



ANTI-SEEP COLLAR DESIGN

Use 100 gr/30 minute H.W. Elev. = 486.44 ft,
Flowline of pipe outflow = 479.12 ft.

Solution: Determine the length of pipe within the saturated zone of the embankment.

$$L_s = y(z+4) \left[1 + \frac{\text{Pipe slope}}{0.25 - \text{Pipe slope}} \right]$$

$$L_s = 7.32'(3+4) \left[1 + \frac{0.01}{0.25 - 0.01} \right]$$

$$L_s = 53.38 \text{ feet}$$

Use Table 1 - to use to find number and size of collars.

Pipe diameter = 2.50 feet

N = 2 collars

Size = 6.30' x 6.30'

Design 2 anti-seep collars (6.30' x 6.30')
Place both of the anti-seep collars within the saturation zone as shown on the profiles.

ANTI-SEEP COLLAR DESIGN

This procedure provides the anti-seep collar dimensions for only temporary sediment basins to increase the seepage length by 15% for various pipe slopes, embankment slopes and riser heights.

The first step in designing anti-seep collars is to determine the length of pipe within the saturated zone of the embankment. This can be done graphically or by the following equation, assuming that the upstream slope of the embankment intersects the invert of the pipe at its upstream end. (See embankment-invert intersection on the drawing below:

$$L_s = y (z + 4) \left[1 + \frac{\text{pipe slope}}{0.25\text{-pipe slope}} \right]$$

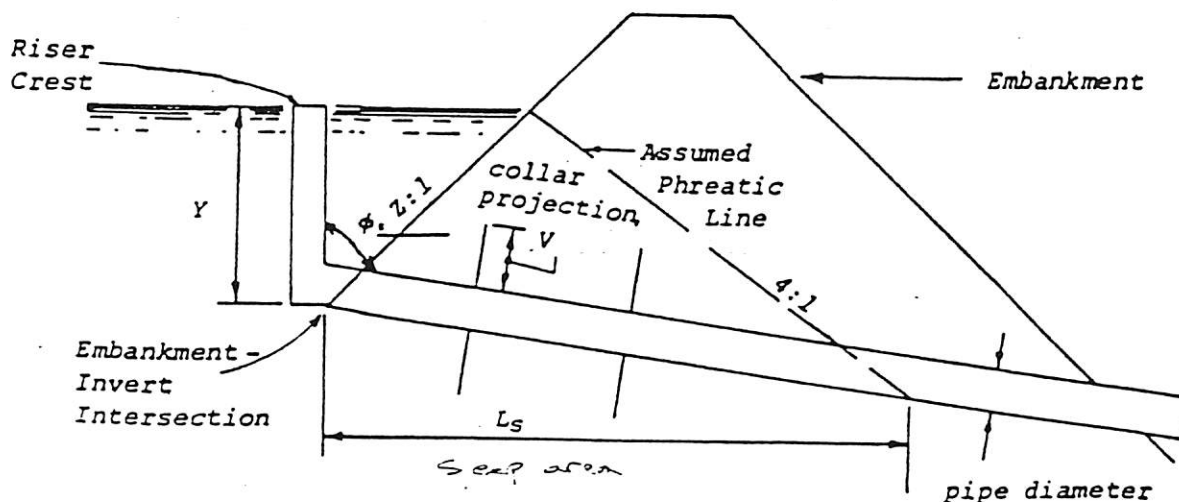
where: L_s = length of pipe in the saturated zone (ft.)

y = distance in feet from upstream invert of pipe to highest normal water level expected to occur during the life of the structure, usually the top of the riser.

z = slope of upstream embankment as a ratio of z ft. horizontal to one ft. vertical.

