

CONTRACT NO: C202539 TIP PROJECT: B-4700M



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**NEW HANOVER
COUNTY**

LOCATION: US-17,74,76, ACROSS CAPE FEAR RIVER

TYPE OF WORK: BRIDGE PRESERVATION: CLEANING & PAINTING LIFT SPAN,
ELECTRICAL REPAIRS, AND MECHANICAL REPAIRS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4700M	1	
STATE PROJECT NO.	F.A. PROJ. NO.	DESCRIPTION	
36727.1.1	BRNHS-000S(504)	PE	
36727.3.14	BRNHS-000S(370)	CONSTR	

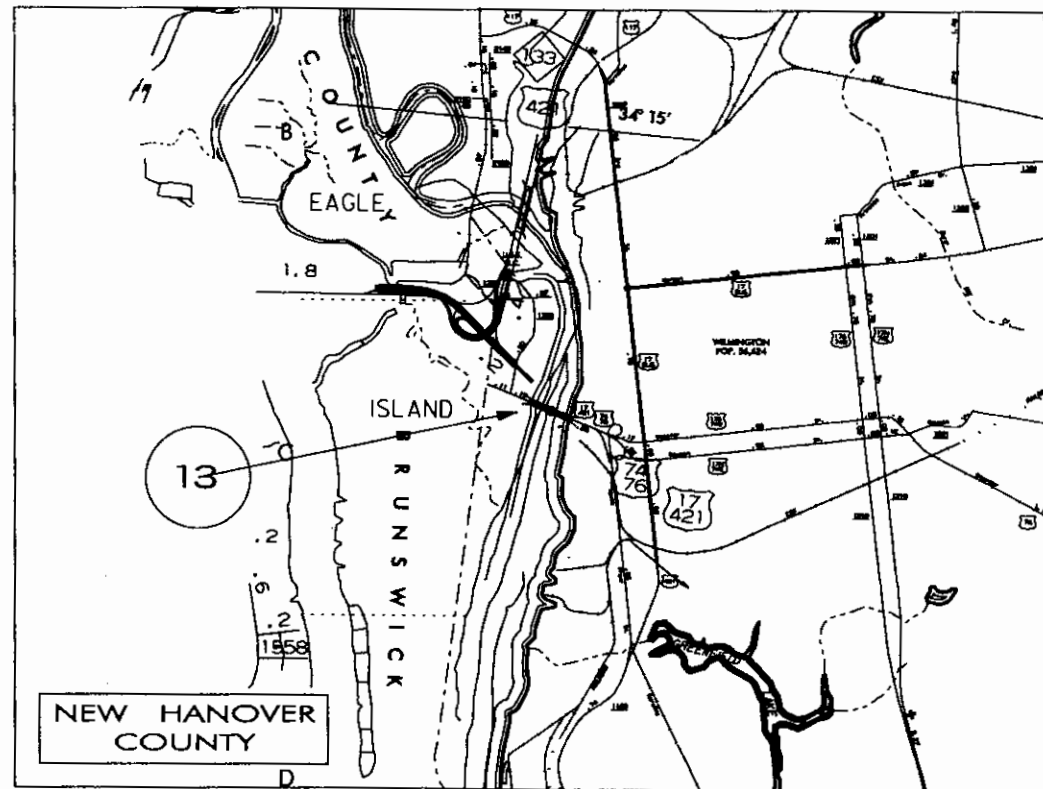


Fig. 13

INDEX OF SHEETS

1	TITLE SHEET
2	SUMMARY OF QUANTITIES
EM-1 THRU EM-15	ELECTRICAL & MECHANICAL REPAIR
S-1 THRU S-40	EXISTING STRUCTURE PLANS
TCP-1 THRU TCP-6	TRAFFIC CONTROL PLANS



PROJECT LENGTH

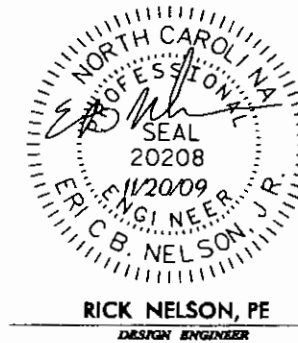
Prepared in the Office of:
BRIDGE MANAGEMENT UNIT
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

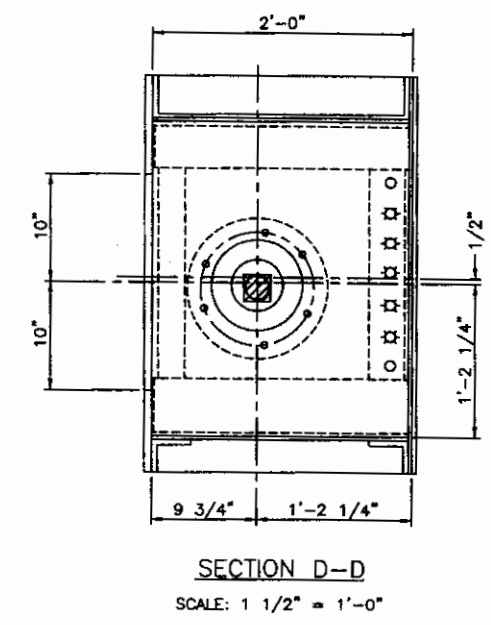
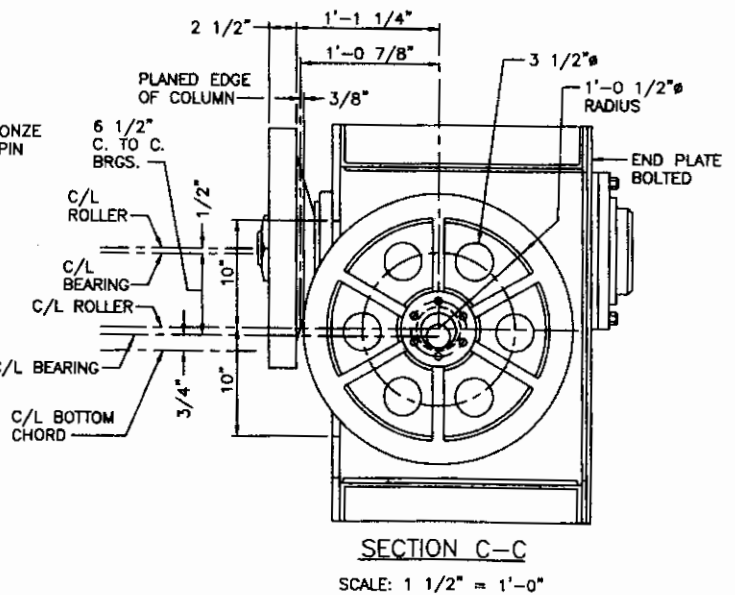
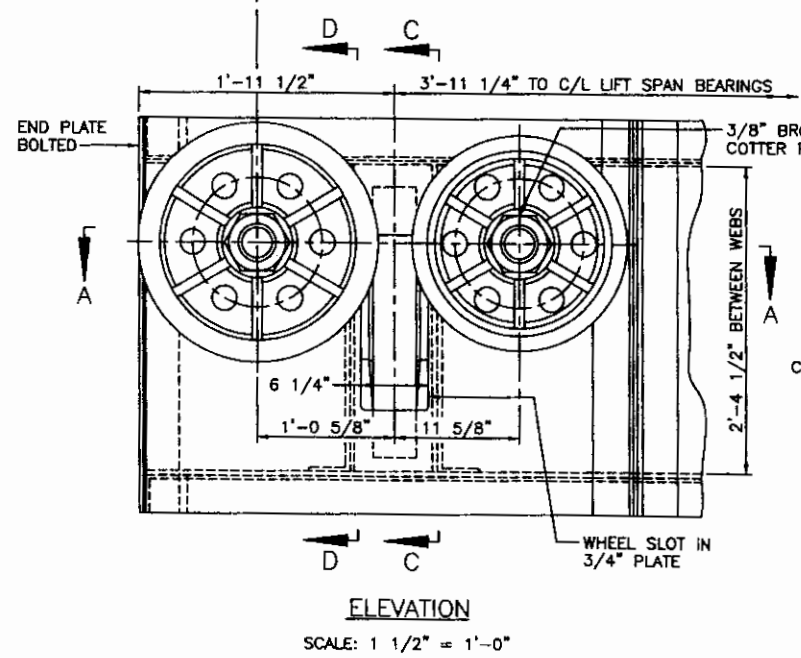
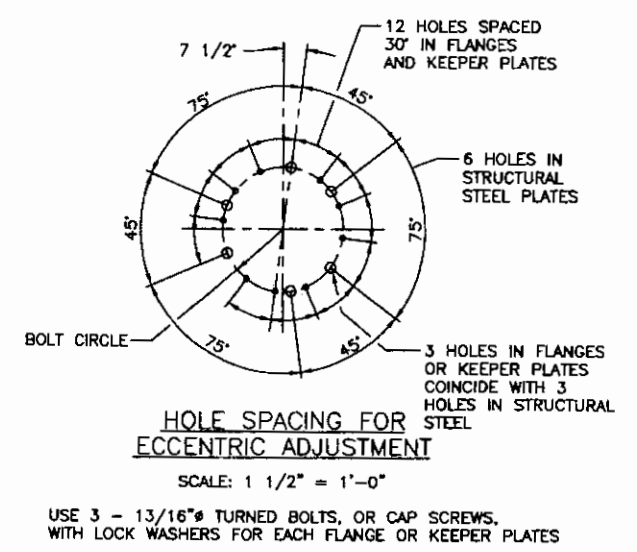
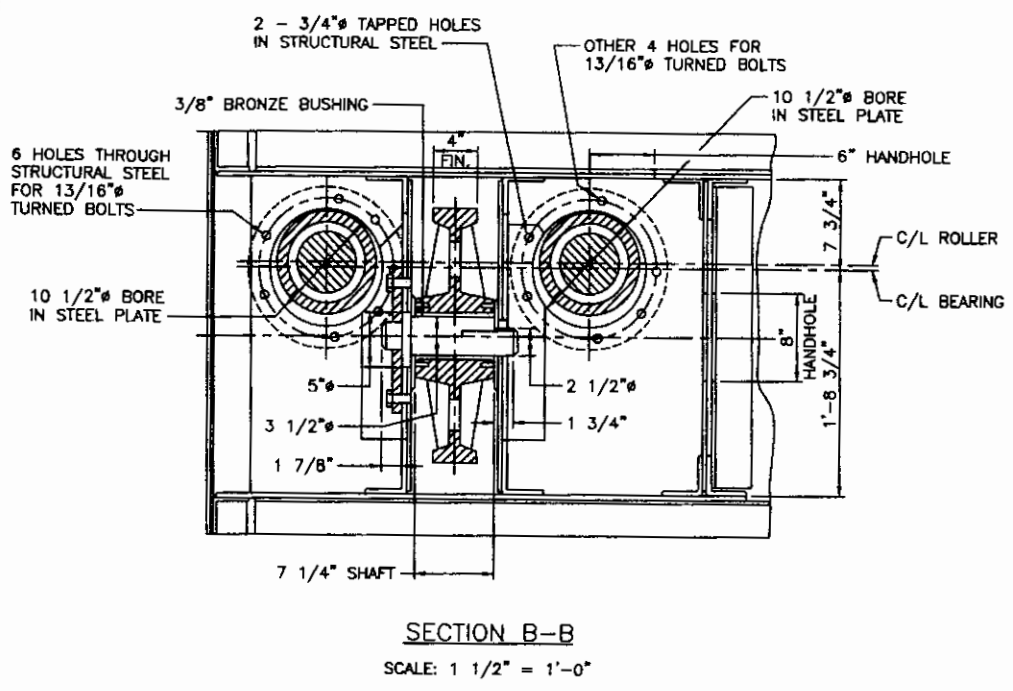
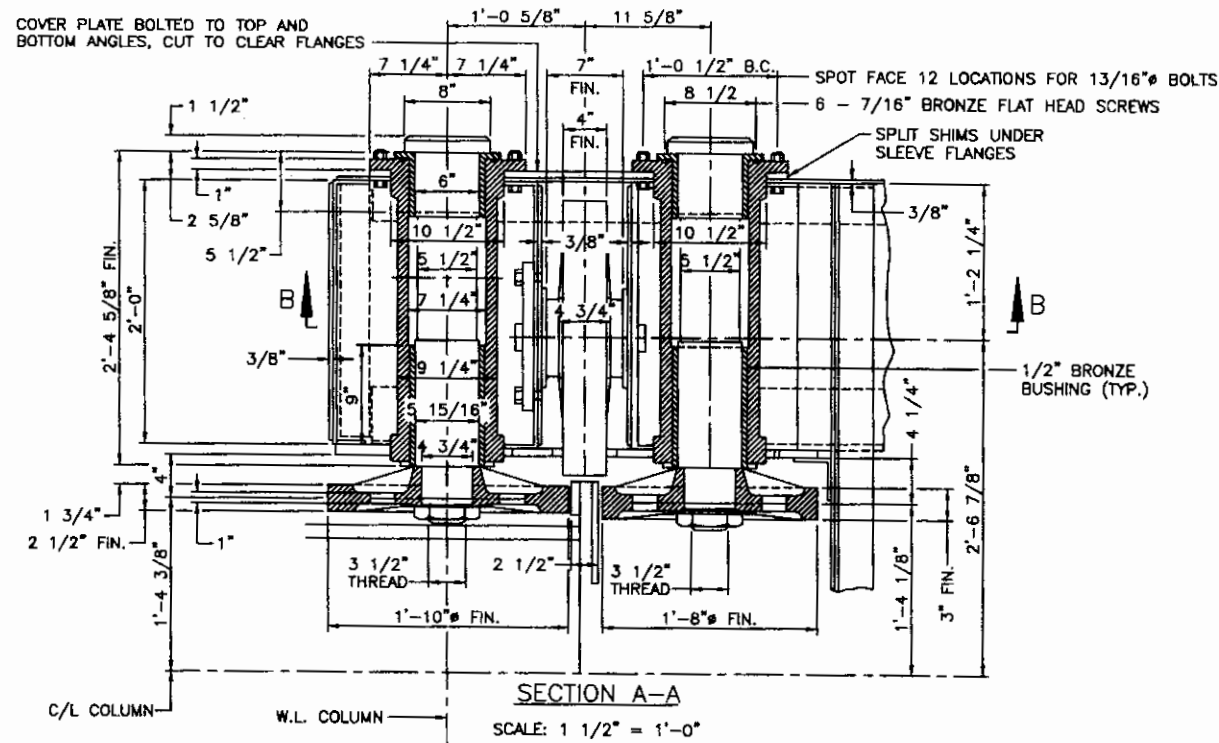
LETTING DATE:
JANUARY 19, 2010

DAN HOLDERMAN, PE
STATE BRIDGE
MANAGEMENT ENGINEER

MIKE SUMMERS
BRIDGE MANAGEMENT
PROJECT MANAGER

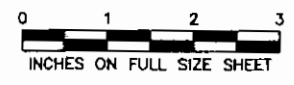


RICK NELSON, PE
DESIGN ENGINEER



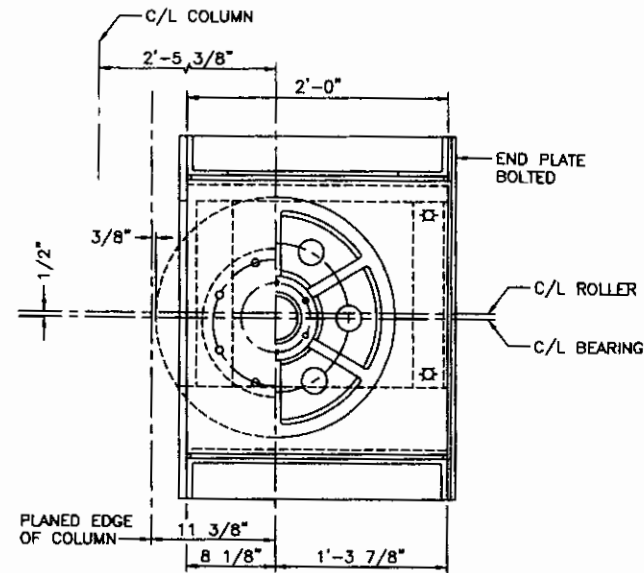
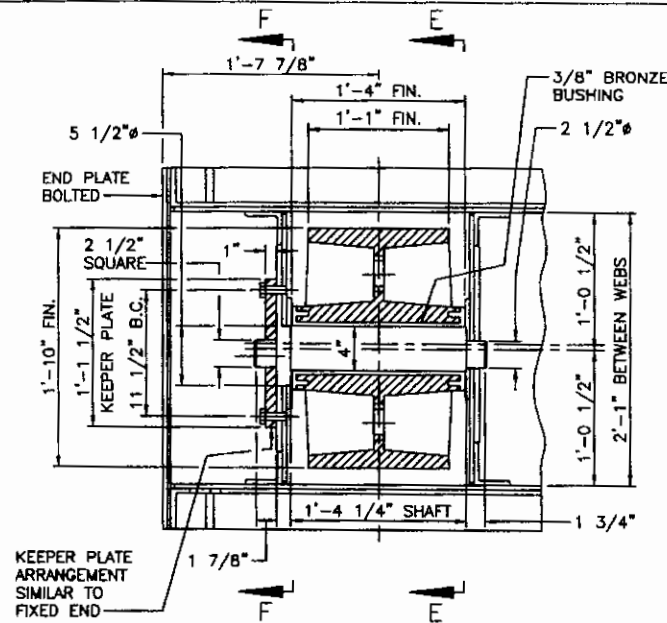
LOWER GUIDE ROLLERS FIXED END
SCALE: 1 1/2" = 1'-0"
(2 SETS REQUIRED)

NOTES:
1. ALL DIMENSIONS ARE FROM THE ORIGINAL DESIGN DRAWINGS AND MUST BE FIELD VERIFIED.



