WILLIS CANYON ALLOTMENT MANAGEMENT PLAN

NORTH KAIBAB RANGER DISTRICT

KAIBAB NATIONAL FOREST

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BUNTING BROTHERS
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District Ranger

I. GOALS AND OBJECTIVES

The goal of this Allotment Management Plan (AMP) is to provide for the long term health and productivity of the environment of the Willis Canyon Allotment, in the presence of livestock grazing.

Specific objectives include:
A. Implement a three pasture modified rest rotation grazing schedule in 1993;
B. Reverse downward trends on all range types of the Allotment by the end of the first rotation of the grazing schedule following full implementation of this AMP;
C. Cause upward trends on all range types in less than satisfactory condition by the end of the first rotation of the grazing schedule following full implementation of this AMP;
D. Through monitoring over the first four year period after full implementation of this AMP, determine livestock carrying capacity, appropriateness of the season of use, and appropriateness of management on the Allotment, and issue new Term Grazing Permits to the livestock permittees of the Allotment to incorporate these findings and balance use with capacity if necessary, to meet objectives for the area before the fifth year after full implementation of this AMP;
E. Enhance range and watershed condition and increase forage quality, quantity, and distribution before the second rotation of the grazing schedule established in this AMP, by improving livestock distribution, establishing utilization standards, and by providing rest in the grazing schedule;
F. Increase soil productivity by limiting compaction, increasing ground cover, reducing accelerated erosion, and maintaining microorganisms;
G. Provide for a diverse mix of wildlife species by mainaining healthy and diverse wildlife habitats on the Allotment, in the presence of livestock grazing;
H. Provide dependable water sources that are distributed to facilitate use of habitat and forage, and maintain water sources in serviceable condition;
I. Maintain Allotment Boundary and division fences in serviceable condition;
J. Maintain water quality on the Allotment to prevent non point source pollution of the Colorado River.

II. DESCRIPTION

A. The Allotment
The Allotment contains approximately 27,489 acres of which 874 acres are public domain lands under Bureau of Land Management (BLM) jurisdiction that are fenced within the current Allotment boundary and managed by the Forest Service. An additional 644 acres of National Forest System lands are adjacent to, but fenced outside of the Allotment, and are used as part of the management activities that occur on public domain lands administered by the BLM.

A large portion of the Allotment is open bottomlands dominated by grass species, or brush/grass habitat. However, the majority of the Allotment is pinyon/juniper woodland. Approximately 1% of the Allotment is Ponderosa pine.
Nearly the entire bottomland in Orderville Canyon within the Allotment was seeded to Crested Wheatgrass in 1954. Prescribed burning to increase openings in the pinyon/juniper woodlands or to improve conditions in the sagebrush/grass vegetation have occurred on portions of the Allotment in the past.

By nature, cattle tend to concentrate in bottomlands, meadows, open park-like vegetation types, riparian areas, or where water has been developed. These are generally the key areas for grazing management with cattle. Since the Willis Canyon Allotment provides a winter grazing season, the tendency for cattle to concentrate in the bottoms is off-set when a winter storm brings snow to the bottomlands. The open bottomlands become covered with snow to the degree that cattle cannot forage effectively. When this happens, cattle naturally move to the adjacent woodlands where forage is provided within the intermixed stands of pinyon and juniper by shrubs that protrude above the snow level, or by other forage under the trees. Cattle become browsers when this happens and will forage on shrubs and forbs as well as grasses. This can create competition for deer over-wintering on the Allotment.

The north end of Orderville Canyon has forage available that receives only light utilization. This is because the cattle naturally prefer the areas further to the south where water is more abundant.

Range vegetation mapping was done in the 1960's and redone in 1986. Bench mark condition and trend studies (cluster transects) were installed in 1957 at five locations on the Allotment. In 1985, one of these, cluster C-4, was not found and was reestablished in the same general vicinity in the same vegetation type. However, prescribed burning had been done in the area in 1977 and comparisons between the original site and the new site are unreliable. The five cluster transects were read in 1957, 1964, and 1985. In 1992, clusters C-1, C-2, C-4, and C-5 were reread. Cluster C-3 was dropped as a permanent study because a water trough had been installed in close proximity to it causing it to be an area where livestock use is concentrated. This concentration of use causes this site to be ineffective as a long term condition and trend bench mark. The following chart summarizes condition and trend findings from these readings:

Condition ratings - VP=very poor P=poor F=fair G=good
Trend ratings - static = constant up = upward down = downward

Cluster	1957	1964	1985	1992
C-1	P static	P up	F static	F static
C-2	static	P down	VP down	VP down
C-3	VP static	VP static	F static	abandoned
C-4	down	VP static	F static	P static
C-5	P static	P static	G static	G static

B. Livestock Grazing

The area encompassed by the Willis Canyon Allotment has been grazed by livestock, to some degree, since the latter 1800's. District records indicate that permitted use was reduced by 40% in 1980. Current permitted Livestock Grazing on the Willis Canyon Allotment is:

Bunting Brothers	111 cattle	11/16-4/30 annually.
Bunting & Sons	64 cattle	11/16-4/30 annually.
Clark & Florene Lamb	69 cattle	11/16-4/30 annually.
TOTAL	244 cattle	1342 Animal Months

The grazing system has traditionally been season long. Although the Allotment is currently divided into two pastures, Forest Service records do not indicate that

a rest or deferred grazing system had been used, except for the 1991-1992 grazing season. Production/utilization studies have not been performed to an appropriate degree to determine carrying capacity, nor have utilization standards been established in the past. With the exception of the northern most portion, utilization in bottomlands in Orderville Canyon during the spring of 1992 was between 70% and 90% throughout, and heaviest in the vicinity of water. Indications are that similar utilization occurred in the spring of 1991 as well. This degree of utilization, along with not having rest built into the grazing schedule prior to the 1991-1992 season, and below average precipitation for several years up to 1992, has reduced production and plant vigor below their potential. Continued utilization at these levels would be damaging to the range resource and impact other resource values, particularly watershed condition and wildlife habitat. Implementation of rest and voluntary non-use for range protection by the permittees in 1992 and 1993 has started the recovery process in Orderville Canyon.

III. ACTION PLAN

A. Grazing Season and Schedule

The Grazing Season is 11/16 thru 4/30. The Grazing Schedule will be:

		YEARS ONE AND TWO (1993-94 and 1994-95)
Cooper Ridge	(spring rest)	Graze 11/16-3/15
Orderville North	(spring grazing)	Graze 12/20-4/30
Orderville South	(spring rest)	Graze 11/16-3/15
		YEARS THREE AND FOUR (1995-96 and 1996-97)
Cooper Ridge	(spring rest)	Graze 11/16-3/15
Orderville North	(spring rest)	Graze 11/16-3/15
Orderville South	(spring grazing)	Graze 12/20-4/30
		YEARS FIVE AND SIX (1997-98 and 1998-99)
Cooper Ridge	(spring grazing)	Graze 12/20-4/30
Orderville North	(spring rest)	Graze 11/16-3/15
Orderville South	(spring rest)	Graze 11/16-3/15

This schedule would start over again every seven years (2000, 2007, etc.), for as long as this AMP is in effect.

