



AMERICAN SOCIETY OF HIGHWAY ENGINEERS

National Project of the Year Award

OFFICIAL ENTRY FORM

AWARD CATEGORY (Check One): Under \$20 Million Over \$20 Million

SPONSORING REGION (Check One):

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> Northeast | <input type="checkbox"/> Great Lakes | <input type="checkbox"/> Northwest |
| <input type="checkbox"/> Mid-Atlantic | <input type="checkbox"/> North Central | <input type="checkbox"/> Rocky Mountain |
| <input type="checkbox"/> Southeast | <input type="checkbox"/> South Central | <input type="checkbox"/> Southwest |

CONTACT INFORMATION FOR SUBMITTING REGION:

Contact Name: Paul McNamee ASHE Region Position: Northeast Regional Board Delegate
Phone (Office): 717-578-7565 Phone (Mobile): 717-578-7565 E-Mail Address: Paul.McNamee@kci.com

PROJECT INFORMATION:

ENTERING AGENCY/COMPANY'S NAME: Whitman, Requardt & Associates, LLP
PROJECT NAME: SR 0322 Section 036 Diverging Diamond Interchange TYPE: Interchange Recon
PROJECT LOCATION: SR 0322/SR 0222
CITY: Ephrata COUNTY: Lancaster STATE: PA
FINAL CONSTRUCTION COST: \$10.7 M BUDGETED CONSTRUCTION COST: \$10.9 M
PROJECT COMPLETION DATE: June 17, 2022 (substantial)

PROJECT ASHE SECTION: Harrisburg ASHE SECTION CONTACT NAME: Paul McNamee
PHONE (OFFICE): 717-578-7565 PHONE (MOBILE): 717-578-7565 E-MAIL: Paul.McNamee@kci.com

PROJECT TEAM:

PROJECT OWNER: PennDOT District 8-0
STREET ADDRESS: 2140 Herr Street
CITY: Harrisburg STATE: PA ZIP: 17103
CONTACT PERSON: David Fratangeli PHONE: 717-705-6176
E-MAIL ADDRESS: dfratangel@pa.gov

PROJECT DESIGN FIRM: Whitman, Requardt & Associates, LLP
STREET ADDRESS: 224 St. Charles Way, Suite 140
CITY: York STATE: PA ZIP: 17402
CONTACT PERSON: Rob Wills PHONE: 717-748-9007
E-MAIL ADDRESS: rwills@wrallp.com

PRIME CONTRACTOR: J.D. Eckman, Inc.
STREET ADDRESS: 4781 Lower Valley Road
CITY: Atglen STATE: PA ZIP: 19310
CONTACT PERSON: Alex Maugle PHONE: 610-593-5143
E-MAIL ADDRESS: amaugle@jdeckmaninc.com

Entry Form Completed By: *Rob Wills* Date: 1/6/2023

Project Narrative

Project Introduction

The SR 0322 Section 036 Diverging Diamond Interchange (DDI) Project is located in Ephrata and West Earl Townships in Lancaster County. SR 0322 and SR 0222 are heavily traveled corridors, and the interchange was notorious for serious accidents including fatalities.

Pennsylvania Department of Transportation (PennDOT) District 8-0 selected the Whitman, Requardt, and Associates, LLP (WRA) team to design the \$10.7M project. David Fratangeli, District 8-0 Senior Project Manager, led the overall project. WRA guided the consultant design team which consisted of Stantec Consulting Services, Inc., Wallace Montgomery & Associates, LLP, Skelly & Loy, Inc., Susquehanna Civil, Inc. and Surveying and Mapping, LLC. The Contractor was J.D. Eckman, Inc.

Complexity

Roadway Geometry: The series of reverse curves and interconnected geometry features associated with a DDI design present uniquely complex challenges. Located at the interchange of two major state routes, the project had to ensure that larger WB-67 design vehicles could make all movements and run concurrently with other vehicles. Similar to roundabout design, a careful and iterative approach was needed to balance these truck turning movements with the necessary curvature of the roadways and natural vehicle paths to reduce the potential for path overlap. Unfamiliarity of this interchange configuration by local residents also required careful design of the crossover intersections using a 45° crossover angle and concrete glare screen to deter wrong way maneuvers while still providing sight distance for emergency vehicles. Due to the site-specific complexity of signalized intersections in close proximity to the crossover intersections, the tangent length between crossovers had to be kept to a minimum. This provided more desirable spacing from the adjacent intersections, and the wider resulting cross section could be accommodated without impact to the existing SR 0222 bridges. Adding an additional layer of complexity, the clearance beneath the existing SR 0222 bridges was posted for height restriction. The SR 0322 pavement was reconstructed to reduce the profile beneath the bridges by 9" which eliminated the need for a posted height restriction. The natural sump beneath the bridges also introduced drainage complications which required precise inlet placement to properly drain the roadway and convey water to appropriate stormwater management facilities while also coordinating utility conflicts with the proposed storm drain pipe network.

Traffic Signals: Due to the close proximity of the DDI crossover intersections, progression between both crossovers is critical to operations to prevent queue spillback; therefore, one traffic signal controller was utilized to control both crossovers to eliminate dependency on communications. Traffic signal timings emphasized queue management and progression for critical interchange movements.

Multi-Modal Accommodations: Multi-modal accommodation was a priority of the project, especially due to the large Amish community that utilizes SR 0322. Given the limited space under SR 0222 to avoid impacting the bridges, 8-ft shoulders were provided to accommodate horse and buggies and bicycles separate from vehicular traffic. A missing sidewalk connection was also included to provide continuity through the interchange for pedestrians.

Temporary Traffic Control: Traffic control also presented a unique challenge due to the major shift in interchange operation during construction. WRA proposed a complex multi-stage scheme to minimize property acquisition and interruption to this congested arterial. A weekend closure of SR 0322 through

the interchange was cited by the contractor as being integral to reducing driver confusion in the work zone and providing time for the safe and efficient switch to the DDI configuration. The closure required monitoring of detour routes along SR 0222 and adjacent interchanges and included provisions for horse and buggies to navigate through the work zone in lieu of using the detour.

Utility Relocation: Frequent coordination was performed to ensure minimal impacts to water, sanitary sewer lines and a critical underground fiber duct bank by the installation of additional storm drain systems and lowering the roadway profile.

