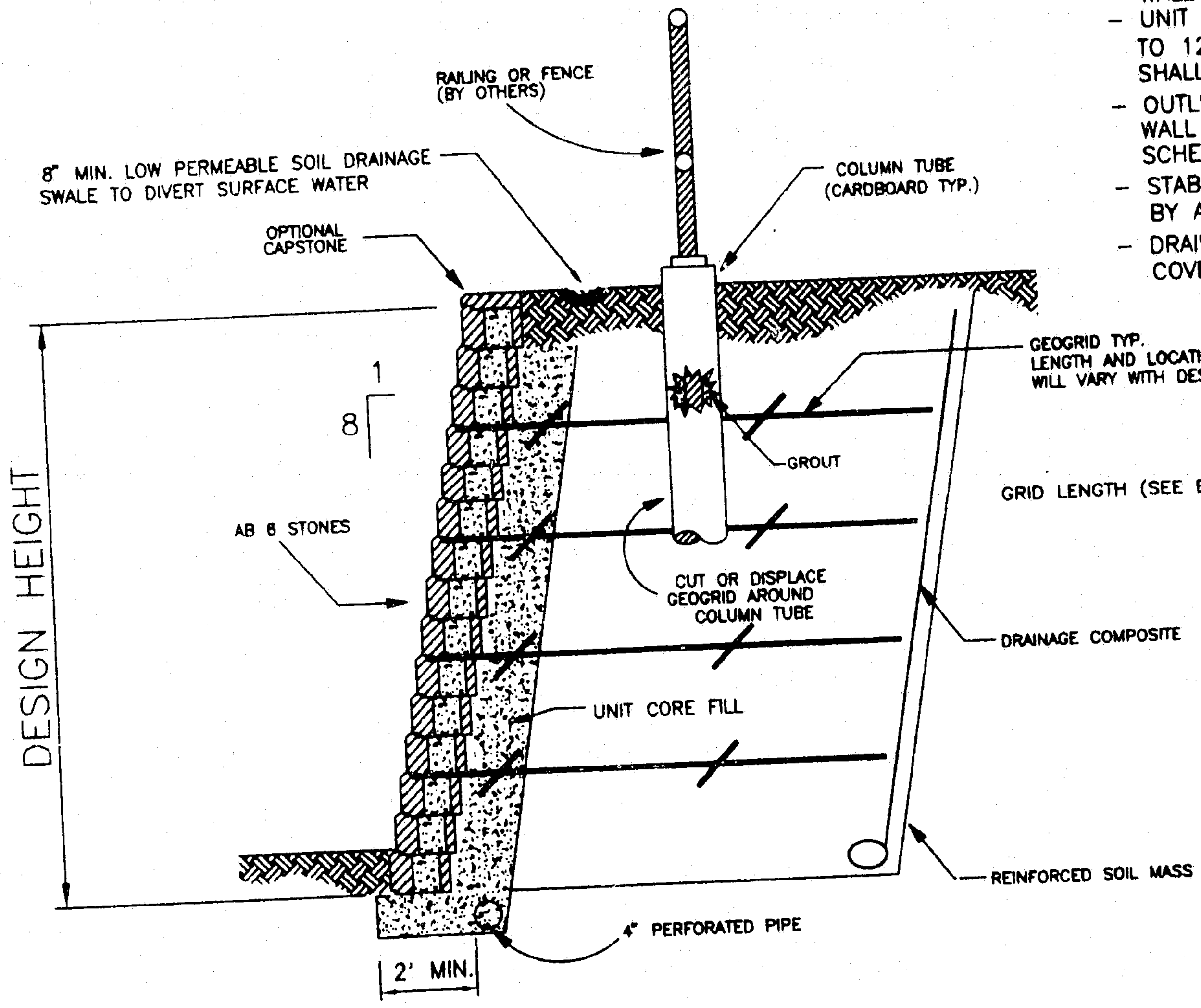
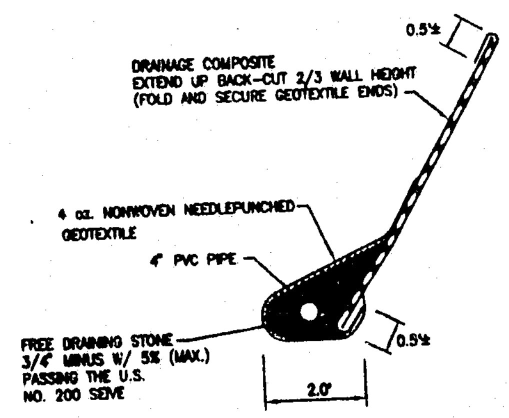
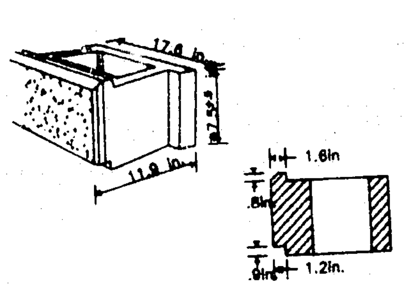
- INSTALL GEOGRID IN TENSION
- COMPACT SOILS TO 95% STANDARD PROCTOR
- COMPACT SOILS IN FRONT OF WALL
- UNIT CORE FILL INSTALLED TO 12" BEHIND AB 6 UNIT SHALL BE 3/4" MINUS STONE.
- OUTLET DRAIN LINES THROUGH WALL AT 100' O.C. WITH SCHEDULE 40 PVC 4" DIA. PIPE.
- STABLE FOUNDATION SHALL BE APPROVED BY A GEOTECHNICAL ENGINEER.
- DRAINAGE COMPOSITE INSTALLED AT 30% COVERAGE, AT 2/3 WALL HEIGHT




