

TABLE W-1 DESIGN VALUES FOR JOISTS AND RAFTERS - VISUALLY GRADED LUMBER

These "F_b" values are for use where repetitive members are spaced not more than 24 inches. For wider spacing, the "F_b" values shall be reduced 13%.
 Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending "F _b "			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
WESTERN CEDARS						
Select Structural	2x4	1725	1985	2155	1,100,000	WCLIB WWPA
No.1		1250	1440	1565	1,000,000	
No.2		1210	1390	1510	1,000,000	
No.3		690	795	865	900,000	
Stud		695	800	870	900,000	
Construction		920	1060	1150	900,000	
Standard		520	595	645	800,000	
Utility		260	300	325	800,000	
Select Structural	2x6	1495	1720	1870	1,100,000	
No.1		1085	1245	1355	1,000,000	
No.2		1045	1205	1310	1,000,000	
No.3		600	690	750	900,000	
Stud	635	725	790	900,000		
Select Structural	2x8	1380	1585	1725	1,100,000	
No.1		1000	1150	1250	1,000,000	
No.2		965	1110	1210	1,000,000	
No.3	550	635	690	900,000		
Select Structural	2x10	1265	1455	1580	1,100,000	
No.1		915	1055	1145	1,000,000	
No.2		885	1020	1105	1,000,000	
No.3		505	580	635	900,000	
Select Structural	2x12	1150	1325	1440	1,100,000	
No.1		835	960	1040	1,000,000	
No.2		805	925	1005	1,000,000	
No.3		460	530	575	900,000	
WESTERN WOODS						
Select Structural	2x4	1510	1735	1885	1,200,000	
No.1		1120	1290	1400	1,100,000	
No.2		1120	1290	1400	1,000,000	
No.3		645	745	810	900,000	
Stud		635	725	790	900,000	
Construction		835	960	1040	1,000,000	
Standard		460	530	575	900,000	
Utility		230	265	290	800,000	
Select Structural	2x6	1310	1505	1635	1,200,000	
No.1		970	1120	1215	1,100,000	
No.2		970	1120	1215	1,000,000	
No.3		560	645	700	900,000	
Stud		575	660	720	900,000	
Select Structural	2x8	1210	1390	1510	1,200,000	
No.1		895	1030	1120	1,100,000	
No.2		895	1030	1120	1,000,000	
No.3		520	595	645	900,000	
Select Structural	2x10	1105	1275	1385	1,200,000	
No.1		820	945	1030	1,100,000	
No.2		820	945	1030	1,000,000	
No.3		475	545	595	900,000	
Select Structural	2x12	1005	1155	1260	1,200,000	
No.1		750	860	935	1,100,000	
No.2		750	860	935	1,000,000	
No.3		430	495	540	900,000	

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Values for surfaced dry or surfaced green lumber apply at 19% maximum moisture content in use.

Species and Grade	Size	Design Value in Bending "F _b "			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
WHITE OAK						
Select Structural	2x4	2070	2380	2590	1,100,000	NELMA
No.1		1510	1735	1885	1,000,000	
No.2		1465	1685	1835	900,000	
No.3		820	940	1025	800,000	
Stud		820	945	1030	800,000	
Construction		1095	1255	1365	900,000	
Standard		605	695	755	800,000	
Utility		290	330	360	800,000	
Select Structural	2x6	1795	2065	2245	1,100,000	
No.1		1310	1505	1635	1,000,000	
No.2		1270	1460	1590	900,000	
No.3		710	815	890	800,000	
Stud	750	860	935	800,000		
Select Structural	2x8	1655	1905	2070	1,100,000	
No.1		1210	1390	1510	1,000,000	
No.2		1175	1350	1465	900,000	
No.3	655	755	820	800,000		
Select Structural	2x10	1520	1745	1900	1,100,000	
No.1		1105	1275	1385	1,000,000	
No.2		1075	1235	1345	900,000	
No.3	600	690	750	800,000		
Select Structural	2x12	1380	1585	1725	1,100,000	
No.1		1005	1155	1260	1,000,000	
No.2		980	1125	1220	900,000	
No.3	545	630	685	800,000		
YELLOW POPLAR						
Select Structural	2x4	1725	1985	2155	1,500,000	NSLB
No.1		1250	1440	1565	1,400,000	
No.2		1210	1390	1510	1,300,000	
No.3		690	795	865	1,200,000	
Stud		695	800	870	1,200,000	
Construction		920	1060	1150	1,300,000	
Standard		520	595	645	1,100,000	
Utility	230	265	290	1,100,000		
Select Structural	2x6	1495	1720	1870	1,500,000	
No.1		1085	1245	1355	1,400,000	
No.2		1045	1205	1310	1,300,000	
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Stud	635	725	790	1,200,000		
Select Structural	2x8	1380	1585	1725	1,500,000	
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No.2		965	1110	1210	1,300,000	
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Select Structural	2x12	1150	1325	1440	1,500,000	
No.1		835	960	1040	1,400,000	
No.2		805	925	1005	1,300,000	
No.3	460	530	575	1,200,000		

TABLE FOOTNOTES

1. When dimension lumber is used where moisture content will exceed 19% for an extended time period, F_b shall be multiplied by 0.85 if F_b exceeds 1150 psi, and E shall be multiplied by 0.9.

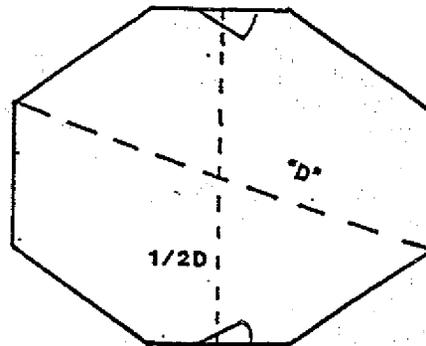
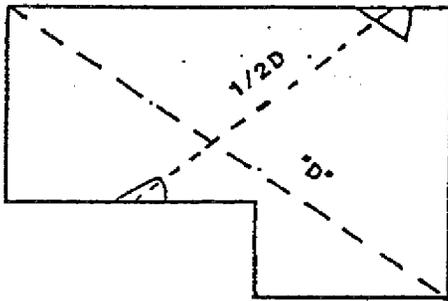
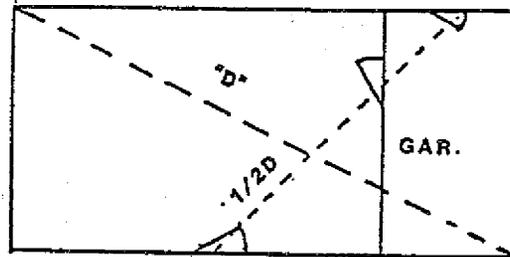
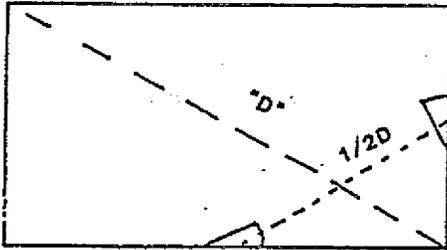
2. Following is a list of agencies certified by the American Lumber Standards Committee Board of Review (as of 1991) for inspection and grading of untreated lumber under the rules indicated. For the most up-to-date list of certified agencies write to:

