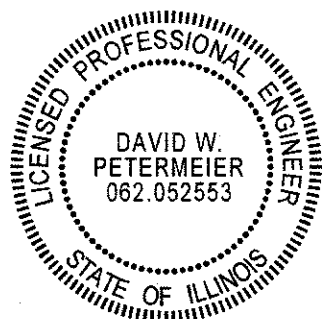


FOR INDEX OF SHEETS, SEE SHEET NO. 2 - KEY PLAN

FOR LIST OF STANDARDS, SEE SHEET NO.2 - KEY PLAN

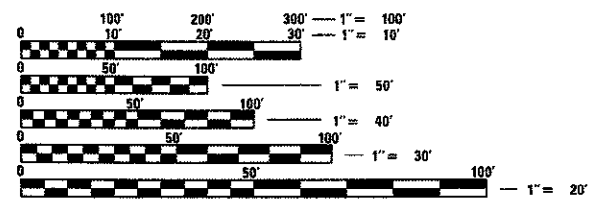
IDOT - ELECTRICAL MAINTENANCE
MEADE ELECTRIC
(708) 588-2544

IMPROVEMENT LOCATED IN THE CITY OF JOLIET AND VILLAGE OF ROCKDALE



David Petermeier 2/19/18

DAVID W. PETERMEIER DATE
ILLINOIS PROFESSIONAL ENGINEER NO. 062.052553
REGISTRATION EXPIRES 11/30/2019
OVERALL PROJECT MANAGEMENT
ADDITIONAL PROFESSIONAL SEALS WITH THE DESIGNATED RESPONSIBILITY FOR INDIVIDUAL DRAWINGS IS SHOWN ON SHEETS 2 AND 431



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1-800-892-0123
OR 811

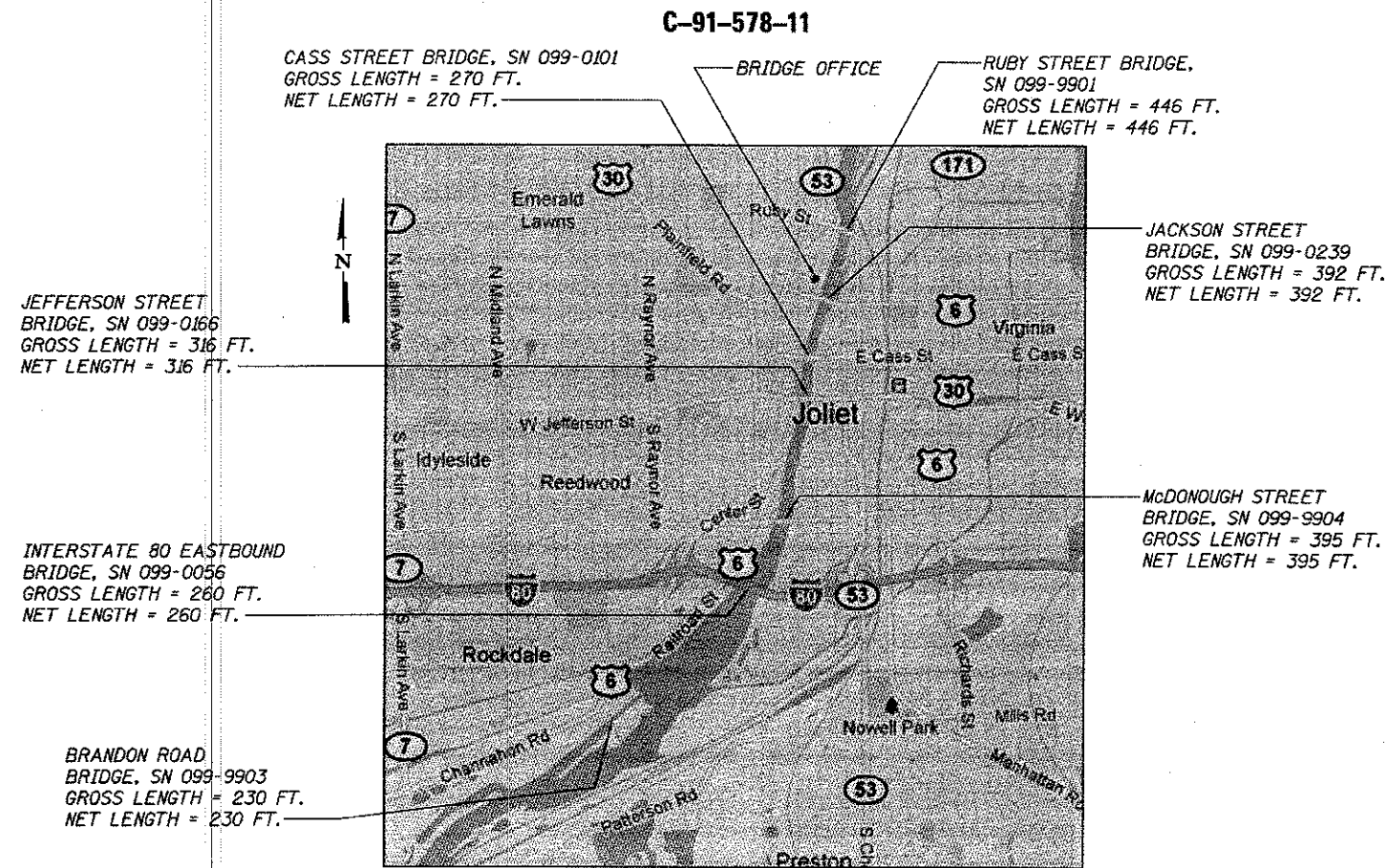
PROJECT ENGINEER: ANA ABREU (847) 705-4482
PROJECT MANAGER: SERIN KELLER (847) 705-4556

CONTRACT NO. 60P55

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROPOSED
HIGHWAY PLANS

VARIOUS ROUTES IN THE CITY OF JOLIET
SECTION 2011-045-I
PROJECT NHPP-STP-FAP6(281)
VARIOUS MOVABLE BRIDGES, LOCAL
CENTRALIZED CONTROL AND OPERATION
WILL COUNTY

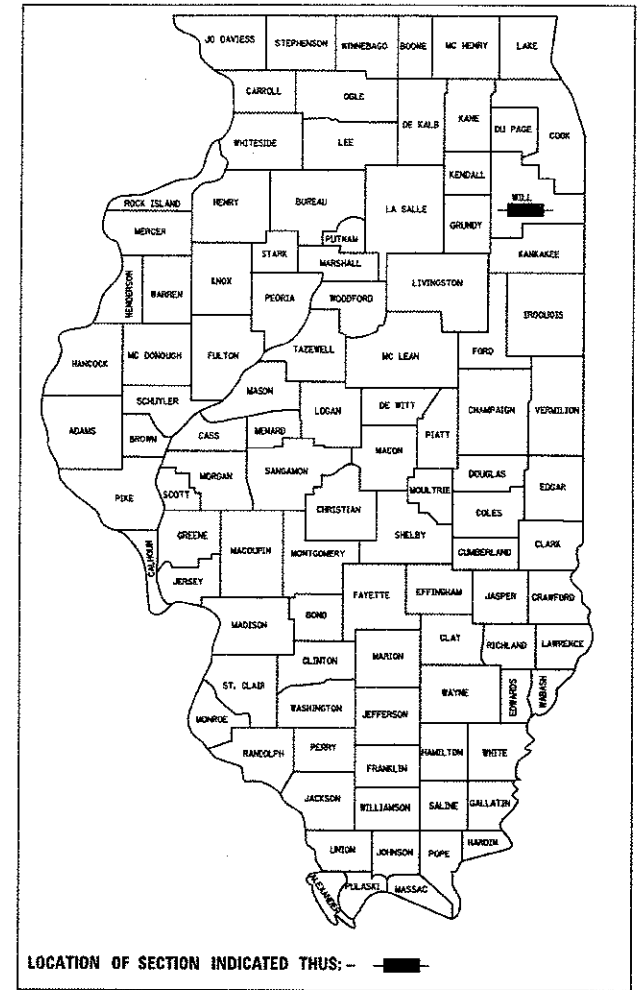


LOCATION MAP

No Scale
GROSS LENGTH = 2309 FT. = 0.44 MILE
NET LENGTH = 2309 FT. = 0.44 MILE

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-I	WILL	488	1
		ILLINOIS	CONTRACT NO. 60P55	

D-91-301-09



PREPARED BY:
MODJESKI AND MASTERS, INC.
#4 SUNSET HILLS PROFESSIONAL CENTER
EDWARDSVILLE, IL 62025

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SUBMITTED January 24 20 18
Anthony A. Ranney REGIONAL ENGINEER
Mark A. Etkin ENGINEER OF DESIGN AND ENVIRONMENT
David L. Chisholm DIRECTOR OF HIGHWAYS PROJECT IMPLEMENTATION

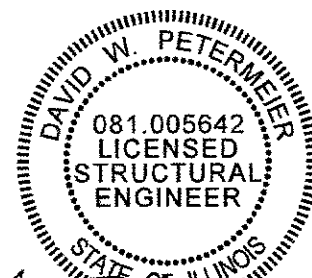
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INDEX OF DRAWINGS

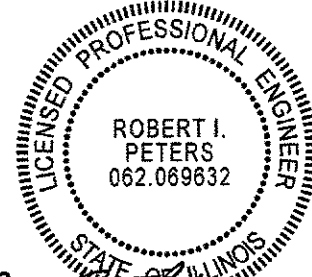
- 1 COVER SHEET
- 2 KEY PLAN
- 3 - 7 SUMMARY OF QUANTITIES
- 8 - 9 ELECTRICAL GENERAL NOTES
- 10 - 11 SCADA AND CCTV TOPOLOGY
- 12 - 13 CABLE FIBER ASSIGNMENTS
- 14 - 110 RUBY STREET
- 111 - 207 JACKSON STREET
- 208 - 246 CASS STREET
- 247 - 285 JEFFERSON STREET
- 286 - 325 McDONOUGH STREET
- 326 - 418 BRANDON STREET
- 419 - 430 WIRELESS BACKUP NETWORK
- 431 - 466 BRIDGE OFFICE



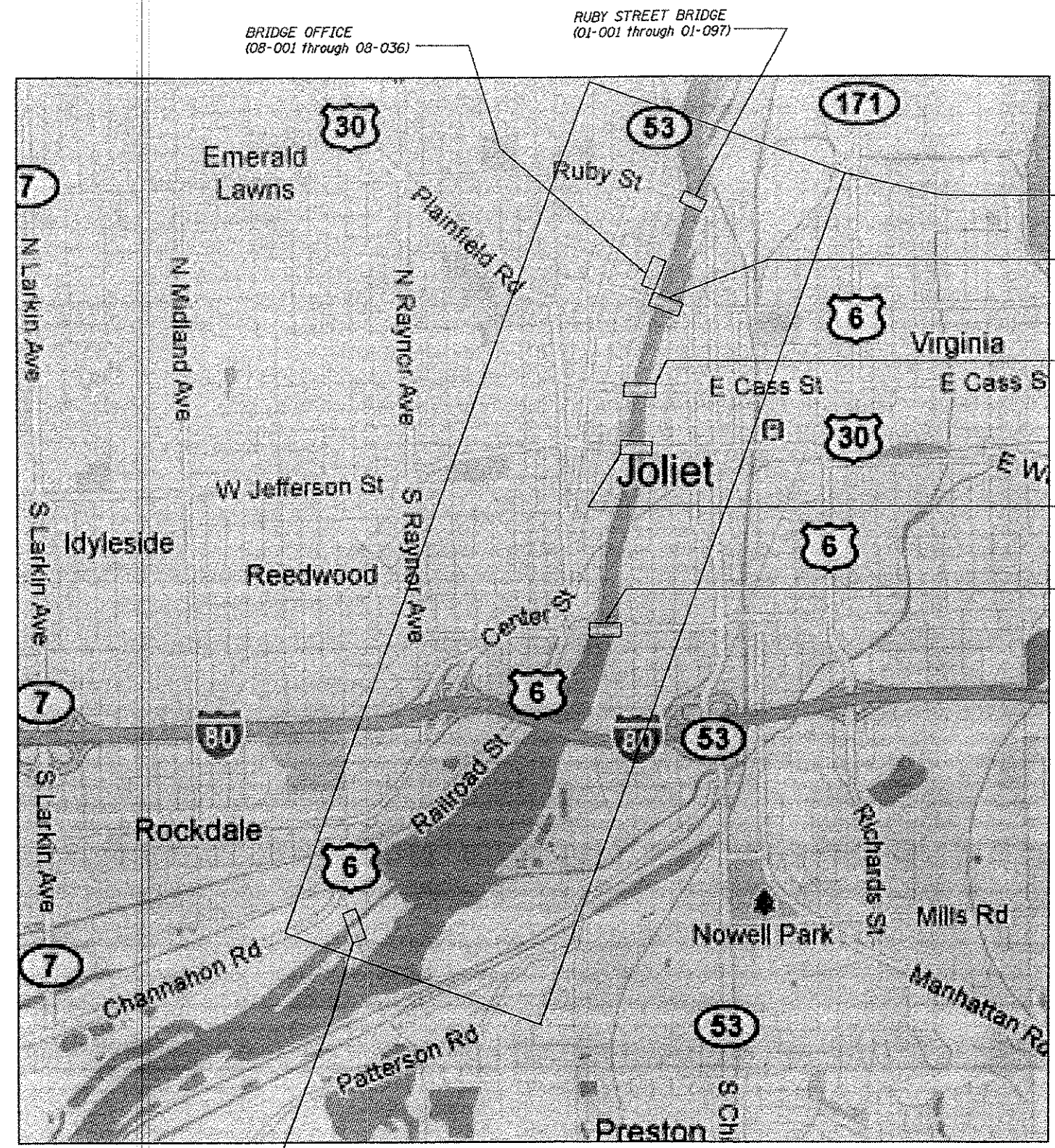
David W. Petermeier 2/19/18
 DAVID W. PETERMEIER
 ILLINOIS PROFESSIONAL ENGINEER NO. 062.052553
 REGISTRATION EXPIRES 11/30/2019
 SHEETS: 2-7, 108-110, 206-207, 245-246, 283-285, 324-325, 417-418



David W. Petermeier 2/19/18
 DAVID W. PETERMEIER
 ILLINOIS STRUCTURAL ENGINEER NO. 081.005642
 REGISTRATION EXPIRES 11/30/2019
 SHEETS: 107, 456



Robert I. Peters 2/19/18
 ROBERT I. PETERS
 ILLINOIS PROFESSIONAL ENGINEER NO. 062.069632
 REGISTRATION EXPIRES 11/30/2019
 SHEETS: 2-106, 11-205, 208-244, 247-282, 286-323, 326-416, 419-430, 458-465



BRIDGE OFFICE (08-001 through 08-036)
 RUBY STREET BRIDGE (01-001 through 01-097)

WIRELESS BACKUP NETWORK (07-001 through 07-012)

JACKSON STREET BRIDGE (02-001 through 02-097)

CASS STREET BRIDGE (03-001 through 03-039)

JEFFERSON STREET BRIDGE (04-001 through 04-039)

McDONOUGH STREET BRIDGE (05-001 through 05-040)

BRANDON ROAD BRIDGE (06-001 through 06-093)

KEY PLAN
 No Scale

HIGHWAY STANDARDS

000001-06	STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS
001006	DECIMAL OF AN INCH AND OF A FOOT
701601-09	URBAN LANE CLOSURE, MULTILANE, 1W OR 2W WITH NONTRAVERSABLE MEDIAN
701701-10	URBAN LANE CLOSURE, MULTILANE INTERSECTION
701901-07	TRAFFIC CONTROL DEVICES



USER NAME =	DESIGNED - R.I. PETERS	REVISED -
PLDT SCALE =	CHECKED - L.V. BORDEN	REVISED -
PLDT DATE =	DRAWN - R.L. REED	REVISED -
	CHECKED - R.I. PETERS	REVISED -

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 KEY PLAN

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-1	WILL	466	2
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	CONSTRUCTION CODE									
				NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	100% CITY OF JOLIET	
				BRIDGE	BRIDGE	BRIDGE	BRIDGE	BRIDGE	BRIDGE	OTHER	UTILITY	UTILITY	
				0013	0013	0013	0013	0013	0013	0044	0043	0043	
				SN 099-9901	SN 099-0239	SN 099-0101	SN 099-0166	SN 099-9904	SN 099-9903	URBAN	SN 099-0056	URBAN	
				Ruby St.	Jackson St.	Cass St.	Jefferson St.	McDonough St.	Brandon Rd.	Bridge Office	I-80	City of Joliet	
42400300	PORTLAND CEMENT CONCRETE SIDEWALK 6 INCH	SQ FT	800.0	400.0		80.0		320.0					
44000500	COMBINATION CURB AND GUTTER REMOVAL	FOOT	20	4	4	4	4	4					
44000600	SIDEWALK REMOVAL	SQ FT	800	400		80		320					
50200100	STRUCTURE EXCAVATION	CU YD	149	149									
50200400	ROCK EXCAVATION FOR STRUCTURES	CU YD	3	3									
50300225	CONCRETE STRUCTURES	CU YD	66.0	66.0									
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	4400	4400									
60603900	COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.12 (ABUTTING EXISTING PAVEMENT)	FOOT	20.0	4.0	4.0	4.0	4.0	4.0					
67100100	MOBILIZATION	L SUM	1	0.15	0.15	0.15	0.15	0.15	0.15	0.05	0.05		
81025200	CONDUIT ENCASED, REINFORCED CONCRETE, 2" DIA., PVC 1 WIDE X 1 HIGH	FOOT	10									10	
81025300	CONDUIT ENCASED, REINFORCED CONCRETE, 2" DIA., PVC 2 WIDE X 1 HIGH	FOOT	30		30								
81100605	CONDUIT ATTACHED TO STRUCTURE, 2" DIA., PVC COATED GALVANIZED STEEL	FOOT	5									5	
81300220	JUNCTION BOX, STAINLESS STEEL, ATTACHED TO STRUCTURE, 6" x 6" x 4"	EACH	1								1		
81300840	JUNCTION BOX, STAINLESS STEEL, ATTACHED TO STRUCTURE, 18" x 18" x 12"	EACH	1									1	

* - SPECIALTY ITEM



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - L.V. BORDEN	REVISED	---
PLOT SCALE =	DRAWN - R.L. REED	REVISED	---
PLOT DATE =	CHECKED - R.I. PETERS	REVISED	---

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
PROJECT SUMMARY OF QUANTITIES - 1

SHEET NO. 3 OF 13 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-I	WILL	466	3
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	CONSTRUCTION CODE									
				NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	100% CITY OF JOLIET
				BRIDGE	BRIDGE	BRIDGE	BRIDGE	BRIDGE	BRIDGE	OTHER	UTILITY	UTILITY	
				0013	0013	0013	0013	0013	0013	0044	0043	0043	
				SN 099-9901	SN 099-0239	SN 099-0101	SN 099-0166	SN 099-9904	SN 099-9903	URBAN	SN 099-0056	URBAN	
				Ruby St.	Jackson St.	Cass St.	Jefferson St.	McDonough St.	Brandon Rd.	Bridge Office	I-80	City of Joliet	
81300960	JUNCTION BOX, STAINLESS STEEL, ATTACHED TO STRUCTURE, 42" X 36" X 12"	EACH	1							1			
* 87302515	ELECTRIC CABLE AERIAL SUSPENDED, SERVICE, NO. 6 3C	FOOT	290								290		
* X0100003	CLEARING AND GRUBBING	SQ YD	360	255	35		30	40					
X0324912	RADIO ANTENNA	EACH	7	1	1	1	1	1	1	1			
X0326254	LAPTOP COMPUTER	EACH	1							1			
X0326267	VIDEO SERVER	EACH	1									1	
X0326500	BRIDGE OPERATION AND MAINTENANCE DURING CONSTRUCTION	L SUM	1	0.167	0.167	0.167	0.167	0.166	0.166				
X0326544	WINDOW BLINDS	L SUM	1							1			
X0326555	MAIN SPAN DRIVE MOTORS	EACH	22	4	4	4	4	4	2				
X0326564	VECTOR-CONTROLLED MOTOR DRIVES	EACH	18		4	4	4	4	2				
X0326615	INTEGRATED BRIDGE CONTROLS SYSTEM	L SUM	1	0.167	0.167	0.167	0.167	0.166	0.166				
* X0326948	CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE, 50 FT. MOUNTING HEIGHT	EACH	4		2			2					
* X0326949	CLOSED CIRCUIT TELEVISION CAMERA STRUCTURE FOUNDATION, 30" DIAMETER	FOOT	40		20			20					
* X0326964	FIBER OPTIC INTERCONNECT CABINET	EACH	8	1	1	1	1	2	1	1			

* - SPECIALTY ITEM



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - L.V. BORDEN	REVISED	---
PLOT SCALE =	DRAWN - R.L. REED	REVISED	---
PLOT DATE =	CHECKED - R.I. PETERS	REVISED	---

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
PROJECT SUMMARY OF QUANTITIES - 2

SHEET NO. 4 OF 13 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-1	WILL	466	4
			CONTRACT NO. 60P55	
[ILLINOIS] FED. AID PROJECT				

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	CONSTRUCTION CODE									
				NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	100% CITY OF JOLIET
				BRIDGE	BRIDGE	BRIDGE	BRIDGE	BRIDGE	BRIDGE	OTHER	UTILITY	UTILITY	
				0013	0013	0013	0013	0013	0013	0044	0043	0043	
				SN 099-9901	SN 099-0239	SN 099-0101	SN 099-0166	SN 099-9904	SN 099-9903	URBAN	SN 099-0056	URBAN	
				Ruby St.	Jackson St.	Cass St.	Jefferson St.	McDonough St.	Brandon Rd.	Bridge Office	I-80	City of Joliet	
X0327345	WORKSTATION FURNITURE, IDOT DISTRICT 1	L SUM	1								1		
X6700410	ENGINEER'S FIELD OFFICE, TYPE A (SPECIAL)	CAL MO	30	4	4	4	4	4	4	4	2		
X7010216	TRAFFIC CONTROL AND PROTECTION, (SPECIAL)	L SUM	1	0.167	0.167	0.167	0.167	0.166	0.166				
X7015005	CHANGEABLE MESSAGE SIGN	CAL DAY	60				60						
* X8040102	ELECTRIC SERVICE INSTALLATION, SPECIAL	EACH	2							1	1		
* X8040300	ELECTRICAL SERVICE CONNECTION	EACH	2							1	1		
* X8040310	ELECTRICAL SERVICE DISCONNECT	EACH	1								1		
* X8780105	CONCRETE FOUNDATIONS (SPECIAL)	EACH	1					1					
* Z0013798	CONSTRUCTION LAYOUT	L SUM	1	0.143	0.143	0.143	0.143	0.143	0.143	0.142			
* Z0030850	TEMPORARY INFORMATION SIGNING	SQ FT	336	56	56	56	56	56	56				
* Z0033052	COMMUNICATIONS VAULT	EACH	1									1	
* Z0033062	RADIO TRANSCEIVER	EACH	9	1	1	1	1	1	1	3			
* Z0073400	TEMPORARY SUPPORT SYSTEM	EACH	6	1	1	1	1	1	1				
* Z0073510	TEMPORARY TRAFFIC SIGNAL TIMING	EACH	53	17	1	3	6	22	4				

* - SPECIALTY ITEM



USER NAME =	DESIGNED - R.I. PETERS	REVISED -
	CHECKED - L.V. BORDEN	REVISED -
PLOT SCALE =	DRAWN - R.L. REED	REVISED -
PLOT DATE =	CHECKED - R.I. PETERS	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
PROJECT SUMMARY OF QUANTITIES - 3

SHEET NO. 5 OF 13 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-1	WILL	466	5
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	CONSTRUCTION CODE								
				NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	100% CITY OF JOLIET
				BRIDGE 0013	BRIDGE 0013	BRIDGE 0013	BRIDGE 0013	BRIDGE 0013	BRIDGE 0013	OTHER 0044	UTILITY 0043	UTILITY 0043
				SN 099-9901	SN 099-0239	SN 099-0101	SN 099-0166	SN 099-9904	SN 099-9903	URBAN	SN 099-0056	URBAN
				Ruby St.	Jackson St.	Cass St.	Jefferson St.	McDonough St.	Brandon Rd.	Bridge Office	I-80	City of Joliet
* X1400311	BRIDGE ELECTRICAL INSTALLATION	EACH	6	1	1	1	1	1	1			
* X1400312	DC DRIVE SYSTEM	EACH	1	1								
* X1400313	SYSTEMS INTEGRATION	L SUM	1	0.13	0.13	0.13	0.13	0.13	0.13	0.11	0.11	
* X1400314	BRIDGE CONTROL CCTV SYSTEM	EACH	7	1	1	1	1	1	1	1		
* X1400315	WIRELESS BACKUP NETWORK	EACH	8	1	1	1	1	1	1	1	1	
* X1400327	PUBLIC ADDRESS SYSTEMS	EACH	7	1	1	1	1	1	1	1		
X0320017	FURNITURE REMOVAL, PROTECTION, RETURN	L SUM	1								1	
X3400005	DEMOLITION - INTERIOR	L SUM	1								1	
X0220044	WALL ASSEMBLY	L SUM	1								1	
X0320045	EXTERIOR DOOR AND WINDOW ASSEMBLY	L SUM	1								1	
X0320046	DOORS, FRAMES, AND HARDWARE	L SUM	1								1	
X0320018	FINISHES	L SUM	1								1	
X0320019	CASEWORK	L SUM	1								1	
X0320039	TOILET ACCESSORIES	L SUM	1								1	

* - SPECIALTY ITEM

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	CONSTRUCTION CODE									
				NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	NHPP 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	STPU 80% FEDERAL 20% STATE	100% CITY OF JOLIET	
				BRIDGE	BRIDGE	BRIDGE	BRIDGE	BRIDGE	BRIDGE	OTHER	UTILITY	UTILITY	
				0013	0013	0013	0013	0013	0013	0044	0043	0043	
				SN 099-9901	SN 099-0239	SN 099-0101	SN 099-0166	SN 099-9904	SN 099-9903	URBAN	SN 099-0056	URBAN	
				Ruby St.	Jackson St.	Cass St.	Jefferson St.	McDonough St.	Brandon Rd.	Bridge Office	I-80	City of Joliet	
X0320043	FIRE EXTINGUISHERS	L SUM	1								1		
* X0320048	PLUMBING WORK BRIDGE OFFICE	L SUM	1								1		
* X0320049	MECHANICAL HVAC WORK BRIDGE OFFICE	L SUM	1								1		
* X0320053	ELECTRICAL WORK BRIDGE OFFICE	L SUM	1								1		
* X0320054	DIESEL ENGINE GENERATOR	EACH	1								1		
* X1400328	AUTOMATIC TRANSFER SWITCH	EACH	1								1		
* X1400329	SCADA SYSTEM	L SUM	1	0.143	0.143	0.143	0.143	0.143	0.143		0.142		
* X1400330	RUBY STREET AERIAL CABLES	L SUM	1	1									
* X1400331	JACKSON STREET AND MCDONOUGH STREET AERIAL CABLES	L SUM	1		0.5				0.5				
* X1400332	CASS STREET AND JEFFERSON STREET AERIAL CABLES	L SUM	1			0.5	0.5						
* X1400333	BRANDON ROAD AERIAL CABLES	L SUM	1							1			
* X1400334	AERIAL CABLE SUPPORT SYSTEM	L SUM	1	1									
Ø 20076600	TRAINEES	HOURL	4000	4000									
Ø 20076604	TRAINEES - TRAINING PROGRAM GRADUATE	HOURL	4000	4000									

* - SPECIALTY ITEM

Ø 0042



USER NAME =	DESIGNED - R.I. PETERS	REVISED -
	CHECKED - L.V. BORDEN	REVISED -
PLOT SCALE =	DRAWN - R.L. REED	REVISED -
PLOT DATE =	CHECKED - R.I. PETERS	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
PROJECT SUMMARY OF QUANTITIES - 5

SHEET NO. 7 OF 13 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-1	WILL	466	7
CONTRACT NO. 60P55			ILLINOIS FED. AID PROJECT	

ELECTRICAL GENERAL NOTES:

1. General

- 1.01 All work shall comply with the current edition of the National Electrical Code in effect at the bid opening time, and all applicable state and/or local codes.
- 1.02 All Equipment, Raceways, Wiring, etc. shall be installed in a neat and workman like manner in accordance with NECA 1 (standard practice of good workmanship in electrical construction), and without violating any required clear working space (NEC 110.26).
- 1.03 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.
- 1.04 The installation of all equipment and materials shall comply with their respective manufacturers' recommendations and installation procedures.
- 1.05 The Contractor is required to deliver a complete, working, and safe electrical system.
- 1.06 Variations from these plans must be submitted to the Engineer for approval. All changes shall be reflected in the as-built drawings.
- 1.07 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.
- 1.08 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.
- 1.09 All Equipment, Raceways, Wiring, etc. shown on these plans, or otherwise required, shall be new unless specifically noted otherwise.
- 1.10 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.
- 1.11 The Contractor is required to coordinate with the local Electric Utility Company for all electric service interruptions required by his work.
- 1.12 The Contractor is responsible for supplying any temporary power required.

- 1.13 Where details are not provided or fully developed, the Contractor shall provide the additional detail development necessary to provide and submit layout drawings and shop drawings for review.
- 1.14 All Rigid Metal Conduit shall be steel, Hot-Dip galvanized inside and outside.
- 2. Wiring materials & methods**
 - 2.01 Unless explicitly indicated otherwise, only the following wiring methods are permitted.
 - (1) All locations
 - 1. Rigid Metal Conduit
 - 2. Liquidtight Flexible Metal Conduit (LFMC), plastic jacket
 - 2.02 All conduit connections to Motors and similar equipment shall be made with flexible conduit. Length of flexible conduit shall be not less than 18 inches but not more than 36 inches.
 - 2.03 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.
 - 2.04 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.
 - 2.05 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.
 - 2.06 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. Conductor insulation shall have a 600V minimum rating.

- 2.07 Neutral Conductors shall not be shared between multiple branch circuits, except for designated multiwire lighting and receptacle circuits where clearly shown on the plans.
- 2.08 Conductor fill in raceways shall not exceed 40%. Minimum conduit size shall be 3/4 inch.
- 2.09 Wiring in Enclosures, Cabinets, Boxes, etc. shall be neatly routed and bundled with PVC Cable Ties or placed in non-metallic wiring troughs.
- 2.10 Spare and un-terminated Conductors shall be capped, or connected to spare Terminal Blocks where available, and clearly identified as spares. One full turn of slack for all spare conductors shall be provided in all Enclosures,, Cabinet, Boxes, etc.
- 2.11 One full turn of slack shall be provided for all Conductors in all Pull Boxes, Junction Boxes, and Terminal Cabinets.
- 2.12 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. Provide adequate slack in conductors to accomodate the expansion.
- 2.13 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 Luminaries and wiring devices which shall utilize compression type, or similar approved, connectors. Limit use of set-screw type connectors to devices to be replaced during long term maintenance. Twist-on (wirenut) type connectors shall not be used. Terminal Blocks shall not have more than two conductors per terminal.
- 2.14 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.
- 2.15 A Conduit Body or Box shall be provided on at least one side of all flexible conduits.
- 2.16 Unless specifically indicated otherwise, Conduit and Cable entrances in damp and wet locations shall be made in the bottom of Cabinets and/or Enclosures.
- 2.17 Conductors with green colored insulation shall be used only for Grounding Conductors. Re-identification of Conductors with green colored insulation, such as with colored tape, is not permitted.
- 2.18 Fittings for use with flexible conduit shall be stainless steel with thermoplastic insulator and sealing ring.



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**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
ELECTRICAL GENERAL NOTES - 1**

SHEET NO. 8 OF 13 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-I	WILL	466	8
ILLINOIS FED. AID PROJECT			CONTRACT NO. 60P55	

ELECTRICAL GENERAL NOTES (CONTINUED):

3. Miscellaneous materials & methods
- 3.01 All Bolts, Nuts, Washers, Concrete Anchors, and similar hardware shall be type 316 stainless steel. All Concrete Anchors shall be epoxy adhesive type.
- 3.02 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.
- 3.03 Supports for electrical equipment shall be fabricated from type 316 stainless steel or type A36 steel hot-dip galvanized after fabrication.
- 3.04 The operating handle(s) of all manually operable devices shall not be less than 2 feet, nor more than 6'-7", above the floor.
- 3.05 Equipment Enclosures, Cabinets, Boxes, and similar items shall be installed plumb and securely fastened in place.
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 machine printed labels.
- 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.
- 4.04 The Contractor shall be responsible for developing a comprehensive wire numbering system and shall label all Wires, Cables, and Terminal Blocks. Identification numbers shall be coordinated for consistency and accuracy with numbers shown on the Contractor's wiring diagrams and shop drawings, field wiring diagrams, and any other diagrams showing the same item.
5. Grounding & bonding
- 5.01 Provide grounding and bonding of all systems per NEC Article 250.
- 5.02 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.
- 5.03 All grounding type Hubs and Connectors in a Box or Enclosure shall be bonded together and to the Box or Enclosure with a stranded copper bonding jumper sized equal to the largest equipment Grounding Conductor in the Box or Enclosure.
- 5.04 All Grounding Conductors within an Equipment Enclosure or Terminal Cabinet shall be terminated on a common uninsulated grounding bar.

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 underground equipment shall be abandoned in place, except where specifically noted otherwise.
- 6.02 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.
- 6.03 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.
- 6.04 The locations and characteristics of all Raceways, Boxes, and Equipment which are abandoned in place shall be clearly documented on the as-built drawings.
- 6.05 The Contractor shall give the Owner the option of salvaging all Electrical Equipment which is to be removed. The Contractor shall remove all equipment which the Owner wishes to salvage from the project site and deliver it to the location designated by the District 1 Engineer. All equipment which is to be salvaged shall be handled with care at all times to avoid damage.
- 6.06 All electrical equipment which is to be removed and the Owner does not wish to salvage shall become the property of the Contractor and shall be removed from the project site.
- 6.07 The Contractor shall bear full responsibility for proper disposal of removed equipment and materials in accordance with all applicable regulations.
- 6.08 Perform all removals in such a manner as to avoid damage to existing Equipment and/or Conductors which are to remain.
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 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 illustrating minimum requirements 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 illustrating minimum requirements 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 typical details shown on these plans.

8. Work in the waterway
- 8.01 For any work requiring Work Barges in the waterways, the Work Barges shall have a Towboat present at all times.
9. Utility
- 9.01 Obtain complete ComEd information for each bridge and bridge office location prior to commencing work.



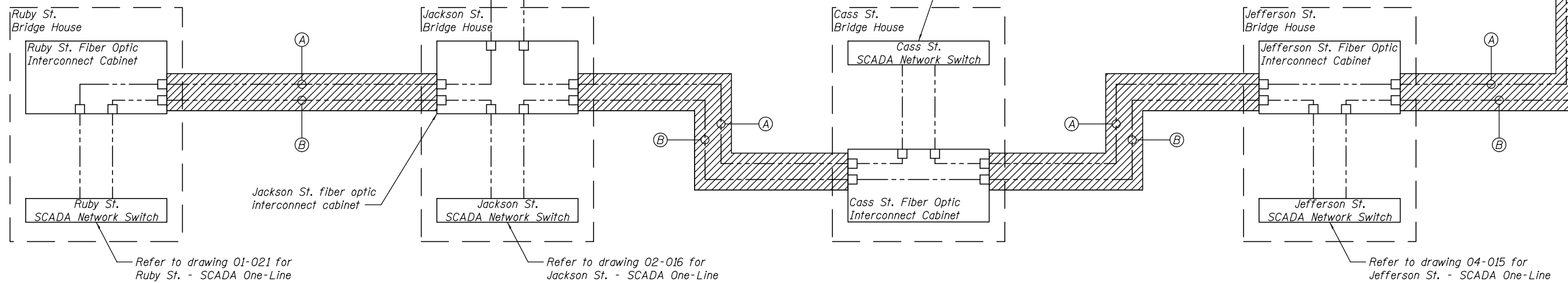
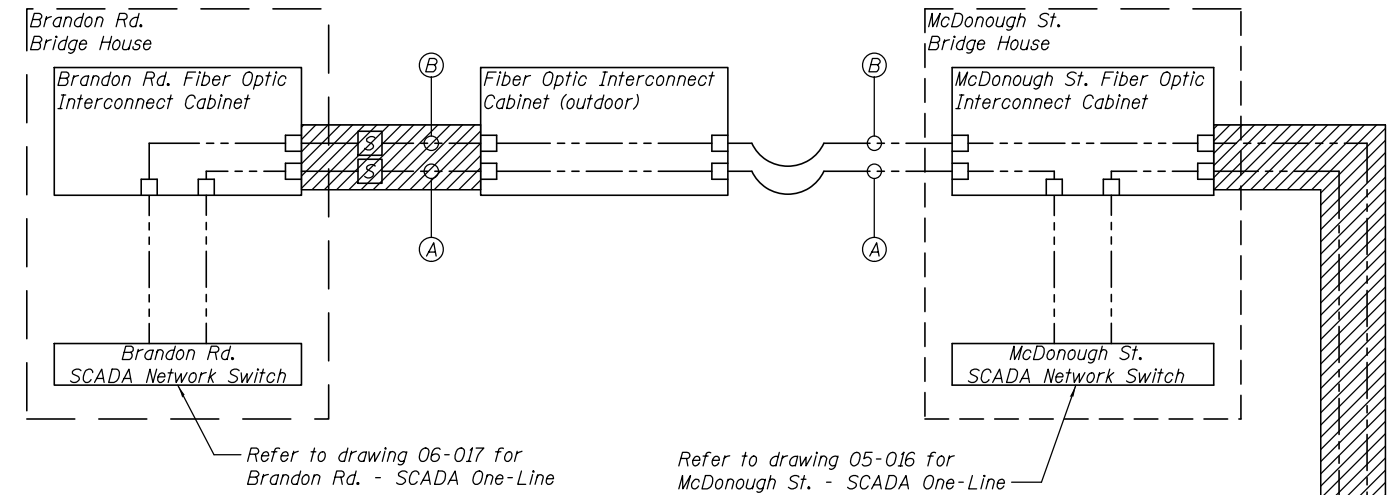
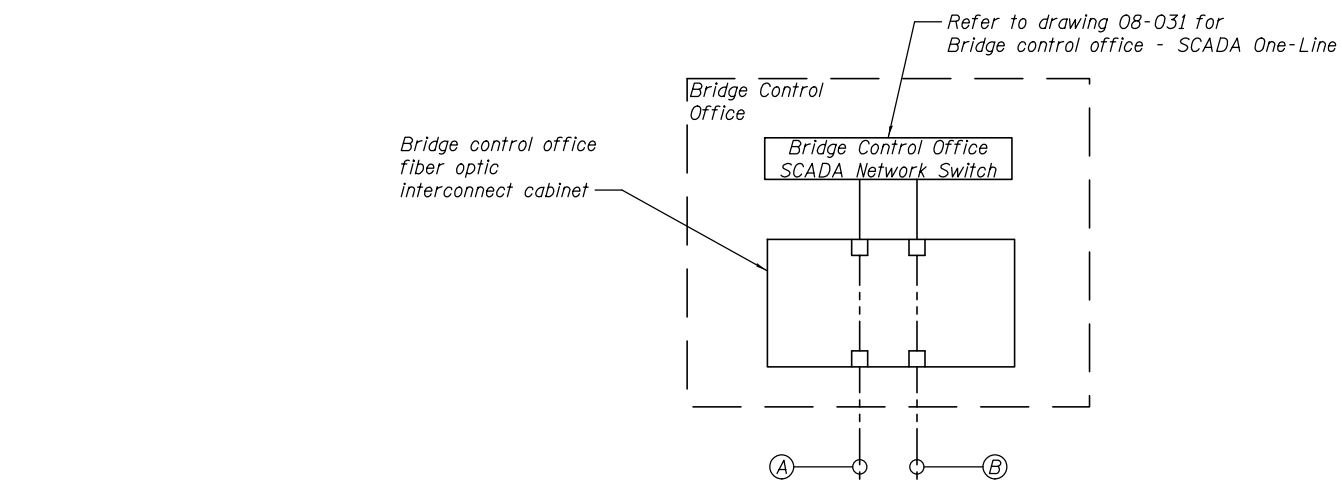
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PLOT DATE =	CHECKED - R.I. PETERS	REVISED _____

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
ELECTRICAL GENERAL NOTES - 2**

SHEET NO. 9 OF 13 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-I	WILL	466	9
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				



LEGEND

- Fiber optic connection
- (A) Conduit A
- (B) Conduit B
- [S] Fiber optic cable splice, mainline
- ~ Bridge aerial cables
- ▨ Denotes portion of Fiber Optic Network to be installed under future separate Fiber Optic Contract

GENERAL NOTE:

1. General bridge interconnecting self-healing ring topology. See specific bridge house/office for site detail.



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PLOT DATE =	CHECKED - R.I. PETERS	REVISED -

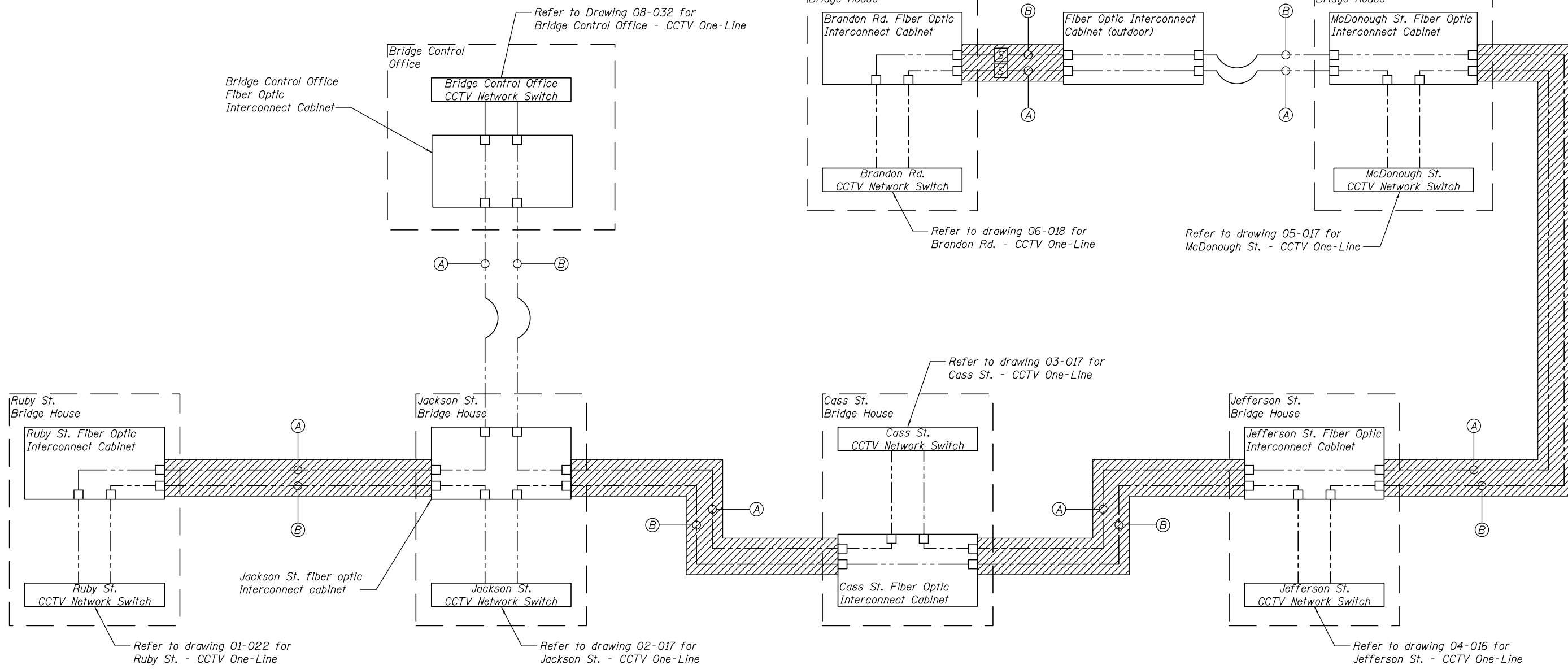
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
SCADA SYSTEM TOPOLOGY**

SHEET NO. 10 OF 13 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-I	WILL	466	10
CONTRACT NO. 60P55				

ILLINOIS FED. AID PROJECT



LEGEND

- Fiber optic connection
- (A) Conduit A
- (B) Conduit B
- [S] Fiber optic cable splice, mainline
- ~ Bridge aerial cables
- ▨ Denotes portion of Fiber Optic Network to be installed under future separate Fiber Optic Contract

GENERAL NOTE:
 1. General bridge interconnecting self-healing ring topology. See specific bridge house/office for site detail.



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PLOT DATE =	CHECKED - R.I. PETERS	REVISED -

**STATE OF ILLINOIS
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**VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 CCTV SYSTEM TOPOLOGY**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-I	WILL	466	11
CONTRACT NO. 60P55				

DISTRIBUTION CABLE FIBER ASSIGNMENTS				ORIGINATION		VARIES, SEE NOTE 1	
DISTRIBUTION CABLE DESIGNATION		DCF- TYPICAL, SEE NOTE 1		DESTINATION		VARIES, SEE NOTE 1	
BUFFER TUBE	FIBER	FIBER NO	ASSIGNMENT	BUFFER TUBE	FIBER NO	FIBER NO	ASSIGNMENT
BLUE	Blue	1	SCADA	SLATE	Blue	49	
	Orange	2	SCADA		Orange	50	
	Green	3			Green	51	
	Brown	4			Brown	52	
	Slate	5			Slate	53	
	White	6			White	54	
	Red	7			Red	55	
	Black	8			Black	56	
	Yellow	9			Yellow	57	
	Violet	10			Violet	58	
	Rose	11			Rose	59	
	Aqua	12			Aqua	60	
ORANGE	Blue	13	CCTV	WHITE	Blue	61	
	Orange	14	CCTV		Orange	62	
	Green	15			Green	63	
	Brown	16			Brown	64	
	Slate	17			Slate	65	
	White	18			White	66	
	Red	19			Red	67	
	Black	20			Black	68	
	Yellow	21			Yellow	69	
	Violet	22			Violet	70	
	Rose	23			Rose	71	
	Aqua	24			Aqua	72	
GREEN	Blue	25		RED	Blue	73	
	Orange	26			Orange	74	
	Green	27			Green	75	
	Brown	28			Brown	76	
	Slate	29			Slate	77	
	White	30			White	78	
	Red	31			Red	79	
	Black	32			Black	80	
	Yellow	33			Yellow	81	
	Violet	34			Violet	82	
	Rose	35			Rose	83	
	Aqua	36			Aqua	84	
BROWN	Blue	37		BLACK	Blue	85	
	Orange	38			Orange	86	
	Green	39			Green	87	
	Brown	40			Brown	88	
	Slate	41			Slate	89	
	White	42			White	90	
	Red	43			Red	91	
	Black	44			Black	92	
	Yellow	45			Yellow	93	
	Violet	46			Violet	94	
	Rose	47			Rose	95	
	Aqua	48			Aqua	96	

NOTES

- Distribution cable fiber assignments are typical of all fiber distribution cables. Refer to sheet nos. 12 and 13 for system topologies. The contractor shall assign discrete labels to all fiber connections.



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**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
DISTRIBUTION CABLE FIBER ASSIGNMENTS**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-I	WILL	466	12
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				

LATERAL CABLE FIBER ASSIGNMENTS		
LCF- TYPICAL SCADA		
FIBER NO	FUNCTION	CONNECTION
1	SCADA IN TX	
2	SCADA IN RX	
3	SCADA OUT TX	
4	SCADA OUT RX	
5		
6		
7		
8		
9		
10		
11		
12		

LATERAL CABLE FIBER ASSIGNMENTS		
LCF-		
FIBER NO	FUNCTION	CONNECTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

LATERAL CABLE FIBER ASSIGNMENTS		
LCF- TYPICAL CCTV		
FIBER NO	FUNCTION	CONNECTION
1	CCTV IN TX	
2	CCTV IN RX	
3	CCTV OUT TX	
4	CCTV OUT RX	
5		
6		
7		
8		
9		
10		
11		
12		

LATERAL CABLE FIBER ASSIGNMENTS		
LCF-		
FIBER NO	FUNCTION	CONNECTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

NOTES

1. Lateral cable fiber assignments, as shown, are typical at the Bridge Control Office, Ruby Street Bridge, Jackson Street Bridge, Cass Street Bridge, Jefferson Street Bridge, McDonough Street Bridge, and Brandon Road Bridge. The contractor shall assign discrete labels to all fiber connections.



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**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

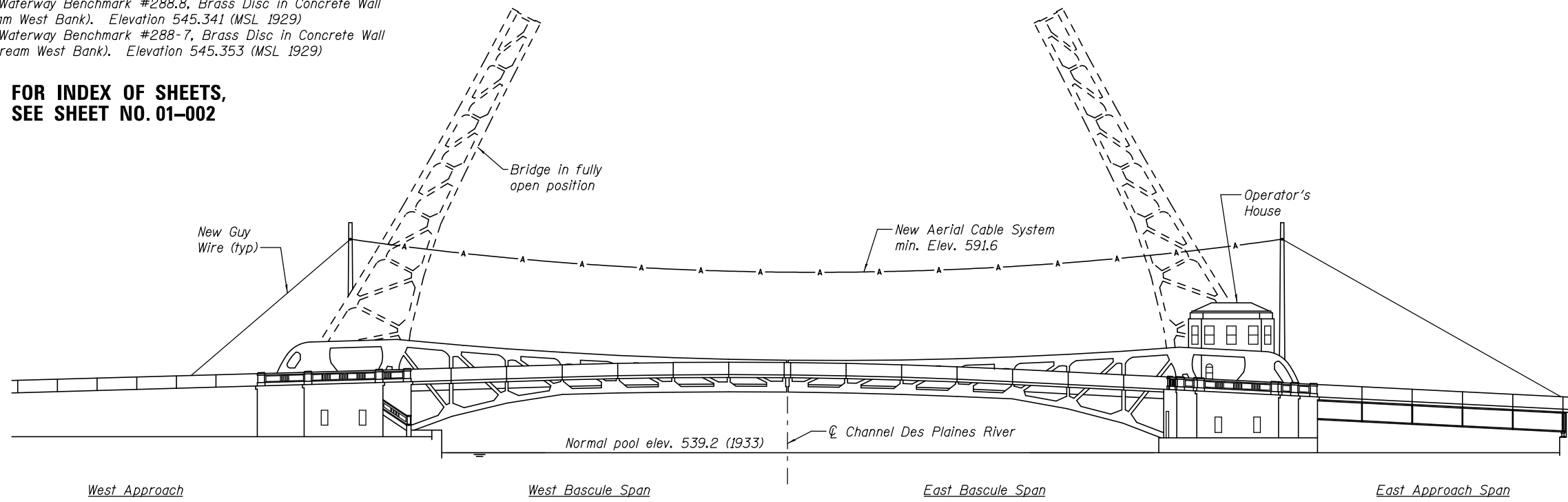
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
TWELVE FIBER LATERAL CABLE FIBER ASSIGNMENTS**

SHEET NO. 13 OF 13 SHEETS

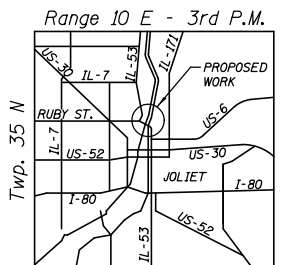
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIES	2011-045-I	WILL	466	13
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				

Benchmark:
 Illinois Waterway Benchmark #288.8, Brass Disc in Concrete Wall
 (Upstream West Bank). Elevation 545.341 (MSL 1929)
 Illinois Waterway Benchmark #288-7, Brass Disc in Concrete Wall
 (Downstream West Bank). Elevation 545.353 (MSL 1929)

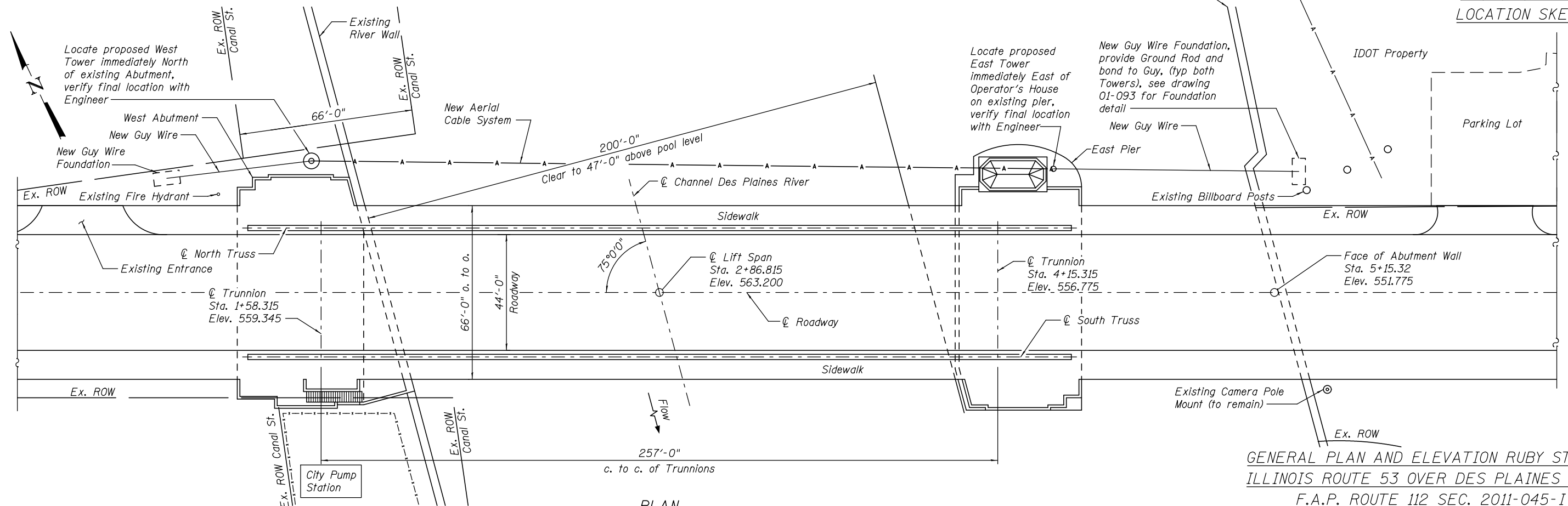
**FOR INDEX OF SHEETS,
 SEE SHEET NO. 01-002**



ELEVATION



LOCATION SKETCH



PLAN

**GENERAL PLAN AND ELEVATION RUBY STREET
 ILLINOIS ROUTE 53 OVER DES PLAINES RIVER
 F.A.P. ROUTE 112 SEC. 2011-045-I
 WILL COUNTY
 STATION 2+86.815
 STRUCTURE NO. 099-9901**

RUBY, Drawing 01-001



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**STATE OF ILLINOIS
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SHEET NO. 1 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	14
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

INDEX OF SHEETS

<u>SHEET</u>	<u>LOCAL SHEET</u>	<u>DESCRIPTION</u>
14	01-001	GENERAL PLAN AND ELEVATION
15	01-002	INDEX OF SHEETS
16	01-003	ELECTRICAL SCOPE PLAN AND ELEVATION
17 - 18	01-004 - 01-005	OPERATOR'S HOUSE DETAILS
19	01-006	NEAR SIDE NORTH MACHINERY LAYOUT
20	01-007	NEAR SIDE SOUTH MACHINERY LAYOUT
21	01-008	FAR SIDE NORTH MACHINERY LAYOUT
22	01-009	FAR SIDE SOUTH MACHINERY LAYOUT
23 - 27	01-010 - 01-014	THREE LINE DIAGRAMS
28	01-015	DISTRIBUTION PANEL LAYOUT
29	01-016	MCC LAYOUT
30 - 31	01-017 - 01-018	PANELBOARD SCHEDULES
32	01-019	FIBER OPTIC ROUTE TO OPERATOR HOUSE
33	01-020	FIBER OPTIC INTERCONNECT CABINET
34	01-021	SCADA ONE-LINE
35	01-022	CCTV ONE-LINE
36 - 40	01-023 - 01-27	CCTV CAMERA LAYOUTS
41	01-028	PUBLIC ADDRESS SPEAKER LAYOUT
42	01-029	NETWORK CABINET DETAILS
43	01-030	CCTV PLAN AND ELEVATION
44	01-031	CCTV MOUNTING DETAILS
45	01-032	BRIDGE CONTROL DIAGRAM
46 - 47	01-033 - 01-034	NEW BRIDGE CONTROL CONSOLE
48 - 50	01-035 - 01-037	CONTROL CIRCUIT LEGENDS
51 - 95	01-038 - 01-082	CONTROL CIRCUITS
96	01-083	LIMIT SWITCH TRIPPING CHARTS
97	01-084	ELECTRICAL EQUIPMENT SCHEDULE
98 - 100	01-085 - 01-087	CONDUIT DIAGRAMS
101 - 104	01-088 - 01-091	CONDUIT TABULATIONS
105	01-092	MISCELLANEOUS ELECTRICAL DETAILS
106 - 107	01-093 - 01-094	AERIAL CABLE DETAILS
108 - 110	01-095 - 01-097	CONSTRUCTION DETOUR ROUTES

RUBY, Drawing 01-002



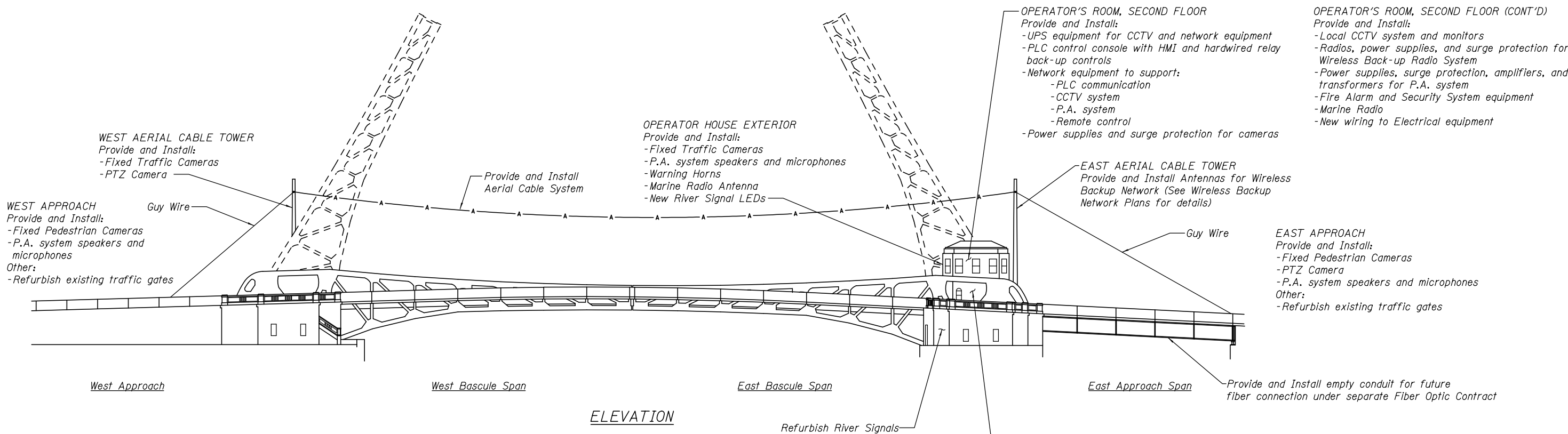
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**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

