

2012 DelDOT Winter Workshop

TEMPORARY TRAFFIC CONTROL
THE GOOD, THE BAD, THE UGLY...
FEBRUARY 20, 2012



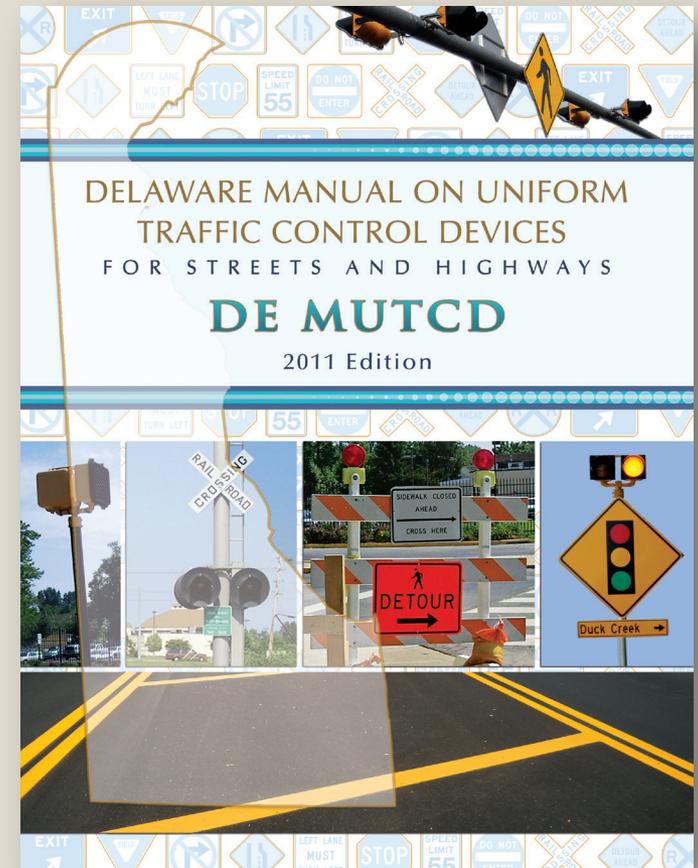
PRESENTED BY:
Adam Weiser, P.E. PTOE
Safety Programs manager
Delaware Department of Transportation

Discussion Topics

- Work Zone Crash Update
- MUTCD Update
- Design Topics
 - Plan Development
 - Positive Protection
 - Impact Attenuators
 - Pedestrians
- Construction Topics
 - Inspection
 - Quality of Devices
 - Signing
 - Pedestrians
 - Storage of Equipment
- “A Picture is Worth 1,000 Words”
- Training

MUTCD Update

- 2011 Delaware MUTCD adopted as state regulation effective **July 10, 2011**
- All projects that will PS&E starting January 2012 shall be compliant with the 2011 Delaware MUTCD
- Minor updates/revisions are expected this year
 - Mostly typos that have been found as we utilize the document
 - No major changes expected at this time
- FHWA Proposed Amendments
 - Definition of Standard
 - Compliance Dates
- Easy to remember website – www.mutcd.deldot.gov



Design Topics

- Plan development
- Positive protection
- Impact attenuators
- Pedestrians

Plan Development

- **Preliminary plan submittal**
 - General construction phasing
 - Safety will schedule meeting with designer and Construction to discuss constructability and TTC
- **Semi-Final plan submittal**
 - Phasing and TTC plans
 - Detour plans 90% complete
 - Substantial comments –
 - ✦ Safety will note on comment form that a revised semi-final plan submittal is required
 - ✦ If needed, Safety will schedule a meeting with designer to discuss TTC issues
- **Final plan submittal**
 - Review to ensure all comments were addressed
 - Hopefully no additional comments
 - Approved detour plans provided to designer

Plan Development

- Scaling of MOT plan sheets
- Details to be shown on plans
 - Temporary pavement markings
 - ✦ Show how they tie-in to existing markings
 - Typical sections
 - ✦ When using barrier
 - Show work area and deflection zone
 - Show offset to travel lanes
 - ✦ Lane shifts
 - Temporary warning signage
 - Pedestrian MOT
 - ✦ If maintaining pedestrians within project limits
 - ✦ Pedestrian detour plan only required when detour pedestrians onto other roads.

