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The Essence of Natural Rock

SPECIFICATIONS FOR REDI-ROCK WALL SYSTEM

SECTION 1

PART 1: GENERAL

1.1 Scope

Work includes furnishing and installing concrete retaining wall units to the lines and grades designated on the construction drawings and as specified herein.

1.2 Reference Standards

ASTM Standard Specifications for Segmental Retaining Wall Units.

1.3 Delivery, Storage, and Handling

A. Contractor shall check the materials upon delivery to assure proper material has been received.
B. Contractor shall prevent excessive mud, wet cement and like materials from coming in contact with the materials.
C. Contractor shall protect the materials from damage. Damaged material shall not be incorporated in the project.

PART 2: MATERIALS

2.1 Wall Units

A. Wall units shall be Redi-Rock™ as produced by a licensed manufacturer.
B. Wall units shall have minimum specifications per the following chart:

Redi-Rock block Specifications as per ASTM C-94 & ACI 301-99 Specifications:

Climate	Air Content	Recom-mended PSI	Slump	Minimum concrete temperature at placement
Negligible	1½%-4½%	2500	3"-5"	50º
Moderate	3%-6%	2500	3"-5"	50º
Severe	4½%-7½%	3000	3"-5"	50º

Notwithstanding anything stated above, all material used in the wall units must meet applicable ASTM and local requirements for exterior concrete. Redi-Rock International requires that all licensed dealers send a representative cylinder test from blocks to Redi-Rock International once every May and once every August to document that quality control procedures are in place.

Map defining climate zones referred to in chart above:

C. Exterior dimensions shall be uniform and consistent. Maximum dimensional deviations shall be 0.75 inch, not including textured face.
D. Wall units shall provide a minimum of 140 pounds total weight per cubic foot.
E. Exposed face shall be finished as specified. Other surfaces to be smooth form type.

2.2 Wall and Foundation Backfill

A. Foundation material shall be well draining compactible aggregate, 0.25 inch to 1.5, with no more than 5% passing the #200 sieve.
B. Drainage material shall be the same as foundation material.
C. Backfill material shall be approved by the geotechnical engineer. Site excavated soils may be used if approved by the Geotechnical Engineer or unless otherwise specified in the drawings. Unsuitable soils for backfill (cohesive soils with a P1>6, organic soils and frost susceptible soils) shall not be used within a 1 to 1 influence area.
D. Where additional fill is required, contractor shall submit sample and specifications to the Engineer for approval.

2.3 Drainage System Underdrain

A. Underdrains shall be perforated geotextile-wrapped, 4 inch diameter, and shall meet the requirements of AASHTO M252 and/or ASTM F949.

PART 3: CONSTRUCTION OF WALL SYSTEM

3.1 Excavation

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall use caution not to over-excavate beyond the lines shown, or to disturb the base elevations beyond those shown.

3.1 Foundation Soil Preparation

A. Native foundation soil shall be excavated as dimensioned on the plans and compacted to a minimum 95% maximum density compaction prior to placement of the foundation backfill material.

B. In-situ foundation soil shall be examined by the Engineer to ensure that the actual foundation soil strength meets or exceeds assumed design strength. Soil not meeting the required strength shall be removed and replaced with acceptable, compacted material.

3.2 Foundation Soil Placement

A. Foundation backfill shall be placed as shown on construction drawing. Top of base shall be located to allow bottom wall units to be buried to proper depths as per wall heights and specifications.
B. Foundation backfill shall be placed on undisturbed native soils or suitable replacements fills compacted at 95% Modified Proctor (MP).
C. Foundation shall be compacted at 95% MP to provide a level hard surface on which to place the first course blocks. The foundation shall be constructed to insure proper wall embedment and the final elevation shown on the plans. Well-graded sand can be used to smooth the top ½ inch on the leveling pad.
D. Foundation backfill shall be a 6 inch minimum depth for walls under 8 feet and a 12 inch minimum depth for walls over 8 feet.

