

MID-COUNTY PLAZA HIGHWAY OCCUPANCY PERMIT

PennDOT EPS #42543

OVERHEAD SIGN STRUCTURE DESIGN REPORT

IN

MARPLE TOWNSHIP
DELAWARE COUNTY

Prepared for

Marple Associates, Inc

November 5, 2013
Revised January 15, 2014

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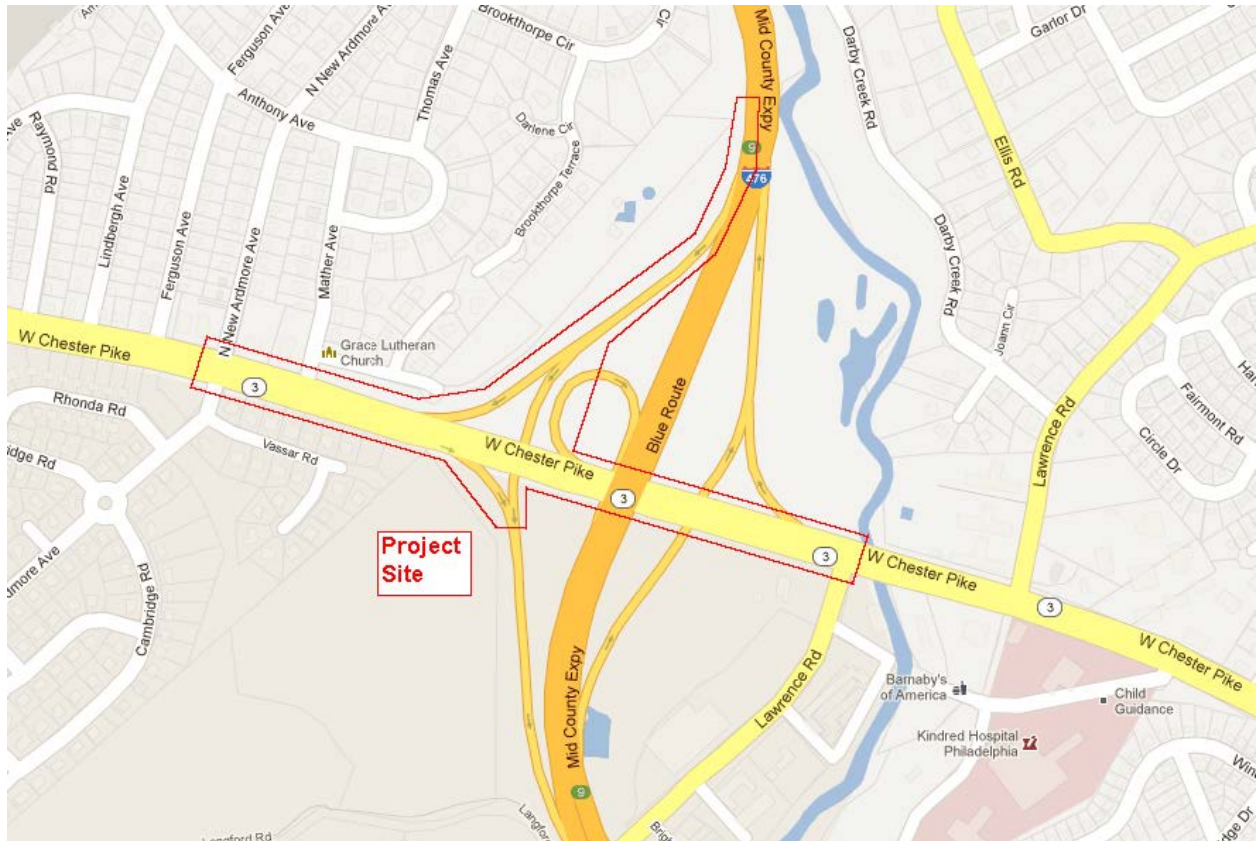
OVERHEAD SIGN STRUCTURE DESIGN

PROJECT SUMMARY:

Mid-County Plaza Mixed Use Development is off of Langford Run Road in Marple Township, Delaware County. Project is adjacent to the southwest quadrant of the I-476/Route 3 interchange. Expected traffic will be the addition of lanes, a new signal, and modifications to an existing signal on Route 3 at the interchange.

