



# ALASKA RAILROAD PASSENGER CAR WIRELESS AND WIFI SERVICE

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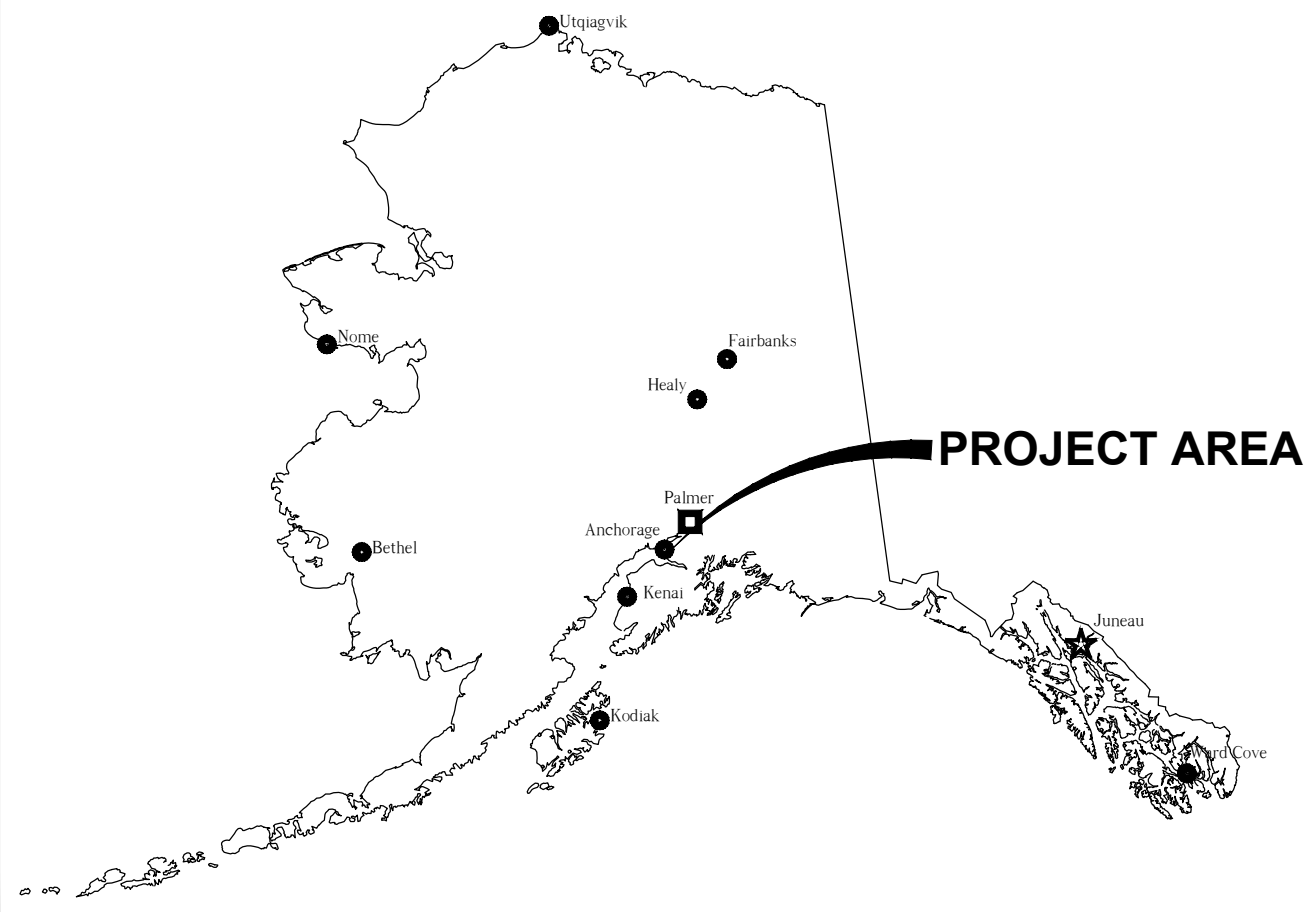
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## PROJECT INFORMATION

PROJECT LOCATION: ANCHORAGE, AK  
NHTI PROJECT NUMBER: 23-0117-20

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IFC

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

COVER  
SHEET

T1.0

GENERAL NOTES:

1. THE INTENT OF THIS DESIGN IS NOT TO DICTATE EXACT LOCATIONS OF EQUIPMENT AND CABLE PATHWAYS. SOME DEVIATION MAY BE REQUIRED. ANY SIGNIFICANT RELOCATIONS MUST BE APPROVED BY THE "OWNER."
2. BIDDERS ARE RESPONSIBLE FOR VERIFYING LOCATIONS AND QUANTITIES.
3. FOLLOW EQUIPMENT MANUFACTURER'S INSTALLATION AND OPERATION INSTRUCTIONS.
4. CARRIAGES EXPAND AND CONTRACT APPROXIMATELY 3 INCHES BETWEEN SUMMER AND WINTER. INSTALLER SHOULD ADJUST QUANTITIES ACCORDINGLY AND USE EXPANSION JOINTS WHERE APPLICABLE.
5. A 72 VDC, 10 AMP, FUSED CIRCUIT TO SUPPLY POWER TO THE SWITCH SUPPLIED BY ALASKA RAILROAD.

SPECIFICATIONS:

1. EN 50155 RAILWAY APPLICATIONS
2. EN 45545-2 FIRE PROTECTION.
3. NFPA 130 FIRE PROTECTION.
4. MINIMUM IP66 INGRESS PROTECTION.
5. LAYER 3, MANAGED, 12 PORT PoE/PoE+ SWITCH TO OPERATE ON 72 VDC.
6. MINIMUM OF TWO, 1 GBPS PORTS FOR THE BACKBONE NETWORK. WIRELESS INTER-CONSIST LINK (ICL).
7. ALL CABLES PLENUM RATED.
8. ARRC TO PROVIDE PAINT COLOR CODES FOR ANY SURFACE THAT REQUIRES PAINTING.
9. ALL PAINT BRANDS AND TYPES SHALL BE APPROVED BY ARRC.

WIRELESS INTER-CONSIST LINK (ICL):

1. WIFI 6
2. PoE/PoE+
3. OPERATES IN BRIDGE MODE
4. AUTO CONFIGURABLE
5. MEETS PCI SECURITY STANDARDS FOR THE TRANSMISSION OF CREDIT CARD DATA.
6. ANTENNA OPTIMIZED FOR ICL AND MEETS IP67 AND IP69 FOR OUTSIDE MOUNTING.
7. EXTERIOR MOUNTING HARDWARE STAINLESS STEEL AND PAINTED TO MATCH SURROUNDING AREA.
8. EVERY ATTEMPT SHOULD BE MADE TO MOUNT THE RADIO AS CLOSE TO THE ANTENNA AS POSSIBLE. KEEP COAX CABLE LENGTH UNDER 30 FT.
9. ANY EXPOSED CABLING TO BE PLACED IN WIRE MOLDING THAT IS PAINTED TO MATCH THE SURROUNDING SURFACES.

INTERIOR WIFI:

1. WIFI 5 OR 6.
2. RADIO AND ANTENNA ALL IN ONE UNIT AND LOW PROFILE FOR MAXIMUM HEAD CLEARANCE.
3. PoE/PoE+
4. AUTO CONFIGURABLE.
5. MEETS PCI SECURITY STANDARDS FOR THE TRANSMISSION OF CREDIT CARD DATA.
6. CONFIGURE A SEPARATE VLANS FOR CREDIT CARD PROCESSING AND GUEST WIFI.

INSTALLATION NOTES:

- ① MOUNT INSIDE CABINET/CLOSET IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- ② MOUNT IN THE OVERHEAD IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- ③ MOUNT ON EXPOSED VERTICAL SURFACE.
- ④ ALL IN ONE ACCESS POINT/ANTENNA FLUSH MOUNTED ON OVERHEAD SURFACE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- ⑤ MOUNT ON THE CENTER LINE OF THE CARRIAGE ABOVE THE DOOR AND BETWEEN COLLISION BARS, WITH NO OBSTRUCTIONS WITHIN 4" OF THE RF PATH. SEE DETAIL, SHEET 4.0.
- ⑥ ROUTE CABLE IN OVERHEAD.
- ⑦ ROUTE CABLE INSIDE ALUMINUM WIRE MOLDING WITH 3" EXPANSION JOINTS.
- ⑧ COAX TO BE KEPT AS SHORT AS POSSIBLE (30 FEET MAXIMUM) AND ROUTED IN OVERHEAD.
- ⑨ ANY EXPOSED CABLING TO BE PLACED IN WIRE MOLDING THAT IS PAINTED TO MATCH THE SURROUNDING SURFACES.
- ⑩ IF SPACE PERMITS, INSTALL A 5 FOOT SERVICE LOOP AT EACH END OF THE COAX AND DATA CABLE.
- ⑪ ANY PENETRATIONS TO THE EXTERIOR SHALL BE MADE BY ARRC.

EQUIPMENT LEGEND:

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ICL)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- ③ 12 PORT MANAGED LAYER 3 SWITCH (SW)
- ④ PATCH ANTENNA (ANT)
- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS

LEGEND:

- — CAT6A
- — COAX

CABLE LABEL:

1. CAR#/TYPE-SEQ/NEAR END EQUIP/DISTANT END EQUIP
2. LABEL EXAMPLE: ARR1-P-001/PDP-1/SW
3. LABEL BOTH ENDS OF CABLE AT CABLE TERMINATION



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IFC

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

ALASKA RAILROAD  
 PASSENGER CAR  
 WIRELESS AND WIFI  
 SERVICES

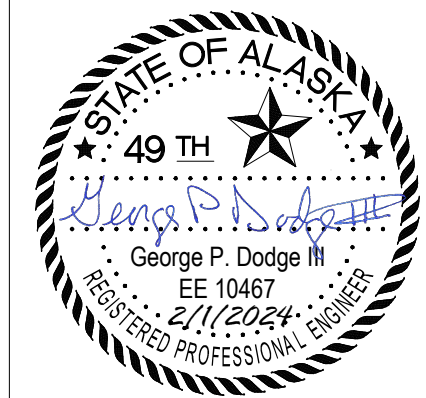
DWN: JAA	DSN: DBK	APP: GPD	REV
JOB #: 23-0117-20	DATE: 240201		0

ELECTRICAL  
 NOTES

E1.0



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 PASSENGER CAR  
 WIRELESS AND WIFI  
 SERVICES

DWN: JAA	DSN: DBK	APP: GPD	REV
JOB #: 23-0117-20	DATE: 240201		0

BILL OF  
 MATERIALS

E1.1

NOTE:  
 SEE CABLE SCHEDULE E1.4 - E1.6 FOR CABLE LENGTHS.

ARR 1				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 110				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 203				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 100				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 111				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 204				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 101				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 200				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 205				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 102				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 201				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 206				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 103				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 202				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 207				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION	ITEM NUMBER	QTY	UNIT	DESCRIPTION
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				



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 PASSENGER CAR  
 WIRELESS AND WIFI  
 SERVICES

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

BILL OF  
 MATERIALS

E1.2

NOTE:  
 SEE CABLE SCHEDULE E1.4 - E1.6 FOR CABLE LENGTHS.

ARR 208				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 352				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 501				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	85	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 209				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 401				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	85	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 502				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 210				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 451				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	90	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 521				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	85	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 301				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	85	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 452				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	90	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 522				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	85	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 351				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	105	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

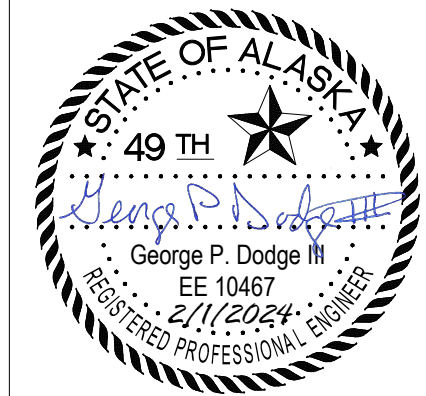
ARR 500				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	85	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 523				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7	85	FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CADE1.2 BILL OF MATERIALS.DWG | PLOT DATE: 240201



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IFC

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

ALASKA RAILROAD  
 PASSENGER CAR  
 WIRELESS AND WIFI  
 SERVICES

DWN: JAA	DSN: DBK	APP: GPD	REV
JOB #: 23-0117-20	DATE: 240201		0

BILL OF  
 MATERIALS

E1.3

NOTE:  
 SEE CABLE SCHEDULE E1.4 - E1.6 FOR CABLE LENGTHS.

