

# STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

## CAPE FEAR MEMORIAL LIFT BRIDGE

### WILMINGTON, NORTH CAROLINA

### MECHANICAL REPAIRS

### NOVEMBER 7, 2017

#### LIST OF DRAWINGS

SHEET NO.	SHEET NAME
M01	TITLE SHEET
M02	GENERAL PLAN AND ELEVATION
M03	AUX. COUNTERWEIGHT ASSEMBLY
M04	AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 1
M05	AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 2
M06	AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 3
M07	AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 4
M08	AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 5
M09	AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 6
M10	LONGITUDINAL SPAN GUIDE ASSEMBLY
M11	LONGITUDINAL SPAN GUIDE DETAILS

PROJECT NO. 15B.13.29  
NEW HANOVER COUNTY  
 BRIDGE NO: 13

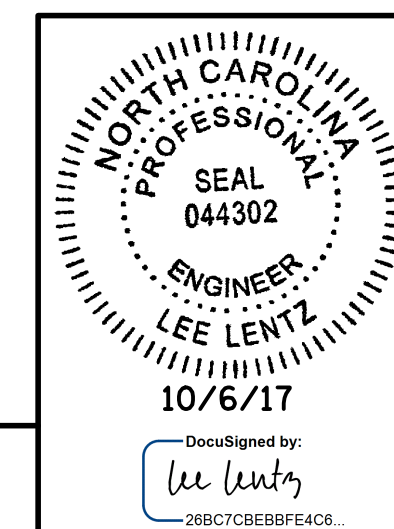
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 FILE: \\vmd0201\Projects\1662.01\CADD\Mechanical\M01 TITLE SHEET

DESIGNED BY:	E. A. SAMPLE	DATE :	08/17/17
DRAWN BY:	J. M. SHOUP	DATE :	08/17/17
CHECKED BY:	L. R. LENTZ	DATE :	08/17/17
DESIGN ENGINEER OF RECORD:	L. R. LENTZ	DATE :	08/17/17



333 FAYETTEVILLE STREET, SUITE 505  
 RALEIGH, NC 27601  
 NC LICENSE NO. C-2979

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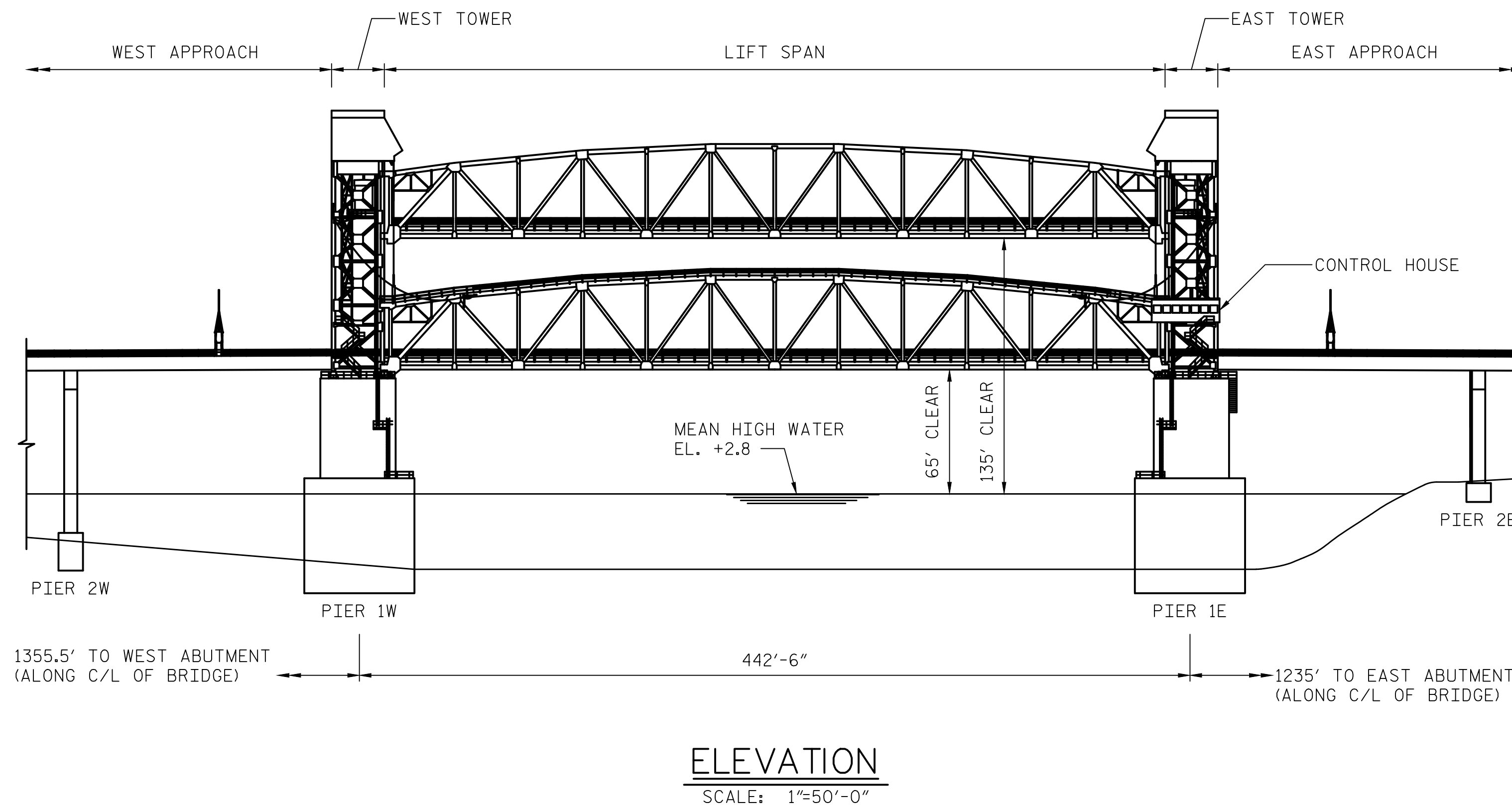
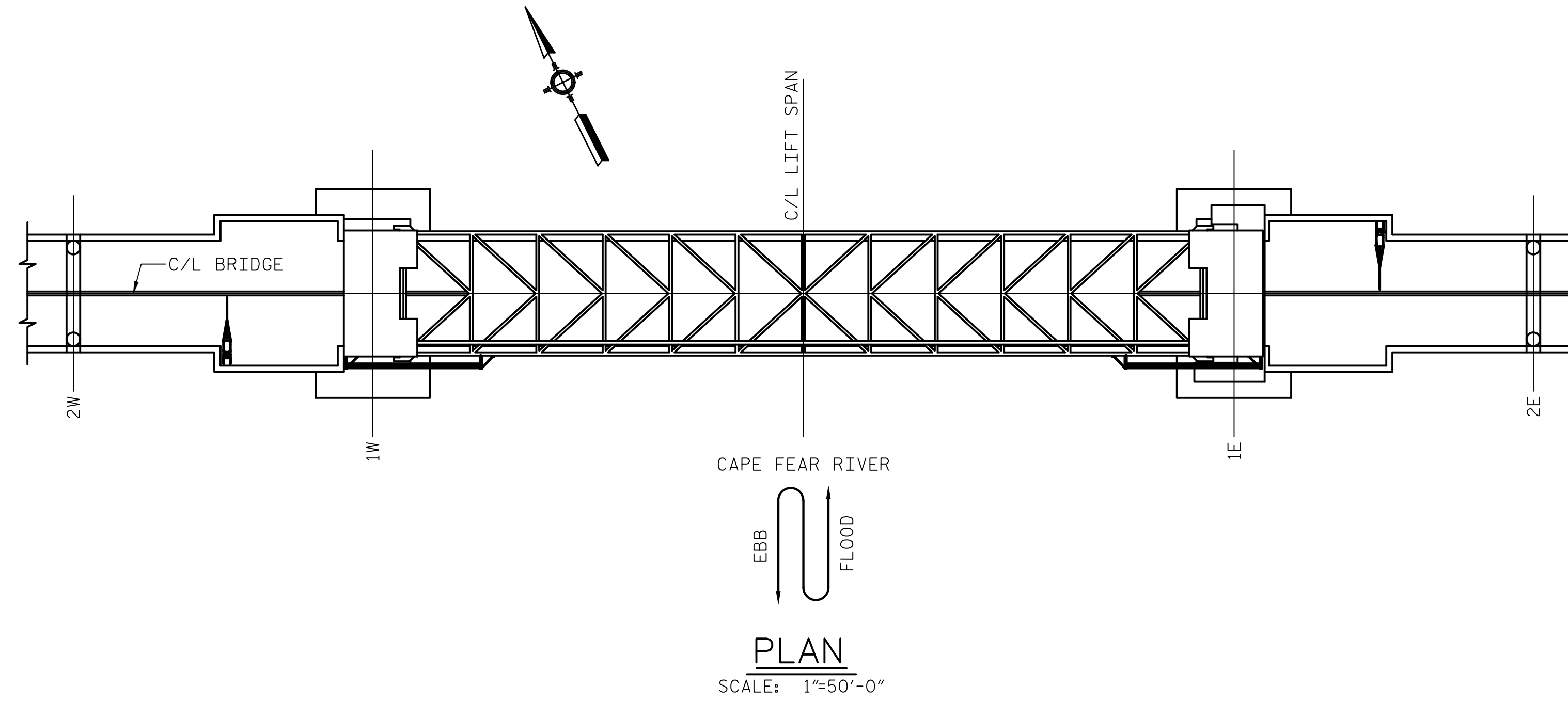
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TITLE SHEET					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. M01 TOTAL SHEETS 11

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**SCOPE OF MECHANICAL WORK**

1. REHABILITATION OF THE EXISTING LONGITUDINAL SPAN GUIDE ASSEMBLIES AND AUXILIARY COUNTERWEIGHT ASSEMBLY COMPONENTS.
2. ALL INCIDENTAL WORK RELATED TO THE ITEMS LISTED ABOVE, AS WELL AS ALL MISCELLANEOUS WORK SHOWN OR IMPLIED HEREIN.
3. FOR ADDITIONAL REQUIREMENTS, SEE SHEETS M03 THROUGH M11 AND THE SPECIAL PROVISIONS.



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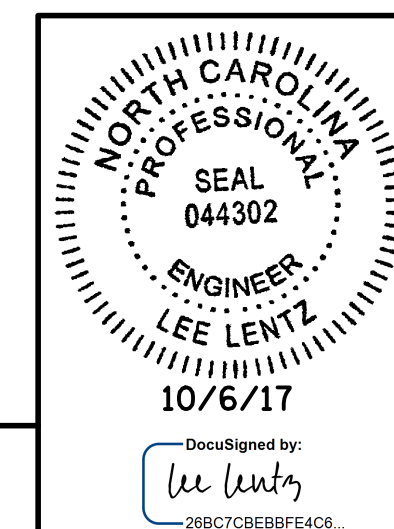
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 FILE: \\mim001\p\projects\15682.01\CADD\Mechanical\M02 GENERAL PLAN AND ELEVATION

DESIGNED BY:	E. A. SAMPLE	DATE :	08/17/17
DRAWN BY:	J. M. SHOUP	DATE :	08/17/17
CHECKED BY:	L. R. LENTZ	DATE :	08/17/17
DESIGN ENGINEER OF RECORD:	L. R. LENTZ	DATE :	08/17/17



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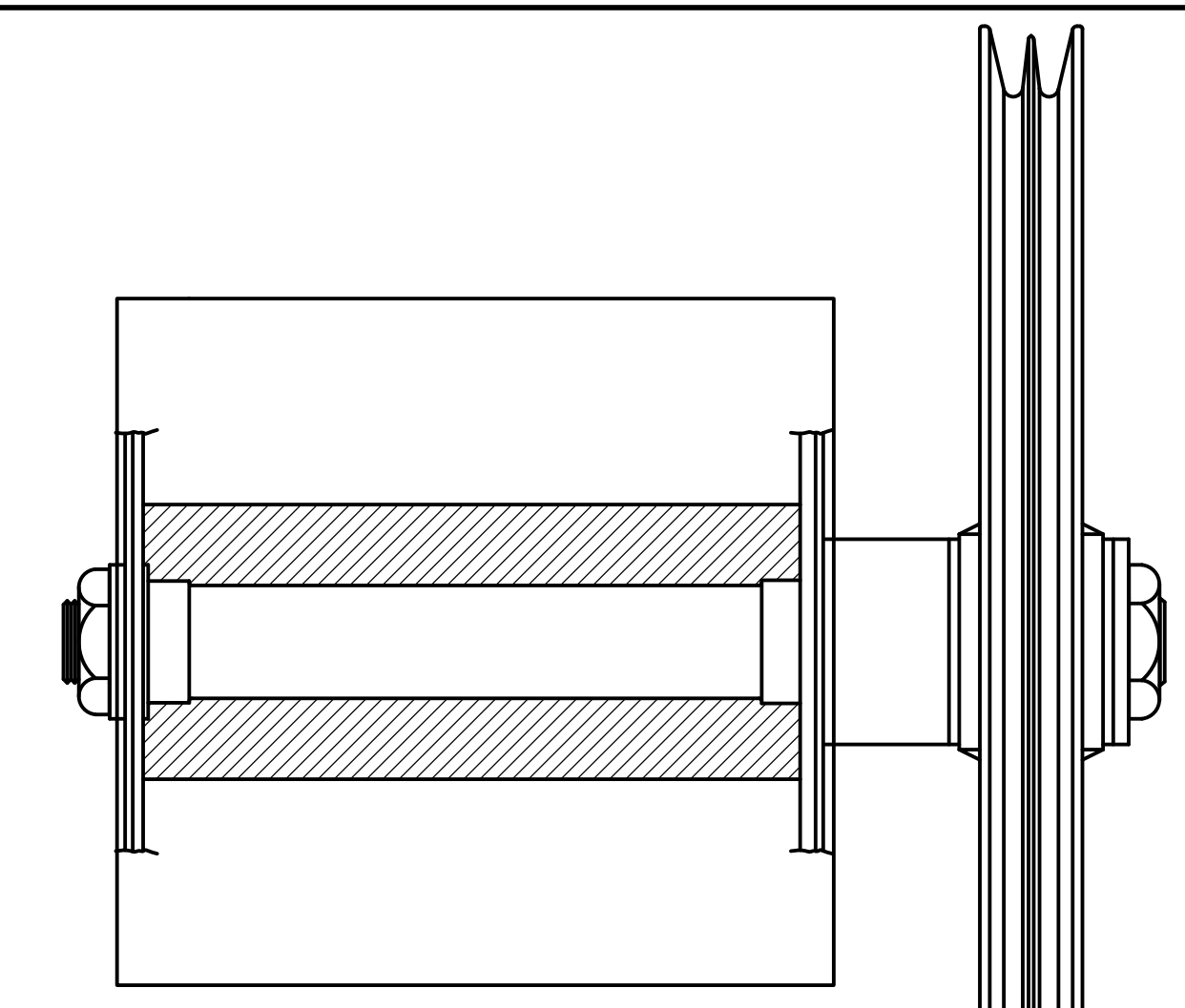
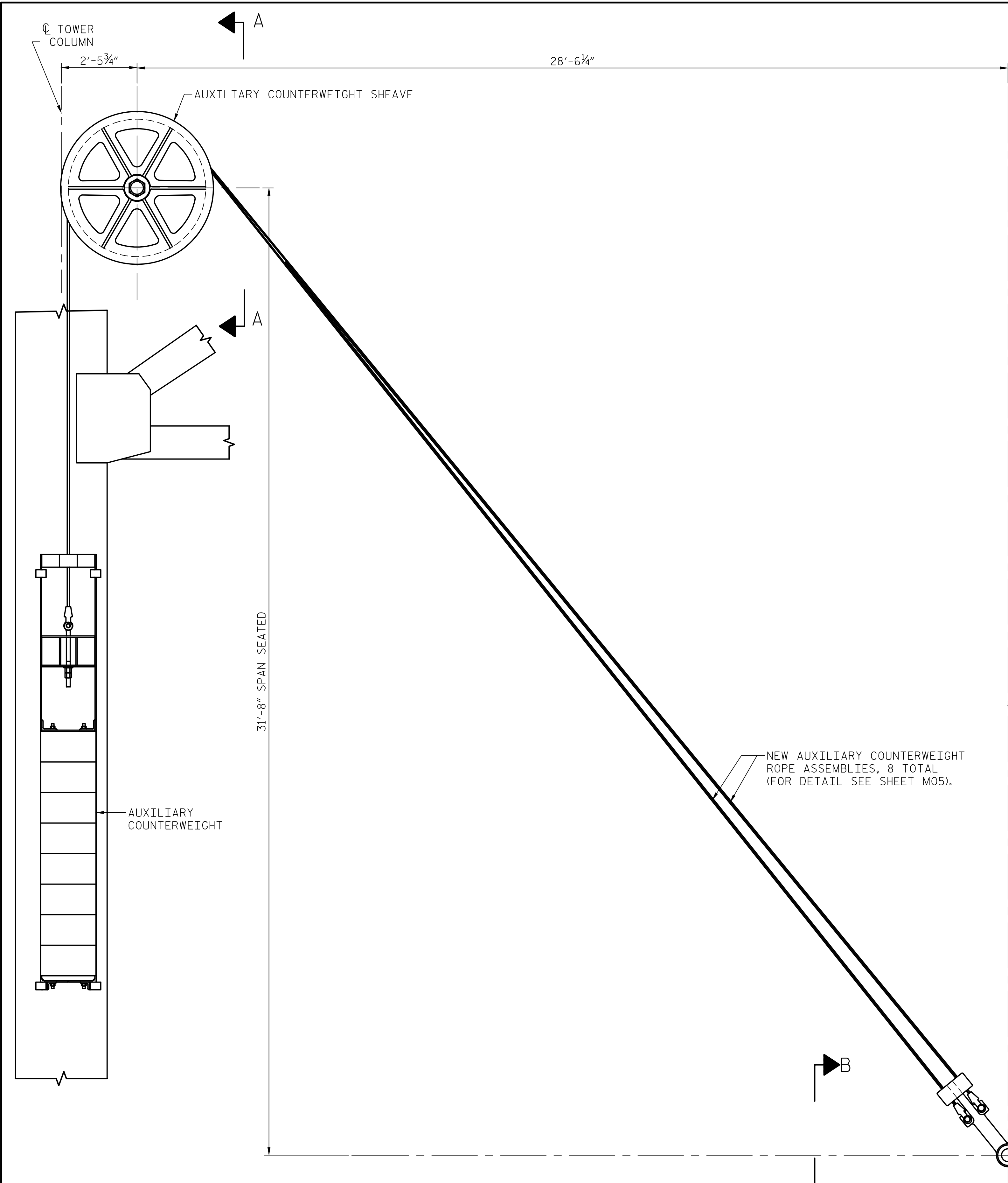
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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**GENERAL PLAN AND  
 ELEVATION**

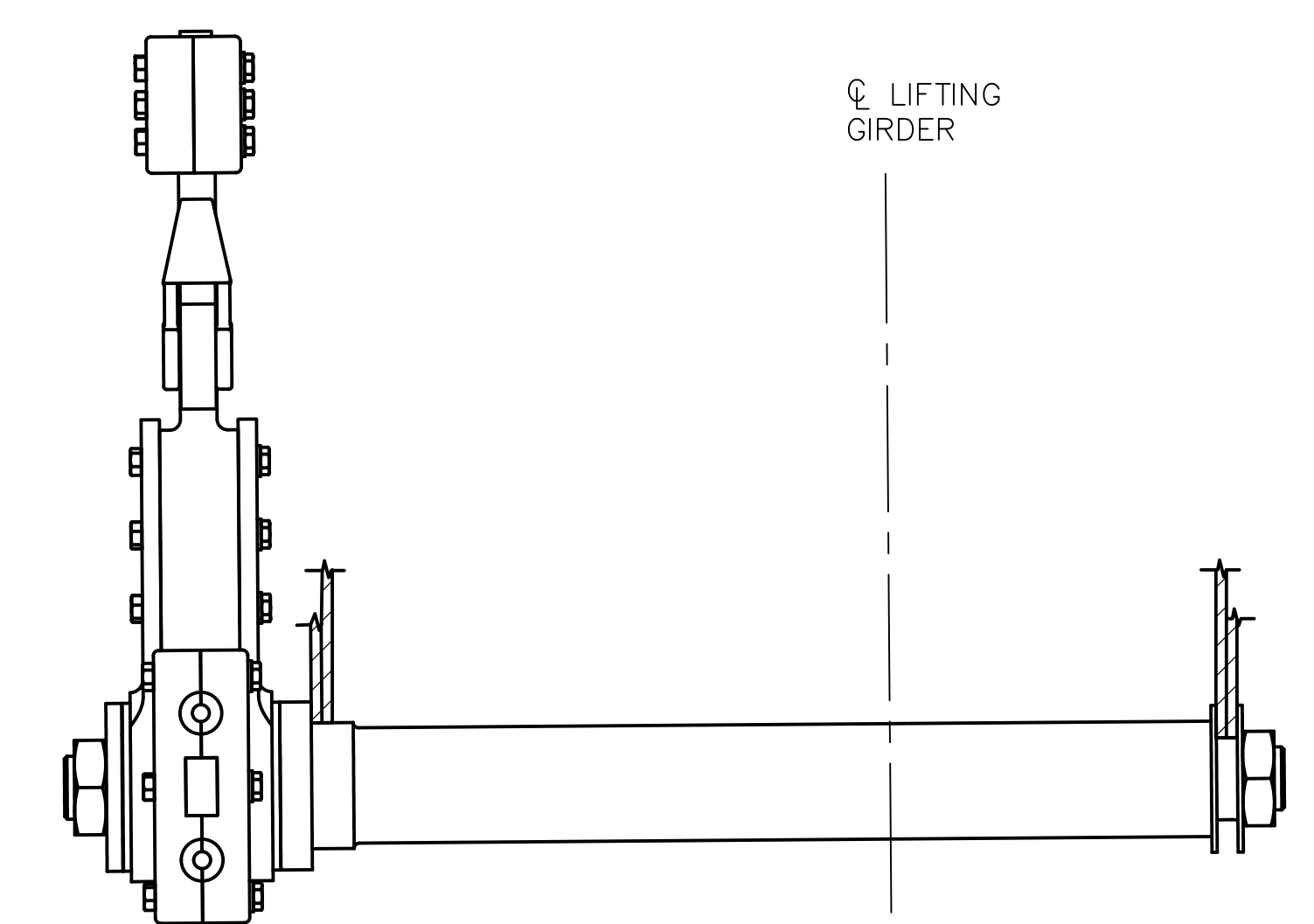
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			11

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 FILE: \\mtd01\p\Projects\3662\01\CADD\Mechanical\M03\_AUX\_COUNTERWEIGHT\_ASSEMBLY



**VIEW A-A**  
 SCALE: 1 1/2"=1'-0"  
 EXISTING AUXILIARY COUNTERWEIGHT SHEAVE ASSEMBLY AT TOWER (TYPICAL 4 LOCATIONS)



**VIEW B-B**  
 SCALE: 1 1/2"=1'-0"  
 EXISTING HITCH SHAFT ASSEMBLY ON LIFT SPAN, SHOWING HITCH SHAFT AND ONE OF 2 HITCH ARMS (TYPICAL 2 LOCATIONS, SEE SHEET M07 FOR COMPLETE VIEW)

**NOTES:**

1. CONTRACTOR MUST SUBMIT DETAILED PROCEDURE FOR REPLACEMENT OF AUXILIARY COUNTERWEIGHT COMPONENTS.
2. ALL DIMENSIONS MUST BE FIELD VERIFIED FOR PROPER FIT WITH EXISTING COMPONENTS.
3. EXISTING AUXILIARY COUNTERWEIGHT TAKE-UP RODS AND NUTS TO BE REMOVED, CLEANED, AND THREADS CHASED FULL LENGTH BEFORE REINSTALLATION. NON-WORKING SURFACES TO BE PAINTED WITH APPROVED PAINT SYSTEM AND THREADS TO BE WELL LUBRICATED.

