

TRB Webinar: Mini-Roundabouts: Maryland's First High Volume Mini-Roundabout

Dept. of Public Works
Harford County Gov't, Maryland

Jeff Stratmeyer
Chief Engineer

Cheryl Banigan
Chief, Traffic & Transportation Planning

Tollgate & MacPhail Road Mini-Roundabout



Tollgate & MacPhail Road Mini-Roundabout



Background.....

Harford County



Tollgate Rd. & Marketplace Dr. 1996





Imagery Date: 9/11/2012 1994

39°31'15.38" N 76°21'09.00" W elev. 332 ft

Eye alt. 829 ft

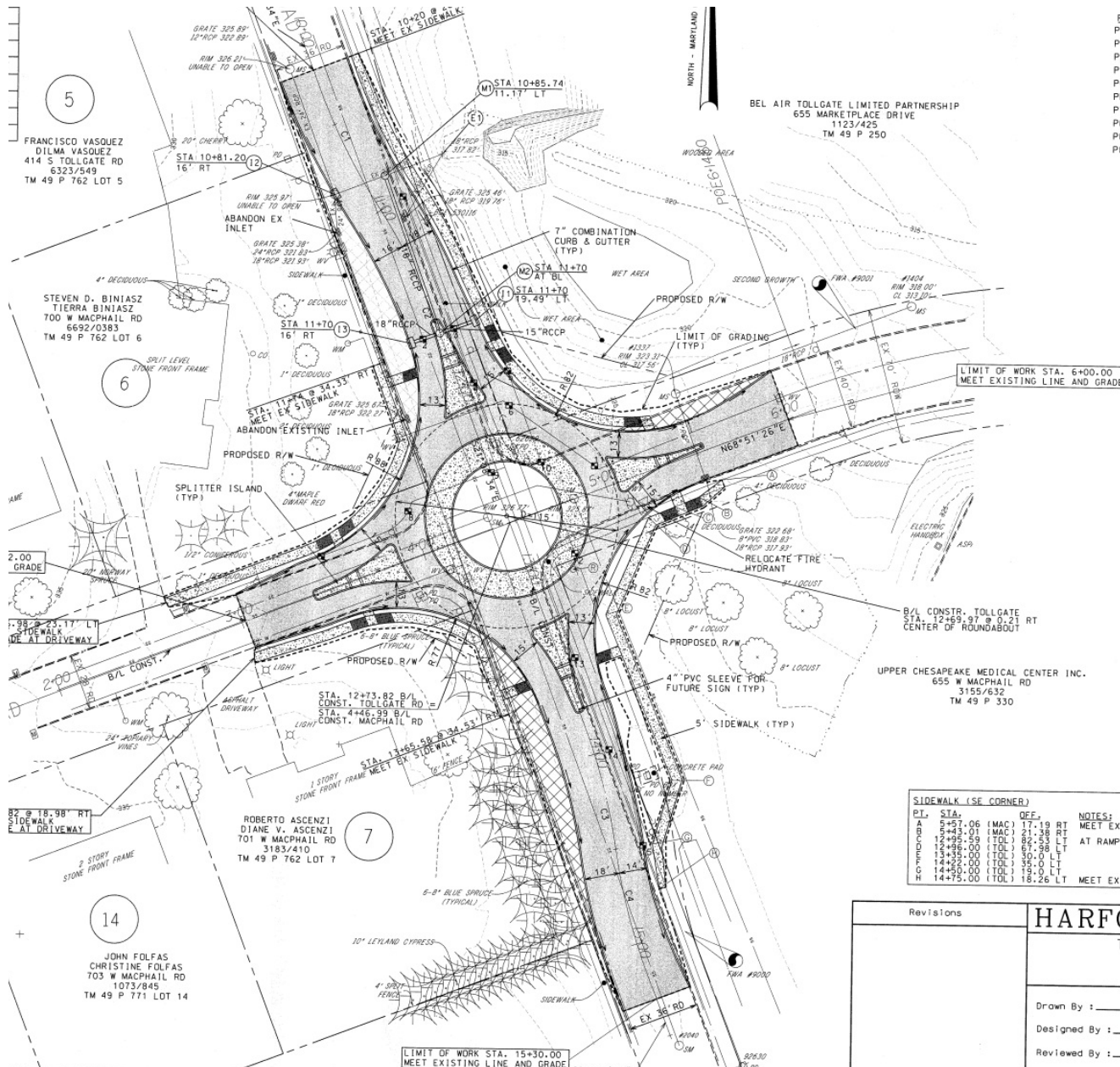
Tollgate & MacPhail Road Mini-Roundabout



Description.....







PI	BASELINE	STA	N	E
PDB	TOLLGATE	10+00.00	675730.1860	1495025.2100
PC	TOLLGATE	10+21.80	675709.8509	1495033.0741
PRC	TOLLGATE	10+97.31	675642.4162	1495066.6335
PT	TOLLGATE	11+72.82	675574.9814	1495100.1930
PC	TOLLGATE	13+74.82	675386.5792	1495173.0530
PRC	TOLLGATE	14+50.33	675314.1112	1495193.5976
PT	TOLLGATE	15+25.84	675241.6433	1495214.1421
POE	TOLLGATE	15+52.04	675217.2095	1495223.5913
PDB	MACPHAIL	0+00.00	675319.5549	1494719.7245
POE	MACPHAIL	6+14.60	675541.2375	1495123.6081

SURVEY CONTROL POINTS:

FWA #9000
REBAR W/CAP
N 675,272.662 E 1,495,229.688
ELEV 326.90'

FWA #9001
REBAR W/CAP
N 675,562.787 E 1,495,313.338
ELEV 319.15'

- NOTES:**
- CONTRACTOR SHALL ABANDON EXISTING INLETS IDENTIFIED BY REMOVING EXISTING GRATE AND HEADPIECE. CONSTRUCTING BRICK BULKHEAD AT EXISTING PIPE OPENINGS AND FILLING REMAINING STRUCTURE WITH AASHTO #57 AGGREGATE
 - CURB AROUND SPLITTER ISLANDS SHALL BE STANDARD TYPE 'C' COMBINATION CURB AND GUTTER
 - ALL EXISTING GAS VALVES, WATER VALVES AND SANITARY SEWER MANHOLES SHALL BE ADJUSTED TO GRADE
 - BLUE SPRUCE TREES ALONG THE PROPERTY OF 701 W MACPHAIL RD SHALL NOT BE DISTURBED

LEGEND

	CONFERENTIAL TREE		DECIDUOUS TREE
	SHRUB		FIRE HYDRANT
	WATER VALVE		WATER METER
	SD INLET		GAS VALVE
	ROAD SIGN		LIGHT POLE
	UTILITY POLE		GUY ANCHOR
	UTILITY PEDESTAL		SPOT GRADE
	CONTROL STATION		CORNER FOUND
	SANITARY SEWER		STORM DRAIN
	METAL FENCE		WOOD FENCE
	TELEPHONE		OVERHEAD LINES
	GAS LINE		ELECTRIC LINE
	WOODS LINE		LIMIT OF GRADING
	RELOCATE		TEST PIT
	FULL DEPTH PAVING		REMOVE EXISTING PAVING

SIDEWALK (SE CORNER)

PI	STA	OFF.	NOTES:
A	5+57.06 (MAC)	17.19 RT	MEET EX. SIDEWALK
B	6+43.01 (MAC)	21.36 RT	
C	12+95.59 (TOL)	82.53 LT	AT RAMP
D	12+95.00 (TOL)	67.98 LT	
E	13+39.00 (TOL)	50.00 LT	
F	14+50.00 (TOL)	38.00 LT	
G	14+50.00 (TOL)	18.26 LT	MEET EX. SIDEWALK

Revisions

HARFORD COUNTY, MARYLAND

TOLLGATE ROAD AT MACPHAIL ROAD ROUNDBOUT PLAN

Drawn By: _____ GCH	Contract No: _____
Designed By: _____ GCH	Scale: 1" = 30'
Reviewed By: _____ JMS	Sheet 4 Of 11

Tollgate & MacPhail Road Mini-Roundabout

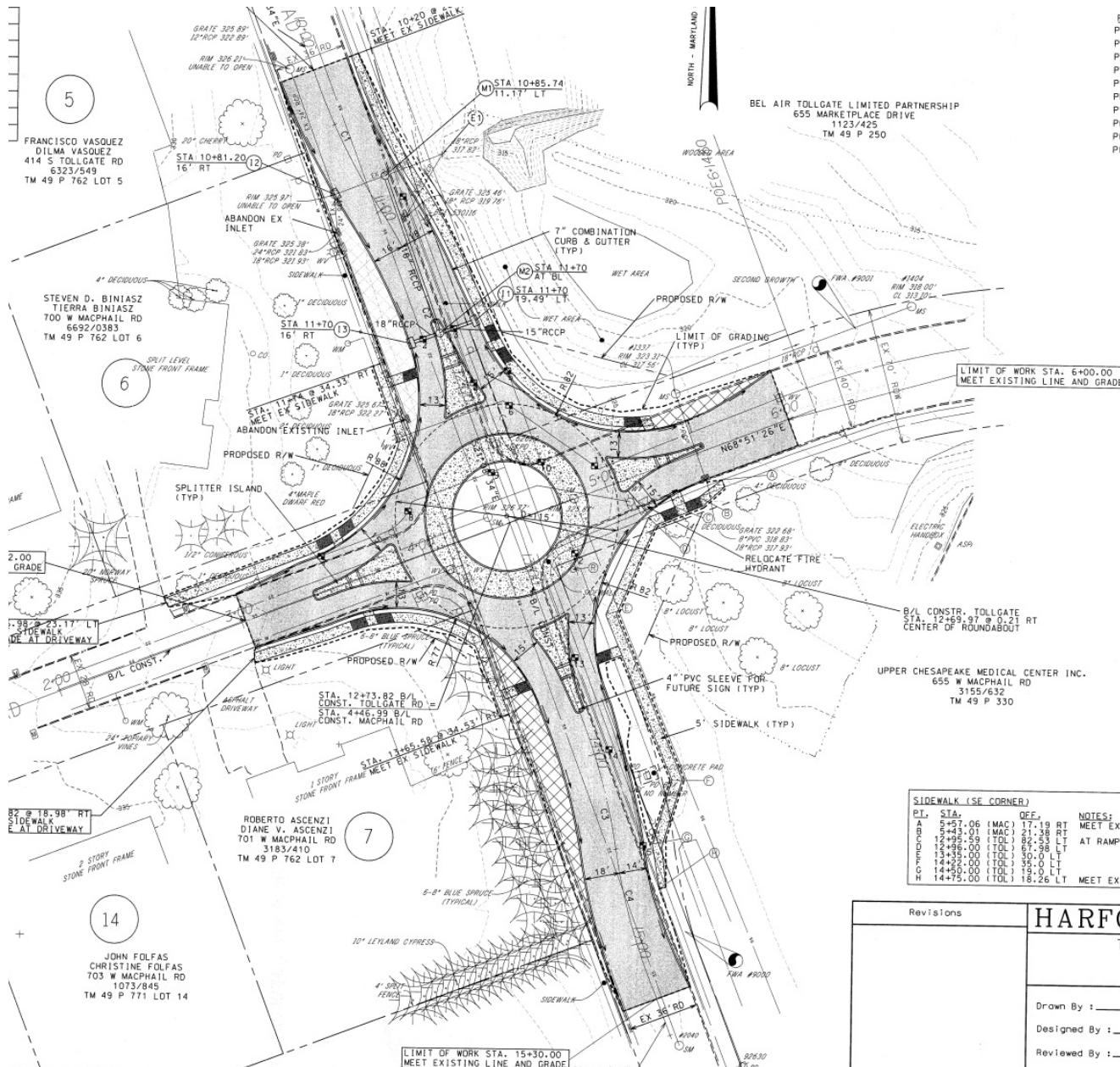


Significant Problem.....

