

Real People. Real Solutions.

Feasibility Report for **2021 Infrastructure Improvements Project** City of Jordan, MN

December 7, 2020





Prepared by:

Bolton & Menk, Inc. 12224 Nicollet Avenue Burnsville, MN 55337

Certification

Feasibility Report

for

2021 Infrastructure Improvements Project

City of Jordan, MN

BMI Project No. 0T1.122893

December 2020

I hereby certify that this plan, specification, or 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.

By:

use Wheeler

Lukas Wheeler, P.E. License No. 57855

Date: December 7, 2020

Table of Contents

1.0	IN	ITRODUCTION	1
2.0	Р	ROJECT INITIATION & BACKGROUND	3
3.0	E	XISTING CONDITIONS	5
	Α.	Streets	5
	В.	Pedestrian Facilities	6
	C.	Alleys	6
4.0	Р	ROPOSED IMPROVEMENTS	7
	Α.	Street Improvements	7
	В.	Pedestrian Improvements	8
	c		
	L.	Alley Improvements	9
5.0	C. P	Alley Improvements UBLIC INPUT	9 11
5.0 6.0	с. Р ТІ	Alley Improvements UBLIC INPUT RAFFIC & ACCESS	9 11 14
5.0 6.0 7.0	C. PI TI E/	Alley Improvements UBLIC INPUT RAFFIC & ACCESS ASEMENTS AND PERMITS	9 11 14 14
5.0 6.0 7.0 8.0	С. Р! Т! Е/ Е?	Alley Improvements UBLIC INPUT RAFFIC & ACCESS ASEMENTS AND PERMITS STIMATED COSTS/FINANCING	9 11 14 14 14
5.0 6.0 7.0 8.0 9.0	с. Р! Т! Е/ Е! Р!	Alley Improvements UBLIC INPUT RAFFIC & ACCESS ASEMENTS AND PERMITS STIMATED COSTS/FINANCING ROJECT SCHEDULE	9 11 14 14 14 14
5.0 6.0 7.0 8.0 9.0 10.0	C. PI E/ E! PI C	Alley Improvements UBLIC INPUT RAFFIC & ACCESS ASEMENTS AND PERMITS STIMATED COSTS/FINANCING ROJECT SCHEDULE ONCLUSION	9 11 14 14 14 16 16

Appendix

Appendix A: Figures Appendix B: Preliminary Cost Estimate Appendix C: Preliminary Assessment Roll & Map<u>s</u> Appendix D: Geotechnical Report

1.0 INTRODUCTION

This report examines the proposed infrastructure improvements for the City of Jordan's 2021 Infrastructure Improvement's Project. This project consists of several sub projects that are identified in the City's Capital Improvement Plan (CIP). These projects are scheduled for construction in 2021 in the CIP.

The proposed improvements include a combination of mill and overlay and full depth reclamation. The following streets in the Lowertown Area are proposed to receive a 2" mill and overlay:

- 1. Third Street from Mertens Street to Broadway Street
- 2. Fourth Street from Syndicate Street to Rice Street
- 3. Fifth Street from Varner Street to Rice Street
- 4. Sixth Street from Syndicate Street to Varner Street
- 5. Syndicate Street from Fourth Street to north of Sixth Street
- 6. Mertens Street from Second Street to Fourth Street
- 7. Wood Street form Second Street to the start of Wood Circle
- 8. West Street from Second Street to north of Sixth Street
- 9. Varner Street from Second Street to north of Sixth Street
- 10. Rice Street from Second Street to Broadway Street
- 11. East Street from First Street to Second Street (TH 282)
- 12. Creek Lane from El Dorado Drive up the bluff to Sunset Drive

The following streets in the Lowertown Area are proposed to be full depth reclaimed in place:

- 1. First Street from west of Mertens Street to West Street
- 2. Fourth Street from Rice Street to Broadway Street
- 3. Mertens Street from First Street to Second Street
- 4. Wood Street form First Street to Second Street
- 5. West Street from First Street to Second Street

The resurfacing improvements in the Lowertown Area and along Creek Lane will also include ADA pedestrian ramp improvements, and spot curb and gutter replacement.

Four blocks of alley improvements are proposed along the alleys ½ block south of Second Street from Mertens Street to Rice Street. Proposed improvements for these four blocks of alley include grading the existing gravel alley ways and paving with bituminous pavement area. The alley between Wood and West Street is recommended to be retrofit with a storm sewer system to promote property drainage and to sustain the pavement. A fifth alley between Broadway Street and Mill Street, ½ block south of First Street is also proposed to be improved adjacent to a new parking lot. The improvements for this block of alley include installing a new 6" concrete pavement.

Also included in these improvements is the construction of two lots parking:

1. One parking lot is located at the historic Jordan Brewery property. The City and the property owner have an agreement for the City to include the improvements as part of the 2021 Infrastructure Improvements project, with all associated costs will be assessed to the property owner.

2. The second parking lot is located within a soon to be City owned parcel off First Street, between Broadway Street and Mill Street (PID 220020330). This proposed parking lot will have access off the alley that is also proposed to be improved as part of this projects. Improvements for both lots include the installation of curb and gutter and bituminous pavement. Some storm sewer and sidewalk are proposed for the lot off First Street.

The above-mentioned project areas can be seen in Figure 1 in Appendix A at the end of this report.

This report will review the existing conditions in the project areas and discuss, in detail, the proposed improvements. It will also provide preliminary cost estimates for the proposed improvements with financing for the project comprising of a combination of the City's Street Fund, MSA Maintenance Funds, and assessments (for alley, parking lot, and sewer/water service improvements).

If the City decides to proceed with the proposed infrastructure improvements described in this report, it is anticipated construction would occur during the 2021 construction season as shown in the project schedule found in Section 9 of this report.

2.0 PROJECT INITIATION & BACKGROUND

The 2021 infrastructure Improvements Project was initiated at the October 5, 2020 City Council Meeting after being listed in the city of Jordan's Capital Improvement Program. The feasibility study and report have been completed to identify the infrastructure improvements needed in the proposed project areas, define estimated costs and preliminary assessments associated with the improvements, and document these findings for use by decision makers. This report will also be used as the basis for the final design component of the project. The report complies with the requirements of MN Statute 429 for levying special assessments to benefitting properties.

This report examines the proposed street and pedestrian improvements on the streets identified in the project area. The project areas consist of the Lowertown Area, Creek Lane, 5 blocks of alleys, and two parking lots in Jordan. The project areas are shown in Figure 1 below.



Figure 1: Project Location Map

The project scope involves:

- Bituminous mill and overlay
- Full depth street reclamation and bituminous paving
- Spot replacement of damaged curb and gutter
- Improvements to implement ADA compliance of pedestrian facilities
- Alley improvements

Permanent parking improvements

A geotechnical evaluation of the project areas was completed in November 2020 to facilitate evaluation of existing street conditions. Additionally, a drone flight was completed to collect imagery and surface data of the project area. Questionnaires were sent to residents adjacent to the project areas in order to collect additional input on project needs. Input from the geotechnical report, City staff, and residents was incorporated into the report recommendations.

3.0 EXISTING CONDITIONS

A. Streets

The street segments in the Lowertown area of the 2021 Infrastructure Improvements Project consist of 2.5 miles of local roads. These local roadways are relatively low volume, low speed roadways serving land uses which are largely single family residential homes. Street widths vary from $20^{\circ} - 50^{\circ}$. Most streets have parking available on both side of the street. Physical characteristics of the streets can be found in Table 1.

Streets in the Lowertown area are starting to deteriorate, consistent with expectations given it has been approximately 20 to 25 years since their reconstruction. Most pavement areas are showing pavement distresses such as longitudinal/lateral cracking and stripping. Some areas with increased deterioration are also displaying significant raveling, block cracking, and alligator cracking.

2,250° of Creek Lane from El Dorado Drive up the bluff to Sunset Drive is also included in these improvements. This stretch of roadway width varies from 32°-56° wide and was built in phases between 1998 and 2002. A sidewalk is located along the west side of the roadway. The existing pavement thickness is approximately 5.5° on average and is showing minor pavement distresses such as longitudinal/lateral cracking.

A geotechnical exploration was performed on the streets in the project area. The exploration consisted of performing ground penetrating radar (GPR) across all streets and taking pavement cores throughout the project area. The cores were used to understand the existing bituminous thickness, physical deterioration of the existing pavement, and determine the appropriate rehabilitation method. A copy of the geotechnical report can be found in Appendix D.

Street	Street Length in Feet	Street Width in Feet (curb face to face)	Average Bituminous Pavement Thickness in Inches (Per GPR)	Pedestrian Facility (If Present)
First Street: Dead End to Mertens	225	33	4.2	
First Street: Mertens to West	750	40	4.2	Concrete Walk (both sides)
Third Street	1,800	40	4.2	Concrete Walk (both sides)
Fourth Street: Mertens to West	700	40	4.2	Concrete Walk (both sides)
Fourth Street: West to Varner	325	44	4.2	Concrete Walk (both sides)
Fourth Street: Varner to Broadway	775	44	4.2	Concrete Walk (south side)
Fifth Street	200	20	4.3	
Sixth Street	1,120	40	3.9	Concrete Walk (south side)
Syndicate Street	975	30	4.6	Concrete Walk (East side)

Table 1: Existing Street Characteristics for Lowertown Area

Mertens Street: First to Second	330	33	4.9	Concrete Walk (West side)
Mertens Street Second to Fourth	415	30	4.9	Concrete Walk (both sides)
Wood Street	1,050	30	4.8	Concrete Walk (both sides)
West Street: First to Second	330	32	4.3	Concrete Walk (both sides)
West Street: Second to Third	335	32	4.3	Concrete Walk (East side)
West Street: Third to Fourth	325	34	4.3	Concrete Walk (West side)
West Street: Sixth to Dead End	485	36	4.3	
Varner Street: Second to Third	335	41	4.5	Concrete Walk (both sides)
Varner Street: Third to Fourth	335	46	4.5	Concrete Walk (both sides)
Varner Street: Fourth to Sixth	895	40	4.5	Concrete Walk (West side)
Varner Street: Sixth to Dead End	325	33	4.5	
Rice Street:	685	24	4.7	Concrete Walk (East side)
East Street	220	16	4.5	

B. Pedestrian Facilities

Most streets in the Lowertown area of the project have pedestrian facilities on one or both sides of the street. The existing sidewalks are 5'-6' concrete walk. Pedestrian ramps on the walk are comprised of varying configurations and in varying conditions. Most of the existing pedestrian ramps in the Lowertown area do not comply with current ADA standards.

The existing walk running along the west side of Creek Lane is a 5' wide concrete walk. Pedestrian ramps along this stretch vary in configuration and condition. Most of the existing pedestrian ramps along Creek Lane do not comply with current ADA standards.

C. Alleys

Five existing alleys are included in this project. Four blocks of existing alley located ½ block south of TH 282 (Second St), between Mertens St and Rice St and a fifth alley between Broadway Street and Mill Street, ½ block south of First Street. The existing alleys are approximately 10' wide and gravel. The exiting gravel requires routine maintenance by public works, particularly after significant rain events. Some drainage issues including standing water have been identified in portions of the existing alley ways.