ARR 551				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 556				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 654				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 552				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 557				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 655				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 553				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 651				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 656				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 554				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 652				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 751				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 555				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 653				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	2	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

ARR 2000				BILL OF MATERIALS			
ITEM NUMBER	QTY	UNIT	DESCRIPTION				
1	2	EA	ACCESS POINTS IN BRIDGE MODE (ILC)				
2	1	EA	ACCESS POINT IN CLIENT MODE (AP)				
3	1	EA	12 PORT SWITCH (SW)				
4	2	EA	PATCH ANTENNA (ANT)				
5		FT	CAT6A M12 TO M12				
6		FT	SPP-250-LLPL QMA TO QMA COAX				
7		FT	WIRE MOLDING				
8	1	FT	BREAKER/FUSE				
9		EA	POWER CABLE				

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CADE1.3 BILL OF MATERIALS.DWG | PLOT DATE: 240201

ATTENTION: ALL CABLE LENGTHS TO BE VERIFIED

NOTES:

1. CABLE LABEL FORMAT: CAR#/TYPE-SEQ/NEAR END EQUIP/DISTANT END EQUIP
2. CABLE LABEL EXAMPLE: ARR1/P-001/PDP-1/SW
3. LABEL BOTH ENDS OF CABLE AT CABLE TERMINATION
4. CABLE LENGTHS INCLUDE 5' SERVICE LOOP ON EACH END AND SHOULD BE VERIFIED

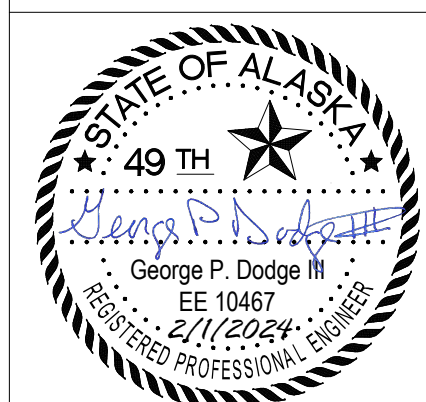
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 1	P	001	30	ARR1	/	PS-1	/	SW
ARR 1	D	001	65	ARR1	/	SW	/	AP-A
ARR 1	D	002	N/A	ARR1	/	SW	/	AP-B
ARR 1	D	003	13	ARR1	/	SW	/	ICL-A
ARR 1	D	004	100	ARR1	/	SW	/	ICL-B
ARR 1	R	001	16	ARR1	/	ICL-A	/	ANT-A-1
ARR 1	R	002	16	ARR1	/	ICL-A	/	ANT-A-2
ARR 1	R	003	20	ARR1	/	ICL-B	/	ANT-B-1
ARR 1	R	004	20	ARR1	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 100	P	001	30	ARR 100	/	PS-1	/	SW
ARR 100	D	001	31	ARR 100	/	SW	/	AP-A
ARR 100	D	002	N/A	ARR 100	/	SW	/	AP-B
ARR 100	D	003	36	ARR 100	/	SW	/	ICL-A
ARR 100	D	004	62	ARR 100	/	SW	/	ICL-B
ARR 100	R	001	16	ARR 100	/	ICL-A	/	ANT-A-1
ARR 100	R	002	16	ARR 100	/	ICL-A	/	ANT-A-2
ARR 100	R	003	16	ARR 100	/	ICL-B	/	ANT-B-1
ARR 100	R	004	16	ARR 100	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 101	P	001	30	ARR 101	/	PS-1	/	SW
ARR 101	D	001	31	ARR 101	/	SW	/	AP-A
ARR 101	D	002	N/A	ARR 101	/	SW	/	AP-B
ARR 101	D	003	36	ARR 101	/	SW	/	ICL-A
ARR 101	D	004	62	ARR 101	/	SW	/	ICL-B
ARR 101	R	001	16	ARR 101	/	ICL-A	/	ANT-A-1
ARR 101	R	002	16	ARR 101	/	ICL-A	/	ANT-A-2
ARR 101	R	003	16	ARR 101	/	ICL-B	/	ANT-B-1
ARR 101	R	004	16	ARR 101	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 102	P	001	30	ARR 102	/	PS-1	/	SW
ARR 102	D	001	31	ARR 102	/	SW	/	AP-A
ARR 102	D	002	N/A	ARR 102	/	SW	/	AP-B
ARR 102	D	003	36	ARR 102	/	SW	/	ICL-A
ARR 102	D	004	62	ARR 102	/	SW	/	ICL-B
ARR 102	R	001	16	ARR 102	/	ICL-A	/	ANT-A-1
ARR 102	R	002	16	ARR 102	/	ICL-A	/	ANT-A-2
ARR 102	R	003	16	ARR 102	/	ICL-B	/	ANT-B-1
ARR 102	R	004	16	ARR 102	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 103	P	001	30	ARR 103	/	PS-1	/	SW
ARR 103	D	001	31	ARR 103	/	SW	/	AP-A
ARR 103	D	002	N/A	ARR 103	/	SW	/	AP-B
ARR 103	D	003	36	ARR 103	/	SW	/	ICL-A
ARR 103	D	004	62	ARR 103	/	SW	/	ICL-B
ARR 103	R	001	16	ARR 103	/	ICL-A	/	ANT-A-1
ARR 103	R	002	16	ARR 103	/	ICL-A	/	ANT-A-2
ARR 103	R	003	16	ARR 103	/	ICL-B	/	ANT-B-1
ARR 103	R	004	16	ARR 103	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								

CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 110	P	001	30	ARR 110	/	PS-1	/	SW
ARR 110	D	001	24	ARR 110	/	SW	/	AP-A
ARR 110	D	002	N/A	ARR 110	/	SW	/	AP-B
ARR 110	D	003	33	ARR 110	/	SW	/	ICL-A
ARR 110	D	004	55	ARR 110	/	SW	/	ICL-B
ARR 110	R	001	16	ARR 110	/	ICL-A	/	ANT-A-1
ARR 110	R	002	16	ARR 110	/	ICL-A	/	ANT-A-2
ARR 110	R	003	16	ARR 110	/	ICL-B	/	ANT-B-1
ARR 110	R	004	16	ARR 110	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 111	P	001	30	ARR 111	/	PS-1	/	SW
ARR 111	D	001	24	ARR 111	/	SW	/	AP-A
ARR 111	D	002	N/A	ARR 111	/	SW	/	AP-B
ARR 111	D	003	33	ARR 111	/	SW	/	ICL-A
ARR 111	D	004	55	ARR 111	/	SW	/	ICL-B
ARR 111	R	001	16	ARR 111	/	ICL-A	/	ANT-A-1
ARR 111	R	002	16	ARR 111	/	ICL-A	/	ANT-A-2
ARR 111	R	003	16	ARR 111	/	ICL-B	/	ANT-B-1
ARR 111	R	004	16	ARR 111	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 200	P	001	30	ARR 200	/	PS-1	/	SW
ARR 200	D	001	55	ARR 200	/	SW	/	AP-A
ARR 200	D	002	N/A	ARR 200	/	SW	/	AP-B
ARR 200	D	003	13	ARR 200	/	SW	/	ICL-A
ARR 200	D	004	84	ARR 200	/	SW	/	ICL-B
ARR 200	R	001	19	ARR 200	/	ICL-A	/	ANT-A-1
ARR 200	R	002	19	ARR 200	/	ICL-A	/	ANT-A-2
ARR 200	R	003	21	ARR 200	/	ICL-B	/	ANT-B-1
ARR 200	R	004	21	ARR 200	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 201	P	001	30	ARR 201	/	PS-1	/	SW
ARR 201	D	001	55	ARR 201	/	SW	/	AP-A
ARR 201	D	002	N/A	ARR 201	/	SW	/	AP-B
ARR 201	D	003	13	ARR 201	/	SW	/	ICL-A
ARR 201	D	004	84	ARR 201	/	SW	/	ICL-B
ARR 201	R	001	19	ARR 201	/	ICL-A	/	ANT-A-1
ARR 201	R	002	19	ARR 201	/	ICL-A	/	ANT-A-2
ARR 201	R	003	21	ARR 201	/	ICL-B	/	ANT-B-1
ARR 201	R	004	21	ARR 201	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 202	P	001	30	ARR 202	/	PS-1	/	SW
ARR 202	D	001	55	ARR 202	/	SW	/	AP-A
ARR 202	D	002	N/A	ARR 202	/	SW	/	AP-B
ARR 202	D	003	13	ARR 202	/	SW	/	ICL-A
ARR 202	D	004	84	ARR 202	/	SW	/	ICL-B
ARR 202	R	001	19	ARR 202	/	ICL-A	/	ANT-A-1
ARR 202	R	002	19	ARR 202	/	ICL-A	/	ANT-A-2
ARR 202	R	003	21	ARR 202	/	ICL-B	/	ANT-B-1
ARR 202	R	004	21	ARR 202	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								

CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 203	P	001	30	ARR 203	/	PS-1	/	SW
ARR 203	D	001	55	ARR 203	/	SW	/	AP-A
ARR 203	D	002	N/A	ARR 203	/	SW	/	AP-B
ARR 203	D	003	13	ARR 203	/	SW	/	ICL-A
ARR 203	D	004	84	ARR 203	/	SW	/	ICL-B
ARR 203	R	001	19	ARR 203	/	ICL-A	/	ANT-A-1
ARR 203	R	002	19	ARR 203	/	ICL-A	/	ANT-A-2
ARR 203	R	003	21	ARR 203	/	ICL-B	/	ANT-B-1
ARR 203	R	004	21	ARR 203	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 204	P	001	30	ARR 204	/	PS-1	/	SW
ARR 204	D	001	55	ARR 204	/	SW	/	AP-A
ARR 204	D	002	N/A	ARR 204	/	SW	/	AP-B
ARR 204	D	003	13	ARR 204	/	SW	/	ICL-A
ARR 204	D	004	84	ARR 204	/	SW	/	ICL-B
ARR 204	R	001	19	ARR 204	/	ICL-A	/	ANT-A-1
ARR 204	R	002	19	ARR 204	/	ICL-A	/	ANT-A-2
ARR 204	R	003	21	ARR 204	/	ICL-B	/	ANT-B-1
ARR 204	R	004	21	ARR 204	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 205	P	001	30	ARR 205	/	PS-1	/	SW
ARR 205	D	001	55	ARR 205	/	SW	/	AP-A
ARR 205	D	002	N/A	ARR 205	/	SW	/	AP-B
ARR 205	D	003	13	ARR 205	/	SW	/	ICL-A
ARR 205	D	004	101	ARR 205	/	SW	/	ICL-B
ARR 205	R	001	16	ARR 205	/	ICL-A	/	ANT-A-1
ARR 205	R	002	16	ARR 205	/	ICL-A	/	ANT-A-2
ARR 205	R	003	13	ARR 205	/	ICL-B	/	ANT-B-1
ARR 205	R	004	13	ARR 205	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 206	P	001	30	ARR 206	/	PS-1	/	SW
ARR 206	D	001	55	ARR 206	/	SW	/	AP-A
ARR 206	D	002	N/A	ARR 206	/	SW	/	AP-B
ARR 206	D	003	13	ARR 206	/	SW	/	ICL-A
ARR 206	D	004	101	ARR 206	/	SW	/	ICL-B
ARR 206	R	001	16	ARR 206	/	ICL-A	/	ANT-A-1
ARR 206	R	002	16	ARR 206	/	ICL-A	/	ANT-A-2
ARR 206	R	003	13	ARR 206	/	ICL-B	/	ANT-B-1
ARR 206	R	004	13	ARR 206	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 207	P	001	30	ARR 207	/	PS-1	/	SW
ARR 207	D	001	55	ARR 207	/	SW	/	AP-A
ARR 207	D	002	N/A	ARR 207	/	SW	/	AP-B
ARR 207	D	003	13	ARR 207	/	SW	/	ICL-A
ARR 207	D	004	101	ARR 207	/	SW	/	ICL-B
ARR 207	R	001	16	ARR 207	/	ICL-A	/	ANT-A-1
ARR 207	R	002	16	ARR 207	/	ICL-A	/	ANT-A-2
ARR 207	R	003	13	ARR 207	/	ICL-B	/	ANT-B-1
ARR 207	R	004	13	ARR 207	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								



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REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	



ATTENTION: ALL CABLE LENGTHS TO BE VERIFIED

NOTES:

1. CABLE LABEL FORMAT: CAR#/TYPE-SEQ/NEAR END EQUIP/DISTANT END EQUIP
2. CABLE LABEL EXAMPLE: ARR1/P-001/PDP-1/SW
3. LABEL BOTH ENDS OF CABLE AT CABLE TERMINATION
4. CABLE LENGTHS INCLUDE 5' SERVICE LOOP ON EACH END AND SHOULD BE VERIFIED

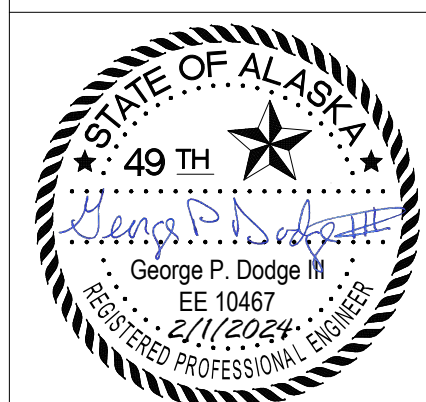
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 551	P	001		ARR 551	/	PS-1	/	SW
ARR 551	D	001	34	ARR 551	/	SW	/	AP-A
ARR 551	D	002	N/A	ARR 551	/	SW	/	AP-B
ARR 551	D	003	3	ARR 551	/	SW	/	ICL-A
ARR 551	D	004	69	ARR 551	/	SW	/	ICL-B
ARR 551	R	001	16	ARR 551	/	ICL-A	/	ANT-A-1
ARR 551	R	002	16	ARR 551	/	ICL-A	/	ANT-A-2
ARR 551	R	003	6	ARR 551	/	ICL-B	/	ANT-B-1
ARR 551	R	004	6	ARR 551	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 552	P	001		ARR 552	/	PS-1	/	SW
ARR 552	D	001	34	ARR 552	/	SW	/	AP-A
ARR 552	D	002	N/A	ARR 552	/	SW	/	AP-B
ARR 552	D	003	3	ARR 552	/	SW	/	ICL-A
ARR 552	D	004	69	ARR 552	/	SW	/	ICL-B
ARR 552	R	001	16	ARR 552	/	ICL-A	/	ANT-A-1
ARR 552	R	002	16	ARR 552	/	ICL-A	/	ANT-A-2
ARR 552	R	003	6	ARR 552	/	ICL-B	/	ANT-B-1
ARR 552	R	004	6	ARR 552	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 553	P	001		ARR 553	/	PS-1	/	SW
ARR 553	D	001	34	ARR 553	/	SW	/	AP-A
ARR 553	D	002	N/A	ARR 553	/	SW	/	AP-B
ARR 553	D	003	3	ARR 553	/	SW	/	ICL-A
ARR 553	D	004	69	ARR 553	/	SW	/	ICL-B
ARR 553	R	001	16	ARR 553	/	ICL-A	/	ANT-A-1
ARR 553	R	002	16	ARR 553	/	ICL-A	/	ANT-A-2
ARR 553	R	003	6	ARR 553	/	ICL-B	/	ANT-B-1
ARR 553	R	004	6	ARR 553	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 554	P	001		ARR 554	/	PS-1	/	SW
ARR 554	D	001	34	ARR 554	/	SW	/	AP-A
ARR 554	D	002	N/A	ARR 554	/	SW	/	AP-B
ARR 554	D	003	3	ARR 554	/	SW	/	ICL-A
ARR 554	D	004	69	ARR 554	/	SW	/	ICL-B
ARR 554	R	001	16	ARR 554	/	ICL-A	/	ANT-A-1
ARR 554	R	002	16	ARR 554	/	ICL-A	/	ANT-A-2
ARR 554	R	003	6	ARR 554	/	ICL-B	/	ANT-B-1
ARR 554	R	004	6	ARR 554	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 555	P	001		ARR 555	/	PS-1	/	SW
ARR 555	D	001	40	ARR 555	/	SW	/	AP-A
ARR 555	D	002	N/A	ARR 555	/	SW	/	AP-B
ARR 555	D	003	3	ARR 555	/	SW	/	ICL-A
ARR 555	D	004	79	ARR 555	/	SW	/	ICL-B
ARR 555	R	001	4	ARR 555	/	ICL-A	/	ANT-A-1
ARR 555	R	002	4	ARR 555	/	ICL-A	/	ANT-A-2
ARR 555	R	003	9	ARR 555	/	ICL-B	/	ANT-B-1
ARR 555	R	004	9	ARR 555	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								

CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 556	P	001	30	ARR 556	/	PS-1	/	SW
ARR 556	D	001	55	ARR 556	/	SW	/	AP-A
ARR 556	D	002	N/A	ARR 556	/	SW	/	AP-B
ARR 556	D	003	13	ARR 556	/	SW	/	ICL-A
ARR 556	D	004	89	ARR 556	/	SW	/	ICL-B
ARR 556	R	001	14	ARR 556	/	ICL-A	/	ANT-A-1
ARR 556	R	002	14	ARR 556	/	ICL-A	/	ANT-A-2
ARR 556	R	003	19	ARR 556	/	ICL-B	/	ANT-B-1
ARR 556	R	004	19	ARR 556	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 557	P	001	30	ARR 557	/	PS-1	/	SW
ARR 557	D	001	55	ARR 557	/	SW	/	AP-A
ARR 557	D	002	N/A	ARR 557	/	SW	/	AP-B
ARR 557	D	003	13	ARR 557	/	SW	/	ICL-A
ARR 557	D	004	89	ARR 557	/	SW	/	ICL-B
ARR 557	R	001	14	ARR 557	/	ICL-A	/	ANT-A-1
ARR 557	R	002	14	ARR 557	/	ICL-A	/	ANT-A-2
ARR 557	R	003	19	ARR 557	/	ICL-B	/	ANT-B-1
ARR 557	R	004	19	ARR 557	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 651	P	001	30	ARR 651	/	PS-1	/	SW
ARR 651	D	001	67	ARR 651	/	SW	/	AP-A
ARR 651	D	002	123	ARR 651	/	SW	/	AP-B
ARR 651	D	003	90	ARR 651	/	SW	/	ICL-A
ARR 651	D	004	13	ARR 651	/	SW	/	ICL-B
ARR 651	R	001	20	ARR 651	/	ICL-A	/	ANT-A-1
ARR 651	R	002	20	ARR 651	/	ICL-A	/	ANT-A-2
ARR 651	R	003	20	ARR 651	/	ICL-B	/	ANT-B-1
ARR 651	R	004	20	ARR 651	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 652	P	001	30	ARR 652	/	PS-1	/	SW
ARR 652	D	001	67	ARR 652	/	SW	/	AP-A
ARR 652	D	002	123	ARR 652	/	SW	/	AP-B
ARR 652	D	003	90	ARR 652	/	SW	/	ICL-A
ARR 652	D	004	13	ARR 652	/	SW	/	ICL-B
ARR 652	R	001	20	ARR 652	/	ICL-A	/	ANT-A-1
ARR 652	R	002	20	ARR 652	/	ICL-A	/	ANT-A-2
ARR 652	R	003	20	ARR 652	/	ICL-B	/	ANT-B-1
ARR 652	R	004	20	ARR 652	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 653	P	001	30	ARR 653	/	PS-1	/	SW
ARR 653	D	001	67	ARR 653	/	SW	/	AP-A
ARR 653	D	002	123	ARR 653	/	SW	/	AP-B
ARR 653	D	003	90	ARR 653	/	SW	/	ICL-A
ARR 653	D	004	13	ARR 653	/	SW	/	ICL-B
ARR 653	R	001	20	ARR 653	/	ICL-A	/	ANT-A-1
ARR 653	R	002	20	ARR 653	/	ICL-A	/	ANT-A-2
ARR 653	R	003	20	ARR 653	/	ICL-B	/	ANT-B-1
ARR 653	R	004	20	ARR 653	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								

CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 654	P	001	30	ARR 654	/	PS-1	/	SW
ARR 654	D	001	67	ARR 654	/	SW	/	AP-A
ARR 654	D	002	123	ARR 654	/	SW	/	AP-B
ARR 654	D	003	90	ARR 654	/	SW	/	ICL-A
ARR 654	D	004	13	ARR 654	/	SW	/	ICL-B
ARR 654	R	001	20	ARR 654	/	ICL-A	/	ANT-A-1
ARR 654	R	002	20	ARR 654	/	ICL-A	/	ANT-A-2
ARR 654	R	003	20	ARR 654	/	ICL-B	/	ANT-B-1
ARR 654	R	004	20	ARR 654	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 655	P	001	30	ARR 655	/	PS-1	/	SW
ARR 655	D	001	67	ARR 655	/	SW	/	AP-A
ARR 655	D	002	123	ARR 655	/	SW	/	AP-B
ARR 655	D	003	90	ARR 655	/	SW	/	ICL-A
ARR 655	D	004	13	ARR 655	/	SW	/	ICL-B
ARR 655	R	001	20	ARR 655	/	ICL-A	/	ANT-A-1
ARR 655	R	002	20	ARR 655	/	ICL-A	/	ANT-A-2
ARR 655	R	003	20	ARR 655	/	ICL-B	/	ANT-B-1
ARR 655	R	004	20	ARR 655	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 656	P	001	30	ARR 656	/	PS-1	/	SW
ARR 656	D	001	67	ARR 656	/	SW	/	AP-A
ARR 656	D	002	123	ARR 656	/	SW	/	AP-B
ARR 656	D	003	90	ARR 656	/	SW	/	ICL-A
ARR 656	D	004	13	ARR 656	/	SW	/	ICL-B
ARR 656	R	001	20	ARR 656	/	ICL-A	/	ANT-A-1
ARR 656	R	002	20	ARR 656	/	ICL-A	/	ANT-A-2
ARR 656	R	003	20	ARR 656	/	ICL-B	/	ANT-B-1
ARR 656	R	004	20	ARR 656	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 751	P	001	30	ARR 751	/	PS-1	/	SW
ARR 751	D	001	56	ARR 751	/	SW	/	AP-A
ARR 751	D	002	84	ARR 751	/	SW	/	AP-B
ARR 751	D	003	13	ARR 751	/	SW	/	ICL-A
ARR 751	D	004	93	ARR 751	/	SW	/	ICL-B
ARR 751	R	001	20	ARR 751	/	ICL-A	/	ANT-A-1
ARR 751	R	002	20	ARR 751	/	ICL-A	/	ANT-A-2
ARR 751	R	003	16	ARR 751	/	ICL-B	/	ANT-B-1
ARR 751	R	004	16	ARR 751	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								
CABLE NUMBER				LABEL (REVERSE LABEL OTHER END)				
CAR #	TYPE	SEQ	LENGTH FT	CAR #	SEPERATOR	EQUIP FROM	SEPERATOR	EQUIP TO
ARR 2000	P	001	30	ARR 2000	/	PS-1	/	SW
ARR 2000	D	001	46	ARR 2000	/	SW	/	AP-A
ARR 2000	D	002	N/A	ARR 2000	/	SW	/	AP-B
ARR 2000	D	003	28	ARR 2000	/	SW	/	ICL-A
ARR 2000	D	004	67	ARR 2000	/	SW	/	ICL-B
ARR 2000	R	001	13	ARR 2000	/	ICL-A	/	ANT-A-1
ARR 2000	R	002	13	ARR 2000	/	ICL-A	/	ANT-A-2
ARR 2000	R	003	25	ARR 2000	/	ICL-B	/	ANT-B-1
ARR 2000	R	004	25	ARR 2000	/	ICL-B	/	ANT-B-2
P - POWER D - DATA R - RF								



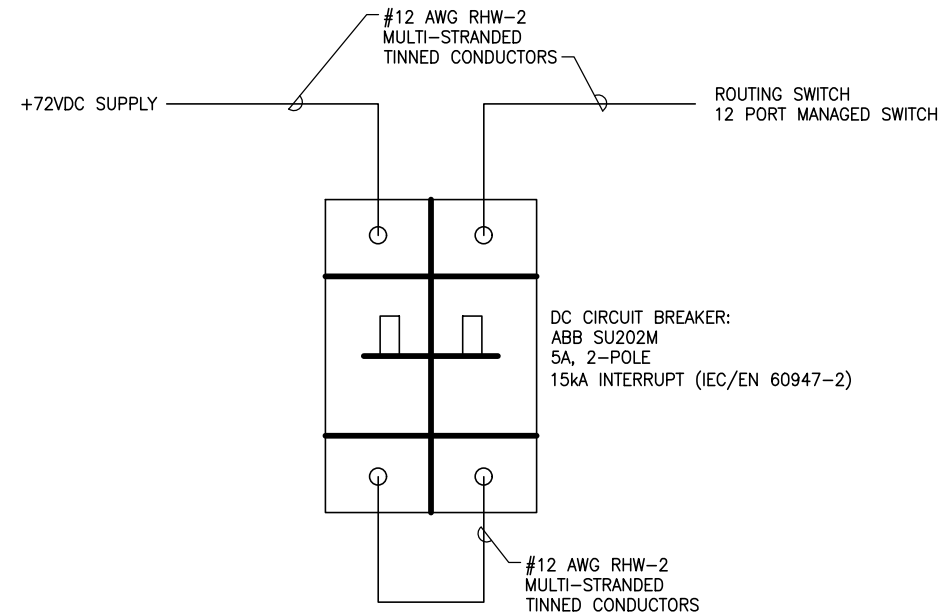
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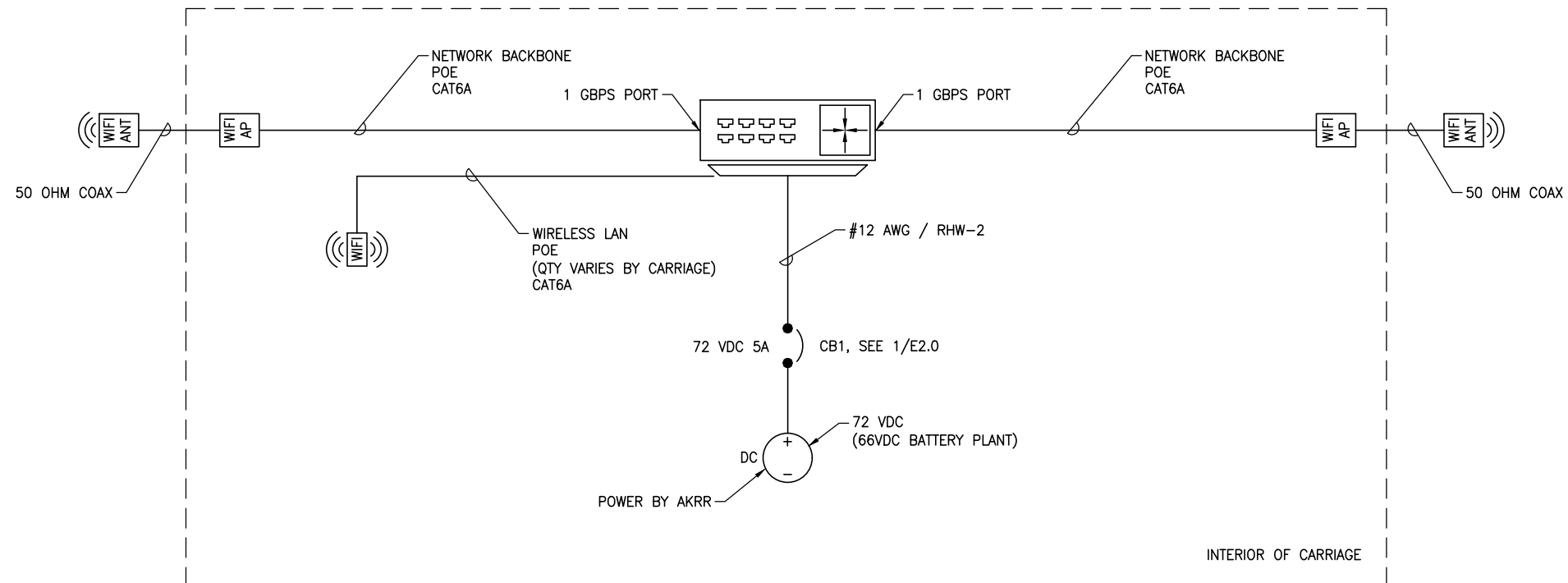
REV	DESCRIPTION	DATE
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TO GET THE REQUIRED VOLTAGE RATING (72VDC) A 2-POLE CIRCUIT BREAKER CONNECTED IN SERIES IS REQUIRED.

**1**  
**E2.0** **BREAKER CONFIGURATION DETAIL**  
SCALE: NTS



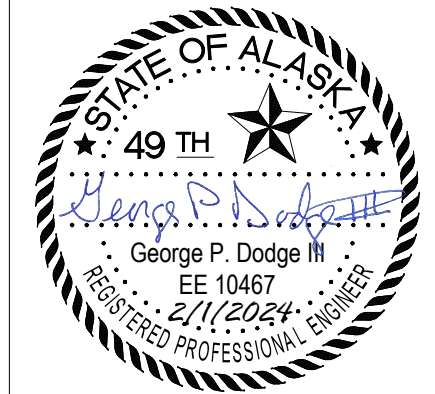
**2**  
**E2.0** **ELECTRICAL ONE-LINE DIAGRAM**  
SCALE: NTS

**NOTES:**

1. THIS ONE-LINE DIAGRAM TYPICAL OF ALL RAILROAD CARS IN THIS DRAWING PACKAGE.
2. ALL CONDUCTORS TO BE COPPER.
3. CONDUCTORS TO BE ROUTED AND INSTALLED PER ARRC SPECIFICATIONS AND STANDARDS.
4. CIRCUIT BREAKER CB1 TO BE INSTALLED IN A PROTECTED LOCATION ANYWHERE BETWEEN THE DC POWER SOURCE AND THE ROUTING SWITCH.