PROJECT NO. 15B.13.29  
NEW HANOVER COUNTY  
 BRIDGE NO: 13

**AUXILIARY COUNTERWEIGHT ASSEMBLY**

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

DESIGNED BY:	E. A. SAMPLE	DATE :	08/17/17
DRAWN BY:	J. M. SHOUP	DATE :	08/17/17
CHECKED BY:	L. R. LENTZ	DATE :	08/17/17
DESIGN ENGINEER OF RECORD:	L. R. LENTZ	DATE :	08/17/17

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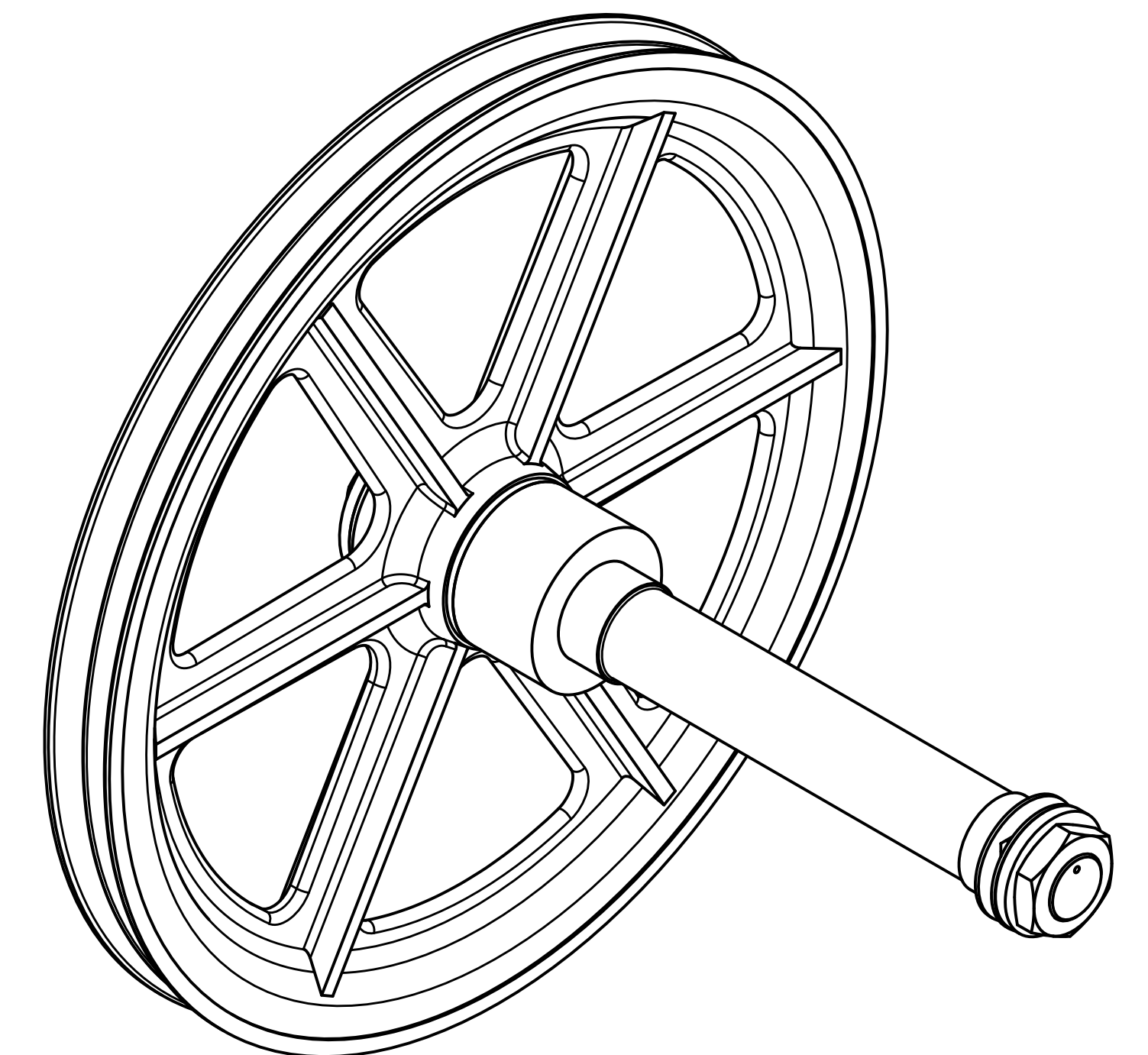
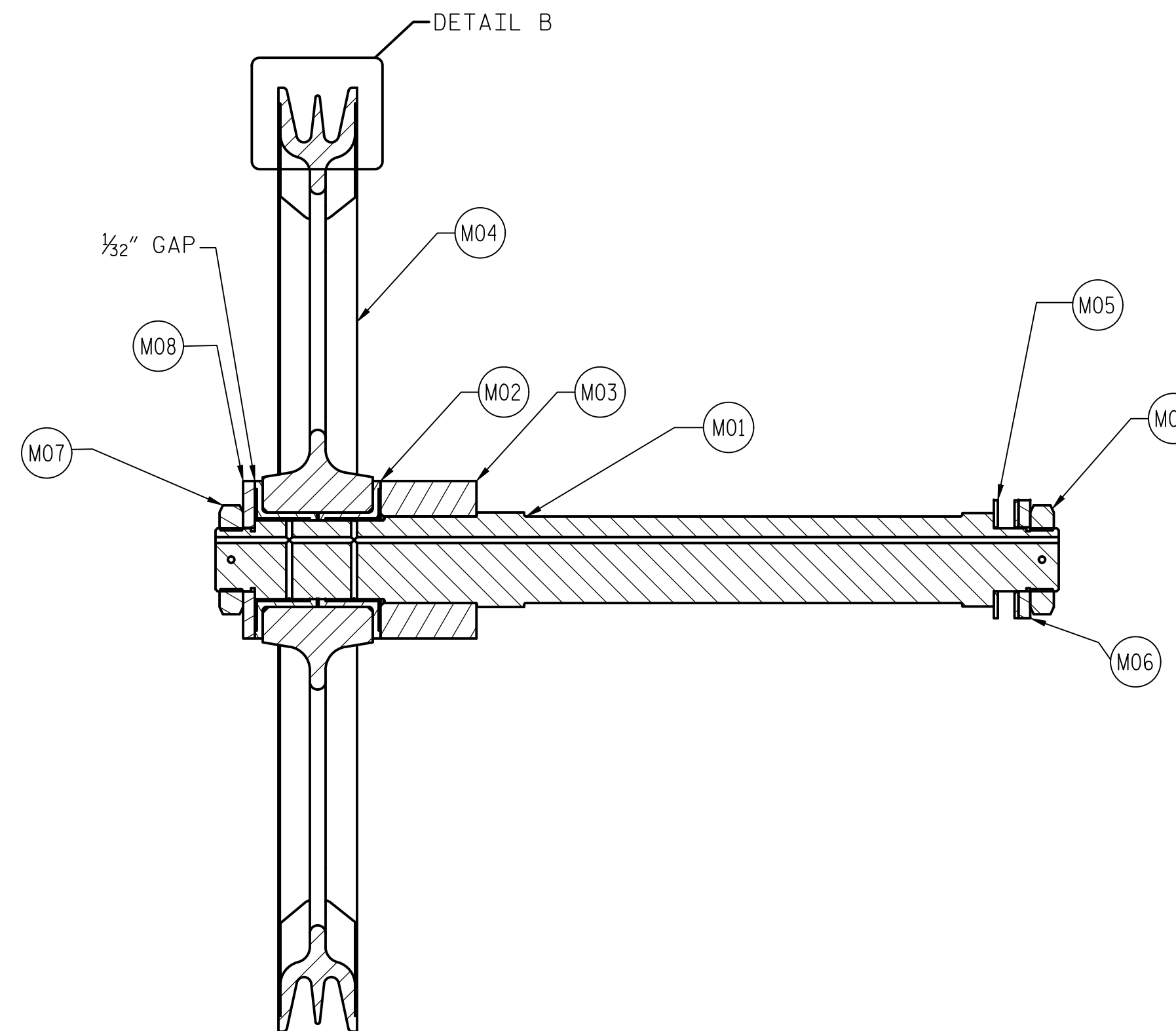
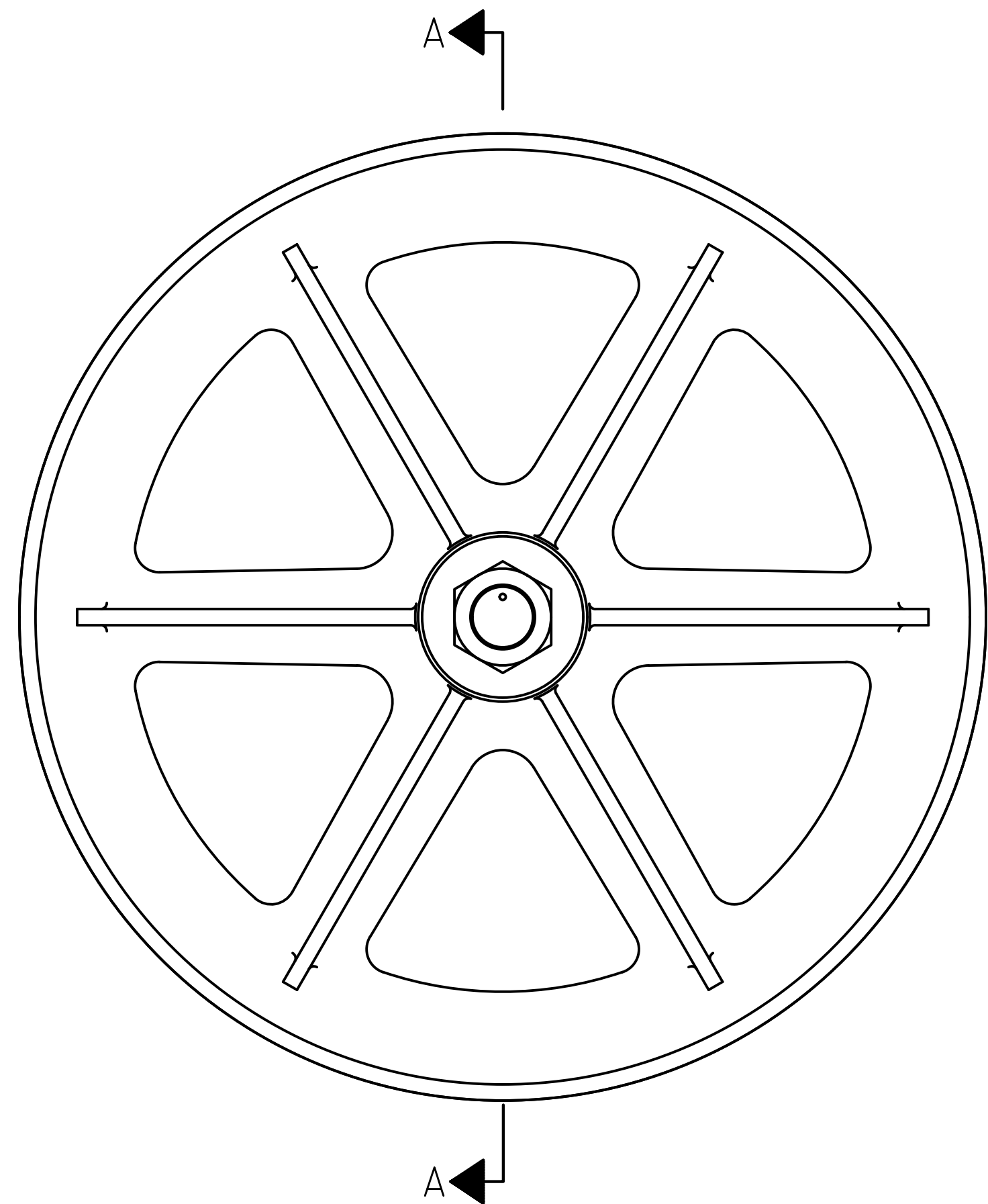
NORTH CAROLINA PROFESSIONAL SEAL  
 044302  
 ENGINEER  
 LEE LENTZ  
 10/6/17  
 DocuSigned by:  
 Lee Lentz

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 ---  
**AUX. COUNTERWEIGHT ASSEMBLY**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			M03
2			4			11

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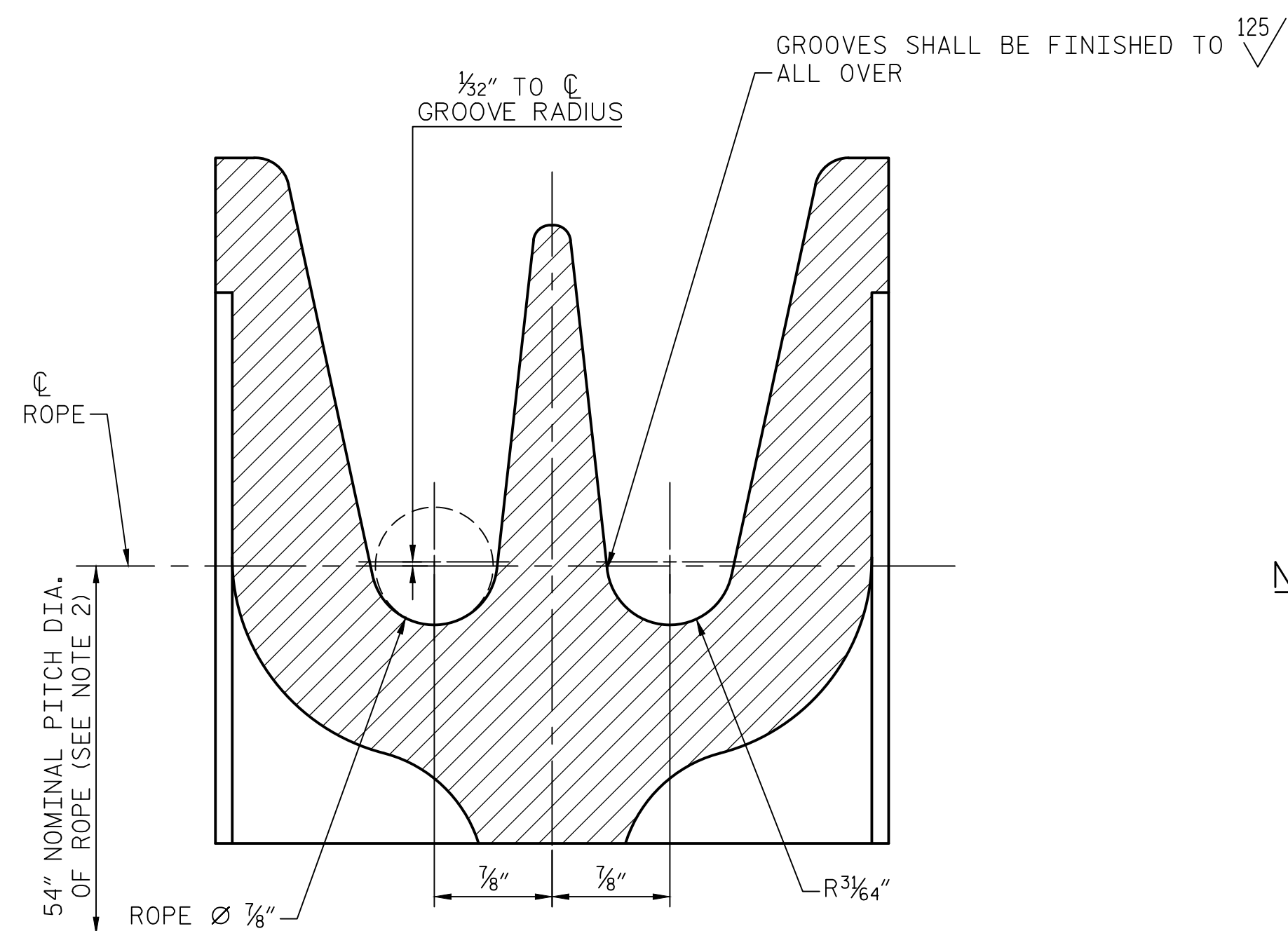


**M04** AUXILIARY COUNTERWEIGHT SHEAVE ASSEMBLY  
SCALE: NTS

SECTION A-A  
SCALE: NTS

BILL OF MATERIALS			
ITEM NO.	QTY.	DESCRIPTION	MATERIAL/MANUFACTURER
M01	4	NEW SHEAVE SHAFT	STEEL, ASTM A291, CLASS 3 OR A311 GR. 4140 COLD DRAWN
M02	8	NEW SHEAVE SHAFT BUSHING	BRONZE, ASTM B22 ALLOY C91100
M03	4	NEW SHEAVE THRUST COLLAR	STEEL, ASTM A311 GR. 1045, HOT ROLLED
M04	4	EXISTING AUXILIARY COUNTERWEIGHT SHEAVE	-
M05	8	NEW SHIM	STAINLESS, ASTM A240 TYPE 316
M06	4	NEW 7.5" THRUST WASHER	STEEL, ASTM A36
M07	8	NEW LOCK NUT WITH SS COTTER PIN	STEEL, ASTM A563, GR. 18-8 COTTER
M08	4	NEW 10" THRUST WASHER	STEEL, ASTM A36

\* NOTE: MINIMUM PROPERTIES OF 90 KSI YIELD, 223 BHN



**M04** DETAIL B  
SCALE: 1'-0"=1'-0"

**NOTES:**

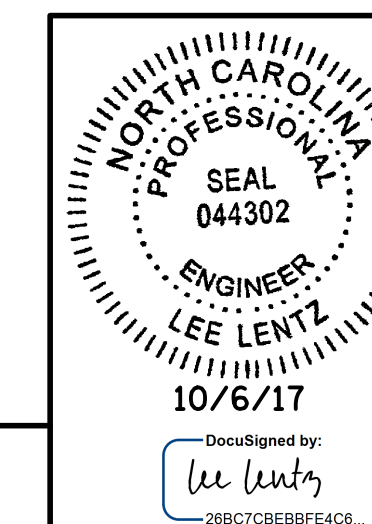
1. ALL COMPONENTS TO BE NEW EXCEPT FOR THE AUXILIARY COUNTERWEIGHT SHEAVE.
2. AUXILIARY COUNTERWEIGHT SHEAVES TO BE CLEANED, PAINTED AND MACHINED TO CLEAN UP THE ROPE GROOVES. GROOVES SHALL BE MACHINED WITH MINIMAL MATERIAL REMOVED, TO A MAXIMUM OF 1/16" ON THE RADIUS. GROOVE MACHINING SHALL BE CONCENTRIC TO THE BORE WITHIN ±0.010". THERE SHALL BE A SMOOTH TRANSITION FROM THE GROOVE UP THROUGH ALL TAPERED SIDE WALLS. BOTH GROOVES ON A SINGLE SHEAVE SHALL BE MACHINED TO THE SAME PITCH DIAMETER, AND THE PITCH DIAMETER OF ALL 4 SHEAVES AFTER MACHINING SHALL BE THE SAME, TO WITHIN 1/16".

