North Avenue Yard Route Pushbutton Project
Maryland Transit Administration

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AECOM

MTA North Avenue Yard

– Light Rail vehicle storage and maintenance facility

– 24 switch machines on 13 tracks
  - Maintenance shop with 4 tracks and one track for carwash

– Capacity for storage of 47 vehicles

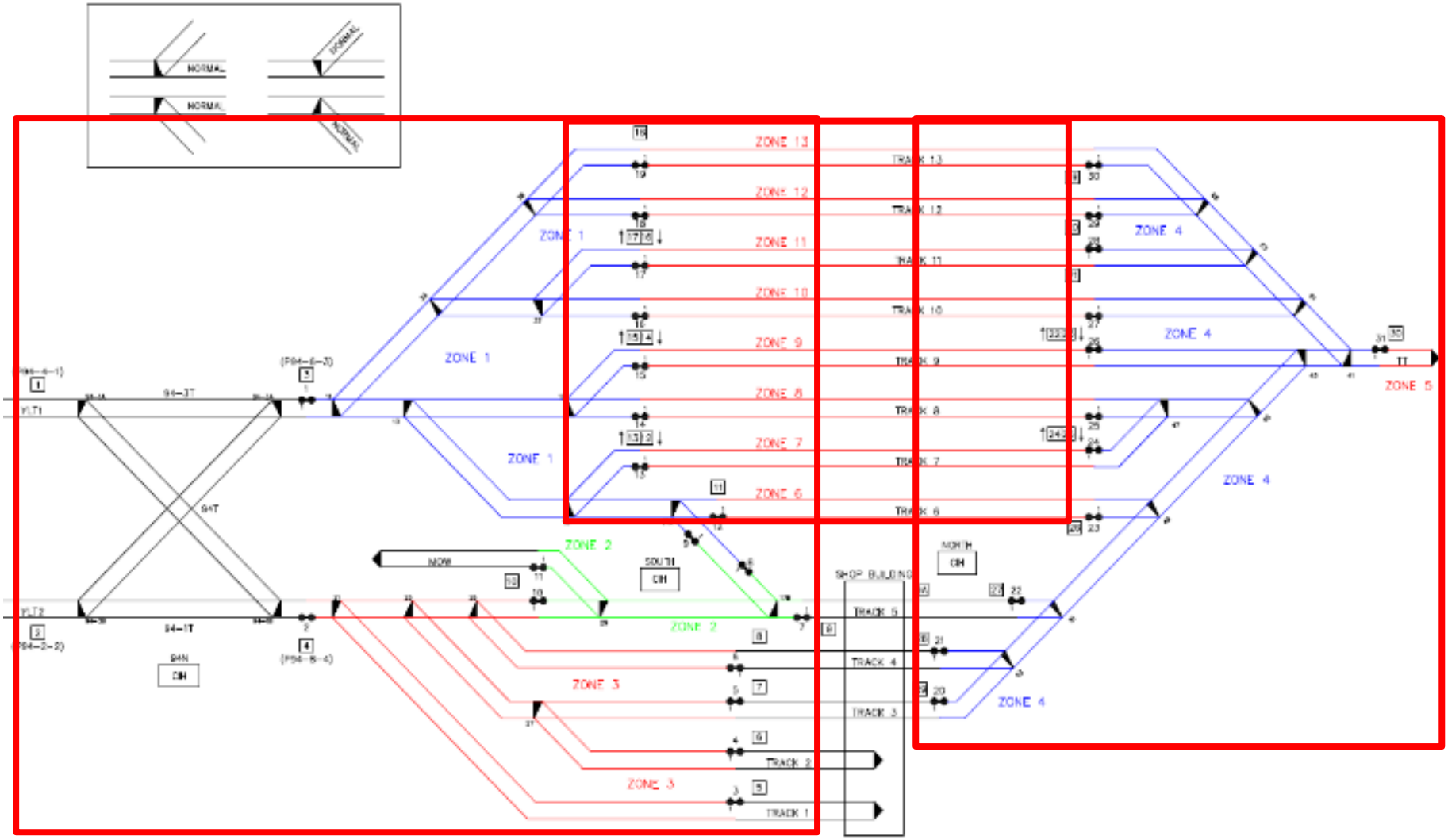
– Prior to 2012, switches were all manual operation.