## TYPICAL CROSS SECTION
## AB 6 UNITS: 6° SETBACK BATTER

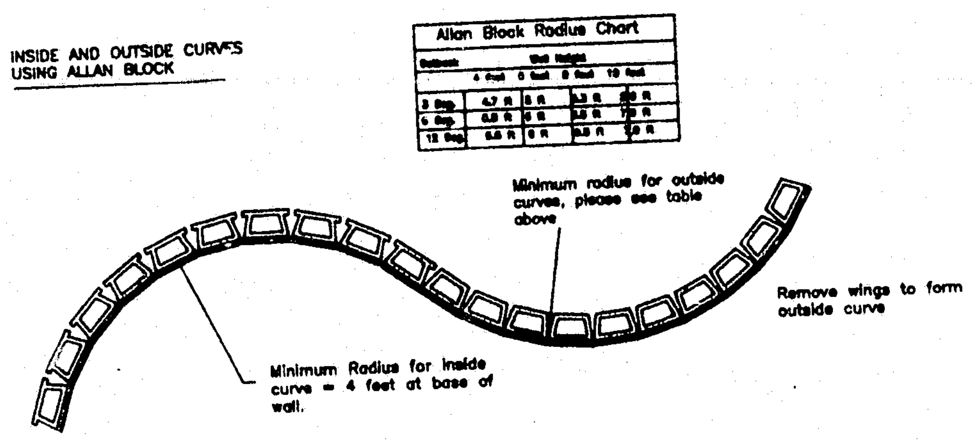



**DRAINAGE COMPOSITE**
NOT TO SCALE

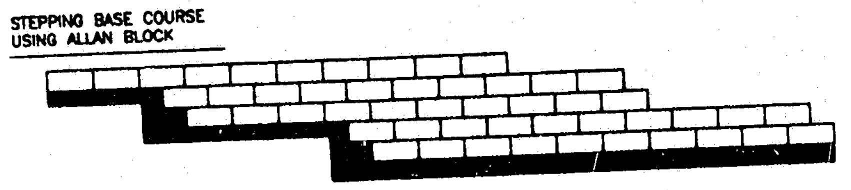



AB 6
*CHECK WITH LOCAL SUPPLIER FOR EXACT BLOCK HEIGHTS

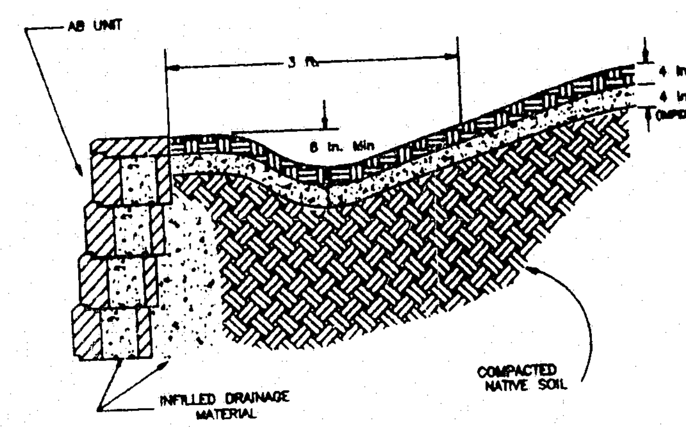
INSIDE AND OUTSIDE CURVES USING ALLAN BLOCK