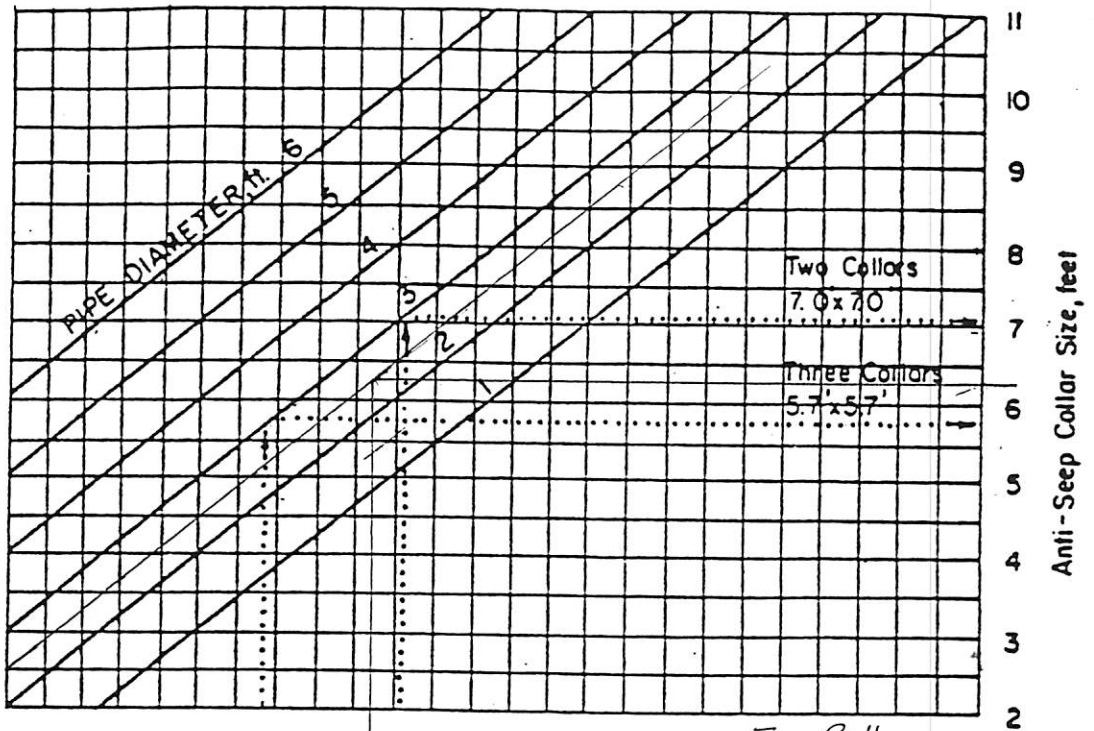
pipe slope = slope of pipe in feet per foot.

This procedure is based on the approximation of the phreatic line as shown in the drawing below:



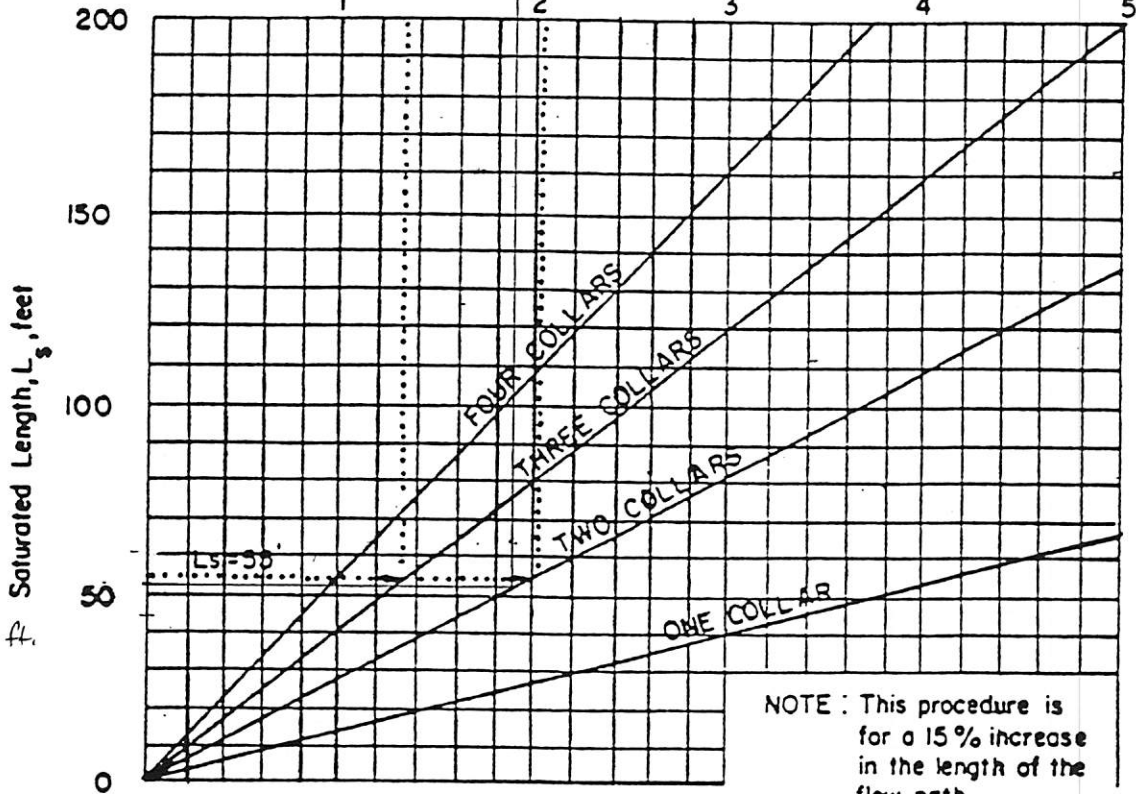
ANTI-SEEP COLLAR DESIGN

$D = 2.50 \text{ ft.}$



COLLAR PROJECTION, V, FEET

Two Collars
6.3' x 6.3'



$L_s = 53.39 \text{ ft.}$

10:39 AM 3/9/98

Channel Calculator

Given Input Data:

| | |
|--------------------|---------------|
| Shape | Advanced |
| Solving for | Depth of Flow |
| Flowrate | 4.0000 cfs |
| Slope | 0.0100 ft/ft |
| Manning's n | 0.0500 |
| Height | 12.0000 in |
| Bottom width | 0.0000 in |
| Left radius | 0.0000 in |
| Right radius | 0.0000 in |
| Left slope | 3.0000 ft/ft |
| Right slope | 3.0000 ft/ft |

Computed Results:

| | |
|------------------------|------------|
| Depth | 10.7058 in |
| Velocity | 1.6752 fps |
| Flow area | 2.3878 ft2 |
| Flow perimeter | 67.7091 in |
| Hydraulic radius | 5.0782 in |
| Top width | 64.2345 in |
| Area | 3.0000 ft2 |
| Perimeter | 75.8947 in |
| Percent full | 89.2146 % |

Critical Information

| | |
|---------------------------------|--------------|
| Critical depth | 7.7243 in |
| Critical slope | 0.0570 ft/ft |
| Critical velocity | 3.2179 fps |
| Critical area | 1.2430 ft2 |
| Critical perimeter | 48.8531 in |
| Critical hydraulic radius | 3.6640 in |
| Critical top width | 46.3461 in |
| Specific energy | 0.9358 ft |
| Minimum energy | 0.9655 ft |
| Froude number | 0.4422 |
| Flow condition | Subcritical |

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Weir Calculator

Given Input Data:

| | |
|-------------------|---------------|
| Weir Type | Rectangular |
| Equation | Suppressed |
| Solving for | Depth of Flow |
| Flowrate | 219.9000 cfs |
| Coefficient | 2.6000 |
| Height | 24.0000 in |

Computed Results:

| | |
|---------------------|--------------|
| Depth of Flow | 11.4358 in |
| Full Flow | 668.5648 cfs |
| Velocity | 13.5735 fps |
| Width | 204.0000 in |
| Area | 34.0000 ft2 |
| Perimeter | 252.0000 in |
| Wet Perimeter | 226.8716 in |
| Wet Area | 16.2007 ft2 |
| Percent Full | 47.6491 % |



Weir Calculator

Given Input Data:

| | |
|-------------------|---------------|
| Weir Type | Rectangular |
| Equation | Suppressed |
| Solving for | Depth of Flow |
| Flowrate | 151.0800 cfs |
| Coefficient | 2.6000 |
| Height | 24.0000 in |

Computed Results:

| | |
|---------------------|--------------|
| Depth of Flow | 8.9040 in |
| Full Flow | 668.5648 cfs |
| Velocity | 11.9771 fps |
| Width | 204.0000 in |
| Area | 34.0000 ft2 |
| Perimeter | 252.0000 in |
| Wet Perimeter | 221.8081 in |
| Wet Area | 12.6140 ft2 |
| Percent Full | 37.1001 % |



Weir Calculator

Given Input Data:

| | |
|-------------------|---------------|
| Weir Type | Rectangular |
| Equation | Suppressed |
| Solving for | Depth of Flow |
| Flowrate | 108.5900 cfs |
| Coefficient | 2.6000 |
| Height | 24.0000 in |