– In 2012 switches were replaced with electric switch machines and automated with individual pushbuttons.

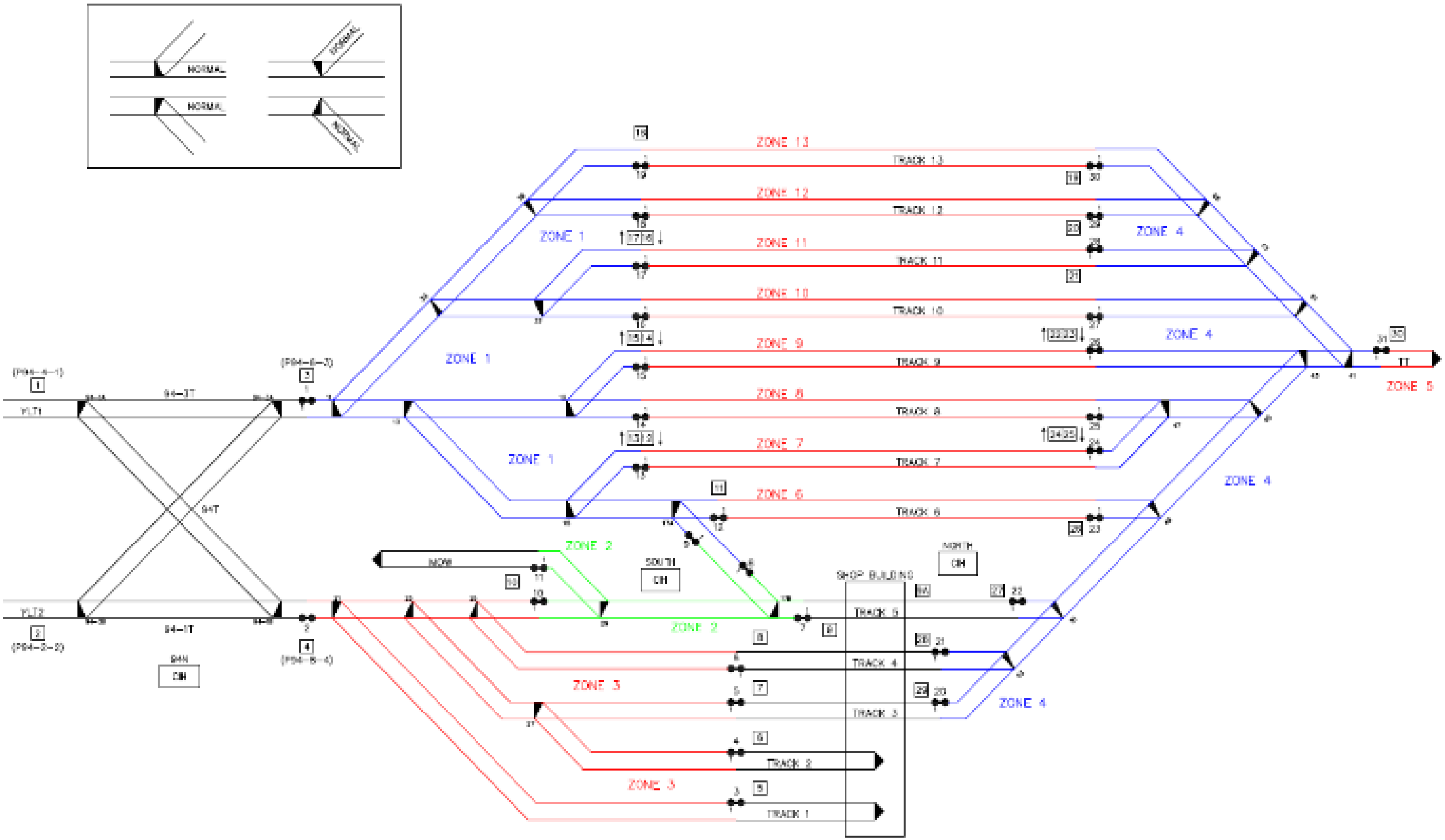
MTA North Avenue Yard

- Advertised – September 9, 2013
  - Non-Vital Route Request and Indication System
    - Route Pushbuttons controlled by non-vital PLC
    - Train detection via wheel detectors
  - Project Objectives
    - Improve efficiency of vehicle movements
    - Eliminate switch trailing
    - Provide operators positive switch and route feedback
    - Increase situational awareness throughout the yard
- MC Dean was the awarded contractor.
    - Frauscher Axle Counter system was used for the final design and implementation
    - Project completion – June 2016