Sticking entirely to a grazing schedule such as the one outlined above would depend on conditions on the ground each year, and could be affected by such things as more or less than average precipitation, timing of precipitation, the need to adjust the schedule to accommodate other resource activities such as the need for rest following a prescribed burn or seeding for watershed improvement, and various other indeterminate events.

B. Permitted Use

The Term Grazing Permits of the three livestock permittees will be cancelled in 1993 and new permits issued prior to the 1993-94 grazing season. The new permits will incorporate Forest Plan standards, guidelines, and direction, range

improvement maintenance standards and responsibility, utilization standards, and so forth to implement direction of the Forest Plan. Permitted use will be the same as on the current permits for four years during which time monitoring will be performed to determine carrying capacity, and appropriateness of season of use and management. Permitted use during this four year period will be:

Bunting Brothers	111 head	Adult Cattle	11/16 - 4/30
Bunting and Sons	64 head	Adult Cattle	11/16 - 4/30
Clark and Florene Lamb	69 head	Adult Cattle	11/16 - 4/30

If monitoring determines that adjustments are necessary, they will occur at the end of the fourth grazing season following implementation of this AMP, and will be implemented by replacing the then existing Term Grazing Permits with new permits for the proper number, season, or management required. This will assure that use and carrying capacity of the range are in balance for the long-term. Minor short-term modifications necessary to meet management objectives will be incorporated in the Annual Operating Plans.

C. Forage Utilization

Forage utilization standards are to leave no less than 40% of the previous season's growth on the fall and winter pastures, and no less than 60% of current year's growth in the spring pastures.

D. Range Improvement Construction

Implementing the grazing schedule will require construction of a new 3-wire pasture division fence across Orderville Canyon, approximately 2.7 miles long (see Appendix 2: Fence Specifications), and reconstruction of the Rock Canyon Tank. These improvements will be a joint venture between the Forest Service and the permittees whereas the Forest Service will provide the bentonite and fencing materials, and the three permittees will provide the labor and equipment to actually carry-out construction. These improvements are to be completed before the 1993-94 grazing season. It is likely that monitoring will indicate a future need to develop additional water in the Orderville North pasture to gain favorable livestock distribution.

Ramps to allow wildlife access to and escape from troughs, will be installed in all troughs over the next few years.

E. Range Improvement Maintenance

Range improvement maintenance standards for the Allotment have been established and will be incorporated into the Term Grazing Permits. Range improvement maintenance responsibility has been determined and will be listed in the Term Grazing Permits. The permittees have agreed to work together to maintain the range improvements regardless of who is responsible for any given improvement by assignment in the Term Grazing Permits.

Because over-winter grazing occurs on the Allotment, during which time it is difficult or impossible to maintain or to inspect range improvements, all

improvements on the Allotment are to be maintained to the specified standards and operational, prior to the entry date for the Allotment.

Needs for heavy maintenance or reconstruction of the following Allotment Improvements has been identified and will occur over the next few years:
Cooper Trick Tank Fence
Navajo Tank and Fence
Summit Valley Tank
Willis/Ryan Allotment Boundary Fence

F. Livestock Distribution

HERDING

Cattle are to be kept in the pasture authorized for any specific time period as authorized in the Annual Operating Plan. Changes to the Annual Operating Plan must be requested in advance and **approved in advance, in writing**, by the District Ranger.

Proper herding and distribution of livestock will require riding on the part of the permittees, to assure improvements are functional, cattle are in the authorized pasture, and gates are closed. Cattle are to be herded away from areas where concentrated use results in over-grazing. These are meadow or bottomland areas, and areas in the vicinity of water. Cattle also tend to bunch-up around pasture division and allotment boundary fences. Cattle are to be herded away from the allotment and pasture division fences to reduce the possibility of livestock use in areas outside of the permitted pasture on the Willis Canyon Allotment and to reduce impact to the ground cover in these areas.

It is usually impossible to gather and move all livestock in one trip. Therefore gathering and moving livestock will start adequately in advance of the move date specified in the grazing schedule so that **all livestock** are moved by the specified off-dates.

SALTING

The proper placement of salt is a valuable distribution aid. Salt will be placed **away from** heavy use areas, bottomlands, waters, and fence lines. Salt will be placed in areas where we normally receive only light use. This will aid in distributing livestock away from areas where we normally receive heavy use. Because salt grounds are areas of high cattle concentration and impact, salt will not be placed in the same area each year. Salt will be placed at least fifty (50) yards away from the area used the previous year. No salt ground will be used more than one year out of three.

IV. MONITORING

Forage production and livestock utilization, and watershed condition transects will be monitored for four years to determine the livestock carrying capacity of the range, and to determine if ground cover is increasing. This monitoring will be based on the key area concept, whereby monitoring of production and utilization will occur in the key areas where the greatest impact or use by cattle is likely to occur. This will include monitoring in areas such as

Orderville Canyon, Round Valley, and in the area east of the Willis Tank (key areas for monitoring are indicated on the Map 1 in the Appendix).