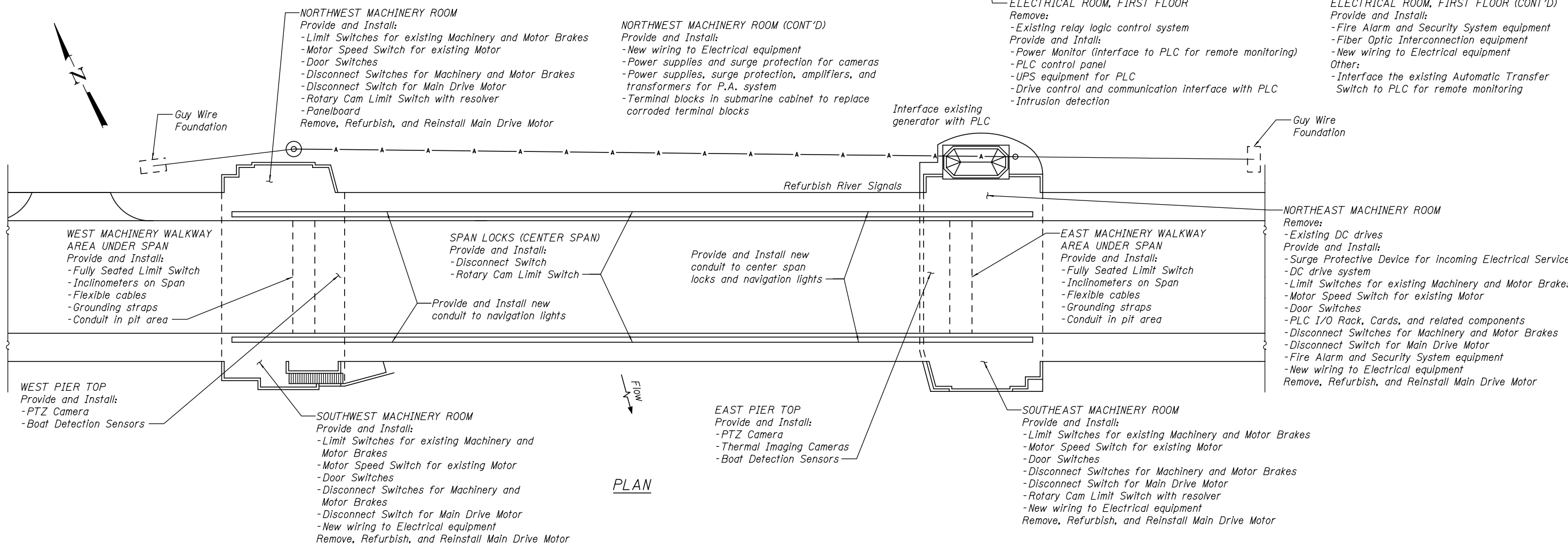
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - INDEX OF SHEETS**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	15
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				

SHEET NO. 2 OF 97 SHEETS



ELEVATION



PLAN

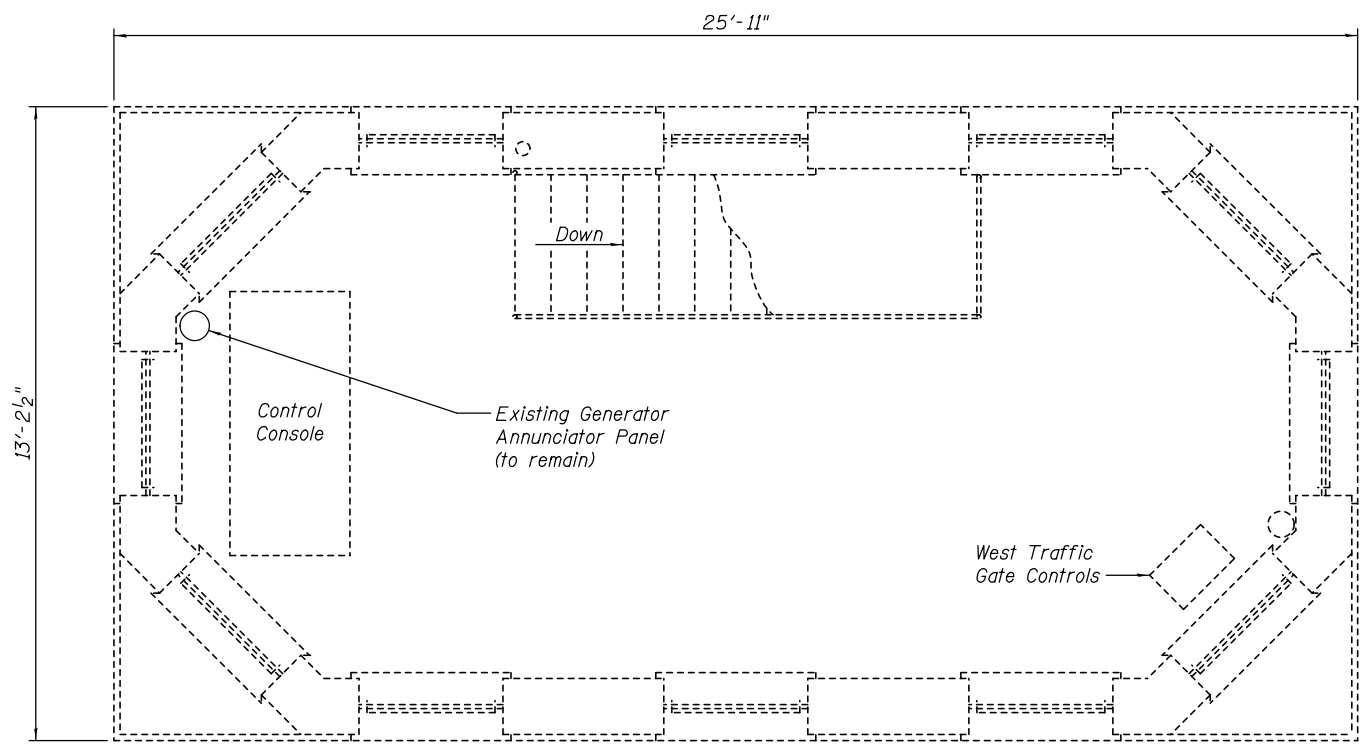
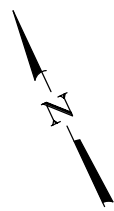


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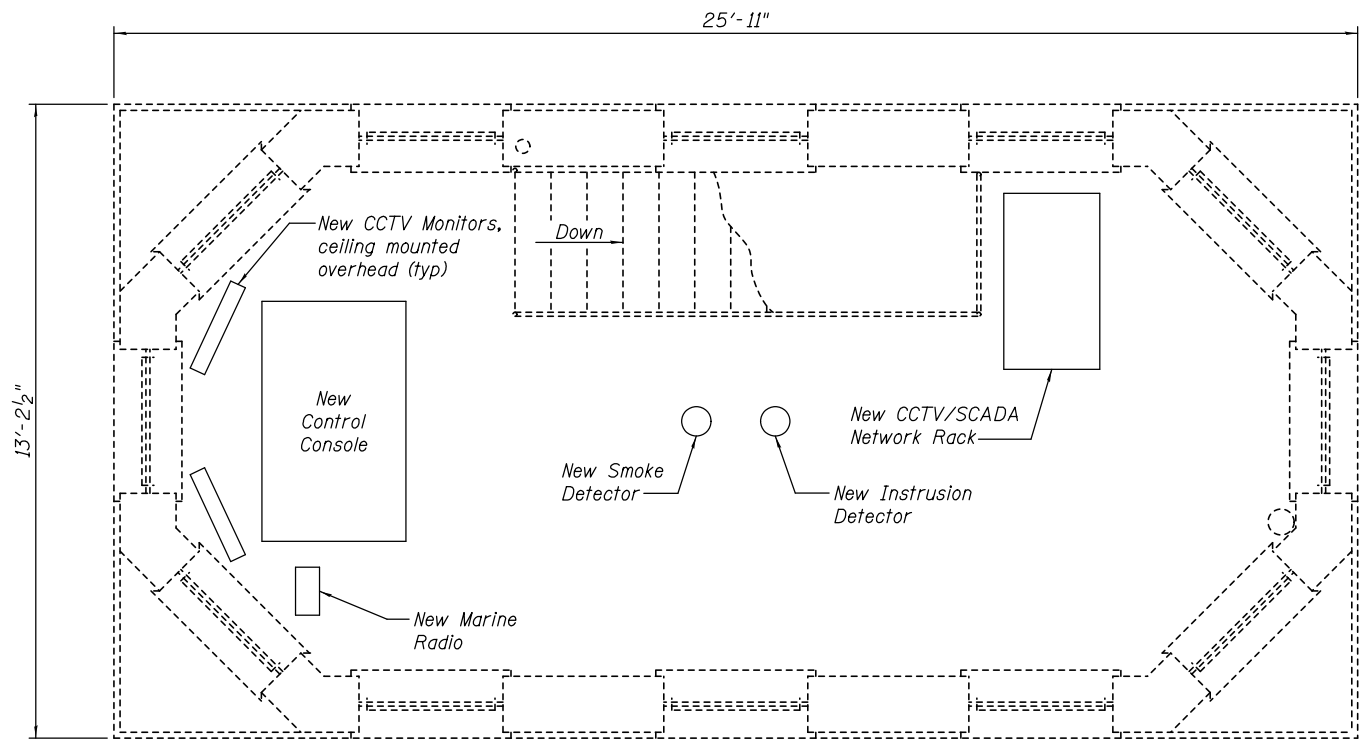
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - ELECTRICAL SCOPE PLAN AND ELEVATION**
SHEET NO. 3 OF 97 SHEETS

RUBY, Drawing 01-003			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 16
CONTRACT NO. 60P55			
ILLINOIS FED. AID PROJECT			



PLAN
EXISTING OPERATOR'S ROOM SECOND FLOOR LAYOUT



PLAN
PROPOSED OPERATOR'S ROOM SECOND FLOOR LAYOUT



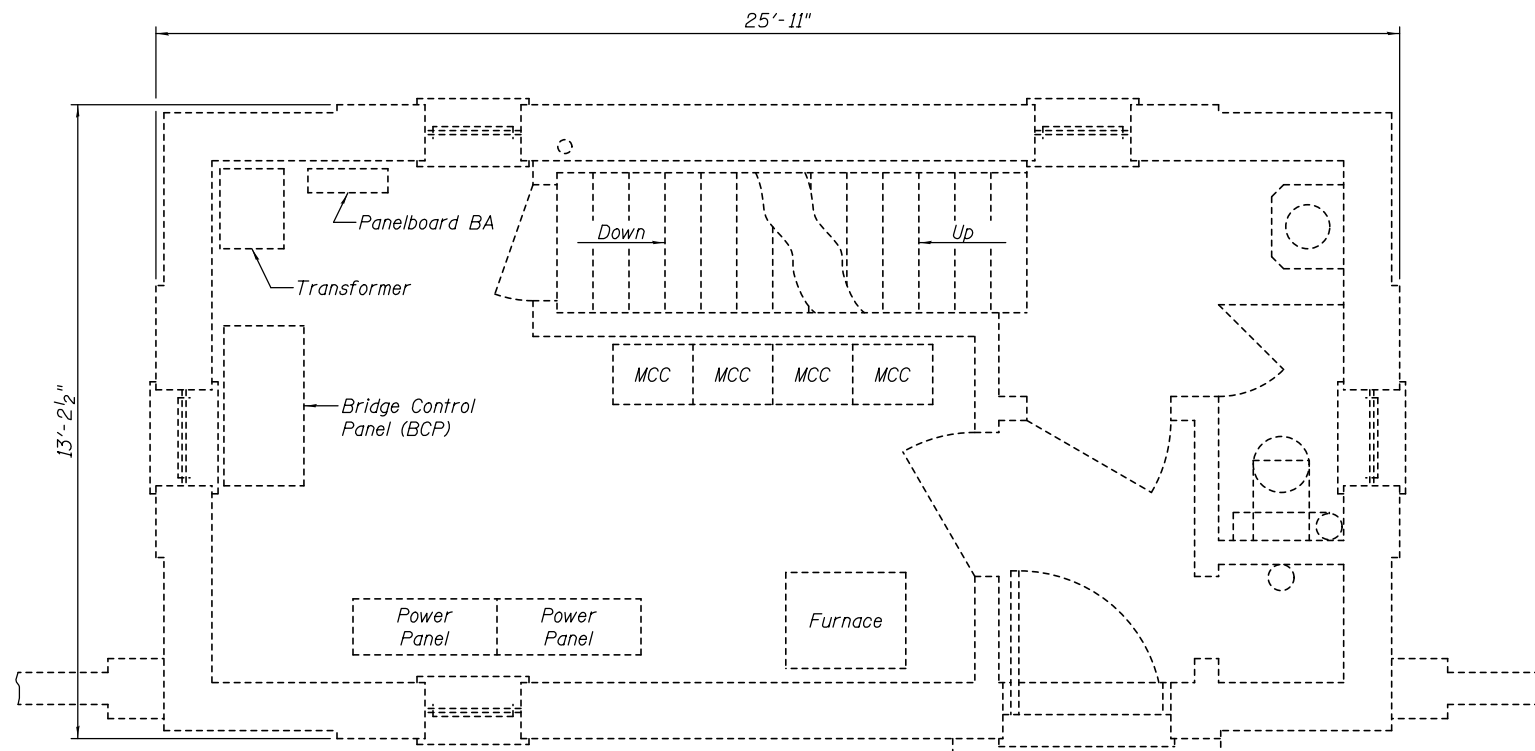
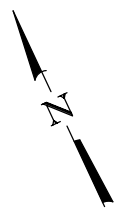
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STATE OF ILLINOIS
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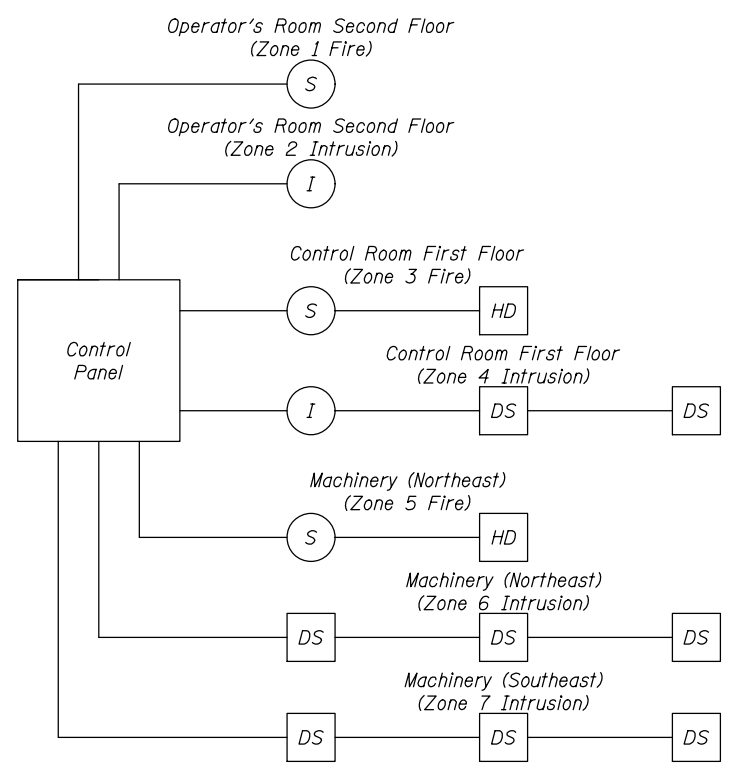
VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - OPERATOR'S HOUSE DETAILS - 1

SHEET NO. 4 OF 97 SHEETS

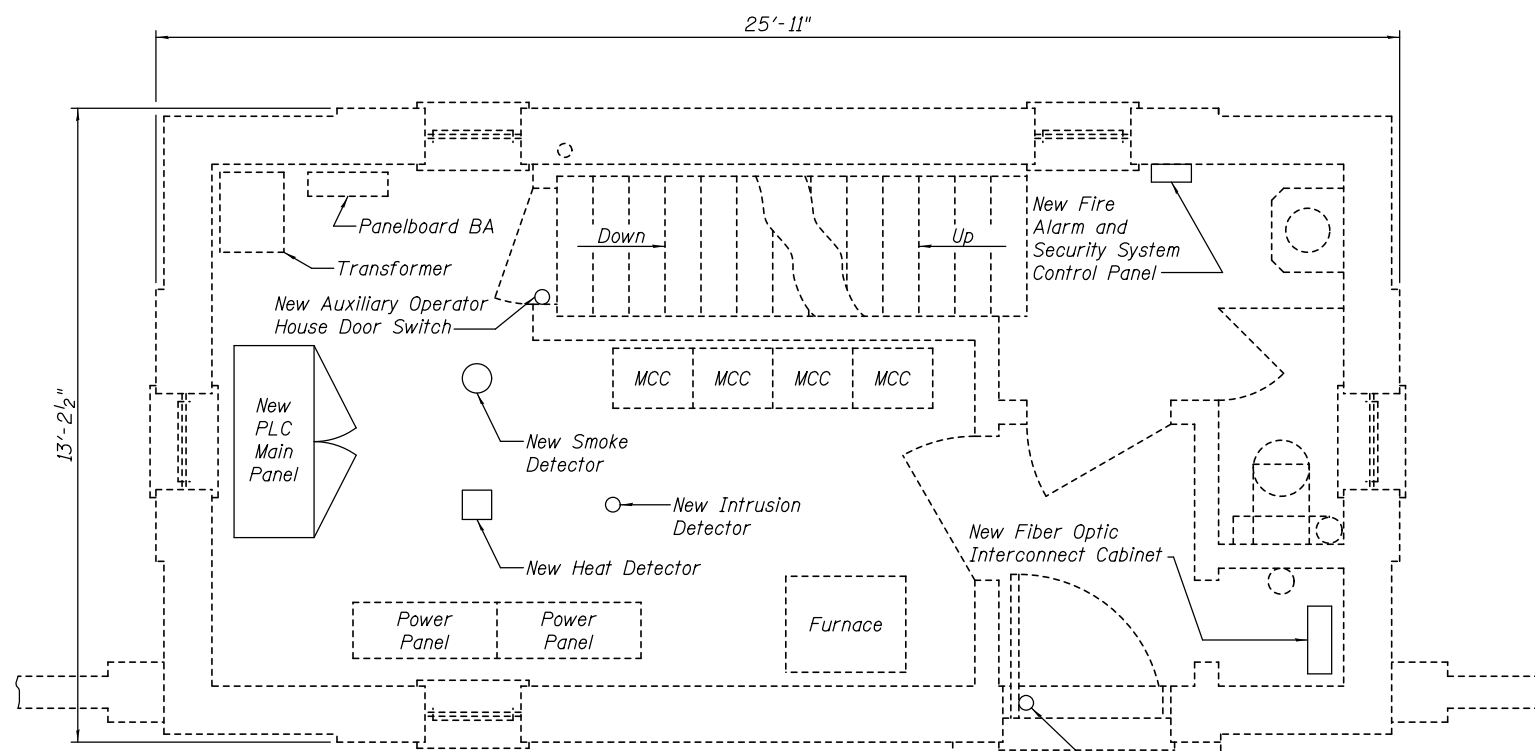
RUBY, Drawing 01-004		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	17	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						



PLAN
EXISTING CONTROL ROOM FIRST FLOOR LAYOUT



FIRE ALARM AND SECURITY SYSTEM



PLAN
PROPOSED CONTROL ROOM FIRST FLOOR LAYOUT

LEGEND

- (S) Smoke Detector
- (I) Intrusion Detector
- [HD] Heat Detector
- [DS] Door Switch

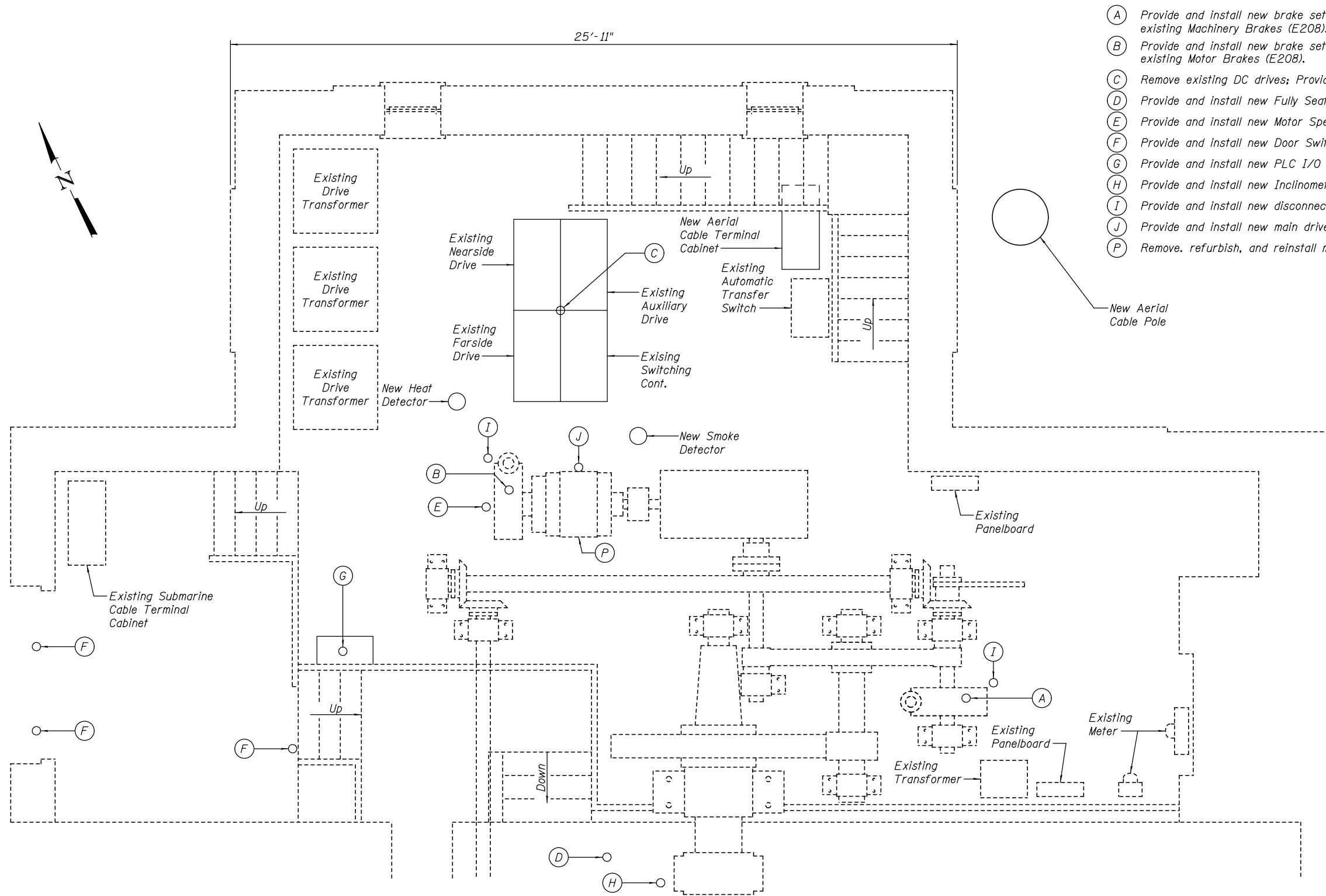


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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - OPERATOR'S HOUSE DETAILS - 2
SHEET NO. 5 OF 97 SHEETS

RUBY, Drawing 01-005		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	18	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						



- (A) Provide and install new brake set, released, and hand released Limit Switches for existing Machinery Brakes (E208).
- (B) Provide and install new brake set, released, and hand released Limit Switches for existing Motor Brakes (E208).
- (C) Remove existing DC drives; Provide and install new DC drive system.
- (D) Provide and install new Fully Seated Limit Switch (E208).
- (E) Provide and install new Motor Speed Switch for existing Motor (E209).
- (F) Provide and install new Door Switches (E210).
- (G) Provide and install new PLC I/O Rack, Cards, Enclosure, and related components.
- (H) Provide and install new Inclnometers (2) on Span (E207).
- (I) Provide and install new disconnect switch (E106).
- (J) Provide and install new main drive disconnect switch (E104).
- (P) Remove, refurbish, and reinstall main drive motor.

PLAN
MACHINERY ROOM - NORTHEAST

- NOTES:**
- Contractor is alerted to the fact that cabinets may need to be custom sized to fit available space.
 - Electrical equipment shall be installed to provide adequate NEC working space.



USER NAME =	DESIGNED - R.I. PETERS	REVISED -
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PLOT SCALE =	DRAWN - R.L. REED	REVISED -
PLOT DATE =	CHECKED - R.I. PETERS	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - NEARSIDE NORTH MACHINERY LAYOUT
SHEET NO. 6 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	19
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-006

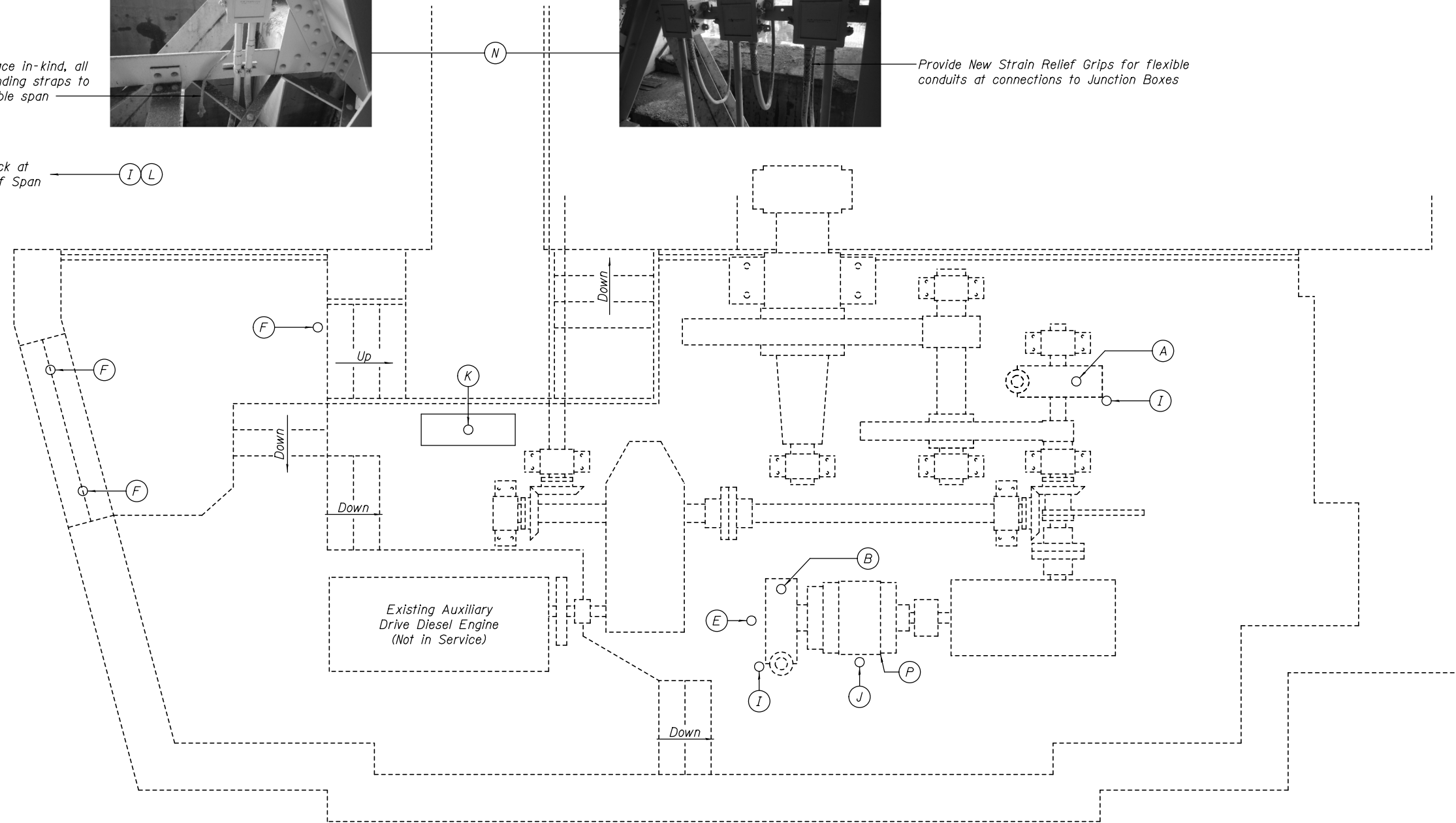
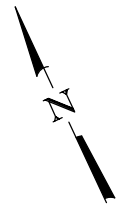


Replace in-kind, all grounding straps to movable span



Provide New Strain Relief Grips for flexible conduits at connections to Junction Boxes

Span Lock at Center of Span (I, L)



PLAN
MACHINERY ROOM - SOUTHEAST

- (A) Provide and install new brake set, released, and hand released Limit Switches for existing Machinery Brakes (E208).
- (B) Provide and install new brake set, released, and hand released Limit Switches for existing Motor Brakes (E208).
- (E) Provide and install new Motor Speed Switch for existing Motor (E209).
- (F) Provide and install new Door Switches (E210).
- (I) Provide and install new disconnect switch (E106).
- (J) Provide and install new main drive disconnect switch (E104).
- (K) Provide and install new rotary cam limit switch with resolver (E206).
- (L) Provide and install new rotary cam limit switch (E204).
- (N) Replace flexible conduits and grounding straps to movable span.
- (P) Remove, refurbish, and reinstall main drive motor.

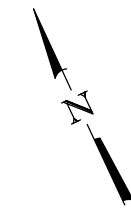


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PLOT SCALE =	DRAWN - R.L. REED	REVISED -
PLOT DATE =	CHECKED - R.I. PETERS	REVISED -

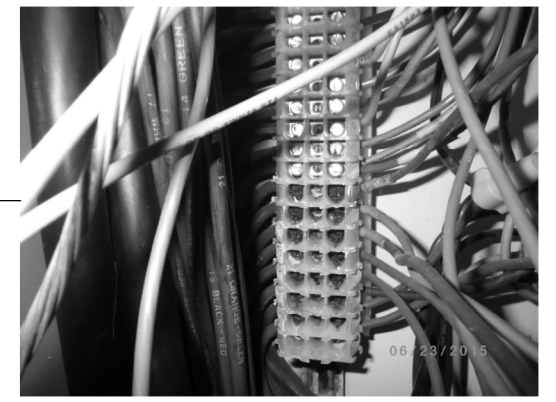
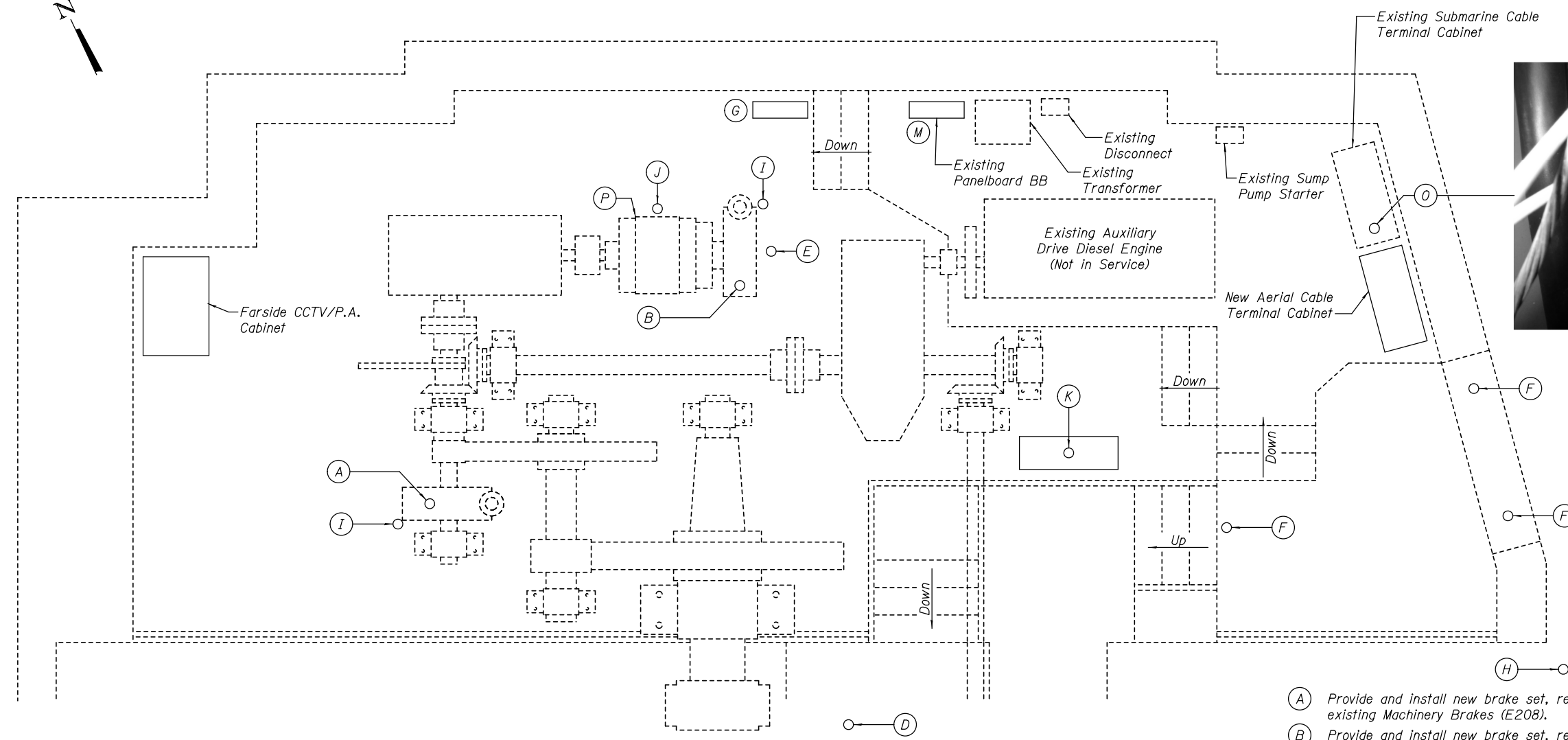
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - NEARSIDE SOUTH MACHINERY LAYOUT

F.A.P. RTE. 112	SECTION 2011-045-I	COUNTY WILL	TOTAL SHEETS 466	SHEET NO. 20
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				



New Aerial Cable Pole



PLAN
MACHINERY ROOM - NORTHWEST

- (A) Provide and install new brake set, released, and hand released Limit Switches for existing Machinery Brakes (E208).
- (B) Provide and install new brake set, released, and hand released Limit Switches for existing Motor Brakes (E208).
- (D) Provide and install new Fully Seated Limit Switch (E208).
- (E) Provide and install new Motor Speed Switch for existing Motor (E209).
- (F) Provide and install new Door Switches (E210).
- (G) Provide and install new PLC I/O Rack, Cards, Enclosure, and related components.
- (H) Provide and install new Inclometers (2) on Span (E207).
- (I) Provide and install new disconnect switch (E106).
- (J) Provide and install new main drive disconnect switch (E104).
- (K) Provide and install new rotary cam limit switch with resolver (E206).
- (M) Replace existing panelboard (E110).
- (O) Replace corroded Terminal Blocks in Submarine Cable Terminal Cabinet.
- (P) Remove, refurbish, and reinstall main drive motor.



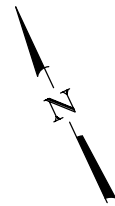
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PLOT SCALE =	DRAWN - R.L. REED	REVISED	---
PLOT DATE =	CHECKED - R.I. PETERS	REVISED	---

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - FAR SIDE NORTH MACHINERY LAYOUT
SHEET NO. 8 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	21
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

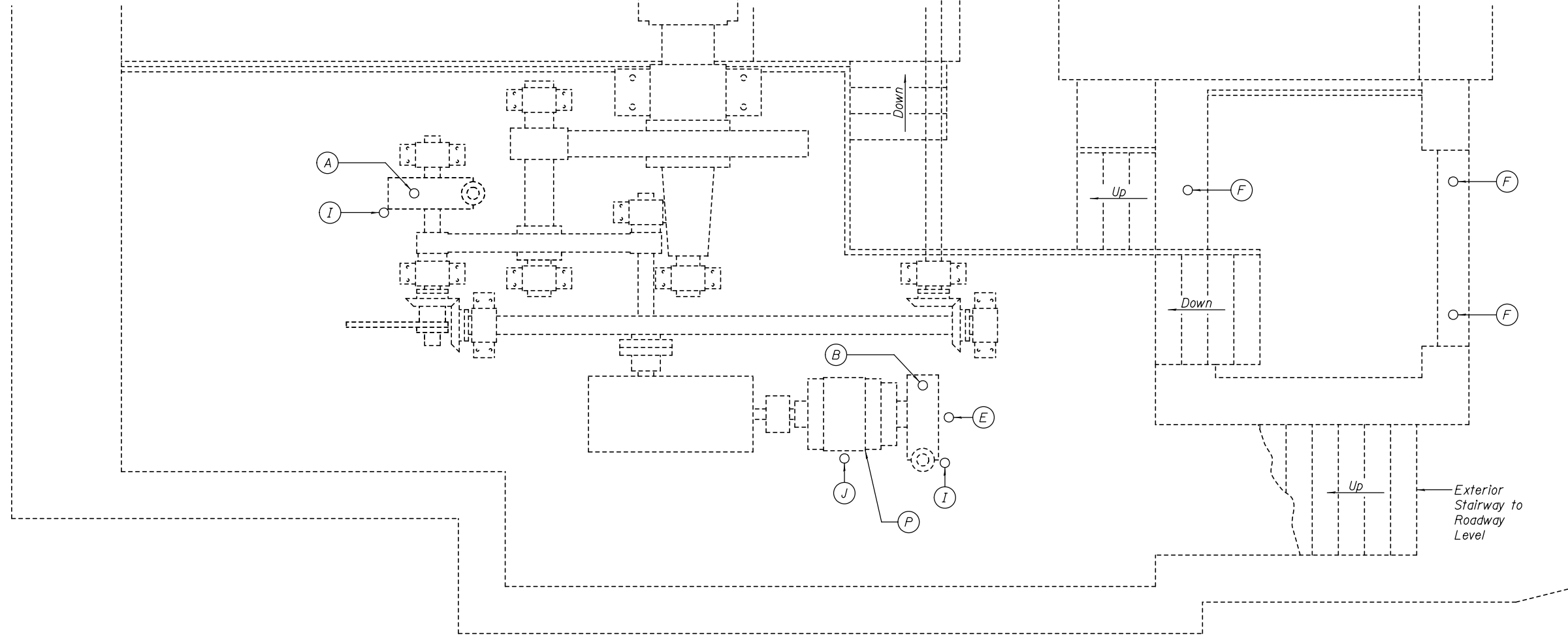
RUBY, Drawing 01-008



Replace in-kind, all grounding straps to movable span



Provide New Strain Relief Grips for flexible conduits at connections to Junction Boxes



PLAN
MACHINERY ROOM - SOUTHWEST

- (A) Provide and install new brake set, released, and hand released Limit Switches for existing Machinery Brakes (E208).
- (B) Provide and install new brake set, released, and hand released Limit Switches for existing Motor Brakes (E208).
- (E) Provide and install new Motor Speed Switch for existing Motor (E209).
- (F) Provide and install new Door Switches (E210).
- (I) Provide and install new disconnect switch (E106).
- (J) Provide and install new main drive disconnect switch (E104).
- (N) Replace flexible conduits and grounding straps to movable span.
- (P) Remove, refurbish, and reinstall main drive motor.



USER NAME =	DESIGNED - R.I. PETERS	REVISED	___
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PLOT SCALE =	DRAWN - R.L. REED	REVISED	___
PLOT DATE =	CHECKED - R.I. PETERS	REVISED	___

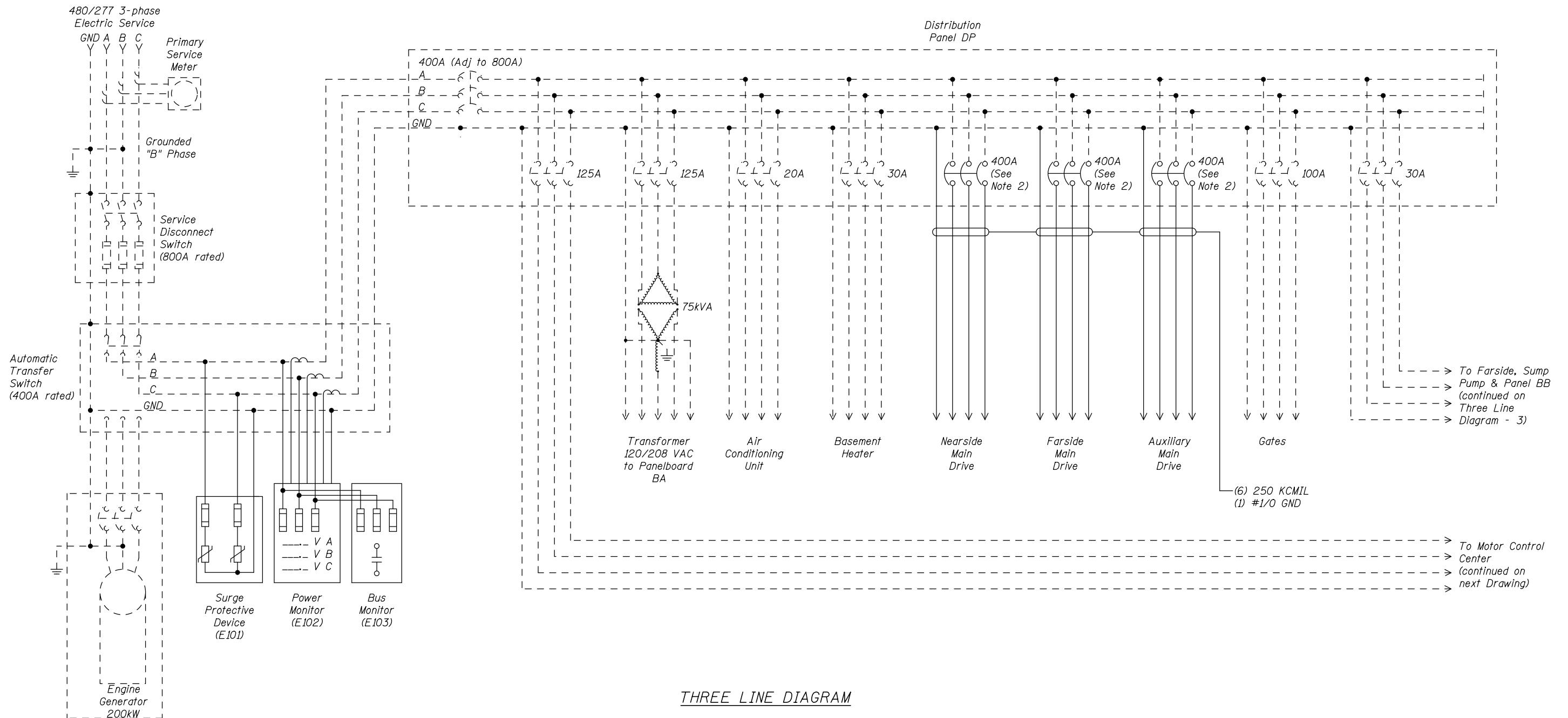
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - FARSIDE SOUTH MACHINERY LAYOUT

SHEET NO. 9 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	22
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-009



THREE LINE DIAGRAM

LEGEND
 - - - - Existing Equipment, Wiring, and Conduit
 _____ New Equipment, Wiring, and Conduit

NOTES:

1. The Contractor shall provide an appropriately sized Nema 12 electrical enclosure for the power monitor, bus monitor, and associated components.
2. Breaker frame size shall be 400A. Set trip amps to lower value per drive manufacturer recommendations.



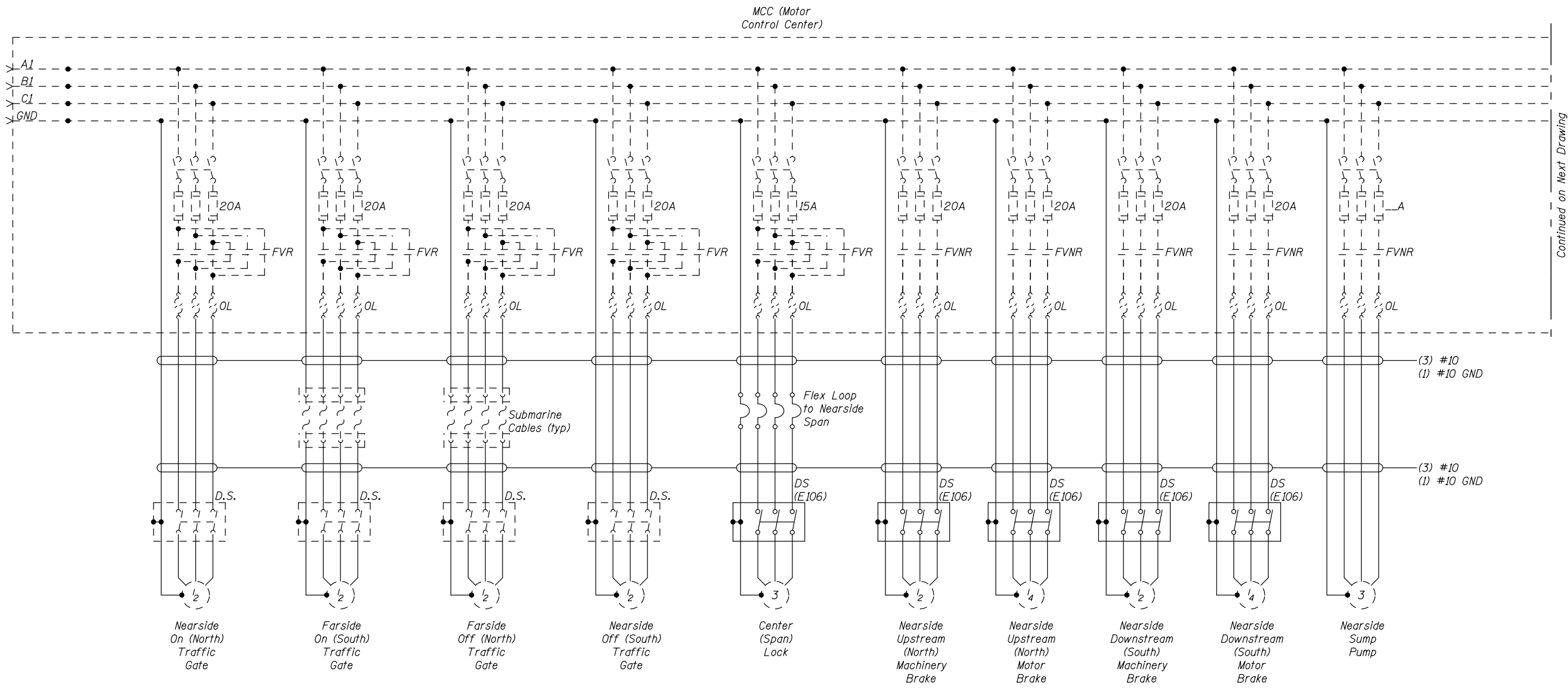
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STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 RUBY STREET - THREE LINE DIAGRAM - 1
 SHEET NO. 10 OF 97 SHEETS

RUBY, Drawing 01-010		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	23	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						

480VAC,
3 Phase
Power from
Distribution
Panel DP
(from previous
Drawing)



Continued on Next Drawing

THREE LINE DIAGRAM

LEGEND

- Existing Equipment, Wiring, and Conduit
- New Equipment, Wiring, and Conduit
- (#) Motor with HP



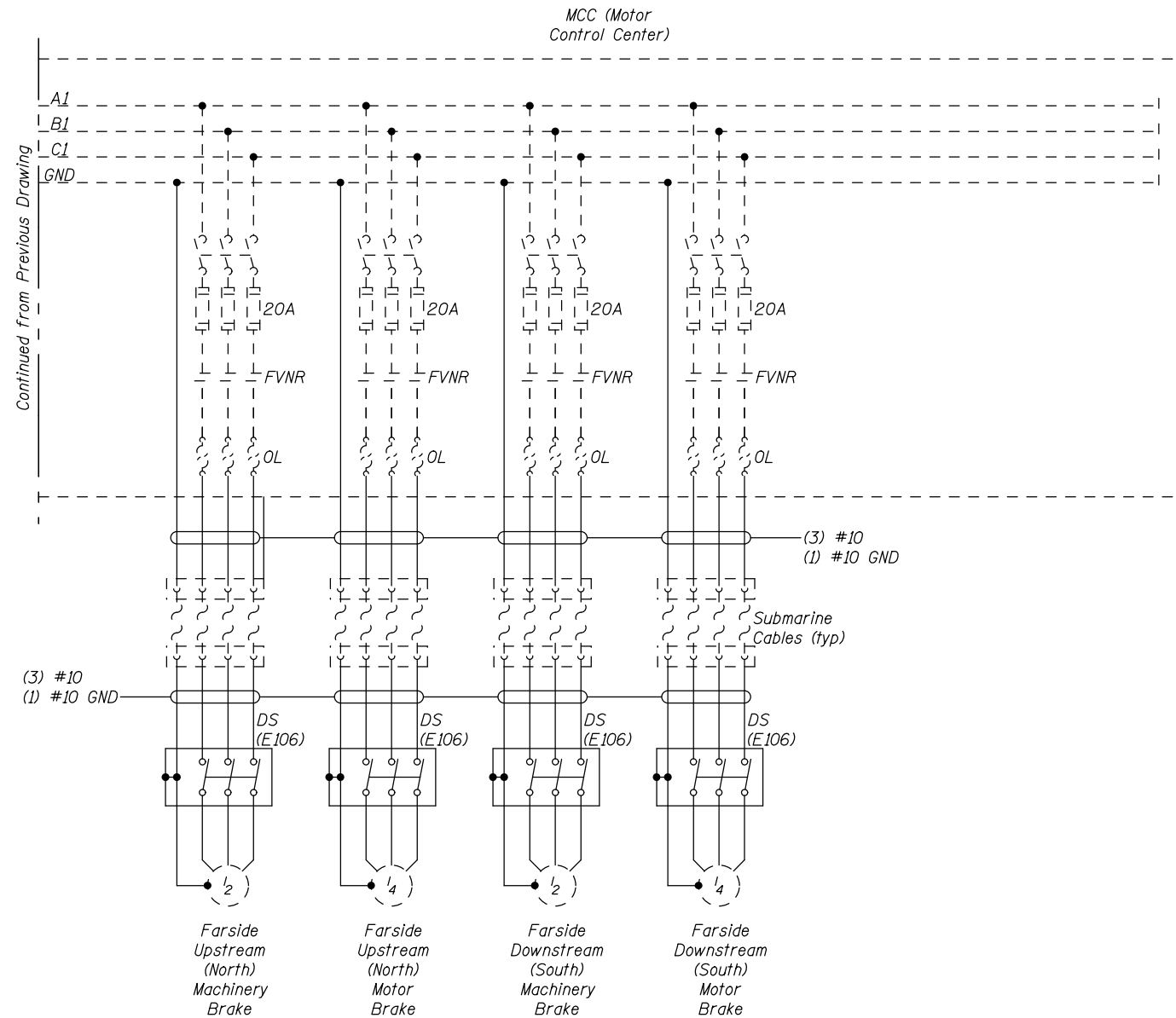
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	CHECKED - L.V. BORDEN	REVISED -
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED -
PLOT DATE =	CHECKED - K.M. GABLE	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

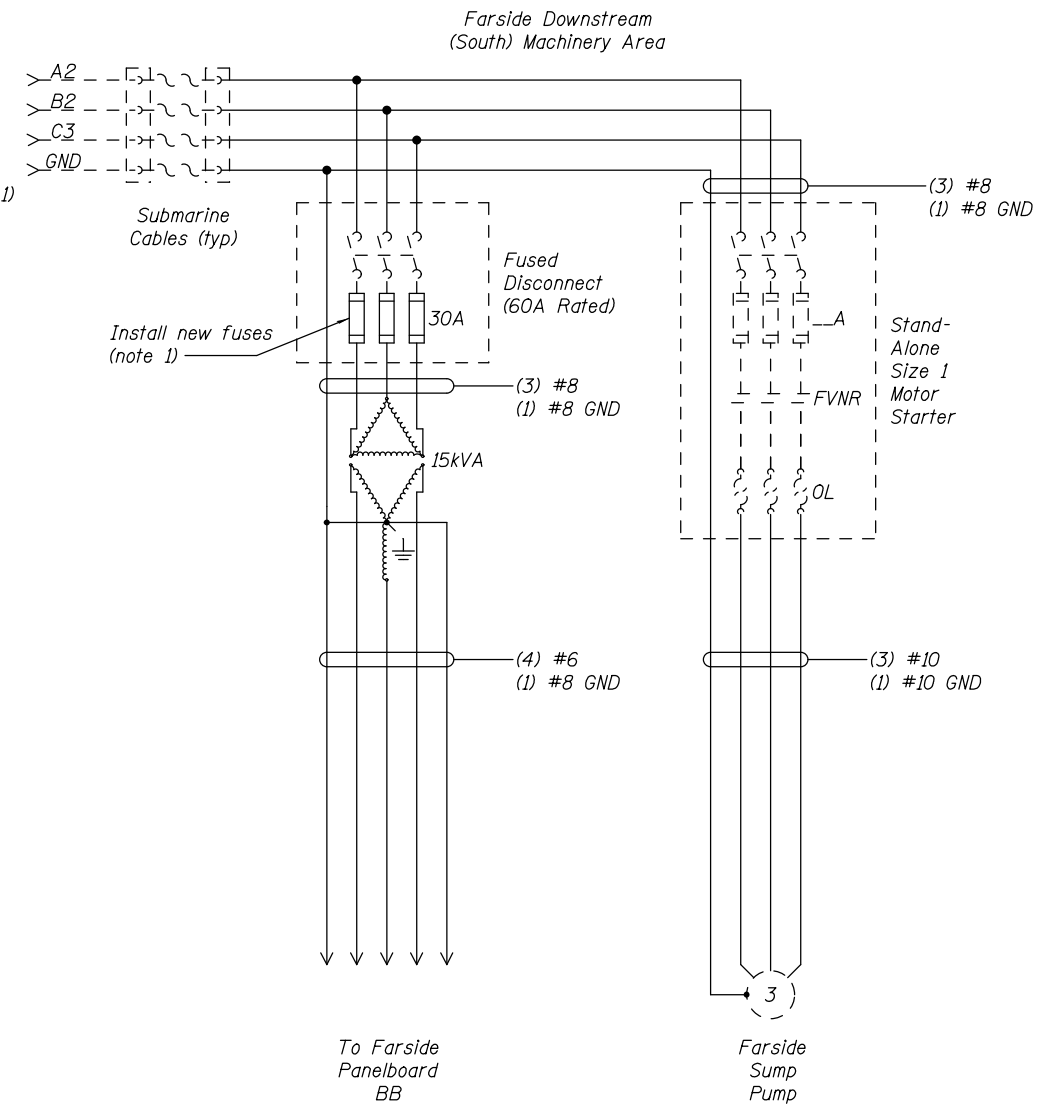
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - THREE LINE DIAGRAM - 2**

SHEET NO. 11 OF 97 SHEETS

RUBY, Drawing 01-011	
F.A.P. RTE.	SECTION
112	2011-045-I
COUNTY	WILL
TOTAL SHEETS	466
SHEET NO.	24
CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT	



480VAC,
3 Phase
Power from
Distribution
Panel DP
(from Three
Line Diagram - 1)



THREE LINE DIAGRAM - EXISTING EQUIPMENT

NOTES:

1. Fuses shall be Class RK5, dual element, current-limiting, time-delay rated for 600VAC, 200KAIC.

LEGEND

- Existing Equipment, Wiring, and Conduit
- New Equipment, Wiring, and Conduit
- (#) Motor with HP



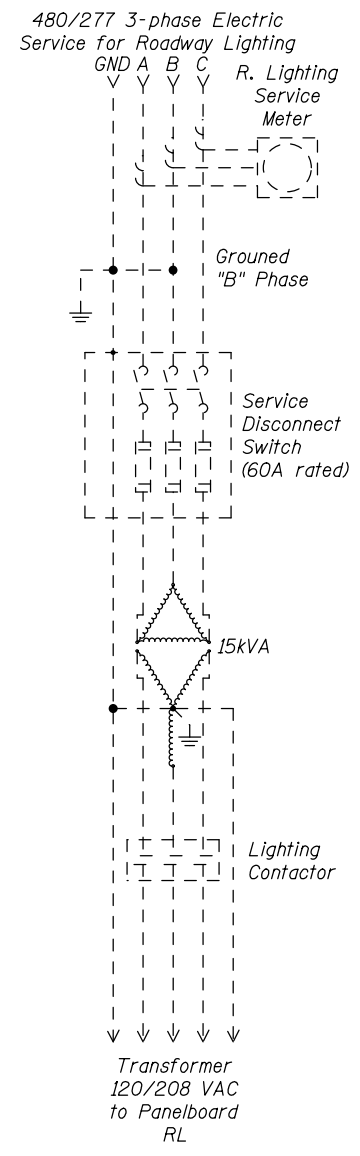
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PLOT DATE =	CHECKED - K.M. GABLE	REVISED	---

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - THREE LINE DIAGRAM - 3

SHEET NO. 12 OF 97 SHEETS

RUBY, Drawing 01-012		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	25	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						



THREE LINE DIAGRAM - EXISTING EQUIPMENT

LEGEND

-----Existing Equipment, Wiring, and Conduit
 _____New Equipment, Wiring, and Conduit

NOTES:

1. This drawing is included for reference only. No modifications to the equipment are required..



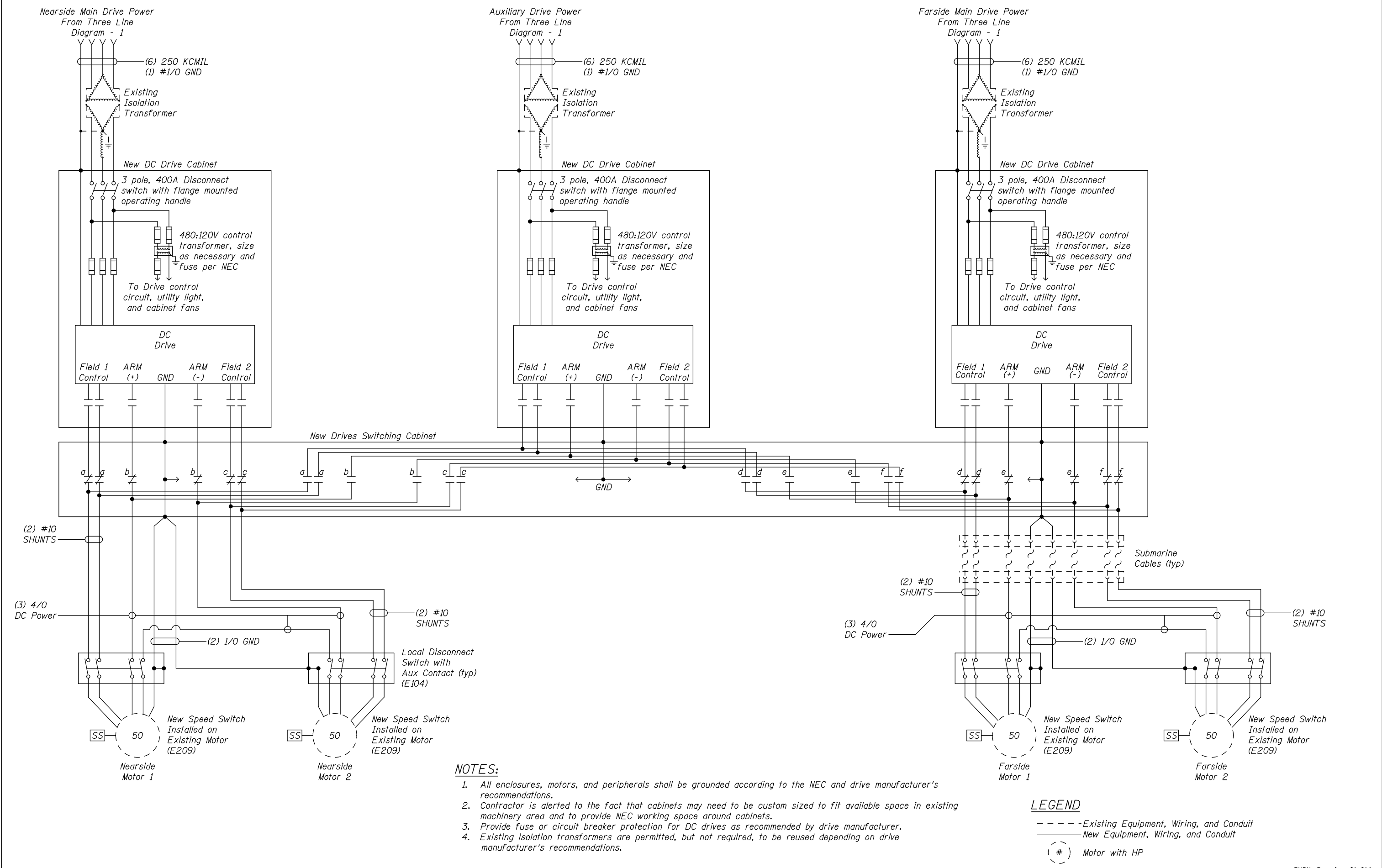
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED _____
PLOT DATE =	CHECKED - K.M. GABLE	REVISED _____

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - THREE LINE DIAGRAM - 4**

SHEET NO. 13 OF 97 SHEETS

RUBY, Drawing 01-013		TOTAL SHEETS		SHEET NO.	
F.A.P. RTE.	SECTION	COUNTY	466	26	
112	2011-045-I	WILL	CONTRACT NO. 60P55		
ILLINOIS FED. AID PROJECT					



- NOTES:**
1. All enclosures, motors, and peripherals shall be grounded according to the NEC and drive manufacturer's recommendations.
 2. Contractor is alerted to the fact that cabinets may need to be custom sized to fit available space in existing machinery area and to provide NEC working space around cabinets.
 3. Provide fuse or circuit breaker protection for DC drives as recommended by drive manufacturer.
 4. Existing isolation transformers are permitted, but not required, to be reused depending on drive manufacturer's recommendations.

