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MEMORANDUM

TO: Chris Heim, Mayor Medicine Lake
Council members

FROM: Dave Hutton, SEH Sr Project Manager (Lic. MN, WI, ND)

DATE: March 6, 2023

RE: Project Updates
SEH No. 170120 14.00

Honorable Mayor and Council:

The purpose of this memo is to update the City Council on several developments related to the CIP street and utility project resulting in plan modifications prior to bidding it.

1. MPCA Stormwater Requirements – MS4 Permit

Since we last bid the project, the MPCA has modified their rules regarding their MS4 (Municipal Separate Storm Sewer System) permit requirements. Under the old rules, a project only had to incorporate Best Management Practices (BMP's) and specifically storm water storage and/or treatment for new impervious surfaces created as part of a reconstruction project. We are not increasing the impervious area with this project.

The new rules require stormwater treatment and ponding for all reconstruction projects, even if the amount of impervious is not increasing. The current project as designed is a reconstruction project with the watermain installation via open cut methods. Horizontal direction drilling (HDD) method for installing the watermain was bid as an option last time.

With the current rules in place, any excavation below the top of subgrade would require storm water treatment to be added to the project. Attached to this memo is a graphic from the MPCA illustrating how much excavation is allowed before the ponding is needed.

This is a very challenging project to add treatment to because a) difficult soils with high groundwater, b) no conveyance system to get the runoff to BMPs, and c) limited areas to incorporate stormwater treatment. Based on this factor, we would like to present a design alternative to minimize excavation and stay within our permit obligations.

2. Watermain Options – HDD vs Open Cut (Current Plan)

To avoid and minimize excavation of the watermain, we are proposing to install all waterman via the horizontal directional drilling HDD method. This serves two purposes. First it drastically minimizes excavations because the drilling pits are only about 10 x 10 in size and spaced every 400-500 feet apart. In between those areas, the pavement stays essentially as is, full width and undisturbed. This reduces the amount of treatment needed for the MPCA requirements. Second, there is far less traffic

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disruption and allows vehicles to move around these small areas as they work without as many barricades and traffic control devices.

The pavement would then be reclaimed rather than reconstructed (remove all existing asphalt and gravel base to the top of subgrade and then build a new road back up). This would comply with the MPCA guidelines and minimize stormwater treatment. There are two areas where the current design does call for removal of poor subgrade soils based on the geotechnical report, which we would still do. More excavations would still be needed for each water service though which need to be accommodated by the overall storm water planning.

Our recommendation is to change the plans to bid the watermain as HDD installed as the base bid rather than as an alternative, and design the pavement to be a reclamation project rather than a reconstruction project. The cost of the watermain is higher, but the pavement and stormwater management costs will be greatly reduced, not to mention the social benefits of vehicles maneuvering around a construction zone.

We still need to follow the MPCA permit requirements and make our “best effort” to meet their storm water requirements and incorporate BMPs into the project, even with the limited excavation proposed (drilling pits and service lines). This will result in plan modifications prior to bidding and securing both the MPCA and Watershed District stormwater management permits.

3. Pedestrian Striping Plan

a. CIP Committee meeting summary

On January 28, 2023, we held a CIP Committee meeting to discuss the various pedestrian facilities/options for the project. Given the stormwater requirements, the Committee provided direction to SEH to primarily focus on only those alternatives that do not increase pavement or impervious (such as widening the shoulders or installing an off-street trail or sidewalk).

At that meeting, we presented several examples from across the nation for low volume low speed management of pedestrians and bicyclist. We focused on a particular solution used in New Hampshire, which is attached for reference.

All traffic management devices (painting, signage, etc.) must follow the Minnesota Manual on Uniform Traffic Control Devices (MMUTCD), the state law on traffic management. This manual has been adopted by all fifty states in some form but generally they all follow the same FHWA guidance on road design.

b. Traffic Memorandum – attached is a memo from our Traffic Engineer essentially offering some recommendations based on the MMUTCD and FHWA standards. In summary:

- 1). If the City wants to deviate from those standards, they must apply for an experimental test section and if selected, it is constructed and monitored over several years before it becomes final. This is the situation the New Hampshire example is using.
- 2). If we modify the original plan as illustrated on the attached traffic memo, it will still meet the intent of the manual and design standards. Basically the modifications would be:
 - i. Eliminate the center yellow stripe thereby creating more of a shared travel way.
 - ii. Eliminate the pedestrian symbol stencils.
 - iii. Use the solid white stripe “shoulder”.