New Application of Existing Techniques/Originality/Innovation

The SR 0322 project included several innovative aspects including the DDI geometry itself. The design team successfully applied the principles of the DDI concept to the existing topography, reconfigured the ramps without impacting SR 0222, minimized impact to adjacent properties, and was able to retain the existing SR 0222 bridges. The offset nature of the northbound SR 0222 ramps and interaction with nearby Hahnstown Road required DDI principles to be tailored to site-specific conditions. Operations were optimized by maintaining north to east traffic at Hahnstown Road, removing this demand from the crossover intersection.

Another application of innovation was the accommodations included in the design due to the presence of non-motorized traffic by the local Amish communities. Larger than required shoulders (8-feet) were included through the DDI to allow for both bicycle and horse and buggy traffic to operate safely outside of the motorized travel way. The selection of non-intrusive radar detection allowed the design team to include provisions for horse and buggies within the shoulder.

The project also included the installation of a PennDOT CCTV camera at the interchange. To eliminate long-term internet access fees, backhaul communications for the signal system were provided via a connection into PennDOT's service connection for the CCTV.

Social/Economic Considerations

Because the DDI is a relatively new interchange configuration in the United States with only one in Pennsylvania at the time of design, educating the public on how a DDI works was critical. Several meetings were held with public officials, the general public and special purpose meetings with leaders from the Amish community. Diagrams and a brochure were utilized to convey the project intent and DDI operation, and an instructional video provided additional explanation and a "driver's eye" view on how to navigate a DDI. Based on the feedback received following the outreach events, attendees felt more comfortable with the DDI as the correct solution. Meetings with the Amish elders allowed designers to validate the design specific to how pedestrians, bicycle, and horse and buggy traffic would navigate the DDI. The Amish community agreed with all the project's provisions and were very appreciative to be involved in the design process.

The project also had to account for economic impacts based on projected development within the area particularly a 69 acre parcel at the eastern limit of the project. The project also accommodated all current businesses ensuring economic viability remained for the businesses within the project limits as well as along the network that utilizes the interchange.

Safety

The primary purpose of the project was to improve safety. The predominate crash types were angle/left-turn and rear end crashes at the ramp terminal intersections, which commonly result in injuries. The design team felt that the best way to mitigate these crashes was to reduce the number of conflict points within the interchange and eliminate the left-turn/through conflicts along SR 0322. The DDI interchange configuration was the perfect solution to address these safety deficiencies as it reduces the number of conflict points from 28 to 14 as compared to the previous diamond interchange. Data collected following conversion to the DDI configuration has shown the project to be a big success as total crashes and angle crashes decreased by 50 percent in the second half of 2021 when compared to a 3-year period prior to construction.

Other project elements contributing to improved safety included the installation of radar detection, emergency vehicle preemption, flashing yellow arrow indications at adjacent signals, highway lighting along SR 0322 and at critical ramp decision points, and enhanced signing (including overhead guide signs) and pavement markings.

Aesthetics and Sustainable Features

Ramp islands utilized a decorative rock surface treatment coordinated with Ephrata Township to reduce the need for maintenance and improve the aesthetic of this frequent entrance point to local communities in the area.

Meeting and Exceeding Owner's/Clients Needs

As determined at the onset of the project, PennDOT District 8 sought to deliver a timely and cost-effective project that would improve safety, maintain or improve operations, and accommodate all modes of transportation at the interchange while also improving public understanding of this new innovative configuration. The DDI was opened to traffic on May 17, 2021, ahead of schedule. It was the second DDI opened to traffic in Pennsylvania and the first in the region. As expected, public reactions were initially mixed as the traveling public utilized the DDI for what was likely their first time in an interchange of this type. Observations and public feedback over the next few days and months indicated that the public was navigating the DDI successfully as they became more familiar with the interchange. Fast forward 4 months to August 2021 and overall, the reviews seem positive with drivers having become more familiar with the interchange. The project met and exceeded the goals set at the onset of the project. Total crashes and angle crashes were documented as having a significant decrease following conversion to the DDI configuration. Vehicular traffic is moving more efficiently (10% travel time reduction along SR 0322 during peak periods), and pedestrian, bicycle and horse and buggy traffic have safe connections through the interchange. The project was completed within 2% of the estimated budget and at a fraction of the cost of a complete interchange reconstruction.



December 13, 2022

Re: ASHE 2023 National Project of the Year Nomination

To ASHE Harrisburg Section:

The Pennsylvania Department of Transportation Engineering District 8-0 is pleased to endorse Whitman, Requardt, and Associates LLP (WRA) and State Route 0322 Section 036 Diverging Diamond Interchange project for consideration in the ASHE Harrisburg Section 2023 National Project of the Year Award.

State Route 322 Section 036 Diverging Diamond Interchange is a safety improvement project. The project's first goal is improving safety while secondary improvements to maintain or improve traffic operations. The project converted a traditional diamond interchange into a DDI configuration to reduce the number of conflict points which increased safety. The location of this innovated design is unique since the design team had to accommodate not only vehicles but also pedestrians, bicyclist and the Amish Community horse and buggy traffic.

Whitman, Requardt and Associates and their team overcame many challenges with the innovated DDI design such as utility conflicts and traffic control configuration. The design team provided a project that was constructed easily without any issues. The final diamond configuration has been receiving positive feedback from the public. The design team is very knowledgeable on the engineering design process and specifically this innovated design. The project was delivered on time for the District without any complications proving WRA as a reliable firm the District can call upon for delivering future projects. The project was substantially completed and opened by the December 31, 2022.

We commend their personnel for their outstanding dedication and performance and we are proud to support Whitman, Requardt, and Associates application of State Route 0322 Section 036 Diverging Diamond Interchange in the ASHE 2023 Project of the Year nomination.

Very truly yours,

A handwritten signature in black ink that reads "Christopher J. Kufro". The signature is written in a cursive style with a large, prominent "C" and "K".