D. Parking Lots

The two parking lots to be improved as part of this project consist of the existing gravel parking lot at the historic Brewery Property, and the existing vacant parcel along First Street between Broadway and Mill Street (behind the Pickle Pig). The Brewery property currently has an existing

gravel lot designated for parking at the property. The property owner previously proposed a change of use (restaurant) for the property. The existing parking area does not meet the parking demand required by the City Code for the requested change of use and thus must be improved to meet code. The City is currently working towards purchasing the existing vacant lot off First Street between Broadway Street and Mill Street (PID 220020330). The lot is currently gravel and has access to the alley running along the south side of the property.

4.0 PROPOSED IMPROVEMENTS

A. Street Improvements

The roadways within the 2021 Infrastructure Improvements Project are proposed to be either be milled and overlaid or full depth reclaimed in place. A majority of Lowertown and Creek Lane are proposed to be milled and overlaid to a two (2) inch depth across the entire roadway section from curb to curb. The proposed 2-inch pavement will be bituminous wearing course. Subgrade improvements and full depth bituminous patching will occur as needed in concentrated areas of overly distressed pavement. Portions of Lowertown exhibiting significant pavement distresses will be reclaimed to a depth of 12" and paved with two layers of tow (2) inch thick bituminous. The first layer of bituminous pavement will be non-wearing course and the top layer will be a wearing course. These improvements are consistent with the recommendations made in the Geotechnical Report found in Appendix D.

The proposed improvements are also consistent the City's Pavement Management Program which includes resurfacing to preserve the initial roadway investment. The project is intended to improve streets that, if no action were taken, will fall into the much more expensive category of a full-depth reconstruction. Existing curb and gutter along each roadway will be analyzed to identify existing areas of poor drainage and damage as defined by the city's current quality standards. Pieces of deficient curb will be removed and replaced with new concrete curb and gutter.

B. Creek Lane Roadway Improvements

Review was requested by the Jordan City Council regarding the cross slope of Creek Lane coupled with its horizontal curvature. Creek Lane is currently shaped with an industry standard 2.0% sloped crown to shed water away from the center of the roadway to the curb on each side. Along the outside lane of the horizontal curves, the cross sloped crown currently creates a feel that the motorist is falling away from the roadway centerline. A desire was expressed to potentially modify the cross slope to add superelevation (i.e. 'bank') the curves in the roadway in a manner that would slope the pavement instead from curb toward the centerline with the goal of safer operations and/or more comfortable driving experience. Review and consideration is as follows:

- *Existing Conditions:* Based on survey data collected as part of this study, Creek Lane has an existing horizontal radius of 400 feet and superelevation of which varies from about -2.0% to -3.0% through the area of interest. The roadway has a posted speed limit of 30 mph.
- *State Aid Standards:* MnDOT State Aid Design standards were reviewed as these minimum standards would need to be met during the reconstruction of Creek Lane if/when it were to occur. The minimum horizontal curve radius per State Aid standards is 300 feet for a roadway with superelevation of -2.0% and 30 mph design speed. Therefore, the existing horizontal radius is acceptable for the existing roadway cross slope per State Aid Design standards, as the 400 foot radius provided exceeds the minimum 300 foot radius standard.
- *AASHTO Guidance:* The American Association of State Highway Transportation Officials (AASHTO) Green Book was also consulted. Per the AASHTO Green Book, the

minimum horizontal curve radius for a roadway with 30 mph design is 333 and 353 feet for a roadway with cross slope of -2.0% and -3.0% respectively. Therefore, the existing horizontal radius is acceptable for the existing roadway cross slope per the AASHTO Green Book as the 400 foot radius provided exceeds the minimum radius guidance. This document noted that a 400' radius on a 30 mph roadway would suffice for a superelevation of up to -5.0%.

The City Council could require a higher design standard than these state aid standards and national guidance documents. In this case, adjustment of the horizontal radius of Creek Lane is likely cost prohibitive or infeasible, due to the presence of the bluff/Firemen's Park on the west side and private property impacts on the east side. Alternatively, the cross slope of the roadway could be modified by raising the easterly curb line to a degree which would increase the cross slope from -2.0% to +2.0%. This would require:

- Removal and replacement of an estimated 1600' of concrete curb and gutter
- Reconstruction of one driveway, the intersection of Creek Lane / Sunset Drive, and extension of Nolden Ln/Benjamin Bus Entrance/Creek Lane.
- Removal and replacement of six storm sewer structures and connecting pipe
- Reclamation of the roadway and full depth resurfacing of the pavement
- The estimated additional cost of these efforts would add approximately \$225,000 in project cost.

While superelevating the roadway would create a more comfortable feel for motorists, it may also increase motorists speeds using the roadway. Utilizing the same guidance documents, if the roadway cross slope were modified to have a +2.0% cross slope rather than -2.0% to -3.0% cross slope, the horizontal curves would effectively meet the design criteria for a 35 mph roadway design and faster moving traffic should therefore be anticipated. The provided sight distance at intersections, (including the entrance for the Pharmacy / Brentwood CDA development) would not be modified by this change, however the necessary (design) sight distance would need to be increased due to increased motorist speed. Given the public input received regarding sight distance concerns along Creek Lane, measures that would increase vehicle speed which would work contrary to addressing sight distance concerns, would not be welcomed by all motorists/residents.

The roadway is not immediately in need of pavement reclamation from a pavement management perspective. Therefore, if this alternative is desired, it is recommended Creek Lane's proposed mill and overlay improvements be removed from the proposed 2021 project and reclamation be budgeted for in a future year (2025 - 2030) in the Capital Improvement Plan. Modification of the Creek Lane curb / superelevation configuration is not recommended for implementation with this project.

C. Pedestrian Improvements

All existing pedestrian ramps along the existing sidewalk throughout the project areas not adhering to current American with Disabilities Act (ADA) standards will be replaced to comply with ADA standards.

The concept of a future regional trail along the east side of Creek Lane has been identified in Scott County and City of Jordan comprehensive plans, between Sunset Drive and TH 282. More broadly, this trail would serve as a portion of the connection between Lagoon Park and to the Minnesota River. Multiple other segments of this conceptual future regional trail link are not yet constructed, including:

- 1. Trail along Sunset Drive, between Lagoon Park and Creek Lane
- 2. Trail along the south side of TH 282, from Creek Lane to US 169 (included in

169/282/9 interchange proposed scope)

- 3. Trail across US 169, and continuing along CR 9 to 190th Street (included in 169/282/9 interchange proposed scope)
- 4. Trail along CR 9, from 190th St to the Minnesota River

The timing of future portions of this regional trail are unknown, either hinging on the timing of interchange funding or entirely unknown based on programming of segments 1 and 4 above by the City and County. The scope of improvements for Creek Lane, involving mill and overlay with the curb largely remaining in place, do not yield a significant gained opportunity to include trail improvements within the scope of work at this time. While consideration to including this regional trail segment in this project scope is made, if/when this regional trail segment is desired along Creek Lane it is recommended it be retrofit to the in place infrastructure along the Sunset Drive segment. External funding opportunities - such as the Met Council regional solicitation, MnDNR Local Trail Connections program, or partnership with Scott County given the regional function of this trail – could also be pursued with this approach. Finally, it is also conceivable that an alternative route than Creek Lane is ultimately desired for this regional trail connection, such as along Varner St (bridge anticipated for reconstruction within next 10 years) and the south side of First St adjacent to the proposed flood levees in that area.

D. Alley Improvements

4 Blocks of Alley between Mertens St & Rice St, south of TH 282

The existing gravel within the alleys will be shaped and graded to ensure proper drainage. The four blocks of alley located ½ block south of TH 282 (Second St), between Mertens St and Rice St will have bituminous pavement installed over the existing/underlying gravel.

The existing alleys were analyzed to determine whether storm sewer is required to achieve proper drainage. The existing grade in the alley between Wood Street and West Street is very flat. Industry standard notes a minimum 1.00% longitudinal grade for bituminous pavement to properly drain. The existing grade in this alley will not allow for 1.00% longitudinal grade to be achieved. Therefore, the addition of storm sewer to the alley is recommended. The storm sewer will run down the center of the alley from mid alley to out to West Street. The sewer will then run south on West Street and tie into the existing storm sewer at the West/First Street intersection.

The other alleys in the project area had adequate grade to achieve drainage, and the addition of storm sewer is not necessary.

1 Blocks of Alley between Broadway St & Mill St, south of First St

The alley between Broadway Street and Mill Street, ½ block south of First Street will be surfaced with 6" concrete pavement. From a preliminary review, this alley appears to have proper surface slope which can be accommodated by the new concrete alley pavement.

E. Parking Lot Improvements

Brewery Parking Lot

The existing gravel parking lot at the historic Jordan Brewery will be reconstructed with concrete curb and gutter and bituminous pavement. The parking lot will include 13 striped parking spaces utilizing one-way traffic circulation from TH 21 to Mill Street.

209 Broadway Street Parking Lot

The City has agreed to terms for purchase of a portion of property (PID 220020330) along First Street between Broadway Street and Mill Street. The area to be acquired is proposed to receive a new parking lot with concrete curb and gutter and bituminous pavement. Sidewalk will be installed along the west perimeter of the lot. Storm sewer will be installed to catch runoff form the lot and the adjacent buildings. The lot will include 35 striped parking spaces and will have

accesses off First Street and the alley. The lot will be available for public use, including the adjacent properties 205, 209, and 213 Broadway St.

The owner of the remaining portion of PID 220020330 has proposed the private addition of an outdoor dining space adjacent to the parking lot, which would be completed separate from these improvements. This project does include the installation of new sanitary sewer and water services to 209 First Street. The existing water and sewer services for this property run out of the back of the building and connect to mains in First Street. These existing services are undersized for a property containing a commercial kitchen and sprinkler system, therefore the property owner desires to upsize the services. New sanitary and water services are proposed to be stubbed from the mains in TH 21 (Broadway St) to 5' from the front of the building. From this location, the property owner may re-align the plumbing inside the structure and connect to the provided service connections. All costs for the installation of the new services will be assessed to the property owner.

5.0 PUBLIC INPUT

A letter was sent to all residents adjacent to the proposed project areas notifying them of the proposed project. A questionnaire was included with the letter encouraging residents to supply any input they may have on the project including any existing drainage issues they have noticed and any other suggestions they would like to be considered as part of the project. Twenty residents returned the questionnaire. The comments received are bulleted as follows, with the project team's corresponding review/consideration of each comment listed in italics:

- Concerns regarding access during construction.
 - Communication during construction is key to assuring reasonable access is maintained while the necessary work is performed. Newsletters will be provided to residents during the construction process, a website will be routinely updated to with the latest information, and contact information for project team members provided to residents to facilitate this communication. In cases where access is to be hindered by construction, such as the unique cases where concrete is curing in front of driveways for a seven day period, specific notice will be provided in advance to affected properties.
- Requests for the railroad crossing improvements on Third Street and Fourth Street including the potential for crossing arms to allow for a quiet zone.
 - Improvements to the crossing at Third Street are proposed with this project. A quiet zone (a Federal Rail Authority designation that prevents trains from sounding their horns) is outside the scope of this project. In general, achieving 'quiet zone' status would involve retrofit of every crossing within the City with a median in the roadway, signal improvements at every crossing location, and associated approvals/documentation with Union Pacific Railroad. If a railroad quiet zone is desired by the City, it is recommended it be studied and implemented separately.
 - Pavement improvements to the 3rd St crossing are planned with this project through coordination with Union Pacific.
- Drainage issues were reported at various locations. Each has been reviewed and some will be further evaluated during final design for more detailed potential solutions.
 - Along Fourth St between Varner St and West St: Some drainage issues were reported adjacent to the Schule Haus. The slope of curb in this area will be evaluated and if needed, a catch basin may be added from the storm sewer which is a mere 50-80 feet away from the reported issued. Coordination with Schule Haus to confirm the problem/solution is ongoing.
 - Along West St, north of Sixth St: Poor drainage in this area appears due to the shallow MnDOT ditch along TH 169. The shallow ditch does not drain as quickly as desired and causes the City's storm sewer (which discharges to the ditch) to hold water at times. MnDOT cleaned out this ditch with their 2015 project and subsequent cleanouts have been coordinated between Jordan Public Works and MnDOT maintenance staff. This ongoing issue is outside the scope of this pavement mill/overlay project to correct.
 - Other, relatively minor comments were received regarding curb/driveway curb panels holding water. Where the scope of work allows correction, the final plans will include mitigating improvements such as via replacement of a handful of concrete curb panels, adjustment of inlet castings, or the addition of a storm sewer structure adjacent to areas which already have a buried storm sewer pipe nearby.

