APPENDIX A

SMF Calculations

APPENDIX A

SR 54 Project Development and Environment (PD&E) Study

American Consulting Engineers of Florida, LLC

ACE Project No. 5067054

Stormwater Management Facilities Sizing Calculations

For

Basins – 1, 2, 3, 4, 9, & 10

Design Criteria
100-year 10-day 20-inch storm
Maximum design storage depth 3.5 ft

December 2007

SR 54 Pond Sizing Calculations

TYPICAL SECTION I

6-lane divided "sub-urban" section with bike lanes and paths. From beginning of project to Meadow Pointe Blvd

Existing curve number

Pervious curve number, CNep $CNep := 80$ based on D soil good condition

Impervious curve number, CNei $CNei := 98$ pavement

Existing pavement width, IWe $IWe := 24ft + 10ft$

Existing ROW width, ROWe $ROWe := 100ft$

Weighted curve number, CNwe $CNwe := \frac{[CNep \cdot (ROWe - IWe)] + (CNei \cdot IWe)}{ROWe}$ two 12 ft lanes + two 5 ft shoulders

$CNwe = 86.12$

Proposed conditions curve number

Pervious curve number, CNpp $CNpp := 80$ D soil

Impervious curve number, CNip $CNpi := 98$ pavement

Proposed impervious width, IWp $IWp := 6 \cdot 12ft + 2 \cdot 4ft + 4 \cdot 2ft + 8ft + 5ft$ six 12 ft lanes + two 4 ft bike lanes + four 2 ft curbs + one 8 ft path + one 5 ft sidewalk

Proposed ROW width, ROWp $ROWp := 166ft$

Weighted curve number, CNwp $CNwp := \frac{[CNpp \cdot (ROWp - IWp)] + CNpi \cdot IWp}{ROWp}$ $CNwp = 90.952$

Based on maximum storage depth in pond, design rainfall depth and treatment volume

Maximume storage depth, Msd $Msd := 3.5ft$

Design rainfall depth, P $P := 20in$

Treatment volume depth, TVd $TVd := 1in$

$Ponds := Msd - P - TVd$ $Ponds = 1.75\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 1**

$Station1 := 67060ft$ $Station2 := 68610ft$ $Length := Station2 - Station1$ $Length = 1550\,ft$

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$

Design precipitation 100 year 10 day rainfall, Pd $Pd := 20in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 0.995\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 5.393\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 9.28\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 3.887\,acre \cdot ft$

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 2.2\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 2.666\,acre$

$SL := Pad^{0.5}$ $SL = 340.751\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZ AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 2**

$Station1 := 68610\,ft$ $Station2 := 71900\,ft$ $Length := Station2 - Station1$

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$ $Length = 3290\,ft$

Design precipitation 100 year 10 day rainfall, Pd $Pd := 20in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 0.995\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 11.448\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 19.699\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 8.251\,acre \cdot ft$

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 4.7\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 5.7\,acre$

$SL := Pad^{0.5}$ $SL = 496.443\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

TYPICAL SECTION II

4-lane divided "sub-urban" section with bike lanes and paths. From Meadow Pointe Blvd to end of project

Existing curve number

Pervious curve number, CNep $CNep := 80$ based on D soil good condition

Impervious curve number, CNei $CNei := 98$ pavement

Existing pavement width, IWe $IWe := 24ft + 10ft$

Existing ROW width, ROWe $ROWe := 100ft$

Weighted curve number, CNwe $CNwe := \frac{[CNep \cdot (ROWe - IWe)] + (CNei \cdot IWe)}{ROWe}$ two 12 ft lanes + two 5 ft shoulders

$CNwe = 86.12$

Proposed conditions curve number

Pervious curve number, CNpp $CNpp := 80$ D soil

Impervious curve number, CNip $CNpi := 98$ pavement

Proposed impervious width, IWp $IWp := 4 \cdot 12ft + 2 \cdot 4ft + 4 \cdot 2ft + 8ft + 5ft$ four 12 ft lanes + two 4 ft bike lanes + four 2 ft curbs + one 8 ft path + one 5 ft sidewalk

Proposed ROW width, ROWp $ROWp := 166ft$

Weighted curve number, CNwp $CNwp := \frac{[CNpp \cdot (ROWp - IWp)] + CNpi \cdot IWp}{ROWp}$ $CNwp = 88.349$

Based on maximum storage depth in pond, design rainfall depth and treatment volume

Max storage depth, Msd $Msd := 3.50ft$

Design rainfall depth, P $P := 20in$

Treatment volume depth, TVd $TVd := 1in$

$Ponds := Msd - P - TVd$ $Ponds = 1.75\ ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 3**

Station1 := 71900ft Station2 := 79980ft Length := Station2 − Station1 − (79605.81ft − 73660.17ft)

Length = 2134 ft

Existing drainage Area, Ae Ae := Length·ROWe

Proposed drainage Area, Ap Ap := Length·ROWp

Design precipitation 100 year 10 day rainfall, Pd Pd := 20in

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ Se = 1.612 in

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ Sp = 1.319 in

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ Ve = 7.426 acre·ft

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ Vp = 12.54 acre·ft

Required attenuation volume Vr := Vp − Ve Vr = 5.113 acre·ft

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ Paw = 2.9 acre

Addition 25% area for maintenance requirements Pad := Paw·120% Pad = 3.5 acre

$SL := Pad^{0.5}$ SL = 390.802 ft

Alternative site 3C not in existing basin

$Paw := \frac{Vr}{1ft}$ Paw = 5.1 acre

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 4**

$Station1 := 79980\,ft$ $Station2 := 81200\,ft$ $Length := Station2 - Station1$

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$ $Length = 1220\,ft$

Design precipitation 100 year 10 day rainfall, Pd $Pd := 20in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 1.319\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 4.245\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 7.168\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 2.923\,acre \cdot ft$