National Realty Corporation proposes to construct a mixed use retail, office, and residential development on Langford Run Road in Marple Township, Delaware County. As part of the development, a left turn lane will be added to SR 0003, West Chester Pike, a thru-lane will be lengthened on SR 0003, SR 8037, the southbound off-ramp from I-476, Blue Route, to SR 0003, will be reconfigured, and Langford Run Road will be widened.

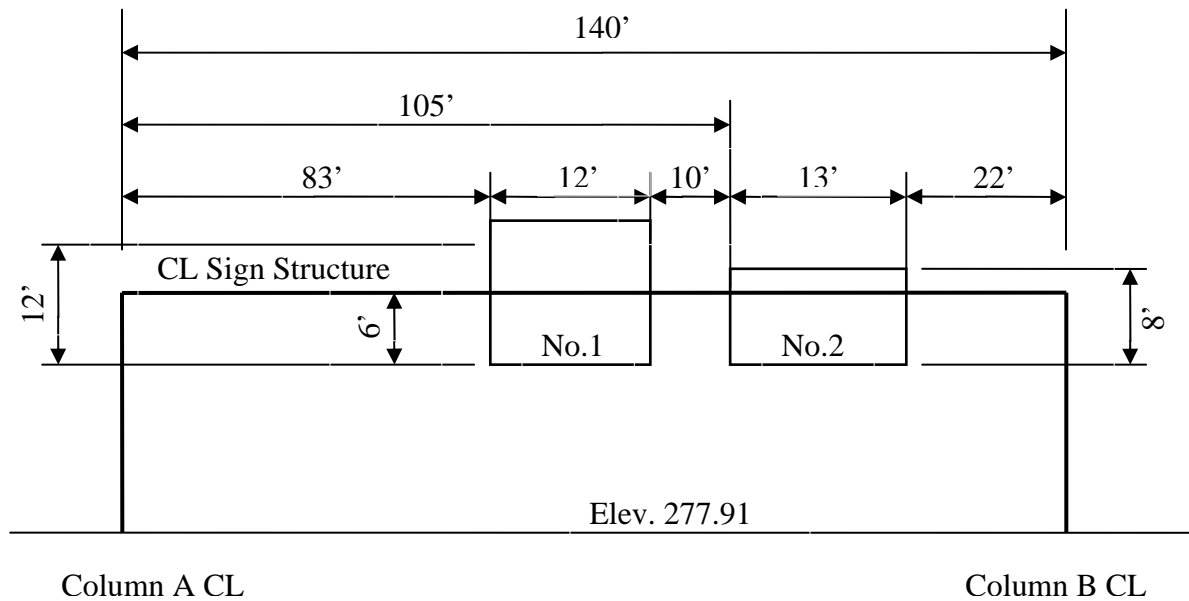
Project Location:



To accommodate the proposed retail development, the eastbound left through lane on SR 0003 will be lengthened. And, a left turn lane for westbound SR 0003 is proposed at the proposed signal for Langford Run Road.

The existing overhead sign structure, located on SR 0003 West Chester Pike approximate Sta 347+52, will be removed due to roadway widening adjacent to the existing grass median. The existing grass median is approximate 33' wide and with the installation of new roadway thru and left turns lanes the new concrete median will be 4' wide and will affect the existing overhead

sign structure foundation located in the existing grass median. We are proposing a new overhead sign structure approximate 25' east of the existing overhead sign structure and span all the lanes of SR 0003 West Chester Pike. The existing sign panels will be relocated to the new overhead sign structure when completed.



SIGN STRUCTURE DESIGN PROCEDURE:

- Elevation highest point on roadway lane is 277.91.
- Set bottom of each sign panel at same elevation.
 - o Elev. 277.91 + 17.75' + 1.67 = 297.33
(1.67' = Bottom of luminaire support to bottom of sign panel)
- Set CL Structure at CL of Sign Panel No.1
 - o Elev. 297.33 + 12/2 = 303.33
- Actual Span Length = 140', Use: 140'
- Design Column Height (H)=
 $H = 303.33 - 277.91 = 25.42'$, Use H = Over 24' to 33'
- CL sign to bottom of catwalk is 6'-0" + 1'-8" = 7'- 8"
- Existing Sign Area Calculation

Existing Sign Area	50% Increase for Urban Area	Design Sign Area
Sign No. 1 = 12'-0" x 12'-0" = 144 SF	0.50 x 144 = 72 SF	144 SF + 72 SF = 216 SF
Sign No. 2 = 13'-0" x (6'-0" x 2) = 156 SF	0.50 x 156 = 78 SF	156 SF + 78 SF = 234 SF
TOTAL		216 SF + 234 SF = 450 SF



Per BD-645M Sheet 2 of 7 – Actual sign area to increase by 50%, based on the probability of signs being added or increased in size on an urban highway. Use 600 SF in the design tables on sheets 6 of 7 and 7 of 7.