LEGEND

--- Existing Equipment, Wiring, and Conduit

— New Equipment, Wiring, and Conduit

(#) Motor with HP

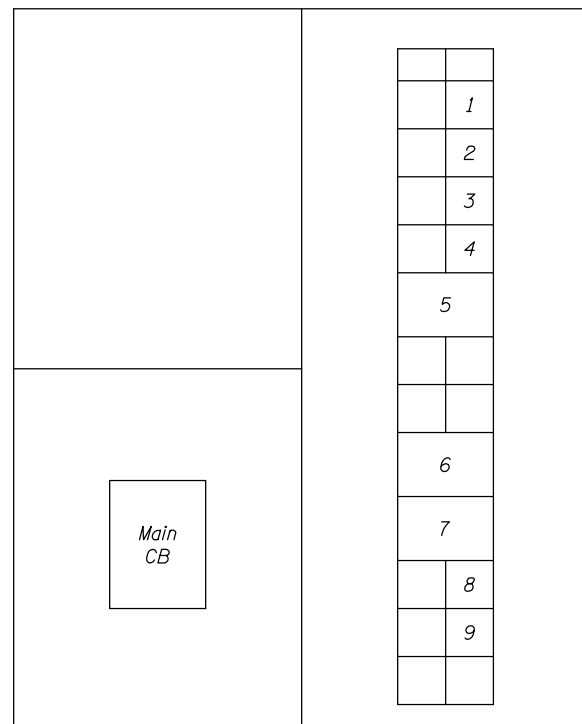


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	CHECKED - L.V. BORDEN	REVISED -
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED -
PLOT DATE =	CHECKED - K.M. GABLE	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - THREE LINE DIAGRAM - 5**

RUBY, Drawing 01-014	
F.A.P. RTE. 112	SECTION 2011-045-I
COUNTY WILL	TOTAL SHEETS 466
	SHEET NO. 27
CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT	



ELEVATION
EXISTING DISTRIBUTION PANEL DP LAYOUT
Scale:None

<u>DISTRIBUTION PANEL DP</u>													
Voltage: 277/480V				Location: Operator House Electrical Room				Fed From: Bridge Service via Automatic Transfer Sw.					
Phase / Wire: 3 Ph / 3W				Manufacturer / Model: Square-D / QED				Mounting Enclosure: Freestanding / Nema 1					
Bus Amperes: 800				Main Circuit Breaker: Adj. Trip at 400A / 800A Frame				Short Circuit: 65,000 AIC at 480VAC					
Description	Load(Amps)			Breaker		A B C	Breaker			Description			
	A	B	C	Poles	Amps		Amps	Poles	A		B	C	
Air Conditioning Unit	7.2	7.2	7.2	3	20	1	2	100	3	-	-	-	Gates
Motor Control Center	19.3	19.3	19.3	3	125	3	4	125	3	90.3	90.3	90.3	75kVA Trans / BA Panel
Nearside Main Drive	260	260	260	3	400	5	6	400	3	260	260	260	Farside Main Drive
Aux Drive	-	-	-	3	400	7	8	30	3	18.1	18.1	18.1	Farside Sump Pump & Panel BB
Basement Heater	-	-	-	3	30	9							

EXISTING DISTRIBUTION PANEL DP SCHEDULE

NOTES:

1. The Contractor shall field verify all DP loads served, DP layout, and ratings.
2. This drawing is included for reference, no modifications other than breaker adjustments are anticipated.



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED _____
PLOT DATE =	CHECKED - K.M. GABLE	REVISED _____

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

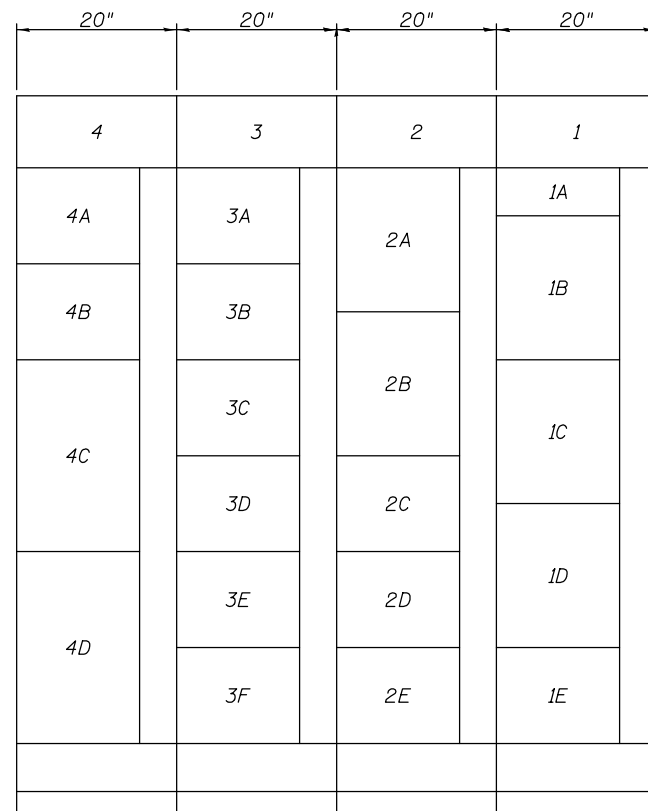
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - DISTRIBUTION PANEL LAYOUT**

SHEET NO. 15 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	28
CONTRACT NO. 60P55				

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-015



ELEVATION
EXISTING MOTOR CONTROL CENTER (MCC) LAYOUT
 Scale: None

MOTOR CONTROL CENTER DATA			
Voltage:		480V	
Phase / Wire:		3 Ph / 3W	
Bus Amperes:		600A Horizontal / 300A Vertical	
Manufacturer / Model:		Square D / Model 5, Class 8998	
Enclosure:		Nema Type 1	
Braced for:		10,000 Symmetrical Amps	
Unit Loc.	Description	Motor HP	Unit Type
1A	Incoming Main Lugs	-	ML
1B	Nearside On (North) Traffic Gate	1/2	FVR
1C	Farside On (South) Traffic Gate	1/2	FVR
1D	Farside Off (North) Traffic Gate	1/2	FVR
1E	Space	-	SP
2A	Nearside Off (South) Traffic Gate	1/2	FVR
2B	Center (Span) Lock	3	FVR
2C	Nearside Upstream (North) Machinery Brake	1/2	FVNR
2D	Nearside Upstream (North) Motor Brake	1/4	FVNR
2E	Space	-	SP
3A	Nearside Downstream (South) Machinery Brake	1/2	FVNR
3B	Nearside Downstream (South) Motor Brake	1/4	FVNR
3C	Nearside Sump Pump	3	FVNR
3D	Farside Upstream (North) Machinery Brake	1/2	FVNR
3E	Farside Upstream (North) Motor Brake	1/4	FVNR
3F	Space	-	SP
4A	Farside Downstream (South) Machinery Brake	1/2	FVNR
4B	Farside Downstream (South) Motor Brake	1/4	FVNR
4C	Space	-	SP
4D	Space	-	SP

Unit Types:
 CB - Circuit Breaker Disconnect
 FD - Fused Disconnect
 FVNR - Full Voltage, Non Reversing Motor Starter
 FVR - Full Voltage, Reversing Motor Starter
 ML - Main Lugs
 SP - Space

NOTES:

- The Contractor shall field verify all MCC loads served.



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PLOT DATE =	CHECKED - R.I. PETERS	REVISED _____

**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 RUBY STREET - MCC LAYOUT**

SHEET NO. 16 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	29
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-016

PANELBOARD BA											
Voltage: 120/208V			Location: Operator House Electrical Room			Phase / Wire: 3 Ph / 4W			Fed From: DP via 75kVA Transformer		
Bus Amperes: 400			Mounting Enclosure: Surface / Nema 1			Main Circuit Breaker: 250A			Short Circuit: 42,000 AIC		
Description	Load(Amps)			Breaker Poles	Amps	A	B	C	Breaker Amps	Poles	Description
	A	B	C								
Downstream Receptacles - South Wall	-	-	-	2	100				100	2	Spare
Electric Toilet	-	-	-	2	30				100	2	Furnace
BCP Panel (Controls)	-	-	-	2	60				20	1	(Unknown Use)
Recept, 2nd floor	-	-	-	1	20				20	1	(Unknown Use)
1" Lights d.stream&catwalk	-	-	-	1	20				20	1	Recepts, upstream low. lev.
Receptacle downstream	-	-	-	1	20				20	1	Light, upstream, lower
BR Sump Pump outlet	-	-	-	1	20				20	1	Spare
R. Center Lock Receptacle	-	-	-	1	20				20	1	Traffic gate heater
Yel. Spare J.Box upstream	-	-	-	1	20				20	1	Spare
Drive Units Light	-	-	-	1	20				20	1	Spare
Drive Units Power	-	-	-	1	20				100	2	Spare
Drive Units Spare	-	-	-	1	20				20	1	Spare
Aux. Engine	-	-	-	1	20				20	1	Hot Water Tank
Aux. Engine	-	-	-	1	20				20	1	Water Pipe Heat Tape
Aux. Engine	-	-	-	1	20				20	1	(20 FL Upstream)
									40	1	Generator Heater

EXISTING PANELBOARD BA SCHEDULE

PANELBOARD BA											
Voltage: 120/208V			Location: Operator House Electrical Room			Phase / Wire: 3 Ph / 4W			Fed From: DP via 75kVA Transformer		
Bus Amperes: 400			Mounting Enclosure: Surface / Nema 1			Main Circuit Breaker: 250A			Short Circuit: 42,000 AIC		
Description	Load(Amps)			Breaker Poles	Amps	A	B	C	Breaker Amps	Poles	Description
	A	B	C								
Downstream Receptacles - South Wall	30	30	-	2	100				20	1	N.S. Traffic&Gate Lts, Gongs
Electric Toilet	16	-	16	2	30				20	1	F.S. Traffic&Gate Lts, Gongs
PLC Controls	-	12	-	1	20				100	2	Furnace
PLC Panel Auxiliary	-	-	5	1	20				20	1	(Unknown Use, Verify)
Recept, 2nd floor	6	-	-	1	20				20	1	(Unknown Use, Verify)
1" Lights d.stream&catwalk	-	6	-	1	20				20	1	Recepts, upstream low. lev.
Receptacle downstream	-	-	2	1	20				20	1	Light, upstream, lower
BR Sump Pump outlet	2	-	-	1	20				20	1	Traffic gate heater
R. Center Lock Receptacle	-	4	-	1	20				20	1	Span Navigation Lights
Yel. Spare J.Box upstream	-	-	2	1	20				20	1	Pier Navigation Lights
Drive Units Light	5	-	-	1	20				20	1	Nearside CCTV Cameras
Drive Units Power	-	5	-	1	20				20	1	Fire/Security System
Drive Units Spare	-	-	5	1	20				20	1	Network UPS / Rack
Aux. Engine (Verify)	-	-	-	1	20				20	1	CCTV System / Rack
Aux. Engine (Verify)	-	-	-	1	20				20	1	Hot Water Tank
Aux. Engine (Verify)	-	-	-	1	20				20	1	Water Pipe Heat Tape
Aux. Engine (Verify)	-	-	-	1	20				20	1	(20 FL Upstream)
Signal (Warning) Horn	1	-	-	1	20				40	1	Spare
River Signal Lights	-	1	-	1	20				20	1	Generator Heater
Nearside Boat Detection	-	-	1	1	20				20	1	Public Address System

Total Connected Load = 160 Amps/Phase
Demand Factor = 65%
Demand Load = 104 Amps/Phase

A	B	C
160	114	147

PROPOSED PANELBOARD BA SCHEDULE (EXISTING PANELBOARD WITH PROPOSED CIRCUITS)

NOTES:

1. The Contractor shall field verify all existing circuits before starting work.
2. Rearrange circuits and provide new breakers as shown in panelboard BA.
3. The Contractor shall provide a neat typewritten or computer printed circuit legend with circuit descriptions for each panelboard.
4. Circuits shall be arranged as required to balance loading.
5. Power for PLC and Remote I/O racks shall utilize the same (A, B, or C) phase where fed from the same power source.
6. The Contractor shall investigate usage of three circuits labeled for use with Aux Engine. If existing circuits are not utilized, remove conductors and label as spares.



USER NAME =	DESIGNED - R.I. PETERS	REVISED -
	CHECKED - L.V. BORDEN	REVISED -
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED -
PLOT DATE =	CHECKED - K.M. GABLE	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - PANELBOARD SCHEDULE - 1**

SHEET NO. 17 OF 97 SHEETS

RUBY, Drawing 01-017				
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	30
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

PANELBOARD EMA										
Voltage:		120/240V		Location:		Nearside North Machinery Area (Basement)				
Phase / Wire:		1 Ph / 3W		Fed From:		Panelboard BA / Transfer Switch				
Bus Amperes:		100A		Mounting Enclosure:		Surface / Nema 1				
Main Circuit Breaker:		100A (Transfer Switch Feed)								
Short Circuit:		10,000 AIC								
Description	Load(Amps)		Breaker		A	B	Breaker	Load(Amps)		Description
	A	B	Poles	Amps				Amps	Poles	
(BA Panel Feed)	-	-	2	100	1	2	20	1	-	RED
YEL	-	-	1	20	3	4	20	1	-	South Wall Receptacle
BR	-	-	1	20	5	6	20	1	-	Heat Tape
BK	-	-	1	20	7	8	20	1	-	Intercom
Fixture	-	-	1	20	9	10	20	1	-	Marine Siren
Camera	-	-	1	20	11	12	20	1	-	Intercom
					13	14	20	1	-	Spare
					15	16				
					17	18				

EXISTING PANELBOARD EMA SCHEDULE

PANELBOARD BB										
Voltage:		120/240V		Location:		Farside North Machinery Area				
Phase / Wire:		1 Ph / 3W		Fed From:		Distribution Panel DP via 15kVA Trans.				
Bus Amperes:		100A		Mounting Enclosure:		Surface / Nema 1				
Main Circuit Breaker:		N/A								
Short Circuit:		10,000 AIC								
Description	Load(Amps)		Breaker		A	B	Breaker	Load(Amps)		Description
	A	B	Poles	Amps				Amps	Poles	
Lighting	-	-	1	20	1	2	20	1	-	Lighting
Receptacle	-	-	1	20	3	4	20	1	-	Receptacle
Receptacle	-	-	1	20	5	6	20	1	-	Heater
					7	8	20	1	-	
					9	10	20	1	-	
					11	12	20	1	-	
					13	14	20	1	-	
Heater	-	-	1	40	15	16	20	1	-	
					17	18				
					19	20				

EXISTING PANELBOARD BB SCHEDULE

NOTES:

1. The Contractor shall field verify all existing circuits before starting work.
2. Remove idle circuits from panelboard EMA when existing CCTV equipment has been removed.
3. Remove existing panelboard BB. Provide and install new panelboard BB.
4. Circuits shall be arranged as required to balance loading.
5. The Contractor shall provide a neat typewritten or computer printed circuit legend with circuit descriptions for each panelboard.
6. Power for PLC and Remote I/O racks shall utilize the same (A, B, or C) phase where fed from the same power source.

PANELBOARD RL												
Voltage:		120/240V		Location:		Nearside North Machinery Area (Basement)						
Phase / Wire:		1 Ph / 3W		Fed From:		Service via 15kVA Transformer/Contactor						
Bus Amperes:		100A		Mounting Enclosure:		Surface / Nema 1						
Main Circuit Breaker:		100A										
Short Circuit:		10,000 AIC										
Description	Load(Amps)			Breaker		A	B	Breaker	Load(Amps)			Description
	A	B	C	Poles	Amps				Amps	Poles	A	
Nearside Roadway Lighting	-	-	-	2	20	1	2	20	2	-	-	Farside Roadway Lighting
Nearside Truss Lighting	-	-	-	1	20	5	6	20	1	-	-	Farside Truss Lighting
Nearside Truss Lighting	-	-	-	1	20	7	8	20	1	-	-	Farside Truss Lighting
Spare	-	-	-	1	20	9	10	20	1	-	-	Spare
Spare	-	-	-	1	20	11	12	20	1	-	-	Spare

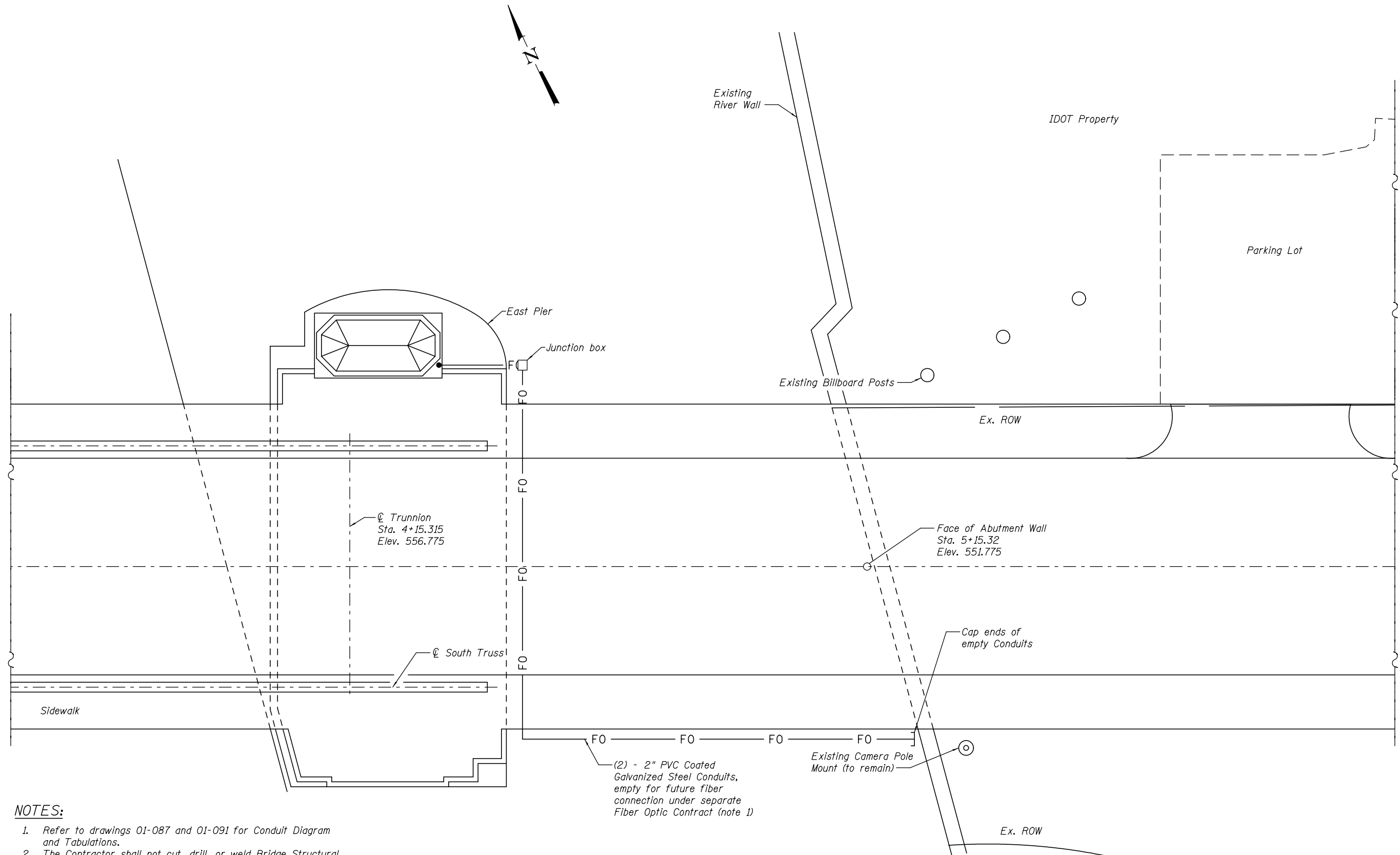
EXISTING PANELBOARD RL SCHEDULE
(SEPARATE SERVICE FOR ROADWAY LIGHTING)

PANELBOARD BB												
Voltage:		120/208V		Location:		Farside North Machinery Area						
Phase / Wire:		3 Ph / 4W		Fed From:		Distribution Panel DP via 15kVA Trans.						
Bus Amperes:		100A		Mounting Enclosure:		Surface / Nema 4X						
Main Circuit Breaker:		50										
Short Circuit:		10,000 AIC										
Description	Load(Amps)			Breaker		A	B	Breaker	Load(Amps)			Description
	A	B	C	Poles	Amps				Amps	Poles	A	
Receptacle	6	-	-	1	20	1	2	20	1	5	-	Lighting
Lighting	-	5	-	1	20	3	4	20	1	-	6	Receptacle
Heater	-	-	20	1	40	5	6	20	1	-	-	Spare
Receptacle	6	-	-	1	20	7	8	20	1	4	-	Farside Network Equipment
Farside Remote I/O	-	3	-	1	20	9	10	20	1	-	8	Heater
Farside Remote I/O Auxiliary	-	-	3	1	20	11	12	20	1	-	-	Spare
Farside Boat Detection	1	-	-	1	20	13	14	20	1	8	-	Farside CCTV Cameras
Farside Mach. Area Alarm	-	1	-	1	20	15	16	20	1	-	-	Spare
Spare	-	-	-	-	20	17	18	20	1	-	-	Spare

A	B	C
30	23	23

Total Connected Load = 30 Amps/Phase
Demand Factor = 65%
Demand Load = 20 Amps/Phase

PROPOSED PANELBOARD BB SCHEDULE (E110)



NOTES:

1. Refer to drawings 01-087 and 01-091 for Conduit Diagram and Tabulations.
2. The Contractor shall not cut, drill, or weld Bridge Structural Members without approval by the Engineer.
3. Provide conduit expansion/deflection fittings at all structural expansion joints and at locations subject to structural movement.
4. Refer to drawing 02-095 for typical details on mounting conduits to structure.

**STATE OF ILLINOIS
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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET – FIBER OPTIC ROUTE TO OPERATOR HOUSE**

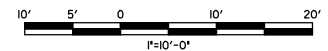
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	32
CONTRACT NO. 60P55				

SHEET NO. 19 OF 97 SHEETS

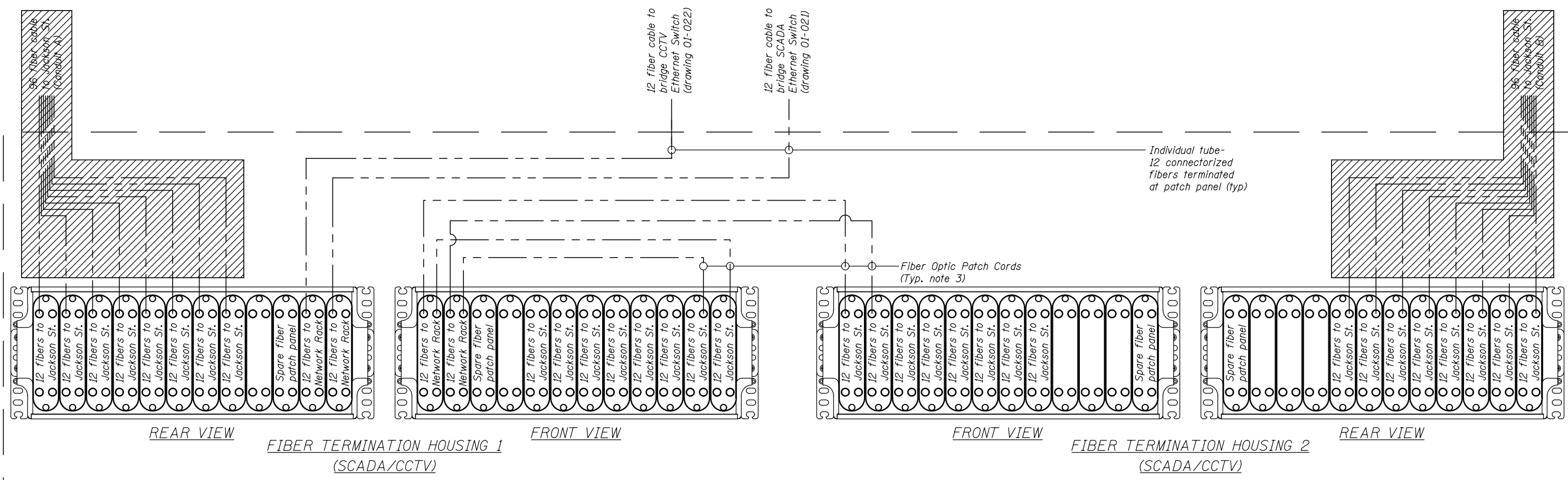
ILLINOIS FED. AID PROJECT



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PLOT SCALE =	DRAWN - R.S. JOHNSON	REVISED	___
PLOT DATE =	CHECKED - R.I. PETERS	REVISED	___



RUBY, Drawing 01-019



Fiber Optic Interconnect Cabinet

LEGEND

- Fiber optic connection
- Denotes to be installed under future separate Fiber Optic Contract

NOTES:

1. Refer to sheet nos. 12 and 13 for fiber optic interconnections with other bridges.
2. All fiber optic cable shown is singlemode type.
3. Provide patch cables to interconnect all 96 fibers of main network cables between locations.



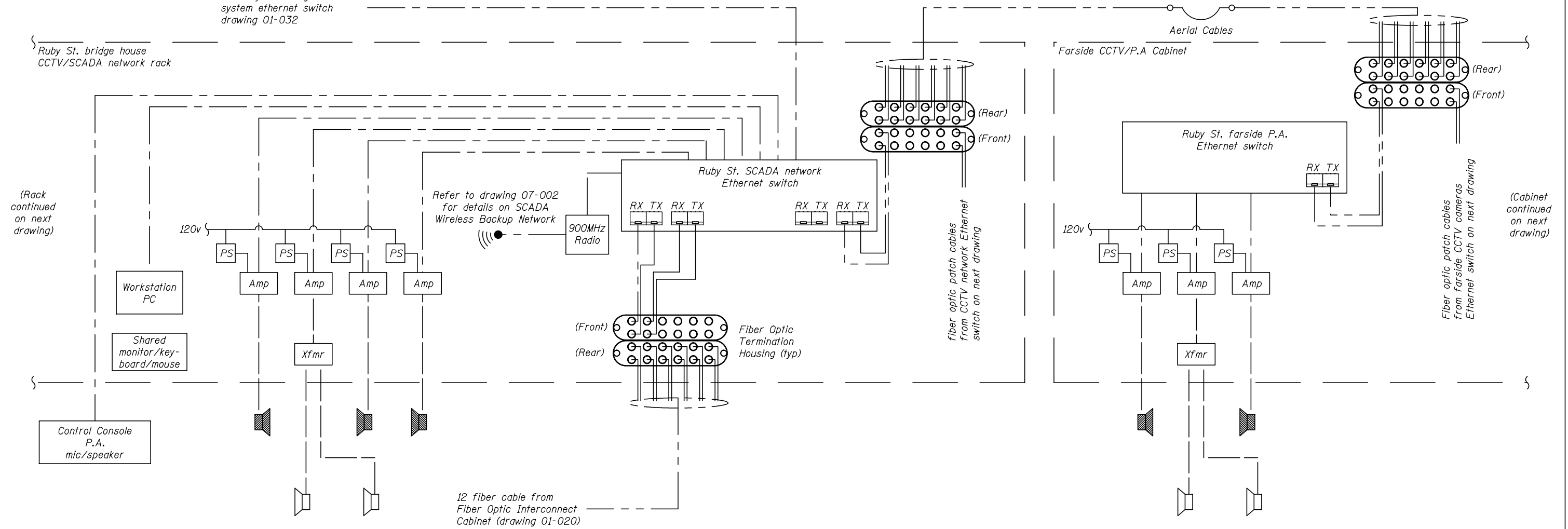
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DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - FIBER OPTIC INTERCONNECT CABINET**

RUBY, Drawing 01-020		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		112	2011-045-I	WILL	466	33
						CONTRACT NO. 60P55
ILLINOIS FED. AID PROJECT						

To Ruby St. bridge control system ethernet switch drawing 01-032



LEGEND

- — — — — Speaker wire connection
- - - - - Fiber optic connection
- - - - - Cat6 ethernet connection
- — — — — Power connection
- - - - - Video / Comm connection
- ▒ Two-way speaker
- ◁ One-way speaker
- (((•)) Wireless network antenna

PUBLIC ADDRESS SYSTEMS EQUIPMENT		
Item No.	Quantity	Item Description
1	1	Rack mount workstation computer
2	1	Monitor, pointer, and keyboard for computer
3	1	Console microphone/speaker and accessories
4	7	Amplifier power supply
5	7	Network speaker amplifier
6	2	One-way speaker transformer
7	5	Two-way outdoor speaker
8	4	One-way outdoor speaker
9	9	Speaker surge protection
10	as req.	Circuit breaker
11	2	Surge Protective Device
12	1	24VDC power supply
13	1	Industrial Ethernet switch
14	1	Utility receptacle
15	as req.	Accessories and installation hardware

WIRELESS BACKUP NETWORK EQUIPMENT		
Item No.	Quantity	Item Description
1	1	900 MHz Ethernet radio
2	1	900 MHz antenna with installation hardware & accessories
3*	1	2.4 GHz Ethernet radio
4*	2	2.4 GHz Antenna with insulation hardware & accessories
5	3	Antenna surge suppressor
6	2	Surge Protective Device
7	2	Circuit breaker
8	2	24VDC power supply/UPS
9	as req.	Accessories and installation hardware

* 1 Radio, and 2 antennas for CCTV wireless system, shown on drawing 01-022.

SCADA SYSTEM EQUIPMENT		
Item No.	Quantity	Item Description
1	1	CCTV/SCADA network rack
2	1	Rack mounted UPS (Uninterruptible Power Supply)
3	1	SCADA network Ethernet switch
4	4	Rack mount fiber termination housings, 12 position
5	as req.	Rack accessories and hardware

NOTES:

1. These equipment schedules are provided for reference and do not provide an exhaustive listing of all equipment required.
2. The Contractor shall be responsible for developing a complete bill of materials of equipment required.



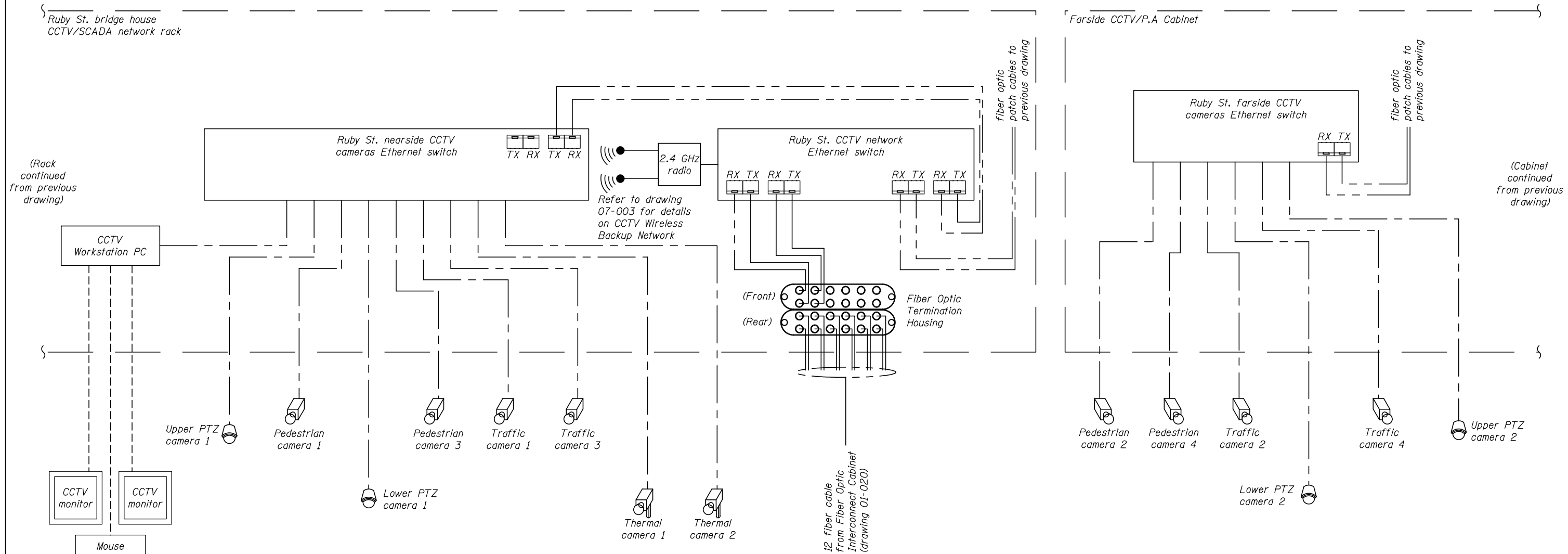
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED -
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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - SCADA ONE-LINE

SHEET NO. 21 OF 97 SHEETS

RUBY, Drawing 01-021		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	34	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						



LEGEND

- Fiber optic connection
- Cat6 connection
- Power connection
- Video / Comm connection

- Pan-tilt-zoom (PTZ) camera
- Pan-tilt thermal camera
- Fixed camera
- Wireless Network Antenna

BRIDGE CONTROL CCTV SYSTEM EQUIPMENT		
Item No.	Quantity	Item Description
1	1	Rack mounted UPS (Uninterruptible Power Supply)
2	1	CCTV network Ethernet switch
3	1	Nearside CCTV camera Ethernet switch
4	4	Rack mount fiber termination housings, 12 position
5	1	CCTV Workstation PC
6	1	Mouse / pointer
7	2	31.5" 1080p video monitor
8	4	Pan-Tilt-Zoom CCTV camera with lens, enclosure, and accessories
9	2	Pan-Tilt Thermal CCTV camera with lens, enclosure, accessories
10	8	Fixed CCTV camera with lens, enclosure, accessories
11	14	CCTV ethernet surge protection
12	as req.	Camera power supplies
13	as req.	camera circuit breakers
14	as req.	POE (Power Over Ethernet) converters

BRIDGE CONTROL CCTV SYSTEM EQUIPMENT (continued)		
Item No.	Quantity	Item Description
15	1	Farside Cabinet for CCTV and public address equipment with equipment & accessories
16	2	Surge Protective Device
17	1	Industrial cabinet UPS
18	1	24VDC power supply
19	1	Industrial Ethernet switch
20	1	Cabinet mount fiber termination housing, 12 position

NOTES:

- These equipment schedules are provided for reference and do not provide an exhaustive listing of all equipment required.
- The Contractor shall be responsible for developing a complete bill of materials of equipment required.



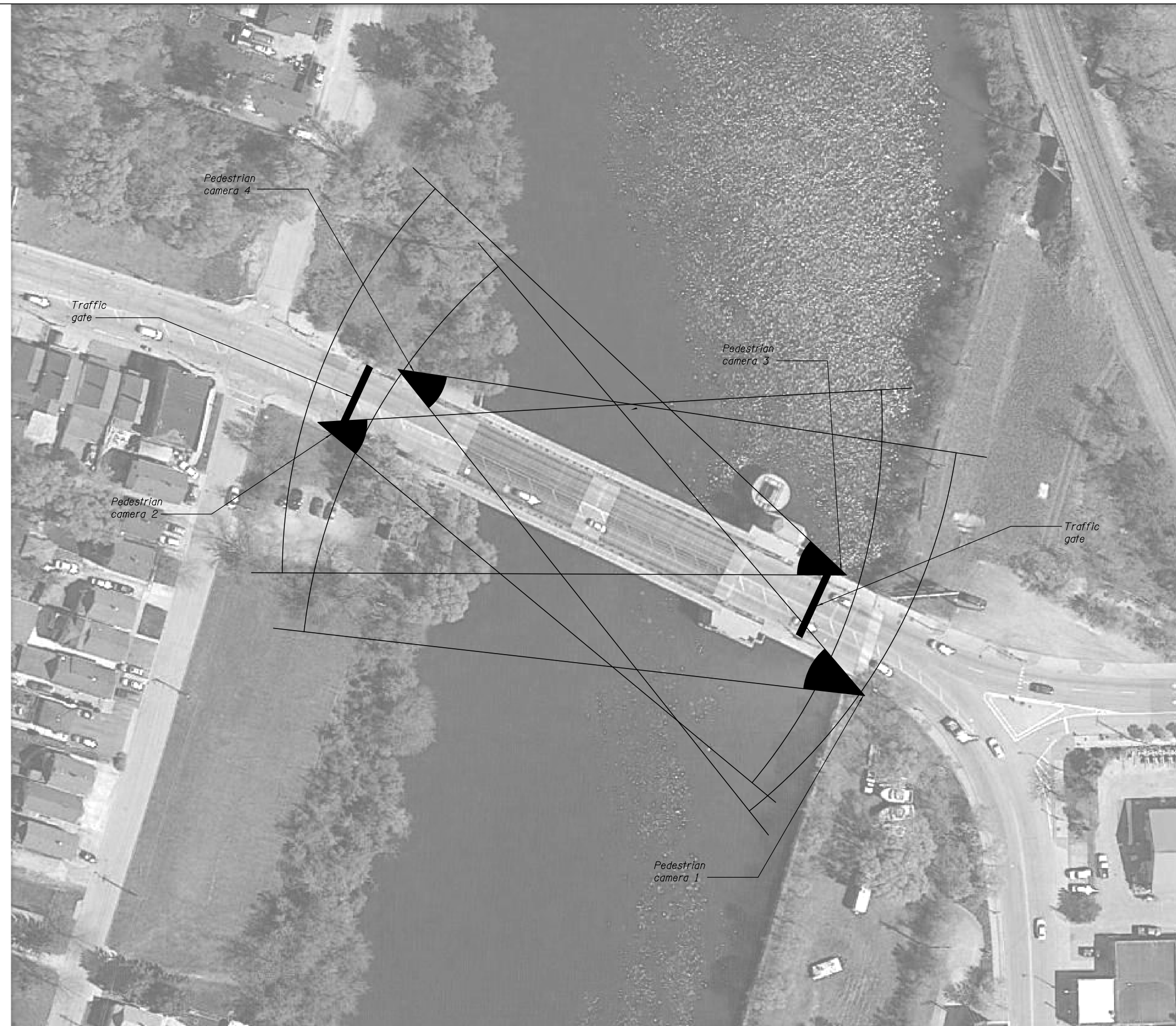
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED -
PLOT DATE =	CHECKED - K.M. GABLE	REVISED -

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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CCTV ONE-LINE**

SHEET NO. 22 OF 97 SHEETS

RUBY, Drawing 01-022		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	35	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						



RUBY ST. PEDESTRAIN CAMERA 1	
Camera type	Fixed pedestrian
Focal length (mm.)*	4.4-132mm (30x zoom)
Camera height (ft.)	35 ft
Camera tilt (°)	-2°

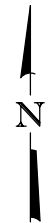
RUBY ST. PEDESTRAIN CAMERA 2	
Camera type	Fixed pedestrian
Focal length (mm.)*	4.4-132mm (30x zoom)
Camera height (ft.)	25 ft
Camera tilt (°)	-1.5°

RUBY ST. PEDESTRAIN CAMERA 3	
Camera type	Fixed pedestrian
Focal length (mm.)*	4.4-132mm (30x zoom)
Camera height (ft.)	25 ft
Camera tilt (°)	-1.5°

RUBY ST. PEDESTRAIN CAMERA 4	
Camera type	Fixed pedestrian
Focal length (mm.)*	4.4-132mm (30x zoom)
Camera height (ft.)	25 ft
Camera tilt (°)	-1.5°

Camera height is based off of pool elevation (EL. +539.91). Location and camera height are approximate. See 'CCTV Plan and Elevation' drawings for mounting details. Camera positioning to be field adjusted at each location.

*Zoom lens focal length shall be field adjusted to the desired field of view.



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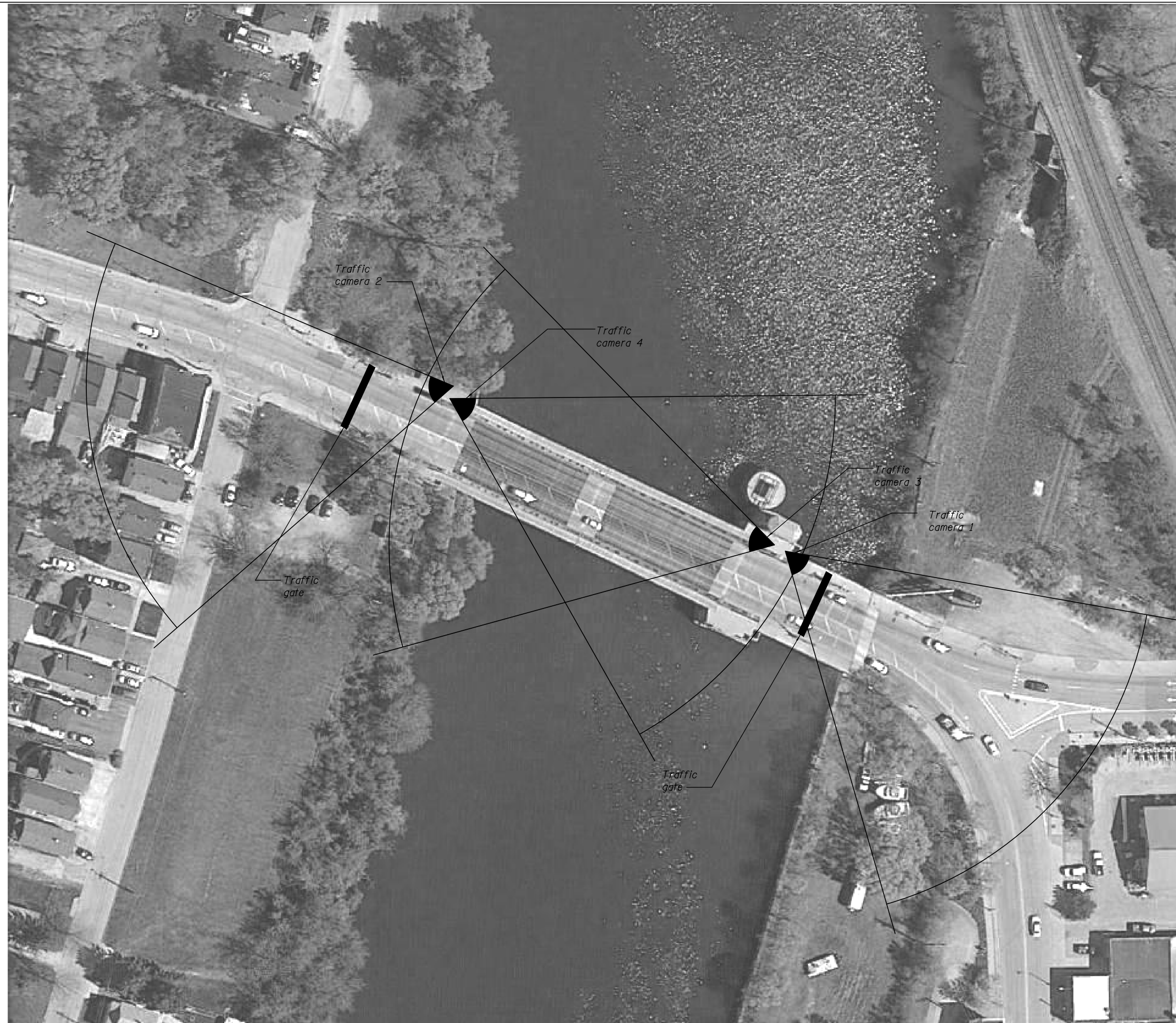
STATE OF ILLINOIS
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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - PEDESTRIAN CAMERA LAYOUT

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	36
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

SHEET NO. 23 OF 97 SHEETS

RUBY, Drawing 01-023



RUBY ST. TRAFFIC CAMERA 1	
Camera type	Fixed traffic
Focal length (mm.)*	4.4-132mm (30x zoom)
Camera height (ft.)	40 ft
Camera tilt (°)	-20°

RUBY ST. TRAFFIC CAMERA 2	
Camera type	Fixed traffic
Focal length (mm.)*	4.4-132mm (30x zoom)
Camera height (ft.)	70 ft
Camera tilt (°)	-30°

RUBY ST. TRAFFIC CAMERA 3	
Camera type	Fixed traffic
Focal length (mm.)*	4.4-132mm (30x zoom)
Camera height (ft.)	40 ft
Camera tilt (°)	-5°

RUBY ST. TRAFFIC CAMERA 4	
Camera type	Fixed traffic
Focal length (mm.)*	4.4-132mm (30x zoom)
Camera height (ft.)	70 ft
Camera tilt (°)	-15°

Camera height is based off of pool elevation (EL. +539.91). Location and camera height are approximate. See 'CCTV Plan and Elevation' drawings for mounting details. Camera positioning to be field adjusted at each location.

*Zoom lens focal length shall be field adjusted to the desired field of view.



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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - TRAFFIC CAMERA LAYOUT

SHEET NO. 24 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	37
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-024



RUBY ST. UPPER PTZ CAMERA 1	
Camera type	Upper PTZ
Focal length (mm.)	4.4-132mm (30x zoom)
Camera height (ft.)	40 ft
Camera tilt (°)	-90° to 5°

RUBY ST. UPPER PTZ CAMERA 2	
Camera type	Upper PTZ
Focal length (mm.)	4.4-132mm (30x zoom)
Camera height (ft.)	70 ft
Camera tilt (°)	-90° to 5°



NOTES:

1. Camera field of view is shown for illustration purposes and is adjustable as required.
2. Camera height is based off of pool elevation (EL. +539.91). Location and camera height are approximate. See 'CCTV Plan and Elevation' drawings for mounting details. Camera positioning to be field adjusted at each location.



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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - UPPER PTZ CAMERA LAYOUT**

SHEET NO. 25 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	38
				CONTRACT NO. 60P55
ILLINOIS FED. AID PROJECT				

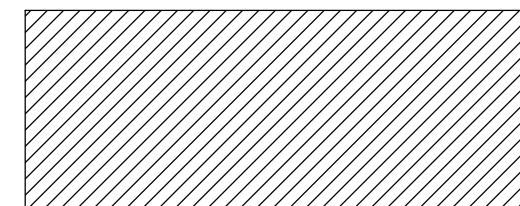
RUBY, Drawing 01-025



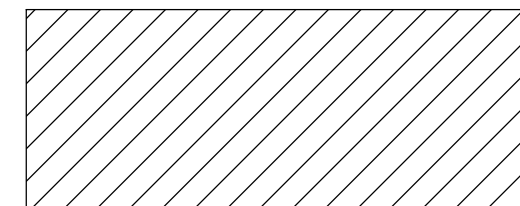
RUBY ST. THERMAL CAMERA 1	
Camera type	Lower thermal (pan & tilt)
Focal length (mm.)	35 mm
Camera height (ft.)	9 ft
Camera tilt (°)	0°

RUBY ST. THERMAL CAMERA 2	
Camera type	Lower thermal (pan & tilt)
Focal length (mm.)	35 mm
Camera height (ft.)	9 ft
Camera tilt (°)	0°

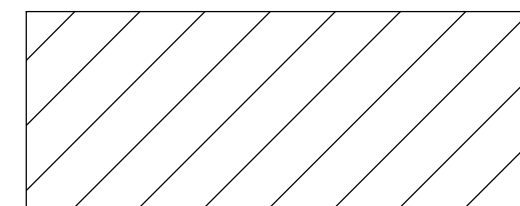
Camera height is based off of pool elevation (E.L. +539.91). Location and camera height are approximate. See 'CCTV Plan and Elevation' drawings for mounting details. Camera positioning to be field adjusted at each location.



Human Identification*
(26 vertical Pixels on Target)



Human Recognition*
(8 vertical Pixels on Target)



Human Detection*
(2 vertical Pixels on Target)

*Viewing distance criteria based on image resolution of 640x480 (VGA format)



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PLOT SCALE =	DRAWN - K.M. GABLE	REVISED	---
PLOT DATE =	CHECKED - R.I. PETERS	REVISED	---

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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - THERMAL CAMERA LAYOUT

SHEET NO. 26 OF 97 SHEETS

RUBY, Drawing 01-026			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS SHEET NO.
112	2011-045-I	WILL	466 39
			CONTRACT NO. 60P55
ILLINOIS FED. AID PROJECT			



RUBY STREET LOWER PTZ CAMERA 1	
Camera type	Lower PTZ
Focal length (mm.)	4.4-132mm (30x zoom)
Camera height (ft.)	9 ft
Camera tilt (°)	0° (at rest)

RUBY STREET LOWER PTZ CAMERA 2	
Camera type	Lower PTZ
Focal length (mm.)	4.4-132mm (30x zoom)
Camera height (ft.)	9 ft
Camera tilt (°)	0° (at rest)



NOTES:

1. Camera field of view shown for illustration purposes and is adjustable as required.
2. Camera height is based off of pool elevation (EL. +539.91). Location and camera height are approximate. See 'CCTV Plan and Elevation' drawings for mounting details. Camera positioning to be field adjusted at each location.



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PLOT DATE =	CHECKED - R.I. PETERS	REVISED	___

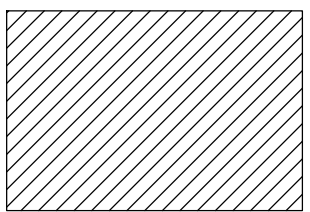
**STATE OF ILLINOIS
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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - LOWER PTZ CAMERA LAYOUT**

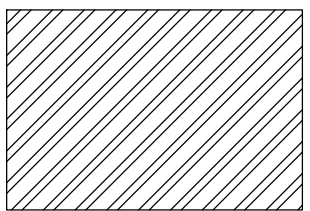
SHEET NO. 27 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	40
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-027



90db audible
1-way speaker



2-way microphone range
2-way speaker



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PLOT SCALE =	DRAWN - K.M. GABLE	REVISED	___
PLOT DATE =	CHECKED - R.I. PETERS	REVISED	___

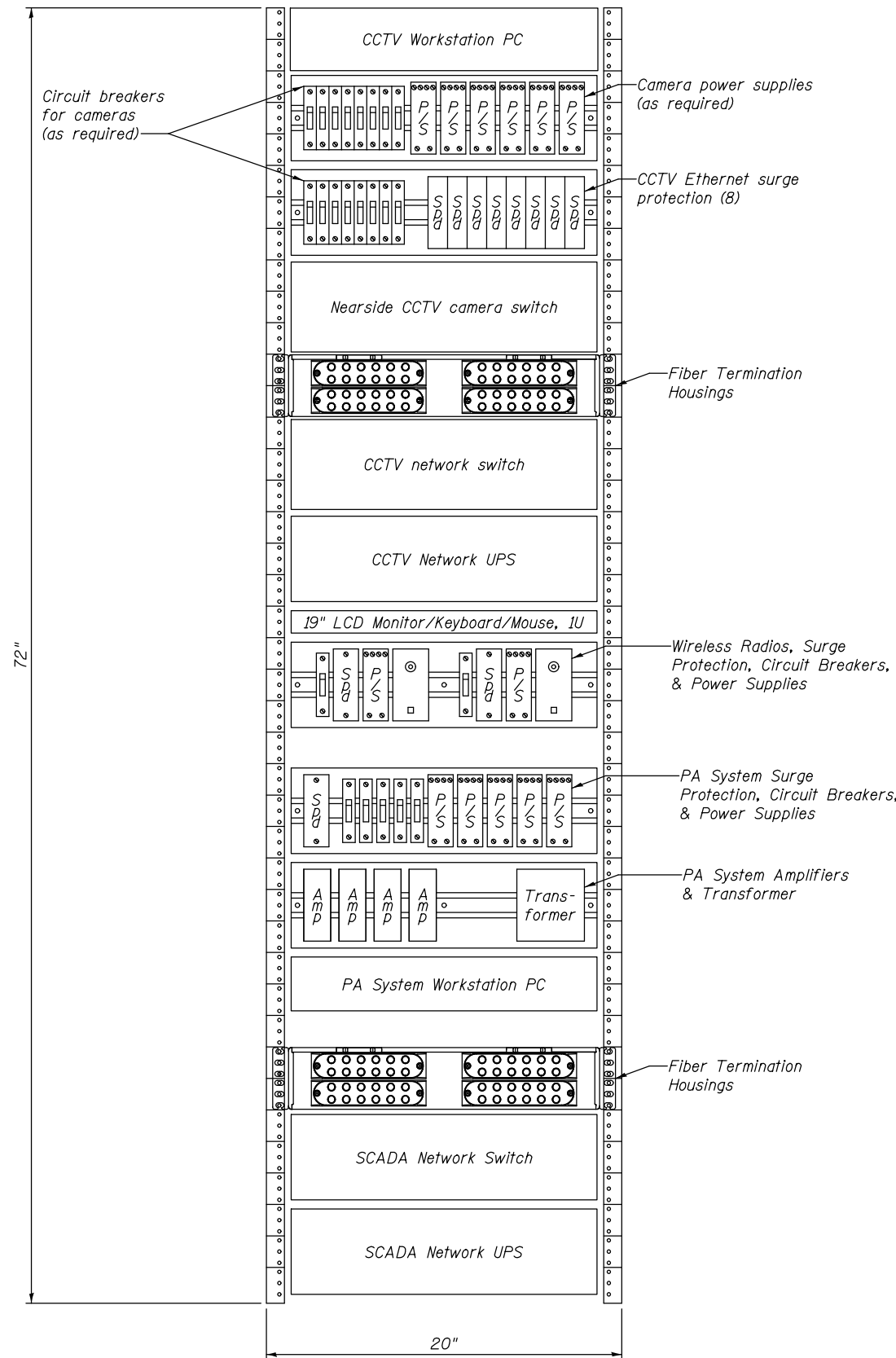
**STATE OF ILLINOIS
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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - P.A. SPEAKER LAYOUT**

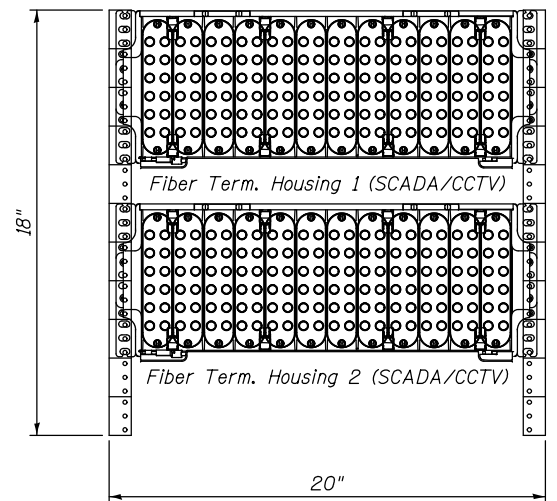
SHEET NO. 28 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

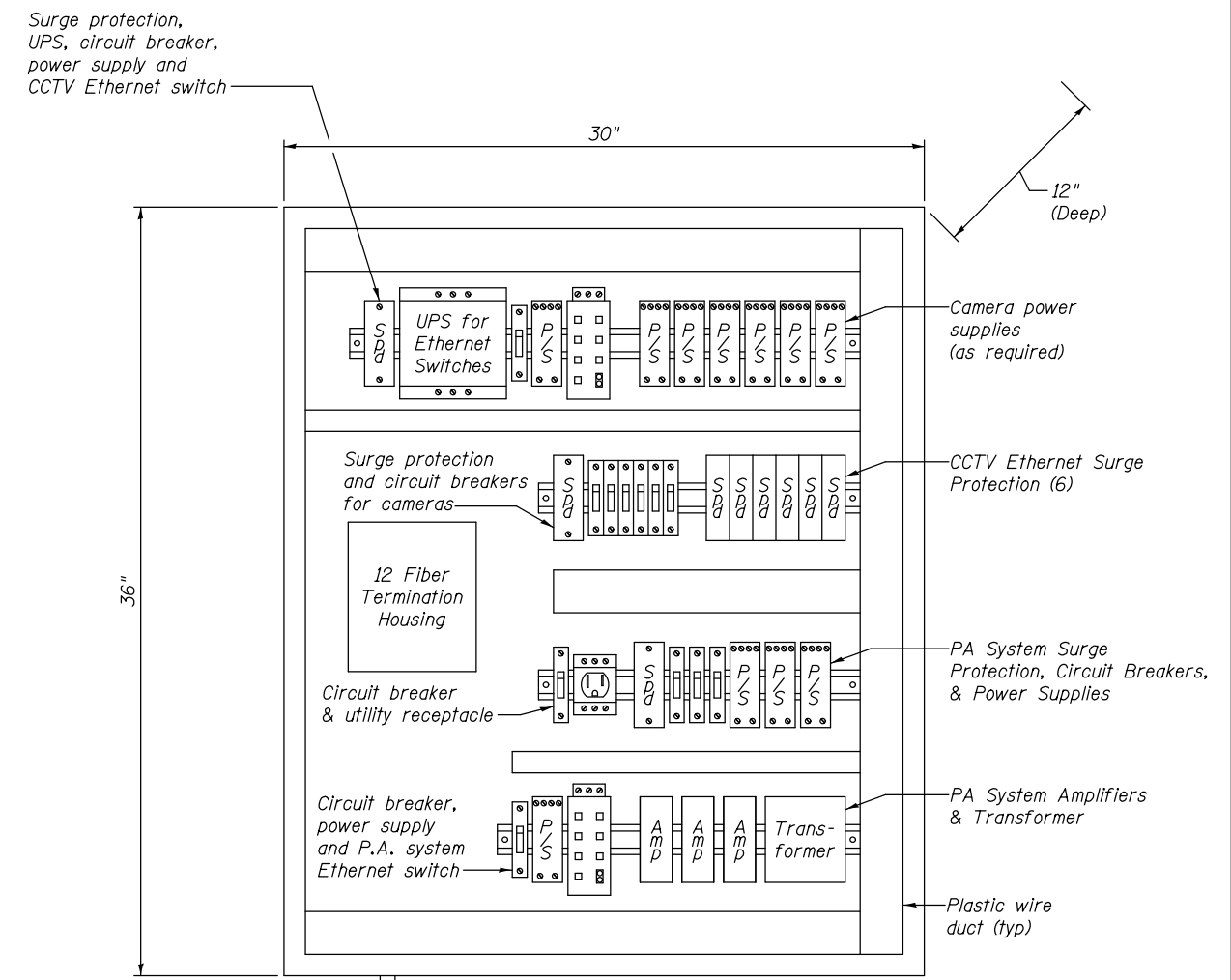
RUBY, Drawing 01-028



CCTV/SCADA NETWORK RACK



FIBER OPTIC INTERCONNECT CABINET



FARSIDE CCTV/P.A. CABINET

- NOTES:
1. Rack and cabinet layouts shown are conceptual. The Contractor shall be responsible for developing and submitting layouts with all required components.
 2. The Systems Integrator shall be responsible for coordinating cabinet sizing requirements to accommodate equipment serving all applicable systems.