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 1.7\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 2\,acre$

$SL := Pad^{0.5}$ $SL = 295.463\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 9**

$Station1 := 90230\,ft$ $Station2 := 93900\,ft$ $Length := Station2 - Station1$

Length = 3670 ft

Length = 0.695 mi

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$

Design precipitation 100 year 10 day rainfall, Pd $Pd := 20in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 1.319\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 12.77\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 21.562\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 8.792\,acre \cdot ft$

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 5.0\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 6\,acre$

$SL := Pad^{0.5}$ $SL = 512.455\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 10**

$Station1 := 93900\,ft$ $Station2 := 95400\,ft$ $Length := Station2 - Station1$

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$ $Length = 1500\,ft$

$Length = 0.284\,mi$

Design precipitation 100 year 10 day rainfall, Pd $Pd := 20in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 1.319\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 5.219\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 8.813\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 3.593\,acre \cdot ft$

No apparent point of discharge for the system within study limits

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 2.1\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 2.5\,acre$

$SL := Pad^{0.5}$ $SL = 327.619\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

SR 54 Project Development and Environment (PD&E) Study

American Consulting Engineers of Florida, LLC

ACE Project No. 5067054

Stormwater Management Facilities Sizing Calculations

For

Basins – 5, 6, 7 & 8

Design Criteria
100-year 24-hour 12-inch storm
Maximum design storage depth 2.5 ft

December 2007

TYPICAL SECTION II

4-lane divided "sub-urban" section with bike lanes and paths. From Meadow Pointe Blvd to end of project

Existing curve number

Pervious curve number, CNep $CNep := 80$ based on D soil good condition

Impervious curve number, CNei $CNei := 98$ pavement

Existing pavement width, IWe $IWe := 24ft + 10ft$

Existing ROW width, ROWe $ROWe := 100ft$

Weighted curve number, CNwe $CNwe := \frac{[CNep \cdot (ROWe - IWe)] + (CNei \cdot IWe)}{ROWe}$ two 12 ft lanes + two 5 ft shoulders

$CNwe = 86.12$

Proposed conditions curve number

Pervious curve number, CNpp $CNpp := 80$ D soil

Impervious curve number, CNip $CNpi := 98$ pavement

Proposed impervious width, IWp $IWp := 4 \cdot 12ft + 2 \cdot 4ft + 4 \cdot 2ft + 8ft + 5ft$ four 12 ft lanes + two 4 ft bike lanes + four 2 ft curbs + one 8 ft path + one 5 ft sidewalk

Proposed ROW width, ROWp $ROWp := 166ft$

Weighted curve number, CNwp $CNwp := \frac{[CNpp \cdot (ROWp - IWp)] + CNpi \cdot IWp}{ROWp}$ $CNwp = 88.349$

Based on maximum storage depth in pond, design rainfall depth and treatment volume

Max storage depth, Msd $Msd := 2.50ft$

Design rainfall depth, P $P := 12in$

Treatment volume depth, TVd $TVd := 1in$

$Ponds := Msd - P - TVd$ $Ponds = 1.417ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 5**

$Station1 := 81200\,ft$ $Station2 := 82930\,ft$ $Length := Station2 - Station1$

Length = 1730 ft

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$

Design precipitation 100 year 1 day rainfall, Pd $Pd := 12\,in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 1.319\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 3.396\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 5.797\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 2.4\,acre \cdot ft$

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 1.7\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 2\,acre$

$SL := Pad^{0.5}$ $SL = 297.607\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 6**

$Station1 := 82930\,ft$ $Station2 := 84260\,ft$ $Length := Station2 - Station1$

Length = 1330 ft

Length = 0.252 mi

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$

Design precipitation 100 year 10 day rainfall, Pd $Pd := 12\,in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 1.319\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 2.611\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 4.456\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 1.845\,acre \cdot ft$

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 1.3\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 1.6\,acre$

$SL := Pad^{0.5}$ $SL = 260.944\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 7**

$Station1 := 84260\,ft$ $Station2 := 87550\,ft$ $Length := Station2 - Station1$

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$

$Length = 3290\,ft$

$Length = 0.623\,mi$

Design precipitation 100 year 10 day rainfall, Pd $Pd := 12.in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 1.319\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 6.459\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 11.023\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 4.565\,acre \cdot ft$

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 3.2\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 3.9\,acre$

$SL := Pad^{0.5}$ $SL = 410.411\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

Runoff comparison by station range, **Basin 8**

$Station1 := 87550ft$ $Station2 := 90230ft$ $Length := Station2 - Station1$

Existing drainage Area, Ae $Ae := Length \cdot ROWe$

Proposed drainage Area, Ap $Ap := Length \cdot ROWp$ $Length = 2680\,ft$ $Length = 0.508\,mi$

Design precipitation 100 year 10 day rainfall, Pd $Pd := 12in$

Existing soil storage, Se $Se := \frac{1000 \cdot in}{CNwe} - 10 \cdot in$ $Se = 1.612\,in$

Proposed soil storage, Sp $Sp := \frac{1000 \cdot in}{CNwp} - 10 \cdot in$ $Sp = 1.319\,in$

Existing runoff volume $Ve := \frac{(Pd - 0.2 \cdot Se)^2}{Pd + 0.8 \cdot Se} \cdot Length \cdot ROWe$ $Ve = 5.261\,acre \cdot ft$