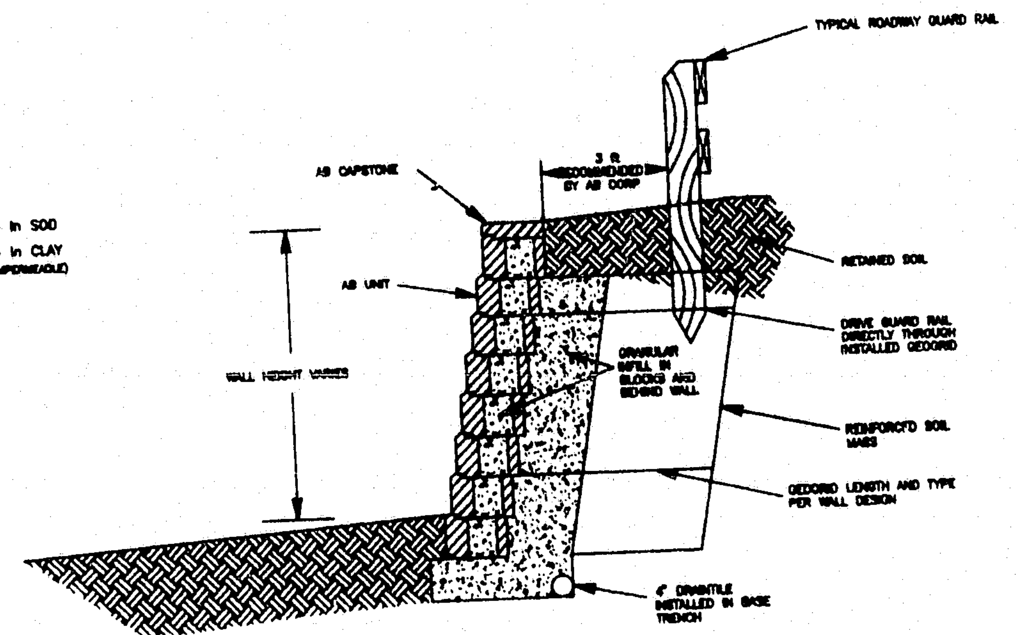



STEPPING BASE COURSE USING ALLAN BLOCK



CLAY LINED SWALE




## TYPICAL ROADWAY GUARD RAIL DETAIL

### STEP 1: EXCAVATE BASE TRENCH

Excavate base trench at the wall location. Make sure the trench is level and to the proper depth (Figure 1).

WIDTH: Minimum 24 inches wide.

DEPTH: 6 inches + 1 inch for each 1 ft. of wall height.

STEP-UPS: Walls built on a sloping grade will require a stepped base.

Begin excavation at the lowest point and dig a level trench into the slope until it is deep enough to accommodate the 6 inch base material and one entire block.

At this point step up the height of one block, and begin a new section of base trench.

Continue to step up as needed to the top of the slope.

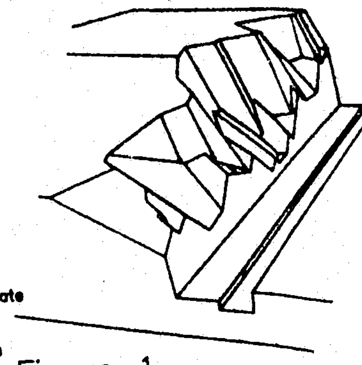


Figure 1

### STEP 2: INSTALL BASE MATERIAL

Base Material: Any clean, compactible granular material with a balanced mix of grain sizes .25 - 1.5 inch diameter.

INSTALLATION:

Place 6 inches of Base Material in the base trench and rake smooth.