Christopher J. Kufro, P.E.
District Executive

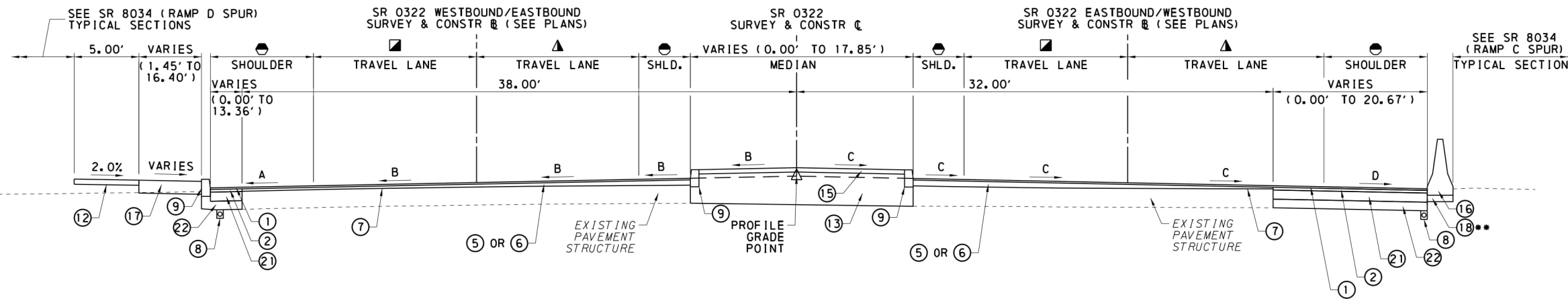
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PLOTTED: 8/6/2019

D-9012 CADD (02-30) REVISED (10-04)

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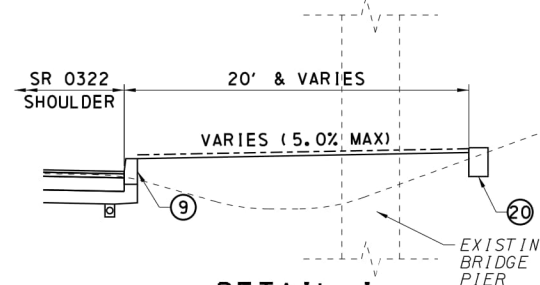
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
8-0	LANCASTER	0322 8034	036	10 OF 114
EPHRATA/WEST EARL TOWNSHIP				
REVISION NUMBER	REVISIONS	DATE	BY	APPROVED



SR 0322 TYPICAL NORMAL CROWN SECTION

(NOT TO SCALE)

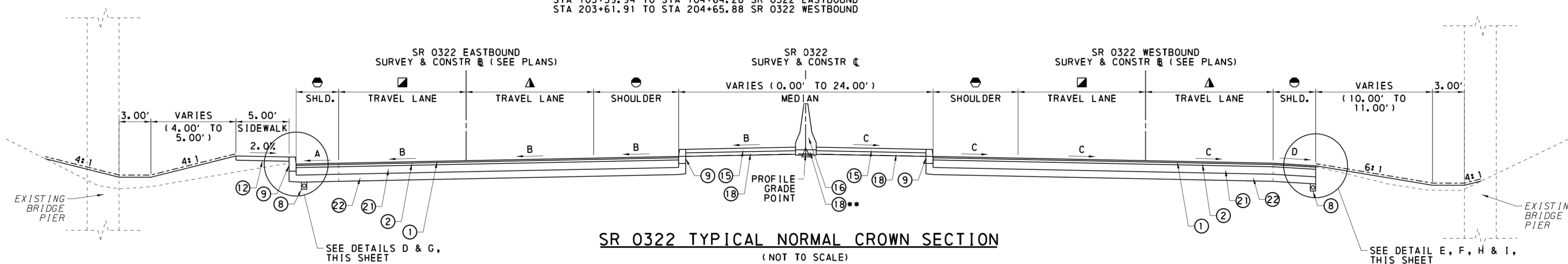
STA 22+12.39 TO STA 23+10.00 SR 0322
STA 103+59.94 TO STA 104+64.28 SR 0322 EASTBOUND
STA 203+61.91 TO STA 204+65.88 SR 0322 WESTBOUND



DETAIL I

(NOT TO SCALE)

STA 25+59.08 TO STA 26+07.67



SR 0322 TYPICAL NORMAL CROWN SECTION

(NOT TO SCALE)

STA 23+10.00 TO STA 26+27.13 SR 0322
STA 104+64.28 TO STA 107+86.70 SR 0322 EASTBOUND
STA 204+65.88 TO STA 207+88.42 SR 0322 WESTBOUND

LEGEND

- ① SUPERPAVE ASPHALT MIXTURE DESIGN, WMA WEARING COURSE, PG 76-22, 3 TO < 10 MILLION ESALS, 12.5 MM MIX, 2" DEPTH, SRL-E
- ② SUPERPAVE ASPHALT MIXTURE DESIGN, WMA BINDER COURSE, PG 64-22, 3 TO < 10 MILLION ESALS, 25.0 MM MIX, 3" DEPTH
- ⑤ SUPERPAVE ASPHALT MIXTURE DESIGN, WMA WEARING COURSE (LEVELING), PG 64-22, 3 TO < 10 MILLION ESALS, 12.5 MM MIX, SRL-L, 1.5" DEPTH MINIMUM (SEE CROSS SECTIONS FOR LIMITS)
- ⑥ SUPERPAVE ASPHALT MIXTURE DESIGN, WMA BINDER COURSE (LEVELING), PG 64-22, 3 TO < 10 MILLION ESALS, 25.0 MM MIX, 3" DEPTH MINIMUM (SEE CROSS SECTIONS FOR LIMITS)
- ⑦ MILLING OF BITUMINOUS PAVEMENT SURFACE, 2" DEPTH, MILLED MATERIAL RETAINED BY CONTRACTOR
- ⑧ 6" PAVEMENT BASE DRAIN AND GEOTEXTILE, CLASS 1
- ⑨ PLAIN CEMENT CONCRETE CURB (SEE PLANS AND TABS FOR LIMITS)
- ⑫ 4" CONCRETE SIDEWALK
- ⑬ SUBBASE (NO. 2A), VARIABLE DEPTH
- ⑮ PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH (SEE PLANS AND TABS FOR LIMITS)
- ⑯ CONCRETE GLARE SCREEN (SEE PLANS AND TABS FOR LIMITS)
- ⑰ ROCK, LANDSCAPING (SEE DETAIL ON SHEET 24)
- ⑱ SUBBASE (NO. 2A), 4" DEPTH
- ⑳ RANDOM STONE SLOPE WALL, CONCRETE TOE (SEE DETAIL ON SHEET 26)
- ㉑ SUPERPAVE ASPHALT MIXTURE DESIGN, WMA BASE COURSE, PG 64-22, 3 TO < 10 MILLION ESALS, 25.0 MM MIX, 9" DEPTH
- ㉒ SUBBASE 8" DEPTH (NO. 2A)

** ITEM INCIDENTAL TO ⑯

● ■ ▲ ● ● - SEE WIDTH TRANSITION TABLE FOR DIMENSIONS (SEE SHEET 13)

A, B, C, D - SEE CROSS SLOPE TRANSITION TABLE FOR CROSS SLOPES (SEE SHEET 13)

NOTES: APPLY A SEPARATE LAYER OF BITUMINOUS TACK COAT BETWEEN EACH PAVING COURSE.