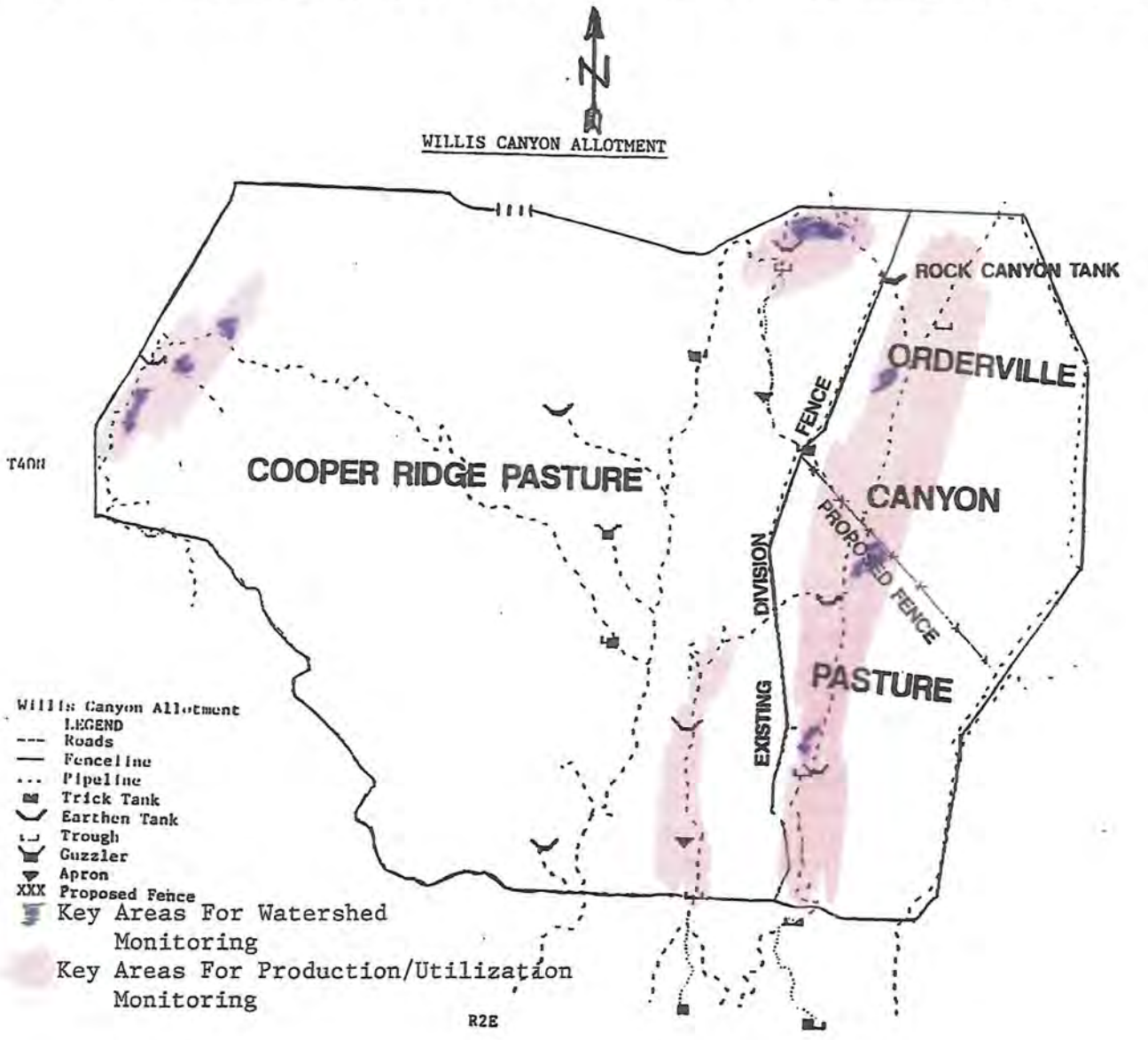
Condition and trend monitoring will be done at the end of the fourth grazing season after full implementation of this AMP, and will occur at the four existing bench marks.

The permittees will be invited to accompany Forest officers during any of the monitoring described above.

The Forest Service will also monitor to assure that livestock are in the authorized pasture and that other terms and conditions of the Term Grazing Permit, the Allotment Management Plan, and the Annual Operating Plan are being followed.

APPENDIX

APPENDIX MAP 1: KEY AREAS FOR PRODUCTION/UTILIZATION AND WATERSHED MONITORING



APPENDIX 2: FENCE SPECIFICATIONS FOR CONSTRUCTION OF THE ORDERVILLE PASTURE DIVISION FENCE

MATERIALS AND SPECIFICATIONS

Design - Fences will be three wire (see attached Fence Specifications diagrams) with wires spaced at 18 inches, 28 inches, and 40 inches from the ground. All wires will be double strand twisted 12-1/2 gauge two point barb wire with four inch interspace between barbs. Wires wil be placed on the north side of the posts **from Summit Valley Trick Tank to approximately 1/4 mile east of the Arizona Trail, and on the south side of the posts from approximately 1/4 mile east of the Arizona Trail to the Willis/Burro allotment boundary fence.**

A total of six gates will be installed as described in Gates below.

"H-braces" will be installed at corners, and every place the fence makes more than a five degree change of slope. Both an H-brace and a diagonal brace will be used at both ends of the fenceline, on the support side of the 16 foot Powder River gate, where the fence makes more than a 10 degree slope, and at every quarter mile. Idler braces will be installed at corners having a greater than 90 degree turn. All braces will be installled according to the specifications listed under BRACES below.

BRACES - All braces will be H-braces, or a combination of H-braces with a diagonal brace (see attached Brace Specifications). Braces will be constructed of treated wooden posts and treated or galvanized steel pipe cross members. **EZ Brace Panels may be installed from approximately 1/4 mile east of the Arizona Trail to the Willis/Burro allotment boundary fence, where rocky ground prevents the digging of 30 inch deep post holes.** All wooden posts will be at least eight inches in diameter, reasonably straight, and be 6-1/2 feet long. New unused treated railroad ties are acceptable. Treated posts must have preservative penetration of at least 3/4 inch radially. Commercially pressure-treated posts will usually meet standards. **Juniper trees which are cleared from the fence right of way may be used in place of treated posts or railroad ties.**

Posts are to be positioned vertically and centered between **8-10 feet** apart. The bottom of the post will be at a depth of 30 inches below ground level. The post hole is to be tamped so that compaction is adequate to hold the post firmly upright without noticeable movement when forceably pushed or shaken by hand at the top. All fence brace cross members must be five inches in diameter or larger and of juniper or treated pine if made of wood **(or of juniper trees which are cleared from the fence right of way)**, or at least 2-1/2 inch inside diameter galvanized steel pipe if made of metal, and between **8-10** feet long. The top of the cross member will be at a height of 40 inches above the ground, and centered on the wooden brace posts. Brace posts will be notched so the cross member fits securely between the two posts, and spikes driven to further secure the cross member.

Braces will be held together using 12-1/2 gauge smooth wire or No.9 galvanized wire by creating a closed loop from the top of the left hand post to the bottom of the right hand post, and another closed loop from the top of the right hand

BRACES (cont'd)
post to the bottom of the left hand post. The two closed loops will create an "X" where the two loops cross in the approximate geometrical center between the two posts, and also between the cross member and the ground. Each of the two loops will be stapled snuggly at the top and bottom, two inches above the top of the brace cross member, and two inches above the ground. The two loops of wire will be tightened by placing a three inch diameter or larger twist stick vertically between the loops where they cross in the geometric center, and twisting both loops simultaneously away from the side the fence wire will be on, until quite tight. Proper tension is achieved when the twist stick has enough tension to return firmly to the cross member when released from about a foot beyond the cross member.