MTA North Avenue Yard - Layout



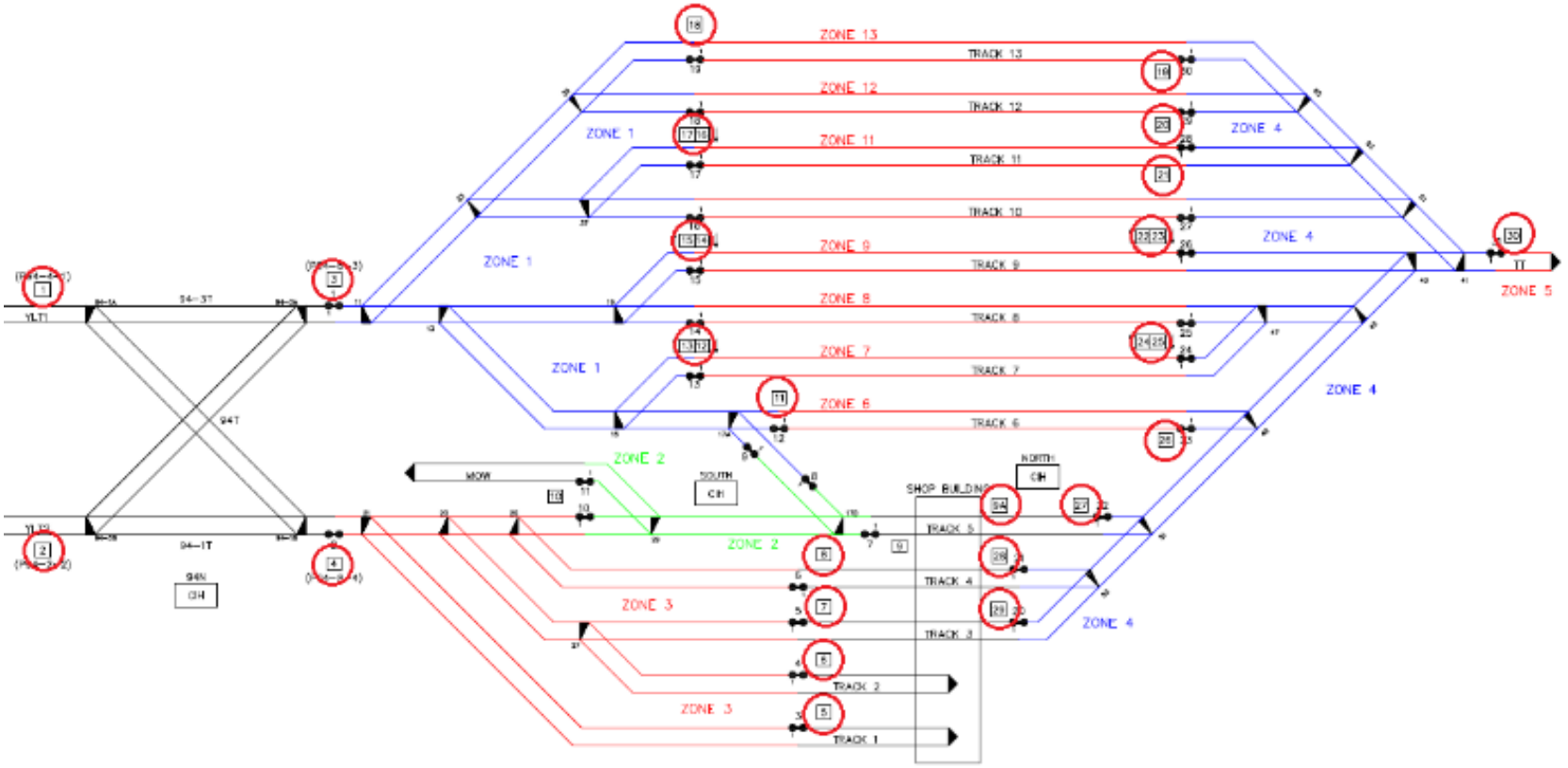
MTA North Avenue Yard - Layout



System Components

- Pushbutton Stations
- Wheel sensors
- Frauscher Axel Counter System
- PLCs and Network