Proposed runoff volume $Vp := \frac{(Pd - 0.2 \cdot Sp)^2}{Pd + 0.8 \cdot Sp} \cdot Length \cdot ROWp$ $Vp = 8.98\,acre \cdot ft$

Required attenuation volume $Vr := Vp - Ve$ $Vr = 3.719\,acre \cdot ft$

Required pond area at water surface elevation $Paw := \frac{Vr}{Ponds}$ $Paw = 2.6\,acre$

Addition 25% area for maintenance requirements $Pad := Paw \cdot 120\%$ $Pad = 3.1\,acre$

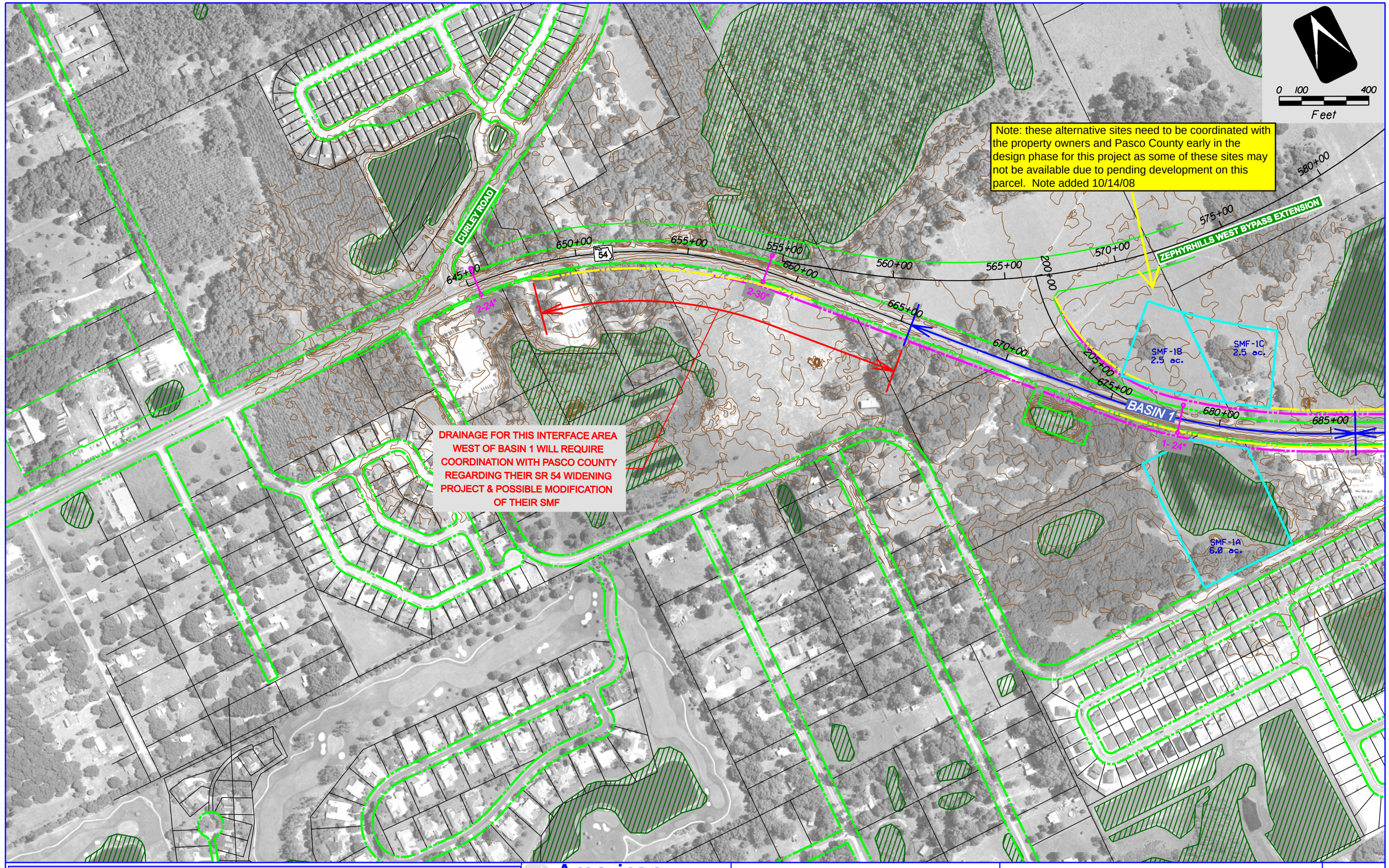
$SL := Pad^{0.5}$ $SL = 370.415\,ft$

NOTE: THE ABOVE CALCULATIONS ARE A PRELIMINARY ESTIMATE OF THE SIZE OF SMF REQUIRED FOR EACH BASIN. THE SMF SIZE AND THE LIMITS OF THE BASINS ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN PHASES I TO FINAL.

APPENDIX B

Conceptual Drainage Maps

With Alternative SMF Sites



Existing Right of Way (ROW)
Alternative A Proposed ROW
Alternative B Proposed ROW
Wetlands
Floodplains
Cross Drains
Alternative SMF
Alternative FPC

Aerial Photo Date: 4/24/06 SMF = Stormwater Management Facility FPC = Floodplain Compensation Site

American Consulting Engineers of Florida, LLC
210 Crystal Grove Blvd
Lutz, FL 33548
Phone: (813) 496-7400 Fax: (813) 496-7401
Certificate of Authorization No. 9302
Jeffrey S. Novotny, P.E. No. 51083

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 54	PASCO	416561-1-22-01

SR 54 PD&E STUDY APPENDIX B

CONCEPTUAL DRAINAGE MAPS

CURLEY RD. TO MORRIS BRIDGE RD.