Computed Results:

| | |
|---------------------|--------------|
| Depth of Flow | 7.1446 in |
| Full Flow | 668.5648 cfs |
| Velocity | 10.7287 fps |
| Width | 204.0000 in |
| Area | 34.0000 ft2 |
| Perimeter | 252.0000 in |
| Wet Perimeter | 218.2891 in |
| Wet Area | 10.1215 ft2 |
| Percent Full | 29.7690 % |

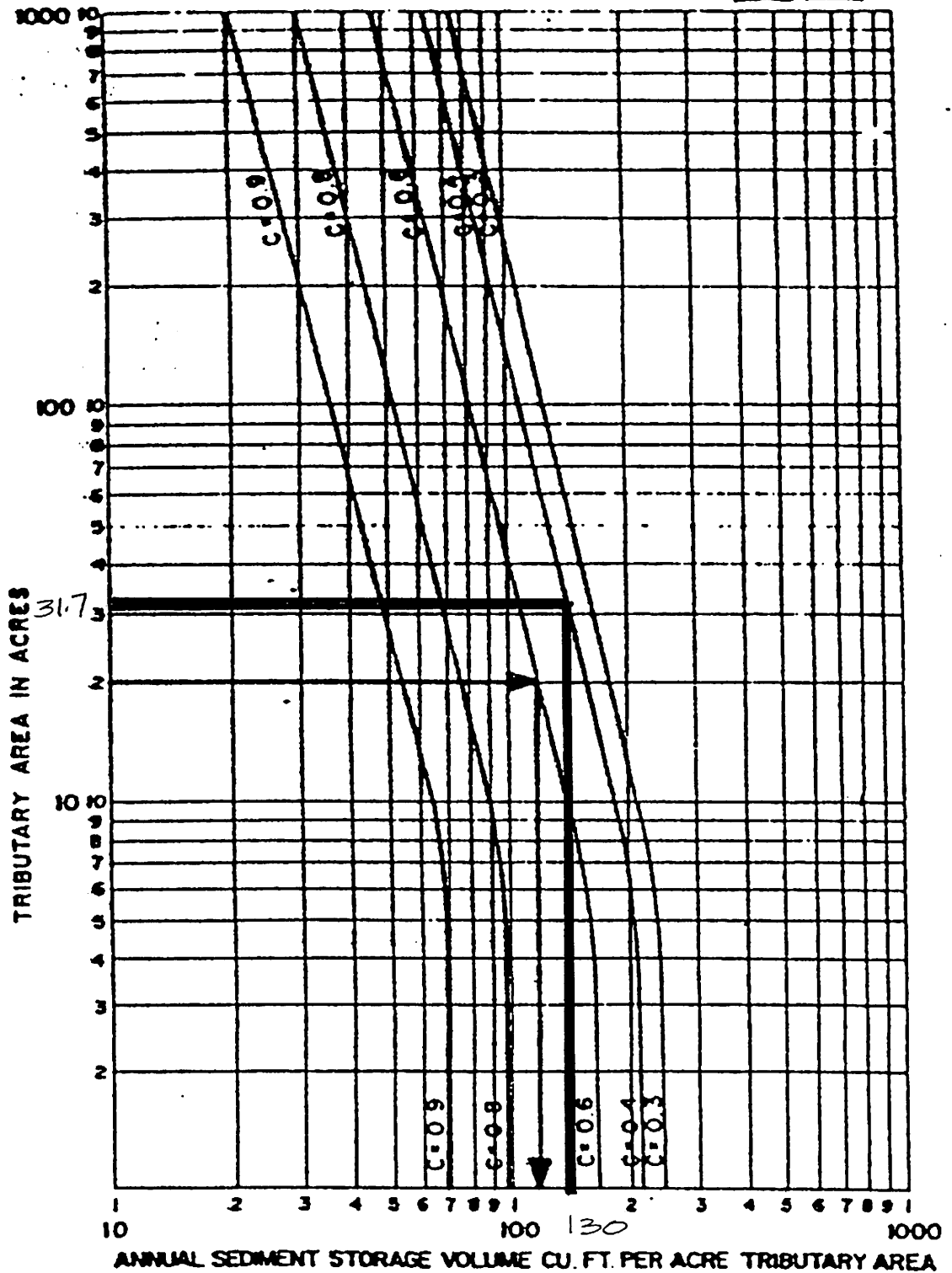
EXAMPLE:

TRIBUTARY AREA = 20 ACRES

RATIONAL METHOD RUNOFF COEFFICIENT "C" = 0.6

SEDIMENT STORAGE = 120 CU. FT. PER ACRE PER YEAR

TOTAL SEDIMENT STORAGE = 120 X 20 = 2400 CU. FT. PER YEAR.



