VARIANCE APPEAL

DANE COUNTY BOARD OF ADJUSTMENT

(I) (WE) TOKEN CREEK SANTARY DEST. hereby appeal to the
Dane County Board of Adjustment for a variance on the following described land:
1W 14 OF SW 14 SEC 9 T.EN R. 10 E 4205 ANDERSON
in the Town of FURKE which is located in the C-Z
Zoning District.
The variance is required because 78.03 of the Dane
County Zoning Ordinance requires that No STRUCTURE SHALL BE
CONSTRUCTED TO A HEIGHT IN EXCESS OF THE HEIGHT INDICATED PER
Proposed use of property, building, addition or alteration if variance is 500.78.02
granted 200,000 GALLON WATER TOWER
GTORAGE TANK
Reason/s why applicant cannot comply with ordinance requirements Top of Tank
ELEVATION MUST BE 1070 IN ORDER TO SERVE THE AREA. TANK LOCATION
15 DICTATED BY HIGH GROUND AND BOVIRED DISTRIBUTION OF WATER SOURCES
DATE: 7-12-93
Owner: DAVIO J. Quam MAYO CORP
Charles M. Jorgensen Mailing Address
PO BUX 8352 600 (ALLYO) DO . 5
Madison, Wissell
MADISON, WI 53719
ACTION BY BOARD OF ADJUSTMENT
ROTTON DI BORRO OF REGUSTREMI
FINDING OF FACT IS INCLUDED IN THE MINUTES OF THE PUBLIC HEARING OF
DECISION: P.H. 8/26/93: Grant variance of 61 feet from maximum height of
structures as shown on the Height Limitation Map of Dane County to
permit construction of municipal water tower.
P.H. 1/26/95: To reconsider nad grant 30 day applicant to obtain_
Zoning Permit.
Appeal No. 2428 Zoning Permit NoIssued

VARIANCE APPEAL

DANE COUNTY BOARD OF ADJUSTMENT

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Dane County Board of Adjustment for a variance on the following described land:
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DATE: 7-12-93 x/Bird war
Signature - Applicant or Agent
DAVID J. QUAM, MAYO CORP
Charles Majorgensen Mailing Address
PC BCX 8352 600 GRAND CANYON DRIVE
MADISON, WI 5370A MADISON, WI 53719
ACTION BY BOARD OF ADJUSTMENT
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permit construction of municipal water tower.
Appeal No. 2428 Zoning Permit NoIssued
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VARIANCE APPEAL

DANE COUNTY BOARD OF ADJUSTMENT

(I) (WE) TOKEN CREEK SANTARY DEST. hereby appeal to the	
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permit construction of municipal water tower.	
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Appeal No. 2428 Zoning Permit NoIssued	



U.S. Department of Transportation

Federal Aviation Administration

JH 2.7 1993



800 Independence Ave., S.W. Washington, D.C. 20591

Mr. David J. Quam Token Creek Sanitary District Mayo Corporation 550 Grand Canyon Drive Madison, WI 53719

Dear Mr. Quam:

Determination of No Hazard to Air Navigation Aeronautical Study Number 93-AGL-1052-OE Water Tower - Madison, Wisconsin Obstruction Evaluation Docket Number 93-AWA-OE-19

We have completed our examination of the petition for discretionary review of the subject determination and have denied the petition.

We are not aware of any other petition for discretionary review of the subject determination, and thus, the Determination of No Hazard to Air Navigation is now final.

This determination expires on January 30, 1995, unless extended, revised, or terminated by the Federal Aviation Administration's Great Lakes Region.

Sincerely,

Richard Huff

Manager, Airspace and

Obstruction Evaluation Branch

Mayo Corporation

Consulting Engineering

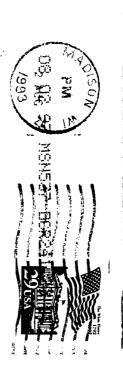
600 550 Grand Canyon Drive • Madison, Wisconsin 53719 • (608) 833-0628

		AUG 03 1993
DATE:	August 2, 1993	RECEIVED
TO:	Karen Michaels Public Service Commission 4802 Sheboygan Ave. Madison, WI 53719	ZONING DIV.
	Dane County Board of Adjustments c/o Dane County Zoning Office City County Building, Room #116 Madison, WI 53709	
RE:	Token Creek Water Utility (PSC Docket 5915-CW-100) (Dane County Application #2428)	
We are	sending you the following on the above named	project.
Enclosu	re Description: FAA No Hazard Determination	for Tower
FcPe PcPr	mber of copies. or your approval and/or comments. or your request. or your information. or eliminary only. ovised copy.	
"Determ office	tower for the above referenced project ination of No Hazard to Air Navigation". The letter enclosed confirmed that determination.	and wrote a national FAA
Sincere	ely yours,	
David J	vam FN TC-07 Quam, P.E.	' - 88 (6)
DJQ:ba		

Dennis Hagen w/Enclosure Tim Fenner w/Enclosure

Mayo Corporation

Consulting Engineering 400 556 Grand Canyon Drive Madison, Wisconsin 53719



Dane County Board of Adjustments c/o Dane County Zoning Office City County Building, Room #116 Madison, WI 53709

STATE OF THE STATE



Mr. David J. Quam

Des Plaines, Illinois

FAA Form 7460-9 (2/83) SUPERSEDES PREVIOUS EDITION

ISSUED IN

Federal Aviation
Administration

GREAT LAKES REGION/AGL-530
2300 East Devon Avenue
Des Plaines, Illinois 60018

IN REPLY REFER TO
AERONAUTICAL STUDY
NO. 93-AGL-1052-0E

CONSTRUCTION LOCATION

PLACE NAME

- REVISED

DETERMINATION OF NO HAZARD TO AIR NAVIGATION

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TC-07-88 (6)

Page 1 of _

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Pages

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ON

The proposed construction would be located approximately 1.97 nautical miles north of Dane Co. Regional Airport, Madison, WI.