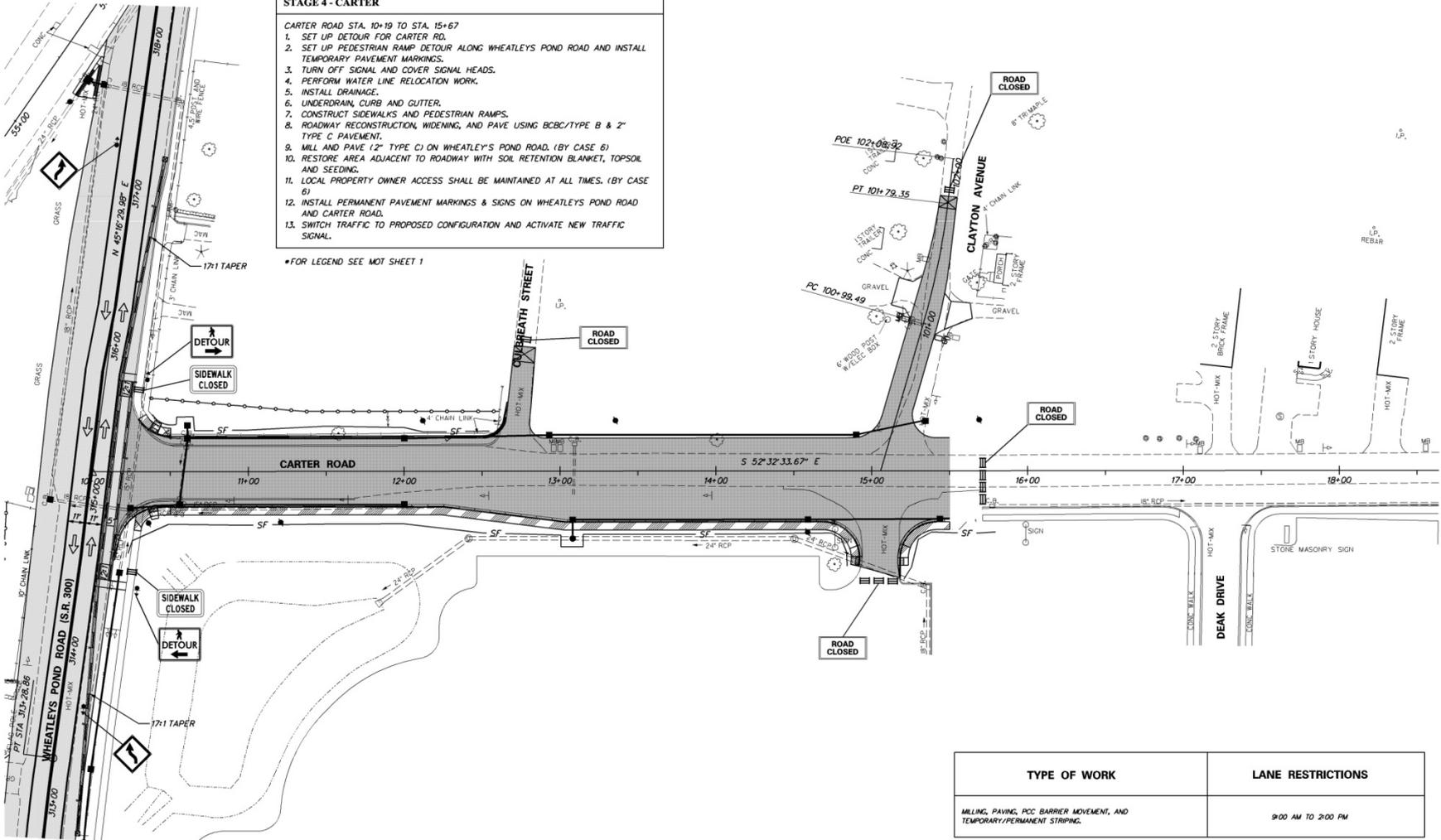
Plan Development

STAGE 4 - CARTER

CARTER ROAD STA. 10+19 TO STA. 15+67

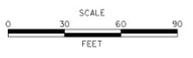
1. SET UP DETOUR FOR CARTER RD.
2. SET UP PEDESTRIAN RAMP DETOUR ALONG WHEATLEYS POND ROAD AND INSTALL TEMPORARY PAVEMENT MARKINGS.
3. TURN OFF SIGNAL AND COVER SIGNAL HEADS.
4. PERFORM WATER LINE RELOCATION WORK.
5. INSTALL DRAINAGE.
6. UNDERDRAIN, CURB AND GUTTER.
7. CONSTRUCT SIDEWALKS AND PEDESTRIAN RAMP.
8. ROADWAY RECONSTRUCTION, WIDENING, AND PAVE USING BCBC/TYP E B & 2" TYPE C PAVEMENT.
9. MILL AND PAVE (2" TYPE C) ON WHEATLEYS POND ROAD. (BY CASE 6)
10. RESTORE AREA ADJACENT TO ROADWAY WITH SOIL RETENTION BLANKET, TOPSOIL AND SEEDING.
11. LOCAL PROPERTY OWNER ACCESS SHALL BE MAINTAINED AT ALL TIMES. (BY CASE 6)
12. INSTALL PERMANENT PAVEMENT MARKINGS & SIGNS ON WHEATLEYS POND ROAD AND CARTER ROAD.
13. SWITCH TRAFFIC TO PROPOSED CONFIGURATION AND ACTIVATE NEW TRAFFIC SIGNAL.

