

Ruggles & Bohm, P.A.

Engineering, Surveying, Land Planning

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September 19, 2012

Mr. Scott Lindebak
City of Wichita, Stormwater Management
455 N Main
Wichita, KS 67202

RE: Platting Bellechase 3rd Addition

Dear Mr. Lindebak,

We are submitting Bellechase 3rd Addition for platting approval. Bellechase 3rd is a re-plat of Bellechase 2nd Addition. Bellechase 2nd has an approved drainage plan and drainage characteristics proposed in the drainage plan will not be altered by re-platting. All detention ponds associated with the sub-division either existed before the original project or were constructed with previous phases. The water quality requirements will be managed in existing ponds in Reserves 'A' and 'B'. Weirs will be modified to handle the channel protection volume requirements. We will provide the appropriate water quality paperwork to your office with the associated storm water drain project.

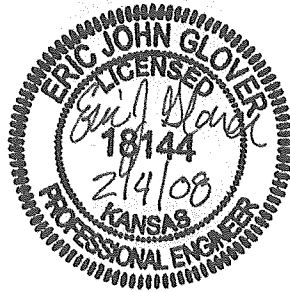
Please feel free to contact me with any questions.

Thank you ,

Eric J Glover, P.E.
Ruggles & Bohm, P.A.

Encl.

**DRAINAGE ANALYSIS
BELLECHASE ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS
FEBRUARY 2008**



**Ruggles & Bohm. P.A.
Eric J Glover P.E.**

**BELLECHASE 2nd ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS
DRAINAGE ANALYSIS
NOVEMBER 2007**

Belle Chase Addition is located near the northwest corner of the intersection of 127th Street East and Harry Street. The total addition consists of approximately 100.8 acres. From the National Cooperative Web Soil Survey 2.0, the predominant on-site soils are Rosehill silty clay and Clime silty clay, hydrologic soils group D and C respectively. For the sake of drainage analysis type D hydrologic group characteristics will be used. The site is currently used as pasture.

Belle Chase Addition is situated immediately south of Country Hollow Addition, Wichita, Sedgwick County, Kansas. A small portion of the southernmost part of the plat is within the floodway.

In the pre-developed condition offsite drainage comes from Country Hollow Addition to the north of the site. Spring Branch Creek flows just south of the addition. The site drains from north to south into the Spring Branch.

In the developed condition, the site will be subdivided into 222 single family lots. There is an existing pond in the Northeast corner of the plat that will be improved. A detention pond will be constructed along the South edge of the plat. The site will be drained into storm water systems and then into the drainage ponds. Some drainage will flow to the Spring Branch undetained. The Spring Branch of the Four-mile creek is a fully developed creek.

There are no local stormwater drainage systems that will be impacted. No wetlands exist on site to be impacted. There is no proposed construction near riparian areas. There will be a need for a LOMA to remove some lots from the floodplain. The floodway will not be impacted by construction.

HEC-HMS 3.0.1 was used for the hydraulic analysis of the site. For all rainstorm events studied, the total discharge from the site was reduced in the developed condition.

Storm Return Period	Existing Runoff (cfs)	Developed Runoff (cfs)
2 yr	236.6	231.3
5 yr	329.6	314.8
10 yr	405.7	381.8
25 yr	480.8	448.9
100 yr	640.2	590.1

Table 1: Peak runoff for each studied rainfall event.

Existing Conditions

The existing site is 100.8 acres of pasture with hydrologic group D and C soil. The Country Hollow Drainage plan was used to input discharge from Country Hollow onto Belle Chase. The time of concentration is 22.8 minutes for the West basin and 18.6 minutes for the East basin. Time of Concentration was found using the velocity method. Considering the soil types and land use, a curve number of 83 was used for the onsite areas. Existing runoff for each return period is shown in Table 1. Runoff from the West basin flows undetained to the Spring Branch. Runoff for the East basin flows into an existing pond. Existing Pond data is found in Table 2.