PROJECT NO. 15B.13.29  
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LAST SAVED 10/14/2017 10:51 AM BY EASAMPLE. LAST PLOTTED 10/16/2017 11:25 AM. FILE: \\vmd001\p\projects\1662\01\CADD\Mechanical\M04 AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 1

DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
DRAWN BY: J. M. SHOUP DATE: 08/17/17  
CHECKED BY: L. R. LENTZ DATE: 08/17/17  
DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 08/17/17

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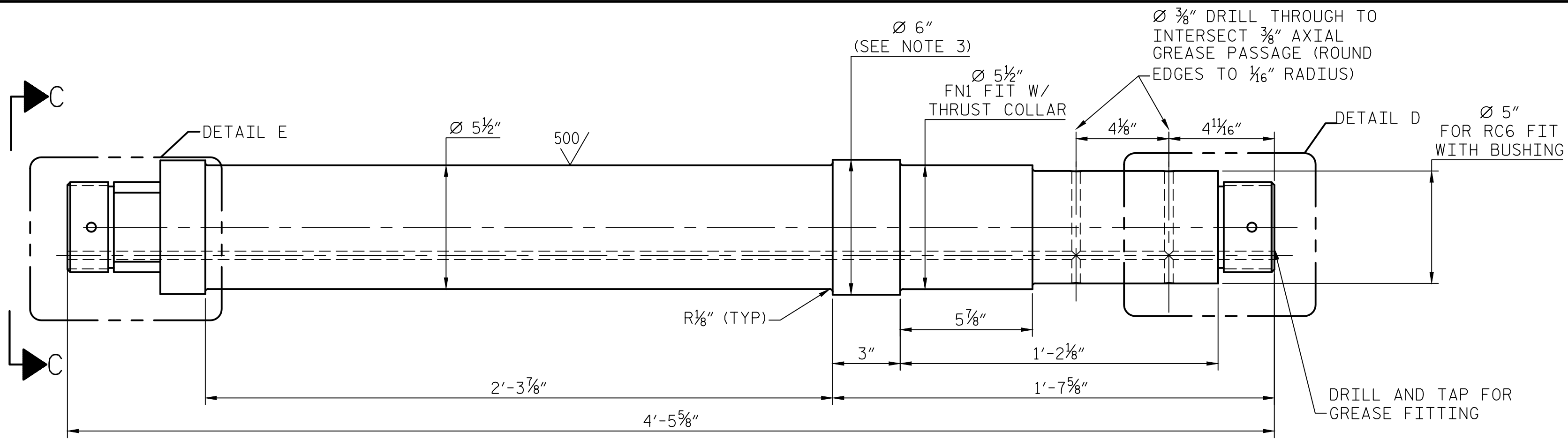
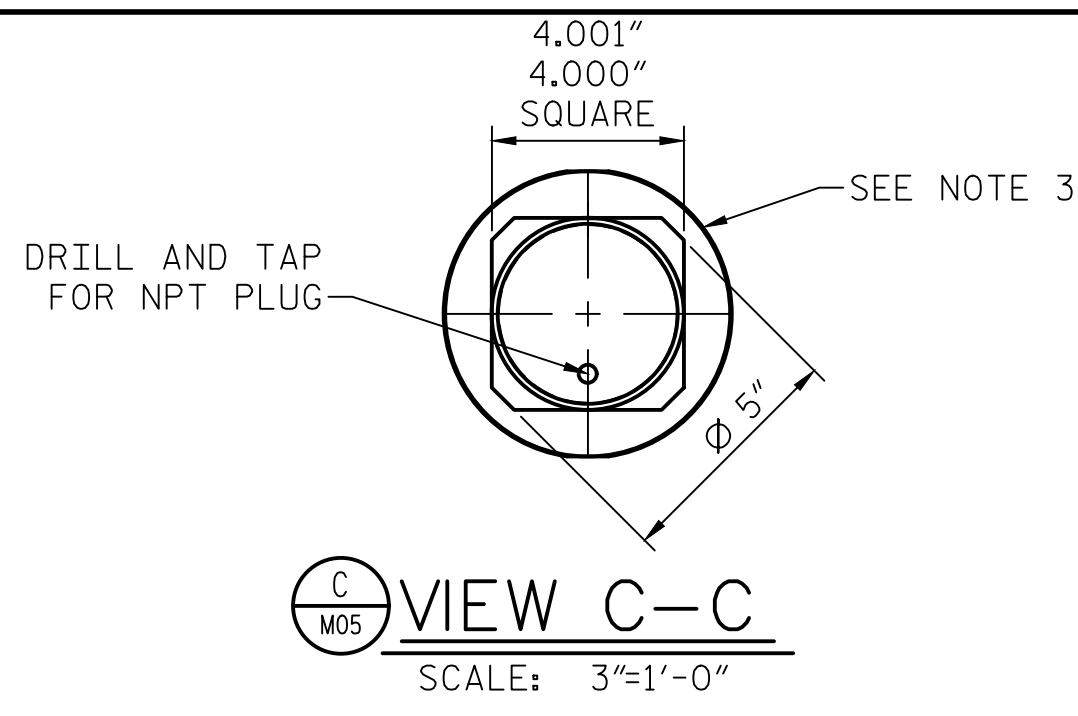
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 1**

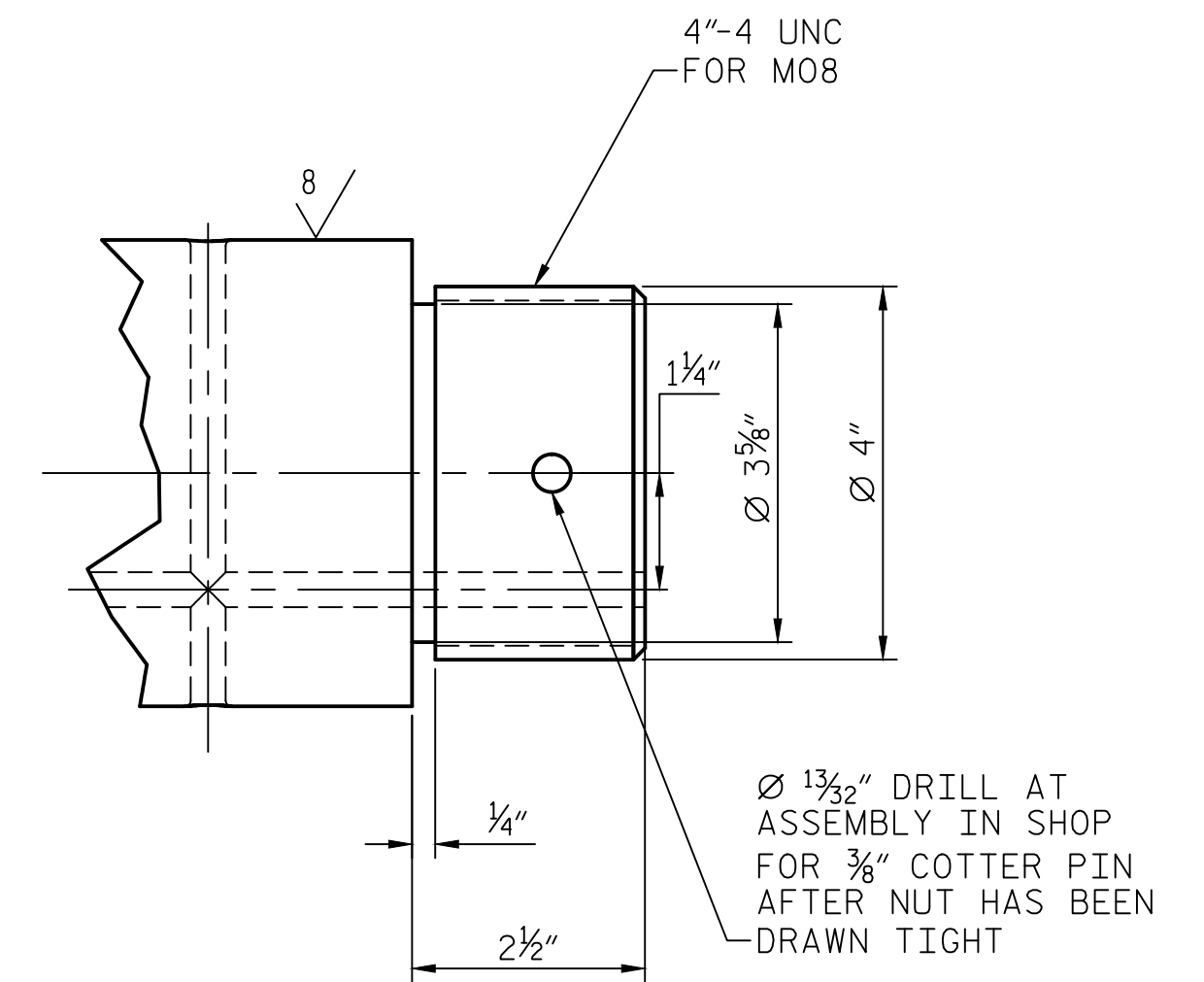
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			11

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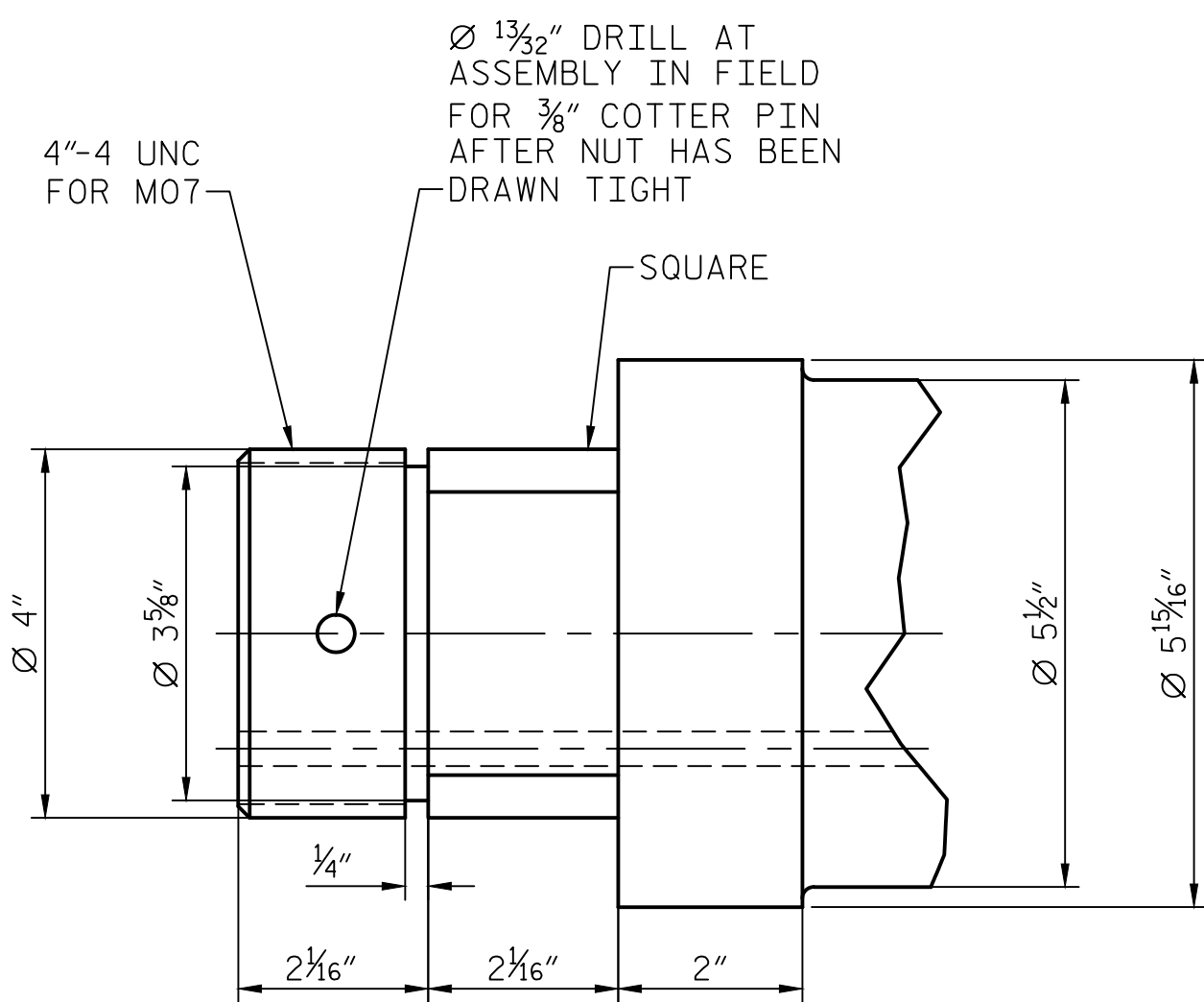
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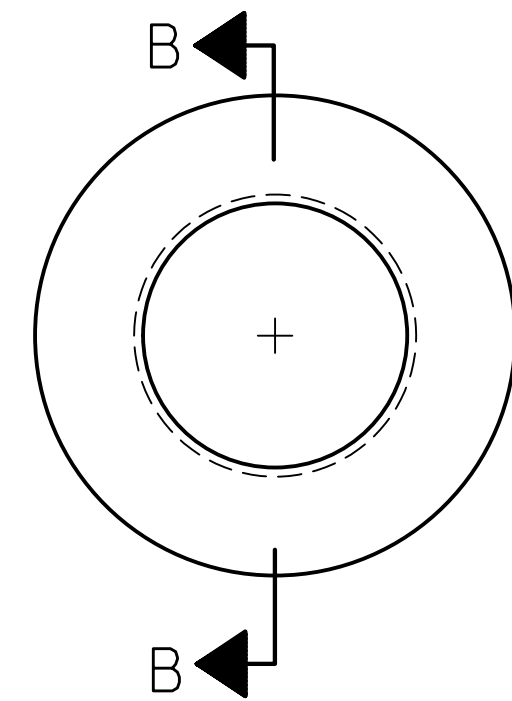
M01 SHEAVE SHAFT  
SCALE: 3"=1'-0"  
125 FINISH ALL OVER EXCEPT AS NOTED



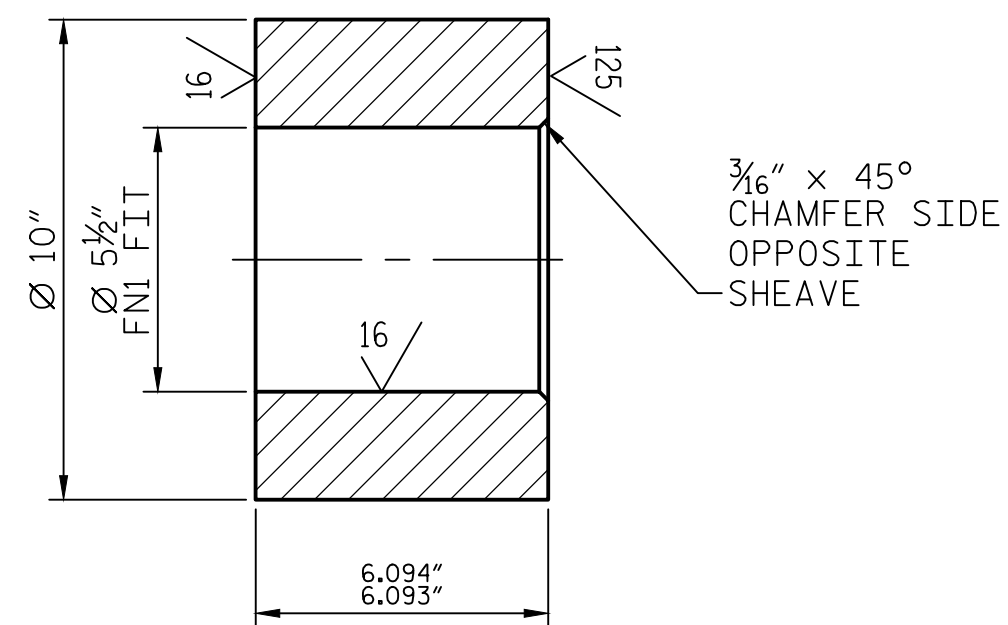
D M05  
DETAIL D  
SCALE: 6"=1'-0"



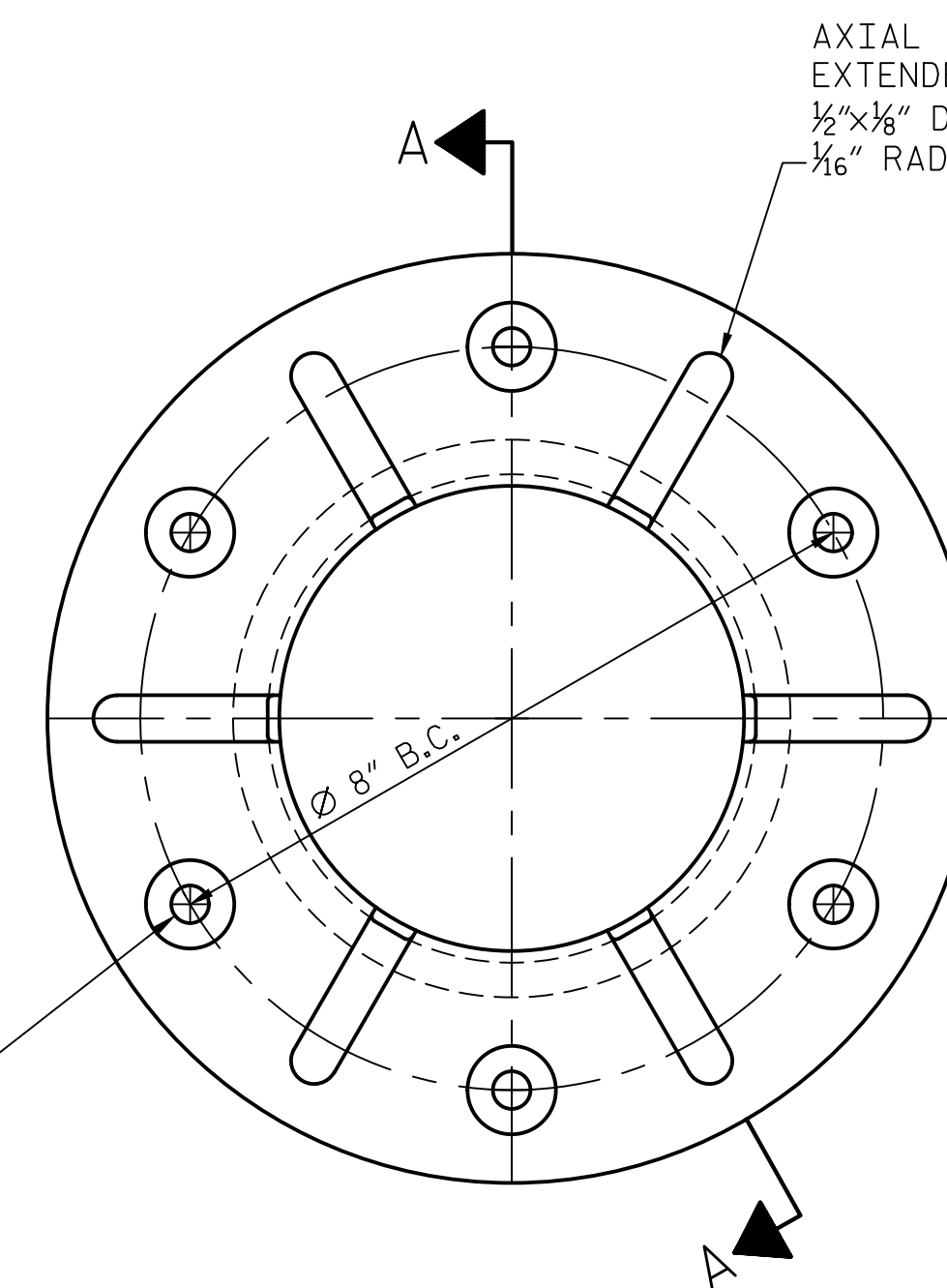
E M05  
DETAIL E  
SCALE: 6"=1'-0"



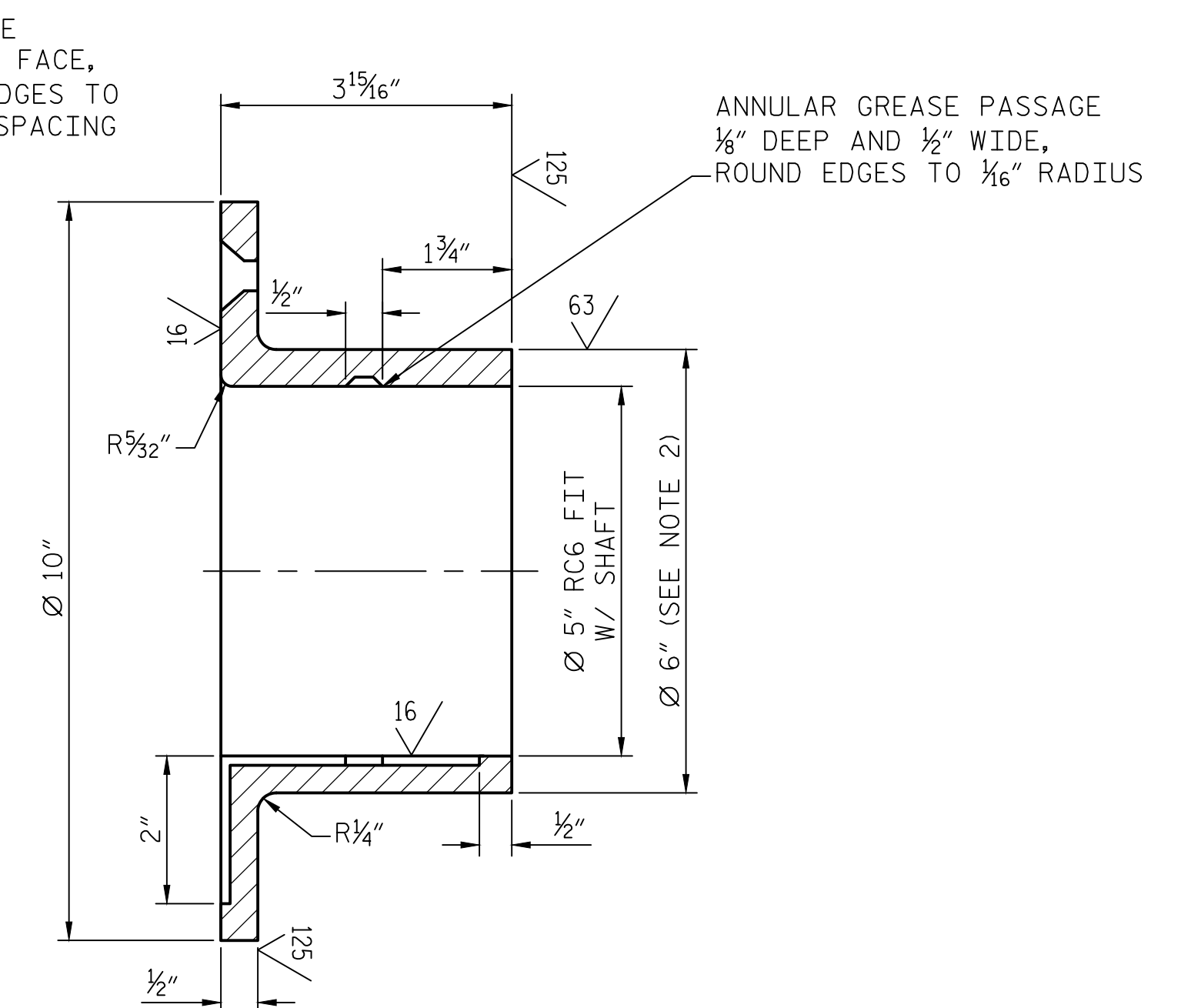
M03 SHEAVE THRUST COLLAR  
SCALE: 3"=1'-0"



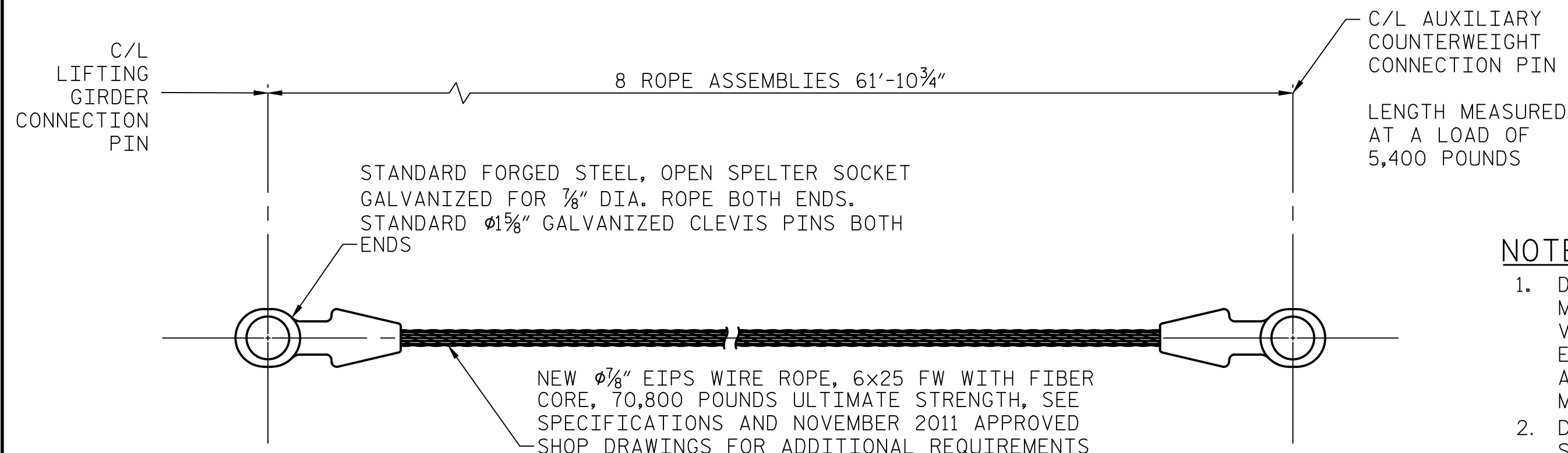
B M05  
SECTION B-B  
SCALE: 3"=1'-0"



M02 SHEAVE SHAFT BUSHING  
SCALE: 6"=1'-0"



A M05  
SECTION A-A  
SCALE: 6"=1'-0"



AUXILIARY COUNTERWEIGHT ROPES AND SOCKETS  
SCALE: NTS

NOTES:

1. DIAMETER OF AUXILIARY COUNTERWEIGHT SHEAVE BORE TO BE MEASURED AFTER DISASSEMBLY. CONTRACTOR SHALL FIELD VERIFY BORES IN EXISTING SUPPORT BRACKET AND SUBMIT TO ENGINEER PRIOR TO FINAL MACHINING. BORE TO BE MACHINED AS NECESSARY TO PROVIDE A CLEAN AND ROUND BORE, WITH MINIMUM MATERIAL REMOVAL.
2. DIAMETER TO MATCH MINIMUM CLEAN SURFACE OF EXISTING SHEAVE FOR FN2 FIT
3. CONTRACTOR SHALL FIELD VERIFY BORES IN EXISTING SUPPORT BRACKET AND SUBMIT TO ENGINEER PRIOR TO FINAL MACHINING.
4. ALL GREASE GROOVES ARE TO BE PROVIDED WITH A 1/16" RADIUS AT EDGES.