Tollgate & MacPhail Road Mini-Roundabout



Significant Problem....Utilities



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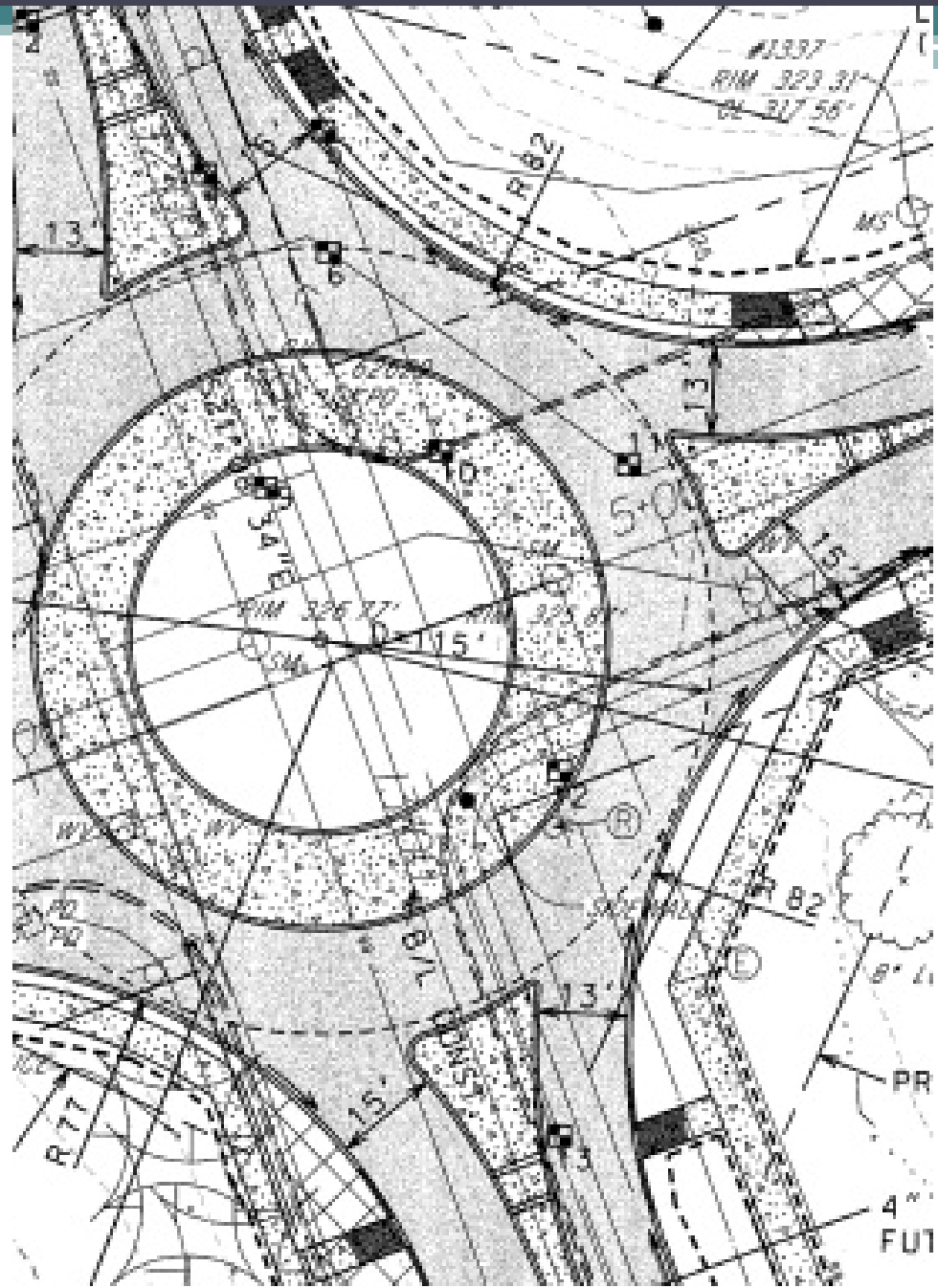


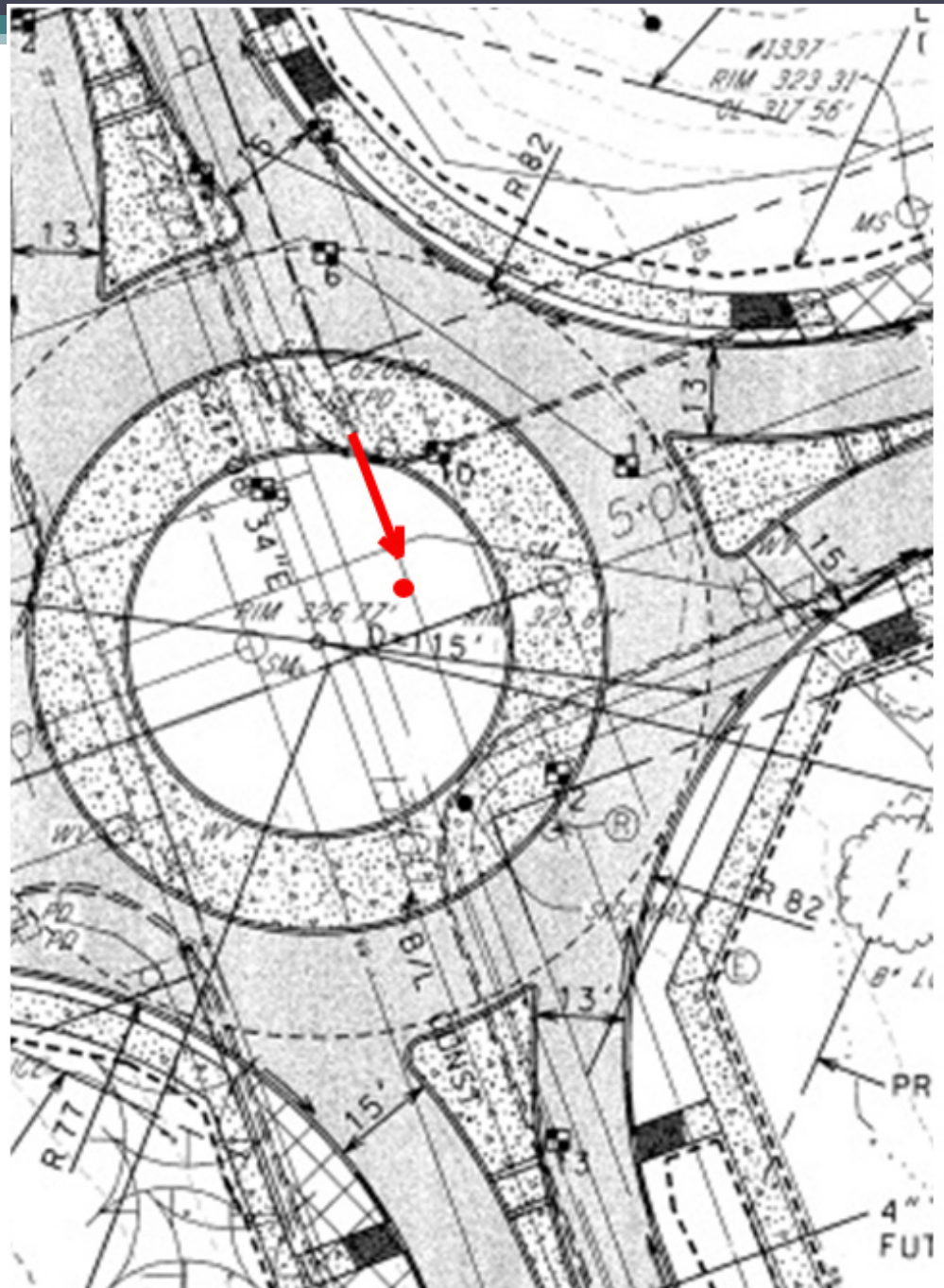


Tollgate & MacPhail Road Mini-Roundabout



Option 1



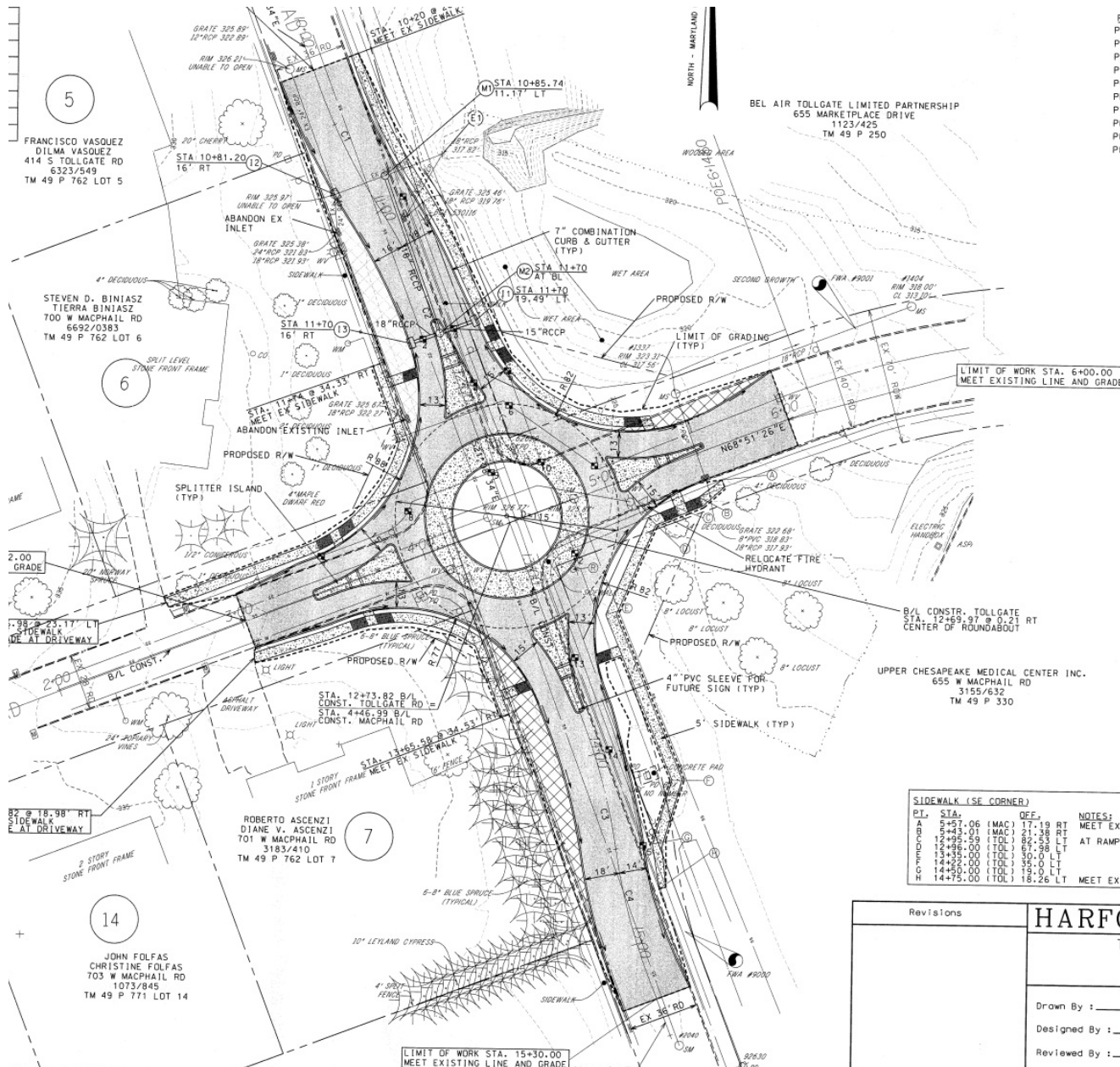












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Law Department: "No"

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HARFORD COUNTY, MARYLAND

TOLLGATE ROAD AT MACPHAIL ROAD
ROUNDBOUT
PLAN

Revisions

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Contract No: _____
Scale: 1" = 30'
Sheet 4 Of 11

Tollgate & MacPhail Road Mini-Roundabout



Option 2

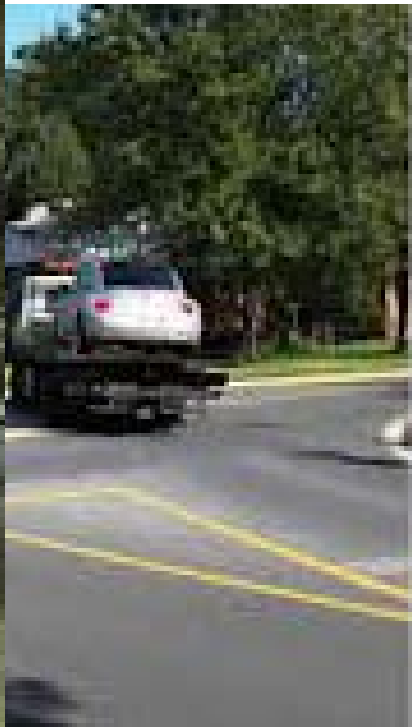
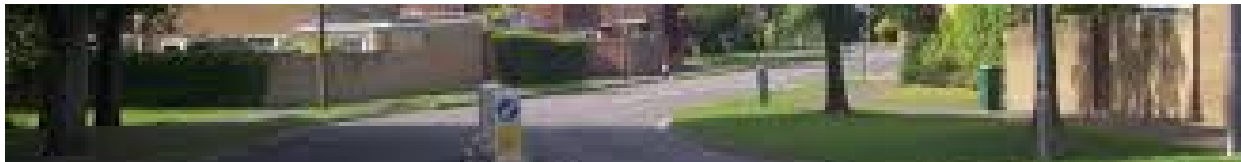
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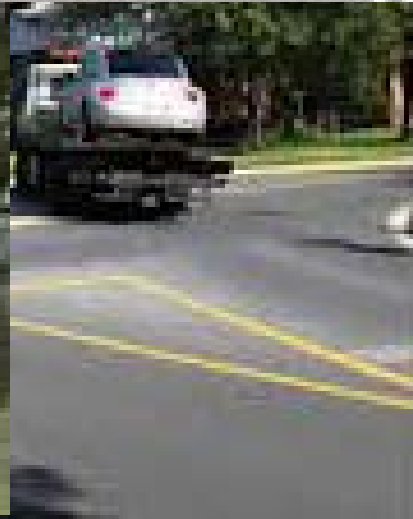
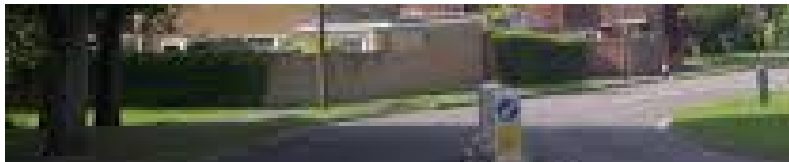
Option 2....Mini-Roundabout