- iv. Add information signs as necessary – Share the Road, Watch for Pedestrians, etc.
 - v. The Sharrow Lane marking for bikes can still be used, although the benefit of their use in safety is somewhat debatable. Our recommendation is to eliminate these markings as it does not appear that accommodating a large number of commuter bicyclists through additional signage is necessary.
- 3). Test striping

One possibility discussed at the CIP committee was to install the recommended striping and signage this spring to show the residents what the final appearance would look like and to gather public input into the traffic safety measures. If Council concurs with the recommended striping plan, we will obtain a couple of quotes from contractors to install the striping plan as soon as possible in May, weather depending.

4). Driver Feedback signs

While the current plans provide for 4 such electronic signs, these signs are generally most effective when the motorists experience a sudden change in speed limits. Based on the five bids received last year, the average price for these signs was about \$60,000 total or \$15,000 per sign.

If Driver Feedback signs are to be included in the project, it would be important to first gather information on existing speeds and traffic volumes and then compare that to the speeds and volumes after they are installed. The cost to set traffic/speed counters this spring is approximately \$2,100 for two 13-hour periods (one weekday and one weekend).

We feel this would be money well spent as it would develop a base line for current driving habits and speeds and based on that the City can make a more informed decision if they should spend the money to install these signs.

These signs are also a good way to educate the public that the posted speed limit is 20 mph which is somewhat unusual for most streets they travel on. So even without “proving” that it reduces speed by taking the before and after studies, they are still useful in calming traffic. One suggestion is to reduce the number of signs from 4 to 2, by incorporating one inbound on Peninsula and one outbound in the opposite direction, to save money yet still provide the public education.

4. Plan Modifications and Bidding

We currently have an open contract with the City for \$20,000 to assist in miscellaneous engineering services for 2023. A portion of this budget has been expended already. I can provide an update on the remaining amount at the Council meeting on March 6.

To fully modify the plans to make the above changes, and to re-bid the project is estimated to cost approximately \$30,300 as broken down below:

Plan modifications	\$13,400
Stormwater BMP's and permitting	\$9,100
Bidding the project	<u>\$7,800</u>
Total	\$30,300

We will continue to use our existing budget for project related activities but at some point, the City will need to increase that budget to accommodate design revisions and rebidding.

The City had previously approved of the construction management budget – i.e. surveying, inspection and contract administration- but this contract has been suspended until a bid has been awarded and construction starts.

The timing of bidding the project is entirely depending on the availability of funds. Depending on when any state or federal money is available, the project could be bid this summer with limited work in 2023 (sewer lining, HDD watermain) with the main street construction occurring in 2024. The other option is to be the project in the fall with all construction occurring in 2024. This decision does not need to be made at this time.

5. I/I Reimbursement

Finally, the City received an I/I grant from Met Council in the amount of \$100,000 for the project. This was generally for the lining of the sewer laterals, but did include a component for the lift station. The Met Council does not feel replacing a lift station assists in removal of I/I from their system and based the grant largely on the lateral lining component of the project which was about \$500,000 total in the bid. Due to the competitive nature of the program, most cities only got a portion of what they asked for.

The Met Council has estimated the amount of the grant for the lift station will only be \$2,500, which is also dependent on proper invoices from the contractor. Because the lift station was bid as lump sum, it has been a challenge to get the adequate documentation from Minger to support the \$2,500 in I/I reduction. It is our recommendation, and supported by Met Council staff, that the City should not apply for any reimbursement just for the lift station but rather apply for the full grant money next go around for the lateral lining component of the project, which has a much high level of I/I reduction and benefit to the system.

Action Requested

Discuss the various design modifications and provide SEH with direction on moving forward.

1. Authorize using HDD and reclamation as the method of construction and to modify the plans accordingly.
2. Authorize using the final recommended traffic striping plan as shown on the Technical Memorandum and to bring back quotes from contractors to install test striping in the spring at the April meeting
3. Discuss the Driver Feedback signs and offer a recommendation on a) completing the traffic speed study and b) the use of them on the project and number of them.
4. Authorize SEH to modify the plans for a not to exceed figure of \$30,300 including bidding, to enable the project to be “shovel ready” once funding is secured.

Please contact me if you have any questions. I will be at the March 6th City Council meeting to go over these items in more detail and answer any questions.

