



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

JAMES H. TROGDON, III  
SECRETARY

January 30, 2018

**Addendum No. 1**

RE: Contract # C204119

WBS # 15BPR.15

STATE FUNDED

**New Hanover County (15BPR.15)**

Bridge #13 Over NE Cape Fear River On US-76/421

**February 20, 2018 Letting**

To Whom It May Concern:

**The Contractor's attention is directed to the fact that a MANDATORY PRE-BID CONFERENCE has been established for this project on Tuesday February 6<sup>th</sup> @ 1:00 PM and attendance at the pre-bid conference is a condition of pre-qualifying to bid on this project. Location:**

**NCDOT Division 3 Traffic Services Conference Room**

**5504 Barbados Blvd.**

**Castle Hayne, NC 28429**

**Contact: Mr. Kevin Bowen 910-341-2000**

**An optional site visit for all interested contractors has been scheduled to take place following the Mandatory Pre-bid Conference. Details about the optional site visit will be discussed at the pre-bid. PPE including safety boots and vests will be required for the site visit.**

Reference is made to the plans and proposal form furnished to you on this project.

The following revisions have been made to the plans:

Sheet No.	Revisions
TMP-3	Revised to add Step 2 concerning the additional mechanical work mentioned below
S-2	Revised to add "Mechanical Auxiliary Counterweight and Span Guide Repairs" to the Sheet Index
S-3	Revised to add Note #5 under "Mechanical"

*Mailing Address:*  
NC DEPARTMENT OF TRANSPORTATION  
CONTRACT STANDARDS AND DEVELOPMENT  
1591 MAIL SERVICE CENTER  
RALEIGH, NC 27699-1591

*Telephone:* (919) 707-6900  
*Fax:* (919) 250-4127  
*Customer Service:* 1-877-368-4968

*Location:*  
1020 BIRCH RIDGE DR.  
RALEIGH, NC 27610

*Website:* www.ncdot.gov

Sheet No.	Revisions
S-4	Revised to add the below noted pay item to the "Total Bill of Material" and to add two notes concerning same
M01	Added Note 1 in upper right hand corner concerning additional mechanical scope
MA-1 thru MA-10	New sheets added to include details for the "Mechanical Auxiliary Counterweight and Span Guide Repairs"

Please void the above listed sheets in your plans and staple the revised sheets thereto. Please add New Sheet Nos MA-1 thru MA-10 after existing Sheet E8.1.

The following revisions have been made to the proposal:

Page No.	Revisions
Proposal Cover	Note added that reads "Includes Addendum No. 1 Dated January 30, 2018".
Table of Contents	Revised to add the project special provisions entitled "Intermediate Contract Time Number 5 and Liquidated Damages" and "Mandatory Pre-Bid Conference (Prequalifying To Bid)"
G-1	Revised the date of availability within the project special provision entitled "Contract Time and Liquidated Damages" and added some language under the "Day and Time Restrictions" within "Intermediate Contract Time Number 1 and Liquidated Damages"
G-3	Revised to add some language under the "Day and Time Restrictions" within "Intermediate Contract Time Number 2 and Liquidated Damages"
G-4	Added New "Intermediate Contract Time Number 5 and Liquidated Damages" and revised the percentages within the project special provision entitled "Schedule of Estimated Completion Progress" (Now on Page G-5)
G-20 and New G-21	Revised to add the project special provision entitled "Mandatory Pre-Bid Conference (Prequalifying To Bid)"
BP-1	Revised to reflect the addition of the new project special provision for "Auxiliary Counterweight and Span Guide Repairs (Special)".
BP-106 thru BP-119	Revised to add the project special provision for "Auxiliary Counterweight and Span Guide Repairs (Special)". The subsequent pages beginning with BP-120 have been renumbered. No other changes were made other than the page numbering.

Please void the Proposal Cover, Table Of Contents, G-1, G-3, G-4, G-20 and BP-1 in your proposal and staple the revised pages thereto. Staple New Page G-21 after revised G-20. Staple New BP-106 thru BP-119 after existing BP-105.

On the item sheets the following new pay item has been added:


<u>Item</u>	<u>Description</u>	<u>Old Quantity</u>	<u>New Quantity</u>
042-8860000000-N- SP	Auxiliary Counterweight and Span Guide Repairs	NEW ITEM	Lump Sum

The Contractor's bid must include the new pay item.

The Expedite File has been updated to reflect this revision. Please download the Expedite Addendum File and follow the instructions for applying the addendum. Bid Express will not accept your bid unless the addendum has been applied.

The contract will be prepared accordingly.

Sincerely,

DocuSigned by:  
  
 F81B6038A47A442...  
 Ronald. E. Davenport, Jr., PE  
 State Contract Officer

RED/jag  
 Attachments

cc: Mr. Lamar Sylvester, PE  
 Ms. Karen Collette, PE  
 Mr. Chris Werner, PE  
 Mr. Jon Weathersbee, PE  
 Mr. Ken Kennedy, PE  
 Mr. Mitchell Dixon  
 Project File (2)

Mr. Ray Arnold, PE  
 Ms. Theresa Canales, PE  
 Mr. Mike Gwyn  
 Ms. Lori Strickland  
 Ms. Jaci Kincaid  
 Ms. Penny Higgins

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH, N.C.

PROPOSAL

**INCLUDES ADDENDUM No. 1 DATED 01-30-2018**

DATE AND TIME OF BID OPENING: **FEBRUARY 20, 2018 AT 2:00 PM**

CONTRACT ID      C204119  
WBS                15BPR.15

FEDERAL-AID NO. STATE FUNDED  
COUNTY            NEW HANOVER  
T.I.P. NO.  
MILES                0.575  
ROUTE NO.         US 76  
LOCATION             BRIDGE #13 OVER NE CAPE FEAR RIVER ON US-76/421.

TYPE OF WORK    BRIDGE PRESERVATION.

**NOTICE:**

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS \$30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

**BIDS WILL BE RECEIVED AS SHOWN BELOW:**

**THIS IS A STRUCTURE PROPOSAL**

**5% BID BOND OR BID DEPOSIT REQUIRED**

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**PROJECT SPECIAL PROVISIONS****GENERAL****CONTRACT TIME AND LIQUIDATED DAMAGES:**

(7-1-95) (Rev. 12-18-07)

108

SP1 G10 A

The date of availability for this contract is **April 2, 2018**.

The completion date for this contract is **April 17, 2019**.

Except where otherwise provided by the contract, observation periods required by the contract will not be a part of the work to be completed by the completion date and/or intermediate contract times stated in the contract. The acceptable completion of the observation periods that extend beyond the final completion date shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Two Thousand Dollars (\$ 2,000.00)** per calendar day.

**INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SP1 G14 A

The Contractor shall complete the required work of installing, maintaining, and removing the traffic control devices for lane closures and restoring traffic to the existing traffic pattern. The Contractor shall not close or narrow a lane of traffic on **any road** during the following time restrictions:

**DAY AND TIME RESTRICTIONS****After the Week of Labor Day until Easter****Monday through Friday, 5:00 AM to 9:00 AM****Monday through Friday, 3:00 PM to 7:00 PM****Saturday & Sunday, 5:00 AM to 7:00 PM****Easter until the Week of Labor Day****Monday through Sunday, 5:00 AM to 7:00 PM****During Step #2 Only (See Intermediate Contract Time No. 5)****Monday through Thursday, 5:00 AM to 9:00 PM****Friday at 5:00 AM to Sunday at 9:00 PM**

In addition, the Contractor shall not close or narrow a lane of traffic on **any road**, detain and/or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

The liquidated damages are **One Thousand Two Hundred Fifty Dollars (\$ 1,250.00)** per fifteen (15) minute time period.

**INTERMEDIATE CONTRACT TIME NUMBER 2 AND LIQUIDATED DAMAGES:**

(2-20-07)

108

SP1 G14 D

The Contractor shall complete the required work of installing, maintaining and removing the traffic control devices for road closures and restoring traffic to the existing traffic pattern. The Contractor shall not close **any road** during the following time restrictions:

**DAY AND TIME RESTRICTIONS**

**After the Week of Labor Day unit Easter**

**Monday through Thursday, 5:00 AM to 9:00 PM**

**Friday 5:00 AM to Sunday 9:00 PM**

**Easter to the Week of Labor Day**

**No Road Closures Allowed**

**During Step #2 Only (See Intermediate Contract Time No. 5)**

**Monday through Thursday, 5:00 AM to 9:00 PM**

**Friday at 5:00 AM to Sunday at 9:00 PM**

The time of availability for this intermediate contract time will be the time the Contractor begins to install traffic control devices required for road closures according to the time restrictions stated herein.

The completion time for this intermediate contract time will be the time the Contractor is required to complete the removal of traffic control devices required for the road closures according to the time restrictions stated herein and restore traffic to the existing traffic pattern.

**The Day and Time Restrictions contained in this intermediate contract time will apply to Intermediate Contract Time No. 3.**

The liquidated damages are **Two Thousand Five Hundred Dollars (\$ 2,500.00)** per fifteen (15) minute time period.

**INTERMEDIATE CONTRACT TIME NUMBER 3 AND LIQUIDATED DAMAGES:**

(2-20-07) (Rev. 6-18-13)

108

SP1 G14 H

The Contractor shall complete the work which requires **road closure(s) not associated with the two-week bridge closure described in Intermediate Contract Time No. 4** and shall place and maintain traffic on same.

The date of availability for this intermediate contract time will be the **first night** the Contractor begins to **install traffic control devices required for road closures according to the time restrictions stated in Intermediate Contract Time No. 2.**

The completion date for this intermediate contract time is the date which is **forty-two (42)** consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages are **One Thousand Dollars (\$ 1,000.00)** per calendar day. **The liquidated damages described in Intermediate Contract Time No. 2 will not apply to the number of consecutive days required to complete this intermediate contract time.**

**INTERMEDIATE CONTRACT TIME NUMBER 4 AND LIQUIDATED DAMAGES:**

(2-20-07) (Rev. 6-18-13)

108

SP1 G14 H

The Contractor shall complete the work which requires **closing both directions of the Memorial Bridge** as shown on Sheet **TMP-3** and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is **the date that the Contractor elects to begin work, but no sooner than September 10, 2018 and no later than April 3, 2019.**

The completion date for this intermediate contract time is the date which is **fourteen (14)** consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages are **Ten Thousand Dollars (\$ 10,000.00)** per calendar day.

**INTERMEDIATE CONTRACT TIME NUMBER 5 AND LIQUIDATED DAMAGES:**

(6-18-13)

108

SP1 G14 L

The Contractor shall complete the work required of **Step #2** as shown on Sheet **TMP-3** and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is **the date the Contractor completes Step #1.**

The completion date for this intermediate contract time is **June 22, 2018.**

The liquidated damages are **Five Hundred Dollars (\$ 500.00)** per calendar day.

**MAJOR CONTRACT ITEMS:**

(2-19-02)

104

SP1 G28

The following listed items are the major contract items for this contract (see Article 104-5 of the *2018 Standard Specifications*):

Line #	Description
31	— PPC Materials
38	— Placing & Finishing PPC Overlay

**NO SPECIALTY ITEMS:**

(7-1-95)

108-6

SP1 G34

None of the items included in this contract will be specialty items (see Article 108-6 of the *2018 Standard Specifications*).



**SCHEDULE OF ESTIMATED COMPLETION PROGRESS:**

(7-15-08) (Rev. 5-16-17)

108-2

SP1 G58

The Contractor's attention is directed to the Standard Special Provision entitled *Availability of Funds Termination of Contracts* included elsewhere in this proposal. The Department of Transportation's schedule of estimated completion progress for this project as required by that Standard Special Provision is as follows:

<b><u>Fiscal Year</u></b>	<b><u>Progress (% of Dollar Value)</u></b>
2018	(7/01/17 - 6/30/18) 34% of Total Amount Bid
2019	(7/01/18 - 6/30/19) 66% of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the *2018 Standard Specifications*. Any acceleration of the progress as shown by the Contractor's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

**MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE:**

(10-16-07)(Rev. 1-17-17)

102-15(J)

SP1 G66

**Description**

The purpose of this Special Provision is to carry out the North Carolina Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts financed in whole or in part with State funds.

**Definitions**

*Additional MBE/WBE Subcontractors* - Any MBE/WBE submitted at the time of bid that will not be used to meet either the MBE or WBE goal. No submittal of a Letter of Intent is required, unless the additional participation is used for banking purposes.

*Committed MBE/WBE Subcontractor* - Any MBE/WBE submitted at the time of bid that is being used to meet either the MBE or WBE goal by submission of a Letter of Intent. Or any MBE or WBE used as a replacement for a previously committed MBE or WBE firm.

*Contract Goals Requirement* - The approved MBE and WBE participation at time of award, but not greater than the advertised contract goals for each.

*Goal Confirmation Letter* - Written documentation from the Department to the bidder confirming the Contractor's approved, committed MBE and WBE participation along with a listing of the committed MBE and WBE firms.

*Manufacturer* - A firm that operates or maintains a factory or establishment that produces on the premises, the materials or supplies obtained by the Contractor.

*MBE Goal* - A portion of the total contract, expressed as a percentage, that is to be performed by committed MBE subcontractor(s).

**Page 1-39, Article 104-10 Maintenance of the Project, lines 42-44,** replace the last sentence of the last paragraph with the following:

The Contractor will not be directly compensated for any maintenance operations necessary, except for maintenance of guardrail/guiderail, as this work will be considered incidental to the work covered by the various contract items. The provisions of Article 104-7, Extra Work, and Article 104-8, Compensation and Record Keeping will apply to authorized maintenance of guardrail/guiderail. Performance of weekly inspections of guardrail/guiderail, and the damage reports required as described above, will be considered to be an incidental part of the work being paid for by the various contract items.

**COOPERATION BETWEEN CONTRACTORS:**

(7-1-95)

105-7

SP1 G133

The Contractor's attention is directed to Article 105-7 of the *2018 Standard Specifications*.

16-16066-01A (NCDOT Roadway Lighting Construction) is currently under construction and is located within the project limits.

2018CPT.03.04.10101, etc. (C204135) is anticipated to be let on February 20, 2018 and is located adjacent to this project.

The Contractor on this project shall cooperate with the Contractor working within or adjacent to the limits of this project to the extent that the work can be carried out to the best advantage of all concerned.

**OUTSOURCING OUTSIDE THE USA:**

(9-21-04) (Rev. 5-16-06)

SP1 G150

All work on consultant contracts, services contracts, and construction contracts shall be performed in the United States of America. No work shall be outsourced outside of the United States of America.

*Outsourcing* for the purpose of this provision is defined as the practice of subcontracting labor, work, services, staffing, or personnel to entities located outside of the United States.

The North Carolina Secretary of Transportation shall approve exceptions to this provision in writing.

**MANDATORY PRE-BID CONFERENCE (Prequalifying To Bid):**

(7-18-06) (Rev. 3-25-13)

SP1 1-14

In order for all prospective bidders to have an extensive knowledge of the project, all prospective bidders shall attend a mandatory pre-bid conference on Tuesday, February 6<sup>th</sup> 2018 at 1:00pm at:

NCDOT Division 3 Traffic Services Conference Room  
5504 Barbados Blvd.  
Castle Hayne, NC 28429  
Contact: Kevin Bowen 910-341-2000

The bidders may also attend a voluntary site visit immediately following the pre-bid conference. A van will be provided to shuttle bidders to the site. Other specifics of the site visit will be discussed at the mandatory pre-bid conference. Closed toed shoes and a reflective safety vest will be required of all participants to visit the site.

The pre-bid conference will include a thorough discussion of the plans, contract pay items, special provisions, etc.

Only bidders who have attended and properly registered at the above scheduled pre-bid conference and who have met all other prequalification requirements will be considered prequalified to bid on this project. A bid received from a bidder who has not attended and properly registered at the above scheduled pre-bid conference will not be accepted and considered for award.

Attendance at the pre-bid conference will not meet the requirements of proper registration unless the individual attending has registered at the pre-bid conference in accordance with the following:

- (A) The individual has signed his name on the official roster no later than 30 minutes after the above noted time for the beginning of the conference.
- (B) The individual has written in the name and address of the company he or she represents.
- (C) Only one company has been shown as being represented by the individual attending.
- (D) The individual attending is an officer or permanent employee of the company they are representing.

Attendance at any prior pre-bid conference will not meet the requirement of this provision.

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**MECHANICAL SPECIAL PROVISIONS****AUXILIARY COUNTERWEIGHT AND SPAN GUIDE REPAIRS**

## PART 1. GENERAL

This specification includes:

1. The removal of existing auxiliary counterweight sheave and hitch shaft assemblies, and auxiliary counterweight ropes. The furnishing, testing, and installation of the select mechanical components for the auxiliary counterweight system including rehabilitated sheave and hitch shaft assemblies and new auxiliary counterweight wire ropes.
2. The removal of the existing longitudinal span guide assemblies. The furnishing, testing, and installing of new longitudinal span guide assemblies.

## 1.1 DESCRIPTION OF WORK

The work shall include removal of existing and furnishing, rehabilitating, manufacture, fabrication, testing, erection, installation, lubricating, and placing into satisfactory service, the auxiliary counterweight sheave assemblies, hitch shaft assemblies, auxiliary counterweight wire rope, and longitudinal span guide assemblies in an approved manner as provided herein. The Contractor shall provide all apparatus, tools, devices, materials and labor necessary to complete the above work. The Contractor shall thoroughly clean all existing associated components to be used. The cleaned/rehabilitated existing components shall be installed on new assemblies that include new shafts, bushings, shims, washers, nuts, pins, and all other associated components necessary to assure proper installation and operation of all new sheave and hitch shaft assemblies, all in accordance with these specifications and contract drawings or as directed by the NCDOT. The jacking, installation, and adjustment shall be by millwrights experienced in this class of work. The Contractor shall maintain the lift span balance throughout the entire Contract.

Items include the following:

- A. For each tower: auxiliary counterweight sheave assemblies, hitch shaft assemblies, ropes, rope sockets, wire rope dressing and all other equipment necessary for proper removal and installation of the assemblies.
- B. For two lower east corners: longitudinal span guide assemblies, temporary longitudinal span guide assemblies, and all other equipment necessary for proper removal and installation of the assemblies.
- C. Shims, bearings, high strength stainless steel pins, bolts, turned bolts, nuts, cotter pins and all other miscellaneous hardware.

## 1.2 REFERENCES

The issue date of references included in these project specifications need not be more current than provided by the latest Change Notice to this specification. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The latest revisions only shall be used for all references.

## AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

Manual of Steel Construction, "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings"

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B 1.1                      Screw Threads

ANSI B 46.1                    Surface Texture

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO Movable Highway Bridge Design Specifications, 2007, 2<sup>nd</sup> Edition (published by the American Association of State Highway and Transportation Officials).

AASHTO Standard Specifications for Movable Highway Bridges, 1988, Including 1992 Revisions (published by the American Association of State Highway and Transportation Officials).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A153                      Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A276                      Stainless Steel Bars

ASTM A 325                      Structural Steel Bolts, Heat Treated

ASTM A 563                      Carbon and Alloy Steel Nuts

ASTM A 668                      Steel Forgings, Carbon and Alloy, for General Industrial Use

ASTM A 1007                     Carbon Steel Wire for Wire Rope

ASTM A 1023                     Stranded Carbon Steel Wire Rope

ASTM B 6                         Zinc (Slab Zinc)

AMERICAN WELDING SOCIETY (AWS)

D1.5                                Structural Welding Code

FEDERAL SPECIFICATIONS (Fed. Spec.)

North Carolina Department of Transportation's Standard Specifications

RR-S-550                         Wire Rope Sockets

1.3      QUALITY ASSURANCE.

1.3.1.   Quality Control

- A.      Inspection. Materials and fabrication procedures are subject to inspection and testing in the mill, shop and field by the NCDOT and/or their Engineering Representative. Such inspections and tests will not relieve the Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
  
- B.      Design of Items and Connections. All details shown on the Contract Drawings are typical and apply to general conditions on the bridge, unless otherwise indicated. All dimensions and details (including auxiliary counterweight rope lengths) shall be verified at the site and submitted to the NCDOT and/or their Engineering Representative before proceeding with any work and to avoid causing subsequent delay in work.