EZ Brace Panels - **All EZ Brace Panels will be installed using two 5-1/2 foot steel fence posts on each end of the panels. One steel post will be driven 30 inches into the ground, and the second steel post will be driven right next to the first, 22 inches deep. The posts will be secured to each other and the EZ panels by hose clamps and/or 12-1/2 gauge or No. 9 galvanized wire. See EZ Brace Panel Specifications.**

Diagonal Braces - Diagonal braces will be constructed with the same materials as the H-braces. The cross member will be placed diagonally from the top of one brace post, to the bottom of the second brace post. The top of the cross member will be at a height of 40 inches above the ground, and centered on the wooden post. The bottom of the cross member will be at a height of two inches above the ground, and centered on the wooden post. The diagonal cross member will be installed towards the direction of pull. The diagonal brace will be notched, spiked, and held together as described in BRACES above.

Idler Braces - At corners where the fence takes a greater than 90 degree turn, an idler brace will be installed. An idler brace is an H-brace that uses the common center post of the corner as the anchor post. The brace post (of the idler brace) will be installed **4-5 feet** out from the anchor post, and centered between the two corner brace posts. The cross member will be between **4-5 feet** long. The top of the cross member will be at a height of 40 inches from the gound, and centered on the wooden posts. The idler brace will be notched, spiked, and held together as described in BRACES above. See Diagonal Brace and Idler Brace Specifications.

Steel Posts - Other than brace posts, all other line type posts will be standard heavy duty T section steel posts 5-1/2 feet in length. Fence wires will be fastened to steel posts only by standard steel clips manufactured for this purpose at heights of 18", 28", and 40" from the ground. Steel posts will be positioned vertically with 20' centers in a straight line between braces, and driven to a depth of 22" below ground level. This will leave 4" of steel post above the top fence wire. See attached Fence Specifications diagram.

Stays - Stays must be of wood and at least 2" and no larger than 4" in diameter. Wooden stays shall extend 4 inches above the top fence wire with the bottom resting on the ground. Stays are to be wired to the fence in a vertical postion at 80" intervals with No. 14 galvanized wire, using a "telephone" type tie or twist. Two evenly spaced stays are required between steel posts. To make a "telephone tie", loop the wire over the fence wire and around the stay. Cross the ends on the back side of the stay and bring each end back around the stay, wrapping the tie wire ends snugly on the fence wire. Care is needed to

STAYS (cont'd)
snug the tie wire tightly around green stays. See Fence Specifications diagram.

Barbed Wire - Barbed wire will be 2-point, 12-1/2 gauge, with 4 inches between barbs. Staples will be 1-1/2 inches long for treated pine posts and one inch long for juniper posts. All line wires will be one continuous strand and dead-ended on the braces. The ends should be wrapped twice around the post, stapled snuggly without pinching the wire, and twisted back on the stretched line wire with at least three wraps. Staples will be set at an angle to the post grain and will be driven just deep enough to snug the line wire without bending it.

Gates - Five-16 foot "range" style wire gates will be installed as follows: One at the Summit Valley Trick Tank trough; one, halfway between this trough and Forest Development Rd.(FDR) 248; one, halfway between the Arizona Trail and FDR 249; and one across FDR 249. See map. Barbed wire will be used on these gates using the same specifications as in the preceding paragraph. These gates will require three twisted wire stays at equal distances from each other and the end posts. The two end posts are to be of wood, and between three and four inches in diameter. See Range Gate Specifications. One four foot range style gate will be installed across the Arizona Trail, and one 16 foot Powder River gate will be installed across FDR 248. The 16 foot Powder River gate will be hung level, with a minimum ground clearance of eight inches, after the gate braces are built and the wire is stretched.
Another post will be installed, 16 feet from the hinged side of the gate and one foot off FDR 248. This post will be cut out, leaving an "L" shaped stump for the gate to rest on when required to be left open. The top of this post will be the same height as the top of the gate. The bottom of the "L" shall be no more than 3/4 inches higher than the bottom of the gate. This 3/4 inch difference will take pressure off the hinged end of the gate when open. A hook will be installed at the top of this "stump post" to allow the gate to be tied open there. See Deadman and Powder River Gate Specifications, and Stump Post Specifications.

WILLIS ALLOTMENT EAST/WEST PASTURE FENCE
NORTH KAIBAB RANGER DISTRICT
KAIBAB NATIONAL FOREST

The Willis Allotment pasture fence is 2.65 miles long. The fence runs southeast from the Summit Valley Trick Tank towards the Burro Trick Tank, tying in at the Willis/Burro allotment boundary fence.

For this project, the Forest Service will be providing materials as outlined below. The permittee(s) will provide the labor and other materials needed to construct the fence (also outlined below).

The Forest Service will provide:

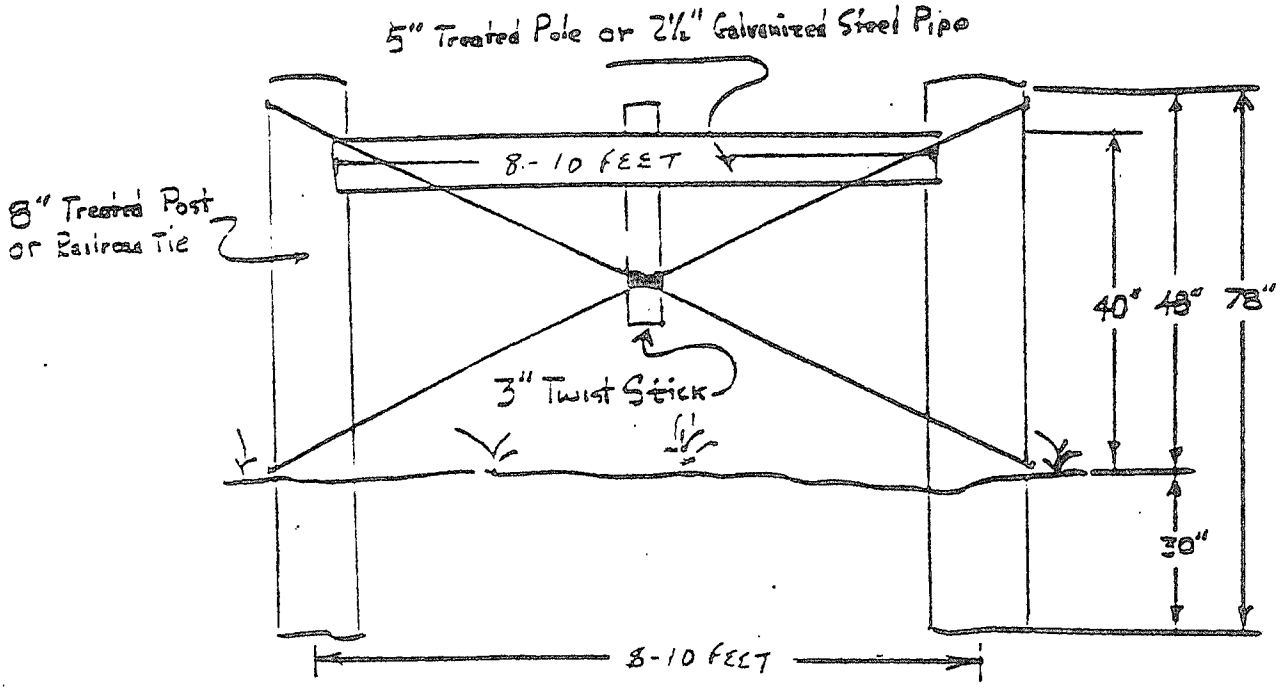
12-1/2 gauge 2-point barb wire: 32 rolls (estimated)
12-1/2 gauge smooth or No.9 galvanized wire: 1 roll (estimated)
No.14 galvanized wire: 1 roll (estimated)
5-1/2 foot steel fence posts: 720 (estimated)
6-1/2 foot treated posts or railroad ties: 82 (estimated)
Cross members - wooden or steel: 41 (estimated)
16 foot Powder River gate: 1
2" X 2" wooden stays: 1440 (estimated)
Wire stays: 14 (estimated)
Steel fence clips: 43 bags (estimated)
Staples: 656 (estimated)

