Future Development

HORZ: 1"=50'

50 0 50 100

STORM SEWER STRUCTURE DATA TABLE

Structure Number	Size	Description	Length	Invert In	Invert Out	Slope	Rim = AD/MH FG = CI IE = FES
			Feet	Elev.	Elev.	%	Elev.
CI #500		24" x 36" Box					407.47
P-501	12"	R.C.P. Cl. III	26	404.97	404.84	0.50	
CI #502		24" x 36" Box					407.47
P-503	12"	R.C.P. Cl. III	8	404.84	404.64	2.50	
MH #504		30" x 30" Box					407.88
P-505	15"	R.C.P. Cl. III	249	404.64	399.88	1.91	
MH #506		30" x 30" Box					403.89
P-507	15"	R.C.P. Cl. III	77	399.88	398.74	1.48	
CI #508		24" x 36" Box					402.25
P-509	15"	R.C.P. Cl. III	72	398.74	395.06	5.12	
FES #510		15" End Section					394.75

Swale #3
69-LF @ 3.99%

Swale #3A
300-LF @ 1.22%

12" HDPE (To be removed)

I.E.=397.3'

Note: Swale #3B will temporarily terminate in the west bank of the existing ditch until the permits have been approved and the ditch is relocated.

Swale #3B
465-LF @ 1.45%

Swale #6
175-LF @ 2.97%

Swale #5A
145-LF @ 1.86%

Swale #1A
220-LF @ 2.32%

Swale #1B
216-LF @ 1.33%

Swale #2
138-LF @ 5.64%
(Sod required)

Swale #5
142-LF @ 2.39%

Swale #4
98-LF @ 0.85%

Riser

Lot 300 Lot 301 Lot 302 Lot 303 Lot 304 Lot 305 Lot 306 Lot 307 Lot 308 Lot 309 Lot 310 Lot 311 Lot 312 Lot 313 Lot 314 Lot 315 Lot 316 Lot 317 Lot 318 Lot 319 Lot 320 Lot 321 Lot 322 Lot 323 Lot 324 Lot 258 Lot 259

Lot 20 Lot 21 Lot 22 Lot 23 Lot 24 Lot 25 Lot 26 Lot 27 Lot 28 Lot 29 Lot 30 Lot 31 Lot 32 Lot 33 Lot 34 Lot 35 Lot 36 Lot 37 Lot 38 Lot 39 Lot 40 Lot 41 Lot 42 Lot 43 Lot 44 Lot 45

Bermuda Court

Aruba Court

Bermuda Drive

PC Sta=12+80.00

PT Sta=13+97.80

Sta=18+42.80

Sta=10+65.00 Bermuda Dr
Sta=5+25.00 Aruba Ct

Sta=12+55.00

CI #502 MH #504 P-505 MH #506 P-507 CI #508 P-509 P-503 P-501 CI #500 FES #510

Surface Overflow Spillway
maximum control elev. =
0.5' above CI #508

Existing Detention Basin #1
Min Top Berm = 396.75'
Emer. Spillway = 395.75'
Pool = 391.61'

8'x4' Box Culvert

I.E.=391.61'

I.E.=390.85'

L.M.&S.D.E.

5' Ingress/Egress Esmt.

10' D.E.

12' P.U.E.

10' P.U.E.

14' P.U.E.

8' P.U.E.

5' D.&UG.P.U.E.

7' D. & UG.P.U.E.

6' D.E. & P.U.E.

4"W

50' R/W

TBM #1

BENCHMARK

TBM-1: Cash Cap set approx. 7.2' southwest of the southwest corner of Lot 324. Elevation = 416.01' (NAVD 1988)

APPROVED
MAR 0 3 2015
VANDERBURGH COUNTY
DRAINAGE BOARD

RECEIVED BY THE
VANDERBURGH COUNTY
SURVEYOR'S OFFICE
2-27-15

GLEN A. MERITT REGISTERED No PE10403870 STATE OF INDIANA PROFESSIONAL ENGINEER

SIGNATURE 26 Feb 15 DATE

CASH WAGGNER & ASSOCIATES, PC
CONSULTING ENGINEERS • LAND SURVEYORS

414 CITADEL CIRCLE
SUITE B
EVANSVILLE, IN 47715
PH: 812.401.5561
FAX: 812.401.5563
CELL: 812.774.2988
E-MAIL: GMERITT@CASHWAGGNER.COM

REVISIONS

No.	Date	By	Description

Project No.:	14-1948
Designed By:	G.A.M.
Drawn By:	G.A.M.
Filename:	1948 BASE
Layout Tab:	Drainage
Scale:	As Shown

Project: CAYMAN RIDGE - SECT. 4
Address: KANSAS ROAD EVANSVILLE, INDIANA
Sheet Title: DRAINAGE PLAN

Date: 02.26.15
Drawing No.: C-101
Of: 13

Sanitary Sewer Lateral Index

L = Length of lateral
D = Distance to downstream manhole

UTILITY NOTES

The Contractor is cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of the respective utility companies, and measurements taken in the field. This information is not to be relied upon as being exact or complete. The Contractor shall notify all utility companies & the State's underground locate service at least 2 (business) days before commencing excavation to request the utilities be located in the field.

If any existing structures/utilities to remain are damaged during construction, it shall be the Contractors responsibility to repair and/or replace the damaged structure/utility as necessary to return it to existing conditions or better.

The Contractor shall be responsible for notifying all property owners that will experience an interruption to their utilities caused by this project.

Construction shall comply & be in conformance with all applicable governing codes and be constructed to same. Material specifications shall be in conformance with the State Department of Transportation's (DOT) standard specifications, latest edition.

Contractor shall provide & maintain traffic control in accordance with the Manual on Uniform Traffic Control Devices, latest edition.

All materials, installation, construction & testing of the water and sewer utilities shall be in conformance with Local Water & Sewer Departments Standards and Specifications, latest edition.

Contractor shall coordinate the installation of building sewers / service laterals with the local water & sewer department. Installation and materials shall be in conformance with applicable codes, standards, and regulations.

Sanitary sewer pipe shall be as follows:
8" & larger mains - SDR 26 PVC Pipe
6" services (laterals) - SDR 26 PVC & as required by local jurisdiction.

All fill material shall be in place and compacted before installation of proposed utilities.

All sanitary sewers shall be installed, inspected, and approved before backfilling.

Contractor shall maintain a minimum of 36" cover on all sanitary sewer lines.

