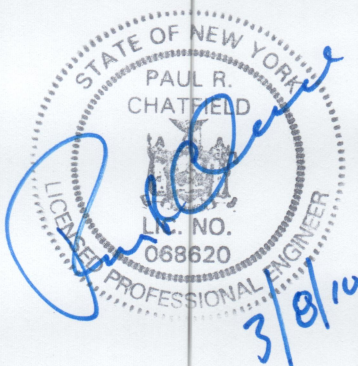


**PRELIMINARY ENGINEERING REPORT
FOR THE
TOWN OF ALABAMA
WATER DISTRICT NO. 2
GENESEE COUNTY, NEW YORK**

MARCH 8, 2010



CHATFIELD ENGINEERS, P.C.
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ROCHESTER, NY 14616
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**Preliminary Engineering Report
for the
Town of Alabama
Water District No. 2
Genesee County, New York
March 8, 2010**

I. GENERAL

A. Purpose

The purpose of this project is to provide a safe and reliable potable water supply and fire protection for residents of the Town of Alabama Water District No. 2 (**hereinafter referred to as the "Project"**) that are currently not served with public water.

In addition to providing a public water supply and fire protection for as many as 411 homes in the Town, the proposed Project will also replace a small private water system in the Hamlet of South Alabama that has been supplying water to 14 residences.

The proposed Project will connect to existing water main of the Village of Oakfield and will share a water storage tank to be constructed by the Village of Oakfield.

The proposed project will generally consist of installing approximately 103,720 linear feet of 6-12 inch diameter PVC water main, valves, fire hydrants, water services and appurtenances throughout portions of the Town of Alabama.

The Boundary Map and Description for Town of Alabama Water District No. 2 is provided in **Appendix A**.

II. PROJECT PLANNING AREA

A. Project Location

The Town of Alabama is located in the northwestern portion of Genesee County, as shown in **Figure 1: General Location Map**.

The area considered for installation of water mains is shown on **Figure 2: Proposed Project Area**. Included in **Table 1** are the areas included in the project along with key information.

B. Environmental Resources Present

Land uses in the areas of the proposed projects are generally agricultural and residential.

Once specific project areas have been determined, further evaluation of environmental resources and environmental impacts will need to be evaluated on a case-by-case basis. The State Environmental Quality Review (SEQR) and the National Environmental Policy Act (NEPA) will take place as project funding progresses along by USDA Rural Development.



**Table 1
Areas of Service**

Road	From	To	# of Houses	Linear Footage	Pipe Size (In.)
Judge Road	Macomber Road	Alleghany Road	63	22,000	12
Maple Street	Judge Road	7170 Maple Street	32	4,000	8
Alleghany Road	Judge Road	House # 7342 Alleghany	34	7,000	8
Bloomingtondale Rd.	Alleghany Road	House # 1099 Bloomingtondale	20	3,700	8
Alleghany Road	Judge Road	Lewiston Road	24	7,800	8
Alleghany Road	Lewiston Road	House #6430 Alleghany	18	2,300	8
Lewiston Road	Alleghany Road	House #739 Lewiston	60	13,500	8
Crosby Road	Lewiston Road	House #6725 Crosby	8	3,200	8
Church Street	Lewiston Road	Alleghany Road	13	1,320	6
Lewiston Road	Alleghany Road	Knowlesville Road	68	13,200	8
Lewiston Road	Knowlesville Rd.	House #2135 Lewiston	4	600	6
Knowlesville Rd.	Lewiston Road	House #6242 Knowlesville	31	7,200	8
Knowlesville Rd.	Lewiston Road	Ham Road	6	4,500	8
Ham Road	Knowlesville Rd.	Knowlesville Road	2	2,300	8
Knowlesville Rd.	Ham Road	Judge Road	28	3,600	8
Judge Road	Macomber Road	500' West of Lewiston Rd.	0	7,500	12
Totals =			411	103,720	

C. Growth Areas and Population Trends

The Town of Alabama population according to the year 2000 US Census is approximately 1,881 people. There are approximately 663 residential structures in the Town of Alabama. Only 44 (7%) of homes within the Town of Alabama are currently served with public water, leaving approximately 619 (93%) residences currently without public water.

The estimated population of those currently receiving public water is 124 people, assuming an average of 2.84 people per household.

The estimated population for the people currently **not** receiving public water is 1,757 people, also assuming an average of 2.84 people per household.

III. EXISTING FACILITIES

There are two existing public water systems in the Town of Alabama.

Alabama Water District No. 1 is owned by the Town of Alabama. It is located in the southwest portion of the Town of Alabama, and serves approximately 75 people through 30 service connections. The source of water for the district is the Erie County Water Authority. A single connection is in place on Bloomingtondale Road at the Genesee-Erie County line. Water District No. 1 terminates at the western boundary of the Tonawanda Indian Reservation.



The **South Alabama Community Water Supply** is a privately-owned and operated water system that serves 14 homes in the Hamlet of South Alabama. The system is supplied by a single drilled well, and was originally constructed to serve homes of workers of a local industry that is no longer in existence. Although the water from the well is chlorinated, as a privately-owned and operated system, it lacks sufficient financial, operational, and managerial capacity to be a viable system. The most recent inspection of this system by the Genesee County Health Department found no significant violations. The distribution system, however, is very old and reportedly consists mostly of two-inch diameter and smaller galvanized iron pipe. Such piping is subject to leakage, as well as potential back siphonage of ground water through piping cracks and/or leaking joints. The distribution system is therefore subject to potential contamination from failing septic systems, since the area is served exclusively by individual septic systems.

There are no other existing public water facilities in the proposed Water District #2. Residents in that area currently obtain water from private wells and/or purchase bottled water for consumption.

IV. NEED FOR PROJECT

A. Health and Safety

The residents in the Town of Alabama currently not served with public water have experienced the following typical problems:

1. **Insufficient quantity** of water is available for the residential wells. Some residents must conserve water by: alternating shower days, alternating laundry days or not washing clothes in their residences at all.
2. **Poor water quality** is predominant in the existing well supplies. The water quality requires some residents to either boil water for consumption or purchase bottled water for cooking and consumption.
3. **Contamination** of existing well supplies by **failing septic systems** is also a common problem. There are no public sewerage collection and/or treatment systems in the Town of Alabama. Consequently, Town residents rely on individual septic systems for disposal of sanitary wastes. Due to high ground water and/or impervious soil conditions throughout the Town, these septic systems often fail. This is a particular concern in the hamlet areas where lot sizes are often small, resulting in inadequate separation distances between wells and septic systems. When such septic systems fail, a **Public Health Hazard** is created.
4. **High cost** to operate and maintain existing well supplies. Several residents must purchase chemicals for softening and treatment systems, and must frequently replace their plumbing systems due to corrosion of their fixtures. Several residents currently pay over \$500 per year to operate and maintain their water system, which still only provides them with poor quality water and insufficient quantities at times. The estimated well operation and maintenance costs are outlined in **Table 2: Summary of Well Costs**.



5. **Fire Protection.** Presently, the only area in the Town of Alabama where fire protection is provided by a public water system is in Alabama Water District No. 1. Consequently, less than 5 percent of the Town's residential population receives this protection. In addition, there are no significant bodies of water in the Town that provide an adequate supply of water for fire protection.