American Lumber Standards Committee
P.O. Box 210
Germantown, Maryland 20874

Rules Writing Agencies	Rules for which grading is authorized
Northeastern Lumber Manufacturers Association (NELMA).....	NELMA,NLGA
272 Tuttle Road, P.O. Box 87A, Cumberland Center, Maine 04021	
Northern Softwood Lumber Bureau (NSLB)	NSLB,WCLIB,WWPA,NLGA
272 Tuttle Road, P.O. Box 87A, Cumberland Center, Maine 04021	
Redwood Inspection Service (RIS)	RIS,WCLIB,WWPA
405 Enfrente Drive, Suite 200, Novato, California 94949	
Southern Pine Inspection Bureau (SPIB)	SPIB,NELMA
4709 Scenic Highway, Pensacola, Florida 32504	
West Coast Lumber Inspection Bureau (WCLIB)	WCLIB,RIS,WWPA,NLGA
6980 SW Varnes Road, PO Box 23145, Portland, Oregon 97223	
Western Wood Products Association (WWPA).....	WWPA,WCLIB,NLGA,RIS
522 S.W. 5th Avenue, Yeon Building, Portland, OR 97204	
National Lumber Grades Authority (NLGA)	
260-1055 W. Hastings Street, Vancouver, B.C., Canada V6E 2E9	
Non-Rules Writing Agencies	
California Lumber Inspection Service	RIS,WCLIB,WWPA,NLGA
Pacific Lumber Inspection Bureau, Inc	RIS,WCLIB,WWPA,NLGA
Timber Products Inspection.....	RIS,SPIB,WCLIB,WWPA NELMA,NSLB,NLGA
Alberta Forest Products Association	NLGA
Canadian Lumbermen's Association	NLGA
Cariboo Lumber Manufacturers Association	NLGA
Central Forest Products Association.....	NLGA
Council of Forest Industries of British Columbia	NLGA
Interior Lumber Manufacturers Association	NLGA
Macdonald Inspection.....	NLGA
Maritime Lumber Bureau	NLGA
Ontario Lumber Manufacturers Association.....	NLGA
Pacific Lumber Inspection Bureau	NLGA
Quebec Lumber Manufacturers Association.....	NLGA

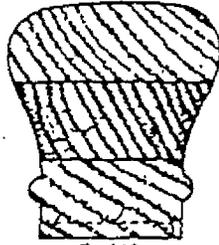
21.03(1), 21.03(5)(b), 21.03(6)(b) Separation of Exits

Note that these sections require the two required exits to be separated as far apart as practical. Any separation distance of less than one-half the longest diagonal measurement of that floor (see diagrams) should be closely scrutinized to see if better separation is feasible.