NOTES:
1. 17' FROM STA 24+37.15 TO STA 24+85.22
15' FROM STA 25+28.27 TO STA 25+77.03

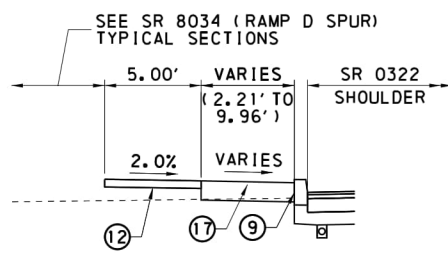
SEEDING LEGEND:
SEEDING (---)

SEEDING AND SOIL SUPPLEMENTS - FORMULA B FOR LAWN AREAS

SEEDING AND SOIL SUPPLEMENTS - FORMULA L FOR SLOPES FLATTER THAN 3:1

SEEDING AND SOIL SUPPLEMENTS - FORMULA L FOR SLOPES STEEPER THAN 3:1

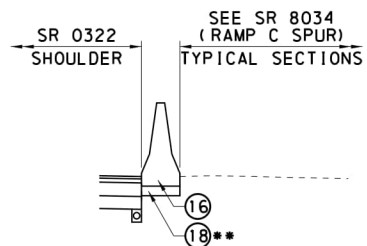
ROCK LINING - ROCK, CLASS R-3 FOR AREAS BENEATH SR 0222 (SEE TABS FOR LIMITS)



DETAIL D

(NOT TO SCALE)

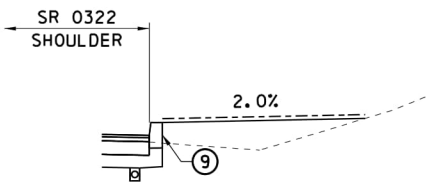
STA 23+10.00 TO STA 23+39.24



DETAIL E

(NOT TO SCALE)

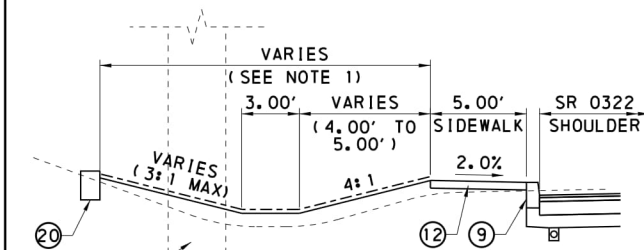
STA 23+10.00 TO STA 23+80.93



DETAIL F

(NOT TO SCALE)

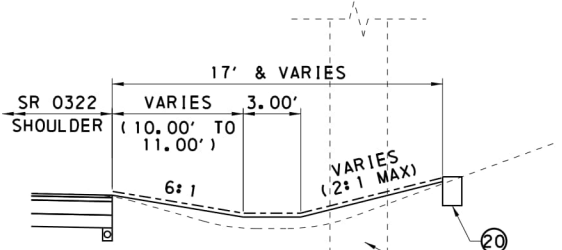
STA 25+65.00 TO STA 26+27.13



DETAIL G

(NOT TO SCALE)

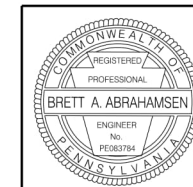
STA 24+37.15 TO STA 24+85.22
STA 25+28.27 TO STA 25+77.03



DETAIL H

(NOT TO SCALE)

STA 24+67.58 TO STA 25+16.16



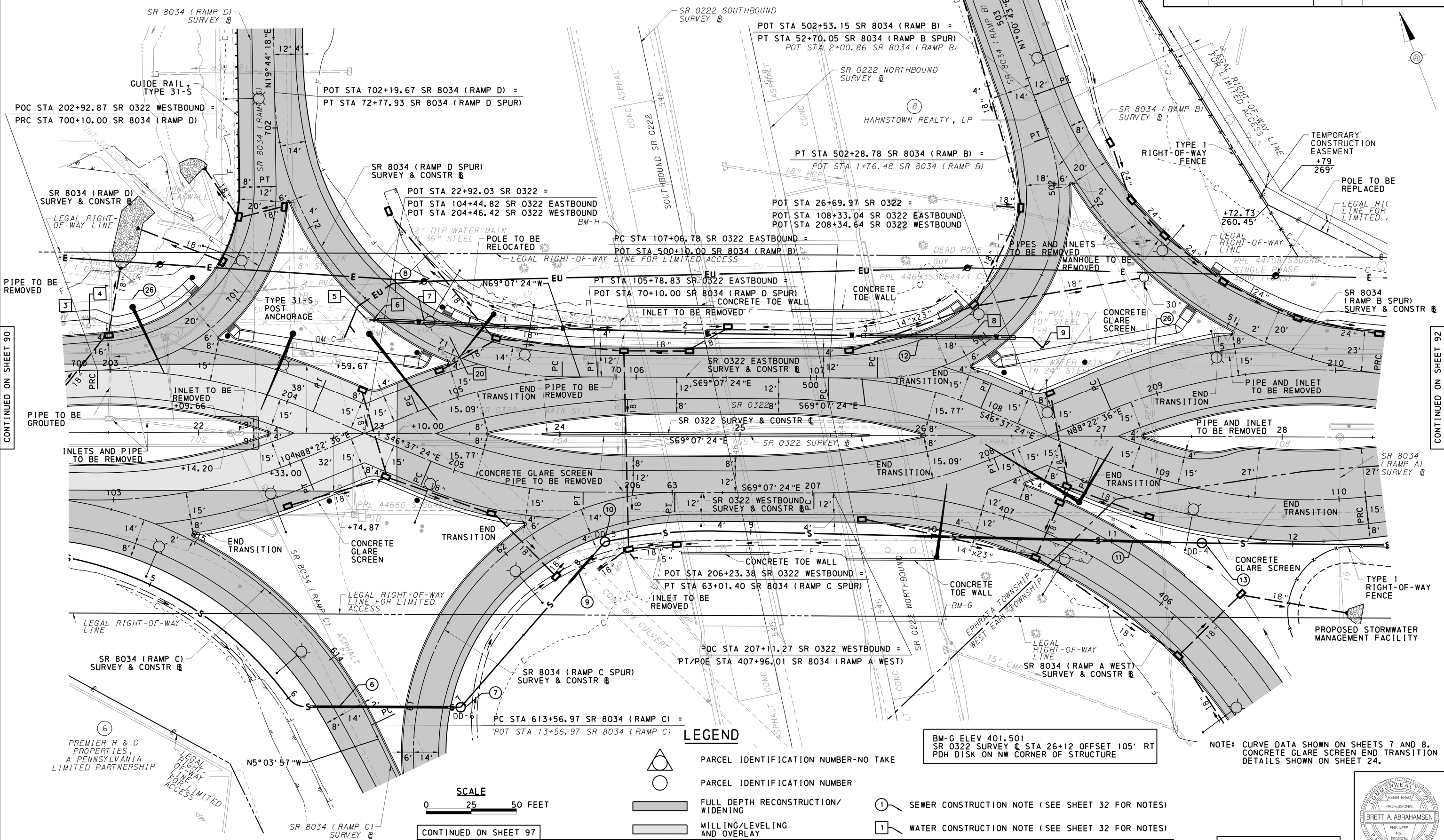
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
8-0	LANCASTER	0322 8034	036	91 OF 114
EPHRATA/WEST EARL TOWNSHIP				
REVISION NUMBER	REVISIONS	DATE	BY	APPROVED

