

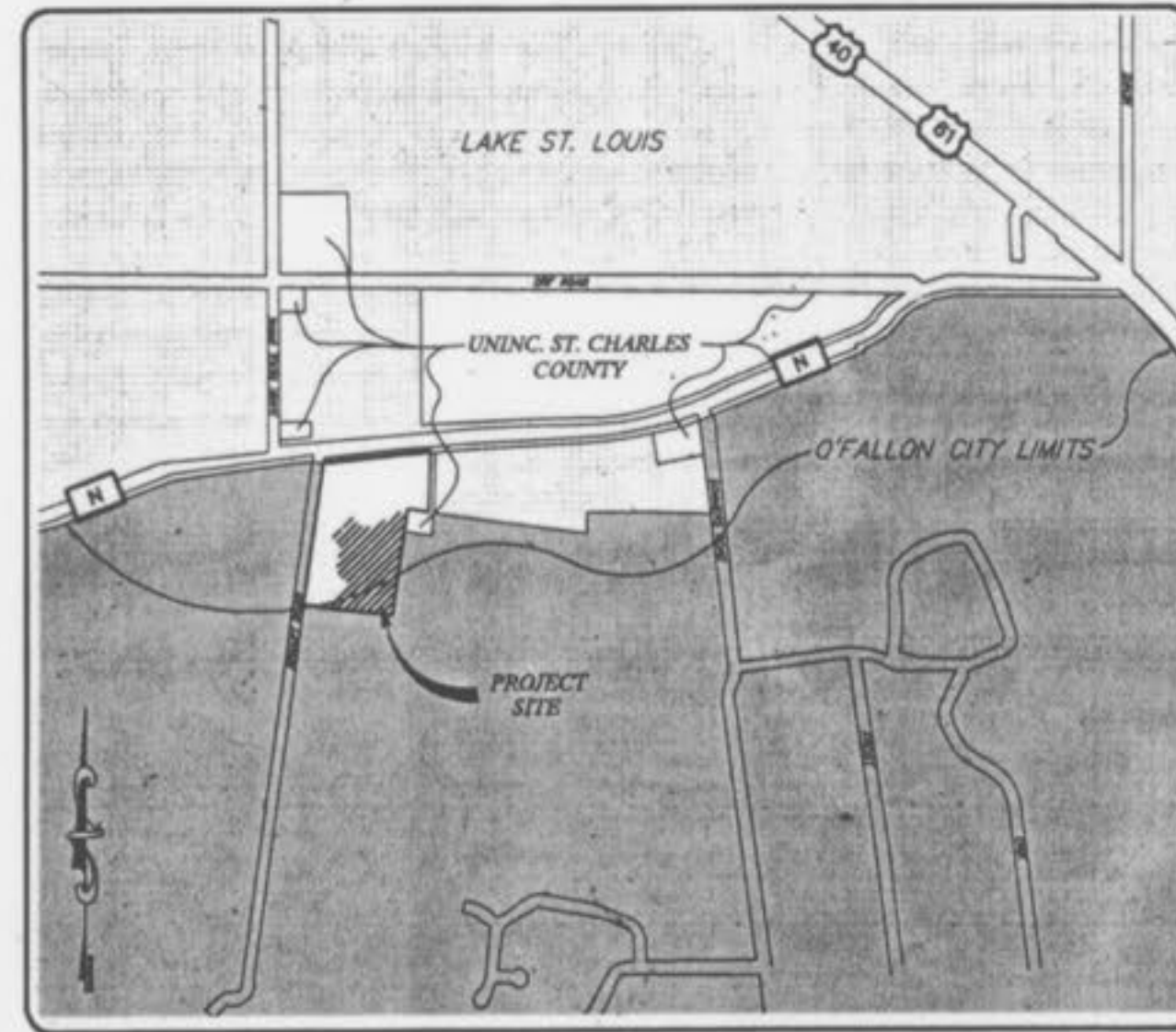
GRADING NOTES:

- All construction methods, materials and practices shall conform to all current applicable specifications of the governing agencies.
- Any destruction of existing improvements or features shall be repaired or replaced in kind by the contractor and shall remain the contractor's responsibility.
- Underground utilities have been plotted from available information and therefore their locations must be considered approximate only. The verification of the location of all underground utilities, either shown or not shown on these plans shall be the responsibility of the contractor, and shall be located prior to grading or construction of improvements.
- It shall be distinctly understood that failure to specifically mention any work which would normally be required to complete the project shall not relieve the contractor of his responsibility to perform such work.
- Contractor shall keep road clear of mud and debris.
- All filled areas to be compacted to a minimum of 90 percent of maximum dry density as determined by the Modified AASHTO Compacting Test, ASTM D1557-78, or as specified by the soils engineer.
- It shall be the grading contractor's responsibility to notify the soils engineer prior to work in progress and to comply with recommendations by the soils engineer with regards to compaction, surface preparation, and placement of fill.
- It shall be the grading contractor's responsibility to provide the location of any existing underground utilities by notifying utility companies prior to grading operations.
- The grading contractor shall cut or fill to subgrade elevation under all areas to be paved. (Subgrade is figured at pavement depth).
- All drainage swales shall be sodded or seeded and mulched to prevent erosion.
- All stumps, limbs, and other debris are to be removed from the site unless a suitable dump area is approved in advance by the owner after consulting with the soils engineer if burning is approved.
- Subgrade is included in the total bid yardage. (Subgrade is figured at pavement depth).
- Slopes to receive fill which are steeper than 5:1 should be benched prior to placement of fill.
- If fill is to be placed in areas of soft soil, particularly in draws, drainage channels and other low lying areas, the soft soil shall be excavated until firm soil is encountered.
- All grading shall comply with the soils engineer's recommendations.
- Permanent grass is required at completion of grading or a 30 day suspension of grading will be imposed.
- A drainage easement will be granted to the City of O'Fallon for any creeks to remain in the development on the record plotted prior to any grading or construction operations and shall be inspected and maintained as necessary to insure their proper function until sufficient vegetation has been established to prevent erosion.
- Not used.
- Additional siltation control may be required as directed by the local governing authority.
- All grading areas shall be protected from erosion by erosion control devices and/or seeding and mulching as required by the City of O'Fallon.
- All fill placed in proposed roads shall be compacted from the bottom of the fill up to 90% maximum density as determined by the Modified AASHTO T-180 Compaction Test or 95% of maximum density as determined by the Standard Proctor Test AASHTO T-99. All tests shall be verified by a soils engineer concurrent with grading and backfilling operations.
- Erosion and sediment control structures shall be maintained throughout the construction process.
- The Developer shall provide the City of O'Fallon construction inspectors with soils reports prior to and during site soil testing.
- The contractor shall assume complete responsibility for controlling all siltation and erosion of the project area. The Contractor shall use whatever means necessary to control erosion and siltation including, but not limited to, staked straw bales and/or siltation fabric fences (possible methods of control are detailed in the plan). Control shall commence with grading and be maintained throughout the project until acceptance of the work by the Owner and/or the City of O'Fallon and/or MoDOT. The Contractor's responsibilities include all design and implementation as required to prevent erosion and the depositing of silt. The Owner and/or the City of O'Fallon and/or MoDOT may at their option direct the Contractor in his methods as deemed fit to protect property and improvements. Any depositing of any silts or mud on new or existing pavement or in new or existing sewers or swales shall be removed after each rain and affected areas cleaned to the satisfaction of the Owner and/or the City of O'Fallon and/or MoDOT.
- All erosion control systems shall be inspected and necessary corrections made within 24 hours of any rainstorm resulting in one-half inch of rain or more.
- Erosion control shall not be limited to what is shown on the plan. Whatever means necessary shall be taken to prevent siltation and erosion from entering natural streams, adjacent roadways, properties, ditches.
- No graded area shall remain bare for over 6 months without being seeded or mulched.
- No slope shall exceed 3(horz.):1(vert.).
- All filled places under proposed storm and sanitary sewer and/or paved areas shall be compacted to 90% of maximum density as determined by the Modified AASHTO T-180 Compaction Test or 95% of maximum density as determined by the Standard Proctor Test AASHTO T-99.
- When deemed necessary, positive steps should be exercised to prevent the soil from damaging adjacent property and siltation on all storm drainage systems whether on or off site.
- All low places whether on-site or off-site should be graded to allow drainage by installing temporary ditches.
- Any wells and/or springs which may exist on this property should be located and sealed in a manner acceptable to the City of O'Fallon.
- All trash and debris on-site, either existing or from construction, must be removed and disposed of off-site.
- Debris and foundation material from any existing on-site building or structure which is scheduled to be razed for this development must be disposed of off-site. All existing buildings and fencing is to be removed.
- Soft soils in the bottom and banks of any existing or former pond sites or tributaries should be removed, spread out and permitted to dry sufficiently to be used as fill. None of this material should be placed in proposed public right-of-way locations or on any storm sewer location. Dewatering of existing pond shall not exceed 50 GPM.
- Please notify the Director of Public Works for the City of O'Fallon 24 hours prior to the commencement of grading. No building permits will be issued by the City of O'Fallon until construction plans are approved and the final plot recorded.
- No grading is proposed within the R/W of Hwy. N at this time. Any subsequent grading or construction within state R/W as part of the final improvement plans will require MoDOT approval.
- The sediment control plan should be implemented before grading begins. This should follow the guidelines in the model sediment and erosion control regulations by St. Charles Soil and Water Conservation District.