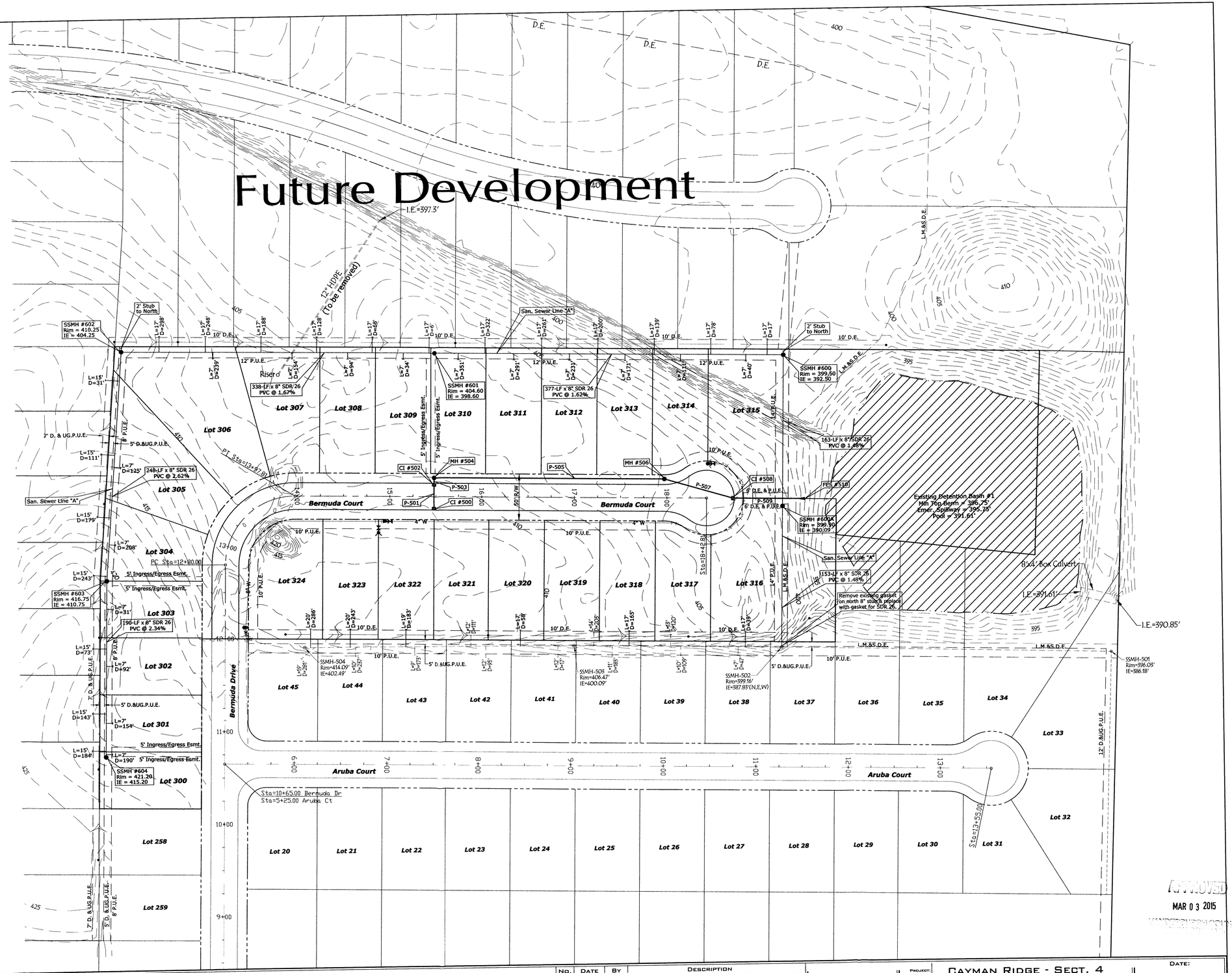
No sanitary sewer manhole shall be within eight (8) feet of a water main as measured from the outside edge of the sanitary sewer manhole to the outside edge of the water main.

LEGEND

Section 4

Section 4 - Materials List

Quantity	Description
1469'	8" PVC SDR 26 Pipe
6	48" Diameter Manholes
41	8" Factory SDR 26 Tee



APPROVED
MAR 0 3 2015
VANDERBURGH COUNTY
PLAN COMMISSION

GLEN A. MERITT, JR. REGISTERED No PE10403870 STATE OF INDIANA PROFESSIONAL ENGINEER

15 Jan 15
SIGNATURE DATE

CASH WAGGNER & ASSOCIATES, PC
CONSULTING ENGINEERS • LAND SURVEYORS
414 CITADEL CIRCLE
SUITE B
EVANSVILLE, IN 47715
PH: 812.401.5561
FAX: 812.401.5563
CELL: 812.774.2988
E-MAIL: GMERITT@CASHWAGGNER.COM

