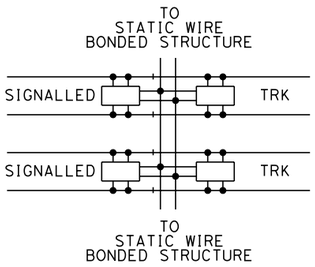
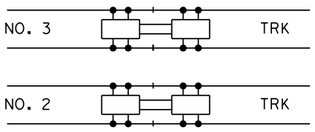
TYPICAL 2 TRACK LOCATION

"A" POINT

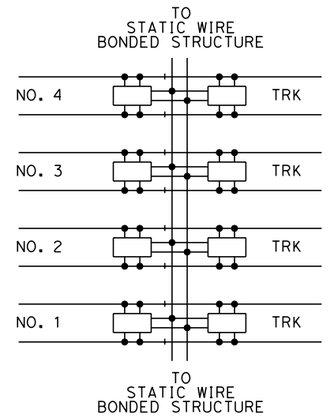


"C" POINT

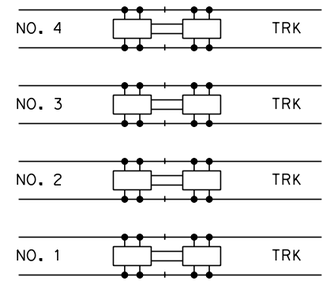


TYPICAL 4 TRACK LOCATION

"A" POINT

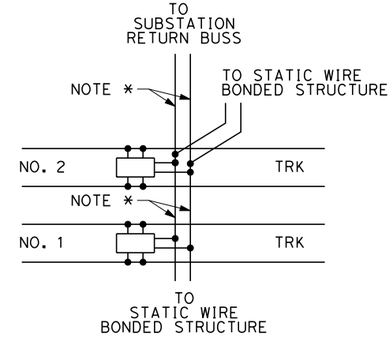


"C" POINT



TYPICAL SUBSTATION WITH NO INSULATED JOINTS (DRAIN BONDS)

"A" POINT



NOTE:

* LEADS FROM SUBSTATION RETURN BUSS TO FARTHEST ELECTRIFIED TRACK MUST BE NOT LESS THAN 2 EA 750 MCM. ALL OTHER CROSS-BOND LEADS, NEUTRAL LEADS, AND SIDE LEADS TO BE 2 EA. 19 #9 40% COPPER CLAD STEEL WIRE. ALL CONNECTION SHALL BE CADWELD.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY H. GLICKENSTEIN
DRAWN BY D. SOLTERO
CHECKED BY E. MORTLOCK
IN CHARGE R. SCHMEDES
DATE 06/08/10

PB PARSONS BRINCKERHOFF

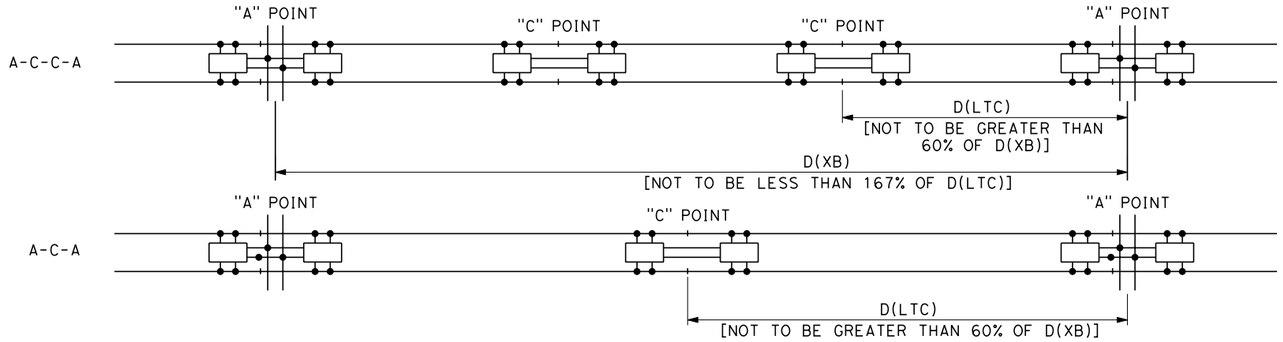
CALIFORNIA HIGH-SPEED RAIL AUTHORITY
FLY CALIFORNIA
Without ever leaving the ground.