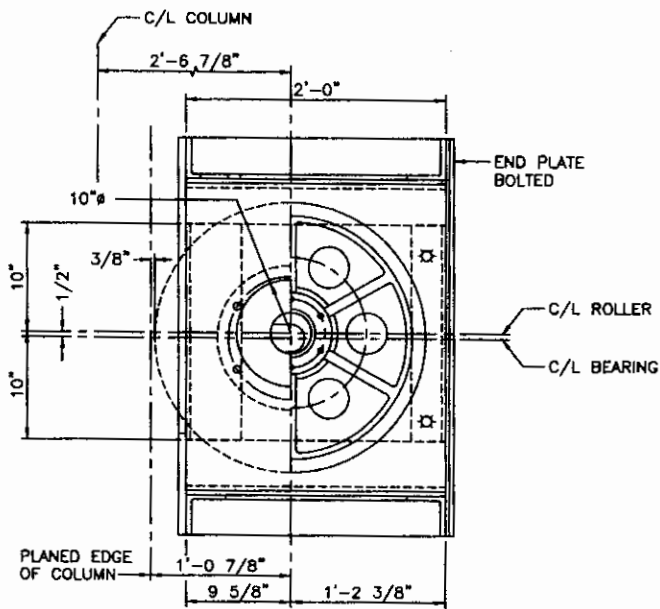
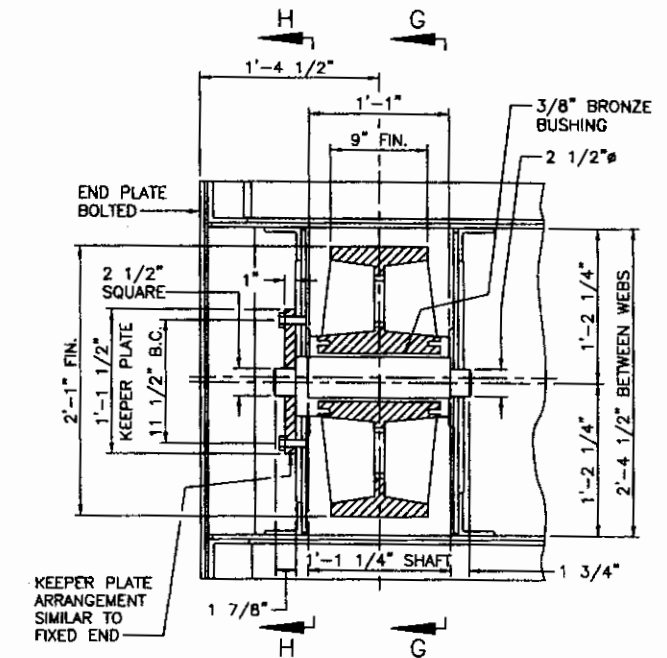
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
CAPE FEAR MEMORIAL LIFT BRIDGE WILMINGTON, NORTH CAROLINA			
EXISTING GUIDE ROLLER ASSEMBLIES -- 1			
DESIGNED	D.M. BARRITT	DATE	OCT. 2009
CHECKED	L.R. LENTZ	DATE	
DRAWN BY	R.L. REED	SCALE	AS NOTED
DRAWING NO.	EM-2		

M1



UPPER GUIDE ROLLERS
FIXED AND EXPANSION END

SCALE: 1 1/2" = 1'-0"
(4 REQUIRED)



LOWER GUIDE ROLLERS
EXPANSION END

SCALE: 1 1/2" = 1'-0"
(2 REQUIRED)

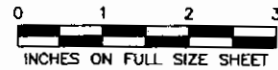
NOTES:

- ALL DIMENSIONS ARE FROM THE ORIGINAL DESIGN DRAWINGS AND MUST BE FIELD VERIFIED.



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	
CAPE FEAR MEMORIAL LIFT BRIDGE WILMINGTON, NORTH CAROLINA	
EXISTING GUIDE ROLLER ASSEMBLIES - 2	
DESIGNED D.M. BARRITT	DRAWN BY R.L. REED
CHECKED L.R. LENTZ	SCALE AS NOTED
CHECKED L.R. LENTZ	DATE OCT. 2008
CHECKED L.R. LENTZ	DRAWING NO. CM-3

M2



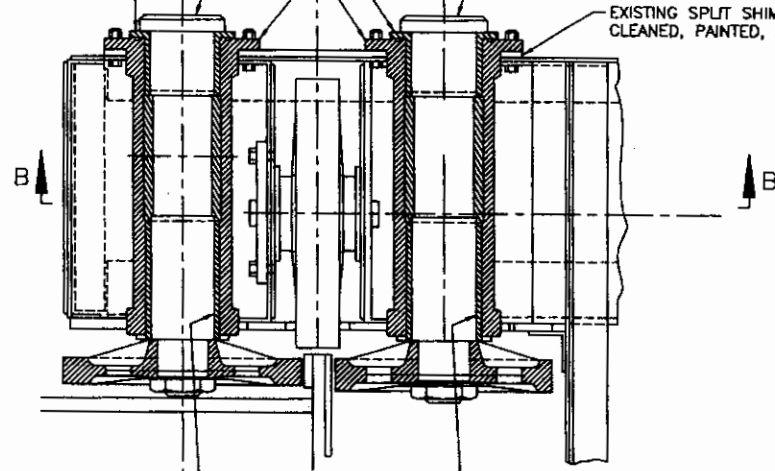
M2 - 03/02/08

NEW OUTBOARD LONGITUDINAL BUSHINGS,
SEE DETAIL ON DRAWING NO. M5

NEW LONGITUDINAL SHAFTS,
(SEE DETAIL ON DRAWING NO. M5)

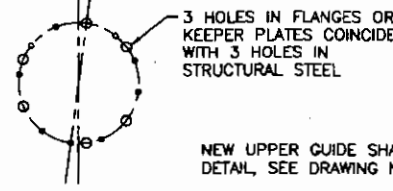
EXISTING SLEEVES TO BE MATCH MARKED,
CLEANED, PAINTED, AND REUSED.

EXISTING SPLIT SHIMS TO BE MATCH MARKED,
CLEANED, PAINTED, AND REUSED.



SECTION A-A

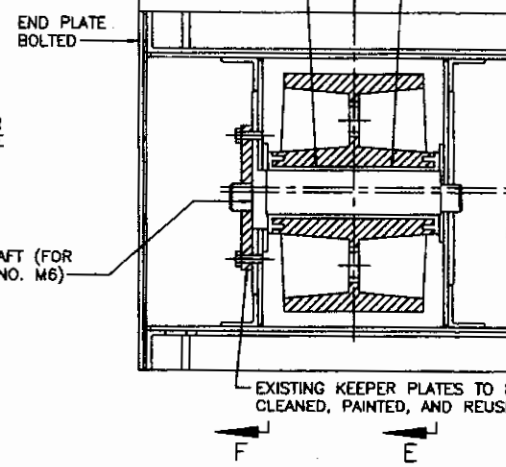
SCALE: 1 1/2" = 1'-0"



HOLE SPACING FOR
ECCENTRIC ADJUSTMENT

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

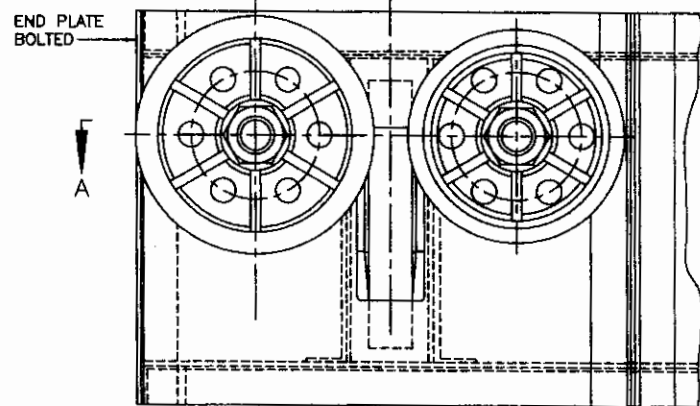
PROVIDE 3 - NEW 13/16" TURNED BOLTS, OR CAP SCREWS,
WITH LOCK WASHERS FOR EACH FLANGE OR KEEPER PLATE
(12 LOCATIONS)



SECTION F-F SECTION E-E

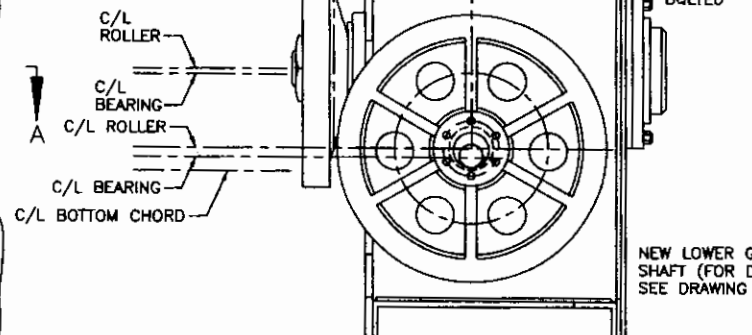
UPPER GUIDE ROLLERS
FIXED AND EXPANSION END

SCALE: 1 1/2" = 1'-0"
(4 REQUIRED)



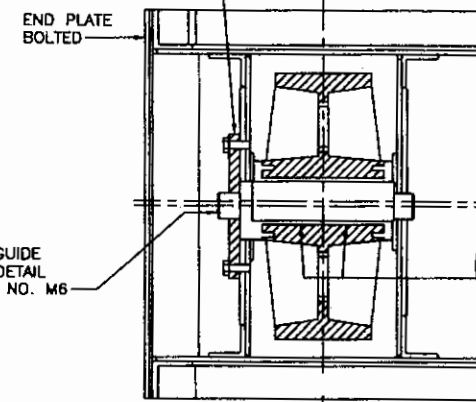
SECTION B-B

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



SECTION C-C

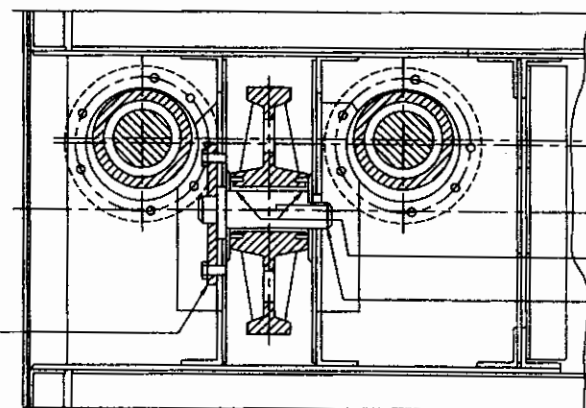
SCALE: 1 1/2" = 1'-0"



SECTION H-H SECTION G-G

LOWER GUIDE ROLLERS
EXPANSION END

SCALE: 1 1/2" = 1'-0"
(2 REQUIRED)

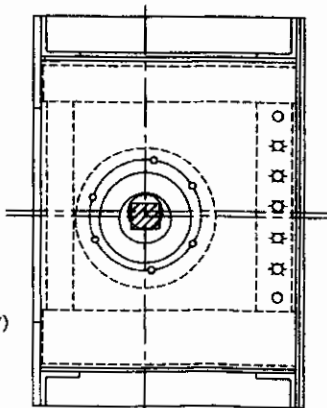


SECTION D-D

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

LOWER GUIDE ROLLERS
FIXED END

SCALE: 1 1/2" = 1'-0"
(2 SETS REQUIRED)



SECTION D-D

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

NOTES:

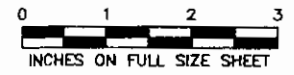
- EXISTING LONGITUDINAL GUIDE ROLLERS SHALL BE TURNED TO THE FIRST CLEAN DIAMETER WITH MINIMUM REMOVAL OF MATERIAL (NO MORE THAN 1/4" ON THE RADIUS REMOVED).
- CONTRACTOR SHOULD NOTE THAT THE SOUTHEAST, EAST SIDE LONGITUDINAL ROLLER AND UPPER SOUTHWEST ROLLER COULD NOT BE ROTATED DURING OUR INSPECTION.



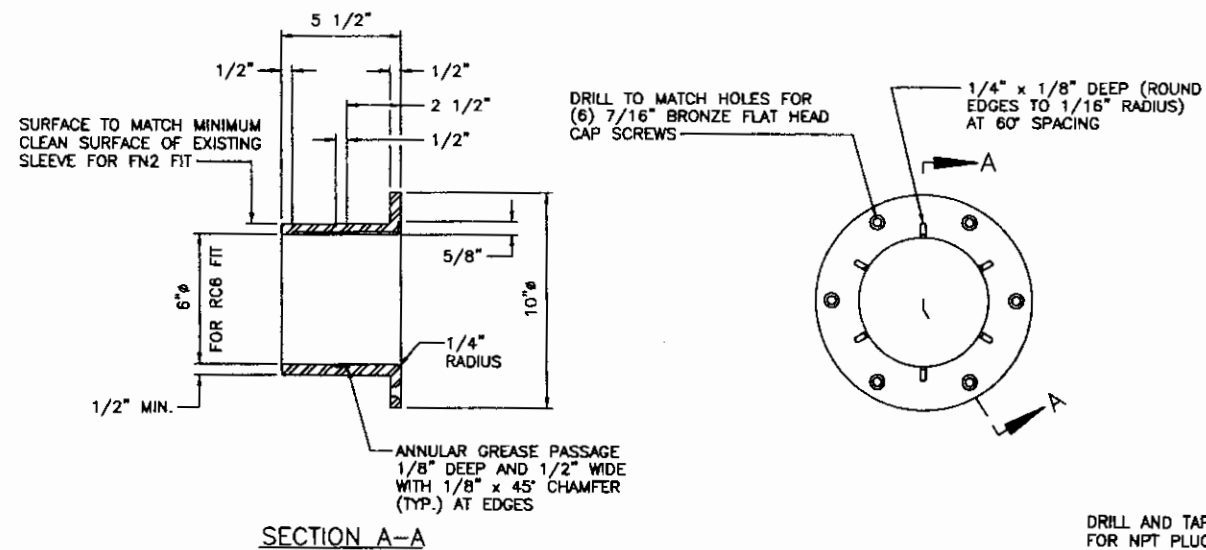
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
CAPE FEAR MEMORIAL LIFT BRIDGE
WILMINGTON, NORTH CAROLINA
NEW GUIDE ROLLER COMPONENTS

DESIGNED	D.M. BARRETT	DETAILED	R.L. REED	DATE	OCT. 2009
CHECKED	L.R. LENTZ	CHECKED	L.R. LENTZ	DRAWING NO.	EM-4

M3



13 - M3-EM-4



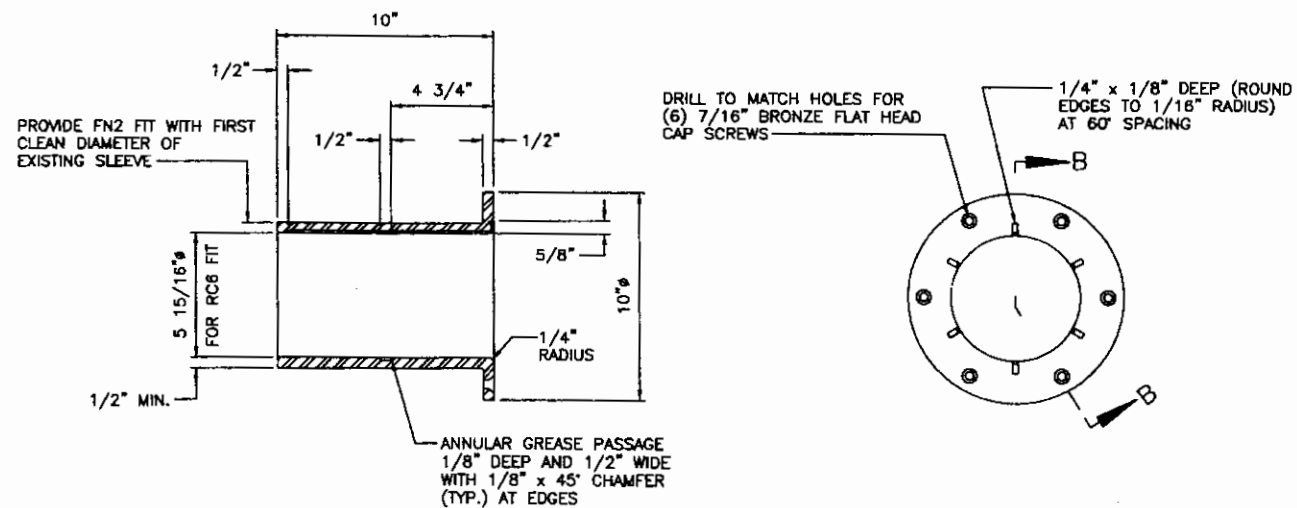
SECTION A-A

NEW OUTBOARD LONGITUDINAL ROLLER BUSHING

SCALE: 3" = 1'-0"
(4 REQUIRED)