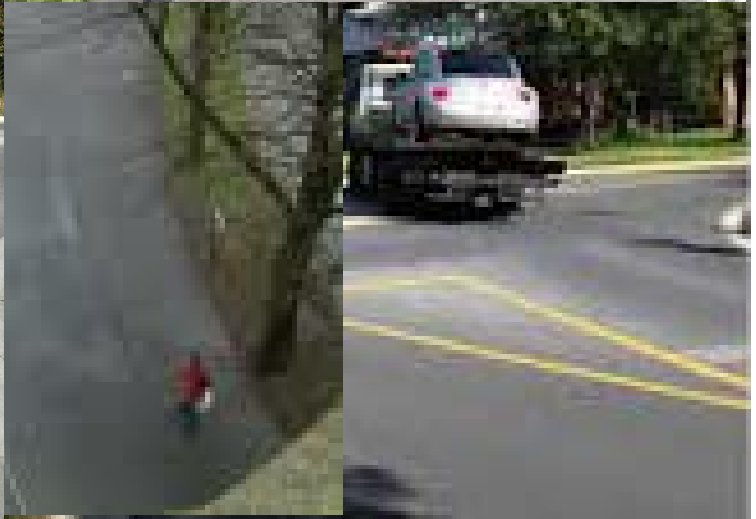














FHWA Mini-Roundabout Technical Summary

<http://safety.fhwa.dot.gov/intersection/roundabouts/fhwasa10007/>

FHWA Mini-Roundabout Instructional Video

<http://www.youtube.com/watch?v=Mr3QAKszLag>

















Case Study: Tollgate Road @ MacPhail Road

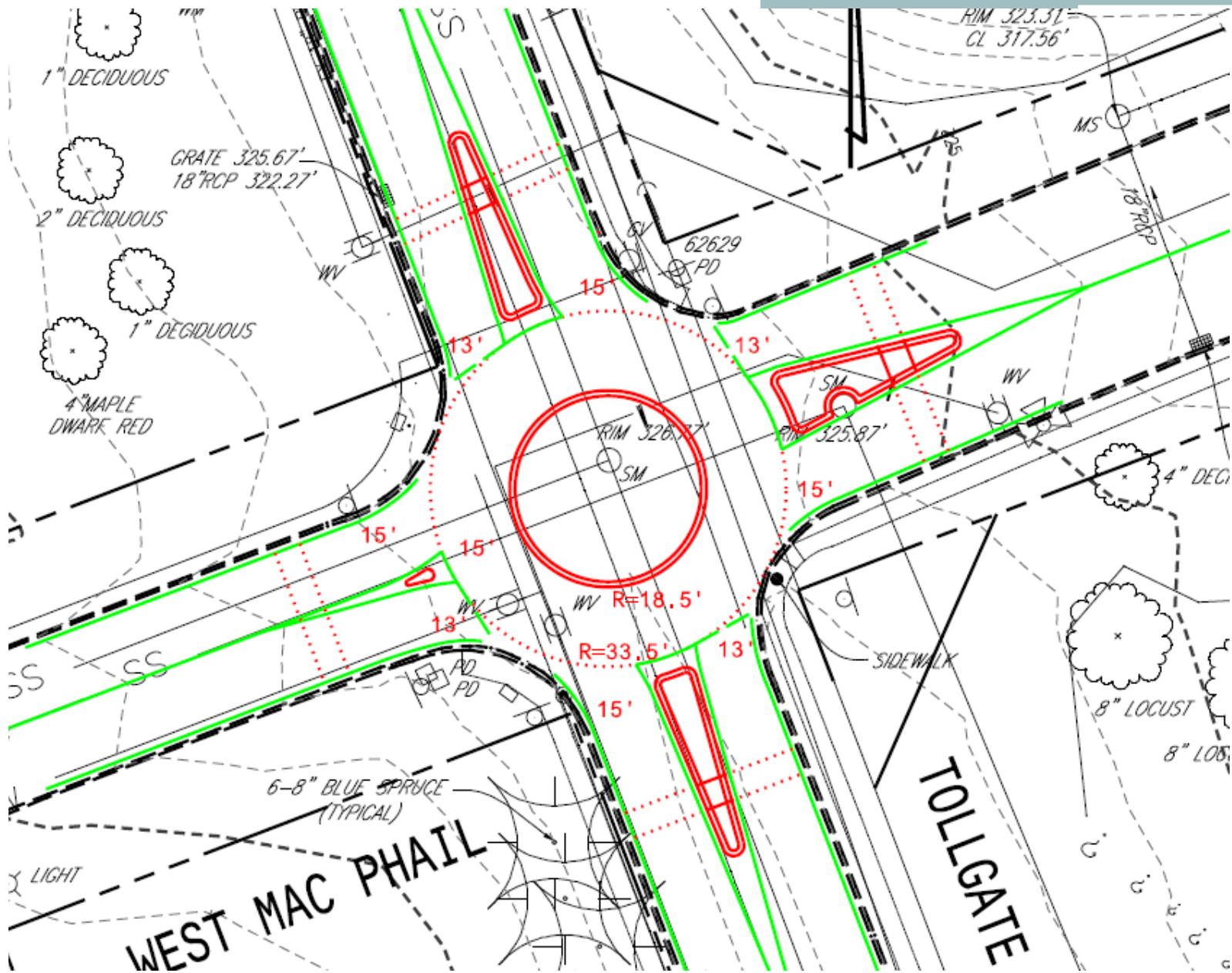
- Design

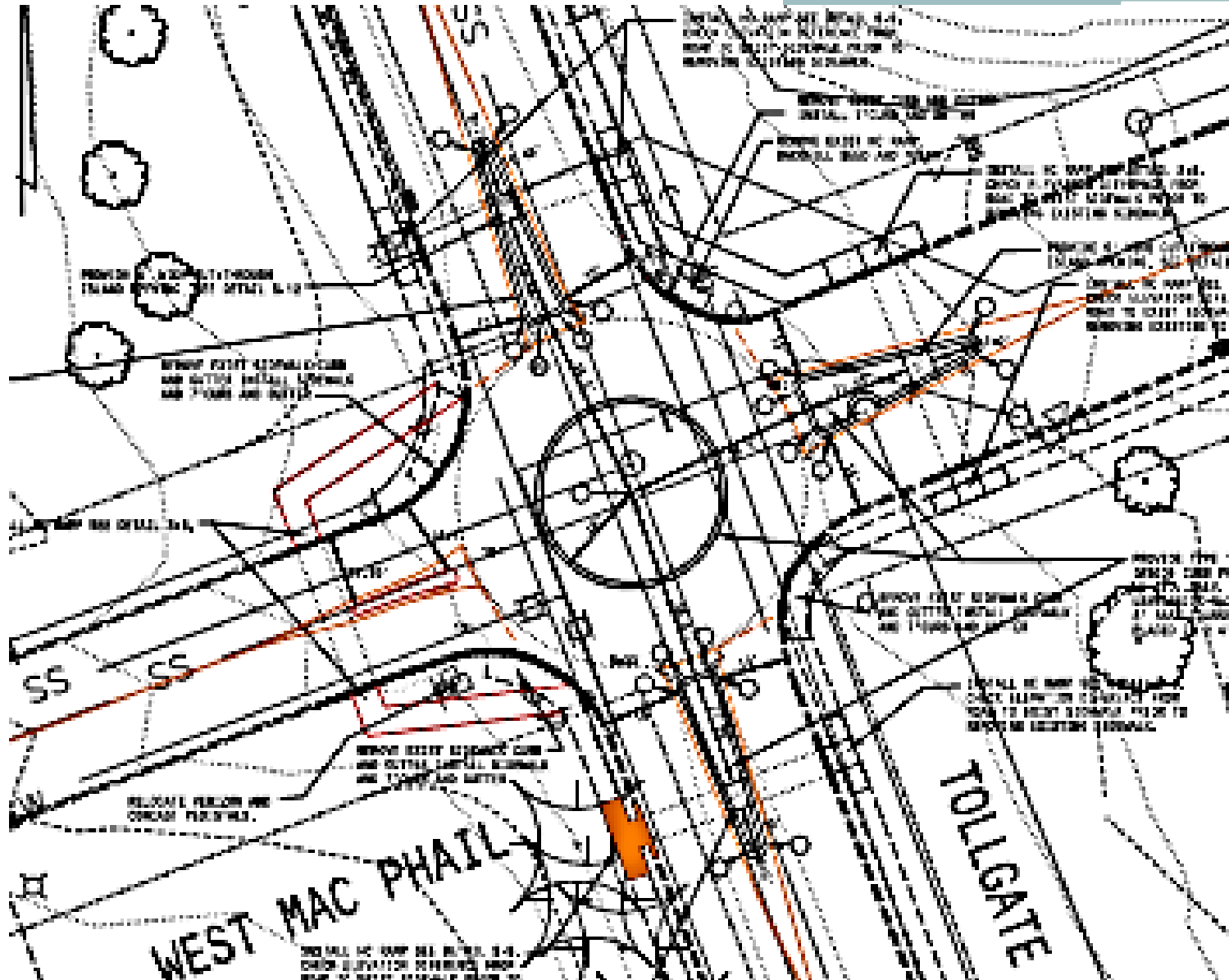
Case Study:

Tollgate Road @ MacPhail Road

- **Design**
 - Fit into the existing paving.







REMOVE EXISTING DRIVE AND
 RELOCATE TO NEW POSITION. SEE
 DETAIL FOR NEW DRIVE AND
 SIDEWALK.

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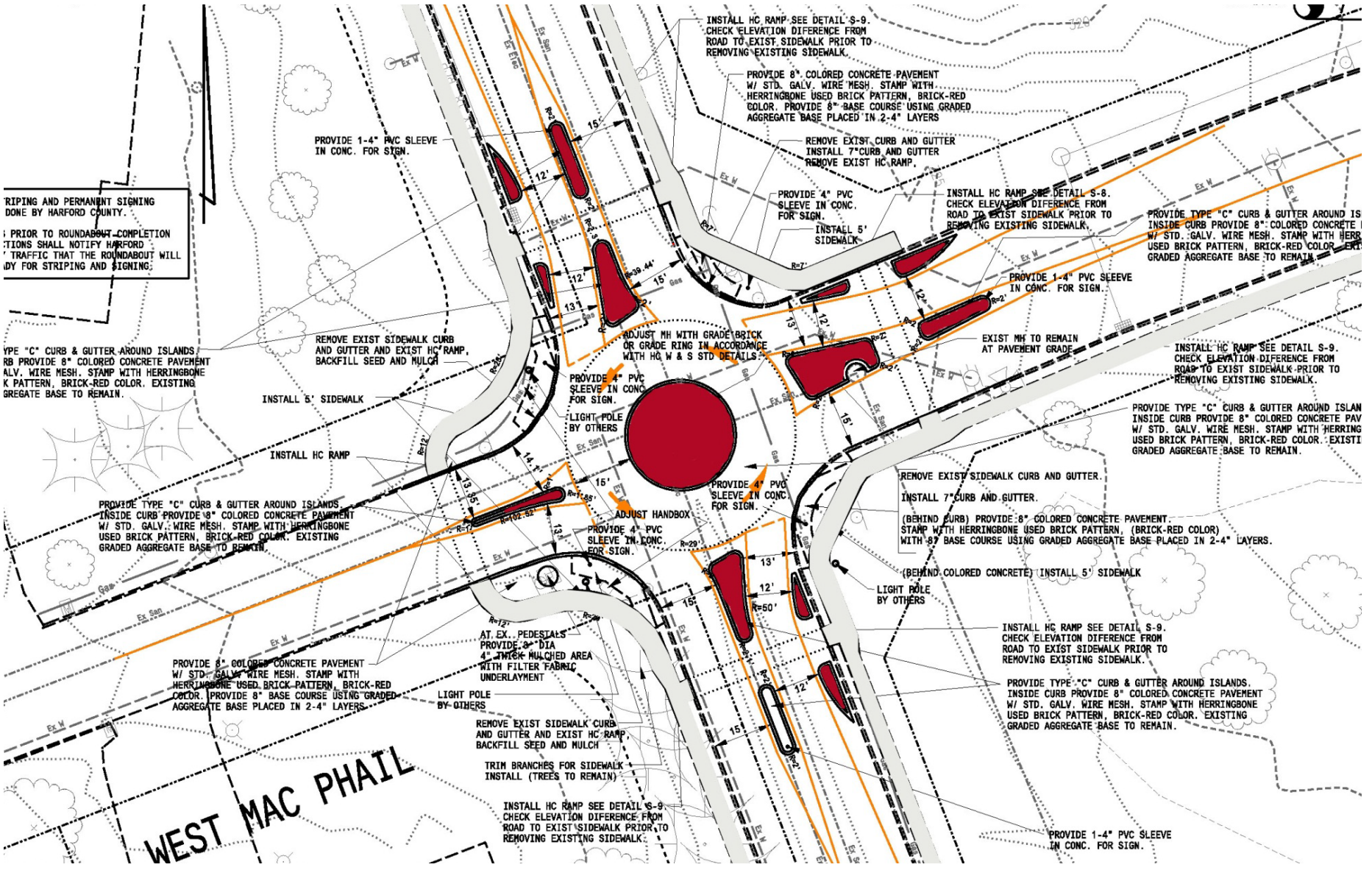
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WEST MAC PHAILS

TOLLGATE

REMOVE EXISTING DRIVE AND
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STRIPING AND PERMANENT SIGNING DONE BY HARFORD COUNTY.