Briarchase Phase Two

A Tract of Land Being a Part of the Northeast Quarter of
Fractional Section 9, and Part of U.S. Survey 931,
in Township 46 North, Range 2 East,
City of O'Fallon, Missouri

IMPROVEMENT PLANS



LOCATION MAP
N.T.S.

EXISTING	LEGEND	PROPOSED
542	CONTOURS	(542)
536	SPOT ELEVATIONS	(536)
	CENTER LINE	
	BUILDINGS, ETC.	
	TREE LINE	
	FENCE	
	STORM SEWERS	
	SANITARY SEWERS	
	CATCH BASIN	
	AREA INLET	
	GRATED INLET	
	STORM MANHOLE	
	SANITARY MANHOLE	
	FLARED END SECTION	
	CLEANOUT	
	LATERAL CONNECTION	
	UTILITY OR POWER POLE	
	FIRE HYDRANT	
	TEST HOLE	
	PAVEMENT	
2"Ø	GAS MAIN & SIZE	(2"Ø)
6"Ø	WATER MAIN & SIZE	(6"Ø)
T	TELEPHONE	(T)
E	ELECTRIC (U) UNDERGROUND	(E)
ØW	ELECTRIC (Ø) OVERHEAD	(ØW)
£	FLOW LINE	£
TC	TO BE REMOVED	TBR
TC	TOP OF CURB	(TC)
—	SWALE	—
XL	LIGHT STANDARD	XL
—	STREET SIGN	—
—	STOP SIGN	—
P.S.	PARKING STALLS	P.S.
Ø	YARD LIGHT	Ø

PROJECT NOTES FOR OVERALL DEVELOPMENT:
R-1 PUD

- Area of Site: 38.47 acres (14.03 acres Phase Two)
- Current Zoning: R-1 PUD
- Present Owner: Stegmann Farms XI L.L.C.
317 Clarkson Road, Ellisville, Mo. 63011
- Lot Data:
 - A. Total Units: 152 (62 Units Phase Two)
 - B. Average Lot size 2,510 sq. ft.
 - C. Minimum Lot width at building line 50'
- Yard set backs:
 - 1. Front - 25'
 - 2. Side - 5'
 - 3. Rear - 15'
- Total area of tract = 38.47 Ac.
Common Ground = 5.04 Ac.
Net Total = 33.43 Ac.
- Allowable Lots:
33.43 Ac x (43,560 Sq.Ft./Ac) = 1,456,000 Sq.Ft. allow/lot
10,000 Sq.Ft allow/lot = 145.6 Lots
- Net lot Area:
33.43 Ac x (43,560 Sq.Ft./Ac) = 1,456,000 Sq.Ft. /Lots
152 Lots = 9,580 Sq.Ft. /Lots
- Density Calculations:
152 / 38.47 = 3.95 lots per ac.
- Smallest Lot Size = 5,244 Sq. Ft.
- Approximate Structure Coverage is 48%.
Structure Coverage is based on largest building placed on smallest lot.
85 - 50' Lots (Lots 68-152)
67 - 60' Lots (Lots 1-67)

INDEX OF SHEETS

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FLOOD NOTE:

ACCORDING TO THE FLOOD INSURANCE RATE MAP OF THE COUNTY OF ST. CHARLES, MISSOURI, UNINCORPORATED AREAS (COMMUNITY PANEL NUMBER 29183C0220 E DATED AUGUST 2, 1996), THIS PROPERTY LIES ENTIRELY WITHIN WITH ZONE X. ZONE X IS DEFINED AS AN AREA OUTSIDE THE 500 YEAR FLOOD HAZARD, IN WHICH BASE FLOOD ELEVATIONS HAVE BEEN DETERMINED.

SITE & U.S.G.S. BENCHMARK

"Sq" CUT WEST END OF SOUTHERN HEADWALL LOCATED AT THE SOUTHWEST INTERSECTION OF SOMMERS ROAD AND STATE HIGHWAY "N"; 36.5' EAST OF CENTERLINE OF SOMMERS AND 14' SOUTH OF CENTERLINE HIGHWAY "N".

ELEVATION = (607.22)

AS-BUILT
SANITARY AND STORM SEWER
FINAL MEASUREMENT PLAT

As of 5/16/04, I certify that the actual sewer lengths, sizes, flowlines, depths of structures and sewers and locations with respect to existing or proposed easements have been measured. The results of those measurements are shown on this set of Final Measurements plans. Since the wye locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that specific information.

All public sewers are located within designated existing easements except as follows:

THE STERLING CO.
ENGINEERS & SURVEYORS
George J. Sterling
Missouri, Reg. No. 10000

THE UNDERGROUND UTILITIES SHOWN HEREON WERE PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NONEXISTENCE, SIZE, TYPE, NUMBER OR LOCATION OF THESE OR OTHER UTILITIES. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, AND SAID UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319, RSMo.

GENERAL NOTES:

- This site is in the following Districts:
Public Water and Sewer District No.2
Wentzville Fire Protection District
Wentzville School District
- This site is in the following Utility Service Areas:
Public Water and Sewer District No.2
AT&T Broadband
Culver River Company
St. Charles County Gas Company
GTE Company
- Sanitary sewer connections shall be as approved by the Public Water and Sewer District No. 2 and the City of O'Fallon.
- Storm Water Management shall be designed pursuant to the requirements of City of O'Fallon and shall discharge at an adequate natural discharge point.
- Grading shall be per City of O'Fallon standards.
- Street trees, landscaping and street lights shall be per City of O'Fallon standards
- The underground utilities shown herein were plotted from available information and do not necessarily reflect the actual existence, nonexistence, size, type, number, or location of these or other utilities. The general contractor shall be responsible for verifying the actual location of all underground utilities, shown or not shown, and shall be located in the field prior to any grading, excavation, or construction of improvements. The provisions shall in no way, absolve any party from complying with the Underground Facility Safety and Damage Prevention Act, Chapter 319, RSMo.
- The Source of topographic information is USGS Datum.
- All proposed utilities and sewers shall be covered by easements granted to the appropriate utility companies and municipalities.
- This project is in compliance with Article 26 of the City of O'Fallon's Zoning Code.
- All sidewalks shall be 4' wide minimum and comply with City of O'Fallon ADA Standards.
- Proposed light standards shall be 16' tall max.
- No known wetlands are on the subject property.
- Existing land use: Residence and Agricultural Bldgs.
- All future uses on subject property will conform with Article XIII of the Zoning Code.
- All necessary utilities (public or private) will be available, functioning and useable prior to the issuance of any occupancy permits.
- Any septic tanks or leach fields to be removed per St. Charles County requirements.
- Developer will meet the requirements of the Tree Preservation Ordinance in accordance with the approved Final Area Plan.
- City approval of the Construction site plans does not mean that single family dwelling units can be constructed on the lots without meeting the building setbacks as required by the Zoning Code.
- Driveway locations shall not interfere with the sidewalk handicap ramps.
- Sidewalks, curb ramps, ramp, and accessible parking spaces shall be constructed in accordance with the current approved American with Disabilities Act Accessibility Guidelines" (ADAAG) along with the required grades, construction materials, specification and signage. If any conflict occurs between the above information and the plans, the ADAAG guidelines shall take precedence and the contractor prior to any construction shall notify the Project Engineer.
- All proposed playgrounds areas and pavilions will need a separate permit from the Building Division.
- All utilities shall be located underground.
- All sign posts, backs, and bracket arms shall be painted black using Corboline Rustbond Penetrating Sealer SG and Corboline 133 HB (or equivalent as approved by the City or MoDOT).
- Prior to the issuance of building permits for more than 30% of the total units, building permits for all recreational amenities shall be pulled and prior to the issuance of building permits for 40% of the total units all recreational amenities shall be open for use.

ISSUE	REMARKS/DATE
1	05-14-03 1st Submittal
2	06-24-03 City of O'Fallon Comments
3	07-15-03 City of O'Fallon Comments

PREPARED FOR:
McBride & Son Homes, Inc.
#1 McBride & Son Center Drive
Chesterfield, Missouri 63005
(636) 637-2000

THE STERLING CO.
ENGINEERS & SURVEYORS
5656 NEW BAUMGARTNER ROAD
ST. LOUIS, MISSOURI 63112
(314) 487-0440 FAX 487-8844
E-Mail: Sterling@sterling-eng.com

DRAWN: [] DESIGNED: [] CHECKED: []

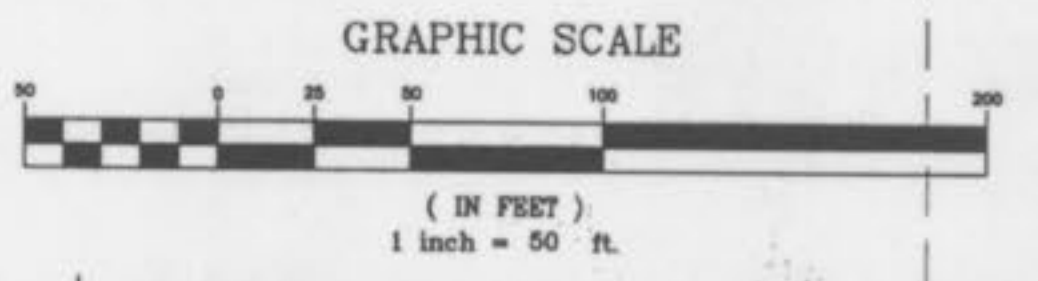
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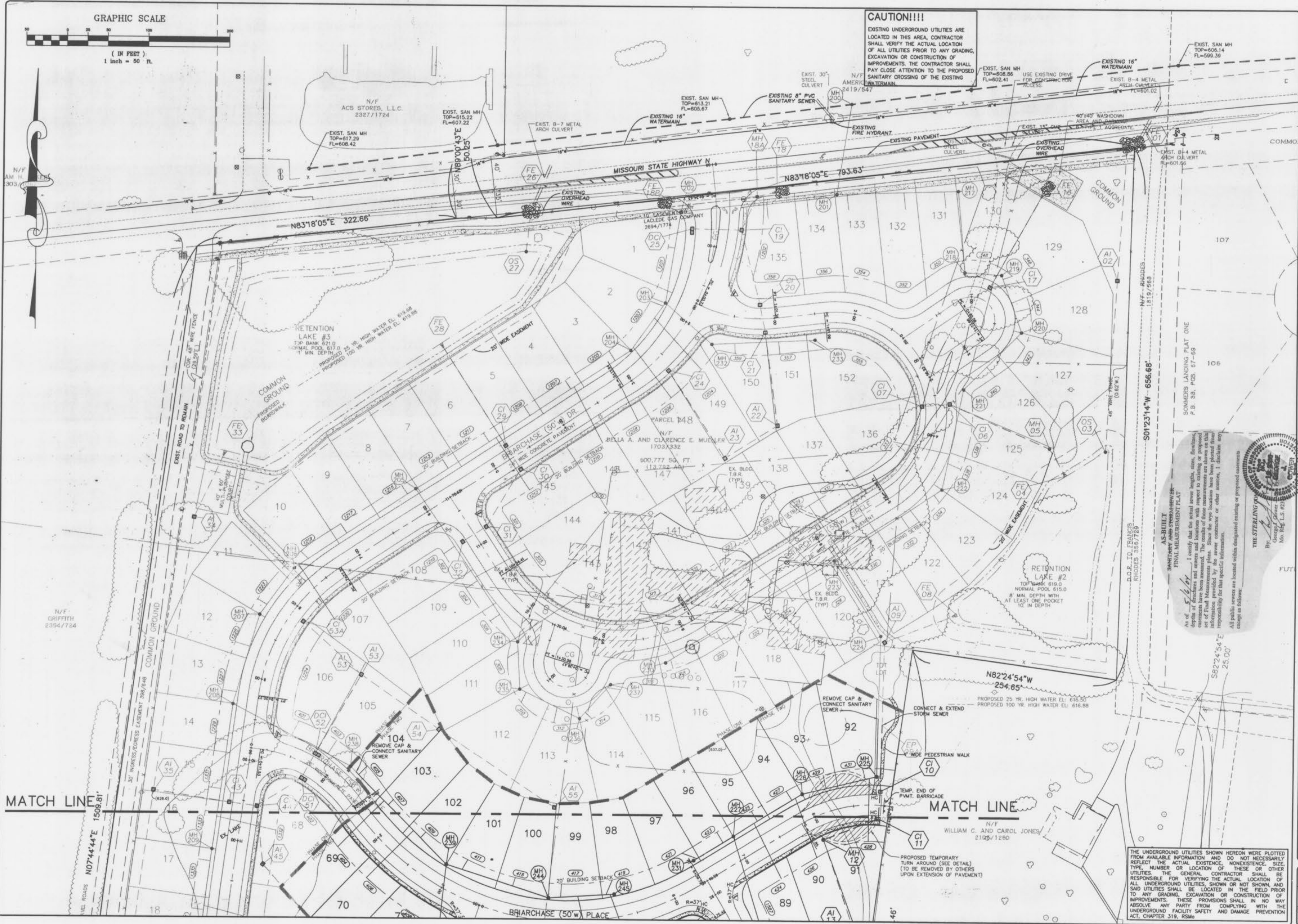
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M.S.D.		SHEET
1		OF 14

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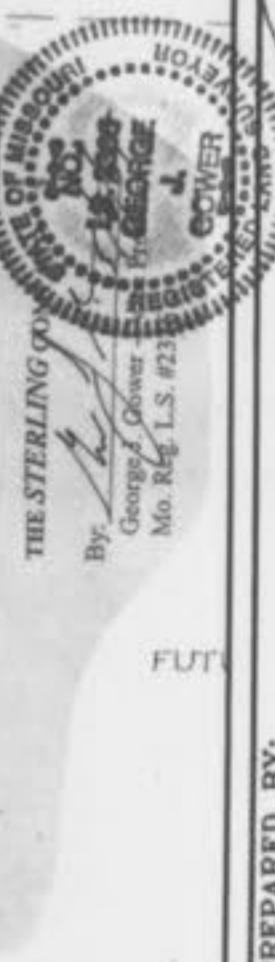
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CAUTION!!!!
EXISTING UNDERGROUND UTILITIES ARE LOCATED IN THIS AREA, CONTRACTOR SHALL VERIFY THE ACTUAL LOCATION OF ALL UTILITIES PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THE CONTRACTOR SHALL PAY CLOSE ATTENTION TO THE PROPOSED SANITARY CROSSING OF THE EXISTING WATERMAIN.