PROVIDE NEW BRONZE FLAT HEAD CAP SCREWS TO MATCH EXISTING

BUSHING MATERIAL:
BRONZE ASTM B22, ALLOY C91100



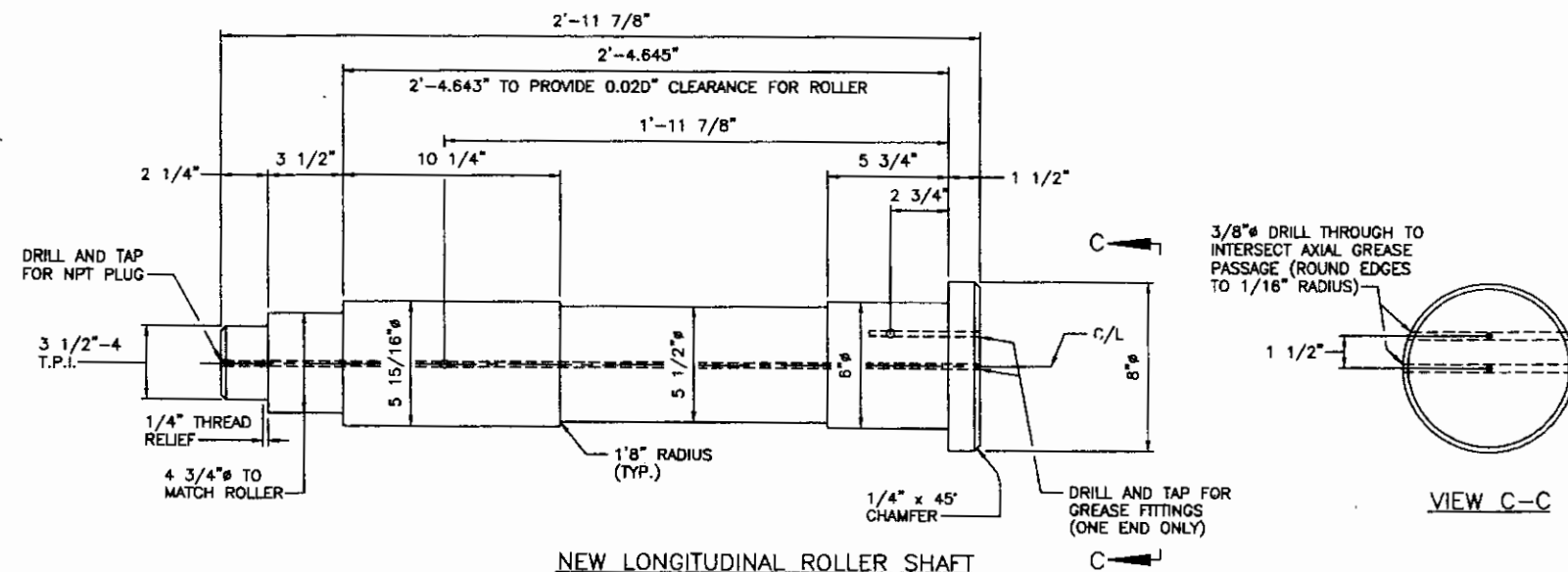
SECTION B-B

NEW INBOARD LONGITUDINAL ROLLER BUSHING

SCALE: 3" = 1'-0"
(4 REQUIRED)

PROVIDE NEW BRONZE FLAT HEAD CAP SCREWS TO MATCH EXISTING

BUSHING MATERIAL:
BRONZE ASTM B22, ALLOY C91100



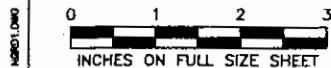
NEW LONGITUDINAL ROLLER SHAFT

SCALE: 3" = 1'-0"
(SEE NOTE 1)
(4 REQUIRED)

SHAFT MATERIAL:
STEEL, ASTM A291, CLASS 3, AISI 4340

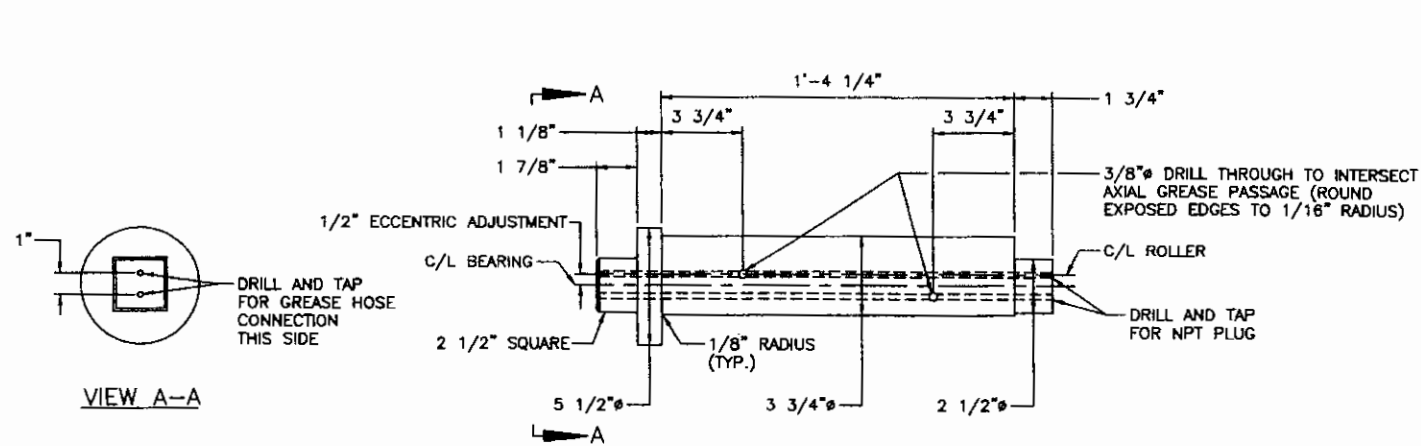
NOTES:

1. ALL DIMENSIONS FOR SHAFTS MUST BE FIELD VERIFIED FOR PROPER FIT WITH EXISTING COMPONENTS.
2. LONGITUDINAL DRILLED GREASE PASSAGES MAY BE 1/2" 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. BUSHINGS ARE TO BE INSTALLED WITH A FN1 FIT.
5. PROVIDE NEW BRONZE FLAT HEAD CAP SCREWS TO MATCH EXISTING.
6. PROVIDE MINIMUM 1/8" FILLET AT ALL CHANGES IN SHAFT DIAMETER OR SECTION.
7. ALL GREASE GROOVES ARE TO BE PROVIDED WITH A 1/16" RADIUS AT EDGES.
8. GREASE HOLE 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.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
CAPE FEAR MEMORIAL LIFT BRIDGE
WILMINGTON, NORTH CAROLINA
NEW GUIDE ROLLER DETAILS - 1

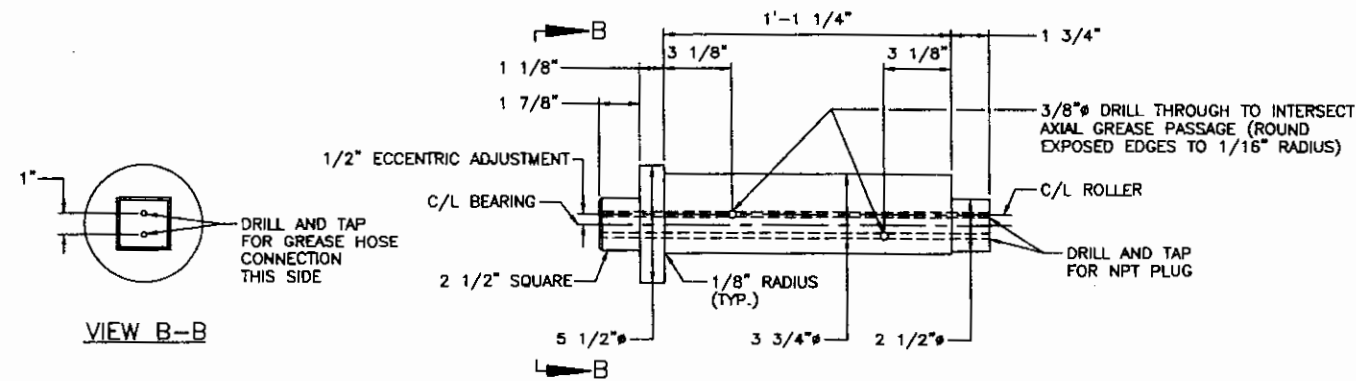
M4	DESIGNED D.M. BARRETT	DATE	OCT. 2008
	CHECKED A.M. BROOSKY	DRAWING NO.	DJ-5
DRAWN BY R.L. REED		SCALE AS NOTED	



NEW UPPER TRANSVERSE ROLLER SHAFT

SCALE: 3" = 1'-0"
(SEE NOTE 1)

SHAFT MATERIAL:
STEEL, ASTM A291, CLASS 3, AISI 4340
(4 REQUIRED)



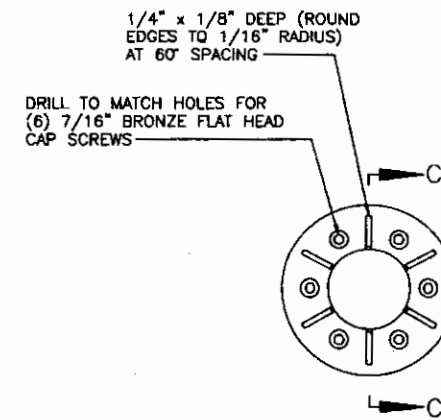
NEW LOWER TRANSVERSE ROLLER SHAFT

SCALE: 3" = 1'-0"
(SEE NOTE 1)

SHAFT MATERIAL:
STEEL, ASTM A291, CLASS 3, AISI 4340
(2 REQUIRED)

NOTES:

- ALL DIMENSIONS FOR SHAFTS MUST BE FIELD VERIFIED FOR PROPER FIT WITH EXISTING COMPONENTS.
- LONGITUDINAL DRILLED GREASE PASSAGES MAY BE 1/2" IF TAPPED AND ADAPTED FOR GREASE HOSE CONNECTION OR NPT PLUG.
- 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.
- BUSHINGS ARE TO BE INSTALLED WITH A FN1 FIT.
- PROVIDE NEW BRONZE FLAT HEAD CAP SCREWS TO MATCH EXISTING.
- PROVIDE MINIMUM 1/8" FILLET AT ALL CHANGES IN SHAFT DIAMETER OR SECTION.
- ALL GREASE GROOVES ARE TO BE PROVIDED WITH A 1/16" RADIUS AT EDGES.
- GREASE HOLE 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.
- REMOVAL OF APPROXIMATELY 1/8" OF MATERIAL ON EACH END OF TRANSVERSE ROLLERS REQUIRED DUE TO THICKER BUSHING FLANGE.

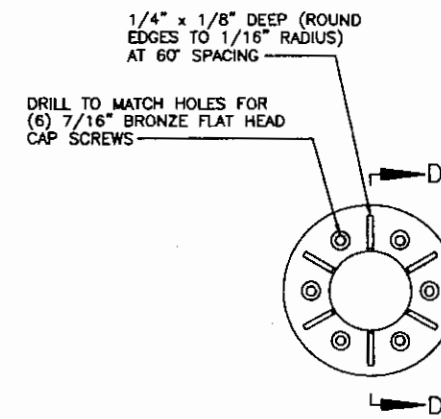


NEW UPPER TRANSVERSE ROLLER BUSHINGS

SCALE: 3" = 1'-0"
(2 PER SHAFT)

PROVIDE NEW BRONZE FLAT HEAD
CAP SCREWS TO MATCH EXISTING

BUSHING MATERIAL:
BRONZE ASTM B22, ALLOY C91100
(8 REQUIRED)

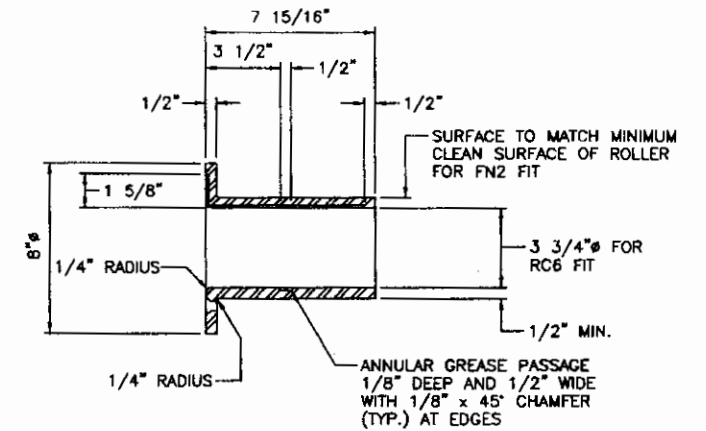


NEW LOWER TRANSVERSE ROLLER BUSHINGS

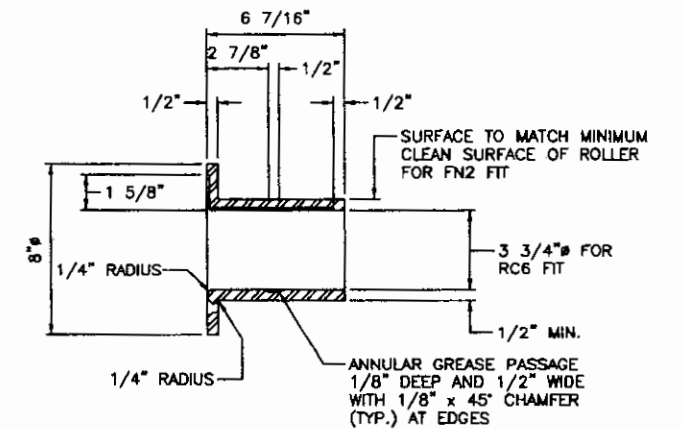
SCALE: 3" = 1'-0"
(2 PER SHAFT)

PROVIDE NEW BRONZE FLAT HEAD
CAP SCREWS TO MATCH EXISTING

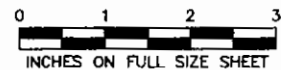
BUSHING MATERIAL:
BRONZE ASTM B22, ALLOY C91100
(4 REQUIRED)



SECTION C-C

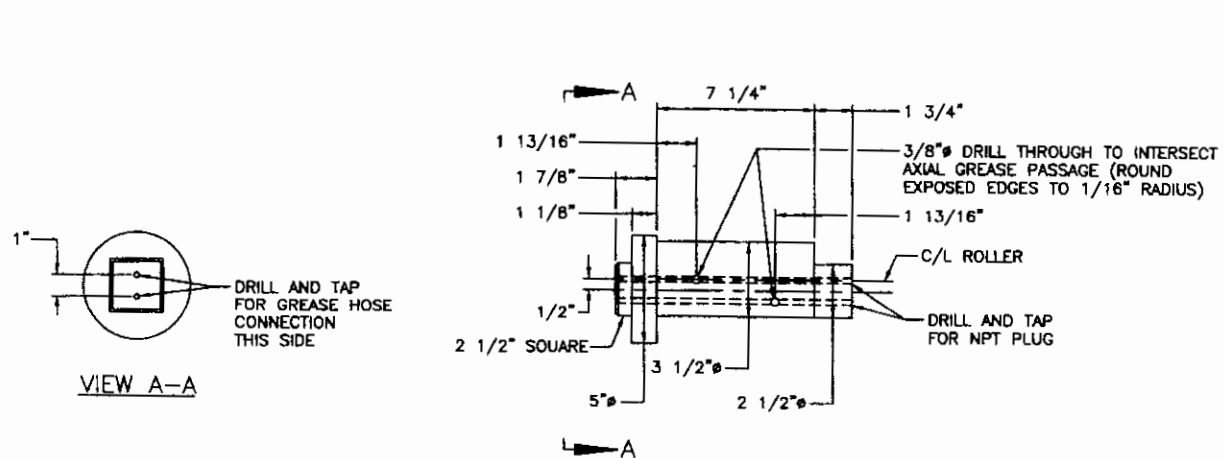


SECTION D-D



STATE OF NORTH CAROLINA	
DEPARTMENT OF TRANSPORTATION	
RALEIGH	
CAPE FEAR MEMORIAL LIFT BRIDGE	
WILMINGTON, NORTH CAROLINA	
NEW GUIDE ROLLER DETAILS - 2	
DESIGNED D.M. BARRETT	DATE OCT. 2009
CHECKED A.M. BRODSKY	DRAWING NO. EM-8
SCALE AS NOTED	
DRAWN BY R.L. REED	