3.3 Unit Installation

A. The first course of wall units shall be placed on the prepared foundation with the asthetic surface facing out and the front edges tight together. All units shall be checked for level and alignment as they are placed.
B. Ensure that units are in full contact with foundation. Proper care shall be taken to develop straight lines and smooth curves on base course as per wall layout.
C. The backfill in front and back of entire base row shall be placed and compacted to firmly lock them in place. Check all units again for level and alignment. All excess material shall be swept from top of units.
D. Install next course of wall units on top of base row. Position blocks to be offset from seams of blocks below. Check each block for proper alignment and level. Fill to 12 inch depth behind block and drainage material. Spread backfill in uniform lifts not exceeding 8 inches. Employ methods using lightweight compaction equipment that will not disrupt the stability or
batter of the wall. Hand-operated plate compaction equipment shall be used on the block and within 3 feet of wall to achieve consolidation. Compact to 95% MP in backfill beyond consolidation zone.
E. Install each subsequent course in like manner. Repeat procedure to the extent of wall height.
F. Allowable construction tolerance at the wall face is 2 degrees vertically and 1 inch in 10 feet horizontally.

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IMPORTANT NOTICE

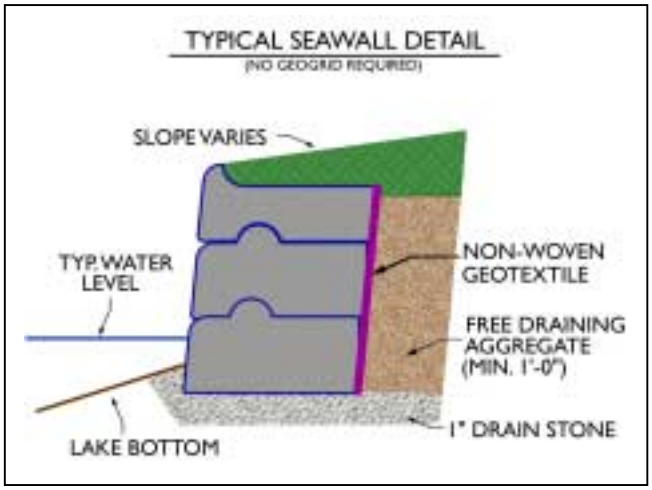
The design specs for Redi-Rock blocks suggest maximum installation heights under certain conditions. These wall heights were calculated using the assumed material properties in the Design Manual or CD-ROM and will vary from location to location depending on the soil properties. Since soil conditions vary greatly from site to site an engineering analysis must be performed on each wall installation.

Because Redi-Rock International does not build the blocks or install the wall system, Redi-Rock International does not assume any responsibility whatsoever regarding structural stability of any particular blocks or particular wall system. In addition, Redi-Rock International assumes no responsibility in connection with any injury, death or property damage claim whatsoever whether asserted against a Leasee, Leasor, Purchaser or others, arising out of or attributable to the operation of or products produced with Redi-Rock International equipment.

Revised 1/12/01

REDI-ROCK™ International Wall Installation Helpful Tips:

I. Base preparation:



A. Compaction: Base must be stable material compacted to minimum 95% Standard Proctor (density).

B. Material:

1. Base material may be sand, stone, road gravel, or free-draining pit run.
2. If base material is clay, marl, or other unstable material, a Soil Engineer should be employed to engineer a proper base.
3. One solution for unstable base material is undercutting 2'-4' of bad base material and replacing it with free-draining stone or sand compacted to minimum 95% Standard Proctor (density) with perforated drain tile installed (see a Soils Engineer).
4. Stabilization fabric may also be used to bridge unstable material in some areas (see a Soils Engineer).

C. Shore-line base preparation:

1. Undercut base material to a base specified by an engineer (see top sketch at right).
2. Place drain stone in the bottom of trench to the depth specified by the engineer. This gives a solid base that does not need compaction. Stone must be leveled and checked using a grade rod and transit or a lazar level.

II. Leveling Base:

The importance of starting with a uniform, level, compacted base cannot be overemphasized. A uniform, level base will accelerate the entire wall installation process, thereby helping to avoid costly repairs at a later date brought about by sagging wall sections (see bottom picture at right).

A. It is important to start the base at the lowest elevation of the wall. This allows for a consistent point of

reference and eliminates the problem of higher courses not lining up with lower ones further up the wall.

B. Two popular methods of leveling the base are as follows:

1. Checking with a grade rod and transit or a lazar level.

2. Leveling the base using two 20' grade pipes and a screed board to (see top picture at right).

C. **Final compaction** with a plate vibrating compactor should be done after final grading. This is done until 95% minimum density is achieved.