AS-BUILT SANITARY AND STORM SEWER FINAL MEASUREMENT PLAT
I certify that the actual sewer lengths, sizes, elevations, depths of structures and manholes and the results of all other measurements have been measured. The results of these measurements are shown on this plat of Final Measurements. Since the true locations have been measured, I disclaim any responsibility for any other information.
All public sewers are located within designated existing or proposed easements except as follows:
D.O.F. TO FRANCIS RHODES 3567725



ISSUE	REMARKS/DATE
1	05-14-03 1st Submittal
2	05-24-03 City of OFallon Comments

PREPARED FOR:
McBride & Son Homes, Inc.
#1 McBride & Son Center Drive
Chesterfield, Missouri 63005
(636) 537-2000

PREPARED BY:
THE STERLING CO.
ENGINEERS & SURVEYORS
5055 NEW BAUMGARTNER ROAD
ST. LOUIS, MISSOURI 63129
(314) 467-0440 FAX 467-8944
E-Mail: Sterling@sterling-eng-survey.com

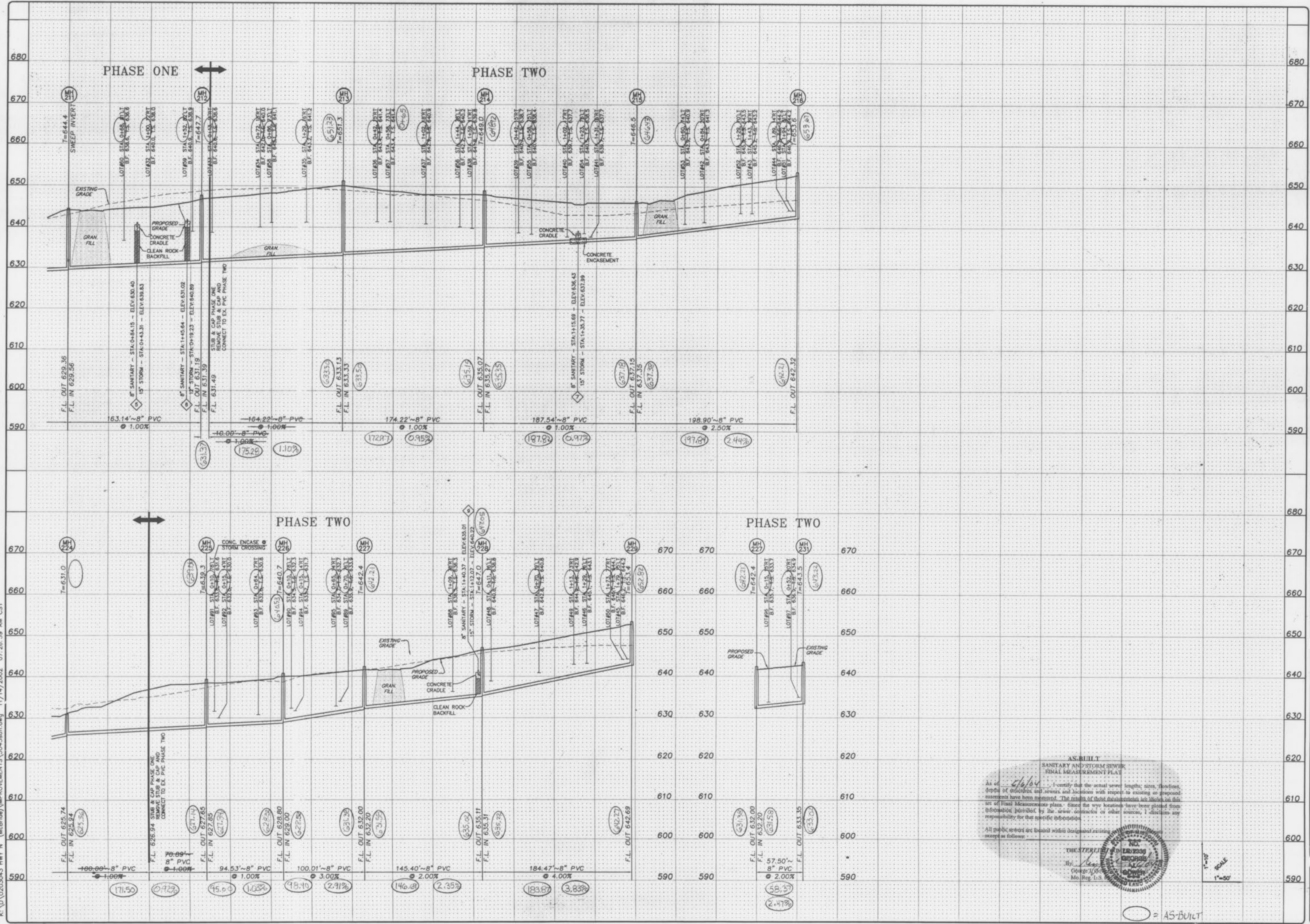
DRAWN: DESIGNED: CHECKED:
BRIARCHASE PHASE TWO
SHEET TITLE: SITE PLAN

NO. 02 03 043
M.S.D. SHEET
P# 4
OF 14

THE UNDERGROUND UTILITIES SHOWN HEREON WERE PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NONEXISTENCE, SIZE, TYPE, NUMBER OR LOCATION OF THESE OR OTHER UTILITIES. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND UTILITIES SHOWN OR NOT SHOWN AND SAID UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319, RSMo

BASE MAP

K:\D\202003\HWY N (McBride)\IMPROVEMENTS\3043sew.dwg 11/14/2002 07:26:39 AM CST



AS-BUILT
 SANITARY AND STORM SEWER
 RINAL MEASUREMENT PLAT

As of 11/14/02, I certify that the actual sewer lengths, sizes, flowlines, depths of inverts and manholes and locations with respect to existing or proposed easements have been measured. The results of these measurements are shown on this set of final measurements plans. Since the very locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that specific information.

All public records are located within designated existing records as follows:

THE STERLING CO.
 ENGINEERS & SURVEYORS
 5055 NEW BAUMGARTNER ROAD
 ST. LOUIS, MISSOURI 63129-8944
 E-Mail: Sterling@sterling-eng-sur.com

By: *[Signature]*
 George J. O'Connell
 Missouri Registered Professional Engineer
 No. 100,000,000

1"=10'
 1"=50'

○ = AS-BUILT

ISSUE	REMARKS/DATE
1	05-14-03 1st Submittal
2	06-24-03 City of O'Fallon Comments

PREPARED FOR:
McBride & Son Homes, Inc.
 #1 McBride & Son Center Drive
 Chesterfield, Missouri 63005
 (636) 537-2000