*FOR LEGEND SEE MOT SHEET 1



TYPE OF WORK	LANE RESTRICTIONS
MILLING, PAVING, PCC BARRIER MOVEMENT, AND TEMPORARY/PERMANENT STRIPING.	9:00 AM TO 2:00 PM

ADDENDUMS / REVISIONS



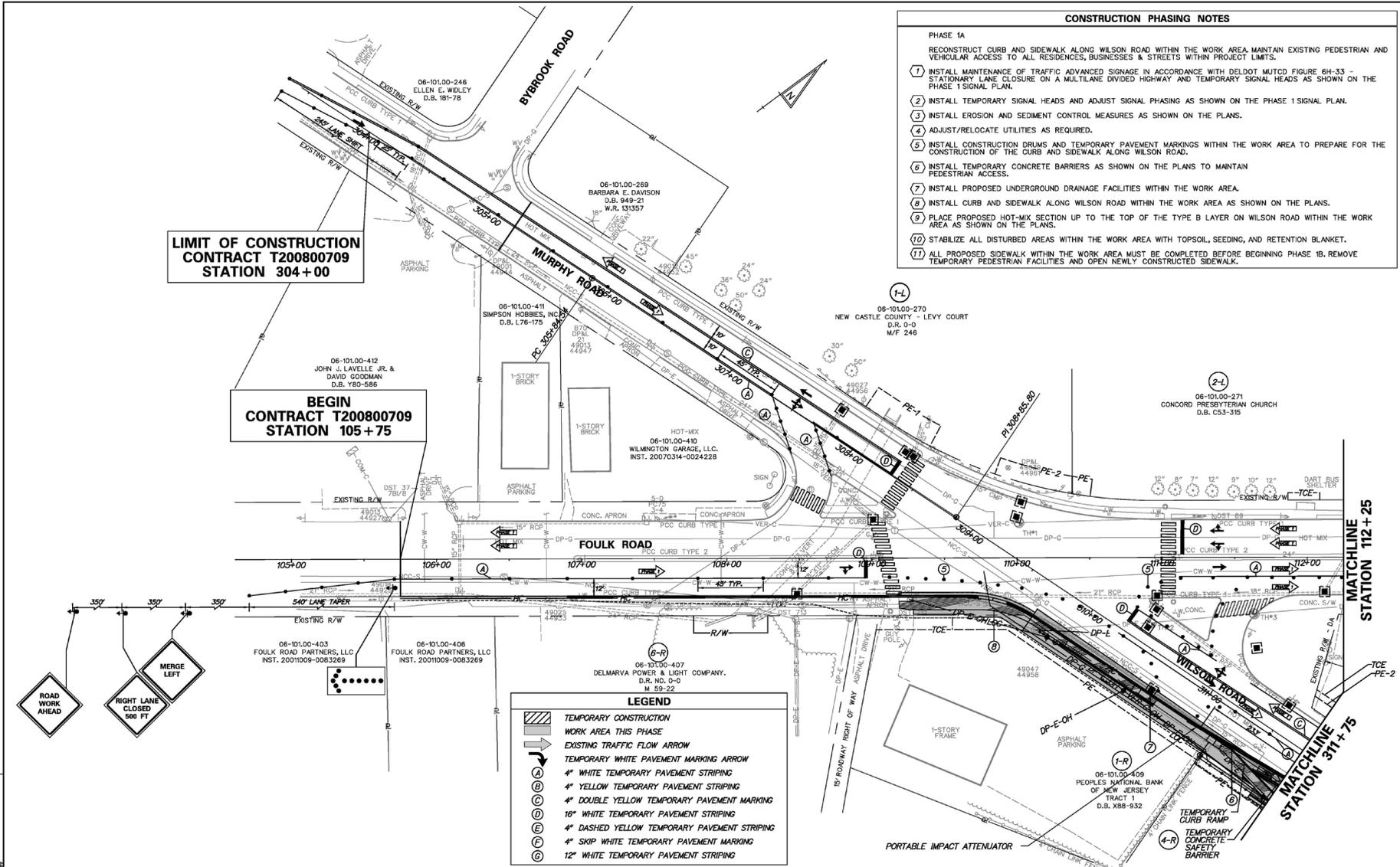
**CARTER ROAD (K137)
SUNNYSIDE ROAD TO
WHEATLEYS POND ROAD**

