

# CITY OF MADISON

# Proposed Conditional Use

Location: 317 Knutson Drive

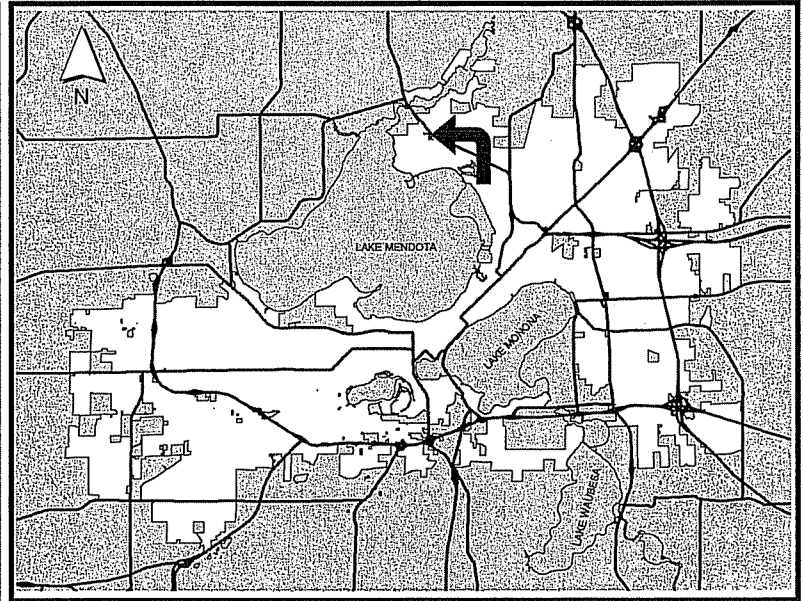
Project Name: US Cellular Northport Station

Applicant: Clandette Higgins - Department of Health and Family Services/Tom Betha - US Cellular

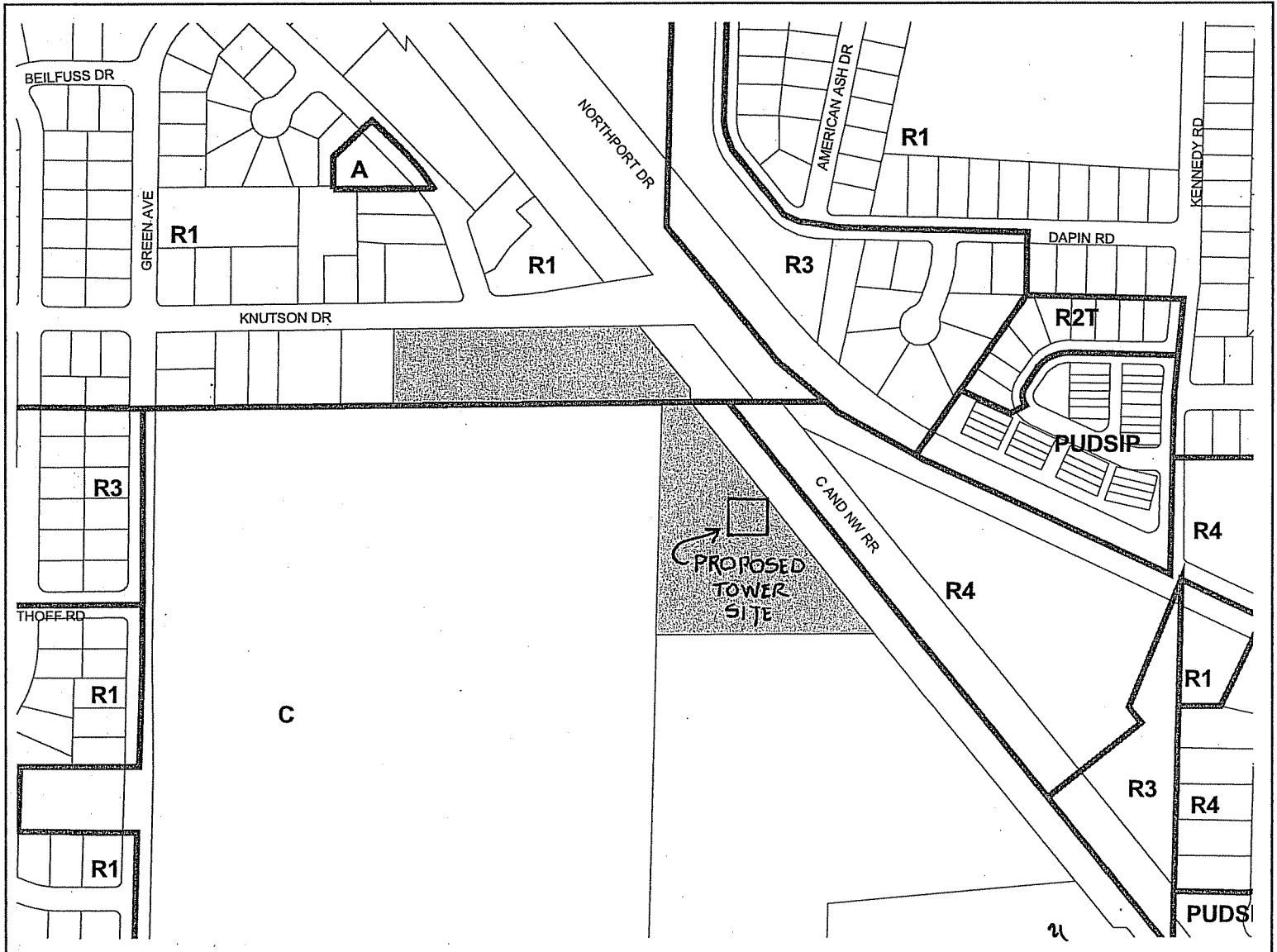
Existing Use: Institutional Grounds

Proposed Use: Communication Tower

Public Hearing Date:  
Plan Commission 02 May 2005



For Questions contact: Bill Roberts at: 266-5974 or broberts@cityofmadison.com or City Planning at 266-4635