CALIFORNIA HIGH-SPEED TRAIN PROJECT

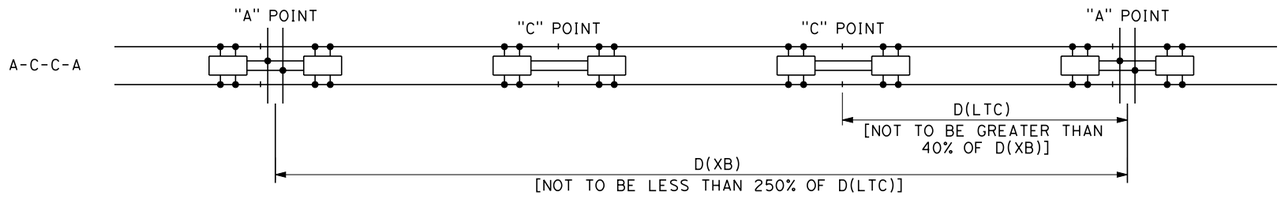
ATC GROUNDING AND BONDING
"A" & "C" POINTS AND DRAIN BOND LOCATIONS

CONTRACT NO. 13259
DRAWING NO. TM 3.3.4-A
SCALE NO SCALE
SHEET NO.

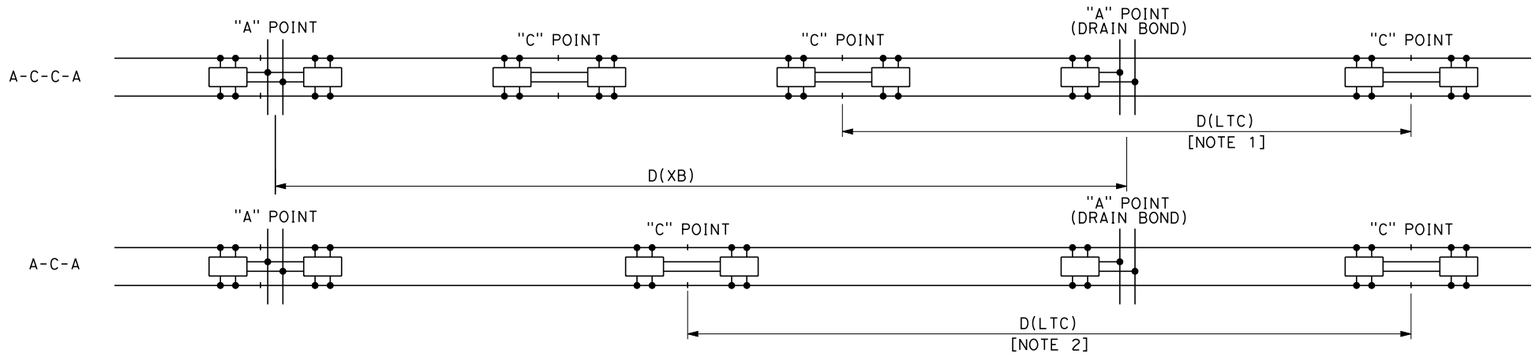
TYPICAL SIGNALLED TRACK WITH CROSS-BONDS NOT LESS THAN 6,000 FT.



TYPICAL TRACK WITH CROSS-BONDS BETWEEN 3,000' AND 6,000'



TYPICAL TRACK WITH ONE CROSS-BOND LOCATION IN THE MIDDLE OF A TRACK CIRCUIT



D(LTC)* LENGTH OF LONGEST TRACK CIRCUIT. ANY PORTION OF WHICH LAYS BETWEEN "A" POINT LOCATIONS.

D(XB)* DISTANCE BETWEEN "A" POINT LOCATIONS.