West Basin:

$T_c = 300' / 0.45 \text{ ft/sec (overland)} + 300' / 1.5 \text{ ft/sec (sheet flow)} + 1260' / 2.5 \text{ ft/sec (channel flow)} = 1370 \text{ seconds} = 22.8 \text{ minutes.}$

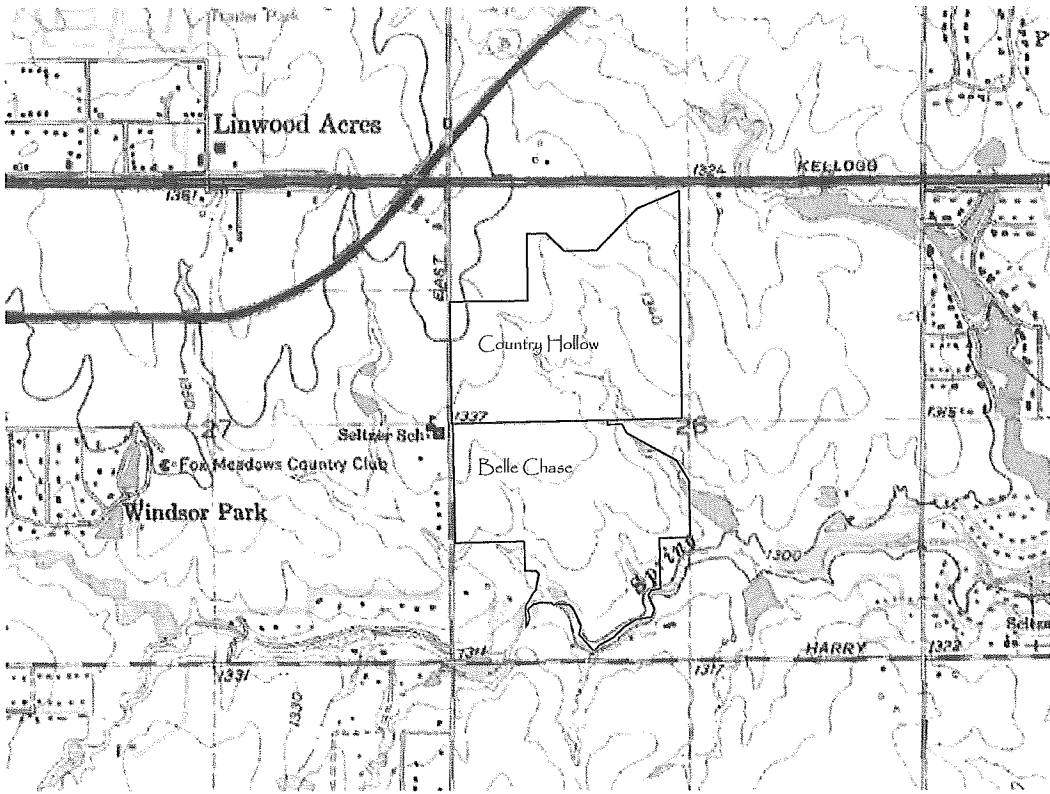
East Basin:


$T_c = 300' / 0.45 \text{ ft/sec (overland)} + 300' / 1.5 \text{ ft/sec (sheet flow)} + 630' / 2.5 \text{ ft/sec (channel flow)} = 1116 \text{ seconds} = 18.6 \text{ minutes.}$

The existing pond is controlled by a 12" CMP and ultimately a low area acts as a weir.

Elevation	Area (acres)	Discharge (cfs)
1313.5	1.16	0.0
1314.0	1.30	0.8
1314.5	1.63	2.1
1315.0	1.95	3.3
1315.5	2.37	54.0
1316.0	2.78	185.0
1316.5	3.33	425.0
1317.0	3.88	792.0


Table 2: Existing Pond data.