Equipment Overview: Pushbutton Locations



Equipment Overview: Pushbutton Stations

– Full Yard Entrance

– Yard Lead Exit

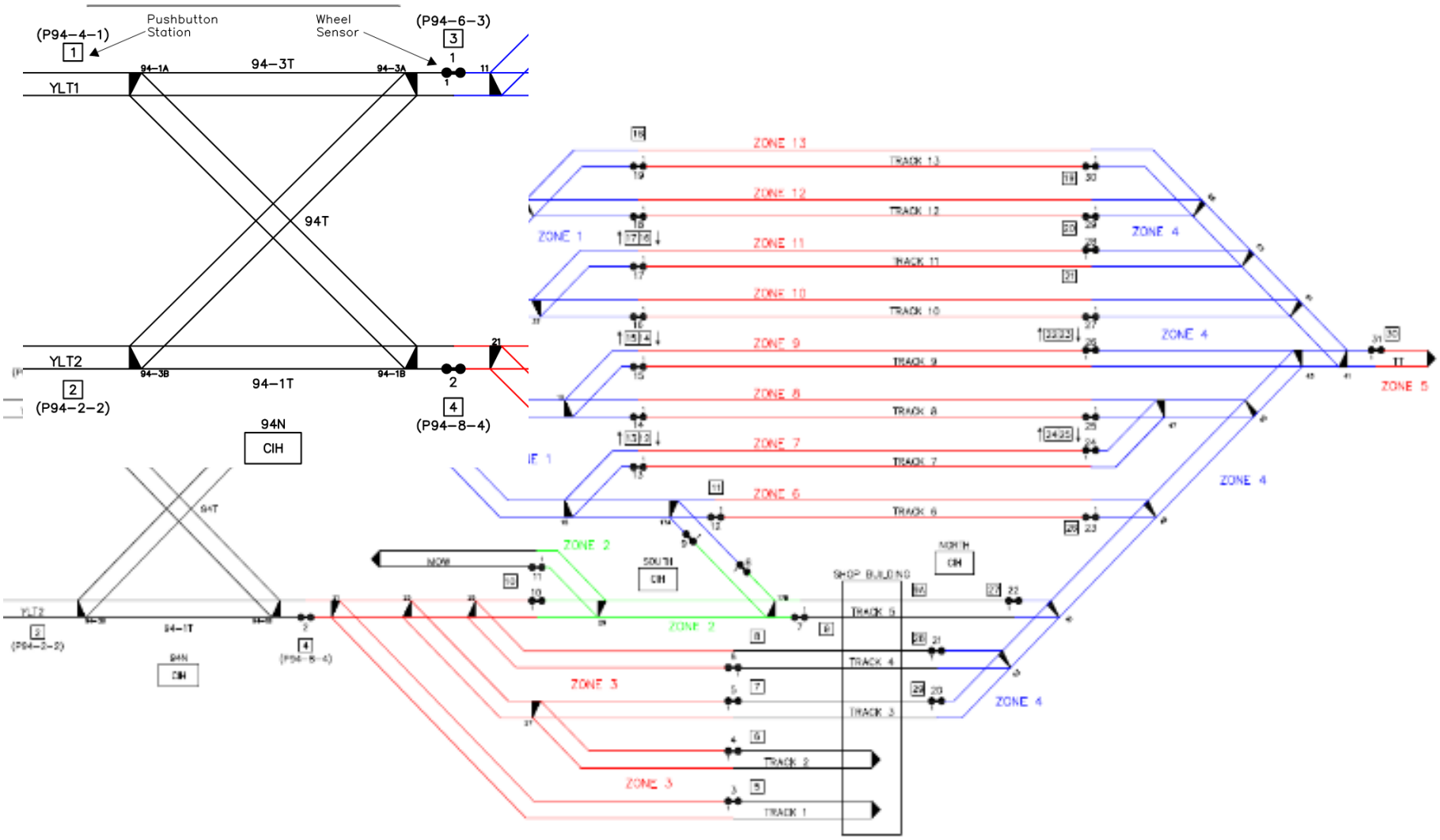
– Tail Track Entrance

– Tail Track to Storage

Equipment Overview: Wheel Sensors

- Wheel sensor: Frauscher RSR180
- Two symmetrical wheel sensor systems
- Used for all applications w/o eddy current brake (e.g. metros, light rails)
- No electronics trackside
- Rail claw mounting
- GAK unit and wheel sensor

