



Agenda Item Executive Summary

Title: Willow Road STADI Project: Independent Engineer's Cost Estimate Review

Presenter: Steven M. Saunders, Director of Public Works/Village Engineer

Agenda Date: 09/01/2015

Consent: YES NO

Ordinance
 Resolution
 Bid Authorization/Award
 Policy Direction
 Informational Only

Item History:

On April 28, 2015, and again on May 12, 2015, the Village Council discussed Review Point #2 for the Willow Road Stormwater Tunnel and Area Drainage Improvements (STADI) project. The Council reviewed the design process undertaken over the last nine months, including updated cost estimates. The original 2011/2012 cost estimate for the STADI project of \$34.6 million was based on conceptual design, broad field data, and typical unit construction costs. MWH incorporated additional information about quantities of materials, site-specific considerations, as well as utility and field data, resulting in a current estimate of \$58.5 million. Due to the significant increase in estimated cost, the Council authorized an independent, third-party engineering review of the project, focusing on two project aspects: 1) the accuracy and reliability of the cost estimates and 2) whether there are other more cost effective ways to design and implement the project. V3 Companies (V3), teaming with tunneling expert Hatch Mott MacDonald (HMM), was contracted in June to complete an independent cost estimate and cost review, and to conduct a value engineering review of the project.

Executive Summary:

Using all available project data to date, V3/HMM developed construction cost estimates, taking into account things such as crew sizes; labor and production rates; material prices; trucking costs; soil disposal costs; and a host of other factors, to develop unit prices for the major work items. General conditions – items such as mobilization, traffic control, overhead, contractor bonds, etc. – were calculated as a percent of hard construction costs. All of these detailed estimates were then “rolled up” to identify subtotals for construction of major sections of the project. A project contingency, necessary at this stage of the project, was also included.

V3/HMM have provided a construction cost estimate, including contingencies, of \$73,789,460. In addition to construction cost, other project costs such as engineering, permitting, and construction management must be included, in order for the estimate to be comparable with prior estimates for the project. When these additional project costs are included, the total estimated project cost is \$81,297,222. This estimate compares unfavorably with the prior estimates provided by Christopher Burke Engineering (\$34.6 million in 2012 dollars) and MWH (\$58.5 million in 2015 dollars). Clearly, the information contained in the independent cost estimate is troubling. The estimated project cost of \$81,297,222 is 39% higher than the recent MWH estimate and more than double the original 2012 Christopher Burke estimate. There are several questions that should be addressed and resolved by the Village Council as the Village continues to work toward providing significant structural flood relief to affected areas:

1. Should V3/HMM and MWH be engaged to reconcile the two recent cost estimates into a single, final, composite cost estimate, at a cost of \$10,000 to \$15,000? Staff recommends this if there is a desire to identify one single “best answer” to the estimated project cost, as the STADI project is currently conceived.
2. Should the Village direct V3/HMM to proceed with the contracted value engineering work, at a cost of \$88,296? Staff does not recommend proceeding with this work at this time.
3. Should the Village direct MWH to continue working toward permit submittal, or should that work be paused to allow for evaluation of other alternative projects?
4. Should the Village direct MWH to proceed with additional water quality work? Staff recommends that if the Village proceeds with submitting permit applications to the Illinois EPA, the Village should confer with the IEPA after initial review to determine what, if any, additional water quality monitoring will be required in support of the application.

The following Agenda Report addresses these questions in detail, and provides guidance and recommendations on possible next steps.

Recommendation:

Review the attached Independent Cost Review of the Willow Road STADI Project and provide policy direction on possible next steps:

Attachments:

Agenda Report
Independent Cost Estimate
Project Technical Review

Agenda Report

Subject: Willow Road STADI Project: Independent Cost Estimate Review

Prepared By: Steven M. Saunders, Director of Public Works/Village Engineer

Date: August 26, 2015

Background

On April 28, 2015, and again on May 12, 2015, the Village Council discussed Review Point #2 for the Willow Road Stormwater Tunnel and Area Drainage Improvements (STADI) project prepared by MWH, the Village's consulting engineering firm. The Council reviewed the design process undertaken over the last nine months, including updated cost estimates. The original 2011/2012 cost estimate for the STADI project of \$34.6 million was based on conceptual design, broad field data, and typical unit construction costs. MWH incorporated additional information about quantities of materials, site-specific considerations, as well as utility and field data, resulting in a current estimate of \$58.5 million.

Due to the significant increase in estimated cost, the Council authorized an independent, third-party engineering review of the project, focusing on two project aspects: 1) the accuracy and reliability of the cost estimates and 2) whether there are other more cost effective ways to design and implement the project. V3 Companies (V3), teaming with tunneling expert Hatch Mott MacDonald (HMM), was contracted in June to complete an independent cost estimate and cost review, and to conduct a value engineering review of the project. The review will provide the community with additional cost information, to inform future decision-making on the project. The value engineering process will creatively evaluate the STADI project and identify potential changes to the project that might better accomplish the desired level of structural flood risk-reduction at a lower capital cost, while providing better overall value and confidence in the effectiveness of the design. The Village's contract with V3 is structured so that the design and cost review are to be conducted first, and the value engineering work is to be conducted subsequently, if authorized by the Village Council.

Independent Opinion of Probable Cost

V3/HMM were provided with a vast amount of project data, beginning with initial drainage studies and conceptual project designs and estimates prepared by Christopher Burke Engineering, as well as detailed surveys, computer modeling, plans, designs, and estimates prepared by MWH. V3/HMM were selected based on their expertise, but also based on their "bottom up" approach to cost estimating for large storm sewer and tunneling projects. Under this approach, the project is structured in the same manner a

contractor would approach bidding, using the set of plans and project documents as they have been developed to date. Construction costs for non-tunneled storm sewer construction were developed by taking into account things such as crew sizes; labor and production rates; material prices; trucking costs; soil disposal costs; and a host of other factors, to develop unit prices for the major work items. General conditions – items such as mobilization, traffic control, overhead, contractor bonds, etc. – were calculated as a percent of hard construction costs.

Construction costs for tunneled sections of storm sewer were developed by HMM using a proprietary database of their prior tunneling projects, also using a “bottom up” approach. Project estimates were developed for major divisions of work, such as access shafts; mining shafts; tunnel liner; outfall structure; etc. The estimates were calculated using anticipated crew size; equipment rates; anticipated productivity rates; soil removal costs; material costs; etc.

All of these detailed section estimates – both tunneled and non-tunneled – were then “rolled up” to identify subtotals for construction of major sections of the project.

A final cost item, a project contingency, was also included. The contingency is necessary at this stage of the project, because while significant design work has been done, the project is still only at approximately the 30% design stage and there are still design details to be developed and refined. The contingency recognizes that some items that will affect ultimate construction costs cannot be satisfactorily quantified as unit prices at this time, and that some unknown items may also affect construction costs. For example, soil borings have indicated that the soil expected along the tunnel alignment is predominantly stiff clay, excellent for tunneling, but that there is a sand and gravel layer at the east end of the tunnel alignment that requires some further exploration. If this ground is problematic, it could result in increased construction costs, which are accounted for in the project contingency.

V3/HMM have provided a construction cost estimate, including contingencies, of \$73,789,460 (see **Attachment #1**). It should be noted that at this stage of design, contingencies are significant, ranging from 10% of hard construction costs on open-cut storm sewer work to 30% of hard construction costs on tunneling work. The total contingency at this time is approximately \$15.4 million, which accounts for just under 21% of the total construction cost.

The table on the following page shows the estimated construction cost, side by side with the MWH estimate presented earlier this year:

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

VILLAGE OF WINNETKA, ILLINOIS WILLOW ROAD STADI PROJECT - COST SUMMARY				
		MWH 2015 30% PDR EOPCC	JUNE 2015 INDEPENDENT OPCC	CHANGE
TUNNEL				
1.00	WILLOW ROAD TUNNEL & APPURTENANCES	\$ 28,194,980.00	\$ 37,297,460.00	\$ 9,102,480.00
SITE WORK				
2.00	WOODLAND AVENUE - STA 200+00 to 227+13	\$ 2,809,330.00	\$ 3,879,000.00	\$ 1,069,670.00
3.00	OAK STREET - STA 300+60 to 303+74	\$ 329,190.00	\$ 329,000.00	\$ (190.00)
4.00	POPLAR STREET - STA 311+08 to 323+62	\$ 1,491,500.00	\$ 1,555,000.00	\$ 63,500.00
5.00	ASH STREET - STA 340+70 to 319+72	\$ 458,340.00	\$ 404,000.00	\$ (54,340.00)
6.00	BIRCH STREET - STA 400+91 to 422+90	\$ 2,865,290.00	\$ 3,709,000.00	\$ 843,710.00
7.00	WESTMOORE ROAD - STA 500+76 to 503+10	\$ 233,630.00	\$ 337,000.00	\$ 103,370.00
8.00	LOCUST STREET - STA 510+49 to 549+45	\$ 3,461,820.00	\$ 4,755,000.00	\$ 1,293,180.00
9.00	WINNETKA ROAD - STA 231+60 to 237+50	\$ 713,650.00	\$ 636,000.00	\$ (77,650.00)
10.00	BERKELEY AVENUE - STA 601+00 to 613+00	\$ 3,454,790.00	\$ 2,811,000.00	\$ (643,790.00)
11.00	ASH STREET - STA 620+50 to 627+29	\$ 580,830.00	\$ 851,000.00	\$ 270,170.00
12.00	PINE STREET - STA 700+72 to 703+33	\$ 362,380.00	\$ 502,000.00	\$ 139,620.00
13.00	HIBBARD ROAD - STA 710+30 to 712+55	\$ 1,080,960.00	\$ 1,318,000.00	\$ 237,040.00
	SUBTOTAL SITEWORK	\$ 17,841,710.00	\$ 21,086,000.00	\$ 3,244,290.00
14.00	SITE WORK CONTINGENCY (20% - 20%)	\$ 3,568,000.00	\$ 4,217,000.00	\$ 649,000.00
15.00	TUNNEL CONTINGENCY (10% - 30%)	\$ 2,819,000.00	\$ 11,189,000.00	\$ 8,370,000.00
	TOTAL	\$ 52,423,690.00	\$ 73,789,460.00	\$ 21,365,770.00

In addition to construction cost, other project costs such as engineering, permitting, and construction management must be included, in order for the estimate to be comparable with prior estimates for the project. When these additional project costs are included, the total estimated project cost is \$81,297,222.

	MWH	V3/HMM
	April 2015 Estimate	August 2015 Estimate
Total Estimated Construction Cost	\$ 52,423,690	\$ 73,789,460
Design Engineering (MWH Contract Amount +10%)	\$ 2,305,000	\$ 2,305,000
Construction Engineering (4.5% of Construction Cost)	\$ 2,359,066	\$ 3,320,526
Permitting (1.0% of Constuction Cost)	\$ 524,237	\$ 737,895
Feasibility Study (Complete)	\$ 37,500	\$ 37,500
Project Management (1.5% of Construction Cost)	\$ 786,355	\$ 1,106,842
Subtotal Additional Project Costs	\$ 6,012,158	\$ 7,507,762
TOTAL ESTIMATED PROJECT COST	\$ 58,435,848	\$ 81,297,222

Comparison with Previous Cost Estimate

This estimate compares unfavorably with the prior estimates provided by Christopher Burke Engineering (\$34.6 million in 2012 dollars) and MWH (\$58.5 million in 2015 dollars). There are two areas where the two cost estimates diverge significantly. First, HMM's estimate of direct construction cost for the tunnel and appurtenances (i.e. shafts and outlet structure) is \$9.1 million (32.3%) higher than the April 2015 MWH estimate for this work. The primary factor for this difference is that HMM has based their

estimates on a sustained tunnel production rate of 32 feet per day, while MWH based their estimate on a higher sustained production rate. Because tunneling is labor- and equipment-intensive, production rates have a significant impact upon construction costs.

Second, HMM has included in their estimate a 30% contingency on the tunnel portion of the project. MWH was previously carrying a 10% contingency on this portion of the work, and the resulting difference between the two contingency estimates is nearly \$8.4 million. While some of this difference is due to the higher construction cost estimate, \$7.4 million of this difference is attributable to the higher percentage used to calculate the contingency. Staff has had several conversations with V3/HMM about the appropriateness of a 30% contingency at this time, and they firmly believe that it is appropriate to carry 30% on the tunnel work given the current state of the design work and detail on the project. Further, there are some specific items that HMM believes may affect the cost, but are not fully detailed at this stage of engineering. For example, no additional direct cost was included to manage the gravel/sand layer at the downstream end of the tunnel alignment. If this ground condition proves problematic, it could add considerable cost to the project. In addition, the design for the outfall structure indicates that the construction work will be supported with walers and steel sheeting. No cost has been included for the possibility of needing tie-backs, non-vibratory installation methods, or slope stabilization. HMM believes that items such as these warrant a higher contingency, and that it is prudent to carry this contingency early in the project to avoid unanticipated costs as design progresses.

Finally, there are differences in the various sections of open-cut storm sewer installation for the project. V3's estimate for some portions was lower than MWH's estimate, but it was higher for other portions. In aggregate, V3's estimate for the open cut storm sewer work is about \$3.2 million (18%) higher than MWH's estimate for this corresponding work.

Possible Next Steps and Recommendations

Clearly, the information contained in the independent cost estimate is troubling. The estimated project cost of \$81,297,222 is 39% higher than the recent MWH estimate and more than double the original 2012 Christopher Burke estimate. There are several questions that should be addressed and resolved by the Village Council at this time.

First, it should be noted that just as there are differences between contractor bid numbers on the open market – and sometimes bid spreads can be quite large – there are different assumptions and calculations between engineering firms when project estimates are developed. For example, the tunneling productivity rate calculated by V3/HMM is significantly slower than the productivity rate day used by MWH, but MWH used a different crew composition, with more workers. These differences affect tunnel costs. One step that may be of value to the Village is to complete an estimate reconciliation, where V3/HMM and MWH discuss the differences in their estimates. It may be that in some cases, MWH's approach and assumptions prove to be more reasonable, while in other cases, V3/HMM's approach proves better. This step has not yet been taken, in order

to preserve the independence of the estimates, but it could provide more cost certainty between the two estimates. However, it should be noted that this approach would, of necessity, result in an additional number somewhere between the two most recent estimates. V3/HMM have estimated that this effort could be completed in September, and the Village Council should determine whether this additional step should be undertaken at this time.

In addition, the Village has also contracted with V3/HMM to complete a value engineering process to creatively evaluate the STADI project and identify potential changes to the project that might better accomplish the desired level of structural flood risk-reduction at a lower capital cost, while providing better overall value and confidence in the effectiveness of the design. This value engineering work, which requires prior Council authorization, would require the expenditure of an additional \$88,296 to complete. Staff does not recommend advancing the value engineering work at this time, because it is unlikely that sufficient savings will be found to make the project financially viable. For example, even if the value engineering effort produced savings of 20% of the \$81.3 million estimated project cost, the cost estimate would still be approximately \$64 million.

Of more immediate concern to the Village should be the status of current and upcoming work on the STADI project. The Village has directed MWH to complete and submit draft permit applications for the project (total cost \$110,000, of which about \$18,500 has been expended to date, leaving about \$91,500 to be expended), and is contemplating collecting additional stormwater quality monitoring information in support of this application (additional cost approximately \$100,000). The thought behind directing MWH to proceed with the permit application, while the Village simultaneously undertook cost estimating and value engineering, is that the permitting process is anticipated to be lengthy, perhaps 12 to 18 months, and starting that process as soon as possible is advantageous. With the V3/HMM estimate complete, and substantially higher than previous estimates, the Council should seriously consider whether to continue with the permitting process, and whether to collect additional permit-related water quality data now, or to pause that effort.

If the Council believes that the STADI project is still viable at this time, it is reasonable to continue with permit applications given the length of time to transit the approval process. However, this process will require significant resources, and will involve multiple public comment periods and review iterations. Staff has preliminarily met with several stakeholder groups devoted to protecting the Great Lakes, including the National Resources Defense Council, the Alliance for the Great Lakes, and Openlands. Each of these groups, while sympathetic to the Village's situation, also expressed concerns and opposition towards the project. This will further complicate the permit process, so that if the Council is not convinced that the STADI project is viable as it stands, serious consideration should be given to pausing that work while other alternatives are investigated and developed.

The Village has published and received responses to a Request for Proposals (RFP) seeking a re-evaluation/development of alternative, non-STADI stormwater relief solutions for western and southwestern Winnetka areas that would be served by the proposed STADI project. Staff anticipates that the Village Council could consider contracting for this work later in September, and that alternative approaches could be available for discussion by early 2016. Given the significant cost increases associated with the STADI project estimates, and the planned discussion and evaluation of non-STADI alternatives in early 2016, the Village Council should consider postponing the next steps of value engineering, additional water quality monitoring, and permit submittal on the STADI project, with an attendant additional investment of up to \$280,000, at this time. Depending upon the results of the alternative analysis, the Council can then consider whether to continue further with the STADI project, or develop and implement whatever other alternative flood risk reduction projects are identified.

Project Technical Review

Finally, V3/HMM also conducted a detailed technical review of the project and has determined that, in general, the technical project engineering to date is sound. They have, however, identified some areas of the project that require further detail, analysis, and development, which is appropriate given the current 30% project engineering level. Among these items to be detailed further are:

- Additional hydrodynamic modelling of the tunnel and outfall structure may be necessary to assure that there will not be significant venting or other velocity effects at drop shafts and the outlet structure as a result of rapid and significant flow variation resulting from heavy and rapid rain events.
- It may be beneficial to perform additional evaluation of the hydrologic model runoff calculations to determine the sensitivity of the model to input curve numbers.
- Further attention should be given to detailed design of access and connection shafts to determine the most advantageous shaft size
- Further investigation should be made to determine the exact soil conditions at the easternmost end of the tunnel alignment, as these conditions could have significant impacts upon design and cost of the outlet structure.
- Consideration should be given to working multiple shifts per day on the tunnel operation, to potentially reduce the duration and cost of the tunneling portion of the project.

V3/HMM's Project Technical Review memorandum is shown in **Attachment #2**.

Recommendation:

Review the attached Independent Cost Review of the Willow Road STADI Project and provide policy direction on possible next steps:

1. Should V3/HMM and MWH be engaged to reconcile the two recent cost estimates into a single, final, composite cost estimate, at a cost of \$10,000 to \$15,000? Staff

recommends this if there is a desire to identify one single “best answer” to the estimated project cost, as the STADI project is currently conceived.

2. Should the Village direct V3/HMM to proceed with the contracted value engineering work, at a cost of \$88,296? Staff does not recommend proceeding with this work at this time.
3. Should the Village direct MWH to continue working toward permit submittal, or should that work be paused to allow for evaluation of other alternative projects?
4. Should the Village direct MWH to proceed with additional water quality work? Staff recommends that if the Village proceeds with submitting permit applications to the Illinois EPA, the Village should confer with the IEPA after initial review to determine what, if any, additional water quality monitoring will be required in support of the application.

Attachments:

1. Independent Cost Estimate
2. Project Technical Review

ATTACHMENT #1
Independent Cost Estimate



August 24, 2015

Mr. Steven M. Saunders
Director of Public Works
Village of Winnetka
1390 Willow Road
Winnetka, IL 60093

Regarding: **Independent Cost Review of Willow Road STADI
Village of Winnetka, IL**

Dear Mr. Saunders:

V3 Companies of Illinois Ltd. (V3) has completed an Independent Cost Review of the Willow Road Stormwater Tunnel and Area Drainage Improvement (STADI) project. This task is the first phase of evaluation of the Willow Road STADI project and involved a professional contractor cost evaluation of the 30% Preliminary Design Plans and 30% Preliminary Design Report completed by MWH. V3 professional construction estimators completed the Stormwater Improvements aspects of this project and Hatch Mott MacDonald (HMM) tunneling experts completed the Tunneling aspects of the project. The following information is provided to the Village of Winnetka as a comparison of the MWH cost estimate for the Willow Road STADI project.

Purpose of the Independent Cost Review

The Village of Winnetka engaged the V3 Team to perform an independent cost review of the Willow Road STADI project to confirm or adjust the \$52,424,534 construction cost estimate that was provided by MWH for the Willow Road STADI project. The V3 Team includes professional cost estimators at V3 Companies who prepare contractor bids in excess of \$100 Million dollars annually for utility and earthwork projects throughout the Chicagoland area. In addition, HMM has developed TED (Tunnel Estimating Database), which is a tunnel and shaft construction cost estimating system that is unique to HMM. TED has an excellent track record of producing estimates close to the winning bid on many projects. To-date, TED has been used to produce over 500 estimates and in cases where the system has been subjected to 'real life' testing where bids are compared with an Engineer's estimate undertaken in advance, the results have been quite impressive with a remarkable track record of construction cost estimates that are typically within 4 percent of the actual low bid. Through this independent cost review, the Village desires to obtain further direction on the design and implementation of a cost effective stormwater solution for flood mitigation.

Scope of the Independent Cost Review

The V3 Team received numerous documents from the Village of Winnetka to utilize in the independent cost review. The primary information that informed this cost evaluation were the following: 1) Willow Road STADI Cost and Alternative Evaluation dated March 19, 2015, 2) Willow Road STADI Opinion of Probable Construction Costs Technical Memorandum dated April 1, 2015, 3) Preliminary Design Drawings by MWH dated April 2015 and the Willow Road Stormwater Tunnel, and 4) Area Drainage Improvements Preliminary Design Report dated April 22, 2015.

Additional documentation was utilized to confirm design decisions and project constraints and evaluate potential cost variations that may occur due to unforeseen or unknown conditions. These clarifications for the independent cost review are detailed below.

Summary of Cost Assumptions or Pricing Constraints

Given that this project is at a Preliminary Design stage (estimated to be 30% complete), a number of design and construction decisions must be further evaluated. The following assumptions and pricing constraints have been included in the V3 Team's independent cost review.

- Property or easement acquisition is not included in this construction estimate.
- Costs for engineering, permit fees or construction management is not included in this construction estimate.

Significant Stormwater Cost Variances

The V3 stormwater improvements portion of the estimate varied from the MWH estimate by approximately \$3.2M. The following items are likely drivers of this additional cost of the project.

- Pipe installation will be slower than average due to very narrow roadway and the need to provide local access to residents. This construction restriction would cause a 10% increase in cost due to longer installation time.
- Very few CCDD disposal facilities in the Winnetka area. Earth Inc., and B&B are currently running disposal operations within a 1.5HR Round of the site but we do not anticipate that this will be long term option. CCDD disposal pricing includes a 2.50 HR Semi round at \$115.00 / HOUR and a \$75 Tip Fee with 15% mark-up.
- MWH included a \$1,587,660 line item for Utility Relocation Cost. V3 believes this is a low estimate and we have included a 20% contingency on the Stormwater Improvements which should cover costs for dry utility relocation (gas, electric, telephone, fiber).