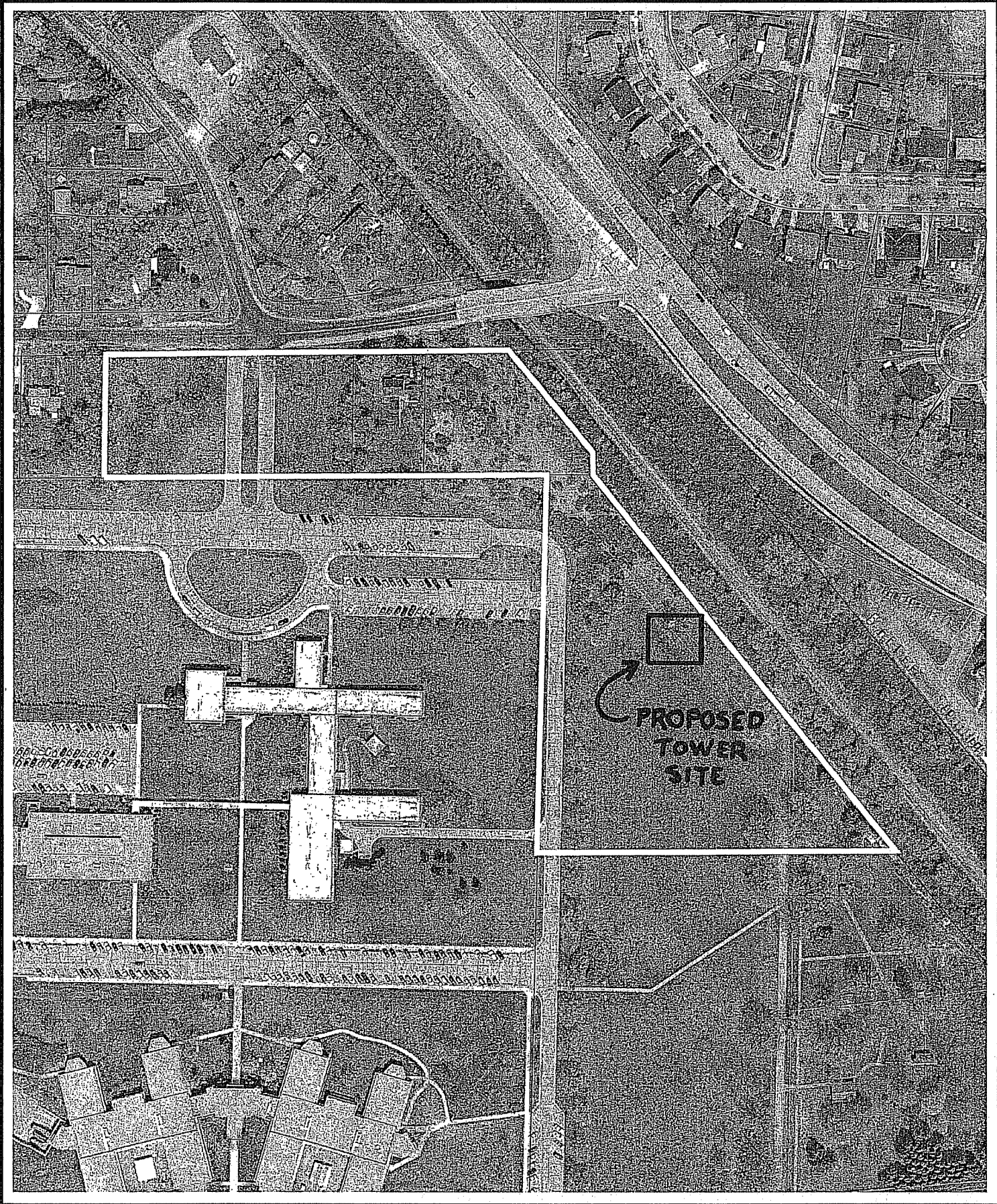


# 317 Knutson Drive



0 100 Feet

*Date of Aerial Photography - April 2003*





CONSULTANTS IN COMMUNICATIONS TECHNOLOGY

April 1, 2005

Ms. Kathy Voek  
Assistant Zoning Administrator  
Madison Municipal Building  
215 Martin Luther King Jr. Blvd.  
PO Box 2984  
Madison, WI 53701

Dear Kathy:

Enclosed, please find one bound and one unbound copy of our report concerning the US Cellular Wireless Tower Site in Madison at Knutson Drive.

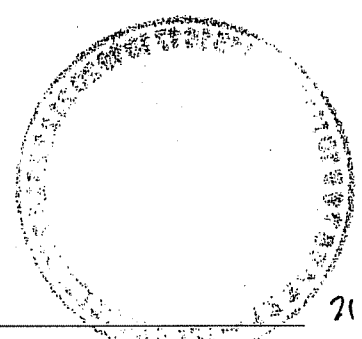
If you have any questions, please call.

Sincerely,

Ralph E. Evans, III

REE/ka

enclosures





**Engineering Statement  
Prepared for the City of Madison  
re:  
US Cellular Wireless Tower Site  
In Madison, Wisconsin  
Knutson Drive Site**

**April 2005**

**Prepared by:**

**Evans Associates Consulting Engineers  
210 S. Main Street, Thiensville, WI 53092  
Phone (262) 242-6000 Fax (262) 242-6045  
[www.evansassoc.com](http://www.evansassoc.com)**

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**Engineering Statement  
Prepared for the City of Madison  
re:  
US Cellular Wireless Tower Site  
In Madison, Wisconsin  
Knutson Drive Site**

**I. Abstract**

Ralph E. Evans P.E. of Evans Associates, Consulting Communications Engineers in Thiensville, Wisconsin, has prepared this engineering statement and the attached figures on behalf of the City of Madison, Wisconsin.

Evans Associates has been retained by the City to evaluate the implementation parameters associated with a new US Cellular site to be located at 317 Knutson Drive, Madison, Wisconsin 53074 (see Figure 6). Pursuant to our employment, this exhibit has been prepared.

The information contained in this report is presented to the City pursuant to the *Consulting Services* specified in the contract between the City and Evans Associates, which was executed on February 25<sup>th</sup>, 2004. The siting information contained in the applicant's submittals to the City Zoning Department and Evans Associates has been used in evaluating the appropriate technical parameters with respect to the applications for building permit for the site. The analysis and the conclusions contained herein have been prepared by or under the direction of Ralph E. Evans, of Evans Associates, or have been submitted by the applicant. Information provided to Evans Associates by other parties is believed to be correct, and has been verified when feasible.

This study has been undertaken in accordance with the City's Code of Ordinances #28.04(23), which retains the services of professional engineering consultant to review each conditional use application for compliance with the requirements set out in section 28.04(23)(g)1 and (h). Accordingly, the instant report has been prepared.

**II. Background**

As cellular phone use increases, and as "Enhanced 911" calling is deployed, the incidence of emergency and safety of life communications will also increase, making high-penetration levels mandatory on the PCS and cellular frequencies. In order to improve coverage as the traffic on adjacent sites approaches the maximum, some new construction is to be expected. At the same time, it is in the interest of local citizens and planning authorities that infrastructure growth be managed in a responsible manner, including the co-location of antennas where feasible. FCC rules require that local communities treat all carriers identically with respect to permit requirements.



On the other hand, public safety<sup>1</sup>, land use and other environmental considerations must be addressed at the local level, especially with respect to the visual impact of the proposed structures. Accordingly, the proposed site has been analyzed carefully from the standpoints of environmental impact and network suitability. The conclusions reached herein represent the most complete engineering evaluation we are able to perform. This document and the attached exhibits are true and accurate to the best knowledge and belief of Evans Associates.

### **III. CUP Analysis**

The following paragraphs represent our analysis of the instant CUP application.

#### **#1 Validation of RF Information**

The proposed site utilizes a monopole supporting a three-sector array holding 12 antennas, representing full omnidirectional coverage. The tower height proposed, 120' AGL<sup>2</sup>, has been requested by US Cellular in order to maximize coverage along Highway 113 between the adjacent sites at Westport and Warner Park (Kohls). This height will also ensure suitability for co-locators in the future (up to two more). According to the tower elevation diagram (see Figure 3), US Cellular proposes future carriers at 110' and 100'. To make the tower shorter would invite additional horizontal tower proliferation, which is not recommended.

