PRELIMINARY ENGINEERING REPORT

GRAND AVENUE STREET & SIDEWALK EXTENSION
PHASE 2
WORTHINGTON, MINNESOTA

October 7, 2015
Project No. 14-16841

ISG
I+S GROUP

info@is-grp.com + www.is-grp.com

Signature Sheet

I HEREBY CERTIFY THAT THIS REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Charles J. Brandel, PE
Project Engineer
Reg. No. 43359

I+S Group, Inc.
115 East Hickory Street, Suite 300
Mankato, Minnesota 56001-3785

Grand Avenue Street & Sidewalk Extension
Phase 2
Worthington, Minnesota

Engineer's Project Number: 14-16841

Dated this ___7th____ day of ___October 2015_____

Dwayne Haffield, PE
Worthington City Engineer
Reg. No. 15010

City of Worthington
P.O. Box 279
Worthington, MN 56187

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Introduction

I+S Group (ISG) was contacted to complete a Preliminary Engineering Report and Hydrology Report for the Grand Avenue Street & Sidewalk Extension north of Oxford Street; see Appendix A for a site location map. In prior improvements, sanitary sewer, storm sewer, and watermain were constructed in this area for the future expansion of Grand Avenue. Along with the storm sewer construction, a regional storm water retention pond was constructed to support the future development of approximately 28 acres of land.

In 2013, the Minnesota Pollution Control Agency (MPCA) raised the standards for detaining runoff from ½-inch to 1-inch for the newly created impervious area. The National Oceanic and Atmospheric Association (NOAA) has also updated the rainfall frequency curves as part of Atlas 14. NOAA's Atlas 14 raised the 10-year precipitation frequency estimate from 4.2 inches to 4.46 inches and the 100-year precipitation frequency estimate from 6.0 to 7.44 inches. The previous Storm Water Report was completed prior to the MPCA and NOAA Atlas 14 changes.

This report has been prepared pursuant to Council Resolution, dated September 14, 2015, Ordering the Preparation of a Feasibility Report on the Proposed Phase 2 Grand Avenue street and walk extension.

Project Need

The City ordered Preliminary Engineering Report for the extension of Grand Avenue from the north end of the previously petitioned extension (the north line of the South Half of the Southwest Quarter of Section 13, Township 102 North, Range 40 West) to Darling Drive. In order to address the City's standards pertaining to walks and the City's Complete Street Policy, the City Council included the installation of walks in the proposed improvement.

The street extension will include paving Grand Avenue, curb and gutter construction, catch basins, and minor watermain and sanitary sewer adjustments. The sidewalk improvement is proposed to include 4-foot concrete walks and/or a 10-foot multi-use trail. Due to the noted adjustments to the MPCA and NOAA Atlas 14 standards, the Phase 1 street expansion will also include the expansion of the existing regional pond in order to satisfy permitting requirements for the proposed street improvement; see the Storm Water Report in Appendix C for more information on the pond expansion.

The improvements will benefit the abutting properties. Based on existing discussions with development groups, the possibility exists that all abutting properties could be fully developed within the Phase 1 construction area within the next few years. Therefore, the Phase 2 Grand Avenue Street Expansion opens up the opportunity for future expansion through to Darling Drive, including access to the future Cecilee Street.

Design

As previously described above, the watermain, sanitary sewer, and storm sewer have already been constructed as part of previous public improvements. With the utilities and drainage facilities already in place and the plans accepted by the City of Worthington for construction, the remaining design of the Grand Avenue Street & Sidewalk Extensions are controlled by this existing and proposed infrastructure.

The original plans called for Grand Avenue to be constructed as a 44 foot wide street, face-to-face, and to widen out closer to Oxford Street. The revised cross-section option will include a 40 foot street width. The 40 foot width reflects more contemporary street design concepts and provides for two 12 foot driving lanes and two 8 foot parking lanes rather than 10 foot parking lanes. This design will be continued through to Darling Drive as part of the Phase 2 Grand Avenue Extension.