Significant Tunnel Variances

The HMM tunnel portion of the estimate varied from the MWH estimate by approximately \$17M. This is essentially summarized in the 3 main line items below:

Item	Cost Delta Between Estimates
96" Diameter Tunnel	\$6.8M
96" Diameter Pipe	\$5.0M
Contingency	\$8.4M

Below are possible items that resulted in the cost deltas between the two estimates:

- **96" Diameter Tunnel.** This item includes excavation of the tunnel and installation of the initial support, including ancillary costs like procurement of the TBM and hauling of spoils. We have not seen the details of the MWH bottom-up estimate, so it is difficult to ascertain the exact discrepancies. However based on the PDR, it appears that we have assumed a less aggressive TBM advance rate (32 ft/shift compared to 50-80 ft/shift per

PDR 3.1.9). This lower rate is based on our historical records/past experience tempered with other factors that we believe will contribute to a lower advance rate for this project such as single-shift mining, potential for boulders and mixed face soil, high traffic and difficulty with muck handling/transport etc.

The TBM advance rate is one of the single largest assumptions from a cost perspective that goes into a tunneling estimate because each additional day of mining requires the full labor crew and extension of services/equipment – for labor alone, we have calculated a cost of \$11,600/day (excluding overhead and profit markups). The duration difference between 32 and 80 ft/day is an additional 159 days of tunneling when using the slower production rate. While a 60 to 80 ft/day sustained average advance rate may be achievable, in our experience this would require 2 working shifts per day, and the project constraints dictate that only a single shift can be operated. Note also that we assumed a larger TBM diameter (as discussed in our design review memo, comment 8), which will have a ripple effect on the tunneling costs between TBM, excavation/hauling volumes, and tonnage of steel support to name a few.

- **96” Diameter Pipe.** This item includes furnishing and installation of the precast reinforced concrete pipe, including backfill grouting of the annulus in the tunnel around the pipe. The MWH estimate calculated an installed pipe price of \$750/ft compared to the HMM-calculated installed price of \$1,331/ft. This assumes a pipe price of \$811.20 obtained from a supplier in Michigan. V3 contacted Concrete Specialties from Romeoville, IL to provide another cost data point. Their list price is a pipe cost of \$700/ft, so it would appear that the MWH installed price is just the product pipe and does not take into account the pipe installation.

The RCP price used in the HMM estimate was \$111/ft more than the Concrete Specialties price. However, the pipe has not been designed yet. If the hydrostatic head is too much to resist with a standard joint at **tunnel** depth, the RCP may have to switch over to a more robust joint. So, we assumed a higher-rated joint at this early stage in design. Assuming that the pipe priced by Concrete Specialties is indeed sufficient for the tunnel, this would reduce the HMM estimate by \$1.1M for the 8500-ft (after applying the 15% markup we used for GC profit).

- **Contingency.** The HMM estimate assumed a 30% contingency whereas the MWH estimate assumed 10%. Contingency can come in several different forms, such as risk, construction, and design contingency. With respect to design contingency, this is a function of the project definition because this will dictate the level of detail available to the estimator to incorporate into the estimate, and also will dictate the potential for design changes leading up to final design. Based on the Association for Advancement of Cost Engineering (AACE), a project at the 30% design phase would be advanced sufficiently for the preparation of a Class 3 or Class 4 estimate – the recommended contingency for these classes is between 10%-50%. There are also other industry-recognized methods for establishing contingency. The 1992 paper by Joe Sperry (attached) is another method we often reference. Using this method and the AACE guidelines, we selected 30% as the contingency, as is standard at HMM (and generally in the industry) for 30% design. Some items that we identified during our review of the documents that could contribute to higher costs (contingency) as the design advances are as follows:

- The tunnel alignment intersects a gravel layer east of Sheridan Road (review comment 5).
- Tunnel initial support system has not finalized (review comments 6, 9).
- The support system for the outfall has not yet been designed and will be challenging considering work adjacent and in Lake Michigan, and the stability of the slope (review comment 11).
- No structural design has been performed so shafts/structures were estimated using assumed concrete thicknesses and rebar based on our previous experience.
- Procurement packaging has not been finalized (review comment 20).
- The rail permit has not been issued so the requirements imposed by the rail owner are unknown (review comment 21).

Summary of Independent Cost Review

The following table provides a snapshot of the cost comparison between the MWH opinion of construction cost and the V3 Independent Cost Review. Additional detail is provided within the attachments to this document.

	MWH 2015 30% PDR EOPCC	JUNE 2015 INDEPENDENT OPCC
TUNNEL		
1.00 WILLOW ROAD TUNNEL & APPURTENANCES	\$28,194,980.00	\$37,297,460.00
SITE WORK		
2.00 WOODLAND AVENUE - STA 200+00 to 227+13	\$ 2,809,330.00	\$ 3,879,000.00
3.00 OAK STREET - STA 300+60 to 303+74	\$ 329,190.00	\$ 329,000.00
4.00 POPLAR STREET - STA 311+08 to 323+62	\$ 1,491,500.00	\$ 1,555,000.00
5.00 ASH STREET - STA 340+70 to 319+72	\$ 458,340.00	\$ 404,000.00
6.00 BIRCH STREET - STA 400+91 to 422+90	\$ 2,865,290.00	\$ 3,709,000.00
7.00 WESTMOORE ROAD - STA 500+76 to 503+10	\$ 233,630.00	\$ 337,000.00
8.00 LOCUST STREET - STA 510+49 to 549+45	\$ 3,461,820.00	\$ 4,755,000.00
9.00 WINNETKA ROAD - STA 231+60 to 237+50	\$ 713,650.00	\$ 636,000.00
10.00 BERKELEY AVENUE - STA 601+00 to 613+00	\$ 3,454,790.00	\$ 2,811,000.00
11.00 ASH STREET - STA 620+50 to 627+29	\$ 580,830.00	\$ 851,000.00
12.00 PINE STREET - STA 700+72 to 703+33	\$ 362,380.00	\$ 502,000.00
13.00 HIBBARD ROAD - STA 710+30 to 712+55	\$ 1,080,960.00	\$ 1,318,000.00
SUBTOTAL SITEWORK	\$17,841,710.00	\$21,086,000.00
14.00 SITE WORK CONTINGENCY (20% - 20%)	\$ 3,568,000.00	\$ 4,217,000.00
15.00 TUNNEL CONTINGENCY (10% - 30%)	\$ 2,819,000.00	\$11,189,000.00
TOTAL	\$52,423,690.00	\$73,789,460.00

Mr. Steven M. Saunders
Village of Winnetka
August 24, 2015
Page 5

We look forward to discussing this cost evaluation further, and the potential Value Engineering of the Willow Road STADI to identify cost effective solutions for flood mitigation. Please feel free to contact me at 630-729-6334 or gwolterstorff@v3co.com.

Sincerely,
V3 Companies of Illinois Ltd.

A handwritten signature in black ink, appearing to read 'G. Wolterstorff', with a long horizontal line extending to the right from the end of the signature.

Gregory V. Wolterstorff, P.E.
Vice President
Director of Natural Resources

Attachments: V3, Conceptual Opinion of Probable Construction Costs, Willow Road STADI
HMM, Basis of Estimate for Willow Road STADI Project



VILLAGE OF WINNETKA

BASIS OF ESTIMATE

FOR

WILLOW ROAD STADI PROJECT

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APPENDICES

- A. Opinion of Probable Construction Costs Summary (*detailed comparison to base estimate*)
- B. Estimate Backup

1. PURPOSE OF ESTIMATE

On January 21, 2014, the Village awarded a contract to MWH Americas, Inc. to provide engineering services for the proposed Willow Road Stormwater Tunnel and Area Drainage Improvements (STADI) project. When MWH’s contract was awarded, the project was at the conceptual design level and a significant amount of engineering was required to bring the project to the stage where construction contracts can be executed. MWH has completed the scope of work associated with preliminary design and the current construction cost estimate (base estimate) is significantly higher than the preliminary conceptual estimate of \$34.6M, (prepared in September 2012).

The Village desires to design and implement a cost-effective and feasible flood-risk reduction project for drainage areas susceptible to flooding, and has procured the team of V3 and Hatch Mott MacDonald (HMM) to provide an independent detailed review of the project cost estimate.

2. COST COMPARISON SUMMARY

The following table is a summary of the overall construction costs compared to the base estimate. See Appendices for more detailed cost breakdown and estimate backup calculation workbooks.

TABLE 1: SUMMARY OF COST ESTIMATES (\$M)			
Description	MWH Base Estimate	HMM	Difference
1 Mobilization	\$3.19	\$3.26	2%
2 Shafts	\$4.50	\$1.81	-60%
3 Tunnel	\$16.48	\$28.24	71%
4 Outfall Structure	\$4.03	\$3.99	-0.9%
5 Subtotal 1	\$28.19	\$37.30	32%
6 Contingency	\$2.82	\$11.19	297%
7 Total	\$31.0	\$48.5	56%

3. GENERAL SCOPE OF WORK & PROJECT DESCRIPTION

The Willow Road STADI Project is a relief storm sewer project intended to provide for the collection and conveyance of excess stormwater from flood-prone areas both east and west of Green Bay Road. During intense events when the capacity of the existing drainage systems is exceeded, the Willow Road STADI Project will serve as an effective outlet to capture and convey excess runoff to a new outfall on Lake Michigan, thereby reducing the risk of structural flooding within the project area.

While there are approximately 5 miles of sewer in total, covering 6 drainage areas, the HMM scope of the estimate included in this memorandum focus on the tunnel contract, envisioned to include the following:

1. **Tunnel:** Approximately 8,500 feet of 96-inch diameter relief sewer constructed as tunnel from Berkeley and Willow to Lake Michigan,
2. **Drop Shafts:** 5 connecting drop structures to connect branch sewers to Willow Tunnel, one of which will serve as the 30-ft excavated diameter mining shaft and the others will be 12-ft diameter drilled shafts.
3. **Outfall:** Structure to discharge flows from tunnel to Lake Michigan. The estimate includes cost for the outfall structure, but not costs for gates and appurtenances, or end-of-pipe treatment and associated structures.

4. ESTIMATE CLASSIFICATION

The cost estimate prepared is a Class 4 Estimate as defined by the Association for the Advancement of Cost Engineering (AACE).

The accuracy of an AACE Class 4 Estimate ranges from -30% to +50%, generally due to the level of project definition at this phase and the impact of the design details of quantity takeoffs and other pricing impacts.

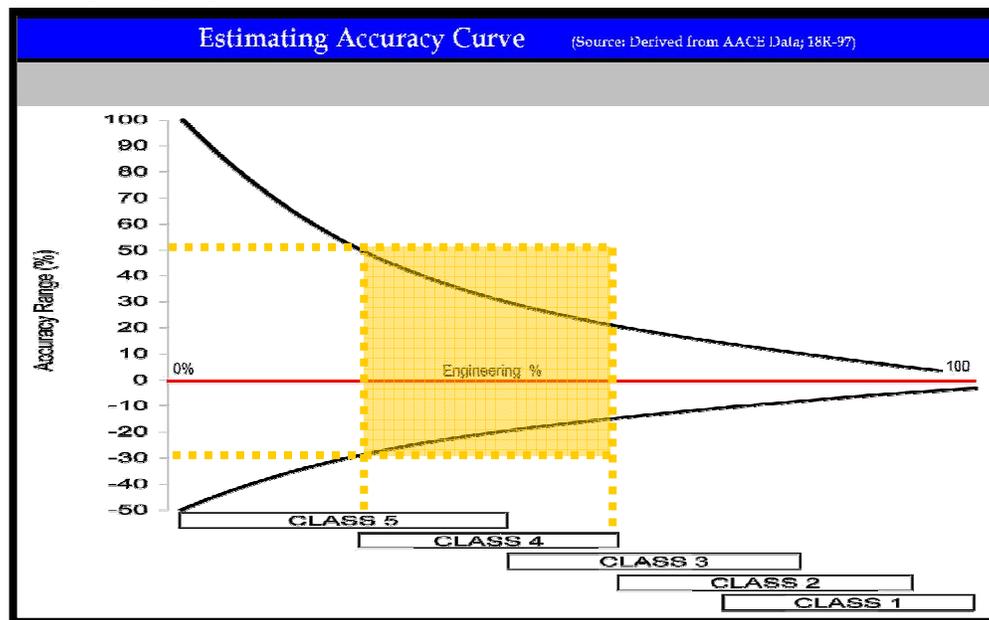


Figure 1: AACE Estimate Classes

5. ESTIMATE METHODOLOGY

The construction cost estimate was mostly developed using HMM's proprietary cost estimating software application known as TED (Tunnel Estimating Database). The database maintains records of advance rates, labor, equipment, and material requirements for particular sizes and types of tunnels. TED models various components of the tunnel construction process by applying appropriate local unit rates and adjustments for ground conditions.

The system is maintained by experienced tunneling engineers with knowledge of tunnel construction processes, equipment, and material requirements. In this way, each new estimate enhances the database of information, and provides the system with greater flexibility and accuracy for the production of future estimates. An important feature of our estimating approach is the ability to accurately gauge the difference between tunnels of different lengths, taking account of the fixed cost that is not affected by length, along with the incremental cost and efficiencies associated with adding length to the tunnel.

Tunnel Work was estimated with TED to create a detailed, bottom-up type estimate based on labor crew size, production rates, and materials/equipment prices – the output is the direct cost to the contractor with appropriate markups (as discussed in the next section) applied to this direct cost.

For site work and the Outfall Structure, assumptions were made on the level of effort and design details (e.g. support system for Outfall excavation), and a combination of bottom-up estimating and unit costs (comprising labor, materials and equipment) were used for these activities.

6. MARKUPS

Included in the estimate are the following markups:

TABLE 2: MARKUPS TO DIRECT COSTS		
Item	Value	Comment
Profit	15%	Based on industry averages for tunnel construction.
Overhead	\$2.9M	Indirect costs calculated based on typical resources required throughout the assumed 2-yr duration. These include items such as supervision, survey, vehicles, quality assurance, safety, site office expenses, ablutions.
Contingency	30%	Applied to the aggregate of direct costs plus all other markups. This percentage is considered appropriate for the 30% design level and falls within the expected accuracy range of AACE Class 4 estimate.
Escalation	0%	To match the base estimate, costs are in January 2015 \$USD. No escalation was applied to the estimate. It is assumed that the cost estimate will be refined as the project advances, and these future estimates will bring the costs into present value dollars.
Sales Tax	0%	This project is assumed to be sales tax exempt.
Owner Allowance	0%	N/A
Insurance & Bonding	3%	Typically 2% for insurance and 1% for bonding.

7. COST RESOURCES

Cost data was obtained from the following resources and utilized where appropriate based on the estimate methodology for individual cost components:

- HMM Proprietary Software - Tunnel Estimating Database (TED)
- Illinois Department of Commerce Prevailing Wages for Cook County
- Historical project data and experiences
- Vendor quotations or list pricing for materials/equipment
- R.S. Means composite unit costs (where design detail was insufficient for other estimating methodologies)

8. LABOR COSTS

Prevailing Wages in Table 2 were obtained for Cook County from the Illinois Department of Commerce. Labor unit prices reflect a burdened rate, inclusive of overtime, workers compensation, unemployment taxes, fringe benefits and medical insurance.

January 2015 wages were used to match the base estimate dollars. Wages were then increased for a period equal to half of the assumed project construction schedule (i.e. 1 year at 4%) to balance additional costs incurred by the contractor due to annual wage increases implemented throughout the course of the project. This markup is different than escalation and is used to account for the cost of extended project duration.

TABLE 2: JANUARY 2015 LABOR RATES FOR COOK COUNTY					
Craft	Base Hourly Rate	Fully Burdened 10-hr Shift Average	Craft	Base Hourly Rate	Fully Burdened 10-hr Shift Average
Labor Foreman	\$ 38.75	\$ 78.77	Surface Laborer	\$ 38.00	\$ 77.75
Loco Driver	\$ 44.75	\$ 95.06	Crane Operator	\$ 49.30	\$ 101.28
TBM Operator	\$ 49.30	\$ 101.28	Grout Plant Operator	\$ 42.70	\$ 92.25
Tunnel Miner	\$ 38.75	\$ 78.77	Concrete Pump Operator	\$ 45.30	\$ 95.81
Cement Mason	\$ 42.58	\$ 84.10	Loader Operator	\$ 44.80	\$ 93.81
Carpenter	\$ 43.35	\$ 88.52	Truck Driver	\$ 34.10	\$ 64.39
Diver	\$ 52.45	\$ 58.31	Piledriver	\$ 43.35	\$ 88.52
Tunnel Mechanic	\$ 43.35	\$ 88.52	Shaft Top	\$ 38.00	\$ 77.75
Tunnel Labor	\$ 38.00	\$ 77.75	Fork Lift Operator	\$ 42.70	\$ 92.25
Tunnel Electrician	\$ 44.00	\$ 90.65	Watch Person	\$ 38.00	\$ 77.75
Welder	\$ 50.95	\$ 102.22	<i>SOURCE:</i> http://www.illinois.gov/idol/laws-rules/conmed/rates/2015/january/cook9999.htm		
Shaft Bottom	\$ 44.75	\$ 95.06			
Equipment Labor	\$ 38.00	\$ 77.75			

9. MAJOR ASSUMPTIONS & ALLOWANCES

1. The work will be bid and completed on a competitive bid basis and under a single contract.
2. Contractor will have reasonable amount of time to complete the Work.
3. Contractor will have reasonable amount of time during the bid period to review the contract documents/addenda and bid the Work.
4. There will be no lack of funding or labor force.
5. Construction duration = 2 years (source: PDR)
6. Working hours assumed to be one 10-hour shift per day, 5 days per week.
7. Tunnel:
 - a. Tunnel will be mined with an open-faced TBM from JC-1 to the outfall using steel ribs and timber lagging at 4-ft centers.
 - b. Excavated tunnel diameter is 11.5-ft based on pipe OD + 2-ft annulus for initial support and clearance for blocking/grouting RCP into place.
 - c. TBM sustained advance rate of 32 feet/day based on HMM historical data and appropriate learning curve consideration. This daily average can be improved upon if working hours are increased.
 - d. No additional cost included to manage gravel/sand layer at downstream end of alignment. If ground is problematic, this can add considerable cost to the project, which warrants a higher contingency than the 10% used in the base estimate.
8. Outfall Structure will be supported with walers and steel sheeting. No cost assumed for tie backs, non-vibratory installation methods, or slope stabilization.
9. Mobilization Allowances:
 - a. Pre-construction Survey: \$150k based on projects from recent HMM projects of similar magnitude. When considering expensive homes in neighborhood and protection that survey provides to Village to ward off spurious claims, the level of effort in pre-con survey is significant.
 - b. Traffic Control: No traffic control shown on plans so \$500k from base estimate carried over. This cost will largely be based on diameter of intermediate shafts and location of these shafts with respect to lanes and ROW.
 - c. Permits & Plans: Included in indirects and various other work activities.
 - d. Mobilization: 5% of direct costs.
 - e. Control of Water: provisions for sumping and pumping included in associated activities. No additional provisions since PDR states water is not of concern in this geology.
 - f. Instrumentation: No instrumentation shown on plans so \$130k from base estimate carried over.
 - g. Post-construction Survey: \$20k to photograph/video structures along Willow.

10. EXCLUDED COSTS

1. Property or easement acquisition.
2. Financing / cost of money.
3. Contingency for unforeseen conditions (natural disasters).
4. Management reserve, construction general allowance, or contingency for project scope modifications, field change orders, etc.
5. Non-construction / soft costs for design and services during construction.
6. Costs associated with construction management, resident project representation, contract administration, and related District overhead costs.
7. Future costs of the project (i.e. O&M, sewer inspection/cleaning, end-of-pipe treatment for effluent dosing and filtration).

11. REFERENCE DOCUMENTS

1. "Preliminary Design Report", dated April 2015.
2. "Preliminary Design Submittal" Drawings, dated April 2015.
3. January 2015 Prevailing Wages for Cook County. Illinois Department of Commerce, <http://www.illinois.gov/idol/laws-rules/conmed/rates/2015/january/cook9999.htm>
4. Cost Estimate Classification System, AACE International Recommended Practice No. 18R-97;
5. Sperry, PE. *Estimating Contingencies*. Update to April 1988 Civil Engineering Magazine article, June 1992.