- Where the corrective action would require work outside the scope of the project, such as the upsizing of the storm sewer system in full or the addition of storm sewer for one block or more, corrective improvements are not proposed. From review of the specifically reported issues, the project team and staff are not aware of significant deficiencies with the storm sewer system which would require this level of corrective action with storm sewer.
- Sinking and damaged curb and gutter and sidewalk causing drainage issues and tripping hazards in the Lowertown Area.
 - Spot replacement of defective curb panels, typically ones which are significantly heaved or cracked, is proposed with the project.
 - Concrete pedestrian ramps are proposed to be replaced in a manner meeting ADA requirement at each intersection.
 - Defective sidewalk panels that are not within pedestrian ramps are outside the scope of this project and are reviewed/managed through a separate City program on an annual basis through the Public Works Department.
- Some storm structures may need to be cleaned out to ensure proper drainage.
 - The Public Works Department cleans structures annually in the fall. The timing of the resident input on this project coincided with the dropping of leaves/litter by overhanging trees in the fall of 2020. It is anticipated structure cleaning has therefore been completed as requested.
- Areas of ice in the winter near pedestrian ramps in Lowertown.
 - Pedestrian ramps are being replaced with the project. Slopes along the curb at these locations will be set by the contractor during construction and it will be required that they adequately drain.
- Signage / Striping requests were received. A request for a stop sign at 6th Street and Varner Street was received. A request for a loading zone specifically for wheel chair access to a bus was received. This item will be reviewed with the City's safety committee.
 - These items will be reviewed with the City's safety committee.
- Boulevard trees causing sight line issues for Second Street / Mertens Street.
 - Follow up with the resident has occurred to understand which trees in particular are of potential concern. Tree trimming for sight lines is managed through separate city efforts, rather than the hiring of a contractor through this project to trim trees. This input has been shared with the City's Public Works Director.
- Request to analyze sight lines along Creek Lane when exiting Brentwood Court
 - This analysis has been completed on multiple occasions previously. In the winter of 2019-2020 for example, analysis was conducted the Brentwood Court property was required to remove a snowbank hindering sight lines. Permanent improvements for sight line increases are not proposed with this project.
- Drainage along the alley should be promoted to the center of the alley and then the street to ensure water does not encroach on adjacent properties.
 - This input is consistent with the alley improvements as proposed.

In December, the project team will reach out to these residents to respond to their questions and comments on the project generally as noted above in italics.

Special assessments are to be used to fund a portion of the alley improvement costs. A public improvement hearing will be held at a council meeting for the alley improvements prior to ordering final plans. This hearing is consistent with the MN Statute 429 process for special assessments. The council will also conduct a public hearing on the assessments prior to adopting the final assessments.

Additional correspondence will be sent to residents adjacent to the project areas as construction approaches including additional information on the proposed project, preliminary assessments (alley improvements only), what to expect during construction, and an approximate project schedule.

6.0 TRAFFIC & ACCESS

Traffic and driveway access will be maintained on all streets during construction. Traffic control devices (barrels, cones, barricades, etc.) will be utilized to delineate areas with active construction. Flagging may be necessary during milling and paving operations. The milled surface will be maintained as a drivable surface prior to bituminous paving. Areas of full pavement correction will be filled in with compacted aggregate base or barricaded off during non-working hours.

7.0 EASEMENTS AND PERMITS

The permanent proposed improvements will be constructed within the existing prescriptive street right-of-way and easements. Acquisition of permanent right of way (ROW) is not proposed with this project.

A Minnesota Pollution Control Agency (MPCA) – General Storm Water Permit for Construction Activity under the National Pollutant Discharge Elimination System (NPDES) will be acquired for the project. Construction BMPs will be implemented within the project areas as necessary in compliance with the City's stormwater ordinance. Less than 1.0 acres of new impervious area is proposed to be generated by the project and therefore no permanent stormwater management (ponding, etc.) is proposed to be built with the project.

A permit for work in MnDOT ROW will be necessary for construction of sanitary sewer/water services in TH 21. All associated costs are to be paid by the private property owner.

A permit for work in MnDOT ROW may be necessary for construction of the brewery parking addition adjacent to TH 21. The need for this permit will be evaluated during development of final plans and will be applied for as needed. No permanent improvements are proposed in MnDOT ROW, grading may extend into MnDOT ROW to facilitate construction of the parking improvements. All associated costs are to be paid by the private property owner.

A permit for work in MNDOT ROW will be necessary for construction of local street improvements connecting to TH 282 and the Broadway-Mill alley improvement connecting to TH 21.

8.0 ESTIMATED COSTS/FINANCING

The estimated project cost to complete the improvements proposed herein are presented below. These costs include estimated construction costs, a 15% contingency, and soft (indirect) costs for finance, legal, administrative, and engineering. Soft costs for the project areas included in the capital improvement plan, generally including the pavement resurfacing and alley improvement areas, amounting to 18% of the estimated construction costs. For the reconstruction/parking lot areas, soft costs are estimated to be 21% of estimated construction costs.

These cost estimates are based upon public construction cost information generated by historical bid prices by contractors observed for similar work. Since the consultant has no control over the cost of labor, materials, competitive bidding process, weather conditions, and other factors affecting the cost of construction, all cost estimates are opinions for general information of the client and no warranty or guarantee as to the accuracy of construction cost estimates is made. It is recommended that costs for project financing should be based upon actual, competitive bid prices with reasonable contingencies.

Location	Total Estimated Cost
Lowertown Area Street Improvements	\$2,238,000
Creek Lane Street Improvements	\$234,800
Bituminous Alley Improvements	\$131,900
West Street Storm Sewer	\$43,400
Concrete Alley Improvements	\$71,000
Broadway/Mill Parking Lot Improvements	\$183,700
Brewery Parking Lot Improvements	\$77,900
Estimated Project Total	\$2,980,700

Table 2 – Estimated Cost Summary 2021 Infrastructure Improvements(See Appendix B for Detailed Cost Estimate)

Table 3 – Funding Summary 2021 Infrastructure Improvements Project

Item	Total Estimated Cost
Street Fund	\$2,710,630
MSA Maintenance Funds	\$84,000
Special Assessments	\$186,070
TOTALS	\$2,980,700

A portion of the alley improvements costs will be assessed. With the guidance of the City's Finance Director and City Administrator, but at the discretion of the City Council, the alley improvements are proposed to be funded with 70% of costs by the City and 30% of costs by special assessments to adjacent private properties. Properties abutting or with access to the proposed improvements are proposed to be assessed. The assessments are on an adjusted front foot basis with benefitting property paying a respective proportion of 30% of the project costs to be assessed. The proposed assessments are proposed to be assessed over a term and based on the interest rate defined by the City's assessment policy or otherwise established by council resolution at the time of the assessment hearing. For this project based on the preliminary estimated assessment amounts, it is anticipated assessments will be payable over a 5-year period at an interest rate 1.0 percent higher than the rate secured by the City for its bonds on this project.

The preliminary assessment roll can be seen in Appendix C. The proposed assessments and funding summary are based on preliminary estimated projects costs and are anticipated to be revised at the time of final assessment hearing based on the bids received.

100% of the costs for the historic Jordan Brewery parking lot will be assessed to the property owner. This is per an agreement between the City and the property owner to complete the necessary improvements as part of the City's project. The owner is required to improve the existing parking to adhere to city code.

100% of the costs for the sanitary and water services constructed as part of the parking lot improvements off First Street between Broadway Street and Mill Street will be assessed to the property owner at 209 Broadway.

9.0 PROJECT SCHEDULE

The proposed project schedule is shown below:

Council Receives Feasibility (Preliminary Engineering) Report	December 7, 2020
Order the Public Improvement Hearing	December 7, 2020
Conduct the Public Improvement Hearing & Order Final Plans	January 18, 2021
Approve Plans & Specs; Authorize Ad for Bids	February 15, 2021
Council Reviews Bids, Order Alley Special Assessment Hearing	March 15, 2021
Assessment Hearing; Award Bid	April 19, 2021
Construction	May 2021 – November 2021

10.0 CONCLUSION

From an engineering standpoint, this project, as proposed, is feasible, cost effective, and necessary. It can best be accomplished by letting competitive bids for the work under one contract in order to complete the work in an orderly and efficient manner. The City, its financial consultant, and the persons assessed will have to determine` the economic feasibility of the proposed improvements.

Appendix A: Figures



2021 Infrastructure Improvements

City of Jordan, MN

Figure 1: Project Area Map

December 2020



Real People. Real Solutions.