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**IFC**

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ELECTRICAL  
ONE-LINE DIAGRAM**

**E2.0**

**NOTES:**

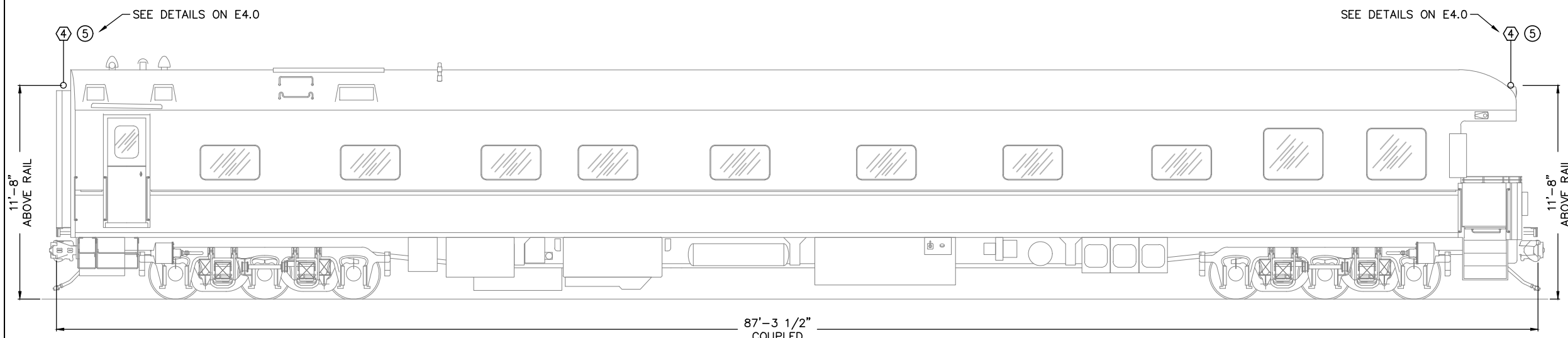
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

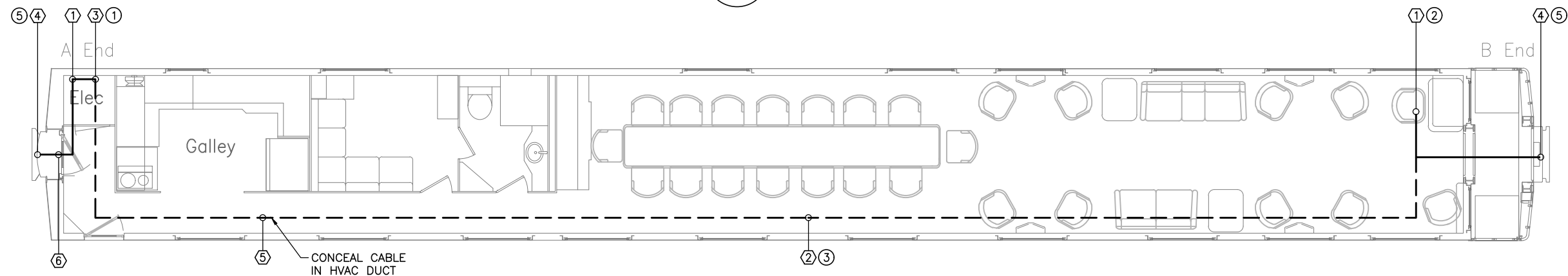
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- 1 ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- 2 ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- 3 12 PORT MANAGED LAYER 3 SWITCH (SW)
- 4 PATCH ANTENNA (ANT)
- 5 CAT6A M12 CONNECTOR TO M12 CONNECTOR
- 6 COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- 7 WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



**A**  
**E3.0** CAR ARR 1 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.0** CAR ARR 1 - PLAN VIEW  
SCALE: NOT TO SCALE



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0	ISSUE FOR CONSTRUCTION	240201

**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 1  
DENALI BUSINESS  
CAR  
E3.0**

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CADE3.0 ARR 1 DENALI BUSINESS CAR.DWG | PLOT DATE: 240201

**NOTES:**

1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

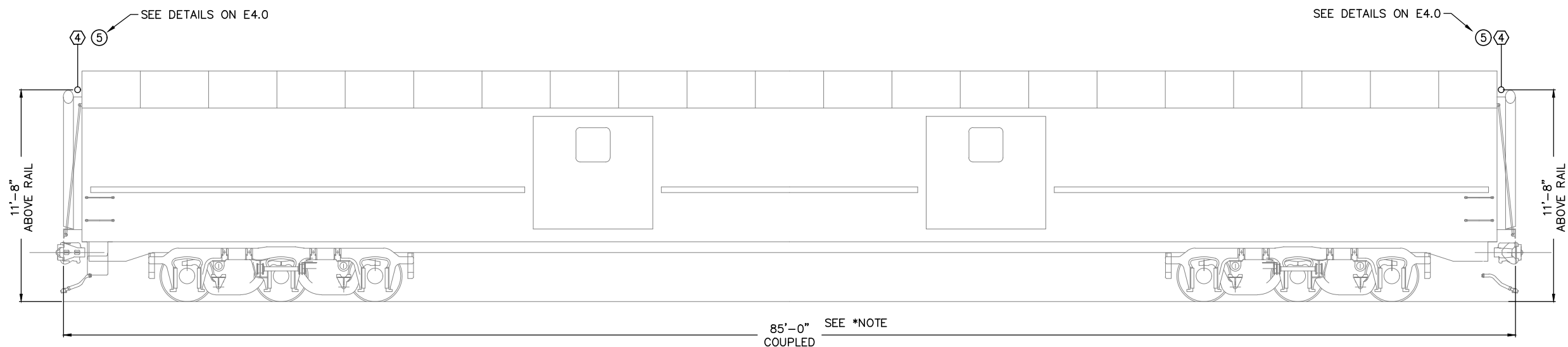
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

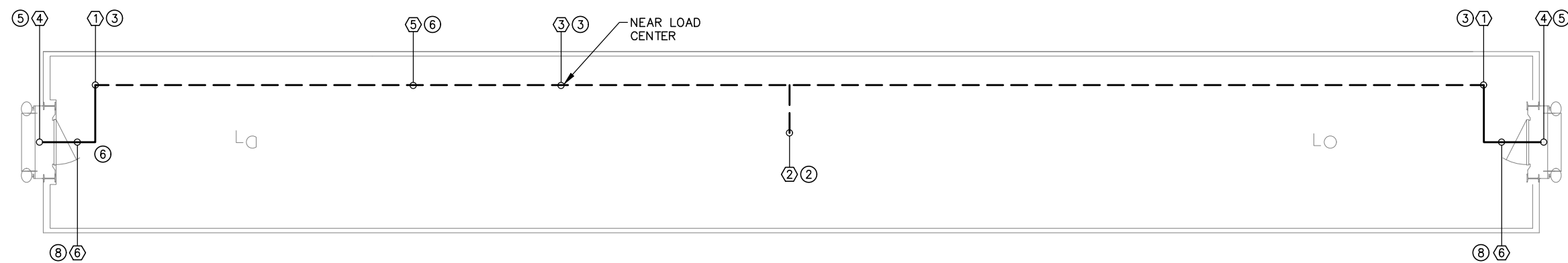
- 1 ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- 2 ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- 3 12 PORT MANAGED LAYER 3 SWITCH (SW)
- 4 PATCH ANTENNA (ANT)
- 5 CAT6A M12 CONNECTOR TO M12 CONNECTOR
- 6 COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- 7 WIRE MOLDING WITH 3 INCH EXPANSION JOINTS

**\*NOTE:**

THE COUPLED LENGTH OF THE CARRIAGES:  
 100-103 ~85 FEET  
 110 AND 111 ~75 FEET



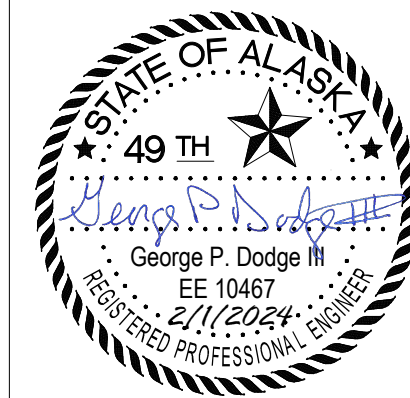
**A**  
**E3.1** CARS ARR 100 - 103, 110, 111 - ELEVATION  
 SCALE: NOT TO SCALE



**1**  
**E3.1** CARS ARR 100 - 103, 110, 111 - PLAN VIEW  
 SCALE: NOT TO SCALE



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REV	DESCRIPTION	DATE
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**ALASKA RAILROAD  
 PASSENGER CAR  
 WIRELESS AND WIFI  
 SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV
JOB #: 23-0117-20	DATE: 240201		0

**ARR  
 100 - 103, 110, 111  
 BAGGAGE CARS**

**E3.1**

**NOTES:**

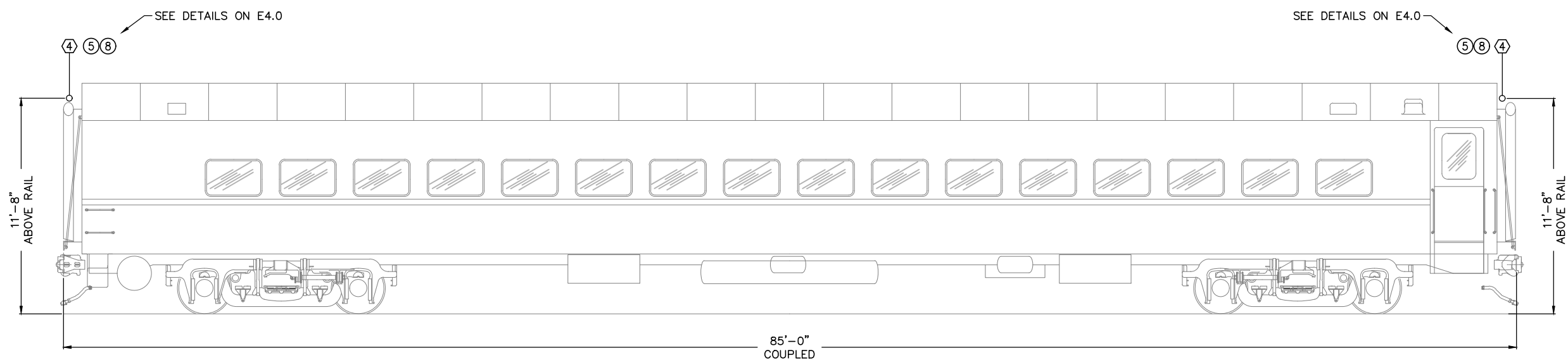
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

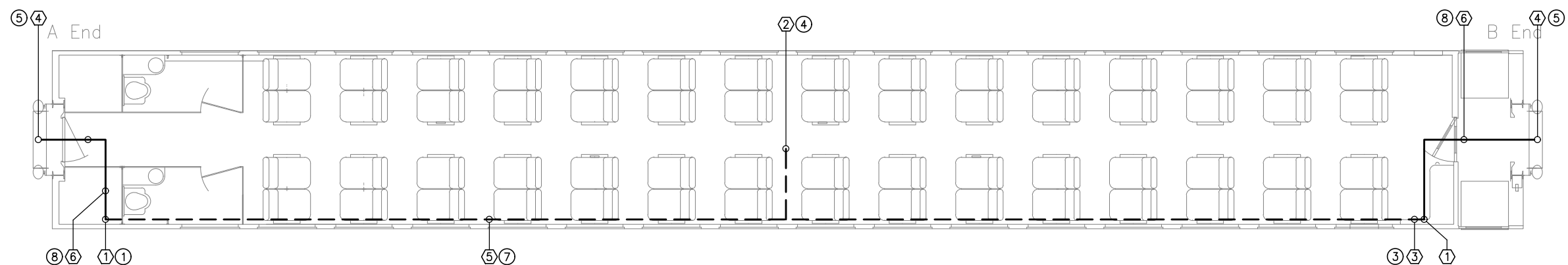
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- ③ 12 PORT MANAGED LAYER 3 SWITCH (SW)
- ④ PATCH ANTENNA (ANT)
- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



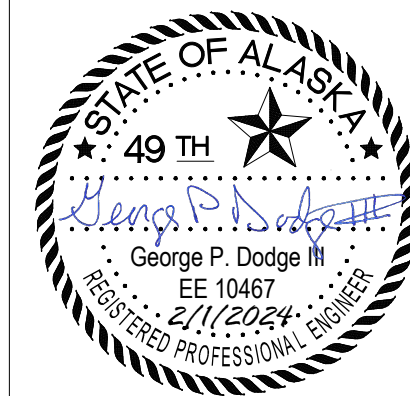
**A**  
**E3.2** CAR ARR 200 - 204 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.2** CAR ARR 200 - 204 - PLAN VIEW  
SCALE: NOT TO SCALE



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REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR  
200 - 204  
COACH CARS  
E3.2**

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CA\DE3.2 ARR 200-204 COACH CAR.DWG | PLOT DATE: 240201

**NOTES:**

1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

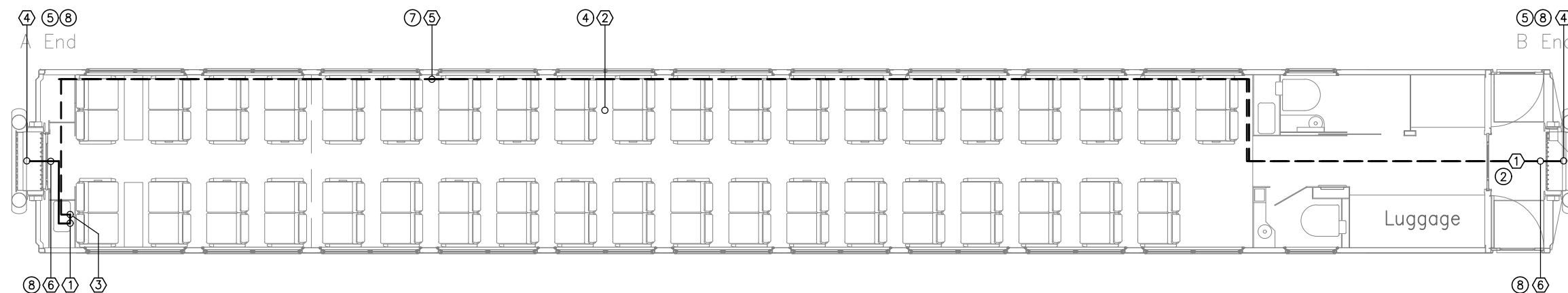
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- ③ 12 PORT MANAGED LAYER 3 SWITCH (SW)
- ④ PATCH ANTENNA (ANT)
- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



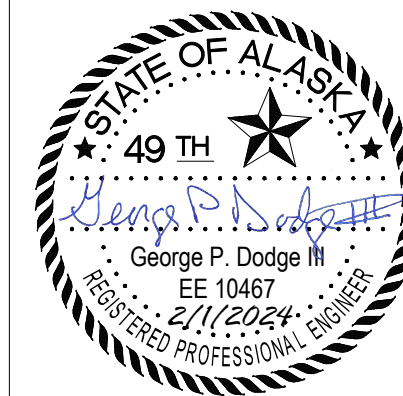
**A**  
**E3.3** CAR ARR 205 - 210 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.3** CAR ARR 205 - 210 - PLAN VIEW  
SCALE: NOT TO SCALE



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REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV
JOB #: 23-0117-20	DATE: 240201		0