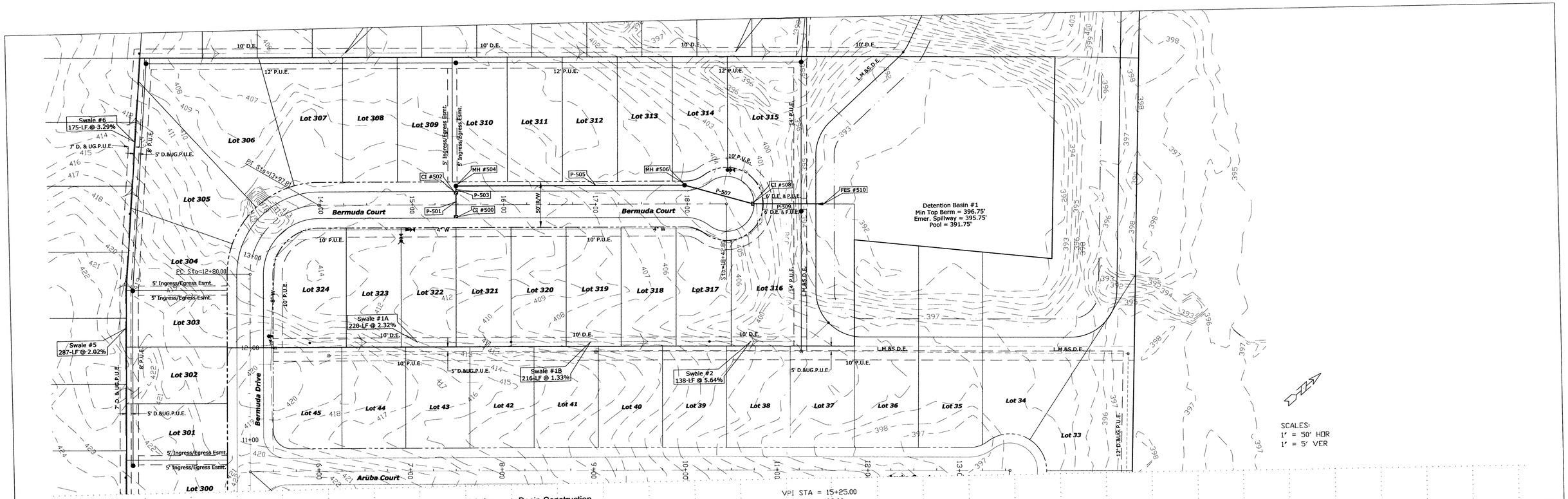
REVISIONS	No.	Date	By	Description

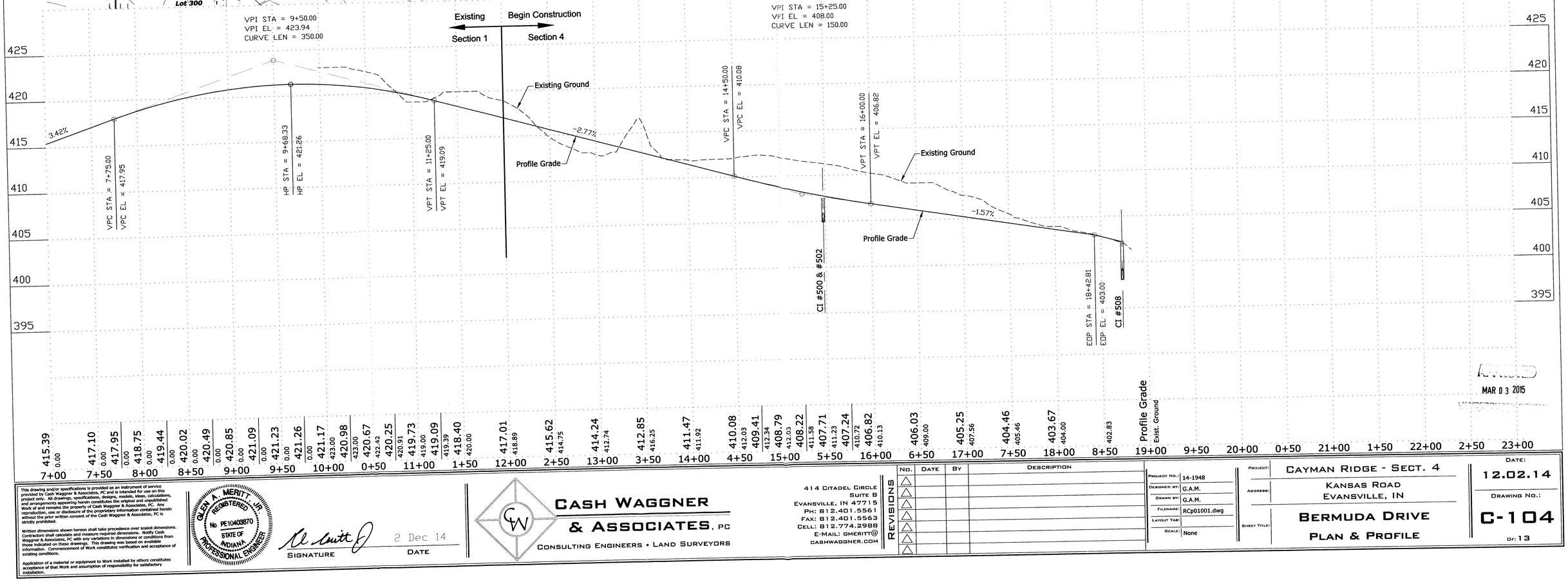
Project No.:	14-1948
Designed By:	G.A.M.
Drawn By:	G.A.M.
Filename:	1948 BASE
Layout Tab:	Sanitary
Scale:	As Shown

Project: CAYMAN RIDGE - SECT. 4
Address: KANSAS ROAD, EVANSVILLE, INDIANA
Sheet Title: SANITARY SEWER PLAN

Date: 01.15.15
Drawing No.: C-102
Of: 13

RECORDED AT THE VANDERBURGH COUNTY AUDITOR'S OFFICE
AS 3/2/15





GLEN A. MERITT, JR. REGISTERED No PE10403870 STATE OF INDIANA PROFESSIONAL ENGINEER

Signature

2 Dec 14
Date

CASH WAGGNER & ASSOCIATES, PC
CONSULTING ENGINEERS • LAND SURVEYORS

414 CITADEL CIRCLE
SUITE B
EVANSVILLE, IN 47715
PH: 812.401.5561
FAX: 812.401.5563
CELL: 812.774.2988
E-MAIL: GMERITT@CASHWAGGNER.COM

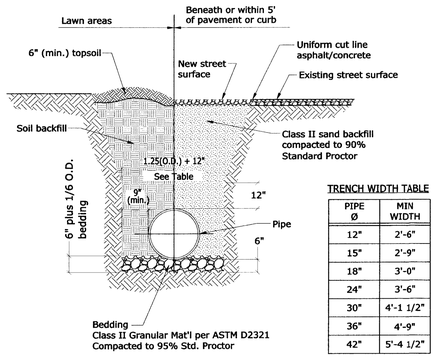
REVISIONS	No.	Date	By	Description
	1			
	2			
	3			
	4			
	5			
	6			
	7			

Project No.:	14-1948
Designed By:	G.A.M.
Drawn By:	G.A.M.
Filename:	RCp01001.dwg
Layout Tab:	
Scale:	None

Project: Cayman Ridge - Sect. 4
Address: Kansas Road, Evansville, IN
Sheet Title: Bermuda Drive Plan & Profile

Date: 12.02.14
Drawing No.: C-104
Of: 13

APPROVED
MAR 03 2015



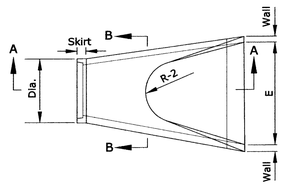
TRENCH WIDTH TABLE

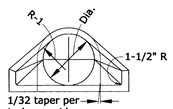
PIPE Ø	MIN WIDTH
12"	2'-6"
15"	2'-9"
18"	3'-0"
24"	3'-6"
30"	4'-1 1/2"
36"	4'-9"
42"	5'-4 1/2"

Notes:
1. New street surface shall comply with local authority jurisdiction.

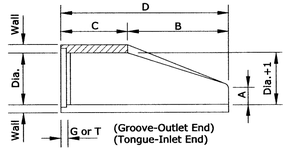
Reinforced Concrete Pipe Bedding

Scale: N.T.S.

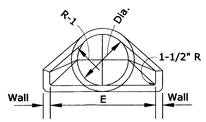




HORIZONTAL FLARE



SECTION A-A



VERTICAL FLARE

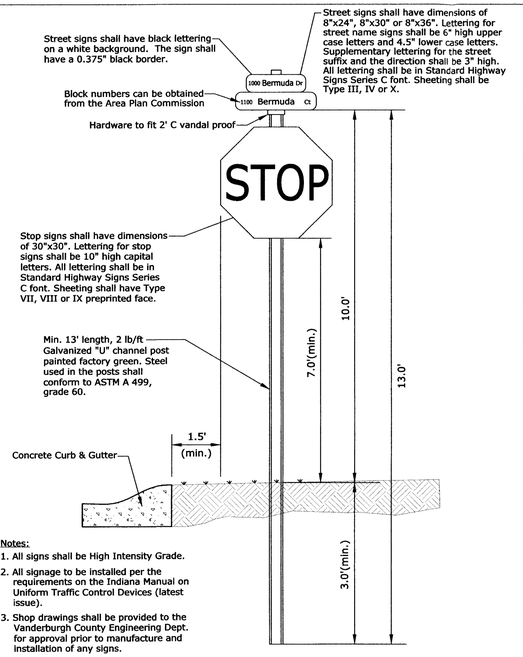
SECTION B-B

DIA.	WALL	G or T	WT. SEC.	A	B	C	D	E	DIA.+1	R-1	R-2	SKIRT
12	2	1 1/2	530	4	24	48 7/8	72 7/8	24	13	10 1/16	9	3 1/2
15	2 1/4	2	740	6	27	46	73	30	16	12 1/2	11	3 1/2
18	2 1/2	2 1/2	990	9	27	46	73	36	19	15 1/2	12	4
21	2 3/4	2 1/4	1280	9	35	38	73	42	22	16 1/8	13	4
24	3	2 1/2	1520	9 1/2	43 1/2	30	73 1/2	48	25	16 11/16	14	4 1/2
27	3 1/4	2 1/2	1930	10 1/2	48	25 1/2	73 1/2	54	28	17 3/4	14 1/2	4 1/2
30	3 1/2	3	2190	12	54	19 3/4	73 3/4	60	31	18 5/16	15	5
33	3 3/4	3 3/8	3150	13 1/2	58 1/2	39 1/4	97 3/4	66	34	23 3/4	17 1/2	5 1/2
36	4	3 1/2	4100	15	63	34 3/4	97 3/4	72	37	24 1/16	20	5 1/2
42	4 1/2	3 3/4	5380	21	63	35	98	78	43	27 1/4	22	5 1/2
48	5	4 1/4	6550	24	72	26	98	84	49	28 1/8	22	5 3/4
54	5 1/2	4 3/4	8040	27	65	35	100	90	55	32 7/8	24	6 1/4
60	6	5	8750	30	60	39	99	96	61	36 3/4	24	6 3/4
66	6 1/2	5 1/2	10630	24	78	21	99	102	67	35 11/16	24	7 1/4
72	7	6	12520	34	78	21	99	108	73	38 5/8	24	7 3/4
78	7 1/2	6 1/2	14430	24	78	21	99	114	79	41 15/16	24	8 1/2
84	8	7	16350	24	78	21	99	120	85	44 13/16	24	9

Note:
Manufacture of end section is in accordance with applicable portions of A.S.T.M. specification C76.