III. Setting Retaining Wall Blocks:

A. **Block Delivery:** A flat bed trailer or boom truck may deliver the blocks (see middle picture at right).

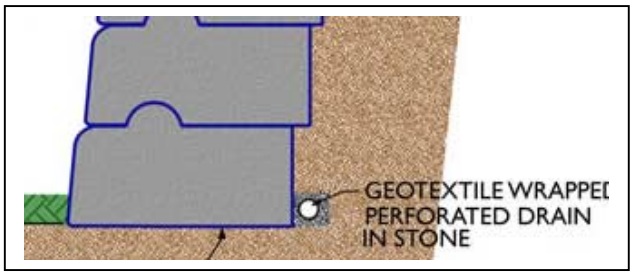
B. **Setting Block:**

1. Rubber tired backhoes, loaders, or skid-steers may be used to set blocks. However, a small excavator may be the most efficient (see bottom picture at right).
2. To maximize efficiency, a coordinated plan utilizing the excavator to prepare and install the base course, followed by a delivery boom truck setting subsequent courses directly in place while unloading the truck is recommended. Drainpipe must also be installed while setting blocks.
3. Because the walls taper back and each row is offset to the row below it, it is very important that each course is backfilled before the next is laid.
3. The top of each course should be swept clean and then the next course laid.
4. For the top course, a Top Block installation will allow the 5" deep topsoil to be placed right up to the face.
5. A Drain Ditch Block may also be used as a top block if only poured 2/3 full.

IV. Drain Pipe Installation:

Placement: A 6" wrapped perforated drainpipe should be installed behind the base course of block, along the bottom of the row. It should be surrounded by a minimum of 1 sq ft of drain stone (see top sketch at right).

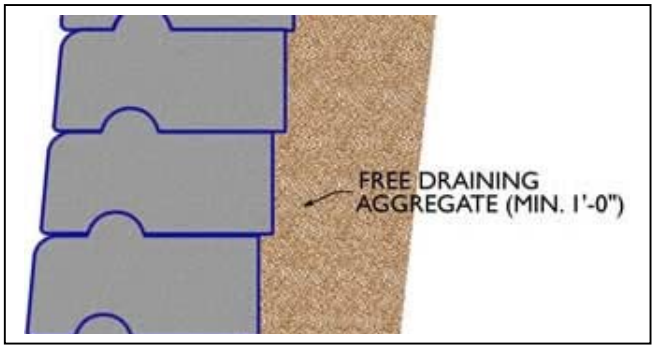
NOTE: Drainpipe should run the full length of the wall, and the end should be exposed to an open drain. This will help to alleviate hydrostatic water pressure building up behind the wall.



V. Backfilling Behind Wall:

A. Material: A minimum of 1' of free-draining soil should be placed behind wall as backfill and compacted to a 95% density (see middle sketch at right).

B. Equipment: An excavator with stone boat works excellent when placing backfill or stone bedding.

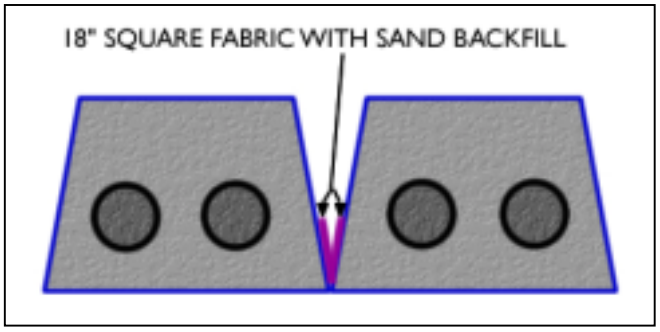


VI: Backfilling Between Blocks:

Backfill between blocks may be either free-draining sand or pea stone.