BM-C ELEV 379.833
SR 0322 SURVEY @ STA 22+80 OFFSET 55' LT
BOX CUT ON SIGNAL CONC PAD

BM-H ELEV 403.950
SR 0322 SURVEY @ STA 24+32 OFFSET 112' LT
PDH DISK ON NW CORNER OF STRUCTURE

SR 8034 (RAMP B)
SURVEY & CONSTR

BM-G ELEV 401.501
SR 0322 SURVEY @ STA 26+12 OFFSET 105' RT
PDH DISK ON NW CORNER OF STRUCTURE

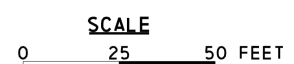


CONTINUED ON SHEET 90

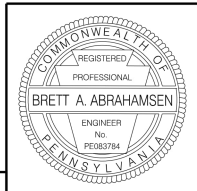
CONTINUED ON SHEET 92

LEGEND

- PARCEL IDENTIFICATION NUMBER-NO TAKE
- PARCEL IDENTIFICATION NUMBER
- FULL DEPTH RECONSTRUCTION/WIDENING
- MILLING/LEVELING AND OVERLAY
- SEWER CONSTRUCTION NOTE (SEE SHEET 32 FOR NOTES)
- WATER CONSTRUCTION NOTE (SEE SHEET 32 FOR NOTES)



NOTE: CURVE DATA SHOWN ON SHEETS 7 AND 8.
CONCRETE GLARE SCREEN END TRANSITION
DETAILS SHOWN ON SHEET 24.

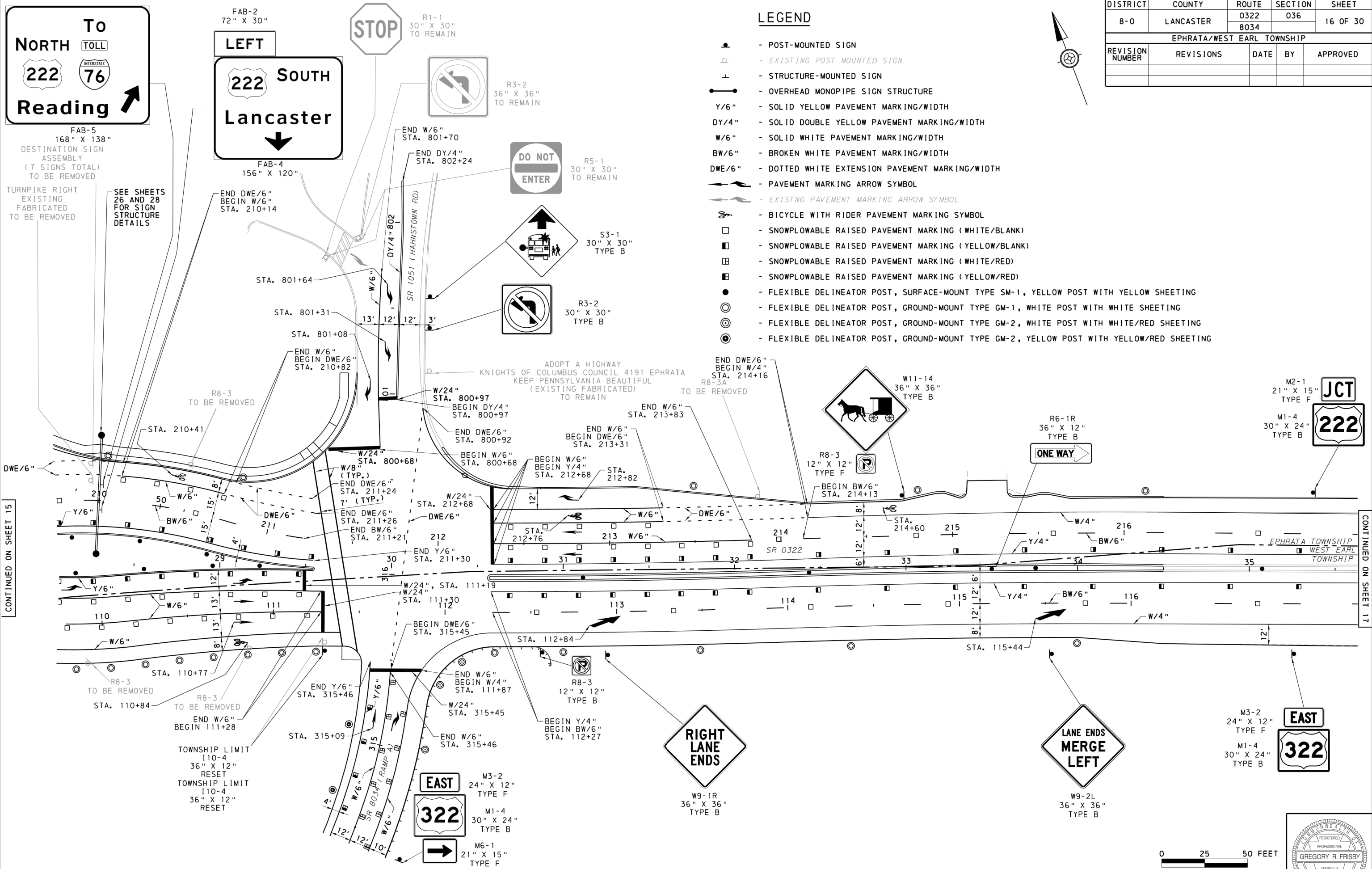
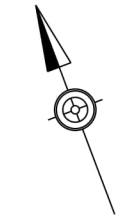


