



1 December 1988

Mr. Steven Lawry, Superintendent  
Marquette Public Works Department  
300 West Baraga Avenue  
Marquette, Michigan 49855

RE: Review of DPW Studies

Dear Mr. Lawry:

Attached to this letter is the completed review of the previous DPW studies. While there were some areas we are not in complete agreement with, there were no areas of striking discrepancy. The previously completed reports seem to be essentially valid based on the information provided for review. All areas which were question were within reasonable limits of acceptability depending on actual scope of the work, contractual obligations, detailed program data, etc.

We are prepared to meet with the City Commission to discuss our findings. Please feel free to contact me if you have any questions.

With Best Regards,

GBKB Associates

John Weting, AIA  
Regional Manager  
U.P. Region

JW/sds

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## ANALYSIS OF PROPOSED MARQUETTE PUBLIC WORKS FACILITY

GBKB has reviewed the documentation provided for adequacy and reasonableness in the following areas:

- Program - The definition of what is to be provided
- Construction Systems - The type of building construction
- Facility Longevity - The probable life span of the buildings
- Construction Cost - The proposed construction budgets
- Professional Fees - The projected professional fees

These areas were reviewed for both the proposed new facility and a rehabilitated Wright Street facility; primary concentration was the proposed new facility. Readers of this report should remember that any review was limited in scope. With respect to any prior phases of this project, the reviewer did not have review information such as a detailed written program, program interviews, budget discussions, contracts and contract negotiations.

### PROGRAM

#### Proposed New Facility

The program as proposed for this facility appears reasonable for the size of the city, the equipment listed to be housed/maintained/stored, and the proposed location of the new facility. It would appear reasonable to provide as much covered storage as possible within the project both to reduce maintenance requirements for equipment and to reduce negative visual impact on the surroundings of this highly visible site. Because the site is lower than the highway, screening of the storage yard will be visually ineffective except where it can be accomplished by the actual building mass.

Outside storage of loose material on this site and handling of materials such as fuels, calcium chloride and sand should be designed with ample consideration of present and future environmental protection regulations due to the presence of Whetstone Brook. All such areas should be designed to provide containment in case of leaks or spillage.

The construction of McClellan Avenue eliminates much of the unnecessary truck traffic along the residential portion of Baraga Avenue which would have required increased street maintenance and/or improvement which was not programmed initially as a cost for this project location. Elimination of the need for truck traffic along Baraga should also increase acceptance of the proposed site by the neighbors.

#### Rehabilitated Facility

The program for the rehabilitated facility seems less definite, possibly due to the extent of the existing buildings on the site. It does not appear that a renovated building as described in the reports reviewed could meet all of the functional needs of the the city as set forth in the program for the new facility.



## **CONSTRUCTION SYSTEMS**

### Proposed New Facility

The recommended construction system for the new facility of precast wall panels with steel truss roof system is an efficient, fire resistant system with the added advantages of good aesthetic appearance and low maintenance. Precast panels can incorporate insulation between concrete shells for energy efficiency, although it is not clear whether this is intended. We would recommend that the insulation be part of the wall system for reasons of insulation protection, cost effectiveness and long life.

This system should be protected against vehicular damage through proper site design and layout and by providing substantial protective devices (guard posts, wheel guards, curbs, etc.) at all interfaces between building and vehicles.

The mechanical system proposed seems to be a combination of hydronic heated slabs and ventilation as required by usage. This would certainly provide a comfortable working environment the majority of the time and should adequately protect the air quality of the complex. We suspect that the heated slab system will not respond quickly enough to repeated opening and closing of overhead doors in the maintenance areas, due to the thermal mass of the system and would recommend that this be carefully investigated. The effectiveness of the system in melting snow and ice off of vehicles brought in for short term maintenance should also be considered. It is admittedly unlikely that this facility would be changed to a substantially different use at some time in the future, however, if that occurred the use of a heating system embedded in concrete severely limits future flexibility. A final concern for this type of heating system would be the tendency of maintenance facilities to bolt new equipment to the floor. Special care would have to be taken to identify piping areas and to prevent floor penetrations in the piping areas.

The electrical systems as proposed are reasonable for this type of facility. An emergency generator (or a connection point for connection of an existing truck or trailer mounted generator set) may be necessary if this facility would be expected to function during a period of extended power outages (major ice storm, catastrophic accident, etc.)

### Rehabilitated Facility

Details on how a rehabilitated structure would be constructed are not as well defined as those for the new facility, however it would be logical to assume that any additions would not be constructed much differently than the buildings they are attached to. This would result in a complex which could be provided at a lower initial cost but which will almost certainly have a higher ownership cost to the city. Depending upon the amount of investment in the existing buildings, the resulting complex would probably require additional major repair/replacement costs far short of the projected 35 year effective life.



#### CONSTRUCTION SYSTEMS (Cont.)

We also see some potential problems in performing the rehabilitation/additions work due to congestion of the site and lack of identified alternate areas for the public works department to function in during the construction period. A typical rehab project has an advantage over new construction because much of the work can be done in bad weather. However in this case the public works department has some of its heaviest work load during the same period, so an alternate site is an absolute must.



## **FACILITY LONGEVITY**

### Proposed New Facility

A new facility of the proposed concrete and steel construction, if properly maintained, should serve the City for a minimum of 50 - 75 years. In addition to the longevity of the structure, the proposed site affords an excellent potential for expansion in the future if needed.