🖉 Bolton & Menk, Inc. 2020, All Rights Reserve






































Appendix B: Preliminary Cost Estimate

PRELIMINARY ENGINEER'S ESTIMATE 2021 INFRASTRUCTURE IMPROVEMENTS CITY OF JORDAN, MN BMI PROJECT NO. 0T1.122893



							LOWER	TOWN				<u> </u>		in the second second							
TEM NO.	BID ITEM	TOTAL PROJECT	UNIT OF	ESTIMATED UNIT	TOTAL PROJECT	RESUR	FACING	OPTIONAL R	ECLAIM AREAS	CREE	K LANE	MERTENS - V	WOOD ALLEY	WOOD - V	VEST ALLEY	WEST - VAR	NER ALLEY	VARNER - F	RICE ALLEY	ALLEY STO	RM SEWER
		QUANTITY	MEASURE	PRICE	AMOUNT	ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED	
						QUANTITY	ESTIMATED COST	QUANTITY	ESTIMATED COST	QUANTITY	ESTIMATED COST	QUANTITY	ESTIMATED COST	QUANTITY	ESTIMATED COST	QUANTITY	ESTIMATED COST	QUANTITY	ESTIMATED COST	QUANTITY	ESTIMATED COST
1	MOBILIZATION	1	LUMP SUM	\$107,000.00	\$107,000.00	0.6	\$64,200	0.1	\$10,700	0.1	\$10,700	0.01	\$1,070	0.01	\$1,070	0.01	\$1,070	0.01	\$1,070	0.01	\$1,070
2	TRAFFIC CONTROL	1	LUMP SUM	\$54,000.00	\$54,000.00	0.6	\$32,400	0.1	\$5,400	0.1	\$5,400	0.01	\$540	0.01	\$540	0.01	\$540	0.01	\$540	0.01	\$540
3	CLEAR AND GRUB TREE	1	EACH	\$500.00	\$500.00																
4	SALVAGE CASTING (SANITARY/STORM)	14	EACH	\$150.00	\$2,100.00	2	\$300	12	\$1,800												
5	REMOVE CURB AND GUTTER (SPOT REPLACEMENT)	4310	LIN FT	\$7.00	\$30,170.00	3110	\$21,770	430	\$3,010	510	\$3,570	60	\$420	60	\$420	60	\$420	60	\$420		
6	REMOVE BITUMINOUS PAVEMENT (STREET)	2825	SQ YD	\$6.00	\$16,950.00	2270	\$13,620			380	\$2,280	20	\$120	20	\$120	20	\$120	20	\$120		
7	REMOVE BITUMINOUS PAVEMENT (DRIVEWAY)	95	SQ YD	\$6.00	\$570.00									35	\$210			60	\$360		
8	REMOVE CONCRETE PAVEMENT (WALK & DRIVEWAY)	4782	SQ YD	\$12.00	\$57,384.00	3480	\$41,760	570	\$6,840	390	\$4,680	30	\$360	47	\$564	95	\$1,140	40	\$480		
9	RECLAIM BITUMINOUS PAVEMENT (IN PLACE)	9800	SQ YD	\$2.00	\$19,600.00	3700	\$7,400	6100	\$12,200												
10	MILL BITUMINOUS SURFACE (2*)	45100	SQ YD	\$1.50	\$67,650.00	37600	\$56,400			7500	\$11,250			-							
11	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	1945	LIN FT	\$3.00	\$5,835.00	1085	\$3,255	115	\$345	185	\$555	60	\$180	70	\$210	60	\$180	80	\$240		
12	SAWING CONCRETE PAVEMENT (FOLL DEPTH) (WALKS AND DRIVEWAYS)	810	UNFI	\$5.00	\$4,050.00	340	\$1,700	40	\$200	340	\$1,700	10	\$50	10	\$50	20	\$100	10	\$50		
13	EUROPADE EXCAVATION (P)	2090	CUYD	\$40.00	\$83,600.00	410	\$16,400	680	\$27,200	120	63.600	30	\$1,200	30	\$1,200	30	\$1,200	40	\$1,600		
14	SUBGRADE EXCAVATION	11190	50 VD	\$20.00	\$16 785 00	2700	\$12,600	6100	\$2,200	130	32,000	240	\$510	240	\$200	240	\$510	270	\$200		
16	BIT IMINOUS MATERIAL FOR TACK COAT	4660	GNI	\$2.00	\$12,980.00	2520	\$10,590	340	\$1,020	660	\$1.980	340	\$60	30	\$60	340	\$60	3/0	590		
17	BITI IMINOUS WEARING COURSE (SPWEA240C)	7040	TON	\$75.00	\$528,000,00	5040	\$278,000	740	\$55,500	910	\$69,250	40	\$2,000	40	\$2,000	40	\$2,000	40	\$2,000		
18	BITUMINOUS NON-WEARING COURSE (SPNWB230C)	1640	TON	\$70.00	\$114.800.00	490	\$34,300	740	\$51,800			40	\$2,800	40	\$2,800	40	\$2,800	40	\$2,800		
19	BITUMINOUS STREET PATCH (2*)	2650	SO YD	\$30.00	\$79,500.00	2270	\$68.100			380	\$11.400										
20	FULL DEPTH BITUMINOUS STREET PATCH	1960	SQ YD	\$150.00	\$294,000.00	1880	\$282,000					5	\$750	5	\$750	5	\$750	5	\$750		
21	3" BITUMINOUS DRIVEWAY PAVEMENT (SPWEA240C)	95	SQ YD	\$30.00	\$2,850.00									35	\$1,050			60	\$1,800		
22	AGGREGATE SURFACEING CLASS 2	80	TON	\$20.00	\$1,600.00							20	\$400	20	\$400	20	\$400	20	\$400		
23	AGGREGATE BASE CLASS 5	2980	TON	\$15.00	\$44,700.00	1150	\$17,250	210	\$3,150	240	\$3,600	20	\$300	20	\$300	20	\$300	20	\$300		
24	CONCRETE CURB & GUTTER - DESIGN B612	505	LIN FT	\$22.00	\$11,110.00																
25	CONCRETE CURB & GUTTER - DESIGN B618	560	LIN FT	\$28.00	\$15,680.00																
26	CONCRETE CURB & GUTTER - DESIGN B618 (SPOT REPLACEMENT)	4290	LIN FT	\$35.00	\$150,150.00	3110	\$108,850	430	\$15,050	510	\$17,850	60	\$2,100	60	\$2,100	60	\$2,100	60	\$2,100		
27	CONCRETE CURB & GUTTER - DESIGN B624	20	LIN FT	\$35.00	\$700.00																
28	4" CONCRETE WALK	5050	SQ FT	\$7.00	\$35,350.00	2940	\$20,580	460	\$3,220	350	\$2,450			-							
29	6" CONCRETE WALK (PEDESTRIAN RAMPS)	690	SQ YD	\$140.00	\$96,600.00	540	\$75,600	110	\$15,400	40	\$5,600			-							
30	6" CONCRETE ALLEY/DRIVEWAY PAVEMENT	495	SQ YD	\$85.00	\$42,075.00									15	\$1,275	60	\$5,100				
31	8" CONCRETE DRIVEWAY APRON	137	SQ YD	\$100.00	\$13,700.00							30	\$3,000	32	\$3,200	35	\$3,500	40	\$4,000		
32	7" VALLEY GUTTER	100	SQ YD	\$110.00	\$11,000.00	100	\$11,000		44.400		40.040										
33	IRUNCALED DOMES	1252	SQFI	\$55.00	\$68,860.00	1100	\$60,500	80	\$4,400	72	23,960										
34		14	EACH	\$130.00	\$2,100.00	2	3300	12	\$1,800		44 644			-							
35	ADJUST CASTING (SANTART/STORM)	15	EACH	\$500.00	\$7,500.00	10	\$5,000		444.4	5	\$2,500										
36	ADJUST VALVE BOX	5	EACH	\$250.00	\$1,250.00	4	\$1,000	1	\$250												
37	6" WATERMAIN DUCTILE IRON CL 52	20	LIN FT	\$5,000.00	\$5,000.00									-							
39	8" X 6" PVC SANITARY SEWER SERVICE WYE	1	EACH	\$300.00	\$300.00																
40	6" PVC SANITARY SEWER SERVICE PIPE	45	LIN FT	\$50.00	\$2,250.00																
41	CONNECT TO EXISTING SANITARY SEWER PIPE	2	EACH	\$2,000.00	\$4,000.00																
42	CONNECT TO EXISTING STORM SEWER PIPE	2	EACH	\$1,200.00	\$2,400.00																
43	CONNECT TO EXISTING STORM STRUCTURE	1	EACH	\$2,000.00	\$2,000.00															1	\$2,000
44	12" STORM PIPE	355	UN FT	\$55.00	\$19,525.00															355	\$19,525
45	15" STORM PIPE	150	UN FT	\$60.00	\$9,000.00																
46	CONSTRUCT STORM MH DES H	1	EACH	\$1,800.00	\$1,800.00															1	\$1,800
47	STORM CATCH BASIN - DES R-1, 2'X3'	1	EACH	\$2,000.00	\$2,000.00																
48	CONSTRUCT STORM MH DES 48" - 4020	3	EACH	\$2,500.00	\$7,500.00															2	\$5,000
49	CASTING (STORM MANHOLE)	3	EACH	\$750.00	\$2,250.00															2	\$1,500
50	CASTING (NEENAH R-2535)	1	EACH	\$750.00	\$750.00															1	\$750
51	CASTING (NEENAH R-3067V)	1	EACH	\$750.00	\$750.00																
52	HYDROMULCH & SEED MIX 25-151	5620	SQ YD	\$1.50	\$8,430.00	2600	\$3,900	400	\$600	300	\$450	340	\$510	340	\$510	340	\$510	370	\$555		
53	COMMMON TOPSOIL BORROW	980	CU YD	\$40.00	\$39,200.00	440	\$17,600	70	\$2,800	50	\$2,000	60	\$2,400	60	\$2,400	60	\$2,400	70	\$2,800		
54	CROSSWALK (MULTI COMP)	1152	SQ FT	\$10.00	\$11,520.00	450	\$4,500	270	\$2,700	432	\$4,320										
55	SIGN PANEL TYPE C	36	SQ FT	\$75.00	\$2,700.00																
56	4" SOLID LINE PAINT (WHITE)	1135	LIN FT	\$1.00	\$1,135.00					200	\$200										
57	DOUBLE 4" SOLID LINE PAINT (YELLOW)	1790	LIN FT	\$2.00	\$3,580.00					1790	\$3,580										
58	PAVEMENT MESSAGE (ARROW)	2	EACH	\$300.00	\$600.00					2	\$600										
59	LANDSCAPE ALLOWANCE	1	LUMP SUM	\$15,000.00	\$15,000.00	0.6	\$9,000	0.1	\$1,500	0.1	\$1,500	0.05	\$750	0.05	\$750	0.05	\$750	0.05	\$750		
60	CONSTRUCTION BY UNIOIN PACIFIC RAILROAD (3RD ST CROSSING)	1	LUMP SUM	\$125,000.00	\$125,000.00	1	\$125,000														
				SUBTOTAL	\$2,290,000		\$1,511,000		\$238,000		\$173,000		\$21,000		\$24,000		\$27,000		\$25,000		\$32,000
			ESTIMATED COM	10% CONTINGENCY:	\$229,000		\$111,900		\$35,700		\$26,000		\$3,200		\$3,600		\$4,100		\$3,800	-	\$4,800
	SOFT COSTS (SURVE	Y, GEOTECHNICAL, DESIGN,	& CONSTRUCTIO	IN INSP, & ADMIN):	\$461,700		\$292,100		\$49,300		\$35,800		\$4,400		\$5,000		\$5,600		\$5,200		\$6,600
		SUBTOTAL: CAPITAL IMI	PROVEMENT PLA	AN PROJECT AREAS	\$2,648,100		\$1,915,000		\$323,000		\$234,800		\$28,600		\$32,600		\$36,700		\$34,000		\$43,400
	SUBTOTAL	DOWNTOWN PARKING LO	DT & ALLEY (NO	T INCL. LAND ACQ)	\$254,700																
	SUBTOTAL	L. DREWERT PARKING LOT (TOTAL ESTIMANT	TED PROJECT COST	\$77,900		\$1,915,000		\$323,000		\$234.800		\$28,600		\$32,600		\$36.700		\$34.000		\$43,400
					\$2,500,500	1	32,723,000		4923,000		\$234,000		220,000		332,000		\$30,100		434,000		243,400