SHEET NO. 1

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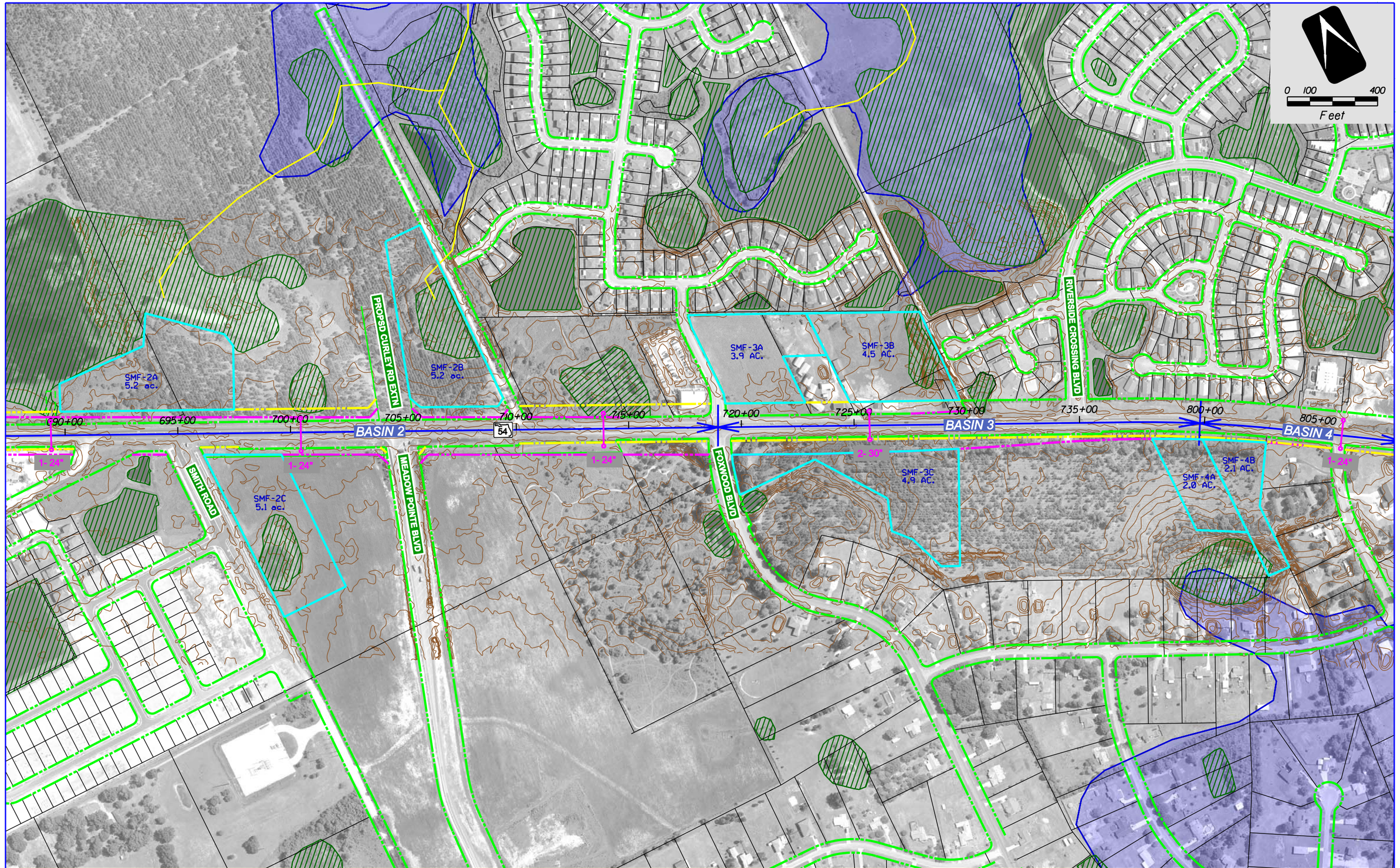

Existing Right of Way (ROW)
Alternative A Proposed ROW
Alternative B Proposed ROW
Wetlands
Floodplains
Cross Drains
Alternative SMF
Alternative FPC

Aerial Photo Date: 4/24/06 SMF = Stormwater Management Facility FPC = Floodplain Compensation Site

American
Consulting Engineers of Florida, LLC
210 Crystal Grove Blvd
Lutz, FL 33548
Phone: (813) 498-7400 Fax: (813) 496-7401
Certificate of Authorization No. 9302
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 54	PASCO	416561-1-22-01

SR 54 PD&E STUDY

CONCEPTUAL DRAINAGE MAPS

CURLEY RD. TO MORRIS BRIDGE RD.