$130 \times 2 = 260$

ANNUAL SEDIMENT STORAGE

FIG. 6



October 29, 1997

Rich Francis
Bax Engineering
1052 South Cloverleaf Drive
St. Peters, MO 63376

RE: (PZ-FP-97-142) - Final Plan
The Knolls - Tract West of Henning Road
Virginia C. Lall
proposed Single Family Residential.

Dear Mr. Francis:

On October 28, 1997, the Planning and Zoning Commission **approved** your request for a Final Plan for the proposed single family residential known as The Knolls located on a Tract west of Henning Road.

The approval is conditional upon the following staff's recommendations being met:

1. The Covenants and Restrictions must state that the ditch and creek may not be altered, or the flow of water impeded in any way.

Note: *Construction Site Plans must be reviewed and approved by Engineering prior to start of construction.*

If you are not aware, any signage to be placed on the property will require a separate permit process via the Planning Department, and a business license will need to be obtained from the Finance Department.

If you have questions about the above, feel free to contact me at 240-2000.

Sincerely,

David S. Woods
Planner I

BMS:

cc: Benny Hedden, City Engineer
Virginia C. Lall (5463 Washeon Road, St. Charles, MO 63301)
Jerry Scheidegger (205 North Fifth Street, Suite 204, St. Charles, MO 63301)

City of O'Fallon, Missouri



January 13, 1998

John Pearson
Bax Engineering Co., INC.
1052 South Cloverleaf Drive
St. Peters, MO 63376-6445

138 South Main Street
O'Fallon, MO 63366
Phone 314-240-2000
Fax 314-978-4144

RE: The Knolls - Project No. 97-9197
Grading Plans

Dear Mr. Pearson:

The grading plans for The Knolls have been reviewed and approved. Approval is contingent upon the following:

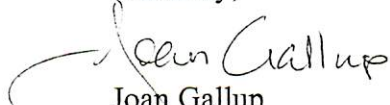
1. Providing any means necessary to prohibit silt from infiltrating the creek
2. Completing enclosed City of O'Fallon Floodplain Development Permit prior to start of construction.

Two stamped "APPROVED" sets are enclosed for your use.

Please make sure the City specifications listed on the grading plan application/checklist are followed. Additional temporary swales, berms and/or silting basins may be required as grading proceeds and planned siltation control is evaluated for effectiveness. Siltation control is to be erected before grading begins in any area. Copies of any required off site easements should be on file before any grading off site. Care should be taken to ensure no soil or mud is tracked onto any pavement from the site. Please notify the Engineering Department at least 48 hours before commencement of grading.

Thank you for your cooperation. If you have any questions, please contact me at 240-5555, Ext. 318.

Sincerely,


Joan Gallup
Engineer III

cc J. Heitkamp, F. Godwin, B. Hedden ^{BH}
Jerry Scheidegger 205 N. Fifth Street Suite 204
St. Charles, Missouri 63301

CITY OF O'FALLON, MISSOURI
APPLICATION
FLOOD PLAIN DEVELOPMENT PERMIT
(Ref. City Ordinance Nos. 1437, 1987 & 2030, 1992 + 2401, 1996)

DATE _____ PERMIT NUMBER _____

NAME OF APPLICANT _____

MAILING ADDRESS _____

TELEPHONE NUMBER (home) _____ (work) _____

PERMIT IS FOR: (check one)

- | | |
|--|---|
| <input type="checkbox"/> New Construction* | <input type="checkbox"/> Other Development |
| <input type="checkbox"/> Substantial Improvement* (Greater than 50% of value) | <input type="checkbox"/> Filling |
| <input type="checkbox"/> Value of Improvement to Building | <input type="checkbox"/> Excavating, Mining |
| <input type="checkbox"/> Addition to Existing Building | <input type="checkbox"/> Grading |
| <input type="checkbox"/> * Elevation Certificate Needed | <input type="checkbox"/> Paving |
| <input type="checkbox"/> Value of Building before Improvement Begins | <input type="checkbox"/> Building, Fencing |
| | <input type="checkbox"/> Drilling |
| | <input type="checkbox"/> Subdivision |

ADDRESS OF DEVELOPMENT _____

(Use lot, tract, or other appropriate description to allow accurate identification) _____

IS SITE IN AN IDENTIFIED FLOOD HAZARD AREA? Map Panel No. _____

- | | |
|--|--------------------------------------|
| <input type="checkbox"/> Yes, Floodway | <input type="checkbox"/> Yes, Zone B |
| <input type="checkbox"/> Yes, Zone A | <input type="checkbox"/> No, Zone C |

ELEVATION OF HUNDRED-YEAR FLOOD _____ FEET ABOVE SEA LEVEL.

