PDN Stage 3 - Signals QC Checklist

|  |  |
| --- | --- |
| **SPOT ID/Project TIP #:** | Click or tap to edit. |
| **Signal Inventory No.** | Click or tap to edit. |
| **County:** | Click or tap to edit. |

3SG1 Complete Signal Design

| **Item #** | **Review Item** | **Yes** | **No** | **N/A** |  |
| --- | --- | --- | --- | --- | --- |
|  | **Signal Plan Sheets** |  |  |  |  |
|  | Upper Title Block |  |  |  |  |
|  | All Data Included in Title Block in Correct Format |  |  |  |  |
|  | Lower Title Block |  |  |  |  |
|  | All Data Included in Title Block in Correct Format |  |  |  |  |
|  | Temporary – Phase & Step Number (i.e.: Signal Upgrade Temporary Design 1 TCP Phase x) |  |  |  |  |
|  | PEF Logo (PEF Plans) |  |  |  |  |
|  | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED |  |  |  |  |
|  | Base Map |  |  |  |  |
|  | Edge of Pavement, Curb & Gutter, Paved Shoulder (Dashed Existing, Solid Proposed) |  |  |  |  |
|  | Right of Way Lines and/or Easement |  |  |  |  |
|  | Route Numbers & Street Names |  |  |  |  |
|  | Speed and Grade - Speeds match signing plans unless design speed used |  |  |  |  |
|  | Existing Poles / New Poles and Stations or Inset |  |  |  |  |
|  | Bridges & Approach Slabs, Driveways, Islands, Sidewalks, Fire Hydrants, Buildings, Large Signs, Trees, etc. |  |  |  |  |
|  | Area of Construction (Shade-Level 60) |  |  |  |  |
|  | Railroad Features and Designation |  |  |  |  |
|  | Check that Scale Matches Title Block |  |  |  |  |
|  | Curb Ramps |  |  |  |  |
|  | Pavement Markings |  |  |  |  |
|  | Stop Bars Laid Out Per Design Manual |  |  |  |  |
|  | Temporary Stop Bar Locations provided to Traffic Control (or PEF) |  |  |  |  |
|  | Final Stop Bar Locations provided to Signing and Delineation (or PEF) |  |  |  |  |
|  | Show Movement Arrows for each Lane (not markings) |  |  |  |  |
|  | Other Markings Match Traffic Control Plans or Final Pavement Marking Plans |  |  |  |  |
|  | Signal Design |  |  |  |  |
|  | New Poles with Station & Offset, or Reference Dimensions |  |  |  |  |
|  | Span Wires/Span Ties/Down Guys |  |  |  |  |
|  | Signal Heads Correctly Located, Depicted, and Numbered |  |  |  |  |
|  | Pedestrian Heads and Numbering |  |  |  |  |
|  | APS- if required |  |  |  |  |
|  | Pushbuttons located 10 feet apart if obtainable |  |  |  |  |
|  | All Appropriate Signal Signs Correctly Located, Depicted, and Numbered |  |  |  |  |
|  | Controller – new or existing |  |  |  |  |
|  | Loops Numbered (New Solid, Existing Dashed) |  |  |  |  |
|  | Lead-in for Each Loop |  |  |  |  |
|  | Pull Boxes (Max. 150’ Apart) |  |  |  |  |
|  | Conduit Symbol (New or Existing) or Label “Direct Bury” |  |  |  |  |
|  | Directional Drill for metal poles with mast arms |  |  |  |  |
|  | Back to Back Left Turn Conflict |  |  |  |  |
|  | Signal Face I.D. |  |  |  |  |
|  | Signal Heads Match Phasing |  |  |  |  |
|  | Ped. Heads and Sizes (Countdown standard) |  |  |  |  |
|  | Signal Heads Numbered Correctly - Shown in Order in Signal Face ID |  |  |  |  |
|  | Head Sizes |  |  |  |  |
|  | Special Features Shown (Louvers, Optically Programmed, Bi-Modal, Etc.), Denotes LED Note |  |  |  |  |
|  | Table of Operations |  |  |  |  |