The narrower street width leaves additional room for consideration of off street and pedestrian and bicycle facilities. Although the City's Active Living Plan is not complete, progress to date is leading toward a recommendation that key pedestrian/bikeway corridors be established and classified. Early work on classifying corridors indicates that Grand Avenue may serve as a secondary/neighborhood route. This designation gives priority to providing pedestrian and bikeway facilities. On-street bike lanes could be suitable in this corridor given no special circumstances, however, the existing configuration of driving and turning lanes near Oxford Street makes it impractical to use such bike lanes on the subject segment of Grand Avenue. To provide appropriate pedestrian and bicycle facilities it is recommended that both a 4-foot walk on the west side of Grand Avenue and a 10-foot wide multi-use trail on the east side of Grand Avenue be provided.

Also, as part of the Phase 1 utility extension plan, the 1.32 acre regional retention pond will be constructed to control storm water runoff into the city storm sewer. As part of the Phase 1 Grand Avenue Street & Sidewalk Extension plan, the pond will be expanded to approximately 1.96 acres to accommodate the changes in the MPCA requirements and new NOAA Atlas 14 rainfall-frequency data.

The Phase 1 Grand Avenue street extension was ordered to be completed with concrete pavement in the summer of 2015. Therefore, only concrete pavement is being presented in this report for consideration to achieve a consistent pavement throughout the entire Grand Avenue corridor between Oxford Street and Darling Drive. The costs presented in this report are based on bids received for the Phase 1 Grand Avenue project.

Costs and Financing

Street Extension

The total estimated cost of the street and storm sewer related work, including engineering and contingencies, is $376,600. These totals include those costs associated with the storm sewer and catch basin installation estimated to be $36,250. The necessary land for the storm water pond has been acquired by easement at no cost.

The properties abutting Grand Avenue are zoned residential. Per the assessment ordinance, only those costs of the project equaling that which would be incurred for construction of a residential street are to be assessed to residential properties. The estimated costs for construction of the Grand Avenue extension as a 36-foot wide residential street is $271,400. The costs for the additional width and pavement thickness will be a non-assessable City share.

Sidewalk Extension

The total estimated cost of the sidewalk component of the improvement, including engineering and contingencies, is $91,100. This total includes those costs for the additional width of the sidewalk on the east side of the street to provide a multi-use trail estimated to be $34,300. The City's assessments policy does not specifically address the assessment for multi-use trails but does provide for the assessment of sidewalks. The policy also establishes the standard width of sidewalks at 5 feet unless otherwise approved or ordered by the Council. Although the policy is silent in regard to a City share for widths greater than 5 feet, it is proposed that the costs for the additional width of sidewalk (greater than the 4 foot width recommended for the west side) be considered a City share. This is proposed on the same basis that the additional costs associated with construction of a collector or arterial street are to be considered a City share when abutting residential properties. That is, the additional sidewalk width is proposed due to the character and use of the street rather than being necessary to serve residential needs. Typically shared use of residential street may satisfy the goals of the Complete Streets Policy with no more than 4 foot wide walks or, in many cases, with no walks. Recreational trails may or may not provide some of the same function as street corridor walks and trails, and therefore may or may not require different consideration in funding. As the Complete Streets Policy is further implemented, the assessment policy may need to clarify the assessment of

surface improvements that appropriately address all forms of transportation. At this time the general intent of the provisions addressing the over sizing of streets abutting residential street is proposed to apply to the additional sidewalk width.

Total Improvement Cost

The total estimated cost of the improvement is $467,700.00. The following table provides a summary of the estimated costs, assessments, and City share for the proposed street and sidewalk extensions.