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED -
PLOT DATE =	CHECKED - K.M. GABLE	REVISED -

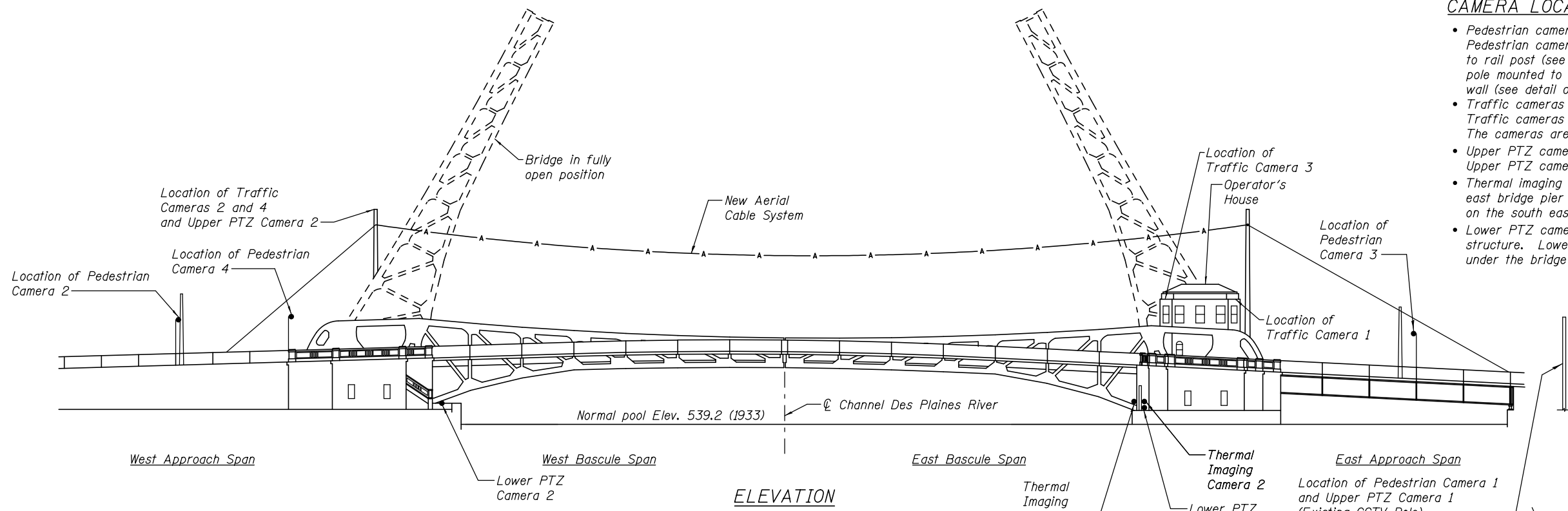
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - NETWORK CABINET DETAILS
SHEET NO. 29 OF 97 SHEETS

RUBY, Drawing 01-029			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 42
CONTRACT NO. 60P55			
ILLINOIS FED. AID PROJECT			

CAMERA LOCATIONS AND DESCRIPTIONS

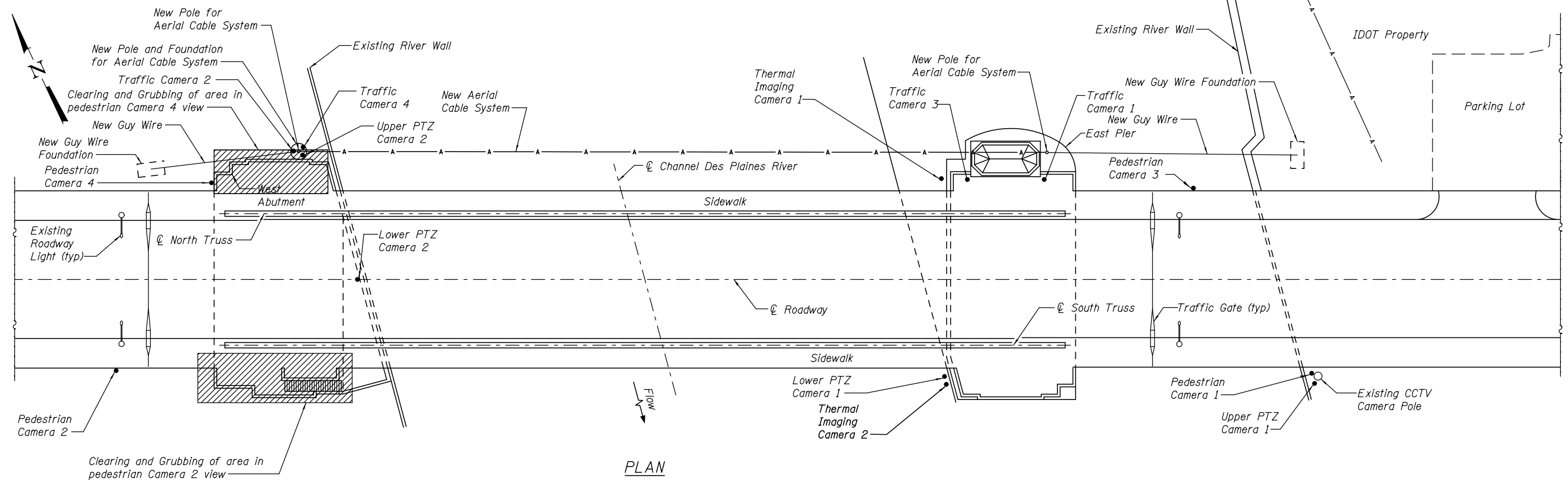
- Pedestrian camera 1 is located on the existing CCTV camera pole. Pedestrian cameras 2 and 3 are pole mounted to new pole attached to rail post (see detail on drawing 04-024). Pedestrian camera 4 is pole mounted to new pole attached to west face of west abutment wall (see detail on drawing 01-031).
- Traffic cameras 1 and 3 are located on the existing operator's house. Traffic cameras 2 and 4 are located on the new aerial cable pole. The cameras are aimed at the traffic gates.
- Upper PTZ camera 1 is located on the existing CCTV camera pole. Upper PTZ camera 2 is located on the new aerial cable pole.
- Thermal imaging camera 1 is located near the fence on the north east bridge pier structure. Thermal imaging camera 2 is located on the south east bridge pier structure.
- Lower PTZ camera 1 is located on the south east bridge pier structure. Lower PTZ camera 2 is located on the west side under the bridge at the center.



ELEVATION

NOTES:

1. All locations shown are approximate. The Contractor shall field verify all camera mounting locations and submit proposed mounting locations to the Engineer for approval. All camera locations shall be clear of the movable span.
2. Lower PTZ cameras' pan and tilt range of motion shall allow viewing of the area directly under the bridge.
3. For cameras located on new aerial cable pole, refer to drawing 06-027 for mounting details.



PLAN



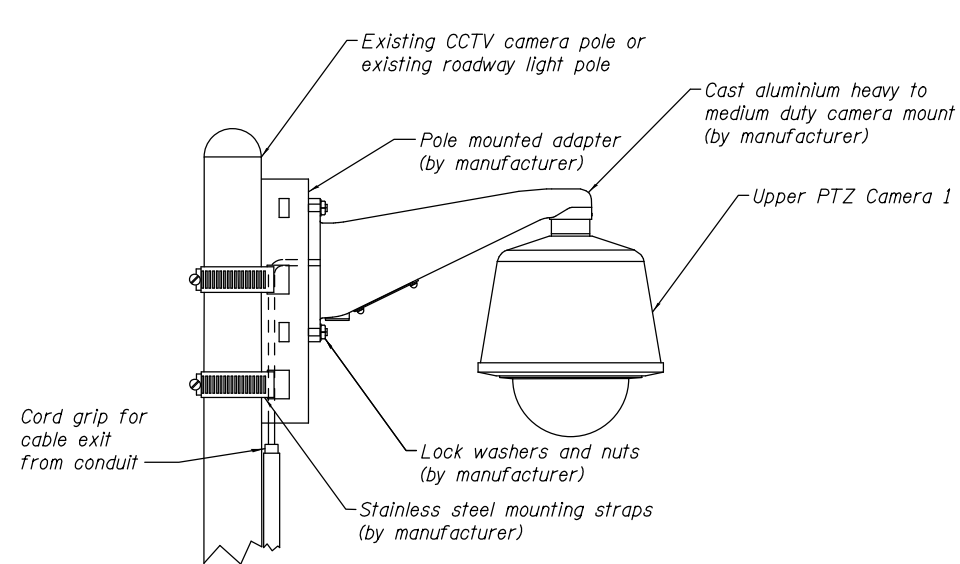
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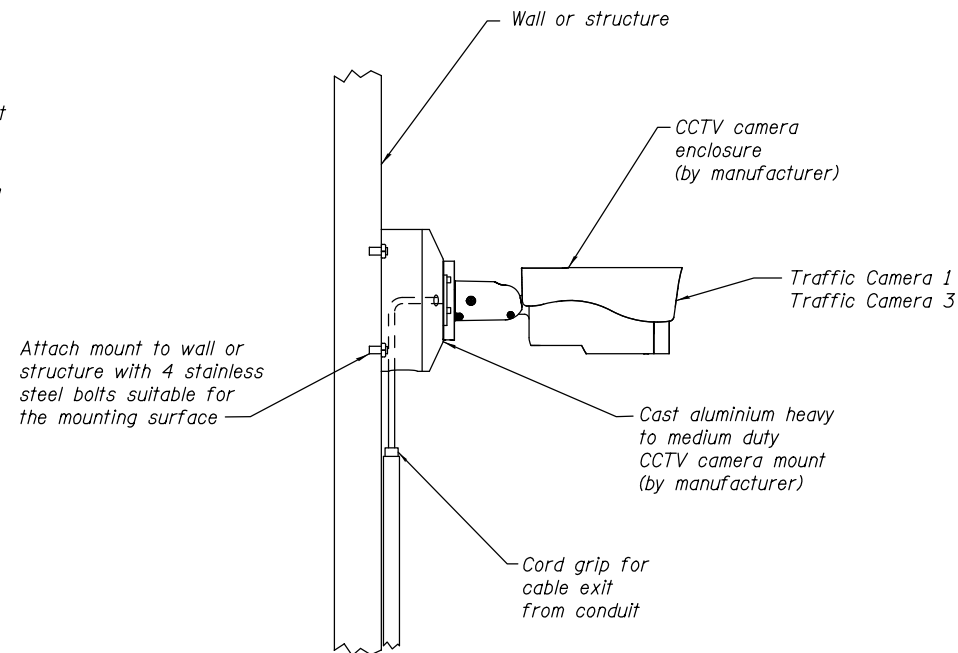
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CCTV PLAN AND ELEVATION**

SHEET NO. 30 OF 97 SHEETS

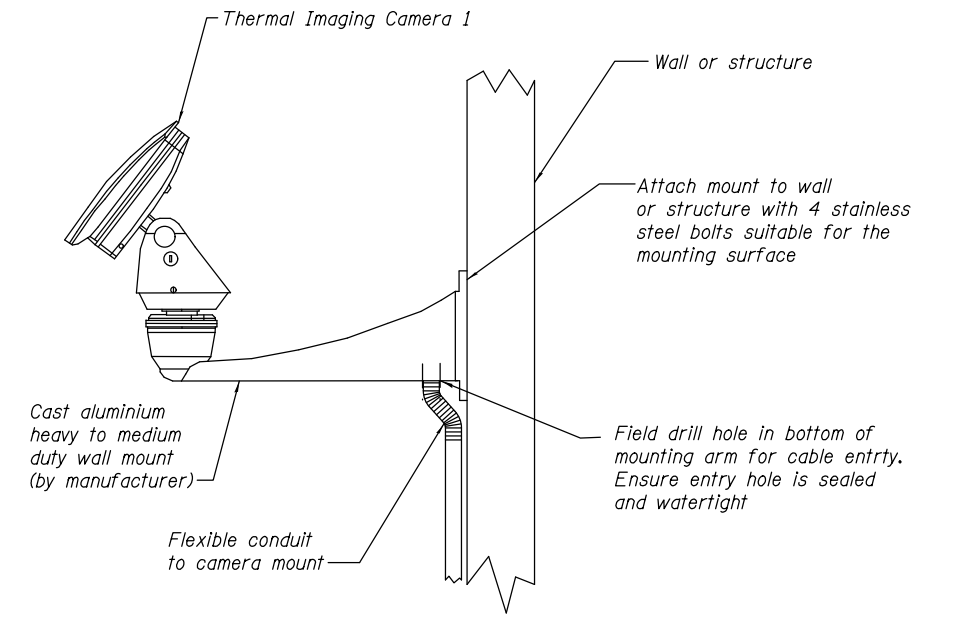
RUBY, Drawing 01-030			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 43
CONTRACT NO. 60P55			
ILLINOIS FED. AID PROJECT			



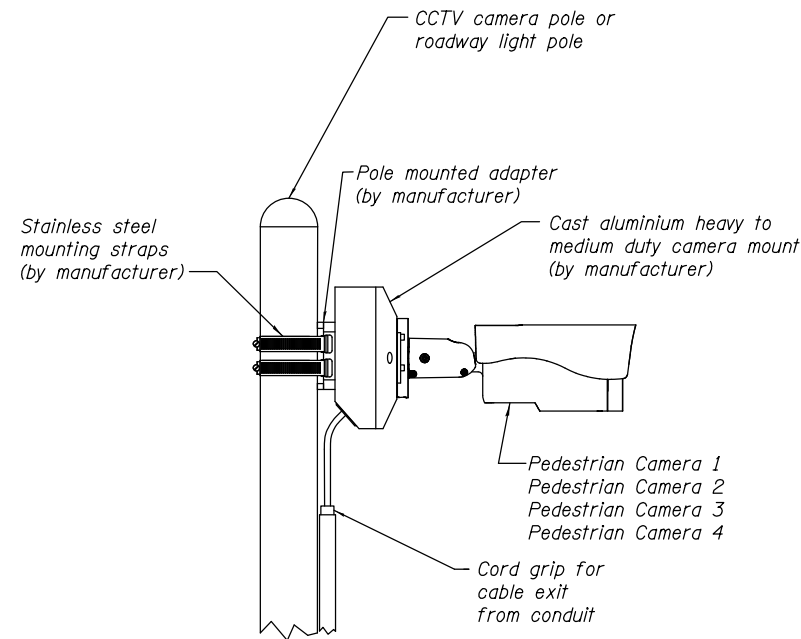
POLE MOUNTED PTZ DOME CAMERA



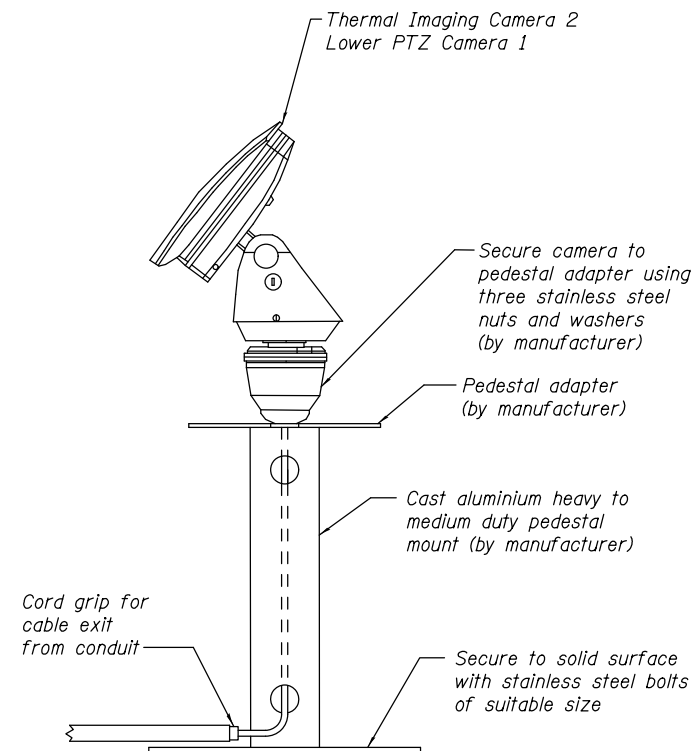
WALL OR STRUCTURE MOUNTED FIXED CAMERA



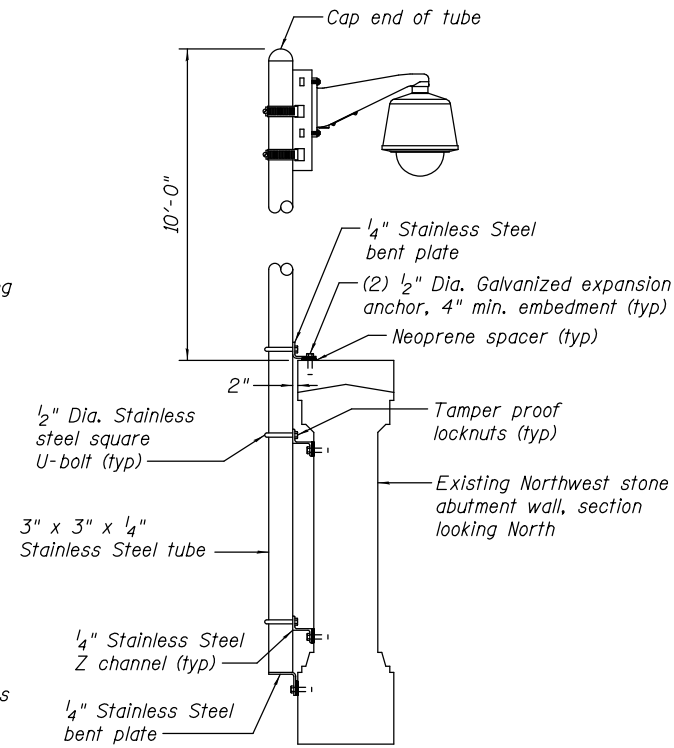
WALL OR STRUCTURE MOUNTED THERMAL IMAGING PTZ CAMERA



POLE MOUNTED FIXED CAMERA

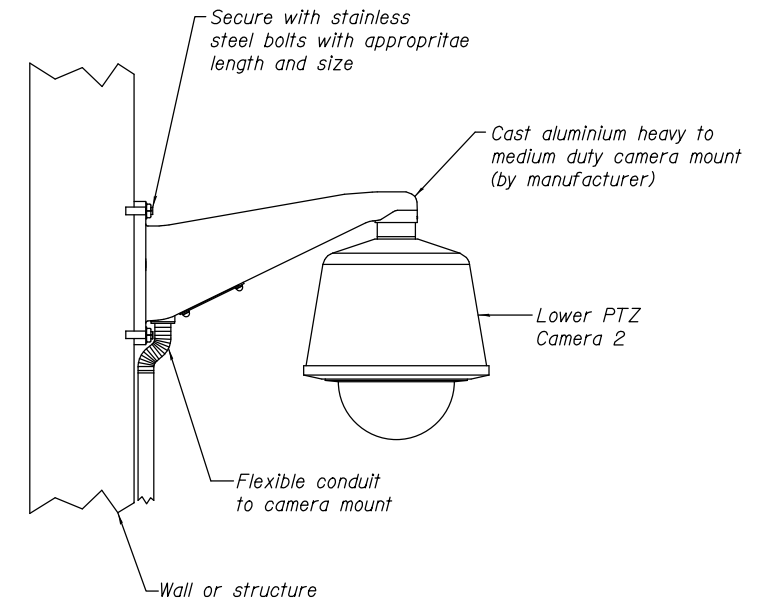


PEDESTAL MOUNTED THERMAL IMAGING PTZ CAMERA



CAMERA POLE MOUNT DETAIL TO EXISTING ABUTMENT WALL

(note 3)



WALL OR STRUCTURE MOUNTED PTZ DOME CAMERA

NOTES:

1. For camera locations, refer to CCTV Plan and Elevation drawings.
2. Cable routing details provide one acceptable routing method. Routing details may vary depending on camera manufacturer.
3. The Contractor shall submit details for pole mounting to existing abutment wall, including all materials, to the Engineer for approval.



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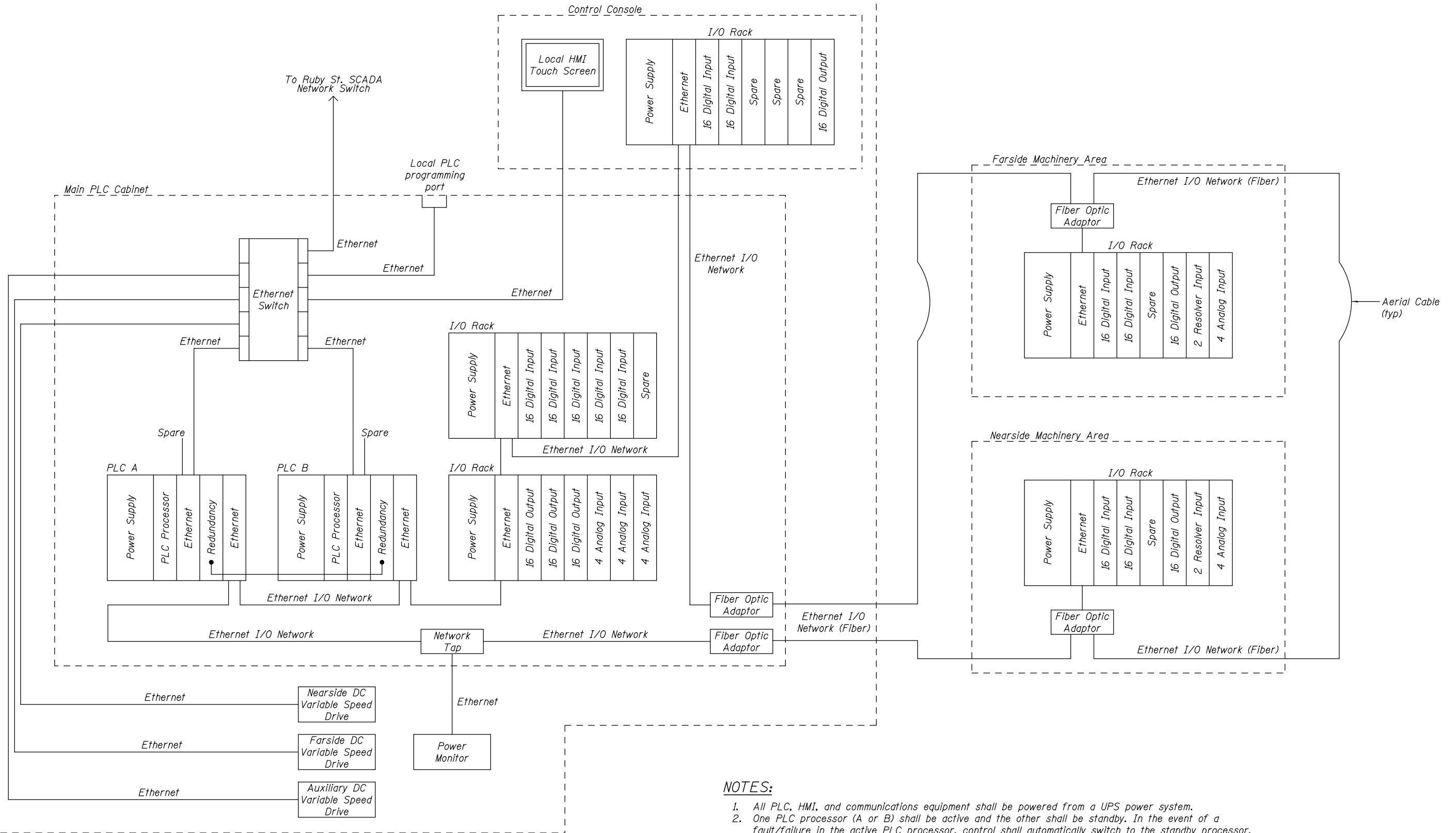
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CCTV MOUNTING DETAILS**

SHEET NO. 31 OF 97 SHEETS

RUBY, Drawing 01-031				
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	44
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

Bridge Operator House



NOTES:

1. All PLC, HMI, and communications equipment shall be powered from a UPS power system.
2. One PLC processor (A or B) shall be active and the other shall be standby. In the event of a fault/failure in the active PLC processor, control shall automatically switch to the standby processor.
3. All equipment shown is new.



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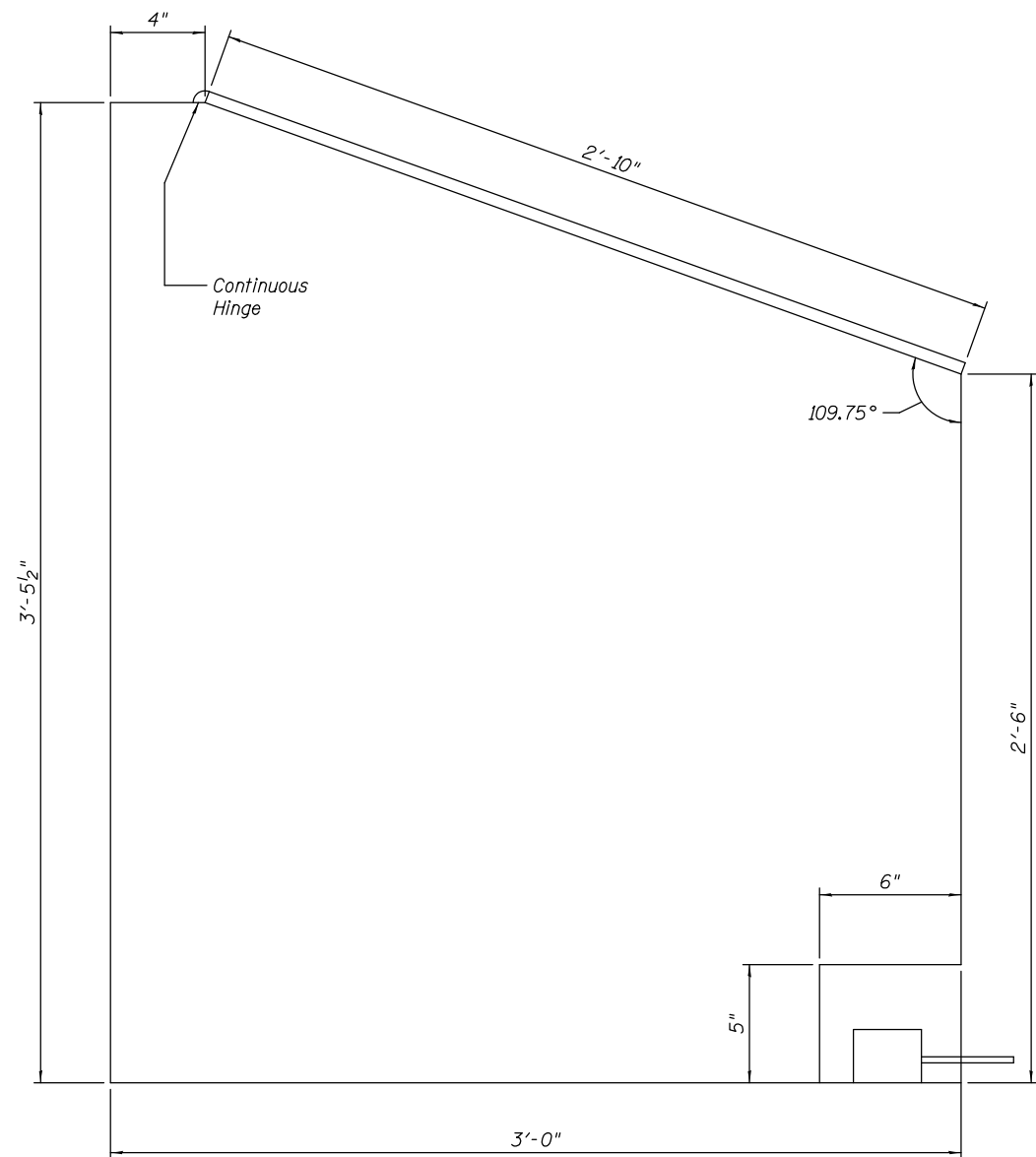
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - BRIDGE CONTROL DIAGRAM**

SHEET NO. 32 OF 97 SHEETS

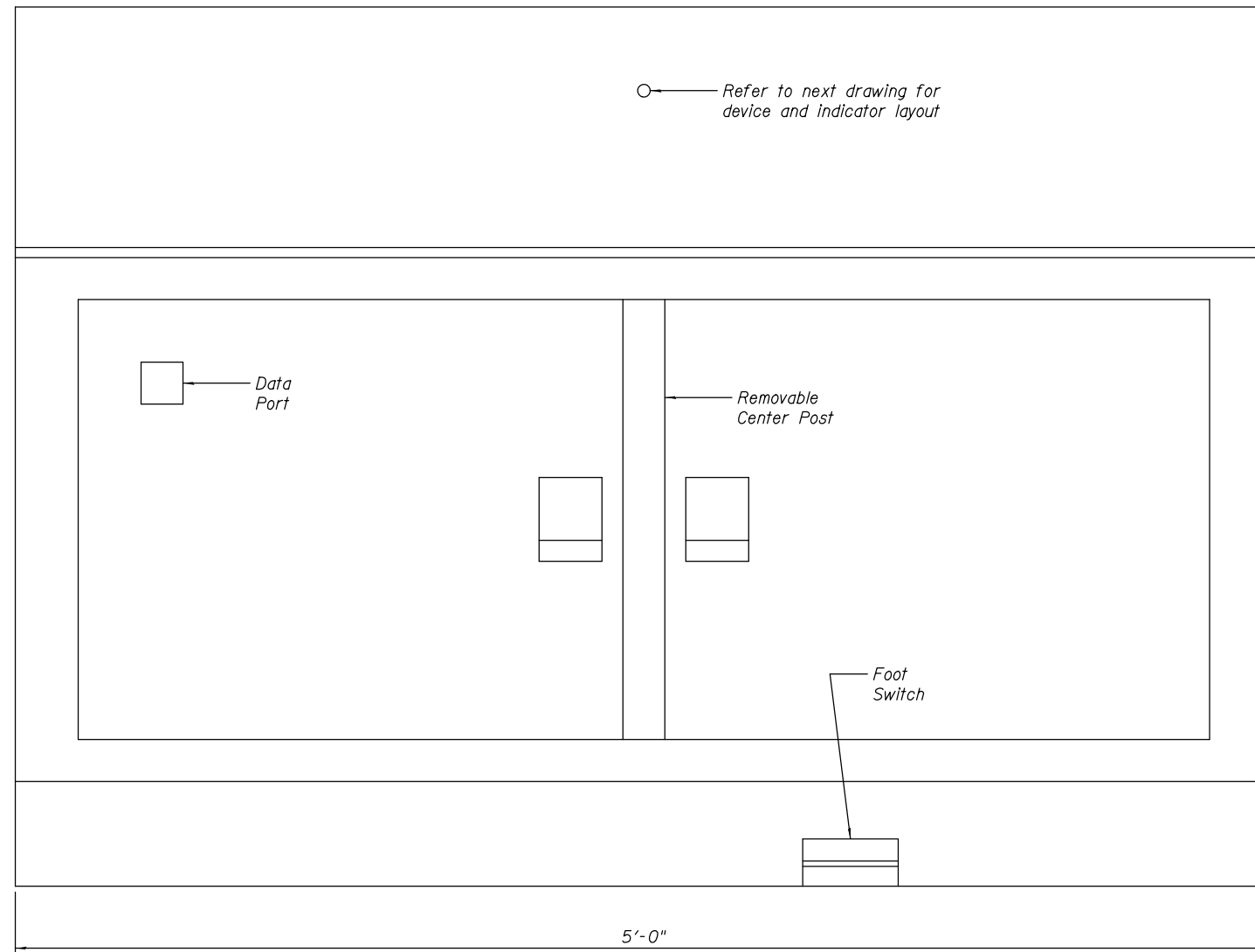
F.A.P. RTE. 112	SECTION 2011-045-I	COUNTY WILL	TOTAL SHEETS 466	SHEET NO. 45
CONTRACT NO. 60P55				

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-032



SIDE VIEW



FRONT VIEW

NOTES:

1. All dimensions shown are approximate. The Contractor shall submit control console layout and design drawings to the Engineer for approval. Actual control console size shall be based on available operator house space, cabinet components required, and fabrication requirements.
2. Provide additional free standing tables for CCTV controller keyboard/joystick, amrine radio, and general utility use. Tables shall be sized and shaped to be placed at either side of the new control console as required by individual control house dimensions. Table tops shall be composite wood or laminated construction, 1/2" minimum thickness with oil and moisture resiatant finish. Legs, top support, cross members, and bracing shall be constructed of powder coated formed steel, minimum 16 gauge. Leg design shall allow height adjustment in 1" increments between approximately 29" to 33".



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PLOT DATE =	CHECKED - R.I. PETERS	REVISED	---

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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - NEW BRIDGE CONTROL CONSOLE - 1**

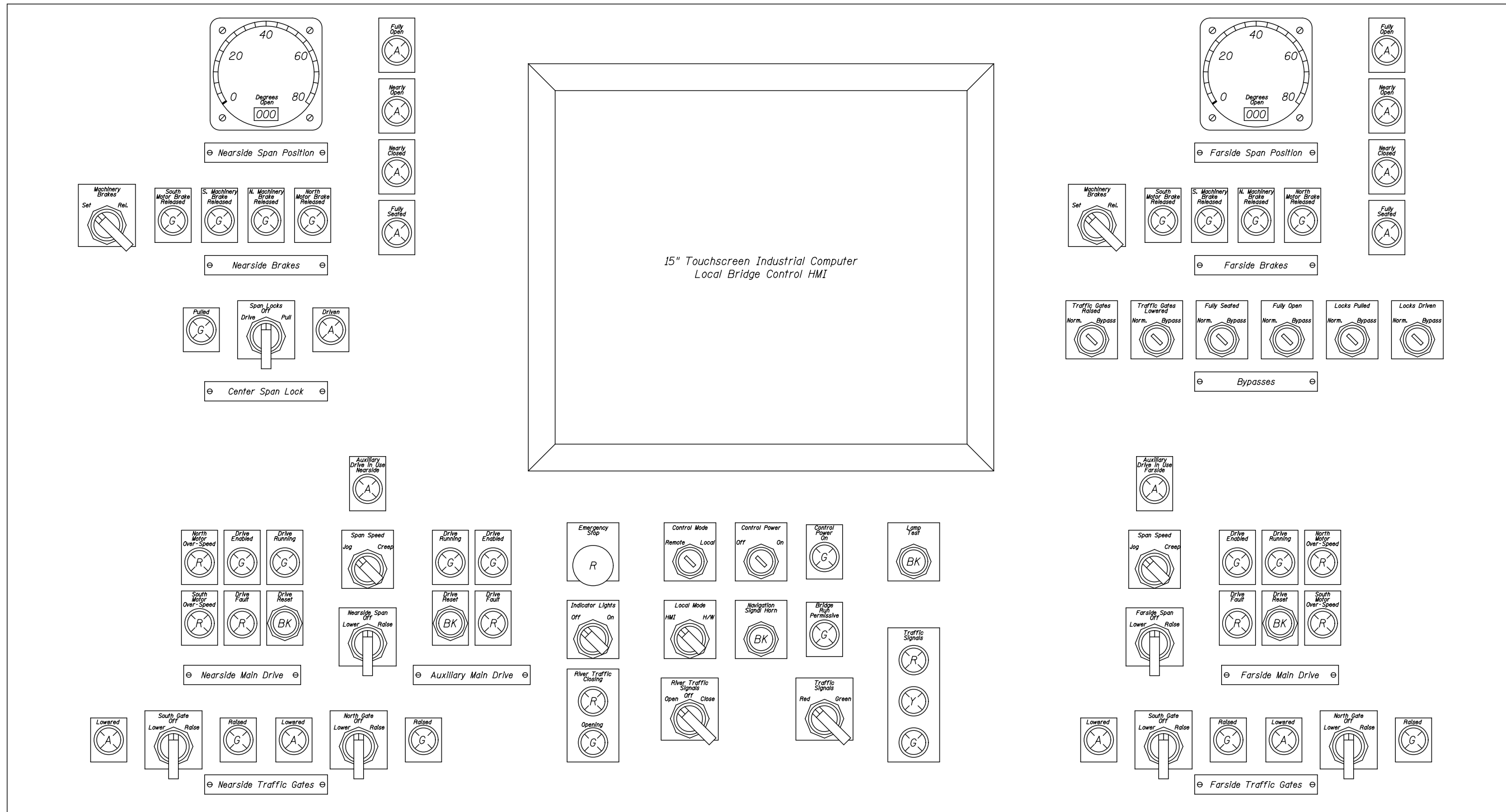
SHEET NO. 33 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	46
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-033

5'-0"

2'-10"



CONTROL CONSOLE DEVICE AND INDICATOR LAYOUT



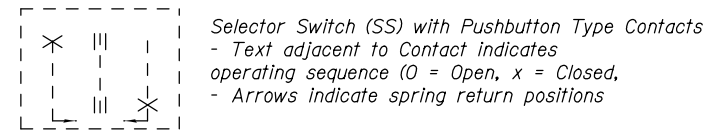
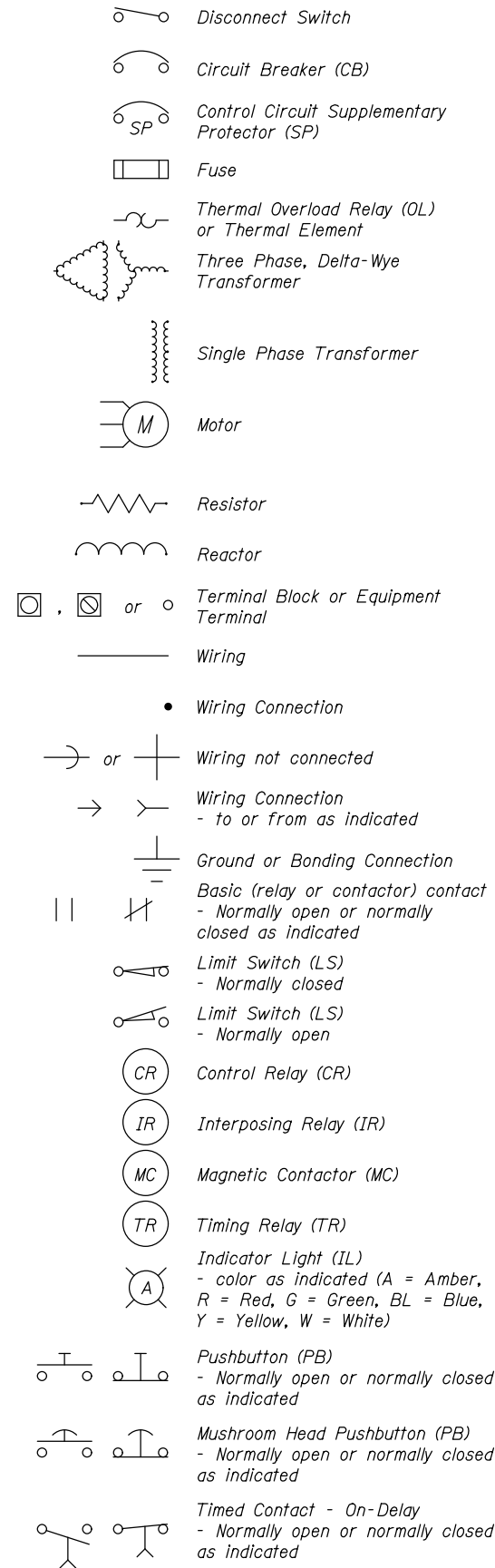
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PLOT DATE =	CHECKED - R.I. PETERS	REVISED -

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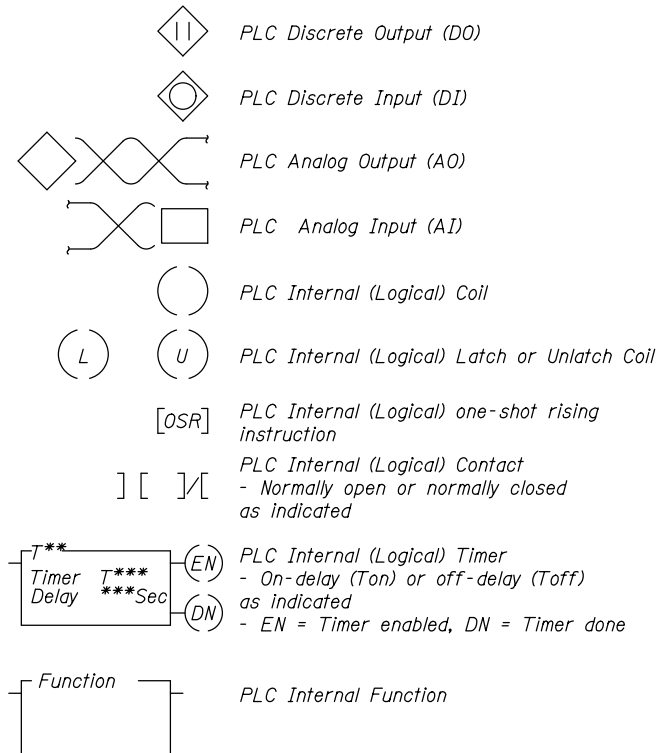
VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - NEW BRIDGE CONTROL CONSOLE - 2
SHEET NO. 34 OF 97 SHEETS

RUBY, Drawing 01-034		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	47	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						

GENERAL ELECTRICAL POWER AND CONTROL CIRCUIT SCHEMATIC SYMBOLS



PLC SYSTEM SYMBOLS



CONTROL CONSOLE INDICATOR AND BUTTON COLOR LEGEND

MISCELLANEOUS

Number in parenthesis to the left of control device (Limit Switches, Pushbuttons, Selector Switches, etc.) Contacts indicates the contact designation.

Control circuit device designations are as follows.
 N = Nearside F = Farside
 N = North S = South

GENERAL LEGEND

Symbol	Description
ACK	Acknowledged
ATS	Automatic Transfer Switch
AUT	Automatic
AUX	Auxiliary
BAT	Battery
BM	Bus Monitor
BYP	Bypass
CB	Circuit Breaker
CCTV	Closed Circuit Television
CON	Contact
CP	Control Power
CR	Control Relay
CS	Control Switch
DC	Direct Current (DC Drive)
ES	Emergency Stop
FLT	Fault
GEN	Generator
HC	Hand Crank Mechanism
HMI	Operator Interface
HW	Hard-Wired Mode
IL	Indicator Light
IN	Inclinometer Sensor
I/O	Input/Output
IR	Interposing Relay
LOC	Local Mode (HMI or HW)
LS	Limit Switch
MAN	Manual
MC	Magnetic Contactor
MCC	Motor Control Center
MD	Main Drive
OL	Motor Overload Relay
PB	Push Button
PLC	Programmable Logic Controller
REM	Remote Mode (SCADA)
RS	Resolver Sensor
SCADA	Supervisory Control and Data Acquisition
SPD	Surge Protective Device
SP	Supplementary Protection
SS	Selector Switch or Speed Switch
SW	Switch
TMR	Timer
TR	Timing Relay
UPS	Uninterruptible Power Supply
UTIL	Utility



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**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT LEGEND - 1**
SHEET NO. 35 OF 97 SHEETS

RUBY, Drawing 01-035	
F.A.P. RTE.	SECTION
112	2011-045-I
COUNTY	TOTAL SHEETS
WILL	466
SHEET NO. 48	
CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT	

LOGIC DIGITAL INPUT LEGEND

Symbol	Description	Address
ATS-G	Generator Power Source Selected	I:004
ATS-GH	Generator Power Available/Healthy	I:005
ATS-U	Utility Power Source Selected	I:002
ATS-UH	Utility Power Available/Healthy	I:003
BM	Bus Monitor Fault	I:006
CR-BDET	Boat Detection (No Boat Present)	I:021
CR-CP	Control Power On	I:301
CR-FTS	Foot Switch	I:308
CR-FNGR	Farside North Gate Raised	I:321
CR-FNGL	Farside North Gate Lowered	I:322
CR-FSGR	Farside South Gate Raised	I:323
CR-FSGL	Farside South Gate Lowered	I:324
CR-FAUX	Farside Using Auxiliary Drive B	I:069
CR-MD-BE	Auxiliary Main Drive B Enabled	I:074
CR-MD-BF	Auxiliary Main Drive B Fault	I:076
CR-MD-BR	Auxiliary Main Drive B Running	I:075
CR-MD-FAE	Farside Main Drive A Enabled	I:071
CR-MD-FAF	Farside Main Drive A Fault	I:073
CR-MD-FAR	Farside Main Drive A Running	I:072
CR-MD-NAE	Nearside Main Drive A Enabled	I:065
CR-MD-NAF	Nearside Main Drive A Fault	I:067
CR-MD-NAR	Nearside Main Drive A Running	I:066
CR-NAUX	Nearside Using Auxiliary Drive B	I:068
CR-NNGL	Nearside North Gate Lowered	I:318
CR-NNGR	Nearside North Gate Raised	I:317
CR-NSGL	Nearside South Gate Lowered	I:320
CR-NSGR	Nearside South Gate Raised	I:319
CR-RSIGC	River Traffic Signal Closing (Signal Is Red)	I:313
CR-RSIGO	River Traffic Signal Opening (Signal Is Green)	I:312
CR-SLD	Span Lock Driven	I:041
CR-SLP	Span Lock Pulled	I:042
CR-TSR	Red Traffic Signal	I:310
CR-TSY	Yellow Traffic Signal	I:311
CS-REM(REM)	Remote Scada Control Mode	I:303
CS-REM(LOC)	Local Control Mode	I:304
CS-HW(H/W)	Local Console Hard-wired Switch Controls	I:305
CS-HW(HMI)	Local HMI Controls	I:306
LS-FBAS	Farside Brake A Set	I:717
LS-FBAR	Farside Brake A Released	I:718
LS-FBAHR	Farside Brake A Hand Released	I:725
LS-FBBS	Farside Brake B Set	I:719
LS-FBBR	Farside Brake B Released	I:720
LS-FBBHR	Farside Brake B Hand Released	I:726
LS-FBCS	Farside Brake C Set	I:721
LS-FBCR	Farside Brake C Released	I:722
LS-FBCHR	Farside Brake C Hand Released	I:727
LS-FBDS	Farside Brake D Set	I:723
LS-FBDR	Farside Brake D Released	I:724
LS-FBDHR	Farside Brake D Hand Released	I:728
LS-FFS	Farside Fully Seated	I:704
LS-FSC(1)	Farside Fully Open	I:705
LS-FSC(2)	Farside Nearly Open	I:706
LS-FSC(3)	Farside Nearly Closed	I:707
LS-FSC(4)	Farside Fully Closed	I:708
LS-NBAS	Nearside Brake A Set	I:517
LS-NBAR	Nearside Brake A Released	I:518
LS-NBAHR	Nearside Brake A Hand Released	I:525

LOGIC DIGITAL INPUT LEGEND (CONTINUED)

Symbol	Description	Address
LS-NBBS	Nearside Brake B Set	I:519
LS-NBBR	Nearside Brake B Released	I:520
LS-NBBHR	Nearside Brake B Hand Released	I:526
LS-NBCS	Nearside Brake C Set	I:521
LS-NBCR	Nearside Brake C Released	I:522
LS-NBCHR	Nearside Brake C Hand Released	I:527
LS-NBDS	Nearside Brake D Set	I:523
LS-NBDR	Nearside Brake D Released	I:524
LS-NBDHR	Nearside Brake D Hand Released	I:528
LS-NFS	Nearside Fully Seated	I:504
LS-NSC(1)	Nearside Fully Open	I:505
LS-NSC(2)	Nearside Nearly Open	I:506
LS-NSC(3)	Nearside Nearly Closed	I:507
LS-NSC(4)	Nearside Fully Closed	I:508
SS-FAOS	Farside Motor A Over-Speed	I:029
SS-FBOS	Farside Motor B Over-Speed	I:030
SS-NAOS	Nearside Motor A Over-Speed	I:027
SS-NBOS	Nearside Motor B Over-Speed	I:028
PB-ES	Emergency Stop Push Button	I:302
PB-WH	Warning Horn Push Button	I:307
SPD	Surge Protective Device Status	I:001
	CCTV UPS Low Battery	I:332
	CCTV UPS Fault	I:331
	Farside I/O UPS Low Battery	I:702
	Farside I/O UPS Fault	I:701
	Farside Machinery Door Switches 1 & 2	I:703
	Farside Machinery Door Switches 3 & 4	I:710
	Operator's Room Fire Alarm	I:019
	Electrical Room Fire Alarm	I:020
	Main UPS Low Battery	I:008
	Main UPS Fault	I:007
	Nearside I/O UPS Low Battery	I:502
	Nearside I/O UPS Fault	I:501
	Nearside Machinery Door Switches 1 & 2	I:503
	Nearside Machinery Door Switches 3 & 4	I:510
	Operator House-Main Door Switch	I:011
	Operator House-Auxiliary Door Switch	I:012

LOGIC ANALOG/SPECIALTY INPUT LEGEND

Symbol	Description	Address
	Analog Input Far Drive A Speed	I:184
	Analog Input Far Drive A Torque	I:185
	Analog Input Farside Resolver PLC Input	I:790
	Analog Input Farside Inclinator PLC Input	I:794
	Analog Input Near Drive A Speed	I:180
	Analog Input Near Drive A Torque	I:181
	Analog Input Auxiliary Drive B Speed	I:182
	Analog Input Auxiliary Drive B Torque	I:183
	Analog Input Nearside Resolver PLC Input	I:590
	Analog Input Nearside Inclinator PLC Input	I:594

LOGIC DIGITAL OUTPUT LEGEND

Symbol	Description	Address
CR-BAGR	Bypass All Gates Raised	O:354
CR-BSFS	Bypass Span Fully Seated	O:355
CR-FMWH	Farside Machinery Area Warning Horn	O:765
CR-NMWH	Nearside Machinery Area Warning Horn	O:565
CR-RR	Request Red Traffic Signal	O:353
CR-WH	Warning Horn	O:362
IR-DSL	Drive (Lock) Span Lock	O:139
IR-LFNG	Lower Farside North Traffic Gate	O:104
IR-LFSG	Lower Farside South Traffic Gate	O:106
IR-LNNG	Lower Nearside North Traffic Gate	O:100
IR-LNSG	Lower Nearside South Traffic Gate	O:102
IR-MDBC	Auxiliary Drive B Creep Speed	-
IR-MDBJ	Auxiliary Drive B Jog Speed	-
IR-MDBT	Auxiliary Drive B Reduced Torque Mode	-
IR-MDBE	Enable Auxiliary Drive B	O:127
IR-MDBL	Auxiliary Main Drive B Lower	O:131
IR-MDBR	Auxiliary Main Drive B Raise	O:129
IR-MDBS	Reset Auxiliary Drive B Fault	O:135
IR-MDFAC	Farside Main Drive A Creep Speed	O:133
IR-MDFAJ	Farside Main Drive A Jog Speed	O:132
IR-MDFAT	Farside Main Drive A Reduced Torque Mode	O:137
IR-MDFAE	Enable Farside Main Drive A	O:126
IR-MDFAL	Farside Main Drive A Lower	O:130
IR-MDFAR	Farside Main Drive A Raise	O:128
IR-MDFAS	Reset Farside Drive A Fault	O:134
IR-MDNAC	Nearside Main Drive A Creep Speed	O:123
IR-MDNAJ	Nearside Main Drive A Jog Speed	O:122
IR-MDNAT	Nearside Main Drive A Reduced Torque Mode	O:136
IR-MDNAE	Enable Nearside Main Drive A	O:116
IR-MDNAL	Nearside Main Drive A Lower	O:120
IR-MDNAR	Nearside Main Drive A Raise	O:118
IR-MDNAS	Reset Nearside Drive A Fault	O:124
IR-PSL	Pull (Unlock) Span Lock	O:138
IR-RFBA	Farside Main Motor A Brake A Release	O:112
IR-RFBB	Farside Main Motor B Brake B Release	O:113
IR-RFBC	Farside North Machinery Brake C Release	O:114
IR-RFBD	Farside South Machinery Brake D Release	O:115
IR-RFNG	Raise Farside North Traffic Gate	O:105
IR-RFSG	Raise Farside South Traffic Gate	O:107
IR-RNBA	Nearside Main Motor A Brake A Release	O:108
IR-RNBB	Nearside Main Motor B Brake B Release	O:109
IR-RNBC	Nearside North Machinery Brake C Release	O:110
IR-RNBD	Nearside North Machinery Brake D Release	O:111
IR-RNNG	Raise Nearside North Traffic Gate	O:101
IR-RNSG	Raise Nearside South Traffic Gate	O:103
IR-RSIGO	River Traffic Signal Opening	O:359
IR-RSIGC	River Traffic Signal Closing	O:360
IR-SES1	Software Emergency Stop Relay 1	O:349
IR-SES2	Software Emergency Stop Relay 2	O:350
IR-SCP1	Software Control Power Relay 1	O:351
IR-SCP2	Software Control Power Relay 2	O:352



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PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT LEGEND - 2

SHEET NO. 36 OF 97 SHEETS

RUBY, Drawing 01-036		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	49	CONTRACT NO. 60P55	
		ILLINOIS FED. AID PROJECT				

PLC LOGIC BINARY LEGEND

Symbol	Description
ADE	All Drives Enabled
AGL	All Gates Lowered
AGR	All Gates Raised
ALD	All Locks Driven
ALP	All Locks Pulled
BDET	Boat Detection
BMF	Bus Monitor Fault
BRP	Bridge Run Permissive
BYP AGL	Bypass All Traffic Gates Lowered
BYP AGR	Bypass All Traffic Gates Raised
BYP ALD	Bypass All Locks Driven
BYP ALP	Bypass All Locks Pulled
BYP FO	Bypass Bridge Fully Open
BYP FS	Bypass Bridge Fully Seated
BYP SFO	Bypass Span Fully Open
BYP SFS	Bypass Span Fully Seated
BYP INHIB	Bypass Inhibit
FFC	Farside Fully Closed
FFO	Farside Fully Open
FFS	Farside Fully Seated
FFS1	Farside Span Fully Seated (Set Brakes)
FFS2	Farside Span Fully Seated (De-energize Drives)
FL	Farside Lower
FNC	Farside Nearly Closed
FNG	Farside North Gate
FNO	Farside Nearly Open
FO	Bridge Fully Open
FOS	Farside Span Overspeed
FR	Farside Raise
FS	Bridge Fully Seated
FSG	Farside South Gate
IN-F	Farside Span Position PLC Inclnomter
IN-N	Nearside Span Position PLC Inclnometer
MAF	Major Fault
MDN-R	Near Main Drive Raise
MDF-R	Far Main Drive Raise
MIF	Minor Fault
ML	Master Lower
MR	Master Raise
NFC	Nearside Fully Closed
NFO	Nearside Fully Open
NFS	Nearside Fully Seated
NFS1	Nearside Span Fully Seated (Set Brakes)
NFS2	Nearside Span Fully Seated (De-energize Drives)
NL	Nearside Lower
NNC	Nearside Nearly Closed
NNG	Nearside North Gate
NNO	Nearside Nearly Open
NOS	Nearside Span Overspeed
NR	Nearside Raise
NS	Normal Stop
NSG	Nearside South Gate
SFS	Span Fully Seated
SL	Span Lock
TSG	Traffic Signal Green
TSR	Traffic Signal Red
TSY	Traffic Signal Yellow