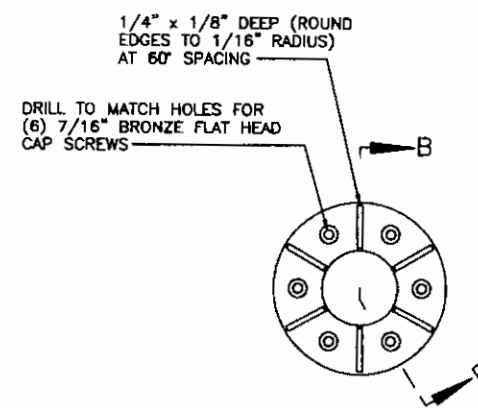
M5



NEW TRANSVERSE ROLLER SHAFT (FIXED END)

SCALE: 3" = 1'-0"
(SEE NOTE 1)

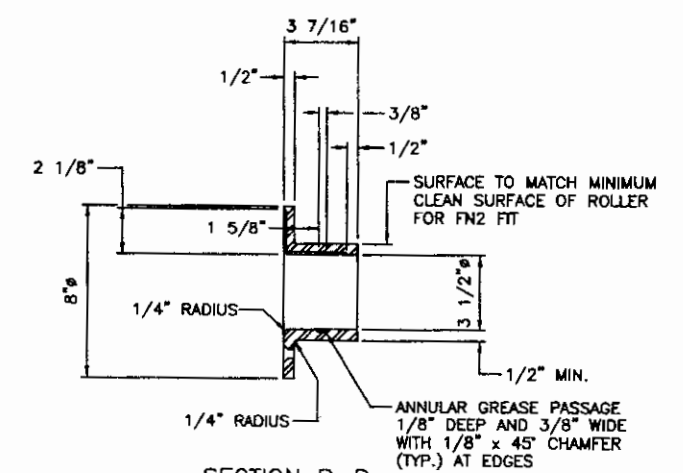
SHAFT MATERIAL:
STEEL, ASTM A291, CLASS 3, AISI 4340
(2 REQUIRED)



NEW TRANSVERSE BUSHINGS (FIXED END)

SCALE: 3" = 1'-0"
(2 PER SHAFT)

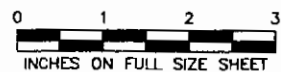
BUSHING MATERIAL:
BRONZE ASTM B22, ALLOY C91100
(4 REQUIRED)



SECTION B-B

NOTES:

1. ALL DIMENSIONS FOR SHAFTS MUST BE FIELD VERIFIED FOR PROPER FIT WITH EXISTING COMPONENTS.
2. LONGITUDINAL DRILLED GREASE PASSAGES MAY BE 1/2" 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. BUSHINGS ARE TO BE INSTALLED WITH A FN1 FIT.
5. PROVIDE NEW BRONZE FLAT HEAD CAP SCREWS TO MATCH EXISTING.
6. PROVIDE MINIMUM 1/8" FILLET AT ALL CHANGES IN SHAFT DIAMETER OR SECTION.
7. ALL GREASE GROOVES ARE TO BE PROVIDED WITH A 1/16" RADIUS AT EDGES.
8. GREASE HOLE 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.
9. REMOVAL OF APPROXIMATELY 1/8" OF MATERIAL ON EACH END OF TRANSVERSE ROLLERS REQUIRED DUE TO THICKER BUSHING FLANGE.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
CAPE FEAR MEMORIAL LIFT BRIDGE
WILMINGTON, NORTH CAROLINA
NEW GUIDE ROLLER DETAILS - 3

M6	DESIGNED	D.M. BARRETT	DETAILED	R.L. REED	DATE	OCT. 2008
	CHECKED	A.M. BROOSKY	CHECKED	A.M. BROOSKY	DRAWING NO.	EM-7
				DRAWN BY	R.L. REED	
				SCALE	AS NOTED	

ELECTRICAL GENERAL NOTES

1. GENERAL

- 1.01 ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (2008 EDITION), THE NORTH CAROLINA ELECTRICAL CODE (2008 EDITION), THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES (LATEST EDITION), THE AASHTO LRFD MOVABLE HIGHWAY BRIDGE DESIGN SPECIFICATIONS (LATEST EDITION), ALL APPLICABLE STATE AND/OR LOCAL CODES, AND THE SPECIAL PROVISIONS.
- 1.02 FOR THE PURPOSES OF APPLYING THE NATIONAL ELECTRICAL CODE, THE FOLLOWING LOCATION DEFINITIONS SHALL APPLY.
 - (1) DRY LOCATIONS: INSIDE THE CONTROL HOUSE OR TOWER TOP MACHINERY ROOMS.
 - (2) DAMP LOCATIONS: NONE.
 - (3) WET LOCATIONS: ANY LOCATION NOT DEFINED AS DRY OR DAMP.
- 1.03 ALL EQUIPMENT, RACEWAYS, WIRING, ETC. SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER IN ACCORDANCE WITH NECA 1 (STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING), AND WITHOUT VIOLATING ANY REQUIRED CLEAR WORKING SPACE (NEC 110.26).
- 1.04 IN NO WAY SHALL THESE PLANS BE INTERPRETED AS REQUIRING A VIOLATION OF THE NATIONAL ELECTRICAL CODE, OR ANY OTHER APPLICABLE FEDERAL, STATE, OR LOCAL CODE OR REGULATION. IN ANY CASE OF DISPUTE BETWEEN THESE PLANS AND THE NATIONAL ELECTRICAL CODE, THE MORE STRINGENT REQUIREMENT SHALL GOVERN.
- 1.05 THE INSTALLATION OF ALL EQUIPMENT AND MATERIALS SHALL COMPLY WITH THEIR RESPECTIVE MANUFACTURERS' RECOMMENDATIONS AND INSTALLATION PROCEDURES.
- 1.06 THE CONTRACTOR IS EXPECTED TO DELIVER A COMPLETE, WORKING, AND SAFE ELECTRICAL SYSTEM.
- 1.07 VARIATIONS FROM THESE PLANS MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL. ALL CHANGES SHALL BE REFLECTED IN THE AS-BUILT DRAWINGS.
- 1.08 IN ADDITION TO THE MATERIALS, COMPONENTS, AND EQUIPMENT SHOWN ON THE PLANS, PROVIDE ALL RACEWAYS, JUNCTION AND PULL BOXES, FITTINGS, CONDUCTORS, CONNECTORS, AND OTHER ITEMS REQUIRED TO PROVIDE A COMPLETE, FUNCTIONAL, AND SAFE INSTALLATION.
- 1.09 THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR VERIFICATION OF ALL RELEVANT DIMENSIONS, EQUIPMENT SPECIFICATIONS, ELECTRICAL LOADS, CIRCUIT LOADS, AND SIMILAR INFORMATION PRIOR TO PURCHASE AND/OR FABRICATION OF EQUIPMENT OR MATERIALS. EQUIPMENT RATINGS AND/OR WIRE SIZES SHOWN ON THE PLANS SHALL BE INCREASED WHERE REQUIRED BY THE LOADS SERVED.
- 1.10 THE CONTRACTOR SHALL INVESTIGATE AND/OR VERIFY THE LOCATIONS OF ALL EXISTING FACILITIES, ABOVE GROUND AND UNDERGROUND, PRIOR TO CONSTRUCTION. ANY DAMAGE TO EXISTING FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
- 1.11 THE CONTRACTOR SHALL CAREFULLY TRACE, LOCATE, IDENTIFY, AND DOCUMENT ALL EXISTING EQUIPMENT, CONDUCTORS, RACEWAYS, AND OTHER ITEMS WHICH ARE EXISTING AND TO REMAIN IN PLACE, BE RE-ROUTED, OR BE RELOCATED. THE CONTRACTOR SHALL EXERCISE CARE NOT TO DAMAGE OR OTHERWISE DISTURB ANY ITEMS WHICH ARE EXISTING AND TO REMAIN IN PLACE.
- 1.12 NUMBERS IN PARENTHESES ASSOCIATED WITH EQUIPMENT REFER TO ITEM NUMBERS IN THE EQUIPMENT SCHEDULES.
- 1.13 ALL EQUIPMENT, RACEWAYS, WIRING, ETC. SHOWN ON THESE PLANS, OR OTHERWISE REQUIRED, SHALL BE NEW UNLESS SPECIFICALLY NOTED OTHERWISE.
- 1.14 LOCATIONS OF RACEWAYS, CABLES, AND EQUIPMENT SHOWN ARE DIAGRAMMATIC ONLY. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR AND SUBJECT TO THE APPROVAL OF THE ENGINEER.
- 1.15 DO NOT CUT, DRILL, OR WELD ANY STRUCTURAL MEMBER WITHOUT THE EXPLICIT PERMISSION OF THE ENGINEER ON A CASE-BY-CASE BASIS.

2. WIRING MATERIALS & METHODS

- 2.01 UNLESS EXPLICITLY INDICATED OTHERWISE, ONLY THE FOLLOWING WIRING METHODS ARE PERMITTED.
 - WET LOCATIONS
 - 1. PLASTIC COATED STEEL RIGID METAL CONDUIT (RMC)
 - 2. LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)
 - DRY LOCATIONS
 - 1. ANY PERMITTED FOR WET LOCATIONS
 - 2. STEEL RIGID METAL CONDUIT (RMC)
- 2.02 THE USE OF FLEXIBLE CONDUIT SHALL BE LIMITED TO THE FOLLOWING.
 - 1. FOR FINAL CONNECTIONS TO MOTORS AND SIMILAR EQUIPMENT SUBJECT TO VIBRATION. LENGTHS SHALL NOT BE LESS THAN 18 INCHES, BUT SHALL NOT EXCEED 36 INCHES.
 - 2. WHERE FLEXIBILITY IS REQUIRED. LENGTHS SHALL NOT EXCEED 18 INCHES, UNLESS EXPLICITLY INDICATED OTHERWISE OR WITH THE SPECIAL PERMISSION OF THE ENGINEER.
 - 3. AS MAY BE OTHERWISE SPECIFICALLY SHOWN IN THESE PLANS.
 - 4. FLEXIBLE CONDUIT SHALL NOT BE USED IN LIEU OF BENDS IN RIGID CONDUIT, EXCEPT WITH THE SPECIAL PERMISSION OF THE ENGINEER.
 - 5. FOR FLEXIBLE CONDUIT CONNECTIONS BETWEEN TWO SECTIONS OF RIGID CONDUIT, PROVIDE A CONDUIT BODY ON AT LEAST ONE SIDE OF THE FLEXIBLE CONDUIT.
- 2.03 ALUMINUM CONDUITS, BOXES, ENCLOSURES, ETC. SHALL BE ISOLATED FROM CONCRETE AND/OR STRUCTURAL STEEL WITH NEOPRENE SHIMS. GALVANIZED CONDUITS, BOXES, ENCLOSURES, ETC. SHALL BE ISOLATED FROM UNPAINTED STEEL WITH NEOPRENE SHIMS.
- 2.04 RIGID CONDUITS SHALL BE SUPPORTED WITHIN 18 INCHES OF ALL TERMINATIONS AND AT REGULAR INTERVALS NOT TO EXCEED 6 FEET. FLEXIBLE CONDUITS SHALL BE SUPPORTED WITHIN 12 INCHES OF ALL TERMINATIONS AND AT REGULAR INTERVALS NOT TO EXCEED 3 FEET.
- 2.05 ALL CONDUIT CONNECTIONS TO BOXES AND ENCLOSURES WHICH DO NOT HAVE INTEGRAL THREADED HUBS SHALL UTILIZE WEATHERPROOF GROUNDING TYPE HUBS OR CONNECTORS. ALL HUBS AND CONNECTORS SHALL HAVE INSULATED THROATS OR BE PROVIDED WITH INSULATED BUSHINGS.
- 2.06 ANY CONDUIT ROUTINGS SHOWN ON THESE PLANS ARE CONCEPTUAL ONLY. ACTUAL ROUTINGS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON ACTUAL CONDITIONS AND SUBMITTED TO THE ENGINEER FOR APPROVAL.
- 2.07 ALL CONDUCTORS SHALL BE STRANDED COPPER TYPE XHHW-2, EXCEPT WHERE SHOWN OTHERWISE ON THE PLANS. THE MINIMUM SIZE FOR FIELD POWER AND CONTROL WIRING SHALL BE 12 AWG.
- 2.08 SUPPORT CABLES IN VERTICAL RACEWAYS IN ACCORDANCE WITH NEC 300.19 WITH CABLE SUPPORTS INSTALLED AT TERMINAL CABINETS AND/OR PULL BOXES.
- 2.09 NEUTRAL CONDUCTORS SHALL NOT BE SHARED BETWEEN MULTIPLE BRANCH CIRCUITS, EXCEPT FOR DESIGNATED MULTIWIRE LIGHTING AND RECEPTACLE CIRCUITS WHERE CLEARLY SHOWN ON THE PLANS.
- 2.10 MINIMUM CONDUIT SIZE SHALL BE 3/4 INCH, EXCEPT THAT 1/2 INCH SHALL BE PERMITTED FOR FLEXIBLE CONDUIT CONNECTIONS TO LUMINAIRES.
- 2.11 WIRING IN ENCLOSURES, CABINETS, BOXES, ETC. SHALL BE NEATLY ROUTED, AND BUNDLED WITH PVC CABLE TIES OR PLACED IN NON-METALLIC WIRING TROUGHS.
- 2.12 SPARE AND UN-TERMINATED CONDUCTORS SHALL BE CAPPED, OR CONNECTED TO SPARE TERMINAL BLOCKS WHERE AVAILABLE, AND CLEARLY IDENTIFIED. ONE FULL TURN OF SLACK FOR ALL SPARE CONDUCTORS SHALL BE PROVIDED IN ALL ENCLOSURES, CABINETS, BOXES, ETC.
- 2.13 ONE FULL TURN OF SLACK SHALL BE PROVIDED FOR ALL CONDUCTORS IN ALL PULL BOXES, JUNCTION BOXES, AND TERMINAL CABINETS.
- 2.14 RACEWAYS CROSSING EXPANSION JOINTS, OR OTHERWISE SUBJECT TO MOVEMENT, SHALL BE PROVIDED WITH EXPANSION AND/OR DEFLECTION FITTINGS, OR OTHER APPROVED MEANS, TO COMPENSATE FOR SUCH MOVEMENT. EACH SUCH EXPANSION AND/OR DEFLECTION MEANS SHALL BE PROVIDED WITH AN EXTERNAL COPPER BONDING JUMPER, SIZED 6 AWG MINIMUM.

- 2.15 CONDUCTORS SPLICES SHALL BE MADE ONLY IN JUNCTION BOXES, OUTLET OR DEVICE BOXES, AND EQUIPMENT ENCLOSURES. SPLICES SHALL BE MADE ONLY ON TERMINAL BLOCKS, EXCEPT FOR SPLICES AT LUMINAIRES AND WIRING DEVICES WHICH SHALL UTILIZE INSULATED SET-SCREW TYPE, OR SIMILAR APPROVED, CONNECTORS. TWIST-ON (WIRENUT) TYPE CONNECTORS SHALL NOT BE USED. TERMINAL BLOCKS SHALL NOT HAVE MORE THAN TWO CONDUCTORS PER TERMINAL.
- 2.16 LAYOUT OF TERMINAL BLOCKS IN JUNCTION BOXES AND TERMINAL CABINETS SHALL COMPLY WITH THE REQUIREMENTS FOR WIRE BENDING SPACE GIVEN IN NEC 312.6, EXCEPT THAT THE MINIMUM SPACE PERMITTED SHALL BE 2 INCHES. PROPOSED LAYOUTS, INCLUDING ANTICIPATED LOCATIONS AND SIZES OF KNOCKOUTS, SHALL BE SUBMITTED FOR APPROVAL PRIOR TO FABRICATION.
- 2.17 A CONDUIT BODY OR BOX SHALL BE PROVIDED ON AT LEAST ONE SIDE OF ALL FLEXIBLE CONDUITS.
- 2.18 ALL RACEWAYS SHALL BE ARRANGED TO DRAIN. CONDUIT DRAINS SHALL BE INSTALLED IN A CONDUIT BODY AT THE LOW POINT OF ALL RUNS.
- 2.19 UNLESS SPECIFICALLY INDICATED OTHERWISE, CONDUIT AND CABLE ENTRANCES IN DAMP AND WET LOCATIONS SHALL BE MADE ONLY IN THE BOTTOM OF CABINETS AND/OR ENCLOSURES.
- 2.20 CONDUCTORS WITH GREEN COLORED INSULATION MAY BE USED ONLY FOR GROUNDING CONDUCTORS. RE-IDENTIFICATION OF CONDUCTORS WITH GREEN COLORED INSULATION, SUCH AS WITH COLORED TAPE, IS NOT PERMITTED.

