LWA "Civil Infrastructure" Station Development Cost Estimate
August 15, 2006
Walter Gerstle

This cost estimate is for the "Civil Infrastructure" required for the development of one 256-antenna LWA station. It does not include the "PoP" (pile of parts: antennas, receivers, on-site cables) described in the August 11, 2006 memo by Steve Ellingson. Nor does it include the equipment shelter.

This cost estimate is based upon the costs associated with the LWDA. The assumption is that the station will be located on flat, sandy ground associated with the dry lakebed of the plains of Saint Agustin. For sites that are in other geological regimes, the costs could be much higher.

Note that the power line trenching costs and road building costs will be higher for the more remote stations. Costs per unit distance for these items are noted.

"Per Station"

RFI Survey

$85 for roundtrip mileage + $160 per/diem + expenses for 2 people for 2 days)
$245 total

Biological/Archeological Survey

($85 for roundtrip mileage + $160/day for 2 people for 2 days)
$245 total

Leveling of Site:

Not required (hopefully!).
$0 total

1" of Gravel over 120mx120m site:

Not required. Use natural vegetation to stabilize soil.
$0 total

Fencing of site: (against antelope intrusion)

ACME Fences, Inc., in Albuquerque charged us a total of $6104.17 to install a 6-strand barbed wire fence with two 12' gates.
$7,000 total, including installation

Road grading (960' of 9' wide road, done by NRAO):

Cost per laborer-hour: $16.85 + 32.5% benefits = $22.32 x (29 hrs) = $647
Cost per technician-hour: $20.60 + 32.5% benefits = $27.30 x (0hrs) = $0
Cost per engineer-hour: $34.86 + 32.5% benefits = $46.19 x (0 hrs) = $0

Grader ($30/hr) x(9 hrs) = $270
Loader ($25/hr)x(4 hrs) = $100
Trencher ($25/hr)x(0 hrs) = $0
Backhoe ($25/hr)x(4 hrs) = $100
Water Truck ($25/hr)x(10 hrs) = $250
Dump Truck ($25/hr)x(3 hrs) = $75

$1,442 total for a 960' road on the Plains of St. Augustin
($1.50 per foot of road)

Optical Fiber Installation (~1500' from CW7 to shelter, 4' deep, done by NRAO):

Cost per laborer-hour: $16.85 + 32.5% benefits = $22.32 x (29 hrs) = $647
Cost per technician-hour: $20.60 + 32.5% benefits = $27.30x(0hrs) = $0
Cost per engineer-hour: $34.86 + 32.5% benefits = $46.19 x (0 hrs) = $0
Grader ($30/hr) x(7 hrs) = $210
Loader ($25/hr)x(0 hrs) = $0
Trencher ($25/hr)x(9 hrs) = $225
Backhoe ($25/hr)x(8 hrs) = $200
Water Truck ($25/hr)x(4 hrs) = $100
Dump Truck ($25/hr)x(0 hrs) = $0
Material: $808.

$2,190 total for a 1500' of 4' deep trench on the Plains of St. Augustin
($1.46 per foot of trench)

Optical Fiber Connection at CW7 and Control Building, done by NRAO):

Cost per laborer-hour: $16.85 + 32.5% benefits = $22.32 x (0 hrs) = $0
Cost per technician-hour: $20.60 + 32.5% benefits = $27.30x(42hrs) = $1,147
Cost per engineer-hour: $34.86 + 32.5% benefits = $46.19 x (5 hrs) = $231.
Material: $201.

$1,580 total for optical fiber connection

Socorro Electric Coop Power (1600' from existing power pole to shelter):

$3,000 SEC charge for cable (600' overhead single phase electric, $3000)
$9,000 SEC charge for 1000' buried 4' single phase including 50 kVa transformer
$500. back hoe mobilization

$13,500 total for power cable + transformer
($8.43 per foot of powerline)

Antenna Foundations: aluminum posts or screws + installation (or similar):

For 4 Ft. posts; 54*5 sticks are required.(54 x 5 =270 posts); ($5,526.90) + shipping.
Say, $7000
Installation: 8 days x 8 hrs/day x 4 people x $25 /hr = $6,400

Equipment rental: $200/day * 8 days = $1600

$15,000 total

Cabling on site (cables buried 6'' deep for 256 antennas, including conduit but not cables):

$10,000 total best guess

Surveying the site:

$3,000 total best guess

Electrical Work: (install pedestal, floodlight, meter, outlets, concrete, posts)

$3,416. total Brooke's Electric Quote.

Miscellaneous travel to and from station:

$1500. total

Total Station Civil Infrastructure Development Cost: $59,118.