Providing public water would address all of these issues for the residents of the Town of Alabama within the proposed service areas.

B. Growth

The ability to serve a growing population in the region has been addressed as part of the preliminary selection of water main size. The water mains will be sized for current and future residential needs in addition to the minimum fire flow requirements. Average daily demand is approximately 65-75 gallons per day per person.

The Insurance Services Office (ISO) requires a minimum fire flow of 500 gpm at 20 psi residual pressure for most of the project area. Fire flow requirements are dependent upon the distance between structures and the type of construction. The majority of structures is wood frame and are typically greater than 100 feet from each other, with the exception of the hamlet areas.

Future residential growth will not be limited as a result of available fire flows.

V. ALTERNATIVES CONSIDERED

As part of this evaluation, we previously identified nine (9) areas in the Town of Alabama currently not served with public water. These areas included the four (4) hamlets of Alabama Center, Basom, South Alabama, and Wheatville, which have the greatest population concentrations in the Town.

The Town of Alabama held a Public Information Meeting in 2009 to present information to the residents in the area proposed for water service. At that meeting, residents in additional areas requested being served as part of this project. Upon our investigation of serving the additional areas, we also investigated the supply option for water to the Project. The Village of Oakfield has the ability to serve the Town of Alabama with potable water and also to provide the operation and maintenance of the system. This option appears to be beneficial to all parties and is the direction chosen for supply of water for the project.

There are numerous alternative combinations of areas to serve, which has been completed in the past. Our previous evaluations considered the following options:

- Serving various combinations of service areas with water obtained from the Village of Oakfield.
- Serving various other combinations of service areas with water obtained from the Niagara County Water District.



For each of the options:

- The need to provide for adequate water storage was included. Either a new Town of Alabama owned water storage tank or a contribution towards a new Village of Oakfield water storage tank was included.
- Most water mains were assumed to be 8-inch diameter poly vinyl chloride (PVC) pipe.
- Costs for engineering, legal, administration, and contingency were included in the estimated total project cost.

In addition, for those options with water being obtained from the Niagara County Water District, a booster pump station was included as part of each project.

The project includes the installation of polyvinyl chloride (PVC) pipe due to the flow characteristics and lower material cost. Ductile Iron Pipe (DIP) could be used however would cost significantly more capital expenditures.

It is not feasible for the Town of Alabama to obtain their own source of supply such as wells, spring supplies, etc.

VI. PROPOSED PROJECT

A. Project Design

1. Water Supply

Water will be provided from the Village of Oakfield, which has excess capacity to serve the needs of the Town of Alabama. The Village of Oakfield receives their water from the Town of Batavia.

The water system would be designed to provide 75 gallons of water per person per day for domestic and commercial uses, and to provide fire protection meeting Insurance Services Office (ISO) Standards.

The Project will serve approximately 1,167 individuals (i.e., 411 EDU X 2.84 persons/EDU). Based upon that population, the water system would initially require approximately 87,525 gallons per day (gpd) or 61 gallons per minute (gpm) if all homes were initially connected. It is common when a system is placed into service that not all homes will initially connect to the system, therefore the initial anticipated water needs would be closer to 60,000 gpd. The peak hourly demand is estimated to be approximately 244 gpm for this service area, based upon a peaking factor of 4. Future demand is estimated at 100,654 gpd, based upon an estimated growth of 15% over the next twenty (20) years or so.

Based upon the zoning in the project area, house spacing will generally exceed 100 feet, therefore the water system will be designed to provide a minimum fire flow of 500 gallons per minute, in addition to the peak hourly demands. Portions of the system will be capable of providing fire flow in excess of 750 gpm at 20 psi residual pressure.



2. Treatment

No treatment will be involved with the project, since water will be obtained from an existing public water system.

3. Storage

The Village of Oakfield intends on constructing a new water storage tank just north of the village, near 5 corners. The proposed water storage tank will be increased in size to accommodate the Town of Alabama's need for water storage associated with the Project. The Town of Alabama will be sharing in the cost of upsizing the water storage tank to accommodate their needs. The Village of Oakfield and Town of Alabama will need to develop a Inter-municipal Agreement to address matters such as cost sharing, operation and maintenance issues and other items associated with sharing the tank and receiving water supply from the Village of Oakfield.

The overflow elevation of the Village of Oakfield Water Storage Tank will be at approximately 908 feet above sea level.

4. Distribution Layout

The proposed area of service is shown in **Figure 2: Proposed Project Area** and details of each area are included in **Table 1: Areas of Service**.

The proposed project will generally consist of installing approximately 103,720 linear feet of 6-12 inch diameter PVC water main, valves, fire hydrants, water services and appurtenances throughout portions of the Town of Alabama. Included in the total footage described above is approximately 7,500 linear feet of 12 inch diameter water main between the Village of Oakfield and the Alabama Town Line on Judge Road to serve as a "transmission line" to supply the project. This line is necessary to transmit water to the Project Area.

Fire hydrants will have a maximum spacing of 600 feet and will generally be located near intersections. Gate valves are generally spaced at approximate intervals of 1,500 linear feet, and at intersections. Water services typically consist of 1-inch diameter Type K copper pipe, and will be provided to the property right-of-way line parallel to the roadway.

The homeowners are responsible for the following:

- Installation of the water service piping between the road right-of-way and their structure.
- Disconnection of their private water supply from the public water supply.
- Internal plumbing changes.
- Payment for water usage, typically on a quarterly basis.
- Debt Service Payment associated with the capital improvements.



5. Hydraulic Calculations

Engineers for the Village of Oakfield provided Chatfield Engineers, P.C. with portions of the hydraulic information used for our preliminary evaluation. Fire flow testing data from the Village of Oakfield was provided by the Village of Oakfield engineering consultants. The results of the tests and the resulting hydraulic conditions are provided in **Appendix B**.

A computer model was utilized to calculate the anticipated hydraulic conditions and fire flows throughout the proposed Service Area, is included in **Appendix B**, and is summarized as follows:

Location	Projected Data			
	Static Press. (psi)	Flow (gpm)	Residual Press.(psi)	Flow (gpm) @ 20 psi
MAPLE STREET (S. END)	45	727	20	727
ALABAMA CENTER	111	1,293	42	1,501
BLOOMINGDALE @ END	88	1,020	20	1,020
SOUTH ALABAMA	68	1,293	43	1,839
KNOWLESVILLE RD (N. END)	109	1,015	20	1,015
INTERSECTION OF ALLEGHANY AND JUDGE ROADS	77	1,293	36	1,545

6. Cost Estimates

The summary of estimated costs for the proposed project as follows:

a.	Construction	\$ 4,200,750
b.	+ 5% Contingency	\$ 210,038
c.	Engineering	\$ 462,082
d.	Legal and Administrative	\$ 336,060
	Total Estimated Project Costs	\$5,208,930
	Less Anticipated Grant	\$ -1,540,000
	Net Local Share	\$ 3,668,930

Total Number of Billable Units (Refer to Table 1) 411

Annual debt service with Grant (2.75% for 38 years)\$ 156,838.09

Annual debt service per parcel with Grants \$ 381.60

Refer to Table 3 for a detailed Cost Estimate of the Proposed Project. Based upon our previous experience with similar type water projects, we feel that 5% contingencies are sufficient for this Project.