PRELIMINARY ENGINEER'S ESTIMATE 2021 INFRASTRUCTURE IMPROVEMENTS CITY OF JORDAN, MN BMI PROJECT NO. 0T1.122893



						BROADWAY / MILL ALLEY & 209 BROADWAY PARKING LOT		() () () () () () () () () ()					
		TOTAL PROJECT	UNITOF		TOTAL PROJECT	BROADWAY	- MILL ALLEY	PARK	NGLOT	209 FIRST ST WA	TER/SEWER SERVICE	BREWERY PARKING LOT	
ITEM NO.	BID ITEM	ESTIMATED	MEASURE	PRICE	• ESTIMATED							/ 	·
		QUANTITY			AMOUNT	ESTIMATED	ESTIMATED COST	ESTIMATED	ESTIMATED COST	ESTIMATED	ESTIMATED COST	ESTIMATED	ESTIMATED COST
						QUANTITY		QUANTITY		QUANTITY		QUANTITY	
1	MOBILIZATION	1	LUMP SUM	\$107,000.00	\$107,000.00	0.03	\$3,210	0.07	\$7,490	0.02	\$2,140	0.03	\$3,210
2	TRAFFIC CONTROL	1	LUMP SUM	\$54,000.00	\$54,000.00	0.03	\$1,620	0.07	\$3,780	0.02	\$1,080	0.03	\$1,620
3	CLEAR AND GRUB TREE	1	EACH	\$500.00	\$500.00					1	\$500	· · · · · · · · · · · · · · · · · · ·	
4	SALVAGE CASTING (SANITARY/STORM)	14	EACH	\$150.00	\$2,100.00								
5	REMOVE CURB AND GUTTER (SPOT REPLACEMENT)	4310	LIN FT	\$7.00	\$30,170.00					20	\$140		
6	REMOVE BITUMINOUS PAVEMENT (STREET)	2825	SQ YD	\$6.00	\$16,950.00					75	\$450	20	\$120
7	REMOVE BITUMINOUS PAVEMENT (DRIVEWAY)	95	SQ YD	\$6.00	\$570.00								
8	REMOVE CONCRETE PAVEMENT (WALK & DRIVEWAY)	4782	SQ YD	\$12.00	\$57,384.00	120	\$1,440			10	\$120		
9	RECLAIM BITUMINOUS PAVEMENT (IN PLACE)	9800	SQ YD	\$2.00	\$19,600.00								
10	MILL BITUMINOUS SURFACE (2")	45100	SQ YD	\$1.50	\$67,650.00								
11	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	1945	LIN FT	\$3.00	\$5,835.00	60	\$180	90	\$270	100	\$300	40	\$120
12	SAWING CONCRETE PAVEMENT (FULL DEPTH) (WALKS AND DRIVEWAYS)	810	LIN FT	\$5.00	\$4,050.00	25	\$125	15	\$75				
13	COMMON EXCAVATION (P)	2090	CU YD	\$40.00	\$83,600.00	150	\$6,000	450	\$18,000			270	\$10,800
14	SUBGRADE EXCAVATION	1030	CU YD	\$20.00	\$20,600.00	25	\$500	75	\$1,500			20	\$400
15	SUBGRADE PREPARATION (P)	11190	SQ YD	\$1.50	\$16,785.00								
16	BITUMINOUS MATERIAL FOR TACK COAT	4660	GAL	\$3.00	\$13,980.00							40	\$120
17	BITUMINOUS WEARING COURSE (SPWEA240C)	7040	TON	\$75.00	\$528,000.00			130	\$9,750			60	\$4,500
18	BITUMINOUS NON-WEARING COURSE (SPNWB230C)	1640	TON	\$70.00	\$114,800.00			170	\$11,900			80	\$5,600
19	BITUMINOUS STREET PATCH (2")	2650	SQ YD	\$30.00	\$79,500.00							· · · · · · · · · · · · · · · · · · ·	
20	FULL DEPTH BITUMINOUS STREET PATCH	1960	SQ YD	\$150.00	\$294,000.00	5	\$750	5	\$750	50	\$7,500	· · · · · · · · · · · · · · · · · · ·	
21	3" BITUMINOUS DRIVEWAY PAVEMENT (SPWEA240C)	95	SQ YD	\$30.00	\$2,850.00								
22	AGGREGATE SURFACEING CLASS 2	80	TON	\$20.00	\$1,600.00								
23	AGGREGATE BASE CLASS 5	2980	TON	\$15.00	\$44,700.00	185	\$2,775	725	\$10,875			390	\$5,850
24	CONCRETE CURB & GUTTER - DESIGN B612	505	LIN FT	\$22.00	\$11,110.00	65	\$1,430	440	\$9,680				
25	CONCRETE CURB & GUTTER - DESIGN B618	560	LIN FT	\$28.00	\$15,680.00							560	\$15,680
26	CONCRETE CURB & GUTTER - DESIGN B618 (SPOT REPLACEMENT)	4290	LIN FT	\$35.00	\$150,150.00								
27	CONCRETE CURB & GUTTER - DESIGN B624	20	LIN FT	\$35.00	\$700.00					20	\$700		
28	4" CONCRETE WALK	5050	SQ FT	\$7.00	\$35,350.00			1200	\$8,400	100	\$700		
29	6" CONCRETE WALK (PEDESTRIAN RAMPS)	690	SQ YD	\$140.00	\$96,600.00								
30	6" CONCRETE ALLEY/DRIVEWAY PAVEMENT	495	SQ YD	\$85.00	\$42,075.00	375	\$31,875	45	\$3,825				
31	8" CONCRETE DRIVEWAY APRON	137	SQ YD	\$100.00	\$13,700.00								
32	7" VALLEY GUTTER	100	SQ YD	\$110.00	\$11,000.00								
33	TRUNCATED DOMES	1252	SQ FT	\$55.00	\$68,860.00								
34	REINSTALL CASTING (SANITARY/STORM)	14	EACH	\$150.00	\$2,100.00								
35	ADJUST CASTING (SANITARY/STORM)	15	EACH	\$500.00	\$7,500.00								
36	ADJUST VALVE BOX	5	EACH	\$250.00	\$1,250.00								
37	6" X 12" WET TAP WITH GATE VALVE	1	EACH	\$5,000.00	\$5,000.00					1	\$5,000		
38	6" WATERMAIN DUCTILE IRON CL 52	20	LIN FT	\$50.00	\$1,000.00					20	\$1,000		
39	8" X 6" PVC SANITARY SEWER SERVICE WYE	1	EACH	\$300.00	\$300.00					1	\$300	· · · · · · · · · · · · · · · · · · ·	
40	6" PVC SANITARY SEWER SERVICE PIPE	45	LIN FT	\$50.00	\$2,250.00					45	\$2,250		
41	CONNECT TO EXISTING SANITARY SEWER PIPE	2	EACH	\$2,000.00	\$4,000.00					2	\$4,000		
42	CONNECT TO EXISTING STORM SEWER PIPE	2	EACH	\$1,200.00	\$2,400.00			2	\$2,400				
43	CONNECT TO EXISTING STORM STRUCTURE	1	EACH	\$2,000.00	\$2,000.00								
44	12" STORM PIPE	355	LIN FT	\$55.00	\$19,525.00								
45	15" STORM PIPE	150	LIN FT	\$60.00	\$9,000.00			150	\$9,000				
46	CONSTRUCT STORM MH DES H	1	EACH	\$1,800.00	\$1,800.00								
47	STORM CATCH BASIN - DES R-1, 2'X3'	1	EACH	\$2,000.00	\$2,000.00			1	\$2,000				
48	CONSTRUCT STORM MH DES 48" - 4020	3	EACH	\$2,500.00	\$7,500.00			1	\$2,500				
49	CASTING (STORM MANHOLE)	3	FACH	\$750.00	\$2,250,00			1	\$750				
50	CASTING (NEENAH R-2535)	1	EACH	\$750.00	\$750.00								
51	CASTING (NEENAH B-3067V)	1	FACH	\$750.00	\$750.00			1	\$750				
51	INDROMUCU & FFTD MIX 2F 1F1		CO VD	51.50	\$7,50,000	100	6150	200	\$750			620	coar
52		3620	SUIND	\$1.30	\$8,430.00	30	5130	200	3300			630	3343
	CONTINUES (ANILE) COMP.	1152	60.07	\$10.00	511 530 00	10	3000	40	\$1,000			110	24,400
54	CRUSSWARK (MIDLIT COMP)	1132	30,11	310.00	311,320.00								44 844
55	SIGN PANEL TYPE C	36	SQFI	\$75.00	\$2,700.00							36	\$2,700
56	4" SOLID LINE PAINT (WHITE)	1135	LIN FT	\$1.00	\$1,135.00			675	\$675			260	\$260
57	DOUBLE 4" SOLID LINE PAINT (YELLOW)	1790	LIN FT	\$2.00	\$3,580.00						+	l	1
58	PAVEMENT MESSAGE (ARROW)	2	EACH	\$300.00	\$600.00							·	-
59	LANDSCAPE ALLOWANCE	1	LUMP SUM	\$15,000.00	\$15,000.00								
60	CONSTRUCTION BY UNIOIN PACIFIC RAILROAD (3RD ST CROSSING)	1	LUMP SUM	\$125,000.00	\$125,000.00			I		L	1	l	1
				SUBTOTAL	\$2,290,000		\$51,000		\$106,000		\$26,000		\$56,000
			ESTIMATED CO	NSTRUCTION COST:	\$2,519,000		\$7,700		\$15,900		\$3,900		\$8,400
	SOFT COSTS (SURVEY, GEOTE	CHNICAL, DESIGN, 8	CONSTRUCTIO	IN INSP, & ADMIN):	\$461,700		\$12,300		\$25,600		\$6,300		\$13,500
	SUBT	OTAL: CAPITAL IMP	ROVEMENT PL	AN PROJECT AREAS	\$2,648,100								
	SUBTOTAL: DOWN	TOWN PARKING LO	I & ALLEY (NO	OWNER FUNDED	\$254,700		\$71,000		\$147,500		\$36,200		677.000
	SUBIDIAL: BREW	Contraction of Contraction (1	TOTAL ESTIMA	TED BROIECT COST	\$77,900		\$71.000		\$147 500		\$26 200		\$77,900