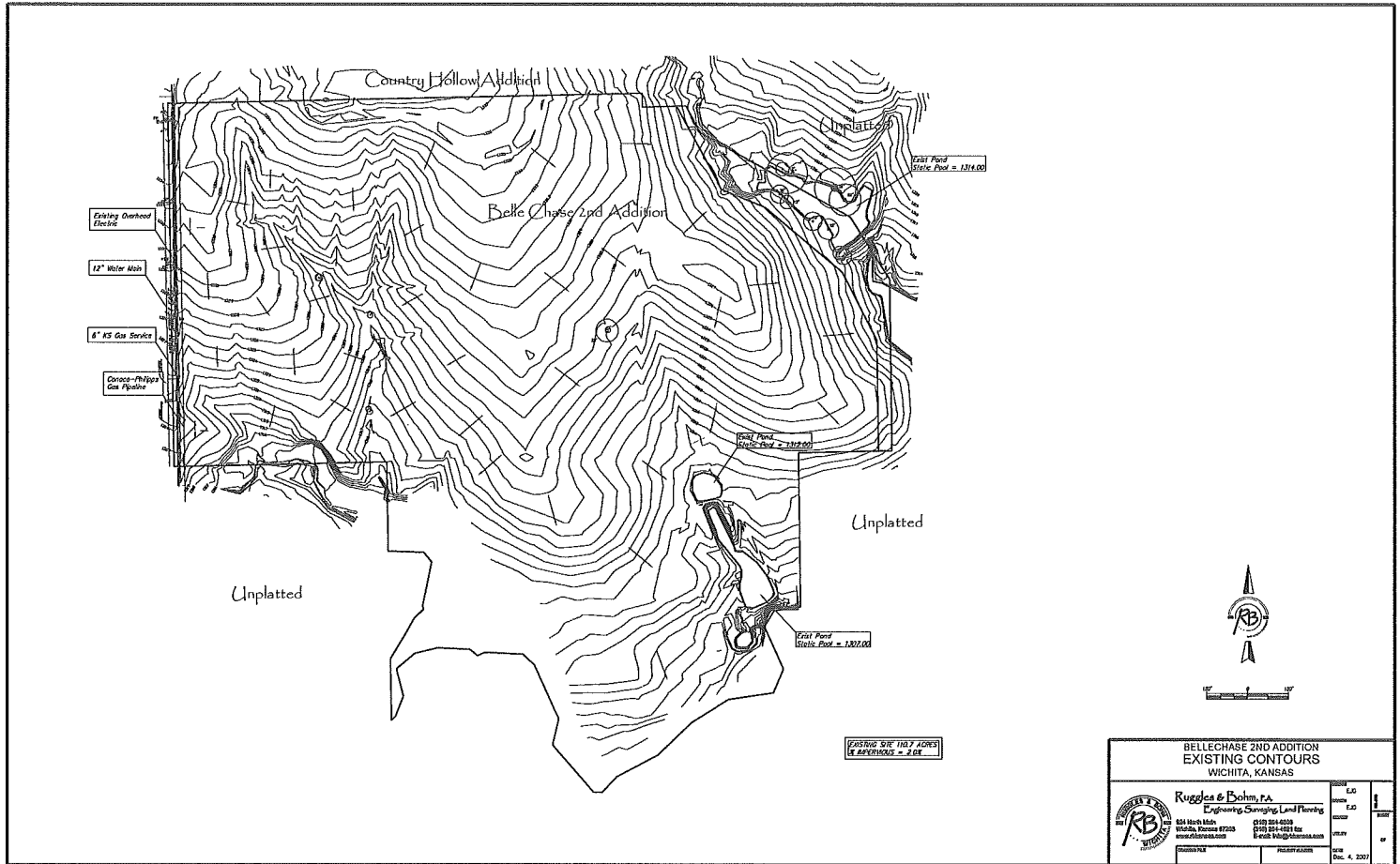


BELLECHASE 2ND ADDITION USGS WICHITA, KANSAS		Ruggles & Dohm, P.A. Engineering, Surveying, Land Planning 604 North Main Wichita, Kansas 67203 www.rdgkansas.com	619 261-6009 619 261-6011 fax E-mail: rdg@rdgkansas.com	DATE 10/4/2001
	PROJECT FILE	PROJECT NUMBER	SHEET NO.	OF



BELLECHASE 2ND ADDITION
AERIAL
WICHITA, KANSAS

	Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning	
	224 North Main Wichita, Kansas 67208 www.ruggles.com	316.264.4200 316.264.4201 fax 6-9148 rfb@ruggles.com
PROJECT FILE	PROJECT NUMBER	DATE
		Dec. 4, 2007



EXISTING SITE 10.7 ACRES
 (2.8 ACRES) = 2.88



BELLECHASE 2ND ADDITION EXISTING CONTOURS WICHITA, KANSAS		<small>SCALE</small> <small>E.C.</small> <small>DATE</small> <small>BY</small> <small>CHK</small>
	Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning	
	624 North Main Wichita, Kansas 67202 www.rugglesandbohm.com	(316) 264-4224 (316) 264-4221 fax E-mail: info@rugglesandbohm.com
<small>DATE PLOTTED</small> <small>PROJECT NUMBER</small>	<small>DATE</small> <small>FILE</small>	<small>DATE</small> <small>FILE</small>