7. Easements

The water main will generally be located within the highway right-of-way. On rare occasions, the water main, fire hydrants or appurtenances may need to be installed on private easements. In those cases, the Town Attorney will prepare a permanent easement map and description for execution by the property owner.



In addition, temporary easements may be necessary for installation of the improvements.

8. Project Schedule

The anticipated Project Schedule is summarized as follows:

Submit the PED Application to USDA RD	March 19, 2010
Receive PED from USDA RD	April 30, 2010 +/-
Finalize Map, Plan and Report	May 2010
TB Accepts Map, Plan and Report	May 2010
TB holds Legal Public Hearing	June 2010
TB declares itself Lead Agency for SEQR	June 2010
Submission to the NYS Comptroller	July 2010
Approval by NYS Comptroller	October 2010
Design Phase of Improvements	Oct. 2010-March 2011
Approvals & Permits	February/March 2011
Bidding Phase	April 2011
Construction Phase	May 2011-Dec. 2011
Final Restoration	May 2012-June 2012
Completion and Closeout of Entire Project	July 2012

B. Annual Operating Budget

1. Income

Water rates are currently \$3.00 per 1,000 gallons for the Village of Oakfield plus \$20.00 per quarter. We have added \$1.00 per 1,000 gallons to the existing water rate to cover operation and maintenance costs associated with operating the water distribution system and water storage tank.

The Village of Oakfield will be responsible for the Operation and Maintenance (O&M) of the proposed water system improvements. The cost for O&M is included in the water rate charged to each user of the system. The Village of Oakfield currently provides the O&M for the entire Village of Oakfield Water System and the Town of Oakfield Water Districts. David Laney is the NYS Department of Health Licensed Water System Operator for the Village of Oakfield.

The average household uses approximately 60,000 gallons of water per year. The total cost of water per year is calculated as follows:

Total Cost of Water per Year:

Cost per Quarter	\$ 20.00/Quarter x 4 Quarters/Year	=	\$ 80.00
Cost of Water	\$ 3.00/1,000 Gal. x 60,000 Gal./Year	=	\$ 180.00
Future O & M	\$ 1.00/1,000 Gal. x 60,000 Gal./Year	=	<u>\$ 60.00</u>
	Total Cost of Water per Year	=	\$320.00

Note: Future O & M includes the Short Lived Assets associated with the water distribution system and water storage tank, and the necessary administration for the Town of Alabama.



2. Debt repayments

The debt service on initial project costs will be based on equivalent dwelling units (Billable Units). The Town of Alabama anticipates securing grants from USDA Rural Development to partially fund the project, while the remaining share will be paid for by a USDA Rural Development Loan.

3. Estimated Costs for the Average Residential User

The **estimated first year costs** for the average residential user are summarized as follows:

1. Purchase of Water Meter	= \$ 260.00
2. Installation of Water Service (75 lf x \$10.00/lf)	= \$ 750.00
3. Internal Plumbing Changes	= \$ 200.00
4. Repayment of Long Term Bonding (Debt Service Charge)	= \$ 381.60
5. Purchase of Water (60,000 gal./yr)	= \$ 320.00
Total First Year Costs for the Average Residential User	= \$ 1,911.60

The **estimated annual costs** for the average residential user **after the first year** are summarized as follows:

1. Repayment of Long Term Bonding (Debt Service Charge)	= \$ 381.60
2. Purchase of Water (60,000 gal./yr)	= \$ 320.00
Total Second Year and beyond Costs for the Average Residential User	= \$ 701.60

The property owner is responsible for paying the fee associated with purchase of the water meter. In addition, the property owner is responsible for installation of their own individual water service and connection to the new water service.

As part of this project, water services will be provided from the water main to the right-of-way in front of each building. A curb stop and box will be located at the right-of-way to shut off the water service if necessary.

VII. CONCLUSIONS AND RECOMMENDATIONS

This project will provide potable water to residents of the Town of Alabama who are in dire need of a public water supply system for daily usage and fire protection.

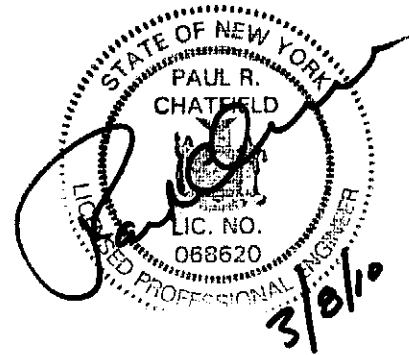
The costs associated with this Project are slightly higher than the current NYS Comptroller's threshold, which is \$677 per year for the average household (in 2010). The Town Attorney will need to submit an application to the NYS Comptroller's Office for approval of the Water District.

The improvements described in this Report will require significant financial assistance from grants and/or low interest loans. The Alabama Town Board should authorize their financial advisor to submit a Preliminary Eligibility Determination (PED) to USDA Rural Development for funding consideration.



The improvements proposed in this report will help to solve health and safety issues (quality and quantity) associated with individual well supplies throughout the Project Area.

**Report prepared for the
Town of Alabama by,**



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2800 Dewey Avenue
Rochester, NY 14616
Telephone: 585-227-6040
paulchatfield@chatfieldengineers.com



