WORK SESSION MEETING
AGENDA
CITY OF CREVE COEUR
CITY COUNCIL
300 NORTH NEW BALLAS RD
APRIL 11, 2016
6:00 PM

CALL TO ORDER

ROLL CALL

DISCUSSION ITEMS

1. **IMS Pavement Maintenance Report**
   Summary: Zac Thomason from Infrastructure Management Services (IMS) will present his firm's review of the City's pavement conditions and will discuss how the City's pavement network would be impacted by various budget scenarios.

2. **FY2017 Pavement Maintenance Program Recommendations**
   Summary: City staff will discuss their recommendations for roadway and sidewalk improvements to be completed through the City's annual pavement maintenance programs.

Pursuant to Section 610.022 RSMo., the City Council could, at any time during the meeting, vote to close the public meeting and move to closed session to discuss matters relating to litigation, legal actions and/or communications from the City Attorney as provided under Section 610.021(1) RSMo. and/or personnel matters under Section 610.021(13) RSMo. And/or employee matters under Section 610.021(3) RSMo. and/or real estate matters under Section 610.021(2) or other matters as permitted by Chapter 610.

Posted: _____ posted 04/7/2016
Deborah Ryan, MPCC
City Clerk

City Council
300 North New Ballas Rd
Creve-Coeur, MO 63141

Debbie Ryan
City Clerk
(314) 872-2517
www.creve-coeur.org/

Meeting: 04/11/16 06:00 PM
DOC ID: 1873

DISCUSSION ITEM (ID # 1873)

IMS Pavement Maintenance Report

The City hired Infrastructure Management Services (IMS) to complete an independent review of the conditions of the City's pavement network. As part of this project, IMS:

- Used a vehicle-mounted laser array to scan the pavement of all City-maintained streets. This information was used to determine each street's pavement condition.
- Collected roughness information for all City-maintained streets.
- Tested the strength of the pavement base for all composite streets.
- Compiled all recorded conditions into the City's Lucity pavement management system.
- Used the Lucity program to project the performance of the pavement network for varying funding levels.

IMS collected the pavement condition information in January 2016, and City staff were able to use this information to help guide the recommendations for the FY2017 pavement maintenance program.

Zac Thomason from IMS will present the methodology used to collect the pavement condition information, summarize these conditions, and discuss how different funding levels influence the outlook for the City's pavement network.

IMS has not yet completed its final report for the project. City staff anticipates that this report will be available soon and may follow the City Council work session in order to reflect the discussions at that meeting.

Following the IMS discussion, City staff will present updated cost projections for improvements to Laduemont Drive and will introduce the proposed pavement maintenance program for FY2017.

City Council
300 North New Ballas Rd
Creve-Coeur, MO 63141

Debbie Ryan
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(314) 872-2517
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Meeting: 04/11/16 06:00 PM
DOC ID: 1872

DISCUSSION ITEM (ID # 1872)

FY2017 Pavement Maintenance Program Recommendations

DEPARTMENT OF PUBLIC WORKS
STAFF MEMORANDUM

DATE: April 7, 2016

TO: Mark Perkins, City Administrator

CC: Jim Heines, Director of Public Works

FROM: Matt Wohlberg, P.E., City Engineer
Rich Beran, P.E., Civil Engineer

SUBJECT: Repair Location Recommendations
FY2017 Roadway Maintenance Program

The Department of Public Works proposes the roadway maintenance program outlined below for the 2017 fiscal year, much of which will be completed during the 2016 construction season. The proposed roadway maintenance program continues the City's typical concrete pavement replacement, roadway reconstruction, asphalt resurfacing, microsurfacing, and sidewalk programs. Two program from the 2016 fiscal year (sidewalk improvements and microsurfacing) are proposed to be moved into the 2017 fiscal year, along with the unused 2016 funding associated with these projects.

Pavement Condition Update
The City hired Infrastructure Management Services (IMS) to evaluate the pavement conditions for every City-maintained street. IMS completed its evaluation in January 2016. Although the final report for this evaluation is not yet available, IMS was able to provide preliminary data so that the updated condition information could be referenced during the development of the recommendations for FY2017.

Two aspects of the pavement data that are used in this report require some explanation:

1. PCI. The pavement condition index (PCI) for each street is developed based upon the number of cracks, potholes, and other defects that be seen. This index is on a scale of 0-100, where 100 represents perfect pavement with no problems.

2. Roughness Index. The amount of vertical change in the street is measured along its length, and this is converted into an index that reflects the level of discomfort a driver might experience by using that street. This index is on a scale of 0-100, where 100 represents a perfectly smooth street.

Roadway Selection
The City invests a significant portion of its annual budget on street and sidewalk maintenance and improvements. However, road and sidewalk work is expensive, and it would be impossible to make all needed repairs immediately. Therefore, this work must be prioritized. To this end, repair recommendations are based upon two goals:

1) to find the most impact for the money spent to perform the maintenance, and 2) to make repairs that improve the lives of the citizens of Creve Coeur.

To achieve the first goal, the number of motorists using the roadway, the cost of the repair, and the condition of the street are weighed for each street. The opportunity cost of not doing a repair should also be considered, and this is an important decision factor for roads that are on the verge of deteriorating to a point where a particular repair can no longer be effective, and thus becoming much more expensive to fix. The goal, therefore, is to perform the right repair on the right street at the right time.

The City has adopted a "neighborhood approach" for street repairs in an attempt to achieve the second goal. Where possible, streets within a subdivision are targeted so to improve as much of the pavement in that subdivision as possible within a span of one or several years. While this will mean that some of the streets addressed each year might be in better condition than a few others in the City, it will also mean that repairs are concentrated in an area for a short time rather than having these repairs performed piecemeal each (and perhaps every) year. The intent is to create a condition in which future repair needs are similar throughout each neighborhood, which has made planning easier and should continue to inconvenience the residents in each area for the least amount of time possible.

Concrete Pavement Replacement

Work involved in this program will include the removal and replacement of failed concrete pavement slabs, curbs, gutters, and sidewalks. New accessible pedestrian curb ramps will also be installed as needed near street repair locations.

The proposed concrete pavement replacement program is listed below, along with the current pavement condition index (PCI) and roughness index for each street with pavement replacement:

Pavement Slab Replacement

Street Name	PCI	Roughness Index
Conway Aire Drive	58	31
Camfield Square	46	39
Haverton Drive	67 *	42 *
Laduemont Drive	64 *	39 *
Mariners Pointe	72 *	51 *
Old Ballas Road	71	60
Royal Gate Drive	69	45
Royal Manor Drive	71 *	52 *
Royalwood Court	66	39
Sackston Woods Lane	70	74
Turrentine Trail	73	52

** Indicates an average condition rating for multiple street segments.*

Curbing Replacement

Balcon Estates Subdivision (cul de sac islands)
Chilton Lane
Beaver Drive at Havenview Court
Winfield Pointe Drive

These streets are proposed for one or several of the following reasons: pavement conditions, previous commitments, support of other projects, and future planning.

Pavement Conditions. City staff reviews the concrete pavement network at the end of each winter to prioritize the repair needs for concrete pavement and curbing. This year, the staff review was augmented by the IMS condition review. Aging, cracked, and broken pavement and curbing exists throughout the City in quantities that exceed what the City could afford to replace in any given year. Hazardous and potentially hazardous pavement and curbing failures have been given the highest priority in replacement, and all pavement identified as such is included in the proposed program.

- Local Failures and PCI. The pavement condition index (PCI) shown for each street represents the average condition for the entire street. One localized failure will lower the street's condition, but it might not make a big impact to the street's PCI. This is most true for longer streets. Local failures are most common on concrete streets where the conditions can vary from one slab to the next.

  Failed and potentially hazardous slabs have developed on Sackston Woods Lane, Turrentine Trail, and Royalwood Court. The proposed program expands beyond these few hazardous slabs to address other priority replacement needs for both of these streets. The proposed pavement replacement will significantly improve the condition of these streets and should eliminate the need for further repairs in the foreseeable future.

- Joint Deterioration. Spalling (i.e. deteriorating) joints present another problem for PCI. When patched, joint spalling is a relatively low-severity problem which will not significantly lower a street's PCI, particularly if the rest of the concrete slab is in good condition. Joint spalling along many of the concrete joints on a street can become a problem, not just for the number of slabs that are affected, but because the failure of one or two joint patches can change the pavement conditions overnight.

  Concrete slabs can be in very good condition except for their joints. Joint issues often impact adjacent slabs, spreading out the problem. Spalling can be addressed in several ways, but badly spalled joints should be cut out and replaced. If many of the street's joints have this problem, then the best long-term solution becomes full slab replacement. Unfortunately, the cost to replace much of the street is expensive and will seem disproportionate to the street's PCI.

- Roughness Index. The IMS investigation into the roughness of the City's streets offers an insight into the level of joint deterioration on concrete streets. A low (poor) roughness index on a street with a good PCI could indicate that the street has significant joint deterioration. Laduemont Drive is a good example of a street that is in this situation, and the repair recommendations for Laduemont Drive aim to make the street smoother, not just structurally sound.

Previous Commitments. The City began pavement replacements in the Royal Manor subdivision in 2014 following several years during which the City addressed only emergency concerns in that neighborhood to avoid conflicting with a sanitary sewer project by the Metropolitan St. Louis Sewer District (MSD). The proposed slab replacement along Royal Gate Drive and Royal Manor Drive will address the remaining issues in this neighborhood, which will conclude the four-year effort to improve streets in that subdivision.

Support for Other Projects and Future Planning. It is common that more than one type of project or approach is required or recommended to address the needs of a street or sidewalk.

This tends to occur with sidewalk projects that require street work (or vice versa) and with composite streets (i.e. concrete streets with an asphalt overlay).

- Sidewalk projects. Work is proposed on Laduemont Drive and Old Ballas Road, in part, to support sidewalk improvements along those streets.

- Asphalt resurfacing projects. Several composite streets are recommended for resurfacing in FY2017. These include Clarissa Drive, Sona Lane, and others, as listed above. Significant concrete pavement replacement is expected for these streets, based upon past experience, but it is rather difficult to know how much of the concrete base will need to be replaced for these streets until it is exposed during construction.

  The IMS investigation included measurement of the soundness of the concrete base for all of the City's composite streets. The concrete base of Sona Lane rated the worst among those proposed for resurfacing in FY2017, and staff expects to replace at least one third of the street's concrete in order to resurface it. However, the measurements of the base for the remaining composite streets (Clarissa, Phyllis, Renee, and Saucier) were consistent with quality concrete pavement. Staff has planned for extensive concrete replacement on these streets, but is hopeful that the concrete base for these streets will be in relatively good condition, as suggested by the IMS data.

  Curbing replacement along Winfield Point Drive is recommended in order to facilitate asphalt resurfacing for that street in FY2018.

- Microsurfacing projects. Staff proposes to replace the existing asphalt curb in the islands of the Balcon Estates subdivision and the island at the Chilton Lane cul de sac with concrete curb that will better withstand tires running it over. This work will help prepare these areas for upcoming microsurfacing projects.

Sidewalk Improvements

The City is obligated to continue improve the accessibility of its sidewalks. Accessibility improvements are typically made in conjunction with adjacent roadway projects.

Sidewalk improvements are proposed along Laduemont Drive, North New Ballas Road, Winfield Pointe Drive, and Old Ballas Road.

Laduemont Drive. The sidewalks along Laduemont Drive are the only continuous and publicly maintained sidewalks between Ladue Road and Conway Road in Creve Coeur west of New Ballas Road, making this sidewalk a priority to improve. The amount of sidewalk work required along Laduemont is too great to be included as one annual program, so staff recommends that this work gets divided and continued in FY2018.