PRIOR TO ROUNDABOUT COMPLETION OPERATIONS SHALL NOTIFY HARFORD COUNTY TRAFFIC THAT THE ROUNDABOUT WILL BE CLOSING FOR STRIPING AND SIGNING.

PROVIDE TYPE "C" CURB & GUTTER AROUND ISLANDS. INSIDE CURB PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING GRADED AGGREGATE BASE TO REMAIN.

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WEST MAC PHAIL

PROVIDE 1-4" PVC SLEEVE IN CONC. FOR SIGN.

REMOVE EXIST SIDEWALK CURB AND GUTTER AND EXIST HC RAMP. BACKFILL SEED AND MULCH.

INSTALL 5' SIDEWALK

INSTALL HC RAMP

AT EX. PEDESTALS PROVIDE 3" DIA 4" THICK MULCHED AREA WITH FILTER FABRIC UNDERLAYMENT

LIGHT POLE BY OTHERS

REMOVE EXIST SIDEWALK CURB AND GUTTER AND EXIST HC RAMP. BACKFILL SEED AND MULCH.

TRIM BRANCHES FOR SIDEWALK. INSTALL (TREES TO REMAIN)

INSTALL HC RAMP SEE DETAIL S-9. CHECK ELEVATION DIFFERENCE FROM ROAD TO EXIST SIDEWALK PRIOR TO REMOVING EXISTING SIDEWALK.

PROVIDE 4" PVC SLEEVE IN CONC FOR SIGN.

LIGHT POLE BY OTHERS

PROVIDE 4" PVC SLEEVE IN CONC FOR SIGN.

LIGHT POLE BY OTHERS

ADJUST HANDBOX

PROVIDE 4" PVC SLEEVE IN CONC FOR SIGN.

LIGHT POLE BY OTHERS

ADJUST MH WITH GRADE BRICK OR GRADE RING IN ACCORDANCE WITH HC W & S STD DETAILS

INSTALL HC RAMP SEE DETAIL S-9. CHECK ELEVATION DIFFERENCE FROM ROAD TO EXIST SIDEWALK PRIOR TO REMOVING EXISTING SIDEWALK.

PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. PROVIDE 8" BASE COURSE USING GRADED AGGREGATE BASE PLACED IN 2-4" LAYERS

REMOVE EXIST CURB AND GUTTER. INSTALL 7" CURB AND GUTTER. REMOVE EXIST HC RAMP.

PROVIDE 4" PVC SLEEVE IN CONC FOR SIGN.

INSTALL 5' SIDEWALK

INSTALL HC RAMP SEE DETAIL S-8. CHECK ELEVATION DIFFERENCE FROM ROAD TO EXIST SIDEWALK PRIOR TO REMOVING EXISTING SIDEWALK.

PROVIDE TYPE "C" CURB & GUTTER AROUND ISLANDS. INSIDE CURB PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING GRADED AGGREGATE BASE TO REMAIN.

PROVIDE 1-4" PVC SLEEVE IN CONC. FOR SIGN.

EXIST MH TO REMAIN AT PAVEMENT GRADE

INSTALL HC RAMP SEE DETAIL S-9. CHECK ELEVATION DIFFERENCE FROM ROAD TO EXIST SIDEWALK PRIOR TO REMOVING EXISTING SIDEWALK.

PROVIDE TYPE "C" CURB & GUTTER AROUND ISLANDS. INSIDE CURB PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING GRADED AGGREGATE BASE TO REMAIN.

REMOVE EXIST SIDEWALK CURB AND GUTTER.

INSTALL 7" CURB AND GUTTER.

(BEHIND CURB) PROVIDE 8" COLORED CONCRETE PAVEMENT. STAMP WITH HERRINGBONE USED BRICK PATTERN, (BRICK-RED COLOR) WITH 8" BASE COURSE USING GRADED AGGREGATE BASE PLACED IN 2-4" LAYERS.

(BEHIND COLORED CONCRETE) INSTALL 5' SIDEWALK

LIGHT POLE BY OTHERS

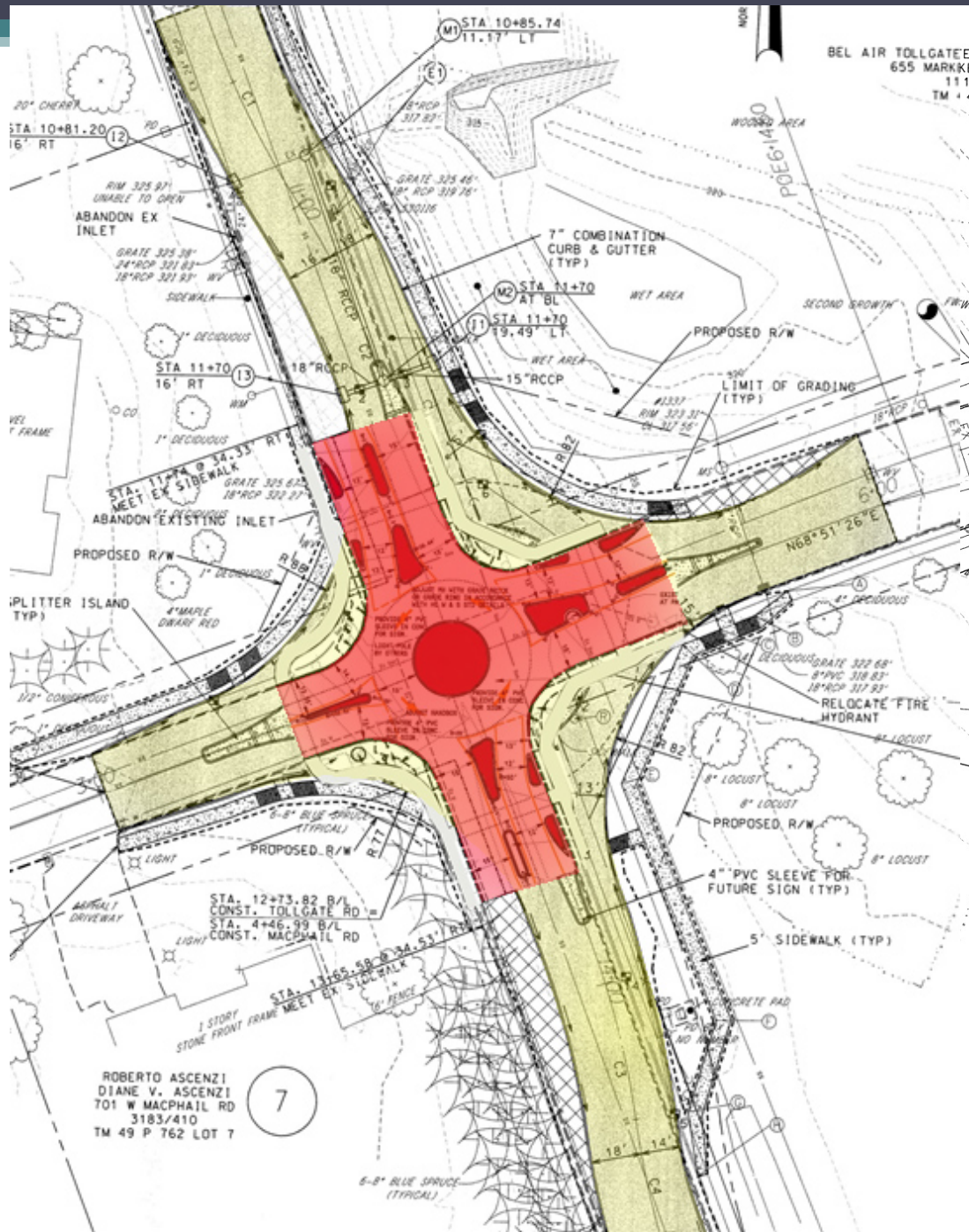
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PROVIDE 1-4" PVC SLEEVE IN CONC. FOR SIGN.

Case Study: Tollgate Road @ MacPhail Road

- **Design**
 - Fit into the existing paving
 - Much smaller than “normal” roundabout



BEL AIR TOLLGATE
655 MARKKE
111
TM 4

20" CHERRY
STA 10+81.20
16' RT

M1 STA 10+85.74
11.17' LT

ABANDON EX INLET
RIM 325.97'
UNABLE TO OPEN
GRATE 325.38'
24" RCP 321.83'
18" RCP 321.93' HW

GRATE 325.46'
18" RCP 319.76'
320116

7" COMBINATION
CURB & GUTTER
(TYP)

M2 STA 11+70
AT BL

M1 STA 11+70
19.49' LT

STA 11+70
16' RT

LIMIT OF GRADING
(TYP)

STA 11+74.35
MEET EX SIDEWALK

ABANDON EXISTING INLET

PROPOSED R/W

PLITTER ISLAND
(TYP)

RELOCATE FIRE
HYDRANT

STA. 12+73.82 B/L
CONST. TOLLGATE RD

STA. 4+46.99 B/L
CONST. MACPHAIL RD

STA. 11+65.58
CONST. SIDEWALK

ROBERTO ASCENZI
DIANE V. ASCENZI
701 W MACPHAIL RD
3183/410
TM 49 P 762 LOT 7

7

6-8" BLUE SPRUCE
(TYPICAL)

7" CURB & GUTTER AROUND ISLANDS. CURB PROVIDE 8" COLORED CONCRETE PAVEMENT GALV. WIRE MESH. STAMP WITH HERRINGBONE PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

'C' CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT WIRE MESH. STAMP WITH HERRINGBONE PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

REMOVE SIDEWALK. WITH

CONCRETE PAVEMENT. STAMP WITH HERRINGBONE PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

SIDEWALK

7" CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT WIRE MESH. STAMP WITH HERRINGBONE PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

INSTALL HC RAMP SEE DETAIL MOD-S-7

AT EX. PEDESTALS PROVIDE 3" DIA 4" THICK MULCHED AREA WITH FILTER FABRIC UNDERLAYMENT

REMOVE 40LF EXIST CURB AND GUTTER, REMOVE SIDEWALK

INSTALL 40LF TYPE 'C' CURB AND GUTTER WITH 3' TRANSITIONS TO EX 7" CURB.

(BEHIND CURB) PROVIDE 8" COLORED CONCRETE PAVEMENT. STAMP WITH HERRINGBONE USED BRICK PATTERN, (BRICK-RED COLOR) WITH 8" BASE COURSE USING GRADED AGGREGATE BASE PLACED IN 2-4" LAYERS.

(BEHIND COLORED CONCRETE) INSTALL 5' SIDEWALK

TRIM BRANCHES FOR SIDEWALK

INSTALL 40LF TYPE 'C' CURB AND GUTTER WITH 3' TRANSITIONS TO EX 7" CURB.

(BEHIND CURB) PROVIDE 8" COLORED CONCRETE PAVEMENT. STAMP WITH HERRINGBONE USED BRICK PATTERN, (BRICK-RED COLOR) WITH 8" BASE COURSE USING GRADED AGGREGATE BASE PLACED IN 2-4" LAYERS.

(BEHIND COLORED CONCRETE) INSTALL 5' SIDEWALK

PROVIDE 4" PVC SLEEVE IN CONC. FOR SIGN.

ADJUST MH WITH GRADE BRICK OR GRADE RING IN ACCORDANCE WITH HC W & S STD DETAILS

PROVIDE 4" PVC SLEEVE IN CONC. FOR SIGN.

LIGHT POLE BY OTHERS

PROVIDE 4" PVC SLEEVE IN CONC. FOR SIGN.

PROVIDE 4" PVC SLEEVE IN CONC. FOR SIGN.

REMOVE 40LF EXIST CURB AND GUTTER, REMOVE SIDEWALK.

INSTALL 40LF TYPE 'C' CURB AND GUTTER WITH 3' TRANSIT.

(BEHIND CURB) PROVIDE 8" COLORED CONCRETE PAVEMENT. STAMP WITH HERRINGBONE USED BRICK PATTERN, (BRICK-RED WITH 8" BASE COURSE USING GRADED AGGREGATE BASE PLACED

(BEHIND COLORED CONCRETE) INSTALL 5' SIDEWALK

LIGHT POLE BY OTHERS

INSTALL HC RAMP SEE DETAIL S-9. CHECK ELEVATION DIFFERENCE FROM ROAD TO EXIST SIDEWALK PRIOR TO REMOVING EXISTING SIDEWALK.

PROVIDE TYPE 'C' CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

PROVIDE 7" CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

PROVIDE NOSE DOWN SEE HC DETAIL S-6

INSTALL HC CHECK ELEVATION DIFFERENCE FROM ROAD TO EXIST SIDEWALK PRIOR TO REMOVING EXISTING SIDEWALK.