**ARR  
205 - 210  
COACH CARS  
E3.3**

**NOTES:**

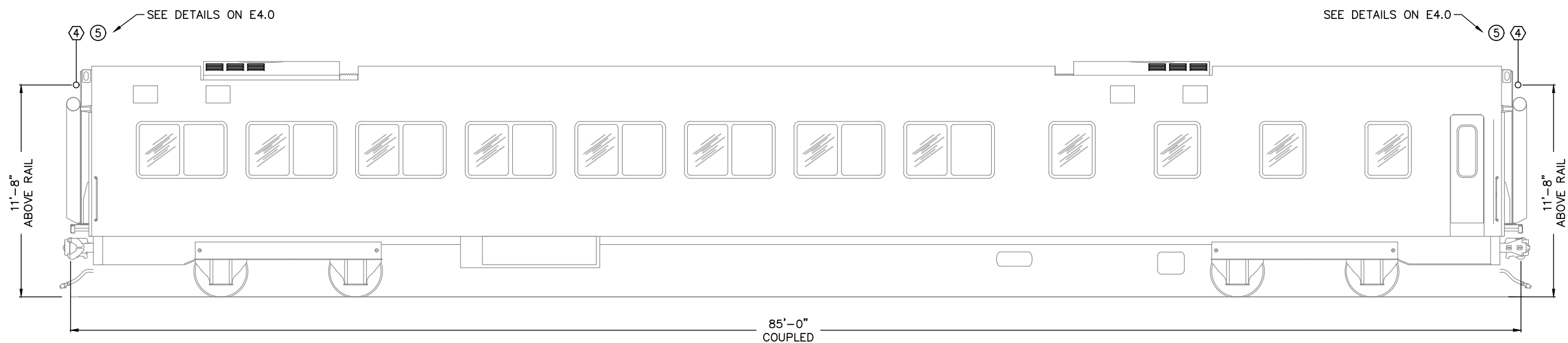
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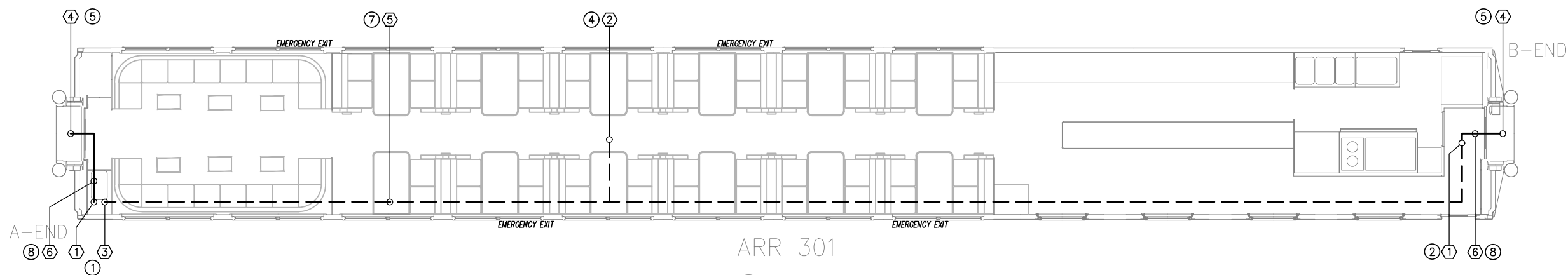
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- ③ 12 PORT MANAGED LAYER 3 SWITCH (SW)
- ④ PATCH ANTENNA (ANT)
- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



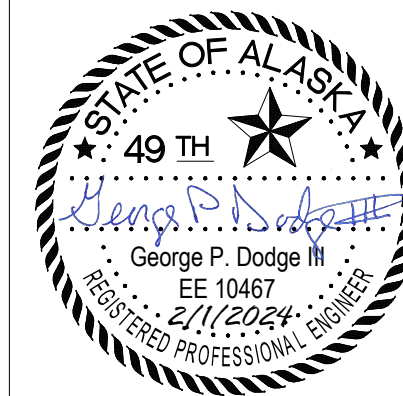
**A**  
**E3.4** CAR ARR 301 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.4** CAR ARR 301 - PLAN VIEW  
SCALE: NOT TO SCALE



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**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 301  
DINER AND LUNCH  
COUNTER CAR**

**E3.4**

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CA\DE3.4 ARR-301 DINER CAFE CAR.DWG | PLOT DATE: 240201

**NOTES:**

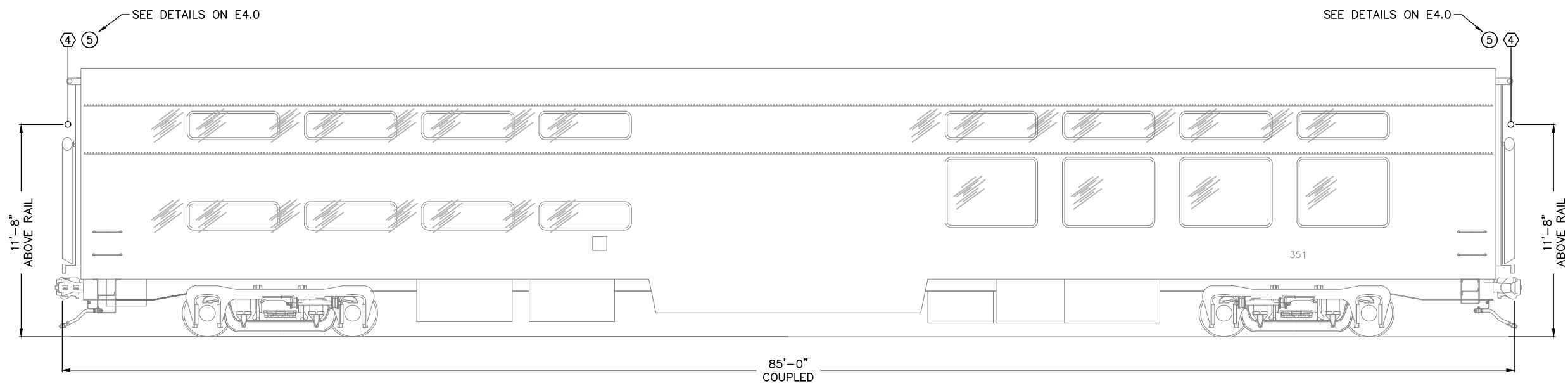
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
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3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

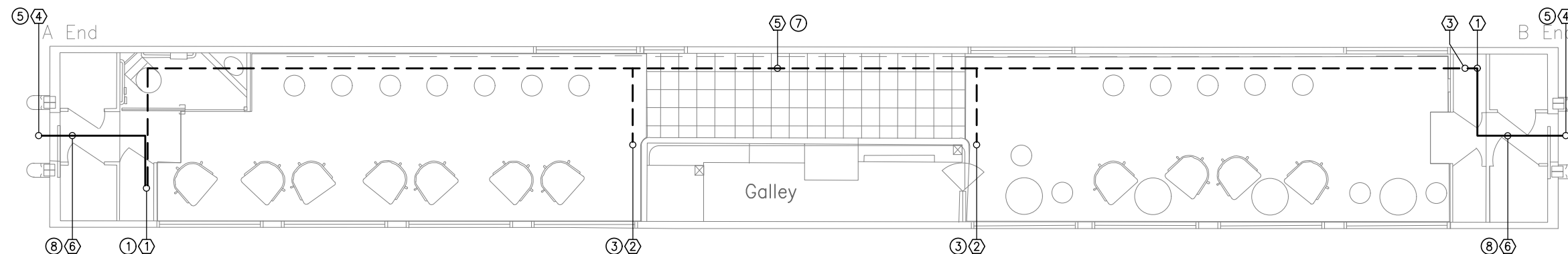
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- 1 ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- 2 ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- 3 12 PORT MANAGED LAYER 3 SWITCH (SW)
- 4 PATCH ANTENNA (ANT)
- 5 CAT6A M12 CONNECTOR TO M12 CONNECTOR
- 6 COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- 7 WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



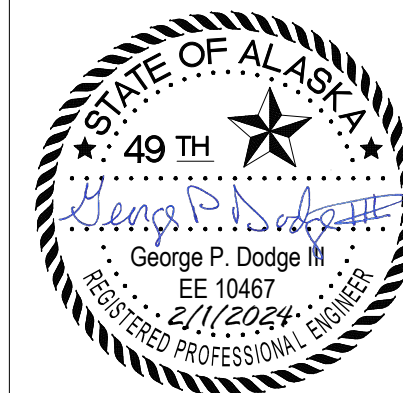
**A**  
**E3.5** CAR ARR 351 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.5** CAR ARR 351 - PLAN VIEW  
SCALE: NOT TO SCALE



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REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 351  
BAR CAFE  
CAR  
E3.5**

**NOTES:**

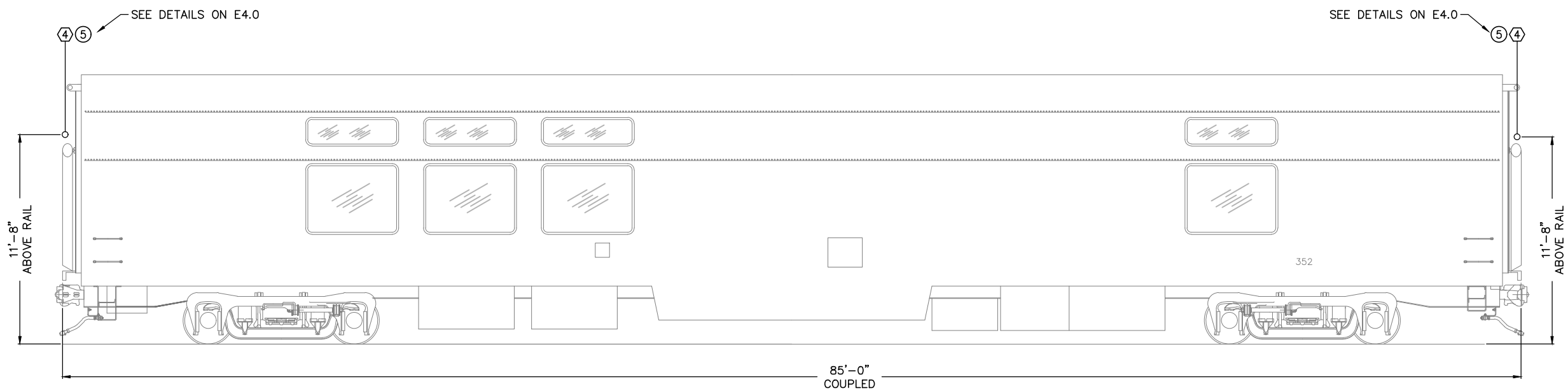
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
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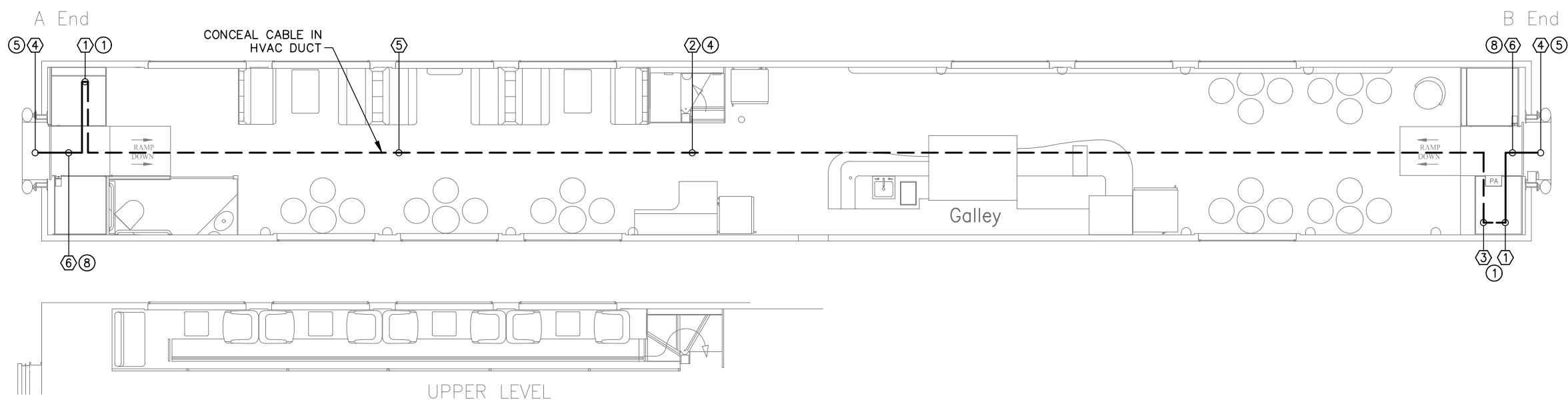
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- ③ 12 PORT MANAGED LAYER 3 SWITCH (SW)
- ④ PATCH ANTENNA (ANT)
- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



**A**  
**E3.6** CAR ARR 352 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.6** CAR ARR 352 - PLAN VIEW  
SCALE: NOT TO SCALE



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**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV
JOB #: 23-0117-20	DATE: 240201		0

**ARR 352  
BAR CAFE  
LOUNGE CAR  
E3.6**



**NOTES:**

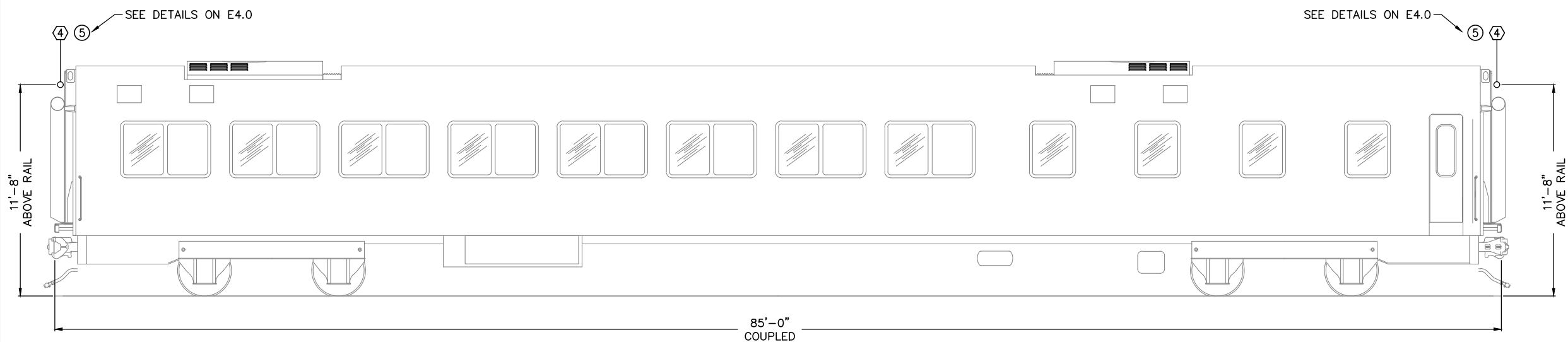
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