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DISTRICT	COUNTY	ROUTE	SECTION	SHEET
8-0	LANCASTER	0322 8034	036	16 OF 30
EPHRATA/WEST EARL TOWNSHIP				
REVISION NUMBER	REVISIONS	DATE	BY	APPROVED

LEGEND

- POST-MOUNTED SIGN
- EXISTING POST MOUNTED SIGN
- STRUCTURE-MOUNTED SIGN
- OVERHEAD MONOPIPE SIGN STRUCTURE
- SOLID YELLOW PAVEMENT MARKING/WIDTH
- SOLID DOUBLE YELLOW PAVEMENT MARKING/WIDTH
- SOLID WHITE PAVEMENT MARKING/WIDTH
- BROKEN WHITE PAVEMENT MARKING/WIDTH
- DOTTED WHITE EXTENSION PAVEMENT MARKING/WIDTH
- PAVEMENT MARKING ARROW SYMBOL
- EXISTING PAVEMENT MARKING ARROW SYMBOL
- BICYCLE WITH RIDER PAVEMENT MARKING SYMBOL
- SNOWPLOWABLE RAISED PAVEMENT MARKING (WHITE/BLANK)
- SNOWPLOWABLE RAISED PAVEMENT MARKING (YELLOW/BLANK)
- SNOWPLOWABLE RAISED PAVEMENT MARKING (WHITE/RED)
- SNOWPLOWABLE RAISED PAVEMENT MARKING (YELLOW/RED)
- FLEXIBLE DELINEATOR POST, SURFACE-MOUNT TYPE SM-1, YELLOW POST WITH YELLOW SHEETING
- FLEXIBLE DELINEATOR POST, GROUND-MOUNT TYPE GM-1, WHITE POST WITH WHITE SHEETING
- FLEXIBLE DELINEATOR POST, GROUND-MOUNT TYPE GM-2, WHITE POST WITH WHITE/RED SHEETING
- FLEXIBLE DELINEATOR POST, GROUND-MOUNT TYPE GM-2, YELLOW POST WITH YELLOW/RED SHEETING

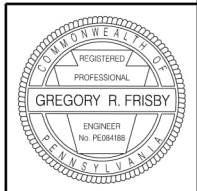
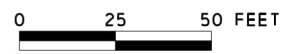


CONTINUED ON SHEET 15

CONTINUED ON SHEET 17

CONTINUED ON SHEET 20

SIGNING AND PAVEMENT MARKING PLAN

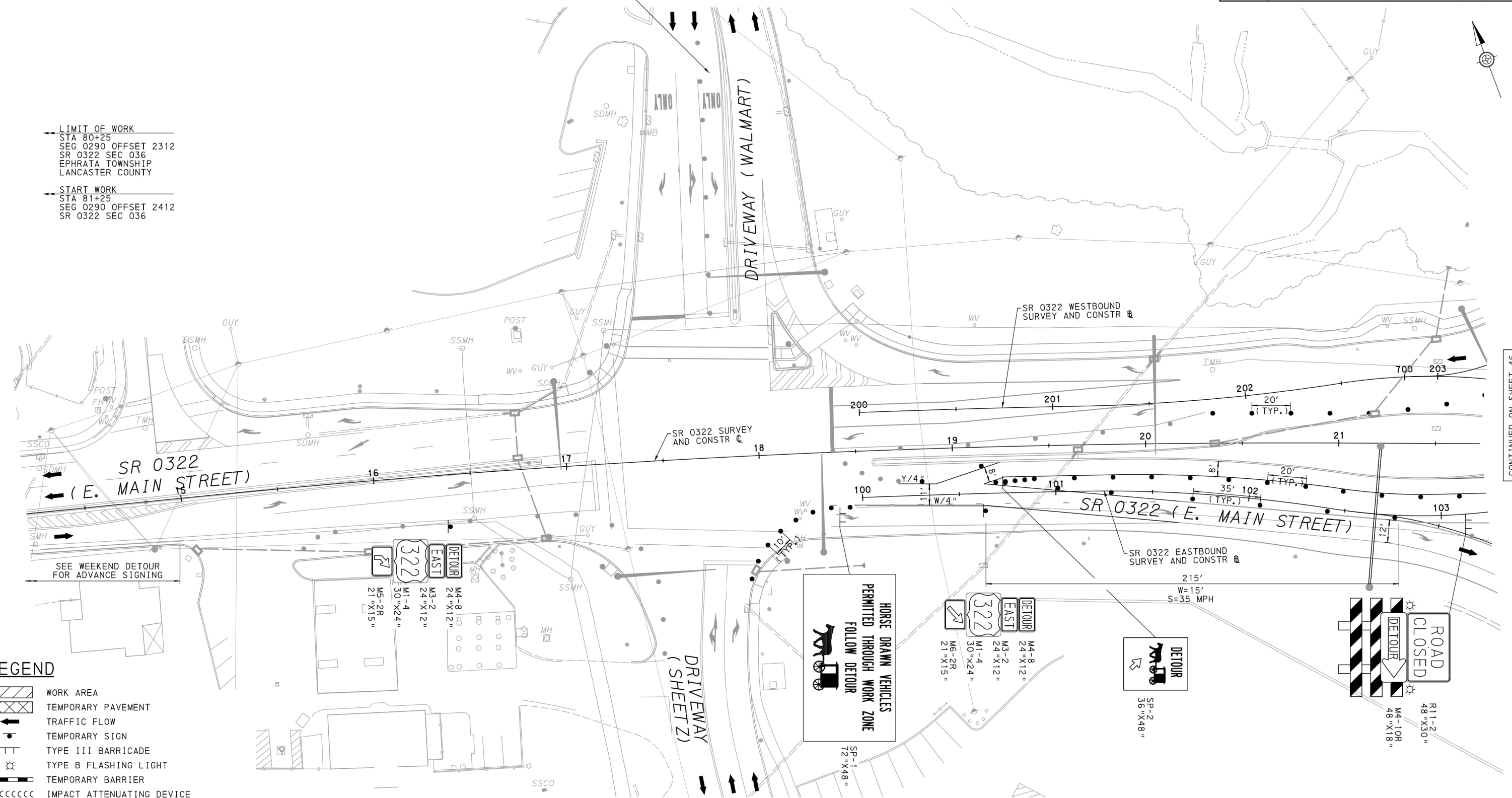


DISTRICT	COUNTY	ROUTE	SECTION	SHEET
8-0	LANCASTER	0322 8034	036 036	45 OF 71
EPRATA/WEST EARL TOWNSHIP				
REVISION NUMBER	REVISIONS	DATE	BY	

