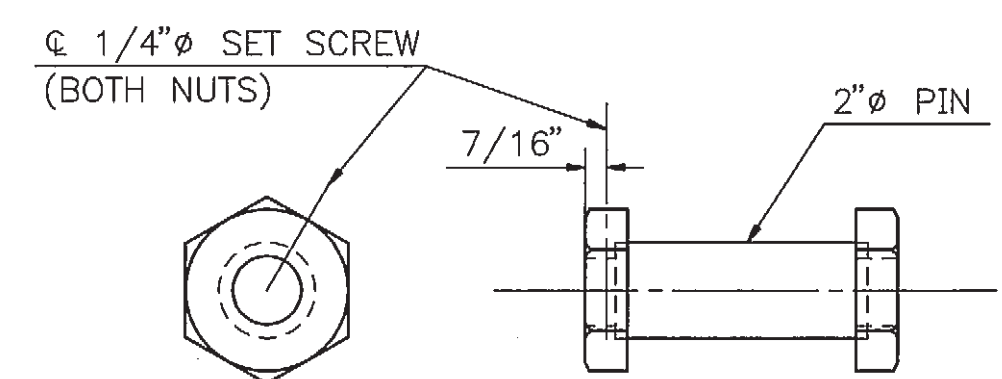
9M-13 ROPE AND SOCKETS
M-13 NO SCALE



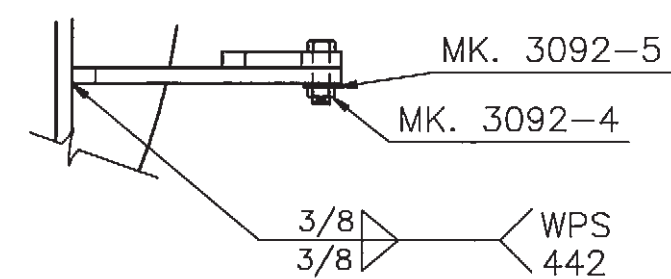
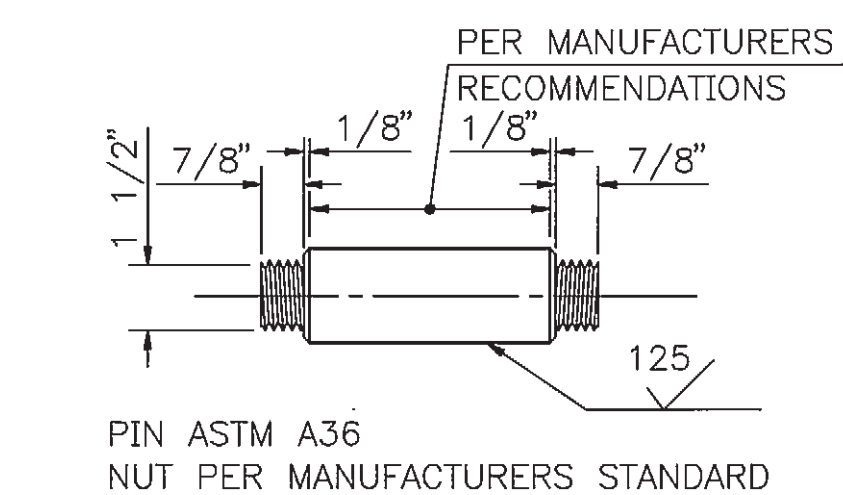
8M-13 AUXILIARY COUNTERWEIGHT ROPE AND SOCKETS
M-13 SCALE: 1 1/2"=1'-0"