3. GROUNDING & BONDING

- 3.01 ALL CIRCUITS SHALL INCLUDE AN EQUIPMENT GROUNDING CONDUCTOR. EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED EQUAL TO THE CIRCUIT CONDUCTORS, EXCEPT WHERE SHOWN OTHERWISE ON THE PLANS.
- 3.02 GROUNDING TYPE HUBS AND CONNECTORS SHALL BE CONNECTED TO THE EQUIPMENT GROUNDING CONDUCTOR(S) CONTAINED WITHIN THEIR ASSOCIATED CONDUIT OR CABLE.
- 3.03 ALL GROUNDING CONDUCTORS WITHIN AN EQUIPMENT ENCLOSURE OR TERMINAL CABINET SHALL BE TERMINATED ON A COMMON UNINSULATED GROUNDING BAR.



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ELECTRICAL GENERAL NOTES - 1			
DESIGNED	N.E. ALGER	DATE	OCT. 2009
CHECKED	C.D. VOOT	CHECKED	C.D. VOOT
DRAWN BY		N.E. ALGER	
SCALE		AS NOTED	
DRAWING NO.		EM-8	

E1

ELECTRICAL GENERAL NOTES (CONTINUED)

4. IDENTIFICATION

- 4.01 ALL CONDUCTORS SHALL BE UNIQUELY IDENTIFIED AND CLEARLY LABELED WITH MACHINE PRINTED, WEATHERPROOF, NON-SHRINK SLEEVE TYPE LABELS.
- 4.02 ALL TERMINAL BLOCKS SHALL BE CLEARLY LABELED, AT EACH TERMINAL POSITION, WITH ENGRAVED PLASTIC WEATHERPROOF LABELS (WHITE TEXT ON BLACK BACKGROUND) ATTACHED WITH STAINLESS STEEL HARDWARE.
- 4.03 ALL ELECTRICAL EQUIPMENT ENCLOSURES, PULL AND JUNCTION BOXES, AND SIMILAR ITEMS SHALL BE CLEARLY LABELED WITH ENGRAVED PLASTIC WEATHERPROOF LABELS (WHITE TEXT ON BLACK BACKGROUND) ATTACHED WITH STAINLESS STEEL HARDWARE.

3. MISCELLANEOUS MATERIALS & METHODS

- 3.01 UNLESS NOTED OTHERWISE FOR A SPECIFIC APPLICATION, ALL BOLTS, NUTS, WASHERS, AND SIMILAR HARDWARES SHALL BE TYPE 316 STAINLESS STEEL.
- 3.02 UNLESS NOTED OTHERWISE FOR A SPECIFIC APPLICATION, ALL CONCRETE ANCHORS SHALL BE EITHER EPOXY ADHESIVE TYPE OR WEDGE STUD TYPE. ALL CONCRETE ANCHORS SHALL BE TYPE 316 STAINLESS STEEL.
- 3.03 ALL BOLTED, AND SIMILAR, CONNECTIONS SHALL UTILIZE LOCK WASHERS. CONNECTIONS WHICH DO NOT PERMIT THE USE OF LOCK WASHERS SHALL UTILIZE AN APPROVED MEDIUM STRENGTH THREADLOCKING ADHESIVE.
- 3.04 SUPPORTS FOR ELECTRICAL EQUIPMENT SHALL BE FABRICATED FROM TYPE 316 STAINLESS STEEL OR TYPE A36 STEEL (HOT-DIP GALVANIZED AFTER FABRICATION).
- 3.05 THE OPERATING HANDLE(S) OF ALL MANUALLY OPERABLE DEVICES SHALL NOT BE LESS THAN 2 FEET, NOR MORE THAN 6'-7", ABOVE THE FLOOR.
- 3.06 EQUIPMENT ENCLOSURES, CABINETS, BOXES, AND SIMILAR ITEMS SHALL BE INSTALLED PLUMB AND SECURELY FASTENED IN PLACE.

6. REMOVALS, SALVAGE, & DISPOSAL

- 6.01 EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE, ONLY EXISTING CONCRETE EMBEDDED RACEWAYS AND BOXES MAY BE ABANDONED IN PLACE. EXISTING UNDERGROUND RACEWAYS, UNDERGROUND BOXES, AND OTHER EQUIPMENT SHALL NOT BE ABANDONED IN PLACE, EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE.

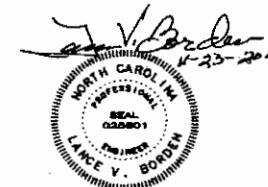
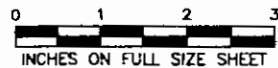
EXISTING CONCRETE EMBEDDED RACEWAYS WHICH ARE TO BE ABANDONED IN PLACE SHALL HAVE ALL CONDUCTORS REMOVED, BE GROUND FLUSH WITH THE CONCRETE, AND FILLED WITH NON-SHRINK GROUT FLUSH WITH THE CONCRETE.

EXISTING CONCRETE EMBEDDED BOXES WHICH ARE TO BE ABANDONED IN PLACE SHALL HAVE ALL CONDUCTORS REMOVED AND BE COVERED WITH A NEW BLANK GALVANIZED STEEL COVER.
- 6.02 THE CONTRACTOR SHALL GIVE THE DEPARTMENT THE OPTION OF SALVAGING ALL ELECTRICAL EQUIPMENT WHICH IS TO BE REMOVED. THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT WHICH THE DEPARTMENT WISHES TO SALVAGE FROM THE PROJECT SITE AND DELIVER IT TO THE LOCATION DESIGNATED BY THE ENGINEER. ALL EQUIPMENT WHICH IS TO BE SALVAGED SHALL BE HANDLED WITH CARE AT ALL TIMES TO AVOID DAMAGE.

ALL ELECTRICAL EQUIPMENT WHICH IS TO BE REMOVED AND THE DEPARTMENT DOES NOT WISH TO SALVAGE SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE PROJECT SITE BY HIM.
- 6.03 THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR PROPER DISPOSAL OF REMOVED EQUIPMENT AND MATERIALS IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.

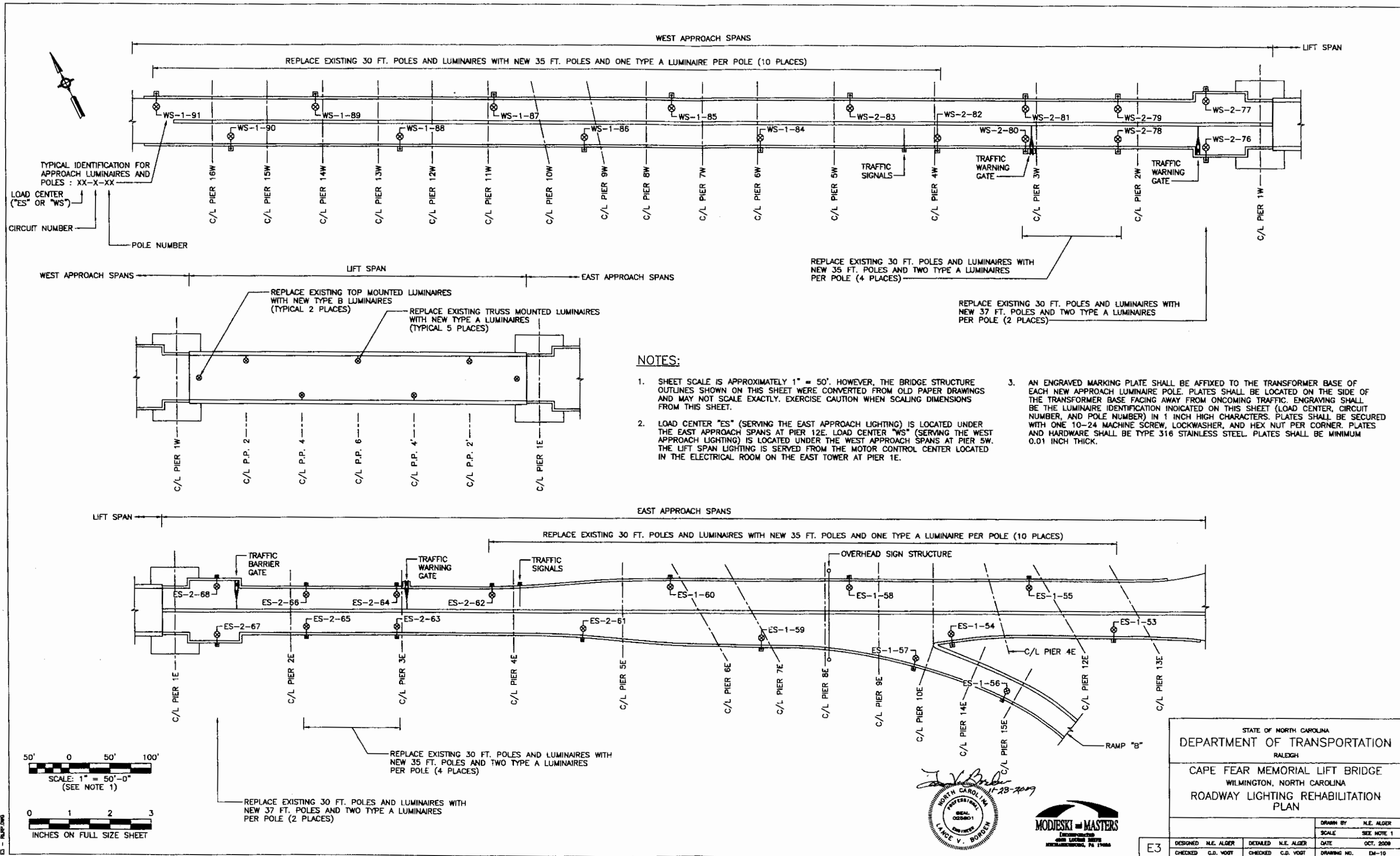
7. WORKING DRAWINGS & SUBMITTALS

- 7.01 THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED WORKING DRAWINGS AND PRODUCT SUBMITTALS, WORKING IN COOPERATION AND COMMUNICATION WITH THE ENGINEER IN ORDER TO PROVIDE A COMPLETE, FUNCTIONAL, AND SAFE INSTALLATION IN ACCORDANCE WITH THE REQUIREMENTS AND INTENTS OF THESE PLANS, THE SPECIFICATIONS, THE CONTRACT DOCUMENTS, AND ALL APPLICABLE CODES.
- 7.02 ALL REQUIRED WORKING DRAWINGS AND PRODUCT DESCRIPTIVE DATA SHALL BE SUBMITTED TO THE PROJECT ENGINEER FOR REVIEW AND APPROVAL. SUCH ITEMS MUST BE APPROVED BY THE PROJECT ENGINEER PRIOR TO PURCHASE OF THE RELATED MATERIALS AND/OR UNDERTAKING OF THE RELATED WORK.
- 7.03 SUBMIT COMPLETE DESCRIPTIVE DATA FOR EACH ITEM OF EQUIPMENT AND MATERIAL.
- 7.04 WIRING DIAGRAMS AND SCHEMATICS PROVIDED IN THESE PLANS ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR DEVELOPING ALL REQUIRED DIAGRAMS, INCLUDING FIELD INTERCONNECTION DIAGRAMS.
- 7.05 WIRING LAYOUTS AND TABULATIONS PROVIDED IN THESE PLANS ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR DEVELOPING THE ACTUAL LAYOUTS AND TABULATIONS.
- 7.06 THE CONTRACTOR SHALL DEVELOP ALL FINAL MOUNTING DETAILS FOR ALL EQUIPMENT. SUCH DETAILS SHALL COMPLY WITH ANY TYPICAL DETAILS SHOWN ON THESE PLANS.



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WILMINGTON, NORTH CAROLINA			
ELECTRICAL GENERAL NOTES - 2			
DESIGNED H.E. ALGER		DRAWN BY H.E. ALGER	
CHECKED C.D. VOOT		SCALE AS NOTED	
DETAILED H.E. ALGER		DATE OCT. 2009	
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E2



NOTES:

1. SHEET SCALE IS APPROXIMATELY 1" = 50'. HOWEVER, THE BRIDGE STRUCTURE OUTLINES SHOWN ON THIS SHEET WERE CONVERTED FROM OLD PAPER DRAWINGS AND MAY NOT SCALE EXACTLY. EXERCISE CAUTION WHEN SCALING DIMENSIONS FROM THIS SHEET.
2. LOAD CENTER "ES" (SERVING THE EAST APPROACH LIGHTING) IS LOCATED UNDER THE EAST APPROACH SPANS AT PIER 12E. LOAD CENTER "WS" (SERVING THE WEST APPROACH LIGHTING) IS LOCATED UNDER THE WEST APPROACH SPANS AT PIER 5W. THE LIFT SPAN LIGHTING IS SERVED FROM THE MOTOR CONTROL CENTER LOCATED IN THE ELECTRICAL ROOM ON THE EAST TOWER AT PIER 1E.
3. AN ENGRAVED MARKING PLATE SHALL BE AFFIXED TO THE TRANSFORMER BASE OF EACH NEW APPROACH LUMINAIRE POLE. PLATES SHALL BE LOCATED ON THE SIDE OF THE TRANSFORMER BASE FACING AWAY FROM ONCOMING TRAFFIC. ENGRAVING SHALL BE THE LUMINAIRE IDENTIFICATION INDICATED ON THIS SHEET (LOAD CENTER NUMBER, AND POLE NUMBER) IN 1 INCH HIGH CHARACTERS. PLATES SHALL BE SECURED WITH ONE 10-24 MACHINE SCREW, LOCKWASHER, AND HEX NUT PER CORNER. PLATES AND HARDWARE SHALL BE TYPE 316 STAINLESS STEEL. PLATES SHALL BE MINIMUM 0.01 INCH THICK.

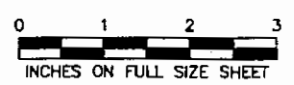
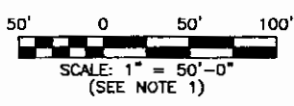
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CAPE FEAR MEMORIAL LIFT BRIDGE
 WILMINGTON, NORTH CAROLINA
 ROADWAY LIGHTING REHABILITATION PLAN

DESIGNED	N.E. ALGER	DATE	OCT. 2009
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SCALE: SEE NOTE 1

DRAWN BY: N.E. ALGER



E3 - REF. DRG.

LUMINAIRE SCHEDULE			
LUMINAIRE TYPE	QUANTITY	MANUFACTURER & MODEL	
A	49	HOLOPHANE VECTOR	"ARM-LESS" ROADWAY LUMINAIRE. 200 WATTS HIGH PRESSURE SODIUM LAMP. IES TYPE IV ("WIDE") LIGHT DISTRIBUTION. 480 VOLTS. KNUCKLE FITTER MOUNTING FOR A 2-3/8 INCH O.D. BY 4 INCH VERTICAL TENON. GRAY FINISH.
B	2	GE TUNNEL GUARD	CEILING MOUNT ROADWAY LUMINAIRE. 70 WATTS HIGH PRESSURE SODIUM LAMP. SYMMETRICAL LIGHT DISTRIBUTION. 480 VOLTS. GRAY FINISH.

POLE SPECIFICATIONS (BRIEF)

(SEE SPECIAL PROVISIONS FOR COMPLETE SPECIFICATIONS.)