Precast Concrete End Section

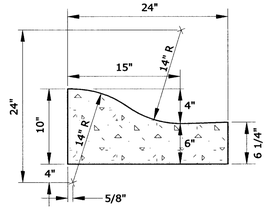
Scale: N.T.S.



Notes:
1. All signs shall be High Intensity Grade.
2. All signage to be installed per the requirements on the Indiana Manual on Uniform Traffic Control Devices (latest issue).
3. Shop drawings shall be provided to the Vanderburgh County Engineering Dept. for approval prior to manufacture and installation of any signs.

Street Signs

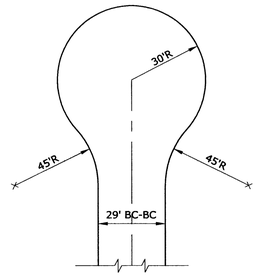
Scale: N.T.S.



Notes:
1. 1/2" preformed expansion joint material at all P.C. and P.T. curb radii.
2. Tooled contraction joints at 10 ft. centers. Contraction joints to be a minimum 2" deep and 1/8" to 1/4" wide.

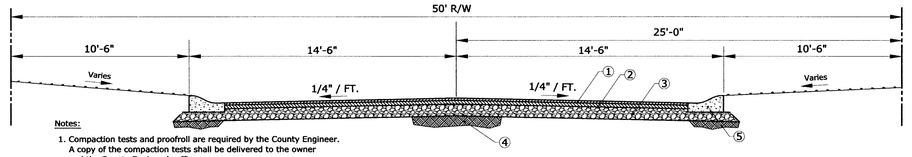
Concrete Roll Curb and Gutter

Scale: N.T.S.



Typical Residential Cul-de-sac

Scale: N.T.S.

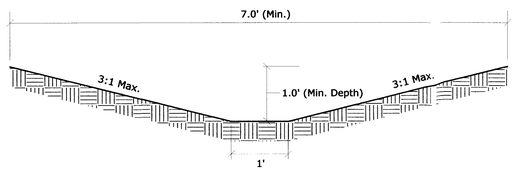


Notes:
1. Compaction tests and proofroll are required by the County Engineer. A copy of the compaction tests shall be delivered to the owner and the County Engineer's office.
2. Sidewalks shall have sawed contraction joints every 5 feet on center and expansion joints every 50 feet on center and at all intersections.
3. All sidewalks and ADA ramps to be constructed per current INDOT and County standards.
4. Subgrade must be proof rolled prior to the placement of any stone or pavement. Proof rolling shall be done by a fully legally loaded tri-axle dump truck. There shall be 1 or 2 complete coverages as directed. Roller marks, irregularities or failures shall be corrected. Proof rolling must be completed in the presence of a county inspector.
5. All fill must be constructed in lifts not to exceed six inches.

① 1" H.M.A. Surface
② 2" H.M.A. Base
③ 6" Compacted Agg. Base, #53 - 95% Standard Proctor
④ Compacted Subgrade - 95% Standard Proctor
⑤ Curb & Gutter per County Stds. - 4000 psi P.C.C.

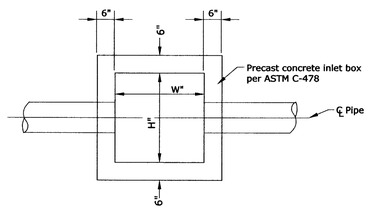
29' Residential Bituminous Pavement with Concrete Roll Curb & Gutter

Scale: N.T.S.

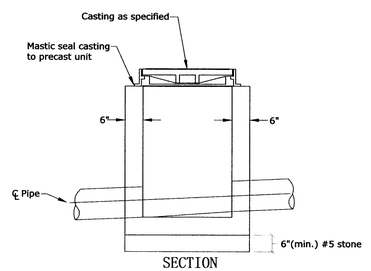


Typical Swale Cross-Section

Scale: N.T.S.



PLAN



SECTION

Area Drain/Manhole

INLET BOX TABLE

	INLET TYPE	CURB INLET	MANHOLE
BOX SIZE	"W"	24"	30"
	"H"	36"	30"
CASTING	Paved Areas	EJIW #7030	
	Grade	Type M2	
	Non-Paved Areas		EJIW #1020
	Grade		Type M2

INLET NOTES:

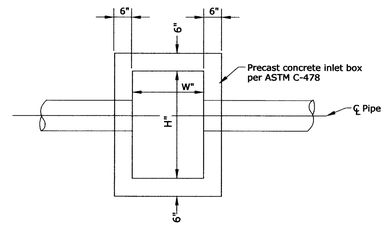
All precast units shall conform to ASTM C-478.

Inlets shall be backfilled with granular material and compacted in 8" loose lifts to 95% Standard Density per ASTM D698.

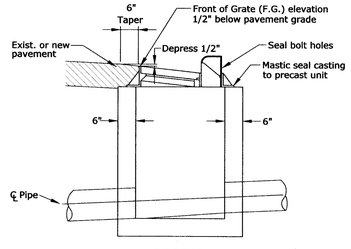
Casting shall be mastic sealed to precast unit.

All connnecting pipes shall be grouted with a high strength, non-shrink grout.

Frame & castings shown are the type & size required for the given box dimensions. Alternates shall be equal to those shown, including grate & opening sizes.



PLAN



SECTION

Curb Inlet

Precast Inlet Box

Scale: N.T.S.

APPROVED
MAR 0 3 2015
VANDERBURGH COUNTY ENGINEER

GLEN A. MERRITT JR. REGISTERED No. PE10403870 STATE OF INDIANA PROFESSIONAL ENGINEER

Signature 2 Dec 14 Date

CASH WAGGNER & ASSOCIATES, PC
CONSULTING ENGINEERS • LAND SURVEYORS
414 CITADEL CIRCLE
SUITE B
EVANSVILLE, IN 47715
PH: 812.401.5561
FAX: 812.401.5563
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REVISIONS	No.	Date	By	Description
	1			
	2			
	3			
	4			
	5			
	6			
	7			

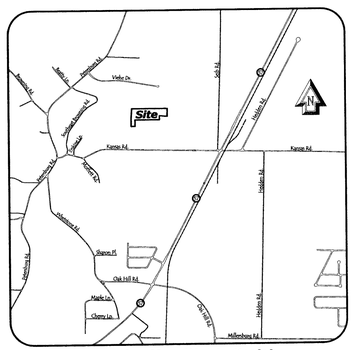
Project No.: 14-1948
Designed By:
Drawn By: G.A.M.
Filename: 1948 Road Storm Dtls
Layout Tab:
Scale: As Shown

Project: Cayman Ridge - Sect. 4
Address: Kansas Road, Evansville, Indiana
Sheet Title: Road & Storm Sewer Details

Date: 12.02.14
Drawing No.: C-107
Of: 13

CONSTRUCTION/STORMWATER POLLUTION PREVENTION PLAN (SWP3) NARRATIVE

A1. PLAN INDEX



Location Map (Not to Scale)

A. CONSTRUCTION PLAN ELEMENTS

A1. PLAN INDEX SHOWING LOCATIONS OF REQUIRED ITEMS:
- This sheet.

A2. 11 BY 17-INCH PLAT SHOWING BUILDING LOT NUMBERS/BOUNDARIES AND ROAD LAYOUT/NAMES:
- See attached primary plat.

A3. NARRATIVE DESCRIBING NATURE AND PURPOSE:
- Develop a single-family residential subdivision. The earthwork, utilities and streets for the subdivision will be constructed in one phase. The existing detention basin located at the northeast corner of the property will be utilized as a sediment basin during construction.