Compact with a mechanical plate compactor (Figure 2).

Check the entire length for level and adjust as needed.

After leveling and compaction is complete, a thin layer of sand (less than .5 inch) may be placed on top of Base Material to make leveling the base row of blocks easier.

Figure 2

### STEP 3: INSTALL BASE COURSE

Begin at the lowest wall elevation.

Place all units top side up on the Base Material with the raised front lip facing forward to the front of wall.

Check and adjust the level and alignment of all AB units. Check frequently for level side-to-side and front-to-back. Verify the proper position of all Allan Block units by examining a straight line across the back of the blocks or the back of the lips (Figure 3).

Make minor adjustments by tapping the AB units with a rubber mallet or by placing small amounts of course sand under the units.

Irregularities in the Base Course become larger as the wall stacks up. Careful attention to a straight and level Base Course will ensure a quality finished wall.

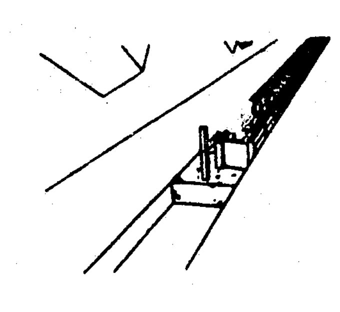


Figure 3

### STEP 4: INSTALL DRAINAGE MATERIAL

Fill the Allan Block hollow cores and the 12 inch Drain Field behind the wall with Drainage Material.

Proper placement of Drainage Material serves three important purposes. First, this material between units and adjoining courses creates a positive interlock between the block and the geogrid. Second, it increases the overall weight of each Allan Block unit, increasing structural stability. Finally, it permits the release of hydrostatic pressures from behind the wall.

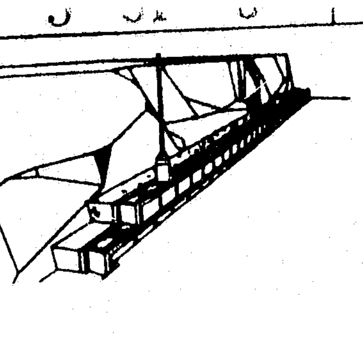


Figure 4

### STEP 5: BACKFILL AND COMPACT

Compaction of the material behind the wall is critical for a quality wall installation.

Use on-site soils to backfill behind the drain field and in front of the base course.

Use a plate compactor to compact the aggregate in the block cores and to lock the base course in place. The first pass of the plate compactor should be directly over the top of the block cores (Figure 5).

After running the plate compactor on the top of the Base Course and Drain Field, compact the Backfill Material immediately behind the wall. Compact in a path parallel to the wall, working from the front of the wall to the back of the Backfill Material (Figure 6).

Check the Base Course for level and adjust as necessary.

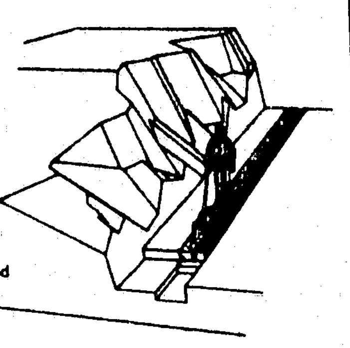


Figure 5

### STEP 6: INSTALL SECOND COURSE

This example assumes 1st layer of geogrid is between 2nd and 3rd courses. Refer to your job-specific plans for exact location.

Remove all excess drainage material and slag from the top surface of all AB units. This prepares a smooth surface for placement of the next course of Allan Block units (Figure 6).

Stack the next row of block with the seams offset from the blocks below. Maintain a 3 inch minimum offset.

Pull blocks tight against the front lip of units below.

Sight down the wall line to check for a straight wall. Blocks may be adjusted to form straight lines and smooth curves.

Check for level before installing Drainage and Backfill Materials. Adjust as necessary. It is acceptable to shim under blocks to compensate for a build up of tolerances or an out of level base. Asphalt shingles and geogrid fabric are good shims. The maximum allowable shim depth per course is 1/8 in.

Repeat steps 4 and 5, installing Drainage and backfill material and compacting parallel to the wall face from front to back.