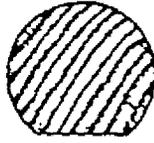


ss. ILHR 21.03(1), (5)(b), & (6)(b)
SEPARATION OF EXITS

HANDRAILS



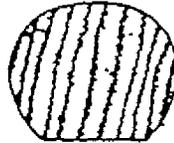
$2\text{-}1/4 \times 2\text{-}3/8^*$



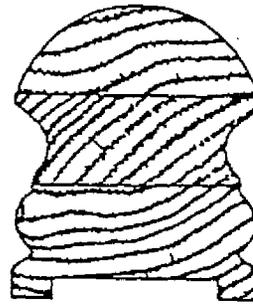
$1\text{-}3/8 \times 1\text{-}1/2$



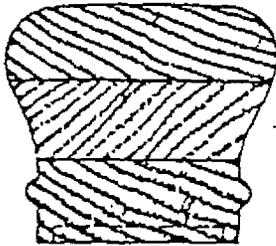
$2\text{-}7/16 \times 2\text{-}5/16^*$



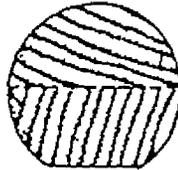
$1\text{-}3/8 \times 1\text{-}3/4$



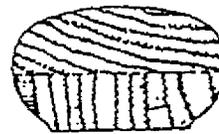
$2\text{-}5/8 \times 2\text{-}27/32^*$



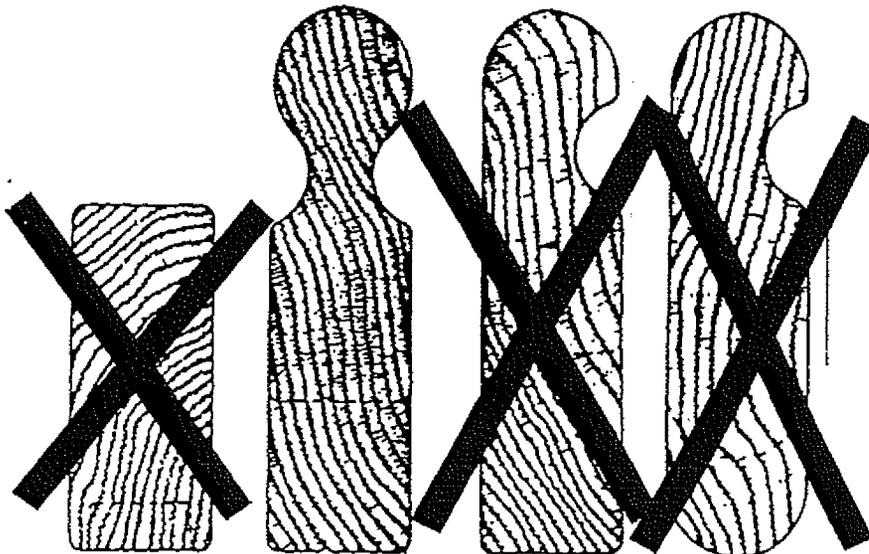
$2\text{-}27/32 \times 2\text{-}3/8^*$



$1\text{-}5/8 \times 1\text{-}3/4$



$1\text{-}1/4 \times 2\text{-}1/4$

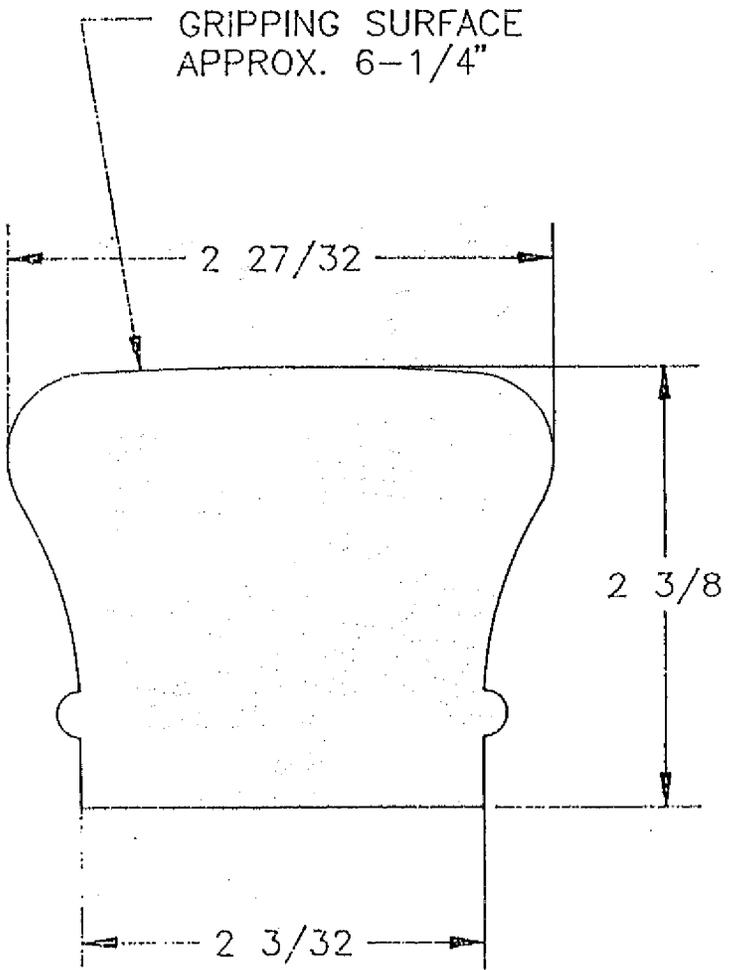
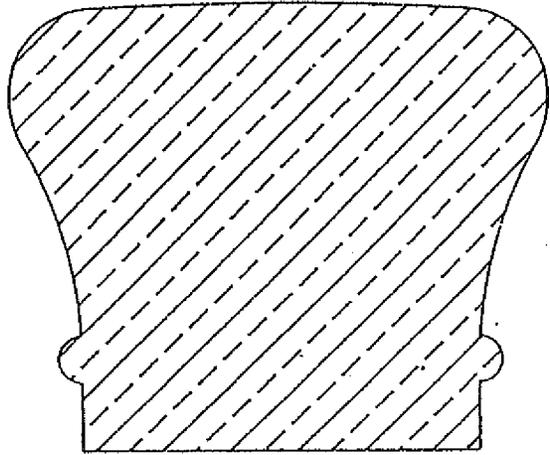


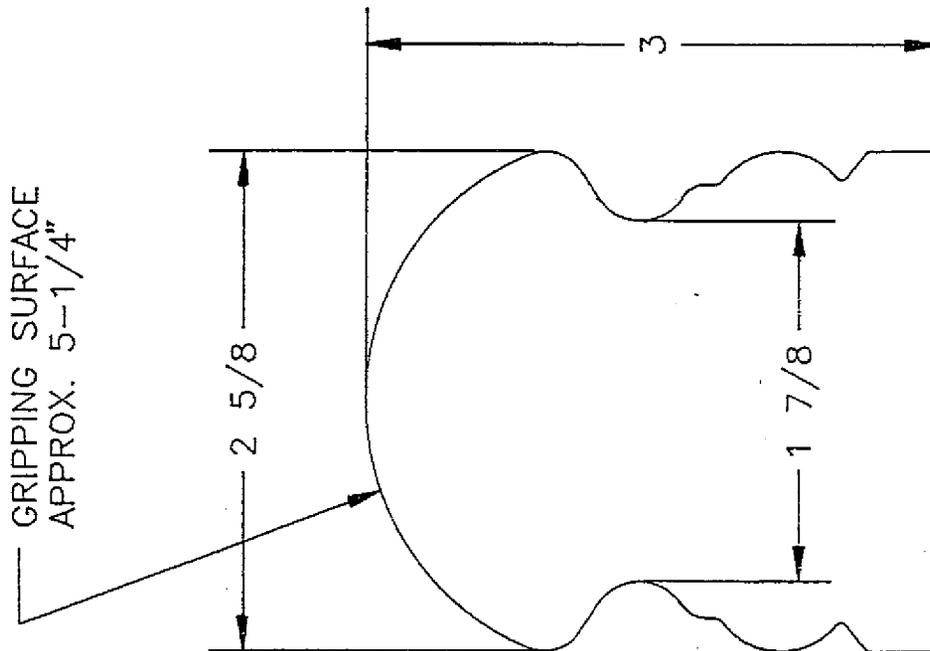
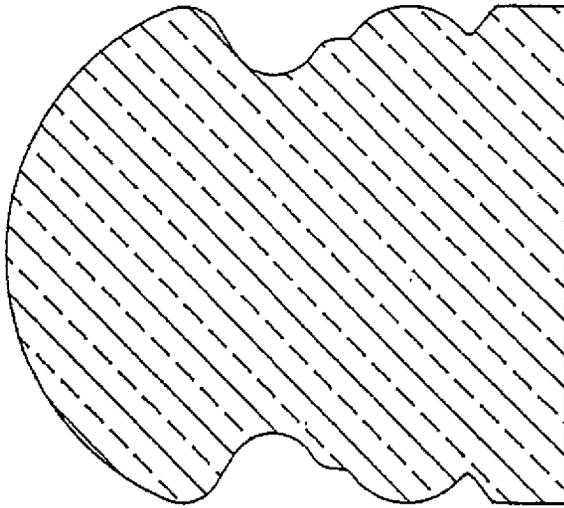
$1\text{-}1/2 \times 3\text{-}1/2$

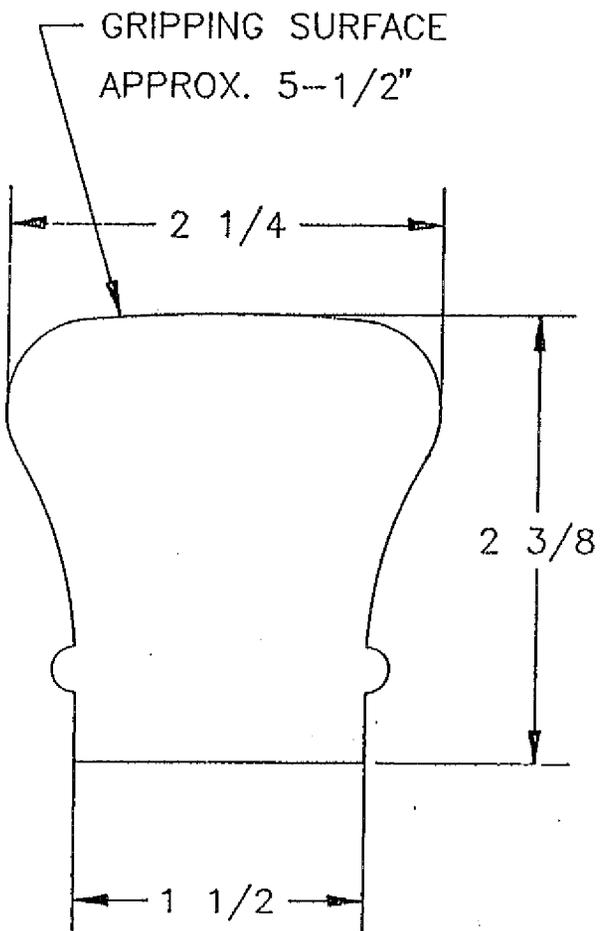
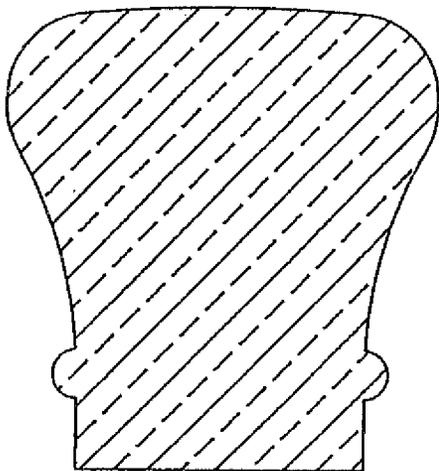
$1\text{-}1/2 \times 4$