- C. The NCDOT shall be notified immediately for clarification whenever any portion of work is not clearly or accurately defined or dimensioned.
- D. Certified Test Reports. As used herein, certified test reports refer to reports of tests conducted on previously manufactured materials or equipment intended for use on the Cape Fear Vertical Lift Bridge. Tests shall have an accuracy and precision inherent to conventional industrial test instruments and equipment. Certification of truthfulness and accuracy shall be required by an authorized representative of the testing agency
- E. Factory Tests. As used herein, factory tests refer to tests required to be performed on the actual materials or equipment proposed for use prior to shipment to the construction site. Results of the tests shall be submitted in accordance with the provisions of this Contract for laboratory test results. "Factory" tests shall be performed at the manufacturer's plant or supplier's premises, or at a separate, independent accredited test laboratory, if appropriate.
- F. Quality Assurance Testing. The NCDOT or designated Engineering inspectors may select sample materials for quality assurance testing for specification compliance. Testing may be on-site or by an independent laboratory. Test results shall be furnished to the NCDOT for reference, or for other applicable disposition if not in compliance.
- G. Warranty. The Contractor shall remedy defects due to quality of work, erection, materials or design for a period of one year after final tests and acceptance have been made, at his own expense. The Contractor shall furnish a satisfactory guarantee to ensure correction of defects. If necessary, such defects may be corrected by other capable Contractors, as approved by the NCDOT, at the expense of the Contractor.
- H. Contractor Experience

The following lists of Contractor experience shall be submitted to the NCDOT.

- 1. The Contractor shall submit a tabulation of experience in the installation of movable bridge components, specifically for vertical lift bridges. The experience shall specifically show past projects involving vertical lift bridge wire rope change out as well as working in a United States Coast Guard marine outage.
- 2. The on-site supervisory personnel of the mechanical work shall have conducted a minimum of two successful mechanical component rehabilitations on a vertical lift bridge.
- 3. The Contractor shall provide personnel with industrial motor drive control experience, with a minimum experience of two vertical lift bridges.

#### 1.4 SUBMITTALS

##### 1.4.1. General

- A. The Contractor shall submit copies of producer or manufacturer data, e.g. specifications, test results and installation instructions for the following items and materials including (but not excluding other items or materials not specifically mentioned):
  - 1. Mill reports and physical tests of all metals.
  - 2. Pins, bolts, and nuts.

3. Lubricants as endorsed by manufacturers including the wire rope manufacturer.
4. Results of required rope tests presented herein.
5. Paint.
6. Standard stocked items.

B. Manufactured Items

1. The Contractor shall submit shop drawings to the NCDOT for approval. These shall include complete details, classification of materials, schedules for fabrication and shop assembly, procedures and diagrams showing sequence and details for erection and approval.
2. Shop drawings shall be given a suitable title to describe the parts detailed thereon. Each drawing shall be identified by the complete project name and number and shall include:
  - a. Dimensions, callouts and notes to completely define the form, fit, function, manufacturing process and allowable deviations for each item.
  - b. Material specifications for each item.
  - c. Heat treatment or specific hardness requirements where applicable.
  - d. The surface finish of machined surfaces and tolerances for each dimension for which a specific fit is required. A general tolerance block shall be used to define the tolerances of all other dimensions. Fits and finishes shall meet or exceed the more rigorous of the AASHTO specifications or suggested manufacturer's specifications. In the absence of requirements in the AASHTO specifications, cited manufacturer tolerances or specifications shall apply when drawings call out a particular manufacturer and model "or equal". In no manner shall "suggested manufacturer" indicate a sole-sourced intent on the part of the NCDOT when competitive products exist.
  - e. Quantity required.
  - f. Capacity and normal operating ratings for each rope assembly.
  - g. Dimensions of all principal elements within the item.
  - h. Certified external dimensions affecting interfaces or installations.
  - i. Gross weight.
  - j. Method and recommended type of lubrication.
3. Shop drawings, which have not been approved or require correction, shall be resubmitted until such time as they are acceptable to the NCDOT. Resubmission and approval shall not be considered a cause for delay. The Contractor shall bear all costs or damages, which may result from the ordering or fabrication of any materials prior to the acceptance of the shop drawings. As a means of expediting delivery prior to acceptance of the shop drawings, the Contractor may request in



writing from the NCDOT approval to order raw materials of the correct type for later fabrication from accepted shop drawings. Such approval by the NCDOT shall be in writing. After acceptance of the shop drawings, the Contractor shall supply the NCDOT with additional copies of the accepted drawings as may be required.

#### 1.4.2 Procedures

Specific and detailed procedures shall be submitted to the NCDOT for approval prior to commencing construction for the following work items:

- A. Auxiliary counterweight assembly installation – The Contractor shall include all temporary construction details, false work, jacks, and miscellaneous items required for removal of existing auxiliary sheave, hitch shaft, and rope assemblies, installation of new auxiliary sheave and hitch shaft assemblies, and installation of the new auxiliary counterweight ropes. This procedure shall be signed and stamped by a North Carolina Professional Engineer.
- B. Longitudinal span guide installation – The Contractor shall include all temporary construction details, false work, jacks, and miscellaneous items required for removal of existing longitudinal span guide assemblies, installation of temporary span guide assemblies if necessary, and installation of the new longitudinal span guide assemblies. This procedure shall be signed and stamped by a North Carolina Professional Engineer.
- C. Lubrication plan – The Contractor shall include shop and field lubricants and sealants endorsed by manufacturers, including the wire rope manufacturer, in writing as well as application procedures for each. The dates that the lubricant was applied to each component shall be included.
- D. Cleaning and painting procedure. – The Contractor shall include a procedure for cleaning the required components to SSPC-SP 1 and SSPC-SP 2 conditions and for the painting of non-working surfaces.

## PART 2 PRODUCTS

### 2.1 MACHINERY, COMPONENTS AND MATERIALS

- A. General
  1. Materials and components shall conform to the drawings and referenced standards.
  2. Hardness and toughness shall be tested and reported for any items or details where plans and specifications require hardness or CVN toughness values.
  3. No item shall be fabricated without sufficient advance notice given to the NCDOT to permit inspection.
    - a. The Contractor shall furnish all facilities and provide for the free access at the plant or shop for the inspection of machinery, components, material and quality of work.
    - b. Initial nominal acceptance of a material or item shall not preclude subsequent rejection if injurious defects are found upon later inspection or discovery.
    - c. The Contractor shall furnish the NCDOT with the number of copies of

purchase orders as requested.

- d. Unless otherwise provided, the Contractor shall furnish without charge, test specimens required herein, and all labor, testing machines, tools and equipment necessary to prepare the specimens and to make the physical tests and analyses. Two copies of test reports and chemical analyses shall be furnished to the NCDOT.

**B. Standard Products**

1. Materials and equipment shall be commercial standard or cataloged products of manufacturers regularly engaged in production of such materials or equipment, and shall have at least five (5) years of satisfactory commercial or industrial use prior to bid opening and the latest design that complies with the requirements on these contract documents.
2. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer.
3. Materials of equal or greater strength, ductility, CVN toughness or corrosion resistance than shown on the design drawings can be proposed, but are subject to approval by the NCDOT.
4. Electrodes for welding shall comply with AWS D1.5-2010 Code.
5. Steel for weldments and miscellaneous components shall be ASTM A668, Class D, unless otherwise specified on the contract documents, fine grain practice is mandatory, and always weldable grades as designated by applicable ASTM standards. Welding materials and methods shall conform to the AWS Structural Welding Code for Bridges AWS D1.5.
6. Heavy hexagonal head bolts, heavy hexagonal nuts, and hardened washers shall conform to ASTM F3125, Type 1. ASTM A307 and SAE Grade 1, 2, or 4 bolts shall not be used. All bolts shall conform to the dimensions of ANSI B18.2.1 finished hex bolts.

Threads for bolts, nuts, and cap screws shall conform to the unified thread standards, coarse thread series with a Class 2A tolerance for bolts and Class 2B tolerance for nuts, in accordance with ANSI B1.1, unless otherwise specified.

7. Turned bolts shall be made from a material and have a strength equal to ASTM F3125, Type 1. Heavy hexagonal nuts, and hardened washers complying with A563, Grade C, and F436 respectively shall be used with the turned bolts. Locking shall preferably be by use of double nuts.

The body of the turned bolts shall be finished to 63 microinches or better. Threads for the turned bolts and nuts shall conform to the Unified Thread Standards, coarse thread series with a Class 2A tolerance for bolts and Class 2B tolerance for nuts, in accordance with ANSI B1.1, unless otherwise specified. Turned bolts are designated by their nominal thread size. The turned bolt body shall be 1/16th of an inch larger in diameter than the nominal size specified, and shall have an LC6 fit with reamed holes. Bolt head and nut bearing surfaces shall be flat and square with the axis of the bolt holes and shall be spot faced if necessary. Unless otherwise noted, bolt holes in machinery parts required for connecting to supporting steelwork may be sub-drilled (in the shop) smaller than the turned bolt

diameter and shall be reamed together with supporting structural steel either during assembly or at erection, after the parts are correctly assembled and aligned. Positive type locking shall be provided. Double nuts are preferred. Where double nuts are used, heavy hex and jam nuts shall be used. Alternate locking methods shall be submitted to the Engineer for approval.

8. Flat countersunk head cap screws shall conform to ASTM F835. Stainless steel hex socket flat countersunk head screws shall be Type 316, with a minimum tensile strength of 80,000 psi, and shall meet or exceed ASTM F879, Alloy Group 1, Condition CW, unless otherwise specified. Dimensions shall conform to ANSI B18.3.
9. Stainless steel for fasteners, threaded rods, pins and dowels where specified shall be Type 304 or 316 Stainless Steel, with a minimum tensile strength of 85,000 psi and shall meet or exceed ASTM F593, Alloy Group 1, Condition CW, unless otherwise specified. Stainless steel for hex nuts shall be Type 304 or 316, with a minimum tensile strength of 85,000 psi and shall meet or exceed ASTM F594, Alloy Group 1, Condition CW, unless otherwise specified. Stainless Steel washers where specified shall be Type 304 or 316. Stainless Steel clevis pins shall be ASTM A276, Type 316, Condition S, Cold Finished.

Stainless steel bolts shall generally be tightened to produce a tension of 70% of the proof load. Include friction coefficient data for any thread lubricant with installation procedures to confirm torque magnitudes.

10. All bronze bushings shall be ASTM B22, Alloy C91100 unless otherwise specified. New bushings shall be provided as shown in the contract drawings.
11. Bronze flat head cap screws shall be used to secure all bronze bushings.
12. Where shown on the drawings, all machinery shims required for leveling and alignment of equipment shall be stainless steel, ASTM A167, Type 302/304, neatly trimmed to the dimensions of the assembled parts and drilled for all bolts that pass through the shims. In general, total shim pack thickness shall be no less than twice the nominal thickness shown on the drawings, and of sufficient varying thicknesses shall be furnished to secure 0.03125-inch variations of the shim allowance including one shim equal to the full allowance. Shims shall be placed to provide full contact between machinery and machinery supports. Shims shall be shown in detail on the shop drawings.
13. Threads for pins shall be machine cut, and conform to the Unified National (UN) system of threading. The number of threads chosen shall correspond to the closest bolt diameter of the UN system.
14. The paint system shall comply with Section 442 of the NCDOT's Standard Specifications and shall be submitted for approval.

C. Manufacturer's Recommendations

1. If the Supplier or wire rope Manufacturer requires specific installation procedures to insure long life service of the component or wire ropes, printed copies of these recommendations shall be furnished to the NCDOT prior to shipment. Shipment of the ropes will not be allowed to proceed until such recommendations are received by the NCDOT.

## 2.2 GENERAL QUALITY OF WORK AND SURFACE FINISH

- A. Machinery components shall be finished, assembled, and adjusted in an approved manner and according to the best shop practice. The limits of accuracy that are to be observed in machining the work, and the allowances for all metal fits shall be placed on the Contractor's working drawings. Fits and finishes of machinery parts shall be as called for herein or on the contract drawings.
- B. Fits and finishes, when not included on these contract documents, shall be in accordance with AASHTO specifications for movable bridges or vendors' recommended specifications, whichever is more rigorous, and as modified below.

Surface finishes are given as the roughness height in micro-inches.

Part	Fit	Finish
Machinery base on steel	-	250
Machinery base on masonry	-	500
Shaft journals	RC6	8
Journal bushings	RC6	16
Split bushing in base	LC1	125
Solid bushing in base (to 1/4" wall)	FN1	63
Solid bushing in base (over 1/4" wall)	FN2	63
Hubs on shafts (to 2" bore)	FN2	32
Hubs on shafts (over 2" bore)	FN2	63
Turned bolts in finished holes	LC6	63
Hubs on main trunnions	FN3	63
Sliding bearings	RC6	32
Center Disks	-	32
Keys and keyways (top and bottom)	*	63
Keys and keyways (sides)	FN2	63
Machinery parts in fixed contact	-	125
Teeth of open spur gears,		
Under 1 inch circular pitch	-	32
1 inch to 1 3/4 inch circular pitch	-	63
over 1 3/4 inch circular pitch	-	125

\* ANSI Standard B17.1, Class II

The above fits for cylindrical parts shall also apply to the major dimensions of non-cylindrical parts.

- C. Rounds and shafts shall be true, straight and free from flaws, piping, laps, seams, or cracks. All shafts shall have finished ends with a 60-degree lathe center with a clearance hole at the exact center of the shaft. Stepped shafts shall have fillets finished smoothly to adjacent surfaces without tool marks or scratches.
- D. All forged shafts shall be reduced to size from a single bloom or ingot until perfect homogeneity is secured. The blooms or ingots, from which shafts or pins are to be made, shall have a cross-sectional area at least three times that required after finishing. No forging shall be done at less than red-heat. Forged rounds for shafts and pins shall be true, straight, and free from any defect.
- E. All shafts and pins shall be accurately finished, round, smooth, and straight; and when turned to different diameters, they shall have rounded fillets at the shoulders. Shafts exhibiting defects will not be accepted. Shafts that are bored with an inspection hole shall have the ends prepared for the attachment of a centering device equivalent to the lathe center. All such devices shall be furnished as part of the work.

- F. Turned, ground and polished shafting straightness tolerance shall be 0.002 inches per foot for shafts up to and including 1-1/2 inches in diameter and 0.003 inches per foot for shafts over 1-1/2 inches in diameter. All shafts shall be free from camber and shall run without vibration, noise, or chatter at all speeds up to and including at all operating speeds.
- G. Where surface finishes are indicated on the drawings or specified herein, the symbols used or finishes specified are in accordance with ANSI B46.1, "Surface Texture". Values of roughness height are specified in micro-inches as an arithmetical average deviation from the mean line. Roughness specified is the maximum value, and any smoother finish will be satisfactory. Compliance with specified surface will be determined by trained sense of feel and by visual inspection of the work compared to a standard roughness gage and in accordance with the provisions of ANSI B46.1. Values of roughness width and waviness are not specified, but shall be consistent with the general type of finish specified by the roughness height. Flaws such as scratches, ridges, holes, peaks, cracks or checks, which will make the part unsuitable, will be cause for rejection.
- H. All journal bearing areas on shafts and pins shall be accurately turned, ground, and polished with no trace of tool marks or scratches on the journal surface or adjoining shoulder fillets.
- I. All hubs shall have an ANSI Class FN2 medium force fit on the shafts unless otherwise specified.
- J. All castings shall be cleaned free of all loose sand and scale. All fins, seams, gates, risers and other irregularities shall be removed. All unfinished edges of castings shall be neatly cast with rounded corners and all inside angles shall have ample fillets. Dimensions of castings shown on the approved shop drawings will be the finished dimensions. Deviations from the dimensions and the thicknesses of the castings, as shown on the drawings, will not be permitted to exceed such amounts as will, in the opinion of the Engineer, impair the strength of the casting as computed from the dimensions shown. Warped or otherwise distorted castings, or castings that are oversize to such an extent as to interfere with the proper fit with other parts of the machinery, will be rejected. All castings shall be manufactured in accordance with ASTM A781 and shall be tested for internal defects using the applicable examination method prescribed under Supplementary Requirements of ASTM A781.
- K. Welding required for machinery shall comply with AWS D1.5 D1.1. Welded steel machinery parts shall be given a stress relief heat treatment prior to machining. The Contractor shall submit a schedule of the proposed stress relief heat treatment to the Engineer for approval. The schedule shall include a description of the part and an explanation of the proposed heat treatment, including the rate of heating, the soaking temperature, the time at the soaking temperature, the rate of cooling, and the temperature at which the part is to be withdrawn from the chamber. Soaking times of less than one hour will not be approved. Completely test all welds used to fabricate machinery by ultrasonic inspection using the methods given by ASTM E164, according to AWS D1.5 for tension members, unless noted otherwise.

All welds shall be complete penetration (cp) welds unless otherwise noted or shown on the Contract Plans. No feather edges allowed on weldments. All free edges of stiffeners, webs, and gussets must be welded.

All welding shall be by certified welders.

Welding for stainless steel shall conform to AWS D1.6.

Welding for aluminum shall conform to AWS D1.2.

Submit all weld procedures and welding qualifications prior to the start of work.

- L. Unspecified surface finishes shall conform to the AASHTO specifications. Mating surfaces shall be machined to provide even, true bearing. Surfaces with rotating or sliding contact shall be highly polished and finished true to the given dimensions.
- M. All work shall be laid out to secure proper matching of adjoining unfinished surfaces. Large discrepancies between adjoining unfinished surfaces, shall be remediated to realize proper alignment. Depressions or holes not affecting the strength or function of the parts may be filled in a manner approved by the NCDOT.

N. Wire Ropes

Wire rope assemblies shall be finished, assembled, tested, and adjusted in an approved manner and according to the best shop practice as defined by the latest edition of the Wire Rope Users Manual, all applicable ASTM and federal wire rope standards, and these Contract Documents. The limits of accuracy that are to be observed in machining the work, and the allowances for all metal fits shall be placed on the Contractor's working drawings. Fits and finishes of machinery parts shall be as called for on the contract drawings or as specified by AASHTO.

1. All auxiliary counterweight wire ropes shall be 7/8" diameter, made of Extra Improved Plow Steel with a minimum ultimate tensile strength of 70,800 pounds, and shall be 6 x 25 filler wire construction with fiber core (FC), and meet all the requirements of ASTM A1023. The wire ropes shall be right regular lay, with a maximum lay length of 6.56". The wire ropes shall be preformed. Each strand shall consist of 19 main wires and 6 filler wires fabricated in one operation, with all wires interlocking. The wire ropes shall comply with ASTM A1023, A1007, and these Contract Documents.
2. The wire ropes shall be made by an established manufacturer, whose facilities and experience have been approved by the NCDOT. Ropes shall be laid in accordance with the best practice. Every effort shall be made to obtain ropes of uniform physical properties. The ropes shall be fabricated in the greatest length practicable, and shall be cut from ropes manufactured with one setting of one stranding machine, and one setting of one closing machine.
3. The actual diameter of the wire rope shall be defined as the diameter of the circumscribed circle. The actual diameter of the rope, measured with the rope under a tension equal to 12 percent of its ultimate tensile strength, shall not be less than its nominal diameter, and not more than 3/64" for the auxiliary counterweight ropes in excess of its nominal diameter.
4. The actual length of each wire rope assembly, measured centerline to centerline of end socket pins, shall not vary from the specified length by more than 1/4" per 100 feet when measured under loading conditions described herein.
5. All portions of the wire rope shall be lubricated during fabrication with a lubricant containing a rust inhibitor.
6. NO splicing of the ropes or individual strands will be permitted.
7. Rope Sockets.
  - a. All rope sockets shall be galvanized open spelter sockets, Type A. The open spelter sockets, the socketing of the wire ropes, and the Inspection and Non-Destructive Testing of all sockets shall conform to Federal Specification RR-S-550, latest revision. The requirements for Type A, open spelter sockets shall apply. Sockets shall be attached to the ropes by using

zinc of a quality not less than that defined in the current specifications for Slab Zinc (Spelter), ASTM B6 High Grade. Maximum socket slip or seating of the zinc cone, with the rope, when tensioned to 80% of its specified ultimately strength, under the test specified previously, shall be 1/6 the nominal diameter of the rope. If a greater slip should occur, the socketing method shall be changed until satisfactory results are obtained.