PROPERTY OWNER SHARE OF IMPROVEMENT COST		
Assessable Frontage	902.6 feet	
Estimated Assessable Rate per Foot	$285.30	(1)
ESTIMATED ASSESSMENTS RECEIVABLE	**$257,510.34**	55.06%
CITY SHARE OF IMPROVEMENT COST		
NON-ASSESSABLE:		
1. RATE DETERMINING COSTS		
a. Estimated Amount for Non Assessable Rate Determining Frontages	$39,200.00	
b. Estimated Amount for Public Right-of-Way Frontages (2)	$31,489.74	
c. Rounding Adjustment	($0.08)	
Sub-total	$70,689.66	
2. NON-RATE DETERMINING COSTS		
a. Estimated Collector Street Costs	$68,950.00	
b. Storm Water Related Costs	$36,250.00	
c. Additional Walk Width	$34,300.00	
Sub-total	$139,500.00	
Total Estimated City Share of Non-Assessable Cost	$210.189.66	
ASSESSABLE:		
City Share of Assessable Cost	$0.00	
TOTAL ESTIMATED CITY SHARE OF IMPROVEMENT	**$210,189.66**	44.94%
TOTAL ESTIMATED COST OF IMPROVEMENT	**$467,700.00**	

(1) $234.88/ft for street only. $50.42/ft for sidewalk only.
(2) Future Cecilee Street frontage on Grand Avenue (70')
Grand Avenue frontage within Darling Drive right-of-way (16.5')
Future Cecille Street stub frontage within Grand Avenue right-of-way (14.5' x 2) (Applicable to street only)

Initial and Long Term Financing

Initial financing of the project costs would be through issuance of a PIR general obligation bond(s) with possible use of 401 construction fund reserves until such a bond is issued. The bond debt is to be recovered by special assessments and by special tax levy for the City share of the project.

Conclusion

The proposed Grand Avenue Street and Sidewalk Extension will provide service access to the pending and future developments abutting the extension. Based on the findings of this Preliminary Engineering Report, the proposed improvement is considered necessary, feasible, and cost-effectively address the future needs of the Grand Avenue corridor. It is recommended that the City proceed by approving this preliminary engineering report, continue the process by holding a public hearing on the proposed improvement, and ordering final plans and specifications in accordance with MS 429.

Proposed Schedule

The proposed project schedule is described below. It should be noted that the City Council can halt the process at any time by simply electing to no take action or otherwise terminating the project.

1. City Council passed a *Ordered the Preparation of Report on Improvement* **on September 14, 2015.**

2. City Council passes a *Resolution Receiving Report and Calling Hearing on Improvement* to indicate its plan to continue the process. **Estimated Date: October 12, 2015.**

3. A public hearing on the proposed improvement is held. **Estimated date: October 26, 2015.**

4. If it is determined that the process will continue, the City Council may pass a *Resolution Ordering Improvement and Preparation of Plans*, which orders development of engineering plans and specifications necessary for soliciting bids for the project. **Estimated date: October 26, 2015.**

5. Plans and specifications for the proposed improvement are completed by ISG and submitted to The City of Worthington for review and approval. **Estimated date: November 24, 2015.**

6. City Engineer's review of plans and specifications is completed. **Estimated date: December 2, 2015.**

7. Final plans and specification revisions are completed by ISG. **Estimated date: December 9, 2015.**

8. After the City Council considers the presentation of the plans and specifications, it may pass a *Resolution Approving Plans and Specifications and Ordering an Advertisement for Bids*. **Estimated date: December 14, 2015.**

9. The advertisement for bids must be published in the official local newspaper and trade publication at least three weeks prior to the bid opening date. **Estimated date: December 18, 2015 – January 20, 2016.**

10. Submitted bids are received and publicly opened. **Estimated date: January 20, 2016.**

11. If the City Council wishes to continue with the improvement after the consideration of bids, the City Council may award the project to the lowest responsible bidder. **Estimated date: January 25, 2016.**