← LIMIT OF WORK
 STA 80+25
 SEG 0290 OFFSET 2312
 SR 0322 SEC 036
 EPHRATA TOWNSHIP
 LANCASTER COUNTY

← START WORK
 STA 81+25
 SEG 0290 OFFSET 2412
 SR 0322 SEC 036

INSIDE EXCLUSIVE LEFT-TURN
 LANE TO REMAIN CLOSED.



LEGEND

- WORK AREA
- TEMPORARY PAVEMENT
- TRAFFIC FLOW
- TEMPORARY SIGN
- TYPE III BARRICADE
- TYPE B FLASHING LIGHT
- TEMPORARY BARRIER
- IMPACT ATTENUATING DEVICE
- CHANNELIZING DEVICE(S)
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- SOLID WHITE LANE LINE/WIDTH
- AUXILIARY WHITE LANE LINE/WIDTH
- BROKEN WHITE LANE LINE/WIDTH
- SOLID YELLOW LANE LINE/WIDTH
- DOUBLE SOLID YELLOW LANE LINE/WIDTH
- DOTTED EXTENSION WHITE LANE LINE/WIDTH



HORSE DRAWN VEHICLES
 PERMITTED THROUGH WORK ZONE
 FOLLOW DETOUR

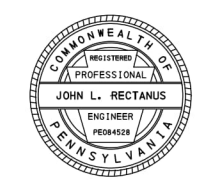
DETOUR
 SP-2
 36" X 48"

ROAD CLOSED
 R11-2
 48" X 30"
 M4-10R
 48" X 18"

322 EAST
 DETOUR
 M4-8
 24" X 12"
 M3-2
 24" X 12"
 M1-4
 30" X 24"
 M6-2R
 21" X 15"

322 EAST
 DETOUR
 M4-8
 24" X 12"
 M3-2
 24" X 12"
 M1-4
 30" X 24"
 M5-2R
 21" X 15"

STAGE 5
 WEEKEND DETOUR
 TRAFFIC CONTROL PLAN



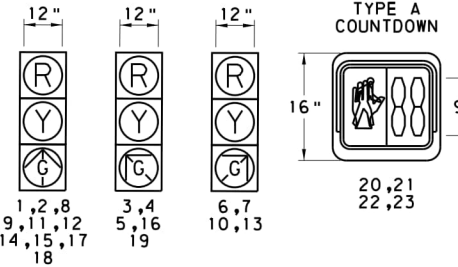
CONTINUED ON SHEET 46

SIGNS

PLAN SYMBOL	STANDARD	DESCRIPTION	SIZE (W X H)	QTY.
A	▲R10-3E(L)	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNTDOWN TIME <--	9" X 15"	1
B	▲R10-3E(R)	EDUCATIONAL PUSH BUTTON FOR WALK SIGNAL WITH COUNTDOWN TIME -->	9" X 15"	3
C	R3-1	NO RIGHT TURN	36" X 36"	6
D	R3-2	NO LEFT TURN	36" X 36"	6
E	R3-3	NO TURNS	36" X 36"	4
F	R5-1	DO NOT ENTER	36" X 36"	10
G	R6-1R	HORIZONTAL RIGHT ONE-WAY	54" X 18"	1
H	R6-1L	HORIZONTAL LEFT ONE-WAY	54" X 18"	2
I	R10-11	NO TURN ON RED SYMBOL	36" X 48"	6
J	R4-7	KEEP RIGHT	24" X 30"	2
K	R4-8	KEEP LEFT	24" X 30"	2
L	R9-3	NO PEDESTRIAN CROSSING	18" X 18"	6
M	R5-1A	WRONG WAY	48" X 30"	4