PLC LOGIC BINARY LEGEND (CONTINUED)

Symbol	Description
UMAF	Unacknowledged Major Fault
UMIF	Unacknowledged Minor Fault
WH-DLY	Warning Horn Delay Before Bridge Movement

HARDWIRED LEGEND

CR-ALD	All Locks Driven
CR-ALP	All Locks Pulled
CR-FONAV	Bridge Fully Open Navigation Lights Power
CR-FSCFC	Farside Span Control Fully Closed
CR-FSCFO	Farside Span Control Fully Open
CR-FSCNC	Farside Span Control Nearly Closed
CR-FSCNO	Farside Span Control Nearly Open
CR-MDBE	Auxiliary Main Drive B Enable
CR-MDBL	Auxiliary Main Drive B Lower
CR-MDBR	Auxiliary Main Drive B Raise
CR-MDBS	Auxiliary Main Drive B Reset
CR-MDFAE	Main Drive Farside A Enable
CR-MDFAL	Main Drive Farside A Lower
CR-MDFAR	Main Drive Farside A Raise
CR-MDFAS	Main Drive Farside A Reset
CR-MDFC	Main Drive Farside Creep Speed
CR-MDFJ	Main Drive Farside Jog Speed
CR-MDFRT	Main Drive Farside Reduced Torque
CR-MDNAE	Main Drive Nearside A Enable
CR-MDNAL	Main Drive Nearside A Lower
CR-MDNAR	Main Drive Nearside A Raise
CR-MDNAS	Main Drive Nearside A Reset
CR-MDNC	Main Drive Nearside Creep Speed
CR-MDNJ	Main Drive Nearside Jog Speed
CR-MDNRT	Main Drive Nearside Reduced Torque
CR-MSCFL	Manual Span Control Farside Lower
CR-MSCFR	Manual Span Control Farside Raise
CR-MSCNL	Manual Span Control Nearside Lower
CR-MSCNR	Manual Span Control Nearside Raise
CR-NSCFC	Nearside Span Control Fully Closed
CR-NSCFO	Nearside Span Control Fully Open
CR-NSCNC	Nearside Span Control Nearly Closed
CR-NSCNO	Nearside Span Control Nearly Open
CR-RFB	Farside Release Brakes
CR-RNB	Nearside Release Brakes
CS-AUX	Select Auxiliary Drive-Off, Nearside, or Farside
CS-BAGL	Bypass All Gates Lowered Select, Byp or Off
CS-BAGR	Bypass All Gates Raised Select, Byp or Off
CS-BALD	Bypass All Locks Driven Select, Byp or Off
CS-BALP	Bypass All Locks Pulled Select, Byp or Off
CS-BSFO	Bypass Span Fully Open
CS-BSFS	Bypass Span Fully Seated
CS-FBR	Farside Brake Select, Set or Release
CS-FNG	Farside North Traffic Gate Select, Raise or Lower
CS-FSG	Farside South Traffic Gate Select, Raise or Lower
CS-IL	Control Console Indicator Lights On-Off
CS-MSCF	Manual Span Control Far Select, Raise or Lower
CS-MSCN	Manual Span Control Near Select, Raise or Lower
CS-MSSF	Manual Span Speed Far Select, Jog or Creep
CS-MSSN	Manual Span Speed Near Select, Jog or Creep
CS-NBR	Nearside Brake Select, Set or Release

HARDWIRED LEGEND (CONTINUED)

Symbol	Description
CS-NNG	Nearside North Traffic Gate Select, Raise or Lower
CS-NSG	Nearside South Traffic Gate Select, Raise or Lower
CS-RSIG	River Signals Select, Open or Close
CS-SL	Span Lock Select, Pull or Drive
CS-TSR	Traffic Signals to Red Light
IN-FHW	Farside Span Position
IN-NHW	Nearside Span Position
MC-DSL	Drive Span Lock Motor Starter
MC-LFNG	Farside North Traffic Gate Lower Motor Starter
MC-LFSG	Farside South Traffic Gate Lower Motor Starter
MC-LNNG	Nearside North Traffic Gate Lower Motor Starter
MC-LNSG	Nearside South Traffic Gate Lower Motor Starter
MC-PSL	Pull Span Lock Motor Starter
MC-RFBA	Farside Main Motor A Brake Motor Starter
MC-RFBB	Farside Main Motor B Brake Motor Starter
MC-RFBC	Farside North Machinery Brake Motor Starter
MC-RFBD	Farside South Machinery Brake Motor Starter
MC-RFNG	Farside North Traffic Gate Raise Motor Starter
MC-RFSG	Farside South Traffic Gate Raise Motor Starter
MC-RNBA	Nearside Main Motor A Brake Motor Starter
MC-RNBB	Nearside Main Motor B Brake Motor Starter
MC-RNBC	Nearside North Machinery Brake Motor Starter
MC-RNBD	Nearside South Machinery Brake Motor Starter
MC-RNNG	Nearside North Traffic Gate Raise Motor Starter
MC-RNSG	Nearside South Traffic Gate Raise Motor Starter
PB-BRS	Auxiliary Main Drive B Fault Reset
PB-FARS	Farside Main Drive A Fault Reset
PB-MARS	Nearside Main Drive A Fault Reset
PB-WH	Warning Horn, Push Button

HARDWIRED TIMING RELAYS

TR-BDETF	Boat Detected Fault
TR-FFS1	Farside Span Fully Seated (Set Brakes) Delay
TR-FFS2	Farside Span Fully Seated (Deenergize Drives) Delay
TR-NFS1	Nearside Span Fully Seated (Set Brakes) Delay
TR-NFS2	Nearside Span Fully Seated (Deenergize Drives) Delay
TR-TSY	Traffic Signal Yellow Time
TR-WH	Warning Horn Time

PLC TIMERS

T1	Bus Monitor Timer
T2	Boat Detection Timer
T3	Farside Fully Seated Timer 1
T4	Farside Fully Seated Timer 2
T5	Nearside Fully Seated Timer 1
T6	Nearside Fully Seated Timer 2
T7	Warning Horn Timer



USER NAME =	DESIGNED - R.I. PETERS	REVISED _____
	CHECKED - L.V. BORDEN	REVISED _____
PLOT SCALE =	DRAWN - N.U. KALGHATGI	REVISED _____
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED _____

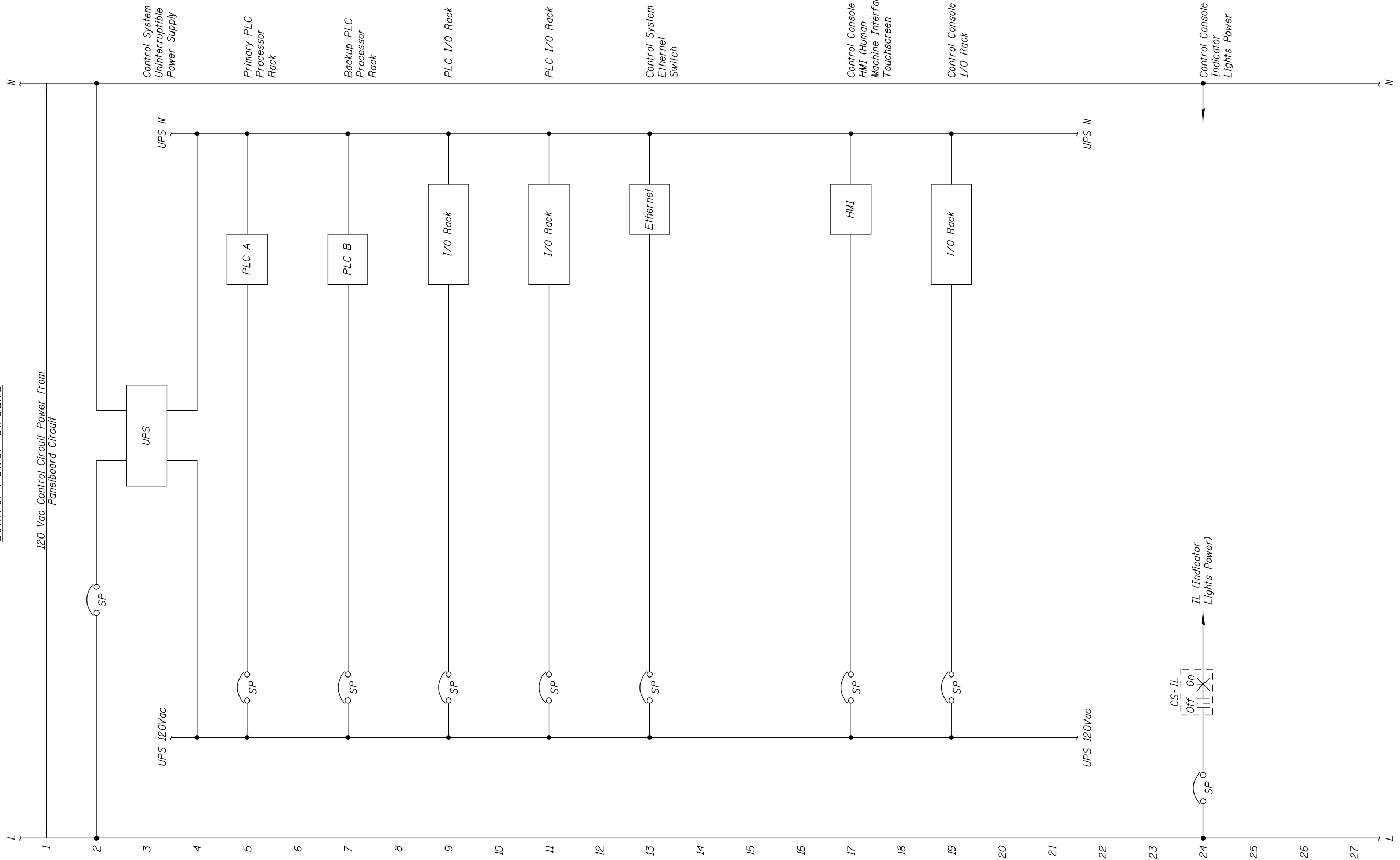
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT LEGEND - 3

SHEET NO. 37 OF 97 SHEETS

RUBY, Drawing 01-037		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	112	2011-045-I		WILL	466	50
						CONTRACT NO. 60P55
ILLINOIS FED. AID PROJECT						

Control Power Circuits



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 1**

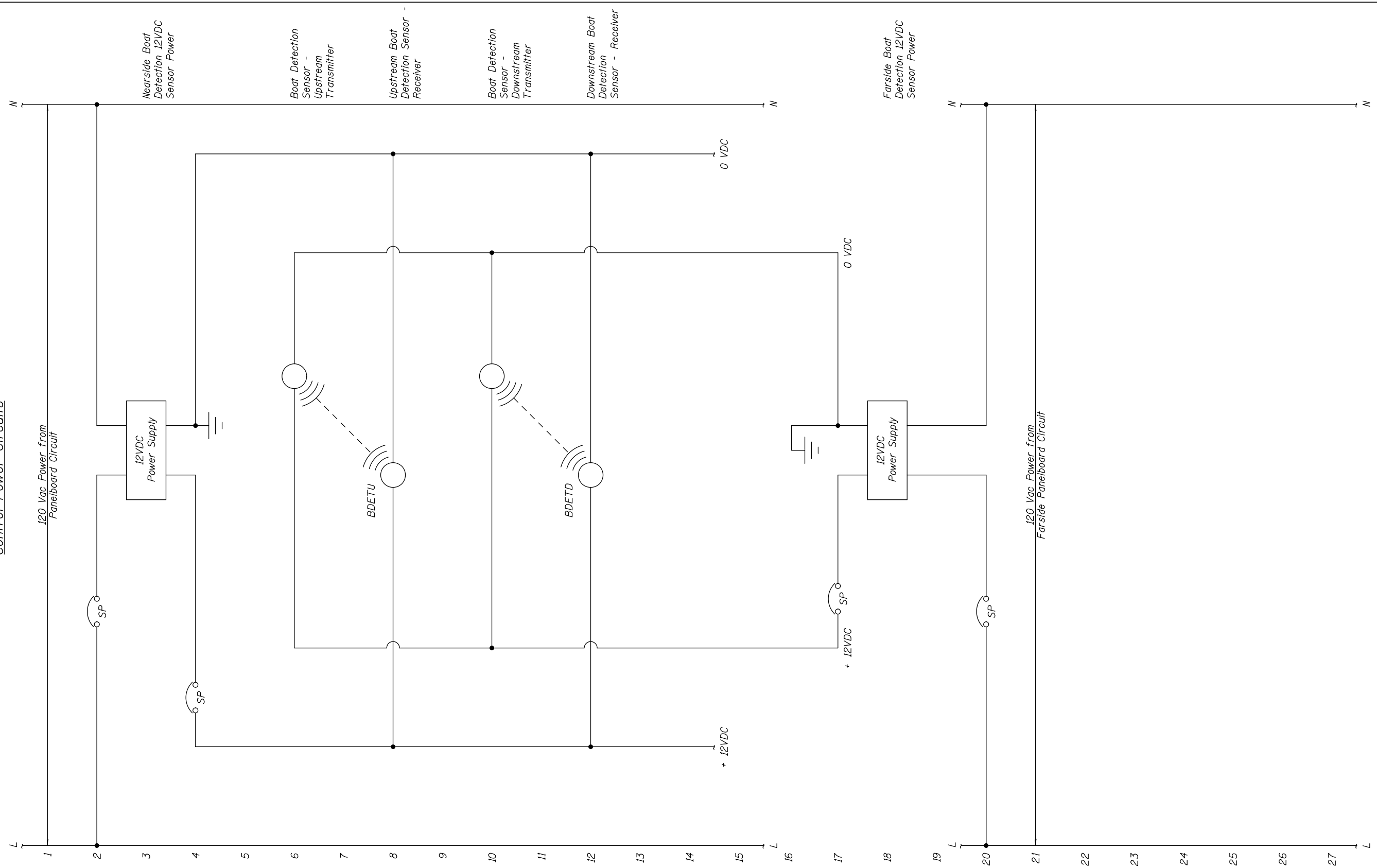
SHEET NO. 38 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	51
CONTRACT NO. 60P55				

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-038

Control Power Circuits



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 2

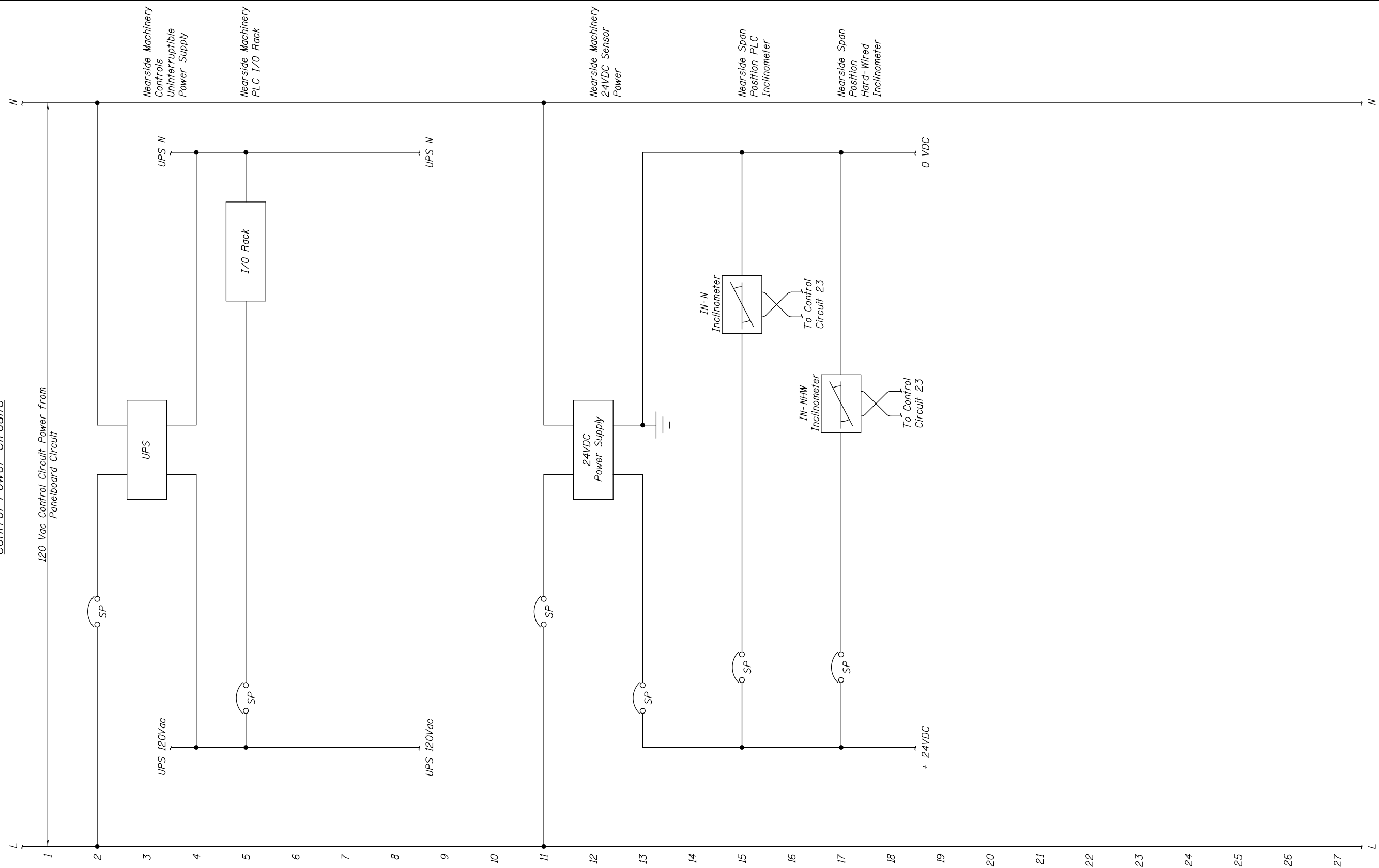
SHEET NO. 39 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	52
CONTRACT NO. 60P55				

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-039

Control Power Circuits



NOTES:

1. Install inclinometers on the span close to the trunnion area. Provide the appropriate loop of flexible cable to accommodate full span travel.



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

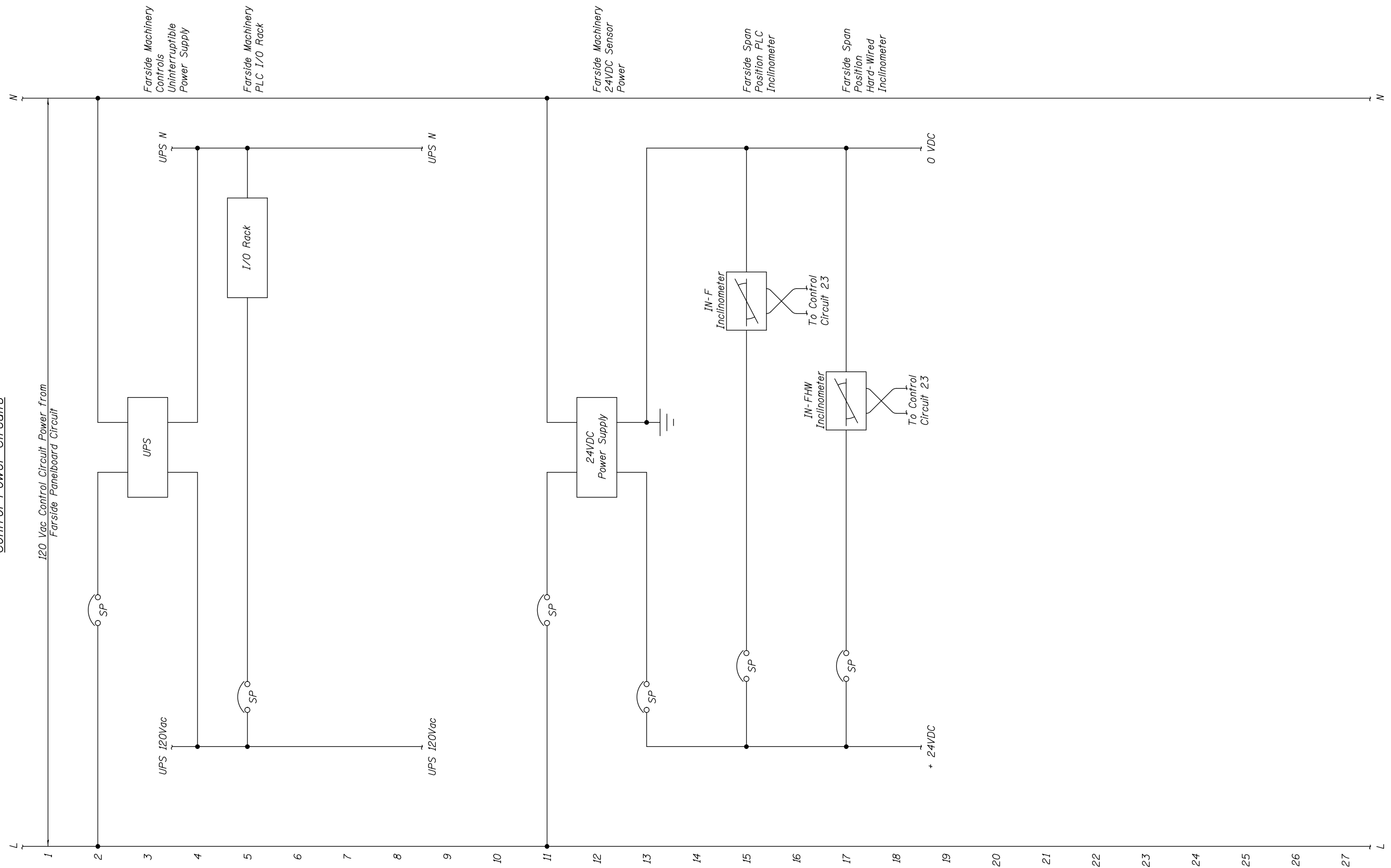
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 3**

SHEET NO. 40 OF 97 SHEETS

RUBY, Drawing 01-040		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		112	2011-045-I	WILL	466	53
					CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						

Control Power Circuits



NOTES:

1. Install inclinometers on the span close to the trunnion area. Provide the appropriate loop of flexible cable to accommodate full span travel.



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 4

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	54
CONTRACT NO. 60P55				

SHEET NO. 41 OF 97 SHEETS

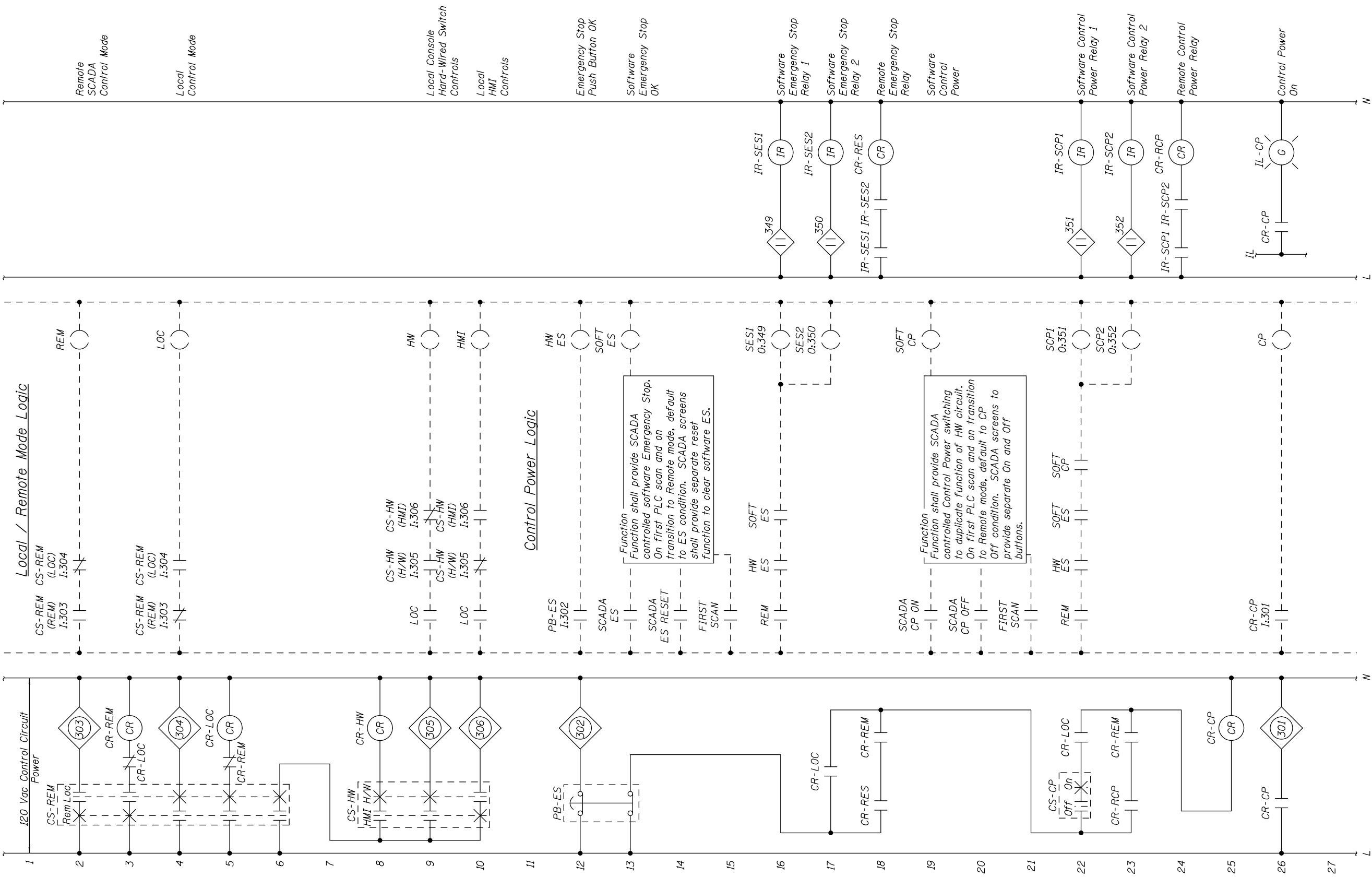
ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-041

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



NOTES:

- Emergency stop Pushbuttons shall be illuminated type and shall be wired to illuminate when pressed.



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 5**

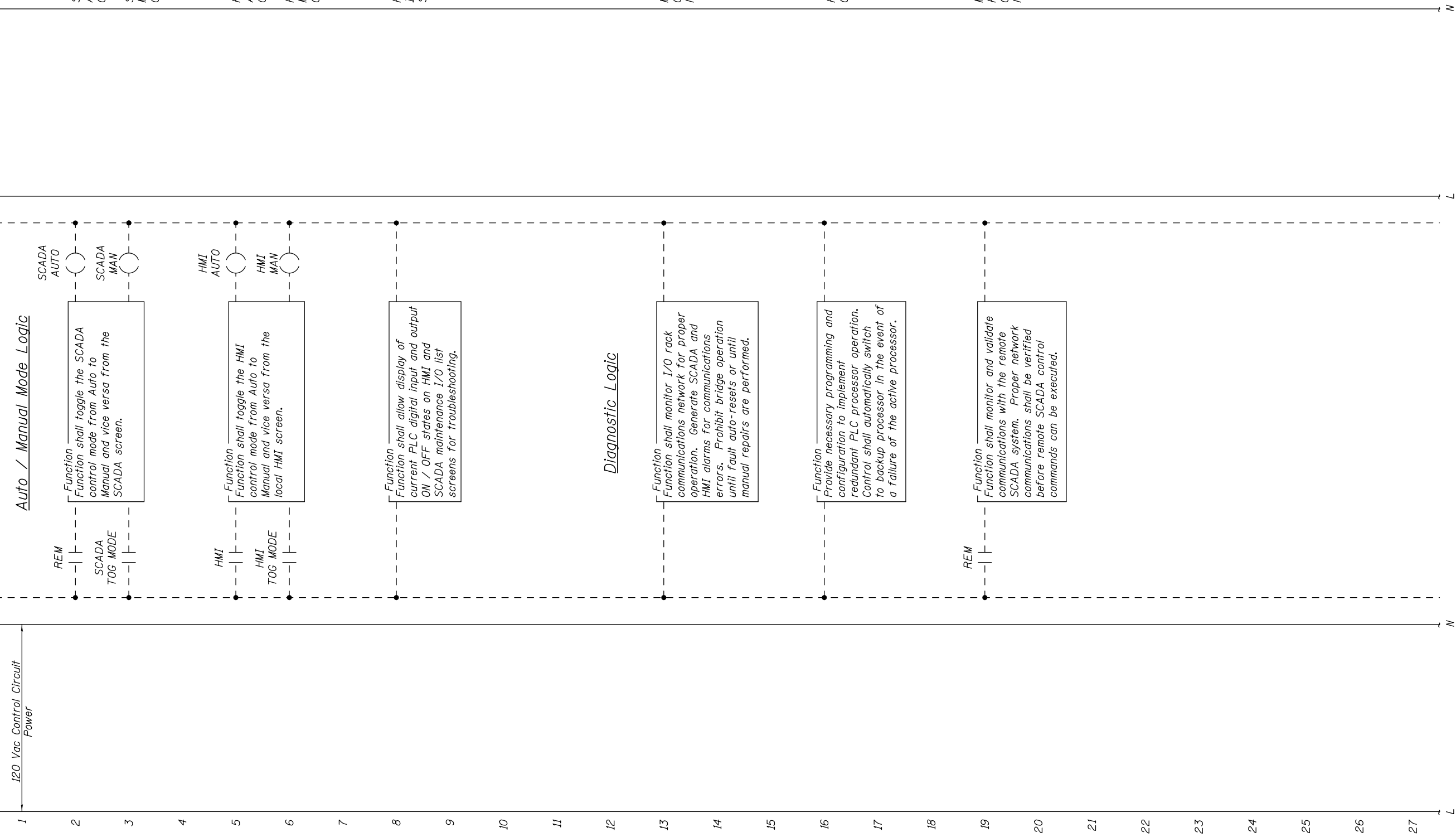
SHEET NO. 42 OF 97 SHEETS

RUBY, Drawing 01-042		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	55	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



Auto / Manual Mode Logic

Function
Function shall toggle the SCADA control mode from Auto to Manual and vice versa from the SCADA screen.

Function
Function shall toggle the HMI control mode from Auto to Manual and vice versa from the local HMI screen.

Function
Function shall allow display of current PLC digital input and output ON / OFF states on HMI and SCADA maintenance I/O list screens for troubleshooting.

Diagnostic Logic

Function
Function shall monitor I/O rack communications network for proper operation. Generate SCADA and HMI alarms for communications errors. Prohibit bridge operation until fault auto-resets or until manual repairs are performed.

Function
Provide necessary programming and configuration to implement redundant PLC processor operation. Control shall automatically switch to backup processor in the event of a failure of the active processor.

Function
Function shall monitor and validate communications with the remote SCADA system. Proper network communications shall be verified before remote SCADA control commands can be executed.

SCADA Automatic Control Mode
SCADA Manual Control Mode

HMI Automatic Control Mode
HMI Manual Control Mode

HMI and SCADA I/O Maintenance Screens

Monitor I/O Communications Network

Redundancy Control Function

Monitor Remote SCADA Communication Network



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

STATE OF ILLINOIS
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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 6

SHEET NO. 43 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	56
CONTRACT NO. 60P55				

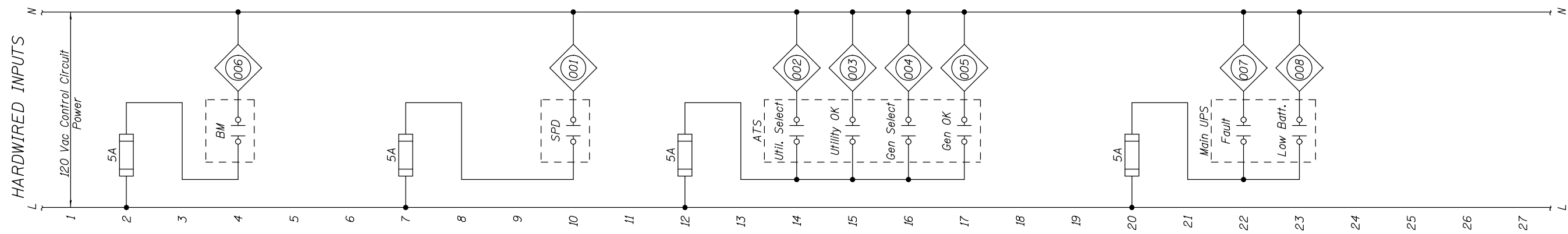
ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-043

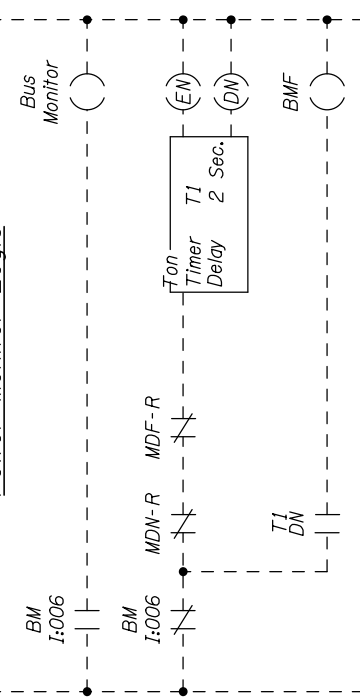
HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



Power Monitor Logic

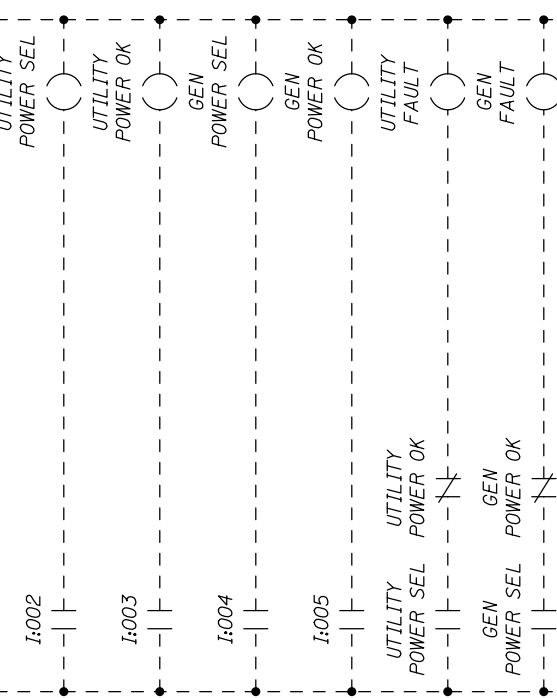


Function shall obtain status and data from power monitor including phase voltages and amps and power for HMI and SCADA display. Provide logic for alarming when values are outside of normal operation ranges.

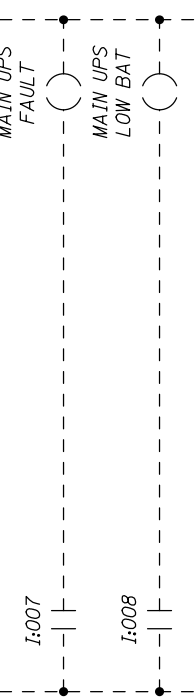
Surge Protective Device Logic



Automatic Transfer Switch Logic



UPS Logic



Incoming Bus Monitor Normal

Bus Monitor Fault

Power Monitor Function

Surge Protective Device Status

ATS - Utility Power Selected

ATS - Utility Power Available

ATS - Generator Power Selected

ATS - Generator Power Available

Utility Power Fault

Generator Power Fault

Main UPS Fault

Main UPS Low Battery Warning

NOTES:

1. Provide additional timers as required to condition PLC inputs from sensing devices.



USER NAME =	DESIGNED - R.I. PETERS	REVISED	___
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	___
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	___

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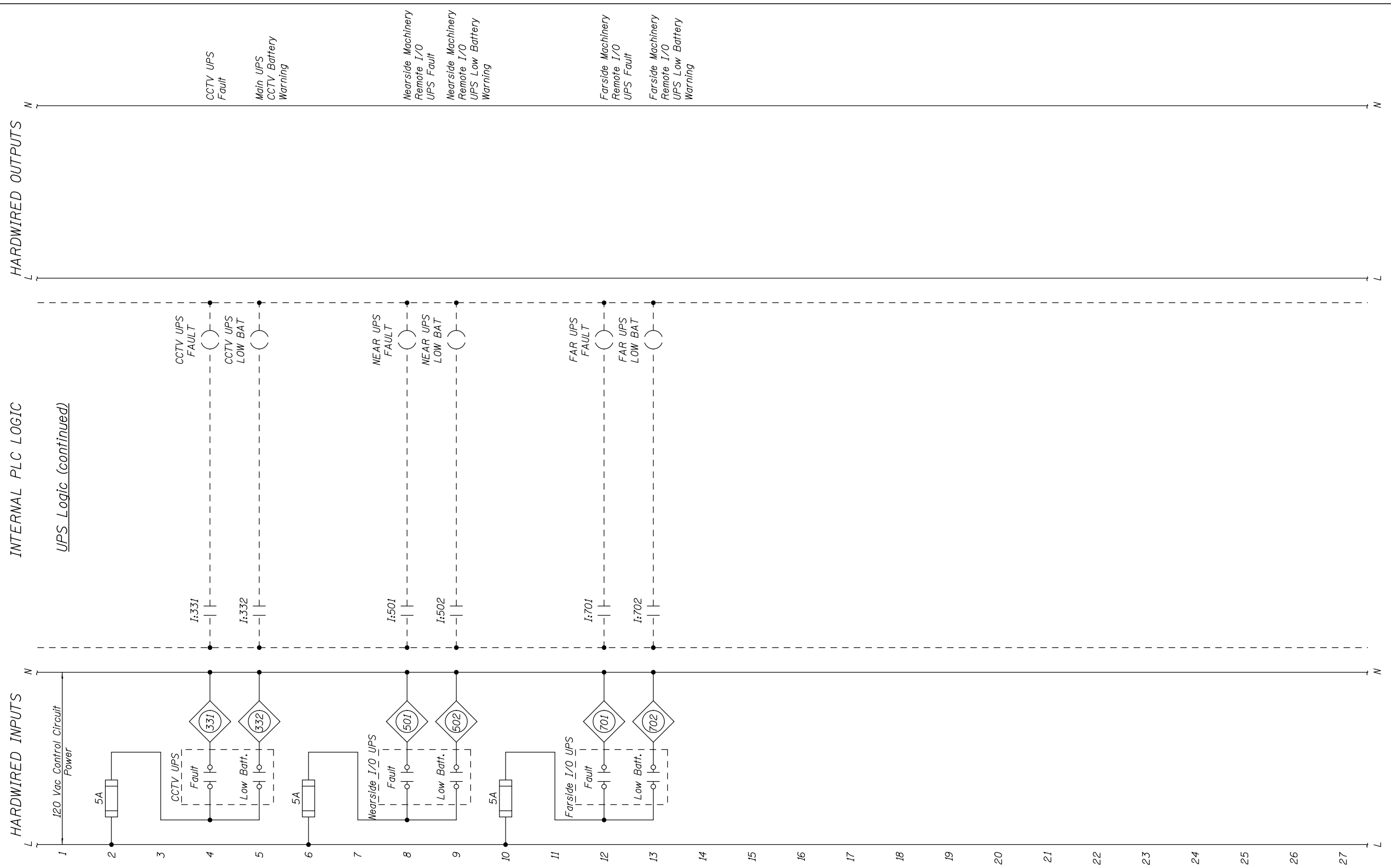
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 7**

SHEET NO. 44 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	57
CONTRACT NO. 60P55				

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-044



NOTES:
 1. Provide additional timers as required to condition PLC inputs from sensing devices.



USER NAME =	DESIGNED - R.I. PETERS	REVISED	___
	CHECKED - J.G. STRENKOSKI	REVISED	___
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	___
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	___

**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 RUBY STREET - CONTROL CIRCUIT - 8**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	58
CONTRACT NO. 60P55				

SHEET NO. 45 OF 97 SHEETS

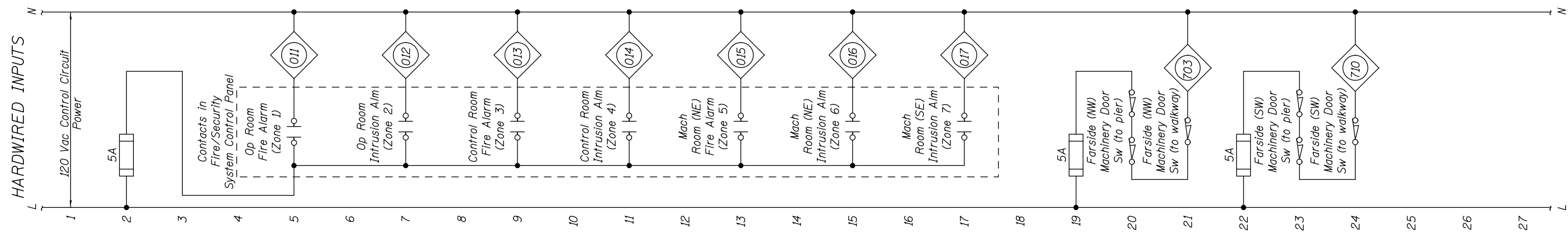
ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-045

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



- NOTES:**
1. Provide additional timers as required to condition PLC inputs.
 2. Where possible, switches and sensors shall be wired to provide fail-safe operation.



USER NAME =	DESIGNED - R.I. PETERS	REVISED	___
	CHECKED - J.G. STRENKOSKI	REVISED	___
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	___
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	___

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 9**

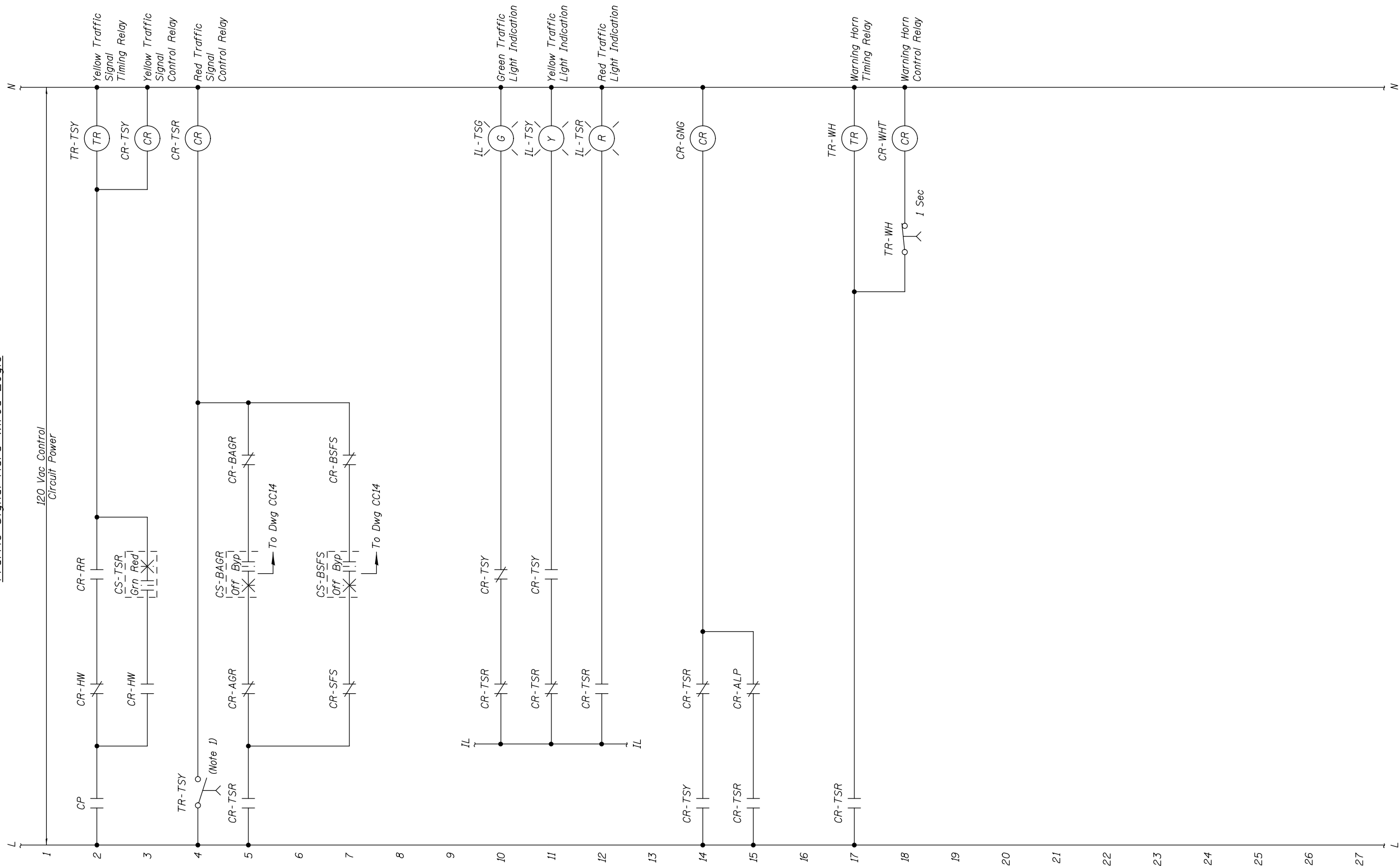
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	59
CONTRACT NO. 60P55				

SHEET NO. 46 OF 97 SHEETS

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-046

Traffic Signal Hard-Wired Logic



NOTES:
 1. Set timer preset according to IDOT requirements for yellow light cycle time.



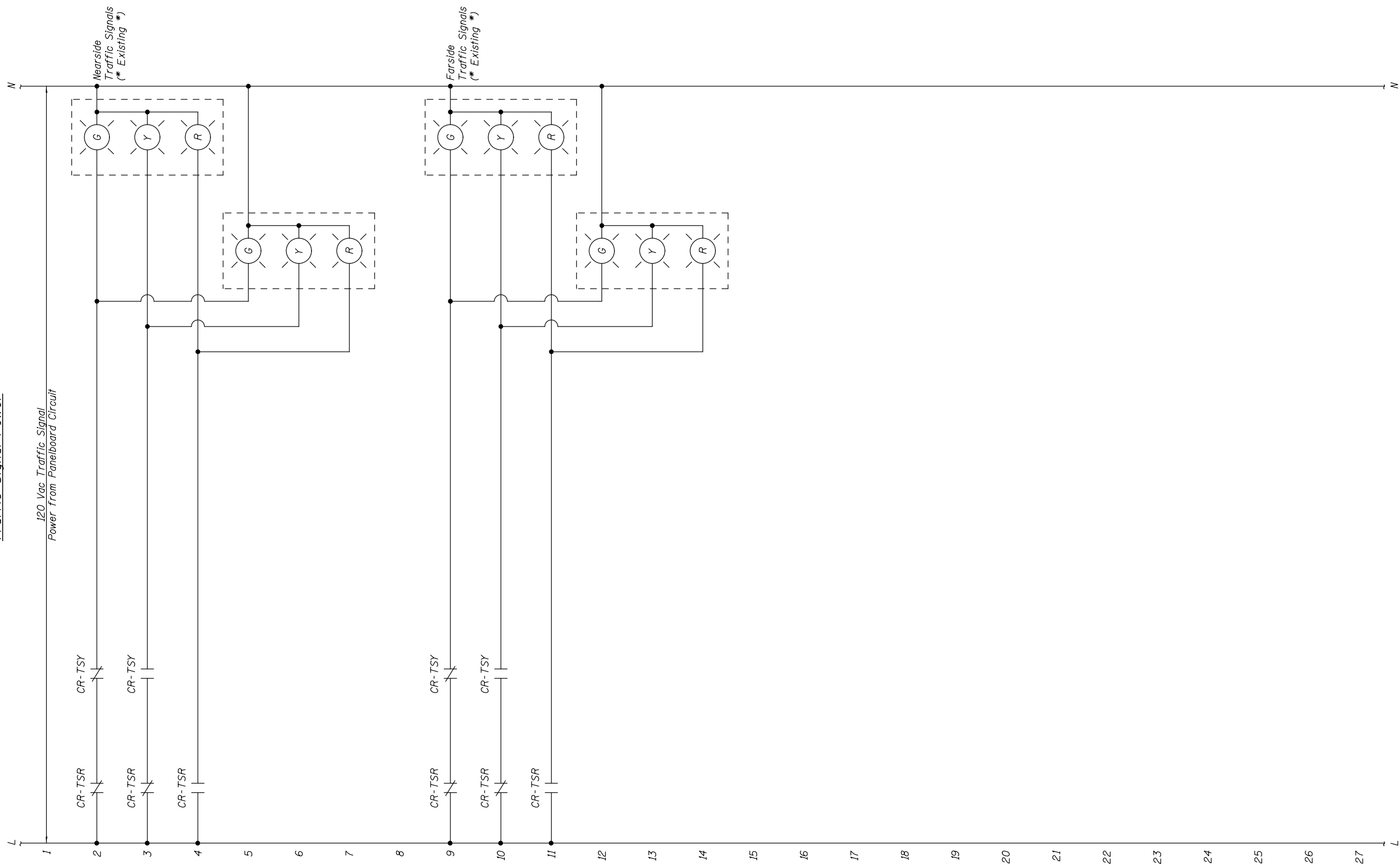
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	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 RUBY STREET - CONTROL CIRCUIT - 10

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	60
CONTRACT NO. 60P55				

Traffic Signal Power



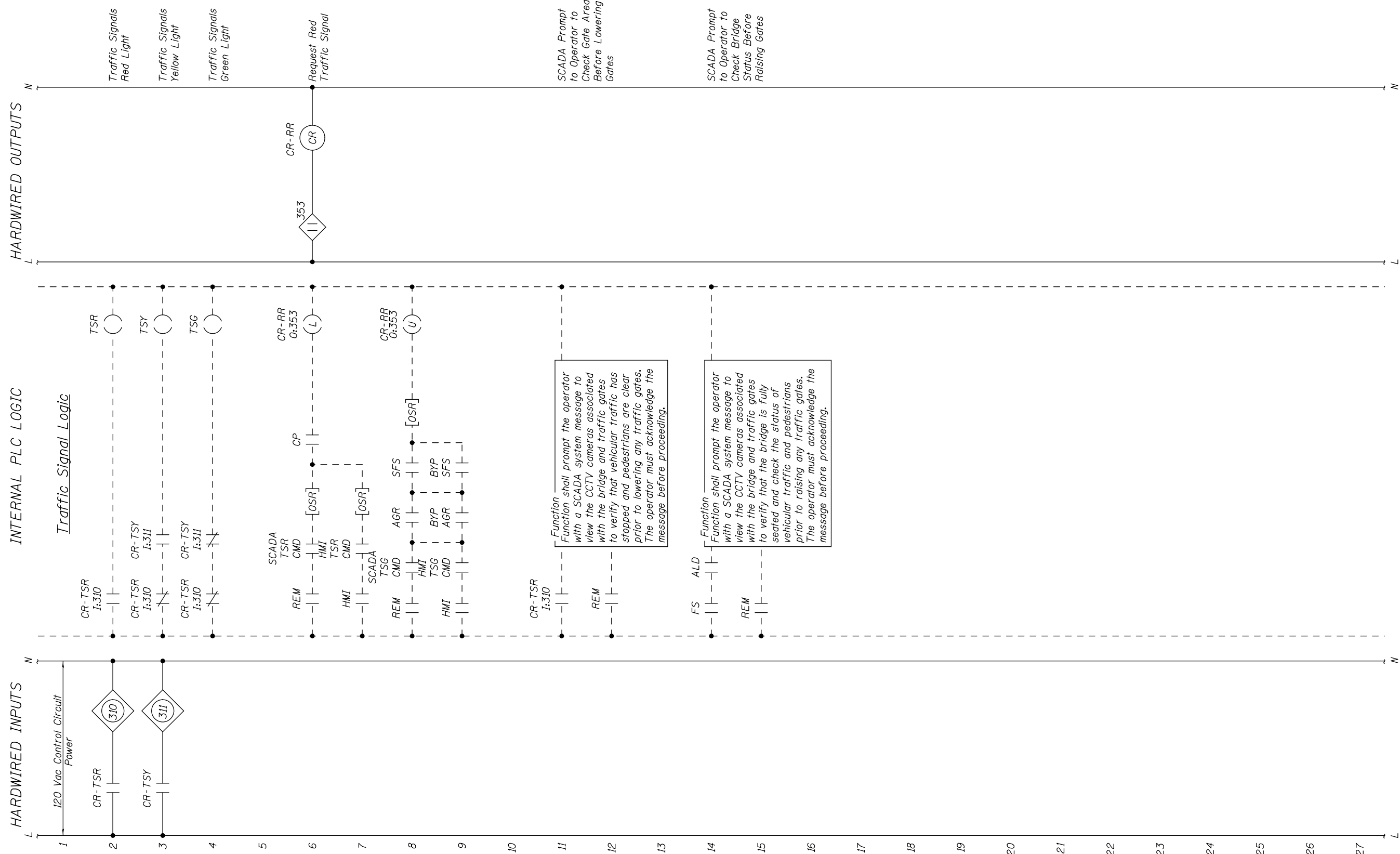
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

STATE OF ILLINOIS
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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 11

SHEET NO. 48 OF 97 SHEETS

RUBY, Drawing 01-048		TOTAL SHEETS		SHEET NO.	
F.A.P. RTE.	SECTION	COUNTY	466	61	
112	2011-045-I	WILL	CONTRACT NO. 60P55		
ILLINOIS FED. AID PROJECT					



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

**STATE OF ILLINOIS
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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 12**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	62
CONTRACT NO. 60P55				

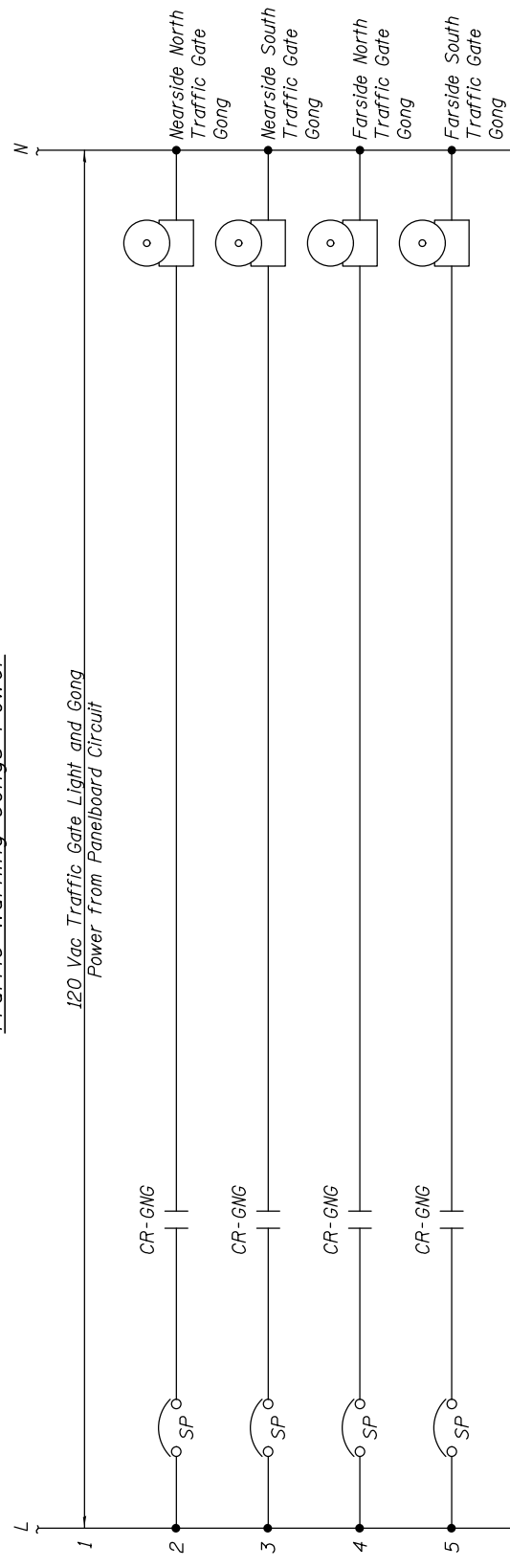
SHEET NO. 49 OF 97 SHEETS

ILLINOIS FED. AID PROJECT

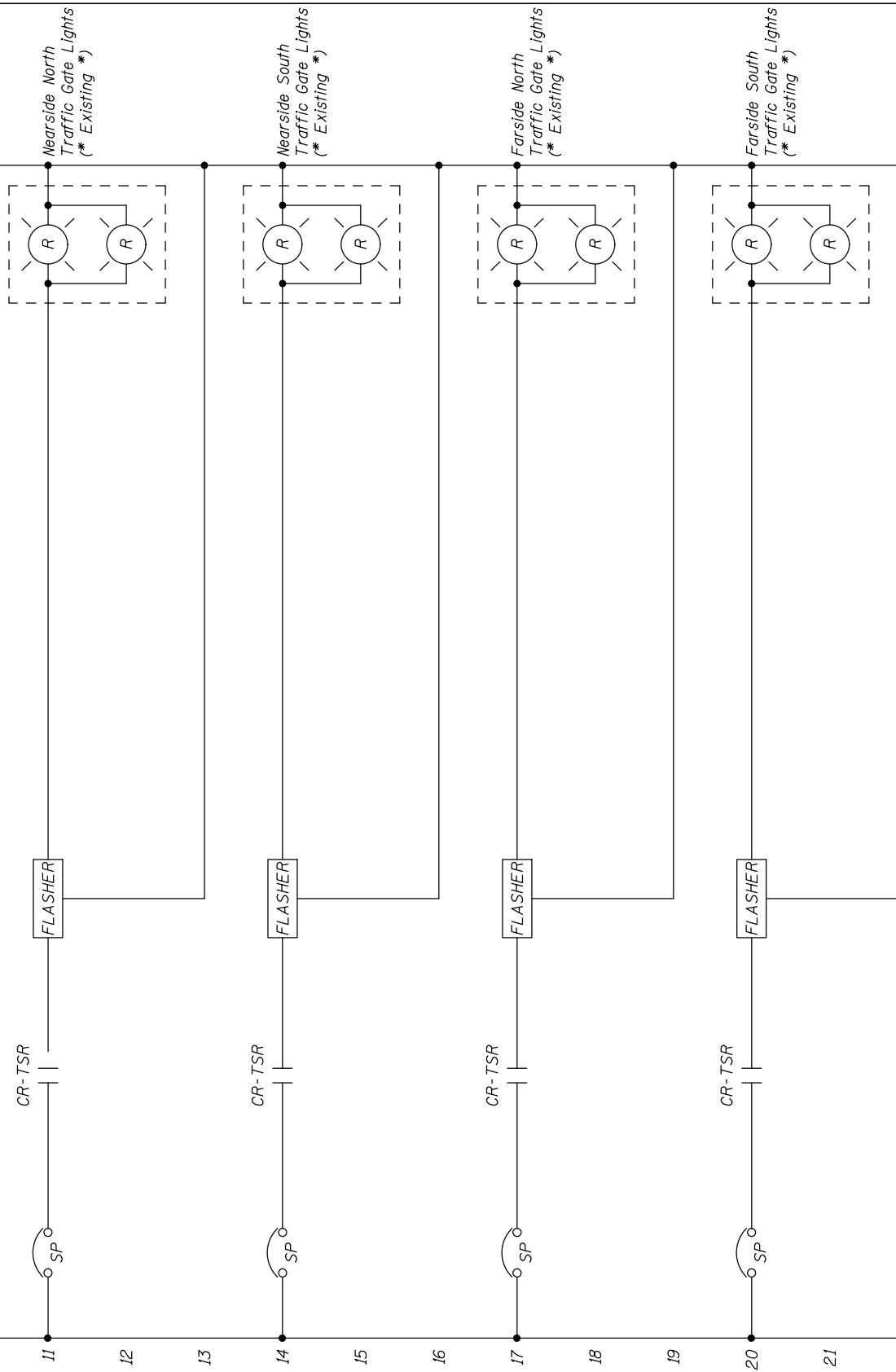
RUBY, Drawing 01-049

Traffic Warning Gongs Power

120 Vac Traffic Gate Light and Gong
Power From Panelboard Circuit



Traffic Gate Warning Lights Power



NOTES:

1. Nearside and farside devices shall be supplied from separate circuits where shown on the panelboard schedule drawings.
2. Existing traffic gate gongs shall be replaced with new units (E201).