The proposed site will meet FCC RF emission requirements with respect to the general population as long as no cellular or PCS antennas are installed within 25' of ground level, and if no high-power broadcast stations are installed on the tower (more than approximately 10 kilowatts ERP). Accordingly, with the RF energy exposure standards utilized in the evaluations by this consultant, and as per previous concurring opinions from the Medical College of Wisconsin, it is concluded that there is no credible concern related to RF health risks with respect to the described site as long as the industry standard construction practices are followed.

#### **#2 Alternative Ways of Addressing a Particular Service Area Void**

The only alternative sites investigated were immediately adjacent to the parcel selected. The proposed site was chosen via a consensus process with staff at the Mendota Mental Health Center. This consultant concurs that, from a network standpoint, the location selected appears to be ideal.

#### **#3 Physical Site Survey**

The structure proposed is a 125' (overall) AGL monopole to be located on a 50' x 50' leased parcel on the Mendota Mental Health Center. The pole is constructed to be able to support additional weight and wind load in the future, making this site available for co-location. In the opinion of the applicant,

<sup>1</sup> Except *Radio Frequency (RF) Exposure* issues, which are regulated by the FCC.

<sup>2</sup> The total height, with antenna tips and lightning rod, is 125'.



this structure represents the appropriate height that will achieve coverage and reduced visibility objectives because of terrain variations and building structures within the proposed service area and due to the fact that this part of City of Madison is underserved for US Cellular. See Figure 3 for a tower elevation diagram.

### **#4 Conformance to Industry Standards**

The tower will be surrounded by a 6' chain link fence for security reasons.

Ramaker Associates, Professional Tower Engineers, has approved the tower plans in advance. It is also recommended that the finished structure be inspected in order to fully protect public safety.

At 125', the pole is short enough so that coordination with aeronautical regulators would normally not be required. However, this consultant recommends that written confirmation of a lack of impact be obtained from the Wisconsin Bureau of Aeronautics (Department of Transportation).

### **#5 Proposed Height Verification**

As per the above discussion, the tower height is dictated by the antenna height necessary for reliable coverage, which is influenced by topography and "look angle." This proposal appears to be reasonable at 120' above ground level (center of radiation).

### **#6 Response to Nearby Residents' Questions**

According to the applicant, none has been received.

### **#7 Validation of Adequate Support Structure**

It is the responsibility of Ramaker Associates to ensure that pertinent EIA RS-222E/F/G standards are being observed. Our past experience with this firm has reinforced its expertise and integrity.

### **#8 Visual Impact Assessment**

This site is located on institutional grounds near electric transmission lines (See Figure 5). Landscaping surrounds the parcel for visual shielding.

The monopole proposed is a relatively low-profile structure consistent with required structural integrity.

### **#9 Network Propagation Analysis**

US Cellular is in the "fill-in" phase in City of Madison at the present time. A propagation study conducted by US Cellular, and verified by this engineer, shows that there is an unmistakable patch of <sup>21</sup>





underserved area with respect to in-vehicle (-90 dBm) design basis utilized by US Cellular at this site (see Figures 1 and 2). A cellular network must be put together like pieces of a puzzle; each site is strategically located so that when the network is completed, a telephone subscriber can use his or her phone anywhere in the community without dropped calls. In the case of US Cellular, outdoor and in-vehicle coverage is the primary concern. This consultant agrees that this site is necessary to maintain the integrity of US Cellular's network.

The areas shown in green represent existing saturated coverage in Figure 1. In-vehicle coverage is represented in green. As seen from the plot, there is currently a major coverage gap. This significant coverage gap frequently results in no service, reduced quality and dropped calls in this area.

Figure 2 shows the same area following installation of the new 120' monopole at the Knutson Drive site. The additional green area shows the acceptable coverage that the new site would provide. This map shows that the intended coverage of the proposed site is along Highway 113 near Northport Drive and School Roads.

Accordingly, the standards to be applied to the proposed site are those pertinent to such a "fill-in" site, and must address such issues as 911-locator emergency telephone.

The subject site is intended to provide continuous coverage in this section of the City of Madison and to seamlessly handle call traffic from adjacent sites.

See Figure 4 (map of the US Cellular Network for Dane County).

Assuming no serious malfunction of either cellular transmitters or public safety radio receivers, interference to other RF services is not expected. Although the cellular service utilizes channels adjacent to public safety 800 MHz. "trunking" frequencies, instances of interference are rare, and when they occur, are nearly always confined to portable radios in the immediate vicinity of the cellular tower. Mixing causing in-band VHF or UHF interference is unlikely. In order to ensure compliance with FCC regulations regarding cross-service interference (CFR 47), all transmitters and receivers located at common sites should observe good engineering practice with respect to tower bonding and grounding (EIA or Motorola specs).

### **#10 Alternative Sites**

According to the applicant, there are no nearby structures that would supply the same functionality as the proposed site, and that would be acceptable to MMHC.

### **#11 Recommendations, consistent with Section 28.04(23).**

This consultant recommends the approval of the proposed site at the requested total height above ground of 125'. With the adoption of the suggestions contained herein, it is the opinion of this consultant that the proposed pole will accommodate the communication needs of residents and



businesses while protecting the public health, safety and general welfare, with respect to those items for which Evans Associates is expert.

**IV. SUMMARY OF RECOMMENDATIONS**

The following recommendations are made with respect to the US Cellular tower site:

- A Professional Engineer should approve the finished tower, and verify that EIA RS-222E/F/G standards are being observed.
- Verification of FAA and Wisconsin DOT/BOA concurrence should be obtained.
- It is suggested that the provider should utilize either an unpainted galvanized finish on the tower or a blue-green stealth finish to minimize visual impact, if permitted by the FAA.

Respectfully submitted,

Ralph E. Evans III  
Evans Associates

**Attachments**

- Figure 1 – Current Propagation Map (without the addition of the new site)
- Figure 2 – Proposed Propagation Map (with the contribution from the new site)
- Figure 3 - Proposed Tower Elevation Diagram
- Figure 4 –US Cellular Network Map
- Figure 5 - Site Plan Diagram
- Figure 6 – Site Location Map

Y:\EA\Client Services\Wireless\Municipal Projects\Madison\US Cellular Knudsen Drive Site\USC Knudsen Drive Report.doc