The proposal exceeds the obstruction standards of Federal Aviation Regulations, Part 77, as follows:

Section 77.23(a)(5) by 58' - a height exceeding a horizontal surface as applied to Dane Co. Regional Airport.

The proposal was circularized for public comment by letter dated January 29, 1993. Two letters of objection were received as a result of circularization.

The manager of Dane County Regional Airport stressed the importance of the water tank not interfering with the operation of a proposed Instrument Landing System to be installed on future runway 21.

The Wisconsin Department of Transportation (WIDOT) objected to the proposal on the basis that it would adversely impact approach and departure aircraft utilizing runway 4/22. However, no specific impacts were stated. WIDOT also objected on the basis that the water tank exceeds a local height limitation zoning ordinance. This would be a matter to be settled between the proponent and the pertinent governmental authority.

Aeronautical study disclosed the proposal would have no effect on any existing or planned instrument flight rules (IFR) operations, procedures, minimum flight altitudes, or air navigation and communication facilities.

Study for visual flight rules (VFR) effect disclosed that the proposal would underlie traffic pattern airspace for Category "C" and "D" aircraft. However, the structure does not penetrate a plane 300 feet beneath the airport traffic pattern altitude and would have no impact on these aircraft operations. At 120 feet above ground level, the structure would not penetrate altitudes considered available for VFR enroute operations.

The cumulative impact resulting from the proposed construction, when combined with the impact of other existing or proposed structures, was negligible.

Therefore, it is determined the proposed structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities and would not be a hazard to air navigation.

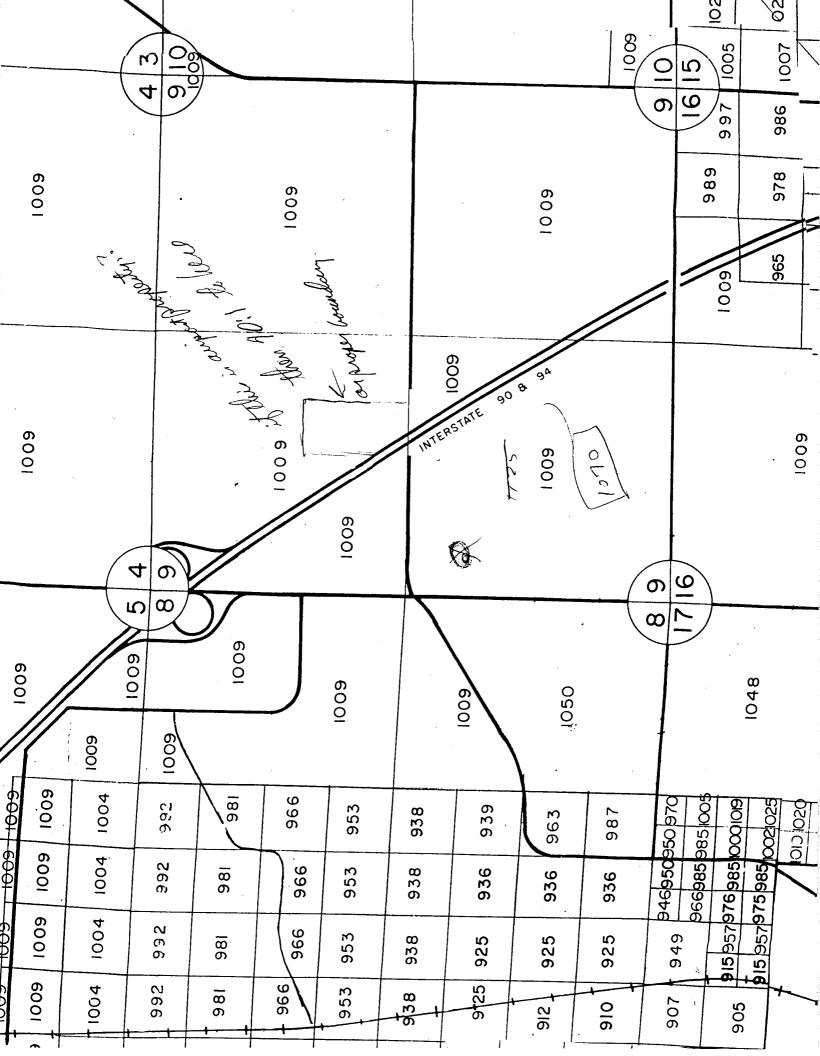
This decision is based solely on the foregoing description of the structure, which includes location & height.

The FAA hereby requests that proper notice be given for any future construction or alteration that would exceed the above described heights, or the addition of any transmitting devices.

Page 2 of 3 Pages
Aeronautical Study 93-AGL-1052-0E

This determination does not include temporary construction equipment such as cranes, derricks, etc., which may be used during the actual construction phase of this proposal. Such equipment which has a height greater than the proposed structure and a height which would exceed the notice standards of Part 77 of the Federal Aviation Regulations requires separate notice. If prior notice for temporary construction equipment is required, please complete and return the enclosed FAA Form 7460-1.

Page 3 of 3 Pages Aeronautical Study 93-AGL-1052-0E



Mayo Corporation

Consulting Engineering
550 Grand Canyon Drive • Madison, Wisconsin 53719 • (608) 833-0628

July 12, 1993

Dane County Board of Adjustments C/O Dane County Zoning Office City-County Bldg., Rm #116 Madison, WI 53709

RE: HEIGHT LIMITATION - VARIANCE APPEAL

TOKEN CREEK SANITARY DISTRICT

Dear Members:

The Token Creek Sanitary District is requesting a variance to build an elevated water storage tank east of US Highway 51 on land to be purchased from Peterbilt. This property is in the northwest quarter of the southwest quarter of Section 9, Township 8 North, Range 10 East. Construction will start in late 1993 or early 1994. The proposed water tank is a 200,000 gallon single pedestal spheroid with a top elevation slightly less than USGS 1070. Enclosed herewith are preliminary construction plans pages 1 of 3 to 3 of 3 and a location plan.