APPENDIX A

Opinion of Probable Construction Costs Summary

Village of Winnetka, Illinois Willow Road STADI Project
Willow Road Tunnel and Appurtenances
Opinion of Probable Construction Costs

Currency: USD-United States-JANUARY 2015 Dollar

MWH 2015 30% PDR EOPCC				June 2015 Independent OPCC				Delta				
No.	Description	Quantity	Unit Price	Total Price	Comments	Direct Total	Quantity	Unit Price	OH&P Direct x MU Factor	\$	%	
												Grand Total Price: \$ 31,015,000
Mobilization				\$ 3,189,620		\$ 2,496,693			\$ 3,260,750	\$ 71,130	2%	
1	Pre-construction Survey	1 LS	\$ 24,020	\$ 24,020		\$ 150,000	1 AL	\$ 195,904	\$ 195,904	\$ 171,884	716%	
2	Traffic Control	1 LS	\$ 500,000	\$ 500,000		\$ 382,848	1 AL	\$ 500,011	\$ 500,011	\$ 11	0%	
3	Permits & Plans	1 LS	\$ 50,350	\$ 50,350		\$ -	0 LS		\$ -	\$ (50,350)	-100%	
4	Erosion Protection	1 LS	\$ 84,650	\$ 84,650		\$ 14,234	1 LS	\$ 18,590	\$ 18,590	\$ (66,060)	-78%	
5	Mobilization	1 LS	\$ 1,912,650	\$ 1,912,650		\$ 1,359,902	5%	\$ 35,521,390	\$ 1,776,069	\$ (136,581)	-7%	
	Site Work					\$ 349,654	1 LS	\$ 456,658	\$ 456,658	\$ 456,658		
6	Control of Water	1 LS	\$ 406,100	\$ 406,100		\$ -	0 LS		\$ -	\$ (406,100)	-100%	
7	Instrumentation	1 LS	\$ 129,150	\$ 129,150		\$ 98,889.74	1 AL	\$ 129,153	\$ 129,153	\$ 3	0%	
8	Demobilization	1 LS	\$ 76,500	\$ 76,500		\$ 121,165	1 LS	\$ 158,245	\$ 158,245	\$ 81,745	107%	
9	Post-construction Survey	1 EA	\$ 6,200	\$ 6,200		\$ 20,000	1 AL	\$ 26,121	\$ 26,121	\$ 19,921	321%	
Construction Shafts				\$ 4,499,415		\$ 1,383,806			\$ 1,807,290	\$ (2,692,125)	-60%	
1	Willow Road Construction Shaft	1 LS	\$ 1,589,200	\$ 1,589,200		\$ 463,064	1 LS	\$ 604,774	\$ 604,774	\$ (984,426)	-62%	
2	MH-101, TBM Receiving Shaft	1 LS	\$ 9,834	\$ 9,834		\$ 40,000	42 VF	\$ 1,244	\$ 52,241	\$ 42,407	431%	
3	Intermediate Shafts	3 EA	\$ 275,000	\$ 825,000		\$ -	0 EA		\$ -	\$ (825,000)	-100%	
4	JC-1, Willow Road & Berkeley	1 LS	\$ 395,261	\$ 395,261		\$ -	43 VF	\$ -	\$ -	\$ (395,261)	-100%	
5	DS-2, Willow Road & Locust	1 LS	\$ 351,293	\$ 351,293		\$ 217,766	45 VF	\$ 6,320	\$ 284,408	\$ (66,885)	-19%	
6	DS-3, Willow Road & Birch	1 LS	\$ 431,898	\$ 431,898		\$ 266,158	55 VF	\$ 6,320	\$ 347,610	\$ (84,288)	-20%	
7	DS-4, Willow Road & Poplar	1 LS	\$ 349,579	\$ 349,579		\$ 203,248	42 VF	\$ 6,320	\$ 265,448	\$ (84,131)	-24%	
8	DS-5, Willow Road & Woodland	1 LS	\$ 355,950	\$ 355,950		\$ 193,570	40 VF	\$ 6,320	\$ 252,808	\$ (103,142)	-29%	
9	Shaft Restoration	1 LS	\$ 191,400	\$ 191,400		\$ -	1 LS	\$ -	\$ -	\$ (191,400)	-100%	
96" Diameter Tunnel				\$ 16,475,865		\$ 21,619,716	8,500 LF	\$ 3,322	\$ 28,235,951	\$ 11,760,086	71%	
1	96" Diameter Tunnel	8,502 LF	\$ 1,175	\$ 9,989,850		\$ 12,892,446	8,500 LF	\$ 1,981	\$ 16,837,894	\$ 6,848,044	69%	
	TBM Setup					\$ 320,733	1 LS	\$ 418,886	\$ 418,886			
	TBM Tunneling					\$ 11,964,033	8,500 LF	\$ 1,838	\$ 15,625,360			
	TBM Maintenance					\$ 190,594	1 LS	\$ 248,921	\$ 248,921			
	Tunnel Cleanup					\$ 417,086	8,500 LF	\$ 64	\$ 544,726			
2	Retrieve TBM	1 LS	\$ 144,765	\$ 144,765		\$ 63,756	1 LS	\$ 83,267	\$ 83,267	\$ (61,498)	-42%	
3	96" Diameter Pipe Jacked in Place	8,455 LF	\$ 750	\$ 6,341,250		\$ 8,663,514	8,500 LF	\$ 1,331	\$ 11,314,791	\$ 4,973,541	78%	
Junction Structures				\$ -		\$ -			\$ -			
1	Willow Road & Berkeley Constr. Shaft	1 LS	\$ 280,000			\$ -	1 LS	\$ -	\$ -			
1	Willow Road & Berkeley	1 LS	\$ 126,359			\$ -	1 LS	\$ -	\$ -			
2	Willow Road & Locust	1 LS	\$ 126,359			\$ -	1 LS	\$ -	\$ -			
3	Willow Road & Birch	1 LS	\$ 126,359			\$ -	1 LS	\$ -	\$ -			
4	Willow Road & Poplar	1 LS	\$ 126,359			\$ -	1 LS	\$ -	\$ -			
5	Willow Road & Woodland	1 LS	\$ 126,359			\$ -	1 LS	\$ -	\$ -			
Outfall Structure				\$ 4,030,078		\$ 3,057,720			\$ 3,993,468	\$ (36,610)	-0.9%	
1	Mobilization	1 LS	\$ 187,022	\$ 187,022								
2	Energy Dissipation Toe Block Piling	1,440 SF	\$ 46	\$ 66,240								
3	SOE Dissipation Structure	1 LS	\$ 400,194	\$ 400,194		\$ 1,563,218	1 LS	\$ 2,041,606	\$ 2,041,606	\$ (36,652)	-2%	
4	SOE Outlet Pipe Structure	1 LS	\$ 497,802	\$ 497,802								
5	Backfill Outlet Structure	603 CY	\$ 78	\$ 47,000								
6	Outfall Structure Concrete	800 CY	\$ 1,100	\$ 880,000								
7	Stormwater Treatment System	1 LS	\$ 1,551,000	\$ 1,551,000		\$ 1,187,596	1 LS	\$ 1,551,033	\$ 1,551,033	\$ 33	0%	
8	Outfall Structure Mechanical/Electrical	1 LS	\$ 250,820	\$ 250,820		\$ 192,052	1 LS	\$ 250,825	\$ 250,825	\$ 5	0%	
9	Outfall Structure Restoration	1 LS	\$ 150,000	\$ 150,000		\$ 114,855	1 LS	\$ 150,003	\$ 150,003	\$ 3	0%	
Subtotal 1:				\$ 28,194,980		\$ 28,557,940			\$ 37,297,460	\$ 9,102,480	32%	
Markups				\$ -		\$ 8,739,525	MU 1.31		Distributed throughout line items above			
		MU Factor: 1.00										
1	Subcontractor Markups	1 LS	0%	\$ -	Included in Unit Rates	\$ -	0%					
2	Prime Contractor OH&P on Subs	1 LS	0%	\$ -		\$ -	0%					
3	Prime Contractor OH&P on Self-Perform	1 LS	0%	\$ -		\$ -	0%					
	Overhead / Indirect Profit					\$ 2,930,000	10%		Calculated - see detailed breakdown			
						\$ 4,723,191	15%		Applied to Subtotal1 + OH			
4	Bonding & Insurance	1 LS	0%	\$ -		\$ 1,086,334	3%		Applied to Subtotal1 + OH&P			
5	State Sales Taxes	1 LS	0%	\$ -	Excluded	\$ -	0%		N/A			
6	Escalation	1 LS	0%	\$ -	Excluded	\$ -	0%		N/A. Jan 2015 USD			
Subtotal 2:				\$ 28,194,980	Total Estimated Co	\$ 37,297,465			\$ 37,297,460	\$ 9,102,480	32%	
Contingency				\$ 2,819,498				30%	\$ 11,189,238	\$ 8,369,740	297%	
MWH Total Estimated Bid Price:				\$ 31,015,000					HMM Total Estimated Bid Price:	\$ 48,487,000	\$ 17,472,000	56%

COMBINED WITH CONSTRUCTION SHAFTS ABOVE

APPENDIX B

Estimate Backup



Hatch Mott MacDonald

Detailed Cost Estimate Report

Project:	Winnetka STADI	Project Number:	358815
Estimate Description:	Mobilization	Parent Estimate ID:	N/A
Tunnel Name:	STADI	Project Phase:	30%
Construction Activity:	Site Work & Restoration	Geology Type:	N/A
Tunnel Technique:	N/A	Estimate Date:	6/25/2015
Estimate Definition ID:	N/A	Tunnel Characteristics ID:	N/A

Site Dimensions

Description	Quantity	Unit	Unit Price	Total
Site Work				
<i>Fencing</i>				
8' Chain Link Fence	1200	lf	\$ 43.15	51,776
24" Manual Swing Gate	2	ea	\$ 2,652	5,303
<i>Site Preparation</i>				
Stripping, storage of topsoil - 10 in	2,469	cy	\$ 2.67	6,587
Gravel Base				
Compact Subgrade per ODOT Item 203	8,889	sy	\$ 2.57	22,815
Geotextile Filter Fabric	8,889	sy	\$ 4.74	42,099
Stone - 10 in	2,469	cy	\$ 30.00	74,074
<i>Utilities</i>				
Install Electrical Duct Bank/Energize	1	ls	\$ 75,000	75,000
<i>Site Maintenance</i>				
Snow Removal, Dust Control, Roadway Cleaning	24	mo.	\$ 3,000	72,000
Total Estimated Cost:				\$349,654

Restoration

<i>Disposal</i>				
Remove All Temporary Fencing	5958	lf	\$ 2.22	13,256
Excavate Temporary Construction Bases	2469	cy	\$ 3.22	7,951
Haul Base Materials Off Site	2469	cy	\$ 15.00	37,037
<i>Seeding</i>				
Topsoil Placement/Grading	20134	sy	\$ 2.55	51,317
Seeding	8889	sy	\$ 1.31	11,604
Total Estimated Cost:				\$121,165

Erosion Control/SWPPP

Rock Construction Entrance (ODOT #2 Stone)	2	ea	\$ 600	1,200
Concrete Washout Pit	1	ea	\$ 1,300	1,300
Silt Fence	1200	lf	\$ 5.02	6,029
Temporary Sediment Trap				
Excavate Pit	350	cy	\$ 9.75	3,413
Geotextile	96	sy	\$ 4.74	455
ODOT Type D Rip-Rap	3	cy	\$ 100	300
Dandy Curb Bags for Inlet Protection	20	ea	\$ 77	1,538
Total Estimated Cost:				\$14,234



Detailed Cost Estimate Report

Project: Winnetka Stormwater Tunnel
Estimate Description: JC-1 Mining Shaft
Tunnel Name: STADI-Launch Shaft
Construction Activity: Launch Shaft
Estimate Definition ID: 7074

Project Number: 358815
Parent Estimate ID: 6792
Project Phase: 30%
Geology Type: Firm soils
Estimate Date: June 23, 2015
Tunnel Characteristics ID: 2965

GENERAL

Shaft Excavation Area **707 ft2**
 Shaft Finished Area **113.10 ft2**
 Shaft Depth **43.00 ft**
 Shaft Perimeter **94.3 ft**
 Excavation Quantity **1,126 Cubic Yards**

PRE-SUPPORT

Shaft excavation support type **Liner plate & r**
 Number piles/wall **1 (1 for slurry wall)**
 Pile Depth **0 ft**
 Excavation Support Advance Rate **0.00 ft/hr**

FINAL SUPPORT

Shaft final lining type **Concrete pipe + backfill**
 Final liner installation rate **2.6 ft/hr**

PRE-TREATMENT

Treatment type **None**
 Treated area **0 ft2**
 Treated depth **0 ft**
 Treatment rate **0 yd3/hr**

EXCAVATE/PRIMARY SUPPORT

Shaft excavation type **Excavation**
 Shaft Advance Rate **150.00 yd3/day**
 Excavation primary support advance rate **100 yd2/hr**

SHIFT DETAILS

Shift Arrangement **1 - 10 hour shifts x 5 days per week**
 Avg. Advance per Shift **2.84 Feet**
 Avg. Advance per Week **14.18 Feet**
 Total number of hours **152**

SHAFT CONSTRUCTION DATA

	<u>Average Advance</u>	<u>Quantity</u>	<u>Unit</u>		<u>Excavation Duration</u>		
Pre-treatment	0.0 yd3/day	0	yd3	0.0 Shifts	0.0 Days	0.00 Weeks	
Pre-support	0.0 ft/day	0	ft	0.0 Shifts	0.0 Days	0.00 Weeks	
Excavation	150.0 yd3/day	1,126	yd3	8.0 Shifts	8.0 Days	1.60 Weeks	
Primary support	90.0 yd2/day	451	yd2	5.0 Shifts	5.0 Days	1.00 Weeks	
Final support	20.0 ft/day	43	ft	2.2 Shifts	2.2 Days	0.43 Weeks	
Total:				15 Shifts	15.2 Days	3.03 Weeks	

Labor	Unit Rate	<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Shifter	\$77.75 \$/hr	0	0	\$0	0	0	\$0	130	1	\$10,108	22	0	\$0	\$10,108
Tunnel miner	\$78.77 \$/hr	0	0	\$0	0	0	\$0	130	1	\$10,240	0	0	\$0	\$10,240
Concrete Laborer	\$0.00 \$/hr	0	0	\$0	0	0	\$0	0	0	\$0	22	2	\$0	\$0
Laborer	\$77.75 \$/hr	0	0	\$0	0	0	\$0	130	3	\$30,323	22	2	\$3,421	\$33,744
Concrete Pump Operator	\$95.81 \$/hr	0	0	\$0	0	0	\$0	0	0	\$0	22	1	\$2,108	\$2,108
Foreman	\$78.77 \$/hr	0	0	\$0	0	0	\$0	0	0	\$0	22	1	\$1,733	\$1,733
Shaft bottom	\$95.06 \$/hr	0	0	\$0	0	0	\$0	130	2	\$24,716	0	0	\$0	\$24,716
Welder	\$101.22 \$/hr	0	0	\$0	0	0	\$0	130	1	\$13,159	22	0	\$0	\$13,159
Shaft top	\$77.75 \$/hr	0	0	\$0	0	0	\$0	0	0	\$0	22	1	\$1,711	\$1,711
Crane operator	\$101.28 \$/hr	0	0	\$0	0	0	\$0	130	1	\$13,166	22	1	\$2,228	\$15,395
Loader operator	\$93.81 \$/hr	0	0	\$0	0	0	\$0	130	1	\$12,195	22	0	\$0	\$12,195
Excavator Operator	\$93.81 \$/hr	0	0	\$0	0	0	\$0	130	1	\$12,195	22	0	\$0	\$12,195
Tunnel mechanic	\$88.52 \$/hr	0	0	\$0	0	0	\$0	130	1	\$11,508	0	0	\$0	\$11,508
				\$0			\$0			\$137,609			\$11,200	\$148,809

Equipment	Unit Rate	<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
150T Crane	\$5,000.00 \$/wk	0	0	\$0	0	0	\$0	2.6	1	\$13,000	0	0	\$0	\$13,000
Small tools	\$148,809.00 \$/Nr	0	0	\$0	0	0	\$0	1	0.1	\$14,881	0	0	\$0	\$14,881
Shaft crane	\$5,000.00 \$/wk	0	0	\$0	0	0	\$0	2.6	0	\$0	0.43	1	\$2,150	\$2,150
Compressors	\$820.00 \$/wk	0	0	\$0	0	0	\$0	2.6	1	\$2,132	0.43	0	\$0	\$2,132
Generators	\$1,860.00 \$/wk	0	0	\$0	0	0	\$0	2.6	1	\$4,836	0.43	0	\$0	\$4,836
Loaders	\$2,200.00 \$/wk	0	0	\$0	0	0	\$0	2.6	1	\$5,720	0.43	0	\$0	\$5,720
Excavator	\$3,500.00 \$/wk	0	0	\$0	0	0	\$0	2.6	1	\$9,100	0.43	0	\$0	\$9,100
Muck bucket	\$700.00 \$/wk	0	0	\$0	0	0	\$0	2.6	2	\$3,640	0.43	0	\$0	\$3,640
Pumps	\$300.00 \$/wk	0	0	\$0	0	0	\$0	2.6	2	\$1,560	0.43	0	\$0	\$1,560
Welding machine	\$500.00 \$/wk	0	0	\$0	0	0	\$0	2.6	1	\$1,300	0.43	0	\$0	\$1,300
				\$0			\$0			\$56,169			\$2,150	\$58,319

Consumables	Unit Rate		<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
			UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Electrical power	\$0.18	\$/kwh	0	0	\$0	0	0	\$0	130	200	\$4,680	22	0	\$0	\$4,680
Gas oil	\$3.75	\$/gal	0	0	\$0	0	0	\$0	4	1000	\$15,000	0	0	\$0	\$15,000
Hydraulic oil	\$20.00	\$/gal	0	0	\$0	0	0	\$0	4	100	\$8,000	0	0	\$0	\$8,000
					\$0			\$0			\$27,680			\$0	\$27,680

Materials	Unit Rate		<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
			UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Steel Ribs	\$2.10	\$/lb	0	0	\$0	0	0	\$0	2323	11	\$53,661	0	0	\$0	\$53,661
Framed Penetration	\$25,000.00	\$/Nr	0	0	\$0	0	0	\$0	1	1	\$25,000	0	0	\$0	\$25,000
Concrete Mud Mat	\$100.00	\$/yd3	0	0	\$0	0	0	\$0	20	1	\$2,000	0	0	\$0	\$2,000
Lagging	\$4.00	\$/ft2	0	0	\$0	40	0	\$0	4055	1	\$16,220	0	0	\$0	\$16,220
Pipe & gasket	\$811.20	\$/Nr	0	0	\$0	0	0	\$0	0	0	\$0	37	1	\$30,014	\$30,014
Backfill	\$80.00	\$/yd3	0	0	\$0	0	0	\$0	0	0	\$0	1012	1.05	\$85,008	\$85,008
Hoarding Site Limit	\$32.00	\$/ft2	0	0	\$0	0	0	\$0	200	1	\$6,400	0	0	\$0	\$6,400
					\$0			\$0			\$103,281			\$115,022	\$218,304

Subcontracts	Unit Rate		<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
			UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Shaft Muck disposal	\$20.00	\$/yd3	0	0	\$0	524	0	\$0	311	1.6	\$9,952	0	0	\$0	\$9,952
					\$0			\$0			\$9,952			\$0	\$9,952

Total Pre-Treatment Cost:	\$0
Total Pre-Support Cost:	\$0
Total Excavate / Primary Support Cost:	\$334,691
Total Final Support Cost:	\$128,373
Total Estimated Cost:	\$463,064
Total Estimated Cost per Foot:	\$10,769
Total Estimated Cost per Week:	\$152,668
Total Estimated Cost per Shift:	\$30,534



Detailed Cost Estimate Report

Project: Winnetka Stormwater Tunnel
Estimate Description: Intermediate Shaft
Tunnel Name: Intermediate Shaft
Construction Activity: Removal Shaft

Estimate Definition ID: 7076

Project Number: 358815
Parent Estimate ID: 7075
Project Phase: 30%
Geology Type: Not Applicable
Estimate Date: June 24, 2015
Tunnel Characteristics ID: 2967

GENERAL

Shaft Excavation Area **153.86 ft²**
 Shaft Finished Area **113.04 ft²**
 Shaft Depth **45.00 ft**
 Shaft Perimeter **43.96 ft**
 Excavation Quantity **256 Cubic Yards**

PRE-SUPPORT

Shaft excavation support type **Soldier piles &**
 Number piles/wall **11 (1 for slurry wall)**
 Pile Depth **50 ft**
 Excavation Support Advance Rate **0.00 ft/hr**

FINAL SUPPORT

Shaft final lining type **Mass concrete**
 Final liner installation rate **2.6 ft/hr**

PRE-TREATMENT

Treatment type **None**
 Treated area **0 ft²**
 Treated depth **0 ft**
 Treatment rate **0 yd³/hr**

EXCAVATE/PRIMARY SUPPORT

Shaft excavation type **Excavation + lagging**
 Shaft Advance Rate **170.00 yd³/day**
 Excavation primary support advance rate **100 yd²/hr**

SHIFT DETAILS

Shift Arrangement **1 - 10 hour shifts x 5 days per week**
 Avg. Advance per Shift **6.49 Feet**
 Avg. Advance per Week **32.43 Feet**
 Total number of hours **69**

SHAFT CONSTRUCTION DATA

	<u>Average Advance</u>	<u>Quantity</u>	<u>Unit</u>		<u>Excavation Duration</u>	
Pre-treatment	0.0 yd ³ /day	0	yd ³	0.0 Shifts	0.0 Days	0.00 Weeks
Pre-support	0.0 ft/day	50	ft	0.0 Shifts	0.0 Days	0.00 Weeks
Excavation	170.0 yd ³ /day	256	yd ³	2.0 Shifts	2.0 Days	0.40 Weeks
Primary support	81.5 yd ² /day	220	yd ²	2.7 Shifts	2.7 Days	0.54 Weeks
Final support	20.2 ft/day	45	ft	2.2 Shifts	2.2 Days	0.45 Weeks
Total:				7 Shifts	6.9 Days	1.39 Weeks

Labor	Unit Rate	<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Shifter	\$78.77 \$/hr	0	0	\$0	0	0	\$0	47	1	\$3,702	22	1	\$1,733	\$5,435
Tunnel miner	\$78.77 \$/hr	0	0	\$0	0	0	\$0	47	1	\$3,702	22	1	\$1,733	\$5,435
Laborer	\$77.75 \$/hr	0	0	\$0	0	0	\$0	47	2	\$7,309	22	2	\$3,421	\$10,730
Shaft bottom	\$95.06 \$/hr	0	0	\$0	0	0	\$0	47	1	\$4,468	0	0	\$0	\$4,468
Welder	\$102.22 \$/hr	0	0	\$0	0	0	\$0	47	1	\$4,804	22	1	\$2,249	\$7,053
Shaft top	\$77.75 \$/hr	0	0	\$0	0	0	\$0	47	1	\$3,654	0	0	\$0	\$3,654
Crane operator	\$101.28 \$/hr	0	0	\$0	0	0	\$0	47	1	\$4,760	22	1	\$2,228	\$6,988
Loader operator	\$93.81 \$/hr	0	0	\$0	0	0	\$0	47	1	\$4,409	22	1	\$2,064	\$6,473
Excavator Operator	\$93.81 \$/hr	0	0	\$0	0	0	\$0	47	1	\$4,409	0	0	\$0	\$4,409
				\$0			\$0			\$41,218			\$13,428	\$54,645

Equipment	Unit Rate	<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
150T Crane	\$5,000.00 \$/wk	0	0	\$0	0	0	\$0	0.94	1	\$4,700	0.45	1	\$2,250	\$6,950
Small tools	\$54,645.00 \$/Nr	0	0	\$0	0	0	\$0	1	0.1	\$5,465	0	0	\$0	\$5,465
Compressors	\$820.00 \$/wk	0	0	\$0	0	0	\$0	0.94	1	\$771	0.45	0	\$0	\$771
Loaders	\$2,200.00 \$/wk	0	0	\$0	0	0	\$0	0.94	1	\$2,068	0	0	\$0	\$2,068
Concrete pumps	\$4,000.00 \$/wk	0	0	\$0	0	0	\$0	0.94	0	\$0	0.45	1	\$1,800	\$1,800
Excavator	\$4,000.00 \$/wk	0	0	\$0	0	0	\$0	0.94	1	\$3,760	0	0	\$0	\$3,760
Muck bucket	\$700.00 \$/wk	0	0	\$0	0	0	\$0	0.94	1	\$658	0	0	\$0	\$658
Pumps	\$300.00 \$/wk	0	0	\$0	0	0	\$0	0.94	1	\$282	0.45	0	\$0	\$282
Welding machine	\$500.00 \$/wk	0	0	\$0	0	0	\$0	0.94	1	\$470	0	0	\$0	\$470
				\$0			\$0			\$18,173			\$4,050	\$22,223

Consumables	Unit Rate	<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Electrical power	\$0.18 \$/kwh	0	0	\$0	0	0	\$0	47	200	\$1,692	0	0	\$0	\$1,692
Hydraulic oil	\$20.00 \$/gal	0	0	\$0	5	0	\$0	1	100	\$2,000	0	0	\$0	\$2,000
Fuel	\$3.75 \$/gal	0	0	\$0	5	0	\$0	1	1000	\$3,750	0	0	\$0	\$3,750
				\$0			\$0			\$7,442			\$0	\$7,442

Materials	Unit Rate	PRE- TREATMENT			PRE-SUPPORT			EXCAVATE / PRIMARY SUPPORT			FINAL SUPPORT			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Steel Ribs	\$2.10 \$/lb	0	0	\$0	0	0	\$0	1083	11	\$25,017	0	0	\$0	\$25,017
Framed Penetration	\$25,000.00 \$/Nr	0	0	\$0	0	0	\$0	1	2	\$50,000	0	0	\$0	\$50,000
Lagging	\$4.00 \$/ft2	0	0	\$0	4080	0	\$0	45	40	\$7,200	0	0	\$0	\$7,200
Pipe & gasket	\$811.20 \$/Nr	0	0	\$0	0	0	\$0	10	0	\$0	37	1	\$30,014	\$30,014
Backfill	\$80.00 \$/yd3	0	0	\$0	0	0	\$0	0	0	\$0	138	1.05	\$11,592	\$11,592
				\$0			\$0			\$82,217			\$41,606	\$123,824

Subcontracts	Unit Rate	PRE- TREATMENT			PRE-SUPPORT			EXCAVATE / PRIMARY SUPPORT			FINAL SUPPORT			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Shaft Muck disposal	\$20.00 \$/yd3	0	0	\$0	4750	0	\$0	256	1.6	\$8,192	0	0	\$0	\$8,192
Bottom Slab	\$120.00 \$/yd3	0	0	\$0	0	0	\$0	12	1	\$1,440	0	0	\$0	\$1,440
				\$0			\$0			\$9,632			\$0	\$9,632

Total Pre-Treatment Cost:	\$0
Total Pre-Support Cost:	\$0
Total Excavate / Primary Support Cost:	\$158,682
Total Final Support Cost:	\$59,084
Total Estimated Cost:	\$217,766
Total Estimated Cost per Foot:	\$4,839
Total Estimated Cost per Week:	\$156,955
Total Estimated Cost per Shift:	\$31,391

Shaft/ Structure	DIAMETER (ft)		Depth VF	COST	
	Excavated	Finished		Direct Cost	\$/VF
DS-2	14	8	45	\$ 217,766	\$4,839
DS-3	14	8	55	\$ 266,158	
DS-4	14	8	42	\$ 203,248	
DS-5	14	8	40	\$ 193,570	
MH-101	within outfall excavation	8	42	\$ 40,000	\$ 952

For intermediate shafts, take cost for DS-2 to develop cost per foot and apply to depths for remaining shafts.