PROJECT NO. 15B.13.29  
NEW HANOVER COUNTY  
BRIDGE NO: 13

STATE OF NORTH CAROLINA  
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AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	M05
1			3			TOTAL SHEETS 11
2			4			

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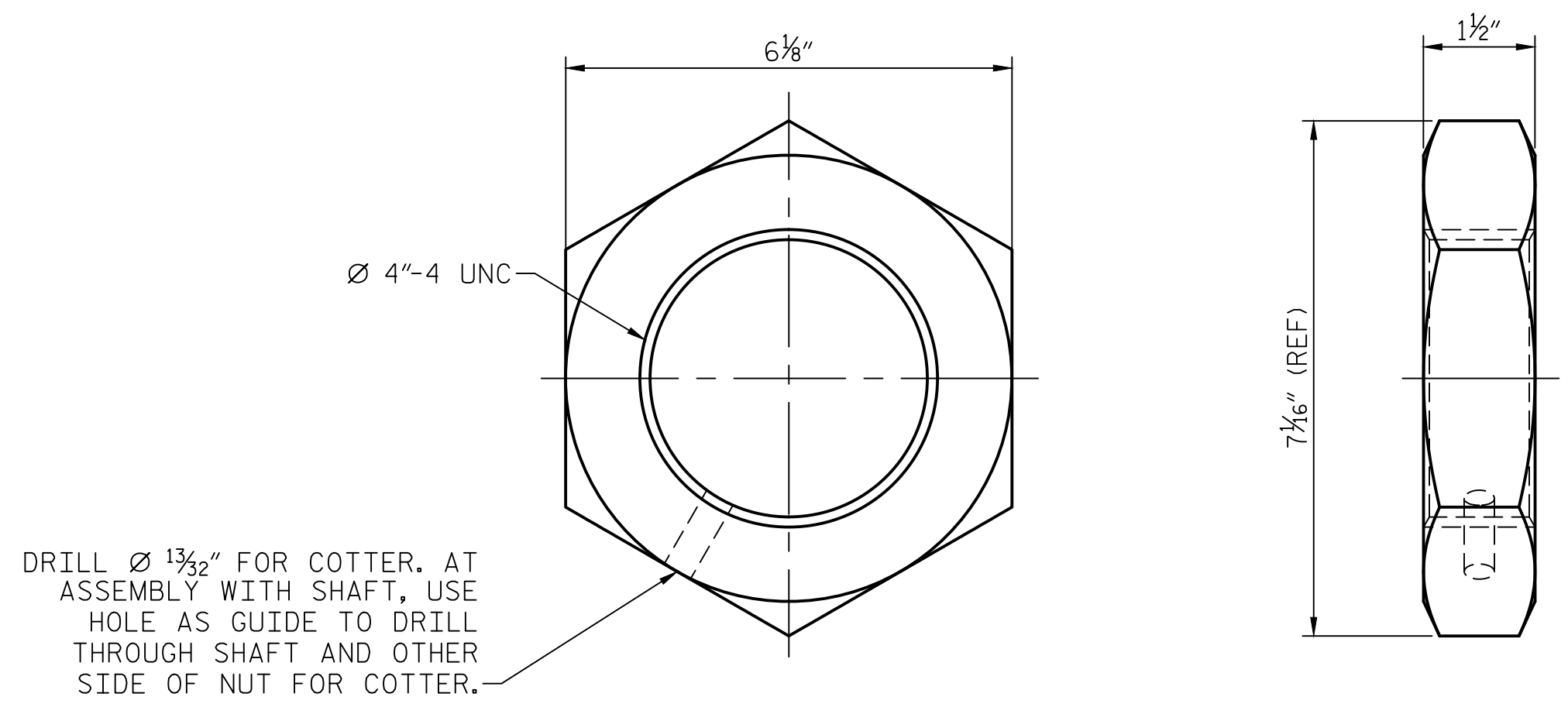
NORTH CAROLINA PROFESSIONAL SEAL  
044302  
ENGINEER  
LEE LENTZ  
10/6/17  
Designed by: *Lee Lentz*

DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
DRAWN BY: J. M. SHOUP DATE: 08/17/17  
CHECKED BY: L. R. LENTZ DATE: 08/17/17  
DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 08/17/17

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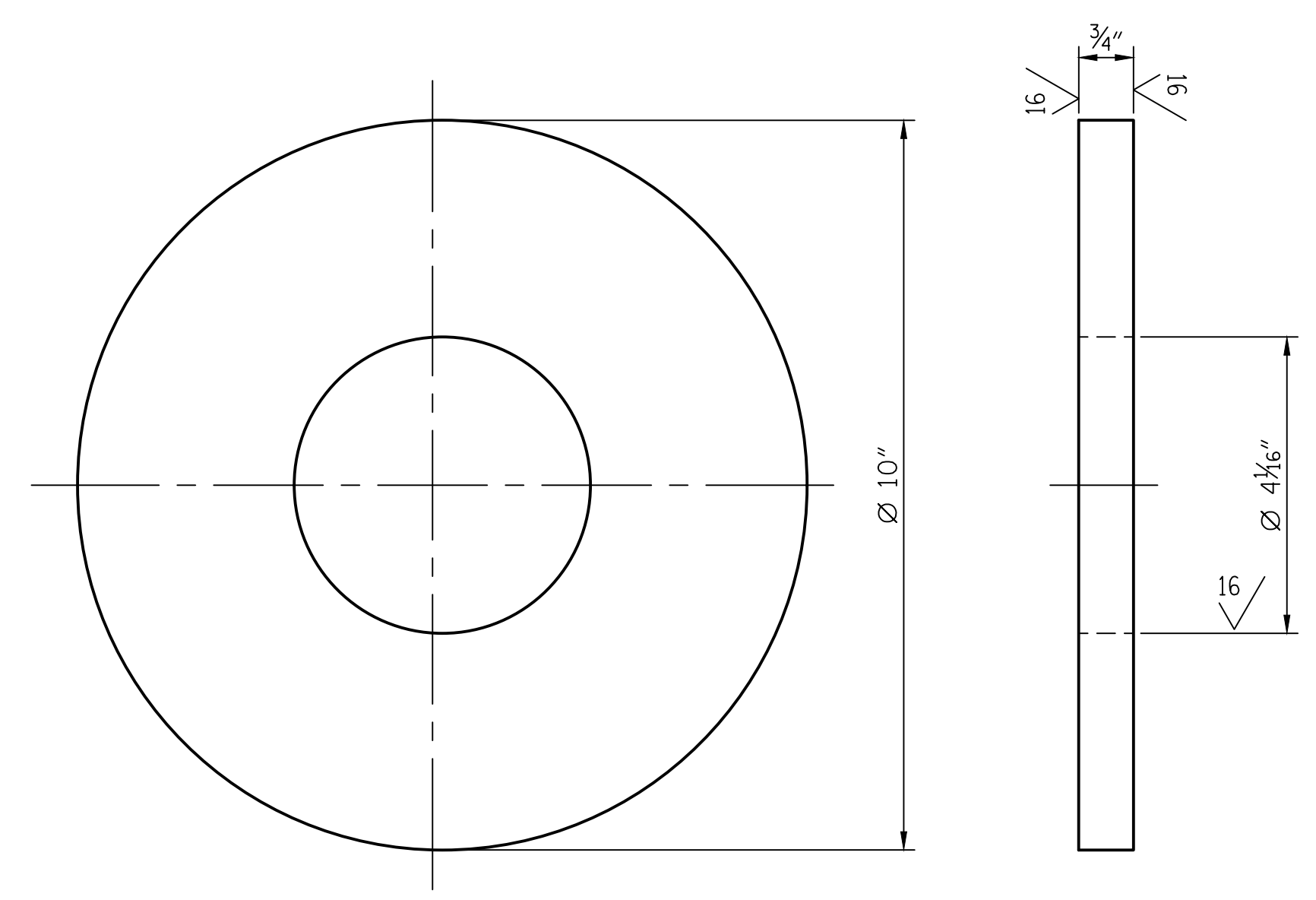
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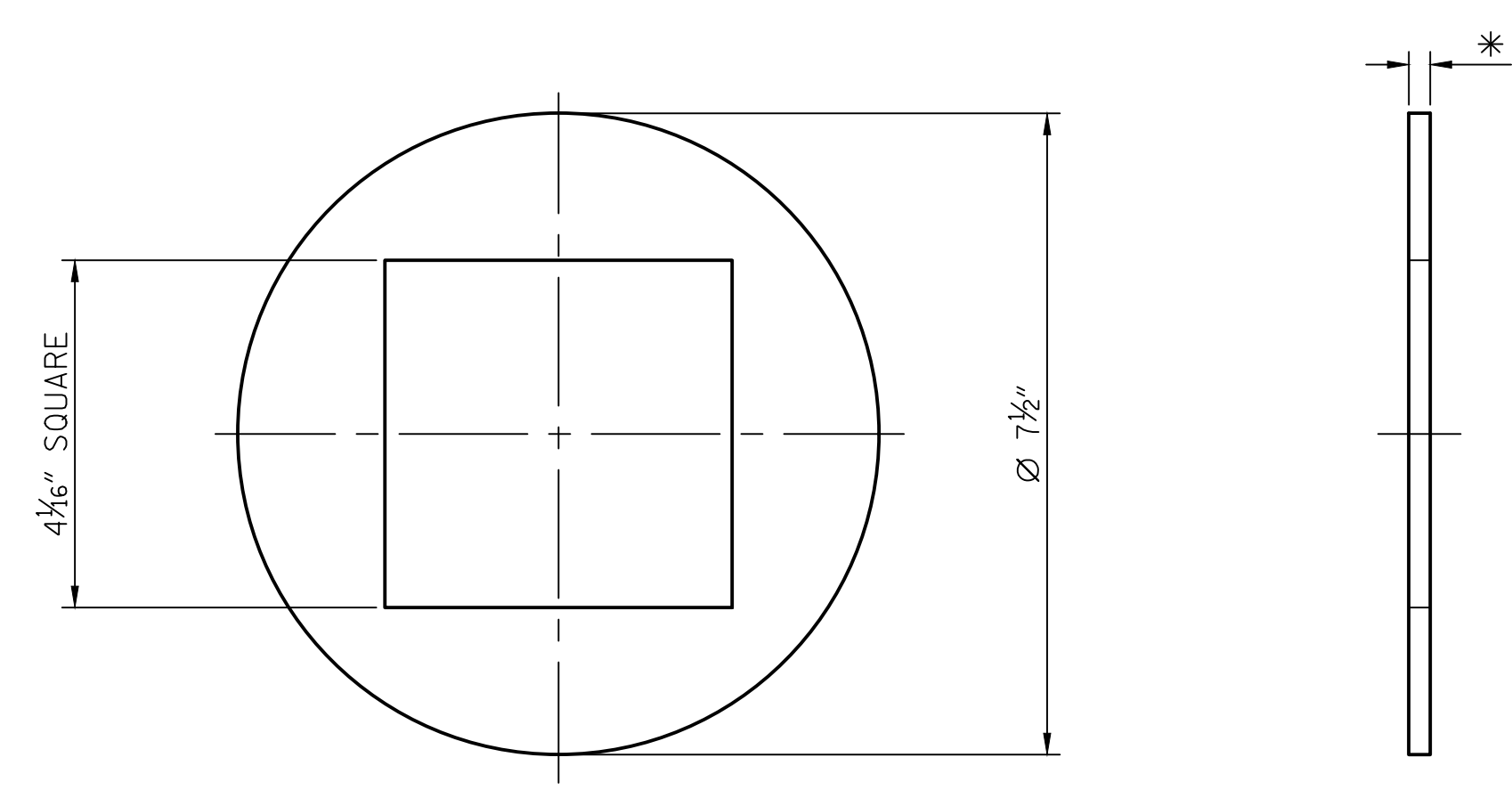


DRILL  $\varnothing 1\frac{3}{32}$ " FOR COTTER. AT ASSEMBLY WITH SHAFT, USE HOLE AS GUIDE TO DRILL THROUGH SHAFT AND OTHER SIDE OF NUT FOR COTTER.

**M07 LOCK NUT**  
 SCALE: 6"=1'-0"



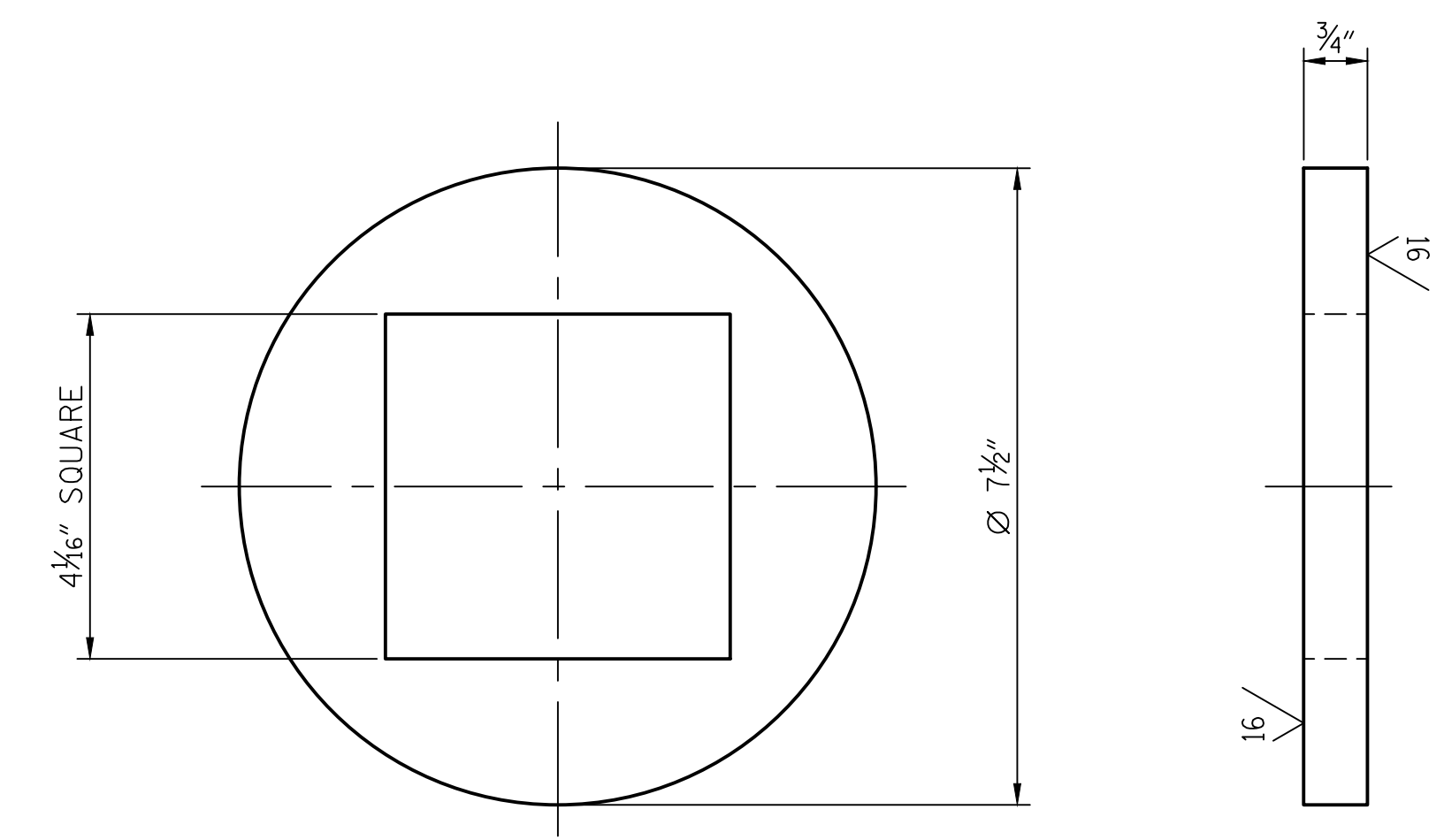
**M08 10" THRUST WASHER**  
 SCALE: 6"=1'-0"



**M05 SHIM**  
 SCALE: 6"=1'-0"

\* EACH SHIM PACK SHALL BE PROVIDED WITH THE FOLLOWING THICKNESSES

QTY:	THICKNESS:
1	1/4"
1	1/8"
1	1/16"
1	1/32"
2	1/64"

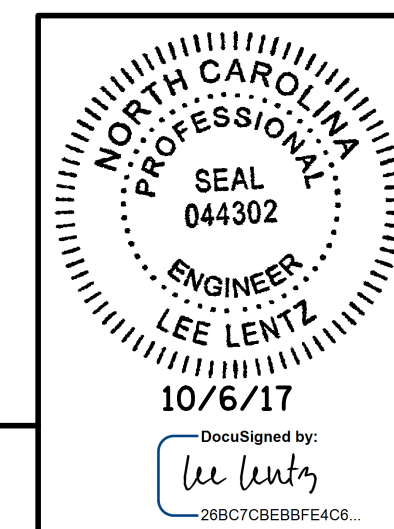


**M06 7 1/2" THRUST WASHER**  
 SCALE: 6"=1'-0"

PROJECT NO. 15B.13.29  
NEW HANOVER COUNTY  
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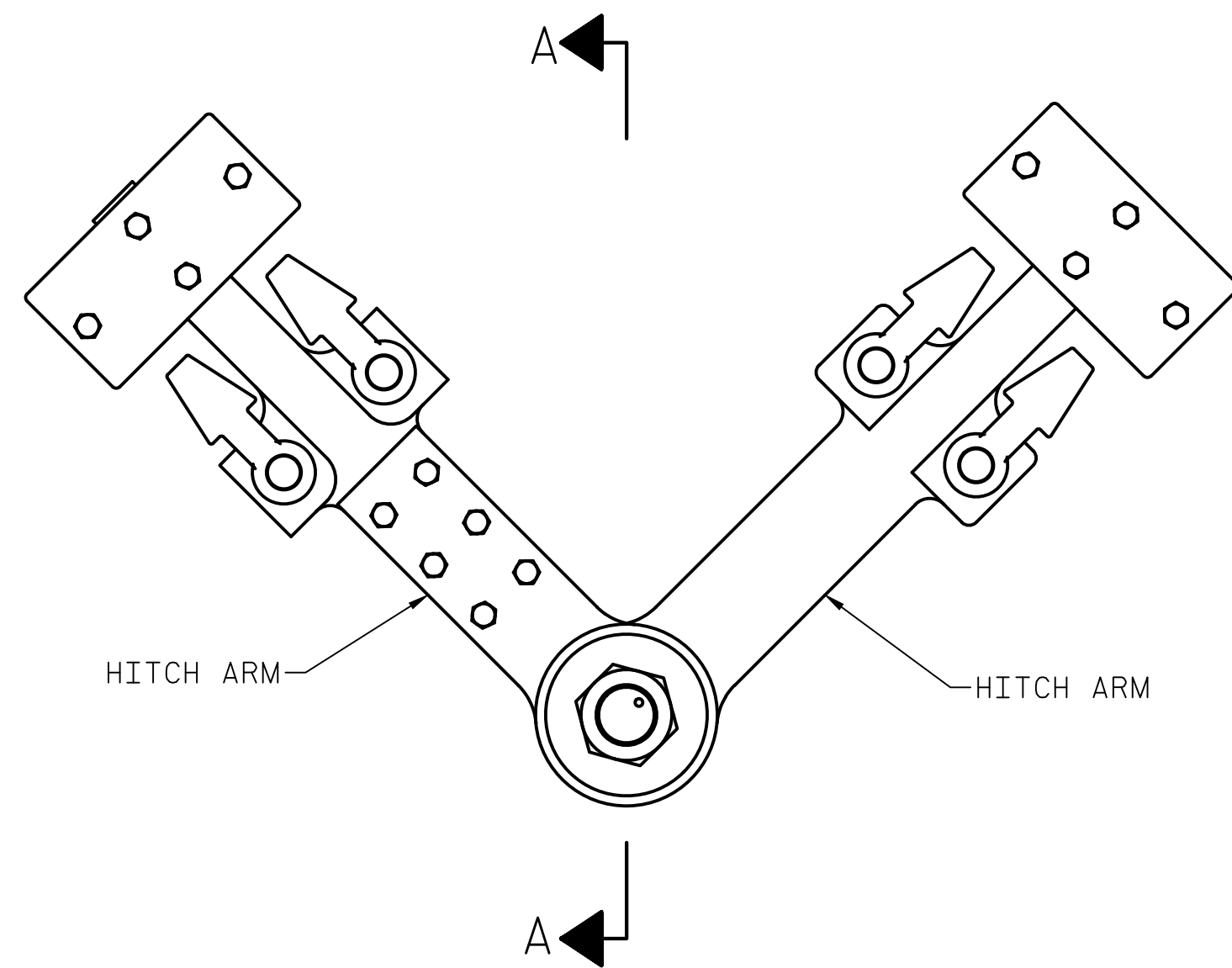