MTA North Avenue Yard – Wheel Sensors

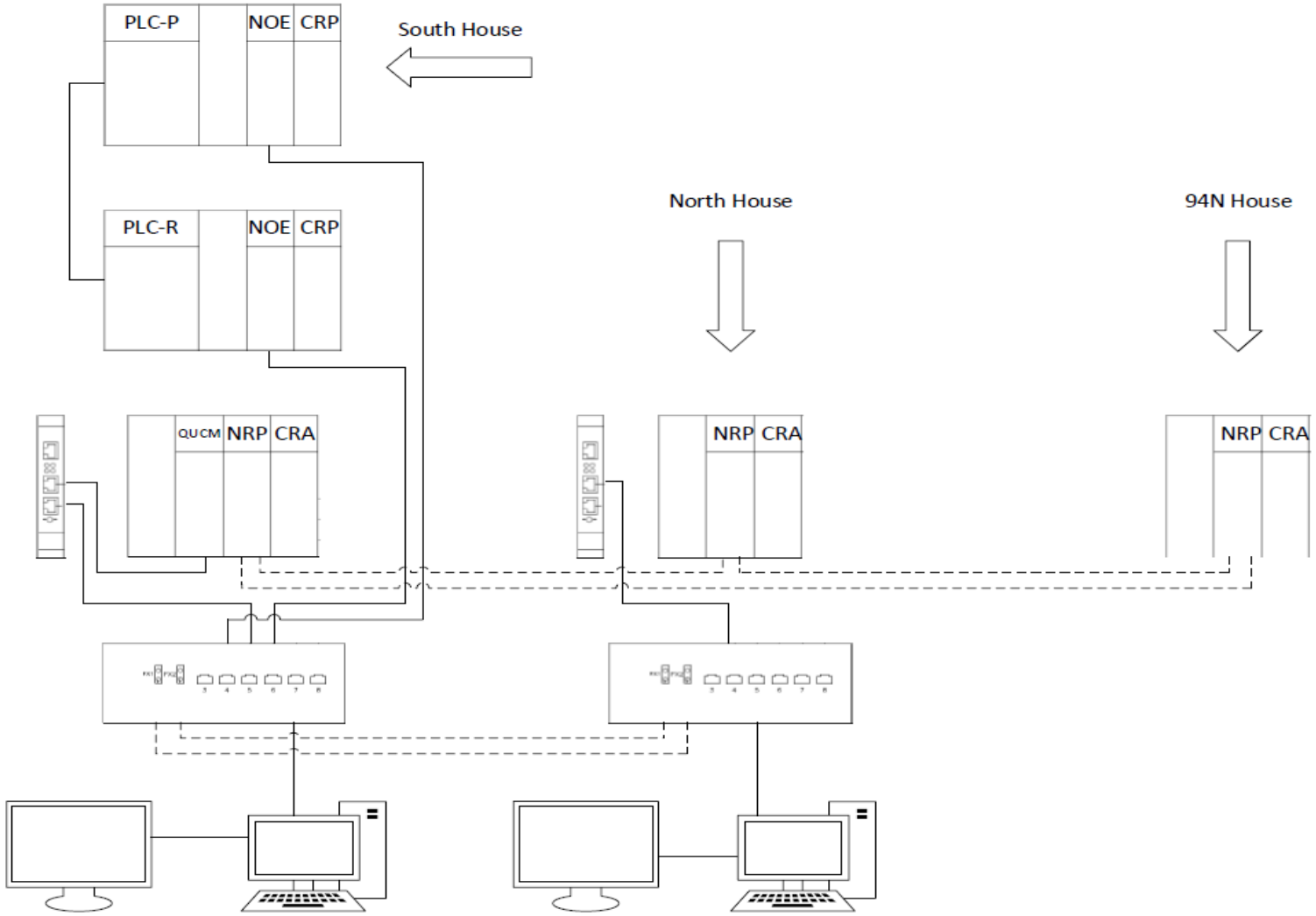


Axle Counter Design features

Axle Counter System:

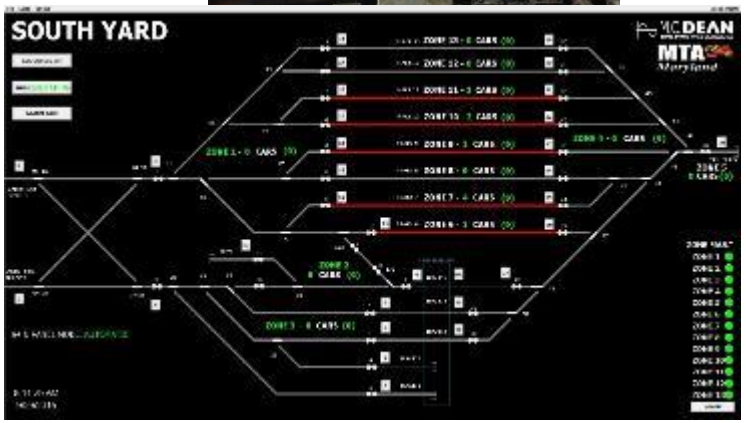
- Axle Counter system: Frauscher FAdC
- Ethernet interface from Axle Counter
- Centralized architecture
- SIL 4 compliant for clear/occupied status & train direction
- Provides operational advantages: Error messages, Reset, Speed
- Board cards can be hot-swapped
- Simple trouble shooting via diagnostic tools and / or LEDs