For MH-101, assume manhole will be installed within steel sheeted shaft for outfall excavation, so cost will only be to insert pipe within this excavation - assume tunnel pipe cost + 17%



Detailed Cost Estimate Report

Project: Winnetka Stormwater Tunnel
Estimate Description: Set up TBM
Tunnel Name: Willow Road Stadi
Construction Activity: Erect TBM Only
Tunnel Technique: Open face TBM - Concrete pipe
Estimate Definition ID: 7069

Project Number: 358815
Parent Estimate ID: 6786
Project Phase: 30%
Geology Type: Firm soils
Estimate Date: June 22, 2015
Tunnel Characteristics ID: 2964

Tunnel Characteristics

Finished Diameter: 8 ft

Activity Details

Shift Arrangement 1 - 10 hour shifts x 5 days per week

Duration of Activity 2 Weeks

Total Number of Shifts 10

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Labor					
Miner Electrician	90.65	\$/hr	100.00	1.00	9,065
Laborer	77.75	\$/hr	100.00	2.00	15,550
Foreman	78.77	\$/hr	100.00	1.00	7,877
Welder	102.22	\$/hr	100.00	1.00	10,222
Crane operator	101.28	\$/hr	100.00	1.00	10,128
Loader operator	93.81	\$/hr	100.00	1.00	9,381
				7.00	\$62,223
Equipment					
150T Crane	5,000.00	\$/wk	2.00	1.00	10,000
Shaft Crane Transportation	22,000.00	\$/Nr	1.00	1.00	22,000
Compressors	820.00	\$/wk	2.00	1.00	1,640
Generators	1,860.00	\$/wk	2.00	1.00	3,720
Loaders	2,200.00	\$/wk	2.00	1.00	4,400
Power Cable	2,000.00	\$/wk	2.00	1.00	4,000
Welding machine	500.00	\$/wk	2.00	1.00	1,000
					\$46,760
Consumables					
Electrical power	0.17	\$/kwh	100.00	400.00	6,800
Lubrication materials	100.00	\$/wk	2.00	1.00	200
Hydraulic oil	20.00	\$/gal	10,000.00	1.00	200,000
Fuel	3.75	\$/gal	1,000.00	1.00	3,750
					\$210,750
Materials					
Temporary materials	500.00	\$/wk	2.00	1.00	1,000
					\$1,000

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Total Estimated Cost:					\$320,733



Detailed Cost Estimate Report

Project: Winnetka Stormwater Tunnel
Estimate Description: Drv.1-TBM Tunnelling
Tunnel Name: Willow Road Stadi
Construction Activity: TBM Tunneling
Tunnel Technique: Open face TBM - Concrete pipe
Estimate Definition ID: 7068

Project Number: 358815
Parent Estimate ID: 6785
Project Phase: 30%
Geology Type: Firm soils
Estimate Date: June 22, 2015
Tunnel Characteristics ID: 2964

Tunnel Characteristics

Tunnel Length: 8,500 ft
Finished Diameter: 8 ft
Initial Support Type: Ribs & timber lagging
Initial Support Thickness: 0.25 ft
Final Lining Thickness: 0.75 ft
Grout Thickness: 0.75 ft

Theoretical Excavation Volumes

Total Neat Excavation: 32,755 Cubic Yards
Initial Lining Volume: 2,786 Cubic Yards
Final Lining Volume: 6,501 Cubic Yards
Theoretical Grout Volume: 7,616 Cubic Yards

Normal Excavation/Support Cycle

Excavation Cycle Length: 4 Feet
Excavate: 12 Minutes
Erect Support: 19 Minutes
Extend Services: 8 Minutes
Total Cycle Time: 39 Minutes

Difficult Excavation/Support Cycle

Length of Difficult Excavation: 40 Feet
Excavate: 30 Minutes
Erect Support: 50 Minutes
Extend Services: 20 Minutes
Total Cycle Time: 100 Minutes

Reduction Factors

Machine availability: 85 %
Back up efficiency: 70 %
Planned maintenance: 10 %
Learning curve efficiency: 40 %
Learning curve duration time: 3 Weeks

Learning Curve Rate: 13.2 ft/day
Experienced Advance Rate: 33.0 ft/day
Difficult Advance Rate: 12.9 ft/day

TBM Skidding Through Excavation

Duration of skidding: 0 Weeks
Length of skidding: 0 Feet

Advance Rate and Shift Details

Shift Arrangement: 1 - 10 hour shifts x 5 days per week
Avg. Drive Advance per Shift: 31.56 Feet
Avg. Drive Advance per Day: 32 Feet
Avg. Drive Advance per Week: 158 Feet
Duration of Tunneling (Incl. Skid): 53.77 Weeks
Total number of shifts (Incl. Skid): 269

	Feet	Days
Learning Curve Drive:	198	15
Experienced Drive:	8,262	251
Difficult Drive:	40	3
Skidding Portion:	0	0

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Labor					
Miner Electrician	90.65	\$/hr	2,693.00	0.50	122,064
Tunnel laborer	77.75	\$/hr	2,693.00	3.00	628,142
Foreman	78.77	\$/hr	2,693.00	1.00	212,128
Loco driver	95.06	\$/hr	2,693.00	1.00	255,997
Shaft bottom	95.06	\$/hr	2,693.00	2.00	511,993
TBM operator	101.28	\$/hr	2,693.00	1.00	272,747
Welder	102.22	\$/hr	2,693.00	0.50	137,639
Shaft top	77.75	\$/hr	2,693.00	1.00	209,381
Crane operator	101.28	\$/hr	2,693.00	1.00	272,747
Loader operator	93.81	\$/hr	2,693.00	1.00	252,630
Fork Lift Operator	92.25	\$/hr	2,693.00	1.00	248,429
				13.00	\$3,123,898
Equipment					
TBM	3,000,000.00	\$/Nr	1.00	0.40	1,200,000
Loco	10,000.00	\$/wk	53.77	2.00	1,075,400
Muck cars	15,000.00	\$/Nr	1.00	8.00	120,000
Flat cars	15,000.00	\$/Nr	1.00	2.00	30,000
150T Crane	5,000.00	\$/wk	53.77	1.00	268,850
Track	60.00	\$/ft	8,500.00	1.00	510,000
Air pipe	15.00	\$/ft	8,500.00	1.00	127,500
Water pipe	10.00	\$/ft	8,500.00	1.00	85,000
Cabling	20.00	\$/ft	8,500.00	1.00	170,000
Lighting	12.00	\$/ft	8,500.00	1.00	102,000
Vent ducting	8.00	\$/ft	8,500.00	1.00	68,000
Vent Fans	15.00	\$/ft	8,500.00	1.00	127,500
Grout pumps	2,500.00	\$/wk	53.77	1.00	134,425
Small tools	3,123,898.00	\$/Nr	1.00	0.10	312,390
Shaft Crane Transportation	10,500.00	\$/Nr	1.00	0.20	2,100
Compressors	820.00	\$/wk	53.77	1.00	44,091
Generators	1,860.00	\$/wk	53.77	1.00	100,012
Loaders	2,200.00	\$/wk	53.77	1.00	118,294
Muck bucket	200.00	\$/wk	53.77	2.00	21,508
Welding machine	500.00	\$/wk	53.77	1.00	26,885
TBM Transportation	50,000.00	\$/Nr	1.00	1.00	50,000
					\$4,693,955
Consumables					
Electrical power	0.18	\$/kwh	2,693.00	200.00	96,948
Filters etc.	870.00	\$/wk	53.77	1.00	46,780
Hydraulic oil	20.00	\$/gal	14.00	100.00	28,000
Other consumables	200.00	\$/wk	53.77	1.00	10,754
Fuel	3.75	\$/gal	14.00	800.00	42,000
					\$224,482

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Materials					
Other materials	500.00	\$/wk	53.77	1.00	26,885
Concrete Mud Mat	150.00	\$/yd3	32,755.00	0.00	4,913
Lagging	200.00	\$/ft	8,500.00	1.00	1,700,000
Steel ribs	1.30	\$/Nr	494.00	1,700.00	1,091,740
					\$2,823,538
Subcontracts					
Muck disposal	20.00	\$/yd3	32,755.00	1.60	1,048,160
Thrust block	50,000.00	\$/Nr	1.00	1.00	50,000
					\$1,098,160

Total Estimated Cost:	\$11,964,033
Total Estimated Cost per Foot:	\$1,408
Total Estimated Cost per Week:	\$222,516
Total Estimated Cost per Shift:	\$44,421



Detailed Cost Estimate Report

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Project: Winnetka Stormwater Tunnel
Estimate Description: Maint.TBM
Tunnel Name: Willow Road Stadi
Construction Activity: TBM Maintenance
Tunnel Technique: Open face TBM - Concrete pipe
Estimate Definition ID: 7070

Project Number: 358815
Parent Estimate ID: 6787
Project Phase: 30%
Geology Type: Firm soils
Estimate Date: June 22, 2015
Tunnel Characteristics ID: 2964

Tunnel Characteristics

Finished Diameter: 8 ft

Activity Details

Shift Arrangement 1 - 8 hour shifts x 1 days per week

Duration of Activity 20.56 Weeks

Total Number of Shifts 20.56

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Labor					
Loco driver	73.91	\$/hr	164.00	1.00	12,121
TBM operator	96.81	\$/hr	164.00	1.00	15,877
Tunnel electrician	72.73	\$/hr	164.00	1.00	11,928
Shaft top	73.73	\$/hr	164.00	1.00	12,092
Crane operator	96.81	\$/hr	164.00	1.00	15,877
Surface laborer	30.00	\$/hr	164.00	1.00	4,920
Tunnel mechanic	89.97	\$/hr	164.00	1.00	14,755
				7.00	\$87,569
Equipment					
Shaft crane	5,000.00	\$/wk	20.56	1.00	102,800
					\$102,800
Consumables					
Fuel	3.75	\$/gal	60.00	1.00	225
					\$225

Total Estimated Cost: \$190,594



Detailed Cost Estimate Report

Project: Winnetka Stormwater Tunnel
Estimate Description: Tunnel Clean up
Tunnel Name: Willow Road Stadi
Construction Activity: Tunnel Clean Up
Tunnel Technique: Open face TBM - Concrete pipe
Estimate Definition ID: 7072

Project Number: 358815
Parent Estimate ID: 6789
Project Phase: 30%
Geology Type: Firm soils
Estimate Date: June 22, 2015
Tunnel Characteristics ID: 2964

Tunnel Characteristics

Tunnel Length: 8,500 ft
Finished Diameter: 8 ft (Circular Tunnels)
Excavated Cross Section: 0 ft² (Non-circular Tunnels)
Excavated Perimeter: 0 ft (Non-circular Tunnels)

Productivity Cycle

Section Length 100 Feet
Vent Line Removal Time 46 Minutes
Track Removal Time 300 Minutes
Temp Lighting Removal Time 0 Minutes
Clean Up Time 53 Minutes
Total Cycle Time 399 Minutes

Reduction Factors

Learning Curve Efficiency: 100 %
Back Up Efficiency: 100 %
Learning Curve Duration: 1 Weeks

Shift Details

Shift Arrangement: 1 - 10 hour shifts x 5 days per week
Avg. Advance per Shift: 149.06 Feet
Avg. Advance per Week: 752 Feet
Total number of hours: 570

Clean Up Productivity Data

	<u>Average Advance</u>	<u>Drive Length</u>	<u>Drive Duration</u>		
Learning Curve Portion:	150.4 ft/day	752 Feet	5 Shifts	5 Days	1.00 Weeks
Experienced Drive Portion:	150.4 ft/day	7,748 Feet	52 Shifts	52 Days	10.31 Weeks
Total:	150.4 ft/day	8,500 Feet	57 Shifts	57 Days	11.31 Weeks

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Labor					
Laborer	77.75	\$/hr	570.00	3.00	132,953
Foreman	78.77	\$/hr	570.00	1.00	44,899
Crane operator	101.28	\$/hr	570.00	1.00	57,730
Loader operator	93.81	\$/hr	570.00	1.00	53,472
				6.00	\$289,053
Equipment					
150T Crane	5,000.00	\$/wk	11.31	1.00	56,550

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Compressors	820.00	\$/wk	11.31	1.00	9,274
Generators	1,860.00	\$/wk	11.31	1.00	21,037
Loaders	2,200.00	\$/wk	11.31	1.00	24,882
Other surface plant	500.00	\$/wk	11.31	1.00	5,655
					\$117,398

Consumables

Electrical power	0.18	\$/kwh	570.00	100.00	10,260
Fuel	3.75	\$/gal	2.00	50.00	375
					\$10,635

Total Estimated Cost:	\$417,086
Total Estimated Cost per Foot:	\$49
Total Estimated Cost per Week:	\$36,894
Total Estimated Cost per Shift:	\$7,314



Detailed Cost Estimate Report

Project:	Winnetka Stormwater Tunnel	Project Number:	358815
Estimate Description:	TBM Remv.	Parent Estimate ID:	6788
Tunnel Name:	Willow Road Stadi	Project Phase:	30%
Construction Activity:	TBM Removal	Geology Type:	Firm soils
Tunnel Technique:	Open face TBM - Concrete pipe	Estimate Date:	June 22, 2015
Estimate Definition ID:	7071	Tunnel Characteristics ID:	2964

Tunnel Characteristics

Finished Diameter: 8 ft

Activity Details

Shift Arrangement 1 - 10 hour shifts x 5 days per week

Duration of Activity 1 Weeks

Total Number of Shifts 5

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Labor					
Laborer	77.75	\$/hr	50.00	2.00	7,775
Foreman	78.77	\$/hr	50.00	1.00	3,939
Tunnel electrician	90.65	\$/hr	50.00	1.00	4,533
Crane operator	101.28	\$/hr	50.00	1.00	5,064
Loader operator	93.81	\$/hr	50.00	1.00	4,691
				6.00	\$26,001
Equipment					
150T Crane	5,000.00	\$/wk	1.00	1.00	5,000
Shaft Crane Transportation	22,000.00	\$/Nr	1.00	1.00	22,000
Compressors	820.00	\$/wk	1.00	1.00	820
Generators	1,860.00	\$/wk	1.00	1.00	1,860
Loaders	2,000.00	\$/wk	1.00	1.00	2,000
Control Cable	700.00	\$/wk	1.00	1.00	700
Welding machine	500.00	\$/wk	1.00	1.00	500
					\$32,880
Consumables					
Electrical power	0.17	\$/kwh	50.00	200.00	1,700
Hydraulic oil	20.00	\$/gal	30.00	1.00	600
Other consumables	200.00	\$/wk	1.00	1.00	200
Fuel	3.75	\$/gal	500.00	1.00	1,875
					\$4,375
Materials					
Temporary materials	500.00	\$/wk	1.00	1.00	500
					\$500

Total Estimated Cost: \$63,756

Estimate Definition ID: 7071

Estimated by: _____

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Page 1 of 1

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Detailed Cost Estimate Report

Project: Winnetka Stormwater Tunnel
Estimate Description: Final Lining-Co.Pipe
Tunnel Name: Willow Road Stadi
Construction Activity: Final Lining
Tunnel Technique: Open face TBM - Concrete pipe
Estimate Definition ID: 7073

Project Number: 358815
Parent Estimate ID: 6791
Project Phase: 30%
Geology Type: Firm soils
Estimate Date: June 22, 2015
Tunnel Characteristics ID: 2964

Tunnel Characteristics

Tunnel Length: 8,500 ft
Finished Diameter: 8 ft (Circular Tunnels)
Excavated Cross Section: 0 ft² (Non-circular Tunnels)
Excavated Perimeter: 0 ft (Non-circular Tunnels)
Initial Support Type: Ribs & timber lagging
Initial Support Thickness: 0.25 ft or 3.0 inches
Final Lining Thickness: 0.75 ft or 9.0 inches
Grout Thickness: 0.75 ft or 9.0 inches

Theoretical Excavation Volumes

Total Neat Excavation: 32,755 Cubic Yards
Initial Lining Volume: 2,786 Cubic Yards
Final Lining Volume: 6,501 Cubic Yards
Grout Volume: 7,616 Cubic Yards

Normal Forming Cycle

Form Length: 8 Feet
Install Form Time: 20 Minutes
Place Concrete Time: 30 Minutes
Strip Form Time: 0 Minutes
Total Cycle Time: 50 Minutes

Reduction Factors

Learning Curve Efficiency: 80 %
Back Up Efficiency: 90 %
Learning Curve Duration: 2 Weeks

Shift Details

Shift Arrangement: 2 - 10 hour shifts x 5 days per week
Avg. Advance per Shift: 82.62 Feet
Avg. Advance per Week: 830 Feet
Total number of hours: 1,029

Lining Productivity Data

	<u>Average Advance</u>	<u>Length</u>	<u>Duration</u>		
Learning Curve Portion:	138.2 ft/day	1,382 Feet	20 Shifts	10 Days	2.00 Weeks
Experienced Drive Portion:	172.8 ft/day	7,118 Feet	82 Shifts	41 Days	8.24 Weeks
Total:	166.0 ft/day	8,500 Feet	103 Shifts	51 Days	10.24 Weeks

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Labor					
Tunnel laborer	77.75	\$/hr	1,029.00	3.00	240,014
Laborer Foreman	78.77	\$/hr	1,029.00	1.00	81,054
Shaft bottom	95.06	\$/hr	1,029.00	1.00	97,817
Pipefitter Journeyman	92.25	\$/hr	1,029.00	1.00	94,925

Estimate Definition ID: 7073

Estimated by: _____

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Page 1 of 2

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Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Shaft top	77.75	\$/hr	1,029.00	1.00	80,005
Crane operator	101.28	\$/hr	1,029.00	1.00	104,217
Surface laborer	77.75	\$/hr	1,029.00	1.00	80,005
Grout plant operator	92.25	\$/hr	1,029.00	1.00	94,925
				10.00	\$872,962
Equipment					
Flat cars	500.00	\$/wk	10.24	2.00	10,240
Man hoists	300.00	\$/wk	10.24	1.00	3,072
Shaft crane	5,000.00	\$/wk	10.24	1.00	51,200
Grout Batch Plant	3,000.00	\$/wk	10.24	1.00	30,720
					\$95,232
Materials					
Grout	160.00	\$/yd3	6,501.00	0.75	780,120
Pipe Transportation	20,000.00	\$/Nr	1.00	1.00	20,000
Pipe & gasket	811.20	\$/ft	8,500.00	1.00	6,895,200
					\$7,695,320

Total Estimated Cost:	\$8,663,514
Total Estimated Cost per Foot:	\$1,019
Total Estimated Cost per Week:	\$846,215
Total Estimated Cost per Shift:	\$84,210



780 S. Material Road • Romeoville, IL. 60446 • Telephone No. (815) 834-0320 • Fax No. (815) 838-9275

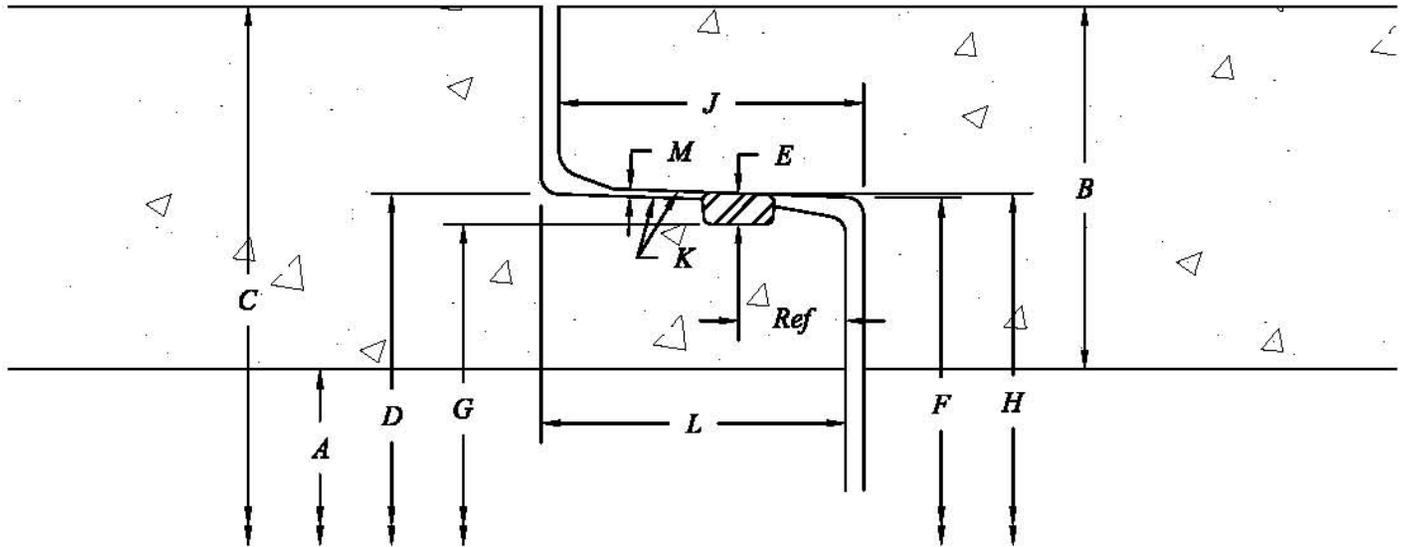
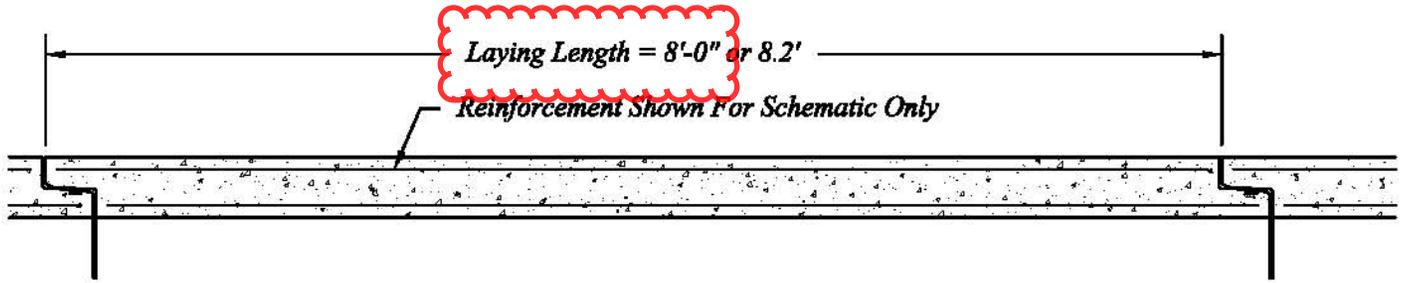
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Quotation