12. Construction begins. **Estimated date: April 4, 2016.**

13. Complete Storm Sewer and Subgrade prep. **Estimated date: April 18, 2016.**

14. Complete Aggregate Base. **Estimated date: Prior to April 28, 2016. (Road remains closed.)**

15. Paving **Estimated date: May 3, 2016.**

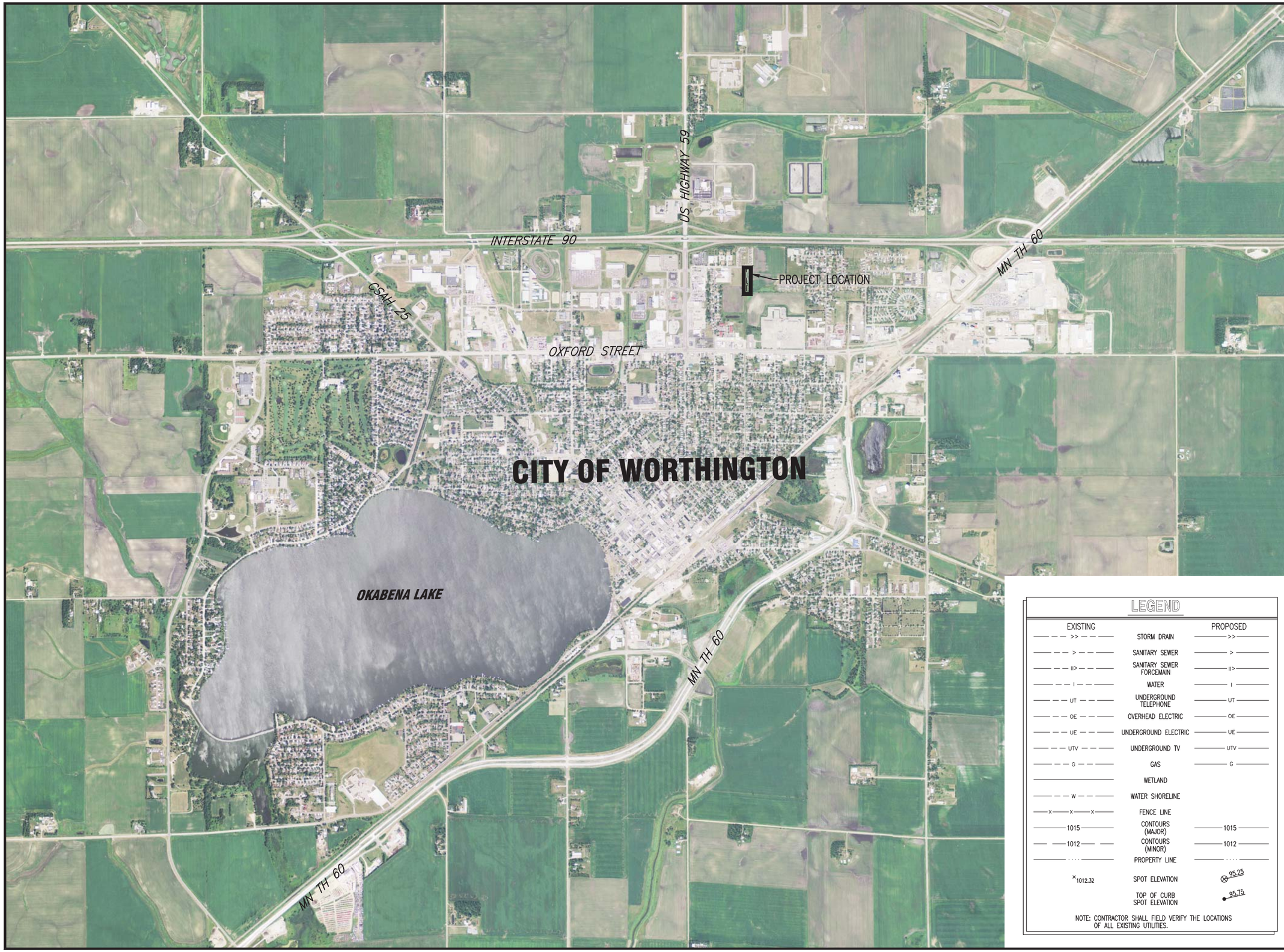
    i. **Road Opens May 17, 2016.**

16. Pave concrete walks. **Estimated date: May 23, 2016.**

17. Final Grading & Seeding. **Estimated date: June 6, 2016.**

18. Final Punch list, seeding touch ups, sod, etc. **Estimated date: June 24, 2016.**

Appendix A: Exhibits



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N

0 1000 2000 3000
Scale:

LEGEND

EXISTING		PROPOSED
>>	STORM DRAIN	>>
>	SANITARY SEWER	>
II>	SANITARY SEWER FORCEMAIN	II>
I	WATER	I
UT	UNDERGROUND TELEPHONE	UT
OE	OVERHEAD ELECTRIC	OE
UE	UNDERGROUND ELECTRIC	UE
UTV	UNDERGROUND TV	UTV
G	GAS	G
	WETLAND	
W	WATER SHORELINE	
X X X	FENCE LINE	
1015	CONTOURS (MAJOR)	1015
1012	CONTOURS (MINOR)	1012
....	PROPERTY LINE	....
×1012.32	SPOT ELEVATION	⊗95.25
	TOP OF CURB SPOT ELEVATION	•95.75

NOTE: CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

PROJECT

CITY OF WORTHINGTON

GRAND AVENUE EXTENSION

WORTHINGTON MINNESOTA

REVISION SCHEDULE

NO	DATE	DESCRIPTION

PROJECT NO.	16841
FILE NAME	16841 PRELIMS
DRAWN BY	KDS
DESIGNED BY	CJB
REVIEWED BY	CJB
ISSUE DATE	
CLIENT PROJECT NO.	

TITLE

PROJECT LOCATION

SHEET

CONCEPT

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0 100 200 300

Scale:

PROJECT

CITY OF WORTHINGTON

GRAND AVENUE EXTENSION

WORTHINGTON MINNESOTA

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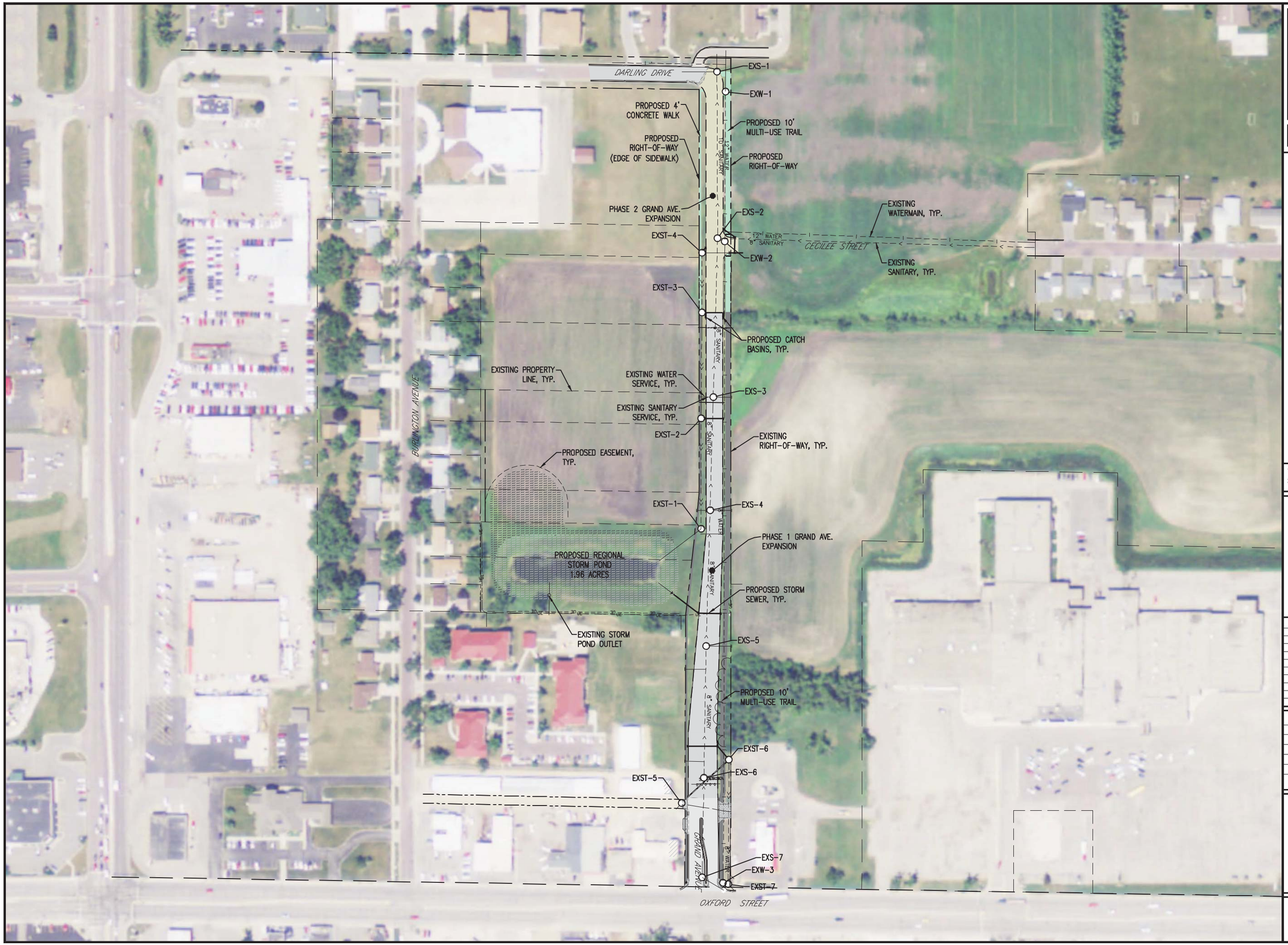
TITLE