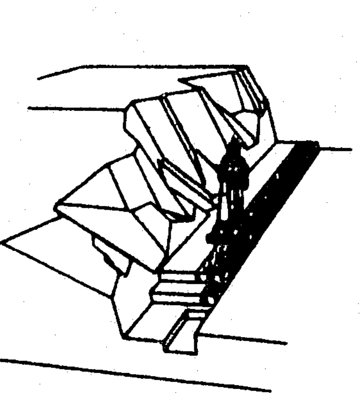


Figure 6

### STEP 7: INSTALL 1ST LAYER OF GEOGRID

Cut sections of geogrid to specified lengths. Check manufacturer's grid specifications for strength or machine direction of the georid. (Figure 7).

Place geogrid behind the Allan Block lip with the machine direction extending back into the slope.

Place next course of block on top of the geogrid.

Pull on the back of the grid to remove any slack. Stake in place before installing Drainage and Backfill Material (Figure 8).

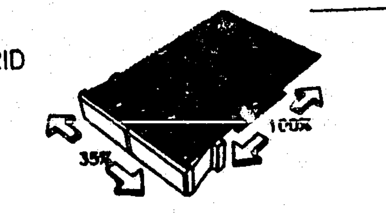



Figure 7

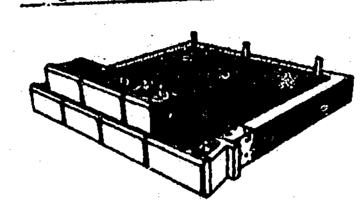


Figure 8

Step 8 cont.

NOTE: There is a natural tendency for all segmental concrete block walls to rotate forward during compaction. For walls that require a precise setback, a slight backward inclination of the base will compensate for rotation during compaction.

Verify your setback during construction using a story pole and Table 1. Advise project owners that construction tolerances of plus or minus 1 degree from nominal is acceptable and expected.

| Table 1 degree of setback | inches per foot of height |
|---|---|
| 3 | .625 in |
| 6 | 1.25 in |
| 12 | 2.50 in. |

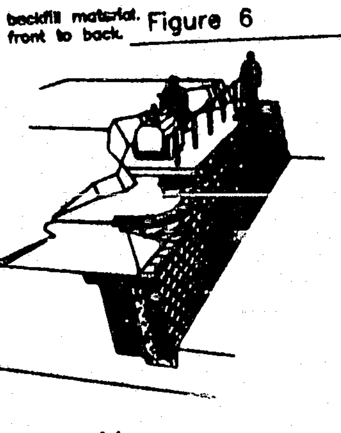


Figure 11

### STEP 8: BACKFILL AND COMPACT

All drainage material in the Drain Field and infill soils within 3 ft. of the wall must be properly compcated using a walk behind plate compactor. Compact in maximum eight inch lifts, starting on the wall and working in a path that runsparallel to the reinforced zone.

All infill soils in the reinforced soil mass must be compacted to a minimum 95% Standard Proctor - (95 percent of the soils maximum density). This can be accomplished with a mechinical plate compactor or ride on mechanical compaciton equipment. (Figure 11).

Never operate compacting equipment directly on geogrid. Place the next eight inch lift of soil on top of the grid and then compact.

All heavy equipment must be kept at least 3 feet from the back of the wall. Wall designs typically do not account for surcharges from heavy compaction equipment. Even a properly installed and compacted wall will rotate forward when extreme surcharges from heavy compaction equipment are applied to the top of the wall during final grading. Use a walk behind plate compactor on top of block and within three feet of the wall. (Figure 11).

### STEP 9: INSTALL ADDITIONAL COURSES

Repeat step 5,6,7 and 8

Each lift of Drainage and Backfill Material should be installed in the same manner. Compact in lifts of eight inches or less, the height of an AB unit (figure 9 and 10).

Check block for level after compacting each lift.