FIGURE 1
TOWN OF ALABAMA
GENERAL LOCATION MAP



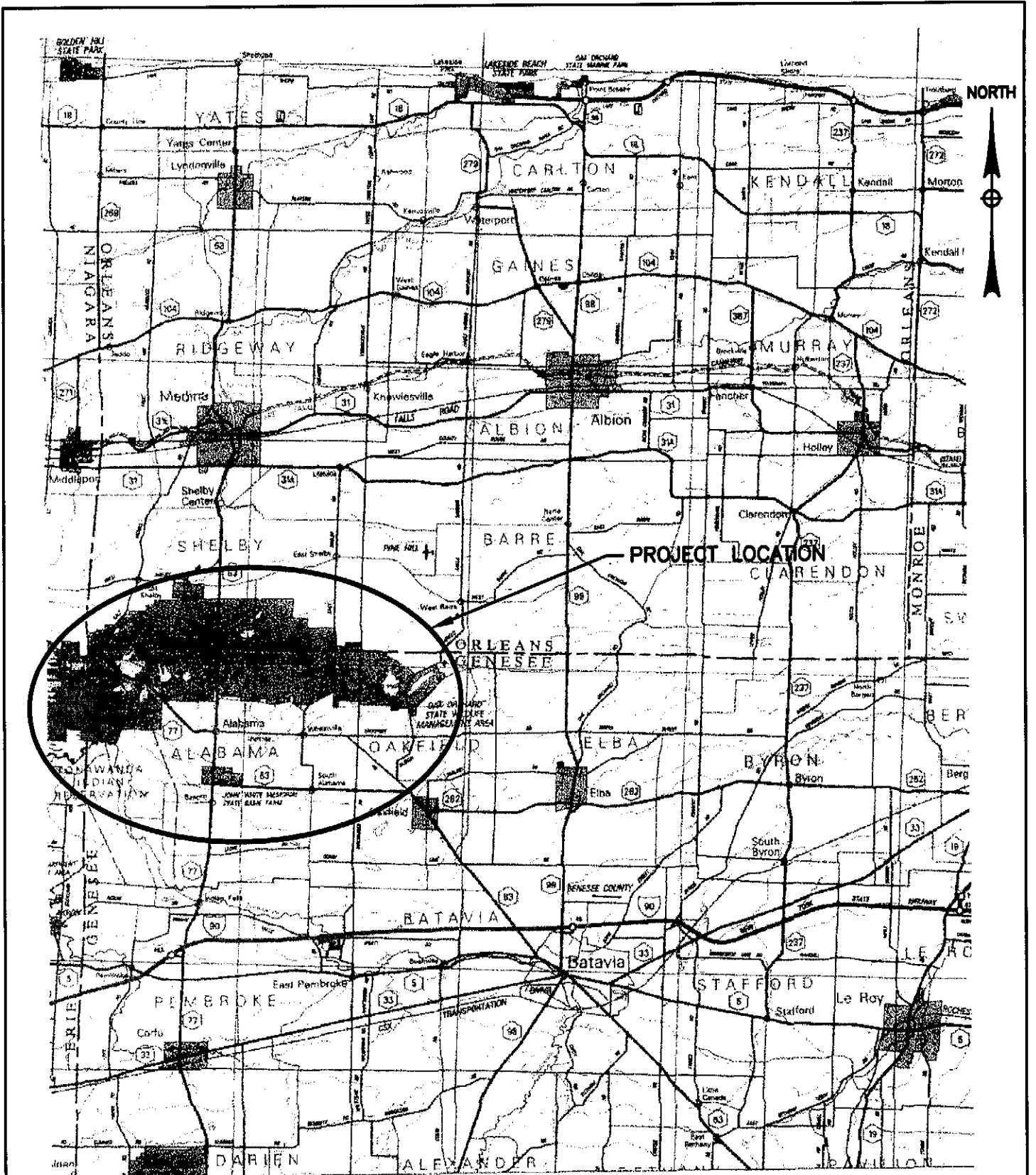


Figure 1
 Town of Alabama
 General Location Map
 N.T.S.

FIGURE 2
PROPOSED PROJECT AREA



TABLE 2
SUMMARY OF WELL COSTS



**Table 2
Summary of Well Costs**

Worst Case Scenario (Very Poor Quality and Quantity Well Water)

Item	Annual Cost	Monthly Cost	Notes
Electricity	\$ 50.00	\$ 4.17	
Pump & Pressure Tank Replacement	\$ 100.00	\$ 8.33	Est. replacement every 7 years
Well Re-Development	\$ 100.00	\$ 8.33	Est. replacement every 30 years
Treatment System	\$ 750.00	\$ 62.50	Est. replacement every 10 years
Chemicals	\$ 300.00	\$ 25.00	
Purchase Drinking Water	\$ 400.00	\$ 33.33	For a family of 3 people
Replacement of Hot Water Heater	\$ 60.00	\$ 5.00	Est. replacement every 7 years
Replacement of Washing Machine	\$ 30.00	\$ 2.50	Est. replacement every 7 years
Replacement of faucets	\$ 20.00	\$ 1.67	
Purchase Towels and Linens	\$ 20.00	\$ 1.67	
Laundromat	\$ 120.00	\$ 10.00	
Bulk purchase of water	\$ 400.00	\$ 33.33	
Totals =	\$ 2,350.00	\$ 195.83	

Savings on Homeowners Insurance	\$ (65.00)	\$ (5.42)	Estimated at 10-15% Savings
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Better Case Scenario (Average Quality and Quantity Well Water)

Item	Annual Cost	Monthly Cost	Notes
Electricity	\$ 50.00	\$ 4.17	
Pump & Pressure Tank Replacement	\$ 50.00	\$ 4.17	Est. replacement every 14 years
Well Re-Development	\$ 75.00	\$ 6.25	Est. replacement every 40 years
Treatment System	\$ -	\$ -	Assume adequate quality
Chemicals	\$ -	\$ -	Assume adequate quality
Purchase Drinking Water	\$ 400.00	\$ 33.33	Assume drinkable water from well
Replacement of Hot Water Heater	\$ -	\$ -	Assume non corrosive well water
Replacement of Washing Machine	\$ -	\$ -	Assume non corrosive well water
Replacement of faucets	\$ -	\$ -	Assume non corrosive well water
Purchase Towels and Linens	\$ -	\$ -	Assume non corrosive well water
Laundromat	\$ -	\$ -	Assume adequate quantity
Bulk purchase of water	\$ -	\$ -	Assume adequate quantity
Totals =	\$ 575.00	\$ 47.92	

Savings on Homeowners Insurance	\$ (65.00)	\$ (5.42)	Estimated at 10-15% Savings
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TABLE 3
PRELIMINARY COST ESTIMATE



Table 3
Town of Alabama Water District No. 2
Preliminary Cost Estimate
March 5, 2010

Description	Quantity	Units	Unit Price	Amount
Rock Excavation	1,000	Cubic Yard	\$100	\$100,000
Select Fill	200	Cubic Yard	\$30	\$6,000
6" PVC DR-18 Water Main	1,920	Linear Feet	\$20	\$38,400
8" PVC DR-18 Water Main	72,300	Linear Feet	\$22	\$1,590,600
12" PVC DR-18 Water Main	29,500	Linear Feet	\$27	\$796,500
Sand Bedding	103,720	Linear Feet	\$1	\$103,720
1" Corp & Tap	411	Each	\$300	\$123,300
1" Copper Service Tubing	8,235	Linear Feet	\$10	\$82,350
1" Curb Stop & Box	411	Each	\$375	\$154,125
Hydrant Assembly	173	Each	\$3,500	\$605,500
6" Hydrant Extension	4	Each	\$350	\$1,400
12" Hydrant Extension	4	Each	\$400	\$1,600
18" Hydrant Extension	4	Each	\$450	\$1,800
Connection To Existing	1	Each	\$2,500	\$2,500
Water Sampling Station	8	Each	\$1,750	\$14,000
6" Gate Valve	4	Each	\$1,000	\$4,000
8" Gate Valve	50	Each	\$1,300	\$65,000
12" Gate Valve	20	Each	\$2,000	\$40,000
Asphalt Road Crossing Restoration	300	Linear Feet	\$25	\$7,500
Asphalt Driveway Restoration	2040	Linear Feet	\$20	\$40,800
Crusher Run Driveway Restoration	1,050	Linear Feet	\$11	\$11,655
Horizontal Boring and Casing	4	Lump Sum	\$40,000	\$160,000
Upsizing Oakfield WST to accommodate Alabama	1	Lump Sum	\$250,000	\$250,000
Sub-Total Amount =				\$4,200,750
Plus Contingency =				\$210,038
Plus Design and Construction Phase Engineering =				\$462,083
Plus Legal and Administration =				\$336,060
Total Capital Cost =				\$5,208,930
Less USDA RD Grant =				(\$1,540,000)
Net Local Share =				\$3,668,930
Total Number of Billable Units=				411.0
Yearly Debt Service with Grant (2.75% for 38 Years) =				\$156,838.09
Yearly Debt Service/Parcel with Grant =				\$381.60
Plus Average Water Usage per Household (60,000 gal./yr.) =				\$320.00
Total Second Year (and beyond to 38th Year)				
Costs for the Average Residential User =				\$701.60



APPENDIX A
BOUNDARY MAP AND DESCRIPTION



APPENDIX A

BOUNDARY MAP AND DESCRIPTION

(To be inserted after PED has been made)

APPENDIX B

**HYDRAULIC INFORMATION
PROVIDED BY CLARK PATTERSON LEE
ON BEHALF OF THE VILLAGE OF OAKFIELD**





December 23, 2009

Richard Pastecki, Mayor
Village of Oakfield
37 Main Street
Oakfield, New York 14125

RE: OAKFIELD AND ALABAMA WATER SUPPLY EVALUATION

Dear Rick:

We have completed a preliminary hydraulic water supply evaluation for Oakfield and Alabama. Enclosed for your review and use are the following documents:

- Two (2) copies of Figure 1 Hydraulic Model Results. This figure provides a graphical summary of the results of the hydraulic modeling performed.
- Two (2) copies of the table of Preliminary Hydraulic Calculations. This table provides a more detailed summary of all of the hydraulic modeling performed as well as the assumptions we made.