Current Dane County height limitation zoning limits construction in this area to a maximum elevation of 1009. Approximately 150 feet west of this proposed tank in the southeast quarter of Section 8, the height limitation is elevation 1050. We have requested and received a "Determination of No Hazard to Air Navigation" from the Great Lakes Region/AGL-530 Federal Aviation Administration, copy enclosed. The national FAA is currently reviewing this determination and we expect confirmation soon.

The water tank is located at this location because this is high ground and on the opposite end of the water system from the proposed well. Water tanks are built on high ground to minimize costs and reduce relative obstruction height. The water tank is located far from the well because this is a long water system and it will function much better in the event of a fire or main break with two remote sources of water. We have enclosed a copy of a portion of the Engineer's Report for the Water Distribution System for Token Creek Water Utility which further discusses the why of the water system and tank.

Please call if you have any questions. We will forward the National FAA determination as soon as it is available. We would appreciate your placing this variance appeal on the agenda for the August 26, 1993 hearing and we will be in attendance.

Sincerely

David J. Ouam. P.E.

DJQ:hah

FN: TC-07-88

Enc.

CC: Dennis Hagen, District Clerk

ENGINEER'S REPORT WATER DISTRIBUTION SYSTEM TOKEN CREEK WATER UTILITY

February 3, 1993

OWNER

TOKEN CREEK SANITARY DISTRICT 4016 E. WASHINGTON AVE. MADISON, WI 53704

PREPARED BY

MAYO CORPORATION 550 GRAND CANYON DRIVE MADISON, WISCONSIN 53719

> TC-07-88 DQ:ba

INTRODUCTION

This project consists of a complete water distribution system including water mains, well, elevated water storage, chemical feed, and the operation building. The proposed system will serve commercial and light industry properties in the Town of Burke that are within the Token Creek Sanitary District. The lands to be served are mostly platted, but many parcels are not yet developed.

In 1986 the Town of Burke agreed, as part of the approval of the Interstate Park plat, to the requirement of the City of Madison that public water be installed when it became economically feasible and within ten years. Due to the current development of the Highway 19 Commercial Plat, and its need for public water, it has been concluded that the Token Creek Sanitary District should now provide public water to a portion of the district. This would include lands currently in the urban service area, which are public sewered, and other lands immediately adjacent.

LOCATION

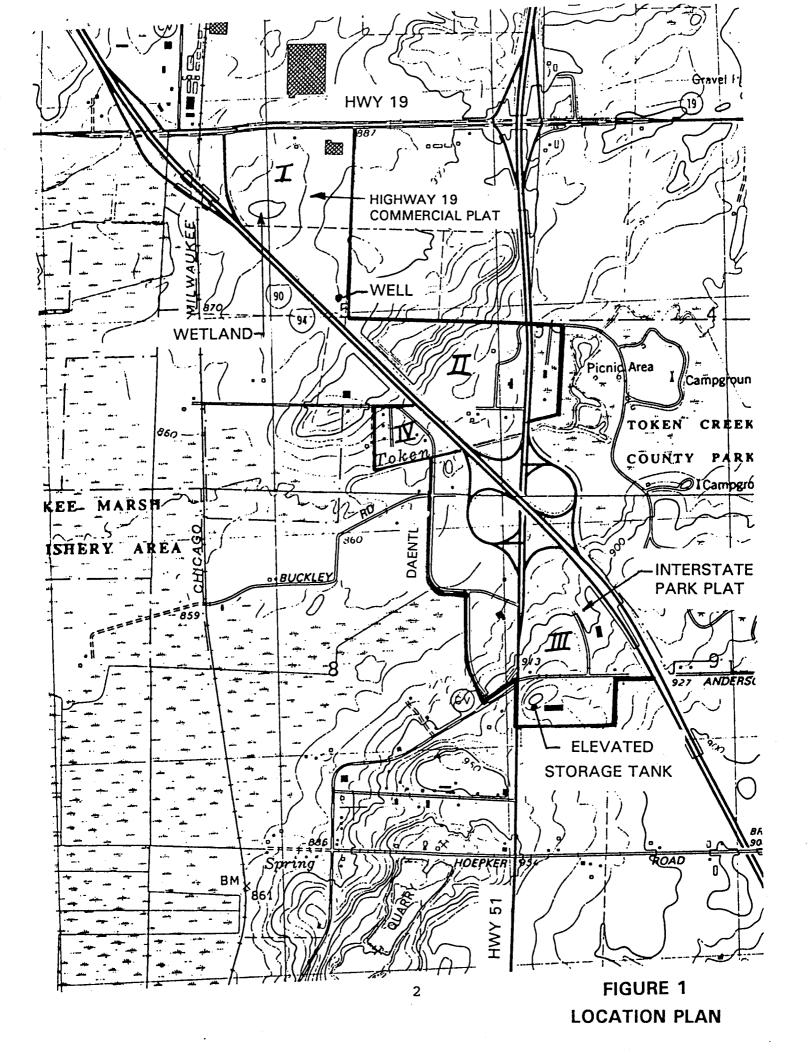
This water system is located north of the Dane County Regional Airport in the Town of Burke. Property served includes commercial property south of Highway 19 and north of I-90-94 (Area I), and north and south of I-90-94 at Highway 51 (Area II and III respectively); and residential property south of I-90-94 and west of Daentle Road (Area IV). See the enclosed topographical map (Figure 1) of the portion of the Sanitary District to be served.