|  | All Heads Listed |  |  |  |  |
|  | All Phases Listed |  |  |  |  |
|  | Phases in Correct Order |  |  |  |  |
|  | Flash Entered Correctly |  |  |  |  |
|  | Operation Shown Correctly |  |  |  |  |
|  | Phasing Diagram |  |  |  |  |
|  | Correct Phasing Diagram |  |  |  |  |
|  | Alternate phasing used? If so, provide documentation from DTE staff |  |  |  |  |
|  | Phases Numbered Correctly |  |  |  |  |
|  | Detected Movements Indicated |  |  |  |  |
|  | Free Flow and Yield Conditions Shown |  |  |  |  |
|  | Pedestrian Movements Shown |  |  |  |  |
|  | Overlaps Shown |  |  |  |  |
|  | RR Tracks Shown |  |  |  |  |
|  | Preemption Phasing Diagram and Phases Shown Correctly |  |  |  |  |
|  | Timed Overlap (TOL) Shown Correctly |  |  |  |  |
|  | Phasing Diagram Legend |  |  |  |  |
|  | Lag Operation at Tees |  |  |  |  |
|  | RTOL where applicable |  |  |  |  |
|  | Arrows Between Phases in Correct Direction |  |  |  |  |
|  | Red Revert used – If appropriate |  |  |  |  |
|  | Timing Chart |  |  |  |  |
|  | Correct Chart for Controller software / signal system / municipality |  |  |  |  |
|  | All Phases & TOLs Listed |  |  |  |  |
|  | Basic Timing Parameters Entered |  |  |  |  |
|  | Yellow and Red Change and Clearance Intervals |  |  |  |  |
|  | Recall Position/Call Memory/Dual Entry |  |  |  |  |
|  | Pedestrian Timing Parameters Entered |  |  |  |  |
|  | Volume Density Times Entered |  |  |  |  |
|  | Appropriate Preemption Chart and Values |  |  |  |  |
|  | Loop Chart |  |  |  |  |
|  | Correct Chart for Controller |  |  |  |  |
|  | All Loops Listed (Including System Loops) |  |  |  |  |
|  | Sizes/Number of Turns/Location shown and Correct |  |  |  |  |
|  | Video detection and/or Out of Pavement Detection shown properly |  |  |  |  |
|  | New or Existing Loop |  |  |  |  |
|  | Phase |  |  |  |  |
|  | New/Existing Unit/Card |  |  |  |  |
|  | Loop Programmed Correctly |  |  |  |  |
|  | Notes/Legend |  |  |  |  |
|  | All Applicable Notes Used |  |  |  |  |
|  | Includes Everything Reference on Plan |  |  |  |  |
|  | Signs Designed Correctly |  |  |  |  |
|  | Directional Drill Number of Conduits |  |  |  |  |
|  | Metal Pole Loading Diagrams |  |  |  |  |
|  | Correct Wind Zone |  |  |  |  |
|  | Correct Notes |  |  |  |  |
|  | Attachment Heights/Elevation Differences |  |  |  |  |
|  | Mastarm Orientations Correct |  |  |  |  |
|  | Load Shown Matches Legend |  |  |  |  |
|  | **Electrical Detail Sheets** |  |  |  |  |
|  | Upper Title Block |  |  |  |  |
|  | All Data Included in Title Block in Correct Format |  |  |  |  |
|  | Lower Title Block |  |  |  |  |
|  | All Data Included in Title Block in Correct Format |  |  |  |  |
|  | Temporary – Phase & Step Number (i.e.: Signal Upgrade Temporary Design 1 TCP Phase x) |  |  |  |  |
|  | PEF Logo (PEF Plans) |  |  |  |  |
|  | Electrical Detail Sheet # of # |  |  |  |  |
|  | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED |  |  |  |  |
|  | Signal Plan I.D. Box |  |  |  |  |
|  | Signal Inventory Number |  |  |  |  |
|  | All Appropriate Signal Desgin/Sealed/Revised Dates |  |  |  |  |
|  | General Electrical Detail Notes |  |  |  |  |
|  | Flash Block Setup |  |  |  |  |
|  | Dual Entry |  |  |  |  |