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 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
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**AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 3**  
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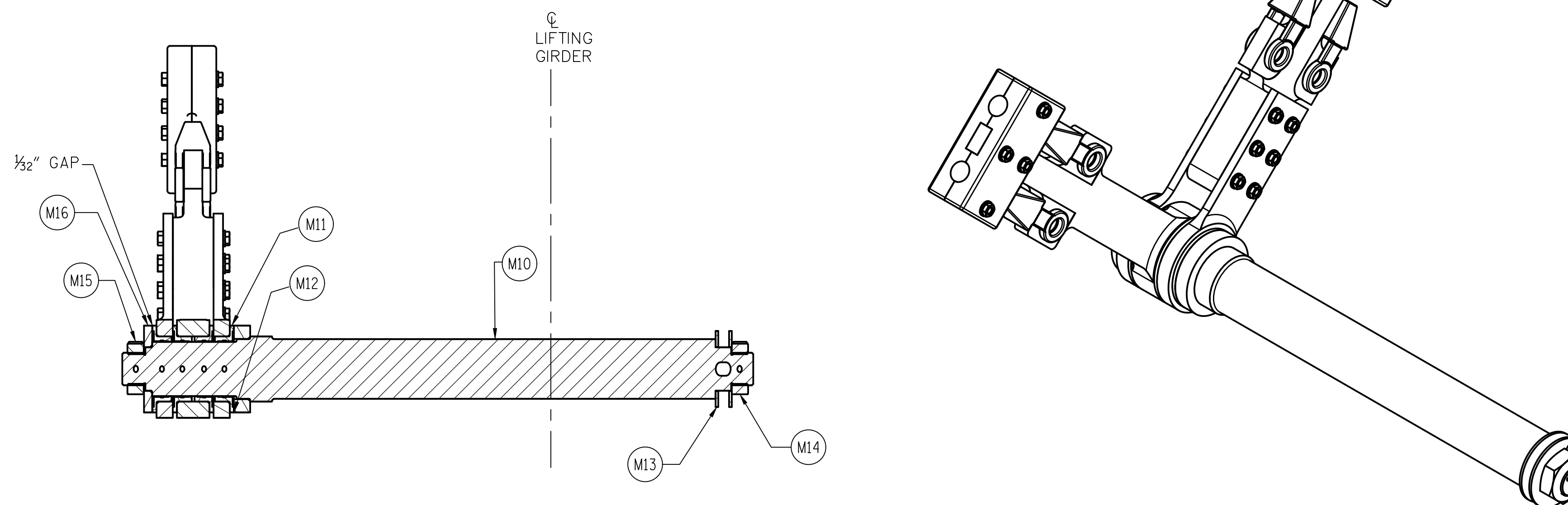
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1			3			M06
2			4			11

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###



**HITCH SHAFT ASSEMBLY**  
SCALE: 1 1/2"=1'-0"



**SECTION A-A**  
SCALE: 1 1/2"=1'-0"

**NOTES:**

1. ALL COMPONENTS TO BE NEW EXCEPT FOR THE HITCH ARMS.

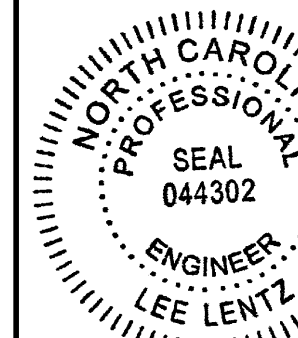
BILL OF MATERIALS			
ITEM NO.	QTY.	DESCRIPTION	MATERIAL/MANUFACTURER
M10	2	NEW HITCH SHAFT	STEEL, ASTM A291, CLASS 3 OR ASTM A311 GR. 4140 COLD DRAWN
M11	8	NEW HITCH SHAFT BUSHING	BRONZE, ASTM B22 ALLOY C91100
M12	2	NEW HITCH THRUST COLLAR	STEEL, ASTM A311 GR. 1045, HOT ROLLED
M13	4	NEW SHIM	STAINLESS, ASTM A240 TYPE 316
M14	4	NEW LOCK NUT WITH SS COTTER PIN	STEEL, ASTM A563, GR. 18-8 COTTER
M15	2	NEW THRUST WASHER	STEEL, ASTM A36

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 FILE: \\mimdd01\p\projects\1562\1\CADD\Mechanical\M07\_AUX\_COUNTERWEIGHT\_ASSEMBLY\_DETAILS - 4

DESIGNED BY: E. A. SAMPLE DATE : 08/17/17  
 DRAWN BY: J. M. SHOUP DATE : 08/17/17  
 CHECKED BY: L. R. LENTZ DATE : 08/17/17  
 DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE : 08/17/17

  
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 RALEIGH, NC 27601  
 NC LICENSE NO. C-2979

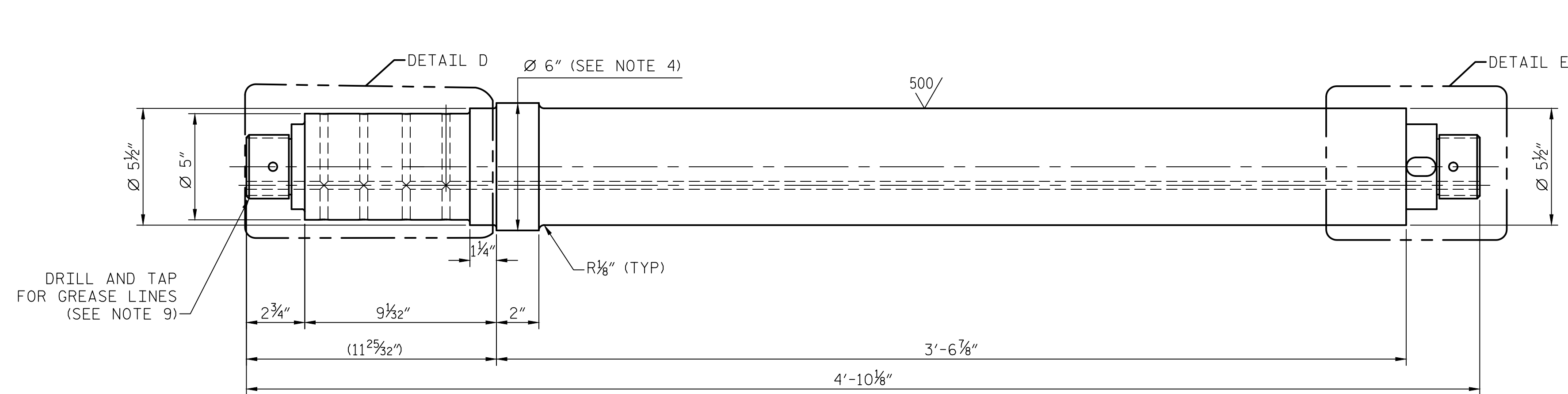
  
 NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 044302  
 ENGINEER  
 LEE LENTZ  
 10/6/17  
 DocuSigned by:  
 Lee Lentz  
 28B7C8EBB8E4C6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 -----  
**AUX. COUNTERWEIGHT  
 ASSEMBLY DETAILS - 4**  
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REVISIONS						SHEET NO.
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1			3			M07
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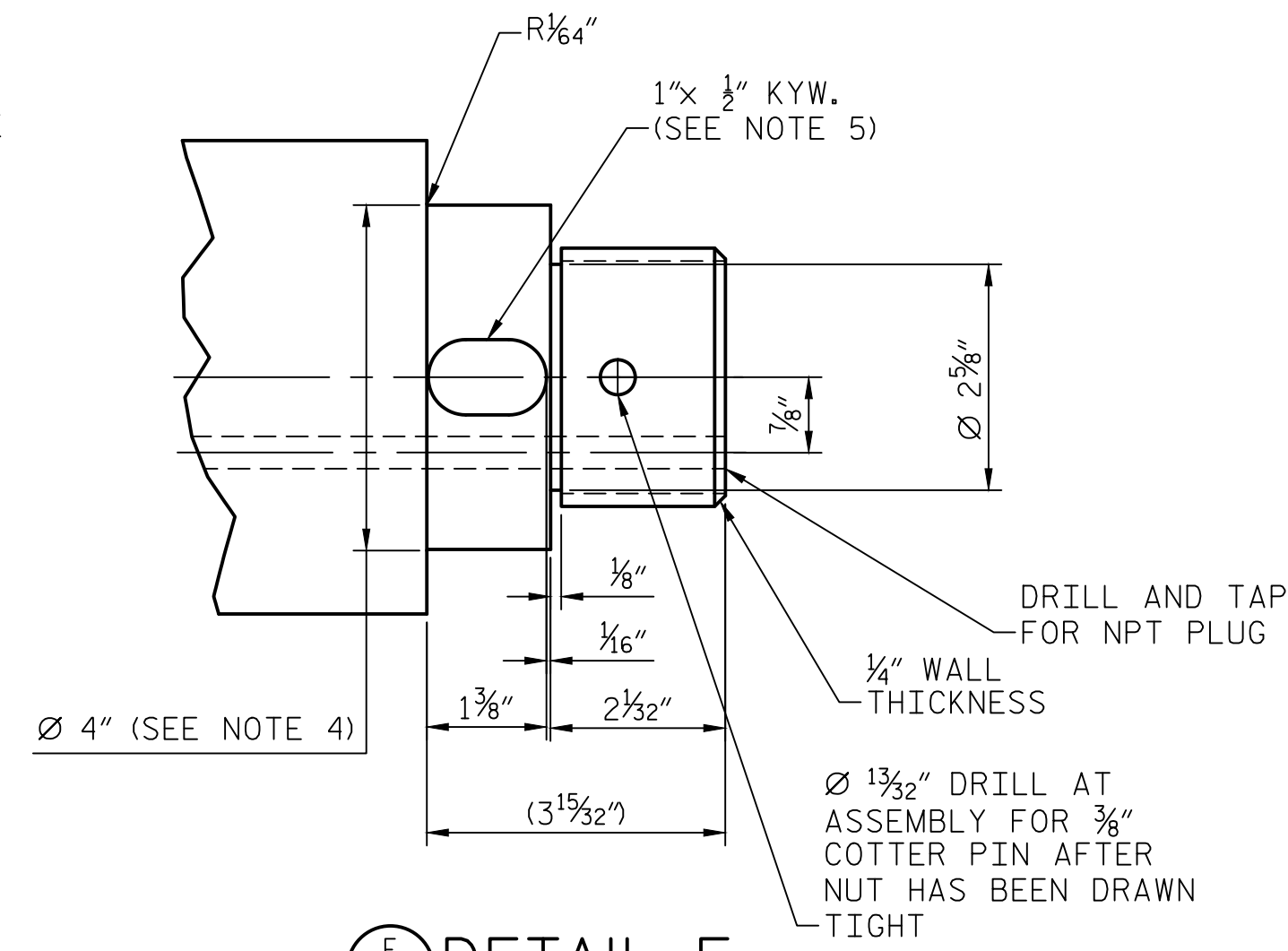
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**M10 HITCH SHAFT**

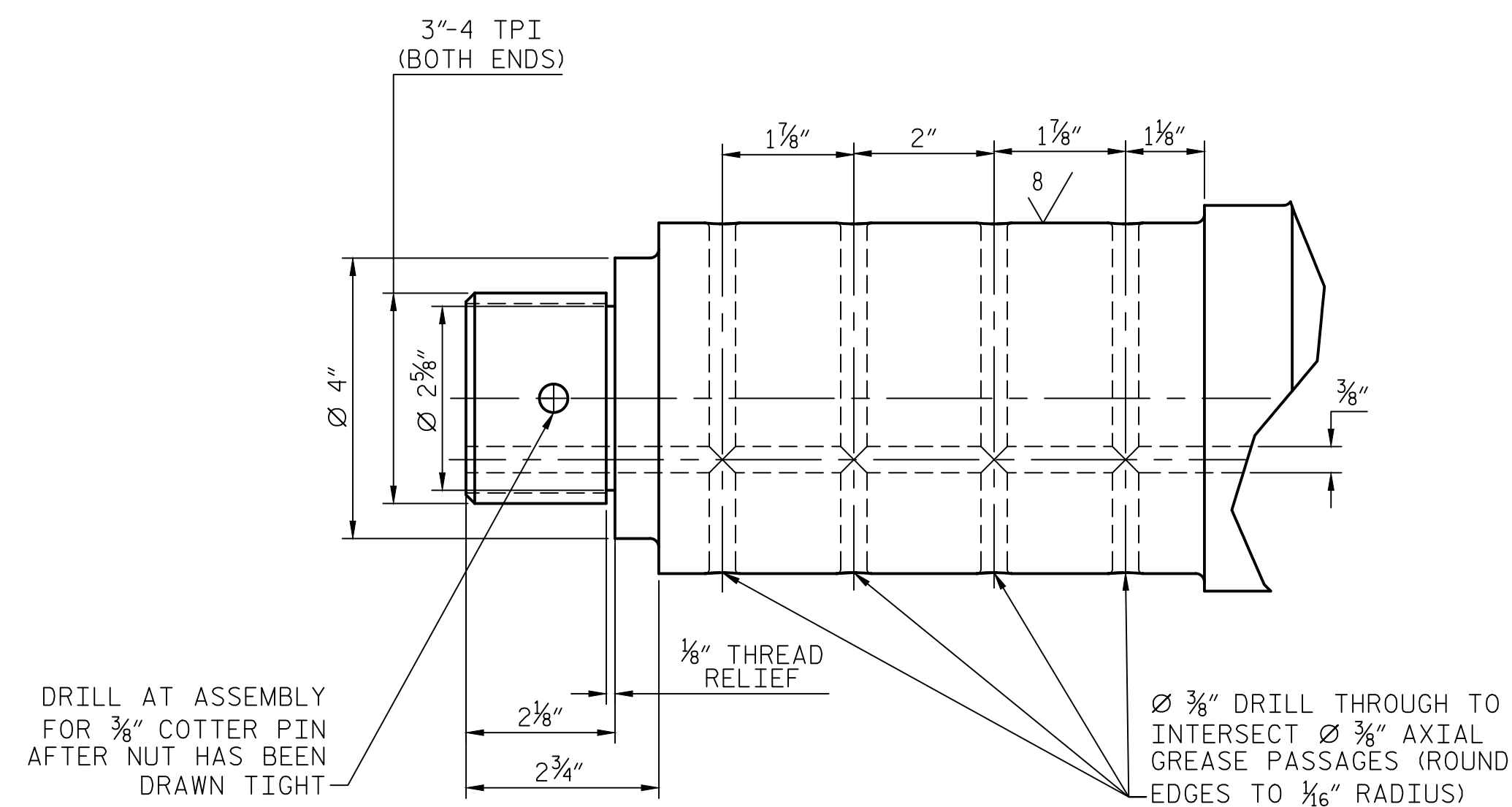
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125/ FINISH ALL OVER EXCEPT AS NOTED



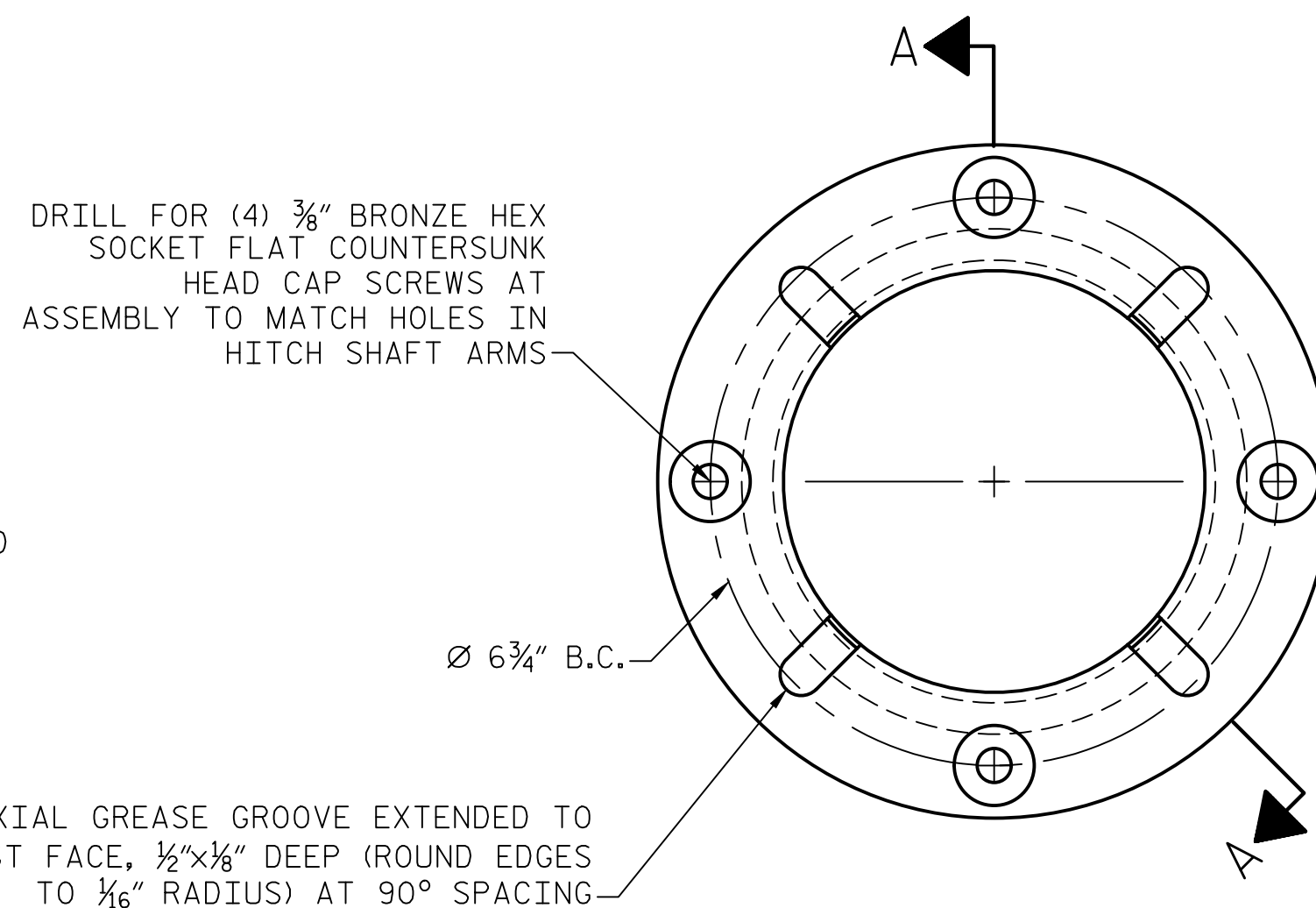
**E DETAIL E**

SCALE: 6"=1'-0"



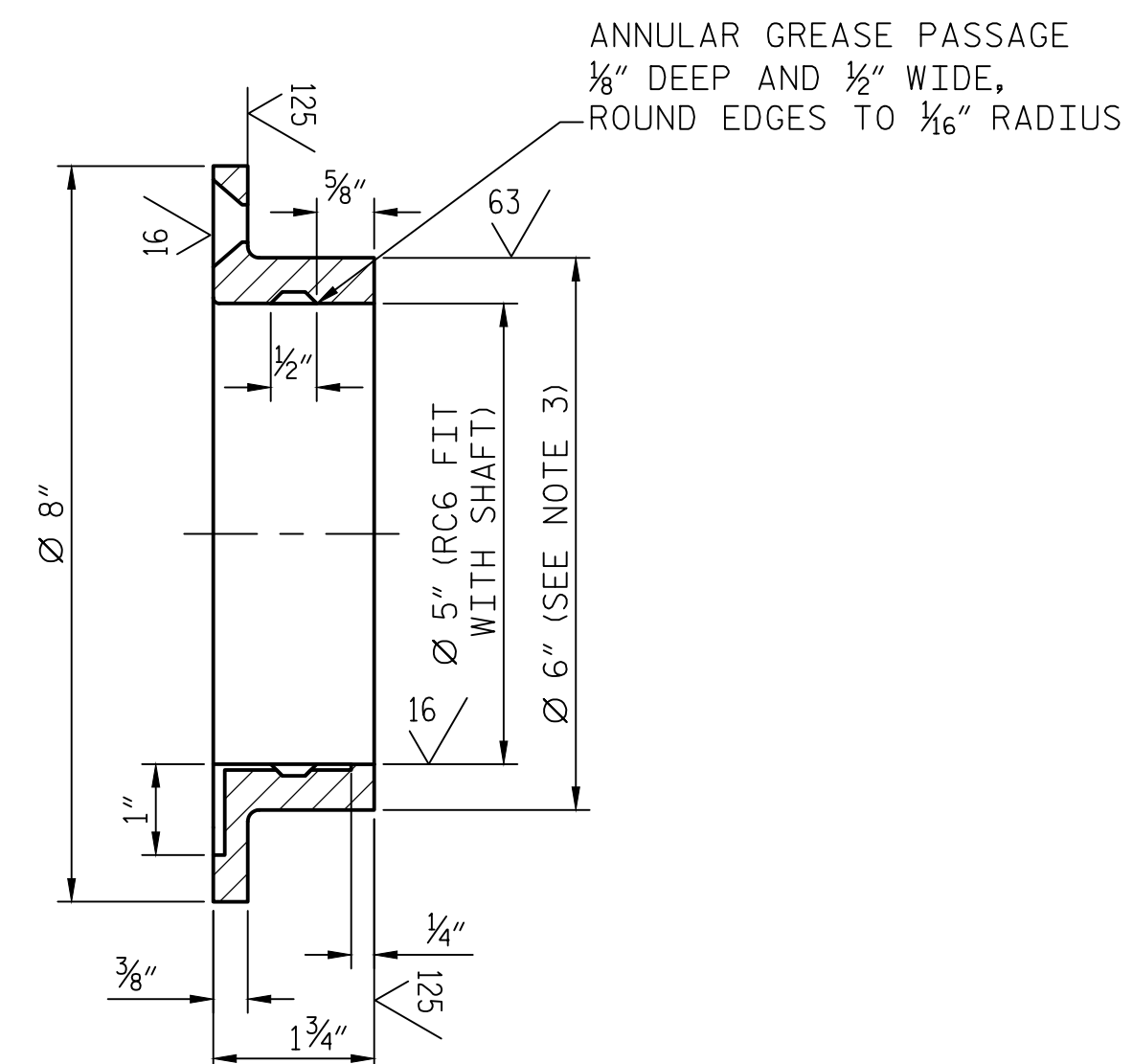
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SCALE: 6"=1'-0"