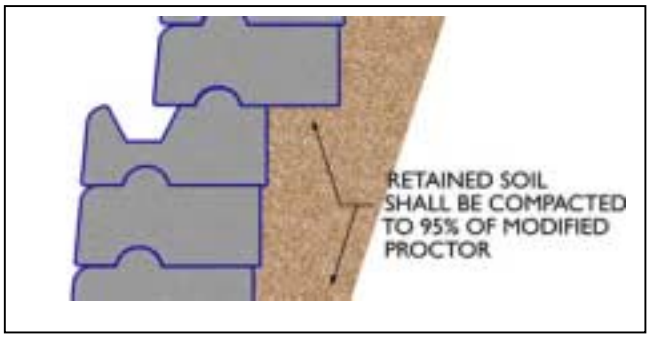
A. Sand: If you use sand, it must first be compacted. After compacting, you should use self-draining fabric placed over the vertical joints to prevent sand from seeping out during rain showers, irrigation, or just over time. This fabric may be cut in 18" squares and placed over vertical joints as you backfill (see bottom sketch at right).

B. Stone: If you use pea stone to backfill between blocks then no fabric is necessary.



VII. Installing Planter Blocks:

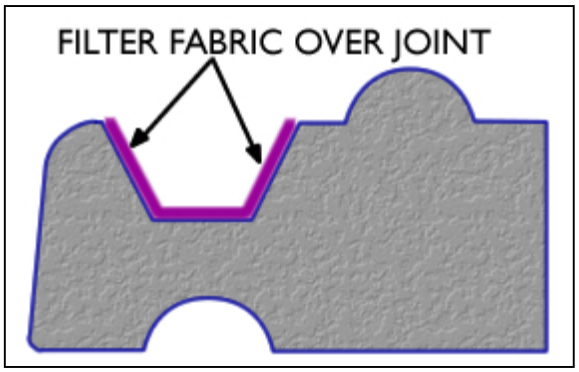
A. Because the Planter Block is set back 14" and rests partially on backfill material, it is crucial that the backfilled material be leveled and compacted to 95% density to ensure engineered design heights of the wall (see top sketch at right).



B. Planter Blocks may be transitioned in or out of a normal middle block course in a wall by removing one or two knobs at the transition.

NOTE: This may offset the bond joints slightly from falling in the middle of the block below. This may be corrected by leaving a small gap between blocks until bond joints are centered again.

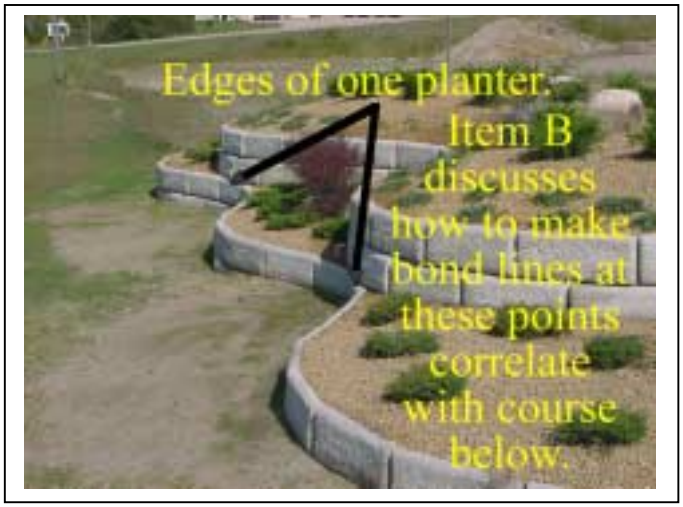
C. Planters may be irrigated; a small piece of filter fabric may be placed over the front joint of the planters to eliminate top dirt from washing out (see middle sketch at right).



VIII. Building Curved Set-Back Planters:

A. When building setback planters, all of the above base row compaction and leveling procedures apply.

B. The most difficult problem is leaving a row below to create a planter and then staying on bond-line with the vertical joints of the row below when coming back to the second row further down the wall (see bottom picture at right). One good way to solve this is to glue ¾" PVC pipe together for the length of the planter you desire to build. Then place a mark on the PVC pipe every 47½" for convex curves or every 45" for concave curves. You can then bend the PVC along the ground at the curve you desire, making sure the PVC stays at the middle of the block you are leaving and also ends at the middle of the block you are returning to. Then paint a mark on the ground corresponding to each mark on the PVC. You are



then ready to set the blocks, making sure each block starts and stops at the paint mark you established.