North New Ballas Road. The public right of way and sidewalk easements that typically extend over the sidewalks along North New Ballas Road do not cover the entrance to the Carlyle Lake subdivision. City staff is working with the trustees and management of this private subdivision to extend the public right of way to include the pedestrian crossing here. In exchange for the right of way, staff recommends reconstructing the pedestrian crossing to be accessible.

The right of way at this entrance will be beneficial to the City the next time the City uses a federal grant to improve the adjacent portion of North New Ballas Road, as is anticipated in the next five years. The City would be required to obtain this right of way or a sidewalk

easement for the pedestrian crossing as part of that project. Obtaining the right of way now allows this process to take place on the City's schedule.

Winfield Point Drive. This asphalt street was found to be in poor condition and should be resurfaced soon. Sidewalk and curbing improvements are proposed for FY2017 in order to prepare the street for resurfacing in FY2018.

Old Ballas Road. The sidewalks along Old Ballas Road from New Ballas Road to Emerson Road have numerous deficiencies and are not technically accessible. Staff proposed to improve these sidewalks as part of the FY2016 pavement maintenance program, but the City had inadequate bid participation for the project. Staff recommends to complete the project in FY2017, along with the sidewalk improvements to Laduemont Drive and North New Ballas Road.

Sidewalks Improvements through Federal Grants. Significant sidewalk improvements are included in two federal grant projects by the City and are expected to be constructed in FY2017.

- Coeur de Ville Rehabilitation Project. The City has been awarded a federal grant to improve the pavement and sidewalks along Coeur de Ville Drive. The project will include accessibility improvements for the length of Coeur de Ville Drive, from Ladue Road to Olive Boulevard. One of these improvements will be to add a crosswalk across Coeur de Ville at Olive Boulevard. Currently, this crosswalk is located approximately 200 feet south of Olive Boulevard.

  The Coeur de Ville project is expected to begin in late summer or early fall of 2016 and should take several months to complete.

- Emerson Sidewalk Improvement Project. The City has been awarded a federal grant to add a sidewalk along the east side of Emerson Road. This new sidewalk will extend from Ladue Road to Old Ballas Road. This project may begin as early as fall of 2016, but coordination and approvals for the project may require that it begin in the spring of 2017.

These projects are included as separate line items in FY2017 of the proposed capital improvement plan. This funding is separate from the annual roadway maintenance program.

Asphalt Resurfacing

The asphalt resurfacing program proposed for FY2017 involves several asphalt and composite streets along Olive Boulevard:

Street Name	PCI	Roughness Index
Bal Harbour Drive	57	42
Clarissa Drive	68	46
Deaver Avenue	51	58
Larkin Avenue	38	55
Park West Drive	45	47
Phyllis Lane	71	49
Renee Drive	51 *	61 *
Saucier Drive	64	36
Sona Lane	50	49
Tempo Drive (north of Olive)	62	55

** Indicates an average condition rating for multiple street segments.*

As discussed above for the concrete pavement replacement program, significant concrete repairs are expected to accommodate resurfacing the composite streets in the recommended program (i.e. Clarissa Drive, Phyllis Lane, Renee Lane, Saucier Drive, and Sona Lane). Sona Lane is the largest concern among these composite streets, as it is in the poorest condition among them.

The City maintains only a portion of Bal Harbour Drive, Park West Drive, and Tempo Drive, as these are located between Olive Boulevard and the north boundary of the City. Each of these sections is approximately 200 feet in length.

Olive Boulevard Resurfacing and Sidewalks (MoDOT). This resurfacing recommendation was delayed from last year to accommodate the current roadway and sidewalk improvements by the Missouri Department of Transportation along Olive Boulevard. Unfortunately, the MoDOT project was delayed by nearly one year, and now the projects will run concurrently. Staff expects that there will be minimal conflict between the two projects, because the MoDOT project will likely be finished in the area of the City's project by July, and the MoDOT project occurs almost exclusively at night. Therefore, staff does not feel that it will be necessary to continue to delay the recommended asphalt resurfacing to accommodate MoDOT's project on Olive.

Asphalt resurfacing through federal grants. The City maintains a section of Coeur de Ville Drive between Royal Valley Drive and the Parc Provence retirement community. Much of the pavement in this area has failed and will be replaced through a reconstruction and resurfacing project that is expected to begin in the summer or fall of 2016. Much of the funding for the Coeur de Ville project will be from a federal grant.

Roadway Reconstruction

The proposed roadway reconstruction for FY2017 involves finishing the reconstruction of New London Drive and reconstructing the composite portion of Lakeshore Drive. Lakeshore Drive, New London Drive, and New Salem Drive form one, continuous street and serve as the primary roadway in the Westchester Estates Subdivision. The reconstruction work that is proposed will complete the replacement of one of the longest composite streets in the City with new concrete pavement, eliminating one of the most significant pavement maintenance liabilities in the City.

Street Name	PCI	Roughness Index
Lakeshore Drive	45 *	53 *
New London Drive	60	53

** Indicates an average condition rating for multiple street segments.*

This street was originally recommended for reconstruction, because previous attempts to make repairs to these streets had been counterproductive: fixing one area led to failures in other areas. Construction along New Salem Drive in the spring of 2016 again found this to be true, as the street failed beneath the equipment replacing the other side.

Schedule. The reconstruction work in the Westchester Estates subdivision was originally expected to require three years to complete. Lower-than-expected project costs and additional funding for the project have made it likely that this project will now be completed in two years. The implications could be important (and presumably welcome) for other failing streets in the City.

Micro-Surfacing

The proposed micro-surfacing project will include minor street repairs and the application of a thin asphaltic surface treatment to the entire roadway surface. This surface treatment is typically aimed at roads that are in good condition, and its purpose is to help seal the pavement from water infiltration while providing an improved driving surface.

The proposed micro-surfacing project will focus on the Ridgemoor Forest, Broadview Farms, Mason Forest, and Balcon Estates neighborhoods. Concrete curb replacement was completed in these neighborhoods in 2013 as preparation for the proposed micro-surfacing, and the intent was to include these streets in the FY2015 and FY2016 program. Unfortunately, material costs for the other pavement programs reduced the budget available for the FY2015 program, and this work was postponed.

Some preparation work in the Mason Forest Subdivision will be required to reduce the size of the subdivision's two cul-de-sac islands. Reduction in the size of these islands will provide more space for vehicles to navigate each cul de sac and should reduce the amount of damage to the islands from vehicle tires.

The roadways proposed for this project are:

Villa Hill Subdivision

Street Name	PCI	Roughness Index
Angleterre Drive	67	60
Carillon Court	78	59
Rugby Court	72	51
Trammel Court	58	54
Villa Hill Lane	49 *	58 *

Mason Forest Subdivision

Street Name	PCI	Roughness Index
Hibler Woods Court	60	37
Hibler Woods Drive	74 *	53 *
Mason Forest Drive	70 *	55 *

Broadview Farm Subdivision

Street Name	PCI	Roughness Index
Broadview Farm Road	66 *	49 *

Balcon Estates Subdivision

Street Name	PCI	Roughness Index
Balcon Estates Drive	64 *	52 *

Additional Streets

Street Name	PCI	Roughness Index
Corporate Square Drive	55 *	68 *
Martin Grove Lane	81	63
Rolling View Drive	65	41
Will Avenue	19	55

** Indicates an average condition rating for multiple street segments.*

Work along Will Avenue is proposed to provide some improvement, but it microsurfacing cannot fix what IMS found to be the City's worst street. This street receives little traffic and serves as something of an alley. Staff feels that it is appropriate to patch and microsurface this street so to postpone its resurfacing or reconstruction for several years.

As with previous years, the City's Public Works staff will correct many of the deficiencies in the pavement surface to prepare these roads for the microsurface application. By having City crews prepare the pavement, the potential cost of this program is typically reduced.

Project Postponements from Previous Fiscal Years. The proposed micro-surfacing project involves the Villa Hill, Broadview Farms, and Mason Forest neighborhoods. The intent was to include these streets in the FY2015 program, and then in the FY2016 program. Unfortunately, material costs for the other pavement programs reduced the budget available for the FY2015 program, and this work was postponed until FY2016.

Staff recently learned that at least one of the few contractors who can complete this type of work will have no availability until late in the summer due to major commitments to other projects. Staff recommends moving the work in the Ridgmoor Forrest, Broadview Farms, and Mason Forest subdivisions to FY2017 to improve the bidding situation for this project.

Projected Costs

City staff estimates that completion of the proposed FY2017 Roadway Maintenance Program will cost approximately $ 1,733,000.

FY2016 transfer to FY2017

The recommended pavement maintenance program for FY2017 incorporates the microsurfacing project and the sidewalk improvement project from FY2016. Funding this work will require moving unused funds from the FY2016 sidewalk and microsurfacing programs into FY2017.

The adjusted budget would be as follows:

FY2016 Microsurfacing	$	150,000
FY2016 Sidewalk Improvements	$	100,000
Total FY2016 Transfer	**$**	**250,000**

Original FY2017 Roadway Maintenance	$	1,133,000
FY2016 Transfer	$	250,000
FY2017 Reconstruction	$	350,000
Total FY2017 Budget	**$**	**1,733,000**

The project breakdown for the adjusted FY2017 roadway program is proposed to be:

Concrete Pavement Replacement	$	500,000
Sidewalk Replacement	$	200,000
Asphalt Resurfacing	$	420,000
Microsurfacing	$	230,000
Reconstruction	$	350,000
City Work (Patching for Micro-Surfacing, etc.)	$	33,000
Total	**$**	**1,733,000**

DEPARTMENT OF PUBLIC WORKS
STAFF MEMORANDUM

DATE: April 6, 2016

TO: Mark Perkins, City Administrator

CC: Jim Heines, Director of Public Works

FROM: Matt Wohlberg, P.E., City Engineer

SUBJECT: Laduemont Drive Review and Repair Recommendations

The results from the pavement condition investigations for the streets in the Ladue Conway Estates subdivision have been reviewed and summarized. In light of this information, staff has updated the cost estimates of several repair strategies for Laduemont Drive and has evaluated these strategies for the consideration of the City Council.

Call for Review

In the spring of 2015, City staff proposed a phased approach to improve the sidewalks and roadway pavement along Laduemont Drive over two or three years. Several residents from the Ladue Conway Estates subdivision disagreed with this recommendation and called for the complete reconstruction of the streets in the subdivision. The subdivision claimed that the conditions of the pavement, poor ride quality, subsurface voids, and water along and beneath the pavement made the staff recommendation inadequate. As a result, the City Council requested additional and independent reviews of Laduemont Drive as part of several City-wide reviews of the City's pavement network.

Pavement Condition Reviews

Three reviews of the pavement of Laduemont Drive were completed in early 2016 to measure surface conditions, ride quality, and subsurface voids.

Pavement Surface Conditions. The City hired Infrastructure Management Systems (IMS), a national pavement consultant, to use their vehicle-mounted, road surface tester (RST) equipment to digitally measure the pavement conditions of every street in the City. The equipment detected defects in the pavement, such as potholes, rutting, and cracking, to provide a consistent and objective review of the City's pavement network.

According to the preliminary data from IMS, the average surface condition for a residential concrete street, like those in the Ladue Conway Estates subdivision, is 71.9 or "very good." This is a measurement from 0-100, where 100 represents a perfect street, and 0 represents a completely failed street.

The pavement surface conditions for the streets in the Ladue Conway Estates subdivision are listed below. The average surface condition index of Laduemont Drive was calculated from the four sections of the street and is weighted by the length of each segment.