The Permittee(s) will provide:

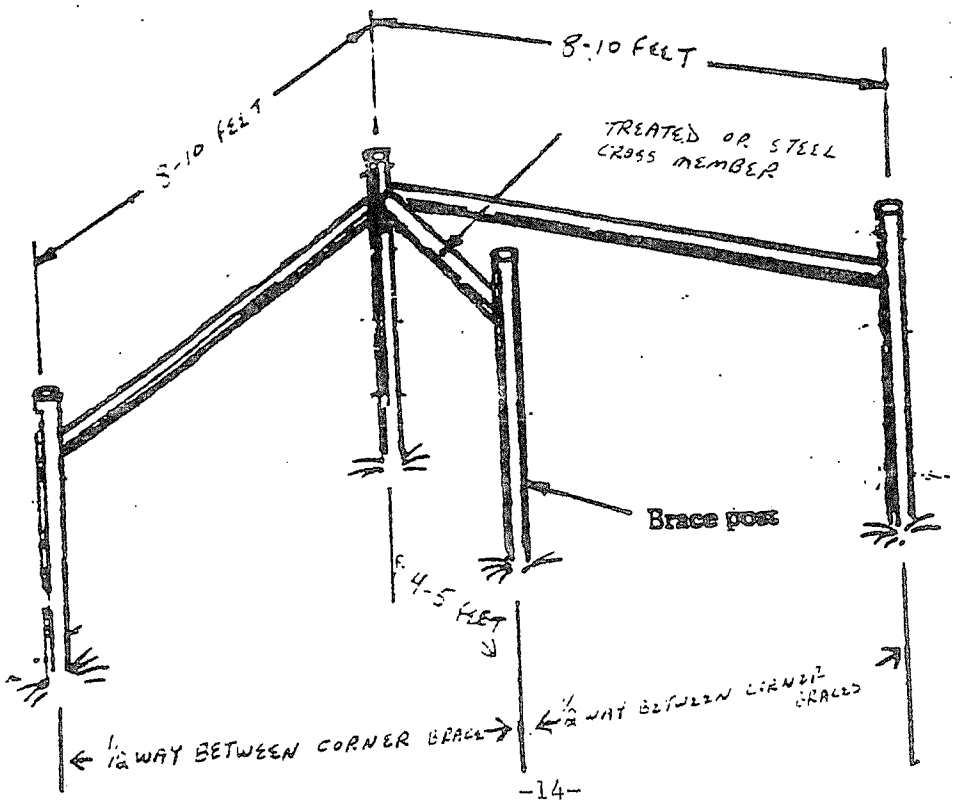
All the labor and tools required to construct the fence.
The labor and equipment required to hand-clear the fenceline.