- b. Variations or substitute designs of sockets will be considered acceptable if they meet or exceed the functional requirements for strength, materials, and other applicable provisions of the Federal Specification.
- c. Sockets shall be stronger than their ropes. If a socket should break during the test specified herein, two other job sockets shall be selected at random and attached to another piece of rope, and the test repeated, and this process shall be continued until the Inspector is satisfied of socket reliability, whereupon the lot shall be accepted. However, if 10% or more of the tested sockets fail at a load less than the specified minimum ultimate strength of the rope, the entire lot of sockets shall be rejected, and new ones shall be furnished which meet specification requirements.
- d. If the pin and socket fits shown on the Plans differ from those specified by the Federal Specification, the fits shown on the Plans shall be met.
- e. Sockets shall be shop galvanized in accordance with ASTM A153.
- f. Sockets for the auxiliary counterweight rope assemblies shall use the standard galvanized clevis pins.

### PART 3 EXECUTION

#### 3.1 REHAB OF AUXILIARY COUNTERWEIGHT SHEAVE AND HITCH SHAFT ASSEMBLIES.

- A. Removal of Existing Auxiliary Sheave and Hitch Shaft Assemblies
  1. To remove the auxiliary sheave and hitch shaft assemblies, it is necessary to first support the auxiliary counterweights to relieve tension on the ropes. The structure has no permanent provision to do this. The Contractor shall propose a method to raise and secure the auxiliary counterweight to the tower legs for this portion of the work. Alternatively, removal and reinstallation options may be submitted for approval.
  2. Remove rope socket pins at span and counterweight and remove existing ropes.
  3. Remove auxiliary counterweight sheave assemblies and hitch shaft assemblies ensuring that the auxiliary counterweight sheaves and hitches are not damaged (these will be reused). Examine structural connections for deficiencies. If deficiencies are found report them to the NCDOT immediately. Replace any structural fasteners that are removed.
  4. Clean and remove all sharp edges from auxiliary counterweight sheaves and hitches. Clean, chase, and lubricate anchor rod threads. Machine sheave grooves as shown on the plans. Clean all old lubricant, debris, etc. from existing auxiliary counterweight, sheave, rope grooves, guides, deflectors, connection rods and attachment points to SSPC-SP 1 and SSPC-SP 2 condition. All non-working surfaces

shall be painted with the approved paint system and working surfaces shall be protected with an application of the approved lubricant.

**B. Install New Auxiliary Sheave and Hitch Shaft Assemblies**

1. The new auxiliary counterweight sheave assemblies and new hitch shaft assemblies shall be installed.
2. The auxiliary counterweight ropes shall be carefully removed from reels or coils by revolving them and shall be erected as to avoid any kinks or bends. The ropes shall not be pulled through dirt or water or over abrasive surfaces. The stripe painted on each rope in the shop shall be straight after the rope is installed. The Contractor shall show the erection procedure for the auxiliary counterweight ropes on the shop drawings. The new ropes shall be installed in the same position as the existing ropes.
3. After installation, the Contractor shall properly clean all new ropes of all foreign material and shall furnish and apply hot, in an approved manner, and when weather conditions are suitably dry and warm, one coat of lubricant that is compatible with that applied during rope fabrication and recommended by the wire rope manufacturer in writing. The Contractor shall remove all seizing at all sockets, properly clean the area, and apply an approved sealing compound at the end of the sockets as per the wire rope manufacturers recommendations. The Contractor shall furnish copies of letters from the wire rope manufacturer endorsing the lubricants and sealants used.
4. Adjust auxiliary counterweight rope tensions using the threaded take-up rods.

**3.2 REMOVAL AND REPLACEMENT OF EXISTING LONGITUDINAL SPAN GUIDE ASSEMBLIES.**

1. Remove existing span guide shaft assemblies.
2. Clean and examine structural connections for deficiencies. If deficiencies are found report them to the NCDOT immediately.
3. Install temporary span guides. Temporary span guides shall be designed by the Contractor and submitted for approval.
4. Remove temporary span guides and install final span guide assemblies.

**3.3 DELIVERY, STORAGE and HANDLING**

- A. All components and materials shall be delivered to the site in accordance with the approved schedule of work. Any special provisions used for material handling shall be provided by the Contractor.
- B. Components and materials shall be properly packaged and protected from initial shipment until the time of installation.
- C. Assembled units shall be mounted on skids or otherwise crated for protection during shipment and storage.
- D. Finished and unpainted metal surfaces that would be damaged by corrosion, shall be coated with a .030" minimum film thickness, as soon as practicable after finishing, of No-Ox-Id, A-Special, as manufactured by San-Chem Company, Chicago, Illinois, or approved equal. This coating shall be removed from all surfaces prior to lubrication for operation and



from all surfaces prior to painting after erection. If the anti-rust coating on any part becomes compromised prior to part installation, the coating shall be restored immediately. As an alternative, metallic components may be wrapped in paper treated with volatile corrosion inhibitors (VCIs) or polyethylene VCIs, and further wrapped in polyethylene. VCIs are available from Daubert Chemical of Burr Ridge, IL; Grofit Plastics of Northbrook, IL; Cromwell-Phoenix of Alsip, IL; or CorTec of St. Paul, MN. When weatherproof containers are used, they shall be lined with multiple bags of silica gel desiccant.

- E. All wire ropes shall be shipped on reels, the diameter of which is not less than 25 times the diameter of the ropes, which shall be mounted on skids or otherwise crated for protection during shipment and storage.
- F. Material storage on site shall afford easy access for inspection and identification, protection from the ground and prevent distortion or damage.
- G. The Contractor shall dispose of all removed materials in accordance with all pertinent existing legal and environmental requirements and guidelines for material disposal in effect at the time of letting. The NCDOT shall specifically identify which items are to be retained. Retained items shall be delivered and stored as directed by the NCDOT, and all others shall be properly discarded as required.

### 3.5 LIFT SPAN BALANCING

- A. It is anticipated that the imbalance per tower at the beginning of construction will be 8000 lbs +/- 1000 lbs in the fully seated position. Coordinate with the NCDOT to confirm this condition prior to beginning work.
- B. The Contractor will be responsible for adjusting the span balance as necessary during construction. The Contractor shall develop and maintain a spreadsheet to track all additions and removals of components and materials to and from the lift span and counterweights. The spreadsheet and all associated calculations shall be submitted to the Engineer for approval prior to the start of work. When weight adjustments are necessary to maintain the balance condition, weight shall be added to or removed from the counterweight pockets in accordance with the approved calculations. The bridge balance conditions shall be adjusted the same day that construction activities result in any alteration of the bridge balance, and prior to any required openings for waterway traffic. At no time shall any brakes or span locks be released or disengaged, respectively, until bridge balance has been properly adjusted. Temporary equipment and tools shall be removed from the lift span prior to each bridge operation, and therefore need not be included in the balance spreadsheet.
- C. The Contractor shall be responsible for all labor and materials required to provide an acceptable balance, as directed by the NCDOT. All weight adjustments shall be carefully documented and formally submitted.
- D. Once the desired final lift span balance is achieved and accepted by the NCDOT, the Contractor can proceed with test operating the span.

### 3.6 CONTRACTOR OPERATION OF THE BRIDGE

- A. This work consists of temporary operation of the bridge during construction activities and supervision for Department personnel in the operation of the bridge.
- B. The Contractor shall assume responsibility for operating the bridge from the time that the normal operating procedure is affected by construction activities until the mechanical rehabilitation is complete and the bridge is fully operable in its final form and as approved

by the Engineer. The Contractor shall provide the Engineer with proposed dates for commencement and conclusion of temporary Contractor operation of the bridge.

- C. Factors that are considered as affecting the normal operating procedure include: work on the bridge machinery, work on the bridge electrical control system, work on the Operator's House, work that affects the barrier gates, any work that affects span balance, Contractor staff, materials and/or equipment on the lift span or interfering with the bridge operator's view of roadway or waterway traffic.
- D. The Contractor shall maintain and provide any required adjustments and/or corrections to the mechanical and electrical equipment of the bridge during construction and through the period of temporary Contractor operation.
- E. The Contractor shall perform work in a way that allows for continued operation of the bridge. During the portion of the work when the auxiliary counterweight is removed, the span shall be lifted and lowered at 1/5th of the normal bridge operating speed. During operation of the span during this temporary condition, the span and drive machinery shall be monitored closely by the Contractor. Because the lift span will not remain span heavy during the entire lift, the operating characteristics of the bridge may change, especially after it passes 35 feet of lift and the balance approaches 0 lbs, and then becomes more and more counterweight heavy.

3.8 BASIS OF PAYMENT:

Payment for Auxiliary Counterweight and Span Guide Repairs will be made at the contract lump sum price bid for which price and payment shall be full compensation for furnishing all labor, materials, equipment, and incidentals necessary to complete the work under the item in accordance with the Contract Drawings and these Specifications, including painting, lubricating, and all other features necessary to insure the satisfactory operation of the bridge.

Lubricants will not be measured for payment but the cost thereof shall be included in the prices stipulated.

Payment will be made under:

<u>Description</u>	<u>Units</u>
Auxiliary Counterweight and Span Guide Repairs	Lump Sum

County : New Hanover

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
<b>ROADWAY ITEMS</b>						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	676	SF	
0003	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	576	SF	
0004	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	30	SF	
0005	4415000000-N	1115	FLASHING ARROW BOARD	4	EA	
0006	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	11	EA	
0007	4430000000-N	1130	DRUMS	175	EA	
0008	4445000000-E	1145	BARRICADES (TYPE III)	104	LF	
0009	4480000000-N	1165	TMA	3	EA	
0010	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	3,825	LF	
0011	4847010000-E	1205	POLYUREA PAVEMENT MARKING LINES (4", 20 MILS)	12,176	LF	
0012	4847050000-E	1205	POLYUREA PAVEMENT MARKING LINES (8", 20 MILS)	630	LF	
0013	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	145	EA	
<b>STRUCTURE ITEMS</b>						
0014	8161000000-E	420	GROOVING BRIDGE FLOORS	149,300	SF	
0015	8296000000-N	442	POLLUTION CONTROL	Lump Sum	L.S.	
0016	8559000000-E	SP	CLASS II, SURFACE PREPARATION	10	SY	
0017	8566000000-E	SP	CLASS III, SURFACE PREPARATION	13.5	SY	

County: New Hanover

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0018	8664000000-E	SP	SHOTCRETE REPAIRS	125 CF		
0019	8678000000-E	SP	EPOXY RESIN INJECTION	1 LF		
0020	8692000000-N	SP	FOAM JOINT SEALS	Lump Sum	L.S.	
0021	8860000000-N	SP	GENERIC STRUCTURE ITEM CLEANING & REPAINTING OF BRIDGE #13	Lump Sum	L.S.	
0022	8860000000-N	SP	GENERIC STRUCTURE ITEM INSTALL NEW SIGNS	Lump Sum	L.S.	
0023	8860000000-N	SP	GENERIC STRUCTURE ITEM MECHANICAL OPERATING MACHINERY	Lump Sum	L.S.	
0024	8860000000-N	SP	GENERIC STRUCTURE ITEM OPERATOR HOUSE RENOVATION	Lump Sum	L.S.	
0025	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING CONTAINMENT FOR BRIDGE #13	Lump Sum	L.S.	
0026	8860000000-N	SP	GENERIC STRUCTURE ITEM REPLACE AIR HORN	Lump Sum	L.S.	
0027	8860000000-N	SP	GENERIC STRUCTURE ITEM REPLACEMENT OF STEEL GRID DECK	Lump Sum	L.S.	
0028	8860000000-N	SP	GENERIC STRUCTURE ITEM UNDER STRUCTURE WORKPLATFORM	Lump Sum	L.S.	
0029	8867000000-E	SP	GENERIC STRUCTURE ITEM MODIFIED ALASKA BARRIER RAIL	3,034 LF		
0030	8881000000-E	SP	GENERIC STRUCTURE ITEM FLOWABLE FILL	8 CY		
0031	8881000000-E	SP	GENERIC STRUCTURE ITEM PPC MATERIALS	495 CY		
0032	8882000000-E	SP	GENERIC STRUCTURE ITEM REPAIRS TO PRESTRESSED CONC- RETE GIRDERS	1.5 CF		
0033	8889000000-E	SP	GENERIC STRUCTURE ITEM STRUCTURAL STEEL FOR REPAIRS	25,000 LB		

County : New Hanover

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0034	8892000000-E	SP	GENERIC STRUCTURE ITEM CONCRETE DECK REPAIR FOR EPOXY OVERLAY	52 SF		
0035	8892000000-E	SP	GENERIC STRUCTURE ITEM EPOXY OVERLAY SYSTEM	7,390 SF		
0036	8893000000-E	SP	GENERIC STRUCTURE ITEM CONCRETE DECK REPAIR FOR PPC OVERLAY	10 SY		
0037	8893000000-E	SP	GENERIC STRUCTURE ITEM HYDRO-DEMOLITION OF BRIDGE DEC K	13.5 SY		
0038	8893000000-E	SP	GENERIC STRUCTURE ITEM PLACING & FINISHING PPC OVER- LAY	17,655 SY		
0039	8893000000-E	SP	GENERIC STRUCTURE ITEM SCARIFYING BRIDGE DECK	17,655 SY		
0040	8893000000-E	SP	GENERIC STRUCTURE ITEM SHOTBLASTING BRIDGE DECK	18,574 SY		
0041	8897000000-N	SP	GENERIC STRUCTURE ITEM SPLICING OF PRESTRESSING STRAN D	1 EA		
0042	8860000000-N	SP	GENERIC STRUCTURE ITEM AUXILIARY COUNTERWEIGHT & SPAN GUIDE REPAIRS	Lump Sum	L.S.	

0917/Jan30/Q257705.5/D309711160000/E42

Total Amount Of Bid For Entire Project :

PROJ. REFERENCE NO.	SHEET NO.
15BPR.15	TMP-3

### TRAFFIC CONTROL PHASING

PERFORM ALL BRIDGE REHABILITATION OPERATIONS IN THE PHASING USING LANE CLOSURES OR ROAD CLOSURES AS OUTLINED BELOW (REFER TO GENERAL NOTES FOR TIME AND HOLIDAY RESTRICTIONS):

LANE CLOSURES

- INBOUND TO DOWNTOWN WILMINGTON USE ROADWAY STD. DRAWING 1101.02, SHEET 3 OF 14 FOR LANE CLOSURES.
- OUTBOUND FROM DOWNTOWN WILMINGTON USE SHEET TMP-8 FOR LEFT OR RIGHT LANE CLOSURES.
- WHEN WORKING IN AN INTERIOR LANE ON THE BRIDGE, CLOSE BOTH INBOUND AND OUTBOUND INTERIOR LANES.

ROAD CLOSURES

- INBOUND TO DOWNTOWN WILMINGTON CLOSE BRIDGE NO.13 IN ACCORDANCE WITH SHEET TMP-4 AND TMP-5 IN CONJUNCTION WITH ROADWAY STD. DRAWING 1101.03, SHEET 7 OF 9.
- OUTBOUND FROM DOWNTOWN WILMINGTON CLOSE BRIDGE NO.13 IN ACCORDANCE WITH SHEET TMP-6 AND TMP-7.
- INBOUND AND OUTBOUND ROAD CLOSURES MAY BE IMPLEMENTED AT THE SAME TIME, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

STEP 1: INSTALL WORK ZONE ADVANCE WARNING SIGNS (SEE TCP-10) ON PROJECT NO MORE THAN THREE (3) CALENDAR DAYS BEFORE BEGINNING WORK.

CREATE A PLAN OF THE EXISTING MARKINGS ON THE BRIDGE THAT SHOWS THE BEGINNING AND ENDING POINT OF EACH MARKING LINE AND HAVE APPROVED BY THE ENGINEER.

NOTE: CONTRACTOR SHALL COMPLETE STEP 2 BY JUNE 22, 2018. (SEE PROJECT SPECIAL PROVISIONS)

STEP 2: USING LANE CLOSURES OR DIRECTIONAL BRIDGE CLOSURES AS DESCRIBED ABOVE, AND AS ALLOWED IN ICT NO. 1 AND ICT. NO. 3, COMPLETE THE FOLLOWING:

- \* PERFORM ALL WORK LISTED IN THE AUXILIARY COUNTERWEIGHT AND SPAN GUIDE REPAIR SPECIAL PROVISION AND AS SHOWN IN THE CONSTRUCTION PLANS (SHEETS MA-01 THROUGH MA-10).

NOTE: BEGINNING SEPTEMBER 10, 2018, THE CONTRACTOR MAY CLOSE THE ENTIRE BRIDGE (BOTH DIRECTIONS) ONE TIME ONLY FOR 14 CONSECUTIVE CALENDAR DAYS TO PERFORM THE WORK LISTED BELOW IN STEP 3. (SEE PROJECT SPECIAL PROVISIONS)


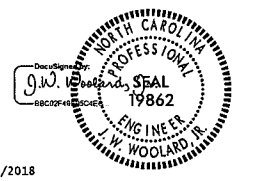

STEP 3: USING LANE CLOSURES OR DIRECTIONAL BRIDGE CLOSURES, AS DESCRIBED ABOVE, COMPLETE THE FOLLOWING REHABILITATION OPERATIONS ON THE BRIDGE:

- \* CLEAN EXISTING PAINT AND PLACE NEW PAINT ON EXISTING APPROACH SPAN STEEL SUPERSTRUCTURE, INCLUDING TOWER SPAN STEEL SUPERSTRUCTURE, AS SHOWN IN THE CONSTRUCTION PLANS.
- \* PERFORM RENOVATIONS TO THE CONTROL HOUSE AS SHOWN IN THE CONSTRUCTION PLANS.
- \* PERFORM MECHANICAL REPAIRS INCLUDING REPLACING CORRODED FASTNERS AT REST PIER MACHINERY AREAS AND LIFTING GIRDERS, REPLACING DAMAGED SHAFT COUPLING SEATS, REPLACING UPPER AIR BUFFERS, AND CLEANING AND LUBRICATING COUNTERWEIGHT CABLES.
- \* REPLACE GRID DECK ON LIFT SPAN AND AT PARKING AREAS ADJACENT TO THE LIFT SPAN.
- \* MILL (SCARIFY) APPROACH AND TOWER SPANS OF BRIDGE AS SHOWN IN THE CONSTRUCTION PLANS.
- \* PERFORM STRUCTURAL REPAIRS AS SHOWN IN THE CONSTRUCTION PLANS.
- \* PLACE PPC OVERLAY ON APPROACH AND TOWER SPANS AS SHOWN IN THE CONSTRUCTION PLANS. PRIOR TO OPENING LANES TO TRAFFIC, PLACE FINAL PAVEMENT MARKINGS AS SHOWN ON SHEET PMP-1 AND THE CONTRACTOR CREATED EXISTING PAVEMENT MARKING LOCATION PLAN.
- \* REPLACE DECK EXPANSION JOINTS ON THE APPROACH SPANS AS SHOWN IN THE CONSTRUCTION PLANS.
- \* REPLACE MEDAIN BARRIER RAILING AS SHOWN IN THE CONSTRUCTION PLANS.

STEP 4: UPON COMPLETION OF ALL REHABILITATION OPERATIONS, REMOVE ALL TRAFFIC CONTROL DEVICES FROM THE PROJECT AND OPEN TO THE FINAL TRAFFIC PATTERN.