A4. VICINITY MAP SHOWING PROJECT LOCATION:
- See lower left hand corner of this sheet.

A5. LEGAL DESCRIPTION OF THE PROJECT SITE:
- The site is located in the SE 1/4 and SW 1/4 of Sec. 22, Township 5-S, Range 10 West; Center Township. Approximate coordinates: Latitude = 38-deg 04' 01" N; Longitude =87-deg 30' 57" W.

A6. LOCATION OF ALL LOTS AND PROPOSED SITE IMPROVEMENTS:
- This project will consist of 25 single-family residential lots and their associated road and utility improvements.

A7. HYDROLOGIC UNIT CODE (14 DIGIT):
- 05140202040070; Bluegrass Creek - Firlick Creek

A8. NOTATION OF ANY STATE OR FEDERAL WATER QUALITY PERMITS:
- None anticipated

A9. SPECIFIC POINTS WHERE STORM WATER DISCHARGE WILL LEAVE THE SITE:
- All stormwater runoff will travel to the existing detention basin located at the northeast corner of the project before leaving the site. The primary spillway of the detention basin then discharges into an existing ditch that flows east thru Stonecreek PUD then discharges into Firlick Creek.

A10. LOCATIONS AND NAME OF ALL WETLANDS, LAKES AND WATERCOURSES ON AND ADJACENT TO THE SITE:
- No wetlands are located within the project boundaries (See attached exhibit)

A11. IDENTIFICATION OF ALL RECEIVING WATERS:
- Firlick Creek.

A12. IDENTIFICATION OF POTENTIAL DISCHARGES TO GROUND WATER:
- There is no apparent potential for direct discharge to ground water via sinkholes, abandoned wells or drywells.

A13. 100 YEAR FLOODPLAINS, FLOODWAYS, AND FLOODWAY FRINGES:
- No portion of the project boundary lies within the Special Flood Hazard Area, Zone 'AE', as said tract plots on the National Flood Insurance Program's Flood Insurance Rate Map for Vanderburgh County, Indiana, Community Panel Map No. 18163C0109D, dated March 17, 2011.

A14. PRE-CONSTRUCTION AND POST CONSTRUCTION ESTIMATE OF PEAK DISCHARGE (10 YEAR EVENT):
- Calculations by the Rational Method indicate a Pre-Construction Q(10) = 17.16-cfs and a Post-Construction Q(10) = 18.78-cfs.

A15. ADJACENT LAND USE, INCLUDING UPSTREAM WATERSHED:
- Immediately adjacent properties are residential to the north, south, east and west.

A16. LOCATIONS AND APPROXIMATE BOUNDARIES OF ALL DISTURBED AREAS:
- The entire site will be disturbed during construction of this project.

A17. IDENTIFICATION OF EXISTING VEGETATIVE COVER:
- The proposed disturbed area is a cultivated field.

A18. SOILS MAP INCLUDING SOIL DESCRIPTIONS AND LIMITATIONS:
- According to the USDA's Soil Survey of Vanderburgh County Indiana, the following soils exist on-site:

SOILS DESCIPTIONS

He Henshaw Silt Loam

HoB2 Hosmer Silt Loam, 2 - 6 percent slopes, eroded

HoC3 Hosmer Silt Loam, 6 - 12 percent slopes, severely eroded

Wm Wilbur Silt Loam

SOILS RATINGS

	Shallow Excavations	Local Roads & Streets
He	Very limited	Very limited
HoB2	Very limited	Very limited
HoC3	Very limited	Very limited
Wm	Very limited	Very limited

A19. LOCATIONS, SIZE AND DIMENSIONS OF PROPOSED-STORM WATER SYSTEMS:
- A drainage swale and storm sewer network will be installed within the development to capture storm runoff and convey it to the detention basin. The detention basin primary spillway discharges to an existing ditch that flows east and discharges into Firlick Creek. See Sheet C-110 for locations, size and dimensions.

A20. PLANS FOR ANY OFF-SITE CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT :
- No off-site construction is anticipated for this project.

A21. LOCATIONS OF PROPOSED SOIL STOCKPILES AND/OR BORROW/DISPOSAL AREAS:
- Proposed soil stockpile location is shown on Sheet C-110.

A22. EXISTING SITE TOPOGRAPHY AT AN INTERVAL APPROPRIATE TO INDICATE DRAINAGE PATTERNS:
- See the SWP3 drawing, Sheet C-110, for existing contours and/or spot elevations.

A23. PROPOSED FINAL TOPOGRAPHY AT AN INTERVAL APPROPRIATE TO INDICATE DRAINAGE PATTERNS:
- See the SWP3 drawing, Sheet C-110, for proposed contours and/or spot elevations.

MAINTENANCE NOTES

SILT FENCE MAINTENANCE REQUIREMENTS
1. INSPECT THE SILT FENCE PERIODICALLY AND AFTER EACH STORM EVENT.
2. IF FENCE FABRIC TEARS, STARTS TO DECOMPOSE, OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE AFFECTED PORTION IMMEDIATELY.
3. REMOVE DEPOSITED SEDIMENT WHEN IT REACHES HALF THE HEIGHT OF THE FENCE AT ITS LOWEST POINT OR CAUSING THE FABRIC TO BULGE.
4. TAKE CARE TO AVOID UNDERMINING THE SILT FENCE DURING CLEAN OUT.
5. AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE THE FENCE AND SEDIMENT DEPOSITS, BRING THE DISTURBED AREA TO GRADE AND STABILIZE.

TEMPORARY SEDIMENT BASIN MAINTENANCE REQUIREMENTS
1. INSPECT TEMPORARY SEDIMENT TRAPS AFTER EACH STORM EVENT AND IMMEDIATELY REPAIR ANY EROSION AND PIPING HOLES.
2. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH.
3. REPLACE SPILLWAY GRAVEL FACING IF CLOGGED.
4. INSPECT VEGETATION AND RE-SEED IF NECESSARY.
5. CHECK THE SPILLWAY DEPTH PERIODICALLY TO INSURE A MINIMUM OF 1.5 FT. DEPTH FROM THE LOWEST POINT OF THE SETTLED EMBANKMENT TO HIGHEST POINT OF THE SPILLWAY CREST AND FILL ANY LOW AREA TO MAINTAIN DESIGN ELEVATION.
6. PROMPTLY REPLACE ANY DISPLACED RIPRAP BEING CAREFUL THAT NO STONES IN THE SPILLWAY ARE ABOVE DESIGN GRADE.
7. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, REMOVE THE STRUCTURE AND SEDIMENT. SMOOTH THE SITE TO BLEND WITH ADJOINING AREAS, AND STABILIZE.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE MAINTENANCE REQUIREMENTS
1. INSPECT ENTRANCE PAD AND SEDIMENT DISPOSAL AREA WEEKLY AND AFTER STORM EVENTS OR HEAVY USE.
2. RESHAPE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.
3. TOPDRESS WITH CLEAN STONE AS NEEDED.
4. IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. BULK CLEARING OF ACCUMULATED SEDIMENT SHALL NOT INCLUDE FLUSHING WITH WATER.
5. REPAIR ANY BROKEN ROAD PAVEMENT IMMEDIATELY.

RIPRAP MAINTENANCE REQUIREMENTS
6. INSPECT PERIODICALLY FOR DISPLACED ROCK MATERIAL, SLUMPING, AND EROSION AT EDGES ESPECIALLY DOWN STREAM OR DOWN SLOPE.

