



November 3, 2007

Ashbriar Home Owners Association
6700 N. Meridian Avenue
Oklahoma City, Oklahoma 73116

Re: Drainage & Erosion Control

Dear Members:

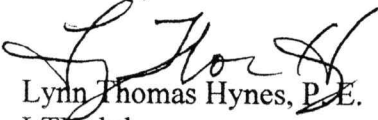
The existing drainage problems on the Ashbriar property result from low lying areas that trap storm waters and have no way to drain other than saturation and evaporation. French Drains are often used to remedy this condition but require manpower and materials to install. Surface drains and drain pipe can also correct the drainage problems and require less manpower and materials and would disrupt less area to install. Please refer to the attached drawing for the proposed placement of surface drains and piping. These items can be purchased and any of the local hardware stores.

The erosion control problems on the Ashbriar property result from two causes:

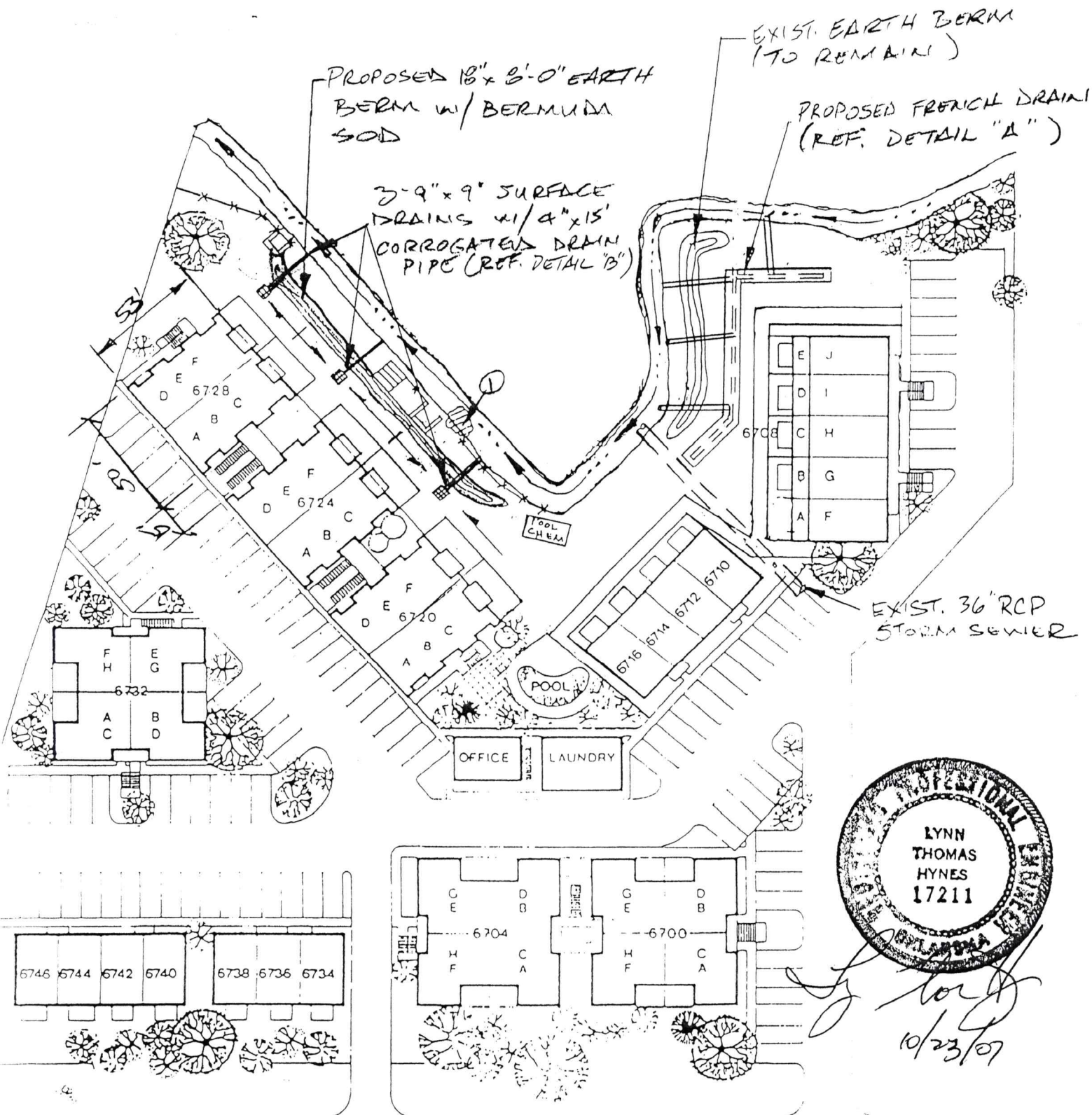
1. Storm waters traveling on the surface that erode the soil as they flow towards the creek. This is a slow but persistent method of erosion and results in the loss of top soil that is required to grow the grass that would reduce the effectiveness of this type of erosion. As vegetation is lost, the velocity of the water flow increases creating the possibility of faster erosion.
2. Storm waters in the creek erode the banks during periods of high level flows due to their velocity, the debris they transport. When these storm waters are redirected by the curves that exist in the creek channel, the velocity near the outer banks increases as does the possibility for damage due to erosion. To reduce the damage it is necessary to protect the banks by installing vegetation or more durable material such as rip rap. This is basically rock or broken concrete that is approximately 12" and larger and is placed on the slopes of the creek channel. Other commercial products have been developed that perform this task better and some consider more aesthetic, but of course, tend to be more expensive.