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 13

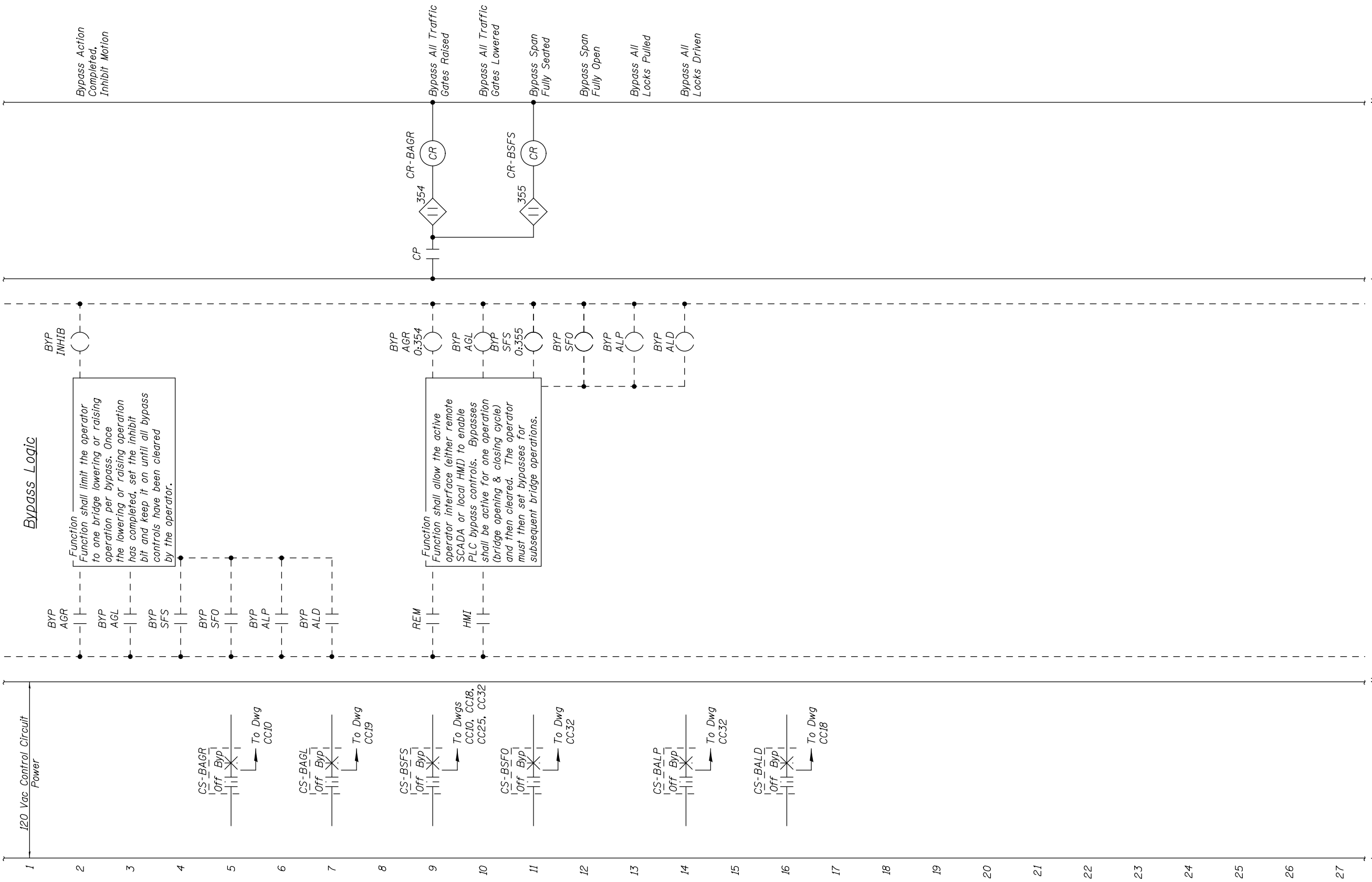
SHEET NO. 50 OF 97 SHEETS

RUBY, Drawing 01-050		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	63	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



USER NAME =	DESIGNED - R.I. PETERS	REVISED
	CHECKED - J.G. STRENKOSKI	REVISED
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED

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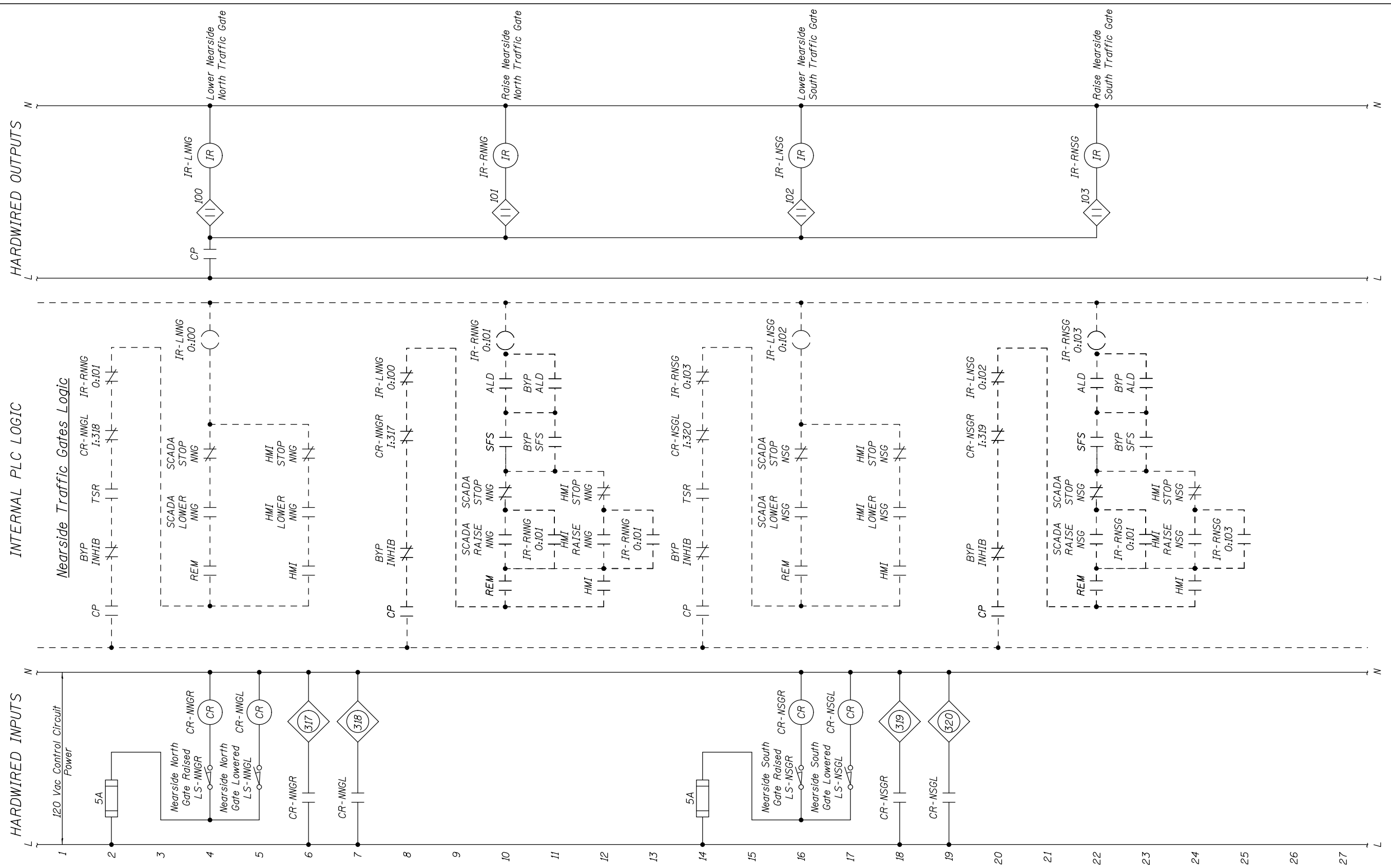
VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 14

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	64
CONTRACT NO. 60P55				

SHEET NO. 51 OF 97 SHEETS

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-051



NOTES:

- Provide additional interlocking logic to prevent off-going traffic gates from being closed until corresponding on-going gate is closed (ie. nearside north gate must be fully lowered before farside north gate is lowered and farside south gate must be fully lowered before nearside south gate is lowered).

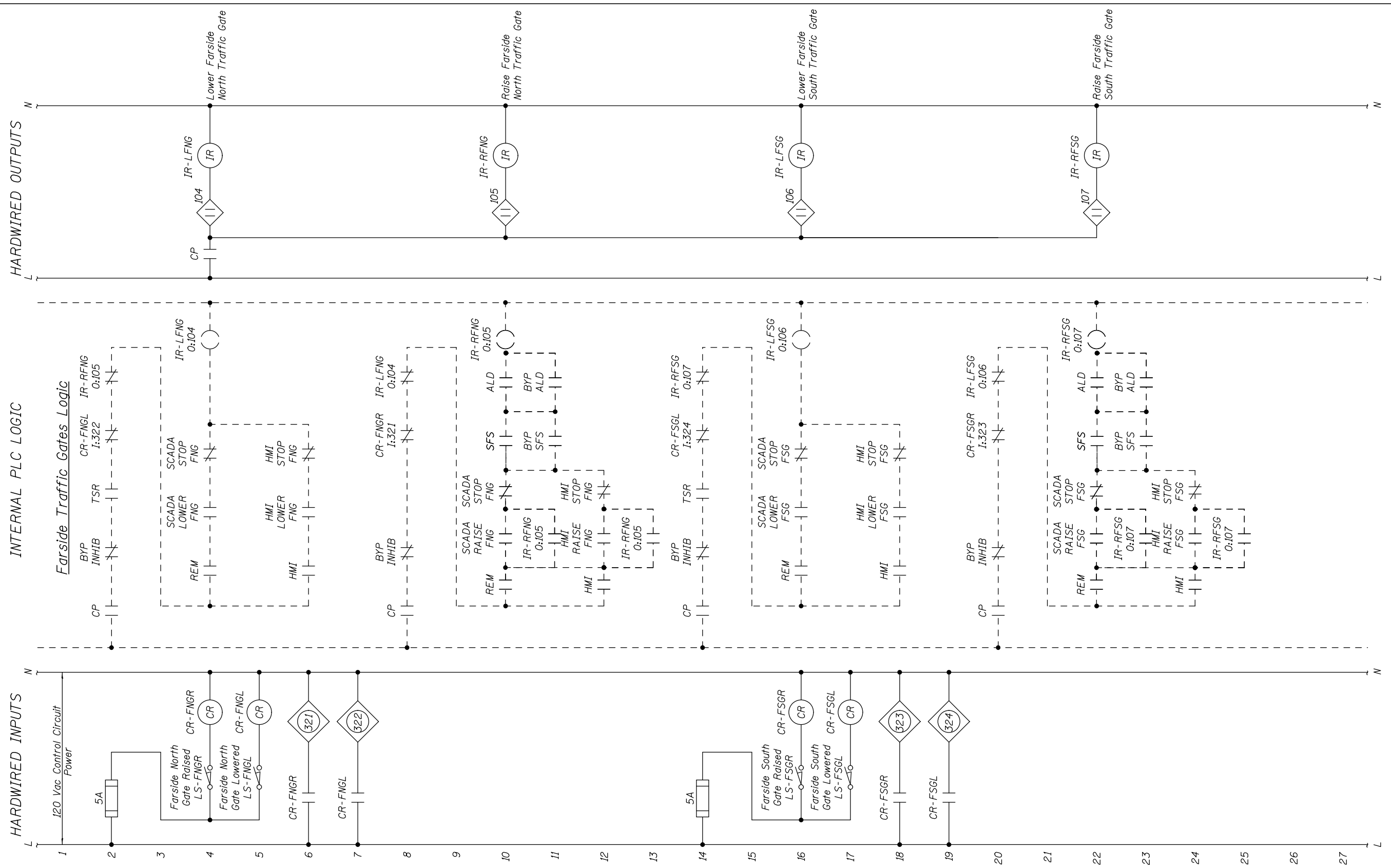


USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 15**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	65
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				



NOTES:

- Provide additional interlocking logic to prevent off-going traffic gates from being closed until corresponding on-going gate is closed (ie. nearside north gate must be fully lowered before farside north gate is lowered and farside south gate must be fully lowered before nearside south gate is lowered).



USER NAME =	DESIGNED - R.I. PETERS	REVISED -
PLOT SCALE =	CHECKED - J.G. STRENKOSKI	REVISED -
PLOT DATE =	DRAWN - R.I. PETERS	REVISED -
	CHECKED - J.G. STRENKOSKI	REVISED -

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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 16

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	66
CONTRACT NO. 60P55				

SHEET NO. 53 OF 97 SHEETS

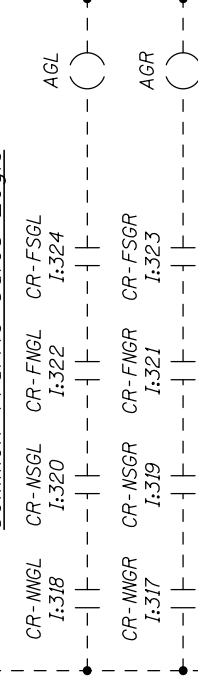
ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-053

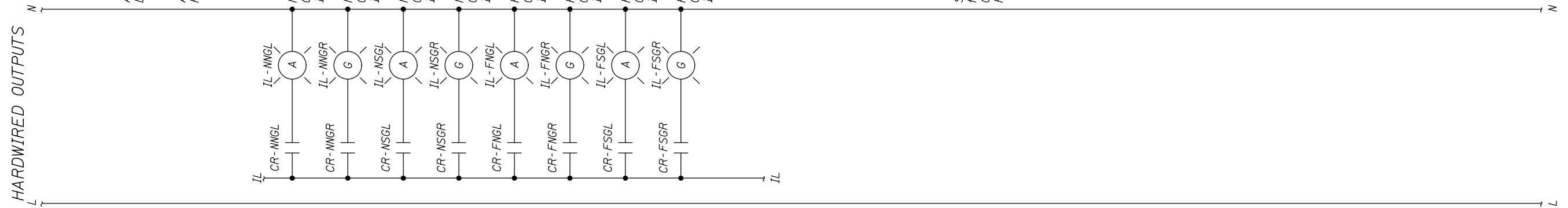


INTERNAL PLC LOGIC

Common Traffic Gates Logic



Function shall prompt the operator with a SCADA system message to view the CCTV cameras associated with the bridge and traffic gates to verify that pedestrians are clear prior to opening the bridge. The operator must acknowledge the message before proceeding.



SCADA Prompt to Operator to Check for Pedestrians



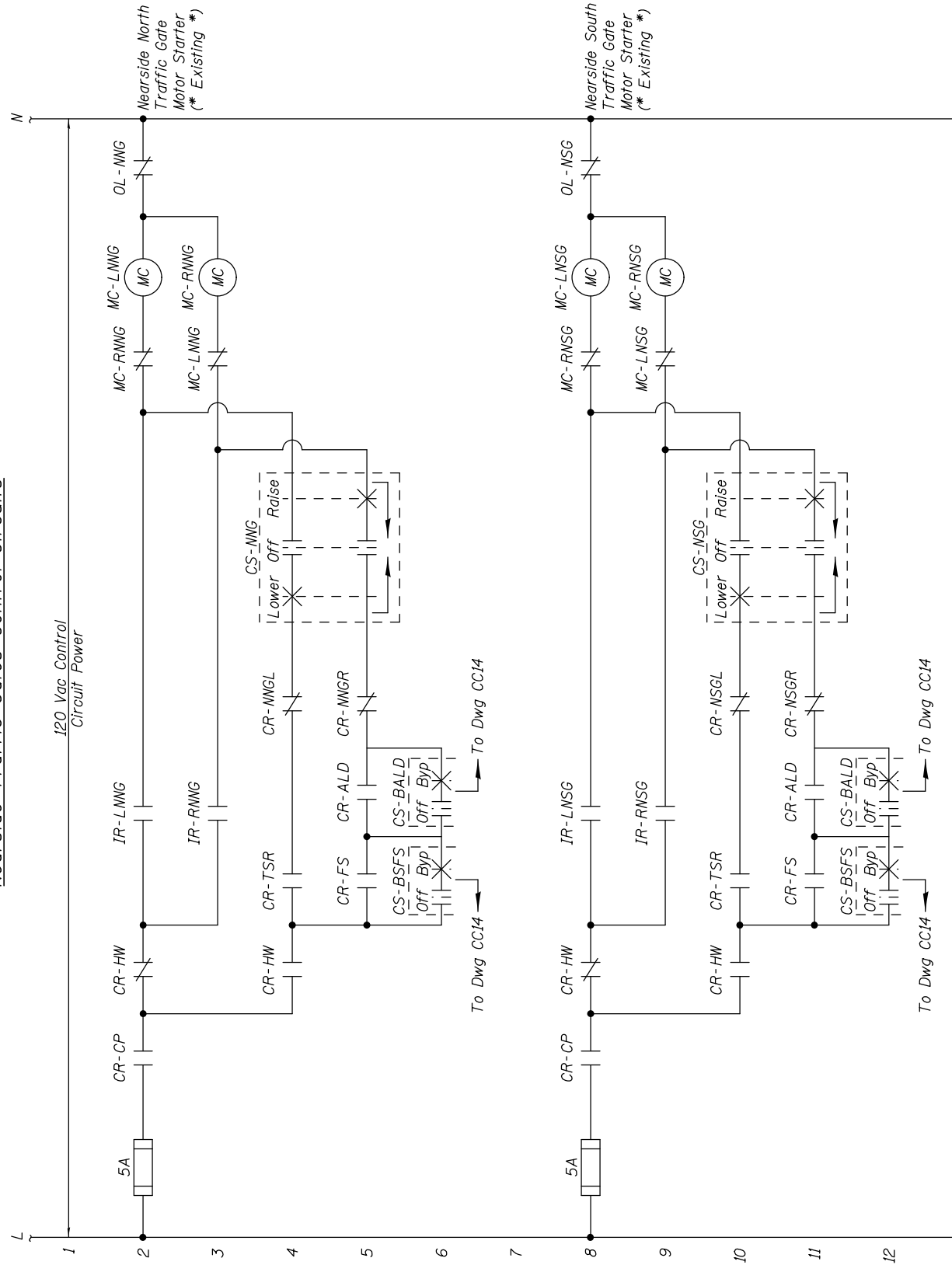
USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
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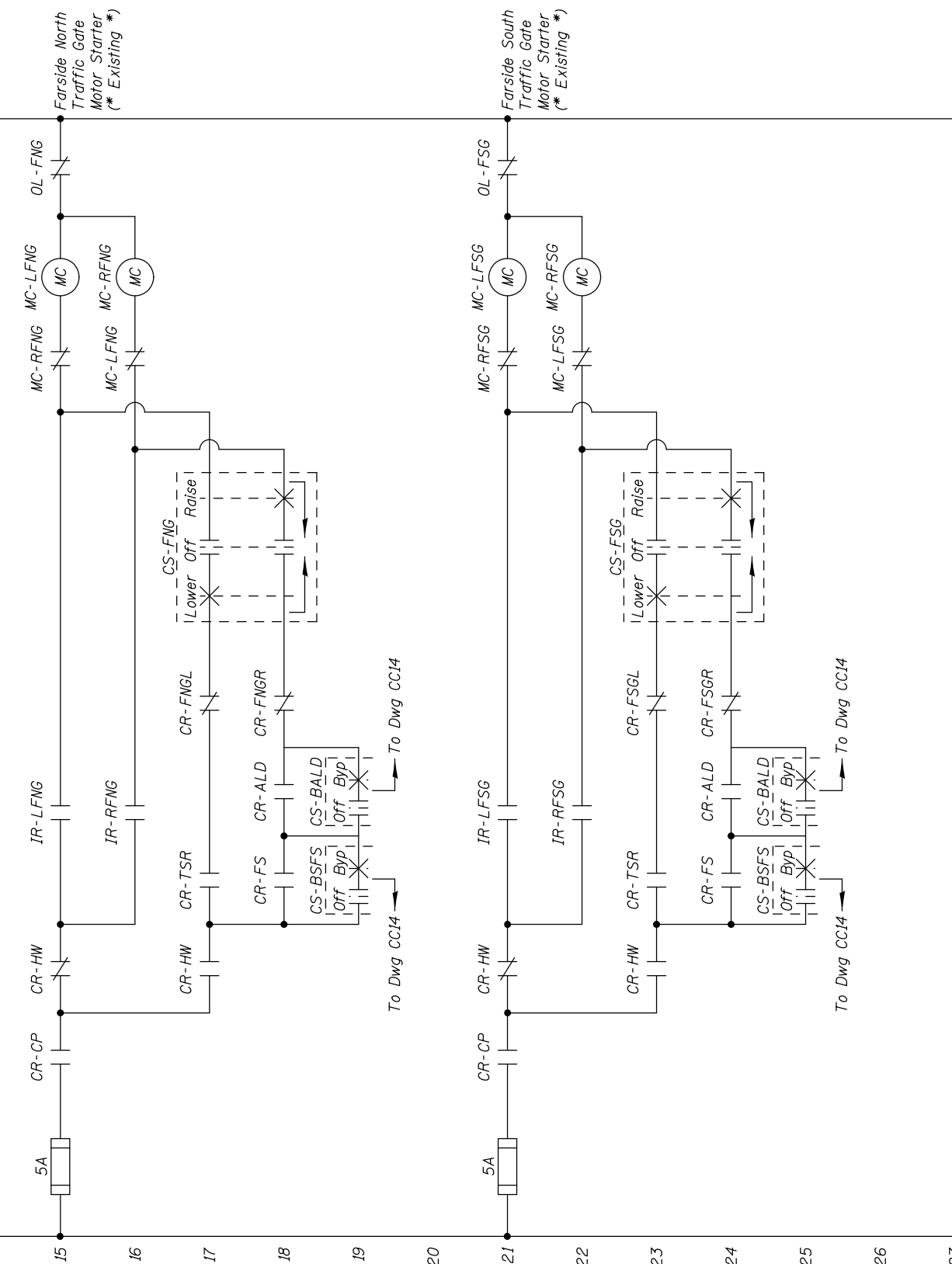
VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 17

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	67
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

Nearside Traffic Gates Control Circuits



Farside Traffic Gates Control Circuits



- NOTES:**
- Rewire existing MCC starters as required to implement new control logic.

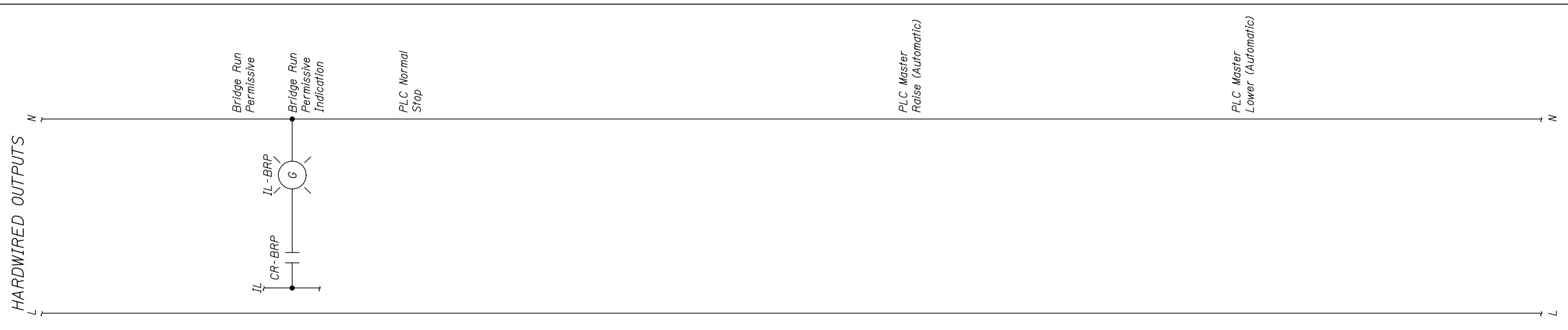
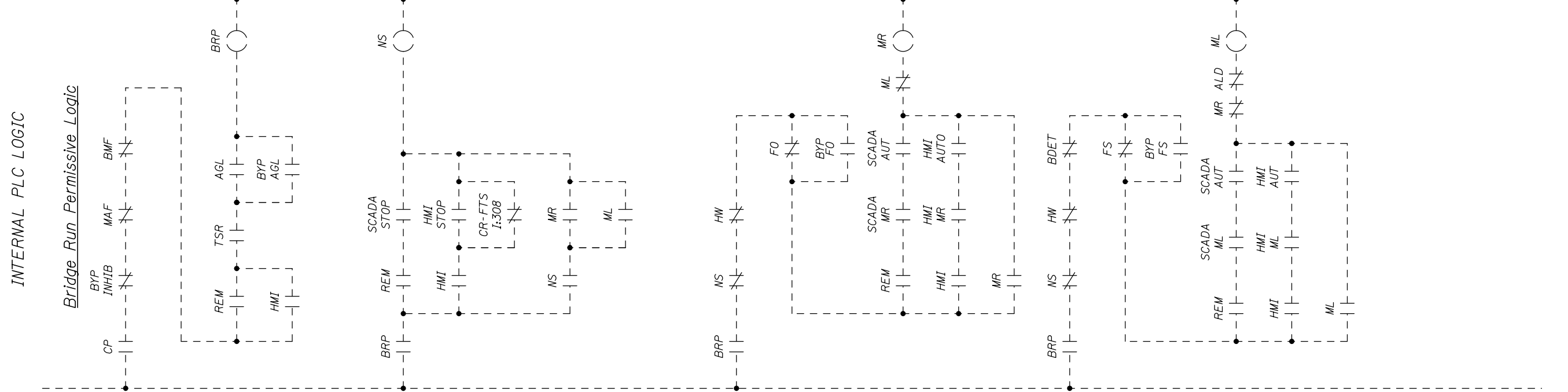


USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 18

RUBY, Drawing 01-055			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 68
CONTRACT NO. 60P55			



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 19**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	69
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

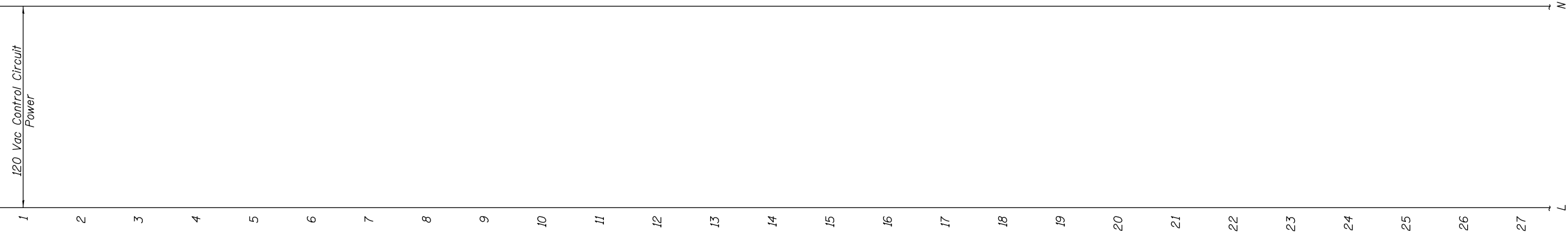
RUBY, Drawing 01-056

SHEET NO. 56 OF 97 SHEETS

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



Bridge Run Permissive Logic (Cont.)

Function
Function shall be used with SCADA system to prevent operator from switching SCADA screens to another bridge while a bridge raising or bridge lowering operation is in progress.

Function
Function shall prompt the operator with a SCADA system message to view the CCTV cameras associated with the waterway traffic to verify that vessels are clear prior to closing the bridge. The operator must acknowledge the message before proceeding.

Function
Function shall cause bridge lowering operation to come to a stop and then open the bridge to fully open position in the event that a boat is detected during a remote bridge lowering operation.

SCADA System Lock to This Bridge During Operation

SCADA Prompt to Operator to Check for Waterway Traffic

Boat Detected During Remote Lowering - Open Bridge Immediately



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PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

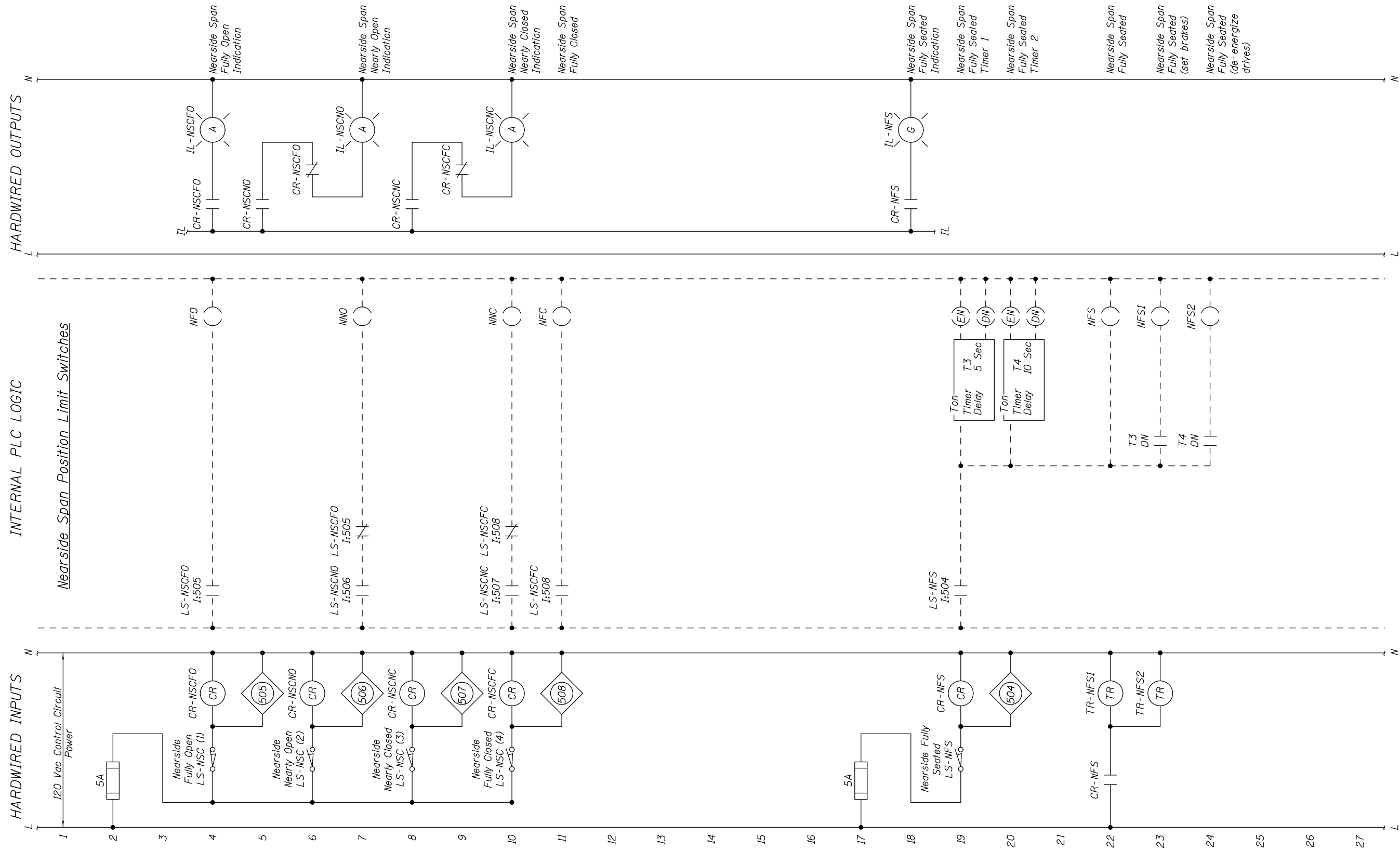
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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 20

SHEET NO. 57 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	70
CONTRACT NO. 60P55				
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RUBY, Drawing 01-057



NOTES:
 1. Provide additional de-bounce timers as required to condition PLC inputs for sensing devices.



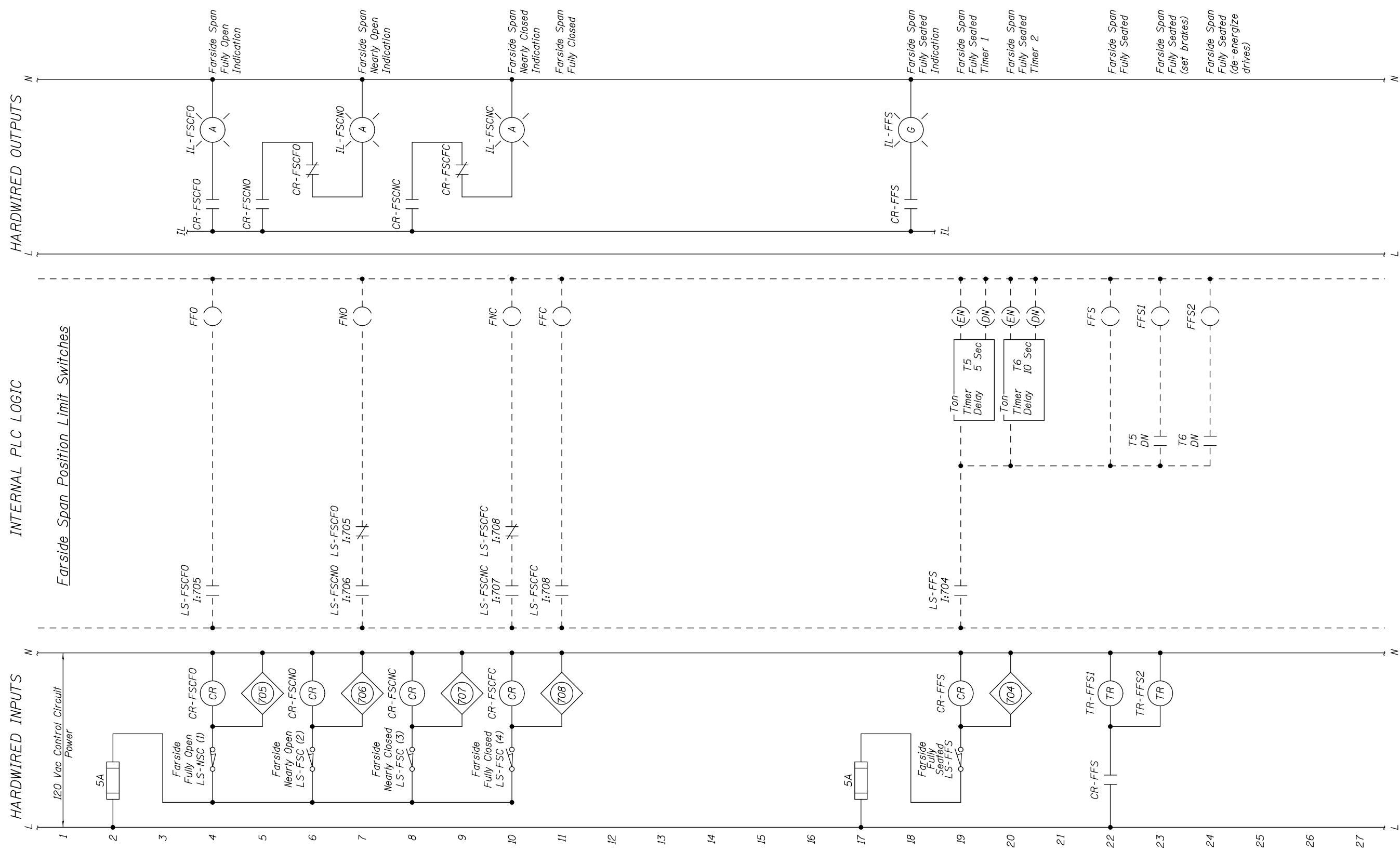
USER NAME =	DESIGNED - R.I. PETERS	REVISED
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED

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**VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 RUBY STREET - CONTROL CIRCUIT - 21**

SHEET NO. 58 OF 97 SHEETS

RUBY, Drawing 01-058	
F.A.P. RTE.	SECTION
112	2011-045-I
COUNTY	WILL
TOTAL SHEETS	466
SHEET NO.	71
CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT	



NOTES:
 1. Provide additional de-bounce timers as required to condition PLC inputs for sensing devices.



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PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED

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**VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 RUBY STREET - CONTROL CIRCUIT - 22**

SHEET NO. 59 OF 97 SHEETS

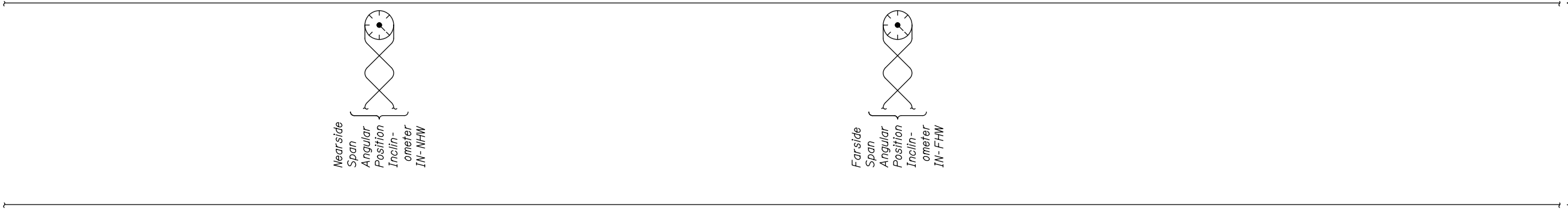
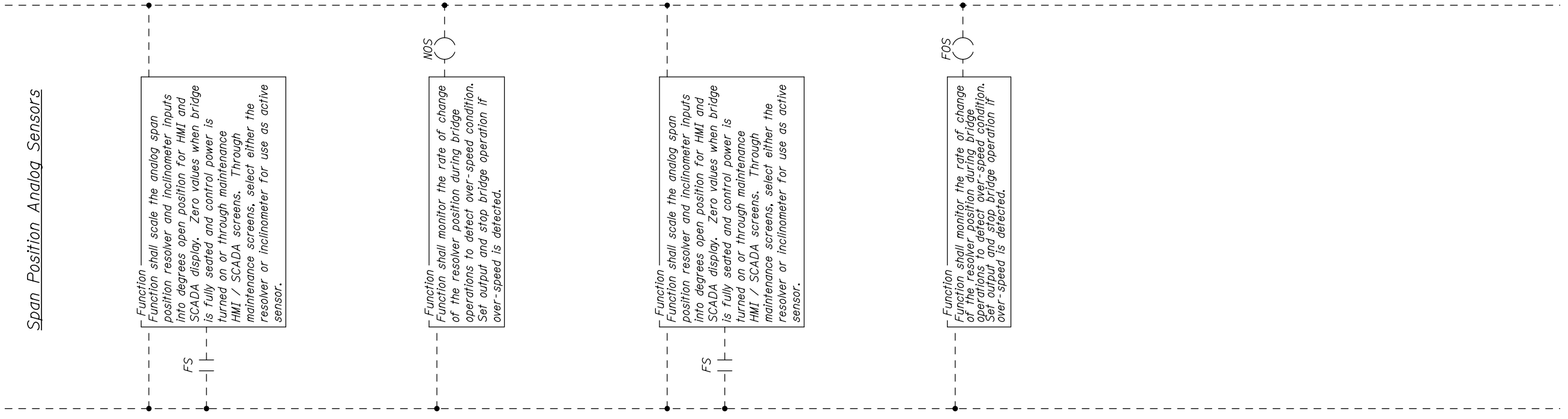
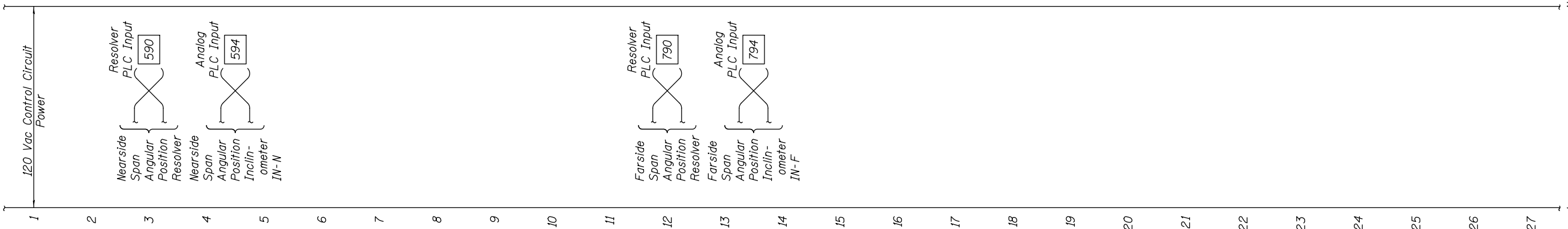
RUBY, Drawing 01-059	
F.A.P. RTE.	SECTION
112	2011-045-I
COUNTY	WILL
TOTAL SHEETS	466
SHEET NO.	72
CONTRACT NO. 60P55	

ILLINOIS FED. AID PROJECT

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



Nearside Span Angular Position
Nearside Span Angular Position Inclino-ometer (to Console Display)
Nearside Span Overspeed
Farside Span Angular Position
Farside Span Angular Position Inclino-ometer (to Console Display)
Farside Span Overspeed



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
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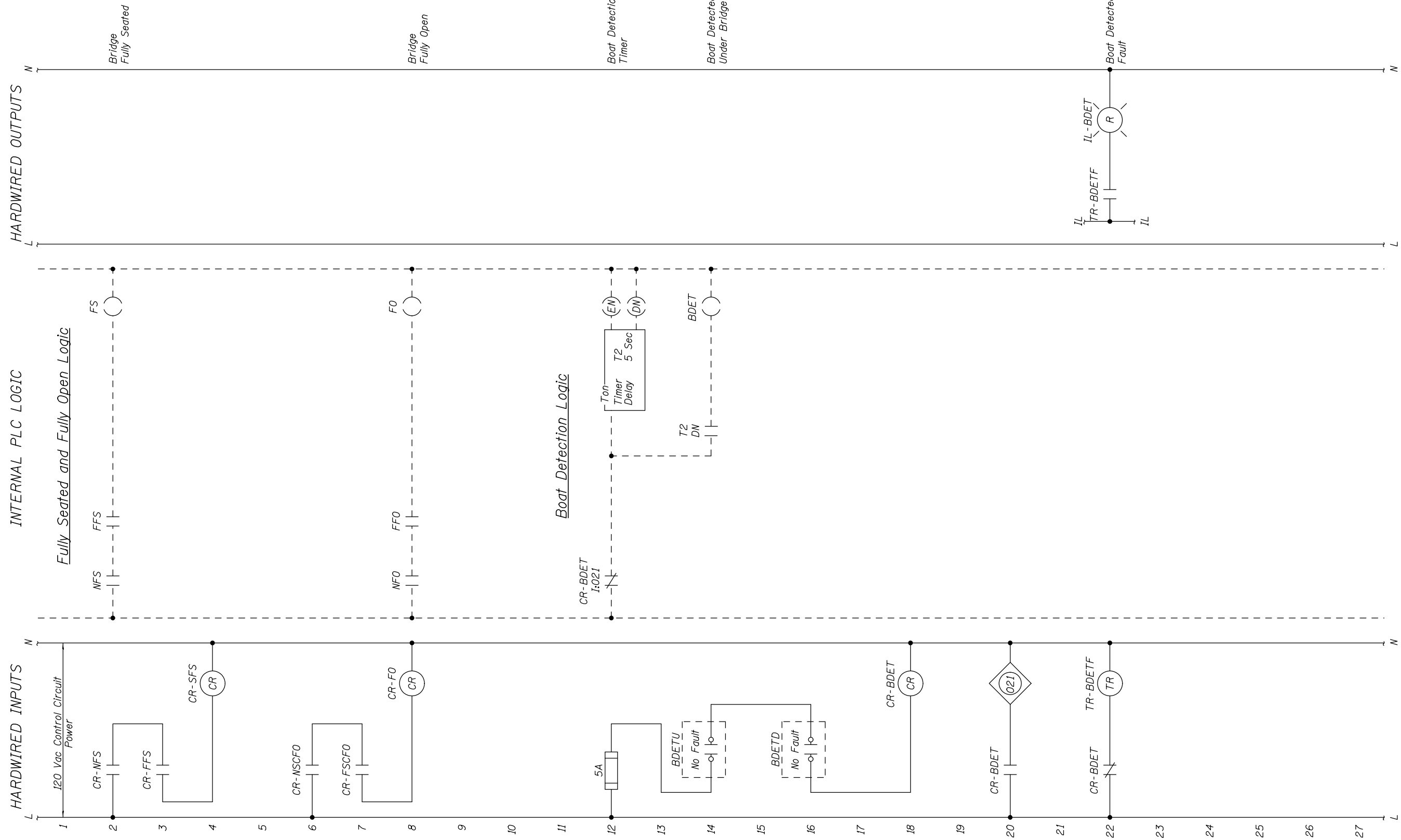
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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 23

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	73
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

SHEET NO. 60 OF 97 SHEETS

RUBY, Drawing 01-060



NOTES:

1. Wire all boat detection sensor contacts back to main PLC cabinet for ease of maintenance and troubleshooting. Do not field "daisy chain" contacts device-to-device.



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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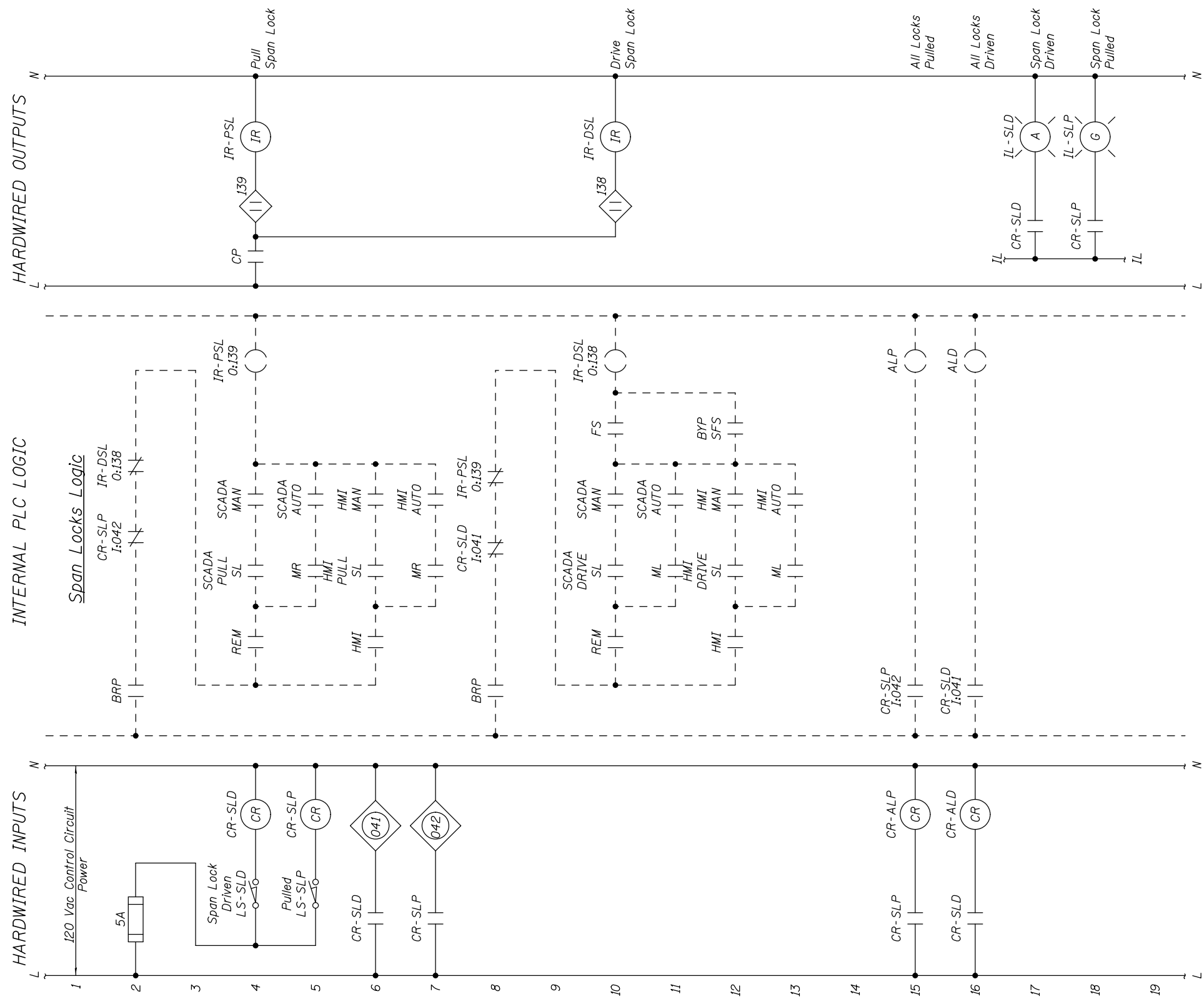
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 24**

SHEET NO. 61 OF 97 SHEETS

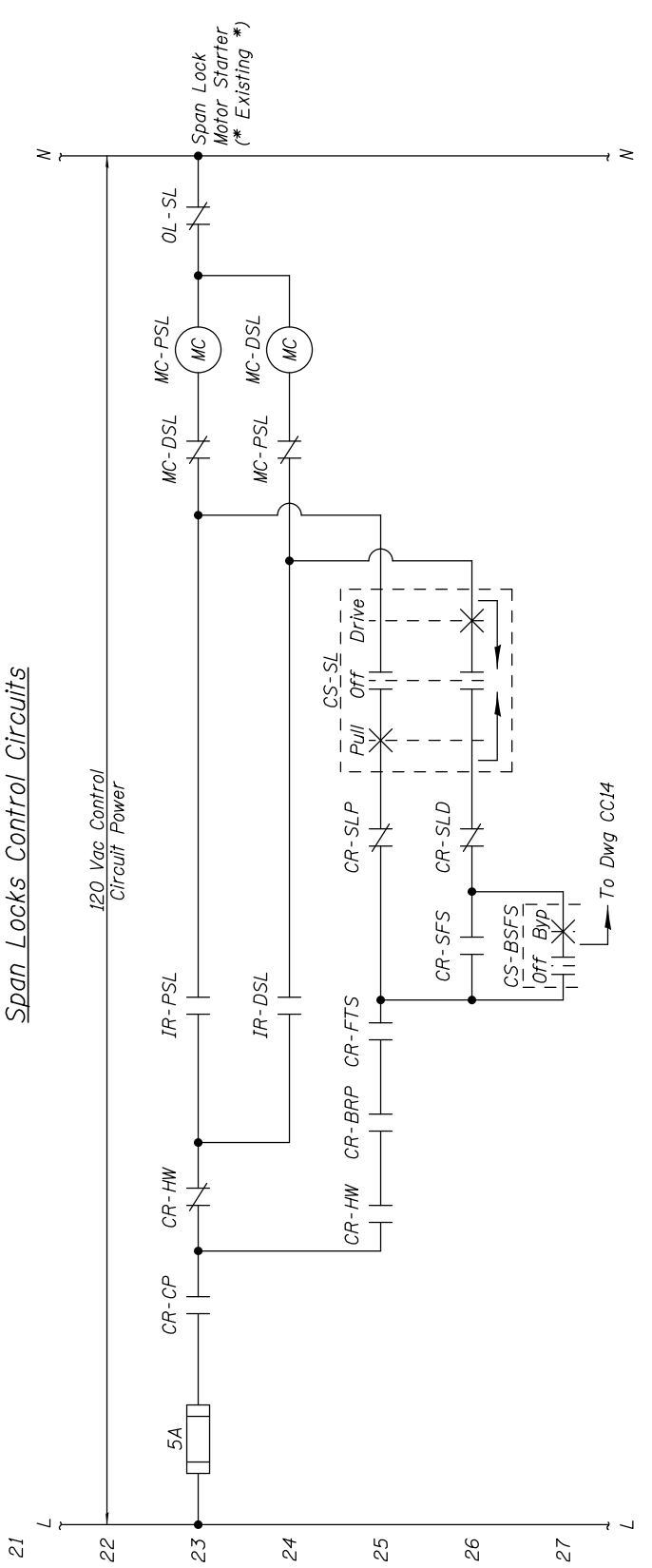
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	74
CONTRACT NO. 60P55				

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-061



Span Locks Control Circuits



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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 25**

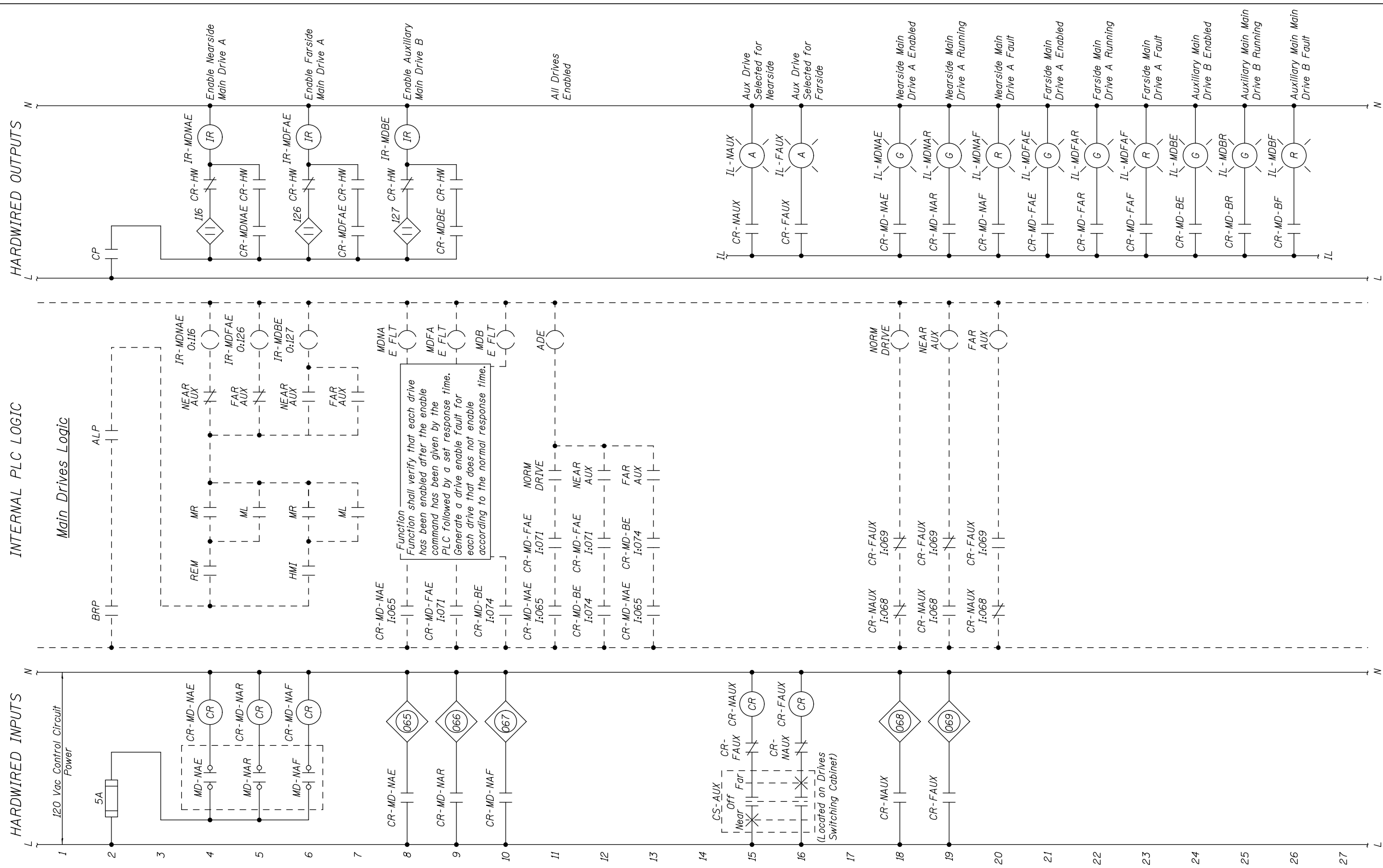
SHEET NO. 62 OF 97 SHEETS

RUBY, Drawing 01-062			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 75
CONTRACT NO. 60P55			
ILLINOIS FED. AID PROJECT			

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



NOTES:

1. Provide additional control circuits to control contactors in Drives Switching Cabinet to allow the Auxiliary Drive to be used with nearside or farside motors based on the position of CS-AUX (Reference Drawing: Three Line Diagram - 5)