Attachments

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MPCA Guidelines

From: [Jeremy Walgrave](#)
To: [David Hutton](#); [Blake Hansen](#)
Subject: FW: Fully Reconstructed Graphic
Date: Tuesday, February 7, 2023 9:02:14 AM

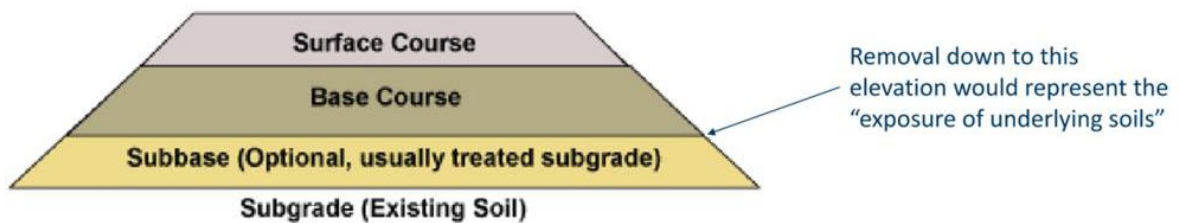
Good morning,

Here is a graphic from MPCA. Basically if we expose the subbase – that would trigger the stormwater requirements for Medicine Lake.

Jeremy

MCM 5: Post-Construction Stormwater Management

- Fully reconstructed impervious surface example (roadway)

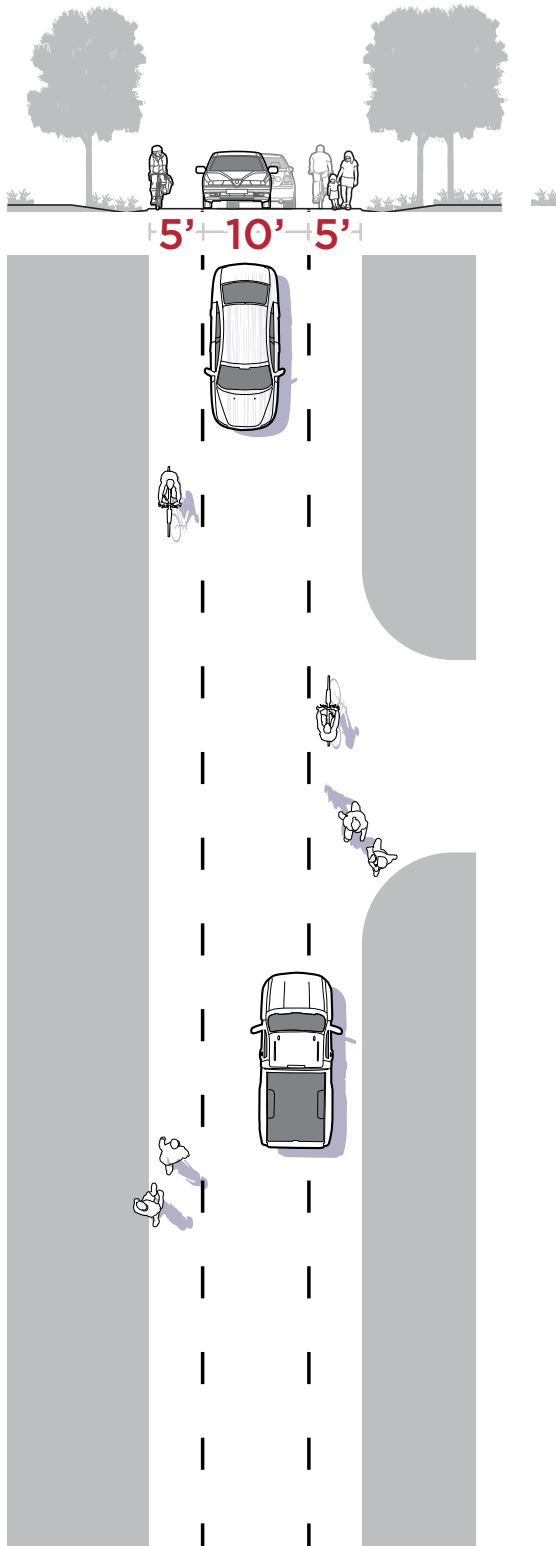


A roadway is comprised of several layers of imported materials. There will be one or more layers of surface course, typically concrete or bituminous. There will be one or more base courses of engineered material that is imported and compacted. The subbase is the "underlying soils". Underlying soils typically consist of existing soils or the soils that were available in the area, sometimes referred to as "common fill".