PROVIDE 7" CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

PROVIDE NOSE DOWN SEE HC DETAIL S-6

IN CH RO RE

PROVIDE TYPE 'C' CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

ALL

Case Study:

Tollgate Road @ MacPhail Road

- **Design**
- **Construction**







Case Study:

Tollgate Road @ MacPhail Road

- Design
- Construction
- Completed Project





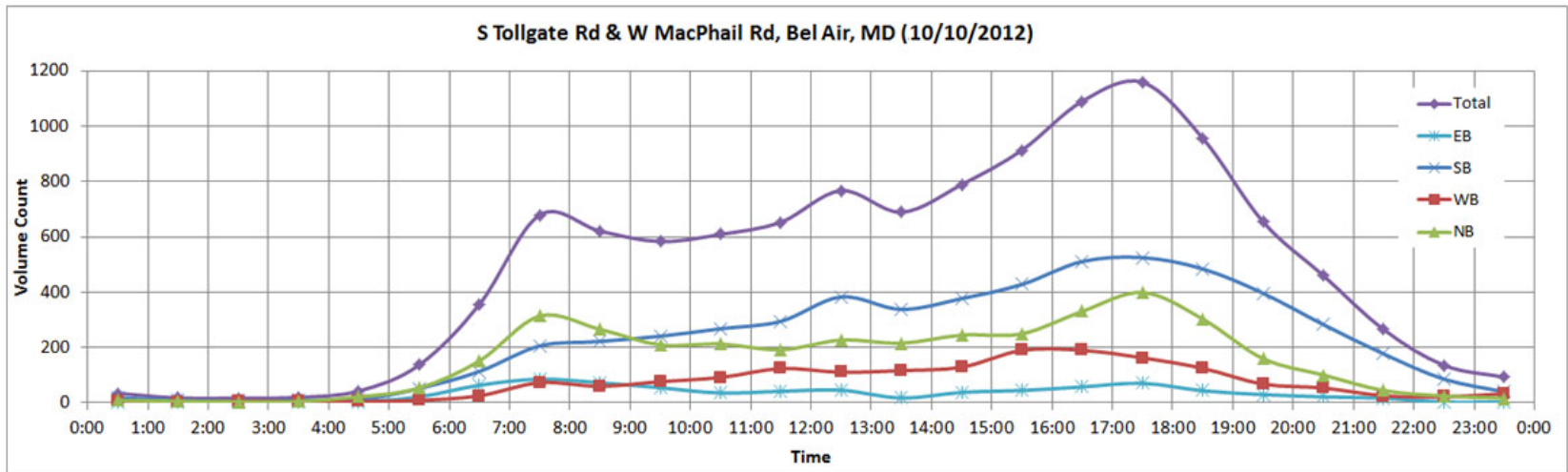
Case Study:

Tollgate Road @ MacPhail Road

- Design
- Construction
- Completed Project
 - Volumes

Tollgate Road at W. MacPhail Road Entering Traffic Volumes

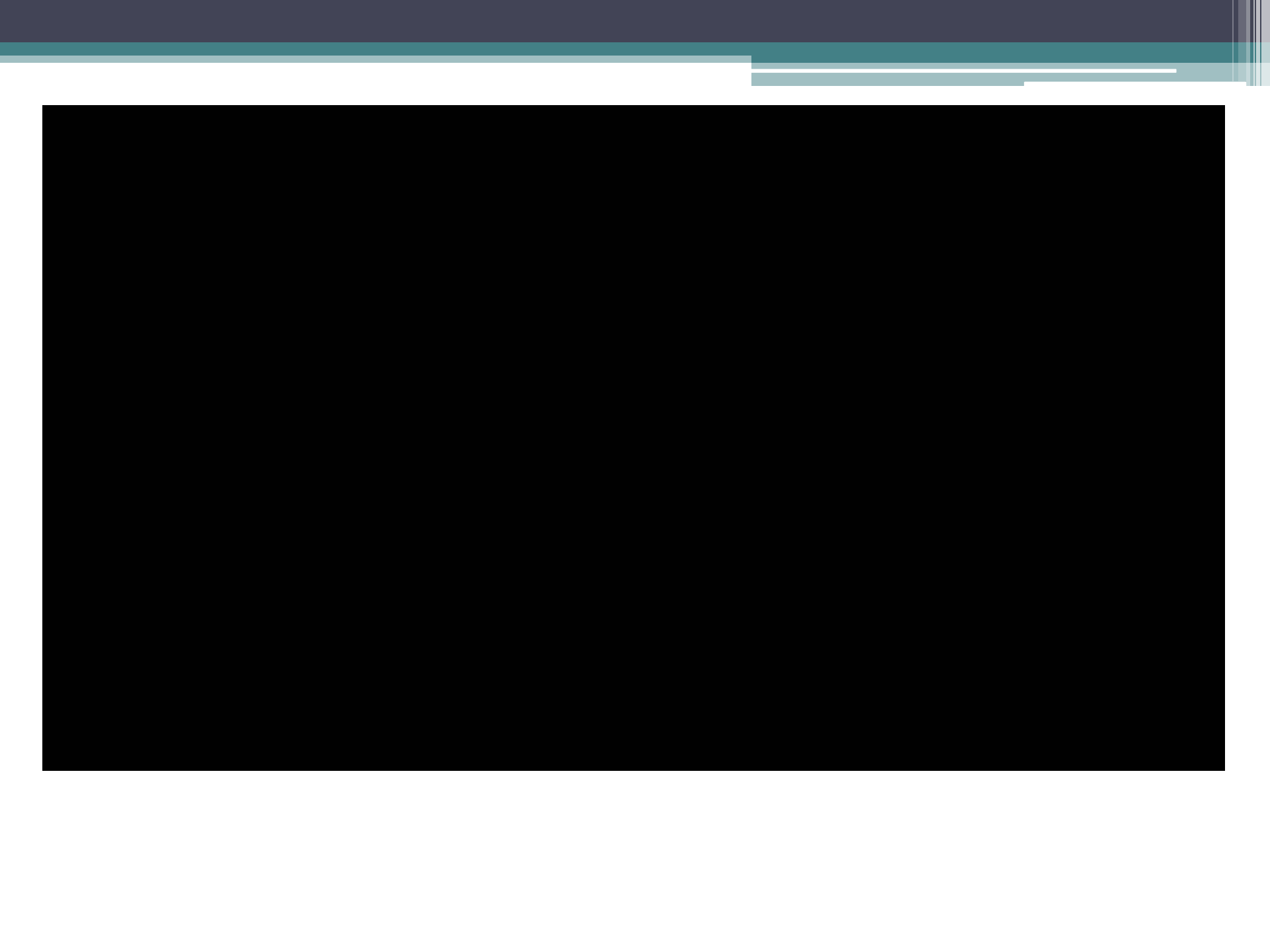
Time Range			Volume Counts				
			EB	SB	WB	NB	Total
0:00	-	1:00	1	18	7	9	35
1:00	-	2:00	1	10	1	6	18
2:00	-	3:00	1	6	6	4	17
3:00	-	4:00	0	10	5	5	20
4:00	-	5:00	4	12	5	22	43
5:00	-	6:00	22	52	9	54	137
6:00	-	7:00	64	114	26	152	356
7:00	-	8:00	86	206	73	314	679
8:00	-	9:00	73	222	60	266	621
9:00	-	10:00	55	241	77	210	583
10:00	-	11:00	36	268	92	213	609
11:00	-	12:00	42	295	124	192	653
12:00	-	13:00	46	383	111	227	767
13:00	-	14:00	18	338	117	216	689
14:00	-	15:00	38	377	129	245	789
15:00	-	16:00	45	428	190	250	913
16:00	-	17:00	58	511	190	331	1090
17:00	-	18:00	71	525	163	399	1158
18:00	-	19:00	44	484	125	303	956
19:00	-	20:00	30	396	68	160	654
20:00	-	21:00	22	283	54	101	460
21:00	-	22:00	17	177	26	45	265
22:00	-	23:00	3	86	22	25	136
23:00	-	0:00	3	40	33	17	93
Total			780	5482	1713	3766	11741



Case Study:

Tollgate Road @ MacPhail Road

- Design
- Construction
- Completed Project
 - Volumes
 - Evening Rush Hour & Nighttime Video
 - “Special” Situations (See link at the end of this presentation)



Case Study:

Tollgate Road @ MacPhail Road

- Design
- Construction
- Completed Project
- Lessons Learned

Case Study:

Tollgate Road @ MacPhail Road

- Design
- Construction
- Completed Project
- Lessons Learned
 - Vehicular Deflection

7" CURB & GUTTER AROUND ISLANDS. CURB PROVIDE 8" COLORED CONCRETE PAVEMENT GALV. WIRE MESH. STAMP WITH HERRINGBONE PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

'C' CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT W/ GALV. WIRE MESH. STAMP WITH HERRINGBONE PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

REMOVE SIDEWALK WITH CONCRETE PAVEMENT. STAMP WITH HERRINGBONE PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

INSTALL HC RAMP SEE DETAIL MOD-S-7
CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT W/ GALV. WIRE MESH. STAMP WITH HERRINGBONE PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

INSTALL HC RAMP SEE DETAIL MOD-S-7
AT EX. PEDESTALS PROVIDE 3" DIA. 4" THICK MULCHED AREA WITH FILTER FABRIC UNDERLAYMENT

REMOVE 40LF EXIST CURB AND GUTTER, REMOVE SIDEWALK. INSTALL 40LF TYPE 'C' CURB AND GUTTER WITH 3' TRANSITIONS TO EX 7" CURB. (BEHIND CURB) PROVIDE 8" COLORED CONCRETE PAVEMENT. STAMP WITH HERRINGBONE USED BRICK PATTERN, (BRICK-RED COLOR) WITH 8" BASE COURSE USING GRADED AGGREGATE BASE PLACED IN 2-4" LAYERS. (BEHIND COLORED CONCRETE) INSTALL 5' SIDEWALK

TRIM BRANCHES FOR SIDEWALK

INSTALL 40LF TYPE 'C' CURB AND GUTTER WITH 3' TRANSITIONS TO EX 7" CURB.

(BEHIND CURB) PROVIDE 8" COLORED CONCRETE PAVEMENT. STAMP WITH HERRINGBONE USED BRICK PATTERN, (BRICK-RED COLOR) WITH 8" BASE COURSE USING GRADED AGGREGATE BASE PLACED IN 2-4" LAYERS.

(BEHIND COLORED CONCRETE) INSTALL 5' SIDEWALK

PROVIDE 4" PVC SLEEVE IN CONC. FOR SIGN.

INSTALL HC CHECK ELEV ROAD TO EX1 REMOVING EX1

PROVIDE 7" CURB & INSIDE CURB PROVIDE W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

PROVIDE NOSE DOWN SEE HC DETAIL S-6

EXIST MH TO REMAIN AT PAVEMENT GRADE. PROVIDE 2' LONG NOSE DOWN ON CURB BOTH SIDES OF MH

PROVIDE TY INSIDE CURB W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

REMOVE 40LF EXIST CURB AND GUTTER, REMOVE SIDEWALK. INSTALL 40LF TYPE 'C' CURB AND GUTTER WITH 3' TRANSIT. (BEHIND CURB) PROVIDE 8" COLORED CONCRETE PAVEMENT. STAMP WITH HERRINGBONE USED BRICK PATTERN, (BRICK-RED WITH 8" BASE COURSE USING GRADED AGGREGATE BASE PLACED IN 2-4" LAYERS.

(BEHIND COLORED CONCRETE) INSTALL 5' SIDEWALK

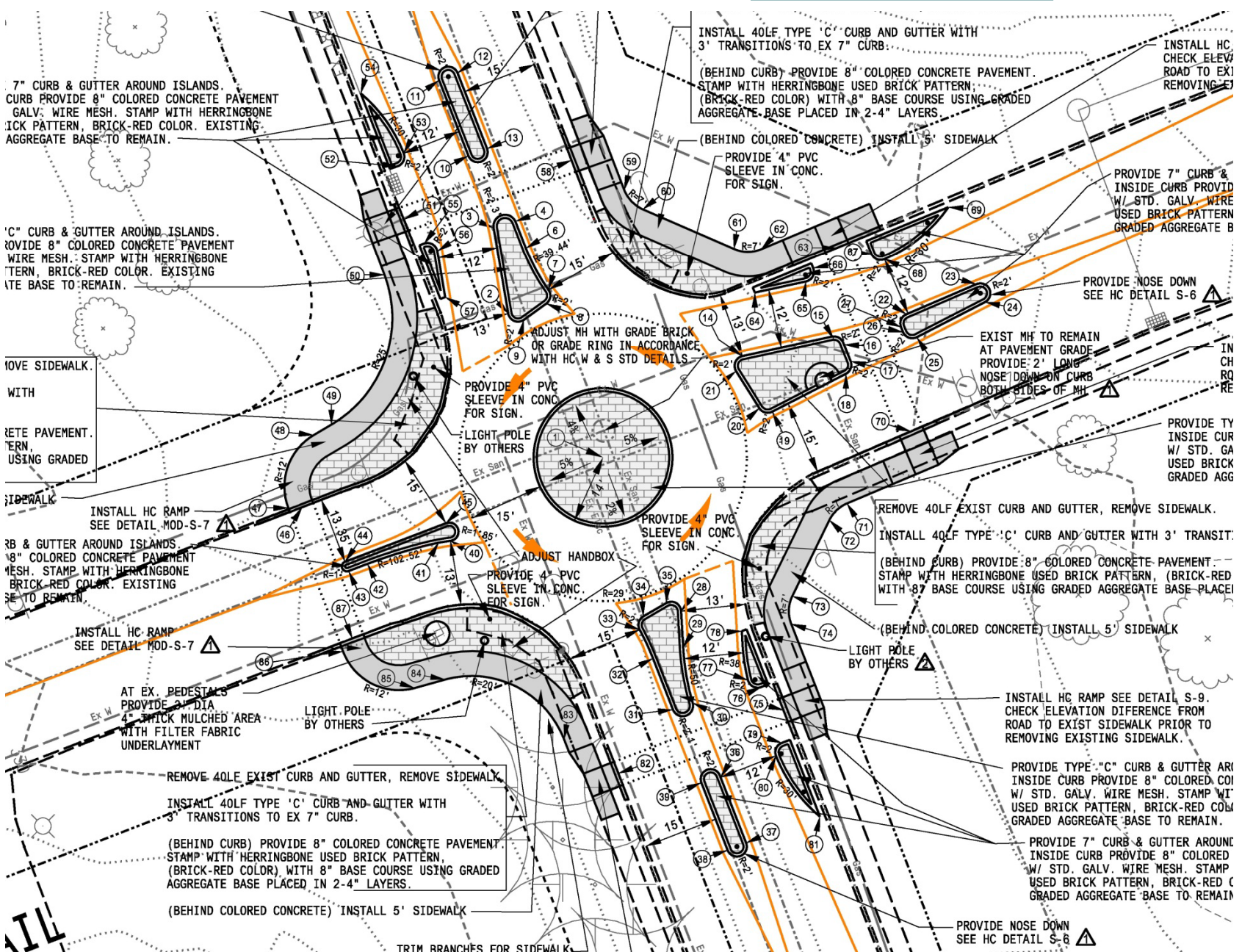
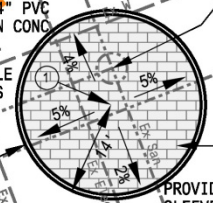
LIGHT POLE BY OTHERS