SHEET NO. 2

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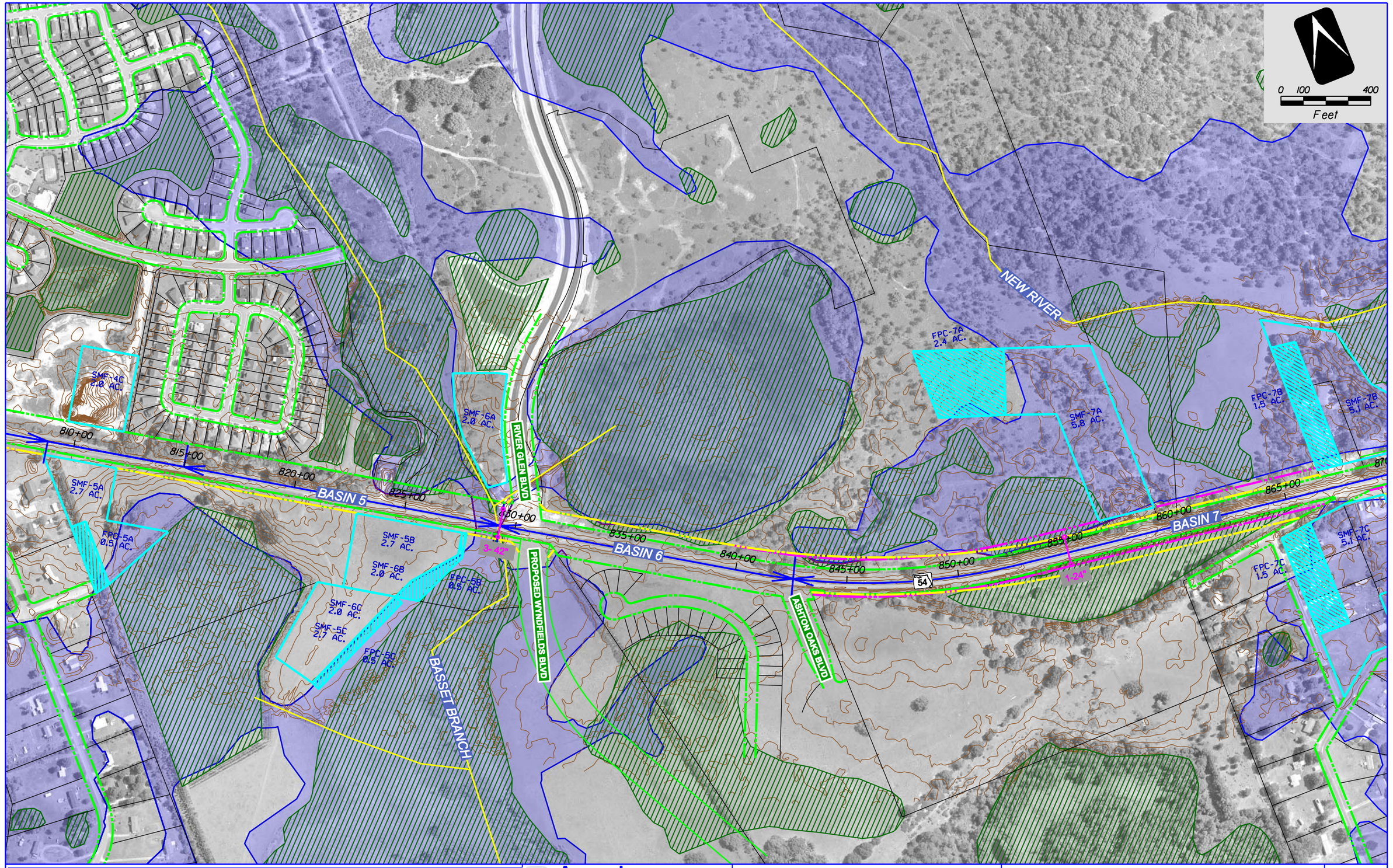

Existing Right of Way (ROW)
Alternative A Proposed ROW
Alternative B Proposed ROW
Wetlands
Floodplains
Cross Drains
Alternative SMF
Alternative FPC

Aerial Photo Date: 4/24/06 SMF = Stormwater Management Facility FPC = Floodplain Compensation Site

American
Consulting Engineers of Florida, LLC
210 Crystal Grove Blvd
Lutz, FL 33548
Phone: (813) 496-7400 Fax: (813) 496-7401
Certificate of Authorization No. 9302
Jeffrey S. Novotny, P.E. No. 51083

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 54	PASCO	41656I-1-22-01

SR 54 PD&E STUDY

CONCEPTUAL DRAINAGE MAP

CURLEY RD. TO MORRIS BRIDGE RD.

SHEET NO. 3

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0 100 400
Feet

NEW RIVER

FPC-8A
0.8 AC.

SMF-8A
4.2 AC.

SMF-7B
5.1 AC.

SMF-9C
5.7 AC.

SMF-9B
5.7 AC.

HANBURY DRIVE

870+00 875+00 880+00 885+00 890+00 895+00 900+00 905+00 910+00 915+00 920+00 925+00

BASIN 8

BASIN 9

3-11'x8' CBC

1-24"

54

SMF-7C
5.1 AC.

SMF-8B
4.7 AC.

FPC-8B
1.0 AC.

SMF-8C
6.8 AC.

FPC-8C
1.0 AC.

NEW RIVER ROAD

SMF-9A
6.2 AC.

Existing Right of Way (ROW)
Alternative A Proposed ROW
Alternative B Proposed ROW
Wetlands
Floodplains
Cross Drains
Alternative SMF
Alternative FPC

Aerial Photo Date: 4/24/06 SMF = Stormwater Management Facility FPC = Floodplain Compensation Site

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Phone: (813) 496-7400 Fax: (813) 496-7401
Certificate of Authorization No. 9302
Jeffrey S. Novotny, P.E. No. 51083

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 54	PASCO	416561-1-22-01

SR 54 PD&E STUDY

CONCEPTUAL DRAINAGE MAP

CURLEY RD. TO MORRIS BRIDGE RD.