Based on the preliminary evaluation, and referencing Figure 1, we have the following comments:

- We evaluated two locations for a shared Oakfield and Alabama water storage tank: Five Corners in Oakfield and Maple Street in Alabama.
- We evaluated two sizes for a Route 63 transmission main between Oakfield and Route 77: 12-inch and 16-inch.
- For this evaluation we assumed that development of STAMP will occur in order to evaluate the long term water supply needs.
- We anticipate that STAMP would require a water storage tank of its own, regardless of the location of a shared Oakfield and Alabama tank. This is due to the fact that it will likely have higher fire protection requirements than Oakfield and Alabama in general.
- We anticipate that even before full build-out, STAMP could require secondary water supply lines to meet daily water consumption demands. On Figure 1 we have identified



Mr. Richard Pastecki

December 23, 2009

Page 2

several potential future sources: 1. Maple Street from Pembroke/Batavia, 2. Route 77 from Pembroke and 3. Route 77 from Niagara County.

- A 12-inch Route 63 transmission main appears to be adequate for the needs of Oakfield and Alabama.
- Upsizing to 16-inch for some or all of a Route 63 transmission main may benefit STAMP, depending on the location of the secondary water supply lines developed.
- A shared tank could be located in either the Oakfield or Alabama water system without significant adverse impacts on the opposite system.
- A Five Corners tank would provide fire flow capacity throughout the Village at least equal to that of the existing condition. Fire flows would be reduced in the Village with a Maple Street tank.
- The Five Corners land will be donated and a more convenient location for the Village Water Department with respect to operations and maintenance.

It may be beneficial to meet with the Town of Alabama again in the near future to discuss this matter in greater detail.

Upon your review, should you have any questions or wish to arrange a meeting, please contact me at (585) 454-4570 ext. 1017.

Sincerely,

Clark Patterson Lee

Thomas A. Carpenter, P.E.

Enclosure

- c: David Laney, Village Superintendent of Public Works, Village of Oakfield (w/ Enc.)
Ken Dodd, Supervisor, Town of Oakfield, (w/ 2 Enc.)
Dan Mangino, Councilman, Town of Alabama (w/ 2 Enc.)
Max Maerten, Councilman, Town of Alabama (w/ 2 Enc.)
Paul Chatfield, P.E., Chatfield Engineers (w/ 2 Enc.)
Steve Hyde, CEO, GCEDC (w/ 2 Enc.)

Oakfield & Alabama
Water Supply Evaluation
Preliminary Hydraulic Calculations
December 16, 2009

Scenario/Drawing Number:	E-8	E-12	E-16	O-12	O-16	A-12	A-16	SO-12	SO-16	SA-12	SA-16
Junction	Location	Static Pressure (psi)	Fire Flow @ 20 psi (gpm)	Fire Flow @ 20 psi (gpm)	Fire Flow @ 20 psi (gpm)	Fire Flow @ 20 psi (gpm)	Fire Flow @ 20 psi (gpm)	Fire Flow @ 20 psi (gpm)	Fire Flow @ 20 psi (gpm)	Fire Flow @ 20 psi (gpm)	Fire Flow @ 20 psi (gpm)
J-101	Connection Point along Route 63, Oakfield	65	3,423	3,423	4,956	1,283	2,886	5,257	6,686	1,393	3,197
J-113	Intersection of Farnsworth Avenue & North Pearl Street	75	2,005	2,005	2,117	1,154	1,761	2,145	2,193	1,232	1,819
J-118	Draks Street (Route 262) @ East Village Line	70	2,665	2,664	2,771	1,180	2,092	2,835	2,971	1,286	2,190
J-127	Intersection of Duck Pond Road & Pine Street	58	362	362	357	323	350	356	358	325	351
J-138	South Main Street (Route 63) @ East Village Line	59	2,256	2,256	2,326	1,032	1,778	2,373	2,488	1,101	1,865
J-140	South Pearl Street @ South Village Line (DPVW Garage)	58	427	427	429	378	418	428	431	381	420
J-344	Oakfield-Alabama Town Line along Route 63	56	612	2,407	3,399	1,478	3,313	3,250	5,630	1,733	3,921
J-502	South Alabama @ Route 63 & Maple Street Road	69	487	2,491	3,185	2,790	5,874	3,229	6,159	4,275	8,867
J-514	Intersection of Judge Road (Route 63) & Allegheny Road (Route 77)	78	457	1,284	2,878	1,784	3,600	3,437	7,143	3,777	7,990
J-522	Basom @ Summer Road	80	445	981	1,353	1,158	1,451	1,413	1,566	1,435	1,578
J-541	Alabama Center @ Route 63 & 77, CR 12	113	628	1,284	1,665	1,537	1,775	3,092	3,661	3,186	3,686
J-561	Wheatville @ CR 12 & 23	100	598	1,199	1,494	1,430	1,590	1,687	1,775	1,707	1,792
J-573	Route 77 @ Iniquis National Wildlife Refuge driveway	125	521	753	815	794	829	1,051	1,092	1,055	1,093
J-575	Genesee-Niagara County Line along Route 77 & CR 12	114	434	578	613	601	620	714	733	715	733
J-591	Maple Street Road @ Alabama Tank Site	26	69	226	300	4,878	4,878	270	321	5,225	5,717
J-701	Intersection of Judge Road & Crosby Road	95	N/A	N/A	N/A	N/A	N/A	4,142	8,757	4,430	9,563
J-702	Intersection of Crosby Road & Patterson Road	103	N/A	N/A	N/A	N/A	N/A	5,438	11,605	5,789	12,367

- Notes:
- The existing Village of Oakfield Water Storage Tank overflow elevation is 908-feet.
 - All scenario models used a Hydraulic Grade Line (HGL) of 905-feet during calculations.
 - Proposed Oakfield Water Storage Tank modeled as: 55' diameter elevated tank, 751-foot grade elevation, 865-foot tank invert elevation and 908-foot overflow elevation.
 - Proposed Oakfield Tank would be connected to the Water System with 12-inch diameter water mains to Route 63.
 - Proposed Alabama Water Storage Tank modeled as: 55' diameter ground tank, 860-foot grade elevation and 908-foot overflow elevation.
 - Proposed Alabama Tank would be connected to the Water System with 16-inch diameter water main to Maple Street Road.
 - Maple Street Road water main would be equal in diameter to Route 63 water main.
 - Static pressures along a portion of Maple Street Road, near tank site, will be less than desired minimum of 20 psi.
 - It is assumed that the potential S.T.A.M.P. project would require another water storage tank on site for increased fire protection.
 - For Hydraulic Modeling purposes, the existing 10-inch transmission main located along South Pearl Street was assumed to be closed.
 - Proposed STAMP Water Storage Tank modeled as: 55' diameter elevated tank, 850-foot grade elevation, 880-foot tank invert elevation and 908-foot overflow elevation.
 - Proposed STAMP Tank water main connection and on-site water mains would be equal in diameter to Route 63 water main.