Developed Conditions

The developed condition for Belle Chase Addition is 222 single family residential lots. 80.0 acres will be developed into lots with the remaining 30.7 left as reserves. The existing detention pond will be improved and controlled with a weir. A new detention pond will be constructed and controlled by a weir. A portion of the site will continue to drain to the Spring Branch undetained. However the overall discharge for the developed site will be decreased from the existing condition. The Country Hollow runoff was recreated using drainage model information furnished by MKEC.

Basin	Peak Discharge (cfs)				
	2-year	5-year	10-year	25-year	100-year
Onsite West	107.2	147.2	179.0	210.8	277.8
Pond Basin	27.2	37.3	45.3	53.3	70.2
Exist Pond	27.2	37.3	45.3	53.3	70.2
Onsite Southeast	19.6	27.9	32.7	38.5	50.6

Table 3 – Developed Basin Discharges.

Developed Drainage Basins

Onsite West

Undetained Drainage to Spring Branch

Area = 49.2 acres

CN = 90

Time of Concentration = 18 minutes

Pond Basin

Onsite Drainage to Proposed Pond

Area = 11.3 acres

CN = 90

Time of Concentration = 15 minutes

Existing Pond

Onsite Drainage to Existing Pond

Area = 11.3 acres

CN = 90

Time of Concentration = 15 minutes

Southeast Basin

Undetained Drainage to Spring Branch

Area = 8.2 acres

CN = 90

Time of Concentration = 15 minutes

Pond Ratings

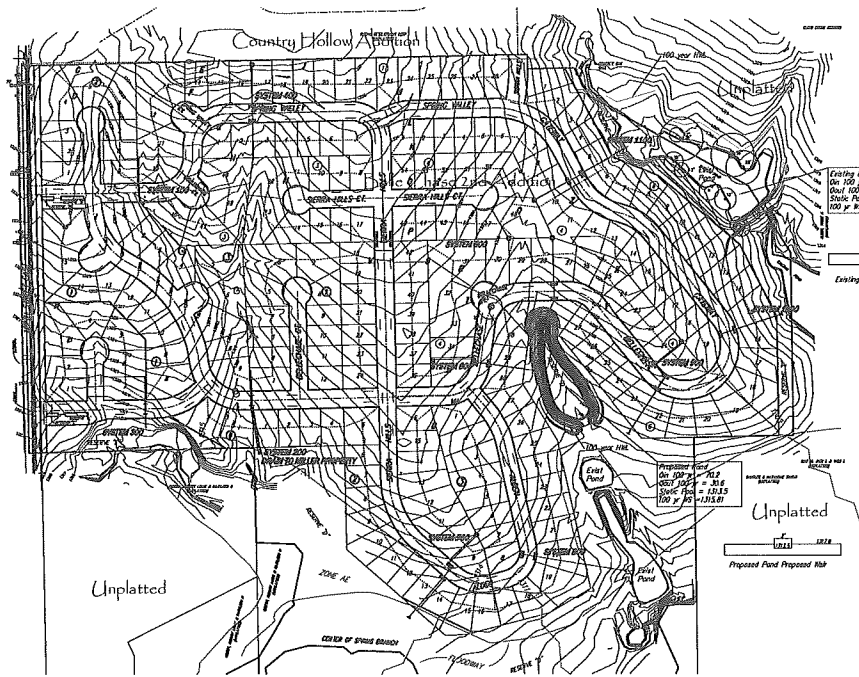
The following tables represent the data associated with the onsite detention ponds.

Elevation	Area (ac)	Discharge (cfs)	Storage (ac-ft)
1313.5	0.98	0.0	0
1314.0	1.55	29.5	0.63
1314.5	1.82	83.4	1.40
1315.0	2.09	153.3	2.30
1315.5	2.46	236.0	3.44
1316.0	2.83	329.8	4.76
1316.5	3.27	433.5	6.38
1317.0	3.71	546.3	8.21

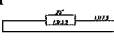
Table 4 – Existing pond (Improved) data.