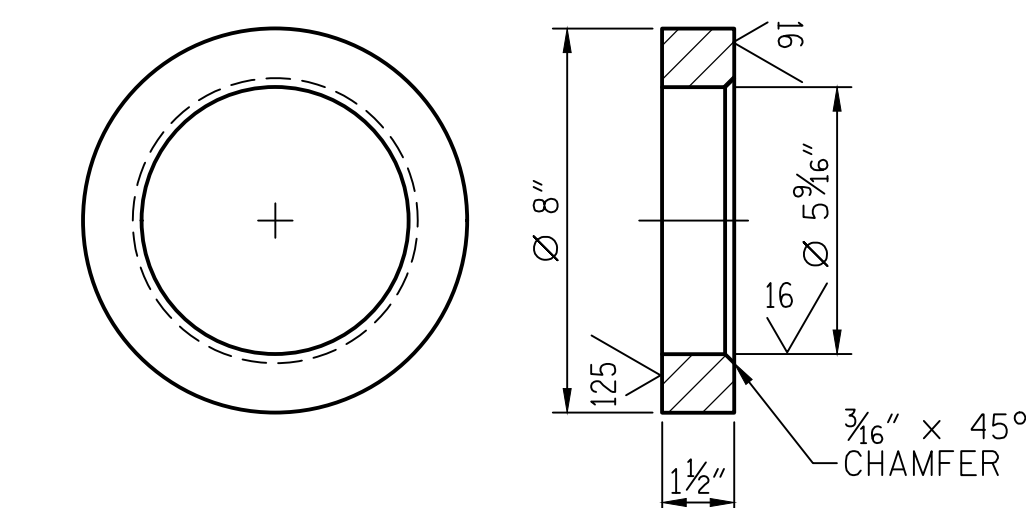
**M11 HITCH SHAFT BUSHING**

SCALE: 6"=1'-0"



**A SECTION A**

SCALE: 6"=1'-0"



**M12 HITCH THRUST COLLAR**

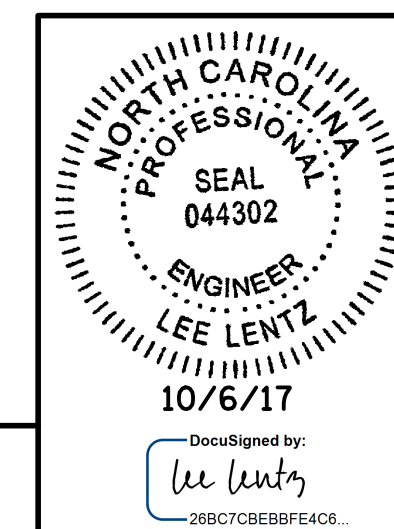
SCALE: 3"=1'-0"

**NOTES:**

- DIAMETER OF AUXILIARY HITCH ARM BORE TO BE MEASURED AFTER DISASSEMBLY.
- BORE TO BE MACHINED AS NECESSARY TO PROVIDE A CLEAN AND ROUND BORE, WITH ONLY THE MINIMAL MATERIAL REMOVED TO ACHIEVE THIS.
- SURFACE TO MATCH MINIMUM CLEAN SURFACE OF EXISTING HITCH ARMS FOR FN2 FIT
- CONTRACTOR SHALL FIELD VERIFY BORES IN EXISTING SUPPORT BRACKET AND SUBMIT TO ENGINEER PRIOR TO FINAL MACHINING.
- CONTRACTOR SHALL SUPPLY A NEW KEY.
- ALL GREASE GROOVES ARE TO BE PROVIDED WITH A 1/16" RADIUS AT EDGES.
- CONTRACTOR SHALL INSTALL AND RUN LUBRICATION LINES FROM THE HITCH ARM SHAFTS TO AN ACCESSIBLE LOCATION AT THE TOP OF THE LIFTING GIRDER.
- LUBRICATION LINES SHALL BE MINIMUM 10,000 PSI BURST PRESSURE WIRE REINFORCED FLEXIBLE HOSE THAT IS EXTENDED TO AN EASILY ACCESSED LOCATION AND ATTACHES TO RIGIDLY MOUNTED GREASE FITTINGS FOR FUTURE MAINTENANCE.

PROJECT NO. 15B.13.29  
NEW HANOVER COUNTY  
 BRIDGE NO: 13

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 AUX. COUNTERWEIGHT  
 ASSEMBLY DETAILS - 5



REVISIONS						SHEET NO.	
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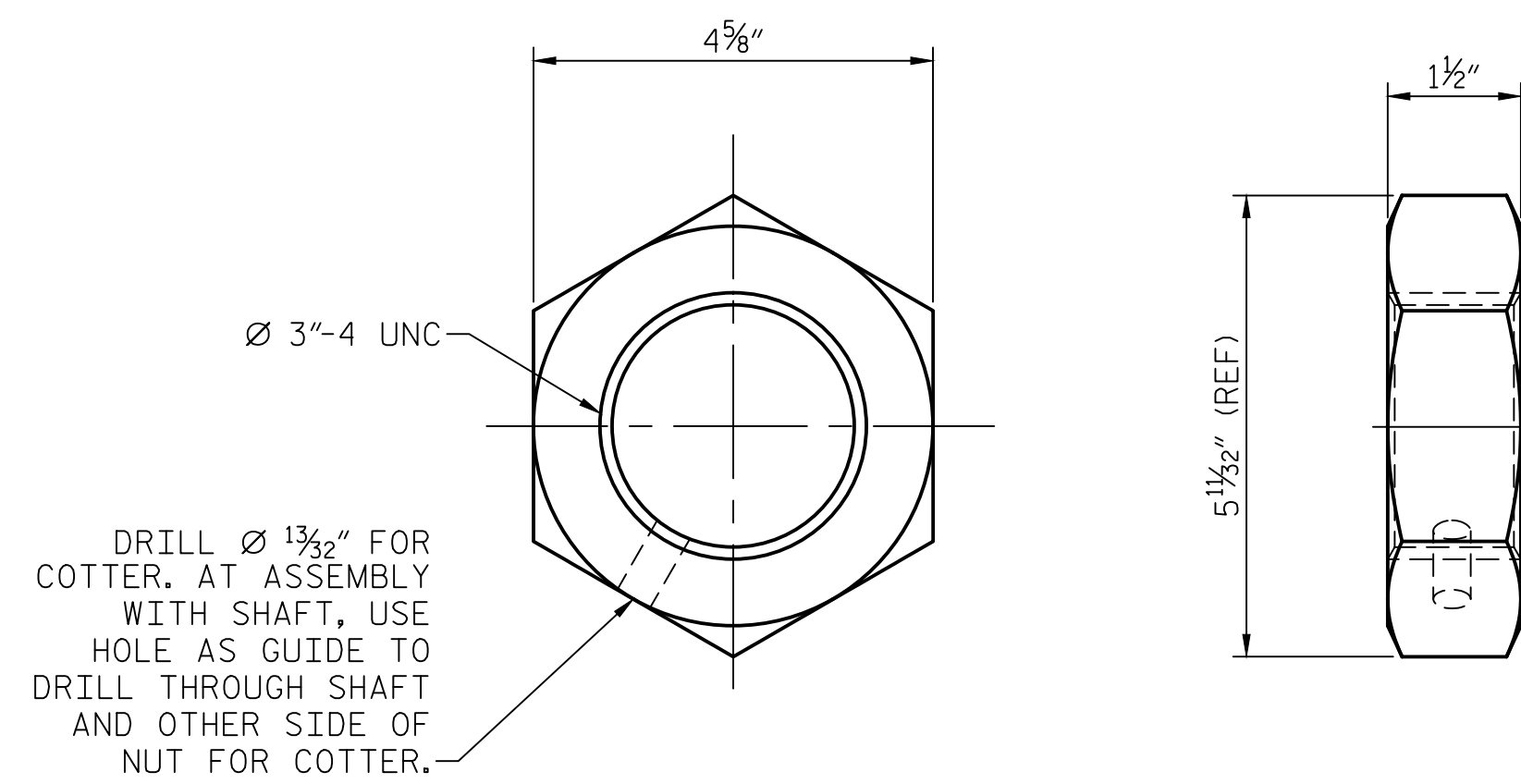
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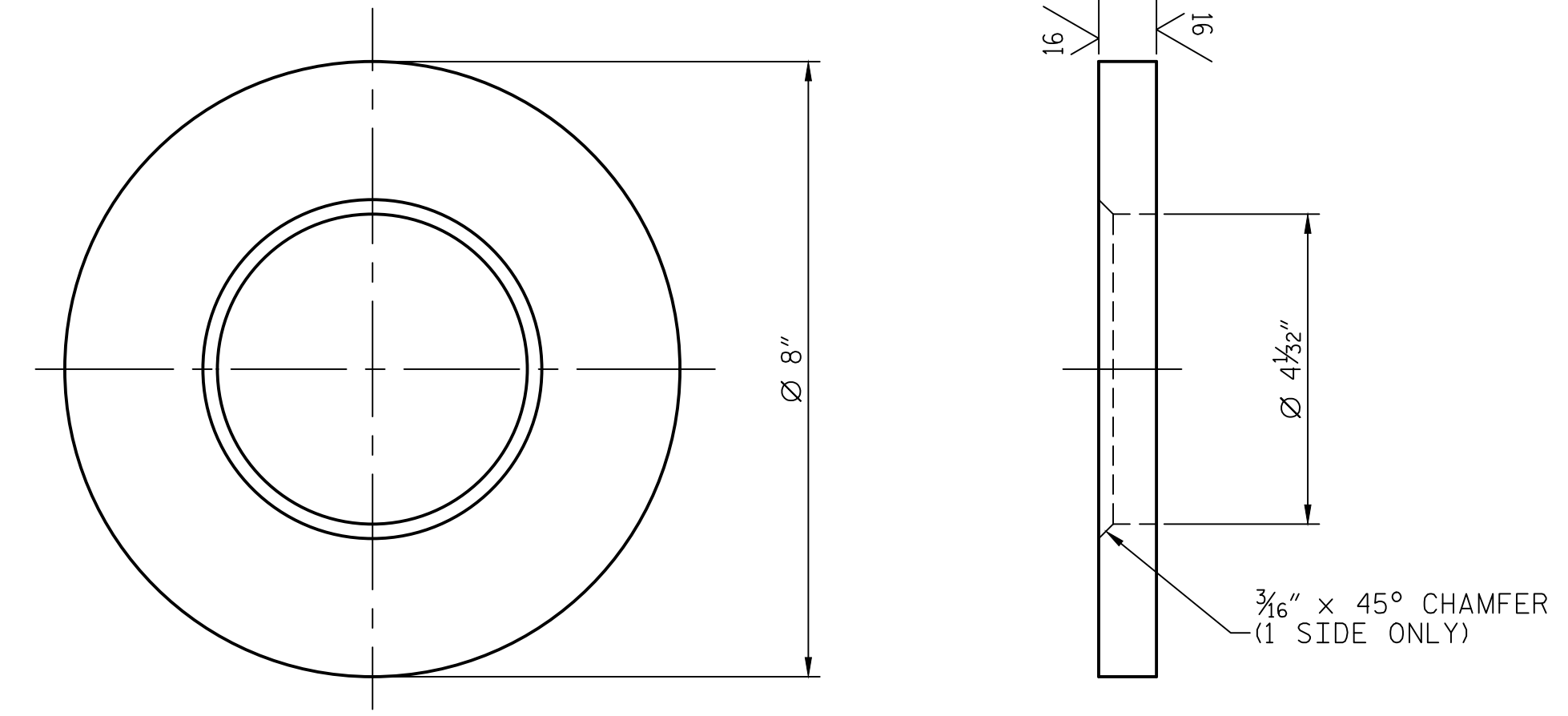
DESIGNED BY:	E. A. SAMPLE	DATE:	08/17/17
DRAWN BY:	J. M. SHOUP	DATE:	08/17/17
CHECKED BY:	L. R. LENTZ	DATE:	08/17/17
DESIGN ENGINEER OF RECORD:	L. R. LENTZ	DATE:	08/17/17



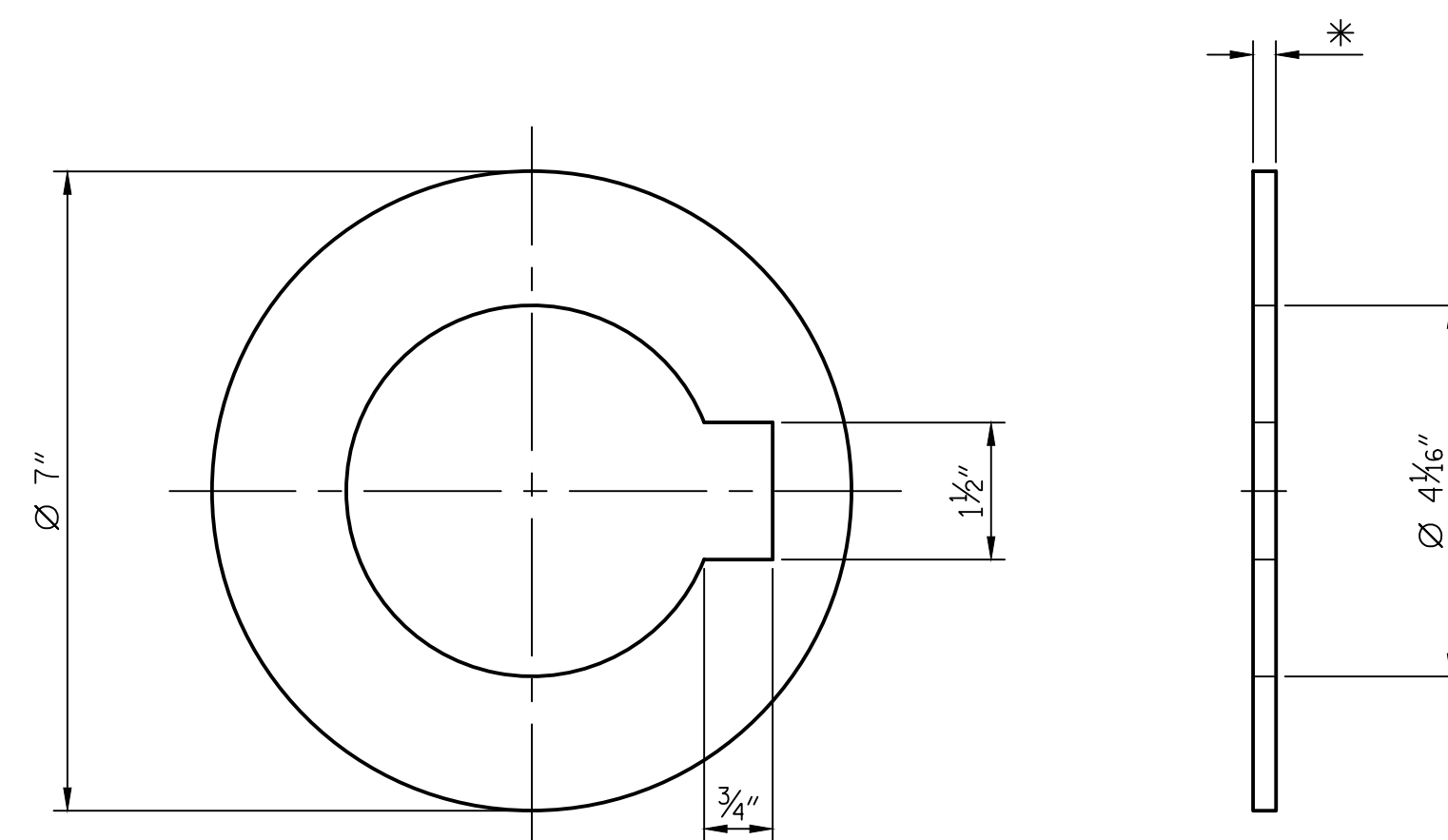
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**M14 LOCK NUT**  
 SCALE: 6"=1'-0"



**M15 THRUST WASHER**  
 SCALE: 6"=1'-0"



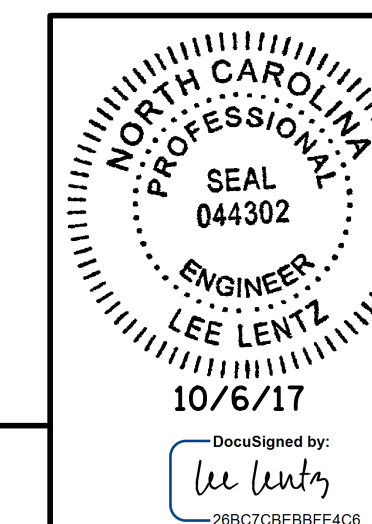
**M13 SHIM**  
 SCALE: 6"=1'-0"

\* EACH SHIM PACK SHALL BE PROVIDED WITH THE FOLLOWING THICKNESSES  
 QTY: THICKNESS:  
 1 1/4"  
 1 1/8"  
 1 1/16"  
 1 1/32"  
 1 1/64"

PROJECT NO. 15B.13.29  
NEW HANOVER COUNTY  
 BRIDGE NO: 13

DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
 DRAWN BY: J. M. SHOUP DATE: 08/17/17  
 CHECKED BY: L. R. LENTZ DATE: 08/17/17  
 DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 08/17/17

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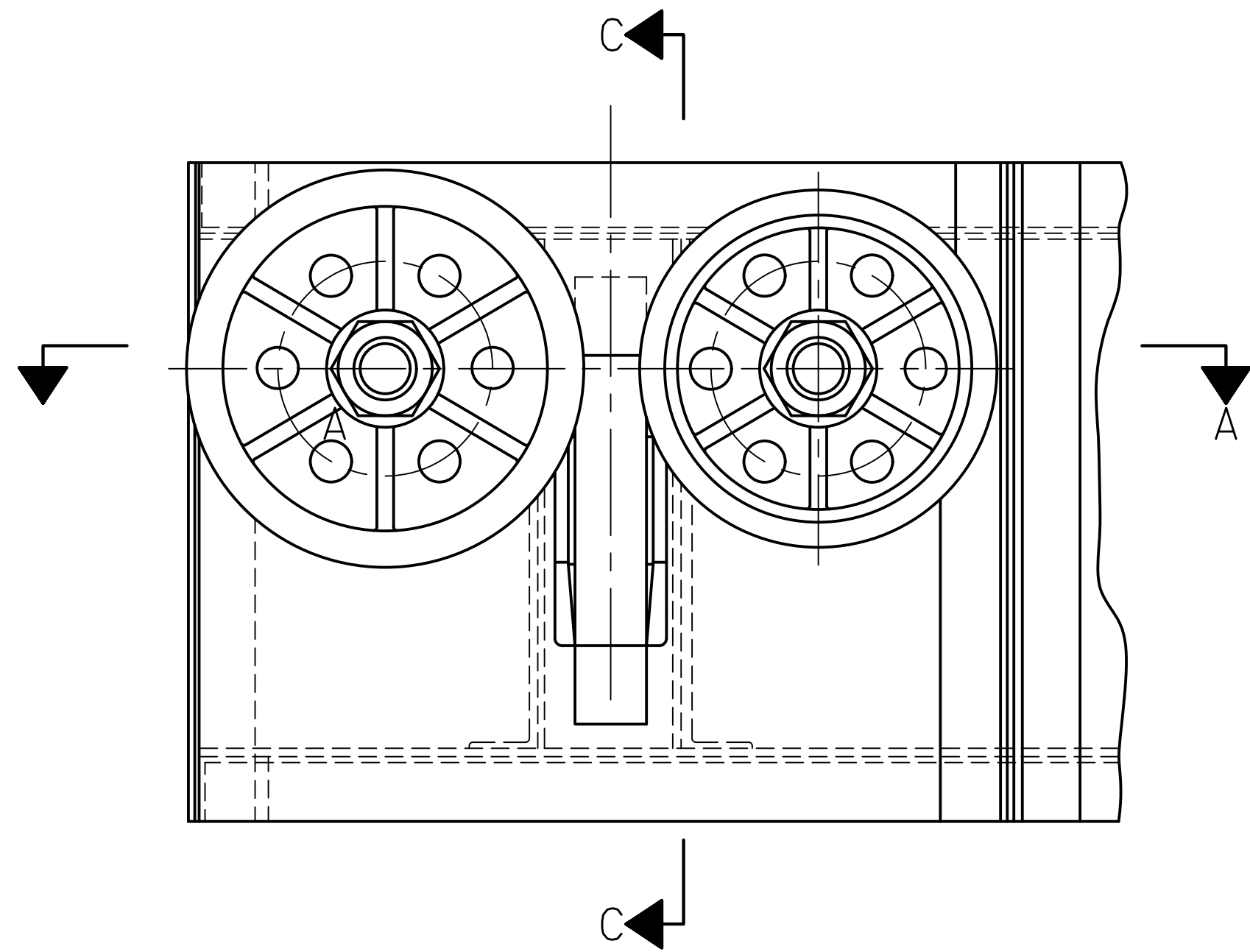
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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AUX. COUNTERWEIGHT  
 ASSEMBLY DETAILS - 6