Street	Surface Condition Index
Laduemont Drive	64.4 (average)
Oakstone Lane (West)	71.6
Oakstone Lane (East)	61.7
Fishel Court	90.8
Greenville Lane	71.6

The average surface condition along Laduemont Drive (64.4 or "good") is lower than the average (71.9 or "very good") for all such streets.

Several residential concrete streets have a similar surface condition index to Laduemont Drive. Examples include:

Street	Surface Condition Index
Ambleside Lane	64.8
Aramis Drive	65.1
Camfield Square Drive	64.5
Hammermill Drive	64.4
Haverton Drive	64.9
Montauban Drive	64.5

Ride Quality. The City-wide review of the street conditions by IMS included a measurement of the International Roughness Index (IRI) for each street. The IRI is a measurement of how much the street pavement varies vertically over the length of the street. IMS converted the IRI into a "Roughness Index" that has a scale of 0-100, with 100 representing a perfectly smooth street, and 0 representing a very rough street. The IMS review found that the average residential concrete street in Creve Coeur has a roughness index of 50.

The roughness index for each of the streets in the Ladue Conway Estates subdivision is listed below. As with the pavement conditions, the average roughness index for Laduemont Drive was calculated from the street's four sections.

Street	Roughness Index
Laduemont Drive	39 (average)
Oakstone Lane (West)	48
Oakstone Lane (East)	31
Fishel Court	73
Greenville Lane	60

The roughness index for Laduemont Drive (39) is below (i.e. worse than) the City's average residential concrete street (50).

Several residential concrete streets have a similar roughness index as Laduemont Drive. The roughness index and the surface condition index are correlated, as a street with a lower surface condition index tends to have a lower roughness index. For the sake of comparison, the list of streets is repeated from the surface condition discussion above:

Street	Roughness Index
Ambleside Lane	38
Aramis Drive	38
Camfield Square Drive	39
Hammermill Drive	36
Haverton Drive	40
Montauban Drive	40

Subsurface Voids. The City hired Geotechnology, Inc., to use ground-penetrating radar (GPR) to identify voids beneath several streets, one of which was Laduemont Drive.

The primary goal of this review was to determine the location and extent of any voids, as this could influence the City's repair strategy for the street. A related goal for the review was to determine whether the pattern of voids suggested that water was running beneath the street.

Geotechnology found voids beneath portions of Laduemont Drive, most notably between Greenville Lane and Oakstone Court. The location and connectivity among the voids did not suggest that water was flowing beneath Laduemont Drive.

The Geotechnology report was discussed in detail with the City Council at their meeting on March 28.

Repair Strategies for Laduemont Drive

The apparent repair options for the streets in the Ladue Conway Estates subdivision were reviewed in detail in the staff memorandum dated April 23, 2015. This memorandum is attached for reference. Two of the repair options for Laduemont Drive from that report will be reviewed here: selective slab replacement and roadway reconstruction.

The points of comparison among the repair strategies for Laduemont Drive are cost and level of improvement. Staff recommends that sidewalk accessibility improvements are included as part of any repair strategy for Laduemont Drive. These costs are itemized in the comparison and are not anticipated to be significantly different among the roadway repair strategies. The roadway replacement associated with the accessibility improvements has been factored into each repair strategy.

Strategy #1: Laduemont Rehabilitation

The scope of work involved with this strategy would include the replacement of approximately 80-100 concrete pavement slabs and approximately 60 pavement joints, mudjacking to fill voids beneath otherwise acceptable pavement, roadway underdrains in two locations, and sidewalk accessibility improvements.

Strategy #2: Complete Reconstruction of Laduemont Drive

This strategy would involve the full replacement of Laduemont Drive, including pavement underdrains and sidewalk accessibility improvements.

The estimated costs associated with each of these strategies is listed below.

Laduemont Strategy	**Roadway Portion**	**Sidewalk Portion**	**Total Cost**
1. Rehabilitation	$ 165,000	$ 105,000	$ 270,000
2. Reconstruction	$ 505,000	$ 105,000	$ 610,000

These estimates have been updated from the April 2015 estimates to reflect the bids received for the most recent concrete pavement replacement project and the most recent roadway reconstruction project. The bid tabulation for each of these projects is attached for reference. Based upon these projects, roadway reconstruction does not offer a significant cost advantage over selective slab replacement.

Approximately $35,000 in additional repairs in the subdivision are warranted, particularly along the east section of Oakstone Court. Work to address the other streets in the subdivision is not included in the comparison above, as the recommendation for the side streets would not change based upon the strategy employed for Laduemont Drive.

Recommendation

Staff recommends that the City pursue the rehabilitation strategy (Strategy #1 above) for the improvement of Laduemont Drive for three reasons:

1. This strategy has proven results. The IMS review found that the streets that have received "focused" repairs through the City's recent annual concrete pavement replacement programs have among the best pavement conditions and roughness in the City. These streets include:

Street	Surface Condition Index	Roughness Index
Ambois Drive	86.5 (average)	68 (average)
Bellerive Estates Drive	85.3 (average)	67 (average)
Fernview Drive	84.2 (average)	65(average)
Janridge Court	82.9	64
Mason Manor Road	86.7 (average)	68 (average)

2. A reconstruction strategy is not sustainable. The conditions present along Laduemont Drive – and worse – are fairly common among concrete streets in Creve Coeur. If the standard for these streets would be reconstruction, then the City would need to allocate significantly more funding toward street improvements to meet this expectation. Reconstruction should be the City's last resort.

3. Laduemont Drive compares well among other concrete streets that need slab replacement repairs, but it might not rank as highly among the reconstruction candidates. If Laduemont were to be slated for reconstruction, staff would recommend vetting this project against the needs of streets like Magna Carta Drive, the Ladue Estates subdivision, and Sackston Ridge Drive, all of which have significant repair needs.

Staff recommends the rehabilitation of Laduemont Drive, as this appears to be a strategy that will work and that will be in the best interest of the City and of the residents in the Ladue Conway Estates subdivision.

Attachments: Staff memorandum "Pavement Condition Review and Repair Recommendations: Ladue Conway Estates Subdivision," dated April 23, 2015.

Staff markup of void detection report by Geotechnology, Inc.

Bid tabulation for 2015 Concrete Pavement Replacement Project

Bid tabulation for 2016 Roadway Reconstruction Project

DEPARTMENT OF PUBLIC WORKS
STAFF MEMORANDUM

DATE: April 23, 2015

TO: Mark Perkins, City Administrator

CC: Jim Heines, Director of Public Works

FROM: Matt Wohlberg, P.E., City Engineer

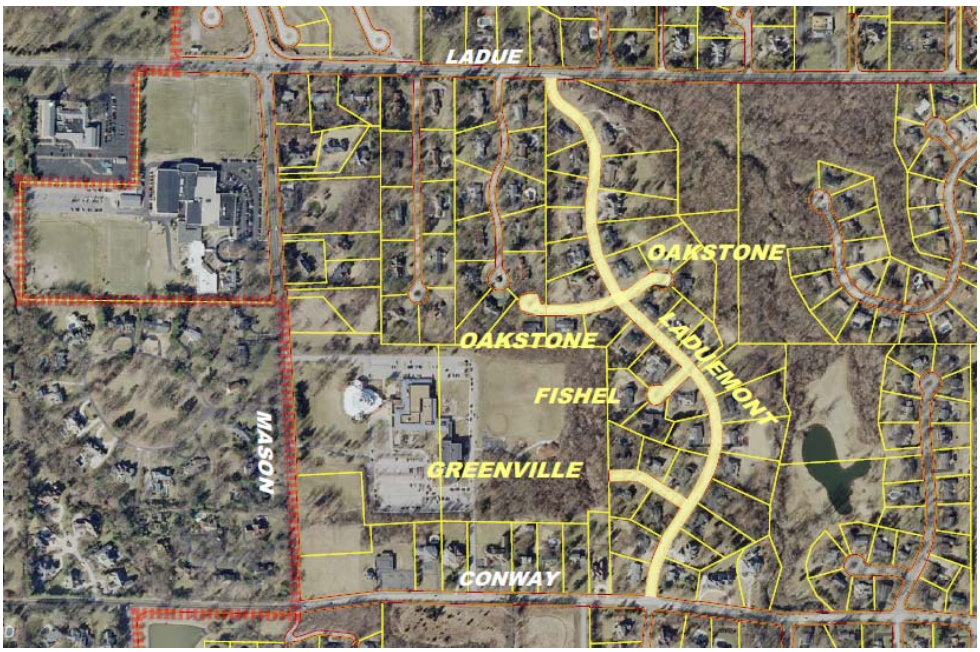
SUBJECT: Pavement Condition Review and Repair Recommendations
Ladue Conway Estates Subdivision
FY2016 Roadway Maintenance Program

Residents from the Ladue Conway Estates subdivision recently requested that the City review their subdivision's pavement conditions and asked that their streets be considered for reconstruction. City staff has reviewed the pavement and sidewalk conditions, as well as the proposed FY2016 roadway maintenance program, and recommends repairs in the subdivision.

Ladue Conway Estates Subdivision Summary

The Ladue Conway Estates subdivision is located between Ladue Road and Conway Road on the west side of Creve Coeur. This subdivision was constructed in the late 1960's and was annexed from St. Louis County in the 1990's along with much of the rest of Ward 4.

The subdivision consists of 40 residential lots that range in area from approximately 0.75 acres to 2.8 acres. Five streets serve these properties. The primary street in the subdivision is Laduemont Drive, with the other four streets – Oakstone Lane (east and west), Fishel Court, and Greenville Lane – all extending off of Laduemont.



Sidewalks line both sides of the street for most of the subdivision. The sidewalks along Laduemont Drive serve as the only continuous public sidewalk that connects Ladue Road and Conway Road in Creve Coeur west of Interstate 270.

Pavement Conditions

All of the streets in the Ladue Conway Estates subdivision are concrete. The most recent inspection of pavement conditions in this subdivision was completed on March 6, 2015, with the following results:

Street	Pavement Condition Index (PCI)
Laduemont Drive (Conway Road to Ladue Road)	88
Oakstone Lane – West (Laduemont to cul de sac)	95
Oakstone Lane – East (Laduemont to cul de sac)	92
Greenville Lane (Laduemont to End)	97
Fishel Court (Laduemont to cul de sac)	98

Structurally, the pavement in this subdivision is in reasonably good condition. However, the subdivision – particularly Laduemont Drive – has a relatively poor ride quality due, in part, to pervasive spalling and deterioration along the joints and slab faulting. These issues cause a vertical edge in the pavement that can be uncomfortable to drive over.

Intermittent slab replacement over the past 20 years may share some of the blame for the ride quality. Significant repairs were needed for the streets that were annexed from St. Louis County, and these repairs focused on structural repairs to address pavement failure. Directly addressing ride quality was simply not possible, given the amount of work required throughout the City.

The City's continuing and significant annual investment into its concrete pavement network has generally stabilized the condition of the City's concrete streets. Pavement failures will continue and will need to be addressed as they occur. However, the numbers of urgent repairs are currently manageable, allowing the City's concrete replacement program to include roadway improvements instead of just repairs. Several streets have been targeted recently for concrete pavement replacement that looks beyond the failed section of pavement so to consider the street as a whole. For these streets in the program, the goals are to eliminate immediate and likely future concerns, improve ride quality, limit future repair needs, and limit the inconvenience to the residents.