APPENDIX C
HYDRAULIC INFORMATION
PREPARED BY CHATFIELD ENGINEERS, P.C.



Fire Flow Node FlexTable: Fire Flow Report (AlabamaWaterSystem Oakfield Feed 2-5-10.wtg)

Current Time: 0.000 hours

Label	Pressure (psi)	Fire Flow (Needed) (gpm)	Zone	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual) Lower Limit (psi)	Pressure (Calculated Residual) Lower Limit (psi)	Junction w/Minimum Pressure (Zone)	Junction w/Minimum Pressure (System)	Is Fire Flow Run Balanc ed?	Pressure (Calculated Residual) @ Total Flow Needed (psi)
A1 (South Alabama)	68.4	500.00	ALABAMA	1,293.01	540.40	1,333.41	20.0	43.8	J1	PMP-2	True	62.6
A2	61.9	500.00	ALABAMA	987.18	504.00	991.18	20.0	37.3	J1	PMP-2	True	53.7
A3	56.8	500.00	ALABAMA	1,511.81	504.00	1,515.81	20.0	32.3	J1	PMP-2	True	52.3
A4	55.7	500.00	ALABAMA	1,913.37	504.00	1,917.37	20.0	31.1	J1	PMP-2	True	52.6
B1	76.8	500.00	ALABAMA	1,292.96	504.00	1,296.96	20.0	36.0	J1	PMP-2	True	67.6
B2	68.2	500.00	ALABAMA	1,292.74	504.00	1,296.74	20.0	31.4	J1	PMP-2	True	59.8
B3	59.2	500.00	ALABAMA	1,292.91	504.00	1,296.91	20.0	25.9	J1	PMP-2	True	51.5
B4	73.1	500.00	ALABAMA	1,293.01	504.00	1,297.01	20.0	43.6	J1	PMP-2	True	66.2
C1 (Basom)	78.9	500.00	ALABAMA	1,021.25	532.80	1,054.05	20.0	33.0	C5	PMP-2	True	64.4
C2	78.9	500.00	ALABAMA	991.94	504.00	995.94	20.0	33.0	C5	PMP-2	True	63.8
C3	78.9	500.00	ALABAMA	991.98	504.00	995.98	20.0	30.0	C5	PMP-2	True	63.0
C4	87.6	500.00	ALABAMA	1,019.46	504.00	1,023.46	20.0	20.0	C5	PMP-2	True	67.2
C5	65.9	500.00	ALABAMA	753.64	504.00	757.64	20.0	20.0	J1	PMP-2	True	43.0
D1	87.6	500.00	ALABAMA	1,292.81	504.00	1,296.81	20.0	34.0	J1	PMP-2	True	75.8
D2	89.2	500.00	ALABAMA	1,292.97	504.00	1,296.97	20.0	26.7	J1	PMP-2	True	75.7
E1	115.6	500.00	ALABAMA	1,292.99	504.00	1,296.99	20.0	26.0	J1	PMP-2	True	97.1
E2 (Alabama Ctr)	111.2	500.00	ALABAMA	1,293.00	542.80	1,335.80	20.0	41.8	J1	PMP-2	True	96.3
E3	111.3	500.00	ALABAMA	1,292.98	504.00	1,296.98	20.0	43.1	J1	PMP-2	True	96.6
E4	111.3	500.00	ALABAMA	1,292.98	504.00	1,296.98	20.0	42.1	J1	PMP-2	True	96.4
E5	100.5	500.00	ALABAMA	1,292.96	504.00	1,296.96	20.0	29.0	J1	PMP-2	True	85.3
F1	100.5	500.00	ALABAMA	1,292.98	504.00	1,296.98	20.0	27.5	J1	PMP-2	True	85.2
G1 (Wheatville)	99.3	500.00	ALABAMA	1,292.90	504.00	1,296.90	20.0	32.7	J1	PMP-2	True	85.4
G2	78.2	500.00	ALABAMA	1,292.99	504.00	1,296.99	20.0	24.0	J1	PMP-2	True	66.7
G3	75.2	500.00	ALABAMA	1,292.92	504.00	1,296.92	20.0	28.0	J1	PMP-2	True	65.1

Fire Flow Node FlexTable: Fire Flow Report (AlabamaWaterSystem Oakfield Feed 2-5-10.wtg)

Current Time: 0.000 hours

Label	Pressure (psi)	Fire Flow (Needed) (gpm)	Zone	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Junction w/Minimum Pressure (Zone)	Junction w/Minimum Pressure (System)	Is Fire Flow Run Balanced?	Pressure (Calculated Residual @ Total Flow Needed) (psi)
H3	124.2	500.00	ALABAMA	873.22	504.00	877.22	20.0	20.1	H4	PMP-2	True	84.8
H4	108.6	500.00	ALABAMA	921.95	504.00	925.95	20.0	20.0	J1	PMP-2	True	77.6
H5	93.5	500.00	ALABAMA	1,066.62	504.00	1,070.62	20.0	20.0	J1	PMP-2	True	72.7
I1	55.7	500.00	OAKFIELD	2,413.94	500.00	2,413.94	20.0	20.0	I2	PMP-2	True	52.7
I2	50.2	500.00	OAKFIELD	2,943.94	500.00	2,943.94	20.0	20.0	I1	PMP-2	True	48.3
I3	55.6	500.00	OAKFIELD	4,388.70	500.00	4,388.70	20.0	25.3	I2	PMP-2	True	54.5
I4	64.6	500.00	OAKFIELD	3,356.26	640.00	3,496.26	20.0	20.0	I2	PMP-2	True	62.5
J1	44.6	500.00	ALABAMA	726.72	500.00	726.72	20.0	20.0	A2	PMP-2	True	31.5
J-38	97.1	500.00	ALABAMA	1,211.11	504.00	1,215.11	20.0	20.0	J1	PMP-2	True	79.8
J-39	112.3	500.00	ALABAMA	1,207.48	504.00	1,211.48	20.0	23.0	J-40	PMP-2	True	92.5
J-40	109.2	500.00	ALABAMA	1,015.22	500.00	1,015.22	20.0	20.0	J1	PMP-2	True	83.2
J-41	101.7	500.00	ALABAMA	997.90	500.00	997.90	20.0	20.0	J-42	PMP-2	True	76.4
J-42	101.7	500.00	ALABAMA	961.26	504.00	965.26	20.0	20.0	J-41	PMP-2	True	74.8

FlexTable: Junction Table (AlabamaWaterSystem Oakfield Feed 2-5-10.wtg)