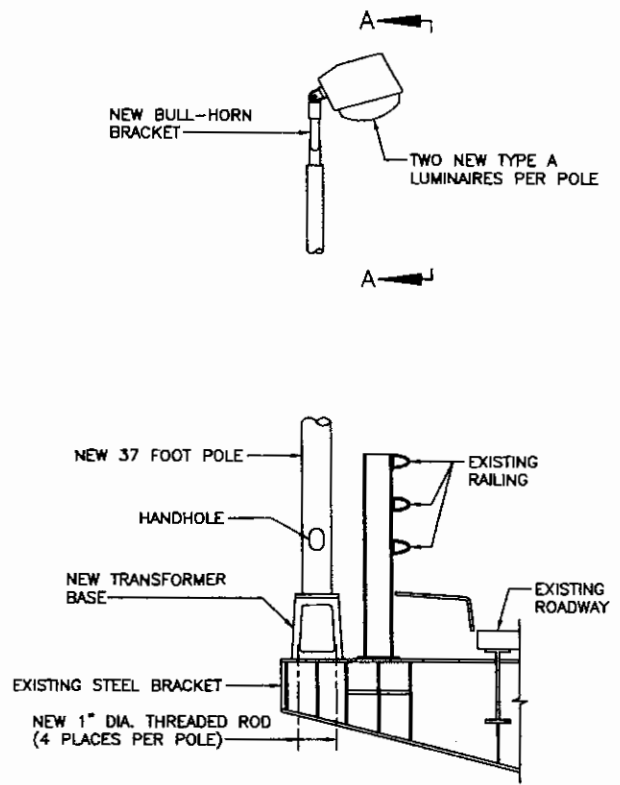
ROUND TAPERED. SPUN FROM SEAMLESS 6063 ALLOY ALUMINUM, HEAT TREATED TO T6 TEMPER. 8 INCH O.D. AT BASE, 4-1/2 INCH O.D. AT TOP. 1/4 INCH WALL.

CAST A356 ALLOY ALUMINUM ANCHOR AND TRANSFORMER BASES, HEAT TREATED TO T6 TEMPER.

2-3/8 INCH O.D. BY 4 INCH VERTICAL TENON ON TOP.

RATED BY MANUFACTURER FOR 150 POUNDS TYPICAL LUMINAIRE WEIGHT AND MINIMUM 5.8 SQUARE FEET LUMINAIRE EFFECTIVE PROJECTED AREA AT 110 MPH.

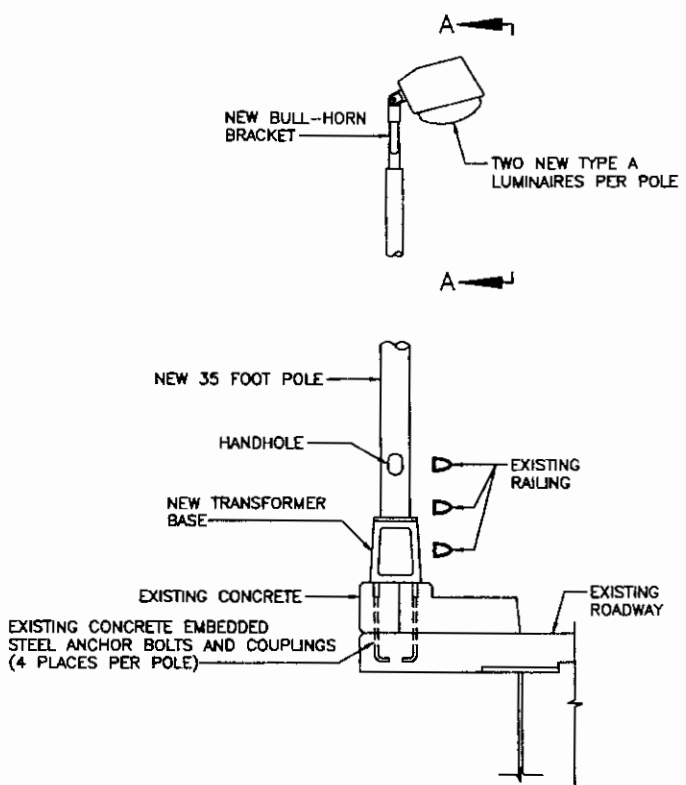
AS MANUFACTURED BY VALMONT, OR APPROVED EQUAL.



TYPICAL DETAIL OF NEW POLES AND LUMINAIRES NEAR EXISTING TRAFFIC BARRIER GATES

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

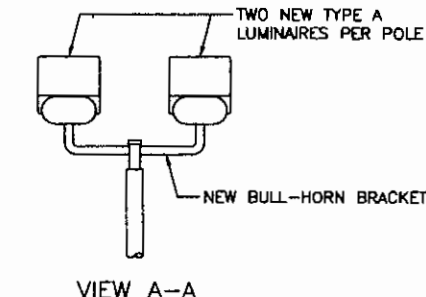
THREADED RODS SHALL BE HOT-DIP GALVANIZED STEEL TYPE A449. PROVIDE NEW HOT-DIP GALVANIZED STEEL BEVEL WASHERS AS REQUIRED. DOUBLE NUT RODS AT BOTH ENDS WITH NEW HOT-DIP GALVANIZED STEEL TYPE A563 NUTS.



TYPICAL DETAIL OF NEW POLES AND LUMINAIRES NEAR EXISTING PIERS 2E, 3E, 2W, AND 3W

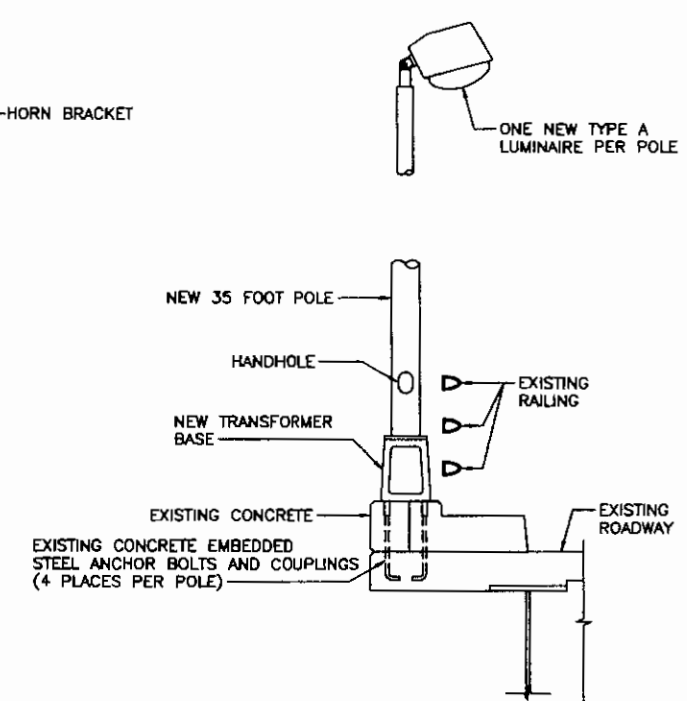
SCALE: 1/2" = 1'-0"

MOUNT NEW POLE TO EXISTING ANCHOR BOLT COUPLINGS WITH NEW 1" DIA. HOT-DIP GALVANIZED STEEL TYPE A325 BOLTS. PROVIDE NEW HOT-DIP GALVANIZED STEEL WASHERS AS REQUIRED.



VIEW A-A

SCALE: 1/2" = 1'-0"
VIEW IS TYPICAL FOR ALL POLES WITH TWO LUMINAIRES.



TYPICAL DETAIL OF NEW POLES AND LUMINAIRES ON EXISTING APPROACHES

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

MOUNT NEW POLE TO EXISTING ANCHOR BOLT COUPLINGS WITH NEW 1" DIA. HOT-DIP GALVANIZED STEEL TYPE A325 BOLTS. PROVIDE NEW HOT-DIP GALVANIZED STEEL WASHERS AS REQUIRED.

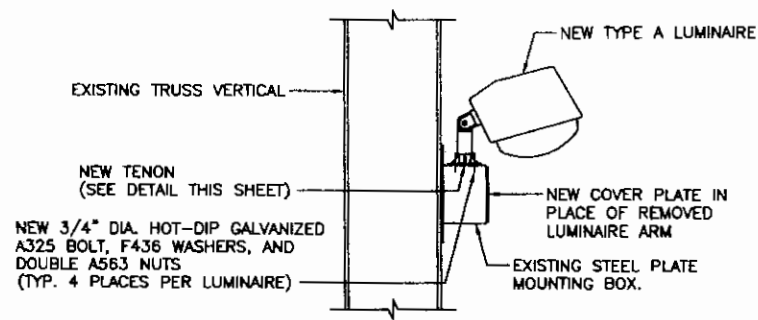
NOTES:

1. TILT OF ALL TYPE A LUMINAIRES SHALL BE -30 DEGREES FROM THE "ZERO" POSITION.
2. POLE HANDHOLES AND TRANSFORMER BASE DOORS SHALL BE ORIENTED TO FACE AWAY FROM ONCOMING TRAFFIC.
3. CONTRACTOR SHALL FIELD MEASURE THE BOLT CIRCLE(S) OF THE EXISTING POLES AND COORDINATE THE NEW POLES TO MATCH.



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ROADWAY LIGHTING REHABILITATION
DETAILS - 1

E4	DESIGNED	N.E. ALGER	DETAILED	N.E. ALGER	DATE	OCT. 2009
	CHECKED	C.D. VOGT	CHECKED	C.D. VOGT	DRAWING NO.	EM-11



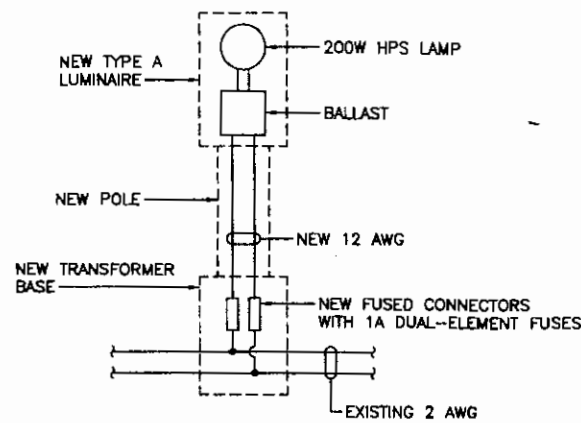
TYPICAL DETAIL OF NEW TRUSS MOUNTED LUMINAIRES ON LIFT SPAN

SCALE: 3/8" = 1'-0"

REPLACE EXISTING CONDUIT (NOT SHOWN) FROM EXISTING MOUNTING BOX TO EXISTING JUNCTION BOX IN THE LIFT SPAN ROADWAY CURB WITH NEW 3/4" DIA. CONDUIT.

NEW COVER PLATE SHALL BE FABRICATED FROM 3/8" A36 STEEL PLATE AND HOT-DIP GALVANIZED AFTER CUTTING AND DRILLING. COVER PLATE SHALL BE FASTENED TO BOX WITH NEW TYPE 316 STAINLESS STEEL BOLTS, NUTS, AND WASHERS. SEAL COVER PLATE AND NEW TENNON TO BOX WITH OIL RESISTANT RTV SILICONE SEALANT SUCH AS LOCTITE SUPERFLEX BLUE.

DRILL NEW 1" DIA. HOLE IN TOP OF MOUNTING BOX TO MATCH HOLE IN BOTTOM PLATE OF NEW TENON.



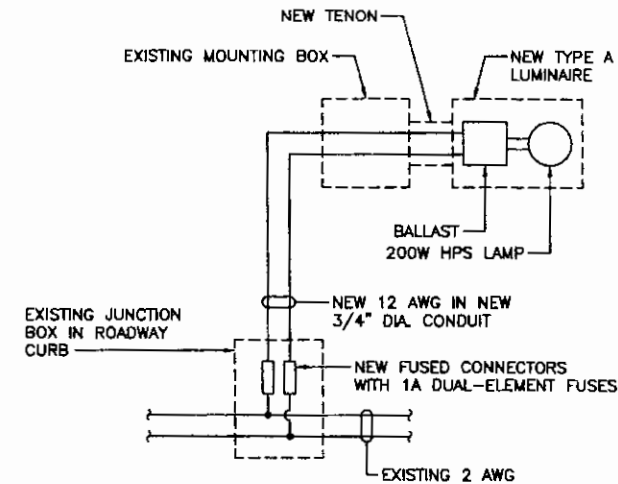
TYPICAL SCHEMATIC NEW LUMINAIRES ON APPROACHES

SCALE: NONE

CIRCUIT VOLTAGE IS 480 VOLTS.

REQUIRED EQUIPMENT GROUNDING CONDUCTORS NOT SHOWN.

FOR POLES WITH TWO LUMINAIRES, EACH LUMINAIRE SHALL BE FUSED AND CIRCUITED SEPERATELY.

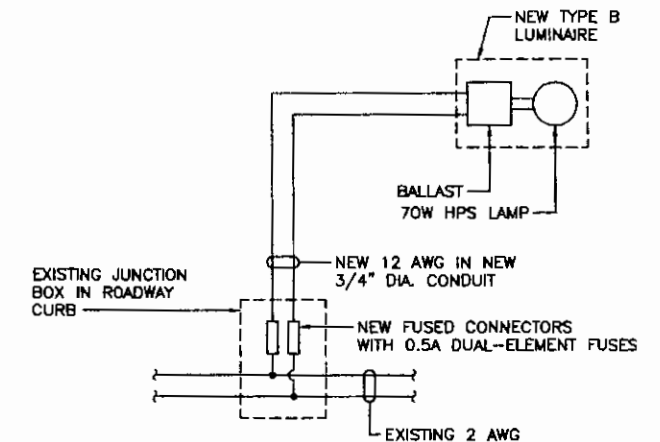


TYPICAL SCHEMATIC NEW TRUSS MOUNTED LUMINAIRES ON LIFT SPAN

SCALE: NONE

CIRCUIT VOLTAGE IS 480 VOLTS.

REQUIRED EQUIPMENT GROUNDING CONDUCTORS NOT SHOWN.

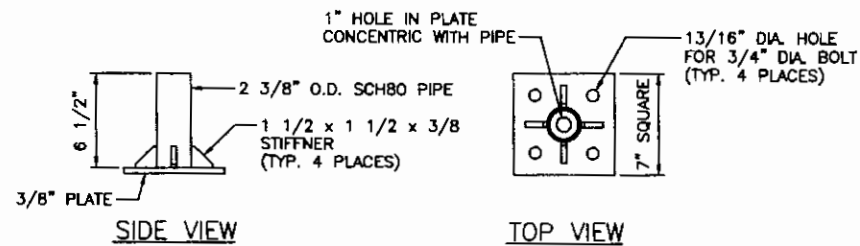


TYPICAL SCHEMATIC NEW TOP MOUNTED LUMINAIRES ON LIFT SPAN

SCALE: NONE

CIRCUIT VOLTAGE IS 480 VOLTS.

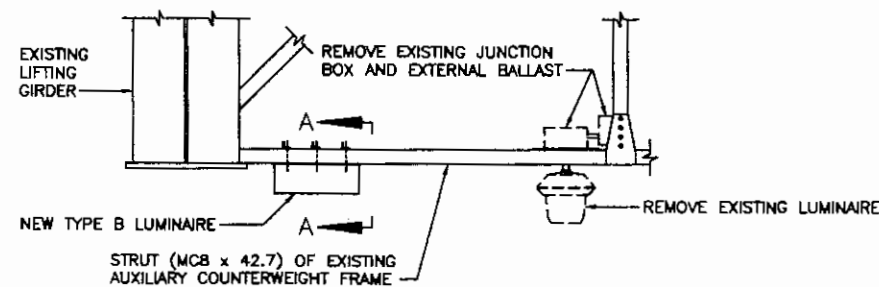
REQUIRED EQUIPMENT GROUNDING CONDUCTORS NOT SHOWN.



DETAIL OF NEW TENON FOR TRUSS MOUNTED LUMINAIRES

SCALE: 1/8" = 1'-0"

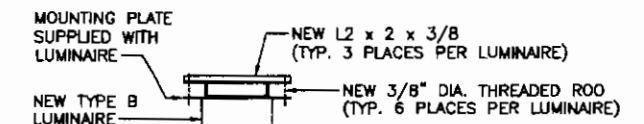
PIPE SHALL BE A53 SEAMLESS STEEL. PLATE AND STIFFNERS SHALL BE A36 STEEL. ALL JOINTS SHALL BE CONTINUOUSLY WELDED ALL AROUND. ALL WELDING SHALL COMPLY WITH AWS D1.1 (LATEST EDITION). COMPLETED TENON SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IS COMPLETE.



TYPICAL DETAIL OF NEW TOP MOUNTED LUMINAIRES AT ENDS OF LIFT SPAN

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

REMOVE EXISTING CONDUIT (NOT SHOWN) TO EXISTING LUMINAIRE. PROVIDE NEW 3/4" DIA. CONDUIT (NOT SHOWN) FROM NEW LUMINAIRE TO EXISTING JUNCTION BOX IN LIFT SPAN ROADWAY CURB.



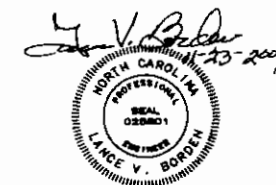
SECTION A-A

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

ANGLES SHALL BE A36 STEEL, HOT-DIP GALVANIZED AFTER CUTTING AND DRILLING. THREADED RODS SHALL BE TYPE 316 STAINLESS STEEL DOUBLE NUT RODS ON BOTH SIDES OF ALL CONNECTIONS WITH TYPE 316 STAINLESS STEEL NUTS AND WASHERS.