B. STORMWATER POLLUTION PREVENTION PLAN - CONSTRUCTION COMPONENT

B1. DESCRIPTION OF POTENTIAL POLLUTANT SOURCES ASSOCIATED WITH CONSTRUCTION ACTIVITIES.
- Fuel and lubricants from machinery, waste from concrete truck washout, sanitary waste from latrines, construction waste, domestic garbage, sedimentation from storm water runoff and vehicle tracking, windborne dust, and fertilizers from seeding operations.

B2. SEQUENCE DESCRIBING STORMWATER QUALITY MEASURE IMPLEMENTED RELATIVE TO LAND DISTURBING ACTIVITIES:

CONSTRUCTION SEQUENCE FOR EROSION & SEDIMENT CONTROL	
CONSTRUCTION PHASE (SPECIFIC ACTIVITIES OR EROSION CONTROL PRACTICES)	CONSTRUCTION SCHEDULE CONSIDERATIONS
PRE-CONSTRUCTION ACTIONS (EVALUATION/PROTECTION OF IMPORTANT SITE CHARACTERISTICS)	BEFORE CONSTRUCTION, EVALUATE, MARK, AND PROTECT VEGETATION SUITABLE FOR FILTER STRIPS, ESPECIALLY IN PERIMETER AREAS.
INSTALL PERIMETER BMPS * (CONSTRUCTION EXITS, FILTER STRIPS, SILT FENCE, DROP INLET PROTECTION, EQUIPMENT PARKING AREAS)	INSTALL GRAVEL ENTRANCE/EXIT; INSTALL SILT FENCE ON THE NORTH AND SOUTH PROPERTY LINES TO PREVENT SEDIMENT FROM EXITING THE SITE.
PREPARE SITE FOR CONSTRUCTION * (SOIL STOCKPILES AND TEMPORARY SEDIMENT BASIN)	INFORM ALL CONTRACTORS OF AREAS TO BE PROTECTED. IF STOCKPILING, IMMEDIATELY AFTER TEMPORARY SEED AND INSTALL SEDIMENT BARRIERS AROUND THE PERIMETER. THE PROPOSED DETENTION BASIN WILL BE UTILIZED AS TEMPORARY SEDIMENT BASIN DURING CONSTRUCTION.
RUNOFF CONTROL * (ROCK CHECK DAMS, DIVERSIONS, PERIMETER DIKES, OUTLET PROTECTION)	INSTALL ENERGY DISSIPATERS AT THE OUTLETS OF ALL FES STRUCTURES IMMEDIATELY AFTER INSTALLATION. INSTALL ROCK CHECK DAMS IMMEDIATELY AFTER SWALES HAVE BEEN CONSTRUCTED.
RUNOFF CONVEYANCE SYSTEMS * (STABILIZE SWALES, STORM DRAINS, INLET AND OUTLET PROTECTION, CHANNELS)	STABILIZE SWALES IMMEDIATELY AFTER CONSTRUCTION WITH PERMANENT SEEDING. INSTALL INLET AND OUTLET PROTECTION IMMEDIATELY AFTER CONSTRUCTION OF STORM SEWER STRUCTURES.
LAND CLEARING AND GRADING * (CUTTING/FILLING, GRADING DRAINS, SEDIMENT TRAPS, BARRIERS, DIVERSIONS, SURFACE ROUGHENING)	BEGIN MAJOR CLEARING AND GRADING AFTER INSTALLING THE KEY SEDIMENT AND RUNOFF CONTOL MEASURES. ADDITIONAL CONTROL MEASURES AS GRADING PROGRESSES.
SURFACE STABILIZATION * (TEMPORARY AND PERMANENT SEEDING, MULCHING, SODDING, RIP-RAP)	APPLY TEMPORARY OR PERMANENT STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS WHERE WORK IS DELAYED OR COMPLETED.
BUILDING CONSTRUCTION * (BUILDING, UTILITIES, PAVING)	INSTALL NECESSARY EROSION AND SEDIMENT CONTROL PRACTICES AS WORK TAKES PLACE.
LANDSCAPING AND FINAL STABILIZATION * (TOPSOIL, TREES, AND SHRUBS, PERMANENT SEEDING, MULCHING, SODDING, RIP-RAP)	STABILIZE ALL OPEN AREAS INCLUDING BORROW AND SPOIL AREAS. REMOVE TEMPORARY CONTROL MEASURES AND STABILIZE.

*MAINTENANCE--(1)INSPECT PRACTICES AT LEAST ONCE A WEEK, & (2) MAKE REPAIRS IMMEDIATELY AFTER PERIODS OF RAINFALL.

B3. STABLE CONSTRUCTION ENTRANCE LOCATIONS AND SPECIFICATIONS:
- A temporary construction drive (large sites more than 2 acres) and equipment staging area shall be installed at the commencement of construction activities in accordance with the Indiana Storm Water Quality Manual. Refer to Sheet C-110 for suggested locations.

B4. SEDIMENT CONTROL MEASURES FOR SHEET FLOW AREAS:
- During excavation and underground utility installation, proposed swales and silt fence will be utilized on the north and south perimeters of the site to slow and filter the storm water runoff generated from this project. Filter strips and silt fence shall be installed per the Indiana Storm Water Quality Manual. Refer to Sheet C-110 for locations. All storm water runoff from this site shall be diverted to the existing detention basin which will be utilized as a sediment basin during construction.

B5. SEDIMENT CONTROL MEASURES FOR CONCENTRATED FLOW AREAS:
- Immediately after swales are constructed, permanent seeding shall be applied and rock check dams installed. Once stabilized, these vegetated swales will slow and filter the runoff before leaving the site.

B6. STORM SEWER INLET PROTECTION MEASURE LOCATION AND SPECIFICATIONS:
- Proposed curb inlets shall be protected with drop inlet protection devices. Refer to Sheet C-109 for locations.

B7. RUNOFF CONTROL MEASURES:
- Rock check dams will be utilized to reduce erosion in the proposed swales by slowing the velocity of the runoff. Rock check dams shall be installed in accordance with the Indiana Storm Water Quality Manual. Swales #1, #2 and #3 shall be utilized as temporary diversion ditches during construction to direct water to the sediment basin.

B8. STORM WATER OUTLET PROTECTION SPECIFICATIONS:
- An energy dissipater shall be installed at FES #510 to reduce the velocity of the storm water flow. The energy dissipators shall be installed in accordance with the Indiana Storm Water Quality Manual.

B9. GRADE STABILIZATION STRUCTURE LOCATIONS AND SPECIFICATIONS:
- None required.

B10. LOCATION, DIMENSIONS, SPECIFICATION, AND CONSTRUCTION DETAILS OF EACH STORMWATER QUALITY MEASURE:
- Refer to the SWP3 drawings for locations of the respective control measures. Dimensions, specifications, and details of the measures are depicted in the Indiana Storm Water Quality Manual. Other practices which may be implemented shall be utilized and installed in accordance with the manufacturer's instructions. See Sheet C-112 for details.

B11. TEMPORARY SURFACE STABILIZATION METHODS APPROPRIATE FOR EACH SEASON:
- The Contractor shall seed and mulch all disturbed areas when construction activities are expected to cease for a period of more than 15 days. Straw/hay mulch shall be applied at a rate of 2 tons/acre and shall be anchored with a mulch anchoring tool or farm disk. Seeding requirements shall be in accordance with Table 1, located in Chapter 7, page 32 of the Indiana Storm Water Quality Manual, which is summarized below.