Appendix C: Preliminary Assessment Roll & Map

PRELIMINARY ASSESSMENT ROLL 2021 INFRASTRUCTURE IMPROVEMENTS CITY OF JORDAN, MN 12/7/2020

	PRELIMINARY SPECIAL ASSESSMENT ROLL: MERTENS ST - RICE ST ALLEYS									
COST TO BE ASSESSED		\$50,670.00								
TOTAL FRONT FOOTAGE		2439	_							
ASSESED FRONT FOOT R	ΑΤΕ	\$20.77								
PID	Taxpayer Name	Taxpayer Address	Front Footage	Assessment Amount						
220020960	NORTHERN STATES POWER CO & PROPERTY TAX DEPT	414 NICOLLET MALL MPLS, MN 55401	60	\$1,246.49						
220020960	NORTHERN STATES POWER CO & PROPERTY TAX DEPT	414 NICOLLET MALL MPLS, MN 55401	121	\$2,513.76						
220020910	BREE PROPERTIES LLC	305 HILLSIDE DR JORDAN, MN 55352	70	\$1,454.24						
220020920	SCHMIT DENNIS J & SHARI A	104 2 ST E JORDAN, MN 55352	60	\$1,246.49						
220020930	SCHMIDT ANTHONY D JR	PO BOX 36 JORDAN, MN 55352	50	\$1,038.75						
220020970	BORCHARDT GENE & REBECCA	20625 HARLOW AVE JORDAN, MN 55352	60	\$1,246.49						
220020980	K-MOX INC	18540 LEGENDS CLUB CIR PRIOR LAKE, MN 55372	60	\$1,246.49						
220020990	BOX HOLDINGS LLC	260 MYRICK ST LE SUEUR, MN 56058	101	\$2,098.27						
220021000	CENTERPOINT ENERGY RESOURCE	PO BOX 1475 HOUSTON, TX 77251	20	\$415.50						
220021030	STIER LAURIE MARIE	105 WEST ST S JORDAN, MN 55352	60	\$1,246.49						
220021040	HENNEN MATTHEW J	112 2 ST W JORDAN, MN 55352	60	\$1,246.49						
220021050	CASE HANS F	108 2 ST W JORDAN, MN 55352	60	\$1,246.49						
220021070	L J M PROPERTIES LLC	PO BOX 55 JORDAN, MN 55352	120	\$2,492.99						
220021090	NYGAARD JOHN	108 VARNER ST S JORDAN, MN 55352	60	\$1,246.49						
220021110	HIPPEN JEREMY	105 1 ST W JORDAN, MN 55352	120	\$2,492.99						
220021120	LAWRIE TIMOTHY T	109 1 ST W JORDAN, MN 55352	60	\$1,246.49						
220021130	KRAGTHORPE MARK S & GAIL M	109 WEST ST S JORDAN, MN 55352	60	\$1,246.49						
220030130	BARND JESSICA	216 2ND ST W JORDAN, MN 55352	60	\$1,246.49						
220030140	GOSEWISCH DAVID A & LORRAINE	212 2 ST W JORDAN, MN 55352	60	\$1,246.49						
220030150	KRATOCHVIL JOHN	208 2 ST W JORDAN, MN 55352	60	\$1,246.49						
220030160	BOSTON CALEB	204 2 ST W JORDAN, MN 55352	60	\$1,246.49						
220030170	ALLMANN RITA A	100 WEST ST S JORDAN, MN 55352	60	\$1,246.49						
220030180	OLSEN ERIC	201 1ST ST W JORDAN, MN 55352	84	\$1,745.09						
220030190	CORRELL TERRY L & KAREN A	209 1 ST W JORDAN, MN 55352	27	\$560.92						
220030200	PIEPER CRUZ	205 1ST ST W JORDAN, MN 55352	33	\$685.57						
220030210	GROSAM RYAN	213 1 ST W JORDAN, MN 55352	35	\$727.12						
220030220	HUGHES LAURA A	221 1ST ST W JORDAN, MN 55352	89	\$1,848.97						
220030230	ARRICHIELLO JOAN	217 1 ST W JORDAN, MN 55352	32	\$664.80						
220030240	LARIVEE LANDON	316 2ND ST W JORDAN, MN 55352	50	\$1,038.75						
220030250	PILLE KIA A	312 2 ST W JORDAN, MN 55352	71	\$1,475.02						
220030260	HEIMKES WILLIAM	308 2ND ST W JORDAN, MN 55352	60	\$1,246.49						
220030270	LAUGHRIDGE TROY	304 2 ST W JORDAN, MN 55352	60	\$1,246.49						
220030280	THEIS MICHAEL J	100 WOOD ST S JORDAN, MN 55352	60	\$1,246.49						
220030290	GROTH JOSEPH R	3550 CREEK RD CHASKA, MN 55318	91	\$1,890.52						
220030300	ZANDER JONATHAN M	1013 PRIMROSE LN SHAKOPEE, MN 55379	30	\$623.25						
220030310	EBNETER TAYLOR M & NICKOLAS E	309 1 ST W JORDAN, MN 55352	40	\$831.00						
220030320	SWANSON-STRAIT NADINE	313 1ST ST W JORDAN, MN 55352	51	\$1,059.52						
220030330	HJELMELAND ERIC R	317 1 ST W JORDAN, MN 55352	91	\$1,890.52						
229190750	HOUSTON MARK	116 2 ST E JORDAN, MN 55352	33	\$685.57						
			SUBTOTAL:	\$50,669.94						

	PRELIMINARY SPECIAL ASSESSMENT ROLL: BROADWAY / MILL ST ALLEY										
COST TO BE ASSESSED		\$21,300.00									
TOTAL FRONT FOOTAGE	E	600									
ASSESED FRONT FOOT I	RATE	\$35.50	-								
PID	Taxpayer Name	Taxpayer Address	Front Footage	Assessment Amount							
220020300	SCHMIDT ANTHONY D JR	PO BOX 36 JORDAN, MN 55352	60	\$2,130.00							
220020320	TRADITION CAPITAL INVESTMENTS LLC	4700 GOLFVIEW DR JORDAN, MN 55352	60	\$2,130.00							
220020310	GRANNESET LLC	408 WILSHIRE WALK, MN 55305	60	\$2,130.00							
220020340	FLICKINGER JANICE M & MARK D	308 1 ST E JORDAN, MN 55352	60	\$2,130.00							
220020350	SJL PROPERTIES LLC	3110 N CHESTNUT ST UNIT 302 CHASKA, MN 55318	60	\$2,130.00							
220020370	WAGNER BERNARD F	208 MILL ST JORDAN, MN 55352	65	\$2,307.50							
220020380	SCHMIDT ANTHONY D JR	PO BOX 36 JORDAN, MN 55352	55	\$1,952.50							
220020390	MACELREE STACY A	5018 BEACH ST NE PRIOR LAKE, MN 55372	60	\$2,130.00							
220020400	KNOX KEVIN P & TERESA L	221 BROADWAY ST S JORDAN, MN 55352	120	\$4,260.00							
			SUBTOTAL:	\$21,300.00							

	PRELIMINARY SPECIAL ASSESSMENT ROLL: BREWERY PARKING LOT											
PID	Taxpayer Name	Taxpayer Address	Assessment Amount									
220010290	BREE PROPERTIES LLC	305 HILLSIDE DR JORDAN, MN 55352	\$38,950.00									
220010291	BREE PROPERTIES LLC	305 HILLSIDE DR JORDAN, MN 55352	\$19,475.00									
229190620	BREE PROPERTIES LLC	305 HILLSIDE DR JORDAN, MN 55352	\$19,475.00									
			SUBTOTAL: \$77,900.00									

	PRELIMINARY SPECIAL ASSESSMENT ROLL: 209 BROADWAY STREET WATER/SEWER SERVICES									
PID Taxpayer Name		Taxpayer Address	Assessment Amount							
220020320	TRADITION CAPITAL INVESTMENTS LLC	4700 GOLFVIEW DR JORDAN, MN 55352	\$36,200.00							

TOTAL AMOUNT TO BE ASSESSED: \$186,069.94

Proposed 2021 Alley Paving Improvements



Property Assessment

November 2020



Real People. Real Solutions.



November 2020



Real People. Real Solutions.



Property Assessment

November 2020



Real People. Real Solutions.



Appendix D: Geotechnical Report



Braun Intertec Corporation 11001 Hampshire Avenue S Minneapolis, MN 55438
 Phone:
 952.995.2000

 Fax:
 952.995.2020

 Web:
 braunintertec.com

November 30, 2020

Project B2009490

Luke Wheeler, PE Bolton & Menk, Inc. 12224 Nicollet Avenue Burnsville, MN 55337

Re: Geotechnical Evaluation City of Jordan 2021 Infrastructure Improvements Jordan, Minnesota

Dear Mr. Wheeler:

We are pleased to present this Geotechnical Evaluation Report for the 2021 Infrastructure Improvements in the City of Jordan, Minnesota. Our results and recommendations in light of the geotechnical issues influencing design and construction are presented in this letter report, which we request you read in its entirety.

We performed our work in general accordance with our proposal (QTB129703) and the Master Subconsultant Agreement for Professional Services dated January 1, 2017 between Bolton & Menk, Inc. and Braun Intertec Corporation.

Purpose and Scope

The purpose of this evaluation was to measure the pavement thicknesses and sample shallow subsurface materials with ground penetrating radar (GPR), coring and hand auger borings; and to use the information gathered to provide recommendations for mill and overlay or reclamation of the project streets. The proposed rehabilitation includes pavement reclamation and resurfacing of the segments shown in Table 1 and Figure 1; a sketch showing exploration locations and project limits is also attached to this letter.

Table 1. Streets Included in the 2021 Infrastructure Improvements Project

		Approx. Length	
Street	Segment	(feet)	Proposed Work
Sixth St	Syndicate St to Varner St	1100	Mill and overlay
West St	Sixth St to End	280	
Syndicate St	TH 169 to Fourth St	1040	Mill and overlay
Fourth St	Syndicate St to Broadway St	1860	Mill and overlay
Wood St	Fourth St to Cul-de-sac	790	Full-depth reclamation
Mertens St	Fourth St to First St	800	Full-depth reclamation (south of Second St) Mill and overlay (north of Second St)
First St	West End to West St	950	Mill and overlay
West St	First St to Fourth St	1070	Full-depth reclamation (south of Second St) Mill and overlay (north of Second St)
Wood St	Third St to First St	700	Full-depth reclamation (south of Second St) Mill and overlay (north of Second St)
Varner St	First St to End	2410	Full-depth reclamation (south of Second St) Mill and overlay (north of Second St)
Fifth St	Varner St to Rice St	300	Mill and overlay
Rice St	Fourth St to Second St	700	Mill and overlay
Third St	Broadway St to Mertens St	1790	Mill and overlay





Figure 1. 2021 City of Jordan Infrastructure Improvements Map (highlighted in yellow)

GPR Analysis

We collected GPR data was collected on November 9, 2020 according to GSSI, Inc.'s GPR SIR-20 processor settings at an interval of approximately one scan per lineal foot. We used RADAN 7.0, a software package included in the GSSI RoadScan system, to estimate depths of pavement layers within the data. Where "ground truth" data (cores and hand auger borings) were performed, we compared the GPR-interpreted layers directly to the measured thicknesses to improve the overall accuracy of the GPR analysis.

Table 2 shows summary statistics of the pavement layer thicknesses, while the attachments present the results graphically. We can provide tabular results electronically at your request.



Table 2	Statistics of	GPR-Estimated	Pavement	Thicknesses
	Statistics of	OF IN EStimated	I UVCIIICIIC	1111011103503

		Bituminous Thickness (inches)					Aggregate Base Thickness (inches)*					
Street Segment	Dir	Avg	Min	Max	15 th Pctle	5 th Pctle	Avg	Min	Max	15 th Pctle	5 th Pctle	
Sixth St (Syndicate St to Varner St)	EB	3.9	3.1	5.7	3.6	3.4	7.4	3.2	10.9	5.9	4.7	
West St (Sixth St to End)	NB	4.4	3.2	5.7	3.9	3.7	7.2	4.8	8.8	6.0	5.4	
Syndicate St (TH 169 to Fourth St)	SB	4.6	2.9	12.5	3.8	3.4	7.1	3.9	10.3	5.7	4.5	
Fourth St (Syndicate St to Broadway St)	EB	4.2	2.8	7.7	3.4	3.3	8.8	5.0	12.4	7.9	7.5	
Wood St (Fourth St to Cul- de-sac)	NB	4.1	1.9	5.8	3.4	2.9	11.2	7.9	14.5	9.6	8.7	
Mertens St (Fourth St to First St)	SB	4.9	2.8	9.3	3.8	3.5						
First St (West End to West St)	EB	4.2	1.1	7.1	3.4	3.0						
West St (First St to Fourth St)	NB	4.3	1.3	8.6	3.0	2.4	9.7	5.6	14.4	7.5	6.6	
Wood St (Third St to First St)	SB	4.8	2.3	8.4	3.5	3.2	11.3	7.7	14.7	9.5	8.7	
Varner St (First St to End)	NB	4.5	2.7	7.9	3.8	3.4	10.9	7.3	15.3	9.8	9.0	
Fifth St (Varner St to Rice St)	EB	4.3	2.2	5.9	3.4	2.8	8.4	5.6	12.3	7.2	6.6	
Rice St (Fourth St to Second St)	SB	4.7	2.9	7.1	4.0	3.7	7.1	4.1	11.0	5.5	4.9	
Third St (Broadway St to Mertens St)	WB	4.2	2.3	9.9	3.4	2.9	8.4	5.3	12.3	7.1	6.5	
Creek Lane/Sunset Dr (Eldorado/Seville Dr to Eischens Dr)	SB	5.4	2.2	10.3	4.1	3.4						
East St (Second St to Water St)	SB	4.5	2.2	8.0	3.6	3.1	9.1	5.2	14.2	7.7	7.1	

*This represents the probable granular material directly below the bituminous layer as used throughout this report.