Concrete Pavement Maintenance Program

City staff reviews the City's concrete pavement network annually to prepare a recommendation for the repair and improvement locations for that year's concrete pavement replacement project. This review involves considering each concrete slab on a scale of 1-5, with a rating of 5 being an emergency, a rating of 4 being a priority for repairs, and a rating of 3 indicating a slab to watch for future repairs. Slabs that would have a 1 or 2 rating are in good condition and are not recorded. A copy of the concrete network review from early 2015 is attached for reference.

This review gives staff some perspective on the City's annual concrete pavement network needs and greatly influences which concrete repairs are recommended. For example,

emergency issues were noted for slabs on Bergerac and Wedgewood, hence the inclusion of these streets into the proposed repair program for FY2016.

The annual review also shows that there are some 1,900 concrete slabs in the City's concrete pavement network that are damaged to a degree that they would be considered for repairs. The proposed concrete replacement program for FY2016 will address less than 300 of those. Through the natural deterioration of the pavement network, new locations will be added to the list of slabs eligible for repair each year. The size of this list may never significantly decrease with the current budget.

A notable and useful aspect of this review is that it provides a quick reference for where the highest concentration of issues can be found. Oakstone, Greenville, and Laduemont from the Ladue Conway Estates subdivision are listed, with a combined deteriorated slab count of 84 slabs, 15 of which are considered priority repairs. Comparing the situation in the Ladue Conway Estates subdivision with several of the streets that have been included in the proposed FY2016 concrete pavement replacement programs offers some insight into why those recommendations were made:

- Somerton Ridge is a residential street that has 111 priority slabs listed and is proposed for focused repairs in the FY2016 program. The proposed repairs follow several years when the street's deteriorated joints were patched with asphalt. Sidewalk accessibility improvements were completed during the FY2015 program.
- The Royal Manor subdivision is currently in the middle of a multi-year program to address its pavement repair needs. Despite being part of the FY2015 concrete replacement program, the subdivision still has 139 priority slabs listed. Repairs to this subdivision are likely to extend into FY2017.

When the entire concrete pavement network is considered, the Ladue Conway Estates subdivision is simply one of many with repair needs. Aside from those streets that are included in the proposed FY2016 program, Runnymede, Haverton, and Castleton are examples of individual streets that have needs that are at least comparable to those of the Ladue Conway Estates subdivision. None of these other streets are included among the proposed FY2016 repairs.

Subdivision Sidewalk and Street Assessment

Residents from the Ladue Conway Estates subdivision attended the City Council meeting March 9, 2015, meeting to express their dissatisfaction with the pavement conditions in their neighborhood and requested that the City review these conditions and consider the subdivision for improvements. Several ideas for improvement were mentioned, including asphalt overlay and reconstruction with either concrete or asphalt.

City staff reviewed the sidewalk and roadway pavement conditions in the Ladue Conway Estates subdivision in March and April 2015 to determine the repairs necessary to address pavement failures, improve sidewalk accessibility, and improve roadway ride quality.

Cost estimates for the repair and reconstruction ideas discussed at the March 9 City Council meeting and for the staff proposal are included below, following a discussion of the staff assessment of the subdivision's sidewalk and streets.

Sidewalk Improvements. The City is obligated to improve its sidewalk network to meet federal accessibility standards, particularly for sidewalks along roadway improvement

projects. Sidewalks are to be treated equally with roads, meaning that the level of attention paid to the street should also be paid to the sidewalk. For this reason, the City's sidewalk improvement program generally targets streets that will be repaired along with the sidewalk improvements or that will be in pavement programs in the near future.

The roadway maintenance program recently presented as part of the FY2016-2020 capital improvement program proposed included the Ladue Conway Estates subdivision in the FY2016 and FY2017 sidewalk programs to provide an accessible route through the subdivision and to set the stage for future roadway improvements, likely in FY2017 and FY2018.

Visually, the sidewalk in the subdivision appears to be in good condition. However, many locations in the subdivision were identified where the sidewalk is pitched too much or where the surface of two adjacent pieces are vertically offset by more than one-half of an inch. Sidewalk and driveway apron replacement is necessary to address many of the issues that were identified. In addition, the subdivision generally lacks accessible curb ramps. New ramps need to be installed throughout the subdivision. Finally, because the accessible route will cross Laduemont and its side streets, many of the crosswalk areas will need to be reshaped to be technically accessible.

Street Improvements. Several concrete pavement slabs were found to be in poor condition or holding water and need to be replaced. The subdivision's residents have reported two areas with subsurface drainage concerns, and these should be addressed through the introduction of underdrains along with the pavement replacement.

Staff proposes to expand the concrete pavement replacement effort beyond what is a structural or drainage concern to attempt to address the smoothness of the ride, particularly along Laduemont Drive. For this reason, some 60 concrete slabs are proposed for replacement, most of which do not necessarily exhibit immediate structural concerns. However, these repairs lengthen the replacement of structural issues and correct surface elevation differential between slabs and are necessary improve the ride quality of the street.

The 60 pavement slabs proposed for replacement collectively represent approximately 15% of the subdivision's total pavement area. An additional 5% of the pavement will be replaced at the subdivision's intersections to accommodate the pedestrian facilities there.

Staff proposes to address the joint issues through full-depth concrete repairs. Deteriorated joints will be cut out and typically replaced with a two-foot-wide section of concrete pavement. Staff proposes to replace approximately 100 joints in this way.

Street slabs with extensive joint deterioration are proposed to be replaced. Bid prices from the most recent concrete pavement replacement program suggest that it will be more cost effective to replace the entire pavement slab than to patch most of its joints. This approach will need to be re-evaluated based upon the bids received for the project(s) to improve this subdivision.

Estimates for recommended repairs. Staff estimates that the proposed repairs in the Ladue Conway Estates subdivision will cost approximately $250,000, with $100,000 in improvements related to pedestrian accessibility and $150,000 in roadway pavement and joint repairs. The following is a summary of this work by street:

Street	Accessibility Improvements	Street Repairs	Total Cost for Street
Laduemont Drive	$ 74,600	$ 100,200	$ 174,800
Oakstone Lane – West	$ 1,800	$ 300	$ 2,100
Oakstone Lane – East	$ 0	$ 14,000	$ 14,000
Fishel Court	$ 2,200	$ 0	$ 2,200
Greenville Lane	$ 6,700	$ 10,200	$ 16,900
Contingency & Lump Sums	$ 15,000	$ 25,400	$ 40,400
Subdivision Totals:	**$ 100,300**	**$ 150,100**	**$ 250,400**

Notes: "Lump Sum" items include mobilization and traffic control that are not assigned to any particular street.

Other options considered. Subdivision residents and the City Council expressed interest in determining the scope and cost for several other rehabilitation and reconstruction options. Three such projects were explored. All options include accessibility improvements for the subdivision and the recommended street repairs for the subdivision's side streets. All repair estimates are approximate.

1. Asphalt Overlay for Laduemont Project Cost: $ 200,000

   The scope of this project includes necessary concrete repairs along Laduemont prior to paving Laduemont with an asphalt overlay.

   An asphalt overlay would provide a smooth driving surface for the street. This project would require the shortest amount of time of these three options.

   Unfortunately, the asphalt overlay would also decrease the stormwater carrying capacity for the gutter line along Laduemont.

   The asphalt overlay option is attractive in the near term, but will become more difficult to manage in the future, as the City is finding with several of its other asphalt-on-concrete ("combination") streets. Once the street is overlaid with asphalt, the street will likely remain in that configuration until a future reconstruction project.

   Staff does not recommend pursuit of this option due to the future maintenance complications and higher long-term costs that are expected with a combination street.

2. Reconstruction of Laduemont (Concrete) Project Cost: $ 610,000

   The scope of this project would be to replace all of the concrete pavement of Laduemont with new concrete pavement. The new pavement would be installed in phases, much in the same way that several of the City's worst streets have been replaced in several years. The result would be a new concrete street that should require little maintenance for the foreseeable future.

   Although the new pavement joints would be tighter and smoother than those that exist today, the new pavement would still have joints that drivers can feel and hear.

Staff does not recommend pursuit of the reconstruction option. Reconstruction is recommended only when there does not appear to be a viable alternative.

3. Reconstruction of Laduemont (Asphalt) Project Cost: $ 700,000

   The scope of this project would involve cutting off the edges of Laduemont, installing new concrete curb and gutter, and then replacing the remaining concrete pavement with asphalt. This project would provide a smooth and long-lasting street that could be kept smooth and like-new with regular maintenance.

   Staff does not recommend pursuit of the reconstruction option. Reconstruction is recommended only when there does not appear to be a viable alternative.

While the staff recommendation does not appear to be the cheapest option, staff feels that the proposed concrete slab and joint replacement is the best option.

Recommendation

Whether the pavement in the Ladue Conway Estates subdivision ranks as the City's highest priority or not, the fact remains that staff recommends significant updates to the subdivision's sidewalks in order to provide a continuous, accessible pedestrian route between Conway Road and Ladue Road. The sidewalk improvements will involve pavement replacement and will likely be completed by the type of contractor who typically completes the City's annual concrete pavement replacement projects. The sidewalk project provides an excellent opportunity to complete pavement repairs in the Ladue Conway Estates subdivision as well.

Staff recommends completion of the sidewalk and street pavement repairs and improvements over a two-year program, beginning in FY2016. The work in the subdivision would essentially be divided in half (by value) at Fishel Court, as follows:

FY2016 Program (North)

Streets involved:

- Laduemont Drive (Ladue to Fishel)
- Oakstone Lane – East
- Oakstone Lane – West
- Fishel Court

Repair cost: $125,000 ($ 75,000 roadway; $ 50,000 sidewalk)

FY2017 Program (South)

Streets involved:

- Laduemont Drive (Fishel to Conway)
- Greenville Lane

Project cost: $125,000 ($75,000 roadway; $50,000 sidewalk)

This proposal completes the repairs in the Ladue Conway Estates subdivision within a two-year period, which is consistent with other programs in the City and limits the inconvenience this work will cause to the subdivision's residents. However, because there are on-going programs in the proposed concrete replacement project, and because it would not be fair to the residents in other subdivisions to postpone or lengthen their projects for the sake of similar-priority needs of Ladue Conway Estates, staff requests an additional

$75,000 funding for the FY2016 roadway maintenance program. The recommendation is to *add* these concrete repairs to the program rather than to *replace* repairs in the program with those for Ladue Conway Estates.

No change is proposed for the funding in the FY2016 Sidewalk Replacement program. The City has many sidewalk improvement needs. If the proposed improvements to the Ladue Conway Estates sidewalks or the pedestrian crossings along Corporate Square do not require all of this funding, staff would consider using the remaining funds to supplement the grant-funded improvements in the Town & Four area or improvements to the Carlyle Lake subdivision entrance.

The proposed revision to the FY2016 roadway maintenance program budget is as follows:

Concrete Pavement Replacement	*$ 525,000*
Sidewalk Replacement	$ 100,000
Asphalt Resurfacing	$ 400,000
Micro-Surfacing	$ 100,000
Reconstruction	$ 300,000
City Work (Patching for Micro-Surfacing, etc.)	$ 50,000
Total	***$ 1,475,000***

Revisions are shown in red italics for emphasis. The original proposal was for a concrete pavement replacement budget of $450,000 and a total budget of $1,400,000.

Comparison between Ladue Conway Estates and Belle Coeur Subdivisions

Although staff feels that the needs and repair history of the Belle Coeur subdivision are not directly related to the current recommendation for the Ladue Conway Estates subdivision (and vice versa), staff has researched the City's roadway maintenance programs dating back to 1996, which is the approximate time of annexation for both subdivisions, in order to document this repair history. This research is summarized in the attached spreadsheet.