ELEVATION OF DEVELOPMENT SITE _____ FEET ABOVE SEA LEVEL.

ELEVATION OF FLOOD PROOFING REQUIREMENT _____ FEET (DIFFERENCE).

IS PROPOSED USE RESIDENTIAL? YES _____ NO _____

Other? _____ Yes, Specify: _____

(Residences must have lowest floor _____ above 100-year flood elevation.

Other buildings must be flood-protected or elevated to that height.)

SUBDIVISION PROPOSALS MUST ATTACH ADDITIONAL INFORMATION:

____ Original site contours, showing existing drainage and watercourses, buildings and other development.

____ Plan for grading, showing new contours, new drainage, altered watercourses, removal of buildings or other development, roads.

____ Limits of flood plain as found on _____ Flood Map (....).

____ Hundred-year flood elevations, as shown on(....)

____ Locations and lowest floor elevations of proposed buildings.

____ Other site data needed by City or County for evaluation, e.g. fire hydrants, sanitary sewerage.

OTHER PERMITS REQUIRED?

____ CORPS OF ENGINEERS (e.g. Section 404, Clean Water Act, for dredging, filling, channel changes, in or beside rivers.)

____ STATE OF MISSOURI (e.g., State Highway Curb Cut; DNR, for NPDES Permit or Section 401, CWA, Water Quality Certification.)

____ LOCAL SPECIAL DISTRICT (e.g., Levee Crossing Permit.)

____ OTHER: _____

ALL PROVISIONS OF THE CITY OF O'FALLON FLOODPLAIN REGULATION ORDINANCE (Nos. 1437 & 2030) SHALL BE COMPLIED WITH.

(Signature of Applicant or Certified Agent)

APPROVAL _____ (Date) _____ (Signature of Authorizing Official)

NAME _____

TITLE _____

City of O'Fallon, Missouri



March 30, 1998

138 South Main Street
O'Fallon, MO 63366
Phone 314-240-2000
Fax 314-978-4144

Mr. Michael Keebler
Bax Engineering
1052 South Cloverleaf Dr.
St. Peters, MO 63376


RE: The Knolls
Improvement Plans
Bax Project No. 97-9197

The improvement plans for The Knolls have been reviewed and are approved.
One (1) set of stamped "APPROVED" plans are enclosed for your use.

Please notify the City of O'Fallon at least 48 hours in advance of the start of construction to facilitate inspection scheduling. Upon completion of the improvements and necessary tests, an engineer shall certify that construction took place according to plan with all changes noted. Please insure that the as-builts show accurately storm sewer locations and elevations. One (1) set of reproducible as-builts should then be submitted along with three (3) copies. With this information, the City of O'Fallon can proceed to accept these improvements.

Thank you for your cooperation in this matter. If you have any questions, please contact this office at 240-5555 ext 318.

Sincerely,


Joan Gallup
Engineer III

cc J. Collard, D. Woods, F. Godwin, J. Heitkamp, B. Hedden ^{Bax}
Jerry Scheidegger 205 N. Fifth Street Suite 204
St. Charles, Mo 63301

January 6, 1998

John Pearson
Bax Engineering Co.
1052 South Cloverleaf Dr.
St. Peters, MO 63376-6445

RE: The Knolls
Grading Plan Comments
Bax Project No. 97-9197

Dear Mr. Pearson:

The proposed grading plans for The Knolls have been reviewed and are approved. The following are comments on the subject site plan:

1. Please note that any modifications to the floodway shall be approved by FEMA or a NO RISE Certificate shall be supplied to the City that demonstrates there are no increases in the base flood elevations.
2. Complete City of O'Fallon Floodplain Development Permit.
3. Coordinate WL of lake between detail sheet and flat plan.
4. Label sedimentation basin.

Thank you for your cooperation. If you have any questions, please contact me at 240-5555, Ext 318.

Sincerely,

Joan Gallup
Engineer III

cc J. Heitkamp, G. Johnson, F. Godwin, B. Hedden