IX. How to "Step-Down" Walls:

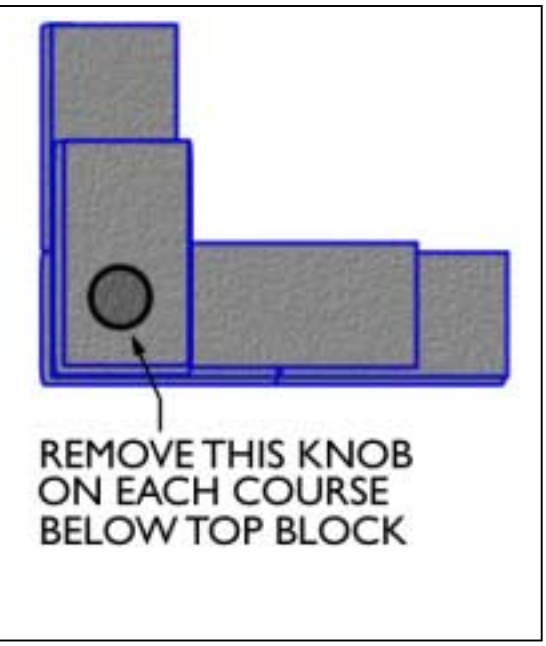
There are two common ways to transition from a higher wall to a lower wall:

A. Use End Blocks: An End Block may be used to make either a left step-down or a right step-down. To accomplish this, make one cut with a concrete saw and knock the lip off with a sledgehammer (see top picture at right) to allow the topsoil to fill around the end of the block.

B. Use the scalloped look: Place Half-Top Blocks in a partial radius of 2 to 4 blocks to do this. Remove the outside knob on the last middle block of bottom course before beginning scallop. Simply make a few saw cuts through the knob and then hit it with a sledgehammer to remove knob (see middle picture at right).

X. Walls with 90° Corners:

The End Block may be used to make either right or left corners. As with other walls, begin each course in these walls at the lowest point until the course using the End Block is reached. At that point, it is important to begin each course at the corner to minimize the spacing caused by the End Block being smaller then standard blocks (see item B below).



A. For the End Block to fit, the knob closest to the corner on the row below must be removed (see bottom sketch at right).

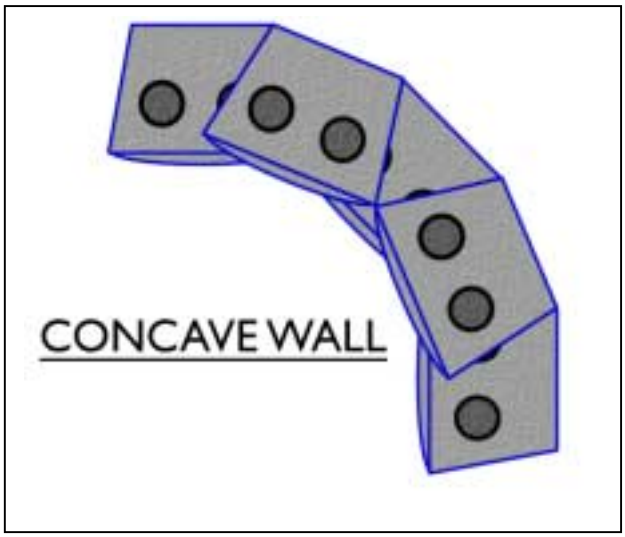
B. NOTE: Because the end block is smaller than a regular block, the joints will be slightly off-center from the row below. Again, this can be accommodated for by leaving a small gap between each block and putting a filter fabric square 18"x18" in the vertical joint between blocks to prevent backfill leaking out.

C. NOTE: Because a corner is battered in towards the backfill by 2" each course you go up, the end block may

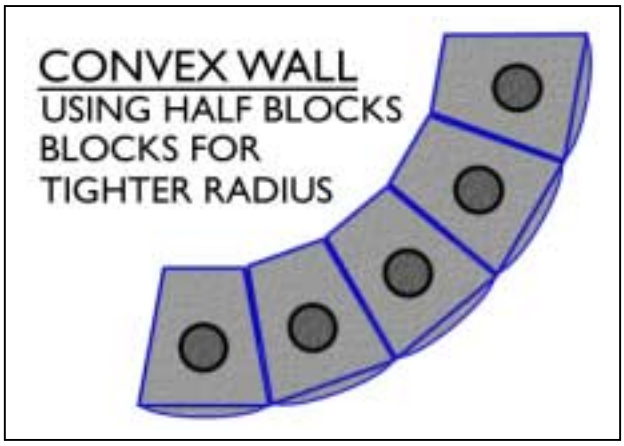
be too big beyond 7'6" height of wall. You may experiment with walls higher then 7'6" on your own.