Staff has found that the past and planned repairs in these subdivisions is comparable based upon the pavement area, traffic counts, and number of households. More investment should be expected in the Belle Coeur subdivision, because it has more pavement area, higher traffic, and more households than the Ladue Conway Estates subdivision.

Attachments: Repair History and Projections – Ladue Conway Estates and Belle Coeur Subdivisions

2015 Concrete Slab Review

Belle Coeur Subdivision

Pavement Type: Asphalt with Concrete Curb and Gutter
Total Subdivision Pavement Area: 18,153 SY
Sidewalks: None
Average Daily Traffic (Weekday) for Principal Street (Chasselle): 943
Number of Lots in Subdivision: 90

Repairs Completed to Date

Repair Year	Repair Description	Street(s)	Quantity	Unit	Unit Cost	Extended Cost	Comments
1996	Curb & Gutter Repair	Chamblee; Champeix; Chasselle; Clion; Cuiseaux	1197	LF	$ 23.11	$ 27,662.67	
2003	Resurfacing	Clion; Coulange; Chamblee	4509	SY	$ 6.91	$ 31,157.19	
2004	Speed Tables	Chasselle	1	LS	$ 9,000.00	$ 9,000.00	
2005	Resurfacing	Champeix; Cuiseaux, Chamblee	7994	SY	$ 7.11	$ 56,837.34	
2005	Microsurfacing	Chasselle	5650	SY	$ 2.15	$ 12,147.50	
2005	Curb & Gutter Repair	Champeix; Cuiseaux, Chamblee	2360	LF	$ 22.10	$ 52,156.00	
2009	Pavement Rejeuvenator	Chamblee; Cuiseaux, Clion, Champeix	12503	SY	$ 0.60	$ 7,501.80	
2012	Curb & Gutter Repair	Chasselle	3178	LF	$ 21.12	$ 67,126.00	
2013	Curb & Gutter Repair	Chamblee; Champeix; Clion	259	SY	$ 21.00	$ 5,439.00	
2013	Roadway Reconstruction	Chasselle	5650	SY	$ 76.33	$ 431,286.00	Includes design and inspection

Total for Projects Completed to Date: **$ 700,313.50**

Completed Project Value Compared to Pavement Area: **$ 38.58 / SY**

Completed Project Value Compared to Vehicle Use: $742.64/ADT
Completed Project Value per Subdivision Lot: $7,781.26/Lot

Proposed Projects

Repair Year	Repair Description	Street(s)	Quantity	Unit	Unit Cost	Extended Cost	Comments
TBD	Ultrathin Overlay	Chamblee, Champeix, Clion, Coulange, Cuiseaux	12700	SY	$ 7.79	$ 98,920.00	Originally planned for 2015

Total for Proposed Projects: **$ 98,920.00**

Total for Subdivision (Past and Proposed): **$ 799,233.50**

Total (Past and Proposed) Project Value Compared to Pavement Area: **$ 44.03 / SY**

Total Project Value Compared to Vehicle Use: $847.54/ADT
Total Project Value per Subdivision Lot: $8,880.37/Lot

Ladue Conway Estates Subdivision

Pavement Type: Concrete
Total Subdivision Pavement Area: 9,571 SY
Sidewalks: Yes (both sides of all streets)
Average Daily Traffic (Weekday) for Principal Street (Laduemont): 391
Number of Lots in Subdivision: 40

Repairs Completed to Date

Repair Year	Repair Description	Street(s)	Quantity	Unit	Unit Cost	Extended Cost	Comments
1996	Concrete slab replacement	Laduemont; Oakstone	2770	SY	$ 47.00	$ 130,190.00	
1999	Concrete slab replacement	Laduemont	630	SY	$ 43.00	$ 27,090.00	Concrete unit cost estimated - Bid tab not found.
2001	Concrete slab replacement	Laduemont	450	SY	$ 40.40	$ 18,180.00	
2002	Concrete slab replacement	Oakstone	330	SY	$ 41.00	$ 13,530.00	Concrete unit cost estimated - Bid tab not found.
2005	Concrete slab replacement	Fishel	300	SY	$ 42.00	$ 12,600.00	
	Curb & Gutter Repair	Fishel	50	LF	$ 24.10	$ 1,205.00	
2006	Concrete slab replacement	Greenville; Fishel	1200	SY	$ 41.85	$ 50,220.00	
2008	Concrete slab replacement	Laduemont; Oakstone	1295	SY	$ 44.20	$ 57,239.00	
	Curb & Gutter Repair	Oakstone	120	LF	$ 13.00	$ 1,560.00	

Total for Projects Completed to Date: **$ 311,814.00**

Completed Project Value Compared to Pavement Area: **$ 32.58 / SY**

Completed Project Value Compared to Vehicle Use: $797.48/ADT
Completed Project Value per Subdivision Lot: $7,795.35/Lot

Proposed Projects

Repair Year	Repair Description	Street(s)	Quantity	Unit	Unit Cost	Extended Cost	Comments
2015	Concrete Slab Replacement; Joint Replacement	Laduemont; Oakstone; Fishel	1	EST	$ 75,000.00	$ 75,000.00	
	Accessibility (Sidewalk and Street)	Laduemont; Oakstone; Fishel	1	EST	$ 50,000.00	$ 50,000.00	
2016	Concrete Slab Replacement; Joint Replacement	Laduemont; Greenville	1	EST	$ 75,000.00	$ 75,000.00	
	Accessibility (Sidewalk and Street)	Laduemont; Greenville	1	EST	$ 50,000.00	$ 50,000.00	
TBD	Diamond Grinding	Laduemont	6000	SY	$ 6.50	$ 39,000.00	Project feasibility to be evaluated following repairs.

Total for Proposed Projects **$ 289,000.00** All planned costs are estimated.

Total for Subdivision (Past and Proposed) **$ 600,814.00**

Total (Past and Proposed) Project Value Compared to Pavement Area: **$ 62.77 / SY**

Total Project Value Compared to Vehicle Use: $1,536.61/ADT
Total Project Value per Subdivision Lot: $15,020.35/Lot

2015 Concrete Slab Review

Estimated Slab SY Price	Estimated Curb and Gutter LF Price
55.00	28.00

2015 Concrete Repair List

Street	Address	Slabs (20' x 13')	Curb and Gutter (LF)	Priority	Distress	Ward	SY Subtotal	SY for 4's	LF for 4's	Estimated Slab Cost	Estimated 4 Slab Cost	Estimated C and G Cost	Estimated 4 C and G Cost
Bergerac	Various	1		5	sinking	4	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	2		4	shattered		57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	10		3	sinking	4	288.9	0.0	0.0	$ 15,888.89	$ -	$ -	$ -
Libourne	Various	10		3	shattered	4	288.9	0.0	0.0	$ 15,888.89	$ -	$ -	$ -
Montmartre	Various	2		4	shattered	4	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	23		3			664.4	0.0	0.0	$ 36,544.44	$ -	$ -	$ -
Montmartre Ct	Various	8		3	shattered	4	231.1	0.0	0.0	$ 12,711.11	$ -	$ -	$ -
Lesparre	Various	2		4	shattered/sinking	4	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	15		3	shattered		433.3	0.0	0.0	$ 23,833.33	$ -	$ -	$ -
Ariege	Various	1		4	shattered	4	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	11		3	shattered		317.8	0.0	0.0	$ 17,477.78	$ -	$ -	$ -
Montauban	Various	4		3	shattered	4	115.6	0.0	0.0	$ 6,355.56	$ -	$ -	$ -
Beauvais	Various	2		4	shattered/spalling	4	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	12		3	shattered/spalling		346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
Timber Run	Various	4		3	shattered		115.6	0.0	0.0	$ 6,355.56	$ -	$ -	$ -
Town and Four	Various	26		3	shattered		751.1	0.0	0.0	$ 41,311.11	$ -	$ -	$ -
Haverton	Various	58		4	shattered/spalling	4	1675.6	1675.6	0.0	$ 92,155.56	$ 92,155.56	$ -	$ -
Mariners Pointe	Various	14		4	shattered	4	404.4	404.4	0.0	$ 22,244.44	$ 22,244.44	$ -	$ -
Somerton Ridge	Various	111		3	shattered	4	3206.7	0.0	0.0	$ 176,366.67	$ -	$ -	$ -
Castleton	Various	34		4	shattered/spalling	4	982.2	982.2	0.0	$ 54,022.22	$ 54,022.22	$ -	$ -
Nimes	Various	24		4	shattered/spalling	4	693.3	693.3	0.0	$ 38,133.33	$ 38,133.33	$ -	$ -
Nimes (east)	Various	18		4	shattered	4	520.0	520.0	0.0	$ 28,600.00	$ 28,600.00	$ -	$ -
Deauville	Various	1		4	shattered	4	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	9		3	shattered		260.0	0.0	0.0	$ 14,300.00	$ -	$ -	$ -
Le Havre	Various	9		3	spalling	4	260.0	0.0	0.0	$ 14,300.00	$ -	$ -	$ -
Barbezieux	Various	6		3			173.3	0.0	0.0	$ 9,533.33	$ -	$ -	$ -
Fernview	Various	3		3	shattered		86.7	0.0	0.0	$ 4,766.67	$ -	$ -	$ -
Bellerive Estates	Various	12		3	shattered		346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
Mason Manor	Various	20		3	shattered		577.8	0.0	0.0	$ 31,777.78	$ -	$ -	$ -
Lampadaire	Various	1		4	shattered		28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	19		3	shattered		548.9	0.0	0.0	$ 30,188.89	$ -	$ -	$ -
Ambois	Various	8		3	shattered		231.1	0.0	0.0	$ 12,711.11	$ -	$ -	$ -
Bellerive Farm	Various	1		4	shattered		28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	3		3	shattered/spalling	4	86.7	0.0	0.0	$ 4,766.67	$ -	$ -	$ -
Bellerive Manor	Various	1		4	shattered	4	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	19		3	shattered	4	548.9	0.0	0.0	$ 30,188.89	$ -	$ -	$ -
D'artagnan	Various	27		3	shattered	4	780.0	0.0	0.0	$ 42,900.00	$ -	$ -	$ -
Turrentine	Various	3		4	shattered/spalling		86.7	86.7	0.0	$ 4,766.67	$ 4,766.67	$ -	$ -
	Various	12		3	shattered/spalling		346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
Gascogne	Various	17		3	shattered	4	491.1	0.0	0.0	$ 27,011.11	$ -	$ -	$ -
Gascogne Ct	Various	6		3	shattered	4	173.3	0.0	0.0	$ 9,533.33	$ -	$ -	$ -
Turrentine	Various	18		3	shattered	4	520.0	0.0	0.0	$ 28,600.00	$ -	$ -	$ -
	Various	1		4	shattered	4	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
Aramis	Various	1		4	shattered		28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	13		3	shattered	4	375.6	0.0	0.0	$ 20,655.56	$ -	$ -	$ -
Cannes (east)	Various	5		3	shattered	4	144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -
Cannes (west)	Various	20		3	shattered	4	577.8	0.0	0.0	$ 31,777.78	$ -	$ -	$ -
Gallagher	Various	1		4	shattered		28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	3		3	shattered	4	86.7	0.0	0.0	$ 4,766.67	$ -	$ -	$ -
Fernway	Various	5		3	shattered	4	144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -
Ferngate	Various	8		3	shattered		231.1	0.0	0.0	$ 12,711.11	$ -	$ -	$ -
Ferntrails	Various	11		3	shattered/spalling	4	317.8	0.0	0.0	$ 17,477.78	$ -	$ -	$ -
Rue de Fleur	Various	3		3	shattered	4	86.7	0.0	0.0	$ 4,766.67	$ -	$ -	$ -
Narbonne	Various	10		3	shattered	4	288.9	0.0	0.0	$ 15,888.89	$ -	$ -	$ -
Chaumont	Various	6		3	shattered	4	173.3	0.0	0.0	$ 9,533.33	$ -	$ -	$ -