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1			3			M09
2			4			11

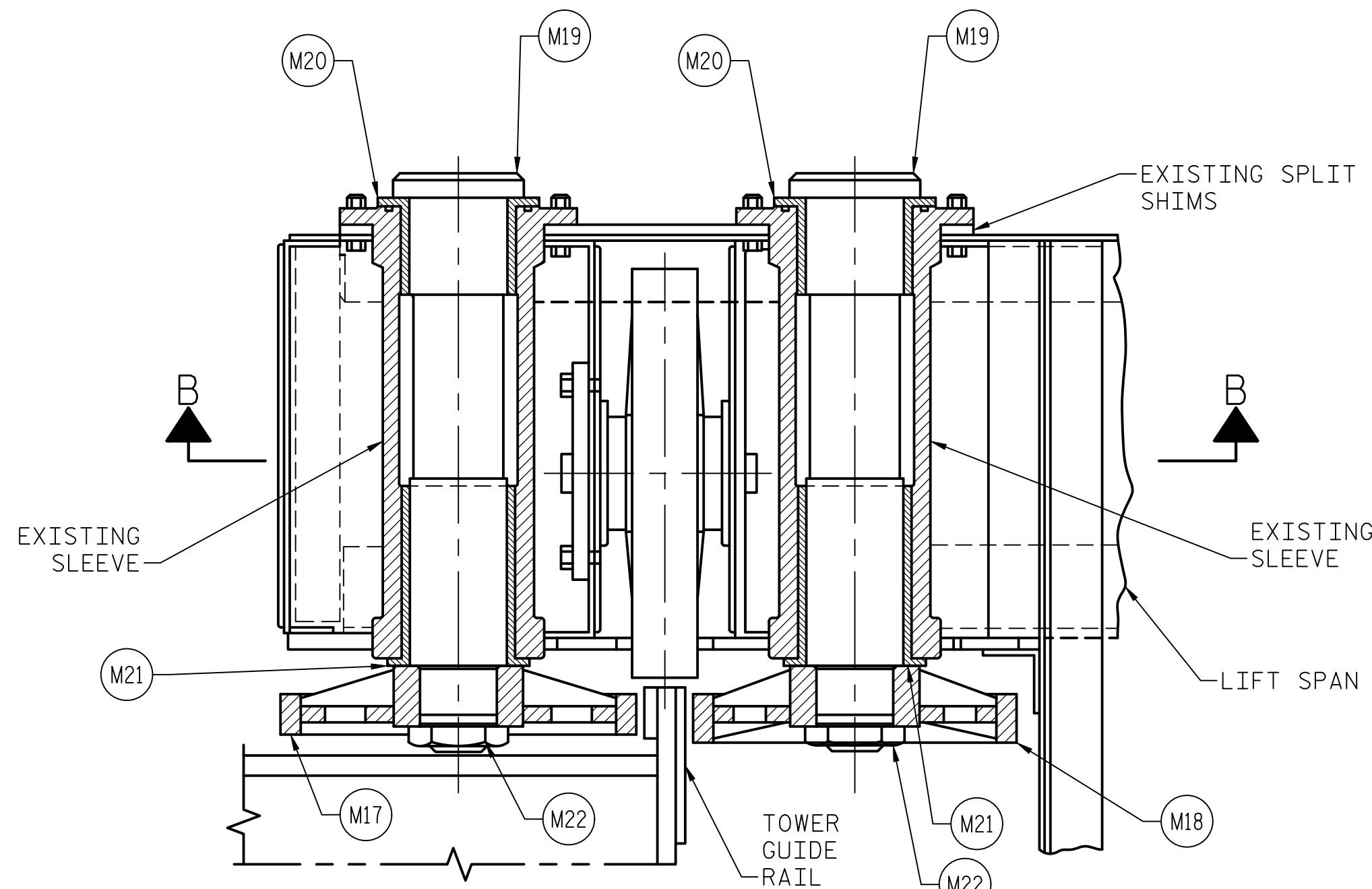
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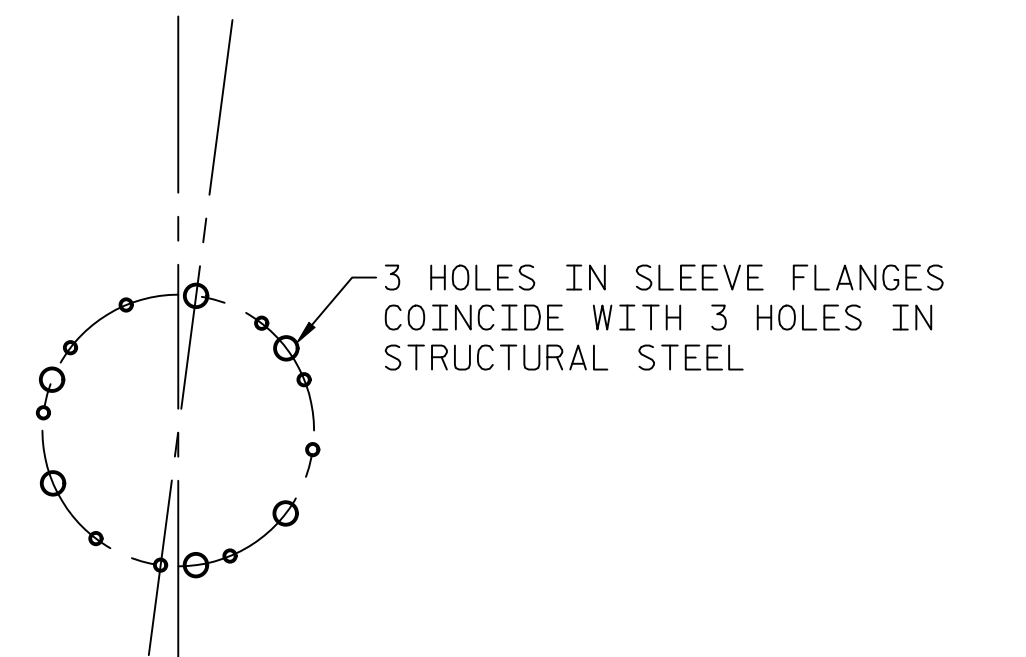
**LOWER GUIDE ROLLERS FIXED END**

SCALE: 1 1/2"=1'-0"  
SOUTHEAST CORNER SHOWN, LOOKING EAST



**SECTION A-A**

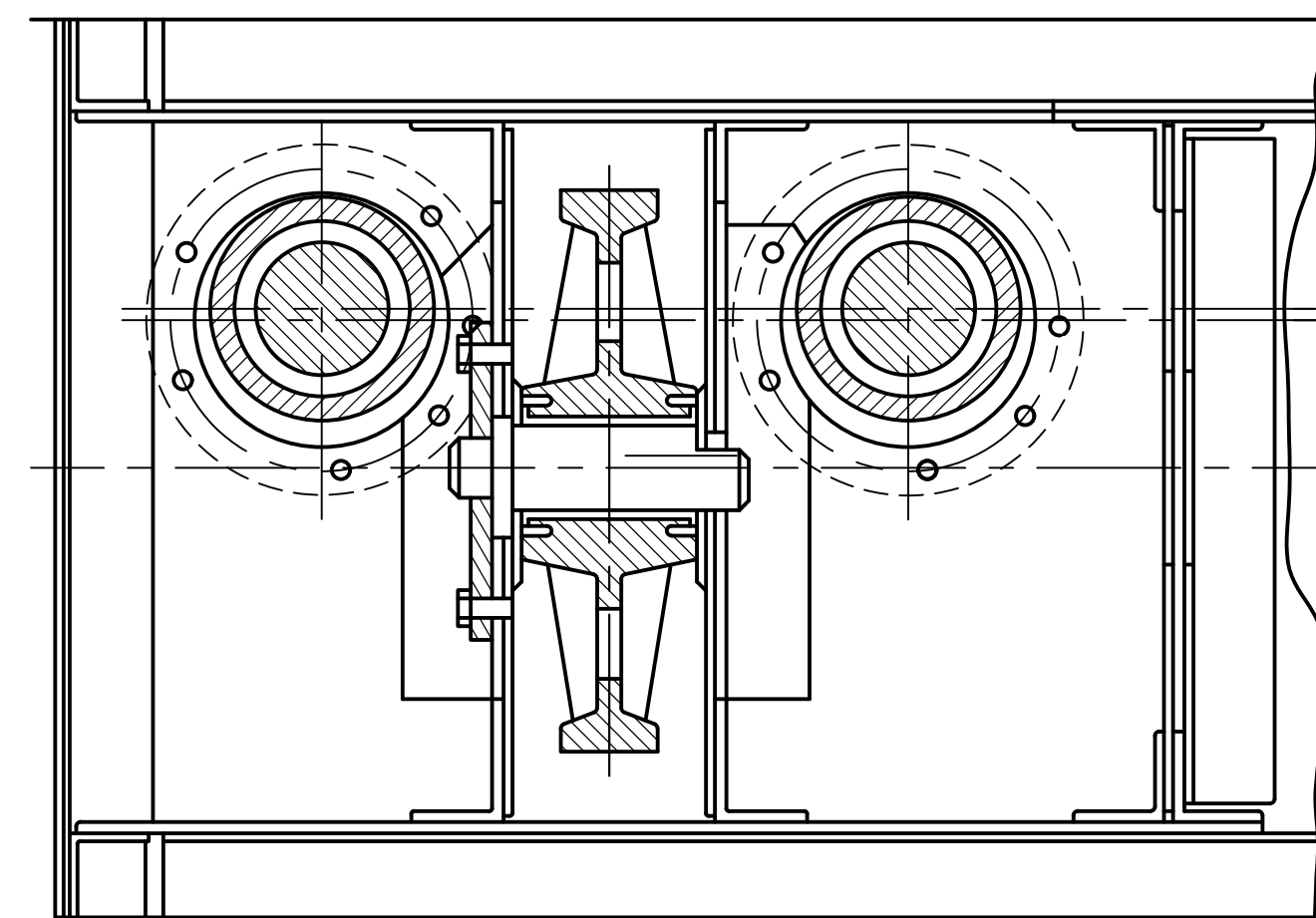
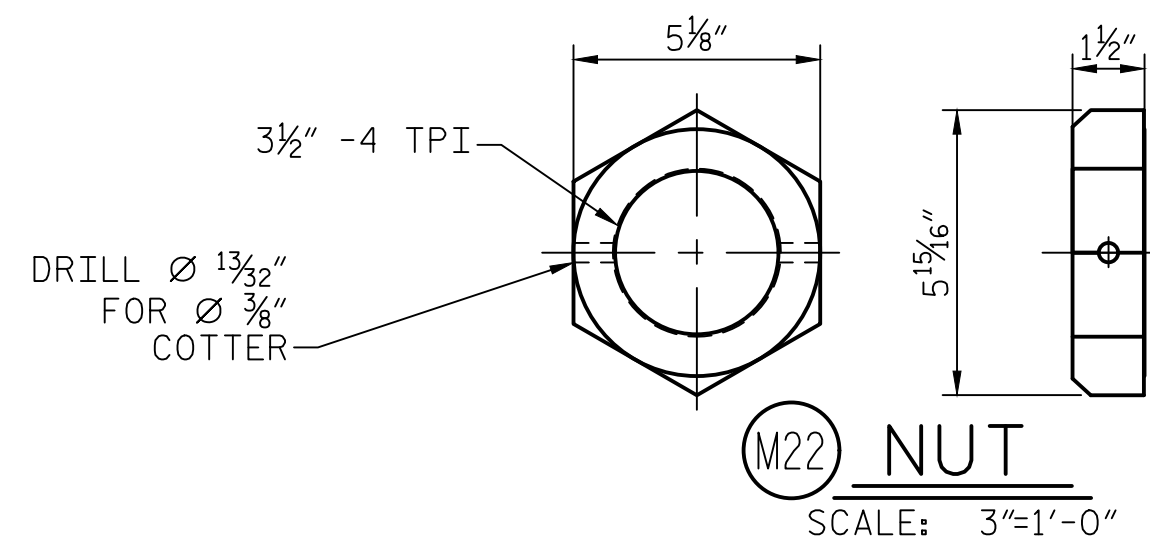
SCALE: 1 1/2"=1'-0"



**HOLE SPACING FOR ECCENTRIC ADJUSTMENT**

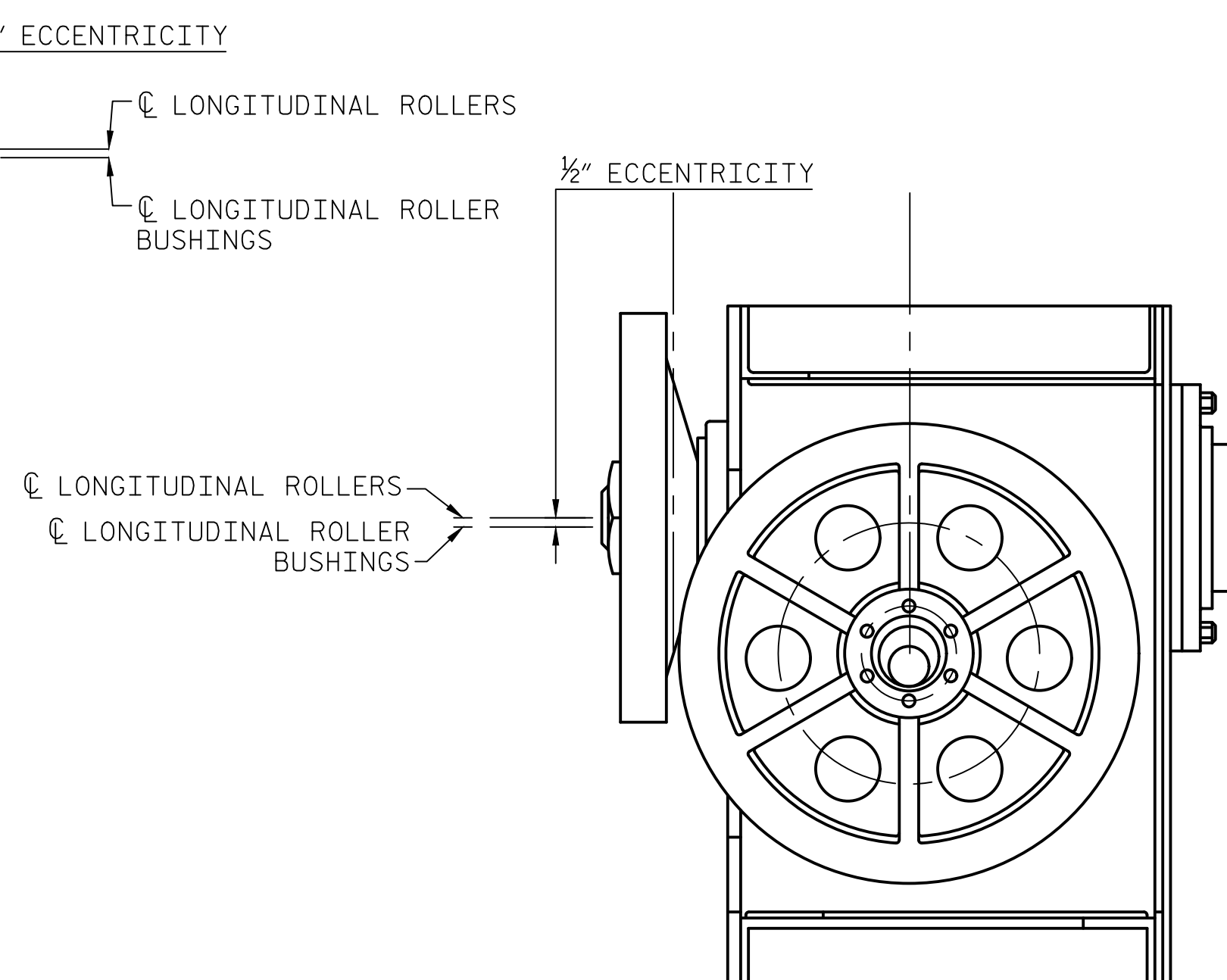
SCALE: 1 1/2"=1'-0"

- REPLACE ALL ECCENTRIC CONNECTION BOLTS IN KIND.  
(12) 3/4" TURNED BOLTS TOTAL  
- 2 TURNED TAP BOLTS WITH LOCK WASHERS  
- 2 TURNED BOLTS WITH LOCK WASHER AND NUT, 3 3/4" LG.  
- 8 TURNED BOLTS WITH LOCK WASHER AND NUT, 3 3/4" LG.



**SECTION B-B**

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



**SECTION C-C**

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

**BILL OF MATERIALS**

ITEM NO.	QTY.	DESCRIPTION	MATERIAL/MANUFACTURER
M17	2	NEW 22" OD LONGITUDINAL ROLLER	STEEL, ASTM A668, CL D*
M18	2	NEW 20" OD LONGITUDINAL ROLLER	STEEL, ASTM A668, CL D*
M19	4	NEW LONGITUDINAL ROLLER SHAFT	STEEL, ASTM A291, CLASS 3 OR ASTM A311 GR. 4140, COLD DRAWN
M20	4	NEW OUTBOARD LONGITUDINAL ROLLER BUSHING	BRONZE, ASTM B22 ALLOY C91100
M21	4	NEW INBOARD LONGITUDINAL ROLLER BUSHING	BRONZE, ASTM B22 ALLOY C91100
M22	4	NEW NUT WITH SS COTTER PIN	STEEL, ASTM A563, GR. 18-8 COTTER

\* NOTE: THE ROLLERS MAY BE MACHINED FROM SOLID, A FABRICATED WELDMENT, OR A CASTING.

**NOTES:**

- CONTRACTOR SHALL SUBMIT DETAILED PROCEDURE FOR REPLACEMENT OF THE LONGITUDINAL SPAN GUIDE ROLLER ASSEMBLIES.
- CONTRACTOR TO PROVIDE TEMPORARY SPAN GUIDES TO MAINTAIN BRIDGE OPERATIONS DURING FINAL MACHINING.

PROJECT NO. 15B.13.29  
NEW HANOVER COUNTY  
BRIDGE NO: 13

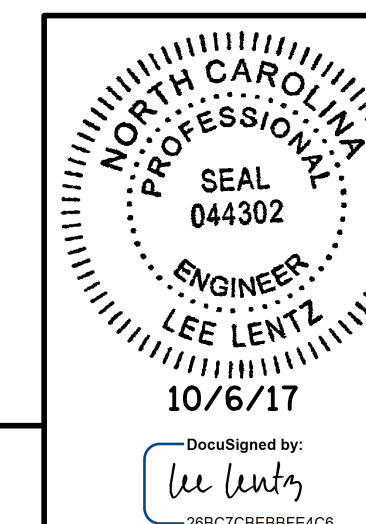
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DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
DRAWN BY: J. M. SHOUP DATE: 08/17/17  
CHECKED BY: L. R. LENTZ DATE: 08/17/17  
DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 08/17/17



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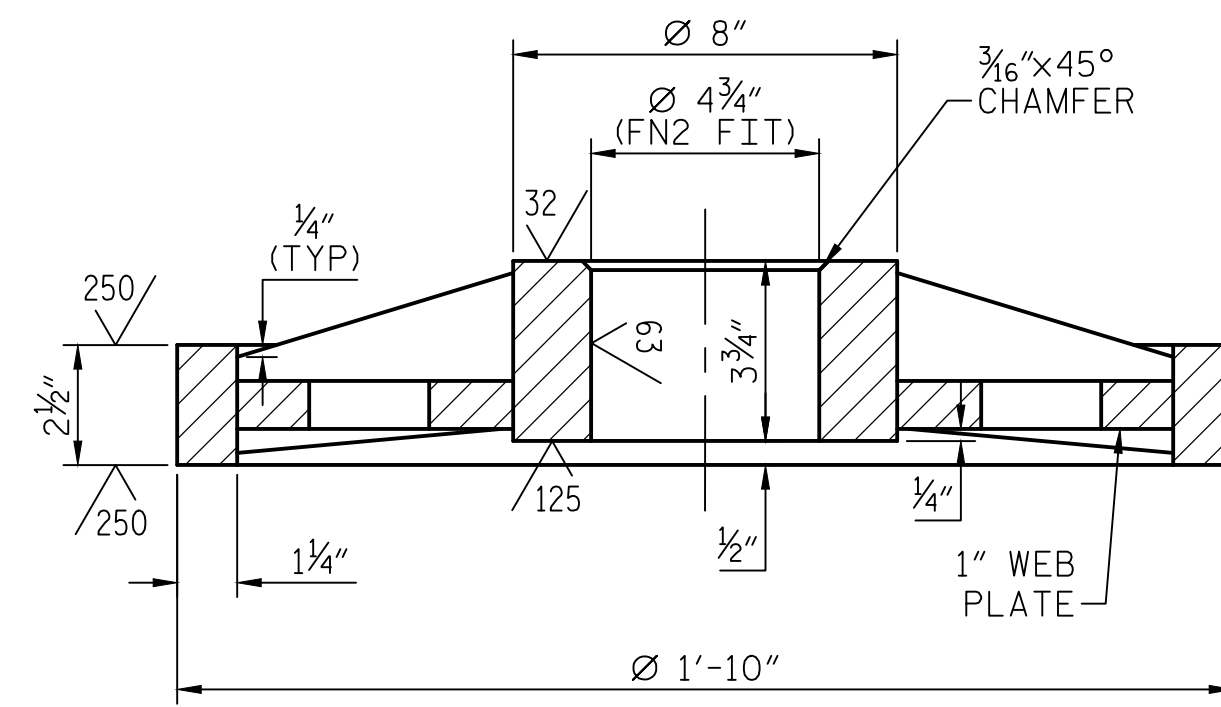
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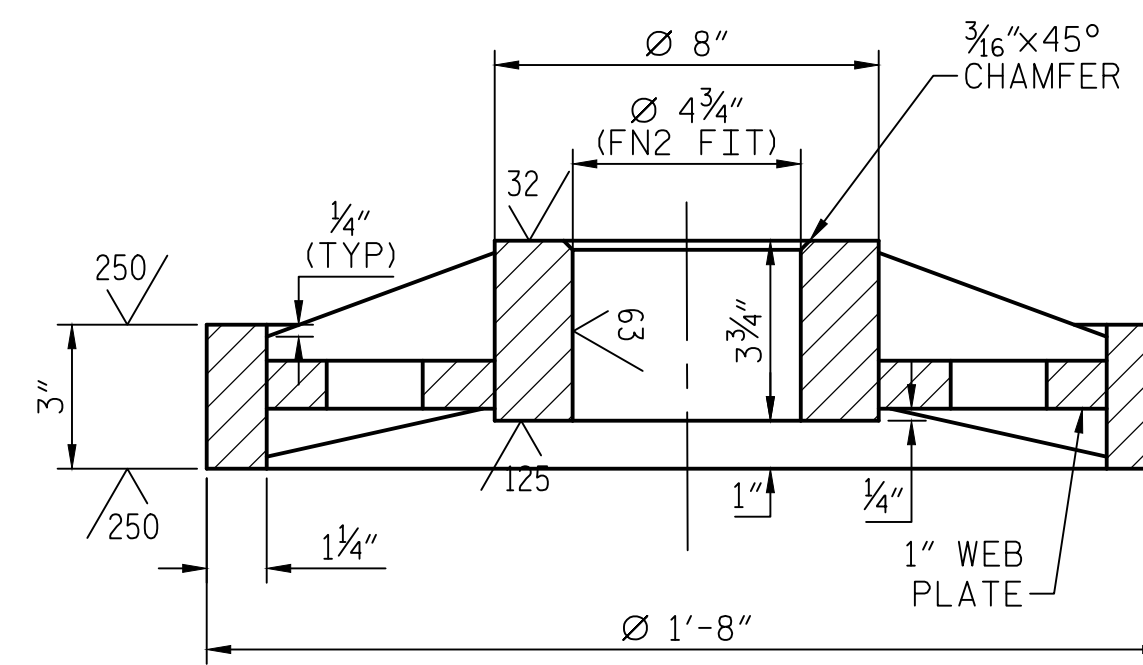
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**SPAN GUIDE ASSEMBLY**