A second layer (probable aggregate base) was often not visible in the scans, i.e. it was difficult to identify as a distinct layer. A lack of a visible second layer in the GPR scan does not imply an absence of one within the pavement section. According to our returned samples the identified "aggregate base" was often materially similar to the underlying soil layer, typically only distinguished by a lower gravel content. Please refer to Table 3 for aggregate base thickness and subgrade soil description.



With the exception of Creek Lane/Sunset Drive, the tested street segments generally appeared to have consistent thicknesses. The pavement section of Sunset Drive appeared to change twice, at Nolden Lane and another point to the south, visible at the surface (see Photos 1 and 2). Consult the attached charts to this letter for variation of pavement section thickness.



Photo 1. Surface View of South Pavement Change, Sunset Drive



Photo 2. Approximate Pavement Change Locations, Sunset Drive



Coring and Hand Auger Borings

In November 2020, we conducted a subsurface investigation by extracting bituminous pavement cores and performing hand auger soil borings at 15 locations shown in the attachment to this letter. Within each corehole, we extended manual soil borings (hand auger borings) to depths of about 2 feet below the surface.

Table 3 summarizes the bituminous and aggregate base thicknesses, as well as the subgrade soils encountered. The table also provides comments on the condition of the bituminous materials. Photos of the cores are included in the Appendix, along with a Descriptive Terminology of Soil for interpreting terms and abbreviations used below.

		Depth					
Street Segment	Core	(inches)	Material	Description or Condition			
Sixth St (Syndicate St to		0 - 3.5	HMA	Good condition			
Varner St)	C-1	3.5 - 12	Agg base	"Sand and gravel" base			
vanier sty		12+	SM	Similar to agg base; less gravel			
		0 - 4	HMA	Good condition			
West St (Sixth St to End)	C-2	4 - 13.5	Agg base	"Sand and gravel" base			
		13.5+	SM	Similar to agg base; less gravel			
Sundicato St /TH 160 to		0-3	HMA	Good condition			
Syndicate St (TH 109 to	C-3	3 – 15	Agg base	"Sand and gravel" base			
Fourth Sty		15+	SP-SM	SP-SM, fine-grained, trace *gravel, brn, moist			
Foundh Ct (Curreliante Ct to		0 - 3.5	HMA	Good condition			
Fourth St (Syndicate St to	C-4	3.5 - 15	Agg base	"Sand and gravel" base			
Bioadway St)		15+	SM	Similar to agg base; less gravel			
Man d Ch (Essenth Ch ha Cod		0 - 3	HMA	High-severity stripping			
wood St (Fourth St to Cul-	C-5	3 - 15	Agg base	"Sand and gravel" base			
ue-sac)		15+	SM	SM, f-m grained, trace gravel, dark brown, moist			
Martana Ch (Faunth China		0 - 3.5	HMA	Debonding; high-severity stripping			
Mertens St (Fourth St to	C-6	3.5 - 19.5	Agg base	"Sand and gravel" base			
Filst St)		19.5+	SM	Similar to agg base; less gravel			
		0 - 3.5	HMA	Good condition			
First St (West End to West	C-7	3.5 - 19	Agg base	"Sand and gravel" base			
51)		19+	SM	SM, f-m grained, trace gravel, brown, moist			
		0 - 3	HMA	Good condition			
West St (First St to Fourth	C-8	3 - 13	Agg base	"Sand and gravel" base			
50		13+	SM	SM, f-m grained, trace gravel, brown, moist			
		0 - 4.5	HMA	Good condition			
	C-9	4.5 - 19	Agg base	"Sand and gravel" base			
5()		19+	SM	SM, f-m grained, trace gravel, brown, moist			
		0 - 3.5	HMA	Good condition			
Varner St (First St to End)	C-10	3.5 - 16.5+	Agg base	"Sand and gravel" base; refusal of auger			
		0 - 3.5	HMA	Good condition			
Fifth St (Varner St to Rice	C-11	3.5 - 13	Agg base	"Sand and gravel" base			
51)		13+	SM	Similar to agg base; less grave			

Table 3. Pavement Core and Hand Auger Boring Summary



Street Segment	Core	Depth (inches)	Material	Description or Condition	
Dies St (Fourth State		0 - 4.5	HMA	Good condition	
Rice St (Fourth St to	C-12	4.5 - 12	Agg base	"Sand and gravel" base	
Second St)		12+	SC	SC, trace gravel, f-m grained sand, brn, moist	
		0 - 3	HMA	Good condition	
Inird St (Broadway St to	C-13	3 - 15	Agg base	Refusal in agg base layer on gravel	
wertens St)		15+	SM	SM, f-m grained, trace gravel, brown, moist	
Creek Lane/Sunset Dr (Eldorado/Seville Dr to Eischens Dr)	C-14	To be completed			
Feet Ct /Ceeend Ct to		0 - 4.5	HMA	Good condition	
East St (Second St to	C-15	4.5 - 18	Agg base	"Sand and gravel" base	
water St)		18+	SM	Similar to agg base; less gravel	

A limited number of bituminous cores (C-5 and C-6) showed stripping, which indicates long-term deterioration of the asphalt/aggregate bond in the bituminous material due to the presence of moisture.

Generally, stripping nearly always begins at the bottom of the bituminous layer, where it may be in contact with saturated aggregate or soil, and proceeds upward. Low-severity stripping is common in bituminous pavements over time. However, those that have stripped to moderate or severe degrees should not be considered for rehabilitation methods that may leave the damaged portion of the pavement in place, such as mill and overlay.

The aggregate base, mostly a "sand and gravel"-type (SP-SM or SM with gravel), was often underlain by fill material of a similar nature, making it more difficult to distinguish from the aggregate base in the borehole, and obscuring the interface, if any, in the GPR signal.

Discussion and Recommendations

Mill and Overlay

The streets in the City of Jordan 2021 project area generally appear to be suitable for mill and overlay based on their visually assessed material condition and thickness. A detailed evaluation of pavement surface conditions, which will influence the suitability and service life of the overlay, was outside of the scope of our evaluation. Some areas may require additional milling and/or excavation to reach a suitable surface for overlay placement. This will include distressed areas such as those with fatigue/alligator distress and edge cracks, as well as areas where bottom-up stripping of the pavement is revealed by milling, such as Cores C-5 and C-6.

Milling should proceed per MnDOT Specification 2232, with bituminous paving in general accordance with MnDOT Specification 2360. We recommend a minimum mill depth of 1 1/2 inches for a 1 1/2-inch



overlay with SPWEA240B for all streets except Creek Lane/Sunset Drive. Mill and overlay and lift thicknesses should be limited to 2 inches; although a thicker overlay will tend to have a slightly longer service life, the risk of damage to areas of thin pavement increases.

For Creek Lane/Sunset Drive, we recommend a minimum 2-inch mill and overlay with SPWEA340B.

Deeper excavations or larger patch areas that penetrate the aggregate base should match the in-place section that is suggested by the cores and average GPR thicknesses. For edge cracking or other distressed areas where milling will be performed to the full depth of the in-place bituminous layer, we recommend performing the mill to at least 1 foot beyond the edge of the visible distress. Patch areas should also be sized to allow for proper compaction of the replacement materials by the available equipment.

Full-depth Reclamation

According to GPR analysis, average pavement thicknesses varied from approximately 4 to 5 inches of bituminous, with relatively consistent bituminous pavement thicknesses within each street segment. These thicknesses were generally thicker than the cores, which in some cases may not have been fully recovered do to bottom-up damage.

Hand auger borings revealed a fairly thick "aggregate base," a washed sand-and-gravel type material, which was often similar to the underlying soils with the exception of gravel content. The exception to sandy subgrades was Core C-12 on Rice Street, which was a clayey sand.

It appears full-depth reclamation (FDR) can be utilized as proposed to obtain materials for aggregate base on the project. A reclamation depth of 12 inches appears feasible. Due to the relatively thin bituminous pavements, we do not recommend pre-milling; instead, material should be removed following reclamation to allow for bituminous placement.

Design Sections – Reclamation Areas

Laboratory tests to determine an R-value for pavement design were not included in the scope of this project. Given most common soils in the top two feet of pavement sections to be silty sand with gravel, we recommend using an R-value of 40 for thickness design.

The City of Jordan Standard Details have one set of pavement section thickness and materials requirements for sections designated as local streets, minor and major collectors. Our recommendations in Table 4 includes this standard. The sections below lack the granular subbase required by the standard, but are otherwise structurally viable for up to 400,000 equivalent single axle loads (ESALs) at the



assumed R-value and 95+ percent reliability. This includes Municipal State Aid streets (MSAS) within the project area except for Sunset Drive/Creek Lane.

Street	Layer	Thickness (inches)	MnDOT Specification/Designation		
	Bituminous wear	2 (1 lift)	SPWEA240C		
Any except Sunset	Bituminous non-wear	2 (1 lift)	SPNWB230C		
Drive	Aggregate base (Class 5 or 6) and/or reclaim	8	3138 3135		

Table 4. Recommended Bituminous Pavement Thickness Design (no Sunset Drive)

The above pavement design is based upon a 20-year performance life. This is the amount of time before major rehabilitation is anticipated. This performance life assumes maintenance such as seal coating and crack sealing is routinely performed. The actual pavement life will vary depending on variations in weather, traffic conditions, and maintenance.

Materials Testing

We recommend conducting DCP tests for aggregate base or reclaim and imported granular materials. We recommend Gyratory tests on bituminous mixes to evaluate strength and air voids and density tests to evaluate compaction.

Continuity of Professional Responsibility

Plan Review

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. We should be retained to review the geotechnical aspects of the designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations.

Construction Observations and Testing

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those encountered by the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the



preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.

General Remarks

This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses, and recommendations may not be appropriate for other parties or projects.

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

We appreciate the opportunity to be of service to you for this pavement evaluation. If you have any questions about this report, please contact Neil Lund at 952.995.2284.

Sincerely,

BRAUN INTERTEC CORPORATION

I hereby certify that this plan, specification, or 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.

Neil G. Lund, PE Senior Engineer License Number: 46212 November 30, 2020

Appendix:

Pavement Core and Hand Auger Boring Location Sketch Descriptive Terminology of Soil GPR Data (plots; 15 sheets) Core Photo Log







Pavement Core and Hand Auger Boring Location GPR Completed

 \bullet

BRAUN INTERTEC The Science You Build On.