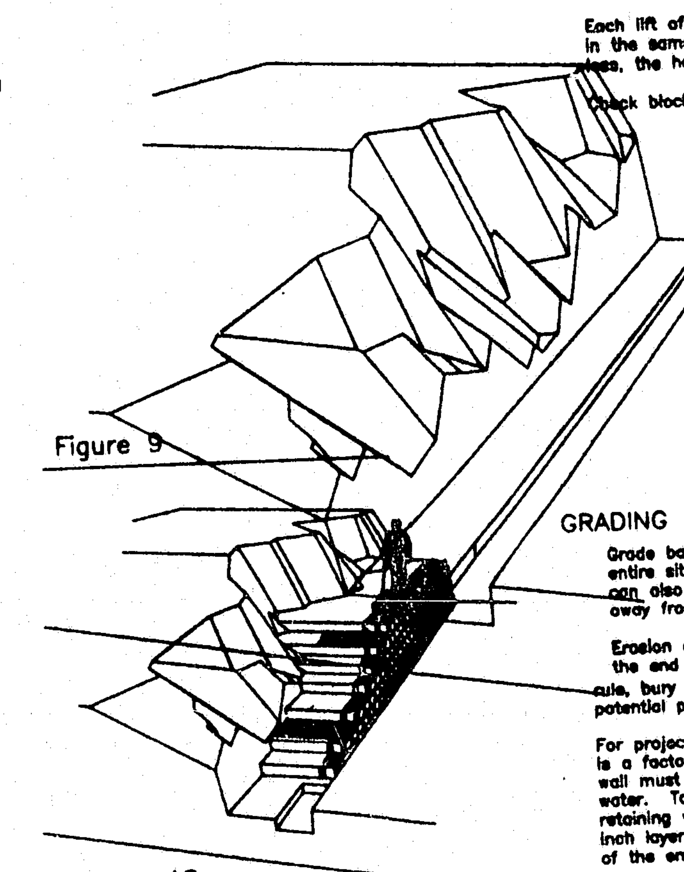


Figure 9

Figure 10

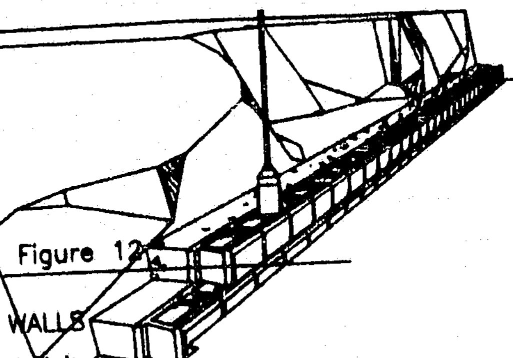


Figure 12

### STEP 10: ENDING AND TOPPING WALLS

Allan Block's patented raised front lip provides a built-in edging for lanscape rock, mulch, grass, soil or AB Capstones. Walls with step downs can be easily finished by turning the ends back into the hillside.

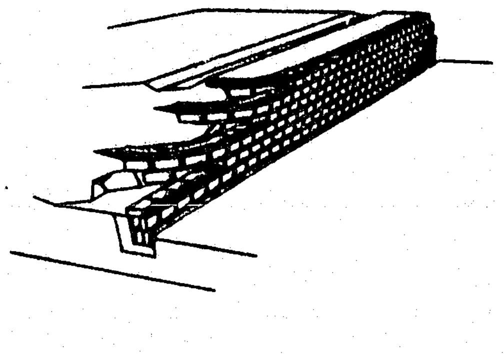


Figure 13

### GRADING AND WATER MANAGEMENT

Grade backfill to ensure that water drainage from the entire site flows away from the wall. A drainage swale can also be incorporated above the wall to route water away from the top of the wall (Figure 13).

Erosion at the end of a wall can be prevented by rolling the end of the wall into the bank. As a general rule, bury two feet of block into the hillside to prevent potential problems.

For projects where excessive water runoff above the wall is a factor (parking lots, roof drains) the top of the wall must be finished off to prevent the penetration of water. To ensure that water runoff from above the retaining wall does not saturate the soil behind it, an 8 inch layer of impermeable fill should be placed on top of the entire runoff area.

Install a drain pipe at the bottom of the reinforced soil mass and vent away from wall to remove excess water. Sites with drainage problems may require a chimney drain at the back of the reinforced zone.

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Michael Kiser 4/28/00

| NO. | REVISIONS | DRN | DATE | CHK | DATE |
|---|---|---|---|---|---|
| | DESIGNER: MICHAEL KISER PE | | | | |

# DETAIL SHEET
## 5001 WESTON OFFICE BLDG. RETAINING WALLS CARY, NC

MLK 4/27/00
JEP 4/27/00

ALLAN BLOCK RETAINING WALL