SECTION 16 - VITAL CIRCUIT AND SOFTWARE DESIGN

Part	C	Type & Subject	Pages	Status
16.1 Recommended Nomenclature				
16.1.1	37-3	Recommended Circuit Nomenclature	17	Revised 2025
16.2 Recommended Symbols				
16.2.1	37-3	Recommended Graphical Symbols for Wayside Signals	1	Reaffirmed 2021
16.2.2	37-3	Recommended Graphical Symbols for Signal Supports	1	Reaffirmed 2021
16.2.4	37-3	Recommended Graphical Symbols for Buildings, Bridges and Tunnels	1	Revised 2022
16.2.5	37-3	Recommended Graphical Symbols for Wayside Fixtures	1	Reaffirmed 2021
16.2.6	37-3	Recommended Graphical Symbols for Switches	2	Reaffirmed 2021
16.2.7	37-3	Recommended Graphical Symbols for Derails	1	Reaffirmed 2021
16.2.8	37-3	Recommended Graphical Symbols for Miscellaneous Devices Applied to Tracks	3	Revised 2021
16.2.11	37-3	Recommended Graphical Symbols for Relays	1	Revised 2021
16.2.12	37-3	Recommended Graphical Symbols for Relay Contacts	2	Revised 2022
16.2.13	37-3	Recommended Graphical Symbols for Circuit Controller Contacts, Miscellaneous	2	Reaffirmed 2021

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Part	C	Type & Subject	Pages	Status
16.2.14	37-3	Recommended Graphical Symbols for Circuit Controller Contacts, Contacts Actuated Mechanically by Interlocking Machine Lever or Latch Contacts	1	Reaffirmed 2021
16.2.15	37-3	Recommended Graphical Symbols for Contacts Actuated by Switch Points, Derails or Locking Connections	2	Revised 2021
16.2.16	37-3	Recommended Graphical Symbols for Signals and Electro-Pneumatic Devices	1	Revised 2021
16.2.17	37-3	Recommended Graphical Symbols for Indicators, Locks, Buzzers and Bells	1	Reaffirmed 2021
16.2.18	37-3	Recommended Graphical Symbols for Circuit Appurtenances	3	Revised 2021
16.2.19	37-3	Recommended Graphical Symbols for Miscellaneous Apparatus	1	Revised 2021
16.3 Recommended General Design Guidelines				
16.3.1	37-3	Recommended Vital Circuit Design Guidelines for Relay Based Systems	5	Revised 2025
16.3.2	37-3	Recommended Application Design Guidelines for Isolation of Power Supplies Used in Vital Signal Systems	2	Revised 2022
16.4 Interlocking & Control Point Recommended Circuits				
16.4.1	37-3	Recommended Vital Circuit Design Guidelines for Time Locking	6	Revised 2022
16.4.2	37-3	Recommended Vital Circuit Design Guidelines for Route Locking	7	Revised 2022

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Part	C	Type & Subject	Pages	Status
16.4.3	37-3	Recommended Vital Circuit Design Guidelines for Traffic Circuits at Interlockings and Controlled Points	3	Revised 2025
16.4.4	37-3	Recommended Vital Circuit Design Guidelines for Route Check Networks at Interlocking and Control Points	3	Revised 2019
16.4.5	37-3	Recommended Vital Circuit Design Guidelines for Home Networks at Interlockings and Controlled Points	5	Revised 2024
16.4.7	37-3	Recommended Guidelines for Battery Check Circuits	6	Revised 2025
16.4.8	37-3	Recommended Vital Circuit Design Guidelines for Loss-of-Shunt Circuits	4	Revised 2022
16.4.9A	37-3	Recommended Vital Design Guidelines for Dead Section Protection	8	New 2021
16.4.10	37-3	Recommended Vital Circuit Design Guidelines for Stuck-Mechanism Detection for Controlled Signals	5	Revised 2022
16.4.20	37-3	Recommended Vital Circuit Design Guidelines for Following Move Stick Circuits at Interlockings and Controlled Points	3	Revised 2025
16.4.21	37-3	Recommended Vital Circuit Design Guidelines for Engine Return Stick Circuits at Interlocking and Control Points	3	Revised 2019