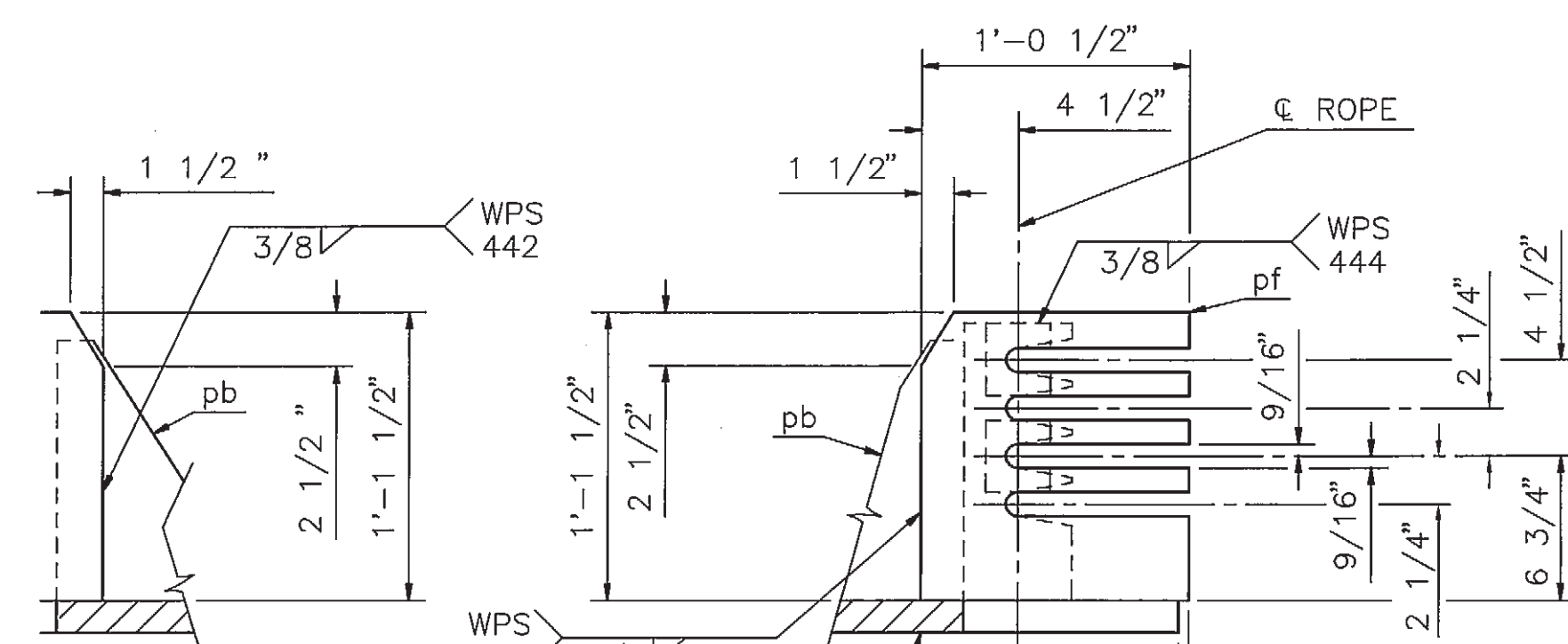
7M-13 DETAIL
2M-13 SCALE: 1 1/2"=1'-0"



10M-13 PIN AND RECESSED PIN NUT
M-13 SCALE: 3"=1'-0"



VIEW 1-1



SECTION C-C
SCALE: 1 1/2"=1'-0"

SECTION D-D
SCALE: 1 1/2"=1'-0"

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NO	DATE	DRAWN	REVISIONS	APP'D	P.O.L.A.	NO	DATE	DRAWN	REVISIONS	APP'D	P.O.L.A.	SCALE: AS SHOWN	DATE	PLANS PREPARED BY:
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												CHECKED: HWL	11-94	36 EXECUTIVE PARK
												DESIGNED: MCH	2-94	SUITE 200
												PROJECT MGR.		IRVINE, CALIFORNIA 92714
												WILLIAM R. HUGHES		

BADGER AVENUE BRIDGE REPLACEMENT -- PHASE II
AUXILIARY COUNTERWEIGHT ANCHORAGE DETAILS

WORLDPORT L.A.

ENGINEERING DIVISION P.O. BOX 151 SAN PEDRO, CALIF.

DRAWING NUMBER
1-1991 M-13