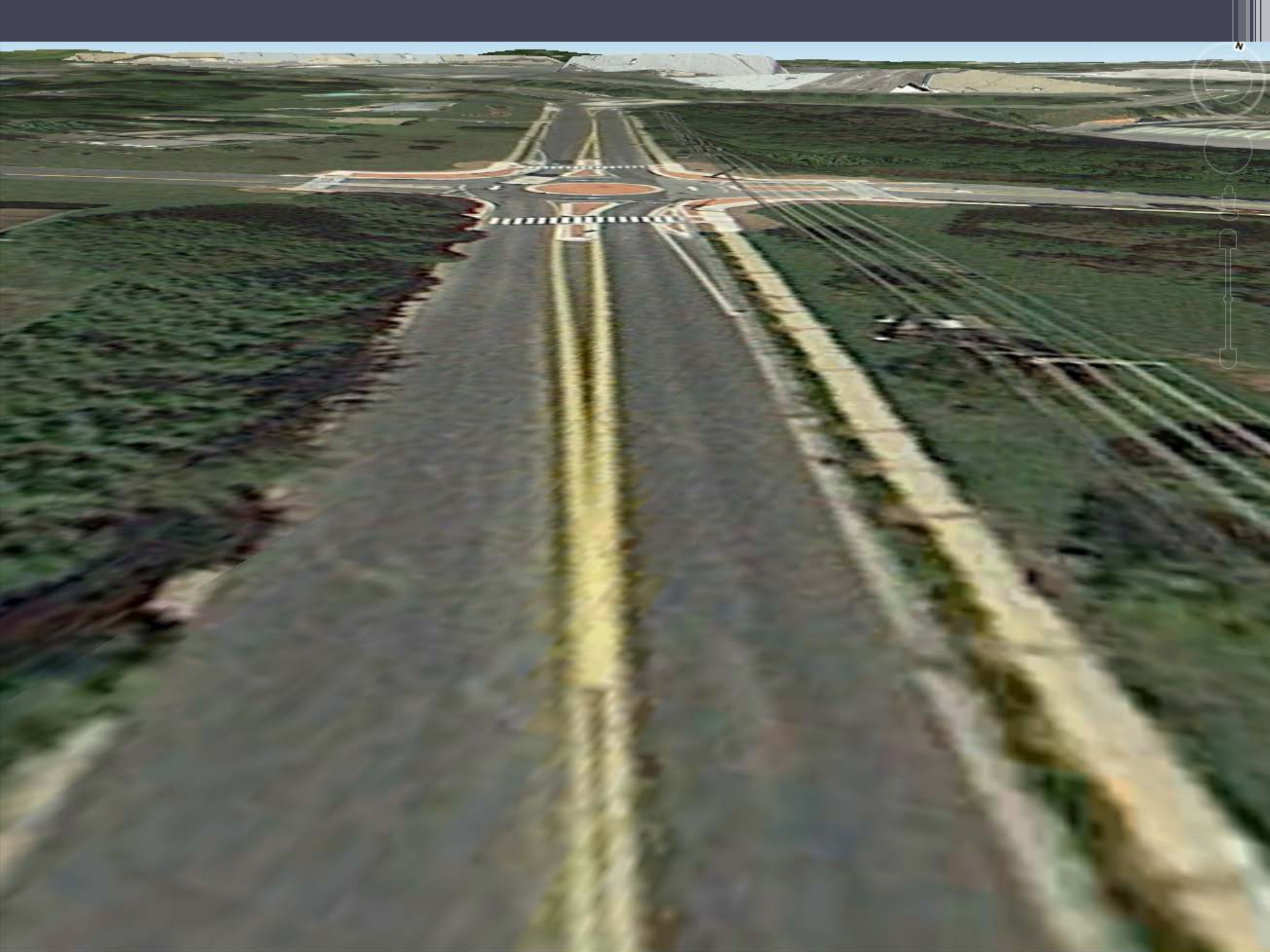
INSTALL HC RAMP SEE DETAIL S-9. CHECK ELEVATION DIFFERENCE FROM ROAD TO EXIST SIDEWALK PRIOR TO REMOVING EXISTING SIDEWALK.

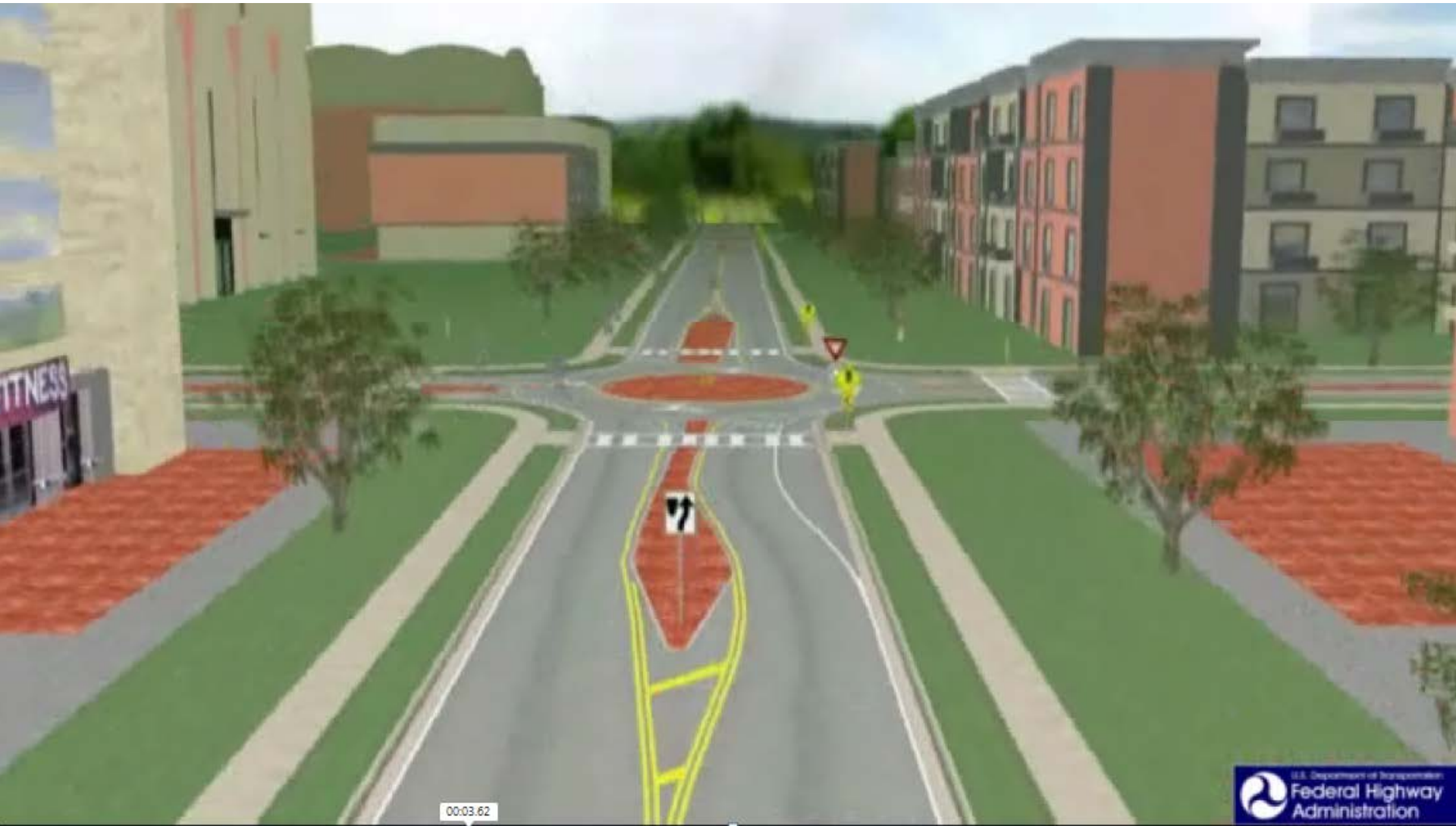
PROVIDE TYPE "C" CURB & GUTTER AROUND ISLANDS. PROVIDE 8" COLORED CONCRETE PAVEMENT W/ STD. GALV. WIRE MESH. STAMP WITH HERRINGBONE USED BRICK PATTERN, BRICK-RED COLOR. EXISTING AGGREGATE BASE TO REMAIN.

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PROVIDE NOSE DOWN SEE HC DETAIL S-6





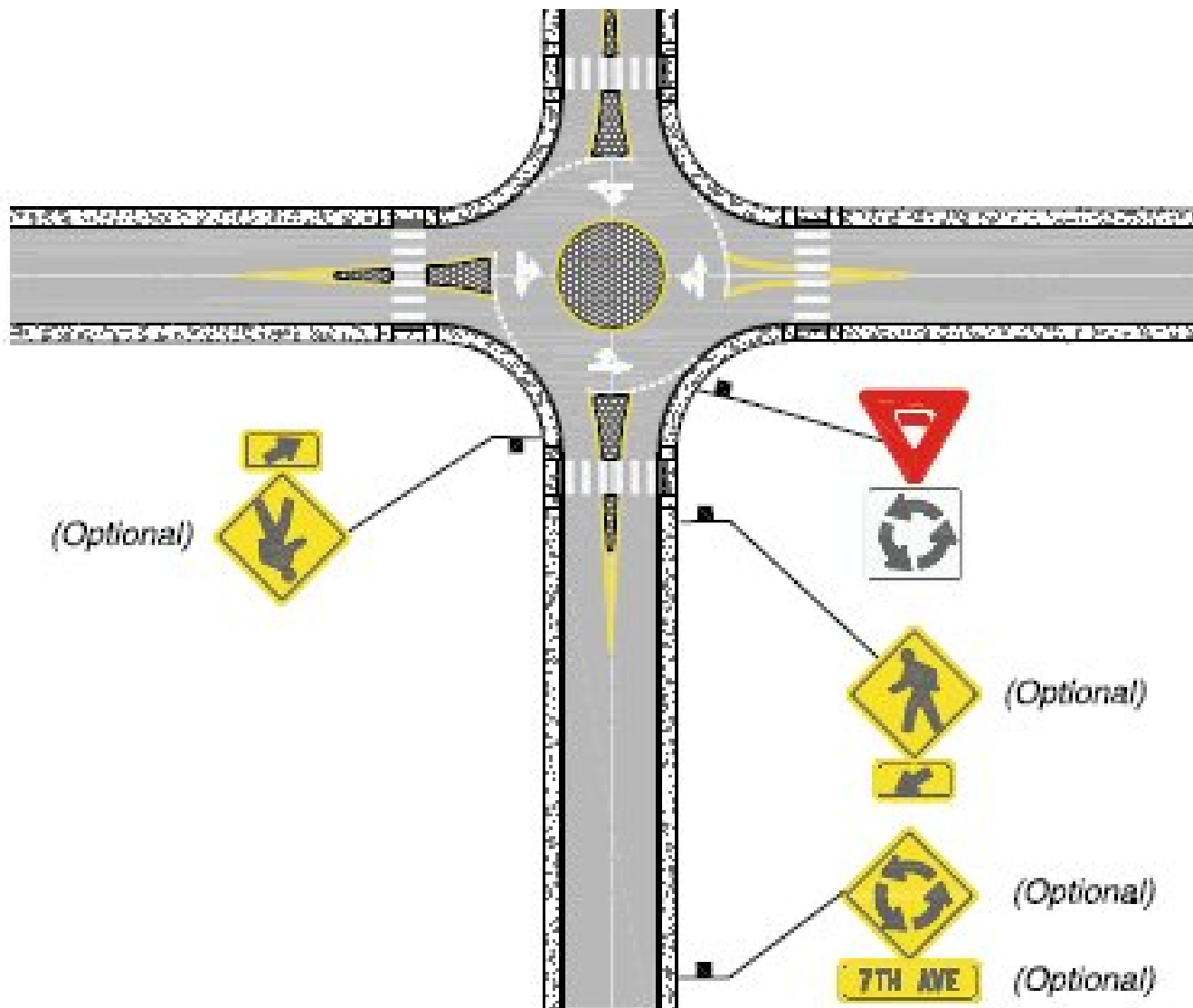


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Case Study:

Tollgate Road @ MacPhail Road

- Design
- Construction
- Completed Project
- Lessons Learned
 - Vehicular Deflection
 - Traffic Control Signs







500 South Tollgate Road



Exit Street View



MACPHAIL RD W.