EXISTING CONDITIONS

SHEET

CONCEPT

Appendix B: Preliminary Concept Designs



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0 100 200 300

Scale:

PROJECT

CITY OF WORTHINGTON

GRAND AVENUE EXTENSION

WORTHINGTON MINNESOTA

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PROJECT NO.	16841
FILE NAME	16841 PRELIMS
DRAWN BY	KDS
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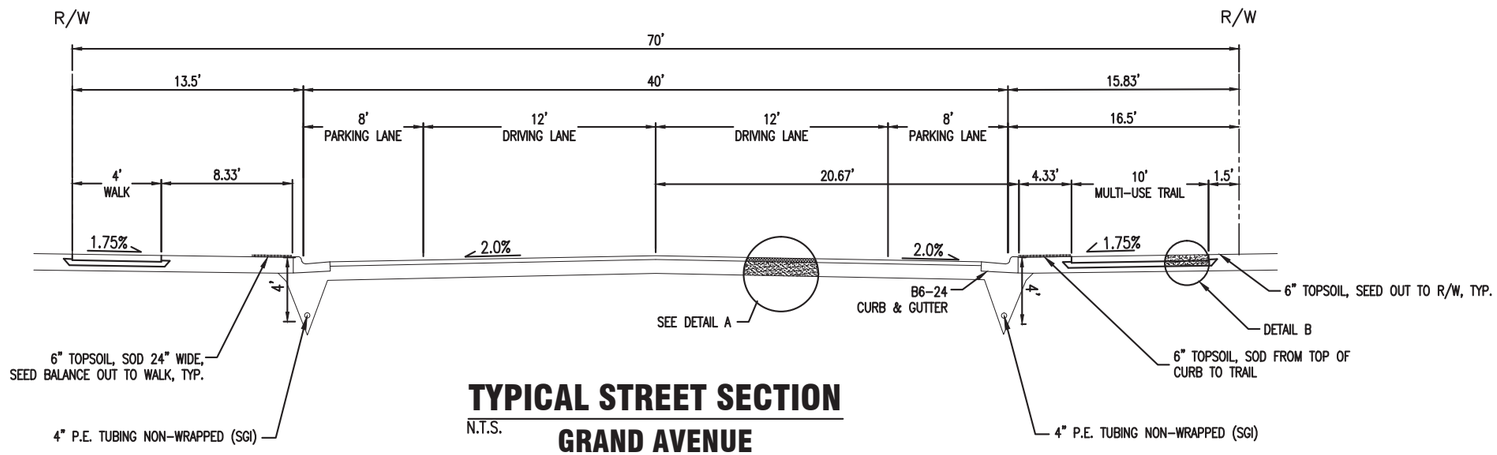
TITLE