System Network



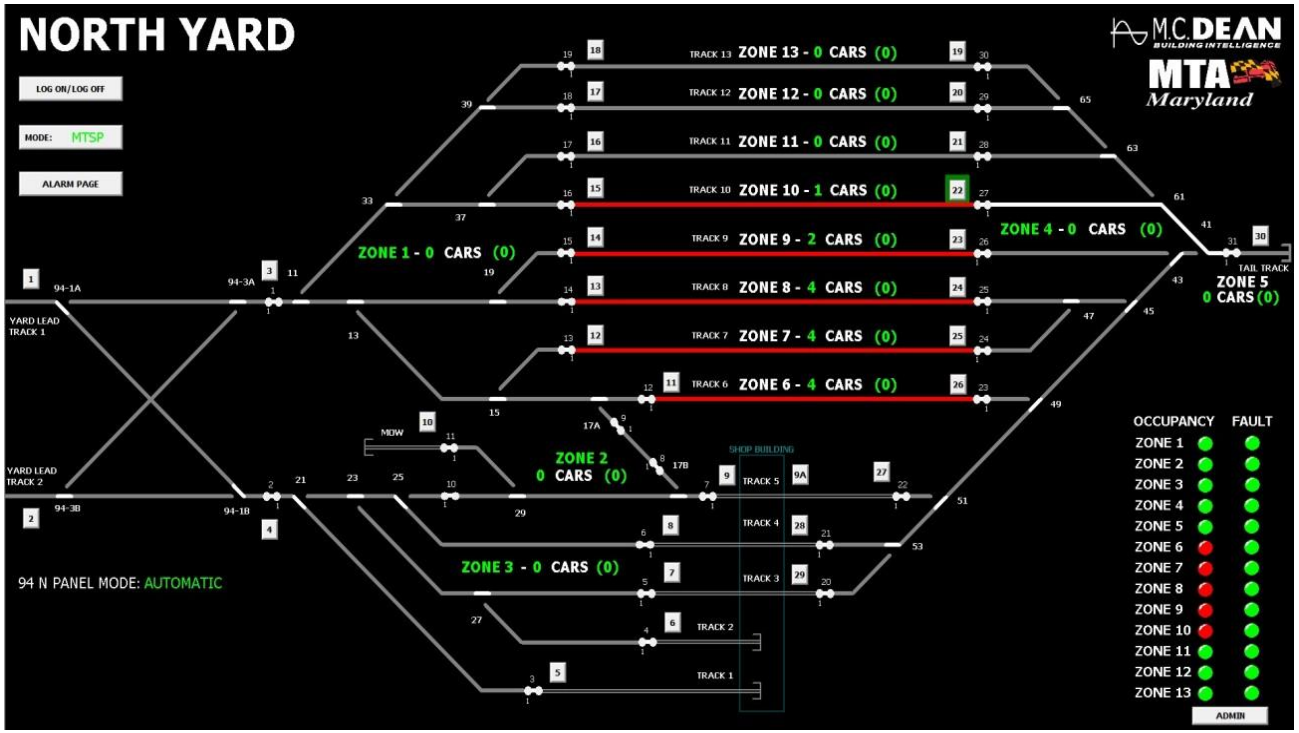
Operational Modes

- Route Pushbutton Mode
- Wayside Switch Pushbutton Mode
- Maintenance Mode
  - Accessible through touch screen in the North and South CIHs.



Maintenance Touchscreen

– Vehicle Quantities and Occupancy
– Remote switch operation
– Diagnostic and Fault Data



Axle Counter Features

System Design:

- Modularity – Ability to apply equipment in a distributed or central architecture
- Wheel sensor that meets IP68 ingress protection requirements (highest rating)

Installation:

- Quick & easy wheel sensor mounting with rail claw (no drilling)
- Flexible wheel sensor cable design - Available in different lengths
- No electronics in the track side connection box

Installation:

- High reliability: MTBF >4 million hours (MIL-HDBK-217F & IEC TR 62380)
- Automated calibration process - no track side calibration needed
- Low maintenance cycle: 2 years
- No expensive special tools needed for mounting, maintenance, installation, or calibration

Conclusions

- Wheel Counter System can provide a reliable means of setting and tracking yard movements
- System with Open architecture, as was provided by Frauscher, allows ease of remote operation and valuable diagnostic and troubleshooting information
- Automated movements allow for a more safe and efficient operation

Thank You

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