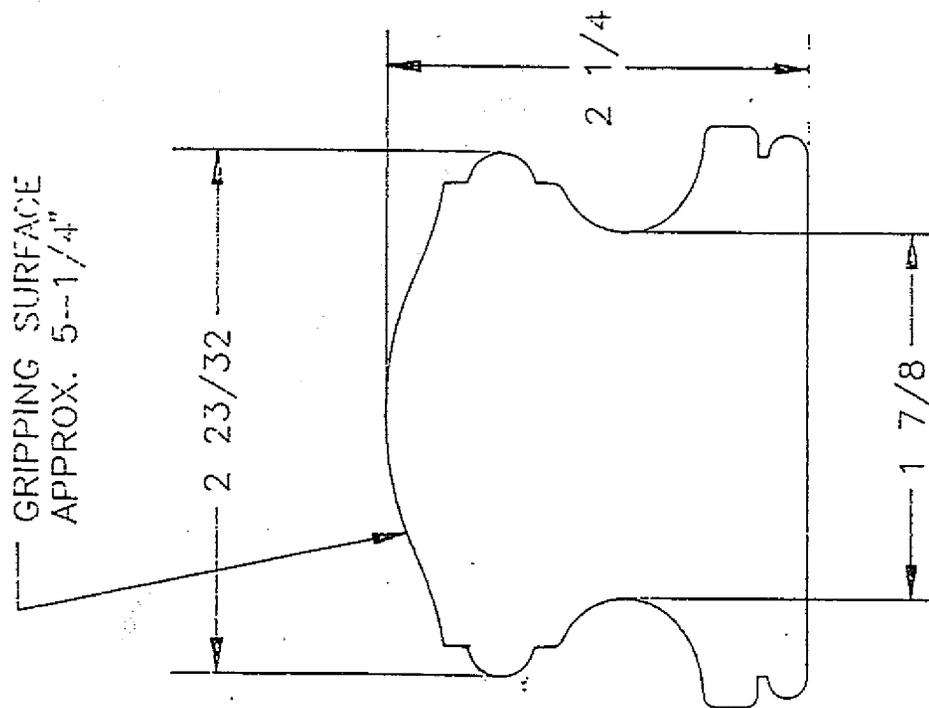
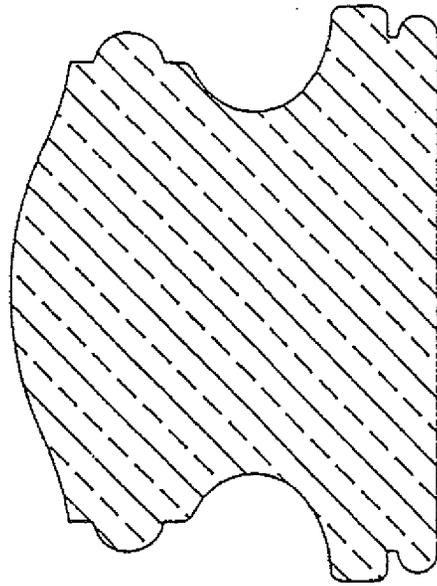
$1\text{-}1/2 \times 3\text{-}1/2$

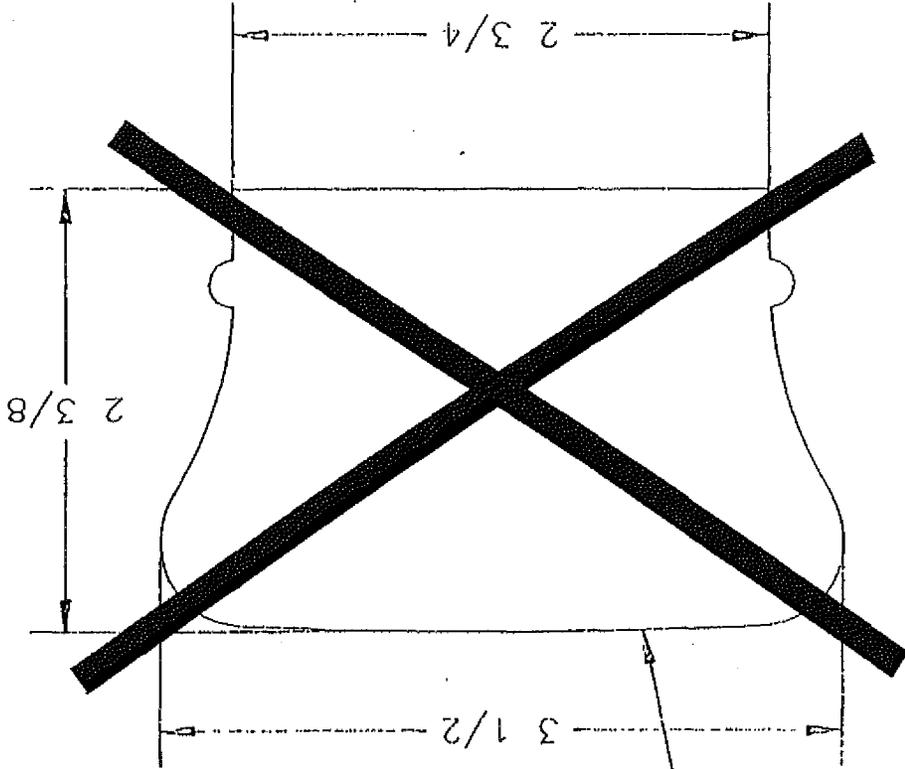
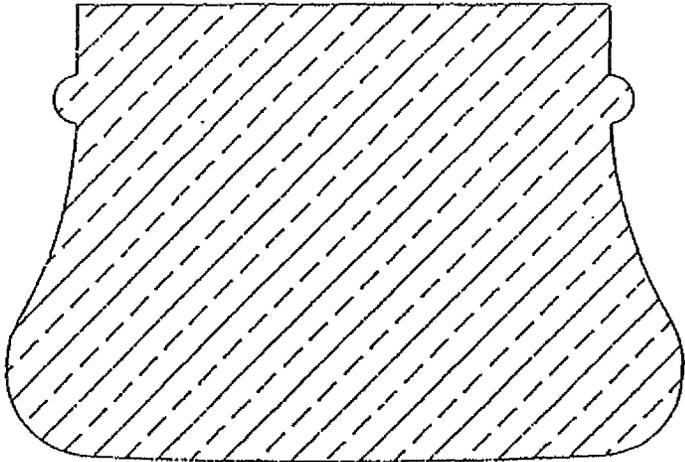
$1\text{-}1/2 \times 4\text{-}1/2$











**APPENDIX
EROSION CONTROL PROCEDURES
EXAMPLES, ILLUSTRATIONS AND GUIDELINES**

The following examples and illustrations of some erosion control procedures are provided for your information. Many of these examples and accompanying illustrations are excerpted from the "Wisconsin Construction Site Best Management Practices Handbook", developed by the Wisconsin department of natural resources. The illustrations, Figures E-1 to E-10, depict the materials and installation of some erosion control procedures.

Note: The Handbook is available from Document sales, 202 South Thornton Avenue, P.O. Box 7840, Madison, WI 53707-8480; phone (608) 266-3358.