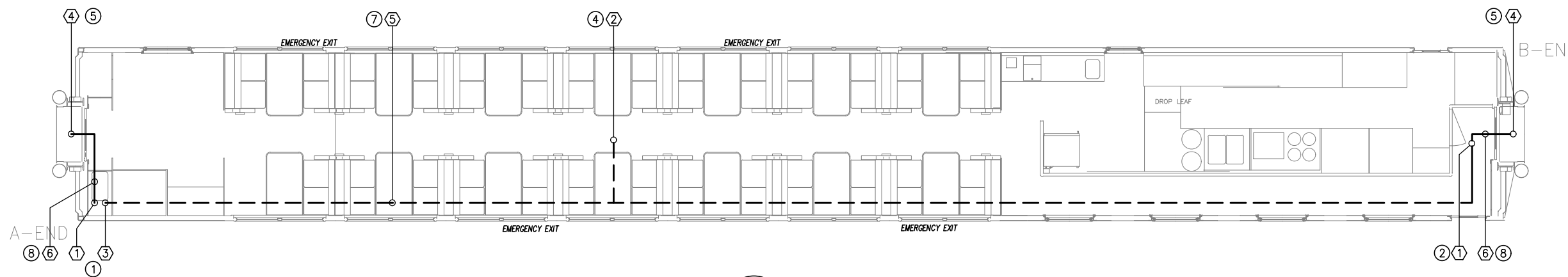
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
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- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



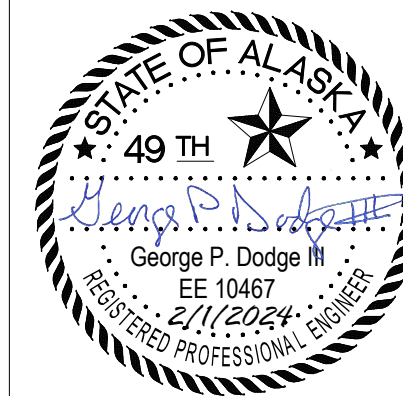
**A**  
**E3.7** CAR ARR 401 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.7** CAR ARR 401 - PLAN VIEW  
SCALE: NOT TO SCALE



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**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 401  
DINER  
CAR  
E3.7**

**NOTES:**

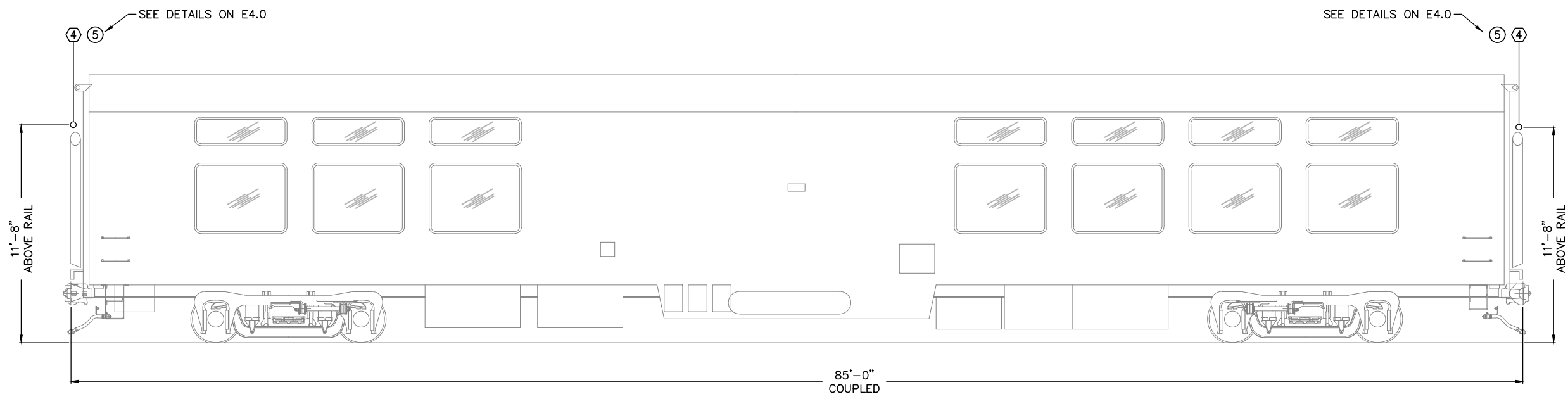
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

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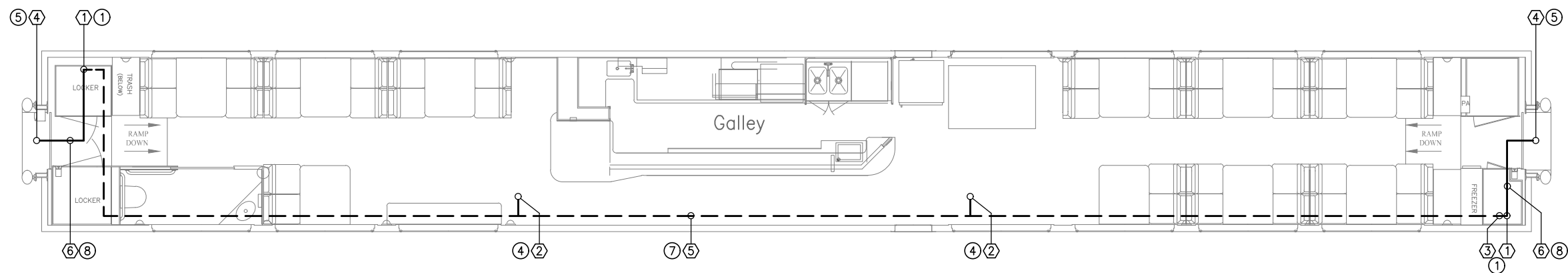
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
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- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



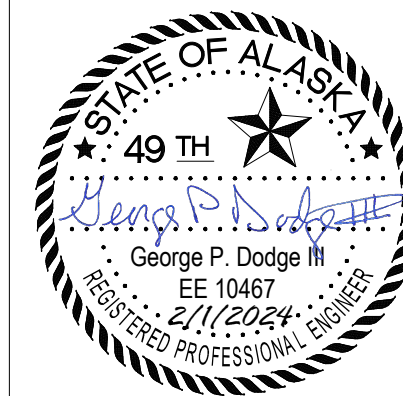
**A**  
**E3.8** CAR ARR 451 AND 452 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.8** CAR ARR 451 AND 452 - PLAN VIEW  
SCALE: NOT TO SCALE



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**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 451 AND 452  
DINER LUNCH  
COUNTER CAR**

**E3.8**

**NOTES:**

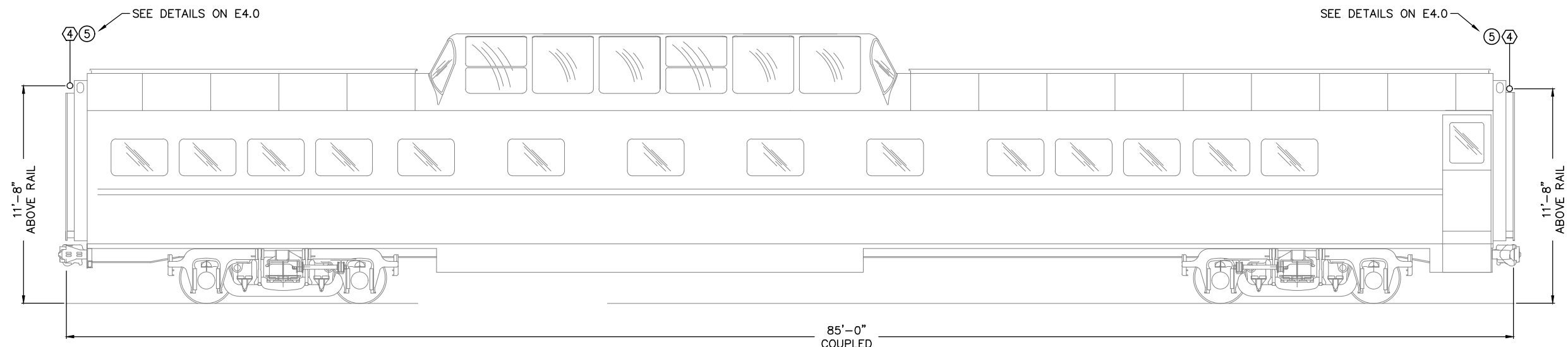
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

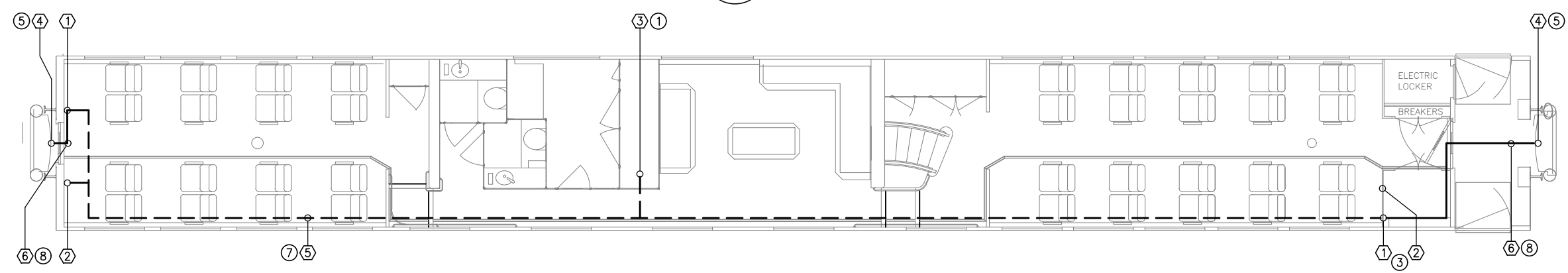
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
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- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



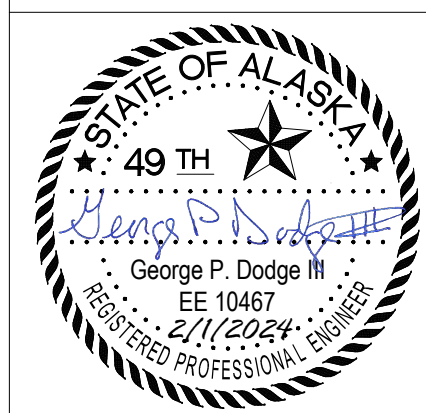
**A**  
**E3.9** CAR ARR 500-502 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.9** CAR ARR 500-502 - PLAN VIEW  
SCALE: NOT TO SCALE



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**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 500 - 502  
DOME COACH  
CARS  
E3.9**

**NOTES:**

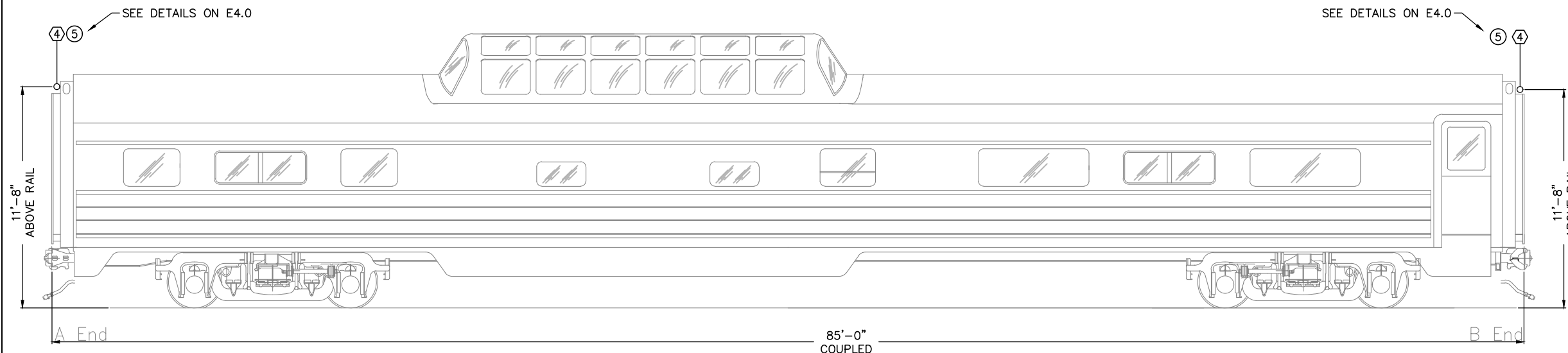
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3. SEE SHEET E2.0 FOR POWER INSTALL.