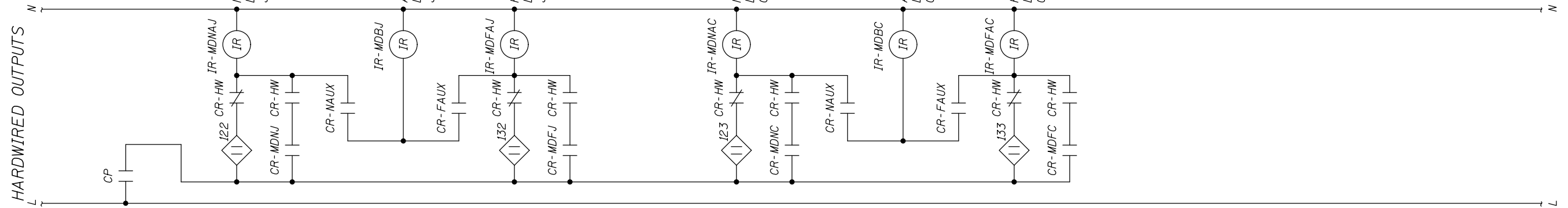
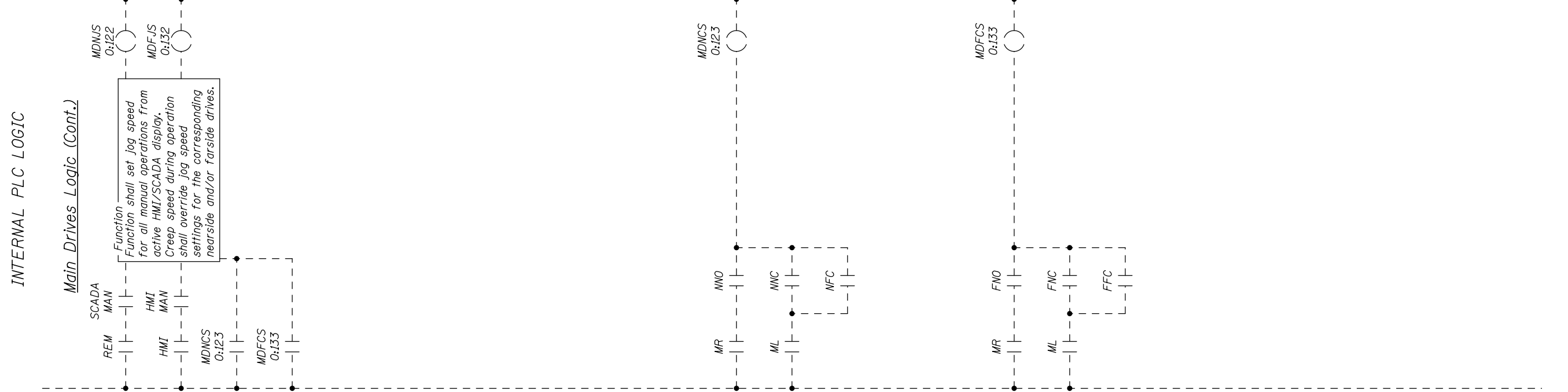
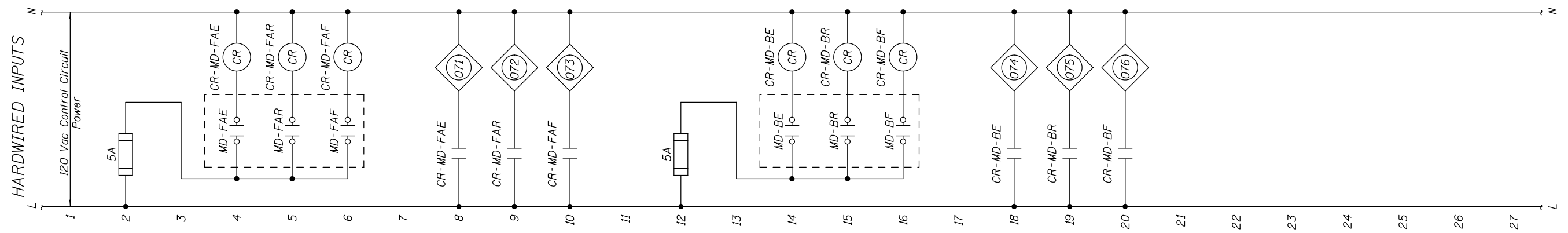
USER NAME =	DESIGNED - R.I. PETERS	REVISED
PLOT SCALE =	CHECKED - J.G. STRENKOSKI	REVISED
PLOT DATE =	DRAWN - R.I. PETERS	REVISED
	CHECKED - J.G. STRENKOSKI	REVISED

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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 26

SHEET NO. 63 OF 97 SHEETS

RUBY, Drawing 01-063			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 76
CONTRACT NO. 60P55			
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PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED

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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 27**

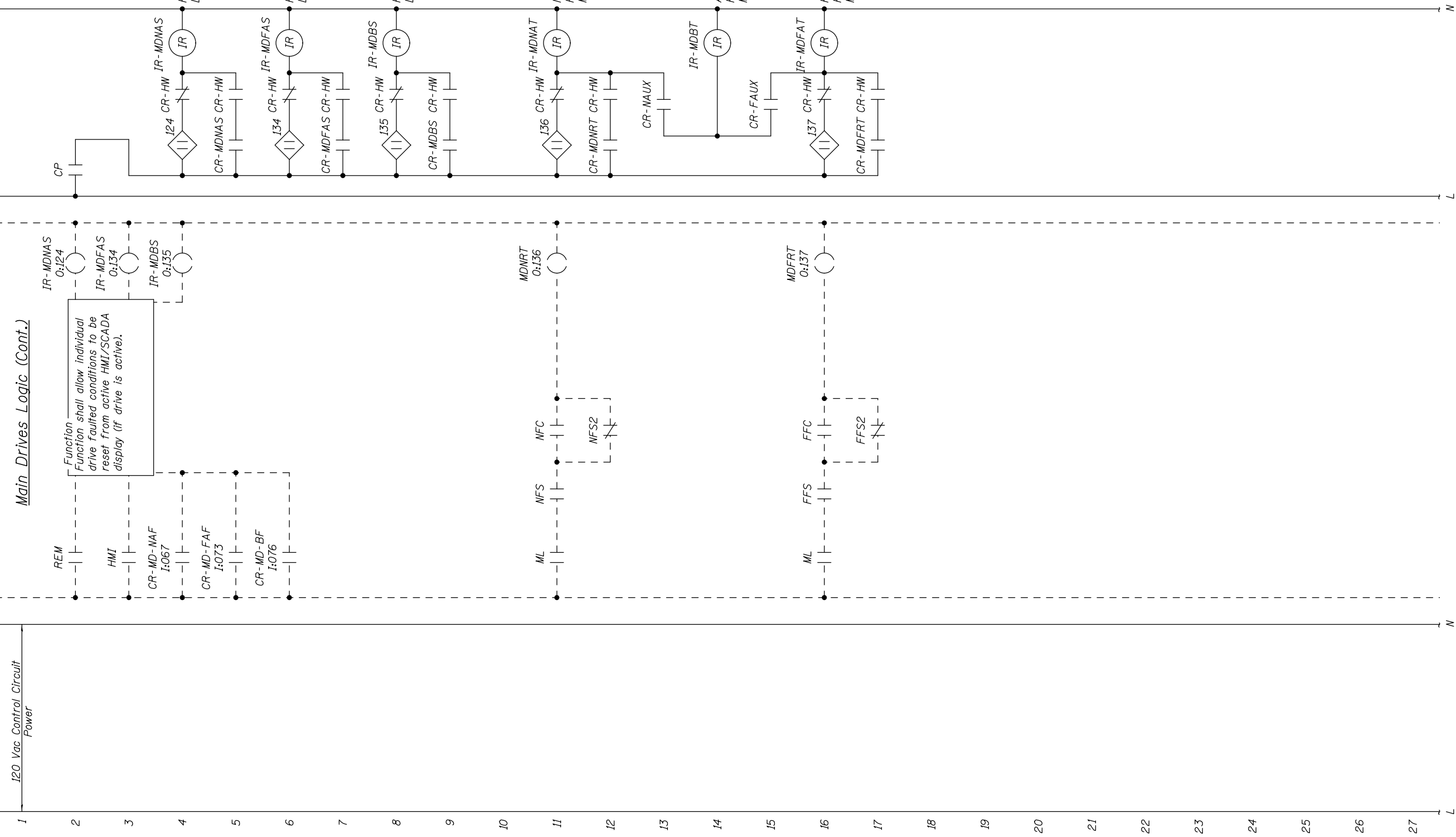
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	77
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-064

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

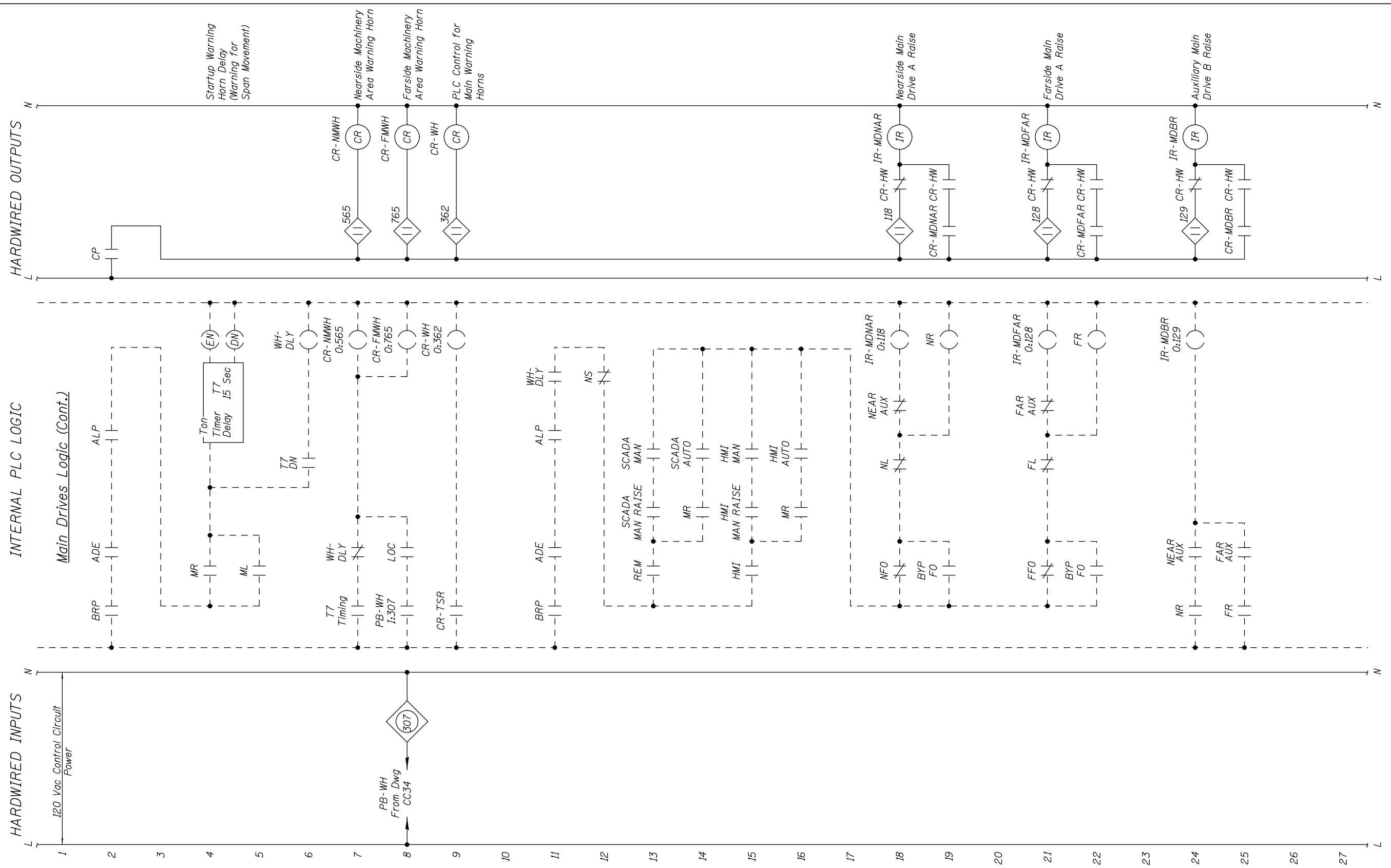
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 28**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	78
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-065

SHEET NO. 65 OF 97 SHEETS



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PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED

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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 29**

SHEET NO. 66 OF 97 SHEETS

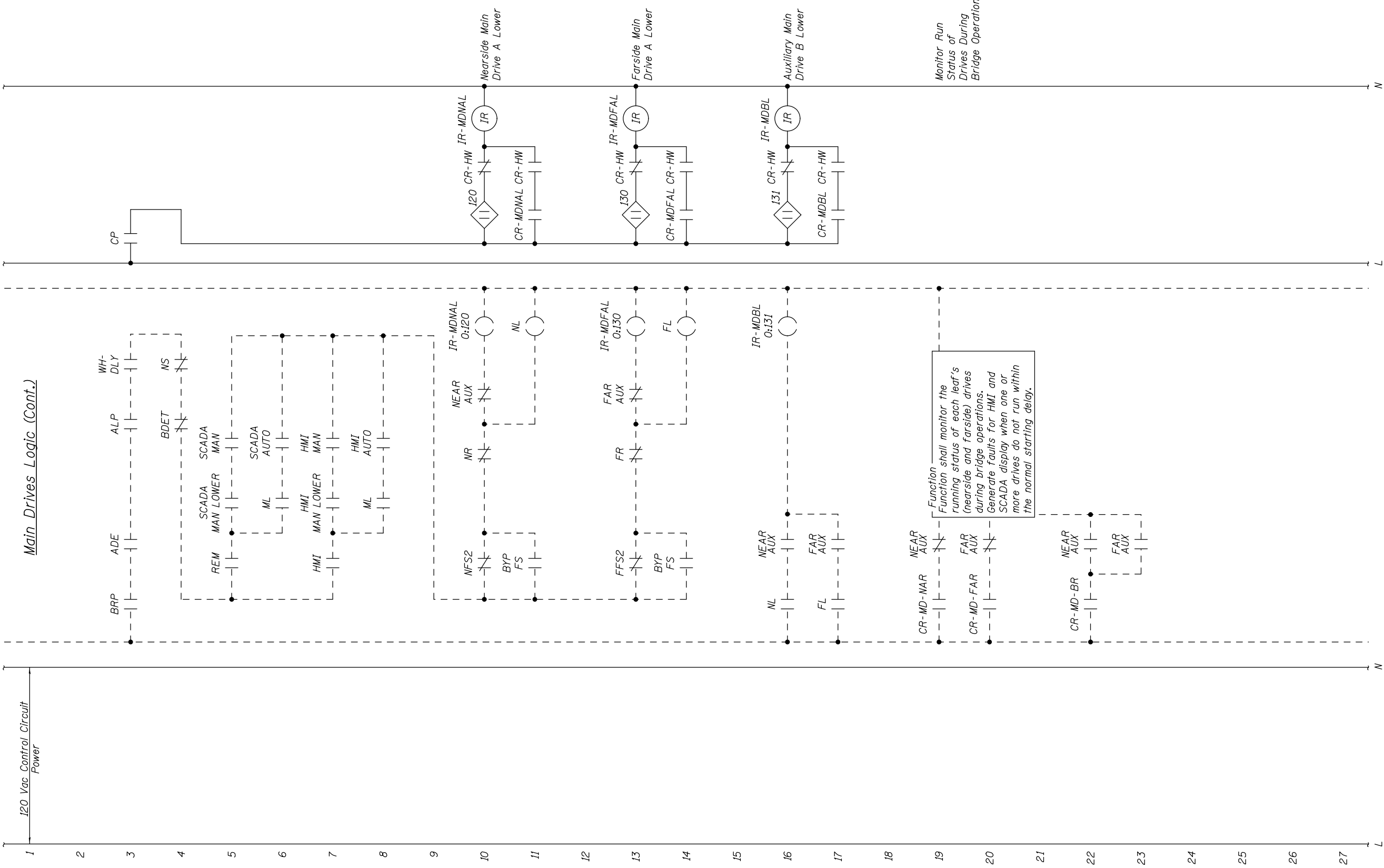
RUBY, Drawing 01-066	
F.A.P. RTE.	SECTION
112	2011-045-I
COUNTY	TOTAL SHEETS
WILL	466
SHEET NO. 79	
CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT	

HARDWIRED OUTPUTS

INTERNAL PLC LOGIC

HARDWIRED INPUTS

Main Drives Logic (Cont.)



Function shall monitor the running status of each leaf's (nearside and farside) drives during bridge operations. Generate faults for HMI and SCADA display when one or more drives do not run within the normal starting delay.

Monitor Run Status of Drives During Bridge Operation



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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 30

SHEET NO. 67 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	80
CONTRACT NO. 60P55				

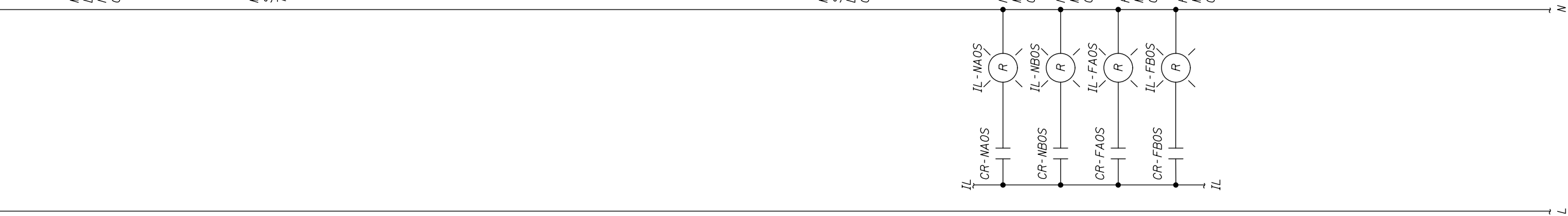
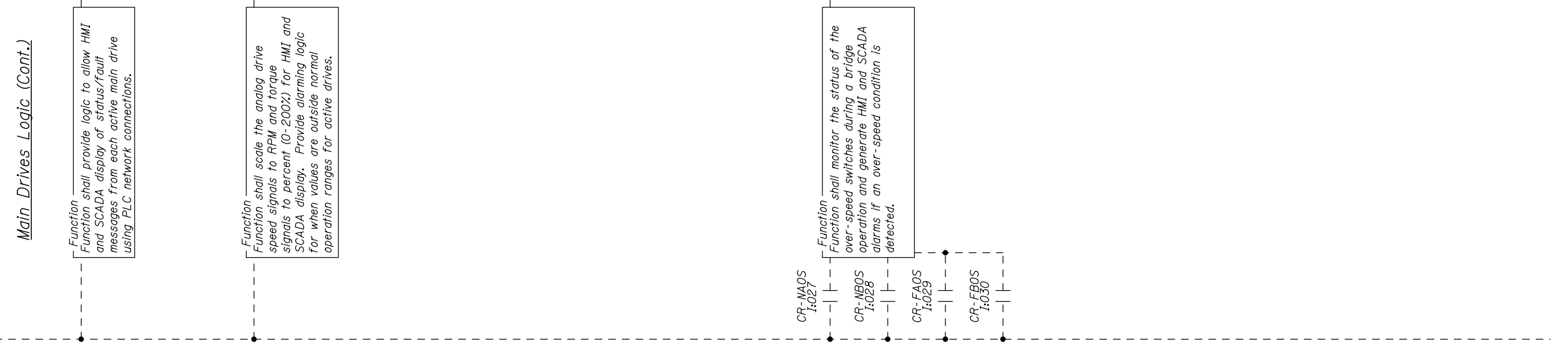
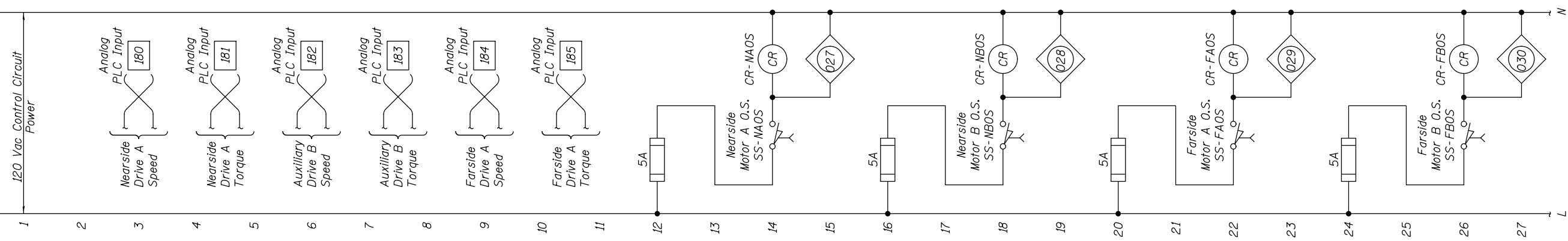
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RUBY, Drawing 01-067

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



Monitor Status of Drives With Network Connection

Monitor Drive Speed and Torque Values

Monitor Motor Speed Switches During Bridge Operation

Nearside Main Motor A Over-Speed
 Nearside Main Motor B Over-Speed
 Farside Main Motor A Over-Speed
 Farside Main Motor B Over-Speed



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PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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VARIOUS MOVABLE BRIDGES
 LOCAL CENTRALIZED CONTROL AND OPERATION
 RUBY STREET - CONTROL CIRCUIT - 31

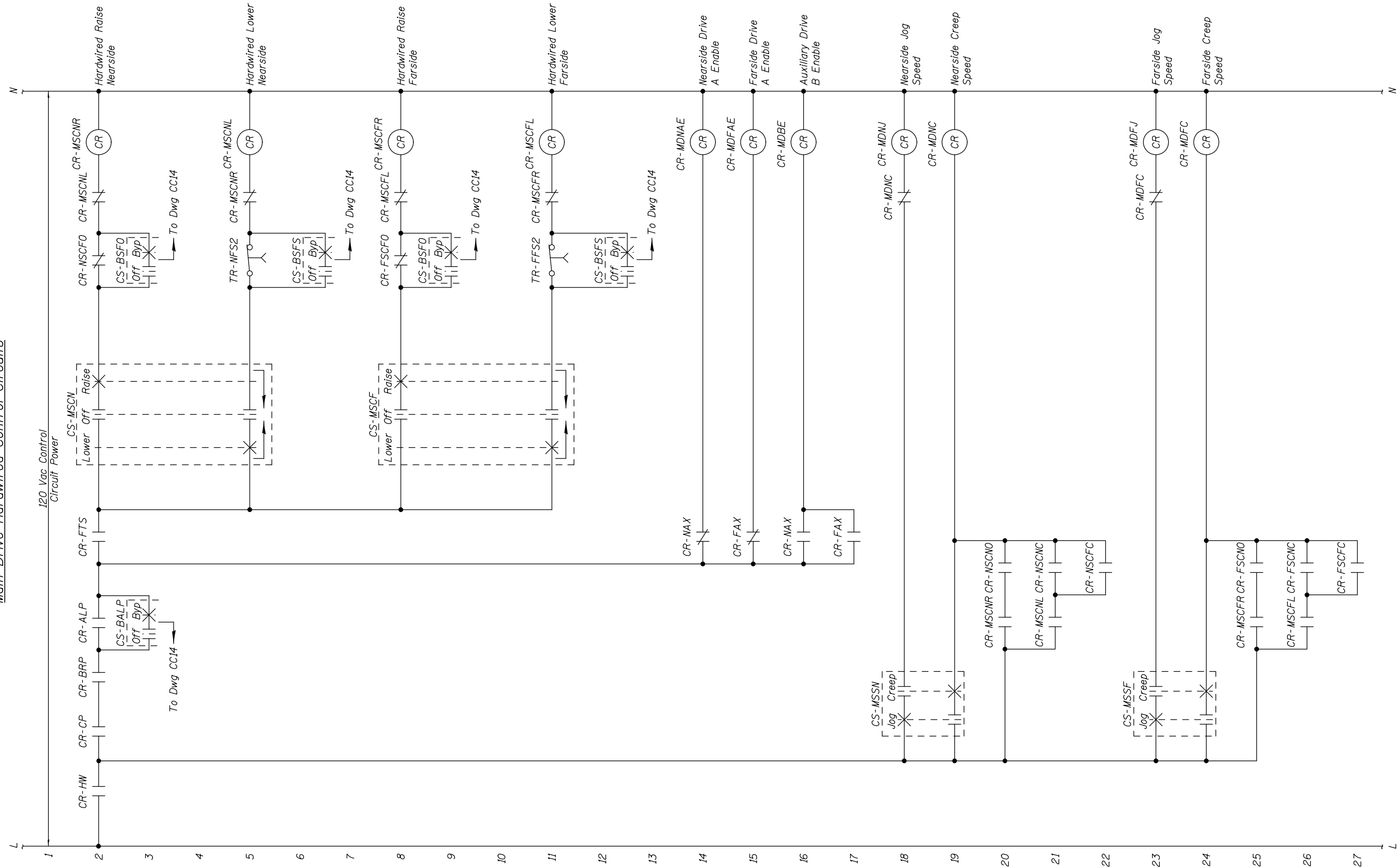
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	81
CONTRACT NO. 60P55				

SHEET NO. 68 OF 97 SHEETS

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-068

Main Drive Hardwired Control Circuits



NOTES:

1. Provide additional control circuits to enable drive output contractors when the corresponding drive is enabled. (Reference Drawing: Three Line Diagram - 5)



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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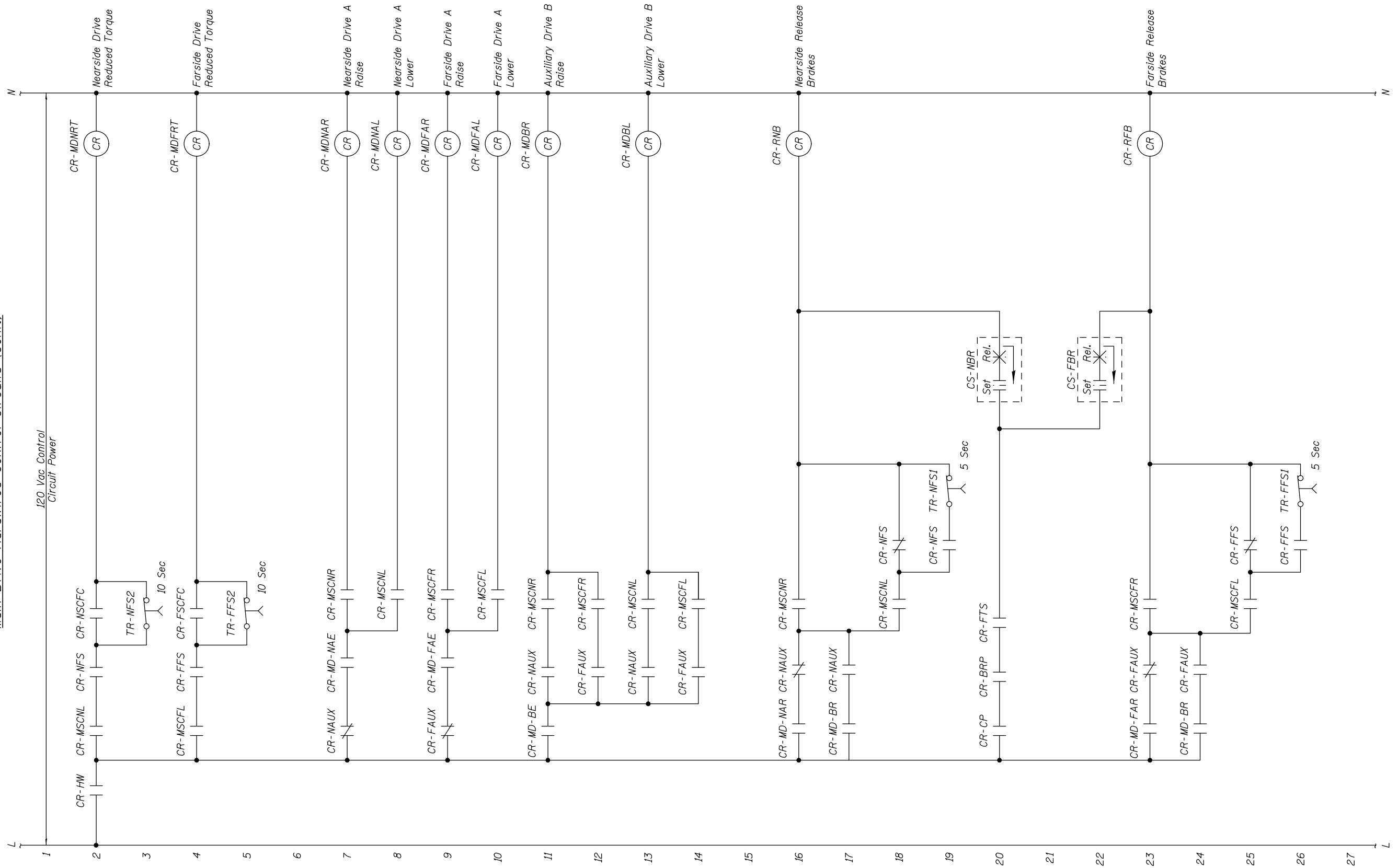
VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 32

RUBY, Drawing 01-069			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 82
CONTRACT NO. 60P55			

SHEET NO. 69 OF 97 SHEETS

ILLINOIS FED. AID PROJECT

Main Drive Hardwired Control Circuits (Cont.)



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 33

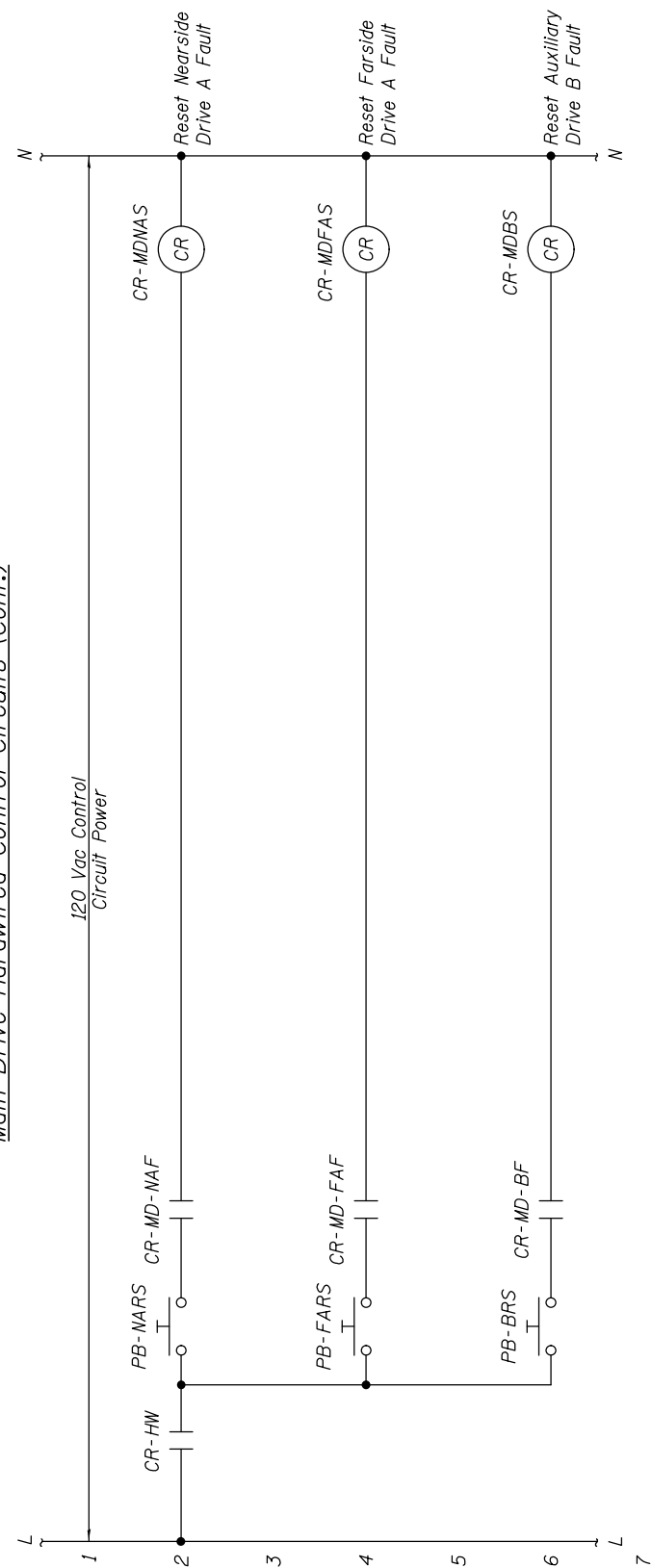
SHEET NO. 70 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	83
CONTRACT NO. 60P55				

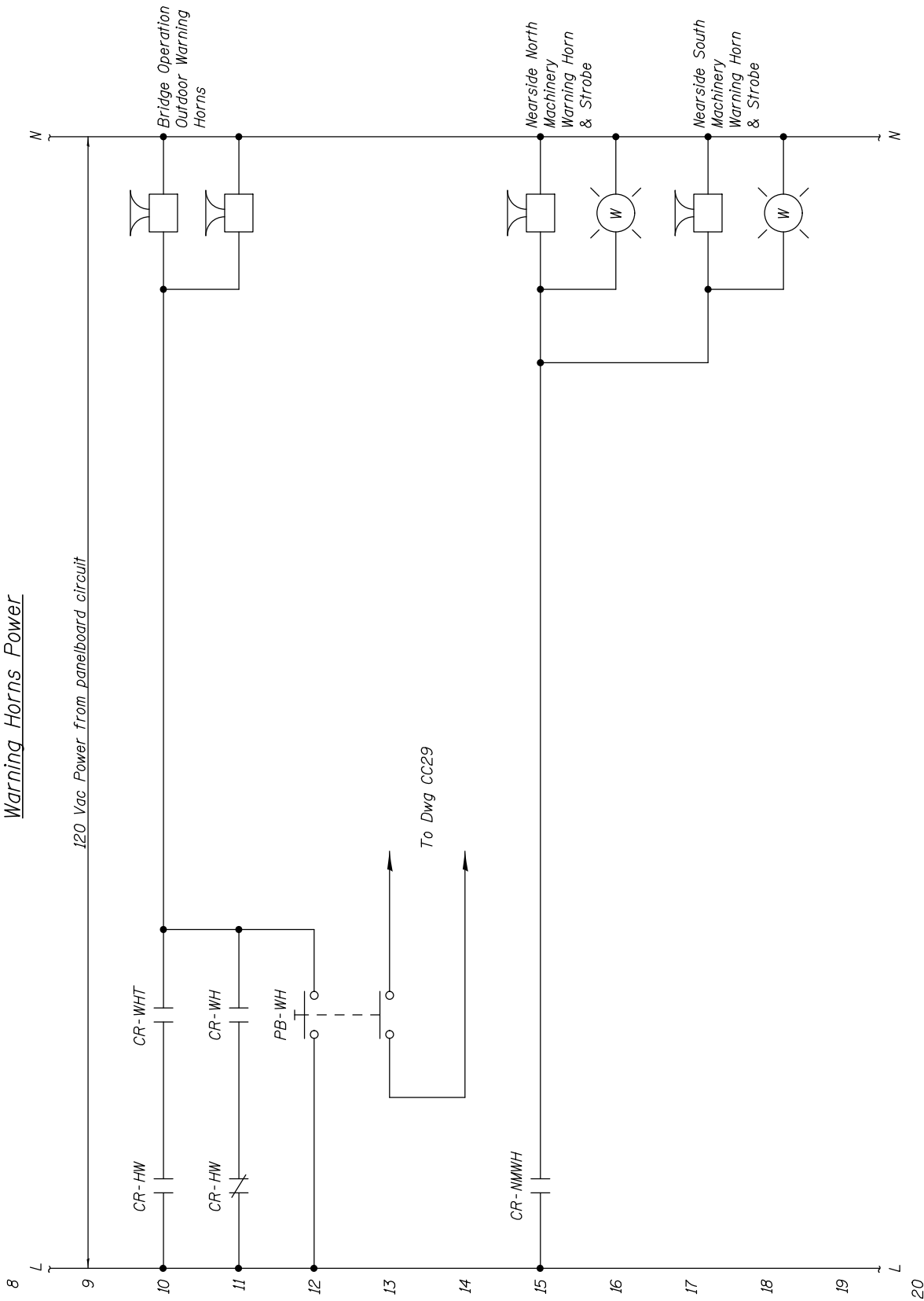
RUBY, Drawing 01-070

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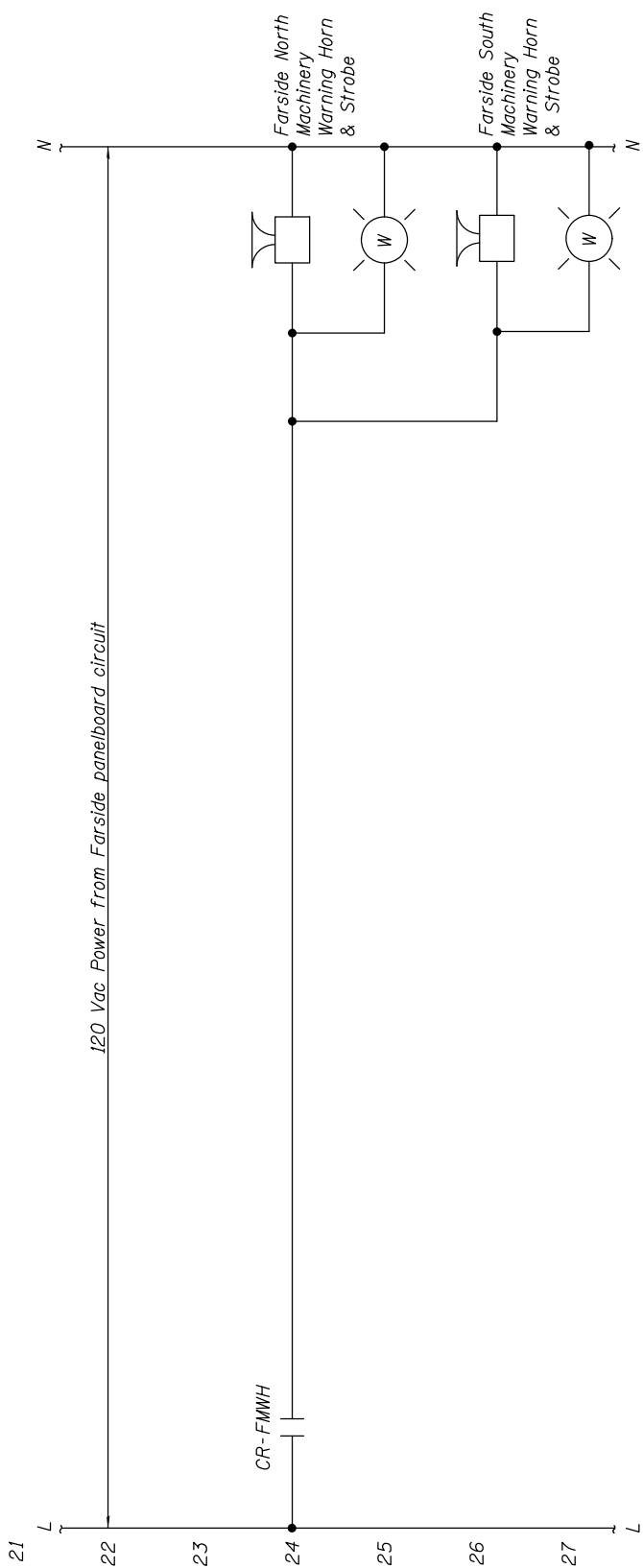
Main Drive Hardwired Control Circuits (Cont.)



Warning Horns Power



120 Vac Power from Farside panelboard circuit



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 34**

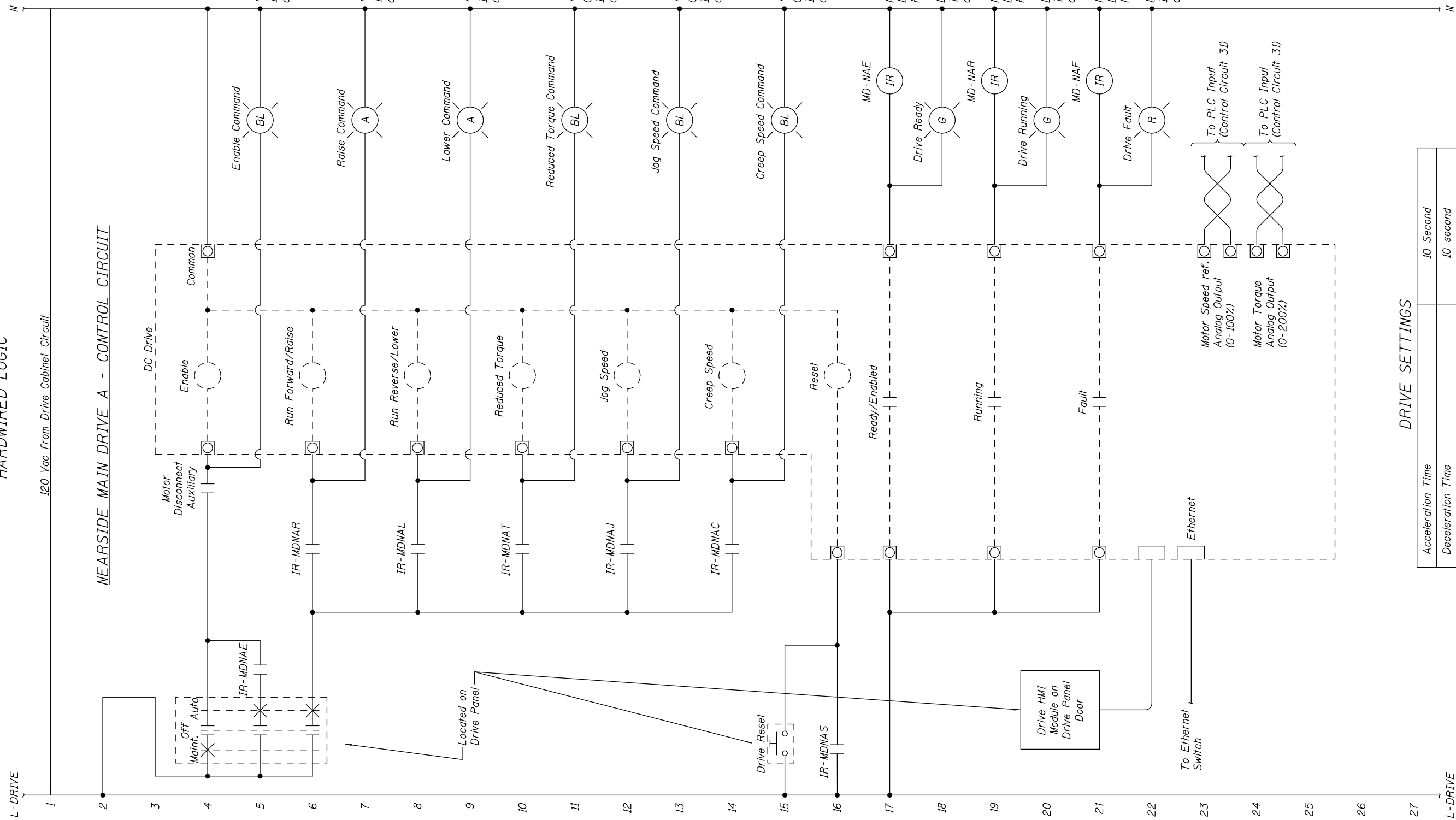
SHEET NO. 71 OF 97 SHEETS

RUBY, Drawing 01-071			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 84
CONTRACT NO. 60P55			
ILLINOIS FED. AID PROJECT			

HARDWIRED LOGIC

120 Vac from Drive Cabinet Circuit

NEARSIDE MAIN DRIVE A - CONTROL CIRCUIT



NOTES:

- Indicator Light shall be mounted on the DC drive Panel and shall be push-to-test type.
- Maintenance mode is intended to be used for setup and testing with the drive HMI unit.
- The Drive Ethernet connection is intended to allow the PLC to access drive fault messages and drive operating conditions. No control operations shall be performed using this connection.

DRIVE SETTINGS

Acceleration Time	10 Second
Deceleration Time	10 second
Stop Mode	Coast
Auto Start	False
Auto Restart	False
Motor Stall Time	20 Seconds
Maximum Torque Limit	150% Motor rated

Note: All settings shall be adjusted as required in the field.



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PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 35

SHEET NO. 72 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	85
CONTRACT NO. 60P55				

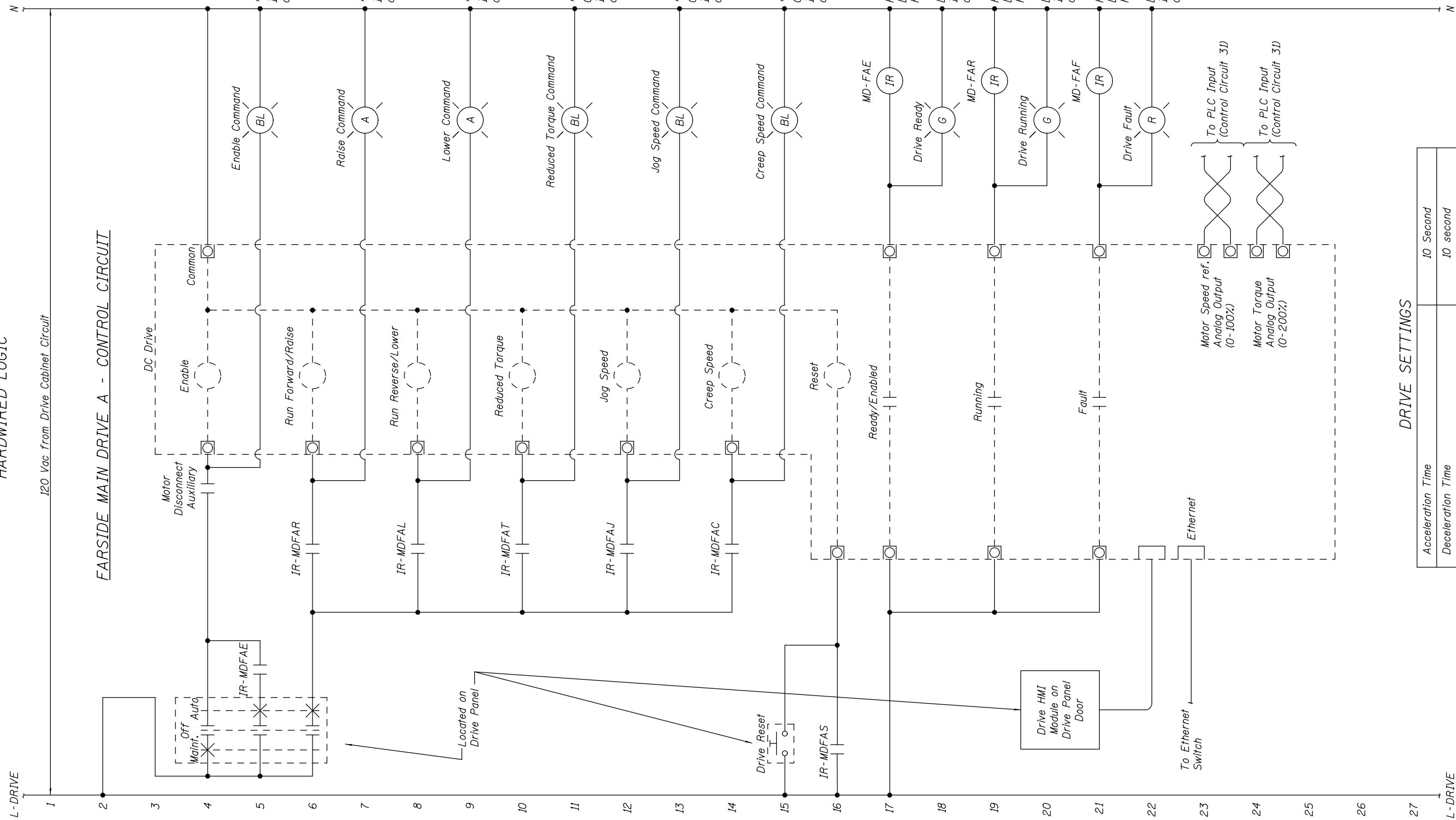
RUBY, Drawing 01-072

ILLINOIS FED. AID PROJECT

HARDWIRED LOGIC

120 Vac from Drive Cabinet Circuit

FARSIDE MAIN DRIVE A - CONTROL CIRCUIT



DRIVE SETTINGS

Acceleration Time	10 Second
Deceleration Time	10 second
Stop Mode	Coast
Auto Start	False
Auto Restart	False
Motor Stall Time	20 Seconds
Maximum Torque Limit	150% Motor rated

Note: All settings shall be adjusted as required in the field.

NOTES:

- Indicator Light shall be mounted on the DC drive Panel and shall be push-to-test type.
- Maintenance mode is intended to be used for setup and testing with the drive HMI unit.
- The Drive Ethernet connection is intended to allow the PLC to access drive fault messages and drive operating conditions. No control operations shall be performed using this connection.



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 36

SHEET NO. 73 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	86
CONTRACT NO. 60P55				

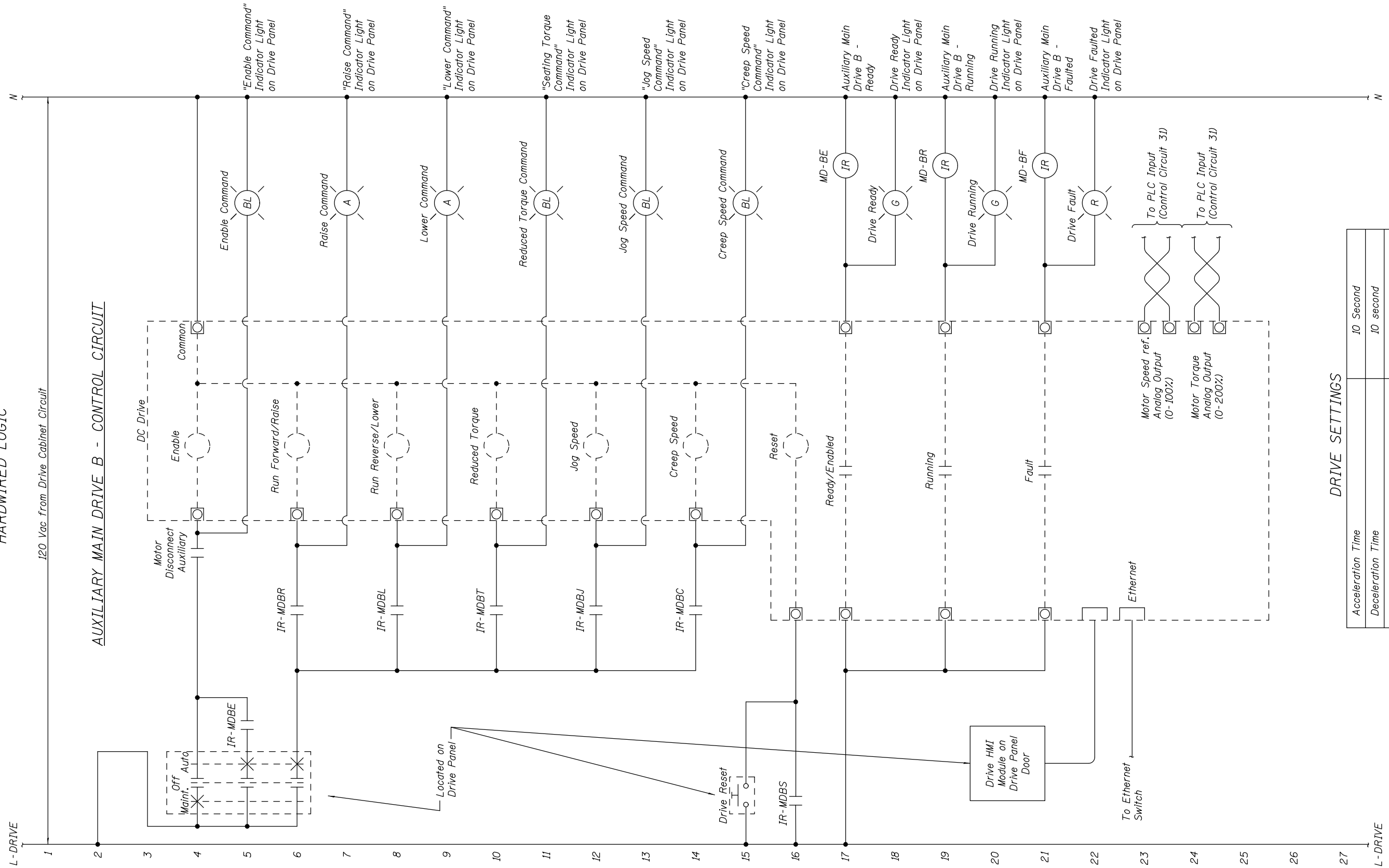
RUBY, Drawing 01-073

ILLINOIS FED. AID PROJECT

HARDWIRED LOGIC

120 Vac from Drive Cabinet Circuit

AUXILIARY MAIN DRIVE B - CONTROL CIRCUIT



NOTES:

1. Indicator Light shall be mounted on the DC drive Panel and shall be push-to-test type.
2. Maintenance mode is intended to be used for setup and testing with the drive HMI unit.
3. The Drive Ethernet connection is intended to allow the PLC to access drive fault messages and drive operating conditions. No control operations shall be performed using this connection.

DRIVE SETTINGS

Acceleration Time	10 Second
Deceleration Time	10 second
Stop Mode	Coast
Auto Start	False
Auto Restart	False
Motor Stall Time	20 Seconds
Maximum Torque Limit	150% Motor rated

Note: All settings shall be adjusted as required in the field.