JOB: Budget Unit Prices
Location: Delivered from Romeoville or Franklin Park Locations
Due Date: August 21, 2015

<u>Quantity</u>	<u>Description</u>	<u>UM</u>	<u>Price</u>	<u>Extension</u>
8	12" x 96" C4 G.J.	LFT	\$ 11.50	\$ 92.00
8	12" x 96" C5 G.J.	LFT	\$ 11.75	\$ 94.00
8	15" x 96" C4 G.J.	LFT	\$ 16.00	\$ 128.00
8	15" x 96" C5 G.J.	LFT	\$ 16.50	\$ 132.00
8	18" x 96" C4 G.J.	LFT	\$ 18.25	\$ 146.00
8	18" x 96" C5 G.J.	LFT	\$ 20.00	\$ 160.00
8	21" x 96" C4 G.J.	LFT	\$ 26.00	\$ 208.00
8	21" x 96" C5 G.J.	LFT	\$ 27.75	\$ 222.00
8	24" x 96" C4 G.J.	LFT	\$ 30.50	\$ 244.00
8	24" x 96" C5 G.J.	LFT	\$ 32.50	\$ 260.00
8	27" x 96" C4 G.J.	LFT	\$ 34.50	\$ 276.00
8	27" x 96" C5 G.J.	LFT	\$ 38.25	\$ 306.00
8	30" x 96" C4 G.J.	LFT	\$ 41.75	\$ 334.00
8	30" x 96" C5 G.J.	LFT	\$ 46.25	\$ 370.00
8	36" x 96" C4 G.J.	LFT	\$ 52.75	\$ 422.00
8	36" x 96" C5 G.J.	LFT	\$ 61.75	\$ 494.00
8	42" x 96" C4 O.R.	LFT	\$ 73.75	\$ 590.00
8	42" x 96" C5 O.R.	LFT	\$ 87.00	\$ 696.00
8	48" x 96" C4 O.R.	LFT	\$ 90.50	\$ 724.00
8	48" x 96" C5 O.R.	LFT	\$ 107.50	\$ 860.00
8	54" x 96" C4 O.R.	LFT	\$ 126.00	\$ 1,008.00
8	54" x 96" C5 O.R.	LFT	\$ 147.00	\$ 1,176.00
8	60" x 96" C4 O.R.	LFT	\$ 147.50	\$ 1,180.00
8	60" x 96" C5 O.R.	LFT	\$ 174.50	\$ 1,396.00
8	66" x 96" C4 O.R.	LFT	\$ 164.00	\$ 1,312.00
8	66" x 96" C5 O.R.	LFT	\$ 200.00	\$ 1,600.00
8	72" x 96" C4 O.R.	LFT	\$ 200.00	\$ 1,600.00
8	72" x 96" C5 O.R.	LFT	\$ 250.00	\$ 2,000.00
8	78" x 96" C4 O.R.	LFT	\$ 227.00	\$ 1,816.00
8	78" x 96" C5 O.R.	LFT	\$ 277.00	\$ 2,216.00
8	84" x 96" C4 O.R.	LFT	\$ 290.00	\$ 2,320.00
8	84" x 96" C5 O.R.	LFT	\$ 330.00	\$ 2,640.00
8	90" x 96" C4 O.R.	LFT	\$ 450.00	\$ 3,600.00
8	90" x 96" C5 O.R.	LFT	\$ 550.00	\$ 4,400.00
8	96" x 96" C4 O.R.	LFT	\$ 550.00	\$ 4,400.00
8	96" x 96" C5 O.R.	LFT	\$ 700.00	\$ 5,600.00
8	102" x 96" C4 O.R.	LFT	\$ 850.00	\$ 6,800.00
8	102" x 96" C5 O.R.	LFT	\$ 1,050.00	\$ 8,400.00
8	108" x 96" C4 O.R.	LFT	\$ 950.00	\$ 7,600.00
8	108" x 96" C5 O.R.	LFT	\$ 1,200.00	\$ 9,600.00

Joint Lubricant (25 lb. Pails) - \$50.00 Each • Mastic (5 Gallon Pails) - \$60.00 Each



A	Pipe Diameter (In)	90	96	102	108	114	120	132	144
	Pipe Diameter (mm)	2250	2400	2550	2700	2850	3000	3300	3600
B	Wall Thickness	9.25	9.00	10.25	10.00	9.50	10.00	11.00	12.00
C	Outside Diameter	108.50	114.00	122.50	128.00	133.00	140.00	154.00	168.00
D	Spigot Joint Outside Diameter	97.599	103.983	110.632	116.974	122.890	128.890	141.641	155.228
E	O-Ring Annular Space	0.562	0.562	0.602	0.622	0.622	0.622	0.622	0.632
F	Bell Joint Inside Diameter	97.500	103.875	110.470	116.875	122.721	128.721	141.471	154.625
G	Diameter @ Back Of O-Ring	96.510	102.898	109.402	115.762	121.630	127.630	140.380	153.893
H	Diameter @ Front Of O-Ring	97.635	104.022	110.606	117.006	122.874	128.874	141.624	155.157
J	Bell Depth	5.00	5.00	5.00	5.00	6.00	6.00	6.00	8.25
K	Joint Taper	2°	2°	2°	2°	2°	2°	2°	2°
L	Spigot Depth	5.00	4.875	4.875	4.875	5.813	5.813	5.813	8.25
M	Joint Annular Space	0.1250	0.1250	0.0938	0.1250	0.1250	0.1250	0.1250	0.1560
Ref		1.938	2.000	1.938	1.813	2.000	2.188	2.000	3.000
	Approximate Weight / L.F.	3004#	3093#	3765#	3862#	3839#	4254#	5148#	6126#

All Pipe Is Manufactured And Tested In Accordance With Current ASTM C-14, ASTM C-76 Or ASTM C-655 Specifications As Required.

All O-Rings Meet ASTM C-443 Requirements.

All O-Ring Materials Meet ASTM C-361 Requirements.

90"Ø to 144"Ø Precast Concrete Pipe w/O-Ring Joint Detail



401 Kelton Street
Bay City, MI 48706
1 800 222 9918

5281 Lansing Road
Charlotte, MI 48813
1 800 874 9701

Date 31 Jan 08
Drawn By BmG

Scale NTS
01.04



Detailed Cost Estimate Report

Project:	Winnetka Stormwater Tunnel	Project Number:	358815
Estimate Description:	STADI-R.Shaft-Outfal	Parent Estimate ID:	6793
Tunnel Name:	Outfall-R.Shaft	Project Phase:	30%
Construction Activity:	Removal Shaft	Geology Type:	Not Applicable
		Estimate Date:	June 24, 2015
Estimate Definition ID:	7075	Tunnel Characteristics ID:	2966

GENERAL

Shaft Excavation Area **4133 ft²**
 Shaft Finished Area **2,822.00 ft²**
 Shaft Depth **10.00 ft**
 Shaft Perimeter **324 ft**
 Excavation Quantity **1,531 Cubic Yards**

PRE-SUPPORT

Shaft excavation support type **Sheet piles**
 Number piles/wall **156 (1 for slurry wall)**
 Pile Depth **31 ft**
 Excavation Support Advance Rate **0.12 ft/hr**

FINAL SUPPORT

Shaft final lining type **Mass concrete**
 Final liner installation rate **0.2 ft/hr**

PRE-TREATMENT

Treatment type **None**
 Treated area **0 ft²**
 Treated depth **0 ft**
 Treatment rate **0 yd³/hr**

EXCAVATE/PRIMARY SUPPORT

Shaft excavation type **Excavation + lagging**
 Shaft Advance Rate **200.00 yd³/day**
 Excavation primary support advance rate **150 yd²/hr**

SHIFT DETAILS

Shift Arrangement **1 - 10 hour shifts x 5 days per week**
 Avg. Advance per Shift **0.23 Feet**
 Avg. Advance per Week **1.17 Feet**
 Total number of hours **429**

SHAFT CONSTRUCTION DATA

	<u>Average Advance</u>	<u>Quantity</u>	<u>Unit</u>		<u>Excavation Duration</u>	
Pre-treatment	0.0 yd ³ /day	0	yd ³	0.0 Shifts	0.0 Days	0.00 Weeks
Pre-support	1.2 ft/day	31	ft	26.3 Shifts	26.3 Days	5.27 Weeks
Excavation	200.0 yd ³ /day	1,531	yd ³	8.2 Shifts	8.2 Days	1.63 Weeks
Primary support	124.1 yd ² /day	360	yd ²	2.9 Shifts	2.9 Days	0.58 Weeks
Final support	1.8 ft/day	10	ft	5.5 Shifts	5.5 Days	1.10 Weeks
Total:				43 Shifts	42.9 Days	8.58 Weeks

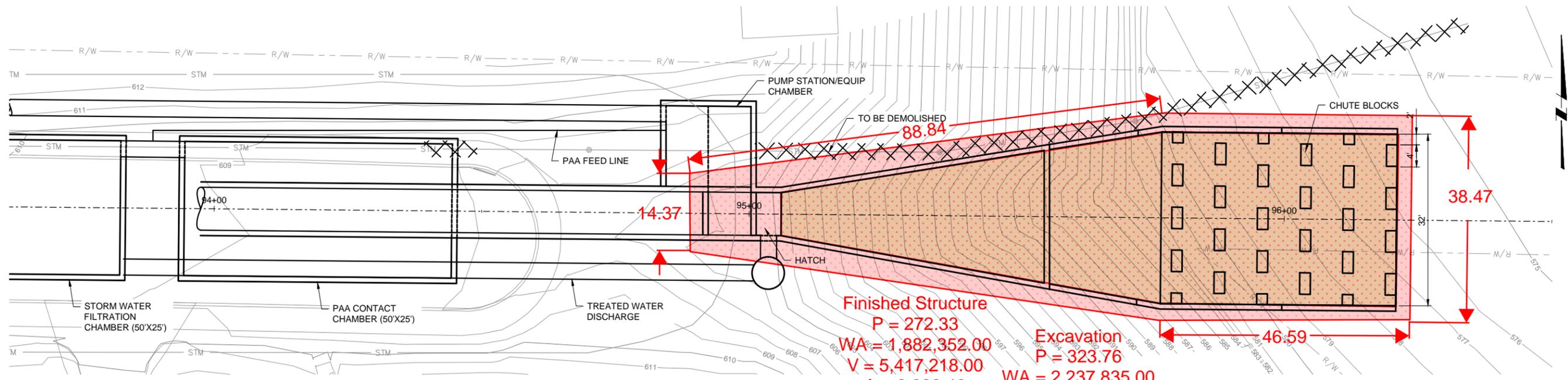
Labor	Unit Rate	<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Shifter	\$78.77 \$/hr	0	0	\$0	263	1	\$20,717	111	1	\$8,743	55	1	\$4,332	\$33,792
Tunnel miner	\$78.77 \$/hr	0	0	\$0	0	0	\$0	111	1	\$8,743	55	1	\$4,332	\$13,076
Laborer	\$77.75 \$/hr	0	0	\$0	263	2	\$40,897	111	1	\$8,630	55	2	\$8,553	\$58,079
Concrete Pump Operator	\$95.81 \$/hr	0	0	\$0	0	0	\$0	0	0	\$0	55	1	\$5,270	\$5,270
Welder	\$102.22 \$/hr	0	0	\$0	263	1	\$26,884	111	1	\$11,346	55	1	\$5,622	\$43,852
Crane operator	\$101.28 \$/hr	0	0	\$0	263	1	\$26,637	111	1	\$11,242	55	1	\$5,570	\$43,449
Loader operator	\$93.81 \$/hr	0	0	\$0	263	1	\$24,672	111	1	\$10,413	55	1	\$5,160	\$40,244
Excavator Operator	\$93.81 \$/hr	0	0	\$0	263	1	\$24,672	0	0	\$0	0	0	\$0	\$24,672
Tunnel mechanic	\$88.52 \$/hr	0	0	\$0	263	1	\$23,281	111	0	\$0	0	0	\$0	\$23,281
Police	\$50.00 \$/hr	0	0	\$0	263	1	\$13,150	0	0	\$0	0	0	\$0	\$13,150
				\$0			\$200,908			\$59,119			\$38,839	\$298,866
Equipment	Unit Rate	<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
		UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
150T Crane	\$5,000.00 \$/wk	0	0	\$0	5.27	0	\$0	2.21	1	\$11,050	1.1	1	\$5,500	\$16,550
Small tools	##### \$/Nr	0	0	\$0	0	0	\$0	1	0.1	\$29,887	0	0	\$0	\$29,887
Shaft crane	\$65.63 \$/hr	0	0	\$0	263	1	\$17,261	111	0	\$0	0	0	\$0	\$17,261
Compressors	\$820.00 \$/wk	0	0	\$0	5.27	1	\$4,321	2.21	1	\$1,812	1.1	0	\$0	\$6,134
Loaders	\$2,200.00 \$/wk	0	0	\$0	5.27	1	\$11,594	2.21	1	\$4,862	0	0	\$0	\$16,456
Loader/backhoe	\$3,500.00 \$/wk	0	0	\$0	5.27	1	\$18,445	2.21	0	\$0	0	0	\$0	\$18,445
Concrete pumps	\$4,000.00 \$/wk	0	0	\$0	5.27	1	\$21,080	2.21	0	\$0	1.1	1	\$4,400	\$25,480
Auger crane	\$7,000.00 \$/wk	0	0	\$0	5.27	1	\$36,890	0	0	\$0	0	0	\$0	\$36,890
Excavator	\$4,000.00 \$/wk	0	0	\$0	0	0	\$0	2.21	1	\$8,840	0	0	\$0	\$8,840
Muck bucket	\$700.00 \$/wk	0	0	\$0	5.27	0	\$0	2.21	1	\$1,547	0	0	\$0	\$1,547
Pumps	\$300.00 \$/wk	0	0	\$0	5.27	0	\$0	2.21	1	\$663	1.1	0	\$0	\$663
Welding machine	\$500.00 \$/wk	0	0	\$0	5.27	1	\$2,635	2.21	1	\$1,105	0	0	\$0	\$3,740
Boom Truck	\$2,500.00 \$/wk	0	0	\$0	5.27	1	\$13,175	2.21	0	\$0	0	0	\$0	\$13,175
				\$0			\$125,401			\$59,766			\$9,900	\$195,067

Consumables	Unit Rate		<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
			UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Electrical power	\$0.18	\$/kwh	0	0	\$0	263	100	\$4,734	111	200	\$3,996	0	0	\$0	\$8,730
Hydraulic oil	\$20.00	\$/gal	0	0	\$0	5	50	\$5,000	2	100	\$4,000	0	0	\$0	\$9,000
Fuel	\$3.75	\$/gal	0	0	\$0	5	500	\$9,375	2	1000	\$7,500	0	0	\$0	\$16,875
					\$0			\$19,109			\$15,496			\$0	\$34,605

Materials	Unit Rate		<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
			UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Walers & struts	\$1.50	\$/lb	0	0	\$0	23100	0	\$0	236000	1	\$354,000	0	0	\$0	\$354,000
Concrete Walls	\$250.00	\$/yd3	0	0	\$0	0	0	\$0	360	0	\$0	360	1	\$90,000	\$90,000
Cellular-Grout	\$120.00	\$/yd3	0	0	\$0	0	0	\$0	0	0	\$0	740	1.05	\$93,240	\$93,240
Sheet piles	\$40.00	\$/ft2	0	0	\$0	10044	1	\$401,760	0	0	\$0	0	0	\$0	\$401,760
					\$0			\$401,760			\$354,000			\$183,240	\$939,000

Subcontracts	Unit Rate		<u>PRE- TREATMENT</u>			<u>PRE-SUPPORT</u>			<u>EXCAVATE / PRIMARY SUPPORT</u>			<u>FINAL SUPPORT</u>			Grand Total
			UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	UQ	RQ	Total	
Shaft Muck disposal	\$20.00	\$/yd3	0	0	\$0	4750	0	\$0	1530	1.6	\$48,960	0	0	\$0	\$48,960
Bottom Slab	\$120.00	\$/yd3	0	0	\$0	0	0	\$0	306	1	\$36,720	0	0	\$0	\$36,720
Traffic Control	\$10,000.00	\$/Nr	0	0	\$0	0	0	\$0	1	1	\$10,000	0	0	\$0	\$10,000
					\$0			\$0			\$95,680			\$0	\$95,680

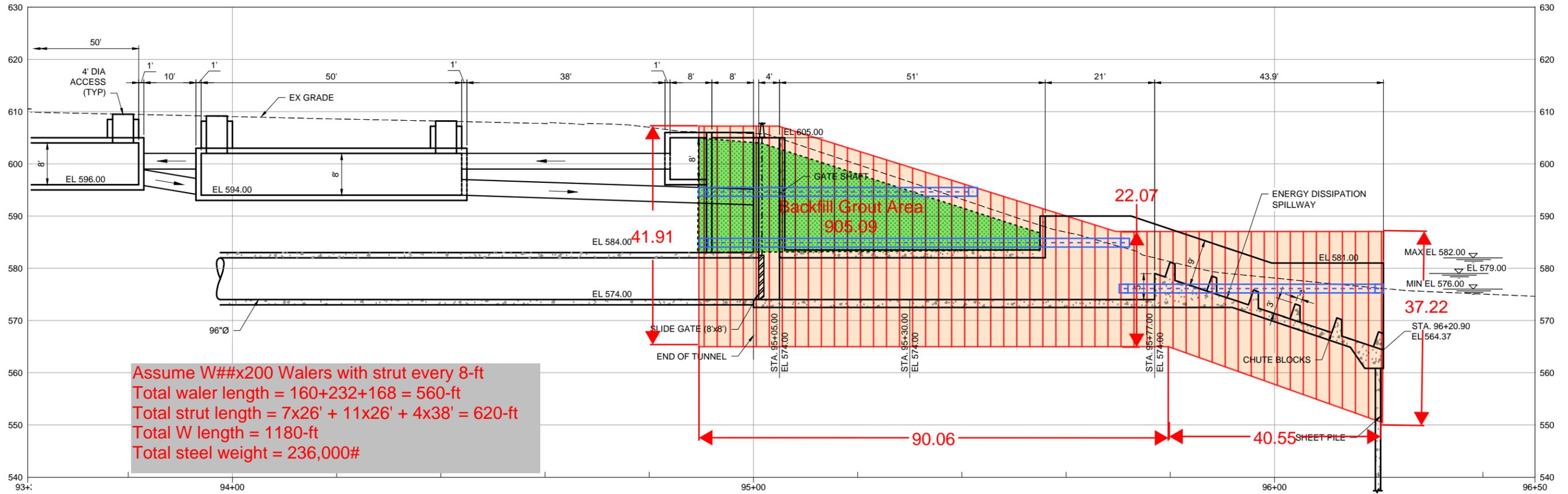
Total Pre-Treatment Cost:	\$0
Total Pre-Support Cost:	\$747,178
Total Excavate / Primary Support Cost:	\$584,060
Total Final Support Cost:	\$231,979
Total Estimated Cost:	\$1,563,218
Total Estimated Cost per Foot:	\$156,322
Total Estimated Cost per Week:	\$182,248
Total Estimated Cost per Shift:	\$36,450



Finished Structure
 P = 272.33
 WA = 1,882,352.00
 V = 5,417,218.00
 A = 2,822.46

Excavation
 P = 323.76
 WA = 2,237,835.00
 V = 7,933,183.00
 A = 4,133.32

PLAN



Assume W##x200 Walers with strut every 8-ft
 Total waler length = 160+232+168 = 560-ft
 Total strut length = 7x26' + 11x26' + 4x38' = 620-ft
 Total W length = 1180-ft
 Total steel weight = 236,000#

PROFILE

NOTICE: THIS STRUCTURE HAS NOT BEEN DESIGNED. FOR THE PURPOSES OF ESTIMATING, GENERAL ASSUMPTIONS HAVE BEEN MADE TO PROVIDE A BASIS FOR COSTING



FILE: C:\Users\stark\Documents\Projects\WILLOW\FINC\10.dwg
 PRINT DATE: Mar 26, 2015 - 10:01 am
 USER: stark

REV	DATE	BY	DESCRIPTION

SCALE	1"=10'
WARNING	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE
DESIGNED	W.MOORE
DRAWN	V.BHOSALE
CHECKED	

PRELIMINARY DESIGN PHASE - MARCH 2015
 NOT FOR CONSTRUCTION
 This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.