NOTES:

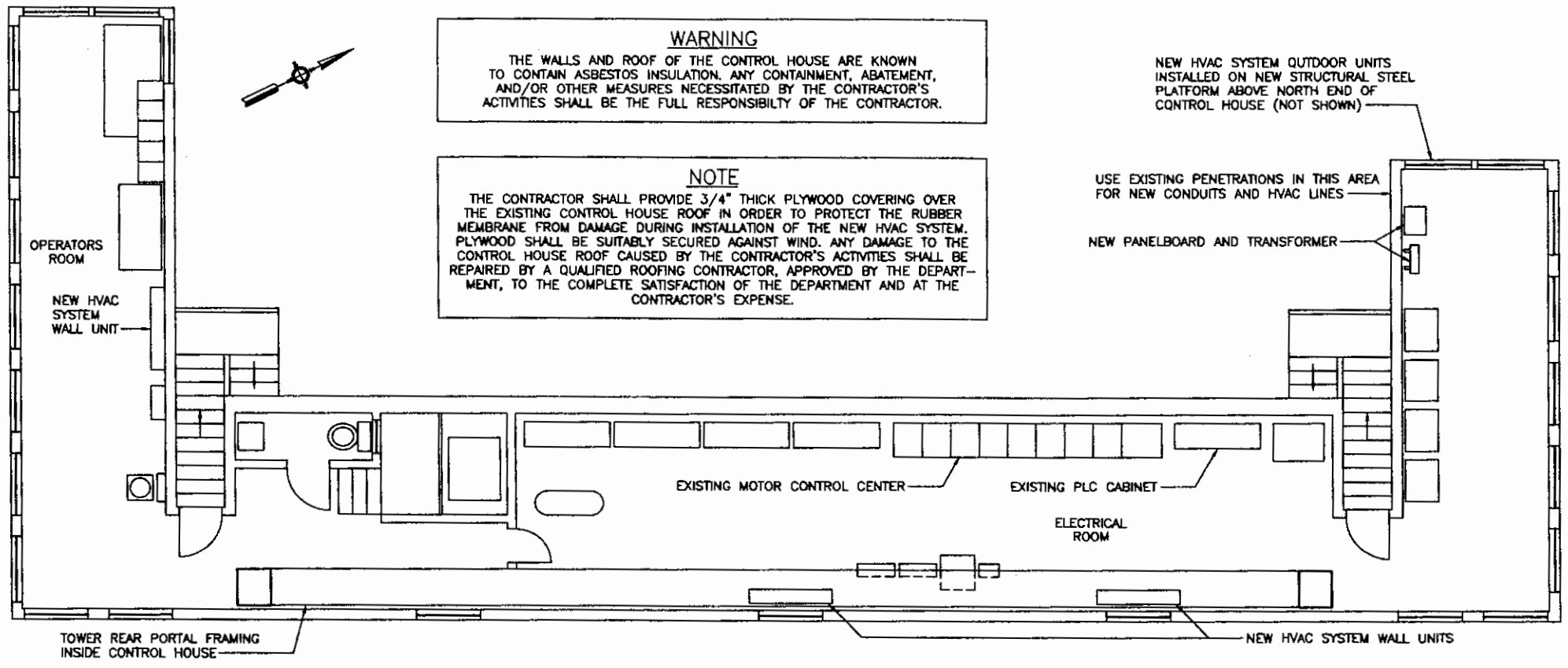
1. TILT OF ALL TYPE A LUMINAIRES SHALL BE -30 DEGREES FROM THE "ZERO" POSITION.



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DETAILS - 2

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E5

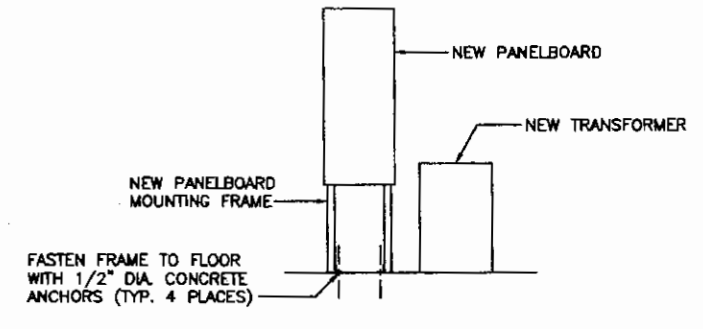


WARNING
 THE WALLS AND ROOF OF THE CONTROL HOUSE ARE KNOWN TO CONTAIN ASBESTOS INSULATION. ANY CONTAINMENT, ABATEMENT, AND/OR OTHER MEASURES NECESSITATED BY THE CONTRACTOR'S ACTIVITIES SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.

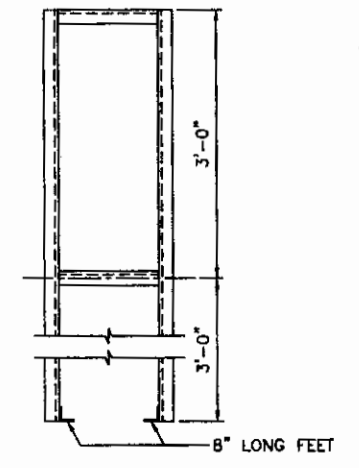
NOTE
 THE CONTRACTOR SHALL PROVIDE 3/4" THICK PLYWOOD COVERING OVER THE EXISTING CONTROL HOUSE ROOF IN ORDER TO PROTECT THE RUBBER MEMBRANE FROM DAMAGE DURING INSTALLATION OF THE NEW HVAC SYSTEM. PLYWOOD SHALL BE SUITABLY SECURED AGAINST WIND. ANY DAMAGE TO THE CONTROL HOUSE ROOF CAUSED BY THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED BY A QUALIFIED ROOFING CONTRACTOR, APPROVED BY THE DEPARTMENT, TO THE COMPLETE SATISFACTION OF THE DEPARTMENT AND AT THE CONTRACTOR'S EXPENSE.

NEW HVAC SYSTEM OUTDOOR UNITS INSTALLED ON NEW STRUCTURAL STEEL PLATFORM ABOVE NORTH END OF CONTROL HOUSE (NOT SHOWN)
 USE EXISTING PENETRATIONS IN THIS AREA FOR NEW CONDUITS AND HVAC LINES
 NEW PANELBOARD AND TRANSFORMER

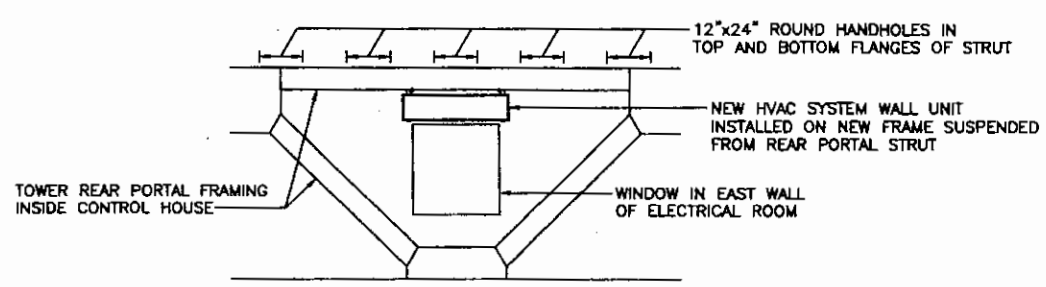
PLAN
NEW CONTROL HOUSE HVAC SYSTEM EQUIPMENT LAYOUT
 SCALE: 1/4" = 1'-0"



ELEVATION
NEW PANELBOARD AND TRANSFORMER
 SCALE: NONE

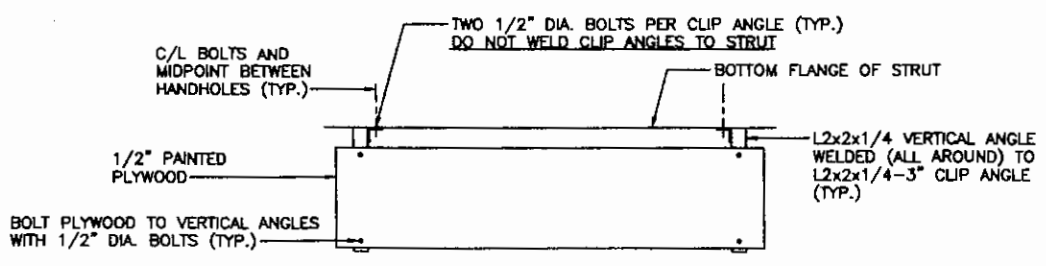


DETAIL OF NEW MOUNTING FRAME FOR NEW PANELBOARD
 SCALE: NONE
 PANELBOARD NOT SHOWN.

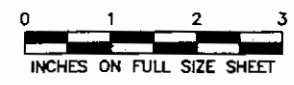


ELEVATION
HVAC SYSTEM WALL UNITS IN ELECTRICAL ROOM
 SCALE: NONE
 TYPICAL TWO PLACES IN ELECTRICAL ROOM.
 CONDUITS AND PIPING NOT SHOWN.

THE LOCATIONS SHOWN FOR THE HANDHOLES IN THE STRUT ARE APPROXIMATE. THE ACTUAL WIDTH AND SPECIFIC LOCATION OF THE NEW FRAME SHALL BE ADJUSTED SUCH THAT THE CONNECTIONS BETWEEN THE NEW FRAME AND THE STRUT WILL BE POSITIONED AT THE MIDPOINTS BETWEEN HANDHOLES.

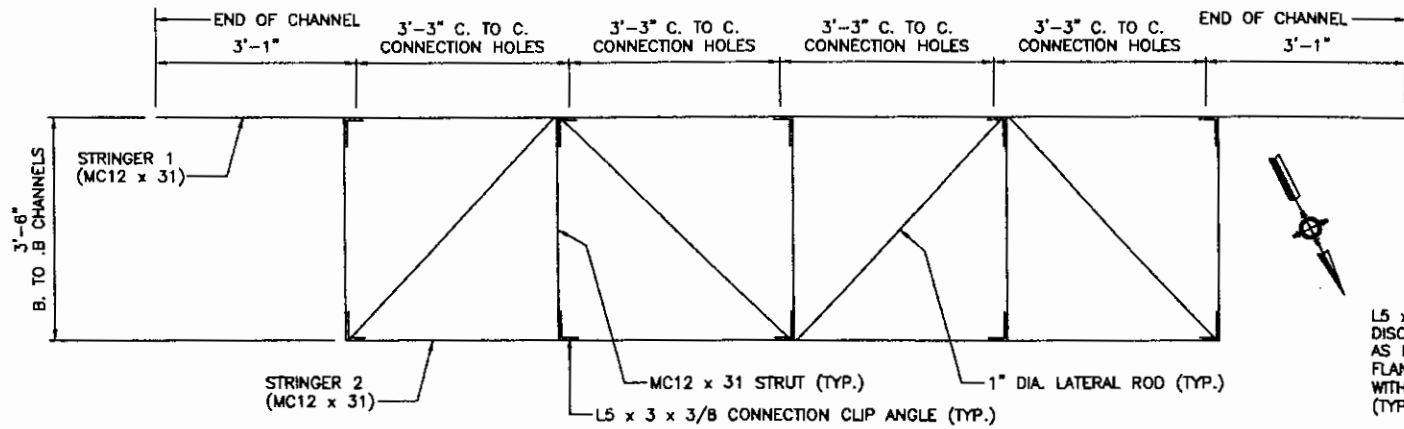


DETAIL OF NEW FRAME FOR HVAC SYSTEM WALL UNITS IN ELECTRICAL ROOM
 SCALE: NONE
 TYPICAL TWO PLACES IN ELECTRICAL ROOM.
 WALL UNIT NOT SHOWN.
 COORDINATE ALL DIMENSIONS WITH ACTUAL WALL UNITS SUPPLIED.
 ANGLES SHALL BE ASTM A36 STEEL, PAINTED TO MATCH HOUSE INSIDE WALL FINISH AFTER FABRICATION.

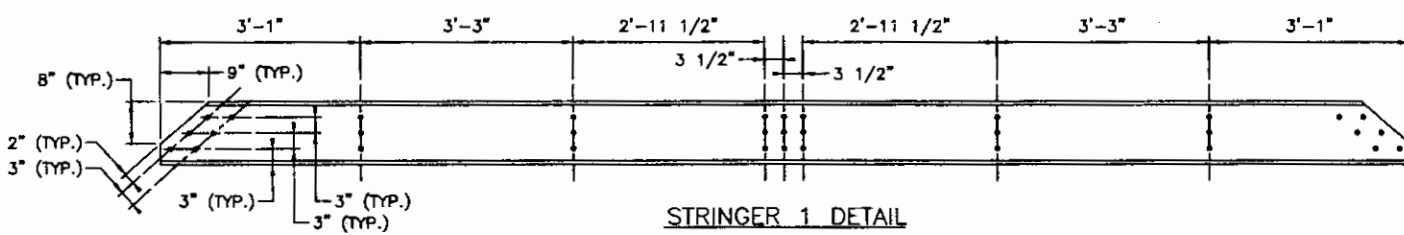


STATE OF NORTH CAROLINA	
DEPARTMENT OF TRANSPORTATION	
RALEIGH	
CAPE FEAR MEMORIAL LIFT BRIDGE	
WILMINGTON, NORTH CAROLINA	
CONTROL HOUSE	
NEW HVAC SYSTEM - 1	
DESIGNED	H.E. ALGER
DATE	OCT. 2009
CHECKED	C.D. VOGT
DRAWING NO.	EA-13

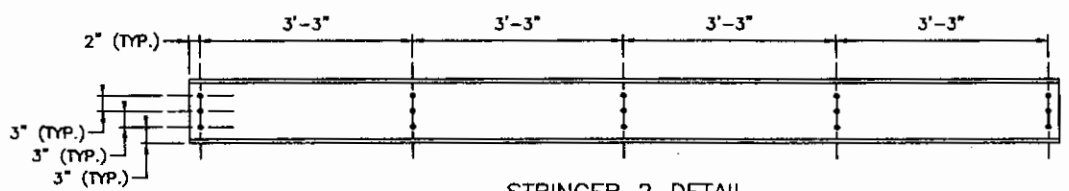
E6



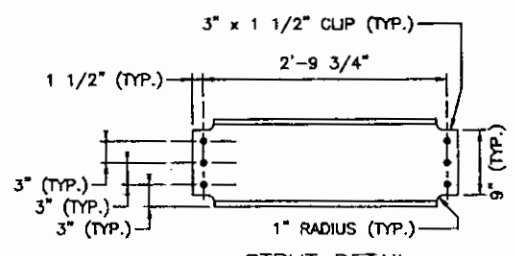
PLATFORM FRAMING PLAN
SCALE: 3/4" = 1'-0"



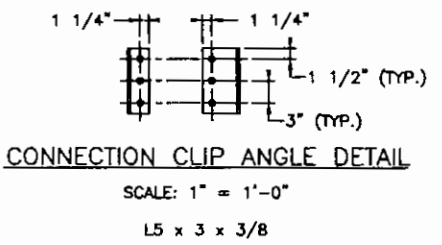
STRINGER 1 DETAIL
SCALE: 3/4" = 1'-0"
MC12 x 31



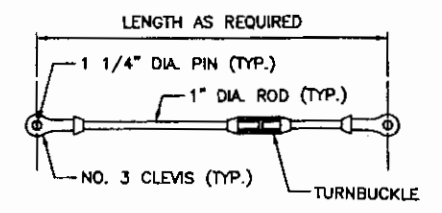
STRINGER 2 DETAIL
SCALE: 3/4" = 1'-0"
MC12 x 31



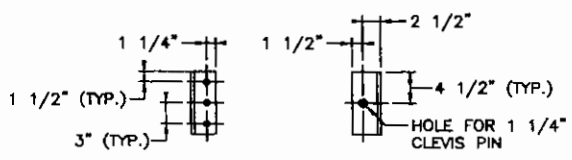
STRUT DETAIL
SCALE: 1" = 1'-0"
MC12 x 31