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Part	C	Type & Subject	Pages	Status
16.4.30	37-3	Recommended Vital Circuit Design Guidelines for Light Out Detection on Color-Light Signals	7	Revised 2018
16.4.32	37-3	Recommended Vital Circuit Design Guidelines for Approach-Lighting Controlled Searchlight Signals	3	Extended 2020
16.4.40	37-3	Recommended Vital Design Guidelines for Field Track Blocking at Interlockings and Controlled Points	3	Revised 2025
16.4.50	37-3	Recommended Design Guidelines for Automatic Speed Control with Continuous Cab Signaling	10	Extended 2018
16.4.60	37-3	Recommended Vital Circuit Design Guidelines for the Zoning of Processor-Based Control Points and Interlockings	27	Revised 2019
16.4.70	37-3	Recommended Design Guidelines for the Organization of Vital and Non-Vital Application Programs Using Nodal Logic Techniques	7	Revised 2019
16.5 Recommended Automatic Signal Circuits				
16.5.1	37-3	Recommended Vital Circuit Design Guidelines for Four Wire Tumbledown Line Circuits in Traffic Control Systems	4	Reaffirmed 2022
16.5.2	37-3	Recommended Vital Circuit and Software Design Guidelines for Limited Tumbledown Applications in Traffic Control Systems	4	Reaffirmed 2022

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Part	C	Type & Subject	Pages	Status
16.5.4	37-3	Recommended Vital Design Guidelines for Directional Stick Circuits at Automatic Signals in TCS	2	Reaffirmed 2025
16.5.10	37-3	Recommended Vital Circuit Design Guidelines for Stuck-Mechanism Detection for Automatic Signals	3	Revised 2020
16.5.20	37-3	Recommended Vital Circuit Design Guidelines for Directional Stick Circuits at Automatic Signals	2	Revised 2025
16.6 Recommended Circuits for Switches				
16.6.3A	37-3	Recommended Vital Design Guidelines for Self-Restoring Switches in Traffic Control Systems	7	Revised 2025
16.6.3B	37-3	Recommended Vital Circuit Design Guidelines for Self-Restoring Switches in Automatic Block Signal Territory	7	Reaffirmed 2022
16.6.3C	37-3	Recommended Vital Design Guidelines for Self-Restoring Switches in Non-Signaled Territory on Main Tracks	8	Revised 2018
16.6.4	37-3	Recommended Vital Circuit Design Guidelines for Spring Switches	3	Reaffirmed 2022
16.6.5	37-3	Recommended Vital Circuit Design Guidelines Using Electric Switch Machines	7	Revised 2025
16.6.6	37-3	Recommended Vital Circuit Design Guidelines for Electric Lock Switch Control at Non-Interlocked Switches	5	Revised 2020

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Part	C	Type & Subject	Pages	Status
16.9 Recommended Special Design Applications				
16.9.1	37-3	Recommended Vital Design Guidelines for Slide Fences	4	Reaffirmed 2022
16.30 Recommended Highway-Rail Grade Crossing Warning System Circuits				
16.30.2	36-1	Recommended Vital Circuit Design Guidelines for Stick Circuits with Grade Crossing Warning System	2	Revised 2025
16.30.5	36-1	Recommended Vital Circuit Design Guidelines for Reverse Switch Cut-Out Applications for Deactivating Grade Crossing Warning Devices	2	Revised 2025
16.30.9	36-1	Recommended Vital Circuit Design Guidelines for Pushbutton Cut-Out for Manually Terminating or Restarting Grade Crossing Warning Devices	2	Revised 2025
16.30.10	36-1	Recommended Vital Circuit Design Guidelines for Highway Traffic Signal or Other Traffic Control Device Interconnection	8	Extended 2025
16.30.11	36-1	Recommended Vital Circuit Design Guidelines for Interconnection of Grade Crossing Warning Systems on Adjacent Tracks	5	Revised 2025
16.30.14	36-1	Recommended Vital Circuit Design Guidelines for Timing Circuits	3	Revised 2025
16.30.15	36-1	Recommended Vital Circuit Design Guidelines for Relay Based Flashing-Light Applications for Grade Crossing Warning Devices	1	Revised 2025

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Part	C	Type & Subject	Pages	Status
16.30.16	36-1	Recommended Vital Circuit Design Guidelines for Flashing-Light and Gate Control Applications for Grade Crossing Warning Devices	2	Revised 2025
16.50 Recommended Drawings				
16.50.1	37-3	Location Plan: C.P. Brannen	1	Reaffirmed 2021
16.50.2	37-3	Line Circuit in Traffic Control System	2	Reaffirmed 2018
16.50.10	37-3	Home Network Circuits	2	Revised 2024

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