Hanover, NH - Valley Road

DIMENSIONS

Length: 1255 ft

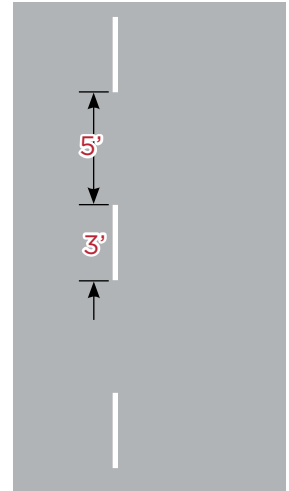


SPEED AND VOLUME

Speed: 25 MPH

Motor Vehicle Volume:
470 ADT

MARKINGS



SIGNS



Custom Sign



PHOTO COURTESY OF DR. YOUNG



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MEMORANDUM

TO: Chris Heim, Mayor
City of Medicine Lake

FROM: Erin Jordan (Lic. IA, MN, WI)
Dave Hutton (Lic. MN, ND, WI)

DATE: February 15, 2023

RE: Peninsula Road Restriping Recommendations
SEH No. 170120 14.00

BACKGROUND AND PURPOSE

The City of Medicine Lake is reconstructing Peninsula Road, north of S Shore Drive. Proposed work includes street reconstruction, including roadway, driveway, and water mains. The project includes restriping approximately 0.5-miles of Peninsula Road between S South Drive and Jevne Park. Pavement surface cannot be widened due to watershed concerns with runoff; therefore, the rural roadway section will maintain the existing 24-feet of pavement.

Peninsula Road is a low volume roadway (<1,000 ADT) low speed (20 MPH posted speed limit) and experiences a variety of roadway users. In 2022, the City and SEH reviewed various design treatments to support mobility for all users, including people walking, rolling, biking, and driving along Peninsula Road, while maintaining the existing 24-foot roadway width. At that time, the proposed striping plan included two 9-foot travel lanes, a dashed yellow center line, shared lane markings (“sharrow”) for a bikeway, and 2-foot 8-inch shoulder on each side of the roadway to accommodate pedestrian activity.

Since the project has been pushed to 2023, the City has requested SEH to reassess the restriping plans, specifically to review the option for Advisory Shoulders or make revisions to the 2022 signing plan. This memo also provides recommendations for installing dynamic speed feedback signs along Peninsula Road.

ADVISORY SHOULDER REVIEW

Advisory shoulders, similar to advisory bike lanes, are dedicated shoulders delineated by dashed pavement markings applied on roadways that are too narrow to accommodate two full travel lanes (for two-way travel) and usable shoulders or bike lanes. These are most applicable on low volume, low-speed, residential roadways such as Peninsula Road. **Figure 1** illustrates the preferred operations for an advisory shoulder.

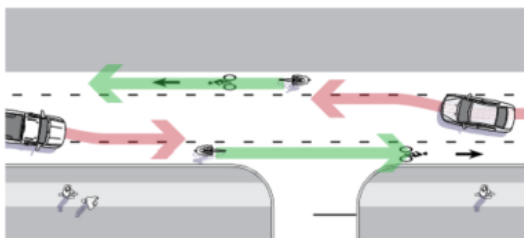


Figure 1: Advisory shoulders allow space for motorists to merge into the shoulder to pass oncoming motorists. Source: Advisory Bike Lanes in North America, August 2017 (Alta Planning + Design).

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Advisory shoulders are not currently allowed via the Minnesota Manual of Uniform Traffic Devices (MnMUTCD) nor the National MUTCD. Therefore, a **Request for Permission to Experiment is required to install Advisory Shoulders**, as outlined in the MnMUTCD, Part 1, Section 1A.10, Interpretations, Experimentations, Changes, and Interim Approvals. If approved by the Federal Highway Administration (FHWA), the Request for Permission to Experiment process would require a detailed evaluation plan for the experiment and commitment by the requestor to complete semi-annual progress reports and a final report submitted to MnDOT and FHWA, among other items.

The FHWA review for a Request for Permission to Experiment may take up to 8-12 weeks and may result in a denied request. If approved, the subsequent evaluation process may take up to at least one year. Due to this significant effort, MnMUTCD-compliant striping options are recommended for Peninsula Road.

SIGNING PLAN REVISIONS & RECOMMENDATIONS

The 2022 striping plan was reassessed to simplify the markings while also achieving an improved complete streets design treatment along Peninsula Road. The recommended changes to the 2022 striping plan are summarized in Figure 2 and adhere to MnMUTCD standards. A discussion for each design decision is provided below.