VILLAGE OF WINNETKA
 510 GREEN BAY ROAD
 WINNETKA, ILLINOIS 60093

WILLOW ROAD STADI PROJECT - CONTRACT XXXX
 CIVIL
 LAKE MICHIGAN OUTFALL
 PLAN AND SECTION

SHEET
 C-10
 10504271



Detailed Cost Estimate Report

Project:	Winnetka Stormwater Tunnel	Project Number:	358815
Estimate Description:	Indirect Costs-STADI	Parent Estimate ID:	6794
Tunnel Name:	Willow Road Stadi	Project Phase:	30%
Construction Activity:	Indirect Costs	Geology Type:	Firm soils
Tunnel Technique:	Open face TBM - Concrete pipe	Estimate Date:	June 25, 2015
Estimate Definition ID:	7077	Tunnel Characteristics ID:	2964

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
Supervision					
Project manager	17,000.00	\$/month	24.00	1.00	408,000
Project superintendent	14,000.00	\$/month	24.00	1.00	336,000
Safety supervisor	13,000.00	\$/month	24.00	0.50	156,000
					\$900,000
Engineering					
Project engineer	13,000.00	\$/month	24.00	1.00	312,000
Office engineer	10,000.00	\$/month	24.00	1.00	240,000
Cost engineer	11,000.00	\$/month	24.00	0.50	132,000
Surveyor	10,500.00	\$/month	24.00	0.50	126,000
Rodman	6,000.00	\$/month	24.00	0.50	72,000
					\$882,000
Office and Clerical					
Secretary	5,000.00	\$/month	24.00	1.00	120,000
					\$120,000
Warehouse and Security					
Drivers	5,000.00	\$/month	24.00	1.00	120,000
Equipment operators	7,000.00	\$/month	24.00	0.50	84,000
					\$204,000
Project Temporary Buildings					
Temp.Bldgs.(Contractor&Engineer)	5,000.00	\$/month	24.00	2.00	240,000
Building services	1,500.00	\$/month	24.00	2.00	72,000
Fuel	500.00	\$/month	24.00	2.00	24,000
Erect and dismantel buildings	10,000.00	\$/Nr	1.00	2.00	20,000
Service installation and removal	10,000.00	\$/Nr	1.00	2.00	20,000
					\$376,000
Vehicles					
Pick-ups	1,500.00	\$/month	24.00	2.00	72,000
Boom truck	2,500.00	\$/month	24.00	1.00	60,000
Yard equipment	2,000.00	\$/month	24.00	1.00	48,000
					\$180,000

Resource Name	Unit Rate	UOM	Unit Quantity	Resource Quantity	Total
General Supplies					
Office equipment	4,000.00	\$/month	24.00	1.00	96,000
Office supplies	500.00	\$/month	24.00	1.00	12,000
Safety and medical supplies	500.00	\$/month	24.00	1.00	12,000
Warehouse supplies	2,000.00	\$/month	24.00	1.00	48,000
					\$168,000
Head Office Support					
Head office support	10,000,000.00	\$/Nr	1.00	0.01	100,000
					\$100,000
Total Estimated Cost:					\$2,930,000



Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

**VILLAGE OF WINNETKA, ILLINOIS
 WILLOW ROAD STADI PROJECT - COST SUMMARY**

		MWH 2015 30% PDR EOPCC	JUNE 2015 INDEPENDENT OPCC	CHANGE
TUNNEL				
1.00	WILLOW ROAD TUNNEL & APPURTENANCES	\$ 28,194,980.00	\$ 37,297,460.00	\$ 9,102,480.00
SITE WORK				
2.00	WOODLAND AVENUE - STA 200+00 to 227+13	\$ 2,809,330.00	\$ 3,879,000.00	\$ 1,069,670.00
3.00	OAK STREET - STA 300+60 to 303+74	\$ 329,190.00	\$ 329,000.00	\$ (190.00)
4.00	POPLAR STREET - STA 311+08 to 323+62	\$ 1,491,500.00	\$ 1,555,000.00	\$ 63,500.00
5.00	ASH STREET - STA 340+70 to 319+72	\$ 458,340.00	\$ 404,000.00	\$ (54,340.00)
6.00	BIRCH STREET - STA 400+91 to 422+90	\$ 2,865,290.00	\$ 3,709,000.00	\$ 843,710.00
7.00	WESTMOORE ROAD - STA 500+76 to 503+10	\$ 233,630.00	\$ 337,000.00	\$ 103,370.00
8.00	LOCUST STREET - STA 510+49 to 549+45	\$ 3,461,820.00	\$ 4,755,000.00	\$ 1,293,180.00
9.00	WINNETKA ROAD - STA 231+60 to 237+50	\$ 713,650.00	\$ 636,000.00	\$ (77,650.00)
10.00	BERKELEY AVENUE - STA 601+00 to 613+00	\$ 3,454,790.00	\$ 2,811,000.00	\$ (643,790.00)
11.00	ASH STREET - STA 620+50 to 627+29	\$ 580,830.00	\$ 851,000.00	\$ 270,170.00
12.00	PINE STREET - STA 700+72 to 703+33	\$ 362,380.00	\$ 502,000.00	\$ 139,620.00
13.00	HIBBARD ROAD - STA 710+30 to 712+55	\$ 1,080,960.00	\$ 1,318,000.00	\$ 237,040.00
	SUBTOTAL SITEWORK	\$ 17,841,710.00	\$ 21,086,000.00	\$ 3,244,290.00
14.00	SITE WORK CONTINGENCY (20% - 20%)	\$ 3,568,000.00	\$ 4,217,000.00	\$ 649,000.00
15.00	TUNNEL CONTINGENCY (10% - 30%)	\$ 2,819,000.00	\$ 11,189,000.00	\$ 8,370,000.00
	TOTAL	\$ 52,423,690.00	\$ 73,789,460.00	\$ 21,365,770.00

This Preliminary Cost Estimate is based on drawings prepared by Montgomery Watson Harza Global titled "Willow Road STADI Project - Contract XXXX - Preliminary Design Submittal" dated April 2015 with no noted revisions. Since V3 Companies of Illinois, Ltd. has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, this Opinion of Probable Construction Cost is made based on V3 Companies of Illinois' best judgment as an experienced and qualified professional contractor, familiar with the Construction industry; however, V3 Companies of Illinois cannot and does not guarantee that proposals, bids or actual Construction Costs will not vary from Opinions of Probable Construction Cost prepared by V3.



WILLOW ROAD TUNNEL & APPURTENANCES

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 37,297,460.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 Pre-construction Survey	1.000	AL	\$ 195,904.00	\$ 195,904.00
1.11 Traffic Control	1.000	AL	\$ 500,011.00	\$ 500,011.00
1.12 Permits & Plans	0.000	LS	"NIC"	NIC
1.13 Erosion Protection	1.000	LS	\$ 18,590.00	\$ 18,590.00
1.14 Mobilization	5.00%		\$ 35,521,390.00	\$ 1,776,069.50
1.15 Site Work	1.000	LS	\$ 456,658.00	\$ 456,658.00
1.16 Control of Water	0.000	LS	NIC	NIC
1.17 Instrumentation	1.000	AL	\$ 129,153.00	\$ 129,153.00
1.18 Demobilization	1.000	LS	\$ 158,245.00	\$ 158,245.00
1.19 Post-construction Survey	1.000	AL	\$ 26,121.00	\$ 26,121.00
SUBTOTAL				\$ 3,260,750.00

2.00 CONSTRUCTION SHAFTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 Willow Road Construction Shaft	1.000	LS	\$ 604,774.00	\$ 604,774.00
2.11 MH-101, TBM Receiving Shaft	42.000	VF	\$ 1,243.84	\$ 52,241.28
2.12 Intermediate Shafts	0.000	EA	INC	INC
2.13 JC-1, Willow Road & Berkeley	43.000	VF	INC	INC
2.14 PCC Curb Removal (10%)	45.000	VF	\$ 6,320.17	\$ 284,407.65
2.15 DS-2, Willow Road & Locust	55.000	VF	\$ 6,320.17	\$ 347,609.35
2.16 DS-3, Willow Road & Birch	42.000	VF	\$ 6,320.17	\$ 265,447.14
2.17 DS-4, Willow Road & Poplar	40.000	VF	\$ 6,320.17	\$ 252,806.80
2.18 DS-5, Willow Road & Woodland	1.000	LS	INC	INC
2.19 Shaft Restoration	1.000	LS	INC	INC
SUBTOTAL				\$ 1,807,290.00

3.00 96" DIAMETER TUNNEL	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 96" Diameter Tunnel	8,500.000	LF	\$ 1,980.93	\$ 16,837,894.38
3.11 TBM Setup	1.000	LS	\$ 418,886.00	INC
3.12 TBM Tunneling	8,500.000	LF	\$ 1,838.28	INC
3.13 TBM Maintenance	1.000	LS	\$ 248,921.00	INC
3.14 Tunnel Cleanup	8,500.000	LF	\$ 64.09	INC
3.15 Retrieve TBM	1.000	LS	\$ 83,267.00	\$ 83,267.00
3.16 96" Diameter Pipe Jacked in Place	8,500.000	LF	\$ 1,331.14	\$ 11,314,730.04
SUBTOTAL				\$ 28,235,951.00

4.00 OUTFALL STRUCTURE	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10 Mobilization	1.000	LS	INC	INC
4.11 Energy Dissipation Toe Block Piling	1.000	LS	INC	INC
4.12 SOE Dissipation Structure	1.000	LS	\$ 2,041,606.00	\$ 2,041,606.00
4.13 SOE Outlet Pipe Structure	1.000	LS	INC	INC
4.14 Backfill Outlet Structure	1.000	LS	INC	INC
4.15 Outfall Structure Concrete	1.000	LS	INC	INC
4.16 Stormwater Treatment System	1.000	LS	\$ 1,551,033.00	\$ 1,551,033.00
4.17 Outfall Structure Mechanical/Electrical	1.000	LS	\$ 250,825.00	\$ 250,825.00
4.18 Outfall Structure Restoration	1.000	LS	\$ 150,003.00	\$ 150,003.00
SUBTOTAL				\$ 3,993,468.00



WOODLAND AVENUE - STA 200+00 to 227+13

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 3,879,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 3,207,000.00	\$ 160,350.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 3,207,000.00	\$ 96,210.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 3,207,000.00	\$ 32,070.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 3,207,000.00	\$ 64,140.00
1.15 Site Sanitary Facilities	4.000	MTH	\$ 650.00	\$ 2,600.00
1.16 Contractors Field Office	4.000	MTH	\$ 3,000.00	\$ 12,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 3,207,000.00	\$ 112,245.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 3,207,000.00	\$ 192,420.00
SUBTOTAL			\$	672,035.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	130.000	LF	\$ 2.25	\$ 292.50
2.12 Demo PCC Roadway 8"	2,435.000	SY	\$ 8.95	\$ 21,793.25
2.13 Bituminous Surface Removal - 3"	2,435.000	SY	\$ 4.15	\$ 10,105.25
2.14 Aggregate Base Course Removal - 4"	265.000	CY	\$ 30.00	\$ 7,950.00
2.15 Aggregate Base Course Removal - 12"	795.000	CY	\$ 30.00	\$ 16,050.00
2.16 PCC Curb Removal	1,930.000	LF	\$ 3.25	\$ 6,272.50
2.20 PIPE INSTALLATION				
2.21 Install 72" RCP Storm Sewer (13' - 16' Dpth)	1,293.000	LF	\$ 550.00	\$ 711,150.00
2.22 Install 60" RCP Storm Sewer (13' - 16' Dpth)	1,330.000	LF	\$ 400.00	\$ 532,000.00
2.23 Storm Manhole Installation	6.000	EACH	\$ 25,000.00	\$ 150,000.00
2.24 Storm Junction Chamber 12' x 12' (14' Dpth)	1.000	EACH	\$ 80,000.00	\$ 80,000.00
2.25 Connect to Existing Deep Drop (+/- 16')	1.000	EACH	\$ 15,000.00	\$ 15,000.00
2.26 Trench Backfill (CA-7)	9,020.000	CY	\$ 54.65	\$ 492,943.00
2.27 Spoil Removal (CCDD)	13,690.000	CY	\$ 35.10	\$ 480,519.00
SUBTOTAL			\$	2,524,075.50

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	4,865.000	SY	\$ 14.25	\$ 69,326.25
3.12 Bituminous Binder Course (2.50")	680.000	TON	\$ 85.00	\$ 57,800.00
3.13 Bituminous Surface Course IL-19, N50 1.50"	405.000	TON	\$ 90.00	\$ 36,450.00
3.14 B6.12 Curb & Gutter	1,930.000	LF	\$ 20.00	\$ 38,600.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 23,000.00	\$ 23,000.00
3.22 Parkway Seed & Blanket	5,830.000	SY	\$ 10.00	\$ 58,300.00
SUBTOTAL			\$	283,476.25



WOODLAND AVENUE - STA 200+00 to 227+13

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 Winnetka, Illinois
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CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 3,879,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Main Replacement (8" dia)	800.000	LF	\$ 150.00	\$ 120,000.00
4.12	Water Service Leads	23.000	EACH	\$ 2,500.00	\$ 57,500.00
4.13	6' Direct Bury Fire Hydrants W/ Aux Valve	2.000	EACH	\$ 5,000.00	\$ 10,000.00
4.14	8" Gate Valve in 48" Dia. Vault	6.000	EACH	\$ 4,500.00	\$ 27,000.00
4.15	Perpendicular Water Crossings	4.000	EACH	\$ 2,000.00	\$ 8,000.00
4.20	STORM SEWER				
4.21	Storm Sewer Replacement (18" dia)	325.000	LF	\$ 60.00	\$ 19,500.00
4.22	Storm Sewer Removal (36" dia)	1,415.000	LF	\$ 75.00	\$ 106,125.00
4.23	SS Manhole 4' Allowance	2.000	EACH	\$ 2,500.00	\$ 5,000.00
4.24	Catch/Inlet Leads	19.000	EACH	\$ 2,000.00	\$ 38,000.00
4.25	Perp. Sanitary & Storm Sewer Crossings	8	EACH	\$ 1,000.00	\$ 8,000.00
SUBTOTAL					\$ 399,125.00



OAK STREET - STA 300+60 to 303+74

Client: Steve Saunders
 Village of Winnetka
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 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 329,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 267,000.00	\$ 13,350.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 267,000.00	\$ 8,010.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 267,000.00	\$ 2,670.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 267,000.00	\$ 5,340.00
1.15 Site Sanitary Facilities	2.000	MTH	\$ 650.00	\$ 1,300.00
1.16 Contractors Field Office	2.000	MTH	\$ 3,000.00	\$ 6,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 267,000.00	\$ 9,345.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 267,000.00	\$ 16,020.00
SUBTOTAL				\$ 62,035.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	300.000	LF	\$ 2.25	\$ 675.00
2.12 Bituminous Surface Removal - 3"	405.000	SY	\$ 4.15	\$ 1,680.75
2.13 Aggregate Base Course Removal - 12"	135.000	CY	\$ 30.00	\$ 4,050.00
2.14 PCC Curb Removal	340.000	LF	\$ 3.25	\$ 1,105.00
2.15 PCC Driveway Apron Removal	220.000	SF	\$ 1.00	\$ 220.00
2.20 PIPE INSTALLATION				
2.22 Install 48" RCP Storm Sewer (8' - 12' Dpth)	288.000	LF	\$ 275.00	\$ 79,200.00
2.23 Storm Manhole Installation	1.000	EACH	\$ 10,000.00	\$ 10,000.00
2.24 High Cap Inlet Installation	2.000	EACH	\$ 6,500.00	\$ 13,000.00
2.25 Trench Backfill (CA-7)	633.000	CY	\$ 54.65	\$ 34,593.45
2.26 Spoil Removal (CCDD)	968.000	CY	\$ 35.10	\$ 33,976.80
SUBTOTAL				\$ 178,501.00

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	405.000	SY	\$ 14.25	\$ 5,771.25
3.12 Bituminous Binder Course (2.50")	55.000	TON	\$ 85.00	\$ 4,675.00
3.13 Bituminous Surface Course IL-19, N50 1.50"	35.000	TON	\$ 90.00	\$ 3,150.00
3.14 B6.12 Curb & Gutter	340.000	LF	\$ 20.00	\$ 6,800.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 7,000.00	\$ 7,000.00
3.22 Parkway Seed & Blanket	640.000	SY	\$ 10.00	\$ 6,400.00
SUBTOTAL				\$ 33,796.25



OAK STREET - STA 300+60 to 303+74

Client: Steve Saunders
Village of Winnetka
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Winnetka, Illinois 60093
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Job Name: Willow Rd STADI
Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 329,000.00

Table with 6 columns: Item Code, Description, Quantity, Unit, Unit Price, Total. Rows include categories like 4.00 UTILITY RELOCATES / REPLACEMENTS, 4.10 WATER MAIN & SERVICES, and 4.20 STORM SEWER.



POPLAR STREET - STA 311+08 to 323+62

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 1,555,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 1,281,000.00	\$ 64,050.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 1,281,000.00	\$ 38,430.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 1,281,000.00	\$ 12,810.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 1,281,000.00	\$ 25,620.00
1.15 Site Sanitary Facilities	3.000	MTH	\$ 650.00	\$ 1,950.00
1.16 Contractors Field Office	3.000	MTH	\$ 3,000.00	\$ 9,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 1,281,000.00	\$ 44,835.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 1,281,000.00	\$ 76,860.00
SUBTOTAL				\$ 273,555.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	1,525.000	LF	\$ 2.25	\$ 3,431.25
2.12 Demo PCC Base Course 8"	1,665.000	SY	\$ 8.95	\$ 14,901.75
2.13 Bituminous Surface Removal - 3"	1,665.000	SY	\$ 4.15	\$ 6,909.75
2.14 Aggregate Base Course Removal - 4"	185.000	CY	\$ 30.00	\$ 5,550.00
2.15 PCC Curb Removal	1,240.000	LF	\$ 3.25	\$ 4,030.00
2.20 PIPE INSTALLATION				
2.21 Install 54" RCP Storm Sewer (13' - 15' Dpth)	1,306.000	LF	\$ 350.00	\$ 457,100.00
2.22 Storm Manhole Installation	3.000	EACH	\$ 15,000.00	\$ 45,000.00
2.23 Storm Junction Chamber 9' x 9' (12' Dpth)	1.000	EACH	\$ 60,000.00	\$ 60,000.00
2.24 Connect to Existing Deep Drop (+/- 16')	1.000	EACH	\$ 15,000.00	\$ 15,000.00
2.25 Trench Backfill (CA-7)	4,596.000	CY	\$ 54.65	\$ 251,171.40
2.26 Spoil Removal (CCDD)	6,395.000	CY	\$ 35.10	\$ 224,464.50
SUBTOTAL				\$ 1,087,558.65

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	1,665.000	SY	\$ 14.25	\$ 23,726.25
3.12 Bituminous Binder Course (2.50")	235.000	TON	\$ 85.00	\$ 19,975.00
3.13 Bituminous Surface Course IL-19, N50 1.50"	140.000	TON	\$ 90.00	\$ 12,600.00
3.14 B6.12 Curb & Gutter	1,240.000	LF	\$ 20.00	\$ 24,800.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 1,000.00	\$ 1,000.00
3.22 Parkway Seed & Blanket	2,900.000	SY	\$ 10.00	\$ 29,000.00
SUBTOTAL				\$ 111,101.25



POPLAR STREET - STA 311+08 to 323+62

Client: Steve Saunders
Village of Winnetka
510 Greenbay Road
Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 1,555,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Main Replacement (8" dia)	100.000	LF	\$ 150.00	\$ 15,000.00
4.12	Water Service Leads	1.000	EACH	\$ 2,500.00	\$ 2,500.00
4.13	Perpendicular Water Crossings	3.000	EACH	\$ 2,000.00	\$ 6,000.00
4.20	STORM SEWER				
4.21	Storm Sewer Replacement (36" dia)	85.000	LF	\$ 125.00	\$ 10,625.00
4.22	SS Manhole 4' Allowance	3.000	EACH	\$ 4,696.00	\$ 14,088.00
4.23	SD Manhole 4' Allowance	3.000	EACH	\$ 3,745.00	\$ 11,235.00
4.24	Catch/Inlet Leads	7.000	EACH	\$ 2,000.00	\$ 14,000.00
4.25	Perp. Sanitary & Storm Sewer Crossings	9	EACH	\$ 1,000.00	\$ 9,000.00
SUBTOTAL					\$ 82,448.00



ASH STREET - STA 340+70 to 319+72

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 404,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 329,000.00	\$ 16,450.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 329,000.00	\$ 9,870.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 329,000.00	\$ 3,290.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 329,000.00	\$ 6,580.00
1.15 Site Sanitary Facilities	2.000	MTH	\$ 650.00	\$ 1,300.00
1.16 Contractors Field Office	2.000	MTH	\$ 3,000.00	\$ 6,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 329,000.00	\$ 11,515.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 329,000.00	\$ 19,740.00
SUBTOTAL				\$ 74,745.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	250.000	LF	\$ 2.25	\$ 562.50
2.12 Demo PCC Base Course 8"	105.000	SY	\$ 8.95	\$ 939.75
2.13 Bituminous Surface Removal - 3"	105.000	SY	\$ 4.15	\$ 435.75
2.14 Aggregate Base Course Removal - 4"	12.000	CY	\$ 30.00	\$ 360.00
2.15 PCC Curb Removal	200.000	LF	\$ 3.25	\$ 650.00
2.20 PIPE INSTALLATION				
2.21 Install 48" RCP Storm Sewer (13' - 16' Dpth)	467.000	LF	\$ 275.00	\$ 128,425.00
2.22 Install 24" RCP Storm Sewer (5' - 7' Dpth)	80.000	LF	\$ 75.00	\$ 6,000.00
2.23 Storm Manhole Installation	2.000	EACH	\$ 10,000.00	\$ 20,000.00
2.24 High Cap Inlet Installation	2.000	EACH	\$ 6,500.00	\$ 13,000.00
2.25 Trench Backfill (CA-7)	390.000	CY	\$ 54.65	\$ 21,313.50
2.26 Spoil Removal (CCDD)	1,800.000	CY	\$ 35.10	\$ 63,180.00
SUBTOTAL				\$ 254,866.50

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	50.000	SY	\$ 14.25	\$ 712.50
3.12 Bituminous Binder Course (2.50")	7.000	TON	\$ 350.00	\$ 2,450.00
3.13 Bituminous Surface Course IL-19, N50 1.50"	4.000	TON	\$ 425.00	\$ 1,700.00
3.14 B6.12 Curb & Gutter	200.000	LF	\$ 20.00	\$ 4,000.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 6,000.00	\$ 6,000.00
3.22 Parkway Seed & Blanket	1,215.000	SY	\$ 10.00	\$ 12,150.00
SUBTOTAL				\$ 27,012.50



ASH STREET - STA 340+70 to 319+72

Client: Steve Saunders
Village of Winnetka
510 Greenbay Road
Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 404,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Service Leads	6.000	EACH	\$ 2,500.00	\$ 15,000.00
4.12	6' Direct Bury Fire Hydrants W/ Aux Valve	1.000	EACH	\$ 5,000.00	\$ 5,000.00
4.13	8" Gate Valve in 48" Dia. Vault	1.000	EACH	\$ 4,500.00	\$ 4,500.00
4.14	Perpendicular Water Crossings	2.000	EACH	\$ 2,000.00	\$ 4,000.00
4.20	STORM SEWER				
4.21	SS Manhole 4' Allowance	2.000	EACH	\$ 2,500.00	\$ 5,000.00
4.22	Catch/Inlet Leads	4.000	EACH	\$ 2,000.00	\$ 8,000.00
4.23	Perp. Sanitary & Storm Sewer Crossings	6	EACH	\$ 1,000.00	\$ 6,000.00
SUBTOTAL					\$ 47,500.00