CONTRACT T200301601	BRIDGE NO.
COUNTY	DESIGNED BY: JZV
KENT	CHECKED BY: NAW

**CONSTRUCTION PHASING
MAINTENANCE OF TRAFFIC
AND EROSION CONTROL
STAGE 4**

SHEET NO.	82
TOTAL SHTS.	134

Plan Development



DELAWARE DEPARTMENT OF TRANSPORTATION
 PROJECT NO. T200800709
 SHEET NO. 22
 DATE: 08/20/2008
 DRAWN BY: J. W. HARRIS
 CHECKED BY: J. W. HARRIS
 IN CHARGE: J. W. HARRIS

ADDENDUMS / REVISIONS



HSP - NCC,
FOULK ROAD AND WILSON ROAD
INTERSECTION IMPROVEMENT

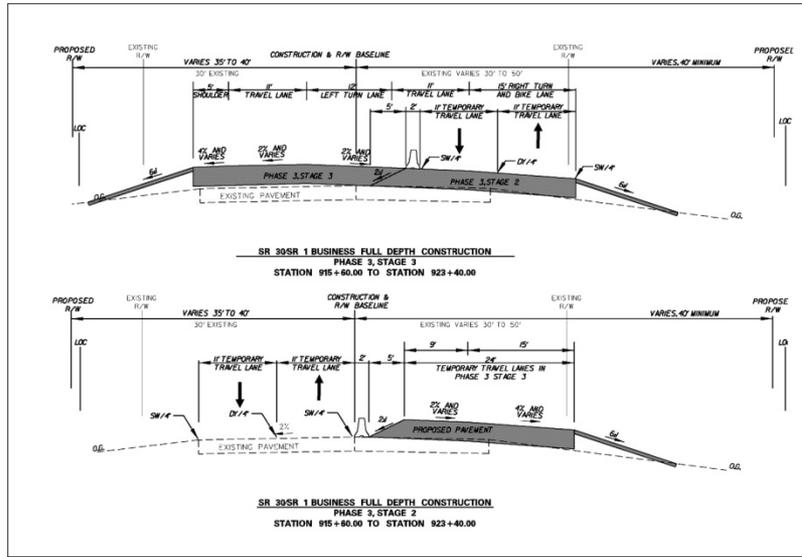
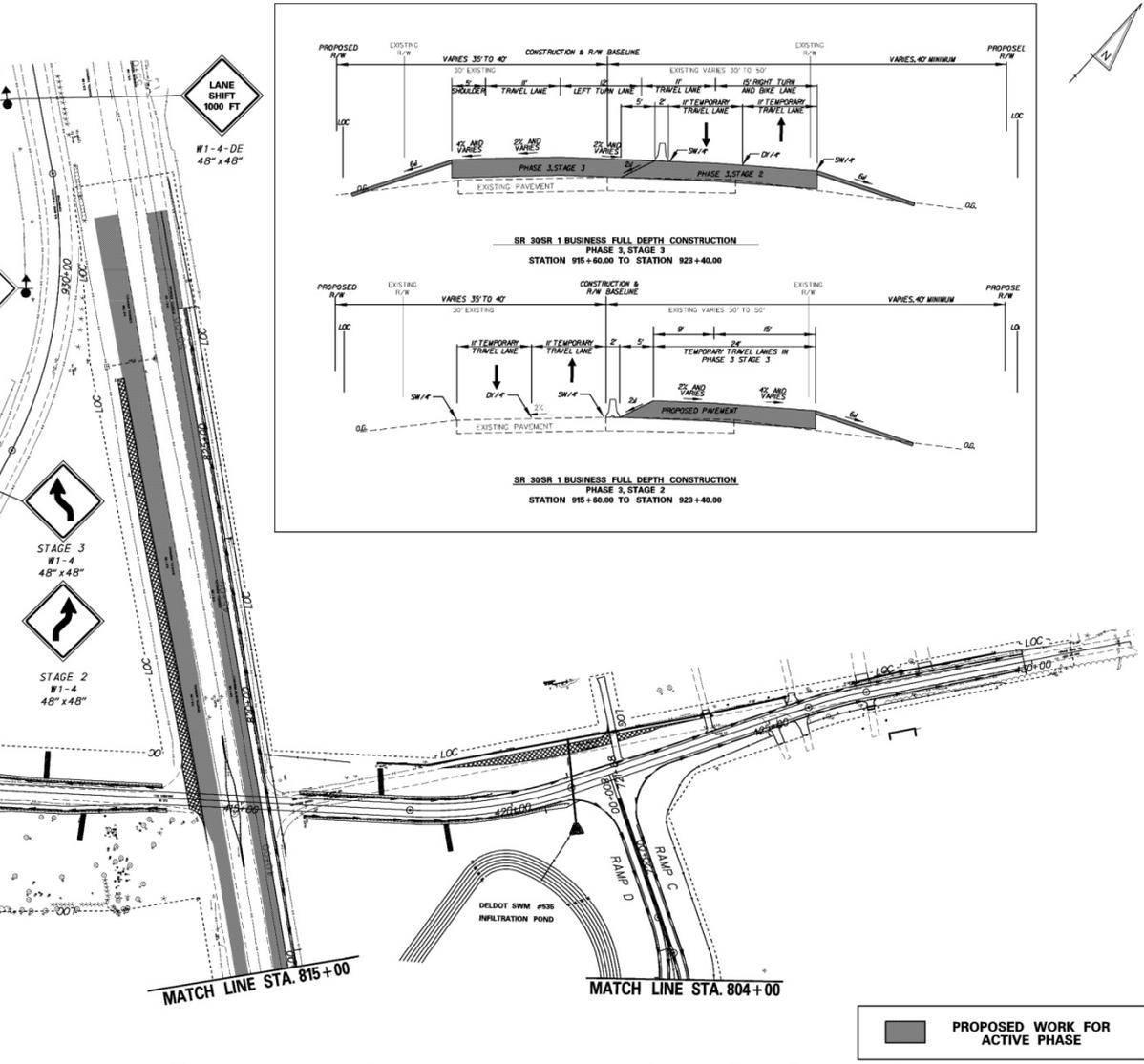
CONTRACT	BRIDGE NO.
T200800709	
COUNTY	DESIGNED BY: TAM
NEW CASTLE	CHECKED BY: MAG