Elevation	Area (ac)	Discharge (cfs)	Storage (ac-ft)
1313.5	0.79	0.0	0.0
1314.0	0.84	3.1	0.41
1314.5	0.89	8.7	0.84
1315.0	0.94	16.0	1.30
1315.5	0.99	24.6	1.78
1316.0	1.04	34.4	2.29
1316.5	1.09	45.2	2.82
1317.0	1.14	56.9	3.38

Table 5 – Proposed Pond Data.

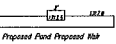


Existing Pond (Proposed)
 On 100 ft = 1418
 On 100 ft = 4218
 Static Pond = 1212.5
 100 ft = 1212.45



Existing Pond Proposed Hb

Proposed Pond
 On 100 ft = 712
 On 100 ft = 1212
 Static Pond = 1212.5
 100 ft = 1212.45



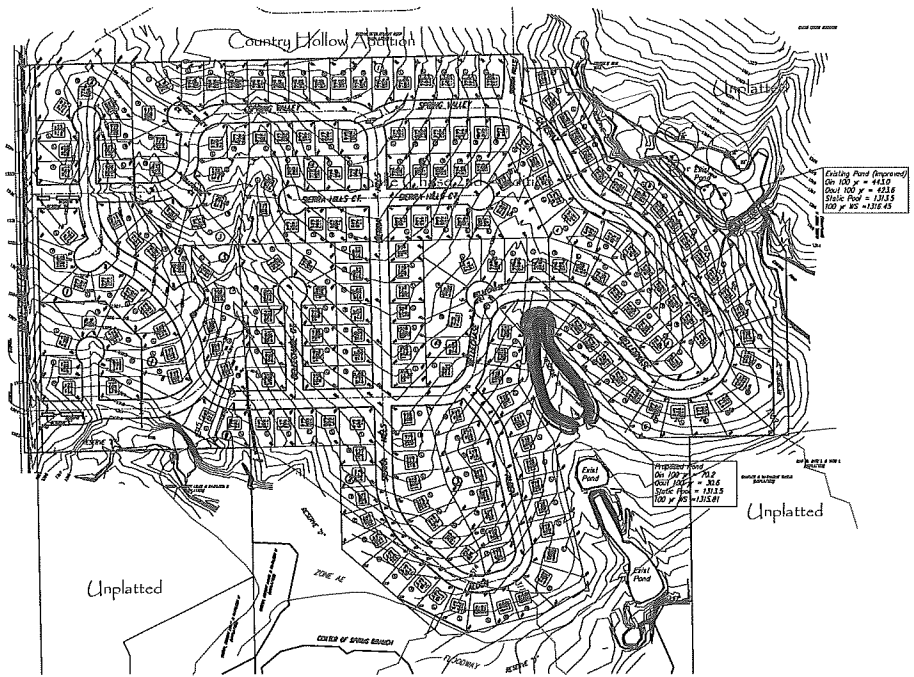
Proposed Pond Proposed Hb

Basin	Area	C	I	Out
A	1.73	6.69	2.77	8.16
B	1.77	6.69	2.77	8.17
C	1.79	6.69	2.77	8.17
D	1.81	6.69	2.77	8.17
E	1.82	6.69	2.77	8.17
F	1.84	6.69	2.77	8.17
G	1.85	6.69	2.77	8.17
H	1.87	6.69	2.77	8.17
I	1.88	6.69	2.77	8.17
J	1.90	6.69	2.77	8.17
K	1.91	6.69	2.77	8.17
L	1.92	6.69	2.77	8.17
M	1.93	6.69	2.77	8.17
N	1.94	6.69	2.77	8.17
O	1.95	6.69	2.77	8.17
P	1.96	6.69	2.77	8.17
Q	1.97	6.69	2.77	8.17
R	1.98	6.69	2.77	8.17
S	1.99	6.69	2.77	8.17
T	2.00	6.69	2.77	8.17
U	2.01	6.69	2.77	8.17
V	2.02	6.69	2.77	8.17
W	2.03	6.69	2.77	8.17
X	2.04	6.69	2.77	8.17
Y	2.05	6.69	2.77	8.17
Z	2.06	6.69	2.77	8.17