BIRCH STREET - STA 400+91 to 422+90

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 3,709,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 3,066,000.00	\$ 153,300.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 3,066,000.00	\$ 91,980.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 3,066,000.00	\$ 30,660.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 3,066,000.00	\$ 61,320.00
1.15 Site Sanitary Facilities	4.000	MTH	\$ 650.00	\$ 2,600.00
1.16 Contractors Field Office	4.000	MTH	\$ 3,000.00	\$ 12,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 3,066,000.00	\$ 107,310.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 3,066,000.00	\$ 183,960.00
SUBTOTAL				\$ 643,130.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	700.000	LF	\$ 2.25	\$ 1,575.00
2.12 Bituminous Surface Removal - 3"	5,225.000	SY	\$ 4.15	\$ 21,683.75
2.13 Aggregate Base Course Removal - 4"	575.000	CY	\$ 30.00	\$ 17,250.00
2.14 PCC Curb Removal	2,286.000	LF	\$ 3.25	\$ 7,429.50
2.20 PIPE INSTALLATION				
2.21 Install 60" RCP Storm Sewer (12' - 25' Dpth)	2,286.000	LF	\$ 450.00	\$ 1,028,700.00
2.22 Storm Manhole Installation	8.000	EACH	\$ 25,000.00	\$ 200,000.00
2.23 High Cap Inlet Installation	4.000	EACH	\$ 6,500.00	\$ 26,000.00
2.24 Connect to Existing Deep Drop (+/- 25')	1.000	EACH	\$ 25,000.00	\$ 25,000.00
2.25 Trench Backfill (CA-7)	9,325.000	CY	\$ 54.65	\$ 509,611.25
2.26 Spoil Removal (CCDD)	12,994.000	CY	\$ 35.10	\$ 456,089.40
SUBTOTAL				\$ 2,293,338.90

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	5,227.000	SY	\$ 14.25	\$ 74,484.75
3.12 Bituminous Binder Course (4.00")	1,170.000	TON	\$ 85.00	\$ 99,450.00
3.13 Bituminous Surface Course IL-19, N50 2.00"	585.000	TON	\$ 90.00	\$ 52,650.00
3.14 B6.12 Curb & Gutter	2,286.000	LF	\$ 20.00	\$ 45,720.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 23,000.00	\$ 23,000.00
3.22 Parkway Seed & Blanket	5,080.000	SY	\$ 10.00	\$ 50,800.00
SUBTOTAL				\$ 346,104.75



BIRCH STREET - STA 400+91 to 422+90

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL	\$ 3,709,000.00
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4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Main Replacement (8" dia)	1,070.000	LF	\$ 150.00	\$ 160,500.00
4.12	Water Service Leads	23.000	EACH	\$ 2,500.00	\$ 57,500.00
4.13	6' Direct Bury Fire Hydrants W/ Aux Valve	2.000	EACH	\$ 5,000.00	\$ 10,000.00
4.14	8" Gate Valve in 48" Dia. Vault	2.000	EACH	\$ 4,500.00	\$ 9,000.00
4.15	Perpendicular Water Crossings	4.000	EACH	\$ 1,500.00	\$ 6,000.00
4.20	STORM & SANITARY SEWER				
4.21	Storm Sewer Replacement (18" RCP)	270.000	LF	\$ 60.00	\$ 16,200.00
4.22	Storm Sewer Replacement (30" RCP)	16.000	LF	\$ 100.00	\$ 1,600.00
4.23	Storm Sewer Replacement (36" RCP)	225.000	LF	\$ 125.00	\$ 28,125.00
4.24	Sanitary Sewer Replacement (8" Dia.)	280.000	LF	\$ 150.00	\$ 42,000.00
4.25	SS Manhole 4' Allowance	5.000	EACH	\$ 4,696.00	\$ 23,480.00
4.26	SD Manhole 4' Allowance	7.000	EACH	\$ 3,745.00	\$ 26,215.00
4.27	Catch/Inlet Leads	19.000	EACH	\$ 2,000.00	\$ 38,000.00
4.28	Perp. Sanitary & Storm Sewer Crossings	8	EACH	\$ 1,000.00	\$ 8,000.00
SUBTOTAL					\$ 426,620.00



WESTMOORE ROAD - STA 500+76 to 503+10

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 337,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 274,000.00	\$ 13,700.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 274,000.00	\$ 8,220.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 274,000.00	\$ 2,740.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 274,000.00	\$ 5,480.00
1.15 Site Sanitary Facilities	2.000	MTH	\$ 650.00	\$ 1,300.00
1.16 Contractors Field Office	2.000	MTH	\$ 3,000.00	\$ 6,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 274,000.00	\$ 9,590.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 274,000.00	\$ 16,440.00
SUBTOTAL				\$ 63,470.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	258.000	LF	\$ 2.25	\$ 580.50
2.13 Bituminous Surface Removal - 3"	333.000	SY	\$ 4.15	\$ 1,381.95
2.14 Aggregate Base Course Removal - 4"	36.000	CY	\$ 30.00	\$ 1,080.00
2.15 PCC Curb Removal	250.000	LF	\$ 3.25	\$ 812.50
2.20 PIPE INSTALLATION				
2.21 Install 48" RCP Storm Sewer (13' - 15' Dpth)	258.000	LF	\$ 275.00	\$ 70,950.00
2.22 Storm Manhole Installation	2.000	EACH	\$ 10,000.00	\$ 20,000.00
2.23 High Cap Inlet Installation	2.000	EACH	\$ 6,500.00	\$ 13,000.00
2.24 Trench Backfill (CA-7)	908.000	CY	\$ 54.65	\$ 49,622.20
2.25 Spoil Removal (CCDD)	1,198.000	CY	\$ 35.10	\$ 42,049.80
SUBTOTAL				\$ 199,476.95

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	333.000	SY	\$ 14.25	\$ 4,745.25
3.12 Bituminous Binder Course (4.00")	75.000	TON	\$ 85.00	\$ 6,375.00
3.13 Bituminous Surface Course IL-19, N50 2.00"	37.000	TON	\$ 90.00	\$ 3,330.00
3.14 B6.12 Curb & Gutter	250.000	LF	\$ 20.00	\$ 5,000.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 3,000.00	\$ 3,000.00
3.22 Parkway Seed & Blanket	575.000	SY	\$ 10.00	\$ 5,750.00
SUBTOTAL				\$ 28,200.25



WESTMOORE ROAD - STA 500+76 to 503+10

Client: Steve Saunders
Village of Winnetka
510 Greenbay Road
Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 337,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Service Leads	3.000	EACH	\$ 2,500.00	\$ 7,500.00
4.12	8" Gate Valve in 48" Dia. Vault	2.000	EACH	\$ 4,500.00	\$ 9,000.00
4.20	STORM SEWER				
4.21	Storm Sewer Replacement (18" dia)	20.000	LF	\$ 60.00	\$ 1,200.00
4.22	Storm Sewer Removal (36" dia)	10.000	LF	\$ 75.00	\$ 750.00
4.23	Sanitary Sewer Replacement (8" Dia.)	120.000	LF	\$ 150.00	\$ 18,000.00
4.24	SD Manhole 4' Allowance	1.000	EACH	\$ 2,500.00	\$ 2,500.00
4.25	Catch/Inlet Leads	3.000	EACH	\$ 2,000.00	\$ 6,000.00
4.26	Perp. Sanitary & Storm Sewer Crossings	1	EACH	\$ 1,000.00	\$ 1,000.00
SUBTOTAL					\$ 45,950.00



LOCUST STREET - STA 510+49 to 549+45

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 4,755,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 3,934,000.00	\$ 196,700.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 3,934,000.00	\$ 118,020.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 3,934,000.00	\$ 39,340.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 3,934,000.00	\$ 78,680.00
1.15 Site Sanitary Facilities	4.000	MTH	\$ 650.00	\$ 2,600.00
1.16 Contractors Field Office	4.000	MTH	\$ 3,000.00	\$ 12,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 3,934,000.00	\$ 137,690.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 3,934,000.00	\$ 236,040.00
SUBTOTAL				\$ 821,070.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	3,959.000	LF	\$ 2.25	\$ 8,907.75
2.13 Bituminous Surface Removal - 3"	5,915.000	SY	\$ 4.15	\$ 24,547.25
2.14 Aggregate Base Course Removal - 4"	650.000	CY	\$ 30.00	\$ 19,500.00
2.15 PCC Curb Removal	4,945.000	LF	\$ 3.25	\$ 16,071.25
2.20 PIPE INSTALLATION				
2.21 Install 72" RCP Storm Sewer (13' - 16' Dpth)	1,339.000	LF	\$ 550.00	\$ 736,450.00
2.22 Install 48" RCP Storm Sewer (15' - 18' Dpth)	2,620.000	LF	\$ 275.00	\$ 720,500.00
2.23 High Cap Inlet Installation	6.000	EACH	\$ 6,500.00	\$ 39,000.00
2.24 Storm Manhole Installation	9.000	EACH	\$ 9,500.00	\$ 85,500.00
2.25 Connect to Existing Deep Drop (+/- 13')	1.000	EACH	\$ 5,000.00	\$ 5,000.00
2.26 Trench Backfill (CA-7)	13,925.000	CY	\$ 54.65	\$ 761,001.25
2.27 Spoil Removal (CCDD)	19,695.000	CY	\$ 35.10	\$ 691,294.50
SUBTOTAL				\$ 3,107,772.00

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	5,915.000	SY	\$ 14.25	\$ 84,288.75
3.12 Bituminous Binder Course (4.00")	1,325.000	TON	\$ 85.00	\$ 112,625.00
3.13 Bituminous Surface Course IL-19, N50 2.00"	660.000	TON	\$ 90.00	\$ 59,400.00
3.14 B6.12 Curb & Gutter	4,945.000	LF	\$ 20.00	\$ 98,900.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 10,000.00	\$ 10,000.00
3.22 Parkway Seed & Blanket	8,800.000	SY	\$ 10.00	\$ 88,000.00
SUBTOTAL				\$ 453,213.75



LOCUST STREET - STA 510+49 to 549+45

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL	\$ 4,755,000.00
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4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Main Replacement (8" dia)	450.000	LF	\$ 150.00	\$ 67,500.00
4.12	Water Service Leads	10.000	EACH	\$ 2,500.00	\$ 25,000.00
4.13	6' Direct Bury Fire Hydrants W/ Aux Valve	2.000	EACH	\$ 5,000.00	\$ 10,000.00
4.14	8" Gate Valve in 48" Dia. Vault	4.000	EACH	\$ 4,500.00	\$ 18,000.00
4.15	Perpendicular Water Crossings	11.000	EACH	\$ 2,000.00	\$ 22,000.00
4.20	STORM SEWER				
4.21	Storm Sewer Replacement (18" dia)	680.000	LF	\$ 60.00	\$ 40,800.00
4.22	Storm Sewer Reopacement (36" dia)	170.000	LF	\$ 125.00	\$ 21,250.00
4.23	Sanitary Sewer Replacement (8" Dia.)	670.000	LF	\$ 150.00	\$ 100,500.00
4.24	SS Manhole 4' Allowance	3.000	EACH	\$ 4,696.00	\$ 14,088.00
4.25	SD Manhole 4' Allowance	5.000	EACH	\$ 3,745.00	\$ 18,725.00
4.26	Catch/Inlet Leads	11.000	EACH	\$ 2,000.00	\$ 22,000.00
4.27	Perp. Sanitary & Storm Sewer Crossings	13.000	EACH	\$ 1,000.00	\$ 13,000.00
SUBTOTAL					\$ 372,863.00



WINNETKA ROAD - STA 231+60 to 237+50

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 636,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 522,000.00	\$ 26,100.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 522,000.00	\$ 15,660.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 522,000.00	\$ 5,220.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 522,000.00	\$ 10,440.00
1.15 Site Sanitary Facilities	2.000	MTH	\$ 650.00	\$ 1,300.00
1.16 Contractors Field Office	2.000	MTH	\$ 3,000.00	\$ 6,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 522,000.00	\$ 18,270.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 522,000.00	\$ 31,320.00
SUBTOTAL				\$ 114,310.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	585.000	LF	\$ 2.25	\$ 1,316.25
2.12 Demo PCC Base Course 8"	485.000	SY	\$ 8.95	\$ 4,340.75
2.13 Bituminous Surface Removal - 3"	485.000	SY	\$ 4.15	\$ 2,012.75
2.14 Aggregate Base Course Removal - 4"	53.000	CY	\$ 30.00	\$ 1,590.00
2.15 PCC Curb Removal	585.000	LF	\$ 3.25	\$ 1,901.25
2.20 PIPE INSTALLATION				
2.21 Install 36" RCP Storm Sewer (6'- 10' Dpth)	170.000	LF	\$ 125.00	\$ 21,250.00
2.22 Install 60" RCP Storm Sewer (13' - 15' Dpth)	521.000	LF	\$ 400.00	\$ 208,400.00
2.23 Storm Manhole Installation	3.000	EACH	\$ 15,000.00	\$ 45,000.00
2.24 High Cap Inlet Installation	2.000	EACH	\$ 6,500.00	\$ 13,000.00
2.25 Trench Backfill (CA-7)	832.000	CY	\$ 54.65	\$ 45,468.80
2.26 Spoil Removal (CCDD)	1,305.000	CY	\$ 35.10	\$ 45,805.50
SUBTOTAL				\$ 390,085.30

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	485.000	SY	\$ 14.25	\$ 6,911.25
3.12 Bituminous Binder Course (2.50")	68.000	TON	\$ 85.00	\$ 5,780.00
3.13 Bituminous Surface Course IL-19, N50 1.50"	40.000	TON	\$ 90.00	\$ 3,600.00
3.14 B6.12 Curb & Gutter	585.000	LF	\$ 20.00	\$ 11,700.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 4,000.00	\$ 4,000.00
3.22 Parkway Seed & Blanket	1,535.000	SY	\$ 10.00	\$ 15,350.00
SUBTOTAL				\$ 47,341.25



WINNETKA ROAD - STA 231+60 to 237+50

Client: Steve Saunders
Village of Winnetka
510 Greenbay Road
Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 636,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Main Replacement (8" dia)	50.000	LF	\$ 150.00	\$ 7,500.00
4.12	Water Service Leads	4.000	EACH	\$ 2,500.00	\$ 10,000.00
4.13	Perpendicular Water Crossings	6.000	EACH	\$ 2,000.00	\$ 12,000.00
4.20	STORM SEWER				
4.21	Storm Sewer Replacement (18" dia)	480.000	LF	\$ 60.00	\$ 28,800.00
4.22	Storm Sewer Removal (36" dia)	120.000	LF	\$ 75.00	\$ 9,000.00
4.23	SS Manhole 4' Allowance	2.000	EACH	\$ 2,500.00	\$ 5,000.00
4.24	Catch/Inlet Leads	4.000	EACH	\$ 2,000.00	\$ 8,000.00
4.25	Perp. Sanitary & Storm Sewer Crossings	4	EACH	\$ 1,000.00	\$ 4,000.00
SUBTOTAL					\$ 84,300.00



BERKELEY AVENUE - STA 601+00 to 613+00

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 2,811,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 2,321,000.00	\$ 116,050.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 2,321,000.00	\$ 69,630.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 2,321,000.00	\$ 23,210.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 2,321,000.00	\$ 46,420.00
1.15 Site Sanitary Facilities	4.000	MTH	\$ 650.00	\$ 2,600.00
1.16 Contractors Field Office	4.000	MTH	\$ 3,000.00	\$ 12,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 2,321,000.00	\$ 81,235.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 2,321,000.00	\$ 139,260.00
SUBTOTAL				\$ 490,405.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	700.000	LF	\$ 2.25	\$ 1,575.00
2.12 Bituminous Surface Removal - 3"	2,960.000	SY	\$ 4.15	\$ 12,284.00
2.13 Aggregate Base Course Removal - 4"	325.000	CY	\$ 30.00	\$ 9,750.00
2.14 PCC Curb Removal	2,562.000	LF	\$ 3.25	\$ 8,326.50
2.20 PIPE INSTALLATION				
2.21 Install 96" RCP Storm Sewer (14' - 16' Dpth)	441.000	LF	\$ 1,100.00	\$ 485,100.00
2.22 Install 84" RCP Storm Sewer (12' - 14' Dpth)	890.000	LF	\$ 700.00	\$ 623,000.00
2.23 Storm Manhole Installation	6.000	EACH	\$ 50,000.00	\$ 300,000.00
2.24 Connect to Existing Deep Drop (+/- 16')	1.000	EACH	\$ 20,000.00	\$ 20,000.00
2.25 Trench Backfill (CA-7)	3,706.000	CY	\$ 54.65	\$ 202,532.90
2.26 Spoil Removal (CCDD)	11,125.000	CY	\$ 35.10	\$ 390,487.50
SUBTOTAL				\$ 2,053,055.90

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	2,960.000	SY	\$ 14.25	\$ 42,180.00
3.12 Bituminous Binder Course (2.50")	415.000	TON	\$ 85.00	\$ 35,275.00
3.13 Bituminous Surface Course IL-19, N50 1.50"	225.000	TON	\$ 90.00	\$ 20,250.00
3.14 B6.12 Curb & Gutter	2,562.000	LF	\$ 20.00	\$ 51,240.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 10,000.00	\$ 10,000.00
3.22 Parkway Seed & Blanket	2,960.000	SY	\$ 10.00	\$ 29,600.00
SUBTOTAL				\$ 188,545.00



BERKELEY AVENUE - STA 601+00 to 613+00

Client: Steve Saunders
Village of Winnetka
510 Greenbay Road
Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 2,811,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Main Replacement (8" dia)	95.000	LF	\$ 150.00	\$ 14,250.00
4.12	Water Service Leads	10.000	EACH	\$ 2,500.00	\$ 25,000.00
4.13	Perpendicular Water Crossings	6.000	EACH	\$ 2,000.00	\$ 12,000.00
4.20	STORM SEWER				
4.21	Catch/Inlet Leads	10.000	EACH	\$ 2,000.00	\$ 20,000.00
4.22	Perp. Sanitary & Storm Sewer Crossings	8	EACH	\$ 1,000.00	\$ 8,000.00
SUBTOTAL					\$ 79,250.00



ASH STREET - STA 620+50 to 627+29

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL	\$	851,000.00
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1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 700,000.00	\$ 35,000.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 700,000.00	\$ 21,000.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 700,000.00	\$ 7,000.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 700,000.00	\$ 14,000.00
1.15 Site Sanitary Facilities	2.000	MTH	\$ 650.00	\$ 1,300.00
1.16 Contractors Field Office	2.000	MTH	\$ 3,000.00	\$ 6,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 700,000.00	\$ 24,500.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 700,000.00	\$ 42,000.00
SUBTOTAL				\$ 150,800.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	680.000	LF	\$ 2.25	\$ 1,530.00
2.12 Bituminous Surface Removal - 3"	1,800.000	SY	\$ 4.15	\$ 7,470.00
2.13 Aggregate Base Course Removal - 4"	198.000	CY	\$ 30.00	\$ 5,940.00
2.14 PCC Curb Removal	1,360.000	LF	\$ 3.25	\$ 4,420.00
2.20 PIPE INSTALLATION				
2.21 Install 24" RCP Storm Sewer (6' - 8' Dpth)	30.000	LF	\$ 100.00	\$ 3,000.00
2.22 Install 48" RCP Storm Sewer (13' - 16' Dpth)	680.000	LF	\$ 275.00	\$ 187,000.00
2.23 Storm Manhole Installation	3.000	EACH	\$ 10,000.00	\$ 30,000.00
2.24 High Cap Inlet Installation	2.000	EACH	\$ 6,500.00	\$ 13,000.00
2.25 Connect to Existing SMH (+/- 10')	1.000	EACH	\$ 6,500.00	\$ 6,500.00
2.26 Trench Backfill (CA-7)	1,136.000	CY	\$ 54.65	\$ 62,082.40
2.27 Spoil Removal (CCDD)	1,906.000	CY	\$ 35.10	\$ 66,900.60
SUBTOTAL				\$ 387,843.00

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	1,800.000	SY	\$ 14.25	\$ 25,650.00
3.12 Bituminous Binder Course (4.00")	405.000	TON	\$ 85.00	\$ 34,425.00
3.13 Bituminous Surface Course IL-19, N50 2.00"	202.000	TON	\$ 90.00	\$ 18,180.00
3.14 B6.12 Curb & Gutter	1,360.000	LF	\$ 20.00	\$ 27,200.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 13,000.00	\$ 13,000.00
3.22 Parkway Seed & Blanket	1,510.000	SY	\$ 10.00	\$ 15,100.00
SUBTOTAL				\$ 133,555.00



ASH STREET - STA 620+50 to 627+29

Client: Steve Saunders
Village of Winnetka
510 Greenbay Road
Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 851,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Main Replacement (8" dia)	710.000	LF	\$ 150.00	\$ 106,500.00
4.12	Water Service Leads	13.000	EACH	\$ 2,500.00	\$ 32,500.00
4.13	6' Direct Bury Fire Hydrants W/ Aux Valve	2.000	EACH	\$ 5,000.00	\$ 10,000.00
4.14	8" Gate Valve in 48" Dia. Vault	2.000	EACH	\$ 4,500.00	\$ 9,000.00
4.15	Perpendicular Water Crossings	1.000	EACH	\$ 2,000.00	\$ 2,000.00
4.20	STORM SEWER				
4.21	SS Manhole 4' Allowance	2.000	EACH	\$ 2,500.00	\$ 5,000.00
4.22	Catch/Inlet Leads	6.000	EACH	\$ 2,000.00	\$ 12,000.00
4.23	Perp. Sanitary & Storm Sewer Crossings	2	EACH	\$ 1,000.00	\$ 2,000.00
SUBTOTAL					\$ 179,000.00



PINE STREET - STA 700+72 to 703+33

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL	\$	502,000.00
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1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 411,000.00	\$ 20,550.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 411,000.00	\$ 12,330.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 411,000.00	\$ 4,110.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 411,000.00	\$ 8,220.00
1.15 Site Sanitary Facilities	2.000	MTH	\$ 650.00	\$ 1,300.00
1.16 Contractors Field Office	2.000	MTH	\$ 3,000.00	\$ 6,000.00
1.20 GENERAL CONDITIONS - SOFT COST				
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 411,000.00	\$ 14,385.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 411,000.00	\$ 24,660.00
SUBTOTAL				\$ 91,555.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	200.000	LF	\$ 2.25	\$ 450.00
2.12 Bituminous Surface Removal - 3"	635.000	SY	\$ 4.15	\$ 2,635.25
2.13 Aggregate Base Course Removal - 4"	70.000	CY	\$ 30.00	\$ 2,100.00
2.14 PCC Curb Removal	620.000	LF	\$ 3.25	\$ 2,015.00
2.20 PIPE INSTALLATION				
2.21 Install 30" RCP Storm Sewer (6' - 8' Dpth)	40.000	LF	\$ 115.00	\$ 4,600.00
2.22 Install 36" RCP Storm Sewer (6' - 8' Dpth)	16.000	LF	\$ 125.00	\$ 2,000.00
2.23 Install 72" RCP Storm Sewer (13' - 16' Dpth)	270.000	LF	\$ 550.00	\$ 148,500.00
2.24 Storm Manhole Installation	2.000	EACH	\$ 25,000.00	\$ 50,000.00
2.25 High Cap Inlet Installation	2.000	EACH	\$ 6,500.00	\$ 13,000.00
2.26 Trench Backfill (CA-7)	562.000	CY	\$ 54.65	\$ 30,713.30
2.27 Spoil Removal (CCDD)	1,200.000	CY	\$ 35.10	\$ 42,120.00
SUBTOTAL				\$ 298,133.55