Please review the attached drawing for the proposed corrective measures and the placement of these items.

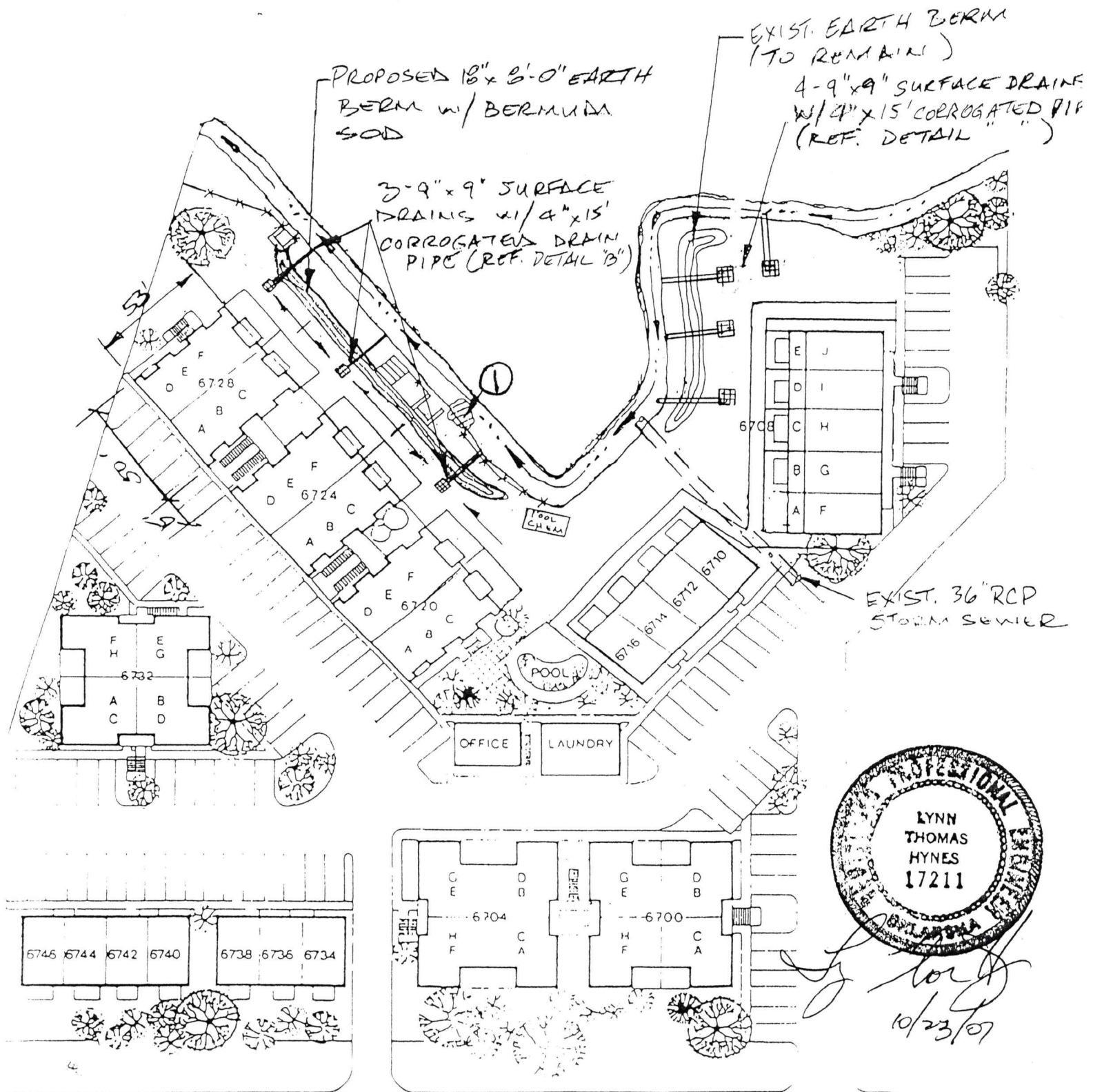
Sincerely,


Lynn Thomas Hynes, P.E.
LTH, Ltd.
Ok CA 3573

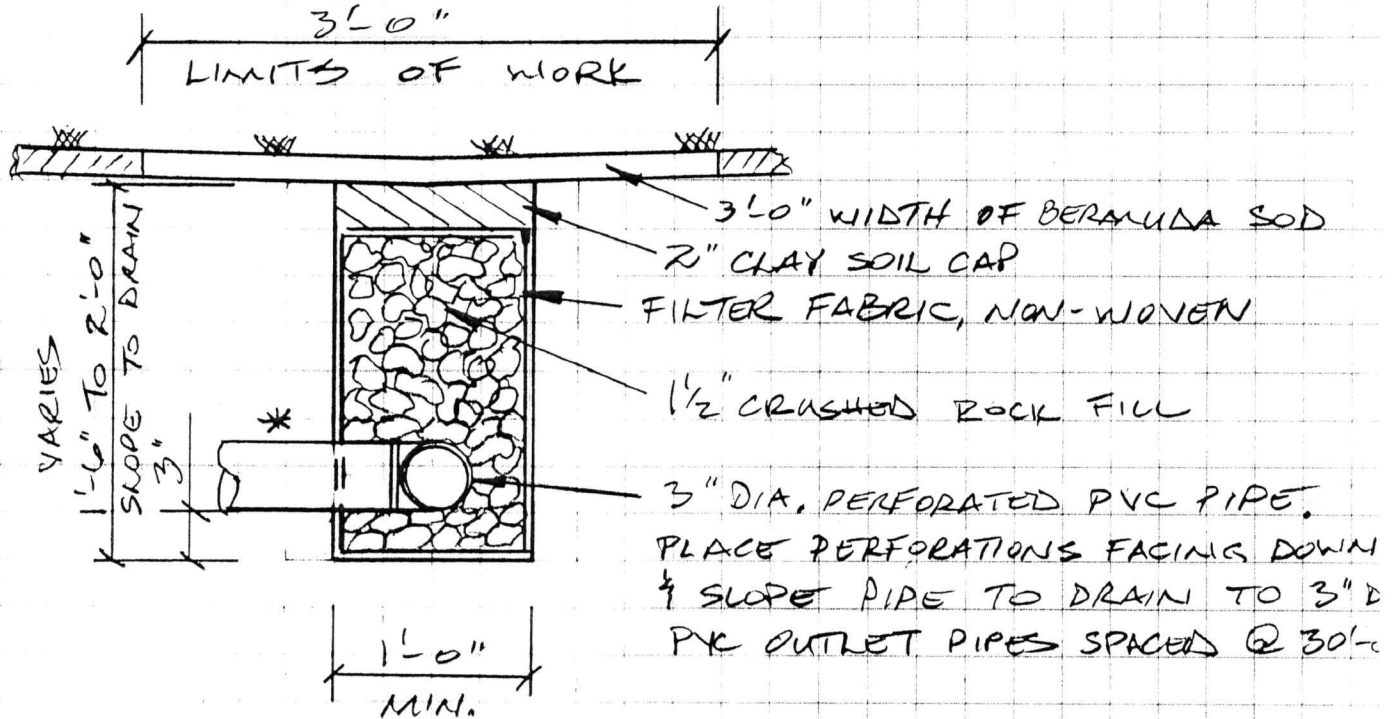
- ① AREA OF CHANNEL SLOPE INSTABILITY. REMOVE LARGE ROCK & DEBRIS UPSTREAM & ADJACENT TO THIS AREA TO REDUCE TURBULENT FLOW CONDITIONS & ASSOCIATED SCOUR. REGRADE CHANNEL SLOPE, ADDING CLAY-RICH SOIL AS REQUIRED. PLACE 18" RIP-RAP ON REGRADED SLOPES & TOP WITH SOIL TO FILL VOIDS & PROMOTE VEGETATION GROWTH.