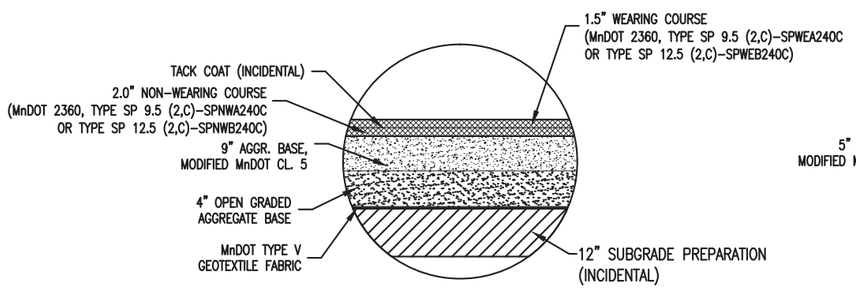
PROPOSED CONDITIONS

SHEET

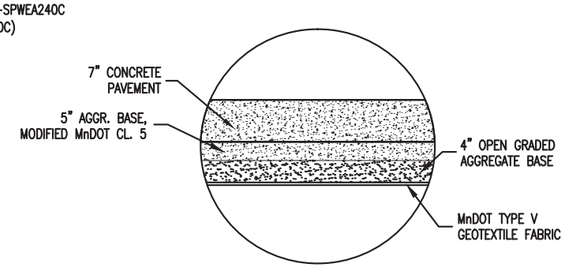
CONCEPT



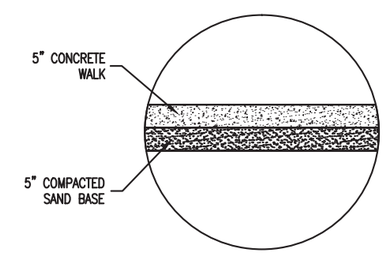
TYPICAL STREET SECTION
N.T.S.
GRAND AVENUE



DETAIL A
BITUMINOUS



DETAIL A
CONCRETE



DETAIL B
CONCRETE SIDEWALK

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PROJECT

CITY OF WORTHINGTON

GRAND AVENUE EXTENSION

WORTHINGTON MINNESOTA

REVISION SCHEDULE

NO	DATE	DESCRIPTION

PROJECT NO.	16841
FILE NAME	16841 PRELIMS
DRAWN BY	KDS
DESIGNED BY	CJB
REVIEWED BY	CJB
ISSUE DATE	
CLIENT PROJECT NO.	

TITLE

TYPICAL CROSS-SECTION DETAILS

SHEET

CONCEPT

Appendix C: Storm Water Report

(Completed as part of Phase 1)

July 21, 2014

Mr. Dwayne Haffield, PE
City Engineer
City of Worthington
303 9th Street, P.O. Box 279
Worthington, MN 56187

RE: Grand Avenue Storm Water Report

Dear Mr. Haffield:

Enclosed is the report for the Storm Water Report for the City of Worthington Grand Avenue Street Extension. Short Elliott Hendrickson, Inc. (SEH) completed the Preliminary Storm Water Report as part of the 2009 Grand Avenue Sewer and Storm Water Extension Plan. The Minnesota Pollution Control Agency (MPCA) has since released new specifications regarding a water quality volume of 1-inch of runoff from the new impervious surfaces created by the project; increased from ½-inch. The National Oceanic and Atmospheric Association (NOAA) has also released new rainfall-frequency data, called Atlas 14. I+S Group (ISG) has completed a revised Storm Water Report for the 2014 Grand Avenue Street Extension.

The site mentioned above is located southeast of the intersection of Interstate 90 (I-90) and Highway 59. The SEH report addressed the routing and ponding requirements for rate control and volume in this area and the evaluation of the design capacities of the storm sewer system that has now been constructed. This report completed by ISG addresses the increased 10-year and 100-year rainfall numbers and the ½-inch increase in the MPCA water quality volume and the need to increase the size of the existing pond, based exclusively on these increases. The report completed by ISG used most of the information previously submitted by SEH to the City of Worthington regarding the Grand Avenue Storm Water Retention pond, however, did alter some of the drainage areas.