|  | Volume Density Programming |  |  |  |  |
|  | Startup Sequence |  |  |  |  |
|  | Startup Pedestrian Calls |  |  |  |  |
|  | Software or Plan Specific Programming Instructions |  |  |  |  |
|  | Detector Logging |  |  |  |  |
|  | Signal System Information |  |  |  |  |
|  | Equipment Information |  |  |  |  |
|  | Controller/Cabinet/Cabinet Mount/Software |  |  |  |  |
|  | Output File Positions |  |  |  |  |
|  | Load Switches Used |  |  |  |  |
|  | Phases and Overlaps Used |  |  |  |  |
|  | Plan Specific Notes |  |  |  |  |
|  | Signal Head Hook-up Chart |  |  |  |  |
|  | Hook-up Chart Appropriate for Cabinet Being Used |  |  |  |  |
|  | Load Switches Labeled with Phase of Overlap Assignment |  |  |  |  |
|  | Signal Head Numbers |  |  |  |  |
|  | Field Terminal Numbers (Ball or Arrow Indications) |  |  |  |  |
|  | Flashing Yellow Arrows |  |  |  |  |
|  | Pedestrian Heads |  |  |  |  |
|  | Load Resistors |  |  |  |  |
|  | Are Load Switches Assigned so that Signal Heads on Same Span Flash Concurrently |  |  |  |  |
|  | Chart Legend and/or Notes |  |  |  |  |
|  | Conflict Monitor |  |  |  |  |
|  | Conflict Monitor Type |  |  |  |  |
|  | Watchdog Enable Switch "ON" |  |  |  |  |
|  | Options Switches |  |  |  |  |
|  | FYA Switches |  |  |  |  |
|  | SSM Switches |  |  |  |  |
|  | List of Diode Jumpers to Remove |  |  |  |  |
|  | Program Card Diagram with Appropriate Jumpers Removed |  |  |  |  |
|  | Yellow Disable Jumpers |  |  |  |  |
|  | Card and Table Programmed Appropriately (NEMA) |  |  |  |  |
|  | Monitor Specific Notes |  |  |  |  |
|  | Input File Position Layout |  |  |  |  |
|  | Vehicle Detector Cards (And System Detectors if Applicable) |  |  |  |  |
|  | Pedestrian DC Isolators |  |  |  |  |
|  | Emergency Vehicle Preemption Detectors |  |  |  |  |
|  | Railroad Preemption AC Isolator |  |  |  |  |
|  | Flash Sense and Stop Time DC Isolator |  |  |  |  |
|  | Empty Slots Labeled |  |  |  |  |
|  | Wired Inputs Labeled |  |  |  |  |
|  | Video, Microwave, or Other Out of Pavement Detection |  |  |  |  |
|  | Legend and/or Notes |  |  |  |  |
|  | Input File Connection and Programming Chart |  |  |  |  |
|  | Loop Number |  |  |  |  |
|  | Loop Terminal |  |  |  |  |
|  | Input File Position |  |  |  |  |
|  | Pin Number |  |  |  |  |
|  | Input Assignment Number (if applicable) |  |  |  |  |
|  | Detector Number |  |  |  |  |
|  | Phase Assigned |  |  |  |  |
|  | Detector Attributes (Call, Extend, Full Time Delay, Use Added Init. Etc.) |  |  |  |  |
|  | Delay Time |  |  |  |  |
|  | Extend (Stretch) Time |  |  |  |  |
|  | Wired Inputs |  |  |  |  |
|  | Pedestrian Detectors |  |  |  |  |
|  | Time of Day Detectors |  |  |  |  |
|  | Video, Microwave, or Other Out of Pavement Detectors |  |  |  |  |
|  | Time of Day Programming Notes |  |  |  |  |
|  | System Detector Programming Notes |  |  |  |  |
|  | Wired Input Notes |  |  |  |  |
|  | Note to Install DC Isolators in Input File |  |  |  |  |
|  | Misc. Software Programming Details |  |  |  |  |
|  | Overlap Programming Detail |  |  |  |  |
|  | Logic Processor Programming Detail |  |  |  |  |
|  | Countdown Pedestrian Head Programming Note |  |  |  |  |