Brace & Idler Brace Specifications

"H" Brace

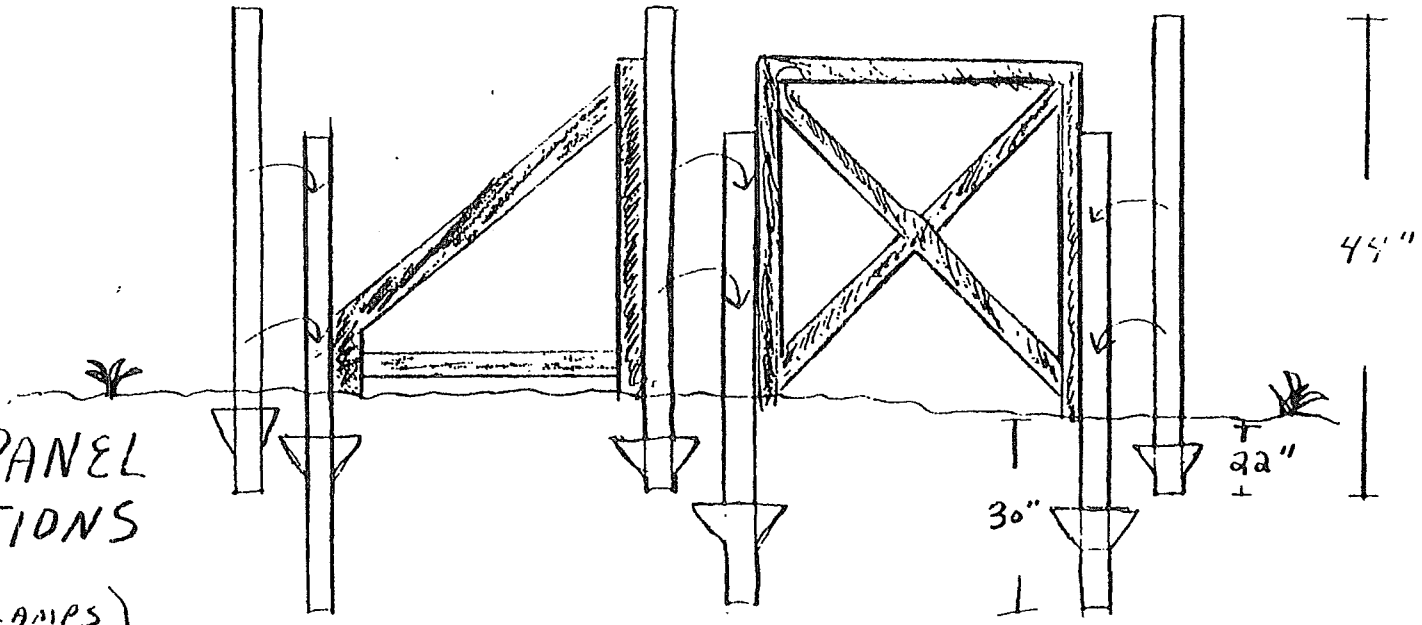


IDLER BRACE



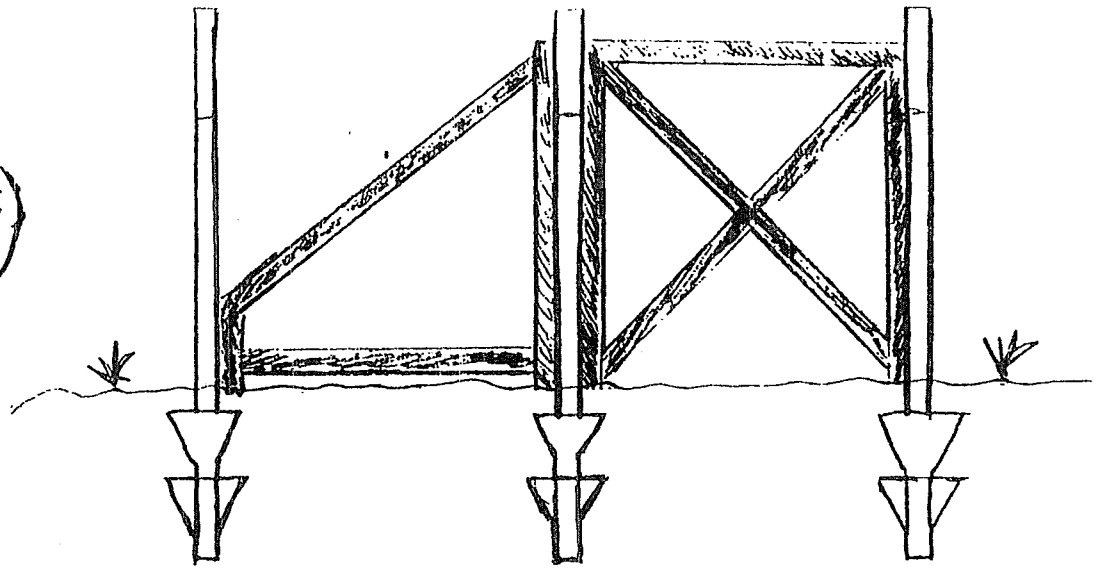
EZ BRACE PANEL SPECIFICATIONS

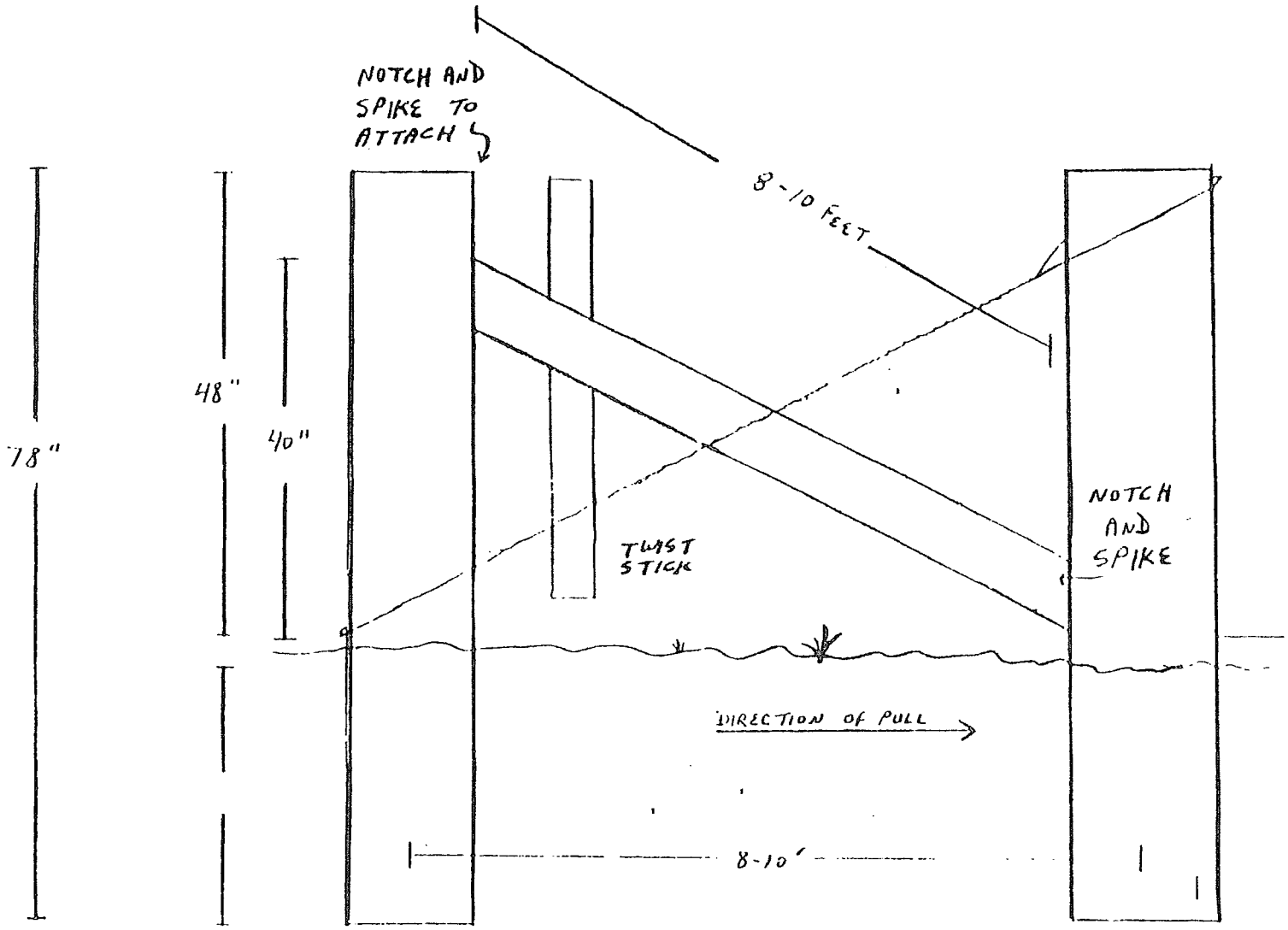
(WITHOUT HOSE CLAMPS TO SHOW DETAIL)