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PROJECT ASH BRIAR



DETAIL "A" - FRENCH DRAIN

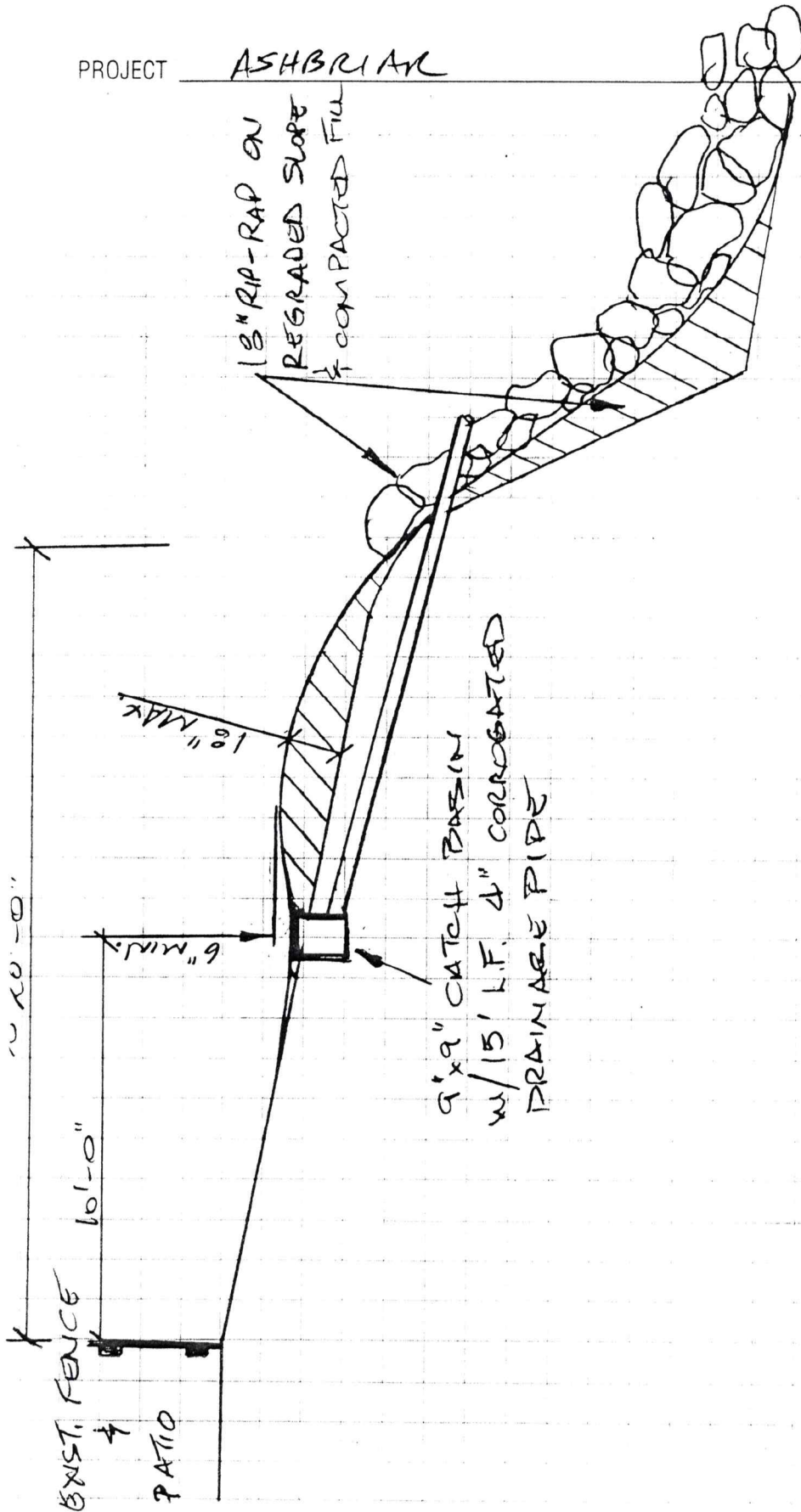
SCALE: 1" = 1'-0"