*LANGUAGE ADDED FOR  
ADDITIONAL STRUCTURE  
WORK.*

1/29/2018 U:\Task 300 - 15BPR.15 - Rehab Project\Traffic\Transportation Management Plan\TCP\PLAN SHEETS\15BPR.15\_TMP\_03\_PHASING.dgn arngood

 <p>Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. 919.851.6866 Fax. 919.851.7024 www.stantec.com License No. F-0672</p>	 <p>1/29/2018 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>		<p>PHASING</p>
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## SHEET INDEX

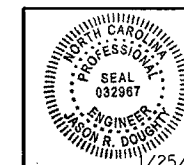
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<b>STRUCTURAL</b>		
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2	S-2	SHEET INDEX
3	S-3	GENERAL PLAN AND ELEVATION
4	S-4	GENERAL NOTES AND TOTAL BILL OF MATERIAL
5	S-5	LIFT SPAN TYPICAL SECTION
6	S-6	TYPICAL SECTION AND OVERLAY DETAILS - SHEET 1 OF 6
7	S-7	TYPICAL SECTION AND OVERLAY DETAILS - SHEET 2 OF 6
8	S-8	TYPICAL SECTION AND OVERLAY DETAILS - SHEET 3 OF 6
9	S-9	TYPICAL SECTION AND OVERLAY DETAILS - SHEET 4 OF 6
10	S-10	TYPICAL SECTION AND OVERLAY DETAILS - SHEET 5 OF 6
11	S-11	TYPICAL SECTION AND OVERLAY DETAILS - SHEET 6 OF 6
12	S-12	SURFACE PREPARATION AND PPC OVERLAY - SHEET 1 OF 5
13	S-13	SURFACE PREPARATION AND PPC OVERLAY - SHEET 2 OF 5
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15	S-15	SURFACE PREPARATION AND PPC OVERLAY - SHEET 4 OF 5
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18	S-18	JOINT REPAIR DETAILS - SHEET 1 OF 3
19	S-19	JOINT REPAIR DETAILS - SHEET 2 OF 3
20	S-20	JOINT REPAIR DETAILS - SHEET 3 OF 3
21	S-21	GRID DECK REPLACEMENT - SHEET 1 OF 3
22	S-22	GRID DECK REPLACEMENT - SHEET 2 OF 3
23	S-23	GRID DECK REPLACEMENT - SHEET 3 OF 3
24	S-24	LIFT SPAN - STRUCTURAL STEEL REPAIR LOCATIONS - SHEET 1 OF 2
25	S-25	LIFT SPAN - STRUCTURAL STEEL REPAIR LOCATIONS - SHEET 2 OF 2
26	S-26	LIFT SPAN - STRUCTURAL STEEL REPAIRS - SHEET 1 OF 3
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28	S-28	LIFT SPAN - STRUCTURAL STEEL REPAIRS - SHEET 3 OF 3
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 STATION: \_\_\_\_\_

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 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### SHEET INDEX

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 Experience great bridges.  
 333 FAYETTEVILLE STREET, SUITE 505  
 RALEIGH, NC 27601  
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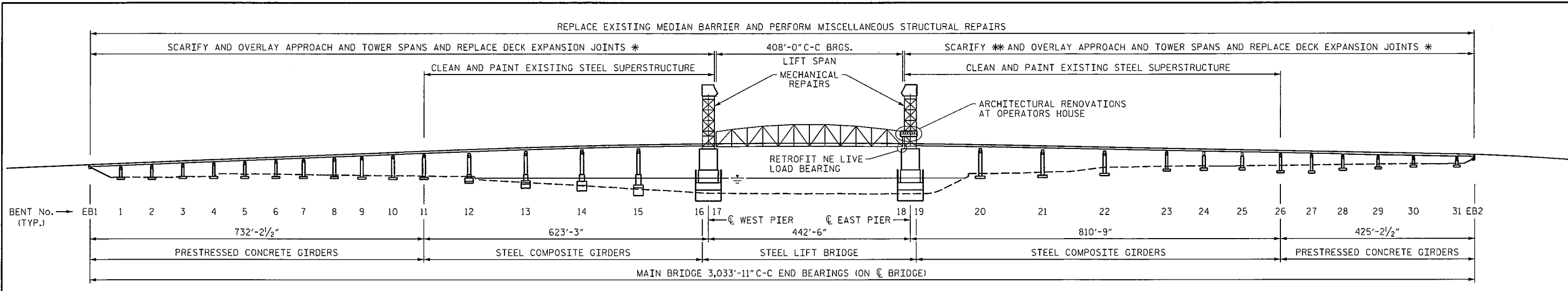
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*Jason R. Doughty*  
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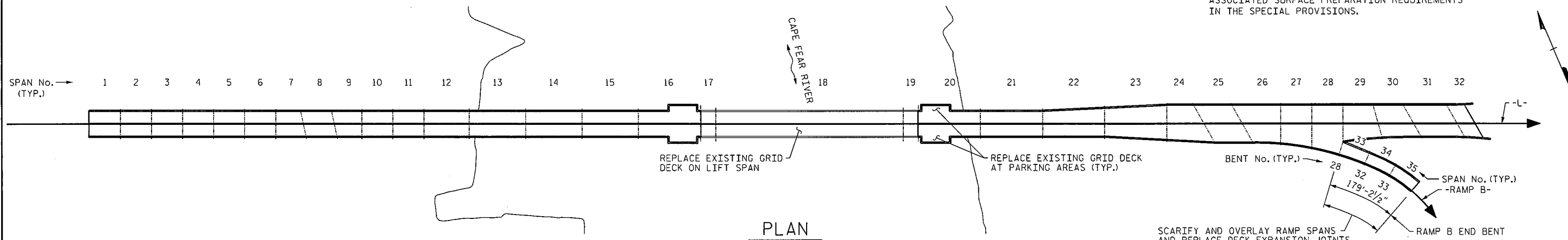
DESIGNED BY: B. LOFLIN DATE: NOV 2017  
 DRAWN BY: B. LOFLIN DATE: NOV 2017  
 CHECKED BY: J. DOUGHTY DATE: JAN 2018  
 DESIGN ENGINEER OF RECORD: J. DOUGHTY DATE: JAN 2018



**ELEVATION**

BENT NUMBERS SHOWN MATCH BENT NUMBERING USED IN BRIDGE INSPECTION REPORTS

- \* EXISTING FINGER JOINTS WILL NOT BE REPLACED.
- \*\* SCARIFYING BRIDGE DECK SHALL NOT BE PERFORMED IN SPAN 20. REFER TO EPOXY OVERLAY SYSTEM AND ASSOCIATED SURFACE PREPARATION REQUIREMENTS IN THE SPECIAL PROVISIONS.



**PLAN**

SPAN NUMBERS SHOWN MATCH SPAN NUMBERING USED IN BRIDGE INSPECTION REPORTS.

**SCOPE OF WORK**

**STRUCTURAL:**

1. GRID DECK REPLACEMENT ON LIFT SPAN AND AT PARKING AREAS AT ENDS OF LIFT SPAN.
2. REPLACE EXISTING MEDIAN BARRIER ON APPROACH SPANS AND LIFT SPAN.
3. SCARIFY AND OVERLAY APPROACH SPANS AND TOWER SPANS.
4. EXCEPT FINGER JOINTS AT BENT 15, REPLACE DECK EXPANSION JOINTS ON APPROACH SPANS.
5. RETROFIT EXISTING LIVE LOAD BEARING AT NORTHEAST CORNER OF LIFT SPAN.
6. PERFORM SUPERSTRUCTURE AND SUBSTRUCTURE REPAIRS AS SHOWN IN THE PLANS.

**MECHANICAL:**

1. REPLACE CORRODED FASTENERS AT REST PIER MACHINERY AREAS AND LIFTING GIRDERS.
2. REPLACE ALL SPAN LOCK SHAFT COUPLING SEALS, GASKETS AND FASTENERS.
3. REPLACE UPPER AIR BUFFERS.
4. CLEAN AND LUBRICATE COUNTERWEIGHT ROPES.
5. PERFORM AUXILIARY COUNTERWEIGHT AND SPAN GUIDE REPAIRS. SEE "MA" SHEETS.

**CLEANING AND PAINTING:**

1. EXISTING STEEL SUPERSTRUCTURE APPROACH SPANS AND EXISTING STEEL SUPERSTRUCTURE TOWER SPANS (STRINGERS AND FLOORBEAMS) SHALL BE CLEANED AND PAINTED IN ACCORDANCE WITH THE SPECIAL PROVISIONS. TOWER MEMBERS AND LIFT SPAN MEMBERS SHALL NOT BE CLEANED AND PAINTED EXCEPT AS NOTED IN THE PLANS OR SPECIAL PROVISIONS.
2. WITHIN THE SPANS TO BE CLEANED AND PAINTED, CLEAN AND PAINT EXISTING STRINGERS, FLOORBEAMS, GIRDERS, DIAPHRAGMS, CROSS FRAMES, STIFFENERS, CONNECTION PLATES, CANTILEVERED BRACKETS, EXTERIOR SURFACES OF TRANSVERSE STEEL CAP GIRDERS, ASSOCIATED CONNECTIONS, AND BEARINGS.

**ARCHITECTURAL:**

1. REPLACE CONTROL HOUSE ROOF.
2. ASBESTOS ABATEMENT AT CONTROL HOUSE.
3. INSTALL NEW CONTROL HOUSE INTERIOR FINISHES, PLUMBING, FIXTURES, LIGHTING, AND WINDOWS.
4. REPLACE CONTROL HOUSE HVAC.
5. INSTALL NEW CONTROL HOUSE FIRE ALARM SYSTEM.
6. REPLACE TOWER ELEVATORS.

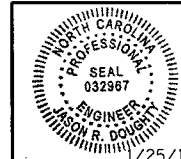
**MISCELLANEOUS:**

1. REPLACE "SLIPPERY WHEN WET" WARNING SIGNS AS SHOWN IN THE PLANS.
2. INSTALL NEW AIR HORN.

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**GENERAL PLAN AND ELEVATION**



DocuSigned by:  
 Jason R. Doughty  
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2			4			TOTAL SHEETS: 66

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DESIGNED BY: J. DOUGHTY DATE: NOV 2017  
 DRAWN BY: K. WHITE DATE: NOV 2017  
 CHECKED BY: B. LOFLIN DATE: DEC 2017  
 DESIGN ENGINEER OF RECORD: J. DOUGHTY DATE: JAN 2018





LOCATION SKETCH

INFORMATION ON THE LOCATION SKETCH SHALL BE CONSIDERED GENERAL INFORMATION ONLY.

TOTAL BILL OF MATERIAL

	GROOVING BRIDGE FLOORS	SHOTCRETE REPAIRS	REPAIRS TO PRESTRESSED CONCRETE GIRDERS	*** SPLICING OF PRESTRESSING STRAND	* CLASS II SURFACE PREPARATION	* CLASS III SURFACE PREPARATION	* HYDRO-DEMOLITION OF BRIDGE DECK	** SCARIFYING BRIDGE DECK	SHOTBLASTING BRIDGE DECK	CONCRETE DECK REPAIR FOR PPC OVERLAY
	SO. FT.	CU. FT.	CU. FT.	EACH	SO. YD.	SO. YD.	SO. YD.	SO. YD.	SO. YD.	SO. YD.
TOTAL	149,300	125	1.5	1	10	13.5	13.5	17,655	18,574	10

	PPC MATERIALS	PLACING AND FINISHING PPC OVERLAY	EPOXY OVERLAY SYSTEM	CLEANING AND REPAINTING OF BRIDGE #13	PAINTING CONTAINMENT FOR BRIDGE #13	STRUCTURAL STEEL FOR REPAIRS	*** EPOXY RESIN INJECTION	MODIFIED ALASKA BARRIER RAIL	FOAM JOINT SEALS	REPLACEMENT OF STEEL GRID DECK
	CU. YD.	SO. YD.	SO. FT.	LUMP SUM	LUMP SUM	LBS.	LIN. FT.	LN. FT.	LUMP SUM	LUMP SUM
TOTAL	495	17655	7390	LUMP SUM	LUMP SUM	25,000	1	3034	LUMP SUM	LUMP SUM

	FLOWABLE FILL	AIR HORN REPLACEMENT	INSTALL NEW SIGNS	MECHANICAL OPERATING MACHINERY	AUXILIARY COUNTERWEIGHT AND SPAN GUIDE REPAIRS	POLLUTION CONTROL	CONC. DECK REPAIR FOR EPOXY OVERLAY	UNDER STRUCTURE WORK PLATFORM	OPERATOR HOUSE RENOVATION
	CY	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	SO. FT.	LUMP SUM	LUMP SUM
TOTAL	8	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	52	LUMP SUM	LUMP SUM

\* QUANTITIES ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. IF ANY ADDITIONAL CLASS II OR III LOCATIONS ARE ENCOUNTERED PRIOR TO OR DURING SCARIFICATION, SEE TYP. 'BLOW THRU' CONTAINMENT AND FALSEWORK DETAILS.

\*\* INCLUDES MILLING OF APPROACH ROADWAY PAVEMENT AT EXISTING APPROACH SLABS.

\*\*\* TOKEN PAY ITEMS ARE INDICATED FOR PRICING PURPOSES, IN CASE UNANTICIPATED REPAIR AREAS ARE ENCOUNTERED.

NOTES:

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS.

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

EXISTING JOINTS AND DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING SURFACE PREPARATION OF BRIDGE DECK.

DEPENDING ON MILLING AND OVERLAY SEQUENCE CHOSEN BY CONTRACTOR, LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS MAY NEED TO BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLAN.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR OVERLAY SURFACE PREPARATION FOR POLYESTER POLYMER CONCRETE, SEE SPECIAL PROVISIONS.

FOR POLYESTER POLYMER CONCRETE BRIDGE DECK OVERLAY, SEE SPECIAL PROVISIONS.

FOR OVERLAY OF BRIDGE WITH EPOXY OVERLAY SYSTEM, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR COAST GUARD COORDINATION, SEE SPECIAL PROVISIONS.

ACCESS TO OPERATOR'S HOUSE FOR BRIDGE TENDER SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.

FOR CONCRETE DECK REPAIR FOR EPOXY OVERLAY, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF WATER TRAFFIC, SEE SPECIAL PROVISIONS.

FOR SECURING VESSELS, SEE SPECIAL PROVISIONS.

FOR FLOWABLE FILL, SEE SPECIAL PROVISIONS.

ALL PROPOSED EXPANSION JOINT DIMENSIONS, OPENINGS AND BLOCKOUTS ARE SHOWN AT 70°F. CONTRACTOR SHALL FOLLOW MANUFACTURER'S INSTALLATION GUIDELINES AND MAKE ANY NECESSARY ADJUSTMENTS.

WORK ON BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE TO ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

PRIOR TO BEGINNING WORK, CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL A COMPLETE SEQUENCE OF TASKS FOR EACH OPERATION AFFECTING THE BRIDGE SURFACE AND/OR TRAFFIC.

CONTRACTOR SHALL DETERMINE EXTENT OF WORKING AREA, STAGING PROCESS, AND INSTALL COVER PLATE ASSEMBLY AS NECESSARY TO MEET THE REQUIREMENTS OF TRAFFIC MANAGEMENT PLANS.

ANY DAMAGE TO EXISTING REINFORCING STEEL, DURING CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR WORK IN, OVER, OR ADJACENT TO NAVIGABLE WATERS, SEE SPECIAL PROVISIONS.

FOR MODIFIED ALASKA BARRIER RAIL, SEE SPECIAL PROVISIONS.

FOR AIR HORN REPLACEMENT, SEE SPECIAL PROVISIONS.

FOR INSTALL NEW SIGNS, SEE SPECIAL PROVISIONS.

FOR MECHANICAL OPERATING MACHINERY, SEE SPECIAL PROVISIONS.

FOR AUXILIARY COUNTERWEIGHT AND SPAN GUIDE REPAIRS, SEE SPECIAL PROVISIONS.

AUXILIARY COUNTERWEIGHT AND SPAN GUIDE REPAIRS SHOWN ON SHEETS MA-1 THROUGH MA-10 SHALL BE COMPLETED EARLY IN THE PROJECT. SEE SHEETS MA-1 THROUGH MA-10 AND THE SPECIAL PROVISIONS.

FOR OPERATOR HOUSE RENOVATIONS, SEE ARCHITECTURAL DRAWINGS AND PROVISIONS. ALL WORK SHOWN ON ARCHITECTURAL DRAWINGS AND DESCRIBED IN THE ARCHITECTURAL PROVISIONS SHALL BE PAID FOR AT THE LUMP SUM PRICE BID FOR OPERATOR HOUSE RENOVATIONS.

FOR CLEANING AND REPAINTING BRIDGE 13, SEE SPECIAL PROVISIONS FOR PAINTING EXISTING STRUCTURE.

FOR REPLACEMENT OF STEEL GRID DECK, SEE SPECIAL PROVISIONS.

FOR STRUCTURAL STEEL FOR REPAIRS, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICES FOR ITEMS ASSOCIATED WITH THE CLEANING AND REPAINTING OF BRIDGE #13.

FOR UNDER STRUCTURE WORK PLATFORM, SEE SPECIAL PROVISIONS.

HYDRO-DEMOLITION IS PERMITTED FOR USE AT CLASS III SURFACE PREPARATION AREA(S) ONLY. FOR HYDRO-DEMOLITION OF BRIDGE DECK, SEE SPECIAL PROVISIONS.