SHEET NO. 4

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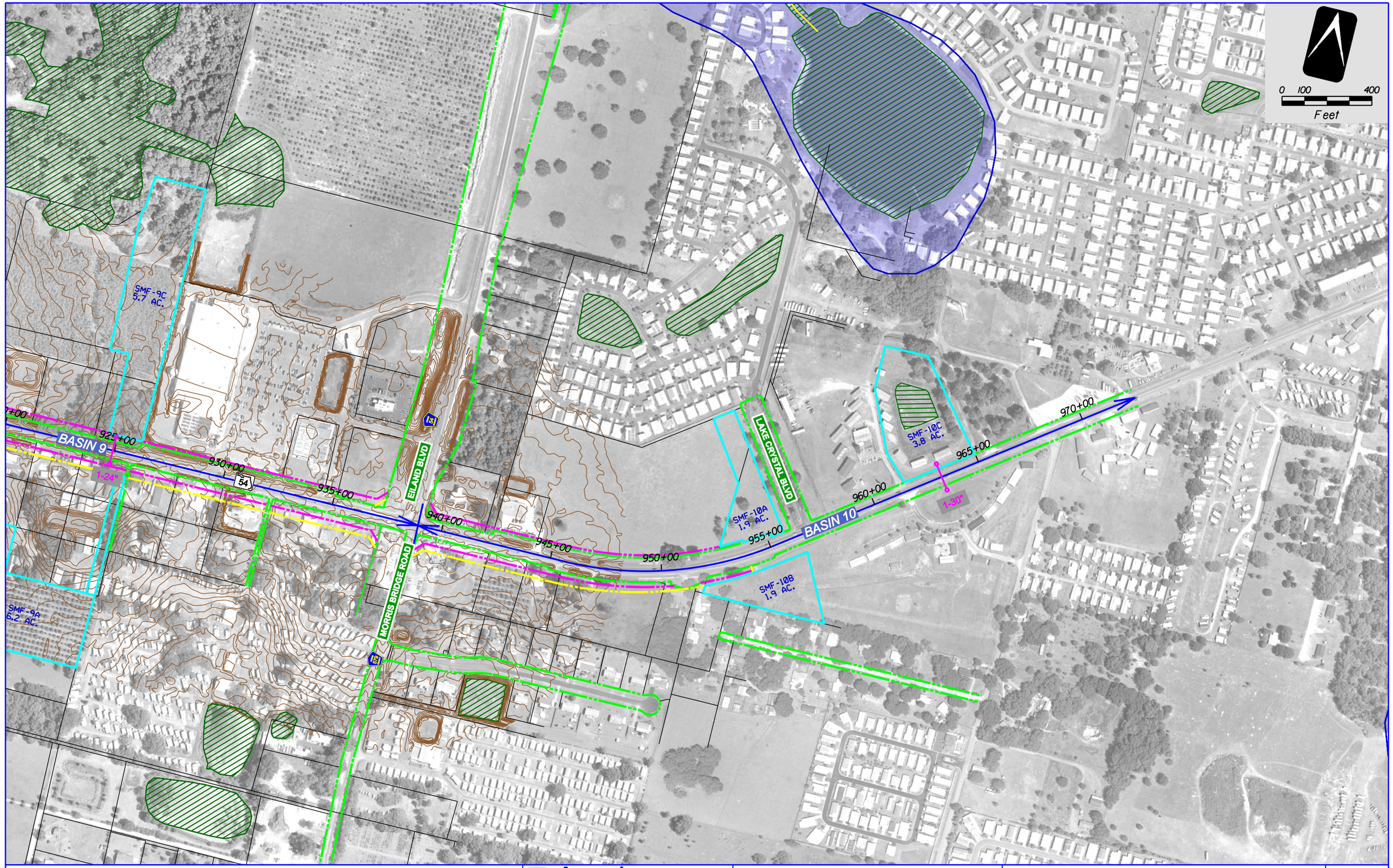

Existing Right of Way (ROW)
Alternative A Proposed ROW
Alternative B Proposed ROW
Wetlands
Floodplains
Cross Drains
Alternative SMF
Alternative FPC

Aerial Photo Date: 4/24/06 SMF = Stormwater Management Facility FPC = Floodplain Compensation Site

American
Consulting Engineers of Florida, LLC
210 Crystal Grove Blvd
Lutz, FL 33548
Phone: (813) 496-7400 Fax: (813) 496-7401
Certificate of Authorization No. 9302
Jeffrey S. Novotny, P.E. No. 51083

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 54	PASCO	41656I-1-22-01

SR 54 PD&E STUDY

CONCEPTUAL DRAINAGE MAP

CURLEY RD. TO MORRIS BRIDGE RD.

SHEET NO. 5

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NORTH

0 50 200

Feet

Note: these alternative sites need to be coordinated with the property owners and Pasco County early in the design phase for this project as some of these sites may not be available due to pending development on this parcel. Note added 10/14/08

ZEPHYRHILLS WEST BYPASS EXTENSION

ACCOUNTED FOR IN B0TH PROJECTS 0.45 ac.

IMPERVIOUS AREAS (PAVEMENT) TO BE REMOVED 0.62 ac.

SMF-BY OTHERS

SMF-1C 2.7 ac.

SMF-1B 2.7 ac.

SMF-1A 6.0 ac.