Estimated Slab SY Price	Estimated Curb and Gutter LF Price
55.00	28.00

2015 Concrete Repair List

Street	Address	Slabs (20' x 13')	Curb and Gutter (LF)	Priority	Distress	Ward	SY Subtotal	SY for 4's	LF for 4's	Estimated Slab Cost	Estimated 4 Slab Cost	Estimated C and G Cost	Estimated 4 C and G Cost
Corum Way	Various	2		4	shattered		57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	15		3	shattered		433.3	0.0	0.0	$ 23,833.33	$ -	$ -	$ -
Sommerton	Various	10		3	shattered	3	288.9	0.0	0.0	$ 15,888.89	$ -	$ -	$ -
Blackheath	Various	2		4	shattered		57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	6		3	shattered	3	173.3	0.0	0.0	$ 9,533.33	$ -	$ -	$ -
Halsgame	Various	13		4	shattered		375.6	375.6	0.0	$ 20,655.56	$ 20,655.56	$ -	$ -
	Various	5		3	shattered	3	144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -
Country Manor	Various	1		4	shattered/spalling		28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	13		3	shattered/spalling	3	375.6	0.0	0.0	$ 20,655.56	$ -	$ -	$ -
Country Manor Ct	Various	2		3	shattered		57.8	0.0	0.0	$ 3,177.78	$ -	$ -	$ -
Country Glen	Various	5		3	shattered	3	144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -
Winrock	Various	4		3	shattered		115.6	0.0	0.0	$ 6,355.56	$ -	$ -	$ -
Royalwood	Various	8		3	shattered/spalling	3	231.1	0.0	0.0	$ 12,711.11	$ -	$ -	$ -
Royalwood Ct	Various	8		3	shattered/spalling		231.1	0.0	0.0	$ 12,711.11	$ -	$ -	$ -
Royal Valley	Various	6		4	shattered	3	173.3	173.3	0.0	$ 9,533.33	$ 9,533.33	$ -	$ -
	Various	18		3	shattered	3	520.0	0.0	0.0	$ 28,600.00	$ -	$ -	$ -
Princetowne	Various	7		3	shattered	3	202.2	0.0	0.0	$ 11,122.22	$ -	$ -	$ -
Park West	Various		60	5	spalling	2	0.0	0.0	60.0	$ -	$ -	$ 1,680.00	$ 1,680.00
Bal Harbour	Various		100	4	spalling	2	0.0	0.0	100.0	$ -	$ -	$ 2,800.00	$ 2,800.00
Mosley Forest	Various	12		3	shattered	2	346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
Mosley Hill	Various	31		3	shattered	2	895.6	0.0	0.0	$ 49,255.56	$ -	$ -	$ -
Camfield Square	Various	1		4	shattered	2	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	16		3	shattered/spalling	2	462.2	0.0	0.0	$ 25,422.22	$ -	$ -	$ -
Executive Estates	Various	3		4	shattered/spalling	1	86.7	86.7	0.0	$ 4,766.67	$ 4,766.67	$ -	$ -
	Various	16		3	shattered/spalling	1	462.2	0.0	0.0	$ 25,422.22	$ -	$ -	$ -
Janridge	Various	1		3	shattered	1	28.9	0.0	0.0	$ 1,588.89	$ -	$ -	$ -
Pine Manor	Various	10		3	spalling	1	288.9	0.0	0.0	$ 15,888.89	$ -	$ -	$ -
Ridgecorde	Various	3		4	shattered/spalling	1	86.7	86.7	0.0	$ 4,766.67	$ 4,766.67	$ -	$ -
	Various	14		3	shattered/spalling	1	404.4	0.0	0.0	$ 22,244.44	$ -	$ -	$ -
Wedgewood	Various	2		5	sinking	1	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	15		4	shattered/spalling	1	433.3	433.3	0.0	$ 23,833.33	$ 23,833.33	$ -	$ -
	Various	25		3	shattered/spalling	1	722.2	0.0	0.0	$ 39,722.22	$ -	$ -	$ -
Langdon	Various	5		3	shattered	1	144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -
Chalet	Various	5		3	shattered	1	144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -
Chambray	Various	12		3	shattered/spalling	1	346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
Winfield Pointe	Various		50	3	sinking	1	0.0	0.0	0.0	$ -	$ -	$ 1,400.00	$ -
Martin Grove	Various		20	3	spalling	1	0.0	0.0	0.0	$ -	$ -	$ 560.00	$ -
Mystic Meadows	Various	1		3	shattered	2	28.9	0.0	0.0	$ 1,588.89	$ -	$ -	$ -
Runnymede	Various	13		4	shattered/spalling	2	375.6	375.6	0.0	$ 20,655.56	$ 20,655.56	$ -	$ -
	Various	62		3	shattered/spalling	2	1791.1	0.0	0.0	$ 98,511.11	$ -	$ -	$ -
Sandhurst	Various	7		3	shattered	2	202.2	0.0	0.0	$ 11,122.22	$ -	$ -	$ -
Hackman	Various	14		3	shattered	2	404.4	0.0	0.0	$ 22,244.44	$ -	$ -	$ -
Larkmont	Various	6		3	shattered/spalling	2	173.3	0.0	0.0	$ 9,533.33	$ -	$ -	$ -
Research	Various		500	3	spalling/drainage	1	0.0	0.0	0.0	$ -	$ -	$ 14,000.00	$ -
Corporate Square	various		600	4	spalling	1	0.0	0.0	600.0	$ -	$ -	$ 16,800.00	$ 16,800.00
Brooktrail	Various	6		4	shattered/spalling	1	173.3	173.3	0.0	$ 9,533.33	$ 9,533.33	$ -	$ -
	Various	12		3	shattered/spalling	1	346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
Plantation	Various	2		4	shattered/sinking	2	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	20		3	shattered	2	577.8	0.0	0.0	$ 31,777.78	$ -	$ -	$ -
Carriage Square	Various	1		4	shattered	2	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	3		3	shattered/sinking	2	86.7	0.0	0.0	$ 4,766.67	$ -	$ -	$ -
Foxbrook	Various	10		3	shattered	1	288.9	0.0	0.0	$ 15,888.89	$ -	$ -	$ -
	Various	7		4	shattered	1	202.2	202.2	0.0	$ 11,122.22	$ 11,122.22	$ -	$ -
Shadybrook	Various	5		3	shattered	1	144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -
Lawrence	Various		150	3	spalling	1	0.0	0.0	0.0	$ -	$ -	$ 4,200.00	$ -