TO TRAFFIC IN CIRCLE

South Tollgate Road

[Report a problem](#)

© 2013 Google

Google earth

Case Study:

Tollgate Road @ MacPhail Road

- Design
- Construction
- Completed Project
- Lessons Learned
 - Vehicular Deflection
 - Traffic Control Signs
 - Turn Signals







Case Study:

Tollgate Road @ MacPhail Road

- Design
- Construction
- Completed Project
- Lessons Learned
 - Vehicular Deflection
 - Traffic Control Signs
 - Turn Signals
 - Accident History

“Before” Accidents (2008 - 2011):

9 reported - 5 injuries (1 serious)

“Before” Accidents (2008 - 2011):

9 reported - 5 injuries (1 serious)

“After” Accidents (2012 - Present):

7 reported accidents - (1 minor injury)

Pre-construction: 85th % speed of 38 MPH – right angle accident

Post-construction: 85th % speed of ~ 15 MPH – side swipe accident

Is this a success??

Mini-Roundabout



Is this a success??

Well, based upon:

- 1. the general acceptance of the mini-roundabout**

Is this a success??

Well, based upon:

1. the general acceptance of the mini-roundabout
2. the reduction in approach speeds

Is this a success??

Well, based upon:

- 1. the general acceptance of the mini-roundabout**
- 2. the reduction in approach speeds**
- 3. the decrease in serious accidents**

Is this a success??

Well, based upon:

1. the general acceptance of the mini-roundabout
2. the reduction in approach speeds
3. the decrease in serious accidents
4. and increase in pedestrian safety

Is this a success??

Well, based upon:

1. the general acceptance of the mini-roundabout
2. the reduction in approach speeds
3. the decrease in serious accidents
4. and increase in pedestrian safety

The answer would be...yes.