11001 Hampshire Avenue S Minneapolis, MN 55438 952.995.2000 braunintertec.com







Project Information

City of Jordan 2021 Infrastructure Improvements

Various Streets

Jordan, Minnesota

GPR, Core and Hand Auger Boring Location Sketch



Descriptive Terminology of Soil

Based on Standards ASTM D 2487-11/2488-09a (Unified Soil Classification System)

Criteria for Assigning Group Symbols and			Soil Classification			
	Group N	lames Using La	aboratory T	Tests ^A	Group Symbol	Group Name ^B
-	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines ^C)		$C_u \ge 4$ and $1 \le C_c \le 3^D$	GW	Well-graded gravel ^E
s sd or				$C_u < 4$ and/or $(C_c < 1 \text{ or } C_c > 3)^D$	GP	Poorly graded gravel ^E
I Soil taine /e)		Gravels with Fines (More than 12% fines ^C)		Fines classify as ML or MH	GM	Silty gravel ^{EFG}
ainec)% re) siev				Fines Classify as CL or CH	GC	Clayey gravel ^{E F G}
e-gra an 50	Sands	Clean Sa	ands	$C_u \ge 6$ and $1 \le C_c \le 3^D$	SW	Well-graded sand
oars e tha No	(50% or more coarse	(Less than 5% fines ^H)		$C_u < 6$ and/or $(C_c < 1 \text{ or } C_c > 3)^D$	SP	Poorly graded sand
(mor C	fraction passes No. 4	Sands with Fines		Fines classify as ML or MH	SM	Silty sand ^{FGI}
	sieve)	(More than 1	2% fines ^H)	Fines classify as CL or CH	SC	Clayey sand ^{FGT}
		Inorganic	PI > 7 and	l plots on or above "A" line ^J	CL	Lean clay ^{KLM}
the	Silts and Clays	morganic	PI < 4 or p	PI < 4 or plots below "A" line ^J		Silt ^{KLM}
ned Soils e passes) sieve)	50)	Organic	nic $\frac{\text{Liquid Limit} - \text{oven dried}}{\text{Liquid Limit} - \text{not dried}} < 0.75$		OL	Organic clay KLMN Organic silt KLMO
-grai		Inorganic	PI plots o	n or above "A" line	СН	Fat clay ^{KLM}
Fine. % or No	Silts and Clays	morganic	PI plots b	elow "A" line	МН	Elastic silt ^{KLM}
(50	more)	more) Organic Liquid Limit – oven dried Liquid Limit – not dried <0.75		nit – oven dried nit – not dried <0.75	ОН	Organic clay KLMP Organic silt KLMQ
Highly Organic Soils Primarily organic matter, dark in color, and organic odor			PT	Peat		

Based on the material passing the 3-inch (75-mm) sieve. Α.

- If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, Β. or both" to group name.
- Gravels with 5 to 12% fines require dual symbols: C.
 - GW-GM well-graded gravel with silt
 - GW-GC well-graded gravel with clay
 - GP-GM poorly graded gravel with silt
 - GP-GC poorly graded gravel with clay
- D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
- If soil contains \geq 15% sand, add "with sand" to group name. E.
- If fines classify as CL-ML, use dual symbol GC-GM or SC-SM. F.
- If fines are organic, add "with organic fines" to group name. G.
- Sands with 5 to 12% fines require dual symbols: н.
 - SW-SM well-graded sand with silt
 - SW-SC well-graded sand with clay
 - poorly graded sand with silt SP-SM
 - SP-SC poorly graded sand with clay
- ١. If soil contains ≥ 15% gravel, add "with gravel" to group name.
- If Atterberg limits plot in hatched area, soil is CL-ML, silty clay. J.

DD

WD

P200

- If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is К. predominant.
- If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name. L.
- M. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
- N. $PI \ge 4$ and plots on or above "A" line.
- PI < 4 or plots below "A" line. 0.
- PI plots on or above "A" line. Ρ.
- Q. PI plots below "A" line



Wet Density, pcf

% Passing #200 sieve

	Laboratory rests
ос	Organic content, %
q	Pocket penetrometer strength
мс	Moisture conent, %

		-
Moisture conent	, %	

Particle Size Identification

Boulders over 12"
Cobbles 3" to 12"
Gravel
Coarse
Fine No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand
Coarse No. 10 to No. 4 (2.00 mm to 4.75 mm)
Medium No. 40 to No. 10 (0.425 mm to 2.00 mm)
Fine No. 200 to No. 40
(0.075 mm to 0.425 mm)
Silt No. 200 (0.075 mm) to .005 mm
Clay< < .005 mm

Relative Proportions^{L, M}

trace	0 to 5%
little	6 to 14%
with	≥ 15%

Inclusion Thicknesses

lens	0 to 1/8"
seam	1/8" to 1"
layer	over 1"

Apparent Relative Density of Cohesionless Soils

Very loose	0 to 4 BPF
Loose	5 to 10 BPF
Medium dense	11 to 30 BPF
Dense	31 to 50 BPF
Very dense	over 50 BPF

Consistency of	Blows	Approximate Unconfined
Conesive Solis	Per Foot	Compressive Strength
Very soft	0 to 1 BPF	< 1/4 tsf
Soft	2 to 4 BPF	1/4 to 1/2 tsf
Medium	5 to 8 BPF	1/2 to 1 tsf
Stiff	9 to 15 BPF	1 to 2 tsf
Very Stiff	16 to 30 BPF	2 to 4 tsf
Hard	over 30 BPF.	> 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch. Moist: Damp but no visible water. Wet: Visible free water, usually soil is below water table.

Drilling Notes:

BPF: Numbers indicate blows per foot recorded in standard penetration test, also known as "N" value. The sampler was set 6 inches into undisturbed soil below the hollow-stem auger. Driving resistances were then counted for second and third 6-inch increments, and added to get BPF.

Partial Penetration: If the sampler cannot be driven the full 12 inches beyond the initial 6-inch set, the number of blows for that partial penetration is shown as "No./X" (i.e., 50/2"). If the sampler cannot be advanced beyond the initial 6-inch set, the depth of penetration will be recorded in the Notes column as "No. to set X" (i.e., 50 to set 4").

WH: WH indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WR: WR indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

WL: WL indicates the water level measured by the drillers either while drilling or following drilling.

Plastic limit, % PL

LL

- Liquid limit, %
- ΡI Plasticity Index, %





~			
700	800	900	1,000
1	1	1	
,700	1,800	1,900	2,000
700	2 800	2 000	2.000
700	2,800	2,900	3,000
1			
,700	3,800	3,900	4,000















GPR Results: Fourth St - Syndicate St to Broadway St





GPR Results: Fourth St - Syndicate St to Broadway St



700	4,800	4,900	5,000
00	5.800	5.900	6.000
	0,000	0,000	0,000
00	6,800	6,900	7,000
1			
/00	7,800	7,900	8,000





700	8,800	8,900	9,000
1			
700	9,800	9,900	10,000
1			
700	9,800	9,900	10,000
1	I		
,700	10,800	10,900	11,000



00	800	900	1,000
	I	I	
700	1,800	1,900	2,000
700	2,800	2,900	3,000
700	3,800	3,900	4,000




A			
1			
'00	800	900	1,000
1	I		
700	1,800	1,900	2,000
1	1		
700	2,800	2,900	3,000
700	2,000	2 0 0 0	
/00	3,800	3,900	4,000







GPR Results: West St - First St to Fourth St









~~			
700	800	900	1,000
1		1	
700	1,800	1,900	2,000
700	2,800	2,900	3,000
700	3,800	3,900	4,000





1	1	1	
,700	2,800	2,900	3,000

1		1	
,700	3,800	3,900	4,000
•	,	,	,





1	1	1	
00	800	900	1,000
]
700	1 000	1 000	
/00	1,800	1,900	2,000
700	2 800	2 900	3 000
00	2,000	2,500	3,000
1	1	1	
700	3,800	3,900	4,000



GPR Results: Rice St - Fourth St to Second St



1	1	1	
00	800	900	1,000
]
700	1 000	1 000	
/00	1,800	1,900	2,000
700	2 800	2 900	3 000
00	2,000	2,500	3,000
1	1	1	
700	3,800	3,900	4,000









Core #:	C-1 (see attached sketch) Project: B2009440
Pavement thickness:	3 1/2 inches Agg base thickness: 8 1/2 inches BRAUN
Facility:	City of Jordan Sixth St (Syndicate St to Varner St)
Date:	November 2020
Notes:	
Core #:	C-2 (see attached sketch)
Core #:	C-2 (see attached sketch) Project: B2009440
Pavement thickness:	4 incnes Agg base thickness: 9 1/2 inches BRAUN
Facility:	City of Jordan West St (Sixth St to End)
Date:	November 2020
Notes:	

Core #:	C-3 (see attached sketch) Project: B2009440
Pavement thickness:	3 inches Agg base thickness: 12 inches RPAUN
Facility:	City of Jordan Syndicate St (TH 169 to Fourth St)
Date:	November 2020
Notes:	
Core #:	C-4 (see attached sketch) Project: B2009440
Pavement thickness:	3 1/2 inches Agg base thickness: 11 1/2 inches BRAUN
Facility:	City of Jordan Fourth St (Syndicate St to Broadway St)
Date:	November 2020
Notes:	

Core #:	C-5 (see attached sketch)			Project: B2009440
Pavement thickness:	3 inches Agg t	base thickness:	12 inches	BRAUN
Facility:	City of Jordan Wood St (Fourth St to	Cul-de-sac)		INITEDTEC
Date:	November 2020			INTERIEC
Notes:	High-severity stripping			
Core #:	C-6 (see attached sketch)			Project: B2009440
Pavement thickness:	3 1/2 inches Agg b	base thickness:	16 inches	BRAUN
Facility:	City of Jordan Mertens St (Fourth St	to First St)		INTERTEC
Date:	November 2020			

High-severity stripping, debonding

Notes:

Core #:	C-7 (see attached sketch) Project: B2009440
Pavement thickness:	3 1/2 inches Agg base thickness: 15 1/2 inches BRAUN
Facility:	City of Jordan First St (West End to West St)
Date:	November 2020
Notes:	
Core #:	C-8 (see attached sketch) Project: B2009440
Favement unickness:	City of lordan - West St (First St to Fourth St)
Date:	November 2020
Date.	

Notes:

Core #:	C-9 (see attached sketch) Project: B2009440
Pavement thickness:	4 1/2 inches Agg base thickness: 14 1/2 inches BRAUN
Facility:	City of Jordan Wood St (Third St to First St)
Date:	November 2020
Notes:	
Core #:	C-10 (see attached sketch) Project: B2009440
Pavement thickness:	3 1/2 inches Agg base thickness: 13 inches BRAUN
Facility:	City of Jordan Varner St (First St to End)
Date:	November 2020
Notes:	

Core #:	C-11 (see attached sketch) Project: B2009440		
Pavement thickness:	3 1/2 inches Agg base thickness: 9 1/2 inches RPAUN		
Facility:	City of Jordan Fifth St (Varner St to Rice St)		
, Date:	November 2020		
Notes:			
Core #:	C-12 (see attached sketch) Project: B2009440		
Pavement thickness:	4 1/2 inches Agg base thickness: 7 1/2 inches BRAUN		
Facility:	City of Jordan Rice St (Fourth St to Second St)		
Date:	November 2020		

Notes:

	C 12 /cca attached skateh			Project: P2000440	
Core #:	C-13 (see attached sketch)		Project: B2009440	
Pavement thickness:	3 inches	Agg base thickness:	12 inches	BRAUN	
Facility:	City of Jordan Third St (Broad	way St to Mertens St)		INTERTEC	
Date:	November 2020				
Info pending					
Core #:	C-14 (see attached sketch)		Project: B2009440	
Pavement thickness:	inches	Agg base thickness:	inches	BRAUN	
Facility:	City of Jordan Creek Lane/Sunset Dr (Eldorado/Seville Dr to Eischens Dr)			INTERTEC	
Date:	November 2020				
Notes:					

Core #:	C-15 (see attached sketc	h)		Project: B2009440	
Pavement thickness:	4 1/2 inches	Agg base thickness:	13 1/2 inches	BRAUN	
Facility:	City of Jordan East St (Second St to Water St)				
Date:	November 2020				
Notes:					