Estimated Slab SY Price	Estimated Curb and Gutter LF Price
55.00	28.00

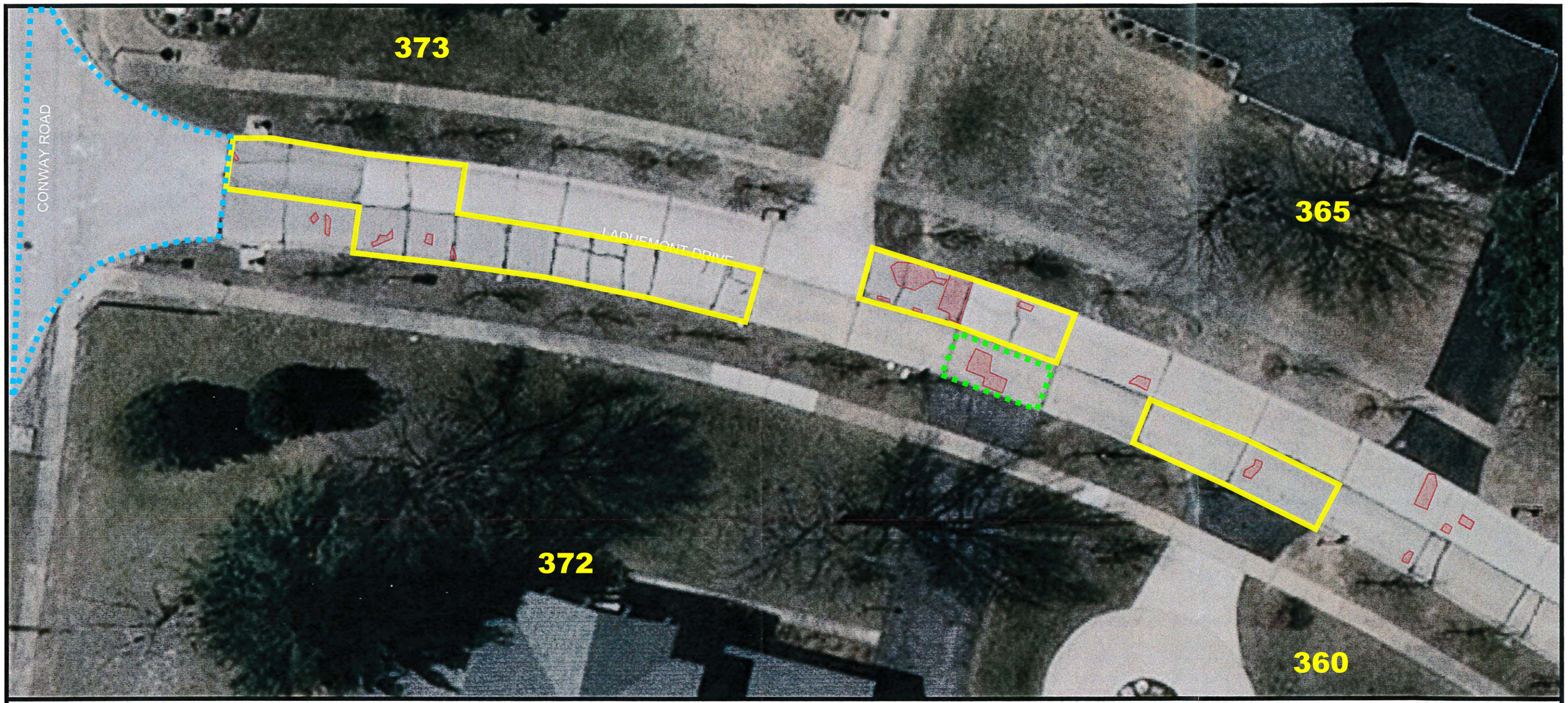
2015 Concrete Repair List

Street	Address	Slabs (20' x 13')	Curb and Gutter (LF)	Priority	Distress	Ward	SY Subtotal	SY for 4's	LF for 4's	Estimated Slab Cost	Estimated 4 Slab Cost	Estimated C and G Cost	Estimated 4 C and G Cost
Ladue Court	Various		150	3	shattered/spalling	1	0.0	0.0	0.0	$ -	$ -	$ 4,200.00	$ -
Kingsbridge Estates	Various		20	3	sinking/spalling	1	0.0	0.0	0.0	$ -	$ -	$ 560.00	$ -
Countryview	Various		200	3	spalling/sinking	1	0.0	0.0	0.0	$ -	$ -	$ 5,600.00	$ -
Oak Park Dr	Various		70	3	spalling	1	0.0	0.0	0.0	$ -	$ -	$ 1,960.00	$ -
	north cul-de-sac (vert.)		100	3	spall	1	0.0	0.0	0.0	$ -	$ -	$ 2,800.00	$ -
Oak Park Ct	Various		60	3	spalling	1	0.0	0.0	0.0	$ -	$ -	$ 1,680.00	$ -
Office Park	Various		200	3	spalling	2	0.0	0.0	0.0	$ -	$ -	$ 5,600.00	$ -
Old Ballas	Various	12		3	shattered	2	346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
	Various		80	4	spalling	2	0.0	0.0	80.0	$ -	$ -	$ 2,240.00	$ 2,240.00
	Various		20	3	spalling	2	0.0	0.0	0.0	$ -	$ -	$ 560.00	$ -
Coeur de Royale	Various	1		4	shattered/spalling	2	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	12		3	shattered/spalling	2	346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
Studt	Various	14		4	longitudinal	2	404.4	404.4	0.0	$ 22,244.44	$ 22,244.44	$ -	$ -
	Various		120	4	shattered	2	0.0	0.0	120.0	$ -	$ -	$ 3,360.00	$ 3,360.00
Santino	Various	2		4	shattered	2	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	13		3	shattered/spalling	2	375.6	0.0	0.0	$ 20,655.56	$ -	$ -	$ -
Emerson	Various	21		3	shattered	2	606.7	0.0	0.0	$ 33,366.67	$ -	$ -	$ -
Decker	Various	34		3	shattered	2	982.2	0.0	0.0	$ 54,022.22	$ -	$ -	$ -
Cabin Grove	Various	32		3	spalling	3	924.4	0.0	0.0	$ 50,844.44	$ -	$ -	$ -
Conway Aire	Various	5		4	shattered	3	144.4	144.4	0.0	$ 7,944.44	$ 7,944.44	$ -	$ -
	Various	12		3	shattered	3	346.7	0.0	0.0	$ 19,066.67	$ -	$ -	$ -
Emerald Green	Various	4		4	shattered	2	115.6	115.6	0.0	$ 6,355.56	$ 6,355.56	$ -	$ -
	Various	18		3	shattered/spalling	2	520.0	0.0	0.0	$ 28,600.00	$ -	$ -	$ -
Sackston Ridge	Various	28		3	shattered/spalling	2	808.9	0.0	0.0	$ 44,488.89	$ -	$ -	$ -
Sackston Woods	Various	7		4	shattered		202.2	202.2	0.0	$ 11,122.22	$ 11,122.22	$ -	$ -
	Various	18		3	shattered		520.0	0.0	0.0	$ 28,600.00	$ -	$ -	$ -
Lakeshore	Various	2		4	shattered/sinking	2	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	25		3	shattered	2	722.2	0.0	0.0	$ 39,722.22	$ -	$ -	$ -
Peekskill	Various	10		3	shattered	2	288.9	0.0	0.0	$ 15,888.89	$ -	$ -	$ -
Nyack	Various	10		3	shattered	2	288.9	0.0	0.0	$ 15,888.89	$ -	$ -	$ -
Tarrytown	Various	1		4	shattered	2	28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	7		3	shattered	2	202.2	0.0	0.0	$ 11,122.22	$ -	$ -	$ -
Conway Pine	Various	2		4	shattered	3	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	11		3	shattered	3	317.8	0.0	0.0	$ 17,477.78	$ -	$ -	$ -
Conway Club	Various	2		4	shattered/spalling	3	57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	20		3	shattered/spalling	3	577.8	0.0	0.0	$ 31,777.78	$ -	$ -	$ -
Conway Downs	Various	10		4	shattered/spalling	3	288.9	288.9	0.0	$ 15,888.89	$ 15,888.89	$ -	$ -
	Various	34		3	shattered	3	982.2	0.0	0.0	$ 54,022.22	$ -	$ -	$ -
Conway Holmes	Various	22		3	shattered	3	635.6	0.0	0.0	$ 34,955.56	$ -	$ -	$ -
Conway Garden (south)	Various		20	4	shattered	3	0.0	0.0	20.0	$ -	$ -	$ 560.00	$ 560.00
	Various		130	3	shattered	3	0.0	0.0	0.0	$ -	$ -	$ 3,640.00	$ -
Conway Lake	Various		10	3	spalling	3	0.0	0.0	0.0	$ -	$ -	$ 280.00	$ -
Hammermill	Various	4		4	shattered	3	115.6	115.6	0.0	$ 6,355.56	$ 6,355.56	$ -	$ -
	Various	19		3	shattered	3	548.9	0.0	0.0	$ 30,188.89	$ -	$ -	$ -
Greenville	Various	4		3	spalling	4	115.6	0.0	0.0	$ 6,355.56	$ -	$ -	$ -
Oakstone	Various	2		4	shatterd		57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	11		3	shattered		317.8	0.0	0.0	$ 17,477.78	$ -	$ -	$ -
Laduemont	Various	13		4	shattered/spalling		375.6	375.6	0.0	$ 20,655.56	$ 20,655.56	$ -	$ -
	Various	54		3	shattered/spalling		1560.0	0.0	0.0	$ 85,800.00	$ -	$ -	$ -
Twin Creek	Various		160	3	spalling	3	0.0	0.0	0.0	$ -	$ -	$ 4,480.00	$ -
Pinehurst Estates	Various	2		3	spalling		57.8	0.0	0.0	$ 3,177.78	$ -	$ -	$ -
Ladue Grove	Various	1		4	shattered/spalling		28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	11		3	shattered	3	317.8	0.0	0.0	$ 17,477.78	$ -	$ -	$ -
Ladue Aire	Various	5		4	shattered/spalling		144.4	144.4	0.0	$ 7,944.44	$ 7,944.44	$ -	$ -
	Various	5		3	spalling	4	144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -

Estimated Slab SY Price	Estimated Curb and Gutter LF Price
55.00	28.00

2015 Concrete Repair List

Street	Address	Slabs (20' x 13')	Curb and Gutter (LF)	Priority	Distress	Ward	SY Subtotal	SY for 4's	LF for 4's	Estimated Slab Cost	Estimated 4 Slab Cost	Estimated C and G Cost	Estimated 4 C and G Cost
Ladue Lake	Various	7		3	shattered/spalling	4	202.2	0.0	0.0	$ 11,122.22	$ -	$ -	$ -
Ladue Lake Ct	Various	1		4	shattered/spalling		28.9	28.9	0.0	$ 1,588.89	$ 1,588.89	$ -	$ -
	Various	9		3	shattered/spalling		260.0	0.0	0.0	$ 14,300.00	$ -	$ -	$ -
Falling Leaves	Various	5		4	shattered/spalling		144.4	144.4	0.0	$ 7,944.44	$ 7,944.44	$ -	$ -
	Various	32		3	shattered/spalling		924.4	0.0	0.0	$ 50,844.44	$ -	$ -	$ -
Petite Royale	Various	47		4	shattered/spalling	3	1357.8	1357.8	0.0	$ 74,677.78	$ 74,677.78	$ -	$ -
Royal Manor Ct	Various	16		4	shattered/spalling	3	462.2	462.2	0.0	$ 25,422.22	$ 25,422.22	$ -	$ -
Royalgate	Various	25		4	shattered/spalling	3	722.2	722.2	0.0	$ 39,722.22	$ 39,722.22	$ -	$ -
Royal Manor	Royal Manor Dr	66		4	shattered/spalling	3	1906.7	1906.7	0.0	$ 104,866.67	$ 104,866.67	$ -	$ -
Worthington Oaks	Various	3		4	shattered		86.7	86.7	0.0	$ 4,766.67	$ 4,766.67	$ -	$ -
	Various	5		3	shattered		144.4	0.0	0.0	$ 7,944.44	$ -	$ -	$ -
Ambleside	Various	2		4	shattered/spalling		57.8	57.8	0.0	$ 3,177.78	$ 3,177.78	$ -	$ -
	Various	17		3	shattered/spalling	4	491.1	0.0	0.0	$ 27,011.11	$ -	$ -	$ -
		Slabs (20' x 13')	**Curb and Gutter (LF)**				**SY Subtotal**	**SY for 4's**	**LF for 4's**	**Slab Cost**	**4 Slab Cost**	**C and G Cost**	**4 C and G Cost**
	Totals	1894	2820				54715.6	14011.1	980.0	$3,009,355.56	$ 770,611.11	$ 78,960.00	$27,440.00



MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

- Interpreted Void Beneath Pavement

N

0 10 20 40
SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MSR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

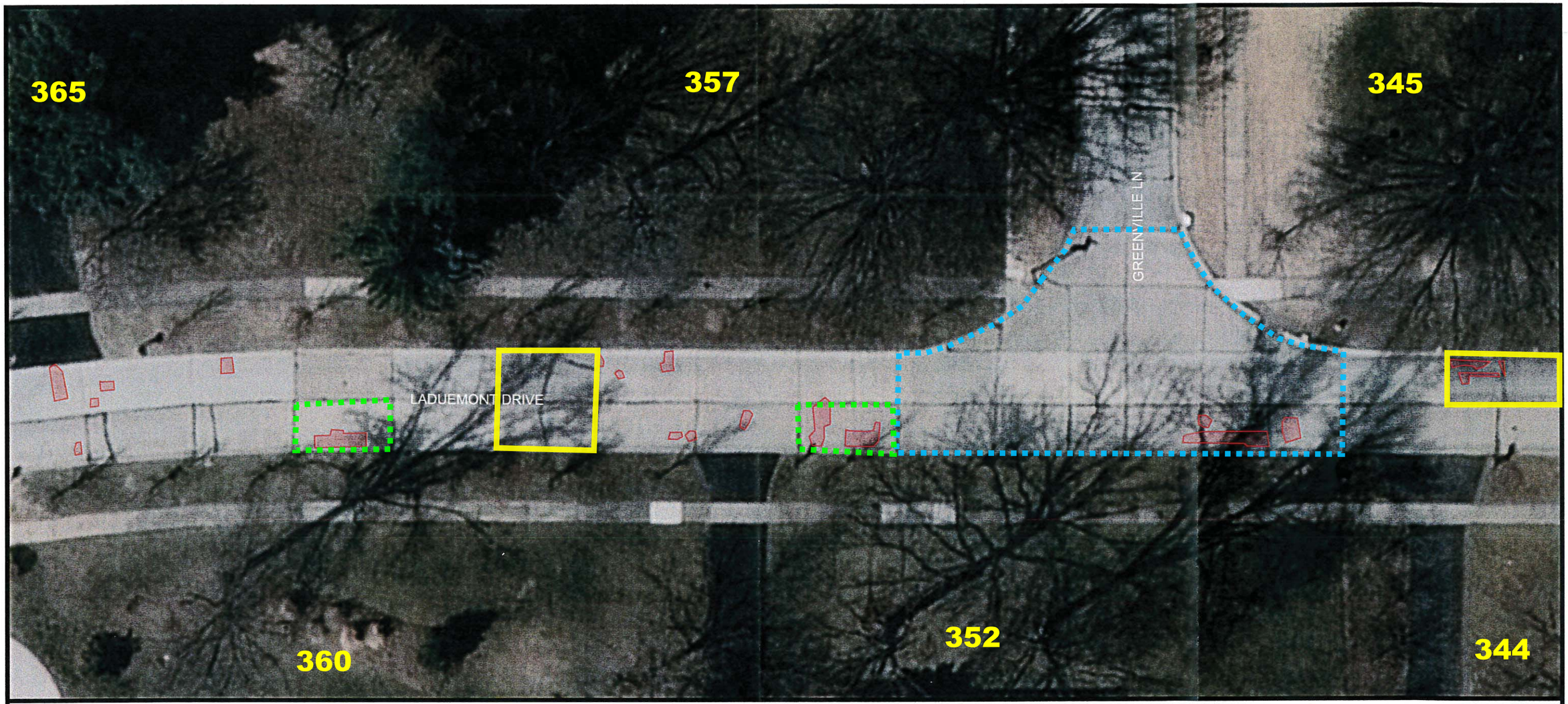
GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA A