Also included in appendix are examples of plot plans depicting the best management practices that will help meet the requirements of the performance standards in this code. Figure E-11 is an example of a site with a simple slope (all slopes occurring in one general direction). Downslope measures are required, to reduce maintenance of these measures, the upslope diversion is recommended. Figure E-12 is an example of a site with complex slopes (slopes occurring in more than one direction). The location of the erosion control procedures are clearly indicated on the plot plan. Figure E-13 is an example of a large lot, greater than 5 acres, with slopes greater than 12% and where the area of land disturbing activity is indicated. This plan indicates the use of vegetative barriers.

Guidelines for timing the implementation of the erosion control practices and procedures in order to stabilize areas disturbed during construction of one and 2-family dwellings are included in this appendix. Dormant seeding, the guidelines for the use of vegetative buffers and the recommended maintenance for erosion control practices are also included.

For sites using either straw bales or silt fences as a perimeter control, Table E-1 is included as a guide for determining the distance between parallel fences constructed on various slopes. Perimeter measures should be installed at right angles to the direction of flow. Drainage area is to be no more than .25 acres (approx. 10,000 square feet) per 100 feet of perimeter control.

**TABLE E-1
DISTANCE BETWEEN PARALLEL
STRAW BALES OR SILT FENCES**

Slope Percent	Slope Distance (feet)
< 2%	100 feet
2 to 5%	75 feet
5 to 10%	50 feet
10 to 20%	25 feet
> 20%	15 feet

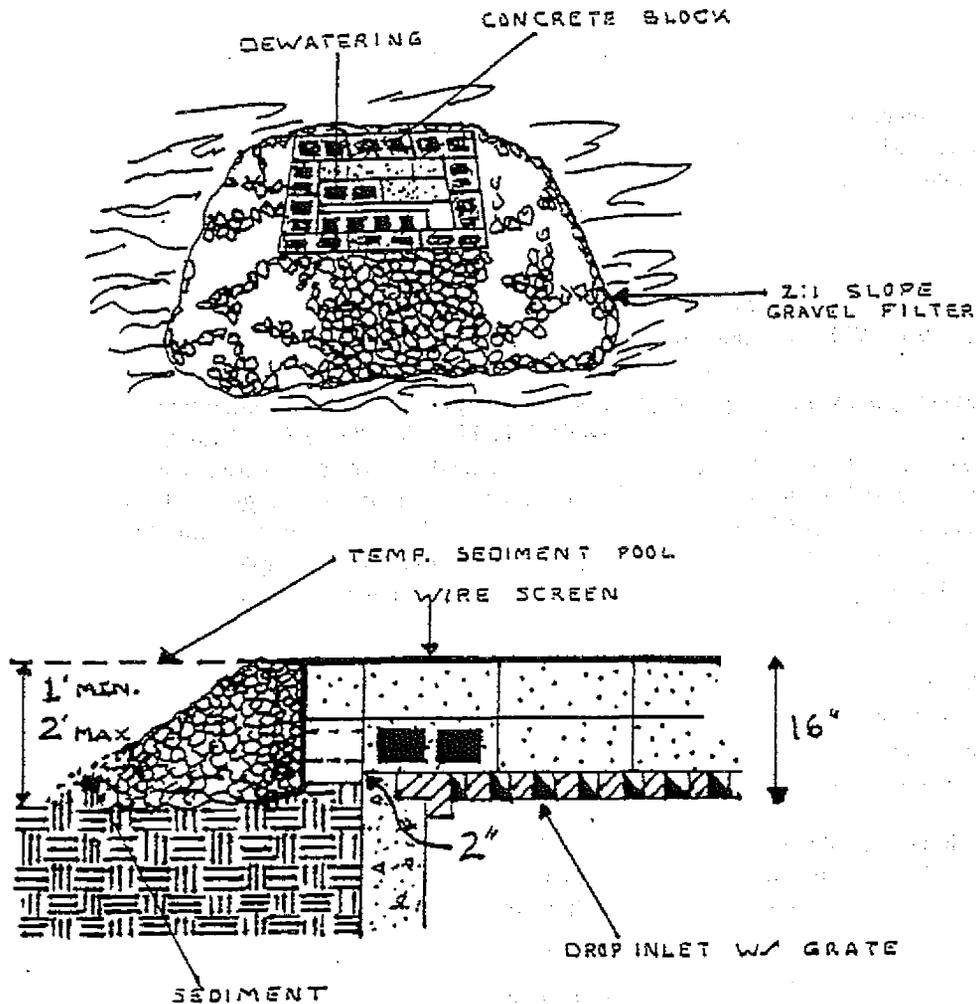
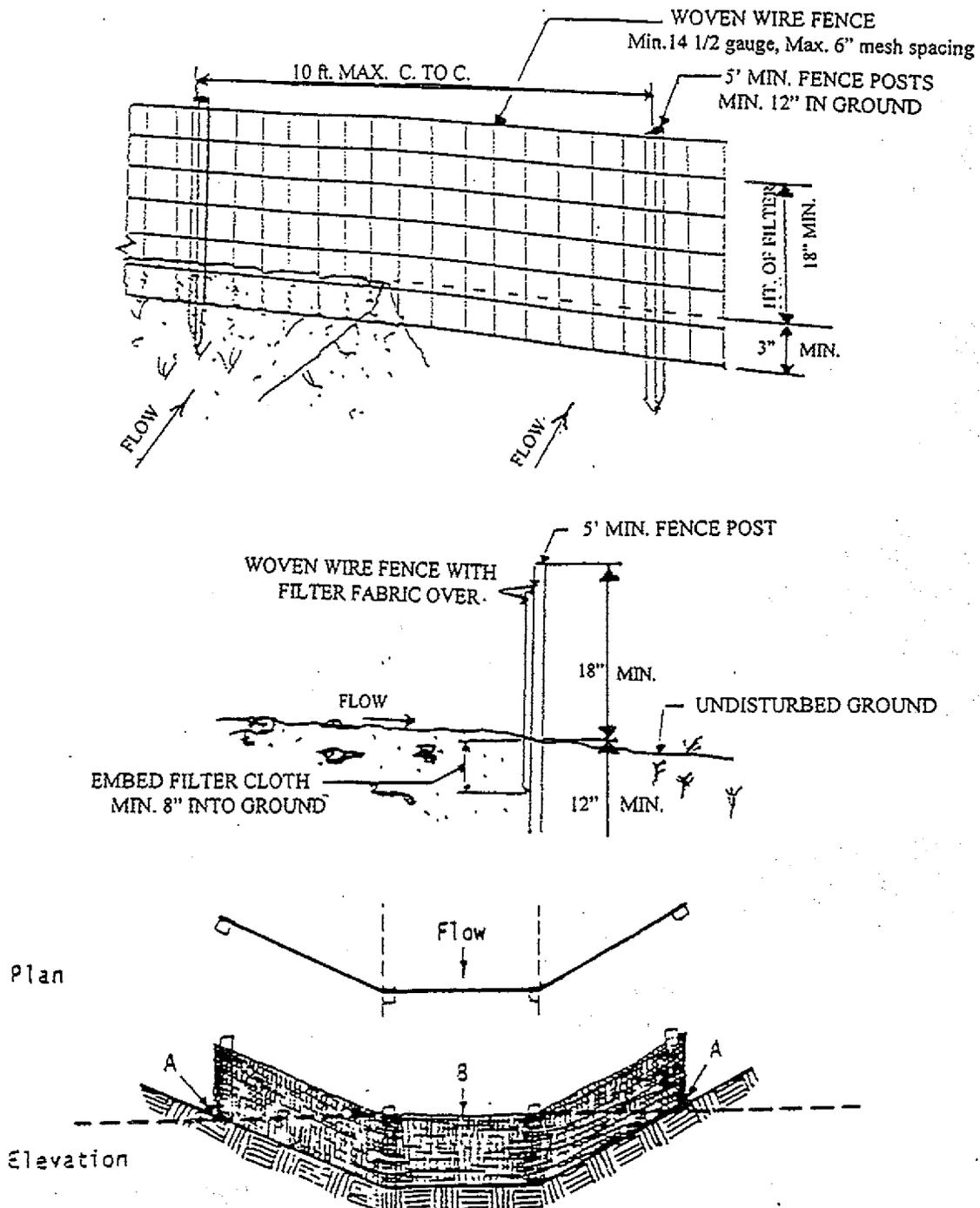