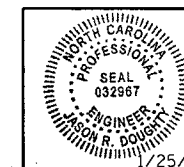
FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

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 STATION: \_\_\_\_\_

STATE OF NORTH CAROLINA  
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GENERAL NOTES  
 AND TOTAL BILL  
 OF MATERIAL

**MODJESKI and MASTERS**  
 Experience great bridges.  
 333 FAYETTEVILLE STREET, SUITE 505  
 RALEIGH, NC 27601  
 NC LICENSE NO. C-2979



DocuSigned by:  
 Jason R Doughty  
 SF73FA2DEA874E8

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-4
2			4			TOTAL SHEETS 66

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

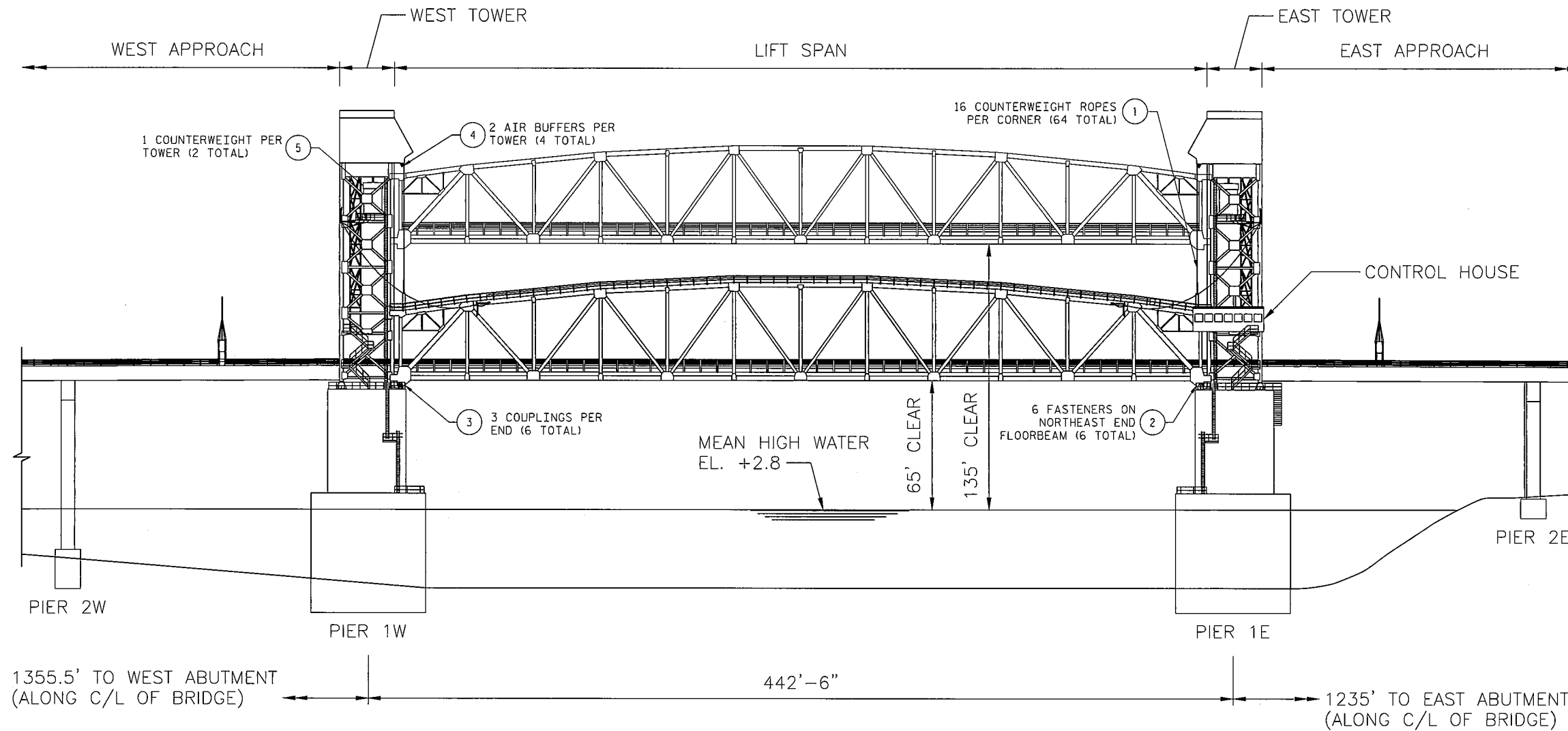
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DESIGNED BY: J. BORUTA DATE: NOV 2017  
 DRAWN BY: C. CORMAN DATE: NOV 2017  
 CHECKED BY: J. DOUGHTY DATE: JAN 2018  
 DESIGN ENGINEER OF RECORD: J. DOUGHTY DATE: JAN 2018

MECHANICAL SCOPE		
ITEM NO.	DESCRIPTION	SHEET NO.
1	CLEAN AND LUBRICATE ALL COUNTERWEIGHT ROPES	M01
2	REPLACE CORRODED FASTENERS AT SPAN LOCK RECEIVER	M02
3	REPLACE ALL SPAN LOCK MACHINERY SHAFT COUPLING SEALS, GASKETS, AND FASTENERS	M02
4	REMOVE UPPER AIR BUFFERS AND REPLACE WITH MARINE FENDER-TYPE BUMPERS ON NEW BRACKETS	M03 AND M04
5	ADD NEW COUNTERWEIGHT PLATES TO BALANCE BRIDGE	SEE SPECIFICATIONS

**NOTE:**

1. FOR ADDITIONAL MECHANICAL SCOPE OF WORK, SEE SHEETS MA-1 THROUGH MA-10.



PROJECT NO. 15BPR.15  
NEW HANOVER COUNTY  
 STATION: \_\_\_\_\_

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 MECHANICAL  
 MECHANICAL SCOPE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	M01
1			3			TOTAL SHEETS
2			4			66

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 RALEIGH, NC 27601  
 NC LICENSE NO. C-2979

01/25/18  
 Lee Lentz  
 283CF085B5F64C

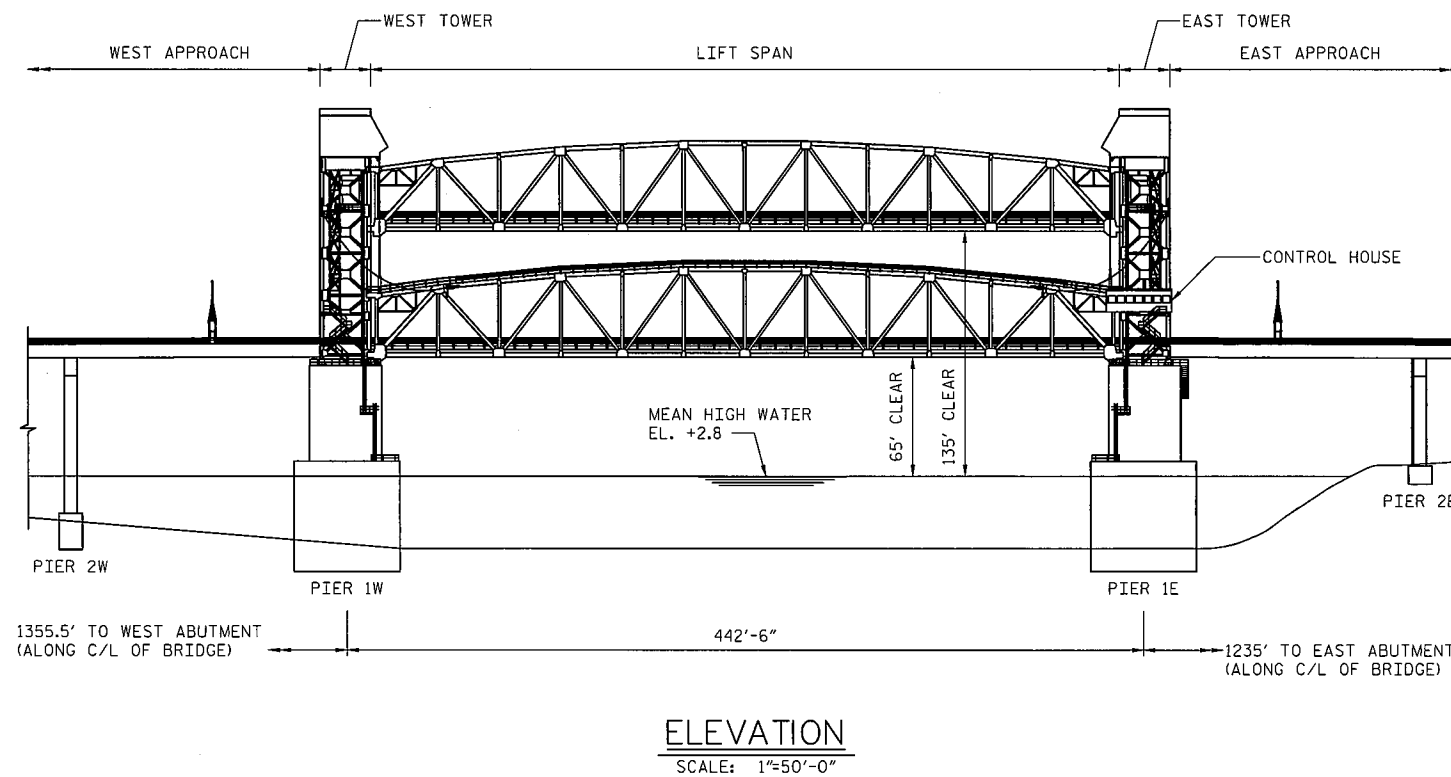
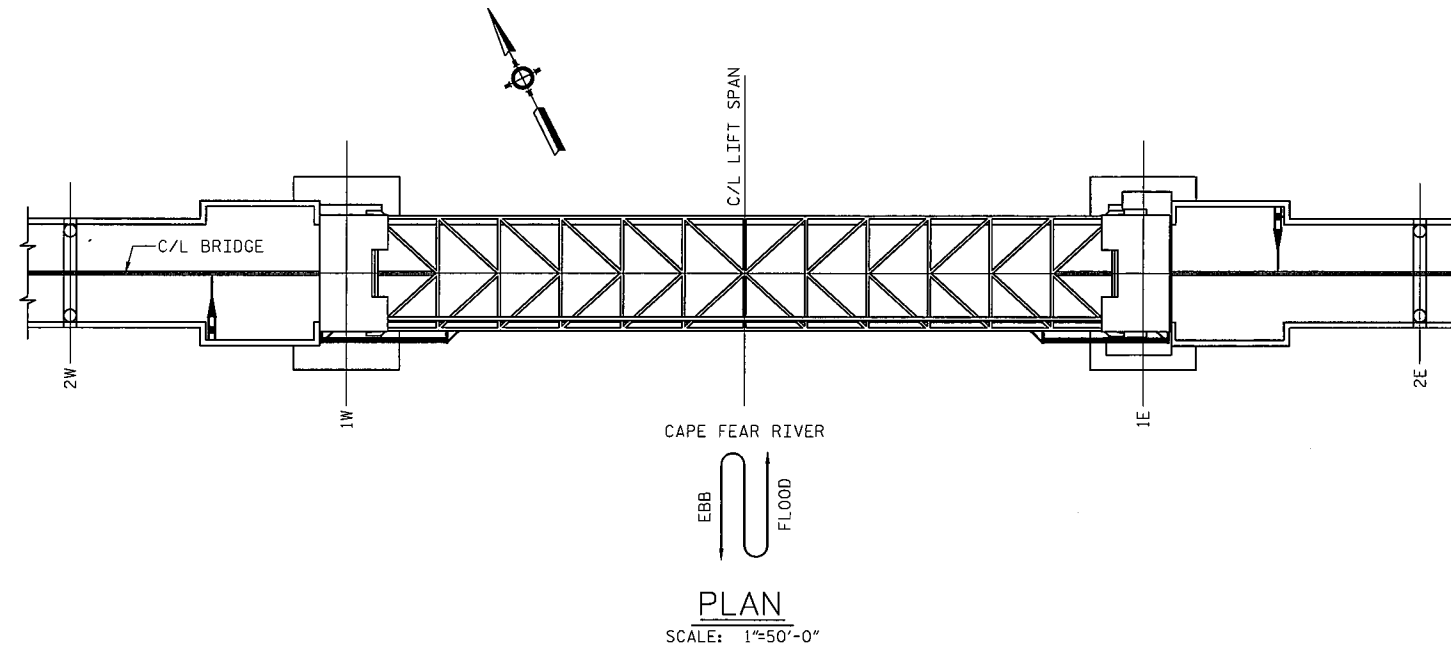
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DESIGNED BY: R. C. HOFFMAN DATE: DEC. 2017  
 DRAWN BY: R. C. HOFFMAN DATE: DEC. 2017  
 CHECKED BY: L. R. LENTZ DATE: JAN. 2018  
 DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: JAN. 2018

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**SCOPE OF MECHANICAL WORK - AUXILIARY COUNTERWEIGHT AND SPAN GUIDE ROLLERS**

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 MA-2 THROUGH MA-10 AND THE SPECIAL PROVISIONS.

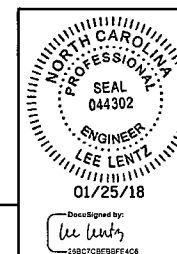


PROJECT NO. 15BPR.15  
NEW HANOVER COUNTY  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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**GENERAL PLAN AND ELEVATION**

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 NC LICENSE NO. C-2979

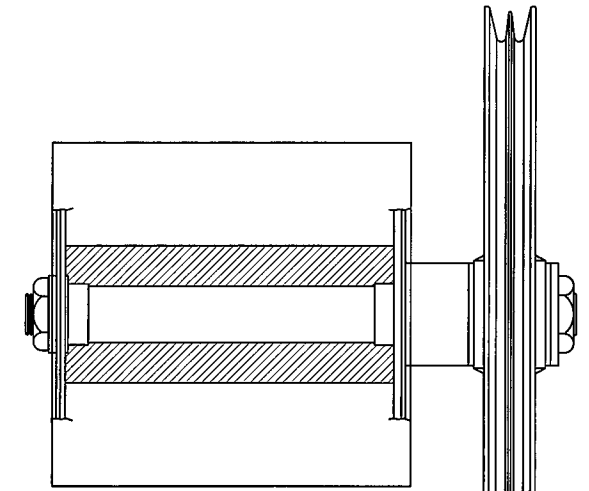
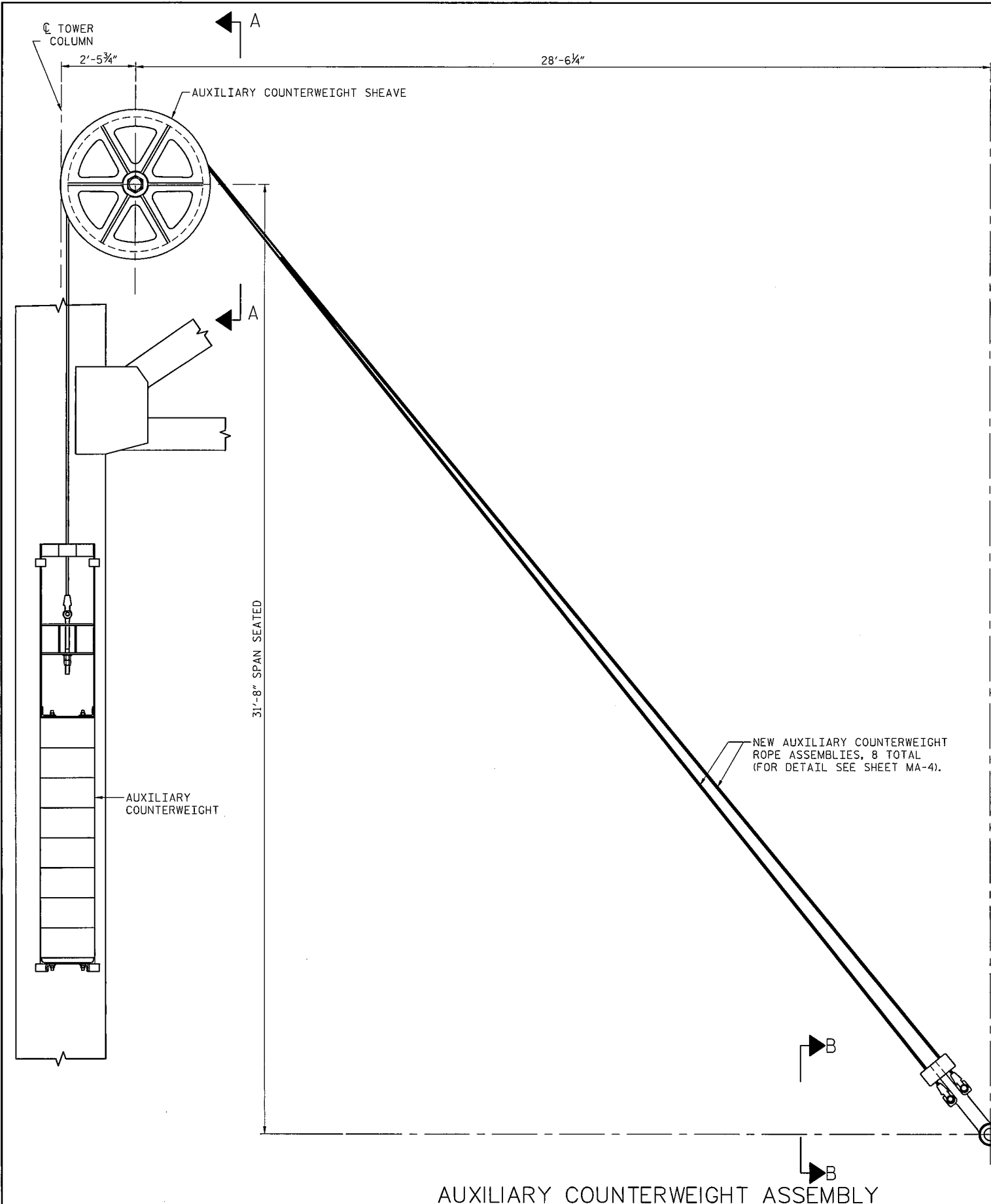


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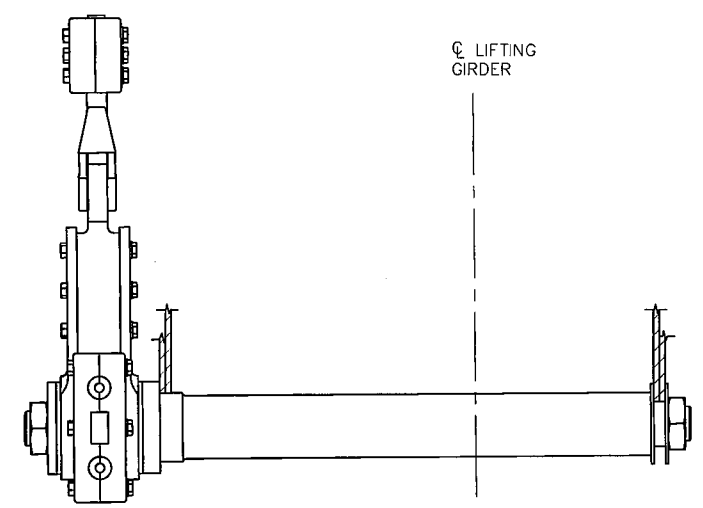
REVISIONS						SHEET NO. MA-1
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

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 FILE: \\modjeski\projects\1562\156201\CADD\Mechanical\MA-1 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: 01/25/18  
 DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18



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



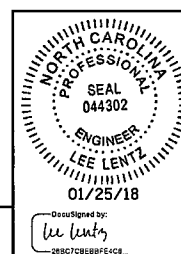
**VIEW B-B**  
SCALE: 1 1/2"=1'-0"  
EXISTING HITCH SHAFT ASSEMBLY ON LIFT SPAN, SHOWING HITCH SHAFT AND ONE OF 2 HITCH ARMS (TYPICAL 2 LOCATIONS, SEE SHEET MA-6 FOR COMPLETE VIEW)

**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. 15BPR.15  
NEW HANOVER COUNTY  
STATION: \_\_\_\_\_

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NC LICENSE NO. C-2979



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

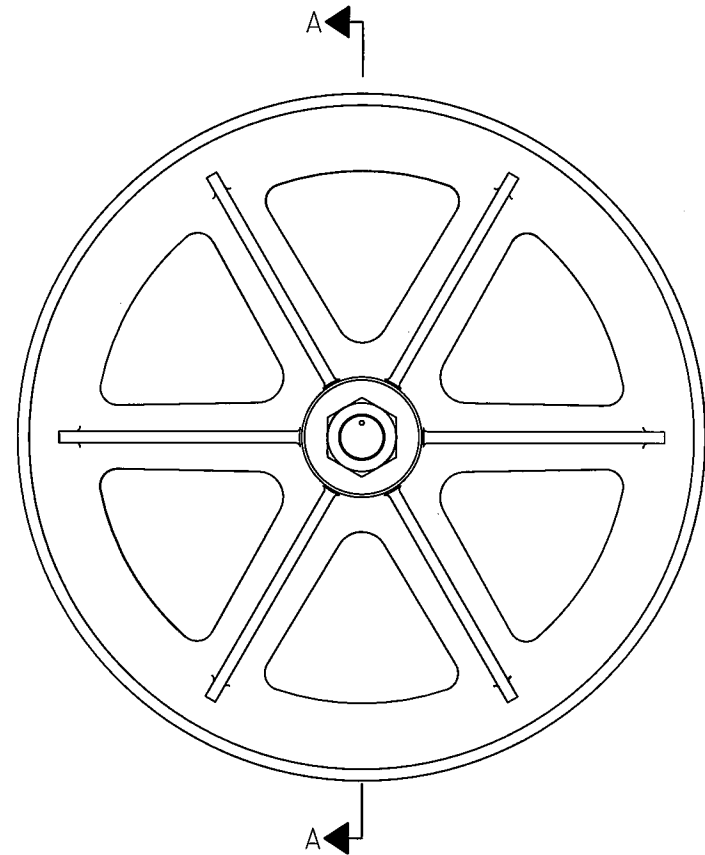
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			10(A)
2			4			