CONSTRUCTION PHASING, M.O.T. AND EROSION CONTROL PLAN - PHASE 1A	SHEET NO. 22 TOTAL SHTS. 43
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Plan Development

PHASE III

- STAGE 1**
1. USING TA-10 FOR LANE CLOSURES AND TA-3 FOR SHOULDER CLOSURES FROM THE LATEST VERSION OF THE DEMUTCD, INSTALL SR30 FULL DEPTH SHOULDER WIDENING UP TO TOP OF THE TYPE B HOTMIX LAYER AND PROPOSED DRAINAGE IMPROVEMENTS FROM STA. 900+00 TO STA. 915+00.
 2. PLACE TEMPORARY STRIPING AND INTERIM SIGNING FOR STAGE 2 LANE SHIFTS AS SHOWN.
 3. SOME PORTIONS OF PHASE III MAY BE WORKED CONCURRENTLY WITH PHASE II IF APPROVED BY THE ENGINEER.
- STAGE 2**
1. USING TA-10, PLACE PCC SAFETY BARRIER AND SHIFT TRAFFIC TO WESTERN SIDE OF SR 30 AND WILKINS ROAD INTERSECTION. REFER TO PHASE 3, STAGE 2 TYPICAL SECTION. CONTRACTOR SHALL RELOCATE STOP SIGNS AS NEEDED TO RETAIN STOP CONTROL AT THE INTERSECTION OF SR30 & S206.
 2. CONSTRUCT FULL DEPTH ROADWAY IMPROVEMENTS AND TIE-IN TO THE OVERPASS APPROACH BETWEEN STA. 915+00 AND STA. 923+14 UP TO THE TOP OF THE TYPE B HOTMIX LAYER. PROVIDE 2:1 PAVEMENT WEDGE AS PER THE TYPICAL SECTION. PROVIDE TEMPORARY HOTMIX PAVEMENT IN PLACE OF PROPOSED PCC CHANNELIZING ISLAND AT STA. 920+00. INSTALL PROPOSED DRAINAGE.
 3. PROVIDE TEMPORARY MARKINGS ON THE NEWLY CONSTRUCTED EASTERN SIDE OF THE INTERSECTION. PROVIDE TEMPORARY WIDENING FOR TAPER TRANSITION FROM FULL DEPTH SECTION TO EXISTING PAVEMENT.
- STAGE 3**
1. CONTRACTOR SHALL NOT START THIS STAGE PRIOR TO COMPLETION OF OVERPASS AND TIE-INS. USING TA-10, RELOCATE THE PCC SAFETY BARRIER AS SHOWN IN THE PHASE 3, STAGE 3 TYPICAL SECTION. PROVIDE TEMPORARY SIGNING FOR LANE SHIFTS TO NEWLY CONSTRUCTED PAVEMENT AS SHOWN.
 2. INSTALL DETOUR AS PER PHASE 3, STAGE 3 DETOUR PLAN TO CLOSE THE WESTERN APPROACH OF WILKINS ROAD TO THE INTERSECTION. THE CONTRACTOR SHALL RELOCATE EXISTING STOP SIGNS AS NEEDED TO MAINTAIN STOP CONTROL OF INTERSECTION. COSTS INCIDENTAL TO ITEM 763500. OPEN THE OVERPASS AND EASTERN SIDE OF INTERSECTION TO TRAFFIC. CONSTRUCT FULL DEPTH PAVING FOR WEST SIDE OF INTERSECTION AND WILKINS ROAD APPROACH.
 3. PLACE REMAINING TYPE C HOTMIX LAYER THROUGHOUT THE INTERSECTION. INSTALL ALL PERMANENT STRIPING AND TRAFFIC CONTROL DEVICES FOR THE SR30 & S206 INTERSECTION.
 4. FULLY OPEN TO TRAFFIC.
 5. UPON COMPLETION OF THE OVERPASS CONSTRUCTION AND OPENING TO TRAFFIC, USE TA-33 TO CLOSE LANES AS NEEDED TO REMOVE SR 1 MEDIUM CROSSOVER AT STATION 24+50. GRADE TO DRAIN, TOPSOIL, SEED AND MULCH.