Table 1. Temporary Seeding Specifications

Seed Species *	Rate/acre	Planting depth	Optimum dates **
Wheat or Rye	150 lbs.	1 to 1-1/2 in.	9/15 to 10/30
Spring Oats	100 lbs.	1 in.	3/1 to 4/15
Annual Ryegrass	40 lbs.	1/4 in.	3/1 to 5/1 8/1 to 9/1
German Millet	40 lbs.	1 to 2 in.	5/1 to 6/1
Sudangrass	35 lbs.	1 to 2 in.	5/1 to 7/30
Buckwheat	60 lbs.	1 to 2 in.	4/15 to 6/1
Corn (broadcast)	300 lbs.	1 to 2 in.	5/11 to 8/10
Sorghum	35 lbs.	1 to 2 in.	5/1 to 7/15

* Perennial species may be used as a temporary cover, especially if the areas to be seeded will remain idle for more than 1 year.
** Seeding done outside the optimum seeding dates increases the chances of seeding failure. Dates may be extended or shortened based on the location of the project site within the state.

- The seed bed shall be prepared by applying 400-600 lbs per acre of 12-12-12 fertilizer and working 2-4 inches into the soil and mulching material applied at the rate of 2 tons per acre.
- Dormant & Frost Seeding should be utilized for seeding when temperatures are too low for germination to occur.

B12. PERMANENT SURFACE STABILIZATION SPECIFICATIONS:
- The Contractor shall fertilize, seed and mulch all disturbed areas when final grading and land disturbing operations are complete. Seeding requirements shall be in accordance with Table 1, located in Chapter 7, pages 38-39 of the Indiana Storm Water Quality Manual, shown to the right.
- The seed bed shall be prepared by applying 400-600 lbs per acre of 12-12-12 fertilizer and working 2-4 inches into the soil and apply straw/hay mulch at the rate of 2 tons per acre.
- Optimum dates for permanent seeding are March 1 - May 10 and August 10 - September 30.
- Temporary seeding should be considered between May 10 and August 10.
- Dormant & Frost Seeding should be utilized when temperatures are too low for germination to occur, October 1 - May 9.

B13. MATERIAL HANDLING AND SPILL PREVENTION:
- The Contractor shall notify the Indiana Department of Environment Management (1.800.233.7745) when spills occur and threaten water quality due to storm water runoff.
- All materials used on-site shall be stored in an orderly manner and approved containers. Materials shall be kept in their original packaging with the manufacturer's labels until ready for installation.
- All materials shall be used, installed and disposed of in accordance with its manufacturer's instructions and as required by governing agencies.
- The Contractor shall utilize re-sealable containers when storing unused materials susceptible to spillage.
- The Contractor shall keep manufacturer's labels and Material Safety Data Sheets (MSDS) on site.
- The Contractor shall monitor equipment and their parking areas for leaks.

B14. MONITORING AND MAINTENANCE GUIDELINES FOR POLLUTION PREVENTION MEASURES:
- All stormwater quality measures shall be inspected and maintained in accordance with its respective manufacturer's recommendations and the Indiana Storm Water Quality Manual.
- A self-monitoring program that includes the following must be implemented:
- A trained individual shall perform a written evaluation of the project site:
  * By the end of the next business day following each 1/2-inch storm event; and
  * at a minimum of one time per week.
- The evaluation must address:
  * The maintenance of existing stormwater quality measures to ensure they are functioning properly; and
  * Identify additional measures necessary to remain in compliance with all applicable statutes and rules.
- Written evaluation reports must include:
  * The name of the individual performing the evaluation;
  * The date of the evaluation;
  * Problems identified at the project site; and
  * Details of corrective actions recommended and completed.

B15. EROSION & SEDIMENT CONTROL SPECIFICATIONS FOR INDIVIDUAL BUILDING LOTS:
- Individual lot Owners/Developers shall comply with Best Management Practices (BMPs) outlined in this plan. In addition, lot Owners/Developers shall be responsible for implementing and maintaining BMPs for their respective lots including, but not limited to:
  * Install/maintain a stable construction site access.
  * Install/maintain appropriate perimeter BMPs prior to land disturbance. (i.e. silt fence, straw bales, vegetated filter strips, etc)
  * Clean-up of sediment that may get tracked or washed onto roads.
  * Stabilize all areas outside the lot which were disturbed as a result of the subject lot development.

C. STORMWATER POLLUTION PREVENTION PLAN - POST CONSTRUCTION COMPONENT

C1. DESCRIPTION OF POLLUTANTS AND THEIR SOURCES ASSOCIATED W/ THE PROPOSED LAND USE:
- Oil, grease, antifreeze, brake fluid, brake dust, rubber fragments, gasoline, diesel fuel, and other hydrocarbons, and metals from vehicular sources.
- Grit (sediment) from wearing of the road surface and falling off vehicular sources.
- Trash, bacteria and biological agents in trash, from littering or improper disposal or storage.
- Pesticides, herbicides, and fertilizers from lawn/landscaping maintenance applications.
- Elevated receiving water temperatures from stormwater runoff contact with impervious surfaces.

C2. SEQUENCE DESCRIBING STORMWATER QUALITY MEASURE IMPLEMENTATION:
- Site monitoring for trash, debris, and deposited pollutants shall be a daily routine.
- Once construction is complete, permanent seeding will be applied to the entire disturbed area excluding the asphalt roadways.
- The use of grass lined swales and vegetated filters are existing and will remain a permanent aspect of the site.
- Absorption materials used to clean up hydrocarbon puddles shall be approved by the EPA.
- Disposal of all trash, debris, and pollutants shall be in a manner approved by their their repsective governmental agencies.

C3. DESCRIPTION OF PROPOSED POST CONSTRUCTION STORMWATER QUALITY MEASURES:
- The lot owner shall monitor the pavement for pollutants deposited from vehicular sources. The lot owner shall use approved absorption materials to clean up such hydrocarbon pollutants.
- The lot owner shall periodically monitor the site for trash, debris, and grit deposited on site. The lot owner shall pick up debris and dispose of in an approved manner.
- The lot owner shall minimize lawn/landscaping chemical applications.
- The detention basin will allow sediment in the runoff entering the basin time to settle out prior to being discharged.
- The existing & proposed vegetated areas will cause infiltration of runoff and trap pollutants before they leave the site.
- The vegetated ditches and detention basin will be utilized to filter pollutants, reduce runoff velocities, and help lower the temperature of the runoff before it reaches the receiving water.
- The storm sewer pipe network will help lower the temperature of the storm water runoff before it discharges into the receiving water.
- The combination of grass lawns, vegetated swales and detention basin will be utilized to meet the minimum requirement of 80% Total Suspended Solids (TSS) removal prior to leaving the site. (See attached literature)

C4. LOCATION, DIMENSIONS, SPECIFICATIONS & CONSTRUCTION DETAILS OF EACH STORMWATER QUALTIY MEASURE:
- Refer to the Sheet C-111 for locations of the respective control measures. Dimensions, specifications, and details of the measures are depicted in the Indiana Storm Water Quality Manual and Sheet C-112. Other practices which may be implemented shall be utilized and installed in accordance with the manufacturer's instructions.

C5. DESCRIPTION OF MAINTENANCE GUIDELINES FOR PROPOSED POST CONSTRUCTION WATER QUALITY MEASURES:
- Site monitoring for trash, debris, and deposited pollutants shall be a daily routine and shall be the responsibility of the lot owners.
- The use of grass-lined swales and vegetated filters are existing and will remain a permanent aspect of the site. The lot owners shall monitor these areas for trapped pollutants and erosion.
- The respective lot owners shall maintain all storm drainage features (i.e. swales, detention basin, etc.) in accordance with the recorded plat covenants.