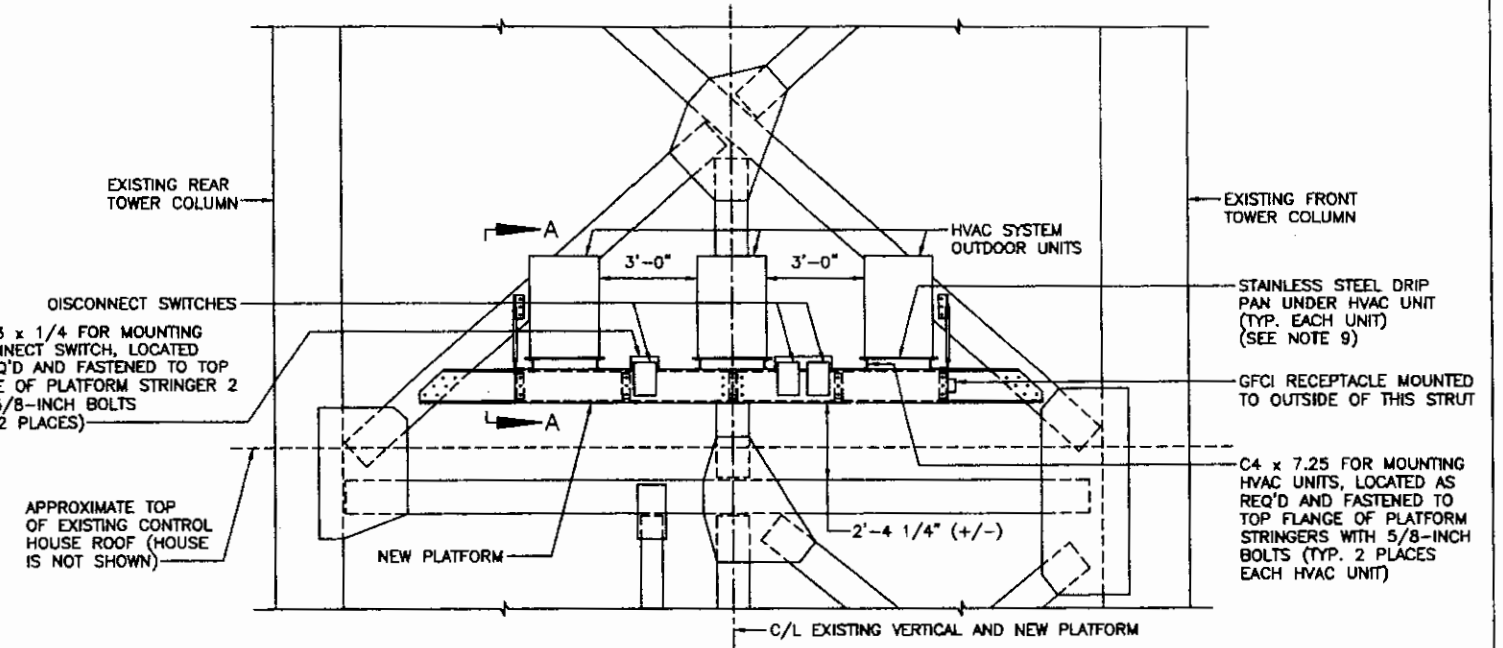
CONNECTION CLIP ANGLE DETAIL
SCALE: 1" = 1'-0"
L5 x 3 x 3/8



HANGER AND LATERAL ROD DETAIL
SCALE: 1" = 1'-0"

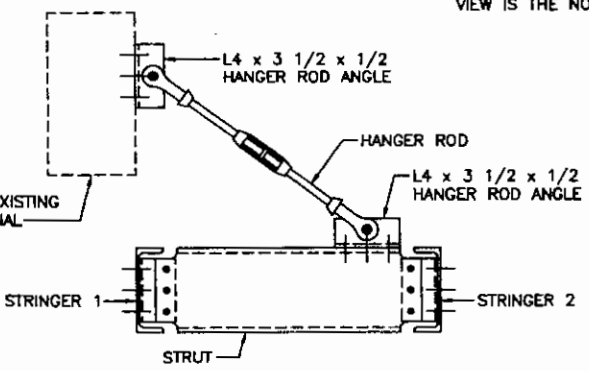


HANGER ROD ANGLE DETAIL
SCALE: 1" = 1'-0"
L4 x 3 1/2 x 1/2



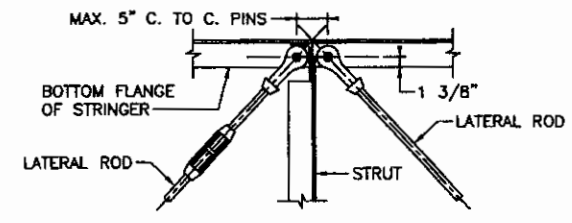
ELEVATION - NEW PLATFORM AND HVAC UNITS
SCALE: 3/8" = 1'-0"

VIEW IS THE NORTH OUTBOARD SIDE OF THE EAST TOWER



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

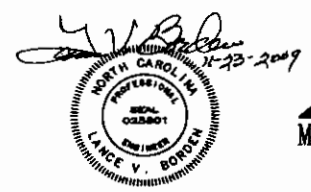
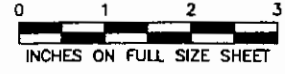
HVAC UNITS AND ELECTRICAL EQUIPMENT NOT SHOWN



TYPICAL LATERAL ROD CONNECTION DETAIL
SCALE: 1" = 1'-0"

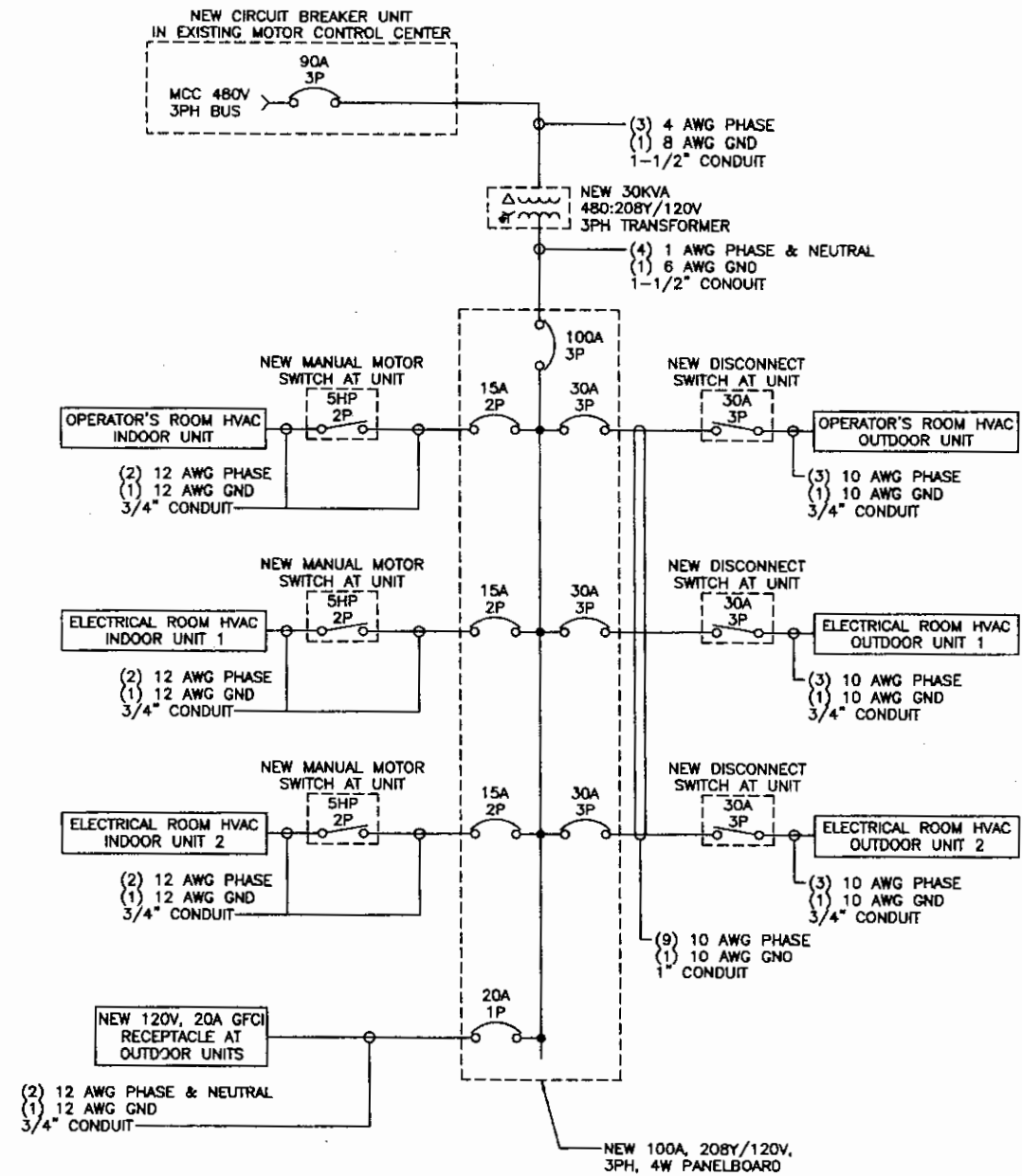
NOTES:

1. PRIOR TO STARTING WORK, THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS OF THE EXISTING STRUCTURE.
2. DIMENSIONS SHOWN ARE BASED ON THE SPECIFIED HVAC EQUIPMENT. CONTRACTOR SHALL MAKE ANY ADJUSTMENTS NECESSARY TO ACCOMMODATE THE ACTUAL HVAC EQUIPMENT SUPPLIED.
3. ALL MATERIAL IS NEW, UNLESS DENOTED AS EXISTING.
4. ALL WORK RELATED TO THE PLATFORM SHALL CONFORM TO THE REQUIREMENTS OF SECTION 440 (STEEL STRUCTURES) OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES AND BE PERFORMED BY QUALIFIED IRONWORKERS. ALL STRUCTURAL ELEMENTS SHALL BE SHOP AND FIELD PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 442 (PAINTING STEEL STRUCTURES).
5. ALL CHANNELS AND ANGLES SHALL CONFORM TO ASTM A709, GRADE 50W. ASTM A588 MAY BE SUBSTITUTED FOR A709, GRADE 50W WITH THE APPROVAL OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE DEPARTMENT. CVN TESTING IS NOT REQUIRED.
6. THE SYMBOL • DENOTES A FASTENER. ALL STRUCTURAL FASTENERS SHALL BE ASTM A325, TYPE 3 WITH A563, GRADE C3 HEAVY HEX NUTS AND F436, TYPE 3 HARDENED WASHERS. ALL STRUCTURAL FASTENERS SHALL BE 7/8-INCH, UNLESS DENOTED OTHERWISE.
7. LATERAL RODS, TURNBUCKLES, CLEVISES, AND PINS SHALL CONFORM TO AISI C1035. THREADS OF TURNBUCKLES AND CLEVISES SHALL BE LOCKED BY WELDING AFTER FINAL TIGHTENING HAS BEEN ACCOMPLISHED.
8. BOLTS, NUTS, AND WASHERS FOR MOUNTING THE HVAC UNITS AND ELECTRICAL EQUIPMENT SHALL BE TYPE 316 STAINLESS STEEL. LOCKWASHERS SHALL BE USED.
9. PROVIDE COPPER DRAIN LINES FROM THE DRIP PANS TO THE NEAREST ROOF DRAIN.



STATE OF NORTH CAROLINA	
DEPARTMENT OF TRANSPORTATION	
RALEIGH	
CAPE FEAR MEMORIAL LIFT BRIDGE	
WILMINGTON, NORTH CAROLINA	
CONTROL HOUSE	
NEW HVAC SYSTEM -- 2	
DESIGNED	D.B. IRWIN
DETAILED	D.B. IRWIN
CHECKED	C.D. VOGT
DATE	OCT. 2009
DRAWING NO.	EM-14

E7

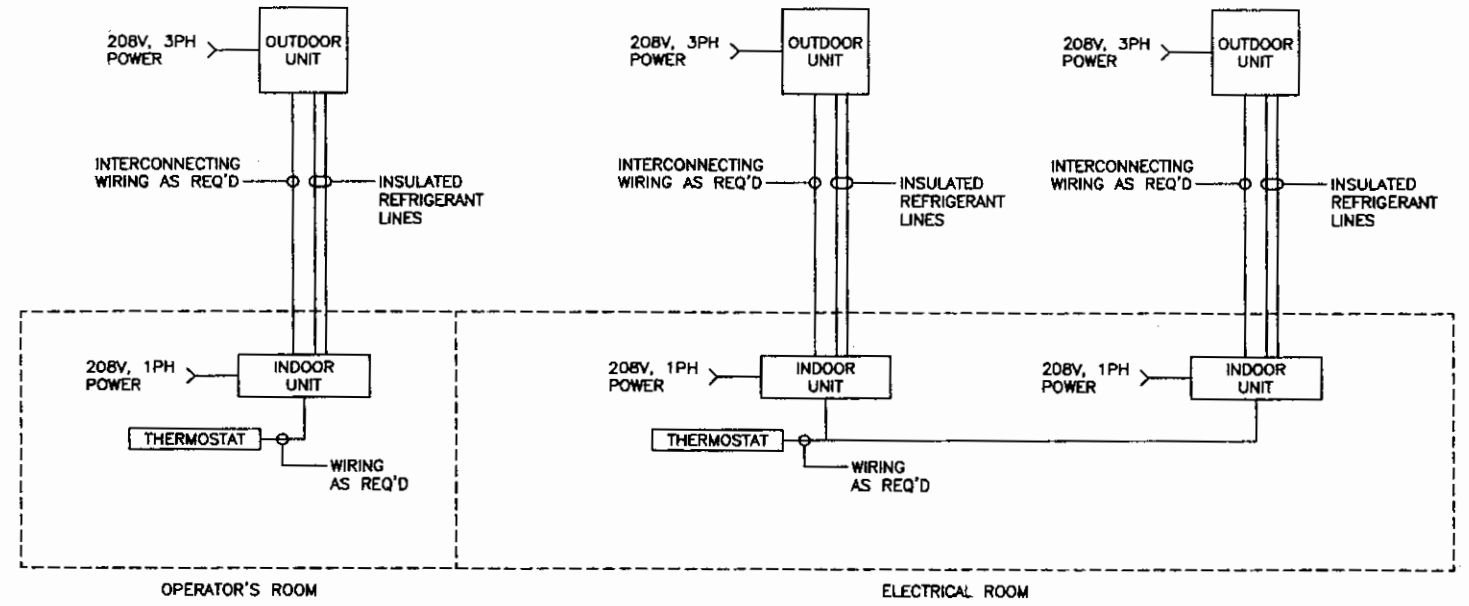
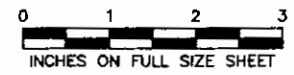


NEW HVAC SYSTEM POWER ONE-LINE DIAGRAM

SCALE: NONE

THE NEW PANELBOARD ENCLOSURE SHALL BE NEMA 12 STEEL THE OUTDOOR UNIT DISCONNECT SWITCHES ENCLOSURES SHALL BE NEMA 4X STAINLESS STEEL (TYPE 316). THE INDOOR UNIT MANUAL MOTOR SWITCH ENCLOSURES SHALL BE NEMA 1, WITH PROVISIONS FOR LOCKING IN THE OFF POSITION.

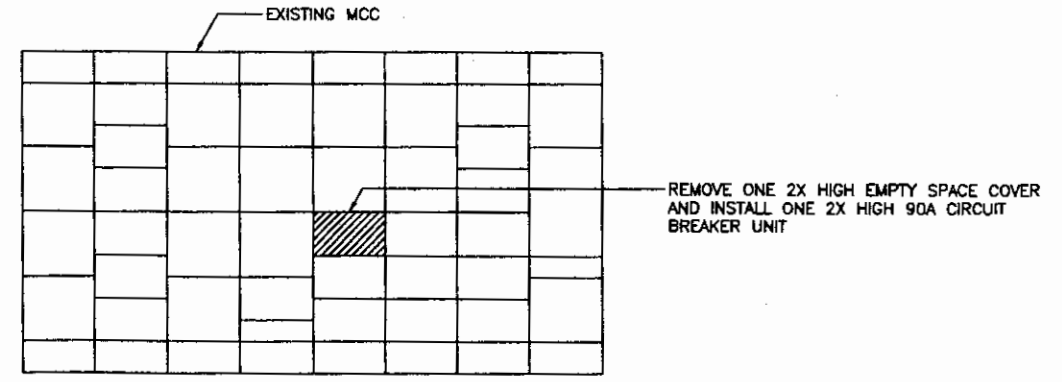
ALL PANELBOARD BRANCH CIRCUIT BREAKER SHALL BE HACR LISTED.



NEW HVAC SYSTEM SCHEMATIC

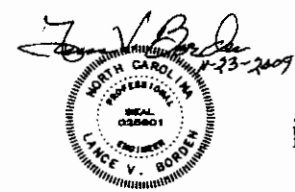
SCALE: NONE

THE NEW HVAC SYSTEM SHALL CONSIST OF THREE DUCT-FREE HEAT PUMPS, EACH WITH A NOMINAL CAPACITY OF 36,000 BTUH, ARRANGED AS SHOWN.



MODIFICATIONS TO EXISTING MOTOR CONTROL CENTER

SCALE: NONE



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 CAPE FEAR MEMORIAL LIFT BRIDGE
 WILMINGTON, NORTH CAROLINA
 CONTROL HOUSE
 NEW HVAC SYSTEM - 3

DESIGNED	H.E. ALDER	DATE	OCT. 2009
CHECKED	C.D. VOGT	DRAWING NO.	EM-15
DRAWN BY	H.E. ALDER	SCALE	AS NOTED
E8			