BASIN 1

2-30"

1- 24"

(PROPOSED IMPROVEMENTS BY OTHERS (MPI #421140-2)

655+00 555+00 660+00 560+00 565+00 570+00 575+00 665+00 670+00 205+00 675+00 680+00

PROPOSED

8' Shared Use Path

5' Sidewalk

Westchase Oaks Professional Park (approved development)

Harrison - Bennett Properties

Wesley Chapel Nursery & Landscape Supply Co

Billboard

CAROL DR

ELMORY

EXISTING RIGHT OF WAY (ROW)
ALTERNATIVE A PROPOSED ROW
ALTERNATIVE B PROPOSED ROW

WETLANDS
FLOODPLAINS
CROSS DRAINS

ALTERNATIVE SMF
ALTERNATIVE FPC

AERIAL PHOTO DATE: 4/24/06

SMF = STORMWATER MANAGEMENT FACILITY

FPC = FLOODPLAIN COMPENSATION SITE

American Consulting Engineers of Florida, LLC
18250 North US Highway 41
Lutz, FL 33549
Phone: (813) 496-7400 Fax: (813) 496-7401
Certificate of Authorization No. 9302
Jeffrey S. Novotny, P.E. No. 51083

SR 54 PD&E STUDY PASCO COUNTY FPID 416561-1-22-01

CONCEPTUAL DRAINAGE MAP

CURLEY RD. TO MORRIS BRIDGE RD.

SHEET NO. EX-1

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APPENDIX C

Agency Coordination

American Consulting Engineers of Florida, LLC
4111 Land O' Lakes Boulevard, Suite 210
Land O' Lakes, Florida 34639
Tel 813.996.2800 • Fax 813.996.1908
american@ace-fla.com • www.ace-fla.com

SWFWMD PRE APPLICATION MEETING MINUTES

Meeting Date: Feb 6, 2008 **Date Issued:** Mar 13, 2008

Location: SWFWMD Brooksville Office

Project Name: S.R. 54 PD&E Study from Curley Road to Morris Bridge Road

Purpose: To discuss stormwater management permitting criteria

Notes by: Michael Ryan **American Project #:** 5067054

Copies to: Attendees, Jeff Novotny, Bill Adams, File: **5067054.B.03**

Attendees	Representing	Phone	Fax or e-mail
Leonard Bartos	SWFWMD	352-796-7211	
David Urban	SWFWMD	352-796-7211	
John Kilgore	American Consulting Engineers	727-499-5764	jkilgore@ace-fla.com
Larry Weatherby	American Consulting Engineers	813-496-7409	lweatherby@ace-fla.com
Michael Ryan	American Consulting Engineers	813-996-2800	mryan@ace-fla.com

The following notes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions or comments, please contact us at the above address. We will consider the minutes to be accurate unless written notice is received within 10 working days of the date issued.

Project Introduction

The meeting began at about 1:05 p.m. American distributed a project fact sheet and an aerial overview sheet showing the project limits and currently proposed typical sections.

Existing Drainage Concerns

SWFWMD indicated that they have some issues with the permitted stormwater management system for the Wiregrass development concerning flood elevations and stormwater modeling. SWFWMD recommended that Andrea Bolling with SWFWMD be contacted during the design phase to discuss any proposed stormwater management system designs within this area. The Watergrass development should also be discussed with Andrea.

If the Wiregrass Development chooses to design their system to accept drainage from the roadway to meet development conditions as apposed to providing a separate facility there are concerns that the current design is not adequate. American's current evaluation identifies a separate stormwater management pond facility, not connected to the Wiregrass Development SWM facility.

SWFWMD identified that there are areas within the New River Basin with flooding issues. American was advised to contact Richard Mayor and Dave Arnold at SWFWMD regarding Trout Creek Basin, Cypress Creek Basin and New River Basin.

American had identified flooding problems along the corridor for adjacent offsite development but no flooding issues were found to exist with the roadway facility. Floodplain compensation is considered and included in the design of the improvement. There will be no adverse floodplain impacts associated with this project.

American was advised to contact Pasco County regarding drainage issues within the study area. Pasco County may be considering designating portions of the basin areas within and adjacent to the study area as basins of special concern, which would include stricter permitting regulations and design criteria, 100-year 5-day design storm. American was advised to contact Jim Widman and Mike Garrett at Pasco County to discuss.

American had previously contacted Mike Garett with Pasco County on November 17 2006 to discuss flooding concerns within the study area. Mike Garett had stated at that time that there have been no reports of S.R. 54 being overtopped by floodwaters.

Design Criteria

SWFWMD Criteria would require that the proposed stormwater management system be designed per open basin criteria (25-yr 24-hr) and shall also be designed for the ultimate typical section. American was advised to contact Wojciech Mroz at SWFWMD to discuss possible sensitive basin criteria and design storm frequencies.
American explained that in sizing alternative pond sites to provide stormwater management for the proposed improvements the requirements for both the SWFWMD and FDOT's Critical Duration for stormwater quantity control as set forth in F.A.C. 14-86 were met. For a closed basin, F.A.C. 14-86 requires storage of the post development minus pre development runoff volume for the 100-year 10-day storm event, and for an open basin the 100-year 24-hr storm event.
SWFWMD agreed that the criteria set forth in F.A.C. 14-86 exceeds the SWFWMD requirements and will govern for the pond sizing design.

Environmental and Floodplain

All wetland impacts for the proposed roadway improvements will be mitigated for either using the Senate Bill or through purchase of credits in a regional mitigation bank. Any other wetland impacts such as for the placement of a pond in wetlands will be discouraged by the SWFWMD. Reference the FDOT Mitigation Plan 2008 for the proposed mitigation within and/or adjacent to the project limits.

There are no sovereign lands within the project limits and no Outstanding Florida Waters treatment will be required. All wetland buffer requirements are as described in the SWFWMD Environmental Resource Permit Information Manual, Part B, Basis of Review, no additional buffer required.

Floodplain compensation (cup for cup) will be required for any floodplain encroachments.

American has included a cup-for-cup evaluation as part of the stormwater management evaluation. Alternative floodplain compensation areas have been identified.