- STAGE 4**
1. USE TA-33 TO PROFILE MILL AND OVERLAY NORTHBOUND AND SOUTHBOUND SR-1 THROUGHOUT THE PROJECT LIMITS.
 2. USE TA-35C TO PLACE PERMANENT STRIPING ON SR-1. USE TA-35 FOR PLACEMENT OF RPMs AND RUMBLE STRIPS ON SR-1.
 3. USE TA-10 TO PROFILE MILL AND OVERLAY ON SR 30 AND APPLICATION OF TYPE C LAYER FOR REMAINING AREAS ON WILKINS RD. AND SR 30 AS APPLICABLE.
- STAGE 5**
1. INSTALL ALL ITEMS, LIGHTING AND PERMANENT SIGNING ITEMS. USE TA-3A FOR SHOULDER CLOSURES AND TA-33 FOR LANE CLOSURES AS NEEDED ON SR-1. USE TA-3 FOR SHOULDER CLOSURES AND TA-10 FOR LANE CLOSURES AS NEEDED ON SIDE ROADS.



Positive Protection

- **Length of Need**

- Barrier length-of-need calculations should be submitted to Safety for review
- Consideration should be given to where contractor might store materials or equipment
- Plan note should be provided to tell contractor that material equipment should not be stored in the BLON

- **Barrier deflection**

- Joint design, among other factors, determines deflection
- Most temporary PCC barrier deflection = 4ft
- Provide for deflection between work area and work zone side of barrier
- If work zone space is limited consider pinning barrier



Positive Protection

- **Pinning of barrier**

- DelDOT does not currently have standard pinning details
- Typical method is to install straps in the toe of the barrier
 - ✦ This method has not been crash tested
- Approved pinning methods exist
 - ✦ List couple of examples
- Cannot simply dowel existing temporary PCC barrier
 - ✦ Rebar placement differs
 - ✦ Lose strength around pinning holes in toe of barrier

- **Barrier stiffening**

- NYDOT, Kentucky and PENNDOT have methods
- Use guardrail sections on work side of barrier over joint to stiffen
 - ✦ NYDOT version has been crash tested, but not approved by FHWA
 - ✦ Limits deflection to 2 feet

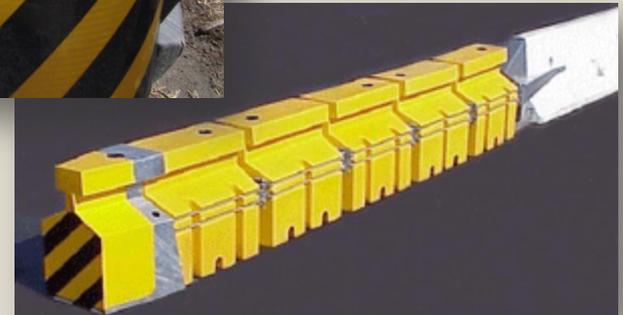


Positive Protection

- Path forward
 - Meeting scheduled with Bridge, Construction, Safety and FHWA
 - ✦ Discuss pinning methods and need for standard details
 - ✦ Discuss repair of temporary PCC safety barrier
 - Potential research project with University of Delaware and/or FHWA Pooled Fund Study
 - ✦ Further crash testing on stiffening methods
 - ✦ Development of pinning design for Delaware
- Future details to come...