FIG. E-3. STONE & BLOCK DROP INLET PROTECTION

Source: New York Guidelines for Urban Erosion and Sediment Control, Oct. 1991

CONSTRUCTION SPECIFICATIONS

1. Lay one block on each side of the structure on its side for dewatering. Foundation shall be 2 inches minimum below rest of inlet and blocks shall be placed against inlet for support.
2. Hardware cloth or 1/2" wire mesh shall be placed over block openings to support stone.
3. Use clean stone or gravel 1/2-3/4 inch in diameter placed 2 inches below the top of the block on a 2:1 slope or flatter.

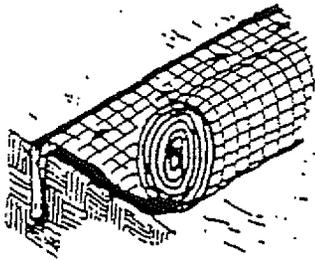


Points A should be higher than point 8

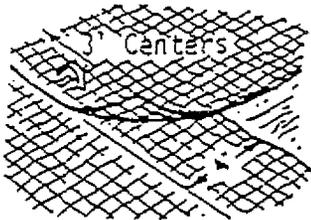
PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

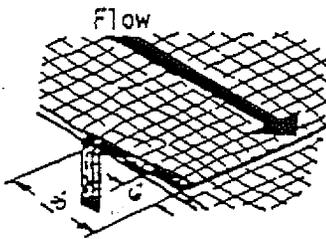
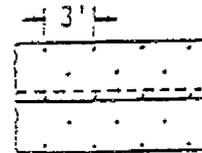
FIG. E-6
SUPPORTED FILTER BARRIER FOR USE IN A DRAINAGE WAY



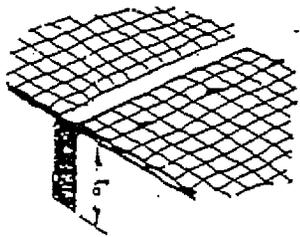
Anchor Slot: Bury the up-channel end of the net in a 5" deep trench. Tamp the soil firmly. Staple at 12" intervals across the net.



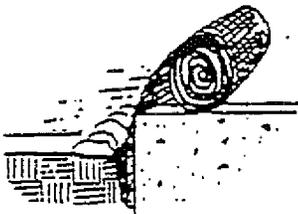
Overlap: Overlap edges of the strips at least 4". Staple every 3 feet down the center of the strip.



Joining Strips: Insert the new roll of net in a trench, as with the Anchor Slot. Overlap the up-channel end of the previous roll 18" and turn the end under 6". Staple the end of the previous roll just below the anchor slot and at the end at 12" intervals.



Check Slots: On erodible soils or steep slopes, check slots should be made every 15 feet. Insert a fold of the net into a 6" trench and tamp firmly. Staple at 12" intervals across the net. Lay the net smoothly on the surface of the soil - do not stretch the net, and do not allow wrinkles.



Anchoring Ends At Structures:

Place the end of the net in a 6" slot on the up-channel side of the structure. Fill the trench and tamp firmly. Roll the net up the channel. Place staples at 12" intervals along the anchor end of the net.

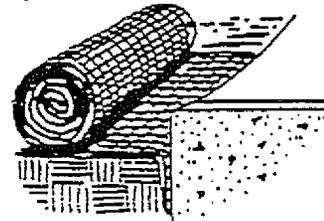
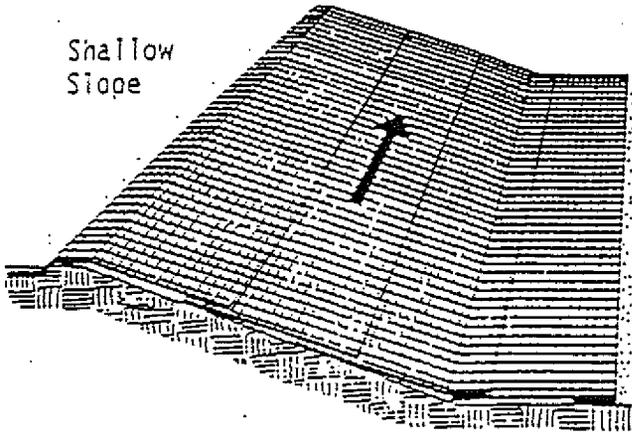


FIG. E-8(a) INSTALLATION OF NETTING OR MATTING
Note: If provided, follow manufacturer's installation specifications

Shallow
Slope

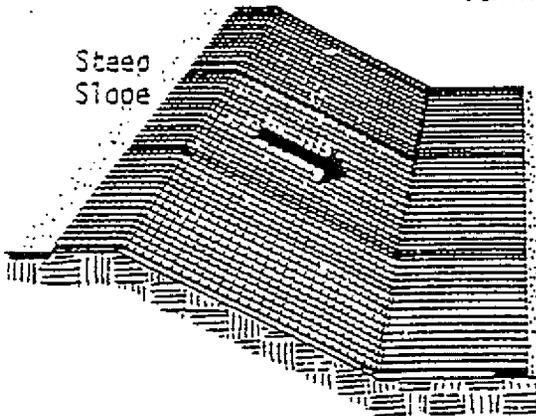


On shallow slopes, strips of netting may be applied across the slope.

Where there is a berm at the top of the slope, bring the netting over the berm and anchor it behind the berm.

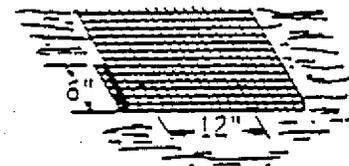


Steep
Slope

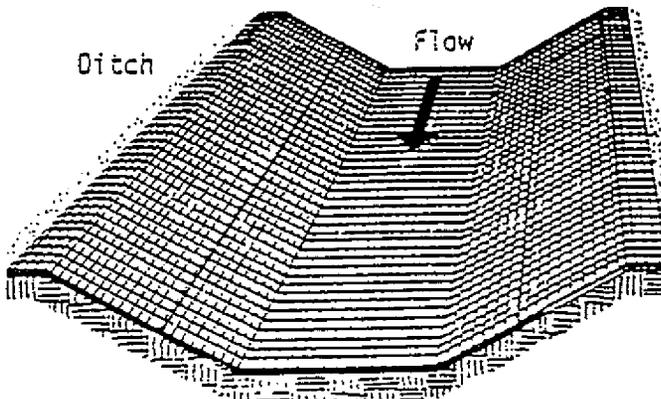


On steep slopes, apply strips of netting parallel to the direction of flow and anchor securely.