Current Time: 0.000 hours

Id	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
126	A1 (South Alabama)	745.00	ALABAMA	<Collection: 1 items>	40.40	903.02	68.4
127	A2	760.00	ALABAMA	<Collection: 1 items>	4.00	903.02	61.9
139	A3	772.00	ALABAMA	<Collection: 1 items>	4.00	903.37	56.8
140	A4	775.00	ALABAMA	<Collection: 1 items>	4.00	903.78	55.7
131	B1	725.00	ALABAMA	<Collection: 1 items>	4.00	902.52	76.8
130	B2	745.00	ALABAMA	<Collection: 1 items>	4.00	902.66	68.2
129	B3	766.00	ALABAMA	<Collection: 1 items>	4.00	902.77	59.2
128	B4	734.00	ALABAMA	<Collection: 1 items>	4.00	902.88	73.1
134	C1 (Basom)	720.00	ALABAMA	<Collection: 1 items>	32.80	902.39	78.9
137	C2	720.00	ALABAMA	<Collection: 1 items>	4.00	902.39	78.9
138	C3	720.00	ALABAMA	<Collection: 1 items>	4.00	902.38	78.9
136	C4	700.00	ALABAMA	<Collection: 1 items>	4.00	902.38	87.6
135	C5	750.00	ALABAMA	<Collection: 1 items>	4.00	902.38	65.9
146	D1	700.00	ALABAMA	<Collection: 1 items>	4.00	902.37	87.6
132	D2	696.00	ALABAMA	<Collection: 1 items>	4.00	902.24	89.2
121	E1	635.00	ALABAMA	<Collection: 1 items>	4.00	902.13	115.6
120	E2 (Alabama Ctr)	645.00	ALABAMA	<Collection: 1 items>	42.80	902.13	111.2
133	E3	645.00	ALABAMA	<Collection: 1 items>	4.00	902.14	111.3
122	E4	645.00	ALABAMA	<Collection: 1 items>	4.00	902.14	111.3
144	E5	670.00	ALABAMA	<Collection: 1 items>	4.00	902.18	100.5
145	F1	670.00	ALABAMA	<Collection: 1 items>	4.00	902.23	100.5
123	G1 (Wheatville)	673.00	ALABAMA	<Collection: 1 items>	4.00	902.46	99.3
124	G2	722.00	ALABAMA	<Collection: 1 items>	4.00	902.68	78.2
125	G3	729.00	ALABAMA	<Collection: 1 items>	4.00	902.78	75.2
117	H3	615.00	ALABAMA	<Collection: 1 items>	4.00	902.09	124.2
118	H4	651.00	ALABAMA	<Collection: 1 items>	4.00	902.10	108.6
119	H5	686.00	ALABAMA	<Collection: 1 items>	4.00	902.11	93.5
149	I1	775.00	OAKFIELD	<Collection: 0 items>	0.00	903.80	55.7
141	I2	788.00	OAKFIELD	<Collection: 0 items>	0.00	904.14	50.2
142	I3	776.00	OAKFIELD	<Collection: 0 items>	0.00	904.40	55.6
143	I4	755.00	OAKFIELD	<Collection: 1 items>	140.00	904.24	64.6
150	J1	800.00	ALABAMA	<Collection: 0 items>	0.00	903.02	44.6
232	J-38	678.00	ALABAMA	<Collection: 1 items>	4.00	902.46	97.1
234	J-39	643.00	ALABAMA	<Collection: 1 items>	4.00	902.46	112.3
236	J-40	650.00	ALABAMA	<Collection: 0 items>	0.00	902.46	109.2
238	J-41	667.00	ALABAMA	<Collection: 0 items>	0.00	902.11	101.7
240	J-42	667.00	ALABAMA	<Collection: 1 items>	4.00	902.11	101.7

FlexTable: Pipe Table (AlabamaWaterSystem Oakfield Feed 2-5-10.wtg)

Current Time: 0.000 hours

Label	Scaled Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss (Friction) (ft)
OAK2	2,111.00	I2	I3	12.0	PVC	150.0	-224.00	0.64	0.26	0.26
OAK3	2,985.69	I3	I4	12.0	PVC	150.0	140.00	0.40	0.15	0.15
OAK6	2,808.69	I1	I2	12.0	PVC	150.0	-224.00	0.64	0.34	0.34
OAK7	1,12.74	A4	I1	12.0	PVC	150.0	-224.00	0.64	0.01	0.01
P5	2,887.35	J1	A2	8.0	PVC	150.0	0.00	0.00	0.00	0.00
P-11	496.98	G1 (Wheatville)	J-38	6.0	PVC	150.0	4.00	0.05	0.00	0.00
P12	4,944.67	H3	H4	8.0	PVC	150.0	-4.00	0.03	0.00	0.00
P-12	3,464.73	G1 (Wheatville)	J-39	8.0	PVC	150.0	4.00	0.03	0.00	0.00
P13	5,911.16	H4	H5	8.0	PVC	150.0	-8.00	0.05	0.01	0.01
P-13	3,741.42	J-39	J-40	8.0	PVC	150.0	0.00	0.00	0.00	0.00
P14	3,307.98	H5	E2 (Alabama Ctr)	8.0	PVC	150.0	-16.00	0.10	0.02	0.02
P-14	2,652.50	H5	J-41	8.0	PVC	150.0	4.00	0.03	0.00	0.00
P15	2,054.06	E2 (Alabama Ctr)	E1	8.0	PVC	150.0	4.00	0.03	0.00	0.00
P-15	903.05	J-41	J-42	8.0	PVC	150.0	4.00	0.03	0.00	0.00
P16	686.48	E2 (Alabama Ctr)	E4	8.0	PVC	150.0	-26.85	0.17	0.01	0.01
P-16	2,021.77	T-3	I3	12.0	PVC	150.0	364.00	1.03	0.60	0.60
P17	474.41	E3	E2 (Alabama Ctr)	8.0	PVC	150.0	35.95	0.23	0.01	0.01
P-17	686.16	R-2	PMP-2	12.0	PVC	150.0	248.18	0.70	0.00	0.00
P18	1,134.60	E3	E4	6.0	PVC	150.0	3.88	0.04	0.00	0.00
P-18	700.08	PMP-2	T-3	12.0	PVC	150.0	248.18	0.70	0.01	0.01
P19	1,977.71	E4	E5	8.0	PVC	150.0	-26.97	0.17	0.03	0.03
P20	2,599.62	E5	F1	8.0	PVC	150.0	-30.97	0.20	0.06	0.06
P21	8,004.90	F1	G1 (Wheatville)	8.0	PVC	150.0	-34.97	0.22	0.23	0.23
P22	4,590.25	G1 (Wheatville)	G2	8.0	PVC	150.0	-46.97	0.30	0.22	0.22
P23	1,744.86	G2	G3	8.0	PVC	150.0	-50.97	0.33	0.10	0.10
P24	3,631.32	G3	A1 (South Alabama)	8.0	PVC	150.0	-54.97	0.35	0.24	0.24
P25	3,136.88	A1 (South Alabama)	A3	12.0	PVC	150.0	-216.00	0.61	0.36	0.36
P26	3,465.67	A3	A4	12.0	PVC	150.0	-220.00	0.62	0.41	0.41
P27	1,434.26	A1 (South Alabama)	A2	8.0	PVC	150.0	4.00	0.03	0.00	0.00
P28	3,649.98	A1 (South Alabama)	B4	12.0	PVC	150.0	116.63	0.33	0.13	0.13

FlexTable: Pipe Table (AlabamaWaterSystem Oakfield Feed 2-5-10.wtg)