TOPOGRAPHY

This area of Dane County consists of rolling terrain. The project area includes two ridges. A northeast-southwest ridge splits the service area and has a high elevation of 932. The second ridge is located in the southeast corner of the service area and has a high elevation of 948, which will be utilized for an elevated storage The project area includes two wetlands. One is small and located in the northwest corner of the service area and the water system will pass around it. The second wetland, Cherokee Marsh & Token Creek, is large and crosses the water district near the intersection of Highway 51 and I-90-94. A water main crossing the second wetland will be built in the existing Daentle Road roadbed. The low ground elevation is 855.2. The district to be served consists of 215 acres of land. Soils in the service area vary considerably but generally consist of topsoil over glacial deposits. Houghton (Ho) and Palms (Pa) shown in Appendix A on page A-1 are lowland deposits of muck. See Appendix A.

DESIGN PERIOD AND PROJECTED DEMAND

This land currently consists of commercial lots, developed and undeveloped, some farmland, and a few single family homes. Streets and utilities (including sanitary) exist near Highway 51 (Area II & III) and are being built in the Highway 19 Plat (Area I). Completion of the Highway 19 Plat Phase I is anticipated in 1993.



Commercial development will proceed as demand dictates. Area I will include 14 commercial lots. Area II consists of 8 tax parcels including 2 which have not been platted. The unplatted portion could be developed into an additional 10 to 15 lots for a total of 15 to 20 commercial lots. Area III includes 30 commercial lots and 1 residential lot. Area IV consists of 7 parcels which could be platted into 18 residential lots. Normal and peak demands are projected based on flow measurements of existing customers by Madison Metropolitan Sewerage District for billing purposes. Based on 14 existing sewerage customers, the average demand is 0.0125 gpm per thousand square feet (ksf) of lot. Three truck stops have a very high demand, and after eliminating them, the average demand is 0.0015 gpm per ksf. See Appendix B.

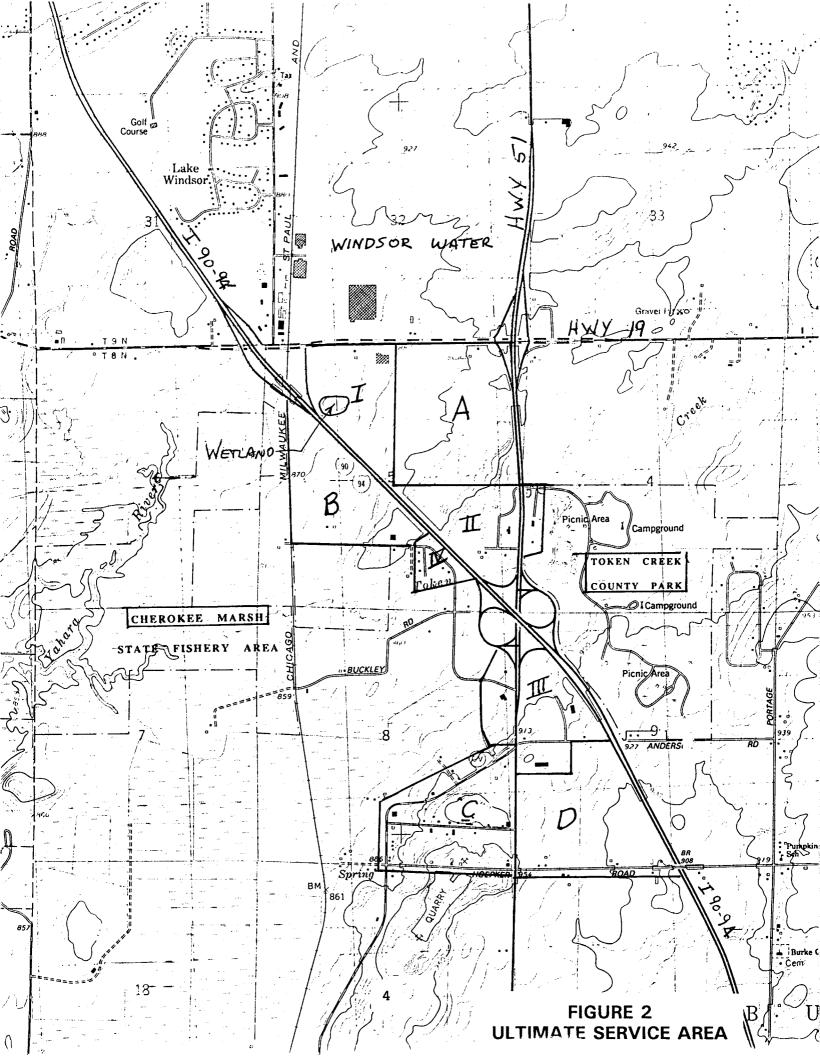
The projected 2013 average demand is 115 gpm based on complete development of the water district (9,424 ksf * 0.0125 gpm per ksf = 115 gpm). The actual demand will probably be less than this because the number of high-water-demand truck stops should be proportionately less. In addition, increased costs and conservation pressures may cause the existing truck stops to recycle their wash water or limit use. A realistic value might be 50 gpm (9424 ksf * 0.005 gpm/ksf = 47.1 gpm).

The ultimate area to be served is restricted. Lands north of Highway 19 are currently furnished water by the Windsor Water Utility. Lands west of the C. M. St P. & P. Railroad or southwest of Daentle Road are mostly in the Cherokee Marsh and owned by Lands east of Hwy 51 and northeast of I-90-94 are Wisconsin DNR. mostly in the Token Creek County Park, owned by Dane County. Lands south of Hoepker Road are within the noise restricted zone of the Dane County Regional Airport. Areas that may ultimately be added are shown on Figure 2 and are labeled A through D. Area A includes approximately 160 acres of farm land which could be developed into commercial land. Area B includes approximately 105 acres of farm land which could be developed into commercial or residential lots. Area C includes approximately 120 acres of light industry with some single family residences. All but the top of the Hoepker Road hill could be connected to the proposed water system. Area D includes approximately 115 acres of farm land which could be developed into commercial lots. Area D is close to the Dane County Regional Airport landing path, so noise regulations may severely limit possible development. The projected ultimate average demand is 208 gpm based on complete development of the ultimate water district (Areas I through IV and A through D) and a realistic water demand (41,441 ksf * 0.005 gpm per ksf = 208 gpm).