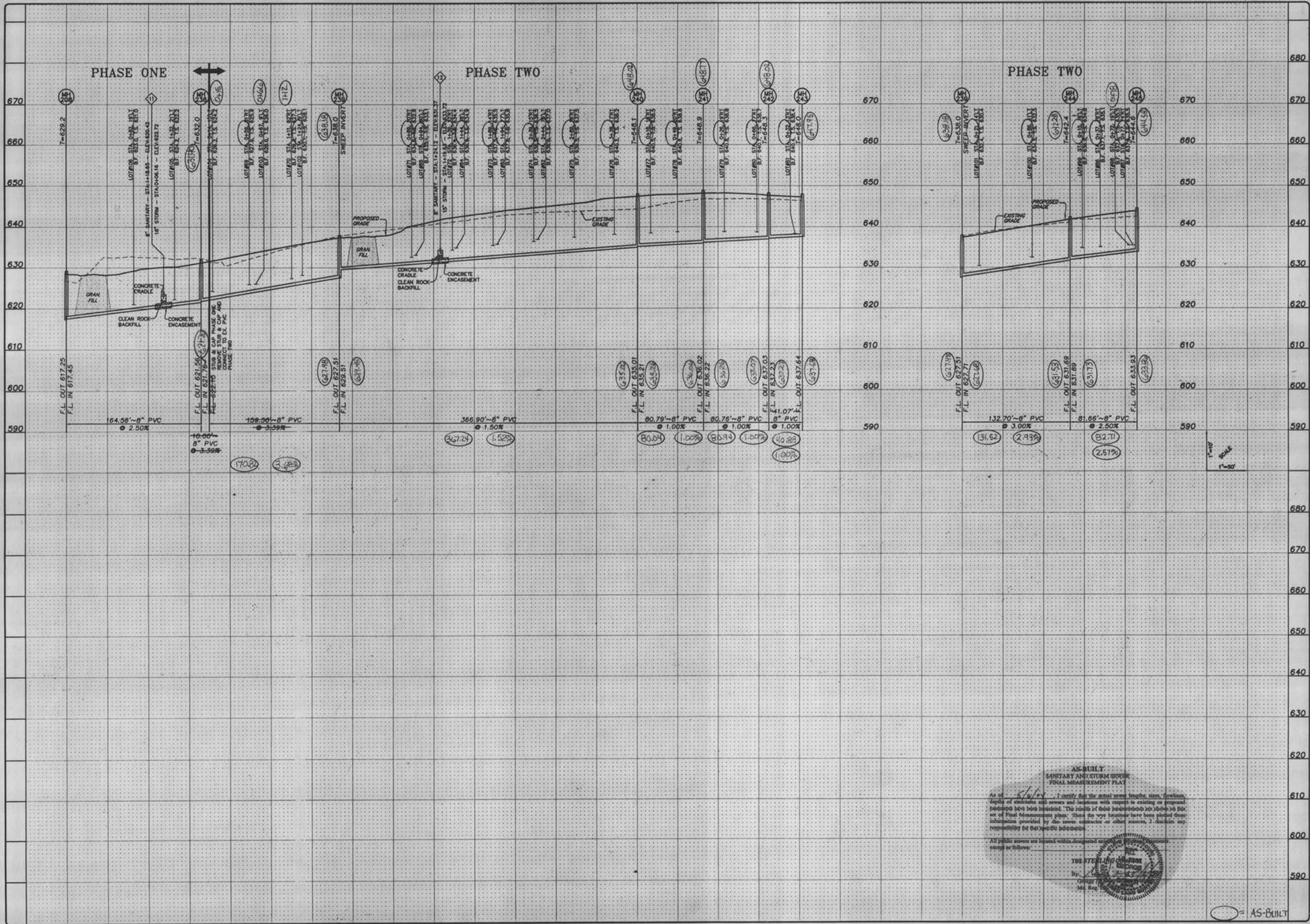
PREPARED BY:
THE STERLING CO.
 ENGINEERS & SURVEYORS
 5055 NEW BAUMGARTNER ROAD
 ST. LOUIS, MISSOURI 63129-8944
 E-Mail: Sterling@sterling-eng-sur.com

DRAWN: _____
 DESIGNED: _____
 CHECKED: _____

PROJECT:
**BRIARCHASE
 PHASE TWO**

SHEET TITLE:
 SANITARY SEWER PROFILES

No.	02 03 043
M.S.D.	
P#	7
SHEET LOCATION	
OF	14



AS-BUILT
 SANITARY AND STORM SEWER
 FINAL MEASUREMENT PLAT

I, *George T. Sterling*, certify that the actual sewer line, size, location, depth of structures and manholes with respect to existing or proposed structures have been measured. The results of these measurements are shown on this set of Final Measurements plan. Since the pipe locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that information.

All public sewers are located within designated easements as shown on the plan.

THE STEELING CO.
 ENGINEERS & SURVEYORS
 5055 NEW BAUMGARTNER ROAD
 ST. LOUIS, MISSOURI 63129
 (314) 487-0440 FAX 487-8944
 E-Mail: Sterling@sterling-eng-sur.com

ISSUE	REVISION/DATE
1	06-14-03 1st Submittal
2	06-24-03 City of OFallon Comments

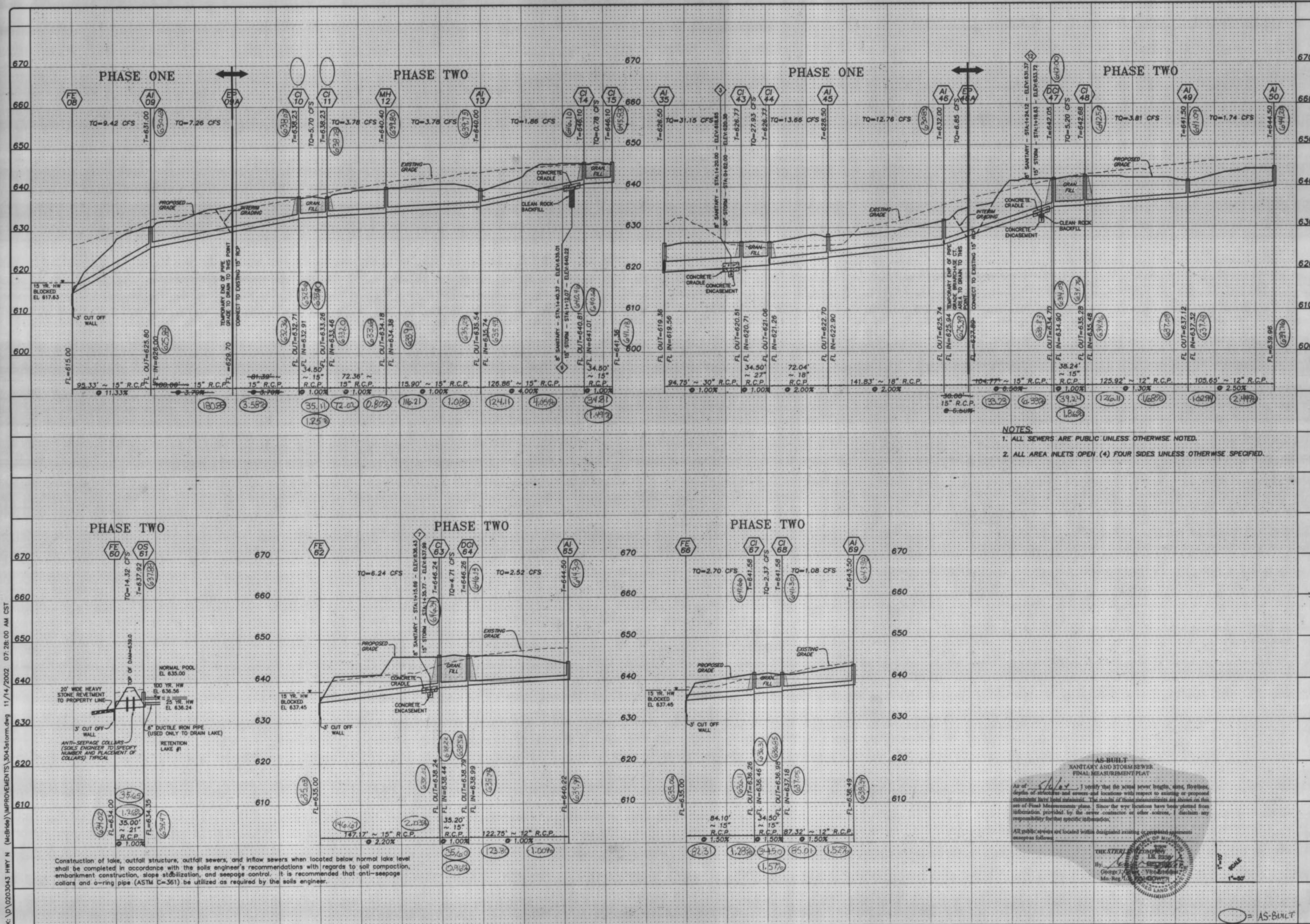
PREPARED FOR:
McBride & Son Homes, Inc.
 #1 McBride & Son Center Drive
 Chesterfield, Missouri 63005
 (636) 537-2000