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	635.000	SY	\$ 14.25	\$ 9,048.75
3.12 Bituminous Binder Course (2.50")	90.000	TON	\$ 85.00	\$ 7,650.00
3.13 Bituminous Surface Course IL-19, N50 1.50"	54.000	TON	\$ 90.00	\$ 4,860.00
3.14 B6.12 Curb & Gutter	620.000	LF	\$ 20.00	\$ 12,400.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 3,000.00	\$ 3,000.00
3.22 Parkway Seed & Blanket	600.000	SY	\$ 10.00	\$ 6,000.00
SUBTOTAL				\$ 42,958.75



PINE STREET - STA 700+72 to 703+33

Client: Steve Saunders
Village of Winnetka
510 Greenbay Road
Winnetka, Illinois 60093

Phone: 847-501-6000

Email:

Job Name: Willow Rd STADI
Winnetka, Illinois

Date of Plans: April 2015

Revision Date: None Noted

Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 502,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Service Leads	3.000	EACH	\$ 2,500.00	\$ 7,500.00
4.20	STORM SEWER				
4.21	SS Manhole 4' Allowance	1.000	EACH	\$ 2,500.00	\$ 2,500.00
4.22	Sanitary Sewer Replacement (8" Dia.)	350.000	LF	\$ 150.00	\$ 52,500.00
4.23	Catch/Inlet Leads	3.000	EACH	\$ 2,000.00	\$ 6,000.00
4.24	Perp. Sanitary & Storm Sewer Crossings	1.000	EACH	\$ 1,000.00	\$ 1,000.00
SUBTOTAL					\$ 69,500.00



HIBBARD ROAD - STA 710+30 to 712+55

Client: Steve Saunders
 Village of Winnetka
 510 Greenbay Road
 Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
 Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 1,318,000.00

1.00 MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10 GENERAL CONDITIONS - HARD COST				
1.11 Mobilization Allowance (5% Hard Costs)	5.00%	LSUM	\$ 1,082,000.00	\$ 54,100.00
1.12 Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LSUM	\$ 1,082,000.00	\$ 32,460.00
1.13 Traffic Control - Signage Detours Etc.	1.00%	LSUM	\$ 1,082,000.00	\$ 10,820.00
1.14 Traffic Control - Flagging	2.00%	LSUM	\$ 1,082,000.00	\$ 21,640.00
1.15 Site Sanitary Facilities	4.000	MTH	\$ 650.00	\$ 2,600.00
1.16 Contractors Field Office	4.000	MTH	\$ 3,000.00	\$ 12,000.00
1.20 GENERAL CONDITIONS - SOFT COST	4.000			
1.21 Insurance & Bonds (3.5% Hard Costs)	3.50%	LSUM	\$ 1,082,000.00	\$ 37,870.00
1.22 GC Overhead / Mngment (6% Hard Costs)	6.00%	LSUM	\$ 1,082,000.00	\$ 64,920.00
SUBTOTAL				\$ 236,410.00

2.00 PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10 DEMOLITION				
2.11 Pavement Sawcutting	250.000	LF	\$ 2.25	\$ 562.50
2.13 Bituminous Surface Removal - 3"	735.000	SY	\$ 4.15	\$ 3,050.25
2.14 Aggregate Base Course Removal - 4"	80.000	CY	\$ 30.00	\$ 2,400.00
2.15 PCC Curb Removal	500.000	LF	\$ 3.25	\$ 1,625.00
2.20 PIPE INSTALLATION				
2.21 Install 72" RCP Storm Sewer (13' - 16' Dpth)	898.000	LF	\$ 550.00	\$ 493,900.00
2.23 Storm Manhole Installation	3.000	EACH	\$ 25,000.00	\$ 75,000.00
2.25 Connect to Existing Manhole (+/- 12')	2.000	EACH	\$ 15,000.00	\$ 30,000.00
2.26 Trench Backfill (CA-7)	1,974.000	CY	\$ 54.65	\$ 107,879.10
2.27 Spoil Removal (CCDD)	3,981.000	CY	\$ 35.10	\$ 139,733.10
SUBTOTAL				\$ 854,149.95

3.00 SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10 ROADWAY PAVING & CONCRETE				
3.11 Aggregate Base Installation (12" CA-6)	735.000	SY	\$ 14.25	\$ 10,473.75
3.12 Bituminous Binder Course (2.50")	105.000	TON	\$ 85.00	\$ 8,925.00
3.13 Bituminous Surface Course IL-19, N50 1.50"	60.000	TON	\$ 90.00	\$ 5,400.00
3.14 B6.12 Curb & Gutter	500.000	LF	\$ 20.00	\$ 10,000.00
3.20 ROW RESTORATION				
3.21 Driveway Replacement Allowance	1.000	LSUM	\$ 5,000.00	\$ 5,000.00
3.22 Parkway Seed & Blanket	1,995.000	SY	\$ 20.00	\$ 39,900.00
SUBTOTAL				\$ 79,698.75



HIBBARD ROAD - STA 710+30 to 712+55

Client: Steve Saunders
Village of Winnetka
510 Greenbay Road
Winnetka, Illinois 60093
Phone: 847-501-6000
Email:

Job Name: Willow Rd STADI
Winnetka, Illinois
Date of Plans: April 2015
Revision Date: None Noted
Date of Estimate: 6/26/2015

CONCEPTUAL OPINION OF PROBABLE CONSTRUCTION COSTS

SECTION TOTAL \$ 1,318,000.00

4.00	UTILITY RELOCATES / REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10	WATER MAIN & SERVICES				
4.11	Water Main Replacement (8" dia)	525.000	LF	\$ 150.00	\$ 78,750.00
4.12	Water Service Leads	5.000	EACH	\$ 2,500.00	\$ 12,500.00
4.13	6' Direct Bury Fire Hydrants W/ Aux Valve	2.000	EACH	\$ 5,000.00	\$ 10,000.00
4.14	8" Gate Valve in 48" Dia. Vault	3.000	EACH	\$ 4,500.00	\$ 13,500.00
4.20	STORM SEWER				
4.21	Storm Sewer Replacement (18" dia)	495.000	LF	\$ 60.00	\$ 29,700.00
4.22	Storm Sewer Removal (36" dia)	10.000	LF	\$ 75.00	\$ 750.00
4.25	Perp. Sanitary & Storm Sewer Crossings	3	EACH	\$ 1,000.00	\$ 3,000.00
SUBTOTAL					\$ 148,200.00

ATTACHMENT #2
Project Technical Review Memo



**WILLOW ROAD STADI
TECHNICAL REVIEW MEMORANDUM**

Winnetka, Illinois

V3 Project No. 15121

August 21, 2015

This technical memo presents the findings of a cursory review of the October 2011 CBBEL Village of Winnetka Flood Risk Reduction Assessment (FRRA) concept report and the April 2015 MWH Willow Road Stormwater Tunnel and Area Drainage Improvements (STADI) Preliminary Design Report. V3 and Hatch Mott MacDonald paid specific attention to the stormwater design and tunneling design aspects respectively. The following comments make up the technical review components of Task 1 of the Independent Cost Review and Value Engineering for the Willow Road STADI project.

Stormwater Design

The purpose of this section is evaluation of the hydrologic and hydraulic aspects of concept and preliminary design elements. A comprehensive evaluation was not considered within the scope of this memo and consequently a detailed analysis of the underlying computer models was not performed by V3 as part of Task 1 of this project.

The selected alternative from the CBBEL FRRA concept report consisting of a deep 8-foot diameter relief sewer along Willow Road with laterals extending north and south to locations of known flood damage. MWH determined this preferred alternative a feasible solution and thus refined in the STADI PDR for implementation. In general, the system proposed for implementation in the STADI PDR appears hydraulically adequate.

1. Consideration should be given to the high velocities expected in the proposed system, particularly near important flow disruption and transition locations such as the Lake Michigan outlet, where water quality capture is necessary. The velocities in the tunnel near Lake Michigan are proposed to be above 20 feet per second. Disruption to the flow at these velocities, such as the gate structure opening and closing, would cause concerns. As also stated in the Tunnel Design section below, V3 questions whether transient modeling has been performed to evaluate surge.
2. It appears that the flow management gate will be a particularly important feature with respect to tunnel hydraulic performance. Section 3.3 of the STADI PDR indicates that the outfall will be gated closed until an intense storm event produces a water level rise rate that triggers "*gradual opening of the gate.*" Since the design storm producing the peak flow of 1039 cfs is of 2-hour duration, the opening rate and control are critical elements. Figure 3.10 of Appendix A indicates

the rate of rise from about 100 cfs (a flow rate less much than the 2-year peak flow) to 1000 cfs is on the order of 16 to 18 minutes.

3. With respect to water quality issues, further evaluation will likely occur for the water quality treatment train once the regulatory agencies are fully engaged in the process. We note that the overview water quality management plan Figure 2.4 was missing from our copy of the STADI PDR (we assume it is similar to Figure 4.1 provided in Appendix D). The expected 2-year peak flow of 153 cfs translates to a treatment rate of nearly 7,000 gpm if only 10 percent of the 2-year peak flows need to be captured and treated. Section 3.1.1 of the STADI PDR indicates an outfall treatment rate of about 7,300 gpm with the statement that *“The treatment system is intended to provide for processing of approximately 70% of the annual discharge to Lake Michigan, including snowmelt and frequent low flows for events up to about the 50% annual chance storm.”* Because the drainage area for flow into the STADI system even for annual and 2-year recurrence events is now larger than that originally directed into Lake Michigan, this statement might be misunderstood to communicate that treatment of a significant percentage of the 2-year recurrence storm that is proposed to be routed to the outfall location would be handled by the proposed Outfall/Treatment Structure into Lake Michigan.
4. With respect to the rainfall depths used for the critical duration analysis, it is common to use the NE Illinois Bulletin 70 Table 13 values for regulatory purposes for sizing of stormwater management features within the northeastern Illinois area. However, in this circumstance it may be considered conservative when sizing for high intensity short duration storm events. The isohyets for Winnetka suggest perhaps a 10 percent reduction in rainfall depth is warranted in this area (see Bulletin 70, Figures 20 & 21 compared to Table 13 values). While adjustments may have been made during the calibration phase to “compensate” for this overage, it is possible to overestimate rainfall amounts and still produce compatible observed versus computed water surface elevations for critical identified locations within the watershed. This may still over-predict the stated 1% annual chance design storm after calibration.
5. It should be noted that the MWRD DWP for the North Branch of the Chicago River reports average Runoff Curve Numbers (RCN’s) of approximately 78 to 79 for the Skokie River portion of the STADI drainage area. The RCN’s presented in the STADI PDR appear to be somewhat higher when looking at the overall average for areas just draining to the Skokie River. It is understood that the scope of the STADI analysis is different when considering local drainage issues versus overall river flood flows. Even so, perhaps a closer look at the calibration for the STADI project area is warranted when considering an appropriate risk assignment level for rainfall depths and corresponding runoff rates and volumes.

Tunnel Design

The purpose of this section is evaluation of the tunneling aspects of concept and preliminary design elements. This portion of the technical evaluation was completed by Hatch Mott MacDonald as part of the Task 1 review.

1. PDR – Figure 2.3: The sketch of NSIS#1 Crossing is based on "NSIS Contract No 1, Sheet No2, October 1913" shows invert EL 592.04 whereas Appendix C Sheet GBR-3 shows 592.67. More importantly, GBR-3 also shows the drop structure invert EL at 589.76. Are these elevations based on contract drawings or as-builts? I.e. has the bottom invert been confirmed with survey? Are there records of the shaft support system that show how far it was installed past the finished invert? Every inch becomes significant with less than 3-ft of clearance between this existing structure and the proposed excavated tunnel.
2. PDR Section 3.1.4: *"...final design allow for construction of shafts directly over the tunnel in the Willow Road right-of-way. This approach will provide potential bidders with greater flexibility in their evaluation of potential tunneling methods."* If tunneling, these intermediate access points are not needed during construction unless pipe jacking/microtunneling are used and it does not appear from the documents that these methods are being considered. However the shafts are required for connection of flow input. We recommend curving the tunnel to the edge of the ROW at shaft locations. This will allow some maintenance of traffic while keeping shafts on line with the tunnel (i.e. without introducing the need for a deep connection addition). As currently shown on the plan and profile drawings, full road closure will be required at each shaft location to allow for shaft support and working clearance around the shaft.
3. PDR Appendix C: Drawing sheets GBR-1 to 5 notes *"location of drop structures at lateral streets to be adjusted in the field (by engineer) to prevent traffic disruption along Willow Road."* While it is unlikely that traffic disruption can be prevented, we would normally site the shafts at the project's current level of design as the alignment is being finalized. The location of the shafts will have significant impact on the neighborhood, so the siting of the shafts should be coupled with the shaft diameter and temporary/permanent support systems.
4. PDR General: Has any transient modeling been performed to evaluate surge potential and therefore the need for ventilation at the shafts?
5. PDR 3.1.4: *"...alignment is located almost entirely within a consistent clay layer, with some indication of gravelly and/or sandy clay near the top of the alignment east of Sheridan Road"*. Appendix C, 3.2.3 notes the groundwater east of Green Bay road at 583 which is above the tunnel crown and within this GC/SC layer. This can pose a major challenge in open face tunnel construction and will need to be mitigated in the design. Mitigation can include some or all of the following: tunnel equipment to manage this ground at the face, augmenting the initial support with geotextile to limit the migration of sands, active dewatering, and/or modifying the vertical alignment. With the proximity of the lake, dewatering may not be feasible due to constant recharge.
6. PDR 3.1.5: *"...using a single pass tunnel with precast segmental lining does not seem to be a cost-competitive method and may result in more tunnel-induced settlement."* It is true that it would likely not be cost competitive due to the need to establish a manufacturing plant and the higher cost of an appropriate TBM (such as an EPB). However, mining with an EPB TBM and segments would provide significantly LESS settlement than open face tunneling using ribs and boards, especially if bentonite were injected outside of the TBM shield as is being done now successfully on other projects. Ultimately, ground conditions and tolerance for settlement

should dictate the method. Note that the tunnel diameter for this project is about the smallest that would be attempted for a segmentally-lined tunnel.

7. PDR 3.1.5: A 2-pass approach with CIP concrete lining is recommended in the first paragraph and precast RCP is stated to possibly be feasible in the section under "Final Lining System." At the diameter for this project, RCP would typically be the most economical approach and delivery of pipe this size is feasible without special traffic consideration. CIP on diameters less than 9 feet is very rare (since 8-ft diameter pipe can be transported within a lane width). FRP is certainly a viable alternative, although 40-ft lengths for this diameter is unlikely due to challenges with manufacturing, hauling, then handling in the tunnel.
8. PDR 3.1.5: A TBM of 10.5 to 11-ft diameter is anticipated for a 2-pass approach. Minimum excavated diameter should be closer to pipe OD to 2-ft to provide clearance for initial support and carrying/blocking of pipe. For RCP, the excavated tunnel diameter required would be closer to 11.5-ft.
9. PDR 3.1.5: *Initial Support System: the PDR recommends ribs 4-ft on center.* We presume that this is to limit lagging deflection, but if ground conditions allow, it is common to space ribs 5-ft on center (typical jack extension length on a TBM this size) which will reduce cost due to number of ribs and schedule savings. We have not evaluated a 5 foot spacing, and for consistency have done our independent estimate on the 4 foot rib spacing.
10. PDR 3.1.6: *"The mucking activity is almost always on the critical path for tunnel construction due to hauling time."* Typically, mucking is only on the critical path when there is a surface space constraint that precludes stockpiling. Since this does not appear to be the case here, the TBM excavation cycle and erection of support will dictate the advance rate, so mucking should not dictate design. The PDR states that the mining shaft is enlarged to 30-ft to allow switching of muck boxes in the shaft to reduce TBM standby. The larger diameter shaft is more dictated by clearance requirements for TBM assembly, and the contractor will make good use of this extra space to support mining operations. They may also install a rail switch at one of the shaft locations or on the trailing gear of the TBM to facilitate mucking.
11. PDR 3.1.6: *Receiving shaft/portal bluff by Lake Michigan: "...portal wall and outfall structure excavation support should be augmented TBM extrusion. Options may include the use of shotcrete/soil nailing or soldier piles and lagging with kickers as lateral temporary support".* When you consider the sandy gravel layer, the need to build in and around the lake, and the need to protect the slope and the adjacent structures, something more substantial than soil nails will likely be required here. A watertight system such as a sheet piling cofferdam with internal support will be required to construct the structures in this area, including the energy dissipation spillway below lake water level. Note that sheet piling carries residual risks such as damage due to vibration from installation, and the possibility to 'hang-up' on boulders. "Silent Piler" or similar technology allows the piles to be placed by pneumatic pushing which will mitigate the vibration risk. The possibility of encountering boulders would require stiffened pile tips and if boulders were encountered, they would need to be pre-split from the surface using specialized equipment.
12. PDR 3.1.6: The 5 drop structures are anticipated to be 12-ft in diameter and drilled to tunnel invert. This does not seem to consider drilled shaft initial support. Due to the likely size of the

TBM bore, these shafts would either need to be: 1) enlarged to allow the TBM to pass through the shaft with proper structural framing of the shaft support or 2) made as small as practical (6 to 8 feet in diameter) to allow a 4-ft dia. precast MH, and drilled to the crown of the tunnel after the tunnel passes and structurally connected into the crown of the RCP-lined tunnel. The larger shaft allows the Village to use CIP concrete in one or more of the intermediate shafts for future access with larger equipment. The smaller shafts could reduce impact on traffic at the surface during construction. Minor note- The PDR recommends volclay water stops at the manhole pipe joints - for this tunnel depth, pipe sections can be manufactured with joints and gaskets to sufficiently resist the groundwater pressure.

13. PDR Figure 3.2: This figure shows a potential work area for mining in the Duke Child's athletic field. While additional staging area certainly is helpful, the separation from the mining shaft by 1 block creates challenges. Furthermore, siting the mining shaft in the street will require closing of Willow Road, and also create difficulties by balancing work area around the shaft with maintaining resident access to their driveways. The Crow Island Woods park adjacent to the mining shaft is not mentioned in the PDR, presumably because this site is off limits? Although this site would be significantly impacted during construction, it would create an excellent mining site and the tunnel could be curved outside to the road immediately. This would save cost and result in a major reduction in neighborhood disruption/nuisance.
14. PDR 3.1.8: *Bullet 4: "Use ribs at 2-foot spacing to allow for support of excavated soil at a faster pace or thicker wood lagging to reduce deflection of ribs."* This would likely result in support of soil at a slower pace due to reduced advance rate from installing additional ribs. Also, thicker wood lagging would not reduce deflection of ribs. This comment also applies to the second bullet about "double erection rings and bigger dutchman" (which we assume to mean two sets of ribs erected side-by-side).
15. PDR 3.1.9: A TBM advance rate of 50 to 80 feet per shift is assumed. It is unclear if this number is a sustained average that was used in the cost estimate and schedule. These numbers are likely achievable for 2 mining shifts. However when factoring in a single mining shift and learning curve to begin tunneling, an average advance rate of 32-ft is more appropriate and this has been used in our estimate.
16. PDR 3.1.9: *"The Village has indicated that it may be possible to use its existing landfill adjacent to the Public Works Garage on Willow Road as a disposal site for suitable clay spoil"*. This information is certainly useful, however we would caution to the risks associated with this collaboration since the Village would be taking ownership of this dump site's availability. This means that the Village must be prepared to readily accept clay during all working hours to avoid potential delay claims.
17. PDR 3.2: *Paragraph 5: "...the trench should be properly supported and dewatered so that the water level is maintained below the trench bottom..."*. If dewatering is a concern for open cut, this will also likely be a concern for tunneling.
18. PDR 4.1.2: *Bullet 1: "Construction of the Willow Road trunk sewer system and the new outfall will likely need to be completed prior to the construction of the branch relief storm sewer projects."* This does not have to be the case if advantageous to the Village. Since the shallow sewers tie into a drop structure, there is a vertical break in the project. Therefore the invert of

the shallow work is set and independent of the tunnel. However this will require clear demarcation of contract limits and the open cut contractor will need to know whether they are tying into a manhole, or installing pipe with a bulkhead at the location of a future manhole.

19. PDR 4.2: A single work shift for tunneling was assumed in the PDR. This is presumably to reduce community impact by restricting work hours. It is common for tunneling to be performed based on two 10-hr shifts or three 8-hr shifts. This would reduce schedule and cost. To reduce nuisance, hauling of spoils could be restricted to normal working hours so only tunneling operations would be ongoing during non-standard times limiting the nuisance to the mining shaft area (this will still require surface support to remove spoil from the tunnel and stockpile at the surface, and to lower materials down shaft). If a mining site can be obtained outside of the road, the noise can be mitigated with sound barriers and other provisions to reduce noise, dust and light pollution. That said, for the purpose of our estimate, we have assumed a single shift for mining.
20. PDR 4.2: The procurement of this project is outlined in 4 contracts. This does not have to be the case and may increase cost due to longer schedule/escalation, additional bidding costs incurred by the Village, and not capitalizing on the efficiencies of a single mobilization. The magnitude of the project can be managed by a tunneling contractor in a single contract, although separation of the tunnel and open cut work into 2 contracts makes sense since the open cut is considerable and it may not be necessary to burden the tunneling contractor with managing this work. The main consideration for the open cut, if done under a single contract, becomes what constraints need to be provided to the contractor. To reduce neighborhood disruption from closing too many roads simultaneously, the constraints could enforce a more strategic schedule for the work, restricting multiple road/lane closures in close proximity.
21. PDR Appendix G: Rail permit application should include additional information to improve reviewer confidence with tunneling methodology and improve probability of approval. For example, should include a plan for geotechnical instrumentation and technical specification with requirements including alert/action levels. Should also include cross sections of the tunnel, and specifications for annulus filling and contact grouting. Since a previous tunnel is referenced of similar configuration, recommend incorporating settlement data from that project to demonstrate successful history in comparable ground.
22. Drawings POPP-6: DS-4 structure does not have surface access. Likely just a drawing oversight at this preliminary phase, but suggest raising to grade for future maintenance.
23. Drawings C-10: The energy dissipation spillway and chute blocks extend 12-15 feet below the lake water level. It would seem that the submerged blocks would not provide much benefit near the end of the spillway since the effluent will be mixing with lake water above that.
24. Drawings C-10: Existing storm sewer into lake called out to be demolished. If acceptable, suggest this be abandoned in place by grouting to avoid cost and challenges associated with working in lake.