|  | Phase Sequence Detail |  |  |  |  |
|  | Input Re-assignment Detail |  |  |  |  |
|  | Output Re-Assignment Detail |  |  |  |  |
|  | Load Switch Assignment Detail |  |  |  |  |
|  | Vehicle or Pedestrian Detector Programming Detail |  |  |  |  |
|  | Preemption Programing Detail (Emergency, Rail, Queue, etc.) |  |  |  |  |
|  | Backup Protection Programming Detail |  |  |  |  |
|  | Advance Flasher/Beacon Programming Detail |  |  |  |  |
|  | Other Special Software Programming Detail |  |  |  |  |
|  | Misc. Hardware Details |  |  |  |  |
|  | Flasher Circuit Modification Detail |  |  |  |  |
|  | Load Resistor Installation Detail |  |  |  |  |
|  | Railroad Preemption Wiring Detail |  |  |  |  |
|  | AC Isolator Card Programming Detail |  |  |  |  |
|  | EV Preemption Wiring Detail |  |  |  |  |
|  | Advance Flasher/Beacon Wiring Detail |  |  |  |  |
|  | Wireless Radio Wiring Detail |  |  |  |  |
|  | Other Special Hardware Detail |  |  |  |  |
|  | **Quantity and Cost Estimates** |  |  |  |  |
|  | All Appropriate Standard Pay Items Identified and Included |  |  |  |  |
|  | Non-Standard Pay Items Identified and Included |  |  |  |  |
|  | Linear Quantities Include Vertical Components where Applicable |  |  |  |  |
|  | Latest ITS & Signals Quantity Spreadsheet Used |  |  |  |  |
|  | All Required Conduit Sizes Included |  |  |  |  |
|  | **Project Special Provisions** |  |  |  |  |
|  | Latest Version of ITS & Signal Project Special Provisions Used |  |  |  |  |
|  | All Pay Items Identified as SP are Included |  |  |  |  |
|  | Unused Items Deleted from Provisions |  |  |  |  |
|  | Special Provision Created for Non-Standard or New Items |  |  |  |  |
|  | Document Named According to Convention and Sealed |  |  |  |  |
|  | **Project Documentation** |  |  |  |  |
|  | Provide Autoturn Simulations for Left-Turning Vehicles forall Signal Designs |  |  |  |  |
|  | Provide Clearance Distance Sheets for Clear Time Calculations for all Signal Designs |  |  |  |  |
|  | Provide Signed Clearance Calculations for all Signal Designs |  |  |  |  |
|  | Provide Approach Grade Documentation for all Signal Designs |  |  |  |  |
|  | Provide Counts and Phasing Justifications for all Signal Designs |  |  |  |  |
|  | Provide Correspondence with NCDOT or Municipal |  |  |  |  |
|  | Metal Poles |  |  |  |  |
|  | Provide Appropriate Elevations and Calculations of Metal Pole Clearances |  |  |  |  |
|  | Provide Standard Strain Pole Selection Spreadsheet |  |  |  |  |
|  | Provide the Controller Database or Config file for each Design |  |  |  |  |

*For items marked* ***No*** *that require further explanation, provide comments or action items in the table below.*

| **Item #** | **Comments and Action Items** |
| --- | --- |
| Click to edit. | Click to edit. |

|  |  |  |  |
| --- | --- | --- | --- |
| ***This checklist may not be comprehensive to every project. It is the responsibility of the reviewer to ensure that an adequate review is performed.***  ***I have reviewed the plans for consistency with this checklist and confirmed that all items have been completed.*** | | | |
| **QC Reviewer Name:** | | Click to edit. | **Date:** | Click to edit. | |
| **QC Reviewer (Signature):** | |  |  |  | |