Adjacent Developments

During the design phase all adjacent property owners must be notified – SWFWMD must receive an electronic copy of all adjacent property owners during the design phase. There are adjacent developments within the project limits with requirements for right-of-way dedication and drainage provisions. Calculations must be submitted during the design phase for all adjacent developments that are accepting right-of-way runoff to confirm that their stormwater management systems are designed with sufficient capacity to account for water quality and quantity requirements.

Future Requirements

SWFWMD stated that Florida DEP may revise the state water quality standards, raising treatment volume requirements in 2009 to 2011.

The meeting adjourned at about 1:45 p.m.

Attachments:

- ERP Pre-Application Meeting Notes, completed by Dave Urban with SWFWMD
- Notes from Wojciech Mroz with SWFWMD

THIS SPACE IS FORMATTED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING AND PROVIDE NOTE TAKING SPACE. A SUPPLEMENTAL "PROMPT LIST" OF DISCUSSION ITEMS IS ATTACHED, WHICH SHOULD BE EXAMINED BY THE APPLICANT PARTIES PRIOR TO THE MEETING TO IDENTIFY TOPICS FOR DISCUSSION.

Southwest Florida Water Management District
Resource Regulation Division

ERP Pre-Application Meeting NOTES

FILE No.

Date: 2.6.08
Time: 1:00 PM
Project Name: SR 54
Attendees: DANE URBAN
LEN PODRATOS
MIKE RYAN

County: PASCO
Total Land acreage: 90 Ac.
Prior Onsite/Offsite Permit activity:

S/T/R: 9,10,13,14,15/26/20
Project acreage: 18/26/21
90 Ac.
4.5 miles

Project Overview:
Widening of an existing two lane. to 4 lane & 6 lane.

Site Information Discussion: (Site Topography, SHW Levels, Flood plain Elevations, Conveyance and Storage, Tailwater Conditions, Adjacent Offsite Contributing Sources, Receiving Waterbody, Karst Formations, Existing Wells, Contaminated Sites / Coordination w/ FDEP, etc.)

- Open Basin

Environmental Discussion: (Wetlands Onsite, Wetlands On Adjacent Properties, Site Visit, Delineation, Permanent/Temporary Impacts, SHWL, Wetland Hydrology, Drawdown Issues, Alternatives Analysis, Elimination/Reduction, Secondary and Cumulative Impacts, T&E species, Conservation Easements, Buffers, Mitigation Options, Mitigation Costs, OFW, Aquatic Preserve, etc.)

- WETLANDS — 7 / ACRE IMPACTS — . NOT DISCUSSED
— SENATE BILL MITIGATION — POSSIBLE ??

Sovereign Lands Discussion: (Title Determination, Delegated Authority, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP, etc.)

- NEW RIVER (POSSIBLE) PROBABLY NOT

Water Quantity Discussion: (Basin Description, Design Storm Event, Pre/Post Volume, Pre/Post Discharge, Local Requirements, Other)

- 25yr. Assumed design for 6 lane — Build 4 & 6
Flood plain comp reqd. Cup for cup.

Water Quality Discussion: (Type of Stormwater Treatment, Technical Characteristics, Non-presumptive Alternatives, Construction Phase Water Management and Erosion Control, Contaminated Sites, Ground Water Protection, etc.)

- Wet Systems

Discuss with Voytek regarding sensitive basin criteria and event frequency.
Adjacent property owner notification for taking
Electronic copy

Operation And Maintenance, Legal Information: (Ownership or Perpetual Control, Eminent Domain, Work on District Property, Inspections During Const., O&M Entity, System O&M Instructions, Homeowner Association Documents, Coastal Zone Requirements, Public Safety, etc.)

- County

Application Type And Fee Required: (40D-4.041Permits Required, 40D-1.607 Fee Schedule, etc.)

- Individual 2500. —

Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits - WUP, WOD, Well Construction, etc.)

-

Disclosure: The District ERP pre-application meeting process is a service made available to the public to assist interested parties in preparing for submittal of a complete permit application. Information shared at pre-application meetings is superseded by the actual permit application submittal. District permit decisions are based upon information submitted during the application process and Rules in effect at the time the application is complete.

The following person was present and authored these ERP Pre-Application Meeting NOTES on behalf of the SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT:

District Staff Representative	Name and Title
Signed	Date

Calendar Entry

Meeting

☐ Notify me ☐ Mark Private ☐ Pencil In

Subject	Mike Ryan- 813-996-2800				
When	Starts	Wed 02/06/2008	01:00 PM	30 mins	
	Ends	Wed 02/06/2008	01:30 PM		
Invitees	Required (to)	Len Bartos/BKV_REG/swfwmd@swfwmd, Wojciech Mroz/BKV_REG/swfwmd@swfwmd			
	Optional (cc)	mryan@ace-fla.com			

Chair	Pre-Application Brooksville-Regulation/BKV_REG/swfwmd
	Sent By Zulima Lugo
Where	Location
Categorize	

Description

Name: Mike Ryan
Address: Curley Rd. to Morris Bridge Rd.
Attendees: WMM,LFB
Project Name: SR 54 P, D, & E

Phone: 813-996-2800
County: Pasco
STR: 9,10,13,14,15/26S/20E & 18/26S/21E

Your Notes

TROUT CREEK, CYPRESS CREEK
NEW RIVER WATERSHEDS
— SOURCE OF FLOOD INFO —
RICHARD BAYER
& DAVE ARNOLD

New Requirement → ALSO → NEW RIVER DRI (HYDRO)
& WIREGRASS (ANDREA)
& WATERGRASS (ANDREA)