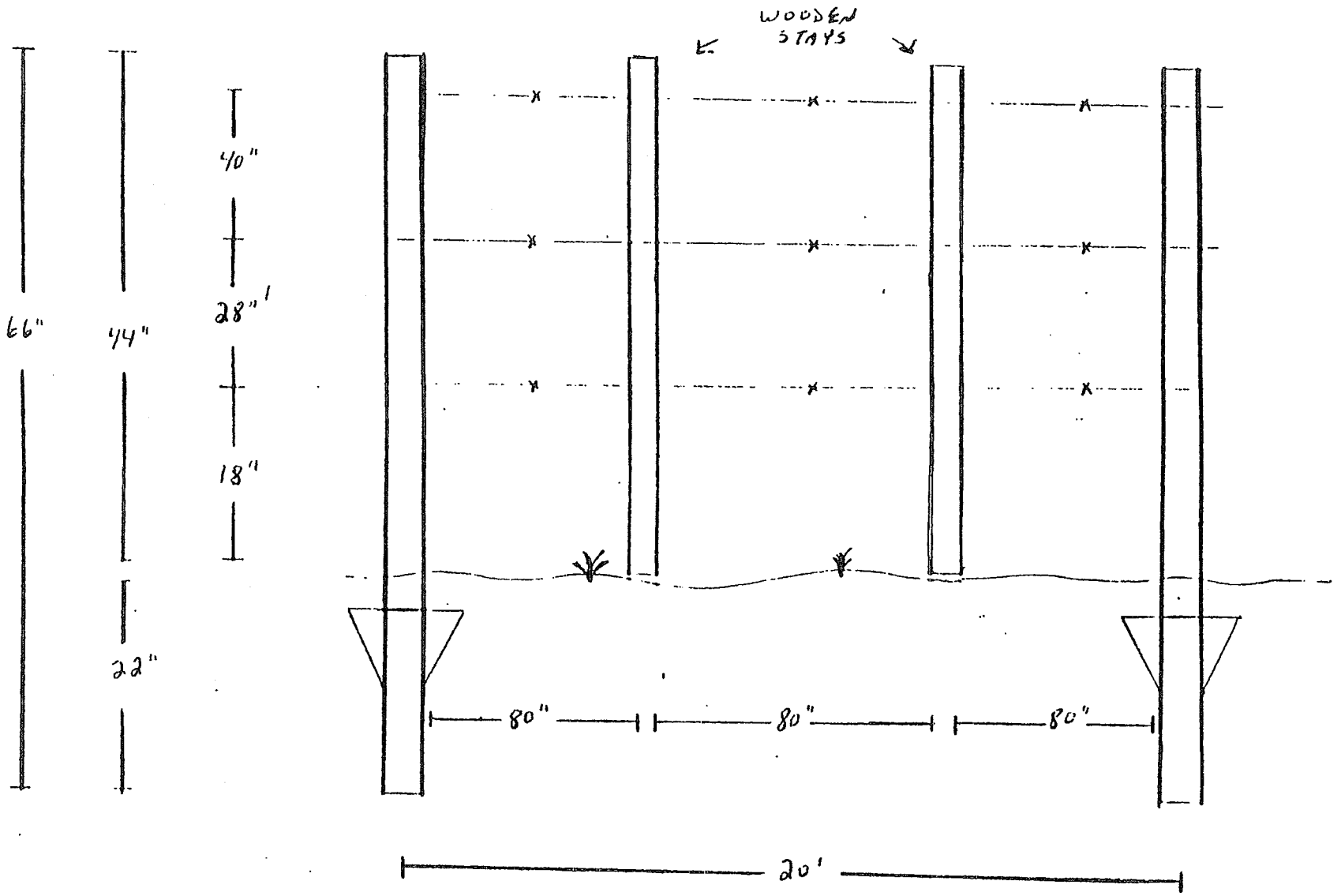
FINISHED LOOK

(WITHOUT HOSE CLAMPS TO SHOW DETAIL)