**AUXILIARY COUNTERWEIGHT ASSEMBLY**  
SCALE: 1/2"=1'-0"

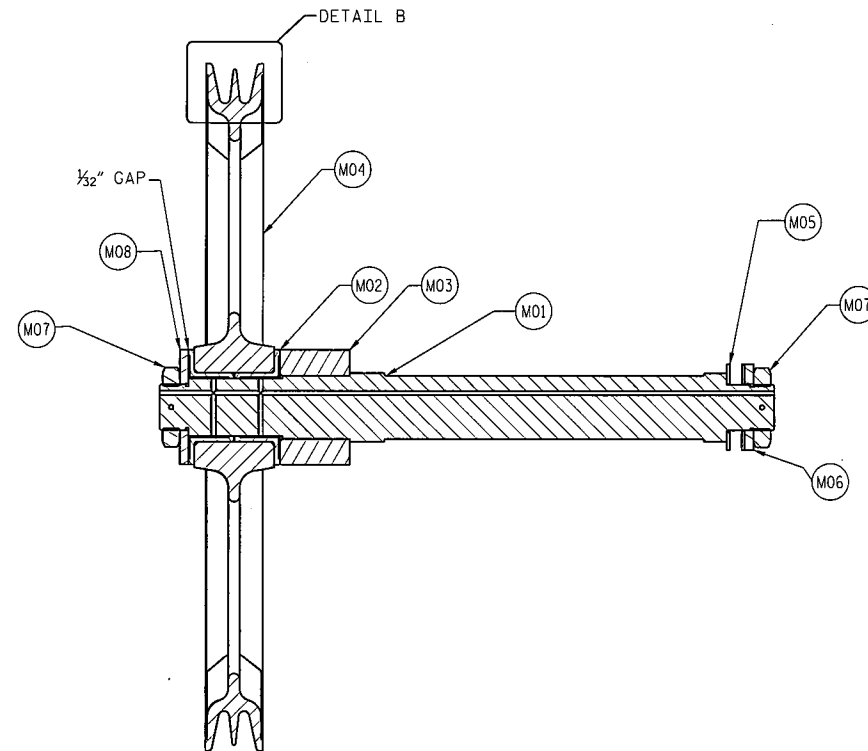
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DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
 DRAWN BY: J. M. SHOUP DATE: 08/17/17  
 CHECKED BY: L. R. LENTZ DATE: 01/25/18  
 DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18

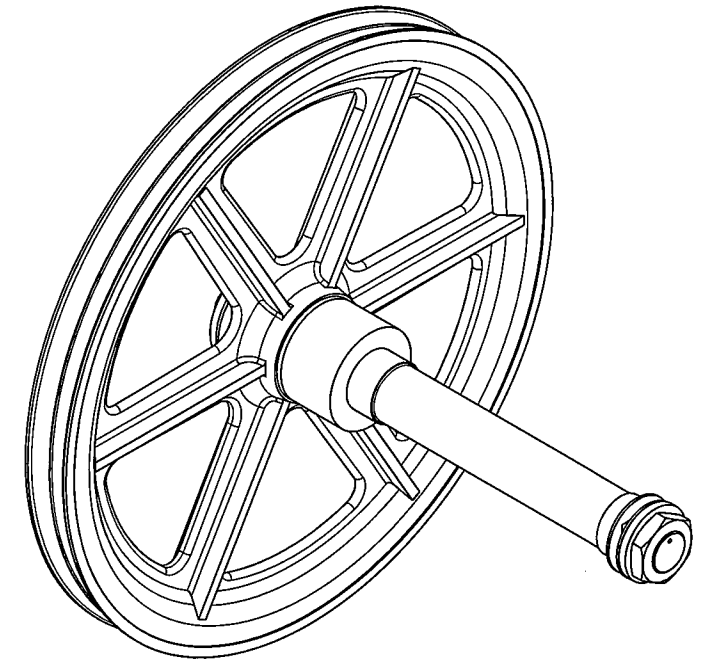
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



**AUXILIARY COUNTERWEIGHT SHEAVE ASSEMBLY**  
SCALE: NTS

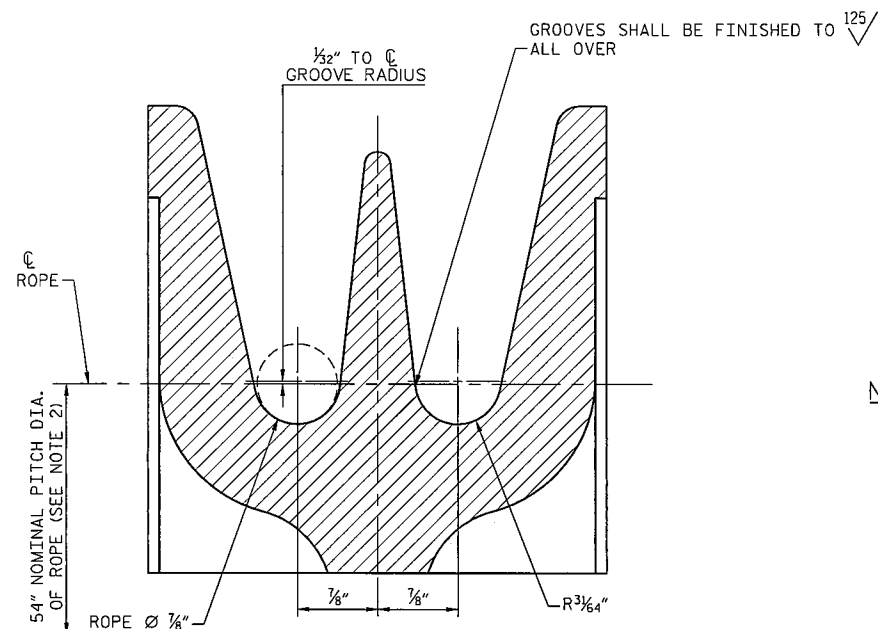


**SECTION A-A**  
SCALE: NTS



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



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

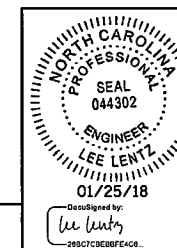
**NOTES:**

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. 15BPR.15  
NEW HANOVER COUNTY  
STATION: \_\_\_\_\_

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 1**

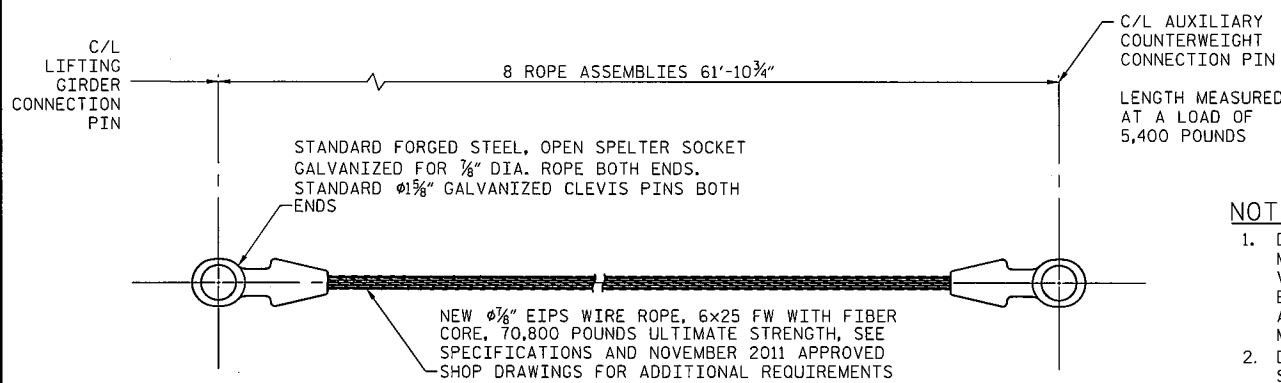
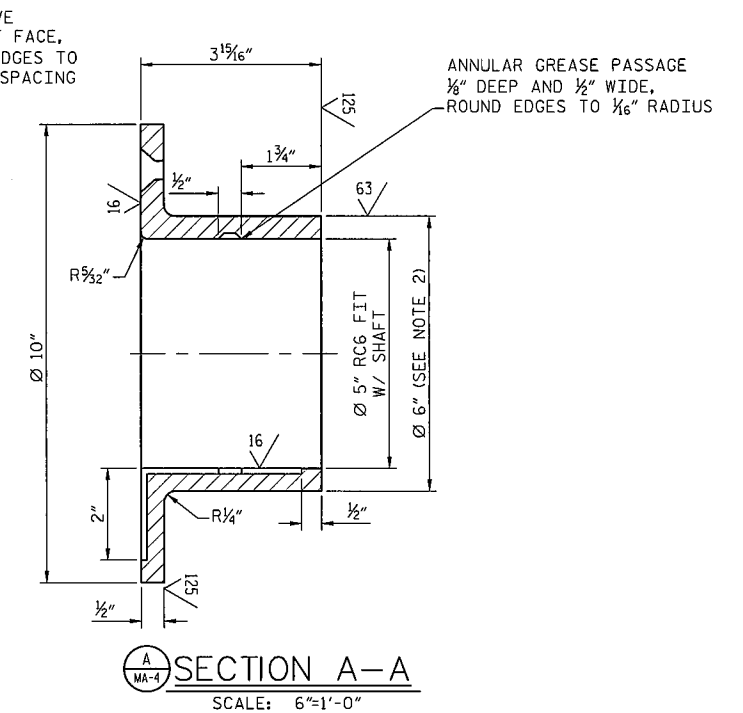
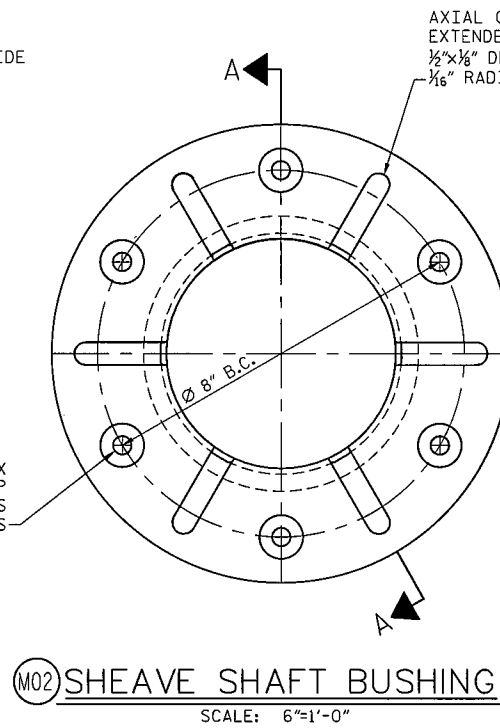
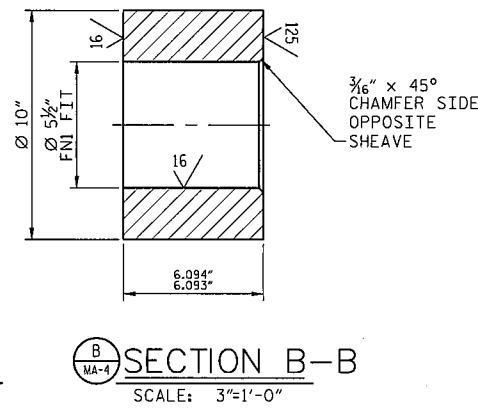
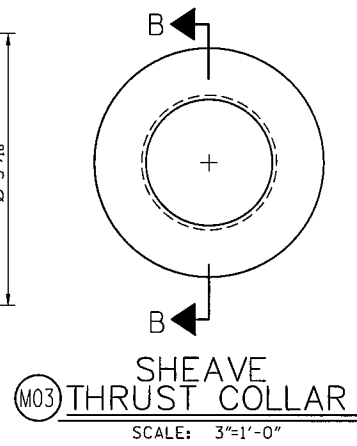
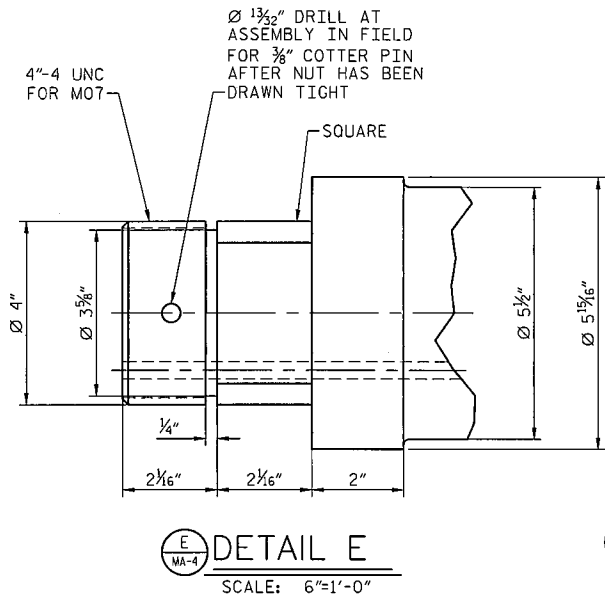
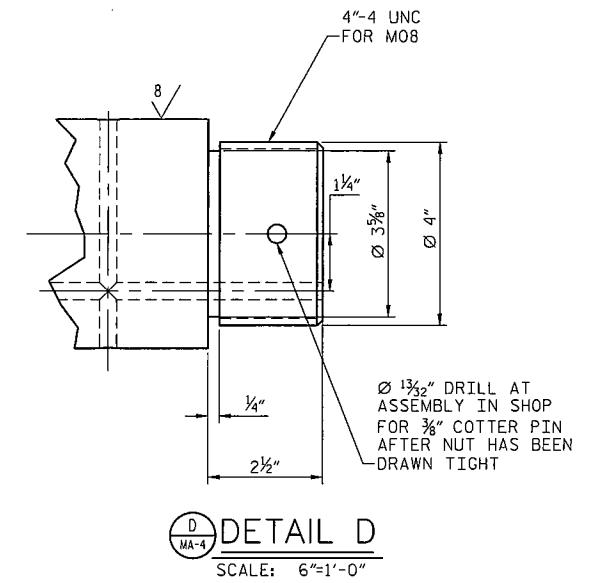
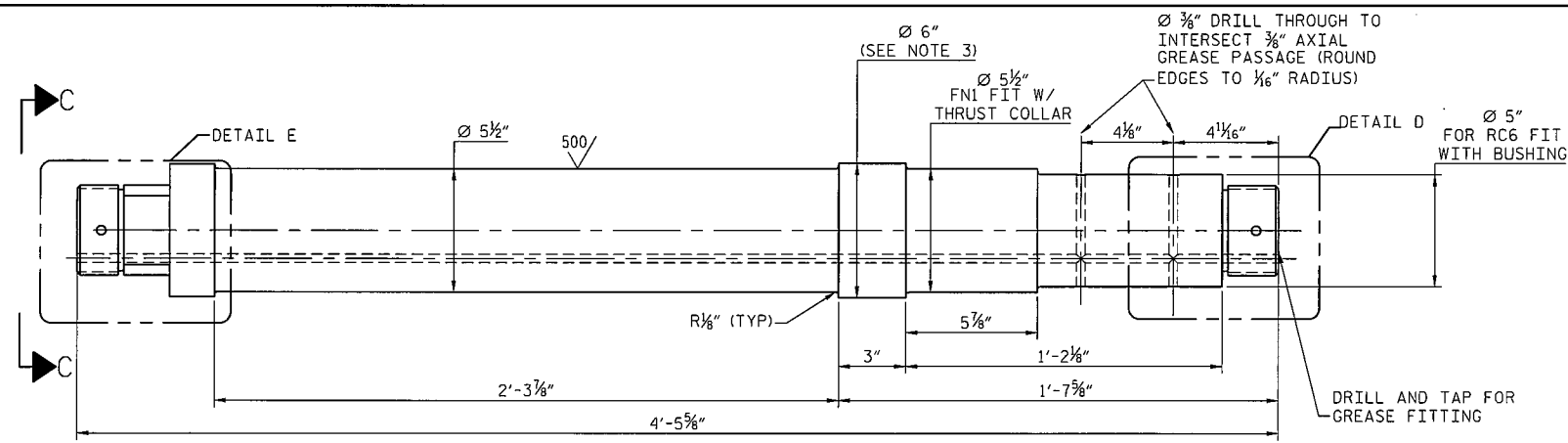
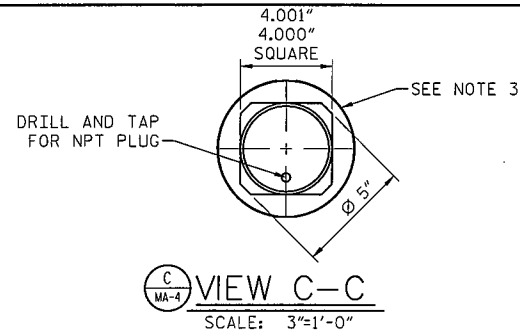
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	MA-3
1			3			TOTAL SHEETS
2			4			10(A)

DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
DRAWN BY: J. M. SHOUP DATE: 08/17/17  
CHECKED BY: L. R. LENTZ DATE: 01/25/18  
DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



- NOTES:**
- 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.
  - DIAMETER TO MATCH MINIMUM CLEAN SURFACE OF EXISTING SHEAVE FOR FN2 FIT
  - CONTRACTOR SHALL FIELD VERIFY BORES IN EXISTING SUPPORT BRACKET AND SUBMIT TO ENGINEER PRIOR TO FINAL MACHINING.
  - ALL GREASE GROOVES ARE TO BE PROVIDED WITH A 1/16" RADIUS AT EDGES.

PROJECT NO. 15BPR.15  
NEW HANOVER COUNTY  
STATION: \_\_\_\_\_

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

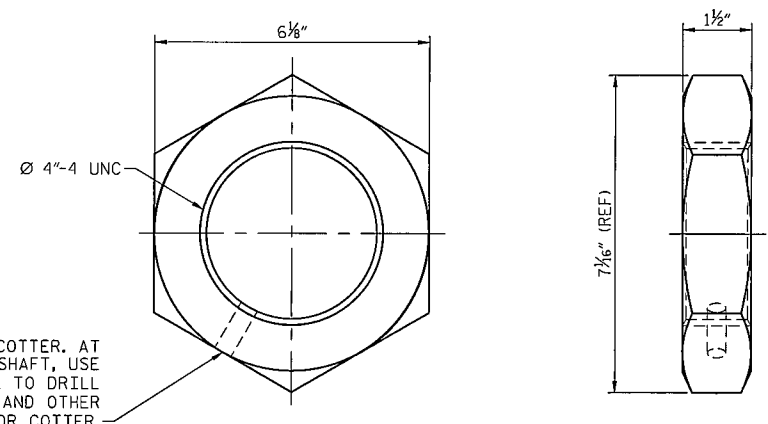
**AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 2**

REVISIONS						SHEET NO. MA-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 10(A)
2			4			

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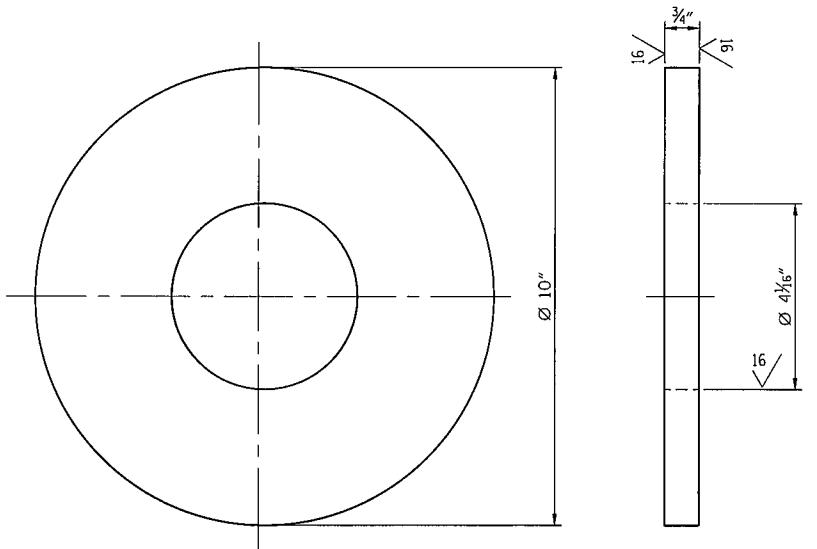
North Carolina Professional Engineer  
SEAL 044302  
ENGINEER  
LEE LENTZ  
01/25/18  
Designed by  
Lee Lentz

DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
DRAWN BY: J. M. SHOUP DATE: 08/17/17  
CHECKED BY: L. R. LENTZ DATE: 01/25/18  
DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18

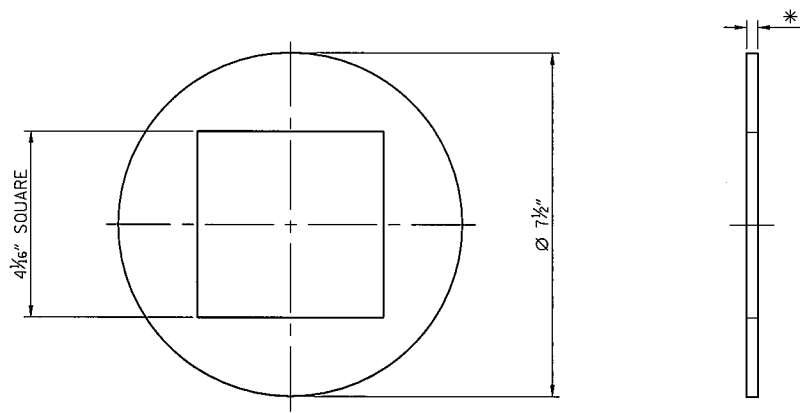


DRILL  $\varnothing 1\frac{1}{2}$ " FOR COTTER. AT ASSEMBLY WITH SHAFT, USE HOLE AS GUIDE TO DRILL THROUGH SHAFT AND OTHER SIDE OF NUT FOR COTTER.