* INSTALL OUTLET PIPES SO THAT THEY INTERSECT THE CHANNEL AT AN ANGLE WITH THE OUTLET POINTING SLIGHTLY DOWNSTREAM.



Lynn Thomas Hynes
10/23/07

PROJECT ASHBRIAN



DETAIL "B" - TYPICAL SECTION
@ PROPOSED BERM & SLOPE REPAIR

SCALE: 1" = 4'-0"



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 10/23/07

DATE 10/23/07
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• DETERMINING PIPE & GRATE SIZE FOR SURFACE DRAINS

RUNOFF COEF., GRASS: $C = 0.35$ ONE HR RAINFALL MAX. / 100 YRS: $I = 4.25"$ DRAINAGE AREA; $A = 50' \times 50' = 2500 \text{ S.F.}$

$$Q_{ACT} = CIA / 96.23 = (0.35)(4.25)(2500) / 96.23 = \underline{\underline{38.64 \text{ gpm}}}$$

FOR 4" PIPE, $Q_{AU} < 79 \text{ gpm} \Rightarrow Q_{ACT} < Q_{AU} \text{ O.K.}$

$$\underline{\underline{\text{USE 4" PIPE}}} \quad (\$4.02/\text{FT})(100') = \underline{\underline{\$40.20}}$$

FOR GRATE, $Q_{AU} = 45.2 \text{ gpm} \Rightarrow (Area)_{GRATE} = 34.4 \text{ ft}^2$ USE 990 GRATE: 9" x 9", GREEN, $Q_{AU} = 51.75 \text{ gpm}$

$$3 \times \$27.69 = \underline{\underline{\$83.07}}$$

USE 990 CATCH BASIN: 9" x 9" w/ 2 OPENINGS

$$3 \times \$21.43 = \underline{\underline{\$64.29}}$$

USE 1243 UNIVERSAL LOCKING OUTLET

$$3 \times \$5.43 = \underline{\underline{\$16.29}}$$

USE 1206 UNIVERSAL ADAPTER PLUG, 6"

$$3 \times \$4.34 = \underline{\underline{\$13.02}}$$

DRAINAGE ITEMS: $\$216.97$