INVESTIGATIONS

Investigations include review of soil information (Appendix A), existing sewer flows (Appendix B), area wells (Appendix C), well site survey (Appendix D), and agency review letters (Appendix E).

The agencies contacted include the Public Service Commission, Division of Historical Preservation, Director of the Bureau of Endangered Resources, and the Federal Aviation Administration.



RECOMMENDATIONS

Two possible alternatives are as follows:

- Do Nothing This choice would result in the expansion of the existing private well system. Multiple wells can result in contamination of the ground water system and are more difficult to monitor. Some of the existing wells are fairly high flow production wells.
- Water System Town of Burke is committed to creation of a water system due to plat approval agreements with the City of Madison. A water system allows for treatment of drinking water and provides fire protection.

WELL AND WELL PUMPING FACILITIES

The well is proposed to be located approximately 200 feet north east of I-90-94 near the west end of the district (see Figure 1). The well building floor will be at elevation 888. The well site survey is included in Appendix D. The well will be approximately 550 feet deep into sandstone bedrock. This is a good aquifer and the anticipated specific capacity of this well based on nearby wells is 25 gpm per foot of drawdown but 10 gpm per foot will be used for initial evaluation. A static water elevation of 850 is assumed. The proposed well will be drilled and tested in 1993. Specifications for the proposed well are available as a separate document.

The well pump capacity is proposed to be 750 gpm to fill the proposed elevated storage tank and supplement tower flows for fire demand. An engine will be provided to provide emergency pumping in case of power failure.

Peak day water demands for 2013 and Ultimate are 172 gpm and 310 gpm respectively, based on projected growth in demand and a 1.5 maximum day factor. Both flows are well within the 750 gpm capacity selected for this well pump. If customer demands are greater than the ultimate projected, either a larger well pump could be placed in the proposed well, or a second well could be added to the system.

Well pump design values are as follows:

Flow	Suction	Tower	Line	\mathtt{TDH}
(qpm)	(USGS)	(USGS)	<u>(ft)</u>	<u>(ft)</u>
750	775.0	1060.0	19.2	304.2

ELEVATED STORAGE

A 200,000 gallon single pedestal spheroid elevated storage tank is proposed to be built in the southeast end of the district on a bedrock ridge (see Figure 1). Existing ground elevation at the proposed tower is 950 USGS and the proposed tower water overflow is elevation 1060. The proposed service area ranges in elevation from

834 to 950. The corresponding static pressures would then range from 97.9 psi to 47.7 psi. Elevation of low water in the tower will be 1030, with static pressures ranging from 84.9 psi to 36.4 psi.

The peak day domestic demand projected for 2013 is estimated to be 172 gpm based on a maximum day factor of 1.5. A 200,000 gallon storage reservoir would provide water for 19.35 hours based on this demand. Normal day demand of 115 gpm would be available for 29.0 hours.

Based on fire flows of 2000 to 2500 gpm for the commercial lots, this elevated tank would provide water for 1.7 and 1.3 hours respectively. A 750 gpm well pump would boost these times to 160.0 and 114.3 hours respectively. If greater fire flows are required by individual customers, they could provide on site storage for their fire systems.

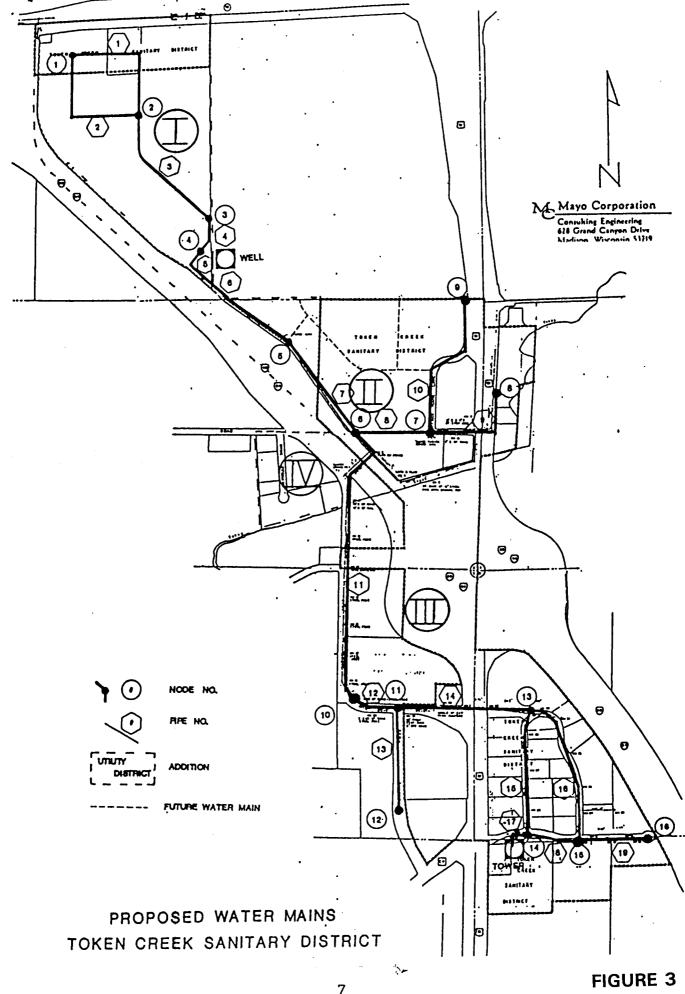
The elevated tank location is currently being reviewed by FAA for possible conflict with the Dane County Regional Airport landing pattern. Preliminary FAA review approximately one year ago suggested that a tower to elevation 1090 might be acceptable at this location.