**Figure 1 – Existing Coverage**

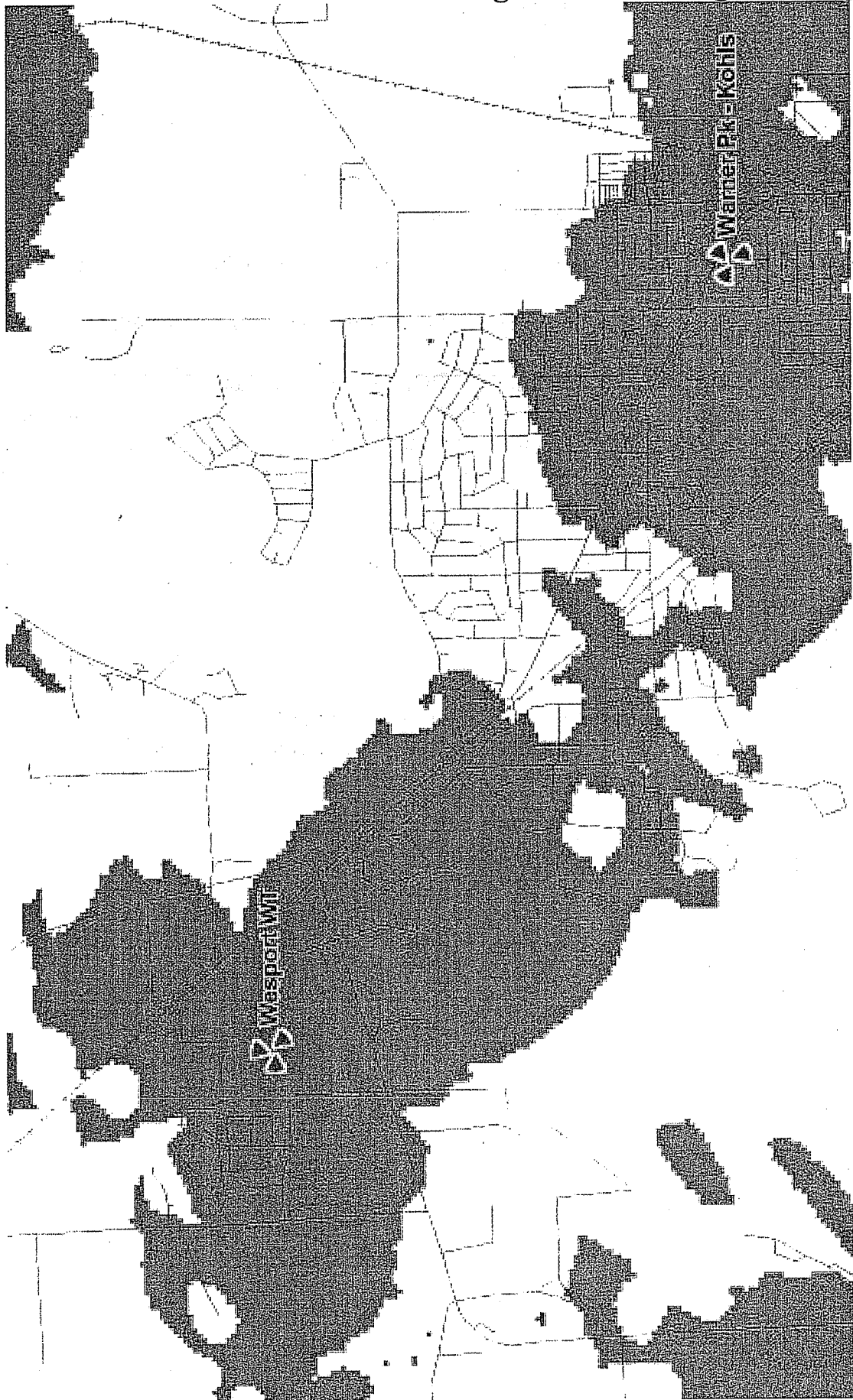


Figure 2 – Proposed Coverage

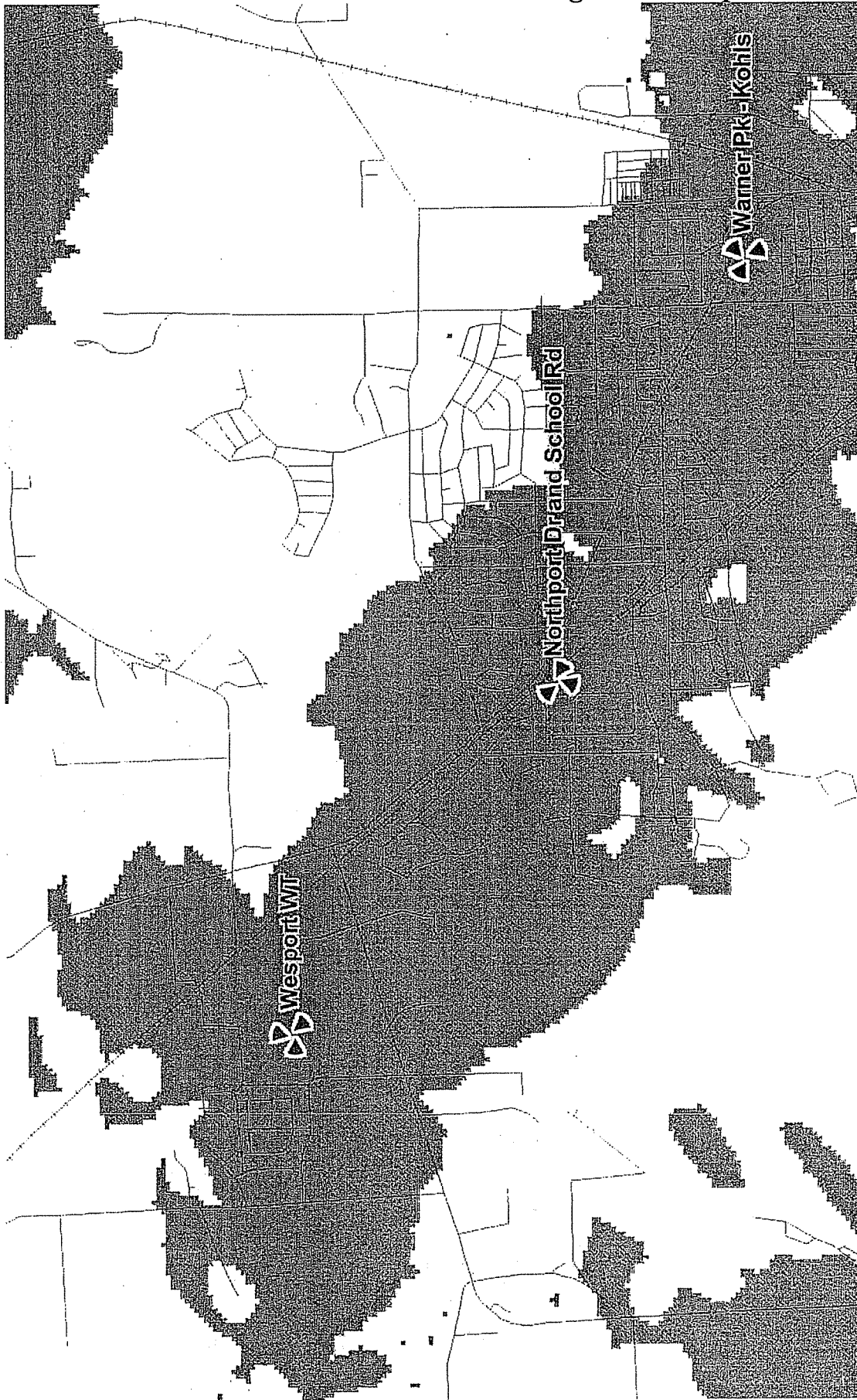