▲ - INCIDENTAL TO PEDESTRIAN PUSH BUTTON ITEM NUMBER 0956-0500

SIGNAL IDENTIFICATION



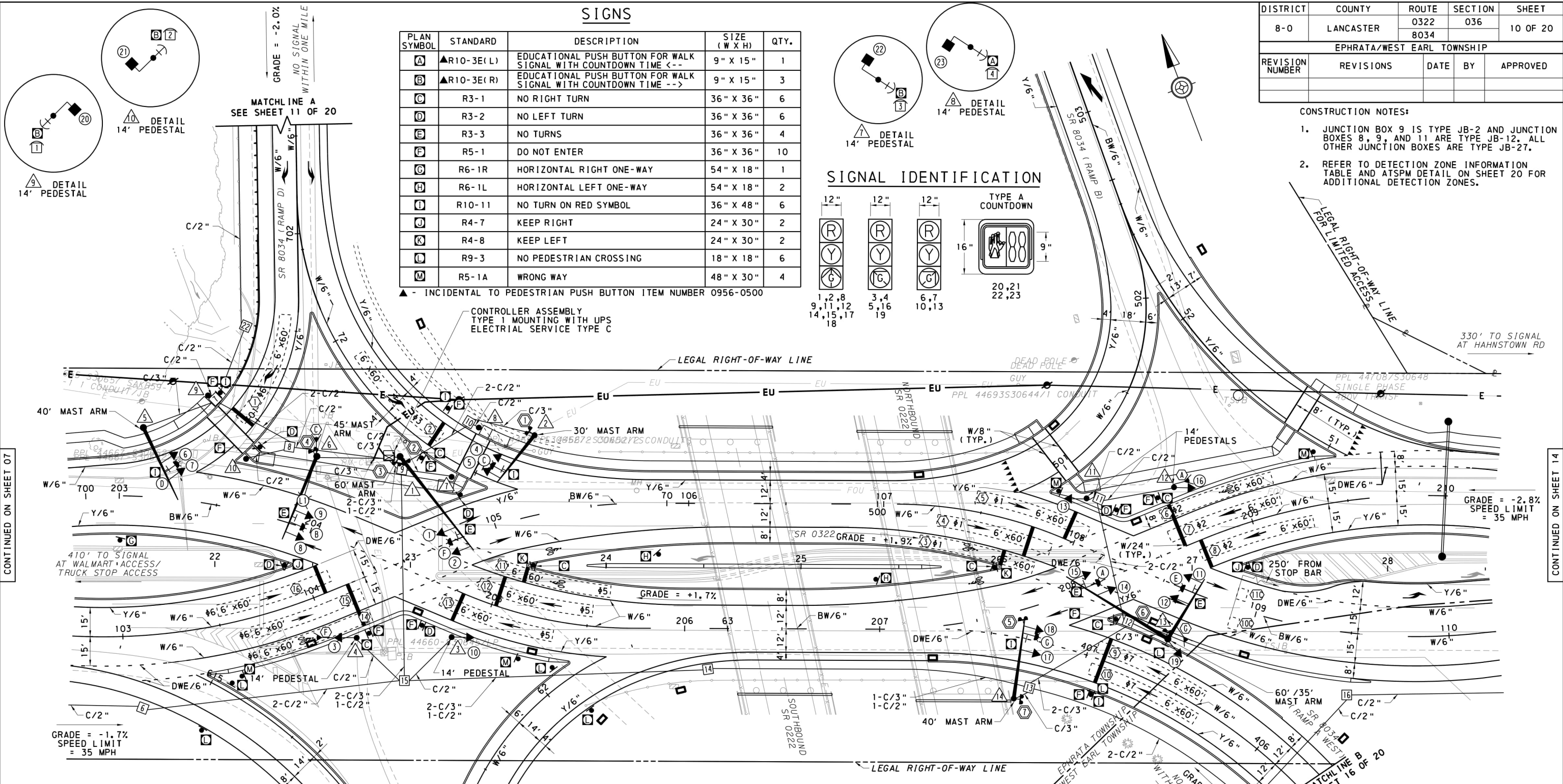
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
8-0	LANCASTER	0322 8034	036	10 OF 20

EPHRATA/WEST EARL TOWNSHIP

REVISION NUMBER	REVISIONS	DATE	BY	APPROVED

CONSTRUCTION NOTES:

- JUNCTION BOX 9 IS TYPE JB-2 AND JUNCTION BOXES 8, 9, AND 11 ARE TYPE JB-12. ALL OTHER JUNCTION BOXES ARE TYPE JB-27.
- REFER TO DETECTION ZONE INFORMATION TABLE AND ATSPM DETAIL ON SHEET 20 FOR ADDITIONAL DETECTION ZONES.



LEGEND

- ▲ - MAST ARM
- - PEDESTAL
- ① - VEHICULAR SIGNAL HEAD
- ② - PEDESTRIAN SIGNAL HEAD
- ▲ - POST MOUNTED SIGN
- ▲ - STRUCTURE MOUNTED SIGN
- ⊕ - VEHICLE RADAR DETECTOR
- ⊕ - RADAR DETECTION ZONE
- ⊕ - EMERGENCY PREEMPTION DETECTOR
- ⊕ - EMERGENCY PREEMPTION CONFIRMATION LIGHT
- ⊕ - PEDESTRIAN PUSH BUTTON/SIGN
- ⊕ - CONTROLLER ASSEMBLY
- W/4" - SOLID WHITE LINE/WIDTH
- Y/4" - SOLID YELLOW LINE/WIDTH
- BW/4" - BROKEN WHITE LINE/WIDTH
- DY/4" - DOUBLE SOLID YELLOW LINE/WIDTH
- DWE/4" - DOTTED WHITE EXTENSION LINE/WIDTH
- - EXISTING PAVEMENT MARKING ARROW LEGEND
- - EXISTING PAVEMENT MARKING LEGEND
- - PAVEMENT MARKING ARROW LEGEND
- ⊕ - LUMINAIRE
- ⊕ - LUMINAIRE ARM
- ⊕ - JUNCTION BOX
- C/1" - CONDUIT/SIZE

SIGNAL NOTES:

- ALL SIGNAL HEADS SHALL HAVE L.E.D. LENSES.
- ALL VEHICULAR SIGNAL HEADS SHALL BE EQUIPPED WITH TUNNEL VISORS AND ONE PIECE ALUMINUM, NON-REFLECTIVE, LOUVERED BACKPLATES WITH 2" FLUORESCENT YELLOW REFLECTIVE TAPE (TYPE IX)
- ALL PEDESTRIAN SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS.
- PORTLAND ORANGE "PEDESTRIAN HAND" AND WHITE "WALKING PERSON" SYMBOLS SHALL HAVE L.E.D. MODULE WITH COUNTDOWN TIMER.
- ALL SIGNAL HEAD MOUNTING BRACKETS SHALL BE ATTACHED WITH HIGH STRENGTH GALVANIZED AIRCRAFT CABLE. BAND MOUNTING BRACKETS WILL NOT BE PERMITTED.

PREPARED BY:
WHITMAN, REQUARDT & ASSOCIATES, LLP

GREGORY R. FRISBY
REGISTERED PROFESSIONAL ENGINEER
No. PE04108

COUNTY: LANCASTER
MUNICIPALITY: EPHRATA TWP. / WEST EARL TWP.
INTERSECTION: SR 0322 (E. MAIN ST.) AND SR 8034 (SR 222 RAMPS - A WEST, B, C, D)

APPROVED BY: _____
MUNICIPAL OFFICIAL - EPHRATA TOWNSHIP DATE _____

RECOMMENDED: _____
DISTRICT TRAFFIC ENGINEER DATE _____

SCALE: 0 25 50 FEET

OPERATOR: gdepricator
 FILE NAME: N:\35000-000\CADD\26-010-35000-TSP-(SR 322 AND SR 222 PLAN).dgn
 D:\9012 CADD (02-30) REVISED (10-04)
 PLOTTED: 5/16/2019 4:47:32 PM
 CONTINUED ON SHEET 07
 CONTINUED ON SHEET 14

SR 322 Interchange Pre-Construction



SR 322 Interchange High Crash Left-Turn Movement (Pre-Construction)



SR 322 Interchange Prevalent Horse and Buggy Traffic (Pre-Construction)



Horse and Buggy Traffic Utilizing Shoulder



Completed SR 322 DDI