MPCA and NOAA Standards

The existing storm water detention pond was designed to meet the MPCA's National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit. The site is partially located in the Heron Lake Watershed District and the Okabena-Ocheda Watershed District. The MPCA NPDES Permit has increased the water quality volume from ½-inch to 1-inch of runoff from the new impervious surfaces created by the project. The NPDES Permit design criteria for the dead-storage volume remained at 1,800 cubic feet per acre of contributing watershed, and water quality discharge of no more than 5.66 cfs per acre of surface area of the pond.

The Preliminary Storm Water Report compared the pre-pond conditions to the overall proposed conditions after all street, housing, and commercial development have taken place. The proposed end result will become approximately 66% of the existing watershed being converted to impervious area. Table 1 below shows the standards for both the MPCA and NOAA rainfall that are referenced throughout this report.

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Table 1: MPCA & NOAA Standards

	Dead Storage (1,800 cf/acre)	Runoff from new impervious area (in/acre of new impervious area)	Water Quality Discharge (cfs/acre)	10-year rainfall event (inches)	100-year rainfall event (inches)
Old Standards	1.26	0.5	5.66	4.20	6.00
New Standards	1.26	1.0	5.66	4.46	7.44

Table 2 below shows the pre-pond runoff rate versus the proposed runoff rate (after Grand Avenue and Cecilee Street have been constructed and development has been completed) for the original design based on the Preliminary Storm Water Report by SEH.

Table 2: Original Design

Original Design	Pre-Pond Construction Runoff Rate (CFS)	Proposed Runoff Rate (with Future Development) (CFS)
10-year rainfall event	25.0	11.4
100-year rainfall event	46.4	30.2

Based on the Preliminary Storm Water Report, the outlet for the pond was to be constructed with a 15-inch pipe leading to the 60-inch riser structure. From there, the riser structure would connect to the existing 36-inch RCP storm sewer system. However, based on the construction plans, an 18-inch pipe was installed instead of the 15-inch. Also, based on the construction plans, the elevations of each of the outlet devices was different than the model completed by SEH. Table 3 below shows the pre-pond runoff rate versus the proposed runoff rate for the constructed design based off of the construction plans and topographic information collected by ISG.

Table 3: Constructed Design

Constructed Design	Pre-Pond Construction Runoff Rate (CFS)	Proposed Runoff Rate (with Future Development) (CFS)
10-year rainfall event	25.0	15.4
100-year rainfall event	46.4	43.6

With the new standards, as previously discussed, the size of the pond will need to be increased to meet these standards. With the required dead storage needed not increasing, all of the pond expansion will take place above the maintained water level of 1573.6 elevation. Table 4 below shows the pre-pond runoff rate versus the proposed runoff rate for the proposed pond design. The expanded pond was designed to match the storm water runoff for the 100-year storm event compared to the already constructed design.

Table 4: New Proposed Design

Proposed Design	Pre-Pond Construction Runoff Rate (CFS)	Proposed Runoff Rate (with Future Development) (CFS)
10-year rainfall event	28.4	10.5
100-year rainfall event	59.8	43.0

Hydrology and Hydraulics

The HydroCAD, version 10.0, modeling software was used to recreate the Hydrologic and Hydraulic model created by SEH. The expanded detention pond was evaluated for the 10-year (4.46 inch) and 100-year (7.44-inch), NRCS 24-hours storm event. The inputs and results from the HydroCAD model are attached to this report. With the proposed pond expansion, the outlet will remain unchanged except for reducing the 18-inch pipe back to a 15-inch, as it was first designed in the Preliminary Storm Water Report. Limiting the outlet pipe to a 15-inch pipe will ensure that the peak flow leaving the pond does not exceed the previously constructed pond. All other existing storm sewer pipes and manholes will remain unchanged but will be extended to match the new alignment of the road.

Recommendations

The proposed expansion of the regional storm sewer pond assumes that all of Grand Avenue and Cecilee Street will be constructed and all future development be graded to drain to the existing and future proposed storm sewer. The expansion of the regional pond will eliminate the need for additional treatment for any future development in the area. However, water quality features such as rain gardens and/or small ponds are encouraged to further enhance the quality of water being drained to the local lakes, streams, and ditches.

Sincerely,

Chuck J. Brandel, PE
Civil Engineer/Principal