Figure 3 - Vertical Elevations

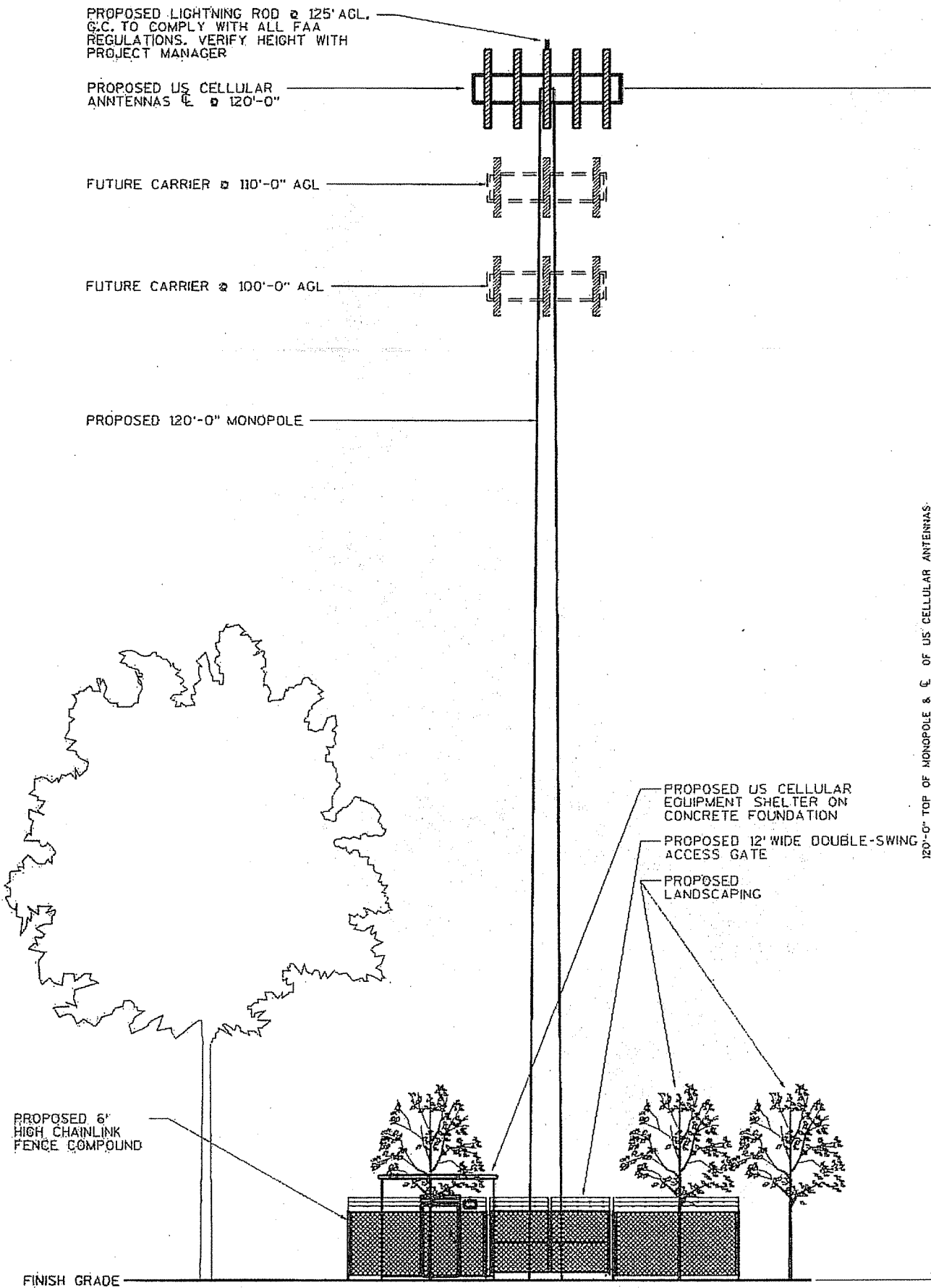
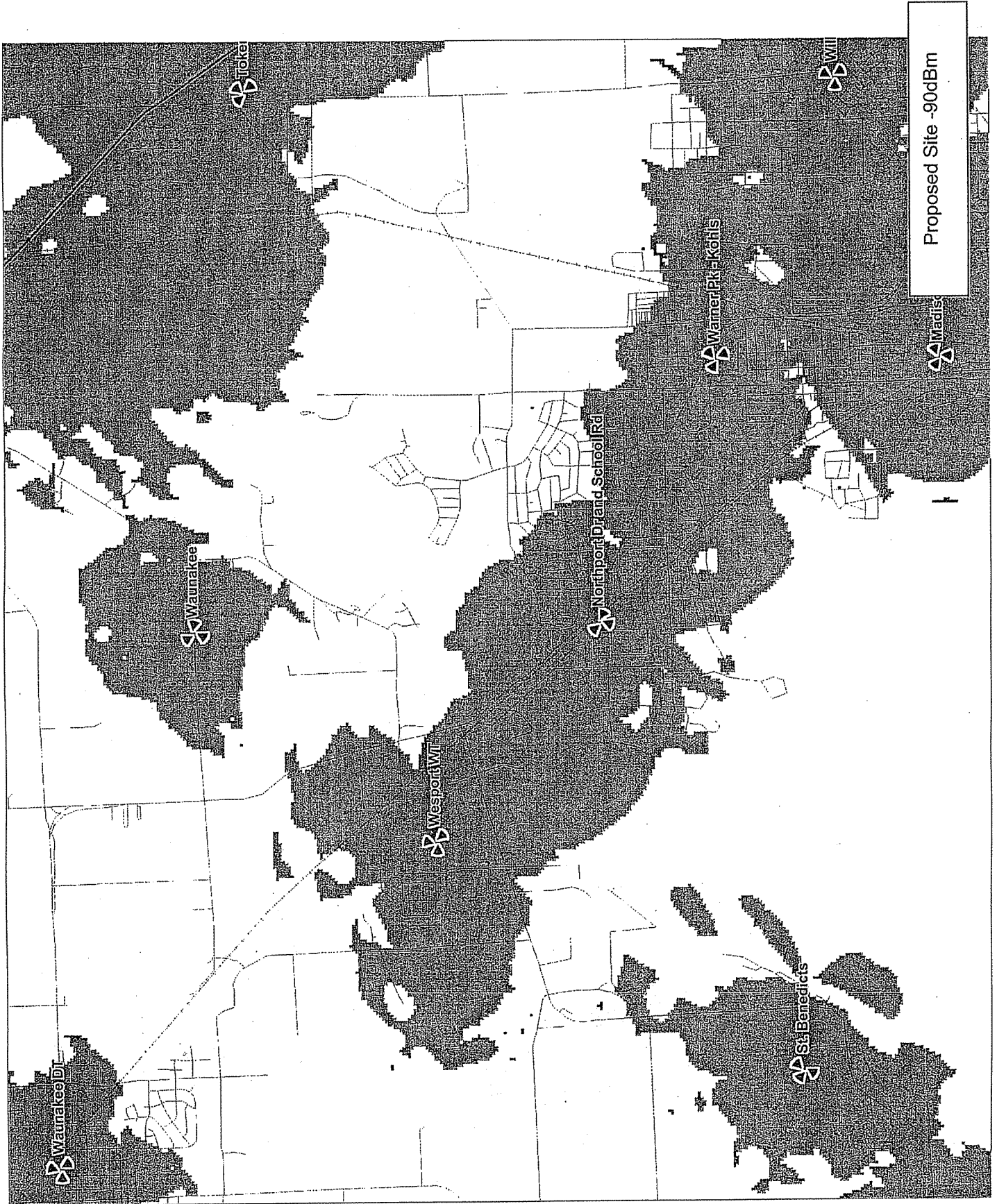