XI. Curved Walls:

A. **Concave Curves** may be installed at a tighter radius then the 14'6" outside radius shown on the spec sheet (see top sketch at right). However, doing so will cause greater exposed overlap. You may experiment and build walls to your satisfaction.



B. **Convex Curves** may also be installed at a tighter radius then the specs show by using half blocks on all radiuses. This will allow a 8' radius for outside corners (see bottom sketch at right).
Further, corner blocks can be used to achieve 90° corners.



XII. Concrete Sealer Application:

A. There are many stains and sealers available on the market ranging from water based stain to acid based stain. We encourage you to use the products available in your local region and follow the recommended application procedures from the supplier.

Redi-Rock International strongly encourages a sealer be applied to the wall after installation whether or not a stain is used. This seals the surface and prevents water from soaking into the face of the block, which could deteriorate the face of the block.

B. Some of the concrete stain suppliers' are as follows:

1. Increte Systems
   8509 Sunstate St.
   P.O. Box 151103
   Tampa, FL 33634
   Phone: 800-752-4626
   Contact: Barrette Spahn

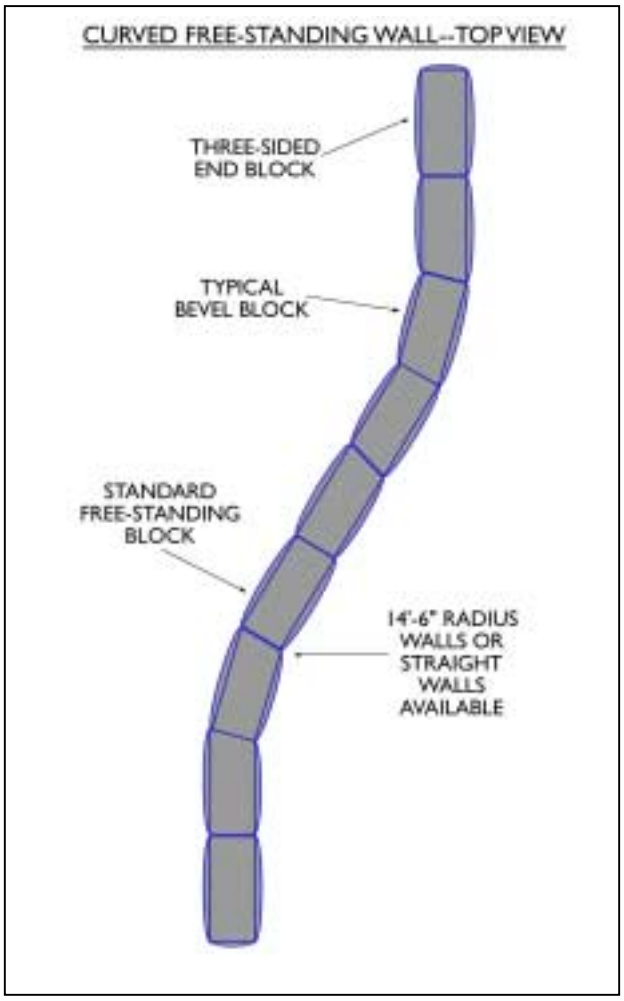
2. DCS
Dynamic Color Solutions
2024 S. Lenox St.
Milwaukee, WI 53207
Phone: 414-769-2580
Contact: Cindy Nowak

3. Sherwin Williams Local Store

XIII. Free-Standing Walls:

A. Free-standing walls may be built in straight lines or in **14-6"** radius curves (see top sketch at right)

NOTE: If Free-Standing Blocks are put in on top of retaining wall blocks, the retaining wall blocks must be laid in either a straight line or a 14'-6" radius or Free-Standing Blocks will not fit (see top sketch at right).



B. The base for the freestanding wall must be prepared using the same compaction and leveling specs as the retaining walls with the exception that no drain tile is needed and no backfill is required beyond the 6" backfill required at the base of the block (see top sketch at right).