Temporary Impact Attenuators

- Things to consider
 - Test level
 - ✦ TL-2
 - ✦ TL-3
 - Gating vs. Non-Gating
 - Redirective vs. Non-Redirective
 - Width of device
 - ✦ Wide vs. narrow
- Examples
 - QuadGuard
 - REACT
 - ABSORB 350
 - Sand barrel arrays
 - Truck mounted

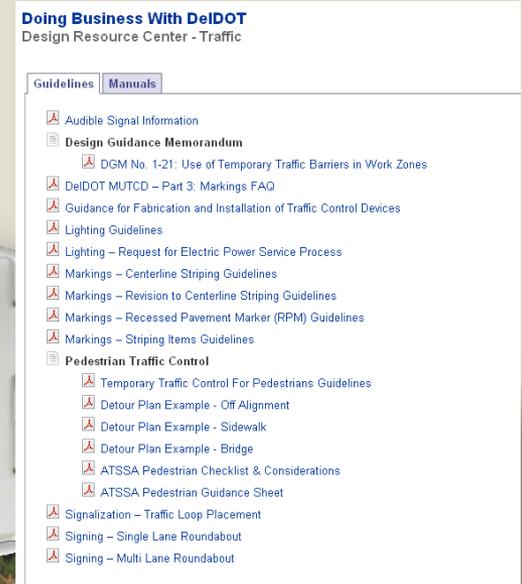


Temporary Impact Attenuators

- **Specification Changes**
 - All existing specifications have been made obsolete
 - “Furnish” specifications
 - Install specification
 - ✦ Covers all types of Impact Attenuators
 - Relocation specification
 - ✦ Covers all types of Impact Attenuators
- **Affect on Plan Development**
 - Currently working with Plan Development Working Group on how to call-out the specific attenuators on a set of plans
 - Most likely will use some sort of “Schedule” to be included on the MOT plan sheets
- **Questions about Impact Attenuators should be directed to the Safety Section**
- **Looking to get some vendors in for some training**

Pedestrian TTC

- Pedestrian TTC Working Group
- Best practices document available on DRC
 - Best practices
 - Model plans
 - ATSSA Checklists
- Evaluate progress
- Working Group meeting in Spring Summer to discuss progress



Construction Topics

- Inspection
- Quality of Devices
- Signing
- Pedestrians
- Storage of Equipment

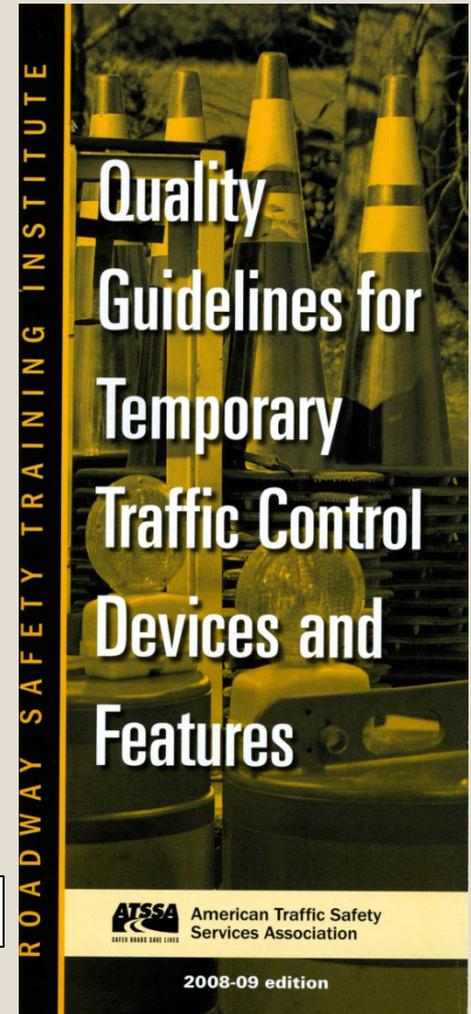
Inspection

- Temporary traffic control must be reviewed on a daily basis
- Whose responsibility?
 - Contractor
 - DelDOT Inspector
 - DelDOT Safety
 - Everyone!!!
- Inspector should be driving through work zone on a daily basis and reviewing all TTC elements
- Hold your inspection staff accountable
 - Inspect the MOT as you would hot-mix, concrete, pipe and other aspects of the project.
- ***Don't be the victim of a Winter Workshop TTC presentation!!!***