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



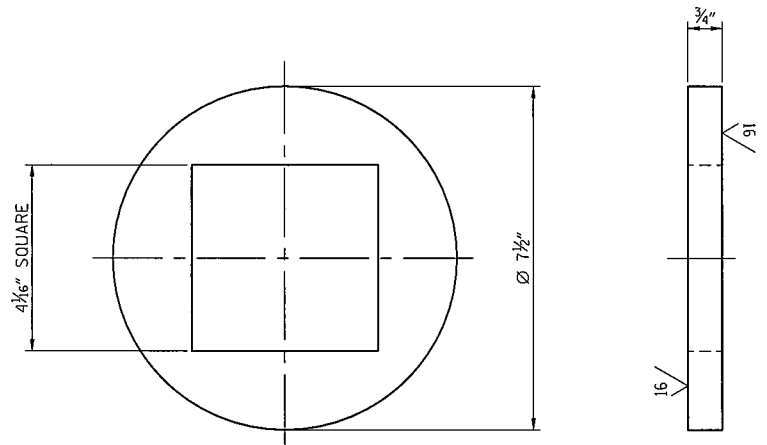
**(M08) 10" THRUST WASHER**  
SCALE: 6"=1'-0"



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

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

QTY:	THICKNESS:
1	1/4"
1	3/8"
1	1/2"
1	5/8"
2	3/4"



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

LAST SAVED 1/24/2018 4:26 PM BY EASAMPLE. LAST PLOTTED 1/24/2018 4:58 PM. FILE: \\nmidg01\project\3682\01\CADD\Mechanical\MA-5 AUX. COUNTERWEIGHT ASSEMBLY DETAILS - 3

DESIGNED BY:	E. A. SAMPLE	DATE:	08/17/17
DRAWN BY:	J. M. SHOUP	DATE:	08/17/17
CHECKED BY:	L. R. LENTZ	DATE:	01/25/18
DESIGN ENGINEER OF RECORD:	L. R. LENTZ	DATE:	01/25/18

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NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 SEAL 044302  
 LEE LENTZ  
 01/25/18  
 Drawn/Sealed by: Lee Lentz

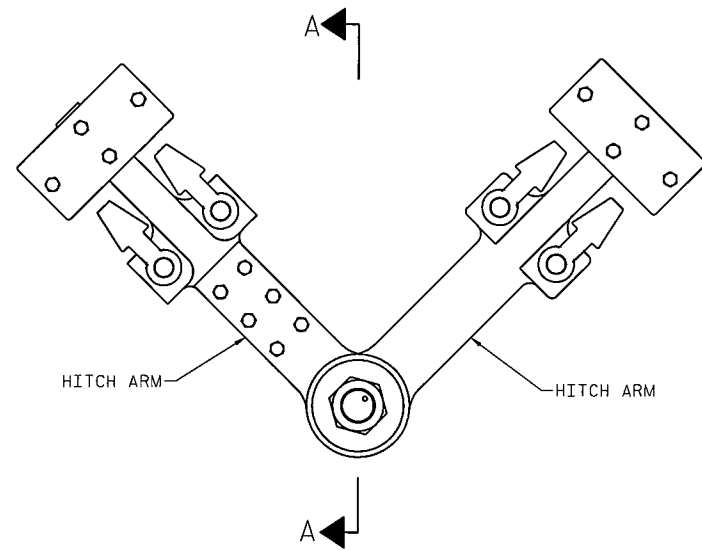
PROJECT NO. 15BPR.15  
NEW HANOVER COUNTY  
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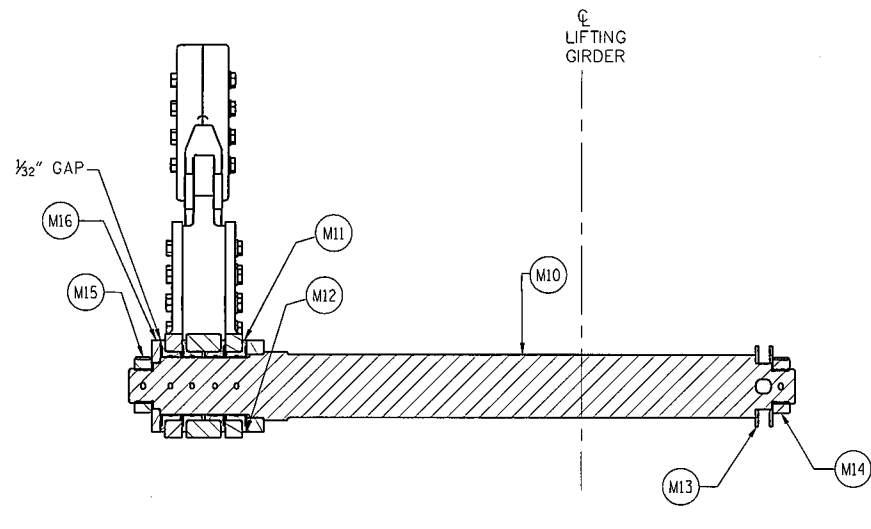
AUX. COUNTERWEIGHT  
 ASSEMBLY DETAILS - 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			MA-5
2			4			10(A)

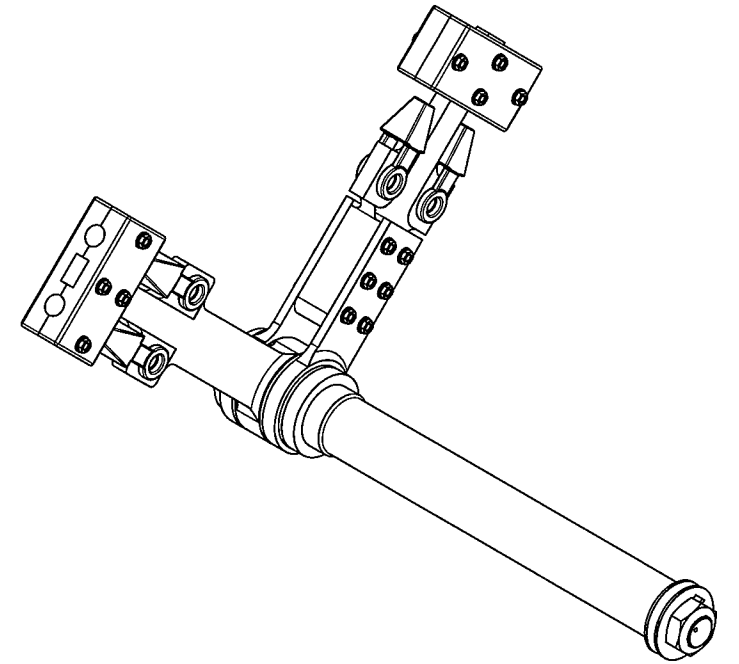
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



**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.

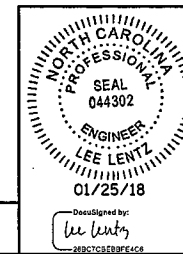
BILL OF MATERIALS			
ITEM NO.	QTY.	DESCRIPTION	MATERIAL/MANUFACTURER
M10	2	NEW HITCH SHAFT	STEEL, ASTM A291, CLASS 3 OR ASTM A311 GR. 4140 COLD DRAWN
M11	8	NEW HITCH SHAFT BUSHING	BRONZE, ASTM B22 ALLOY C91100
M12	2	NEW HITCH THRUST COLLAR	STEEL, ASTM A311 GR. 1045, HOT ROLLED
M13	4	NEW SHIM	STAINLESS, 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

PROJECT NO. 15BPR.15  
NEW HANOVER COUNTY  
STATION: \_\_\_\_\_

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AUX. COUNTERWEIGHT  
ASSEMBLY DETAILS - 4

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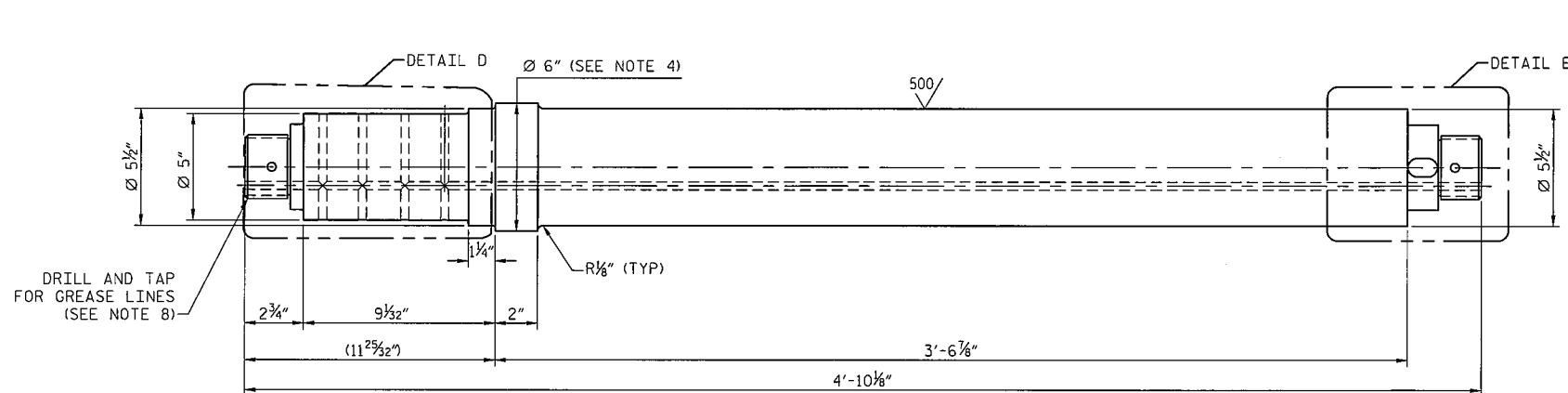
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DRAWN BY: J. M. SHOLP DATE: 08/17/17  
CHECKED BY: L. R. LENTZ DATE: 01/25/18  
DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	MA-6
1			3			TOTAL SHEETS
2			4			10(A)

LAST SAVED 1/24/2018 4:27 PM BY CASAMPLE. LAST PLOTTED 1/24/2018 4:38 PM. FILE: \\modjeski\proj\15BPR\15BPR-01\CADD\Mechanical\MA-6\_AUX\_COUNTERWEIGHT\_ASSEMBLY\_DETAILS - 4

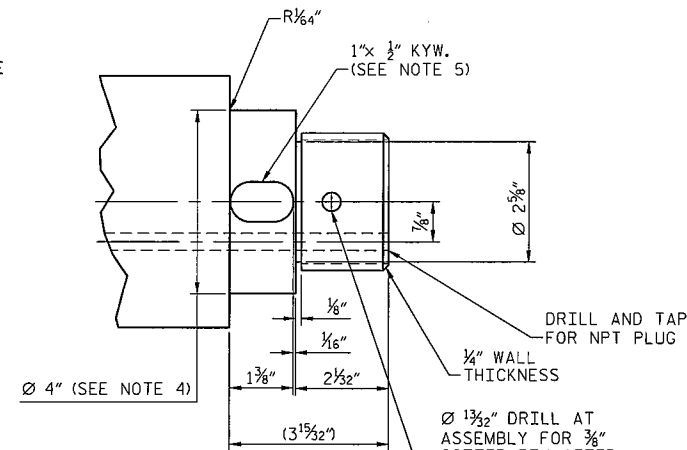




**M10 HITCH SHAFT**

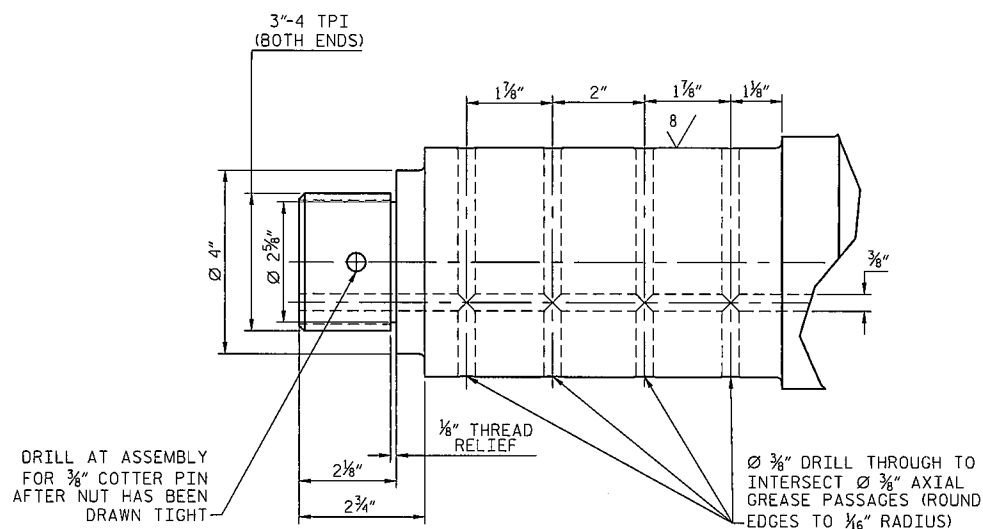
SCALE: 3"=1'-0"

125/ FINISH ALL OVER EXCEPT AS NOTED



**DETAIL E**

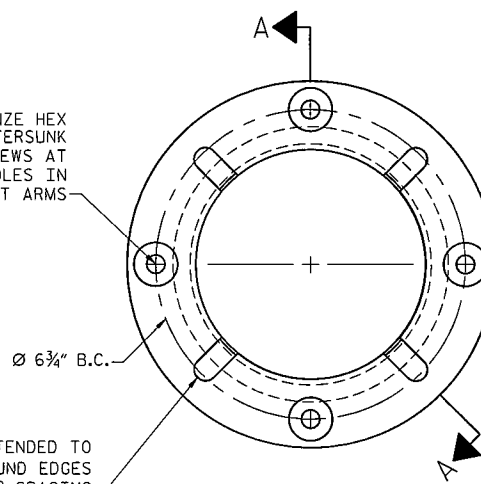
SCALE: 6"=1'-0"



**DETAIL D**

SCALE: 6"=1'-0"

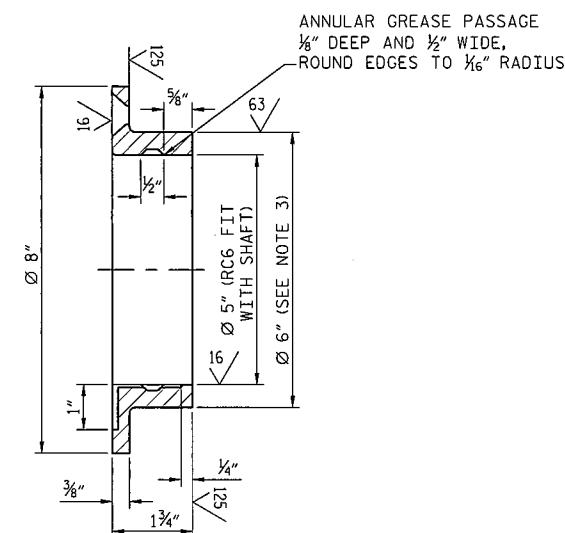
DRILL FOR (4) 3/8" BRONZE HEX SOCKET FLAT COUNTERSUNK HEAD CAP SCREWS AT ASSEMBLY TO MATCH HOLES IN HITCH SHAFT ARMS



**M11 HITCH SHAFT BUSHING**

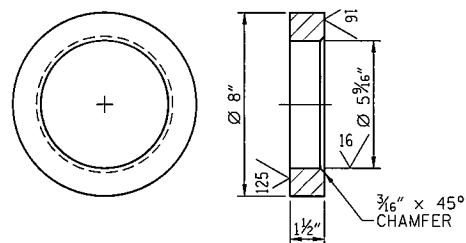
SCALE: 6"=1'-0"

AXIAL GREASE GROOVE EXTENDED TO THRUST FACE, 1/2" x 1/8" DEEP (ROUND EDGES TO 1/16" RADIUS) AT 90° SPACING



**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. 15BPR.15  
NEW HANOVER COUNTY  
 STATION: \_\_\_\_\_

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

AUX. COUNTERWEIGHT  
 ASSEMBLY DETAILS - 5

DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
 DRAWN BY: J. M. SHOUP DATE: 08/17/17  
 CHECKED BY: L. R. LENTZ DATE: 01/25/18  
 DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18

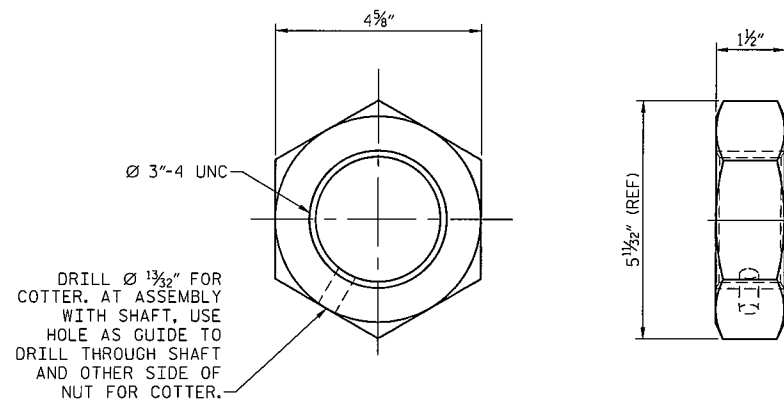
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 NC LICENSE NO. C-2979

**NORTH CAROLINA PROFESSIONAL ENGINEER**  
 SEAL 044302  
 LEE LENTZ  
 01/25/18  
 Discussed by: *lee lentz*

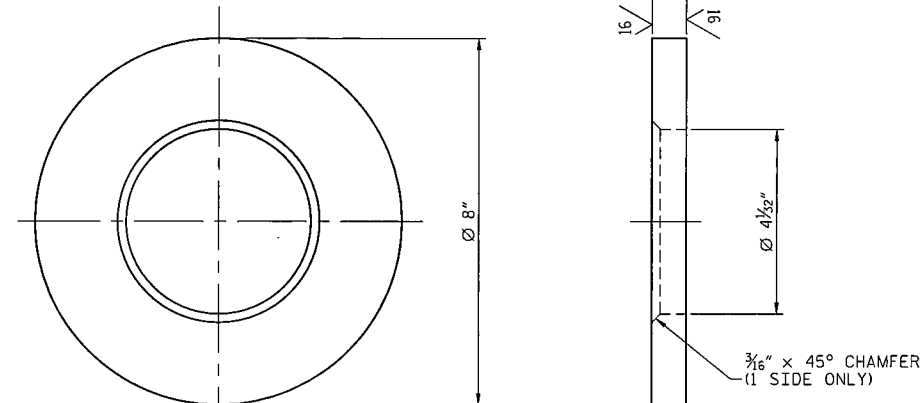
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2			4			10(A)