- Locate C.G. of sign area
 $X = (144 \text{ SF} \times (83+12/2)) + (156 \text{ SF} \times (105+13/2)) / 300 \text{ SF} = 100.7$
 $100.7 / 140' = 0.72$
 $0.72 > 0.58$, Use Loading Type 2.
- Fatigue Category II is for non-cantilever structures

DESIGN CRITERIA:

- Sign Area (A) = 600 SF
- Span Length (L) = 140 FT
- Structure Height (H) = <24 FT to 33 FT
- Loading Type = Type 2
- Fatigue Category = II

**OVERHEAD SIGN STRUCTURE
4 POST 4 CORD TRUSS
SPANS FROM 100' TO 200'
(BD-645M Sheet 7 of 7)**

DESIGN TABLES LOADING TYPE 2

Design Span: Over 120' to 140'

Sign Area: 600 SF

Truss Members

- Chord A: 8 x .322
- Chord B: 8 x .322
- Chord C: 8 x .322

Diagonals

- Front & Rear: 2.5 x .203
- Top & Bottom: 2.5 x .203

End Verticals

- Front & Rear: 2.5 x .203
- Top & Bottom: 2.5 x .203

Truss Cross Bracing: 2.5 x .203

Tower Member: H over 24' to 33'

- Column: 24 x .375
- Bracing: 4 x 11.5

Foundation

- Pedestal Type: FP24
- Footing: 926

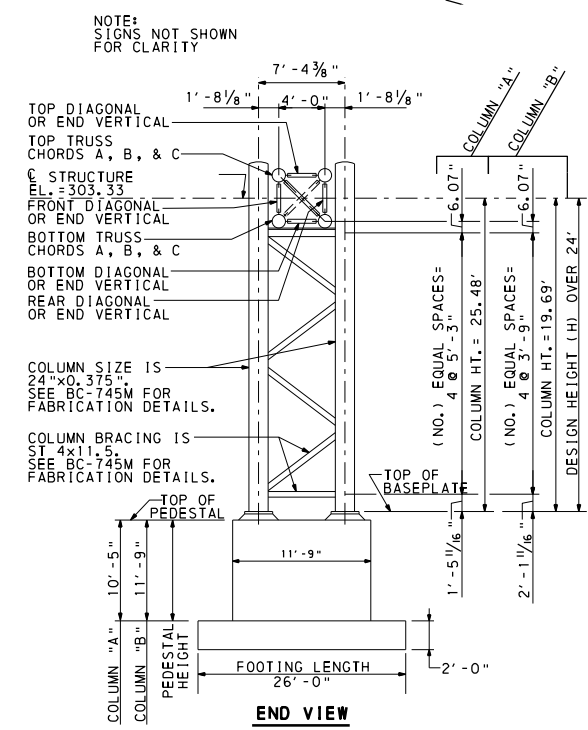
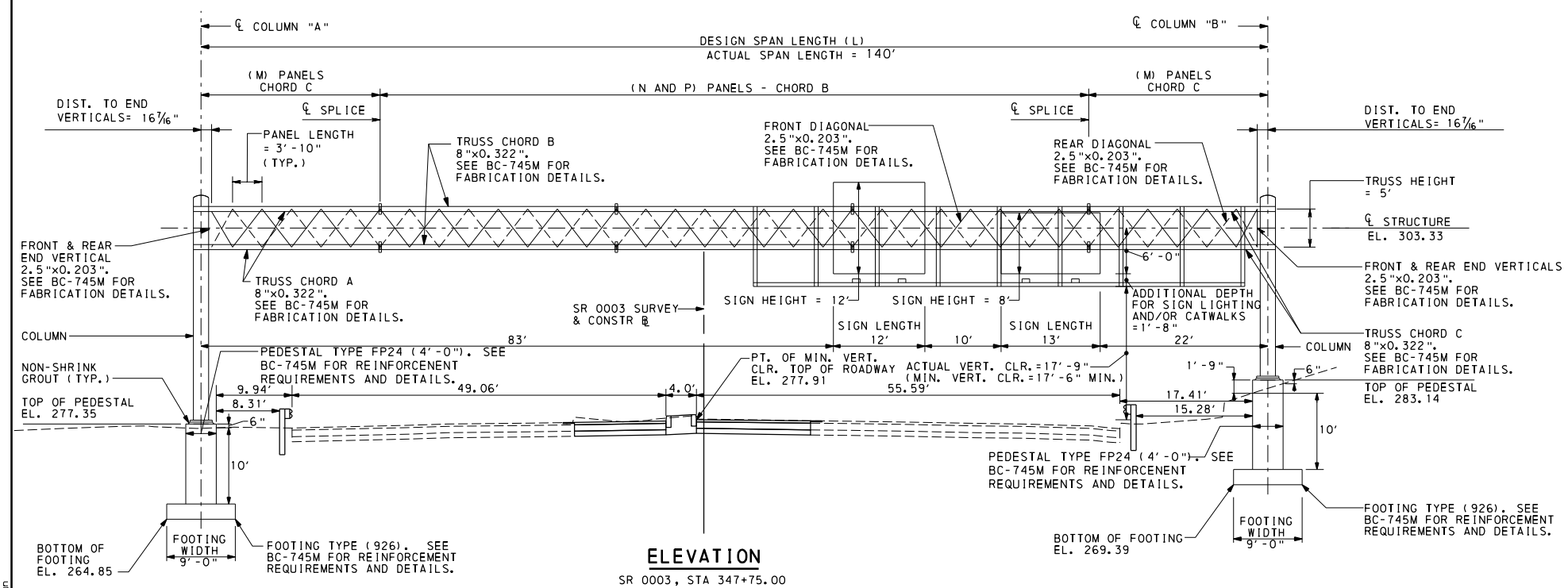
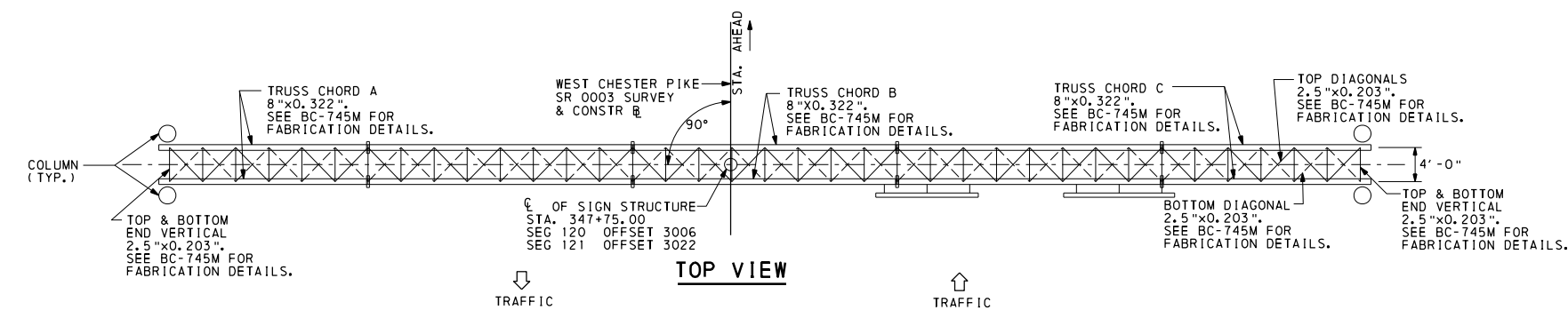
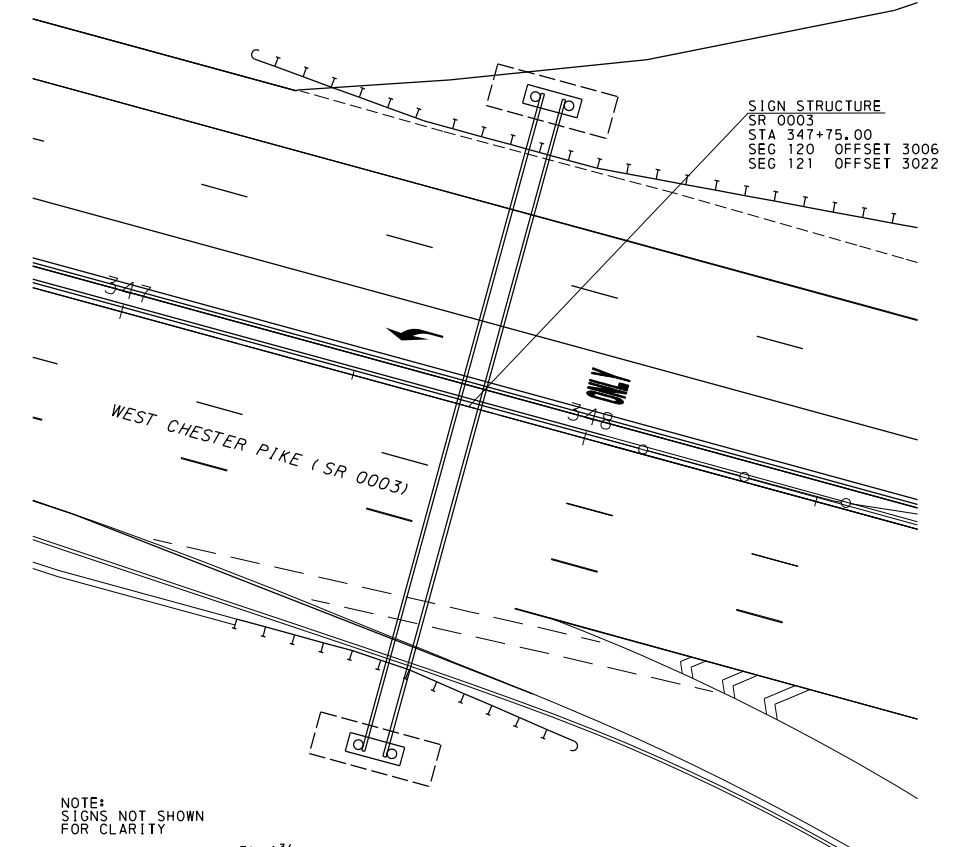