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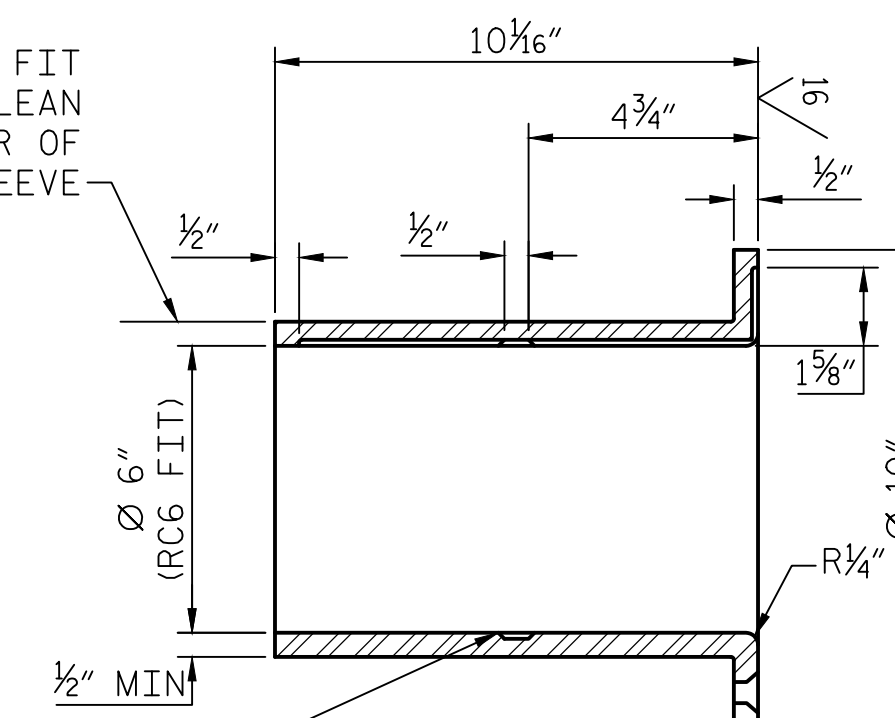


**M17** SECTION A-A  
SCALE: 3"=1'-0"



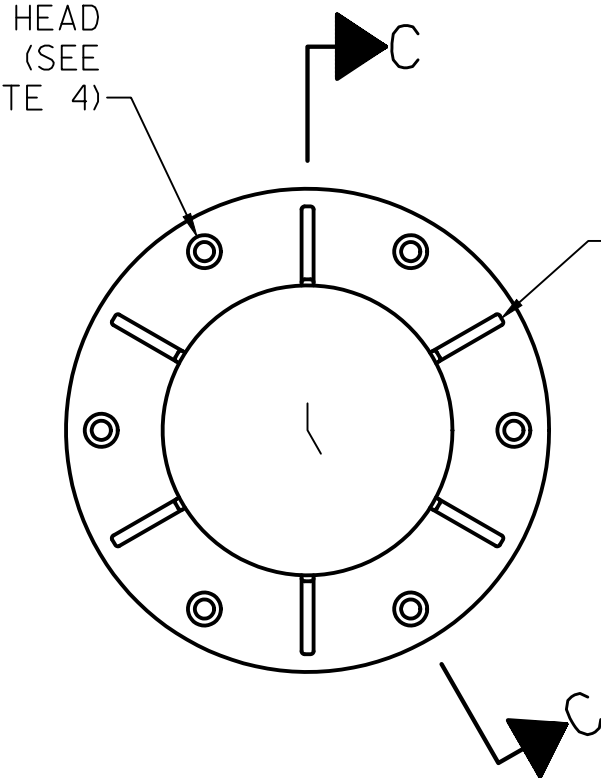
**M18** SECTION B-B  
SCALE: 3"=1'-0"

PROVIDE FN2 FIT WITH FIRST CLEAN DIAMETER OF EXISTING SLEEVE



**M21** SECTION C-C  
SCALE: 3"=1'-0"

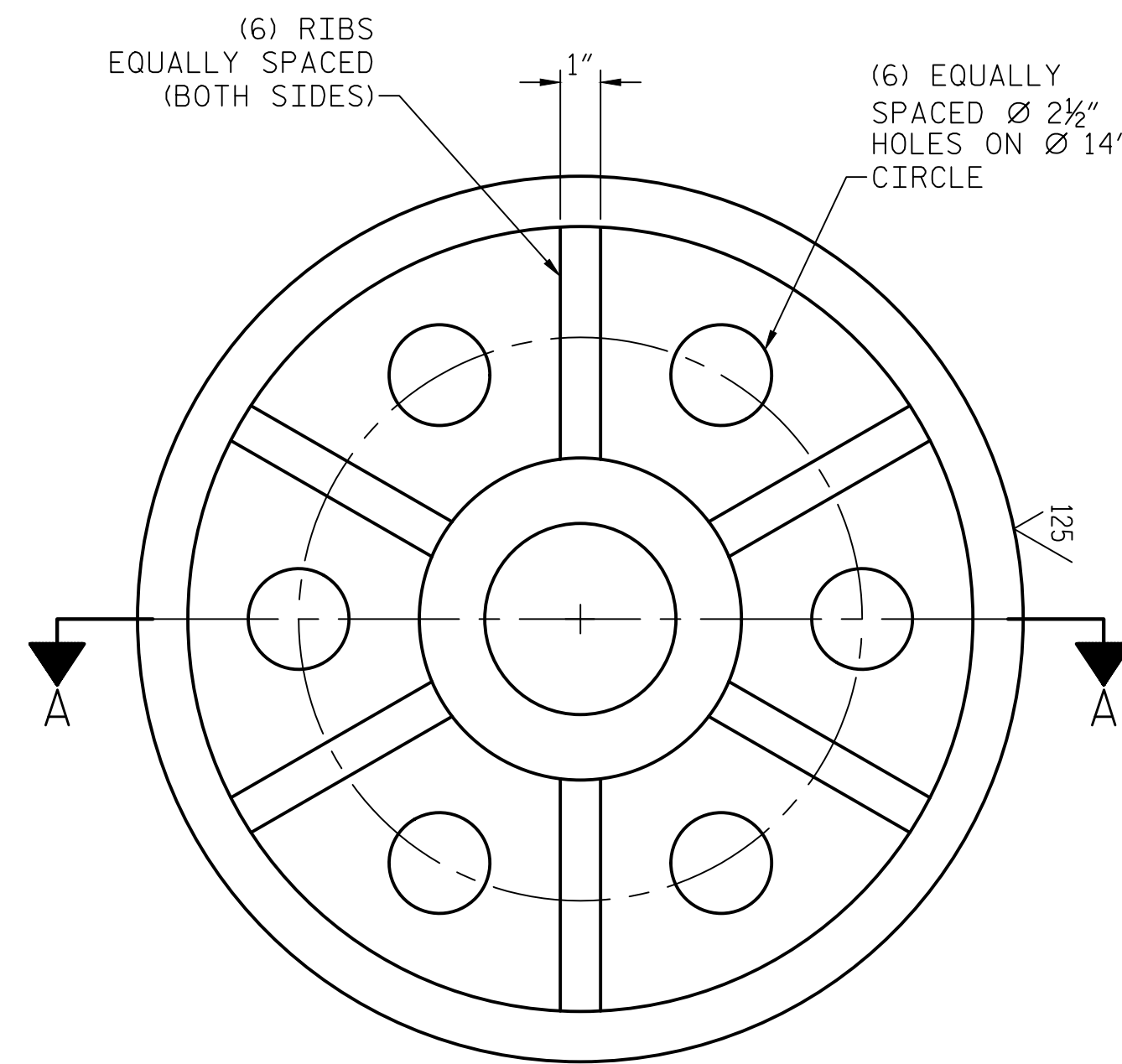
DRILL TO MATCH HOLES FOR (6) 3/16" BRONZE FLAT HEAD CAP SCREWS (SEE NOTE 4)



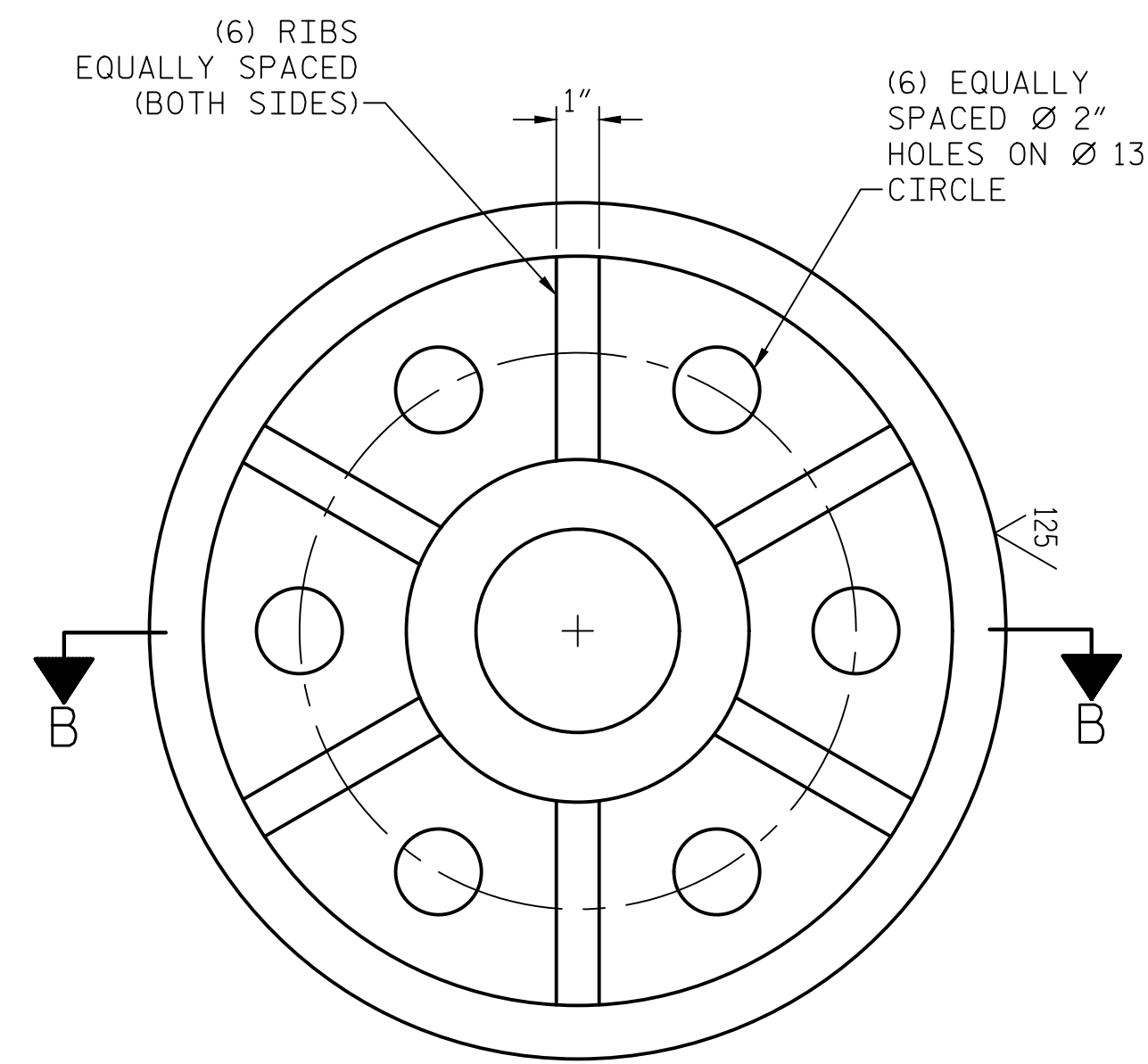
AXIAL GREASE GROOVE EXTENDED TO THRUST FACE, 1/2" x 1/8" DEEP (ROUND EDGES TO 1/16" RADIUS) AT 60° SPACING

ANNULAR GREASE PASSAGE 1/8" DEEP AND 1/2" WIDE WITH ROUND EDGES TO 1/16" RADIUS

**M21** INBOARD LONGITUDINAL ROLLER BUSHING  
SCALE: 3"=1'-0"

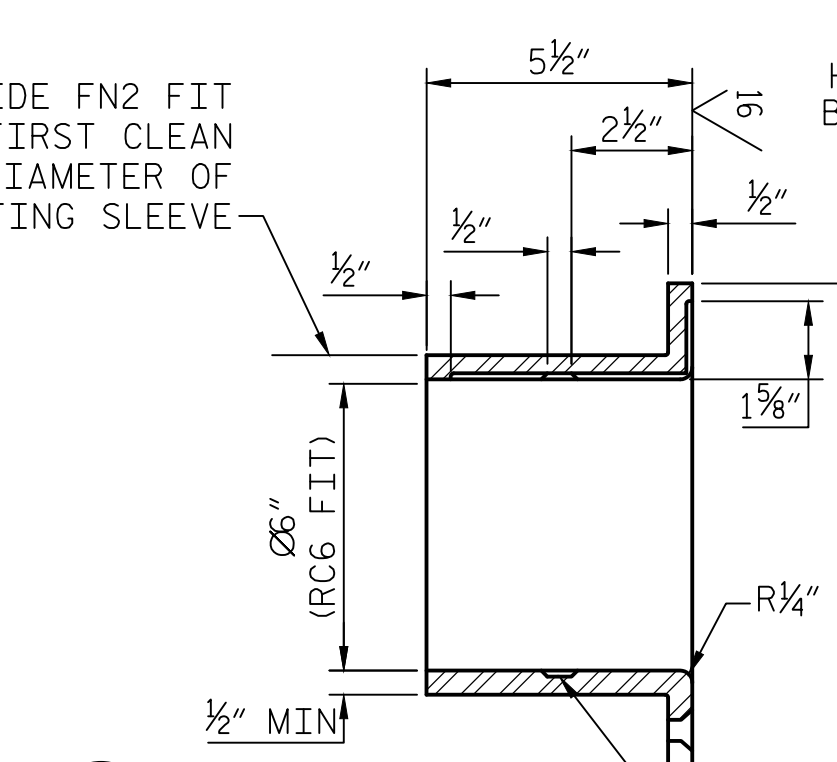


**M17** 22" O.D. LONGITUDINAL ROLLER  
SCALE: 3"=1'-0"



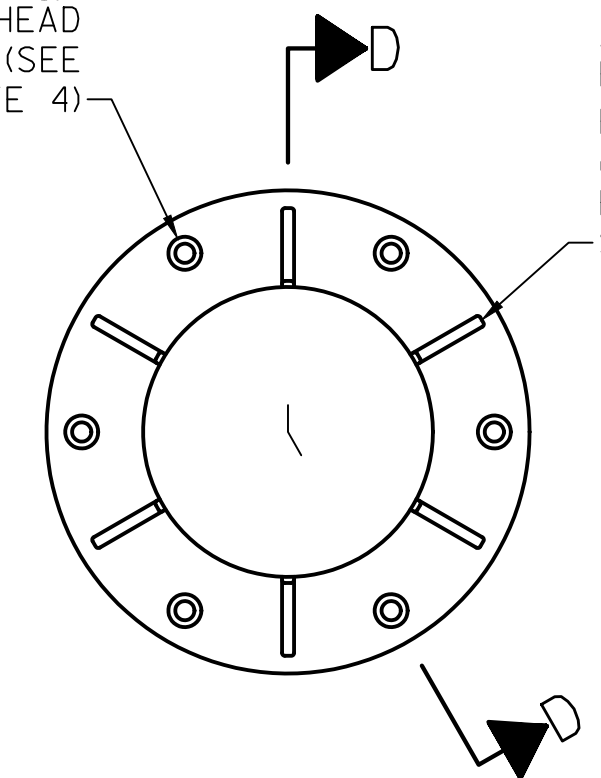
**M18** 20" O.D. LONGITUDINAL ROLLER  
SCALE: 3"=1'-0"

PROVIDE FN2 FIT WITH FIRST CLEAN DIAMETER OF EXISTING SLEEVE



**M20** SECTION D-D  
SCALE: 3"=1'-0"

DRILL TO MATCH HOLES FOR (6) 3/16" BRONZE FLAT HEAD CAP SCREWS (SEE NOTE 4)

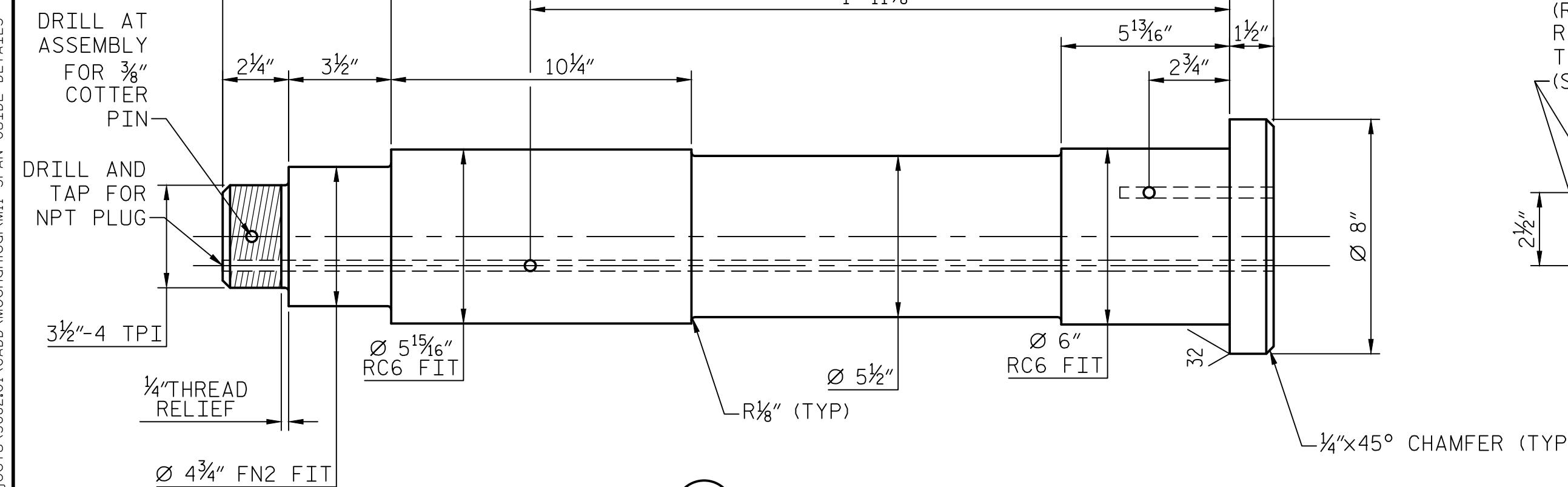


AXIAL GREASE GROOVE EXTENDED TO THRUST FACE, 1/2" x 1/8" DEEP (ROUND EDGES TO 1/16" RADIUS) AT 60° SPACING

ANNULAR GREASE PASSAGE 1/8" DEEP AND 1/2" WIDE, ROUND EDGES TO 1/16" RADIUS

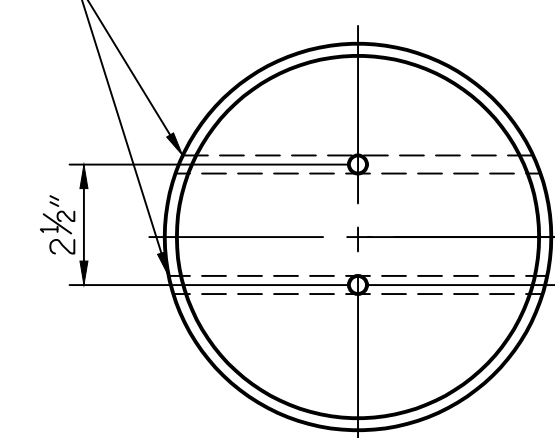
**M20** OUTBOARD LONGITUDINAL ROLLER BUSHING  
SCALE: 3"=1'-0"

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**M19** LONGITUDINAL ROLLER SHAFT  
SCALE: 3"=1'-0"

Ø 3/8" DRILL THROUGH TO INTERSECT Ø 3/8" AXIAL GREASE PASSAGE (ROUND EDGES TO 1/16" RADIUS). DRILL AND TAP FOR GREASE LINES (SEE NOTE 8)



**NOTES:**

1. ALL DIMENSIONS FOR NEW COMPONENTS MUST BE FIELD VERIFIED FOR PROPER FIT WITH EXISTING COMPONENTS.
2. LONGITUDINAL DRILLED GREASE PASSAGES MAY BE 1/2"Ø IF TAPPED AND ADAPTED FOR GREASE HOSE CONNECTION OR NPT PLUG.
3. SURFACE FINISHES ARE TO BE PER THE SPECIFICATIONS, WITH 8 MICROINCHES FOR SHAFT JOURNALS, 16 MICROINCHES FOR JOURNAL BUSHINGS AND THRUST FACES, AND 63 MICROINCHES FOR BUSHING/BASE CONTACT SURFACES.
4. PROVIDE NEW BRONZE FLAT HEAD CAP SCREWS TO MATCH EXISTING.
5. ALL GREASE GROOVES ARE TO BE PROVIDED WITH A 1/16" RADIUS AT EDGES.
6. ALL COMPONENTS NEW THIS SHEET.
7. CONTRACTOR SHALL INSTALL AND RUN LUBRICATION LINES FROM EACH NEW AND EXISTING SPAN GUIDE ROLLER TO AN ACCESSIBLE LOCATION ON THE LIFT SPAN.
8. LUBRICATION LINES SHALL BE MINIMUM 10,000 PSI BURST PRESSURE WIRE REINFORCED FLEXIBLE HOSE THAT IS EXTENDED TO AN EASILY ACCESSED LOCATION AND ATTACHES TO RIGIDLY MOUNTED GREASE FITTINGS FOR FUTURE MAINTENANCE.

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**NORTH CAROLINA PROFESSIONAL ENGINEER**  
SEAL 044302  
LEE LENTZ  
10/6/17

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SPAN GUIDE DETAILS**

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DESIGNED BY:	E. A. SAMPLE	DATE:	08/17/17
DRAWN BY:	J. M. SHOUP	DATE:	08/17/17
CHECKED BY:	L. R. LENTZ	DATE:	08/17/17
DESIGN ENGINEER OF RECORD:	L. R. LENTZ	DATE:	08/17/17

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