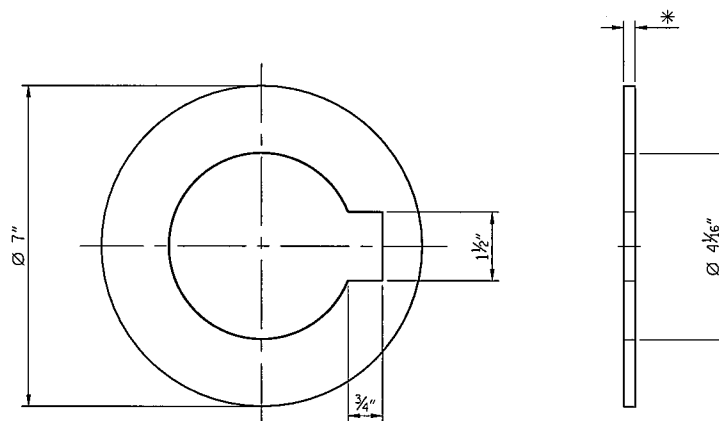
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**M14 LOCK NUT**  
SCALE: 6"=1'-0"



**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:

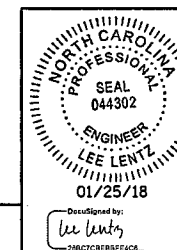
- 1 1/4"
- 1 1/8"
- 1 1/16"
- 1 1/32"
- 1 1/64"

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NEW HANOVER COUNTY  
STATION: \_\_\_\_\_

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DEPARTMENT OF TRANSPORTATION  
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AUX. COUNTERWEIGHT  
ASSEMBLY DETAILS - 6

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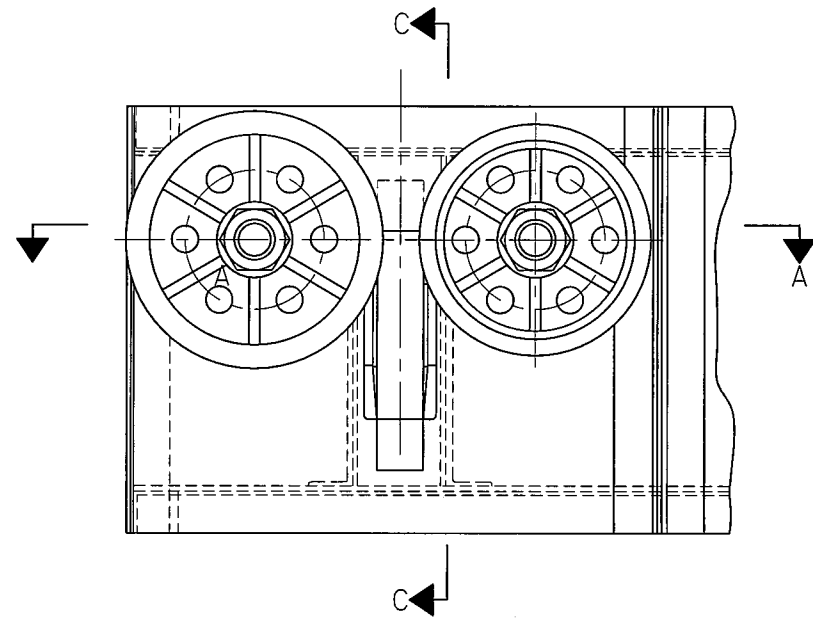


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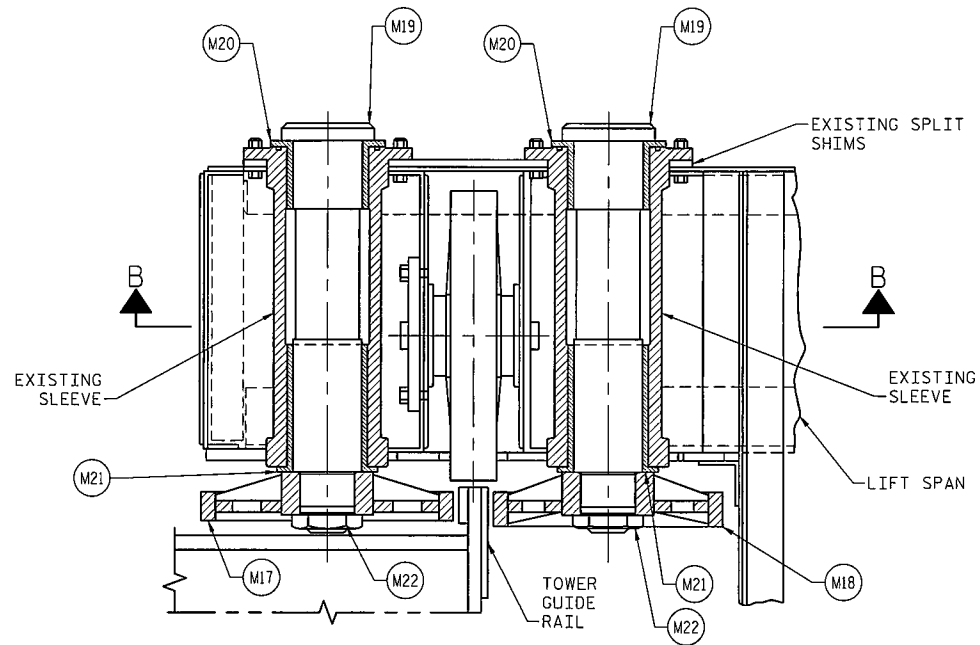
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DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
DRAWN BY: J. M. SHOUP DATE: 08/17/17  
CHECKED BY: L. R. LENTZ DATE: 01/25/18  
DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18



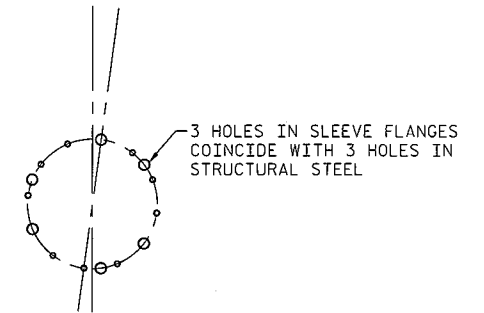
**LOWER GUIDE ROLLERS FIXED END**

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



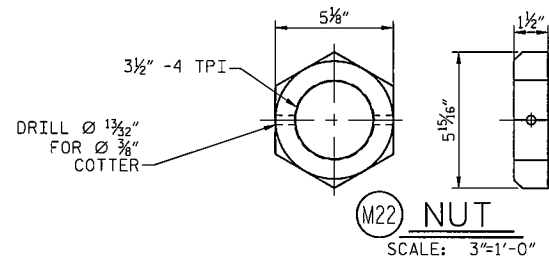
**SECTION A-A**

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

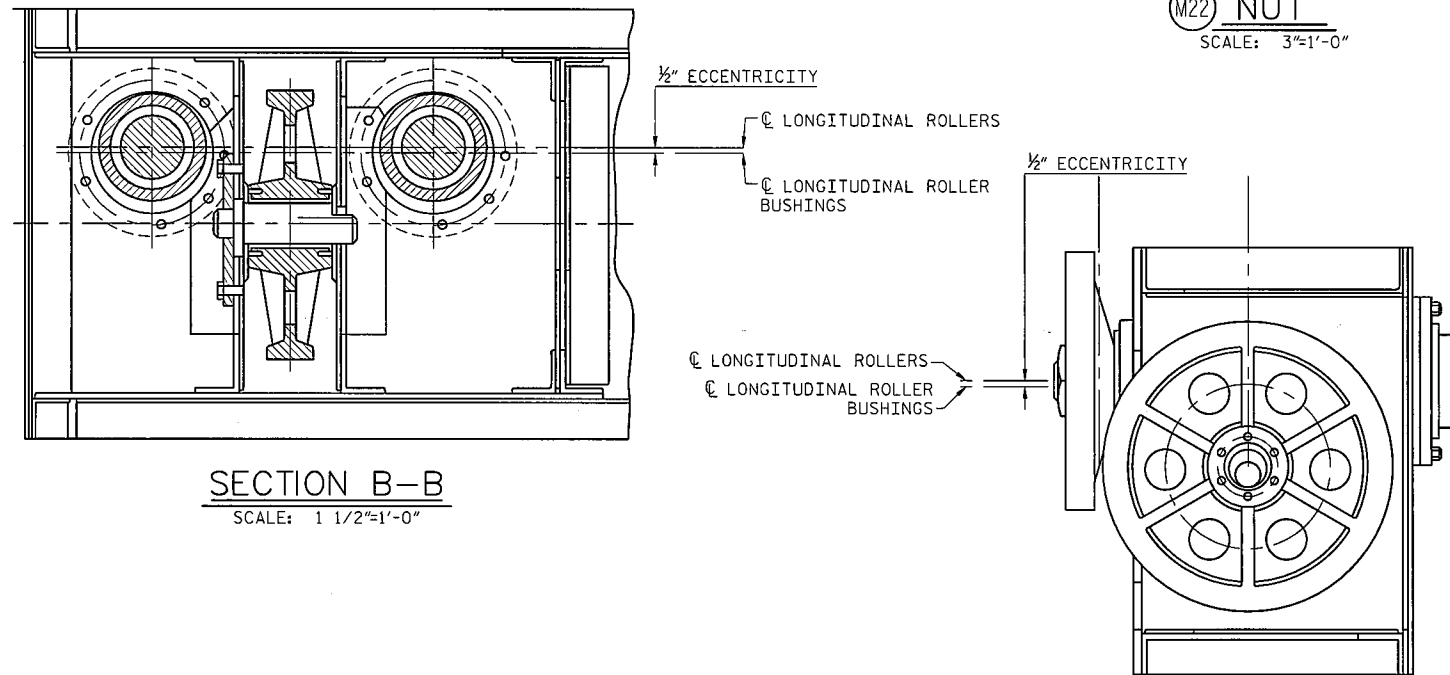


**HOLE SPACING FOR ECCENTRIC ADJUSTMENT**

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 1/4" LG.



**M22 NUT**  
SCALE: 3"=1'-0"



**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. 15BPR.15  
NEW HANOVER COUNTY  
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**SPAN GUIDE ASSEMBLY**

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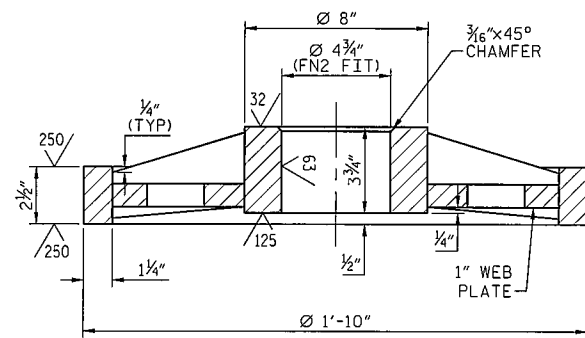
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 044302  
LEE LENTZ  
01/25/18  
Designed by: *Lee Lentz*

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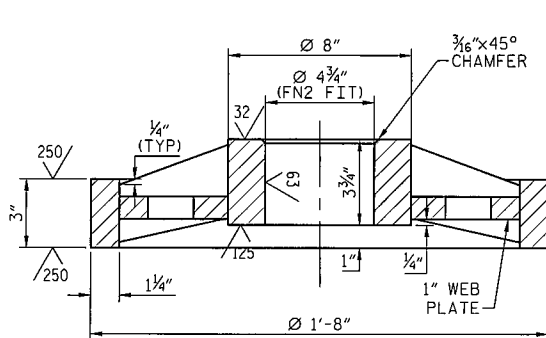
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DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
DRAWN BY: J. M. SHOUP DATE: 08/17/17  
CHECKED BY: L. R. LENTZ DATE: 01/25/18  
DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18

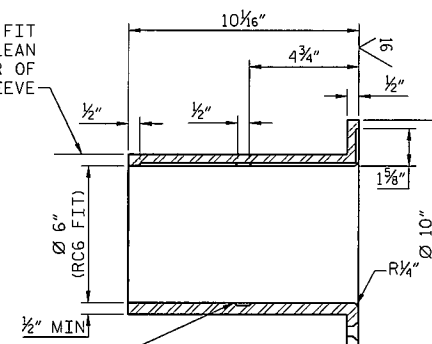


**SECTION A-A**  
SCALE: 3"=1'-0"



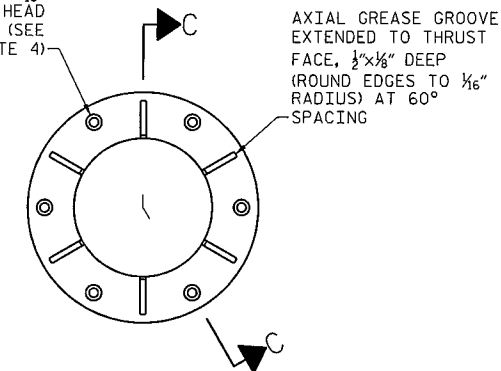
**SECTION B-B**  
SCALE: 3"=1'-0"

PROVIDE FN2 FIT WITH FIRST CLEAN DIAMETER OF EXISTING SLEEVE

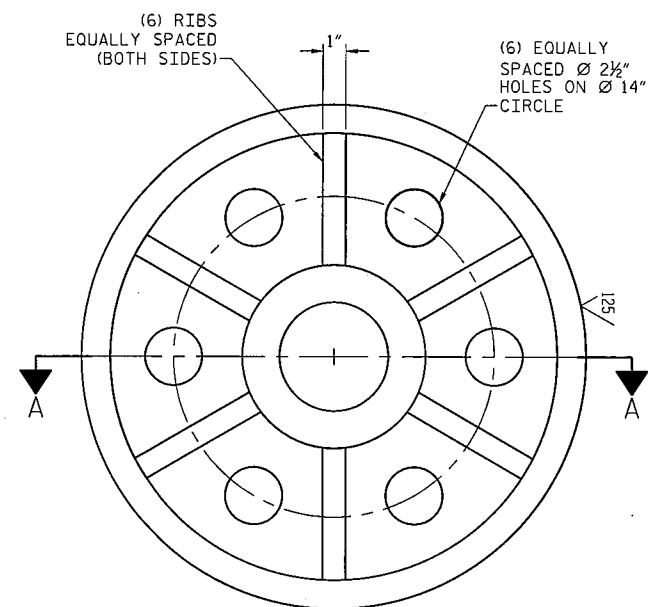


**SECTION C-C**  
SCALE: 3"=1'-0"

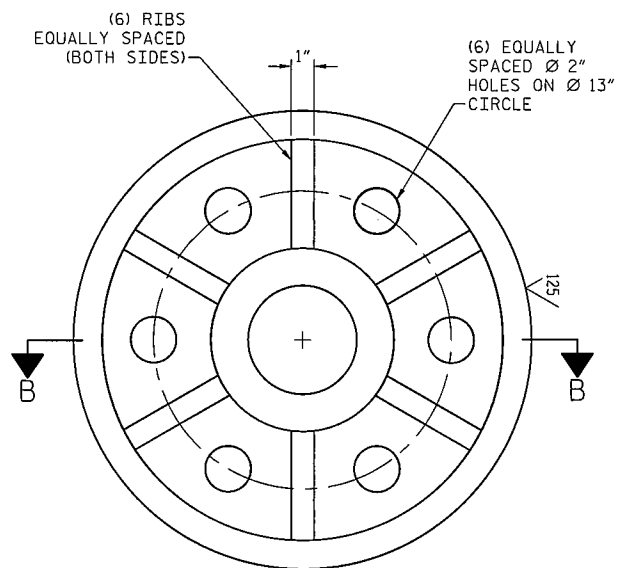
DRILL TO MATCH HOLES FOR (6) 3/16" BRONZE FLAT HEAD CAP SCREWS (SEE NOTE 4)



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

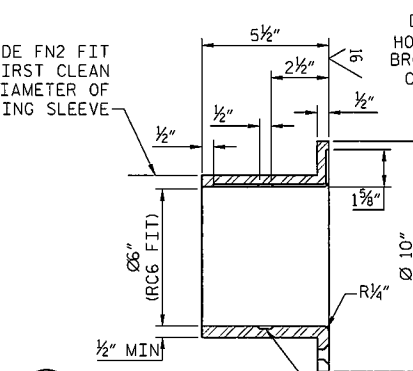


**M17 22" O.D. LONGITUDINAL ROLLER**  
SCALE: 3"=1'-0"



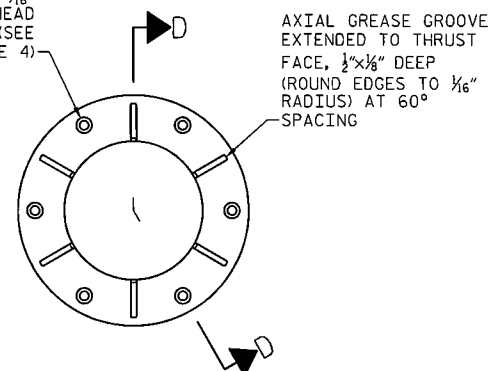
**M18 20" O.D. LONGITUDINAL ROLLER**  
SCALE: 3"=1'-0"

PROVIDE FN2 FIT WITH FIRST CLEAN DIAMETER OF EXISTING SLEEVE

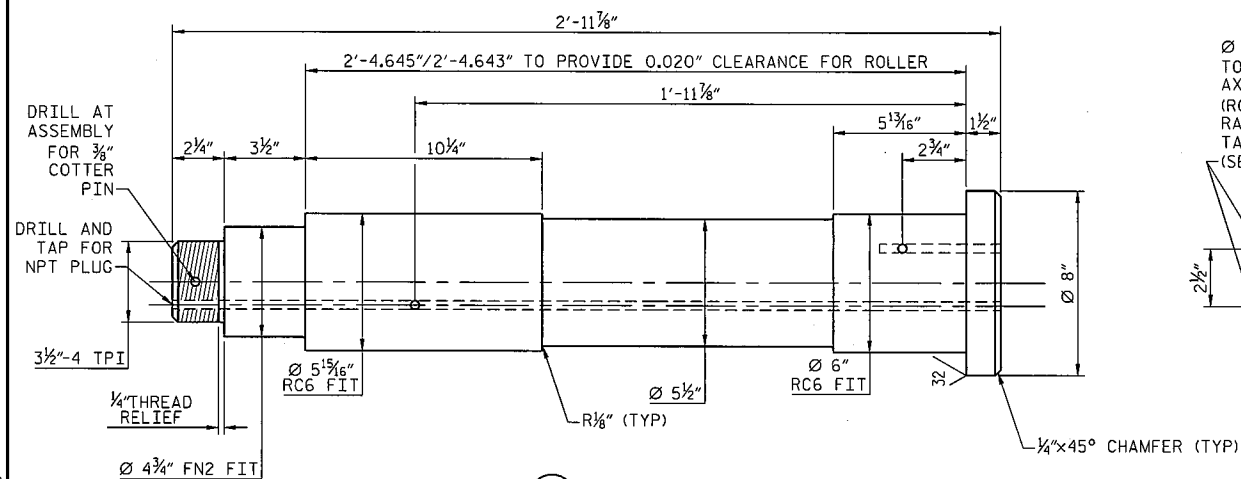


**SECTION D-D**  
SCALE: 3"=1'-0"

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

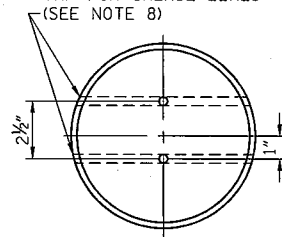


**M20 OUTBOARD LONGITUDINAL ROLLER BUSHING**  
SCALE: 3"=1'-0"



**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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DESIGNED BY: E. A. SAMPLE DATE: 08/17/17  
 DRAWN BY: J. M. SHOUP DATE: 08/17/17  
 CHECKED BY: L. R. LENTZ DATE: 01/25/18  
 DESIGN ENGINEER OF RECORD: L. R. LENTZ DATE: 01/25/18

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 RALEIGH, NC 27601  
 NC LICENSE NO. C-2979

**STATE OF NORTH CAROLINA**  
 PROFESSIONAL SEAL  
 044302  
 ENGINEER  
 LEE LENTZ  
 01/25/18  
 Lee Lentz

PROJECT NO. 15BPR.15  
 NEW HANOVER COUNTY  
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STATE OF NORTH CAROLINA  
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SPAN GUIDE  
 DETAILS

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