Quality of Devices

- Maintain quality of all TTC Devices
 - Requirement of FHWA Final Rule on TTC Devices
 - Requirement of Delaware MUTCD
 - Requirement of revised MOT specification
- ATSSA Quality Guidelines brochure
 - DelDOT's standard for TTC Device quality
 - Available for purchase from ATSSA's website
 - \$12.00 per copy
 - Each inspector should have a copy
- Grading criteria
 - Acceptable
 - Marginal ← **Minimum Requirement**
 - Unacceptable ← **Remove from Project**



Quality of Devices



Signing

- Signs in place greater than 3 days
 - Ground mount using approved sign posts
 - Portable sign stands acceptable only:
 - ✦ When there is a documented utility conflict and sign is repositioned
 - ✦ Sign is placed on a concrete island or on pavement
 - Ex: Median island
 - If DelDOT has a sign in the ground, there should be no reason why Contractor cannot install sign in ground
 - Signs not in use shall be removed or covered completely



Signing

- Signs in place less than 3 days or temporary warning signs
 - Mount on approved portable sign stand
 - ✦ Windmaster
 - ✦ Hi-pro 350
 - Signs not in use shall be removed from roadway or placed behind barrier or guardrail
 - ✦ Signs can be no longer stored in grass adjacent to the edge of road
 - Do not lean signs and/or stands on guardrail
 - Signs not removed will be confiscated by DelDOT



Pedestrians

- Pedestrian TTC is improving statewide
- An accessible path shall be provided regardless of the number of pedestrians
- Considerations
 - Phasing
 - High-early concrete
 - Flaggers to escort pedestrians
- New specifications are being developed to allow this to be accomplished
- If everyone works together, we can overcome the challenges that we face when dealing with pedestrians in work zones

Pedestrians



Pedestrians



Pedestrians



Pedestrians



Storage of Equipment

- Equipment and material are considered fixed objects, especially when placed within the clear zone
- Guidelines in Delaware MUTCD
 - Section 6G.
 - Table 6G.02
- Do not store equipment or materials within the barrier length-of-need



A Picture is Worth 1,000 Words...







**SIDEWALK
CLOSED**




DETOUR
←

CAUT





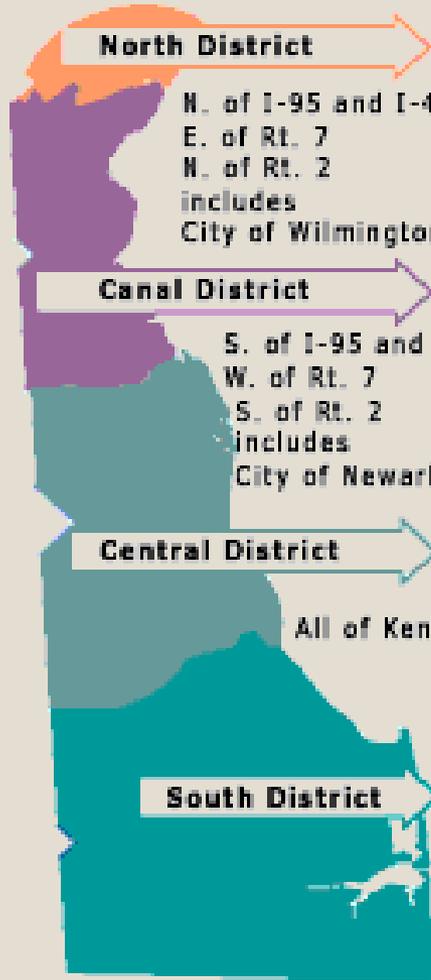




Work Zone Training

- **Field awareness training for design personnel**
 - Brown bag lunch session, probably in April
- **Law enforcement work zone training**
 - Currently under development
 - Will be soliciting comments from Construction this month
 - Draft to State Police by end of March
- **Future training – begin development this year**
 - Project development training
 - Construction inspection training

Safety Section Contact Information



North District

N. of I-95 and I-495
E. of Rt. 7
N. of Rt. 2
includes
City of Wilmington

Wayne Hamilton, North District Safety Officer

O: (302) 326-4495

E: Wayne.Hamilton@state.de.us

Canal District

S. of I-95 and I-495
W. of Rt. 7
S. of Rt. 2
includes
City of Newark

Jim King, Canal District Safety Officer

O: (302) 326-4494

E: James.King@state.de.us

Gerald Nagyiski, Jr.
Chief Safety Officer

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Central District

All of Kent Co.

John Subda, Central District Safety Officer

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Safety Programs Manager

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South District

All of
Sussex
Co.

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Thank you!

Questions???