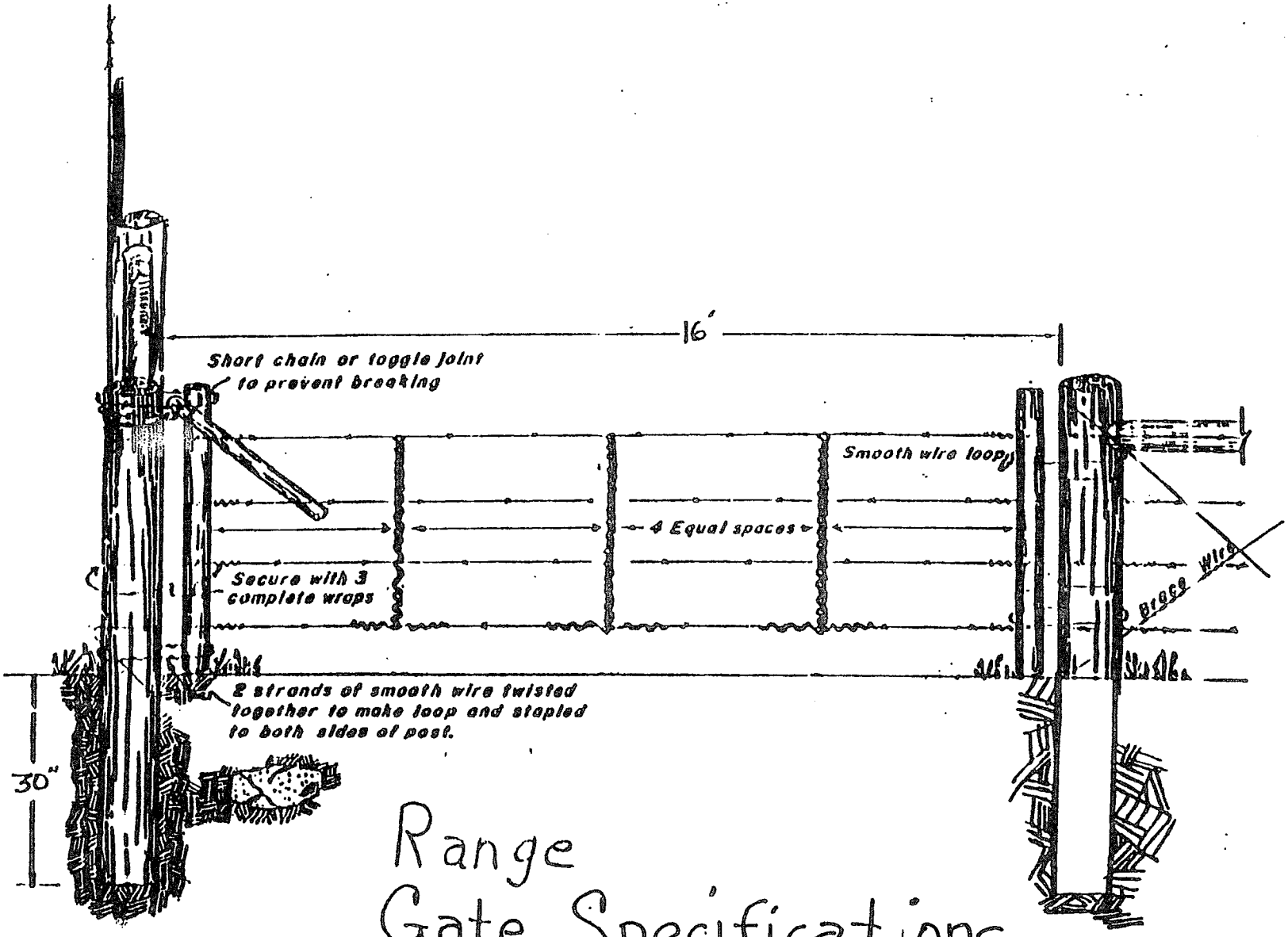




DIAGONAL BRACE SPECIFICATION



LINE POSTS, STAYS, AND WIRE SPACING



Range Gate Specifications

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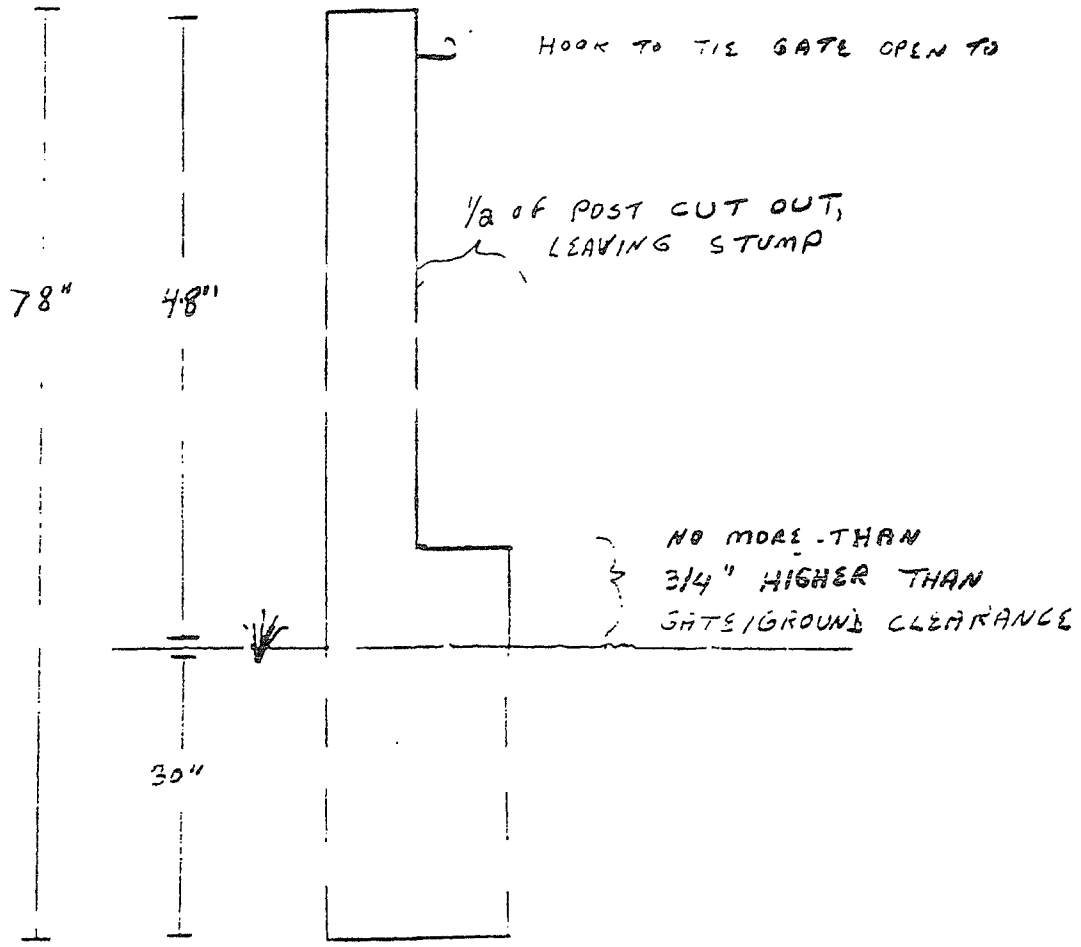
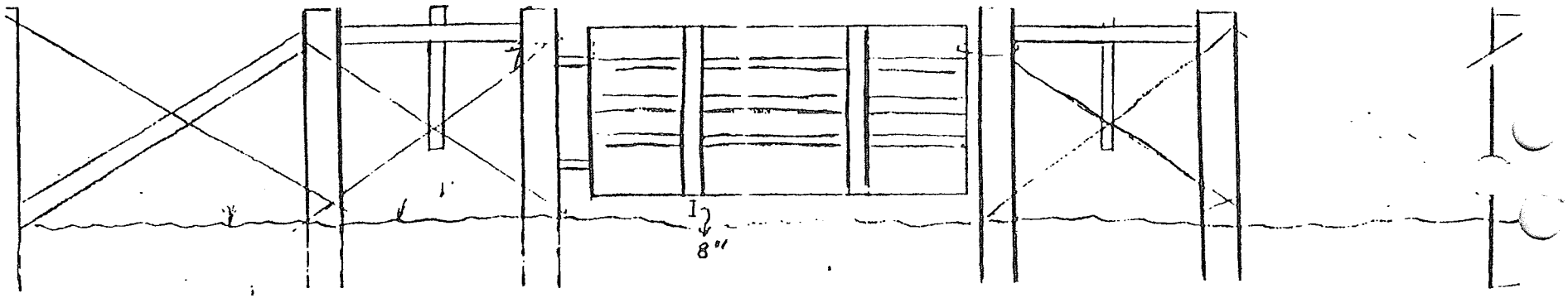
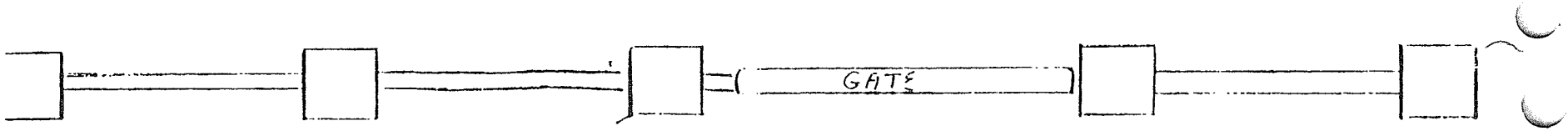


STUMP POST SPECIFICATIONS



< DIRECTION OF PULL

SIDE VIEW OF POWDER RIVER GATE



TOP VIEW OF POWDER RIVER GATE