Water Tower Way @ Granary Road



Looking southbound on Water Tower Way at Granary Rd



Future location of another mini just south of the one at Granary Road



Water Tower Way @ Bynum Road

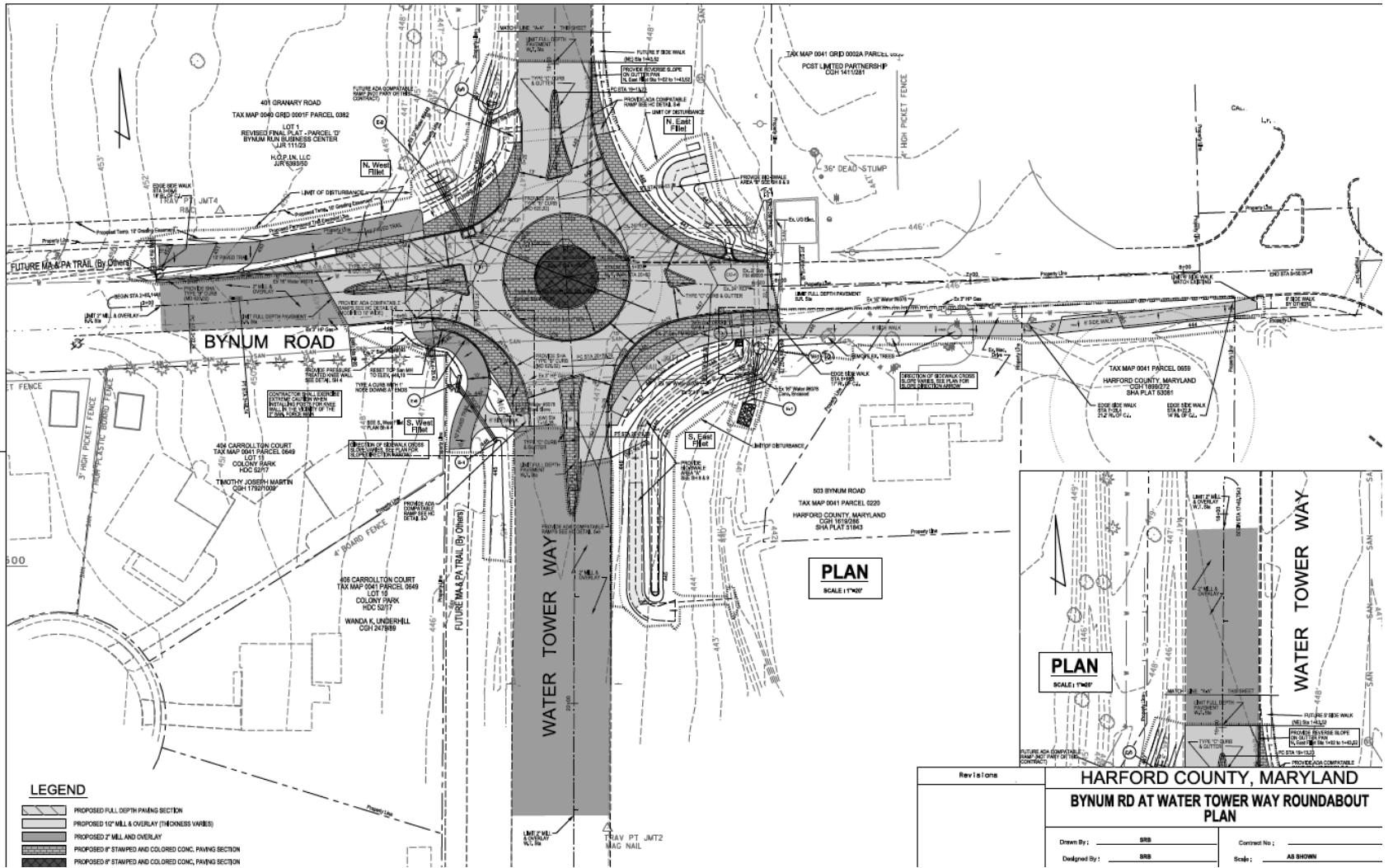




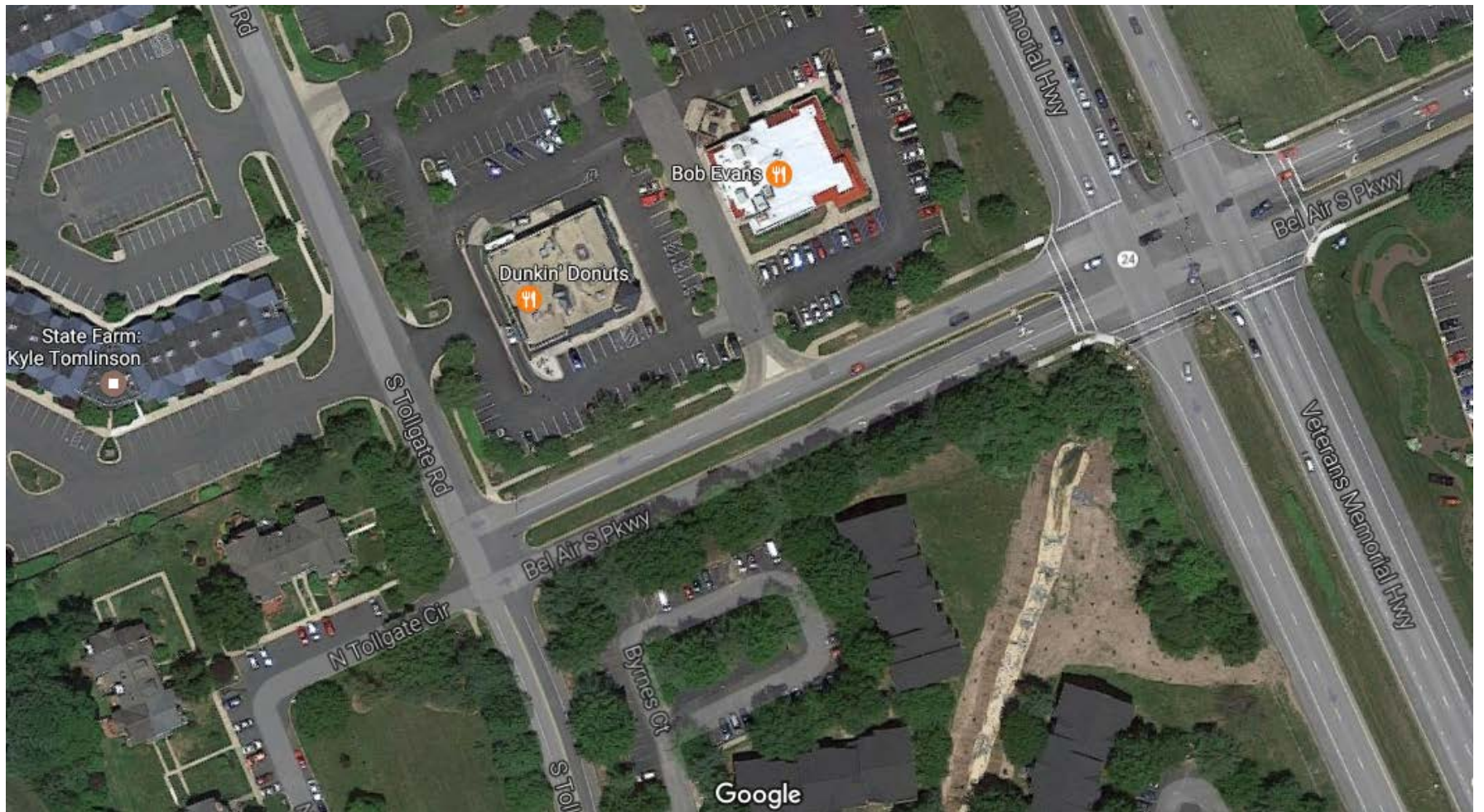
Existing Trail

Proposed
Bynum & Water Tower Way
Roundabout

Proposed Trail



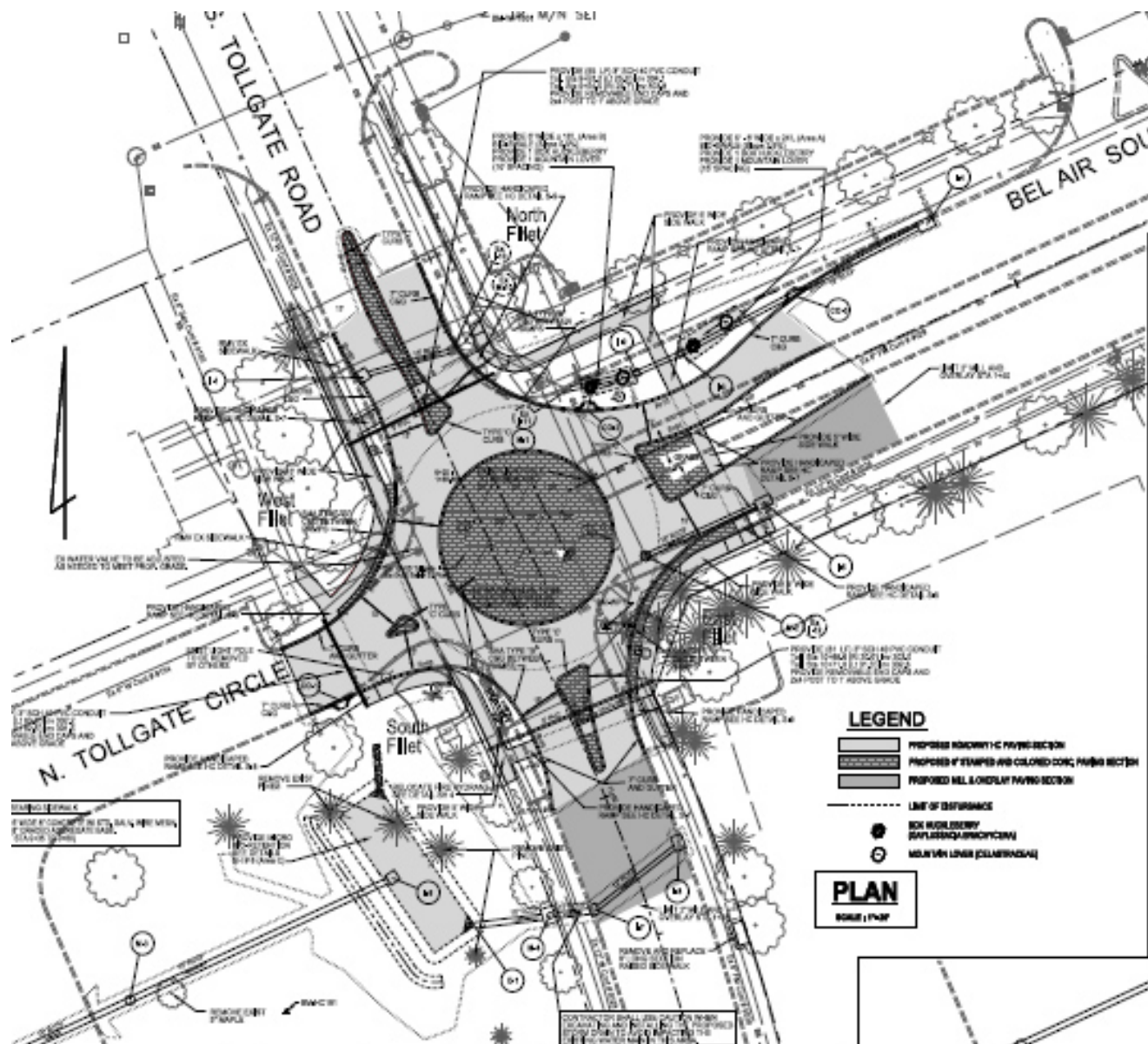
Revisions



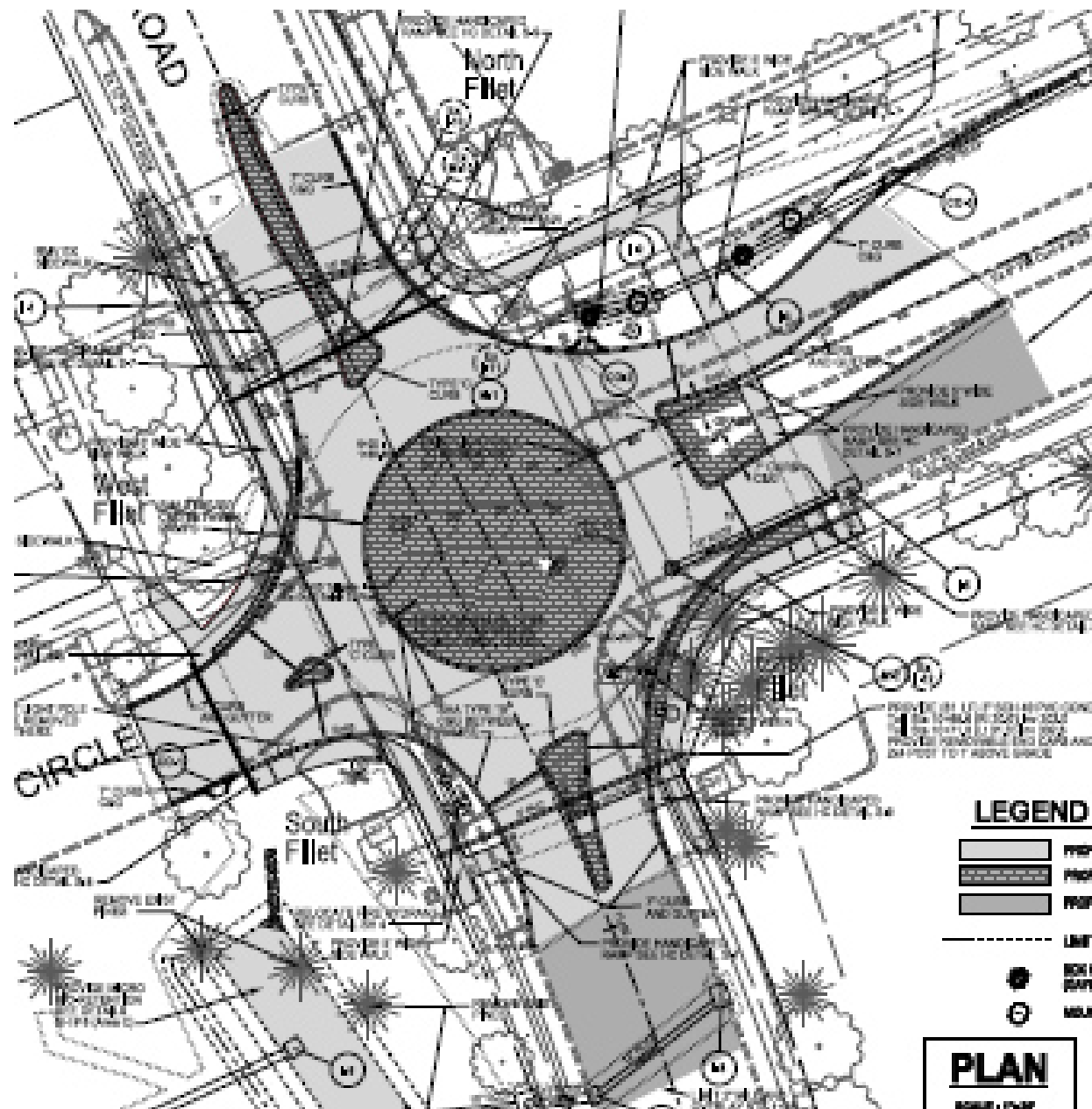


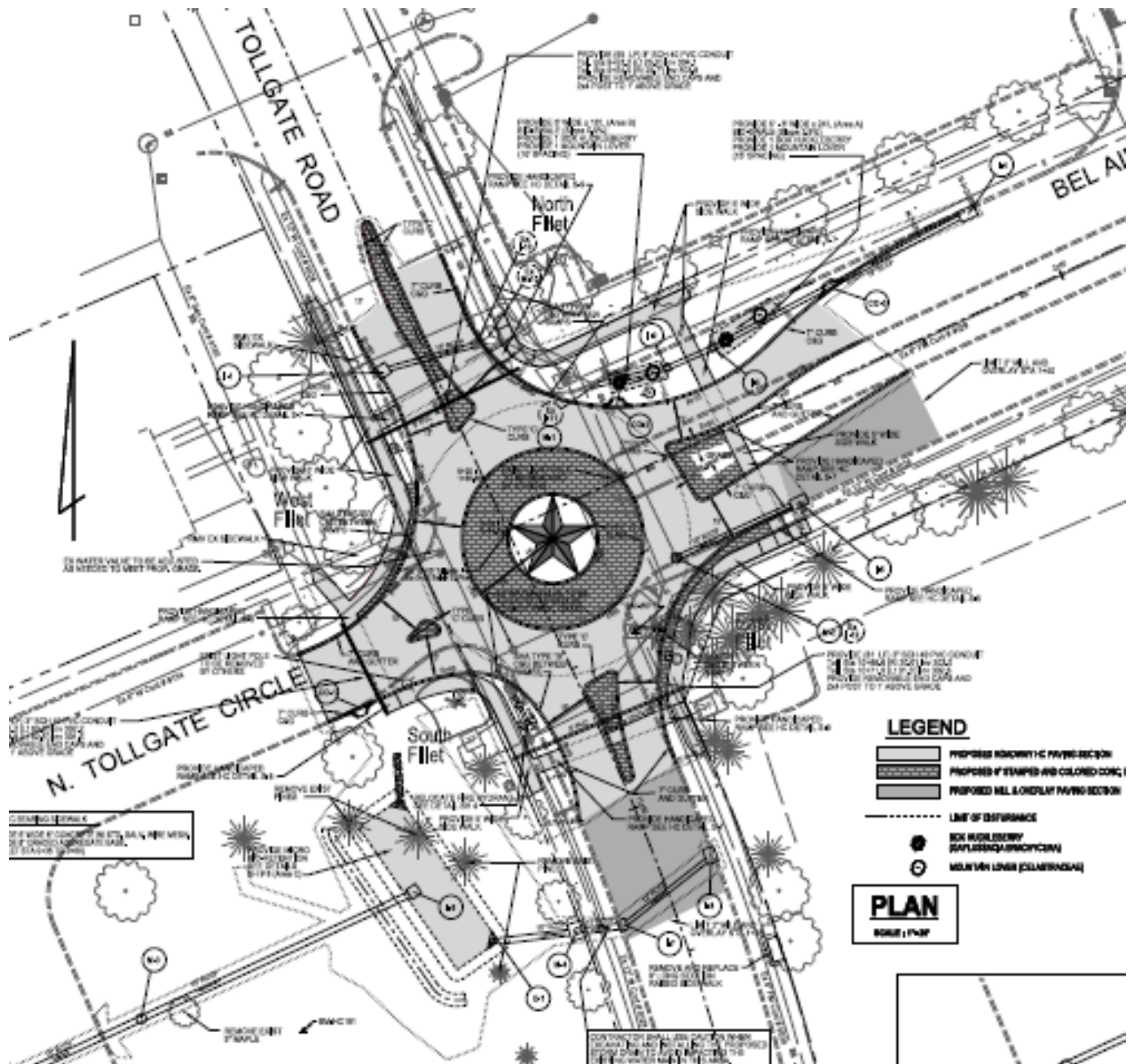


60' DIA - Rev 6-10-14



MAYNARD COUNTY STREET LIGHT SCHEDULE		
SECTION	SECTION	SECTION
1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	21
22	23	24
25	26	27
28	29	30
31	32	33
34	35	36
37	38	39
40	41	42
43	44	45
46	47	48
49	50	51
52	53	54
55	56	57
58	59	60
61	62	63
64	65	66
67	68	69
70	71	72
73	74	75
76	77	78
79	80	81
82	83	84
85	86	87
88	89	90
91	92	93
94	95	96
97	98	99
100	101	102





REMOVE EXISTING CONCRETE
 AND RECONSTRUCT WITH ASPHALT
 SURFACE TO MATCH ADJACENT

REMOVE EXISTING ASPHALT
 SURFACE AND RECONSTRUCT
 WITH ASPHALT TO MATCH
 ADJACENT

REMOVE EXISTING ASPHALT
 SURFACE AND RECONSTRUCT
 WITH ASPHALT TO MATCH
 ADJACENT







REMOVE EXISTING ASPHALT
 SURFACE AND RECONSTRUCT
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 ADJACENT

REMOVE EXISTING CONCRETE
 SURFACE AND RECONSTRUCT
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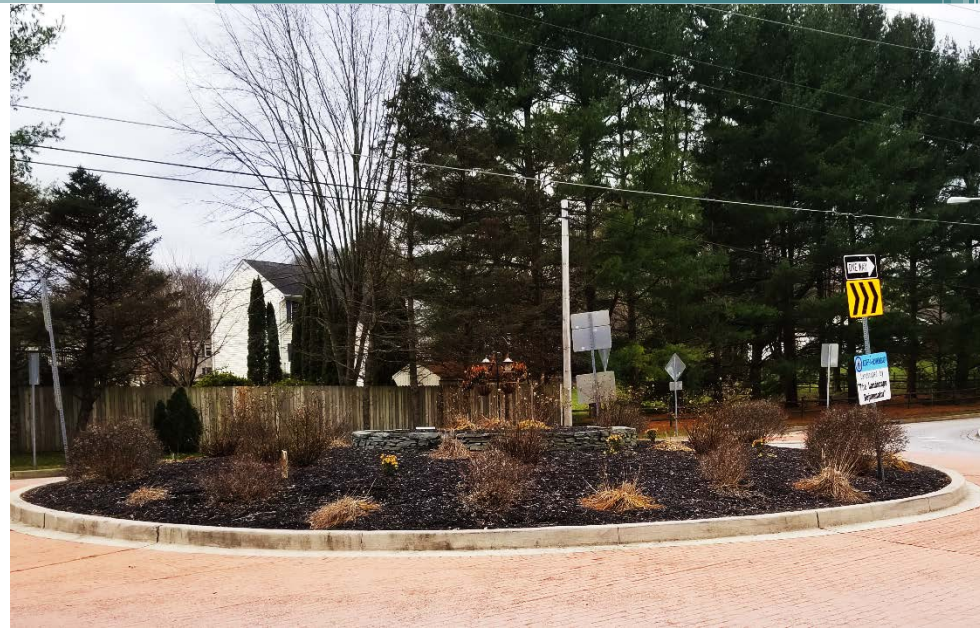
REMOVE EXISTING ASPHALT
 SURFACE AND RECONSTRUCT
 WITH ASPHALT TO MATCH
 ADJACENT

LEGEND

-  PROPOSED SIDEWALK PAVING SECTION
-  PROPOSED STAMPED AND COLORED CONC.
-  PROPOSED MILL & OVERLAY PAVING SECTION
-  LIMIT OF DISTURBANCE
-  SIX INCH DIAMETER SANITARIAN MANHOLE
-  NINE INCH DIAMETER SANITARIAN

PLAN
 SCALE: 1"=40'

Roundabout landscaping



ADOPT-A-ROUNDAABOUT

Landscaped by

**THE LANDSCAPE
REJUVENATOR**

Thank You

Questions and Additional Information:

Harford County Government Roundabouts - Website

<https://www.facebook.com/Harford-County-Roundabouts-308793279204833/>

FHWA Mini-Roundabout Design Manual - Website

<http://safety.fhwa.dot.gov/intersection/roundabouts/fhwas10007/>

Jeff Stratmeyer – Chief Engineer, Harford County, MD DPW

E-mail: jmstratmeyer@harfordcountymd.gov

Tollgate Road & MacPhail Road Mini-Roundabout Video Link

Tollgate & MacPhail Mini-Roundabout.wmv

<https://www.youtube.com/watch?v=3KLbr1awEbk>