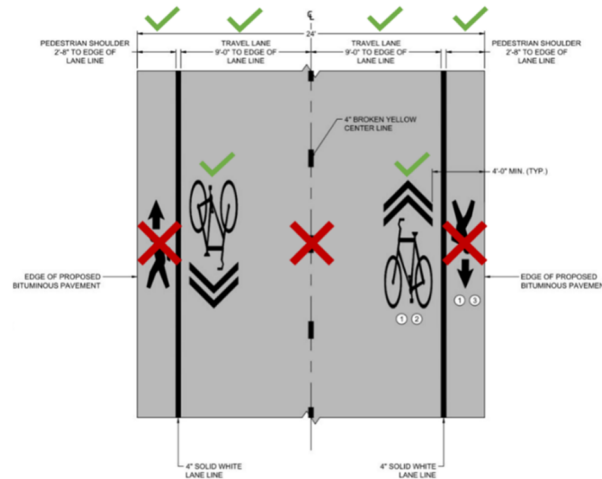


Figure 2: Recommended revisions to the 2022 striping plan for Peninsula Road.

- **Travel Lanes**

Minnesota State Statute 8820.9926, Minimum Design Standards: Rural and Suburban Undivided; Reconditioning Projects, states that the minimum lane width for a paved roadway is 10 feet for a low-volume, low-speed roadway. However, based on the roadway's context, City goals, surrounding land use, and low-volume characteristics, engineering judgment has been made to reduce to 9-foot travel lanes to allow space for shoulders. Peninsula Road is a non-State Aid route and therefore does not require a variance for this lane width reduction.

It is not recommended to include a broken yellow centerline primary due to the roadway context and surrounding land use. When the roadway is safe and clear, motorists will be able to encroach on the opposite lane to provide space between non-motorized users on the roadway (e.g., walkers and bikers). This is consistent with similar local, low volume streets in the City. Centerline markings are typically more appropriate on higher-volume collector or arterial roadways, wider roadways, and/or to improve safety.

- **Shared Lane Marking (“Sharrow”)**

“Sharrows” indicate to bicyclists and motorists where people biking should ride within a lane. The 2022 striping plan includes these markings on the outside edge of each travel lane, approximately 4-feet from the edge of pavement. Per MnMUTCD Chapter 9C.7, markings should be placed immediately after an intersection and spaced at intervals not greater than 250 feet. These markings are recommended to alert road users of bicyclists that may be within the traveled way and encourage bicyclists to travel in the correct direction.

- **3-foot shoulder**

Consistent with the 2022 striping plan, 3-foot shoulders are recommended to be striped on both sides of the roadway to act as a traffic calming feature for motorists and to provide dedicated space for multimodal activity (e.g., pedestrian activity). Providing shoulders on both sides of the roadway allow pedestrians to walk in the counterflow direction of traffic and provide a connection to the existing trail and sidewalk networks along S Shore Drive.

It is not recommended to include pedestrian markings since the 3-foot width is below the MnDOT accessibility guidelines for a sidewalk (minimum of 4 feet) and may not allow for safe use of mobility devices.

ADDITIONAL TRAFFIC CONTROL DEVICE RECOMMENDATIONS

- **Bikes May Use Full Lane Sign**

To supplement the “sharrow” markings, “Bikes May Use Full Lane” signs should be installed to alert motorists that bicyclists are expected on the roadway.



- **No Parking**

No Parking signs currently exist along Peninsula Road. It is recommended to maintain the No Parking enforcement to provide consistent space and visibility for non-motorized roadway users.

- **Dynamic Feedback Signs**

As a traffic calming measure, dynamic speed feedback signs provide immediate feedback to drivers who are traveling over the posted speed limit by displaying a message such as “YOUR SPEED XX” or “SLOW DOWN.” They are posted in conjunction with a posted speed limit sign and most applicable on streets with excessive speeding activity.