THE **STERLING** CO.
 ENGINEERS & SURVEYORS
 5055 NEW BAUMGARTNER ROAD
 ST. LOUIS, MISSOURI 63129
 (314) 487-0440 FAX 487-8944
 E-Mail: Sterling@sterling-eng-sur.com

PROJECT:	BRIARCHASE PHASE TWO	
SHEET TITLE:	SANITARY SEWER PROFILES	
NO.	02	03 043
M.S.D.	SHEET 8	
DATE:	14	

AS-BUILT
 BASE MAP

K:\D\0203043 HWY N (McBride)\IMPROVEMENTS\3043storm.dwg 11/14/2002 07:28:00 AM CST



NOTES:
 1. ALL SEWERS ARE PUBLIC UNLESS OTHERWISE NOTED.
 2. ALL AREA INLETS OPEN (4) FOUR SIDES UNLESS OTHERWISE SPECIFIED.

Construction of lake, outfall structure, outfall sewers, and inflow sewers when located below normal lake level shall be completed in accordance with the soils engineer's recommendations with regards to soil compaction, embankment construction, slope stabilization, and seepage control. It is recommended that anti-seepage collars and o-ring pipe (ASTM C-361) be utilized as required by the soils engineer.

AS-BUILT
 SANITARY AND STORM SEWER
 FINAL MEASUREMENT PLAT
 I, *[Signature]*, certify that the actual sewer lengths, depths, flowlines, depths of structures and locations with respect to existing or proposed structures have been measured. The results of these measurements are shown on this set of Final Measurements plans. Since the eye locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that specific information.
 All public streets are located within designated existing or proposed easements except as follows:

THE STERLING CO.
 ENGINEERS & SURVEYORS
 505 S. MAIN ST.
 ST. LOUIS, MISSOURI 63102
 (314) 487-0440 FAX 487-8944
 E-Mail: Sterling@sterling-eng-sur.com

ISSUE	REMARKS/DATE
1	05-14-03 1st Submittal
2	08-24-03 City of O'Fallon Comments

PREPARED FOR:
McBride & Son Homes, Inc.
 #1 McBride & Son Center Drive
 Chesterfield, Missouri 63005
 (636) 537-2000

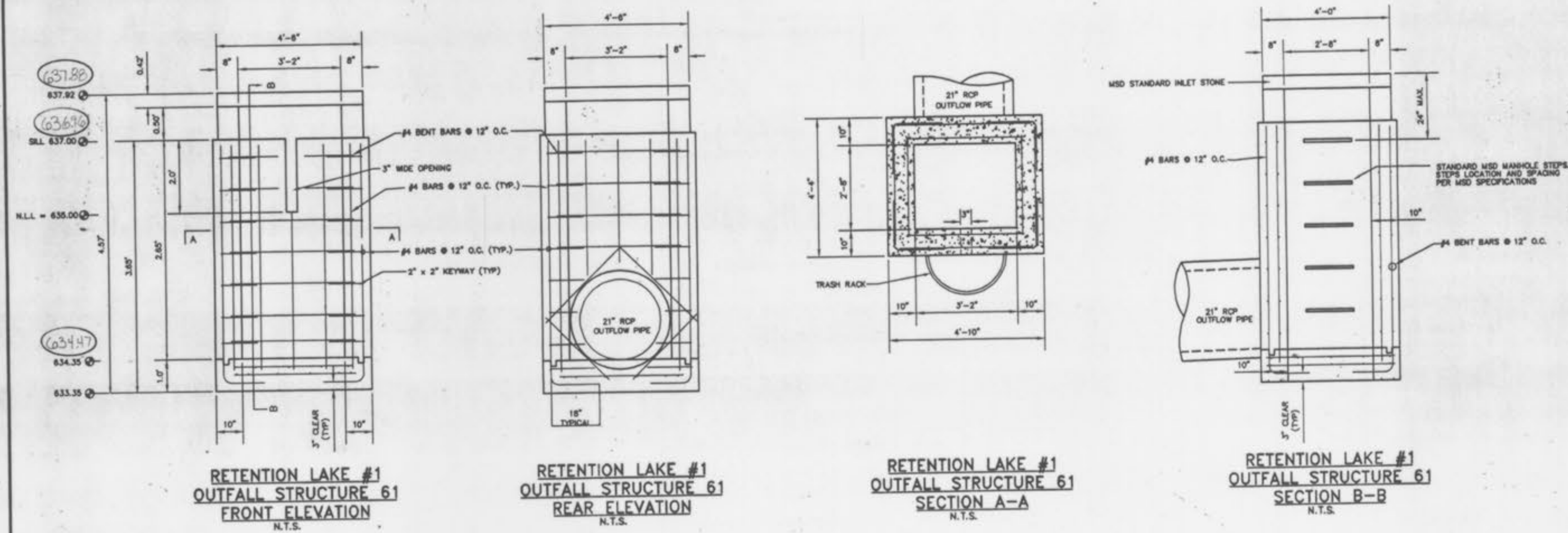
PREPARED BY:
THE STERLING CO.
 ENGINEERS & SURVEYORS
 505 S. MAIN ST.
 ST. LOUIS, MISSOURI 63102
 (314) 487-0440 FAX 487-8944
 E-Mail: Sterling@sterling-eng-sur.com