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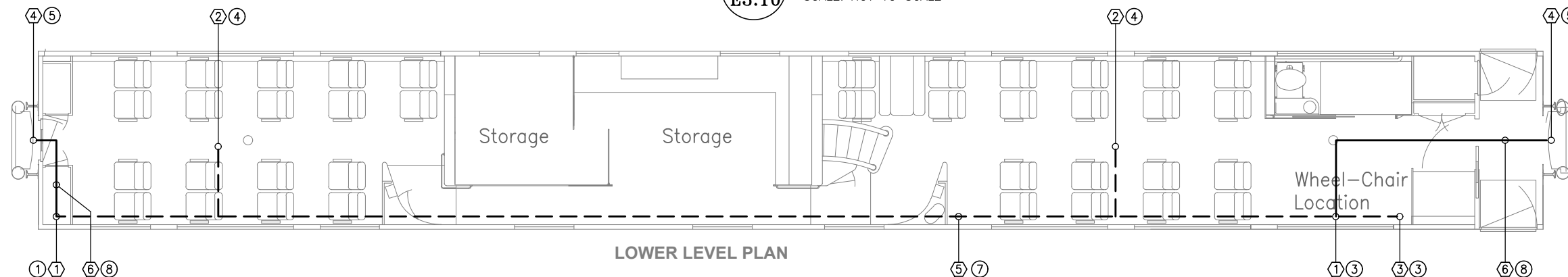
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

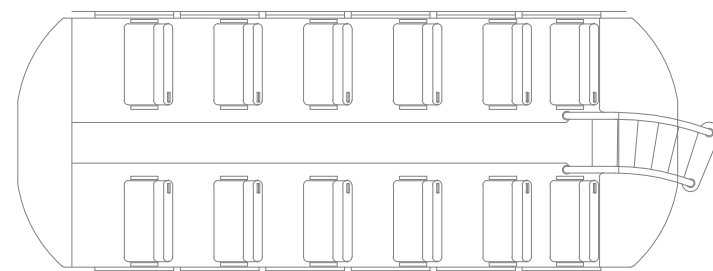
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- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



**A**  
**E3.10** CAR ARR 521-523 - ELEVATION  
SCALE: NOT TO SCALE



**LOWER LEVEL PLAN**

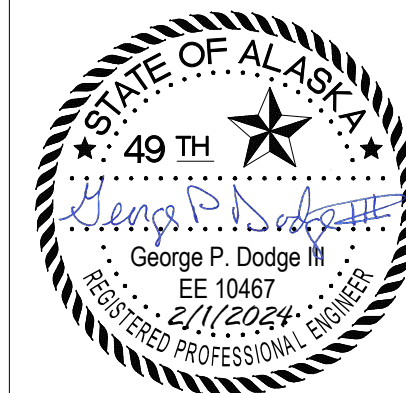


**DOME LEVEL PLAN**

**1**  
**E3.10** CAR ARR 521-523 - PLAN VIEW  
SCALE: NOT TO SCALE



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**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 521 - 523  
DOME COACH  
CARS  
E3.10**

**NOTES:**

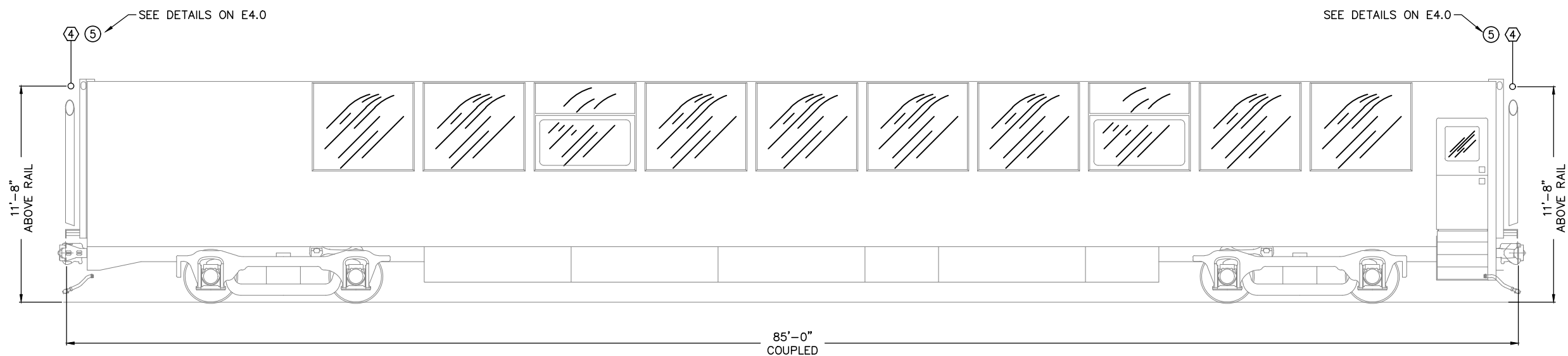
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**LEGEND:**

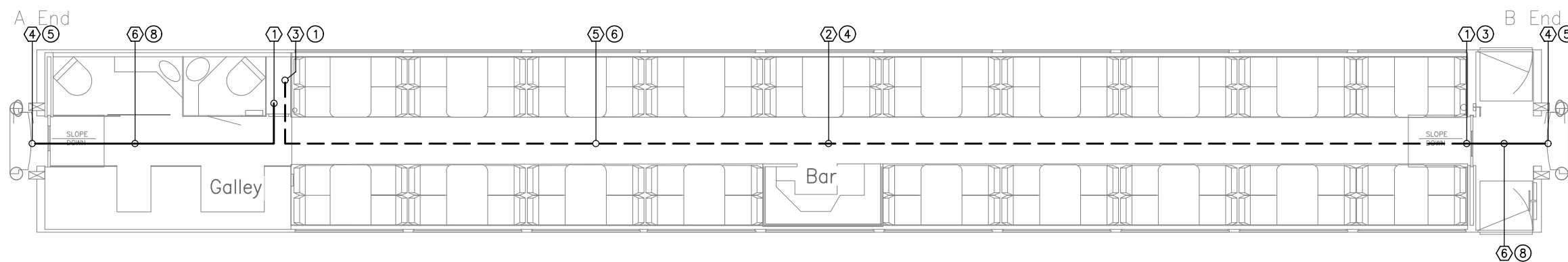
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
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- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



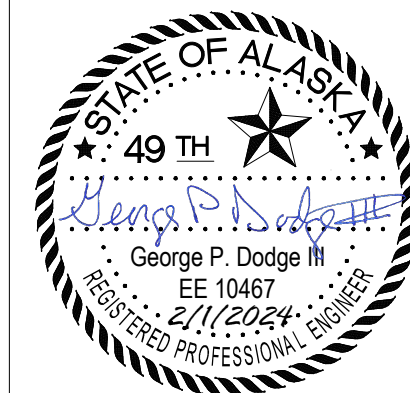
**A**  
**E3.11** CAR ARR 551-554 - ELEVATION  
 SCALE: NOT TO SCALE



**1**  
**E3.11** CAR ARR 551-554 - PLAN VIEW  
 SCALE: NOT TO SCALE



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**ALASKA RAILROAD  
 PASSENGER CAR  
 WIRELESS AND WIFI  
 SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 551 - 554  
 SERIES COACH  
 CARS  
 E3.11**

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CA\DE3.11 ARR 551-554 SERIES COACH CAR.DWG | PLOT DATE: 240201

**NOTES:**

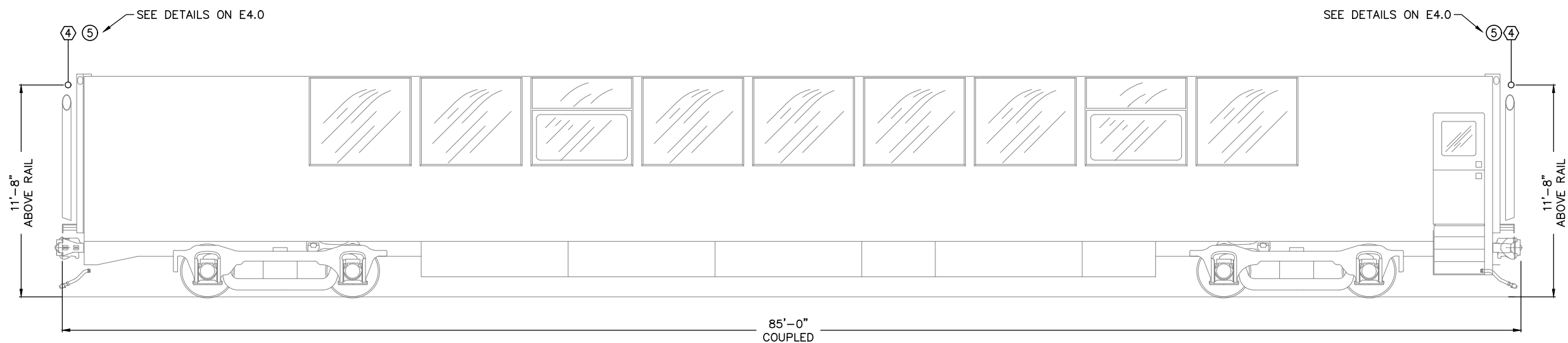
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3. SEE SHEET E2.0 FOR POWER INSTALL.

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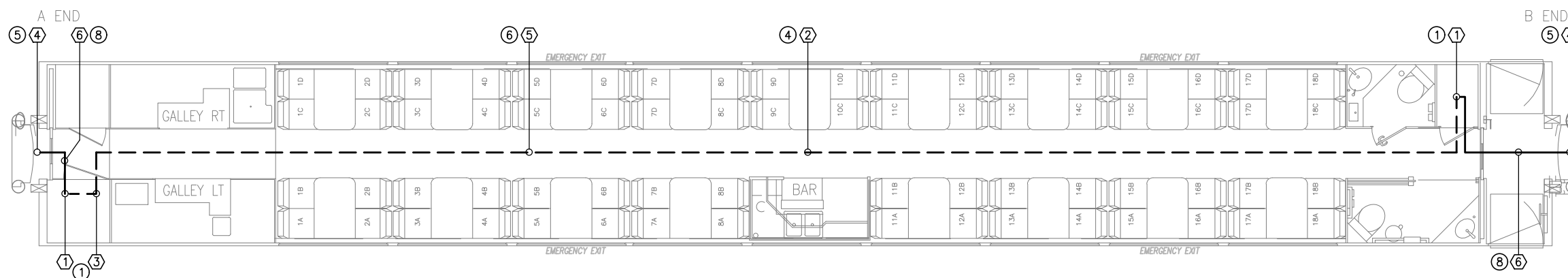
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

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- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



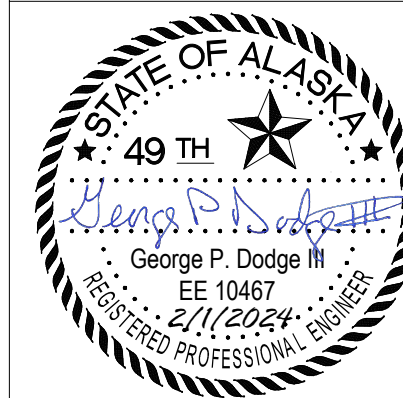
**A**  
**E3.12** CAR ARR 555-557 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.12** CAR ARR 555-557 - PLAN VIEW  
SCALE: NOT TO SCALE



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**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 555 - 557  
SERIES COACH  
CARS  
E3.12**

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CADE3.12 ARR 555-557 SERIES COACH CAR.DWG | PLOT DATE: 240201

**NOTES:**

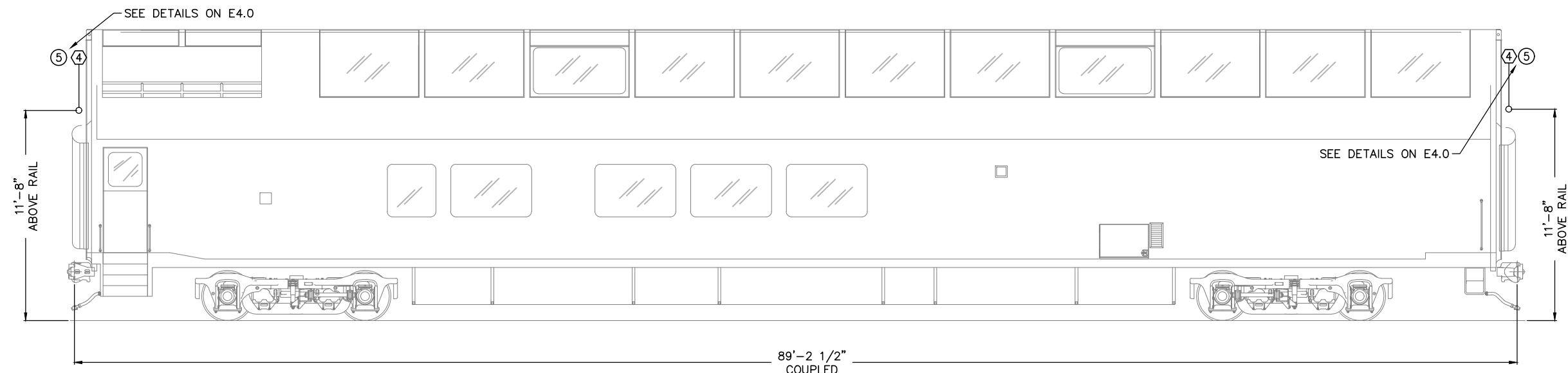
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

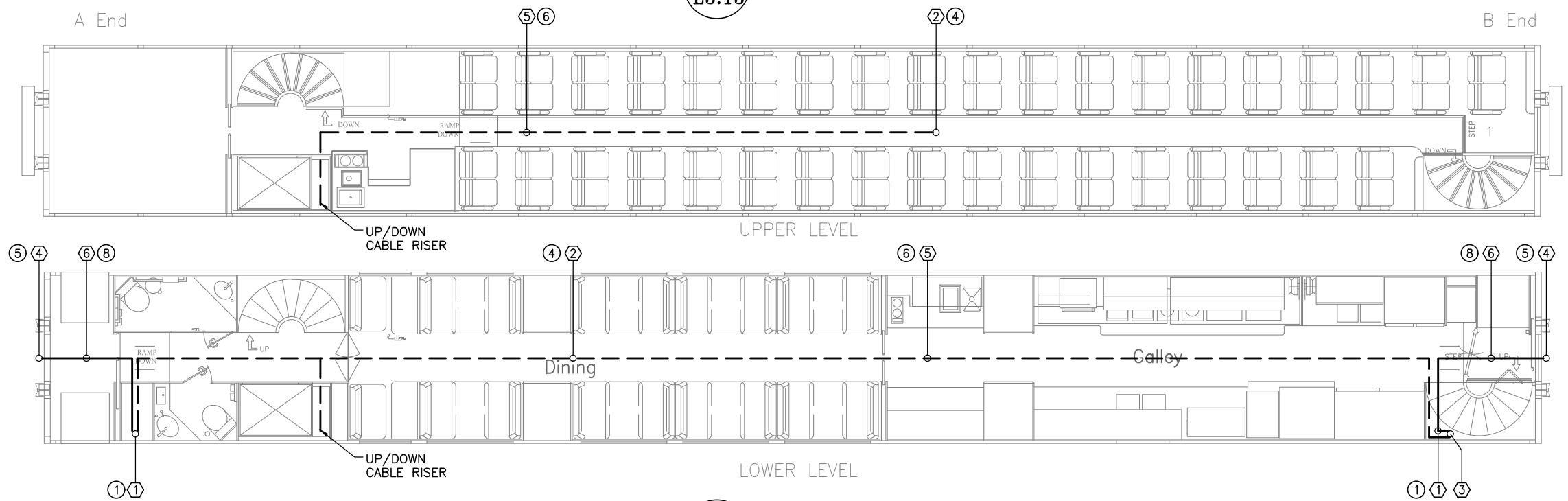
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- ③ 12 PORT MANAGED LAYER 3 SWITCH (SW)
- ④ PATCH ANTENNA (ANT)
- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



**A**  
**E3.13** CAR ARR 651-656 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.13** CAR ARR 651-656 - PLAN VIEW  
SCALE: NOT TO SCALE



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**IFC**

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 651 - 656  
BI-LEVEL DOME  
CARS  
E3.13**