Appendix A

Proposed Sign Structure Plan

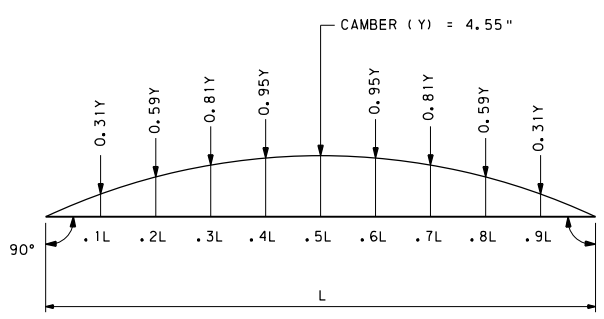


DESIGN CRITERA	
SIGN AREA (A) =	600 SF
SPAN LENGTH (L) =	140'
STRUCTURE HEIGHT (H) =	>24'
LOADING TYPE =	2
FATIGUE CATEGORY =	11



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NOTE: PRIOR TO SHIPMENT OF TRUSS STRUCTURE TO THE SITE, SHOP ASSEMBLE TRUSSES IN AN UPRIGHT POSITION AND CHECK TRUSS CAMBER.



RECOMMENDED: _____ 20 _____
DISTRICT BRIDGE ENGINEER

S -	NO. REVISION		DATE
	1	ADDRESSING DECEMBER 13, 2013 COMMENTS	1/2014
OVERHEAD SIGN STRUCTURE			
Orth - Rodgers & Associates, Inc. TRANSPORTATION ENGINEERS and PLANNERS <small>Great Valley Office 301 Lindenwood Drive, Suite 130 Malvern, PA 19355 (610) 407-9700</small>			
WEST CHESTER PIKE (SR 0003) MARPLE TOWNSHIP, DELAWARE COUNTY			
DESIGNED BY: GRS	DRAWN BY: LBW	CHECKED BY: TGS	
REGISTERED PROFESSIONAL ENGINEER	PennDOT EPS Application #42543	DATE: NOVEMBER 5, 2013	SHEET NUMBER 13 OF 61
		PROJECT NUMBER: 2013-065	