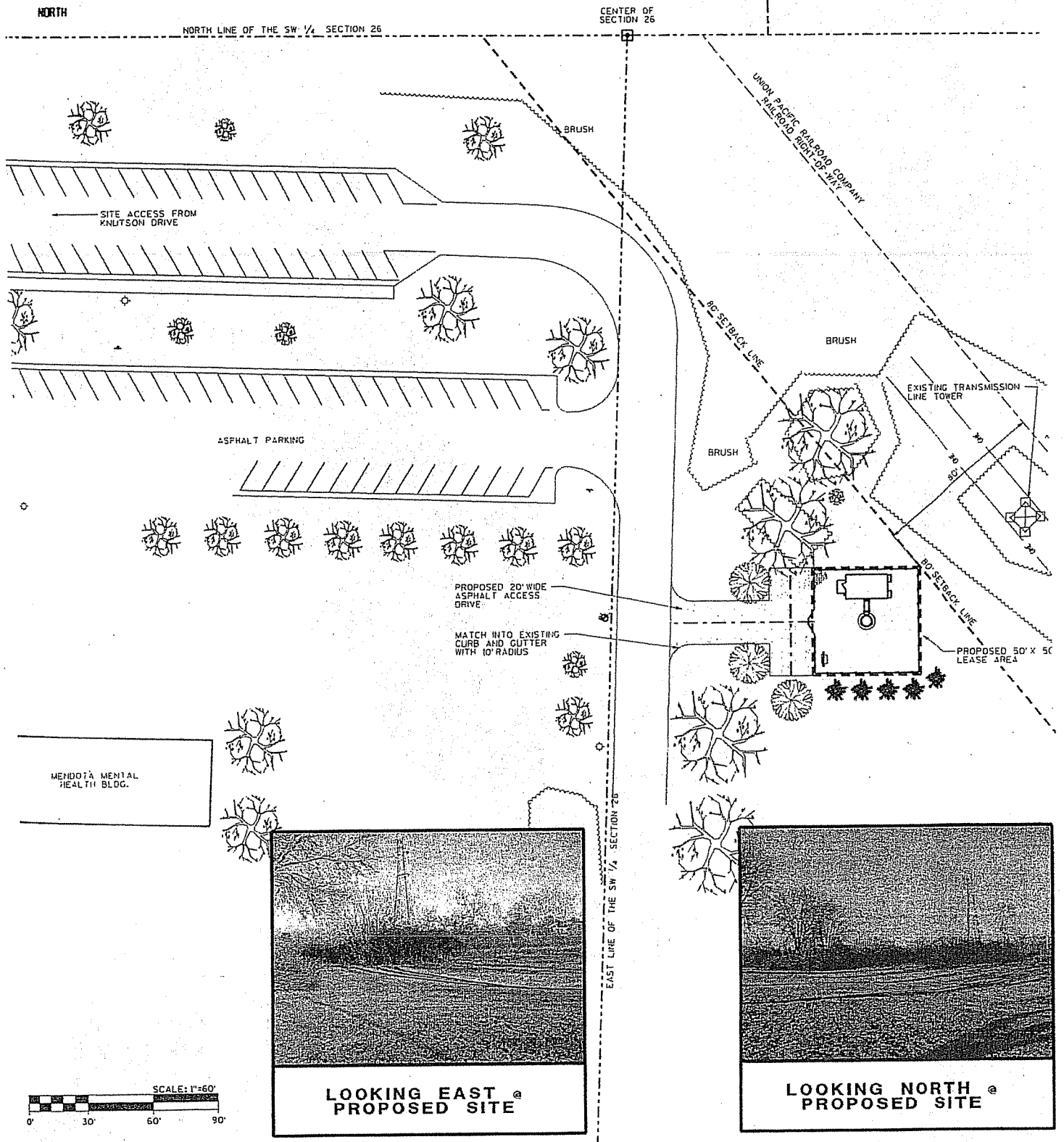
Figure 4 - Network



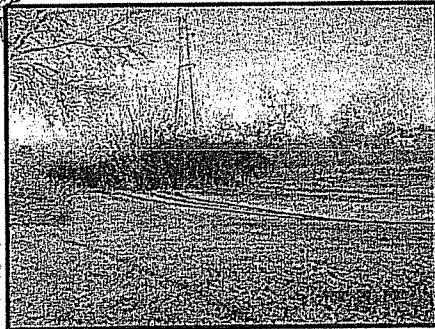
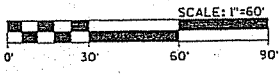
**Figure 5a – Horizontal Plan**



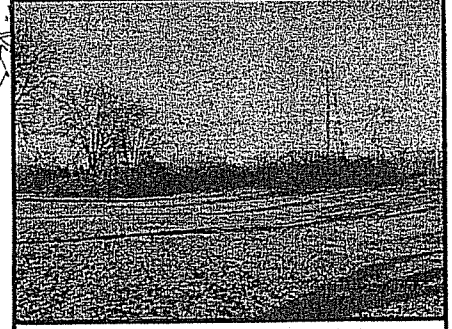
NORTH



MENDOTA MENTAL HEALTH BLDG.