WATER DISTRIBUTION SYSTEM

The proposed water system is shown in Figure 3. The water system utilizes a 12-inch transmission main between the well and the tower. Smaller pipes including 8 and 10-inch are used for distribution mains. Distribution mains are looped wherever possible, but due to the shape of the area being served, looping was not always possible. Future development will allow for some additional looping and the ultimate development will allow for more looping. The well and elevated storage tank are located in opposite ends of the water system, providing alternate sources for water in case of a breakdown of the connecting main.

The water system was modeled with the Kentucky Pipe Program using the Hazen Williams Equation with a C of 100. Computer printout of model results are included in Appendix F. Max hour domestic demand of 362.2 gpm (Year average of 115 gpm * 3.15 peaking factor) distributed across the system resulted in a low pressure of 50.22 psi. Doubling the max hour demand to 724.4 gpm (115 gpm * 6.3) distributed across the system resulted in a low pressure of 46.77 psi. The system proposed is more than adequate for the domestic demand.

Fire flows were evaluated at the three ends of the water system. A residual pressure of 20 psi is required at all points in the service area under fire flows. Results are included in Appendix F. A fire flow of 2150 gpm was modeled at node #1 near Highway 19 and the resulting low pressure was 22.19 psi. A fire flow of 2100 gpm was modeled at node #8 which is the most northerly node on Highway 51 and also the end of a long dead end main, and the resulting low pressure was 20.89 psi. A fire flow of 2350 gpm was modeled at



node #16, which is the east end of Anderson Road and the end of a short dead end main, and the resulting low pressure was 19.28 psi. In all models, the low pressure is at the point of fire demand. Actual fire flow capacity may be higher based on a C of 120 as allowed for cement-lined ductile iron water main.

TREATMENT

Facilities will be provided to add fluoride and chlorine to the water system as water leaves the well. Chlorine will be added as a disinfectant on an as-needed basis. District equipment will include water testing apparatus. District staff will include a certified operator who will direct water evaluation. Fluoride may not be added on a regular basis, because the customers are primarily commercial and light industry.

MAINTENANCE

Water district equipment, including meters, will be tested, repaired, and maintained in the well building maintenance room.

M

Mayo Corporation

Consulting Engineering
600 Grand Canyon Drive • Madison, Wisconsin 53740 • (608) 833-0628

RECEIVED

January 12, 1995

Mr. Steve Reynolds Dane County Zoning 210 Martin Luther King Jr. Blvd., RM 116 Madison, WI 53709

RE: TOKEN CREEK WATER UTILITY 200,000 GALLON WATER TOWER

NORTHWEST QUARTER, SOUTHWEST QUARTER, SECTION 9

TOWNSHIP 8 NORTH, RANGE 10 EAST

ZONING PERMIT

Dear Mr. Reynolds:

Per David Quam's discussion in your office on January 11, 1995 and our phone conversation of January 12, 1995, we are hereby requesting an extension of time on the zoning variance appeal #2428 to obtain a zoning permit. We requested a variance to allow construction of the above referenced water tower above the maximum height of construction. This variance was requested July 12, 1993, the public hearing was held August 26, 1995, and the variance was granted August 26, 1993. Until recently, our understanding was that this variance was the only County requirement for construction of the water tower. The water utility bid and built the water tower with the structure reaching its greatest height on June 15, 1994. We were contacted by Pat Anderson of your office on January 10, 1995 and informed that we had not obtained a zoning permit and the one year expiration date had passed.

Thank you in advance for your efforts in our behalf. If you have any questions or if you require any additional documentation, please do not hesitate to call. We have enclosed a copy of the Variance Appeal #2428 for your reference.

Sincerely

Don E. Mayo, P.E.