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 37

SHEET NO. 74 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	87
CONTRACT NO. 60P55				

RUBY, Drawing 01-074

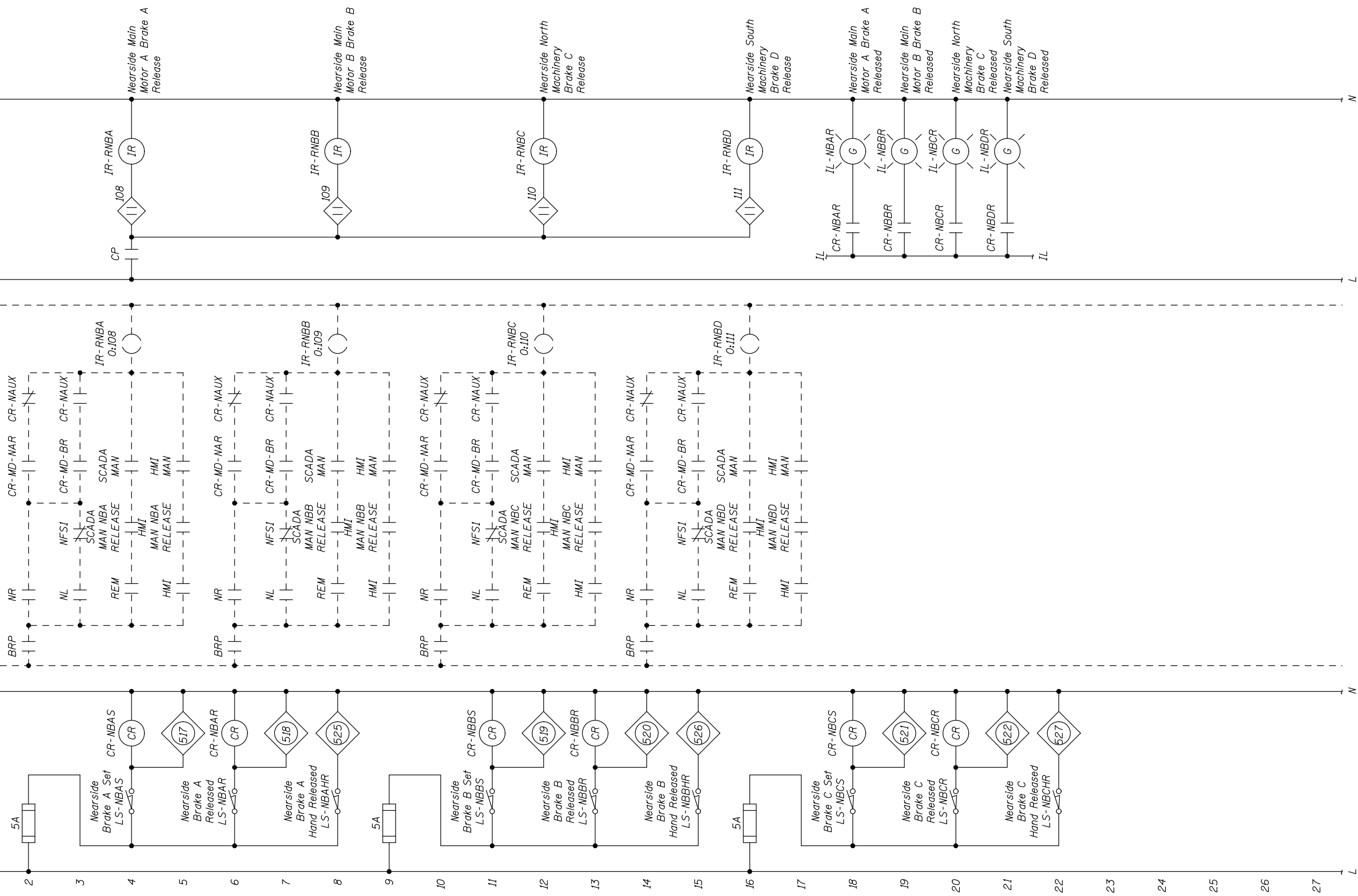
ILLINOIS FED. AID PROJECT

HARDWIRED INPUTS

HARDWIRED OUTPUTS

INTERNAL PLC LOGIC

Nearside Brakes Logic



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
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PLOT DATE =	DRAWN - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---

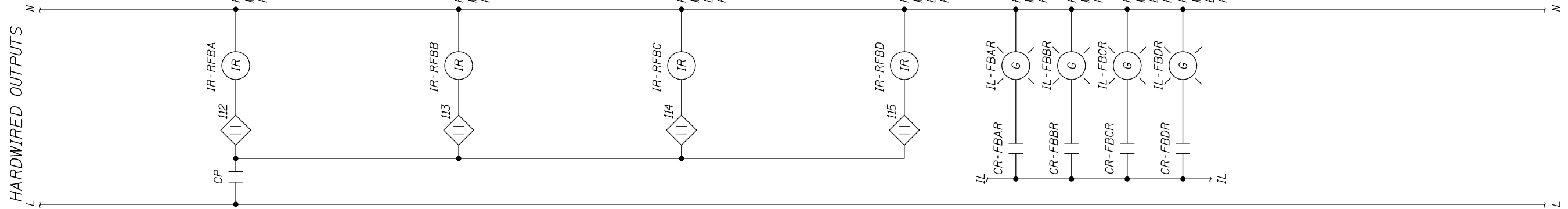
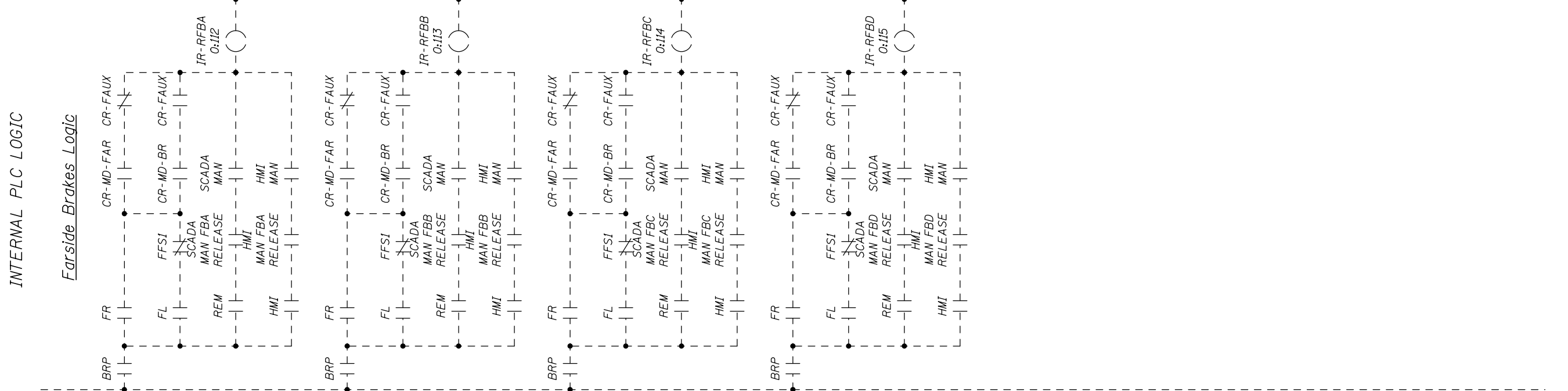
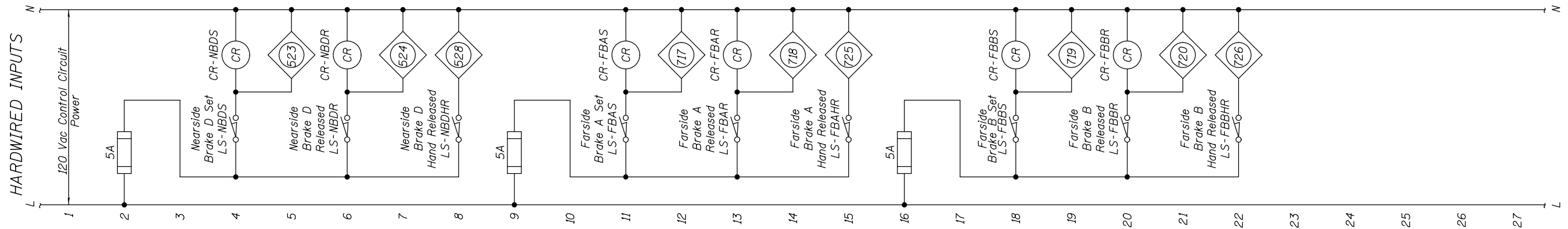
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 38**

SHEET NO. 75 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	88
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-075



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
	CHECKED - J.G. STRENKOSKI	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

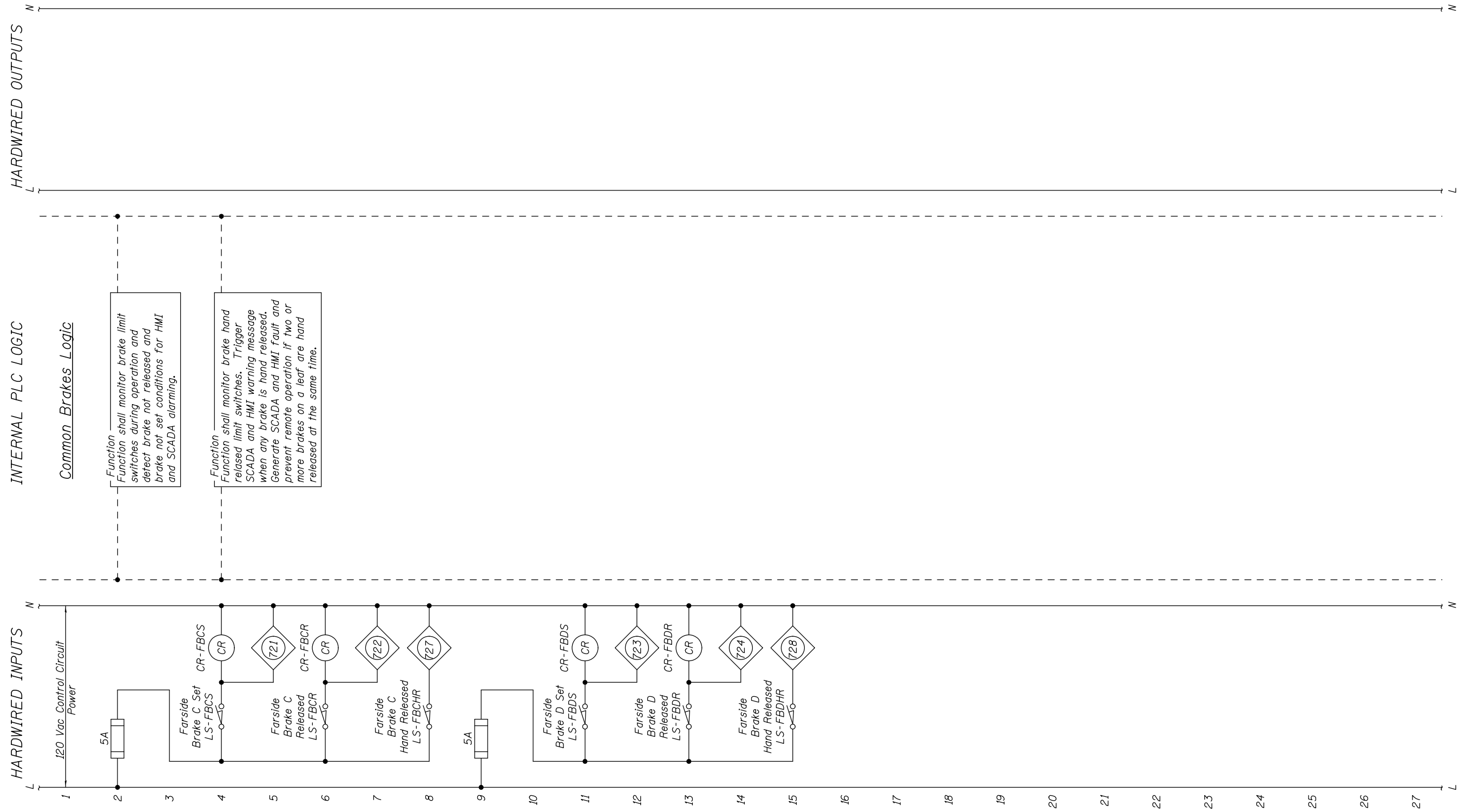
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 39**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	89
CONTRACT NO. 60P55				

SHEET NO. 76 OF 97 SHEETS

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-076



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

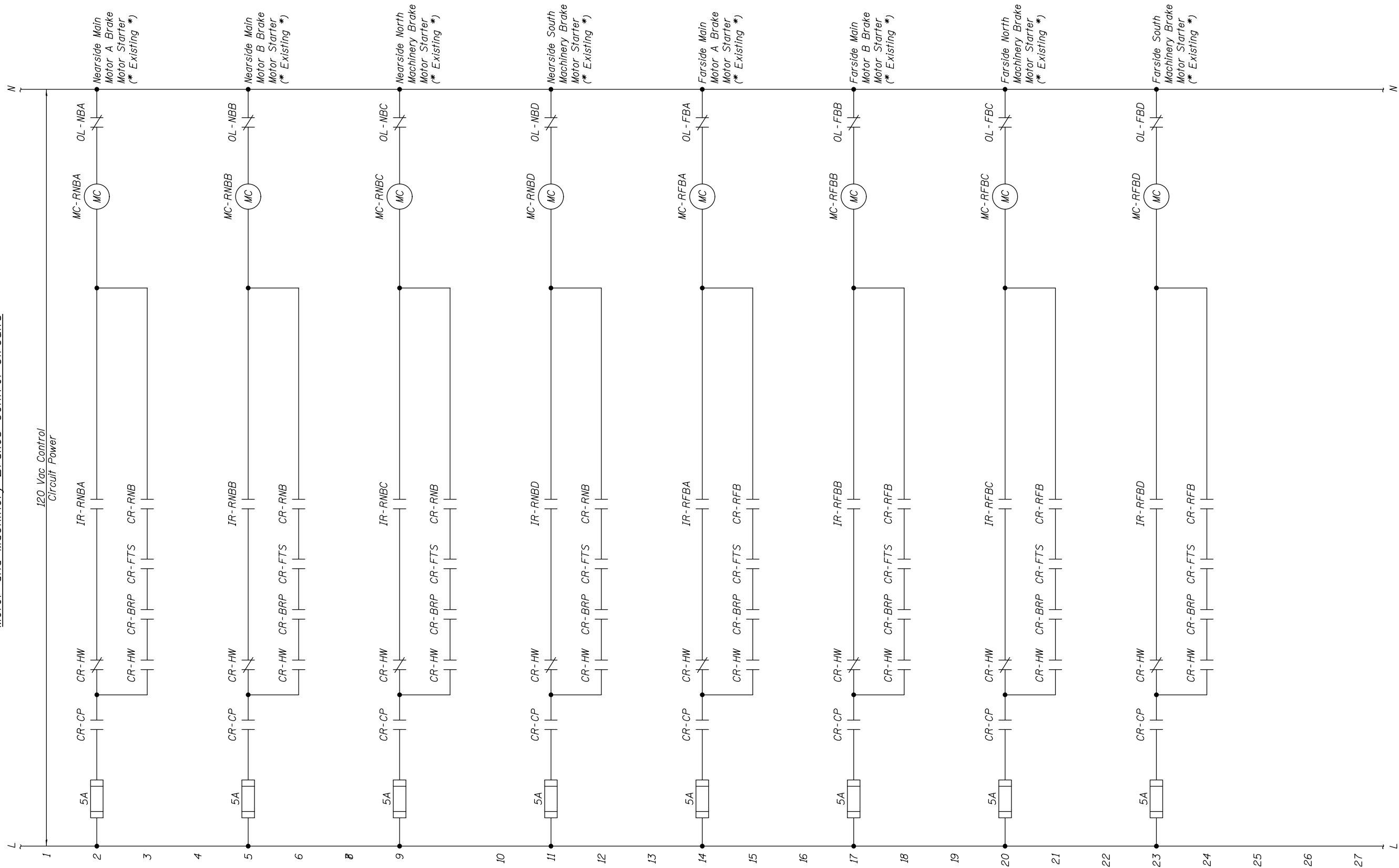
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 40**

SHEET NO. 77 OF 97 SHEETS

F.A.P. RTE.		SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112		2011-045-I	WILL	466	90
					CONTRACT NO. 60P55
ILLINOIS FED. AID PROJECT					

RUBY, Drawing 01-077

Motor and Machinery Brakes Control Circuits



NOTES:

1. Rewire existing MCC starters as required to implement new control logic.



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

STATE OF ILLINOIS
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VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 41

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	91
CONTRACT NO. 60P55				

SHEET NO. 78 OF 97 SHEETS

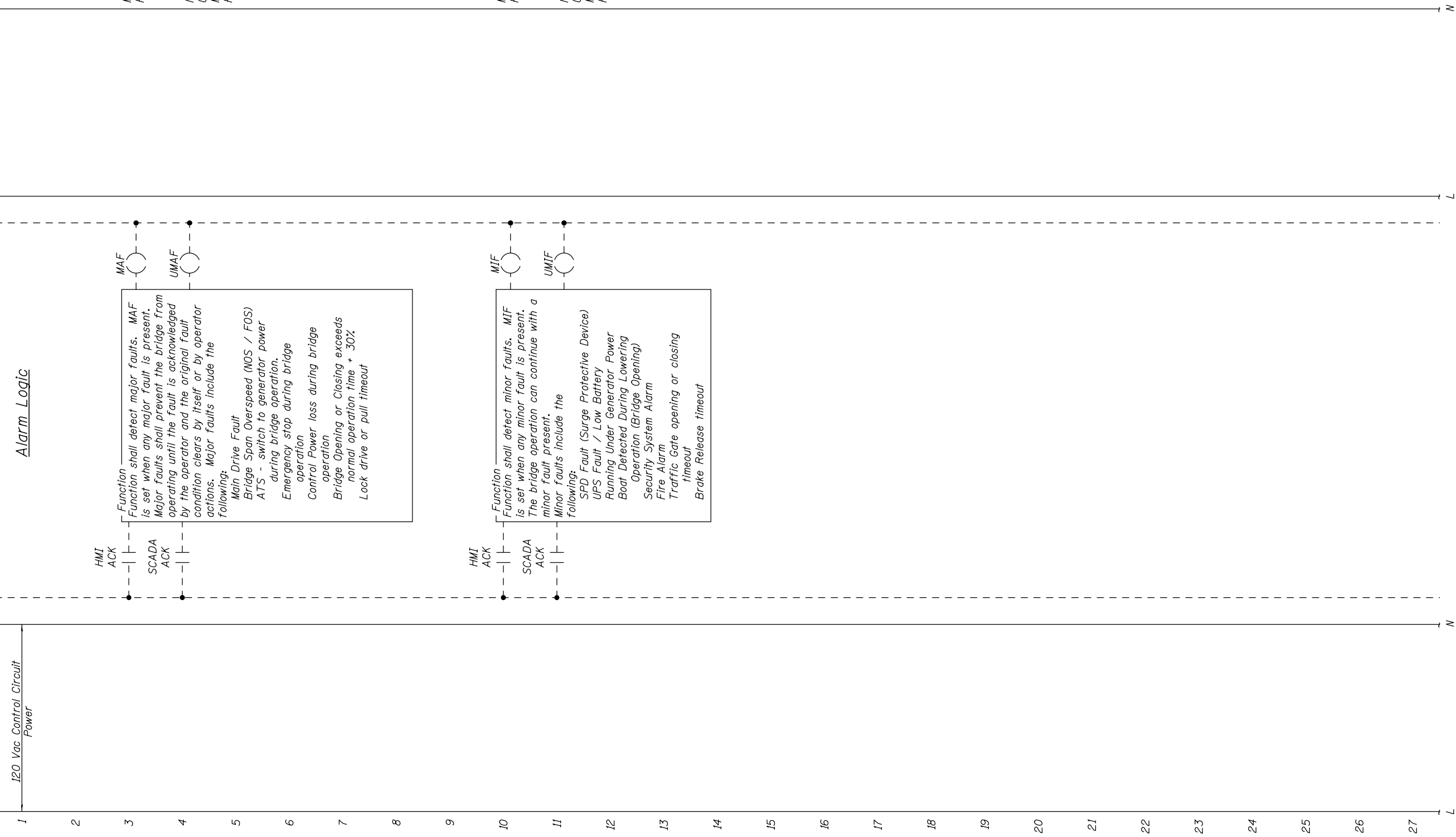
ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-078

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



USER NAME =	DESIGNED - R.I. PETERS	REVISED	---
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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 42**

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	92
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				

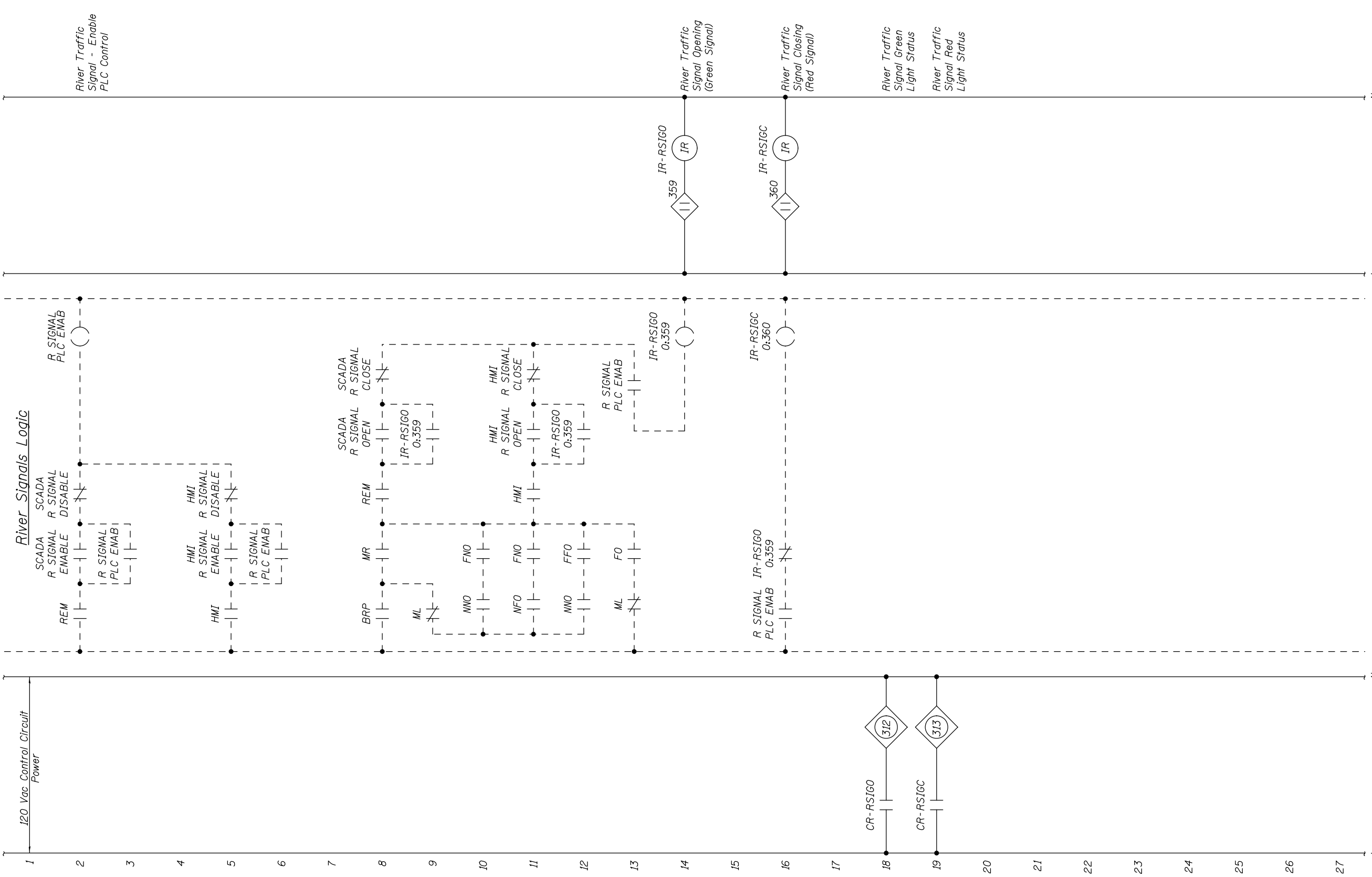
SHEET NO. 79 OF 97 SHEETS

RUBY, Drawing 01-079

HARDWIRED INPUTS

INTERNAL PLC LOGIC

HARDWIRED OUTPUTS



USER NAME =	DESIGNED - R.I. PETERS	REVISED	___
	CHECKED - J.G. STRENKOSKI	REVISED	___
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	___
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	___

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

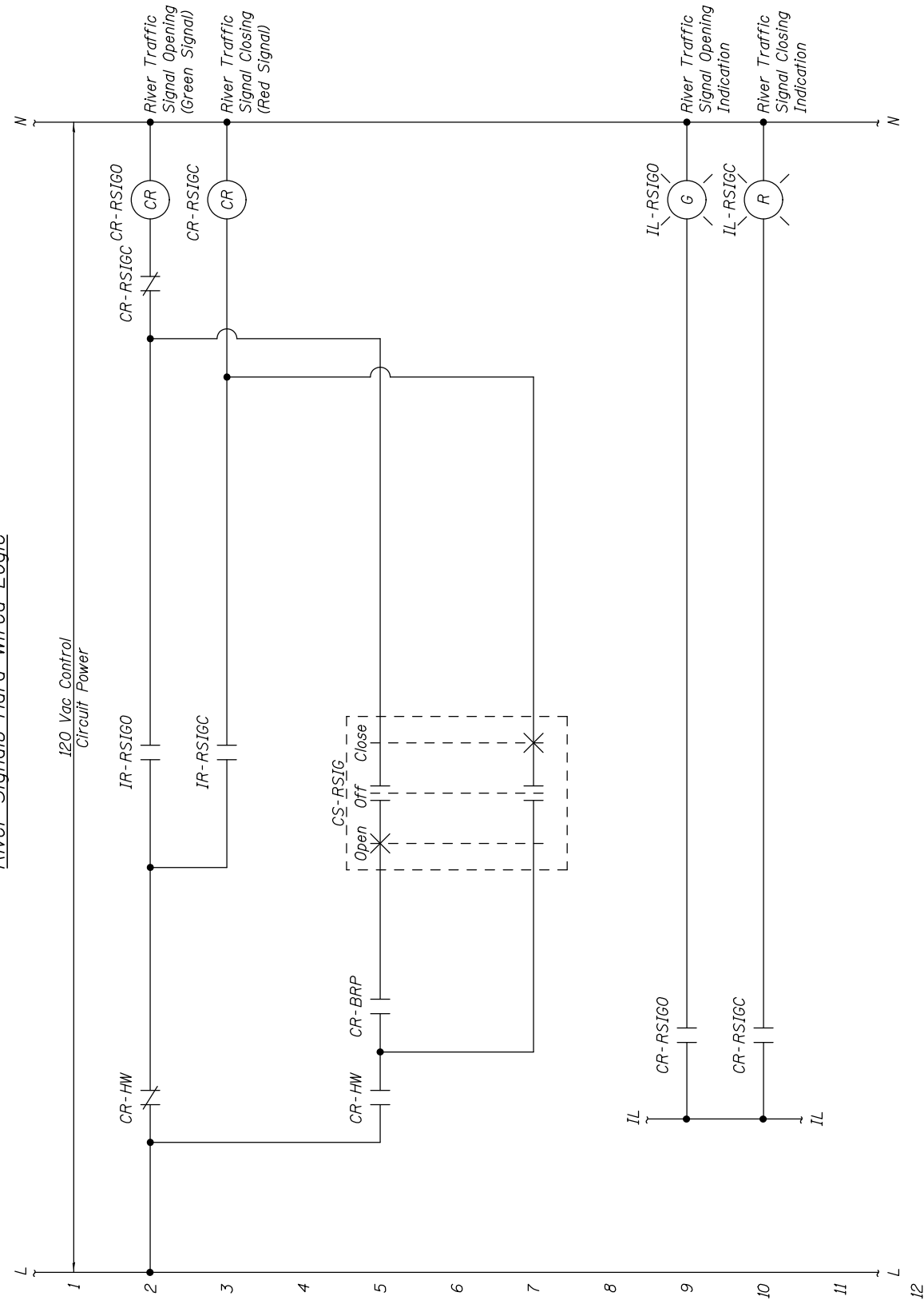
**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 43**

SHEET NO. 80 OF 97 SHEETS

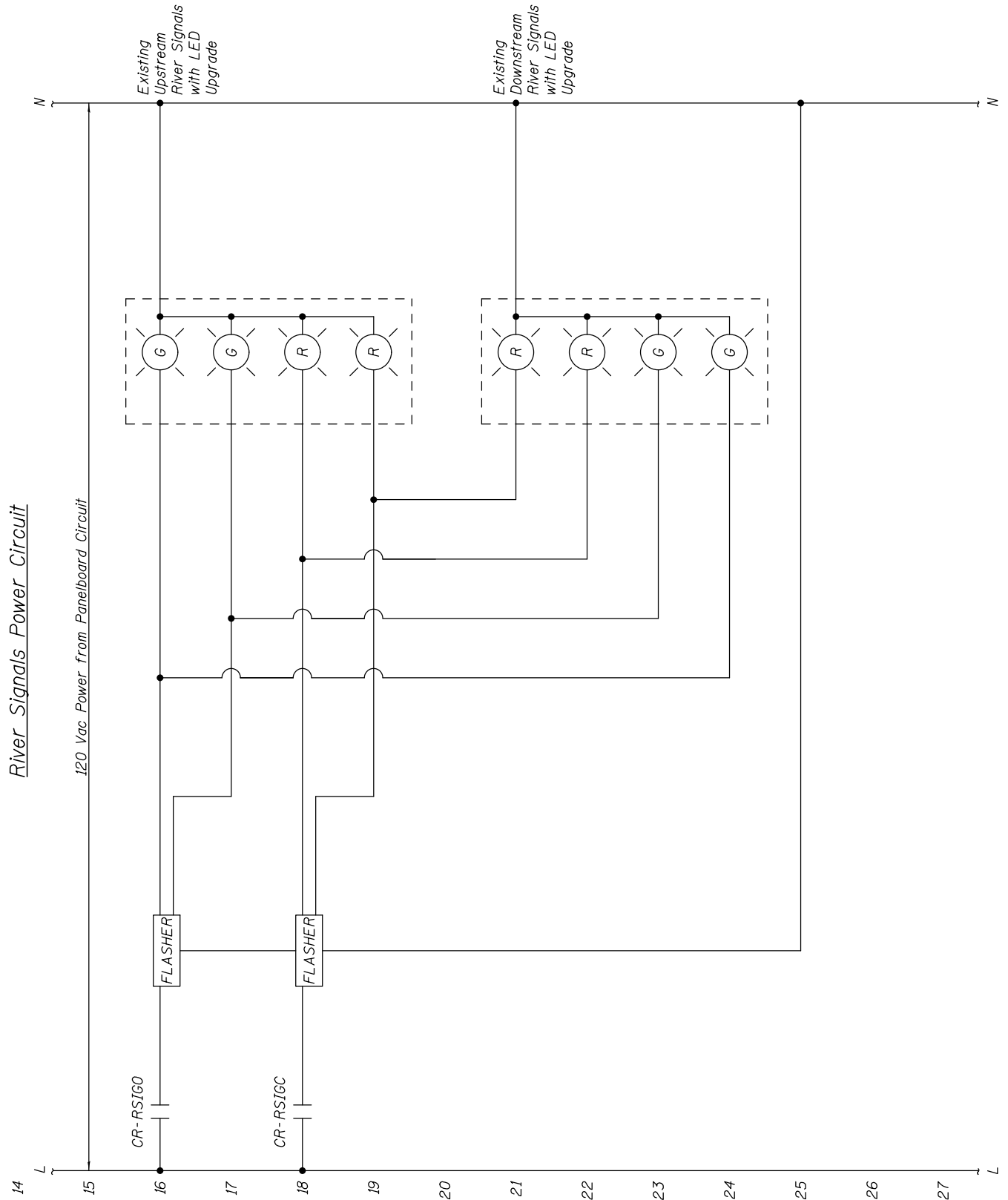
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	93
CONTRACT NO. 60P55				
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-080

River Signals Hard-Wired Logic



River Signals Power Circuit



NOTES:

1. Flashers shall alternately flash active lights.



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PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

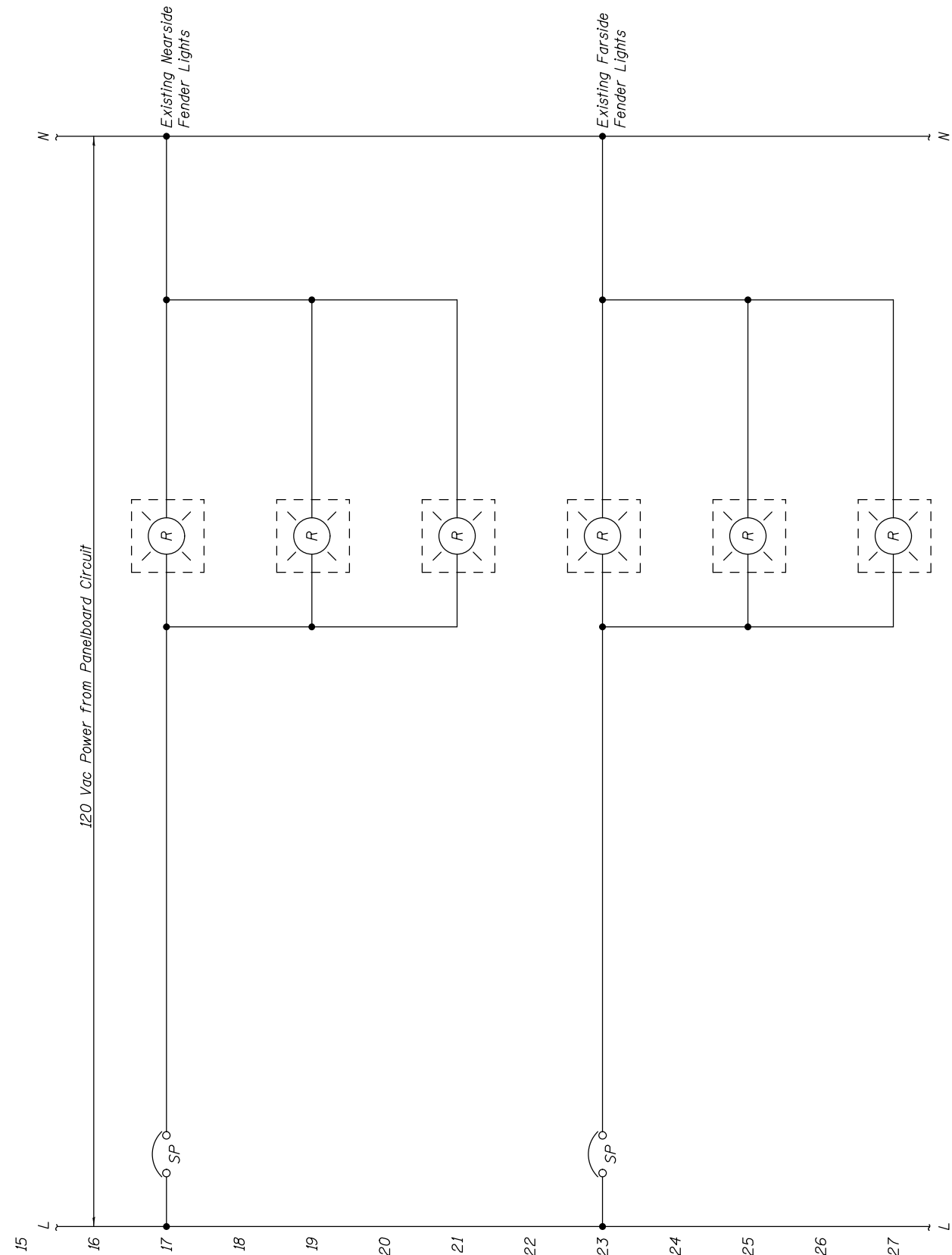
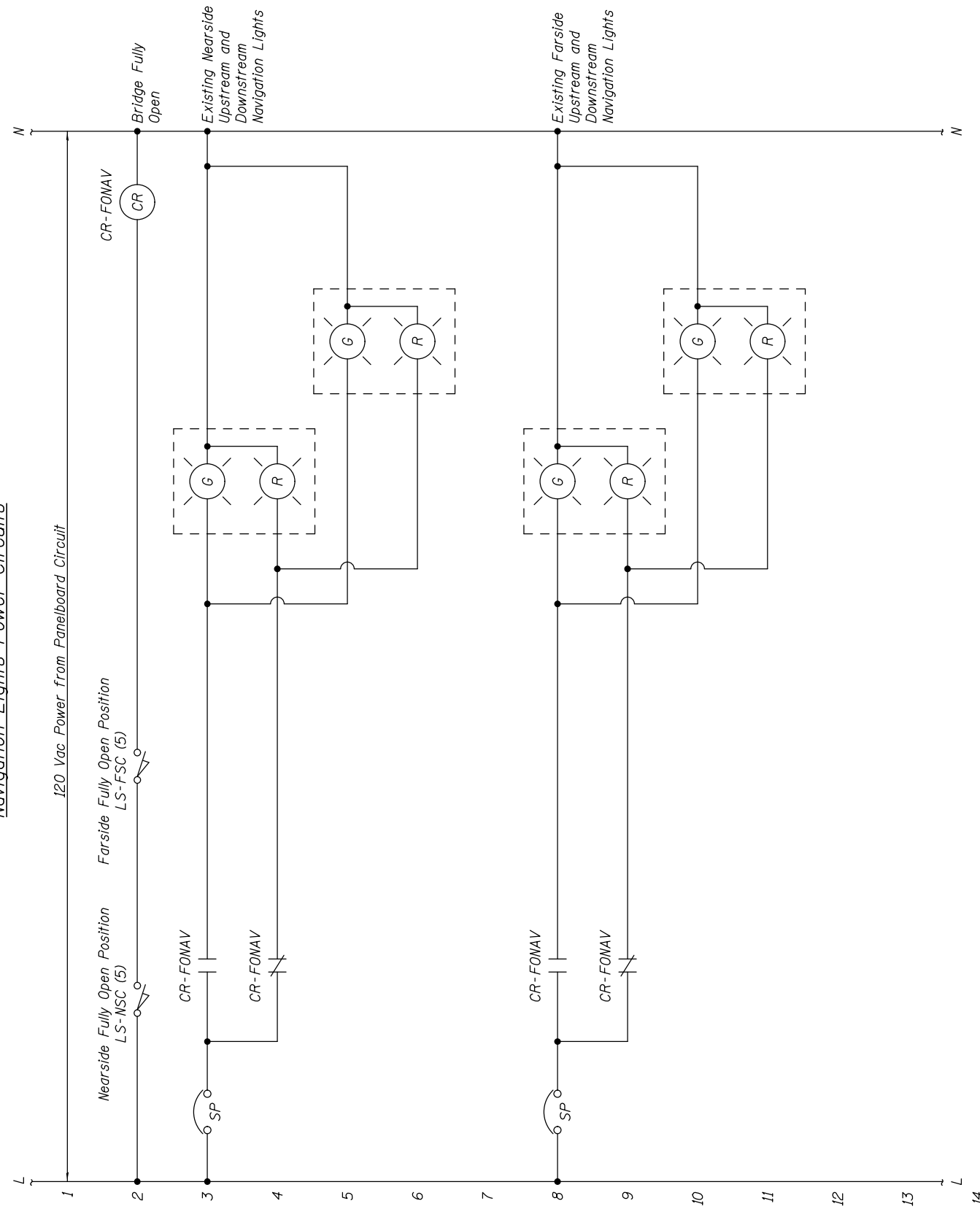
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 44**

SHEET NO. 81 OF 97 SHEETS

RUBY, Drawing 01-081			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-I	WILL	466
			SHEET NO. 94
CONTRACT NO. 60P55			
ILLINOIS FED. AID PROJECT			

Navigation Lights Power Circuits



NOTES:

1. Wire all limit switch sensor contacts back to main PLC cabinet for ease of maintenance and troubleshooting. Do not field "daisy chain" contacts device-to-device.
2. Existing span navigation and fender (pier) lights shall be reused.



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PLOT DATE =	CHECKED - J.G. STRENKOSKI	REVISED	---

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

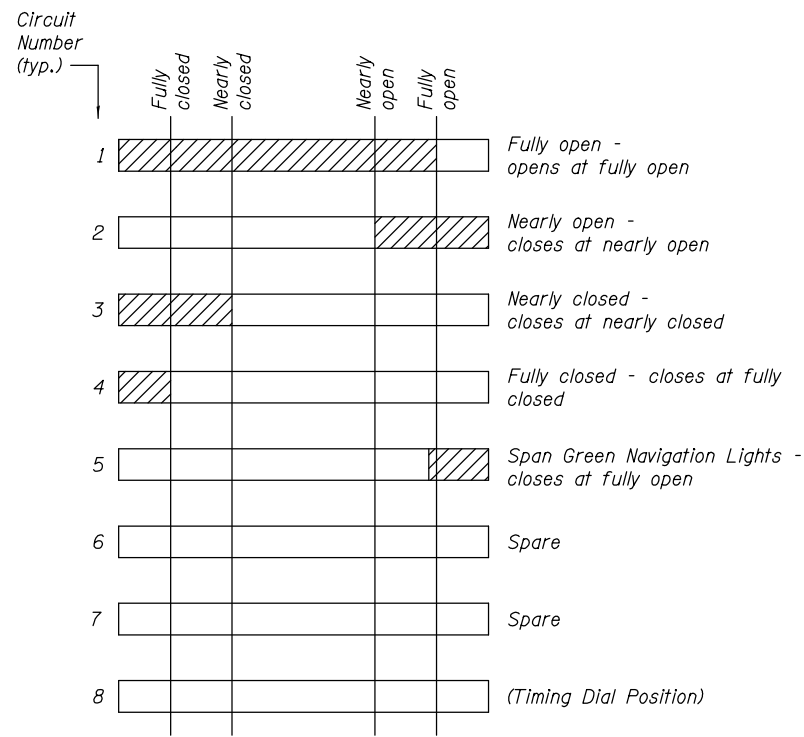
VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONTROL CIRCUIT - 45

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	95
CONTRACT NO. 60P55				

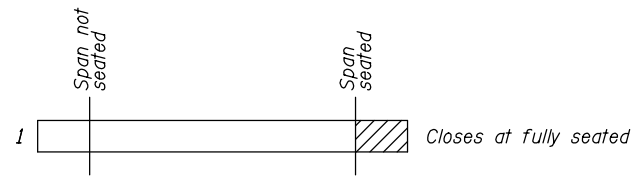
SHEET NO. 82 OF 97 SHEETS

ILLINOIS FED. AID PROJECT

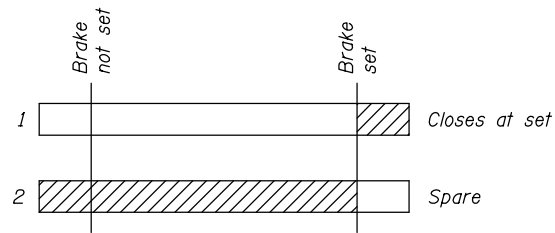
RUBY, Drawing 01-082



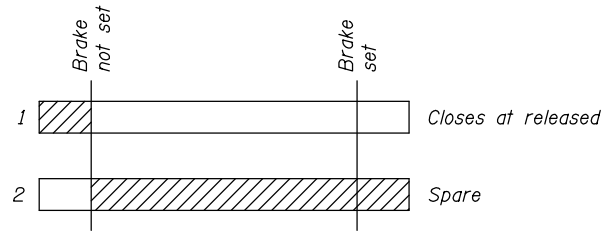
SPAN CONTROL ROTARY CAM LIMIT SWITCH
LS-FSC, LS-NSC



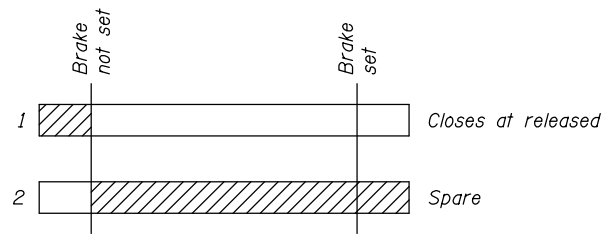
SPAN FULLY SEATED LIMIT SWITCH
LS-FFS, LS-NFS



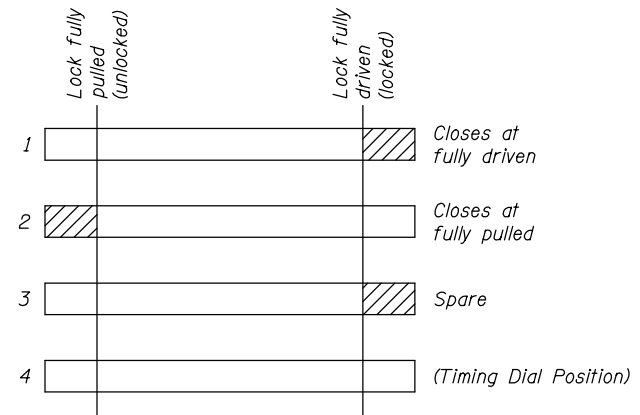
BRAKE SET LIMIT SWITCH
LS-FBAS, LS-FBBS, LS-FBCS,
LS-FBDS, LS-NBAS, LS-NBBS,
LS-NBCS, LS-NBDS



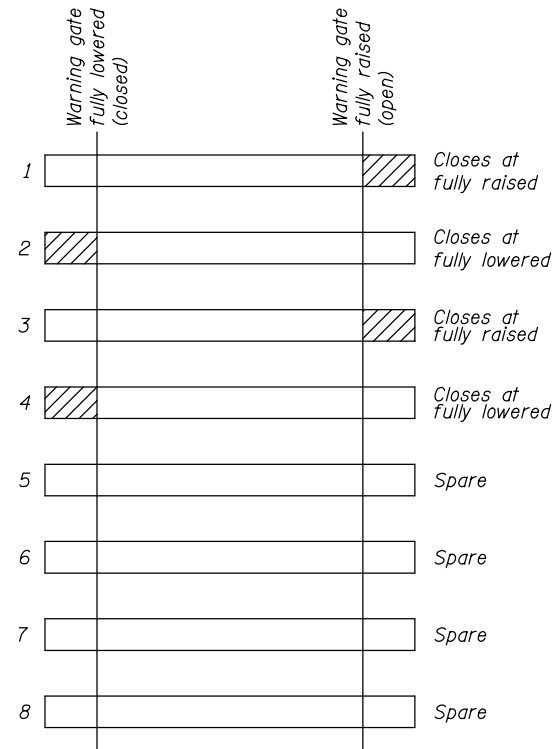
BRAKE RELEASED LIMIT SWITCH
LS-FBAR, LS-FBBR, LS-FBCR,
LS-FBDR, LS-NBAR, LS-NBBR,
LS-NBCR, LS-NBDR



BRAKE HAND-RELEASED LIMIT SWITCH
LS-FBAHR, LS-FBBHR, LS-FBCHR,
LS-FBDHR, LS-NBAHR, LS-NBBHR,
LS-NBCHR, LS-NBDHR

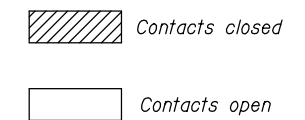


SPAN LOCK ROTARY CAM LIMIT SWITCH
LS-SLD, LS-SLP



TRAFFIC GATE LIMIT SWITCH
(see Jackson drawing 02-092 for repair details)
LS-NNGR/L, LS-NSGR/L,
LS-FNGR/L, LS-FSGR/L

LEGEND



USER NAME =	DESIGNED - R.I. PETERS	REVISED -
	CHECKED - L.V. BORDEN	REVISED -
PLOT SCALE =	DRAWN - R.L. REED	REVISED -
PLOT DATE =	CHECKED - R.I. PETERS	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - LIMIT SWITCH CHARTS**

SHEET NO. 83 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	96
CONTRACT NO. 60P55				

ILLINOIS FED. AID PROJECT

RUBY, Drawing 01-083

GROUP 100 EQUIPMENT

<i>Item No.</i>	<i>Quantity</i>	<i>Item Name</i>	<i>Description</i>
E101	1	Surge Protective Device (SPD)	Bridge electrical service SPD
E102	1	Power Monitor	Bridge electrical service power and energy meter
E103	1	Bus Monitor	Bridge electrical service ABC phase sequencing monitor
E104	4	200A Motor Disconnect Switch	Main drive DC motors, 4 pole
E105	N/A		
E106	9	30A Motor Disconnect Switch	Brake and span lock motors
E107	N/A		
E108	N/A		
E109	N/A		
E110	1	120/208V Panelboard, 18 Circuit	Replacement panelboard with breakers and accessories

GROUP 200 EQUIPMENT

<i>Item No.</i>	<i>Quantity</i>	<i>Item Name</i>	<i>Description</i>
E201	4	Traffic Gate Warning Gong	For existing traffic gates
E202	4	Machinery Warning Horn/Light	Machinery area startup warning
E203	2	Outdoor Warning Horn	Operator house exterior warning
E204	1	Rotary Cam Limit Switch	Span lock position sensing
E205	2	Boat Detection Sensor	Microwave transmitter and receiver sensor
E206	2	Rotary Cam Limit Switch/Resolver	Bridge position sensing
E207	4	Inclinometer	Bridge open angle sensing
E208	26	Magnetic Proximity Switch	Span fully seated and brake position sensing
E209	4	Motor Speed Switches	Main drive over-speed sensing
E210	14	Door Switch	Two piece magnetic contact switch for entry doors
E211	1	Fire Alarm & Security System	Monitor operator house for fire and intrusion

NOTES:

1. These equipment schedules are provided for reference and do not provide an exhaustive listing of all equipment required.
2. The Contractor shall be responsible for developing a complete bill of materials of equipment required.



USER NAME =	DESIGNED - R.I. PETERS	REVISED _____
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PLOT DATE =	CHECKED - K.M. GABLE	REVISED _____

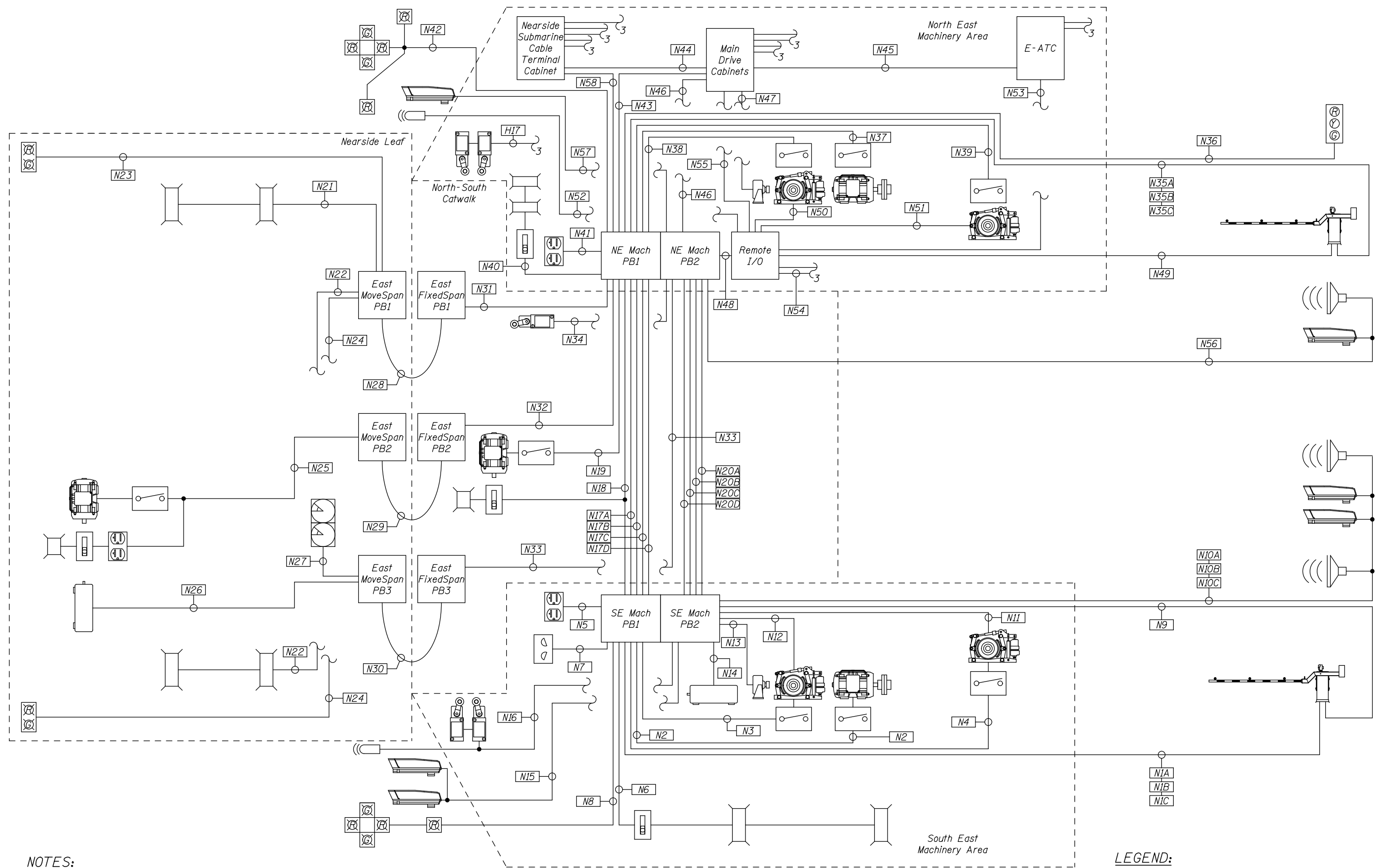
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET – ELECTRICAL EQUIPMENT SCHEDULE**

SHEET NO. 84 OF 97 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	97
			CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT				

RUBY, Drawing 01-084



NOTES:

1. This layout and the accompanying tabulations are for reference only. All required raceways and wiring are not necessarily shown on this layout.
2. The Contractor shall be responsible for developing a complete wiring and conduit tabulations for all conductors and cables.

LEGEND:

⌋ Indicates continued on Ruby Street - Conduit Diagram - 3



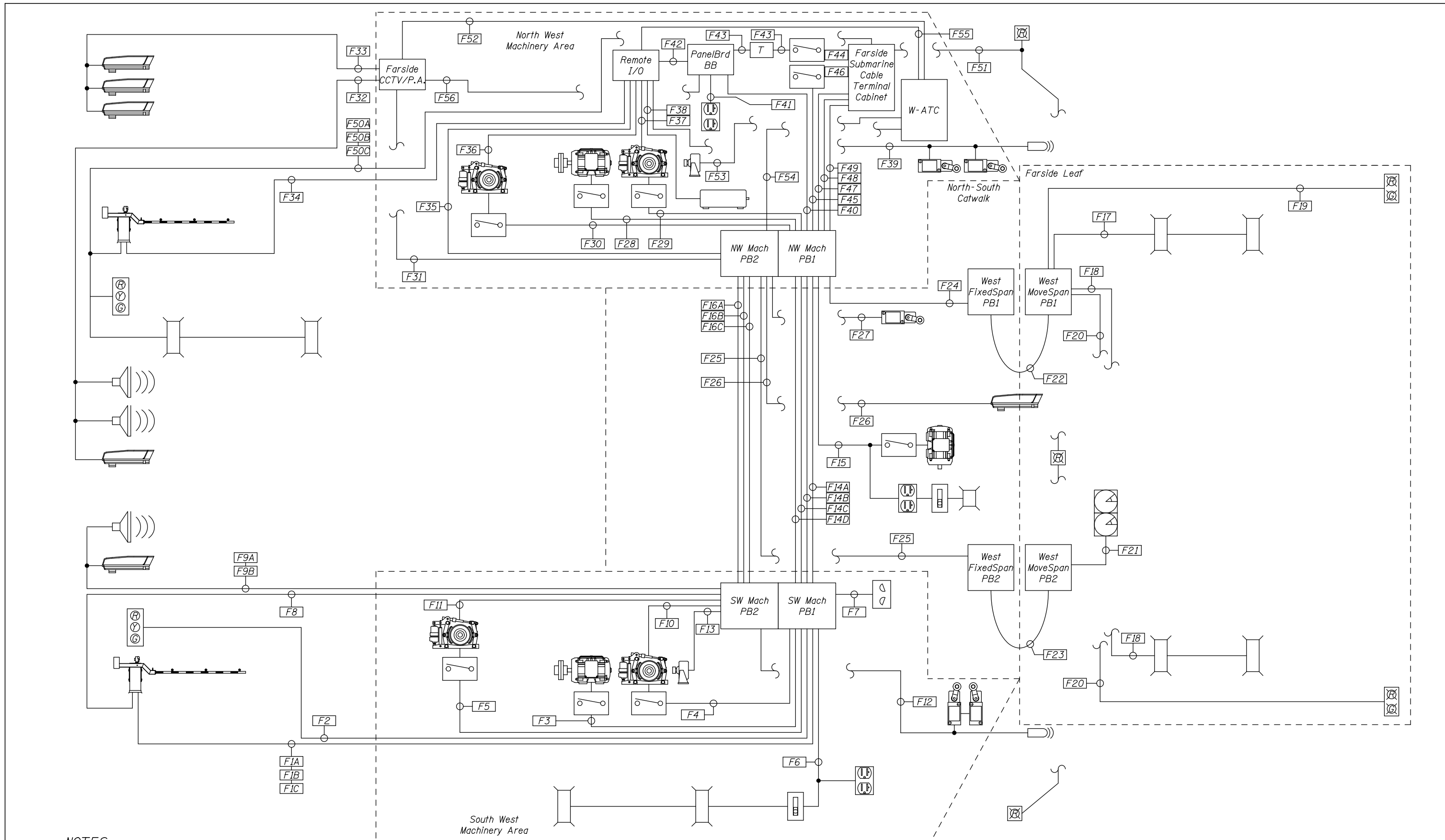
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	CHECKED - L.V. BORDEN	REVISED	---
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED	---
PLOT DATE =	CHECKED - K.M. GABLE	REVISED	---

**STATE OF ILLINOIS
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**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONDUIT DIAGRAM - 1**

SHEET NO. 85 OF 97 SHEETS

RUBY, Drawing 01-085			
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS
112	2011-045-1	WILL	466
			SHEET NO. 98
CONTRACT NO. 60P55			
ILLINOIS FED. AID PROJECT			



NOTES:

1. This layout and the accompanying tabulations are for reference only. All required raceways and wiring are not necessarily shown on this layout.
2. The Contractor shall be responsible for developing a complete wiring and conduit tabulations for all conductors and cables.



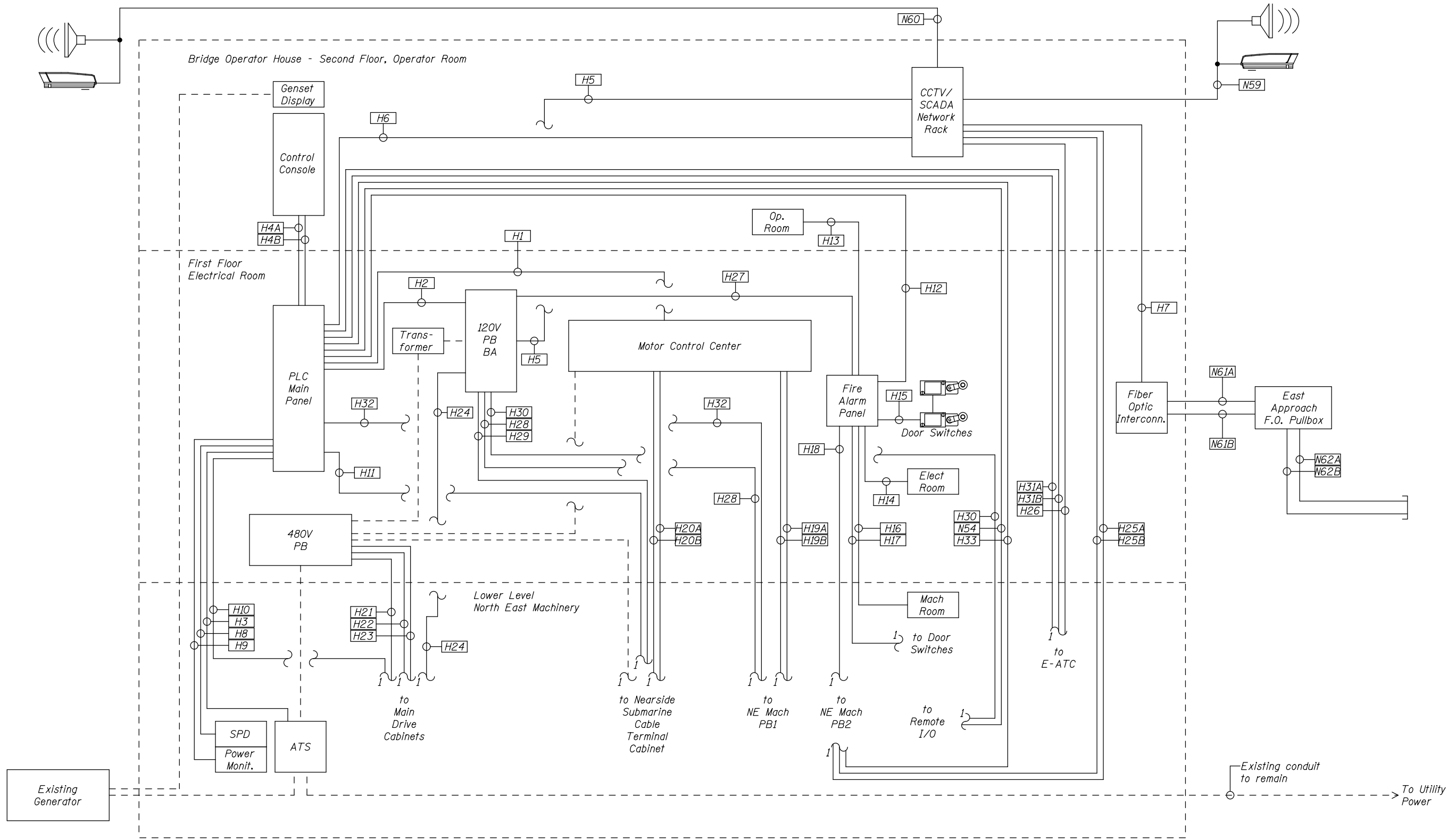
USER NAME =	DESIGNED - R.I. PETERS	REVISED -
	CHECKED - L.V. BORDEN	REVISED -
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED -
PLOT DATE =	CHECKED - K.M. GABLE	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONDUIT DIAGRAM - 2**

SHEET NO. 86 OF 97 SHEETS

RUBY, Drawing 01-086		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	99	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						



NOTES:

1. This layout and the accompanying tabulations are for reference only. All required raceways and wiring are not necessarily shown on this layout.
2. The Contractor shall be responsible for developing a complete wiring and conduit tabulations for all conductors and cables.

LEGEND:

⌋₁ Indicates continued on Ruby Street - Conduit Diagram - 1



USER NAME =	DESIGNED - R.I. PETERS	REVISED -
	CHECKED - L.V. BORDEN	REVISED -
PLOT SCALE =	DRAWN - R.I. PETERS	REVISED -
PLOT DATE =	CHECKED - K.M. GABLE	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**VARIOUS MOVABLE BRIDGES
LOCAL CENTRALIZED CONTROL AND OPERATION
RUBY STREET - CONDUIT DIAGRAM - 3**

SHEET NO. 87 OF 97 SHEETS

RUBY, Drawing 01-087		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
112	2011-045-I	WILL	466	100	CONTRACT NO. 60P55	
ILLINOIS FED. AID PROJECT						