Typically, dynamic feedback signs are most effective in reducing high-end speeds and the long-term effectiveness has not been studied widely. Research shows that dynamic speed feedback signs can be an effective tool to reduce speeds, including a reduction in up to 3 mph for the 85th percentile speed in some locations. It is recommended that the City collect existing speed data at various points on the roadway to understand if dynamic feedback signs would be viable and cost-effective to install. If high-end speeds and high 85th percentile speeds are observed, it is recommended that the City consider installing at least one pair of dynamic feedback signs near the roadway entrance and enforce the posted speed limit to further encourage compliance.

ekj



Billing Title		CSM/PM	PE	Tech	PE	Grad Eng	Admin Tech	Expenses	Total
TASK 2 - FINAL PLANS REVISIONS									
2.1	Plan Revisions								
	Project Management	6	6				4		16
	Quantity and specification updates.		6	4			6		16
									0
	PLAN UPDATES								0
	Revise construction notes for watermain installation, staging and phasing, BMPs, and confirm all other notes.		2						2
	Typical pavement markings			1					1
	BMP detail sheets, plan layouts, and sections.		8	24					32
	Removal sheets revisions.			4					4
	Street plan and profile sheets to identify BMPs.		2	4					6
	Watermain plan and profile revisions.		4	8					12
	SWPPP sheets revisions.			2					2
	<i>ASSUMPTIONS: No changes will be required for vertical or horizontal street geometry. Specification updates will be limited to trenchless watermain, BMPs, and contract dates.</i>								0
	City Council updates - assumes 2 meetings to provide design updates/feedback and 1 meeting to award the bids	4	3						7
	Task 2 Hours Summary	10	31	47	0	0	10	N/A	98
	Task 2 Fee Summary	\$2,403.20	\$4,978.85	\$4,869.95	\$0.00	\$0.00	\$1,124.16	\$0.00	\$13,376.16
TASK 3 - STORM WATER BMPS AND PERMITTING									
3.1	Stormwater BMP Design and Permitting								
	Identification of Stormwater BMP locations and provide design recommendations and details to the Civil design team.				4	24			28
	BCWMC Coordination				2	2			4
	Revise/Update SWPPP				1	6			7
	Development of Specification Special Provisions				1	4			5
	Preparation of permit applications for MPCA & BCWMC				2	16			18



Billing Title		CSM/PM	PE	Tech	PE	Grad Eng	Admin Tech	Expenses	Total
	Technical Memorandum documenting strategy for implementation, permit requirements, and limitations on BMPs.				2	8			10
	<i>ASSUMPTIONS: Project will result in one or more acre of new and fully reconstructed impervious surface. Wetlands will not be allowed as sites for new BMPs. Permit application fees are not included in the fee estimate, and City will pay application fees directly. The overall total impervious surface will not be substantially increased as part of the project.</i>								0
	Task 3 Hours Summary	0	0	0	12	60	0	N/A	72
	Task 3 Fee Summary	\$0.00	\$0.00	\$0.00	\$2,544.00	\$6,600.96	\$0.00	\$0.00	\$9,144.96
TASK 4 - BIDDING SERVICES									
7.1	Bidding Services								
	Prepare ad for bid. Assume e-bidding thru QuestCDN	2	4		4		2		12
	Respond to bidder questions and issue addendums if needed	4	4		4				12
	Open bids and review bidder qualifications	2	2						4
	Prepare bid tabulations and make recommendation to City	2					2		4
	Attend City Council meeting for bid award	4							4
	Prepare conformed contracts for execution by City and contractor	2					2		4
	Subtotal Hours	16	10	0	8	0	6	N/A	40
	Subtotal Fees	\$3,845.12	\$1,606.08	\$0.00	\$1,696.00	\$0.00	\$674.50	\$0.00	\$7,821.70
TASK 2 - FINAL PLANS REVISIONS									
	Task Hours Summary	10	31	47	0	0	10	N/A	98
	Task Fee Summary	\$2,403.20	\$4,978.85	\$4,869.95	\$0.00	\$0.00	\$1,124.16	\$0.00	\$13,376.16



Billing Title		CSM/PM	PE	Tech	PE	Grad Eng	Admin Tech	Expenses	Total
TASK 3 - STORM WATER BMPS AND PERMITTING									
	Task Hours Summary	0	0	0	12	60	0	N/A	72
	Task Fee Summary	\$0.00	\$0.00	\$0.00	\$2,544.00	\$6,600.96	\$0.00	\$0.00	\$9,144.96
TASK 4 - BIDDING SERVICES									
	Task Hours Summary	16	10	0	8	0	6	N/A	40
	Task Fee Summary	\$3,845.12	\$1,606.08	\$0.00	\$1,696.00	\$0.00	\$674.50	\$0.00	\$7,821.70
PROJECT SUMMARY									
	Project Hours Summary	26	41	47	20	60	16	N/A	210
	Project Fee Summary	\$6,248.32	\$6,584.93	\$4,869.95	\$4,240.00	\$6,600.96	\$1,798.66	\$0.00	\$30,342.82