PROJECT: **BRIARCHASE PHASE TWO**
 SHEET TITLE: **STORM SEWER PROFILES**

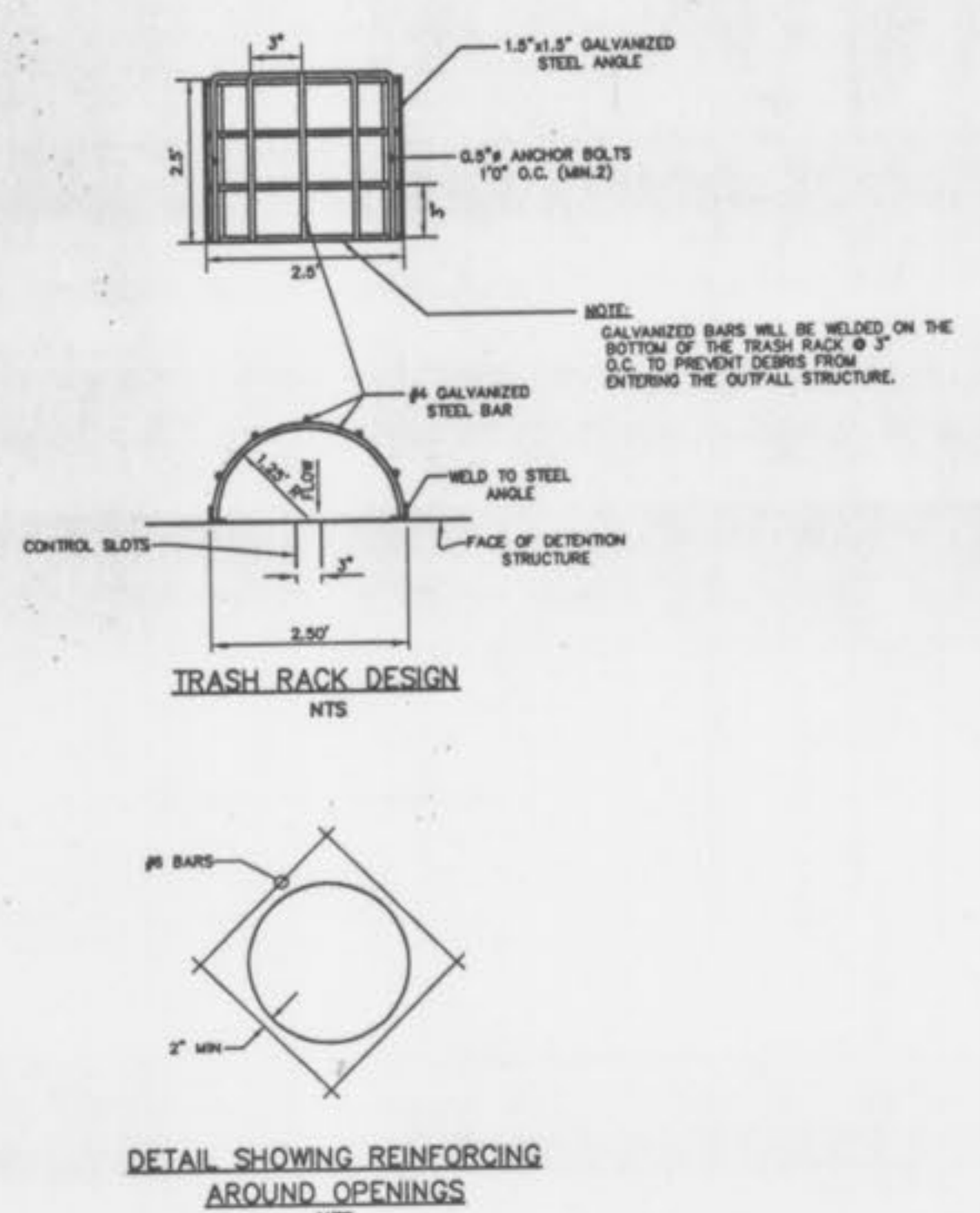
NO. 02 03 043
M.S.D. P# 9
SHEET 9 OF 14

BASE MAP

Drawing name: K:\D\0203043 HWY N (McBride)\IMPROVEMENTS 02-26-03\3043DETSTRUC.dwg Plotted on: Jun 24, 2003 - 8:40am - Plotted by: jueltehenhaus



RETENTION LAKE #1 OS 61
 2 YEAR, 20 MIN. STORM HIGH WATER = 635.65
 15 YEAR, 20 MIN. STORM HIGH WATER = 636.02
 25 YEAR, 20 MIN. STORM HIGH WATER = 636.24
 100 YEAR, 20 MIN. STORM HIGH WATER = 636.56
 2 YEAR, 20 MIN. STORM HIGH WATER BLOCKED LOW FLOW = 637.30
 15 YEAR, 20 MIN. STORM HIGH WATER BLOCKED LOW FLOW = 637.45
 25 YEAR, 20 MIN. STORM HIGH WATER BLOCKED LOW FLOW = 637.53
 100 YEAR, 20 MIN. STORM HIGH WATER BLOCKED LOW FLOW = 637.66



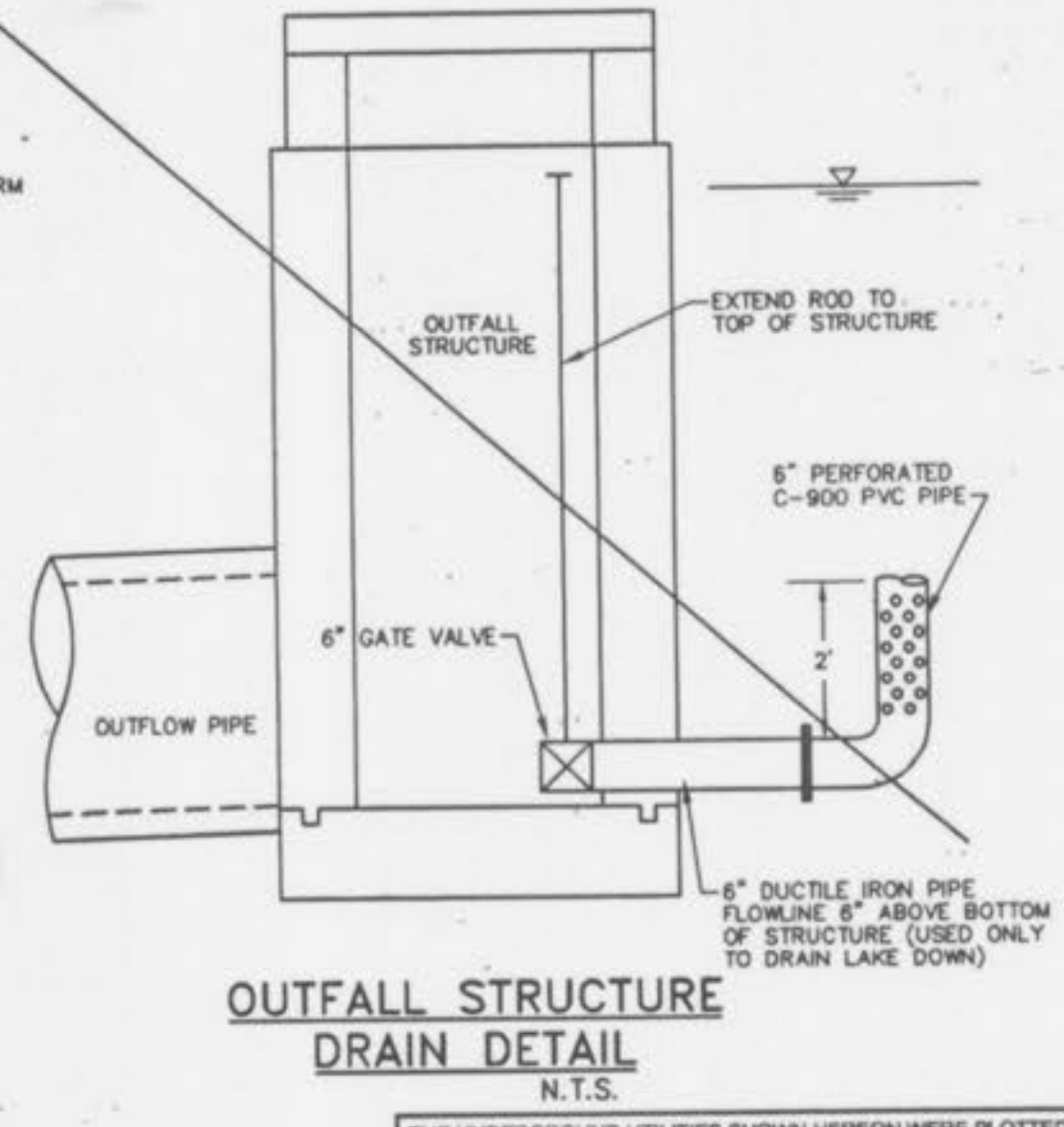
- CONSTRUCTION NOTES:**
- Concrete for the structure shall be "air entrained" and contain at least 6 sack Class "A" Portland Cement per cubic yard. The concrete shall be placed at a slump of 4 inches ±1/2 inch. The concrete shall be proportioned and transported in accordance with ASTM C-94.
 - Reinforcing steel shall conform to ASTM C-615-60 with deformations conforming to ASTM A-305 and shall have a minimum cover of 2 inches except for 3 inches where concrete is poured against earth.
 - Laps and/or splices in reinforcing steel shall be a minimum of 30 bar diameters.
 - Keyed joints shown are to be 2-inch by 2-inch keyed construction joints.
 - Fy = 60,000 psi.
 - Fc = 3,500 psi.
 - All exposed edges are to have a 3/4-inch Chamfer.
 - Contractor to provide for bypass of stormwater during construction of structure.
 - Soil density tests shall be obtained by the soils engineer at selected intervals to insure compliance with soils specifications.
 - All soil specifications shall be directed by soils engineer.
 - 2" clear (typ) to closest rebar to concrete surface.