**BELLECHASE 2ND ADDITION
 DRAINAGE BASINS
 WICHITA, KANSAS**

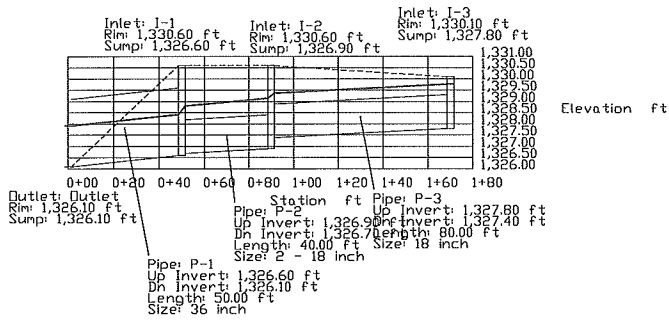
 <p>Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning</p>	1001 North Main Wichita, Kansas 67202 Phone: 316-264-8225 Fax: 316-264-8226 E-mail: info@rbo.com	1001 North Main Wichita, Kansas 67202 Phone: 316-264-8225 Fax: 316-264-8226 E-mail: info@rbo.com	SHEET NO. 1 PROJECT NUMBER DATE: 4, 2007
	1001 North Main Wichita, Kansas 67202 Phone: 316-264-8225 Fax: 316-264-8226 E-mail: info@rbo.com		SHEET NO. 1 PROJECT NUMBER DATE: 4, 2007



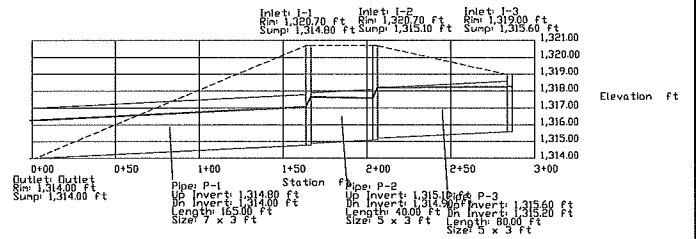
**BELLECHASE 2ND ADDITION
4 CORNER LOT GRADING
WICHITA, KANSAS**

	Ruggles & Bohm, P.A.		DATE
	Engineering, Surveying, Land Planning		E.G.
534 North Main Wichita, Kansas 67202 www.rugglesandbohm.com		PHONE	E.G.
(316) 264-6228 (316) 264-6221 fax E-mail: info@rugglesandbohm.com		FAX	E.G.
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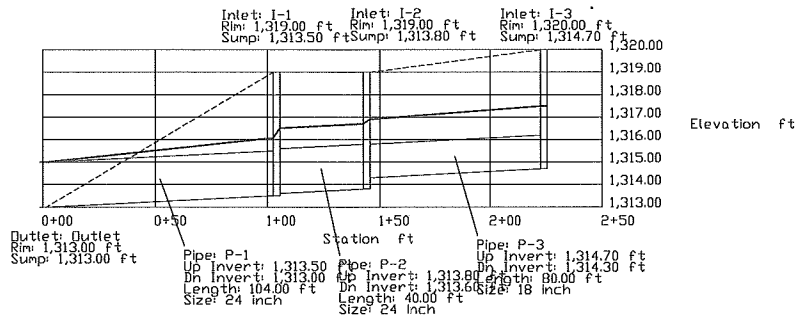
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SYSTEM 200 PROFILE



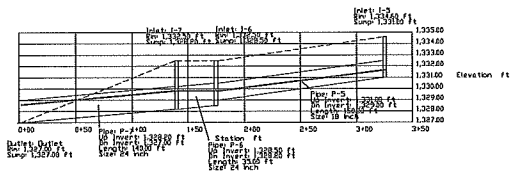
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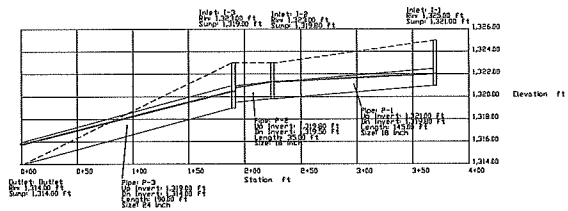
BELLE CHASE 2nd ADDITION
SWS PROFILES

	Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning		Title SWS Profiles
	604 North Mall Yorkville, Kansas 67309 www.rugglesandbohm.com		Date Dec. 4, 2009
Project No. SWS Profiles	Revision 1	Drawn By [Blank]	Date [Blank]