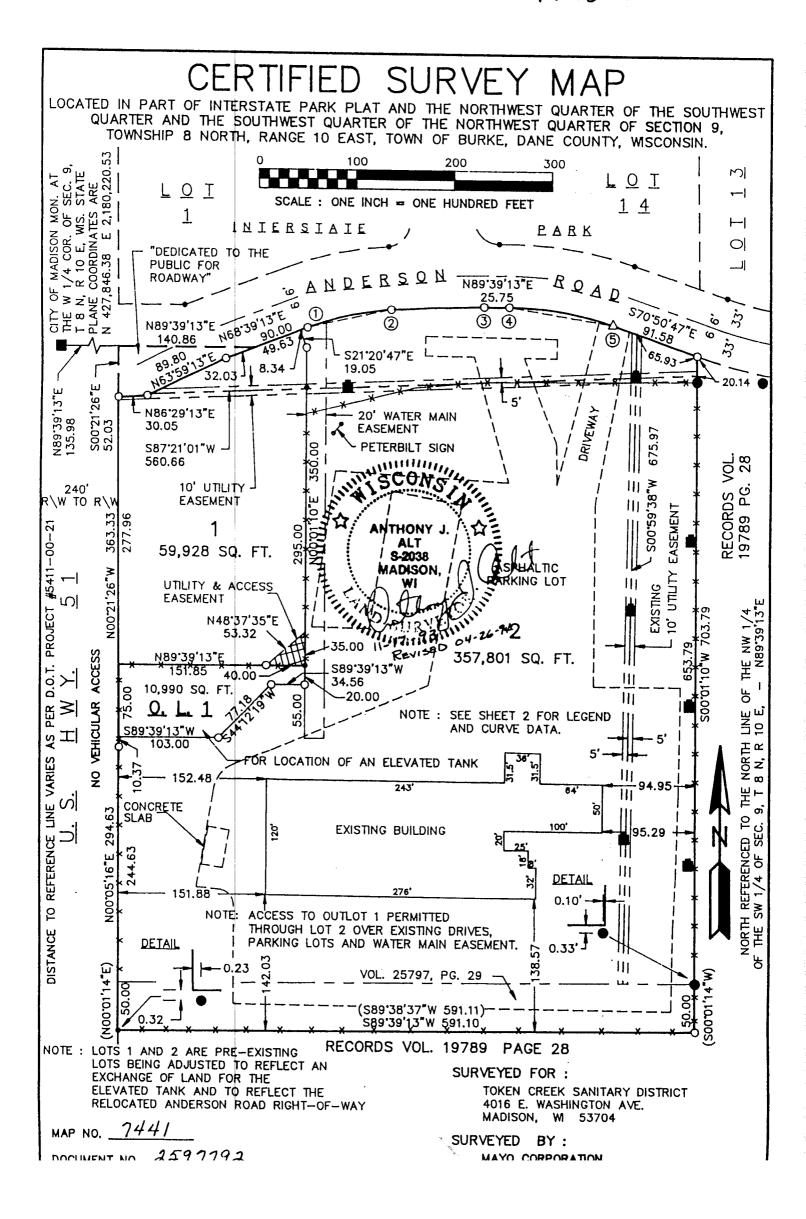
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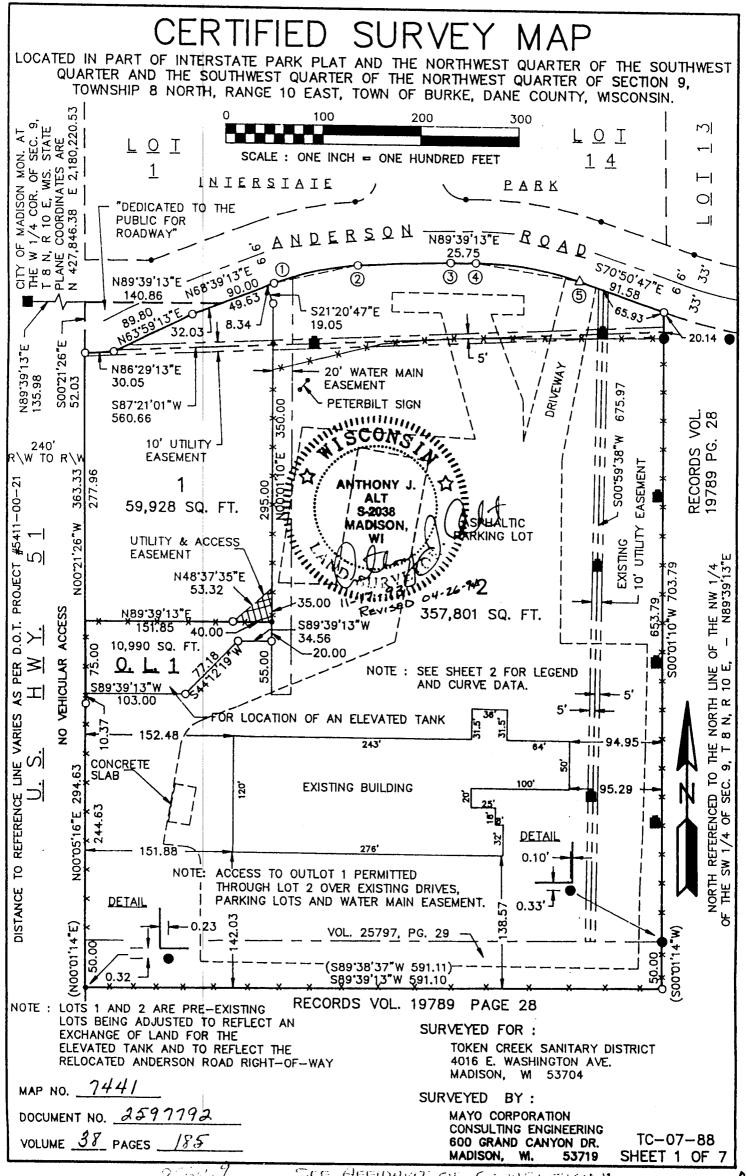
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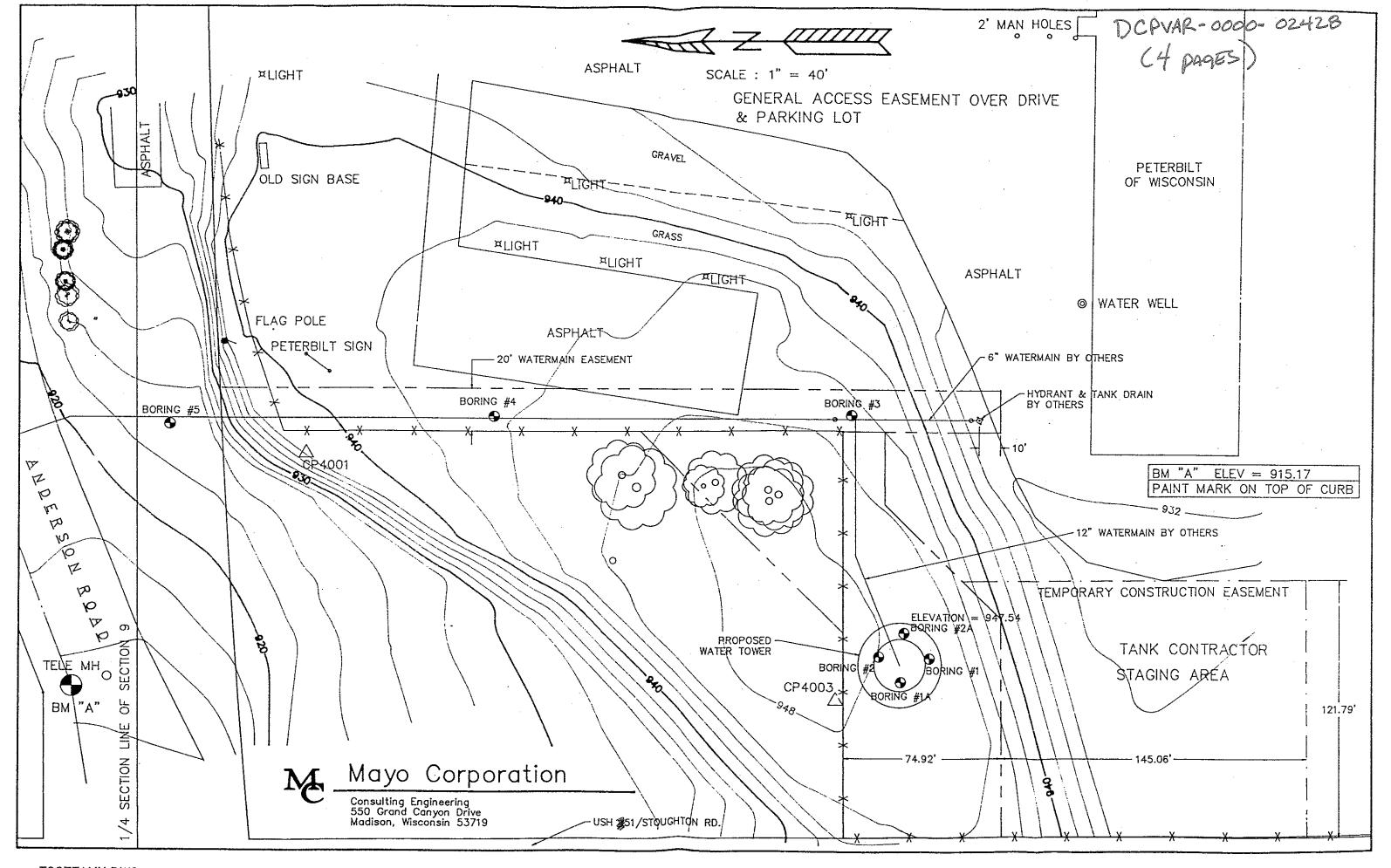
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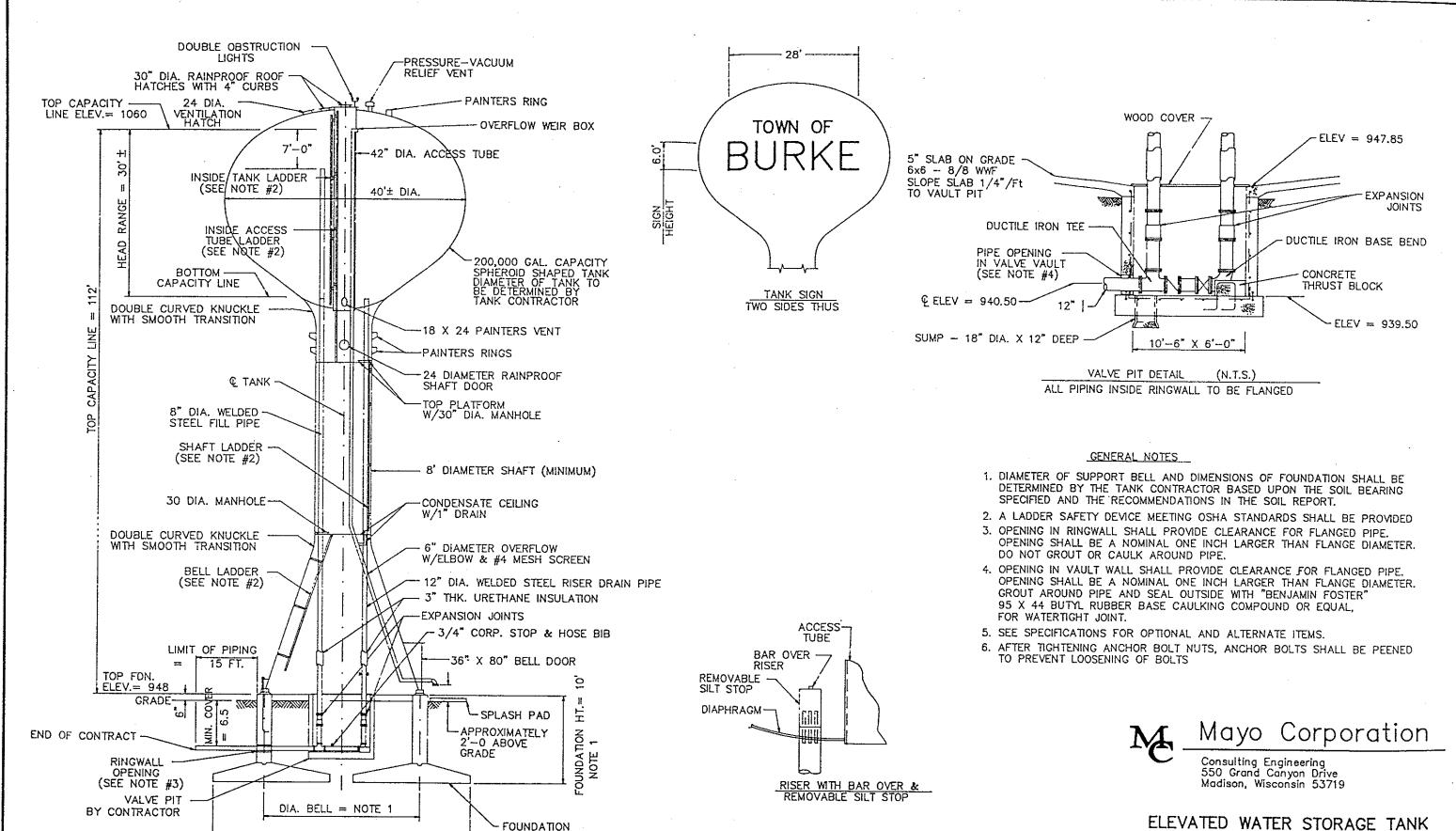
Message

For From All Mann Mann From From All Mann From From All Manner All From Fine Faxt. Tel. No. Ferbinand You. Called to see you. Called to see you. Will call again. Mould like you to call. Living Will call again. Mesponse to your call. Left no message. And Manner All Man
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WATERSPHEROID
200,000 GALLON CAPACITY

OUTSIDE DIA. FOUNDATION = NOTE 1

ELEVATION (N.T.S.)

BY CONTRACTOR