Table 1. Permanent Seeding Recommendations

Open Low-Maintenance Areas (remaining idle more than six months)

Seed Mixtures	Rate/acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white clover *	70 lbs. 2 lbs.	5.6 to 7.0
2. Perennial ryegrass - tall fescue **	70 lbs. 50 lbs.	5.6 to 7.0
3. Tall fescue ** - white clover *	70 lbs. 2 lbs.	5.5 to 7.5

Steep Banks and Cuts, Low-Maintenance Areas (not mowed)

Seed Mixtures	Rate/acre Pure Live Seed	Optimum Soil pH
1. Smooth brome grass - red clover *	35 lbs. 20 lbs.	5.5 to 7.0
2. Tall fescue ** - white clover *	50 lbs. 2 lbs.	5.5 to 7.5
3. Tall fescue ** - red clover *	50 lbs. 20 lbs.	5.5 to 7.5
4. Orchard grass - red clover * - white clover *	30 lbs. 20 lbs. 2 lbs.	5.6 to 7.0
5. Crownvetch * - tall fescue **	12 lbs. 30 lbs.	5.6 to 7.0

Lawns and High-Maintenance Areas

Seed Mixtures	Rate/acre Pure Live Seed	Optimum Soil pH
1. Bluegrass	140 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf type)	60 lbs. 90 lbs.	5.6 to 7.0
3. Tall fescue (turf type) ** - bluegrass	170 lbs. 30 lbs.	5.6 to 7.5

Channels and Areas of Concentrated Flow

Seed Mixtures	Rate/acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white *	150 lbs. 2 lbs.	5.5 to 7.0
2. Kentucky bluegrass - smooth bromegrass - switchgrass - timothy - perennial ryegrass - white clover **	20 lbs. 10 lbs. 3 lbs. 4 lbs. 10 lbs. 2 lbs.	5.5 to 7.5
3. Tall fescue * - white clover **	150 lbs. 2 lbs.	5.5 to 7.5
4. Tall fescue ** - perennial ryegrass - Kentucky bluegrass	150 lbs. 20 lbs. 20 lbs.	5.5 to 7.5

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded; and (c) if legumes are fall-seeded, do so in early fall.

** Tall fescue provides little cover for, and may be toxic to some species of wildlife. The IDNR recognizes the need for additional research on alternatives such as buffalograss, orchardgrass, smooth bromegrass, and switchgrass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability and drought resistance.

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SIGNATURE — 7 Nov 14 — DATE

CASH WAGGNER & ASSOCIATES, PC
CONSULTING ENGINEERS • LAND SURVEYORS
414 CITADEL CIRCLE
SUITE B
EVANSVILLE, IN 47715
PH: 812.401.5561
FAX: 812.401.5563
CELL: 812.774.2988
E-MAIL: GMERITT@CASHWAGGNER.COM

REVISIONS	NO.	DATE	BY	DESCRIPTION
	1			
	2			
	3			
	4			
	5			
	6			
	7			

PROJECT NO.: 14-1948
DESIGNED BY: G.A.M.
DRAWN BY: G.A.M.
FILENAME: SWP3 Narrative
LAYOUT TAB: SWP3 Narr
SCALE: None

PROJECT: CAYMAN RIDGE - SECT. 4
ADDRESS: KANSAS ROAD, EVANSVILLE, IN
SHEET TITLE: SWP3 NARRATIVE

DATE: 11.07.14
DRAWING NO.: C-109
OF: 13

GLENN A. MERITT, JR. REGISTERED No PE10403870 STATE OF INDIANA PROFESSIONAL ENGINEER

Signature 19 Feb 15 Date

CASH WAGGNER & ASSOCIATES, PC
CONSULTING ENGINEERS • LAND SURVEYORS

414 CITADEL CIRCLE
SUITE B
EVANSVILLE, IN 47715
PH: 812.401.5561
FAX: 812.401.5563
CELL: 812.774.2988
E-MAIL: GMERITT@CASHWAGGNER.COM

REVISIONS	No.	Date	By	Description

Project No.:	14-1948
Designed By:	G.A.M.
Drawn By:	G.A.M.
Filename:	1948 BASE Overall
Layout Tab:	Undev Sub
Scale:	As Shown

Project: CAYMAN RIDGE - SECT. 4
Address: KANSAS ROAD EVANSVILLE, INDIANA
Sheet Title: UNDEVELOPED SUB-BASIN EXHIBIT

Date: 02.19.15
Drawing No.: 1
Of: 2

APPROVED
MAR 03 2015
VANDERBURGH COUNTY DRAINAGE BOARD

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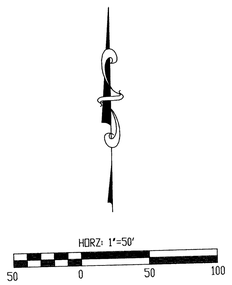
Aug 2 2015



Future Development

Swale #3
69-LF @ 3.99%

Swale #3A
308-LF @ 1.22%

12" HDPE
(To be removed)

Note: Swale #3B will temporarily terminate in the west bank of the existing ditch until the permits have been approved and the ditch is relocated.

Swale #3B
465-LF @ 1.45%

Swale #6
135-LF @ 2.97%

Swale #5A
145-LF @ 1.86%

Swale #5
142-LF @ 2.39%

Swale #4
98-LF @ 0.85%

Swale #1A
220-LF @ 2.32%

Swale #1B
216-LF @ 1.33%

Swale #2
138-LF @ 5.64%
(Sod required)

Surface Overflow Spillway
maximum control elev. is
0.5' above CI #508

Existing Detention Basin #1
Min Top Depth = 396.75'
Emer. Spillway = 395.75'
Pool = 391.61'

8'x4' Box Culvert
I.E.=391.61'
I.E.=390.85'

Bermuda Court
Bermuda Drive
Aruba Court

Sta=10+65.00 Bermuda Dr
Sta=5+25.00 Aruba Ct

Lot 20 Lot 21 Lot 22 Lot 23 Lot 24 Lot 25 Lot 26 Lot 27 Lot 28 Lot 29 Lot 30 Lot 31 Lot 32 Lot 33 Lot 34 Lot 35 Lot 36 Lot 37 Lot 38 Lot 39 Lot 40 Lot 41 Lot 42 Lot 43 Lot 44 Lot 45 Lot 258 Lot 259 Lot 300 Lot 301 Lot 302 Lot 303 Lot 304 Lot 305 Lot 306 Lot 307 Lot 308 Lot 309 Lot 310 Lot 311 Lot 312 Lot 313 Lot 314 Lot 315 Lot 316 Lot 317 Lot 318 Lot 319 Lot 320 Lot 321 Lot 322 Lot 323 Lot 324

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MAR 0 3 2015
VANDERBURGH COUNTY
DRAINAGE BOARD

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MAR 2/2/15

GLEN A. MERITT JR. REGISTERED No. PE10403870 STATE OF INDIANA PROFESSIONAL ENGINEER

SIGNATURE

19 Feb 15
DATE

CASH WAGGNER & ASSOCIATES, PC
CONSULTING ENGINEERS • LAND SURVEYORS

414 CITADEL CIRCLE
SUITE B
EVANSVILLE, IN 47715
PH: 812.401.5561
FAX: 812.401.5563
CELL: 812.774.2988
E-MAIL: GMERITT@CASHWAGGNER.COM

REVISIONS	NO.	DATE	BY	DESCRIPTION
	1			
	2			
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	6			
	7			

PROJECT NO.:	14-1948
DESIGNED BY:	G.A.M.
DRAWN BY:	G.A.M.
FILENAME:	1948 BASE
LAYOUT TAB:	Subbasin
SCALE:	As Shown

PROJECT: CAYMAN RIDGE - SECT. 4
ADDRESS: KANSAS ROAD, EVANSVILLE, INDIANA
SHEET TITLE: DEVELOPED SUB-BASINS

DATE: 02.19.15
DRAWING NO.: 2
OF: 2