### Rehabilitated Facility

The rehabilitated facility has a projected longevity at this time of approximately 10 - 15 years with an ever increasing amount of annual maintenance. With the proposed additional work at the existing site, the site would be at or near its maximum spatial utilization. There would be no appreciable space for site expansion without acquisition of additional properties.



## CONSTRUCTION COSTS

### Proposed New Facility

An analysis of construction costs is limited, in the scope of this report, to looking at the costs proposed and applying a test of "reasonableness". This analysis is somewhat limited by the use of two separate square footage figures in this report, 88,000 square feet and 93,776 square feet. Overall costs seem to use the lower figure, costs for specific areas use the higher figure. Our own calculated areas using the drawings (only date shown is January 15, 1986) provided are 94,460 square feet plus an uncalculated area of mezzanine and basement.

Site development costs of \$630,000 are identified in the reports reviewed. This cost appears reasonable based on the information shown on the January 15, 1986 site plan reviewed. We would expect the 1988 cost to be \$664,000. There is no indication of whether or not this figure includes costs for removing subsurface obstructions which we understand exist at this site. (Depending upon the extent of the obstructions, costs for removing the obstructions and replacing with engineered fill could run from \$20,000 to \$100,000--or more.)

According to R. S. Means Company the median cost per square foot for a Municipal Maintenance Facility of this type in 1988 is \$47.25. Median costs for a warehouse facility range from \$19.10 per square foot for unheated space to \$26.40 for heated space. Shop/warehouse space will cost \$33.35 as a median and office and support space should cost about \$55.00 per square foot as a median cost. Factoring these costs together translates to a composite median cost per square foot of \$35.00. The building system proposed is slightly better than what we would expect for a median building which would add about 15% to the cost for a total cost of 40.25 per square foot.

The building cost of \$39.47 per square foot calculated in 1985 would be \$41.50 updated to 1988 and compares favorably with current national costs. The overall cost for this building would therefore range from \$3,652,000 (for 88,000 square feet) to \$3,896,310 (for 94,456 square feet) plus the cost of any basement or mezzanine areas. This compares to a cost of \$3,486,900 shown in the August 12, 1985 report which we used for comparison.

Costs used for the upgrading of the existing plant on Wright Street appear to be valid and need only to be upgraded from the date of the original report. Construction costs for rehabilitating and adding to the existing facility should be increased approximately 7%.



### PROFESSIONAL FEES

The other area reviewed for cost was professional fees. The total professional fee indicated for this project is \$262,930 and is composed of the following:

Architectural & Engineering design fees	\$214,930
<u>On site construction administration</u>	<u>\$48,000</u>
Sub-total for A&E fees	\$252,930
<u>Assumed legal and other costs</u>	<u>\$10,000</u>
Total professional fees	\$262,930

The total design and construction administration fee for this project would be approximately \$252,930 or 6.144%. Based on R.S. Means, Guidelines (a professional trade organization) and our own fee structure, the professional fee for a project of this type and size should range from 5.25% to 6.125% depending on the level of professional services contracted for. Depending on the level of professional services contracted for, an A&E fee of 6.144% is marginally in excess of the 6.125% upper limit of the fee range. This difference could be explained by scope of services contracted for, overhead expenses, etc. According to the AIA guidelines this fee would normally be divided as follows:

Schematic Design	15%	\$37,940
Design Development	20%	\$50,586
Construction Documents	40%	\$101,172
Bidding	5%	\$12,646
<u>Construction Administration</u>	<u>20%</u>	<u>\$50,586</u>
TOTAL A&E FEES		\$252,930

Assuming a percentage fee increase to 1988 values similar to the percentage increase for building costs, we would anticipate a total professional design and construction administration fee of approximately \$266,240.

The services of a construction manager may provide a possible construction cost savings. The Upper Peninsula is fortunate to have a strong core of qualified and competent general contractors. The result of this resource is reflected in the close competitive bids on construction projects and may minimize the effectiveness of a construction manager. With the services of a construction manager, it may be possible for the City to recognize a savings of approximately 10% of the construction cost. However, to maximize these savings, the services of the construction manager would have to be included as a part of the project team starting with the design phase. If the construction manager is brought in at the time of bidding and negotiation, we would anticipate a potential cost savings of no more than 5% of the construction cost. Construction management also has the added potential, on larger projects, of utilizing a larger portion of local construction labor.



## SUMMARY

A critical analysis of potential operating savings is beyond the scope of this report. Based on the information provided and the assumptions given, the potential savings projected do not appear unreasonable. We understand that some of the work suggested at the existing facility has been accomplished, such as consolidation of satellite facilities onto a single site, construction of a 9,800 sq ft pole barn, patching and painting of the existing main building, and structural repair of other buildings on site. Additionally, some operational procedures have changed reducing total vehicle miles and associated maintenance. These changes and expenditures would have the effect of reducing projected savings, at least initially. The necessity of making these expenditures points out the need for resolving the long term direction for the public works facility as soon as possible.

After reviewing the documentation provided, we believe that the project as proposed can meet the needs of the city. There are areas where reduction can be considered, including the amount of inside storage and space for the relocation of the engineering department, however these areas have tradeoffs in terms of increased maintenance costs, visual blight in an important area of the city, and potential for theft and vandalism.

The costs used for projecting construction cost are in line with cost expected for the type of building proposed. These costs could be reduced through a less expensive type of construction, however we question the wisdom of doing so. A public entity has no way of accounting for costs of replacement through depreciation in the manner that a private for profit entity would and must therefore consider capital improvements on a life cycle cost basis. We believe that the life cycle cost analysis performed is in line with what we would expect, given the assumptions stated by the city's consultant.