Bring netting down to a level area before terminating the installation. Turn the end under 6" and staple at 12" intervals.



Ditch



In ditches, apply netting parallel to the direction of flow. Use check slots every 15 feet. Do not join strips in the center of the ditch.

FIG. E-8(b) ORIENTATION OF NETTING OR MATTING
Note: If provided, follow manufacturer's installation specifications

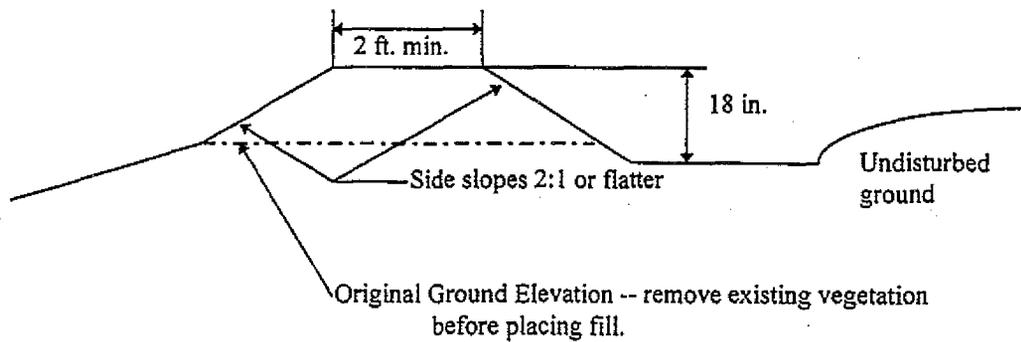


FIG. E-10. TEMPORARY DIVERSION

PURPOSE

To divert runoff around disturbed areas to a location where the clean water can be discharged to existing vegetation in such a way as to prevent any negative offsite impacts.

CONDITIONS WHERE PRACTICE APPLIES

1. Where drainage areas do not exceed 3 acres.
2. Upslope of disturbed areas where erosion is likely to occur.
3. Upslope of soil piles.
4. Above steep cut or fill slopes.

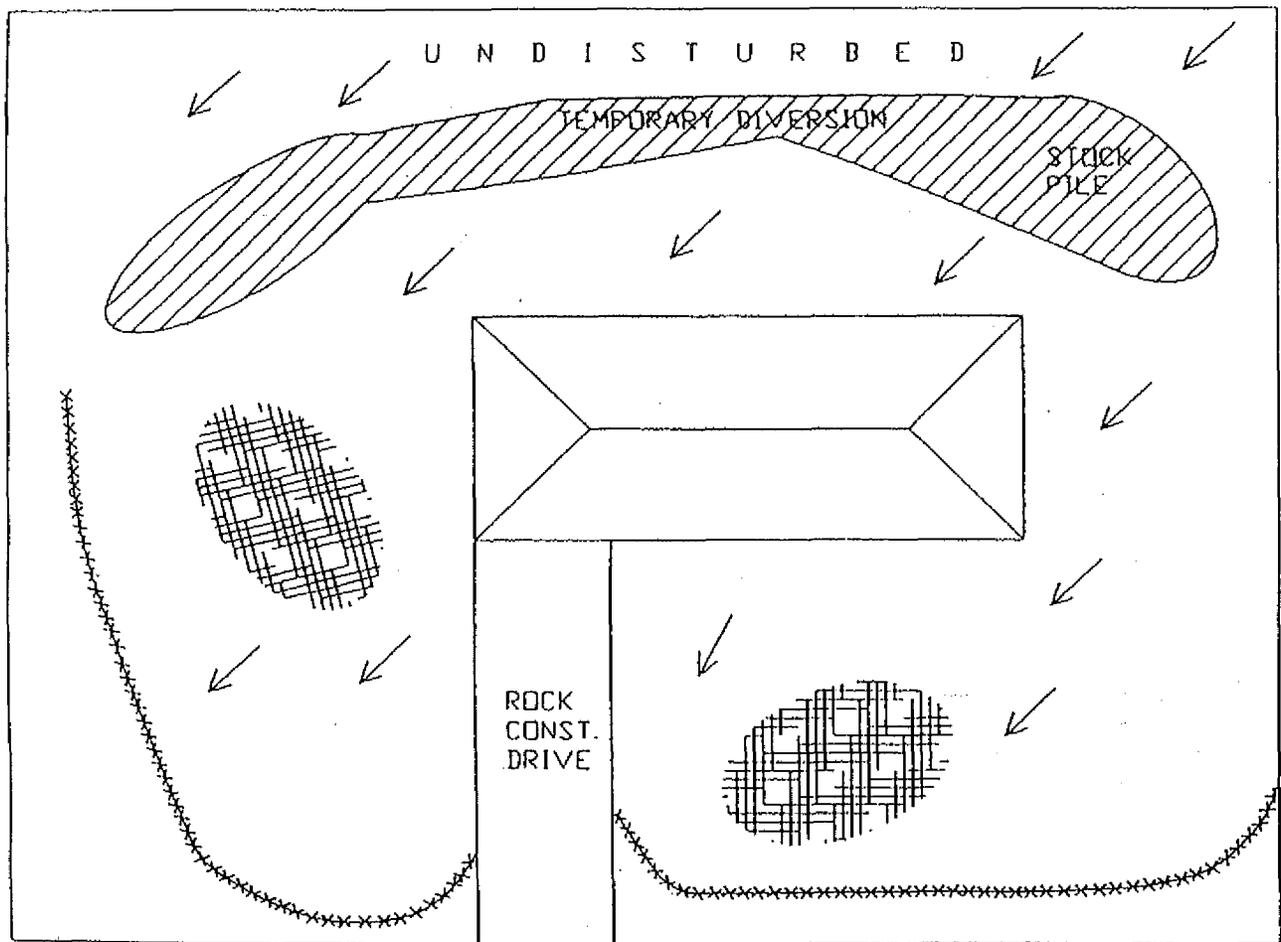
STABILIZATION

Diversions side slopes, ridge, downslope side of the berm and channel should be stabilized within 7 days of final grading by:

1. Sodding;
2. seeding and mulching in combination with filter fabric barriers or straw bale barriers;
3. covering with suitable geotextile;
4. covering with 6 mil polyethylene sheeting.

(vegetation should be used as the stabilization method if diversion is to be in place 30 days or longer)

NOTE: Diversions are to be constructed so the channel area is flat enough that an erosion problem is not created.