**LOOKING EAST @ PROPOSED SITE**



**LOOKING NORTH @ PROPOSED SITE**

Figure 5b – Horizontal Plan



30° SE BACK LINE

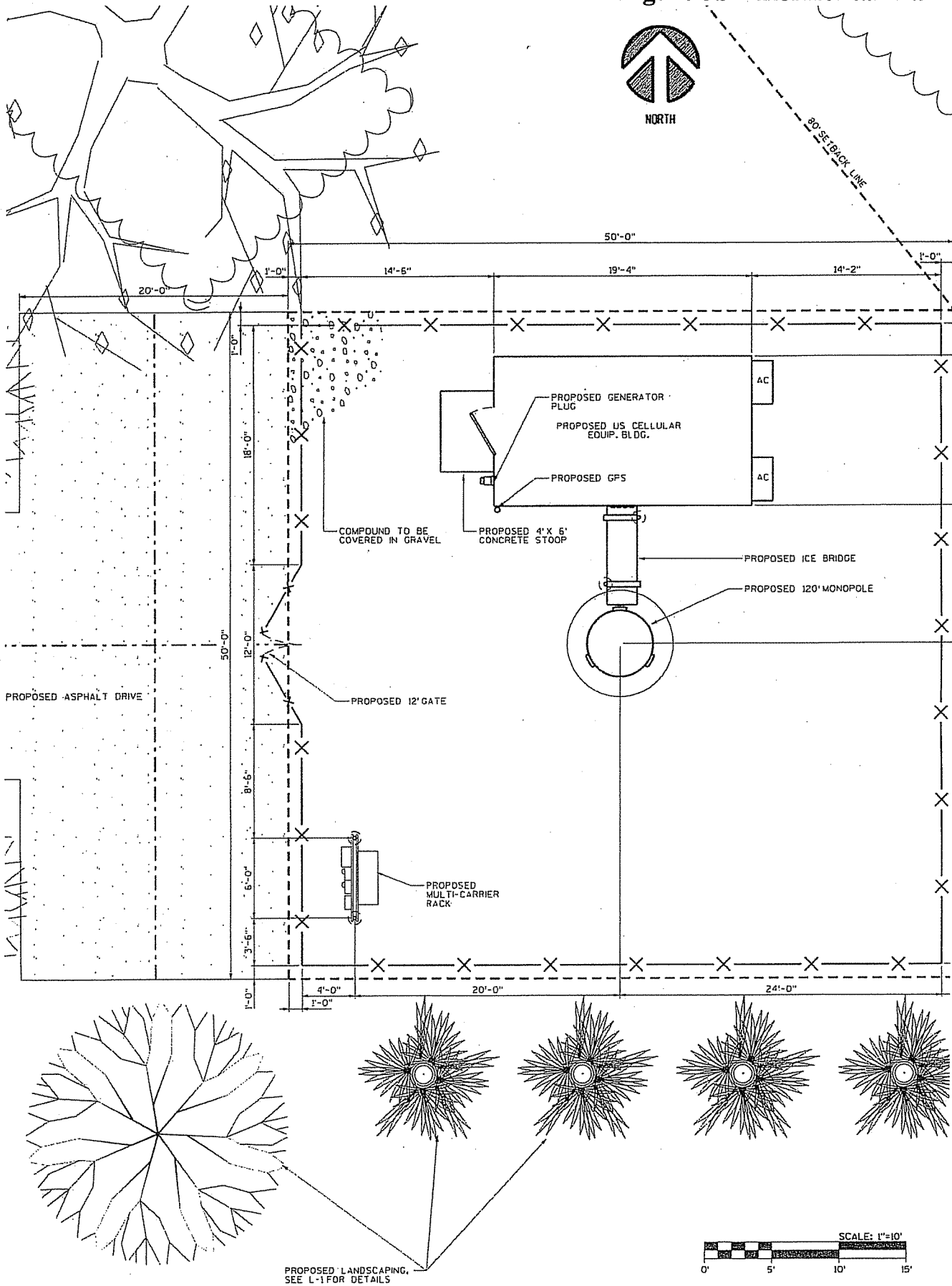
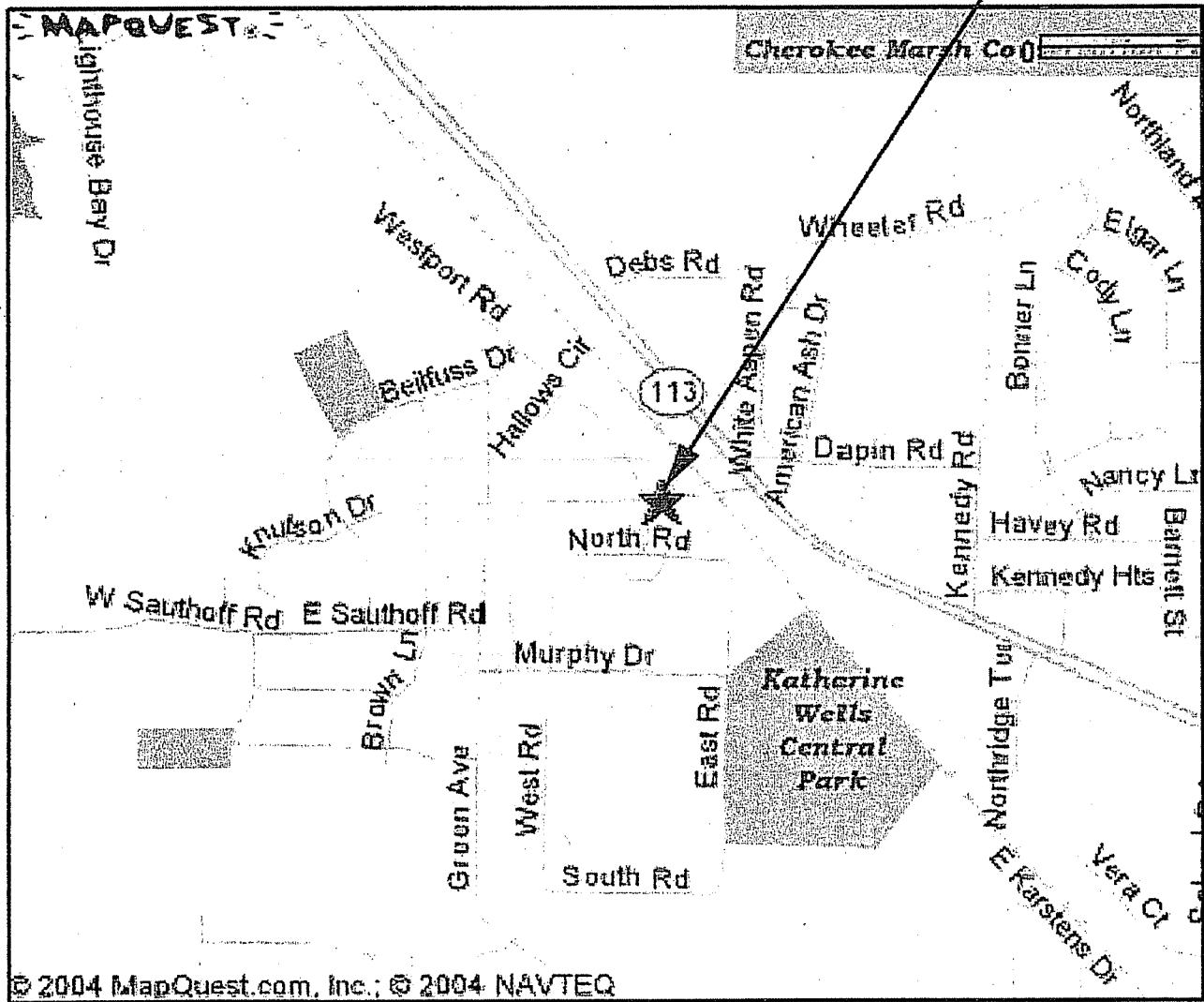




Figure 6 - Location



# ***Buell Consulting, Inc.***

2720 N. Dayton St., Unit B  
Chicago, IL 60614  
(773) 653-4580  
Fax (773) 404-9341 (call first)

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## ***MEMORANDUM***

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**TO: Madison Planning Staff and Plan Commission      DATE: January 26, 2005**

**FM: Tom Bethea, Agent for U.S. Cellular**

**Subj: Letter of Intent, CUP application for 120' U.S. Cellular Monopole  
East of East Rd., Mendota Mental Health Center, Madison**

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**Location Rationale:** The site proposed by USC's network engineers offers close-to-optimal coordination with this applicant's surrounding stations (Town of Westport water tower; Bong Rd. lattice tower; Town of Burke water tower; and a monopole near Oscar Mayer); falls within an established utility corridor (featuring both electric transmission and rail lines); and is well separated and screened from residences in the area.

**Construction schedule:** The installation would be completed as soon as all required approvals are issued.

**The people:**

- No contracts have been let, but the most likely contractors would be either Joe Daniels Construction, Madison, or Wave Communications, Sun Prairie;
- The engineer/designer would be Ramaker Assocs, Sauk City;
- U.S. Cellular's project manager (construction) would be Mike Stafford, 441-4175;
- The ongoing site-technician would be selected by USC when the station is powered up.