NOTES:

1. D(LTC) NOT TO BE GREATER THAN 60% OF D (XB) IF D(XB) IS 6,000 FT. OR GREATER.
   D(LTC) NOT TO BE GREATER THAN 40% OF D (XB) IF D(XB) IS LESS THAN 6,000 FT.

2. D(LTC) NOT TO BE GREATER THAN 60% OF D(XB) AND D(XB) IS TO BE AT LEAST 6,000 FT.

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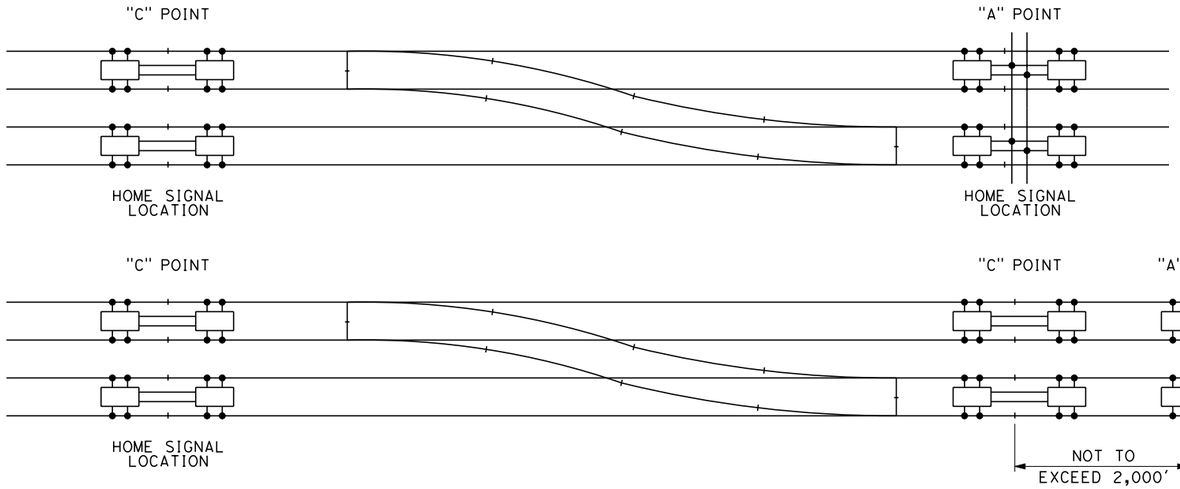
ATC GROUNDING AND BONDING
CROSS-BONDING PRACTICE

CONTRACT NO. 13259
DRAWING NO. TM 3.3.4-B
SCALE NO SCALE
SHEET NO.