-  TOP SOIL STOCK PILE-USED TO CREATE DIVERSION (SEED & MULCH)
-  TEMPORARY BACK-FILL STOCK PILES
-  SILT FENCE

FIG. E 11
PLOT PLAN FOR SIMPLE SLOPES

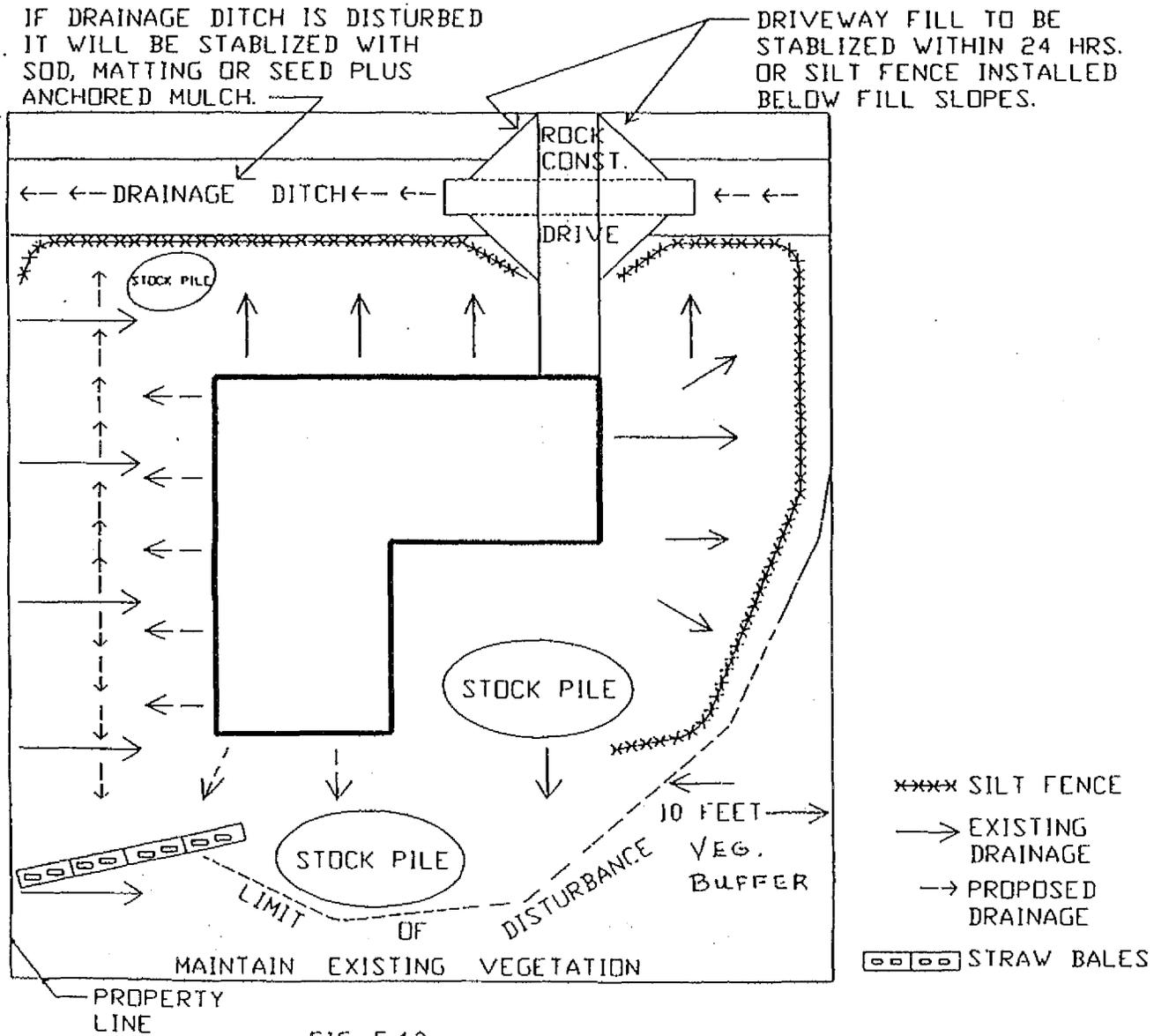


FIG. E 12
PLOT PLAN FOR SLOPES

VEGETATIVE BARRIERS

Vegetative barriers may be used as a perimeter measure if disturbed areas above consist of slopes no greater than 6% and barriers are on a grade no steeper than 2%. Vegetative barriers are to be a minimum of 10' wide for every 50 feet of open ground draining to them. These barriers must be maintained, i.e. not driven on or destroyed. If the barriers become covered with silt or otherwise destroyed, additional perimeter measures may be required.

TEMPORARY STABILIZATION OR MULCH CROP

It is much easier to control erosion than to control sediment. Temporary stabilization helps to minimize erosion and therefore the need for long term maintenance of silt fences and straw bales. Annual rye grass may be planted as a temporary cover between April 1 and September 15. If seeding is done in the spring or summer seeding dates and slopes are 6% or less, mulch may not be necessary. Winter rye may be planted between July 15 and October 15. These seedings should be mulched.

LATE SEASON CONSTRUCTION MULCHING/DORMANT SEEDING

If ground is broken after September 15, mulch should be applied as soon as a rough grade is established, unless final grade and landscaping is to be completed before the next growing season. Mulch will help to reduce the raindrop impact. Seeding should not be done between September 15 and November 1 as the weather is warm enough for the seed to germinate but it will not have an opportunity to establish a root system strong enough to survive the winter. A dormant seeding may be done OVER the mulch after November 1. These seedings are risky. A split application of seed may also be made, using half in November and balance early in spring.

WINTER CONSTRUCTION

In areas with course soils, (sands) if excavation is possible most likely a trencher can be used to install the necessary silt fence. If at all possible leave the perimeter of the site undisturbed (this is assuming the site had vegetation present prior to frost); this may be the easiest erosion control for flat sites (6% or less). In areas that have heavy soils, (clays) close attention should be paid to the try to get perimeter measures installed prior to frost penetrating greater than 6". If ground is solidly frozen, perimeter measures may have to wait to be installed when the frost first starts to come out in the spring.

Maintenance of the most commonly used erosion control procedures in the construction of one and two family dwellings.

SILT FENCES

Repair or replacement should be done within 24 hours if fencing is torn, sagging, overtopped, blown over (laying down), shows a lack of integrity, or in any way is not functioning as designed. Sediment deposits should be removed after each storm event. Sediment deposits shall be removed when deposits reach 0.5 the above ground height of the fence. Silt fence should be removed after upland areas have been stabilized. Any sediment deposits remaining in place after the silt fence is no longer required should be dressed to conform to the existing grade, prepared and seeded.

STRAWBALES

Replacement of broken or torn bales should be done within 24 hours. Sediment deposits should be removed when deposits reach 0.5 the height of the fence. Strawbales should be removed after upland areas have been stabilized. Any sediment deposits remaining in place after the straw bale barrier is no longer required should be dressed to conform to the existing grade, prepared and seeded.

MULCHING

Additional mulch, netting or matting should be applied when rills develop. (rill - small eroded ditch measuring 1" wide).

TEMPORARY DIVERSIONS

Any breaks or eroded areas of a diversion should be repaired within 24 hours.

SEDIMENT TRAP

Any structural deficiencies should be repaired within 24 hours. Sediment should be removed when it reaches half of the outlet height of the trap.

SODDING

Repair or replacement of sod that has been destroyed in an area of channelized flow should be done within 24 hours after the rain event.

INLET PROTECTION BARRIERS

Sediment deposits should be removed when deposits reach 0.5 the height of the fence. Repair or replacement should be made to damaged barriers within 24 hours.

TEMPORARY GRAVELED ACCESS ROADS

Rock should be maintained to meet the design criteria of 2-3" aggregate stone; 7 feet wide and 50 feet long or the distance to the foundation, whichever is less; and maintained at a depth of 6".