Current Time: 0.000 hours

Label	Scaled Length (ft)	Start Node	Stop Node	Diameter (In)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss (Friction) (ft)
P29	3,441.94	B4	B3	12.0	PVC	150.0	112.63	0.32	0.12	0.12
P31	3,487.60	B3	B2	12.0	PVC	150.0	108.63	0.31	0.11	0.11
P32	4,413.19	B2	B1	12.0	PVC	150.0	104.63	0.30	0.13	0.13
P33	2,648.87	B1	C1 (Basom)	8.0	PVC	150.0	48.80	0.31	0.14	0.14
P34	3,440.38	C1 (Basom)	C4	8.0	PVC	150.0	4.00	0.03	0.00	0.00
P35	356.87	C1 (Basom)	C2	8.0	PVC	150.0	12.00	0.08	0.00	0.00
P36	498.52	C2	C3	8.0	PVC	150.0	4.00	0.03	0.00	0.00
P37	4,624.79	C2	C5	8.0	PVC	150.0	4.00	0.03	0.00	0.00
P38	2,665.97	B1	D1	8.0	PVC	150.0	51.83	0.33	0.16	0.16
P39	2,627.44	D1	D2	8.0	PVC	150.0	47.83	0.31	0.13	0.13
P40	2,198.97	D2	E3	8.0	PVC	150.0	43.83	0.28	0.09	0.09

FlexTable: Tank Table (AlabamaWaterSystem Oakfield Feed 2-5-10.wtg)

Current Time: 0.000 hours

Id	Label	Zone	Base Elevation (ft)	Minimum Elevation (ft)	Initial Elevation (ft)	Maximum Elevation (ft)	Inactive Volume (gal)	Diameter (ft)	Outflow (gpm)	Hydraulic Grade (ft)
243	T-3	<None>	754.00	880.00	905.00	908.00	0.00	55.00	115.82	905.00

FlexTable: Reservoir Table (AlabamaWaterSystem Oakfield Feed 2-5-10.wtg)

Current Time: 0.000 hours

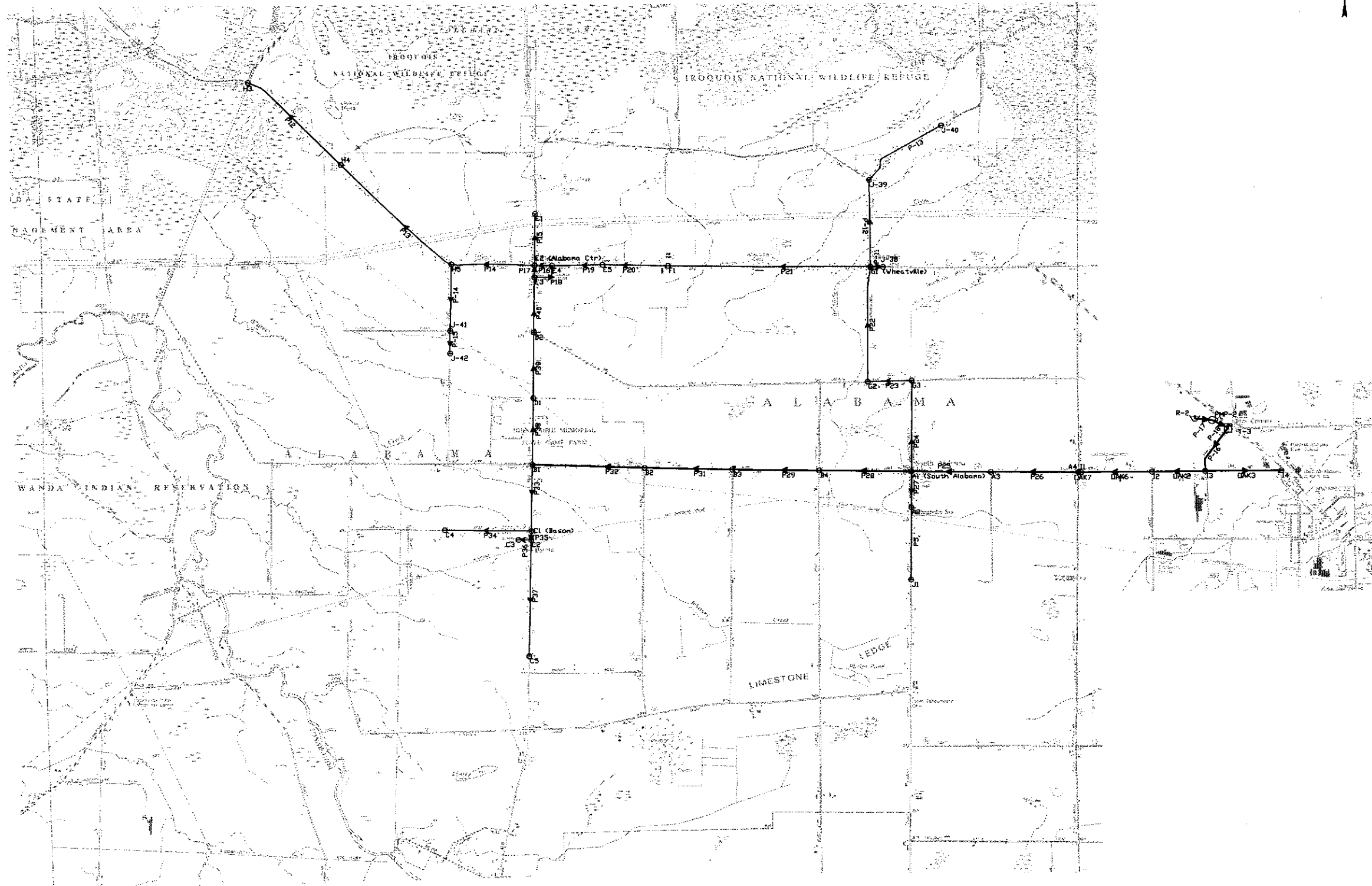
Id	Label	Elevation (ft)	Zone	Outflow (gpm)	Hydraulic Grade (ft)
245	R-2	700.00	<None>	248.18	700.00

FlexTable: Pump Table (AlabamaWaterSystem Oakfield Feed 2-5-10.wtg)

Current Time: 0.000 hours

Label	Elevation (ft)	Pump Definition	Status	Intake Grade (ft)	Discharge Grade (ft)	Discharge (gpm)	Pump Head (ft)
PMP-2	700.00	OAKFIELD-1	On	700.00	905.01	248.18	205.02

filename: (T) ALABAMA\06-754\ALABAMAWATER.DWG



Color Coding Legend	
Pipe Diameter (in)	
—	6.0
—	8.0
—	10.0
—	12.0
—	Other

NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBSECTION 2 OF THE NEW YORK STATE EDUCATION LAW.

BY	DATE

NO.	REVISIONS

PROJECT ENGINEER: JAF
 DESIGNED BY: BTJ
 CHECKED BY: PRC
 SCALE: 1"=2,000'
 DATE: MARCH 2010

PROJECT: TOWN OF ALABAMA POTENTIAL WATER DISTRICT
 TITLE: POTENTIAL WATER DISTRICT WATER SYSTEM MODEL

PROJECT MANAGER: [Name]
 FIRM PRINCIPAL: [Name]

PROJECT No. 06-754
 DRAWING No. 1 OF 1