TYPICAL CROSS-BONDING TO PROTECT INTERLOCKING CROSS-OVERS

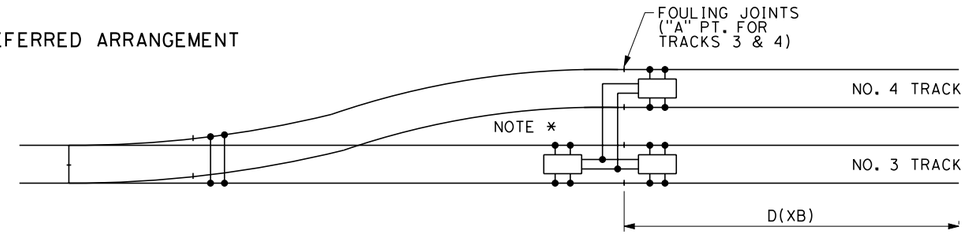


PERFERRED ARRANGEMENT
"A" POINT AT ONE
HOME SIGNAL LOCATION

ALTERNATE ARRANGEMENT
WHERE SUBSTATION RETURN
BUSS NOT GREATER THAN
2,000' FROM HOME SIGNAL

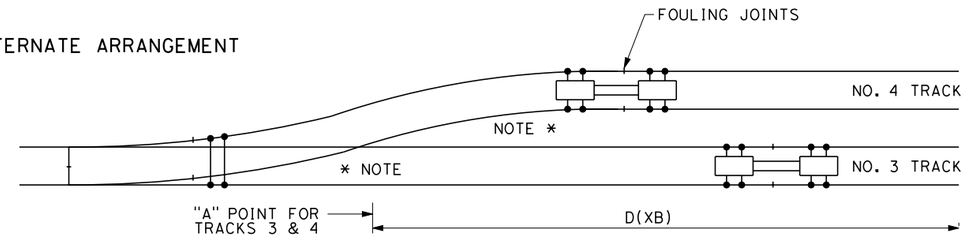
TYPICAL BONDING WHERE INTERLOCKING TURNOUT LEADS TO ANOTHER SIGNALED/ELECTRIFIED MAIN TRACK

PREFERRED ARRANGEMENT



PREFERRED ARRANGEMENT
[NOTE THAT D(XB) FOR TRACKS 3 & 4
BEGINS AT THE FOULING JOINTS]

ALTERNATE ARRANGEMENT



ALTERNATE ARRANGEMENT
[NOTE THAT D(XB) FOR TRACKS 3 & 4
BEGINS AT THE FROG OF THE TURNOUT]

NOTE:

* CROSS-BONDS IN PREFERRED ARRANGEMENT AND FOULING WIRES IN ALTERNATE ARRANGEMENT MUST BE 2 EACH 19 #9 40% COPPER CLAD STEEL WIRE. SAME AS NEUTRAL AND SIDE LEADS.

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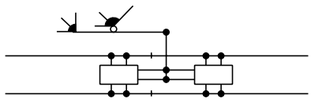
ATC GROUNDING AND BONDING
CROSS-BONDING AT INTERLOCKINGS

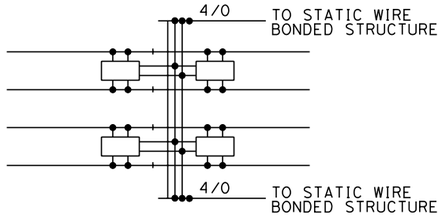
CONTRACT NO. 13259
DRAWING NO. TM 3.3.4-C
SCALE NO SCALE
SHEET NO.

GROUND MOUNTED SIGNAL MAST



CADWELD CONNECTION [1 EA 19 #9 40% COPPER CLAD STEEL WIRE] FROM BASE OF SIGNAL MAST TO NEUTRAL LEADS OF INSULATED JOINTS ON TRACK GOVERNED BY SIGNAL ONLY. NO OTHER CONNECTION TO OTHER TRACKS. STRUCTURES OR SIGNALS UNLESS PART OF "A" POINT SHOWN ON PLAN

SIGNAL BRIDGE, PART OF AN "A" POINT LOCATION



AERIAL CONNECTION FROM EACH END OF SIGNAL BRIDGE TO NEAREST STATIC WIRE BONDED STRUCTURE. AERIAL CONNECTIONS NOT REQUIRED IF SIGNAL BRIDGE IS PART OF TRANSMISSION STRUCTURE BONDED INTO STATIC WIRE RETURN SYSTEM.

SIGNAL BRIDGE, NOT AT AN "A" POINT LOCATION

AERIAL CONNECTION FROM EACH END OF SIGNAL BRIDGE TO NEAREST STATIC WIRE BONDED STRUCTURE. NO CONNECTIONS TO ANY PART OF TRACK OR NEUTRAL LEADS.

OVERHEAD BRIDGE

AERIAL CONNECTIONS FROM EACH END OF OVERHEAD BRIDGE TO NEAREST STATIC WIRE BONDED STRUCTURE.

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CHECKED BY: E. MORTLOCK
IN CHARGE: R. SCHMEDES
DATE: 06/08/10

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ATC GROUNDING AND BONDING OF SIGNALS AND OVERHEAD STRUCTURES

CONTRACT NO. 13259
DRAWING NO. TM 3.3.4-D
SCALE NO SCALE
SHEET NO.