**Business type:** Wireless telecom, semi-public utility;

**Operating hours:** 24 / 7 / 365;

**Square footage of site (tax parcel 0809-262-0403-5):** 57 acres;

**Dwelling units:** NA;

**Employees:** NA, this would be an unattended site;

**Gross square footage of the installation:** approx. 320 sq. ft. plus ice bridge as shown on plan;

**Parking:** NA – site technicians visit USC once every two months, on average, for approximately 60 minutes per visit, and would park on the leasehold apron, off East Rd

# PART A

Occupant Notification Fee: \$50

Rezoning and Conditional Use application fees see attached.

The following information is **REQUIRED** for ALL applications for Plan Commission review:

#

**FOR OFFICE USE ONLY:**

Amt. Paid 4,00 Receipt # 57835  
 Date Received 1-26-05  
 Parcel No. 0809-262-0403-5  
 Aldermanic District 18, Paul Van Rooy  
 GQ OK!  
 Zoning District ~~RF~~ Consistency

**For complete submittal:**

Application   
 Legal Description   
 Letter of Intent   
 Plans   
 Zoning Text N/A  
 Received By RJT  
 Alder Notif.  Waiver   
 Nbr. Assn. Notif. \_\_\_\_\_ Waiver \_\_\_\_\_  
 Issued Sign \_\_\_\_\_

- Address of Site: 317 KNOTSON DR.  
 Name of Project: East of East Rd - Mandata Mental Health Ctr.  
 Acreage of Site: V.S. Cellular "Northport + School" station  
Leasehold 0.057 acs, parcel size 57 acs.

- This is an application for (check at least one):  
 Rezoning from \_\_\_\_\_ to \_\_\_\_\_  
 Conditional Use  
 Demolition Permit (Please provide age, City assessment, and the condition of the building(s) to be demolished. Provide photos.)  
 Other (Describe) \_\_\_\_\_

- You must include or attach a **legal description**—Lot and block number of recorded certified survey map or plat, or metes and bounds by surveyor, engineer, title company, etc., (Note: A "Plat of Survey" or "Site Plan" is **NOT** a legal description). Any extra costs to the City, because of legal description problems, are to be paid by the applicant. **(Any application, without a proper, complete and appropriate legal description, will NOT be processed).** See attached instruction sheet regarding submittal of legal descriptions on computer diskette.  
Drawings attached

- General description of the project or intended use(s) of this property.  
120' monopole for wireless antennas, with 12x20 prefab radio shelter, serving as radiotelephone base station with CDMA technology

- Are there existing buildings on this site? No  
 What is the present zoning of this site? R-1  
 What are the present uses of this site? Institutional grounds - Lawns

- Do you intend to use the existing building(s)? NA

7. What exterior changes are proposed to the existing building(s)? NA

8. What interior changes are proposed to the existing building(s)? NA

9. Are you proposing to add or build new dwelling units? NO

How many units? \_\_\_\_\_  
Owner occupied \_\_\_\_\_ selling price, from \$ \_\_\_\_\_ to \$ \_\_\_\_\_  
Rental \_\_\_\_\_ rent levels, from \$ \_\_\_\_\_ to \$ \_\_\_\_\_

10. For rental housing will you be accepting Section 8 housing vouchers? \_\_\_\_\_

11. When do you wish to occupy this site or building? As soon as permits issued

12. Does this proposal involve any development in the public right-of-way? \_\_\_\_\_  
No  Yes \_\_\_\_\_ Explain: \_\_\_\_\_

13. Please print (or type) name and mailing address of the property owner. (Please include all owners involved in partnerships) Deat Health & Family Svcs (Clemente Higgins - 267-7299) 1 W. Wilson St, Madison, WI 53703

Phone: 267-7299 Fax: \_\_\_\_\_

Please print (or type) name and mailing address of contact person for this project [the person that can answer any questions regarding this application or project plans and will appear at the public hearing(s)]. Tom Bethra Agent for V.S. Cellular

2720 N. Dayton St, Unit B3  
Chicago, IL 60614

Phone: 773-653 4580 Fax: 773 404 9341

14. Property owner's authorization signature: [Signature] pending  
[If offer to purchase or contract owner, please indicate below (check one). Architect's, real estate agent's, contractor's or tenant's signature is NOT adequate].  
\_\_\_\_ Owner \_\_\_\_\_ Offer to Purchase \_\_\_\_\_ Other (Explain \_\_\_\_\_)

15. It is extremely important that you inform the ALDERPERSON and NEIGHBORHOOD ASSOCIATION of this district about your proposal as soon as possible. As required by Section 28.12(10)(c) and (d), I have notified Alderperson Paul Van Rovy and \_\_\_\_\_ of the \_\_\_\_\_ Neighborhood Association in writing by mail no less than thirty (30) days prior to this submittal.

Yes \_\_\_\_\_ No

Date that the alderperson was notified: early Jan 05

Date that the Neighborhood Association was notified: NA

9. That when applying the above standards to any new construction of a building or an addition to an existing building the City Plan Commission:
- Shall bear in mind the statement of purpose for the zoning district such that the proposed building or addition at its location does not defeat the purposes and objective of the zoning district, and
  - May require the applicant to submit plans to the Urban Design Commission for comments and recommendations, and
  - May consider the use of the proposed building as it relates to the City's Land Use Plan. When a conditional use application is denied, the Plan Commission shall furnish the applicant in writing those standards that are not met and enumerate reasons the Commission has used in determining that each standard was not met.
- [Sec. 28.12(10)(g)8., Cr. by Ord. 5869, 6-1-77]

The undersigned applicant or authorized agent of the applicant **hereby certifies that he or she has read all of the information contained in this application and that the same is true and correct.**

The undersigned further understands and agrees that any review, recommendation, approval, or permit, based upon any statement, drawings, plans, evidence or information furnished by the applicant or any agent of the applicant to the Plan Commission or Common Council with respect to the project which is the subject of this application and which at the time made is misleading, inaccurate, untrue or incorrect in any material respect, shall be declared null and void by the Commission, issuing written notice thereof to the applicant or designated agent without further public hearing.

<i>T. Bethea</i>	<i>Agent</i>	<i>1-26-05</i>
Applicant Signature	Relationship to Owner	Date

Please print (or type) name and mailing address of above applicant: Tom Bethea, Agent for  
V.S. Cellular, 5117 W. Terrace Dr., Madison, WI 53718

Phone 608441 4500 Fax 608441 4102

**The following material is REQUIRED for all applications:**

- Twelve (12) copies of a Letter of Intent describing this application in detail, including: Construction schedules, names of people involved (contractor, architect, landscaper, business manager, etc.), types of businesses, hours of operation, square footage or acreage of the site, number of dwelling units, number of employees, gross square footage of building, number of parking stalls, etc.
- Seven (7) copies of "Full Size" scaled site plans **and** seven (7) copies of reduced site plans on 11 inch by 17-inch paper. Scaled site plans to be drawn at a scale of one-inch equals 20 feet. All plan sets must include: A site plan showing all lot lines, building locations, building additions, demolitions, or changes, parking areas, driveways, sidewalks, location of any new signs, existing and proposed utility locations, and landscaping. Also include building elevations and floor plans. Plans must be drawn to scale and include all dimensions.