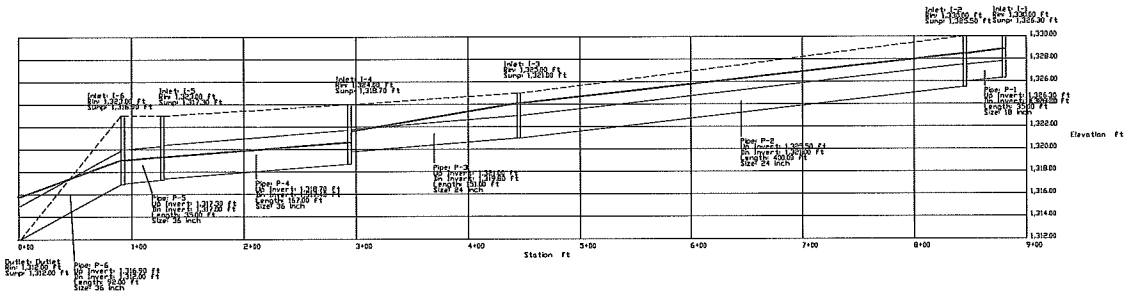
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SYSTEM 600 PROFILE



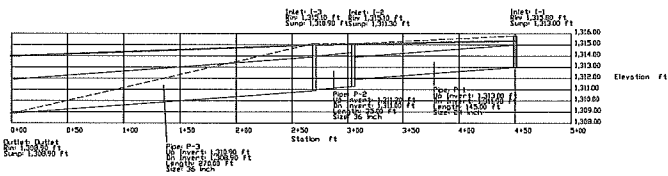
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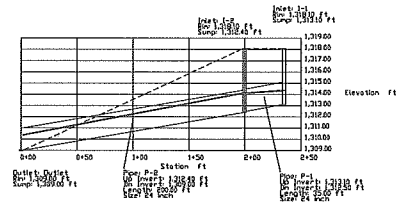
BELLE CHASE 2nd ADDITION
SWS PROFILES

	Ruggles & Bohm, PA Engineering, Surveying, Land Planning		DATE 12/4/07
	2040 W. 11th Street York, PA 17402 www.rugglesandbohm.com		PHONE 717-766-6000 717-766-6011 fax Email: info@ruggles.com
PROJECT SWS Profiles		PREPARED BY [Signature]	DATE Dec. 4, 2007

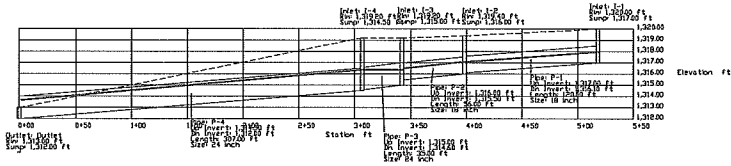
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SYSTEM 800 PROFILE



SYSTEM 900 PROFILE



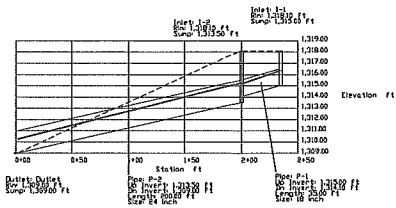
BELLE CHASE 2nd ADDITION
SWS PROFILES



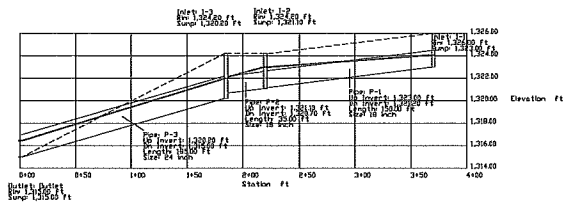
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1000 N. ...
www.rugglesandbohm.com

DATE	12/1/2011
BY	...
CHECKED	...
DATE	DEC. 4, 2011

SYSTEM 1000 PROFILE



SYSTEM 1100 PROFILE



**BELLE CHASE 2nd ADDITION
SWS PROFILES**



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DATE	10/4/2007
BY	SPW
CHECKED	
DATE	
BY	
CHECKED	
DATE	

PROJECT NAME: SWS Profiles

DATE: Oct. 4, 2007