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CA\DE3.13 ARR 651-656 BI-LEVEL DOME CARS.DWG 1 PLOT DATE: 240201

**NOTES:**

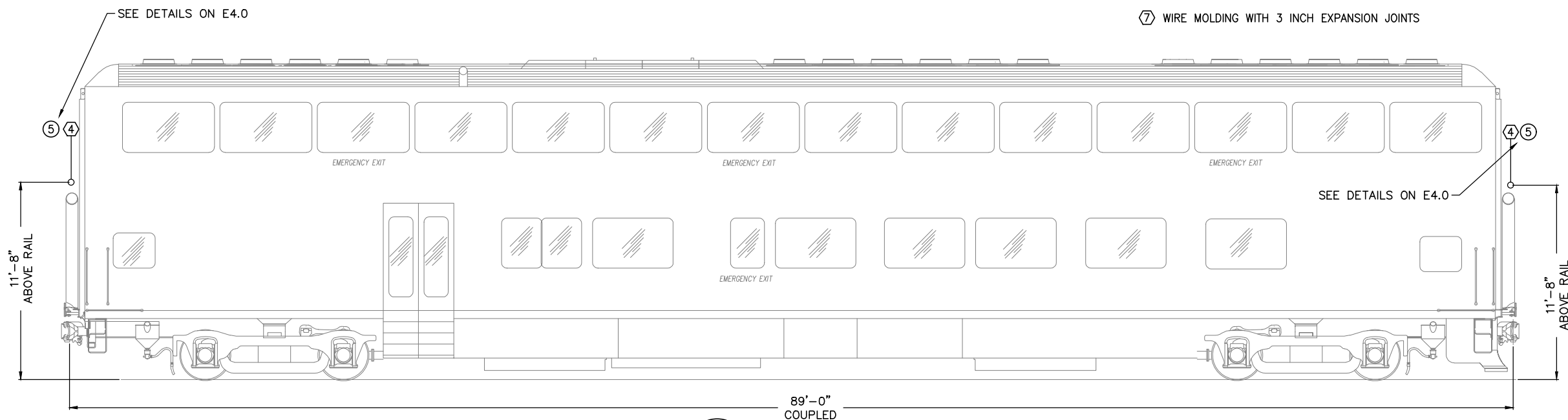
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2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

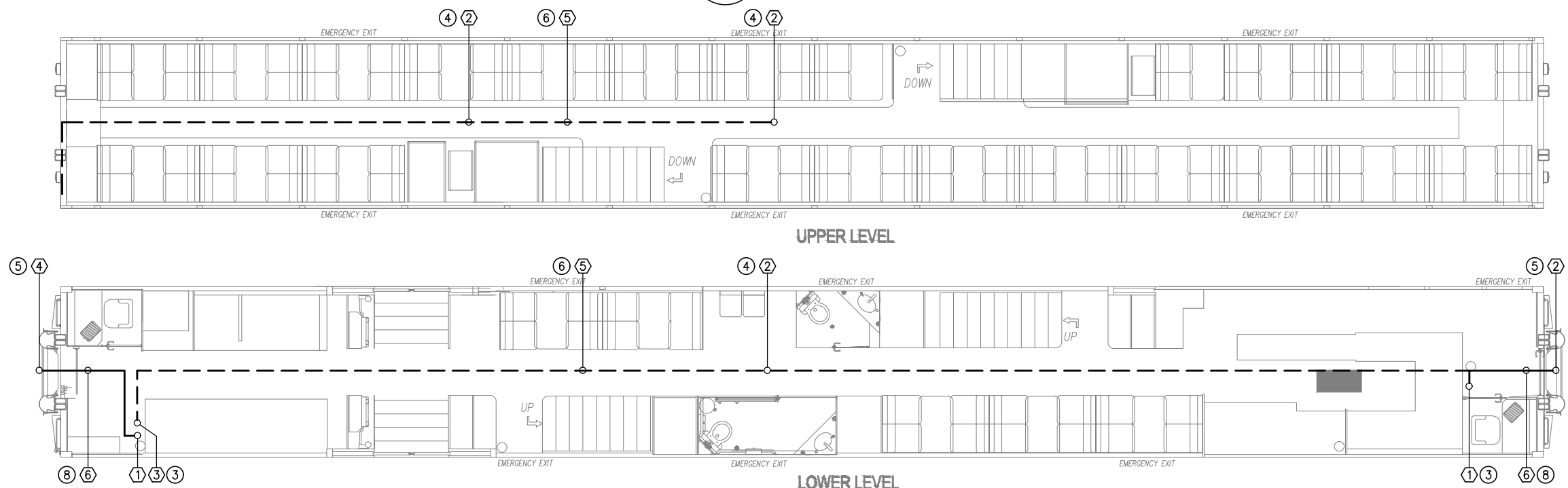
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- ① ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- ② ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- ③ 12 PORT MANAGED LAYER 3 SWITCH (SW)
- ④ PATCH ANTENNA (ANT)
- ⑤ CAT6A M12 CONNECTOR TO M12 CONNECTOR
- ⑥ COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- ⑦ WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



**A**  
**E3.14** CAR ARR 751 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.14** CAR ARR 751 - PLAN VIEW  
SCALE: NOT TO SCALE



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0	ISSUE FOR CONSTRUCTION	240201

**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV
JOB #: 23-0117-20	DATE: 240201		0

**ARR 751 DIESEL  
MULTIPLE UNIT  
CAR  
E3.14**



**NOTES:**

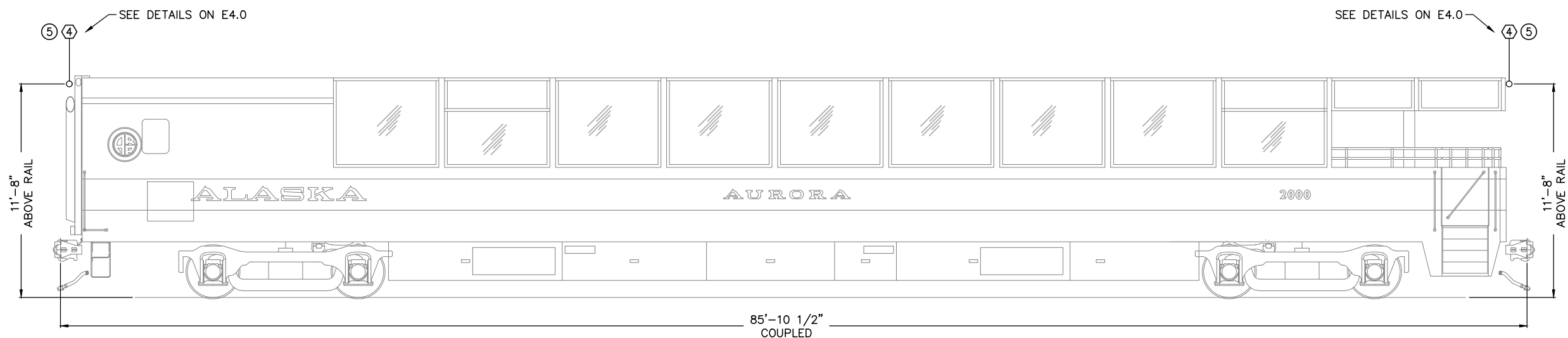
1. (N) ALL EQUIPMENT CALL OUTS MAY NOT BE ON THIS SHEET.
2. (N) CIRCLED NUMBERS REFERENCE INSTALLATION NOTES ON SHEET E1.0
3. SEE SHEET E2.0 FOR POWER INSTALL.

**LEGEND:**

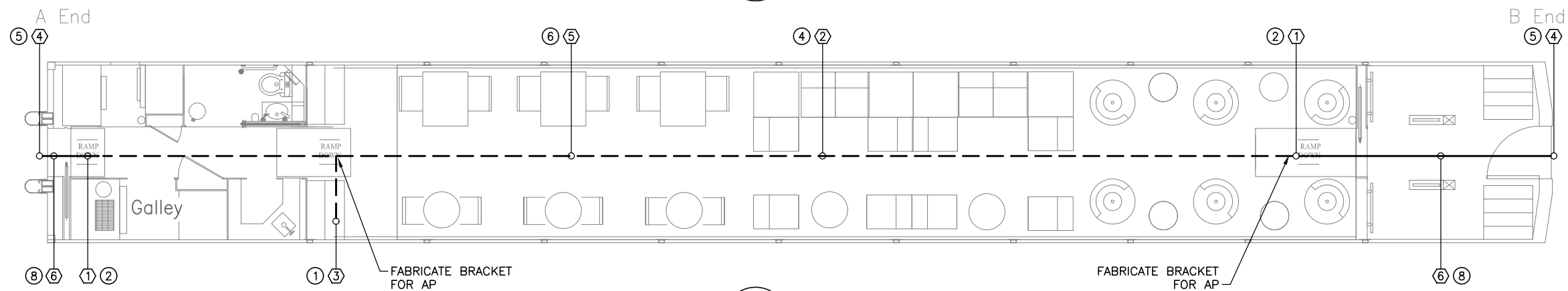
- CAT6A
- COAX

**EQUIPMENT LEGEND:**

- 1 ACCESS POINT IN BRIDGE MODE INTER-CONSIST LINK (ILC)
- 2 ACCESS POINT (ALL IN ONE UNIT) IN CLIENT MODE (AP)
- 3 12 PORT MANAGED LAYER 3 SWITCH (SW)
- 4 PATCH ANTENNA (ANT)
- 5 CAT6A M12 CONNECTOR TO M12 CONNECTOR
- 6 COAX QMA CONNECTOR TO QMA CONNECTOR (TWO CABLES PER ANTENNA)
- 7 WIRE MOLDING WITH 3 INCH EXPANSION JOINTS



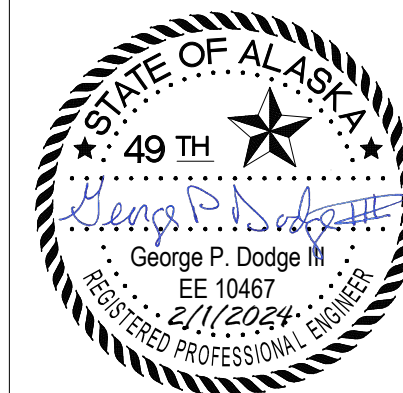
**A**  
**E3.15** CAR ARR 2000 - ELEVATION  
SCALE: NOT TO SCALE



**1**  
**E3.15** CAR ARR 2000 - PLAN VIEW  
SCALE: NOT TO SCALE



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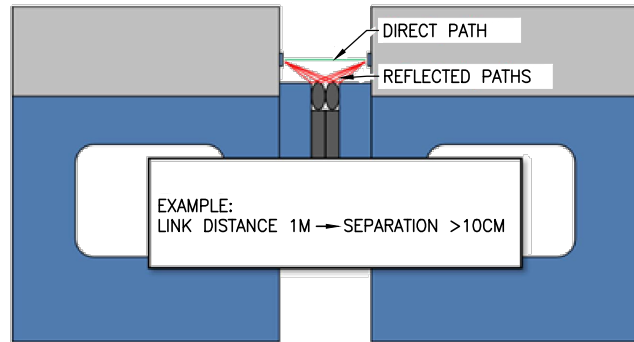
**IFC**

REV	DESCRIPTION	DATE
0	ISSUE FOR CONSTRUCTION	240201

**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

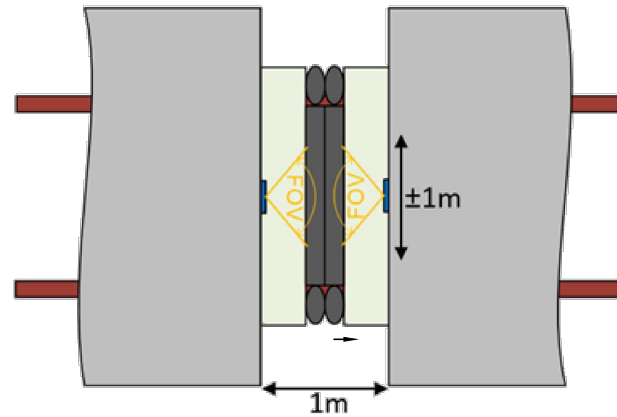
DWN: JAA	DSN: DBK	APP: GPD	REV 0
JOB #: 23-0117-20		DATE: 240201	

**ARR 2000  
BUSINESS  
CAR  
E3.15**



THERE SHOULD BE NO OBJECT CLOSER TO THE RF PATH THAN 10CM, SO THAT THE REFLECTIVE PATHS DO NOT DISTURB THE DIRECT PATH

**1**  
**E4.0** **DETAIL**  
SCALE: NOT TO SCALE



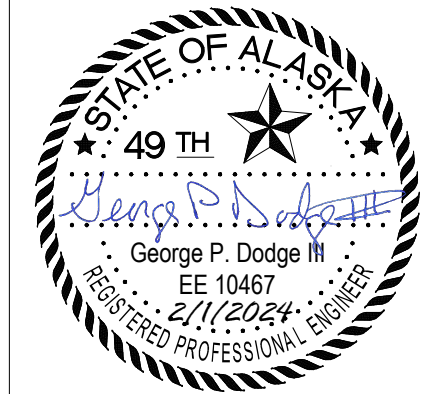
FOR THE BEST PERFORMANCE, ICL ANTENNAS SHOULD BE POSITIONED IN THE MIDDLE OF THE TRACK.  
VERTICAL POSITION IS TYPICALLY ABOVE THE CARRIAGE DOOR.  
THE HORIZONTAL MOVING TOLERANCE IS ABOUT +/-1m, WHICH IS NEEDED WHEN THE WAGON IS IN NARROW CURVES OR MOVING OVER CROSSINGS.

AN ANTENNA PLACEMENT SURVEY SHOULD BE PERFORMED PRIOR TO FINALIZING/SPECIFYING THE INSTALLATION LOCATION(S).

**2**  
**E4.0** **DETAIL**  
SCALE: NOT TO SCALE



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**IFC**

REV	DESCRIPTION	DATE
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**ALASKA RAILROAD  
PASSENGER CAR  
WIRELESS AND WIFI  
SERVICES**

DWN: JAA	DSN: DBK	APP: GPD	REV
JOB #: 23-0117-20	DATE: 240201		0

**ICL ANTENNA  
LOCATION DETAILS**

**E4.0**

FILE: X:\23 JOBS\23-0117-20 ARRC - PASSENGER CAR WIRELESS & WIFI ENGINEERING SERVICES\05-ENGR\CAD\E4.0 DETAILS.DWG | PLOT DATE: 240201