STORM SEWER HYDRAULICS

THE STERLING COMPANY Date: 11/14/02 Ver 1.33
 Prepared by: R.A. Briarchase Checked by: D.H. 1
 Job No: 3043 Sheet No: 1

Upper Str. Type	Str. Number	Len. in	Area in ²	P.I. c.f.s.	D in	Total Q c.f.s.	Pipe Size in	Const. in	V in	Vh in	Q x Vh	Hyd. Grade	Flow Line Elevation Upper	Top of Structure Elevation Lower	Free Board	Hydraulic Loss	Frict. Loss	Curve Loss	Junc. Loss	Entr. Angle	Turn Loss	Capacity C.F.S.	Normal Depth Ft.			
T	69	68	87.32	1.08	1.08	12	1.50X	1.38	0.03	0.03	0.09X	638.49	637.18	643.50	641.58	4.68	638.82	638.18	0.08	0.06	0.03	5	0.00	4.36	0.25	0.33
CI	68	67	34.5	1.29	2.37	15	1.51X	1.93	0.06	0.14	0.13X	636.98	636.46	641.58	641.58	3.40	637.76	637.71	0.05	0.19	0.16	10	0.02	7.93	0.30	0.46
CI	67	66	84.1	0.33	2.70	15	1.50X	2.20	0.08	0.20	0.17X	636.26	635.00	641.58	3.87	637.60	637.45	0.15	0.30	0.30	10	0.03	7.91	0.34	0.50	
T	65	64	122.75	2.52	2.52	12	1.00X	3.21	0.16	0.40	0.50X	640.22	638.99	644.50	646.26	3.66	640.84	639.99	0.61	0.19	0.16	10	0.02	3.57	0.71	0.62
DCI	64	63	35.2	2.19	4.71	15	1.00X	3.84	0.23	1.08	0.53X	638.79	638.44	646.26	646.24	6.27	639.88	639.69	0.19	0.30	0.30	10	0.03	6.46	0.73	0.79
CI	63	62	147.17	1.53	6.24	15	2.20X	5.08	0.40	2.51	0.93X	638.24	635.00	646.24	6.55	638.97	637.45	1.37	0.23	0.23	35	0.32	9.58	0.65	0.73	
T	61	60	35	14.32	14.32	21	1.00X	5.95	0.55	7.88	0.82X	634.35	634.00	637.92	1.88	636.04	635.75	0.29	0.55	0.55	15	0.85	15.85	0.90	1.30	
T	50	49	105.65	1.74	1.74	12	2.50X	2.22	0.08	0.13	0.24X	639.96	637.38	644.50	641.50	4.16	640.34	638.32	0.25	0.44	0.08	65	0.04	5.63	0.31	0.38
AI	49	48	125.92	2.07	3.81	12	1.30X	4.85	0.37	1.39	1.14X	637.12	635.49	641.50	642.68	635.74	646.10	640.00	0.00	0.01	0.01	25	0.11	4.07	0.94	0.76
CI	48	47	38.24	1.39	5.20	15	0.99X	4.24	0.28	1.45	0.65X	635.28	634.90	642.68	642.05	6.20	636.44	636.20	0.25	0.36	0.36	25	0.08	6.44	0.81	0.85
DCI	47	46	134.77	1.65	6.85	15	6.50X	5.58	0.48	3.31	1.12X	634.70	625.94	642.05	632.00	5.85	635.25	629.40	1.52	0.67	0.67	40	0.31	16.47	0.42	0.55
AI	46	45	141.83	3.09	12.76	18	2.00X	7.22	0.81	10.33	1.48X	625.74	622.90	632.00	628.50	6.00	628.42	626.33	2.09	0.23	0.23	35	0.32	14.86	0.86	1.07
CI	45	44	72.04	0.90	13.66	18	2.00X	7.73	0.93	12.67	1.69X	622.70	621.26	628.50	626.77	2.17	625.78	624.56	1.22	0.19	0.19	75	0.74	14.85	0.92	1.13
CI	44	43	34.5	2.19	27.93	27	1.01X	7.02	0.77	21.40	0.81X	621.06	620.71	626.77	626.77	2.21	623.63	623.35	0.28	0.27	0.27	31	1.19	31.19	0.90	1.64
CI	43	35	94.75	3.22	31.15	30	1.00X	6.35	0.63	19.48	0.58X	620.51	619.56	626.77	626.50	3.42	623.35	622.80	0.55	0.66	0.66	90	0.44	41.07	0.76	1.63
T	15	14	34.5	0.78	0.78	15	1.00X	0.64	0.01	0.00	0.01X	641.36	641.01	646.10	646.10	3.83	642.27	642.26	0.01	0.04	0.01	95	0.02	12.91	0.14	0.31
CI	14	13	126.86	1.08	1.86	15	4.00X	1.52	0.04	0.07	0.08X	640.81	635.74	646.10	640.00	3.84	641.12	636.99	0.11	0.17	0.17	90	0.10	6.46	0.58	0.68
AI	13	12	115.9	1.92	3.78	15	1.00X	3.08	0.15	0.56	0.34X	635.54	634.38	640.00	640.00	3.01	636.22	635.63	0.40	0.32	0.32	65	0.08	6.44	0.59	0.69
MH	12	11	72.36	1.92	3.78	15	1.00X	3.08	0.15	0.56	0.34X	634.18	633.46	640.00	638.23	4.77	634.96	634.71	0.25	0.37	0.37	65	0.08	6.47	0.88	0.90
CI	11	10	34.5	1.92	5.70	15	1.00X	4.64	0.33	1.91	0.78X	633.26	632.91	638.23	638.23	3.52	634.45	634.18	0.27	0.66	0.66	70	0.33	12.42	0.58	0.68
CI	10	9	181.39	1.56	7.26	15	3.70X	5.92	0.54	3.95	1.26X	632.71	626.00	638.23	631.00	4.05	633.39	627.57	2.29	0.27	0.27	31	1.19	31.19	0.90	1.64
AI	9	8	95.33	2.16	9.42	15	11.33X	7.68	0.91	8.62	2.13X	625.80	615.00	631.00	615.00	3.33	626.38	617.63	2.03	0.66	0.66	70	0.33	21.74	0.43	0.58

NOTE: AI=Area Inlet, M=Manhole, T=Terminal Structure, CI=Curb Inlet, DCI=Double Curb Inlet, SCI=Skewed Curb Inlet, TP=Tangent Point, EP=End of Pipe, OS=Outfall Structure
 n=0.013 For RCP, 0.024 For CMP. For Drainage Areas, P.I. & Bypass, See Drainage Area Map.



THE UNDERGROUND UTILITIES SHOWN HEREON WERE PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NONEXISTENCE, SIZE, TYPE, NUMBER OR LOCATION OF THESE OR OTHER UTILITIES. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, AND SAID UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 318, RSMO.

ISSUE REMARKS/DATE
 1 05-14-03 1st Submittal
 2 08-24-03 City of Ottumwa Comments

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PROJECT: **BRIARCHASE PHASE TWO**

DRAWN: DESIGNED: CHECKED:

SHEET TITLE: **HYDRAULICS & OUTFALL DETAILS**

NO. 02 03 043
 M.S.D. SHEET
 P# 12
 OF 14

BASE MAP