Project Number
J025378.01

PLATE 6A



MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

Interpreted Void Beneath Pavement

0 10 20 40

SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MSR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

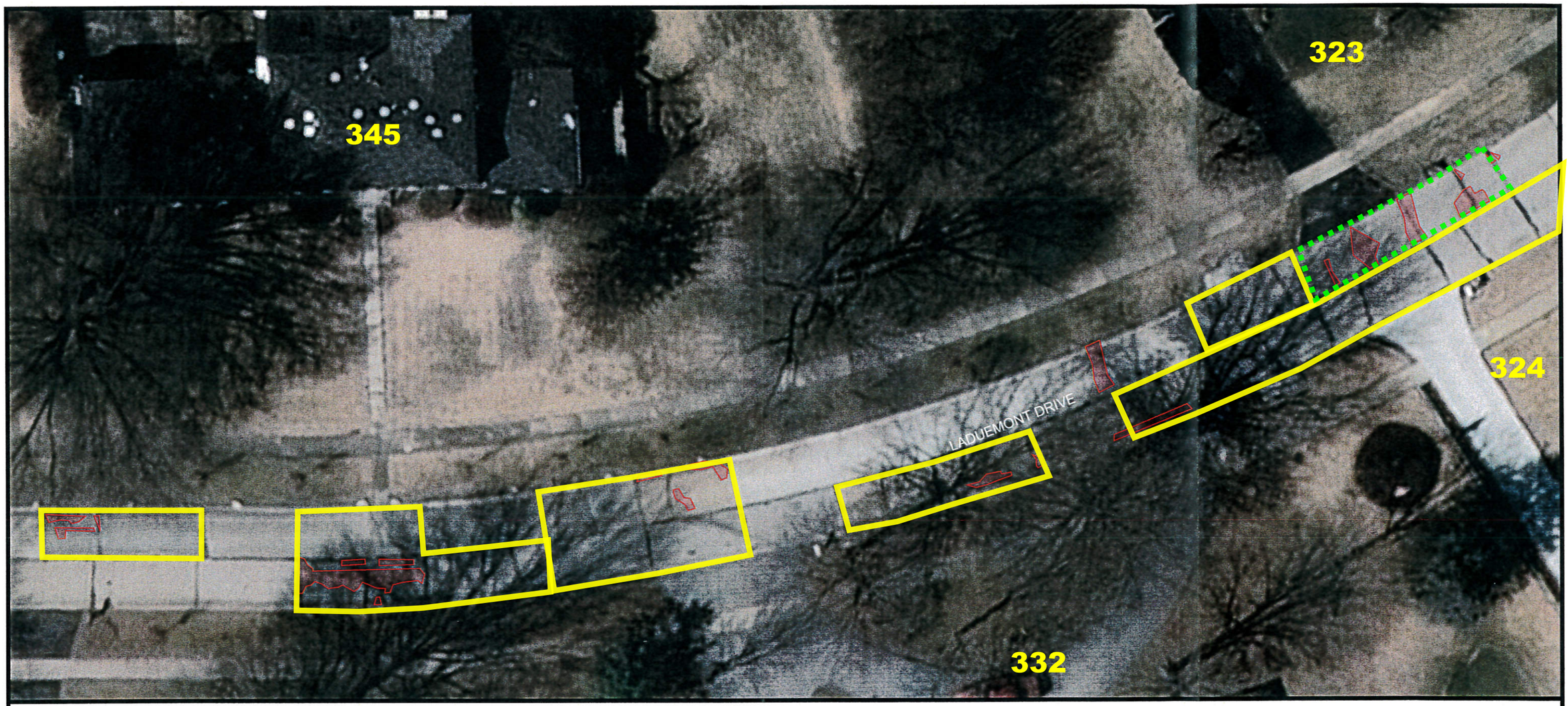
GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA B

Project Number J025378.01

PLATE 6B



MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

Interpreted Void Beneath Pavement

0 10 20 40

SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MSR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA C

Project Number J025378.01

PLATE 6C

MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

Interpreted Void Beneath Pavement

0 10 20 40
SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MJR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA D

Project Number J025378.01	PLATE 6D

MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

Interpreted Void Beneath Pavement

N

0 10 20 40
SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MBR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

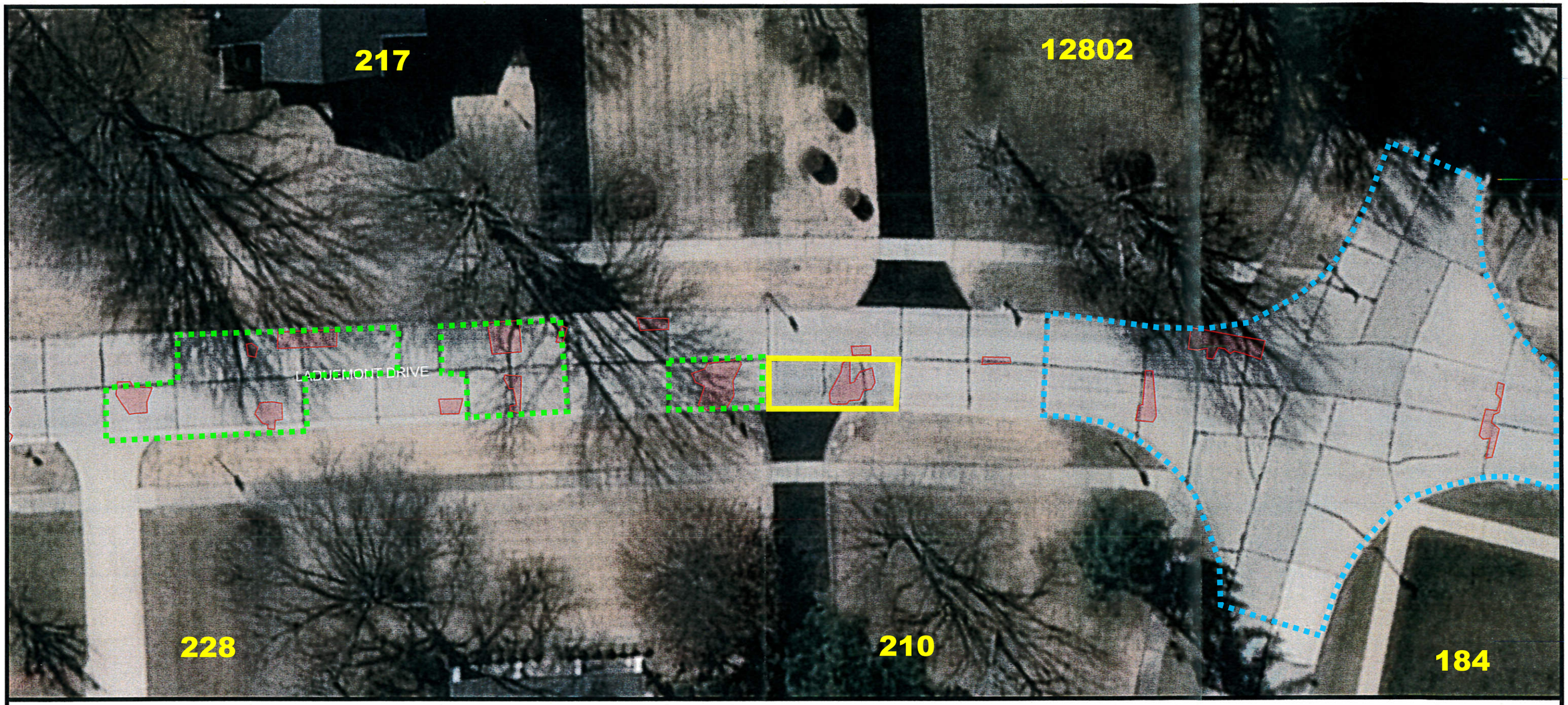
GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA E

Project Number
J025378.01

PLATE 6E



MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

- Interpreted Void Beneath Pavement

N

0 10 20 40
SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MSR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

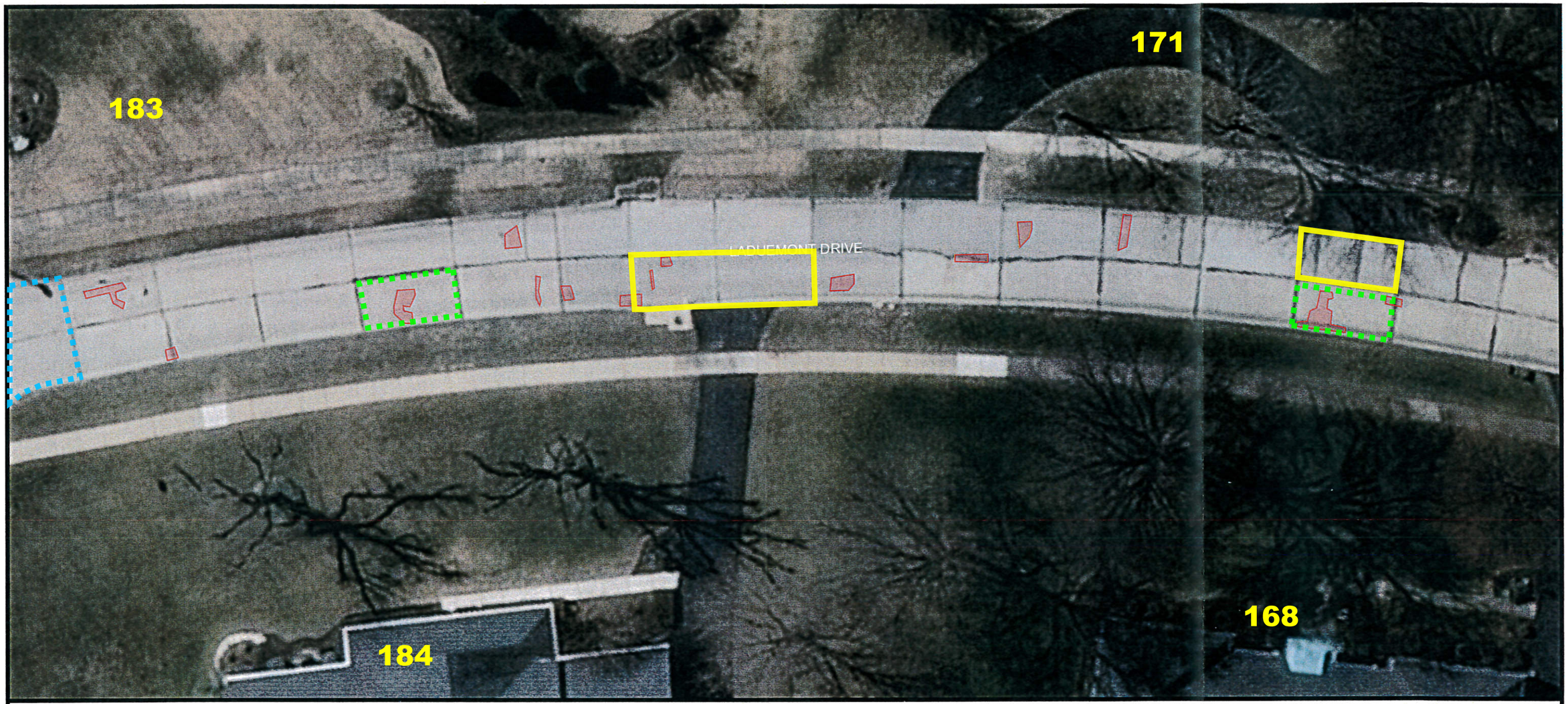
GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA F

Project Number J025378.01

PLATE 6F



MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

Interpreted Void Beneath Pavement

0 10 20 40
SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MSR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

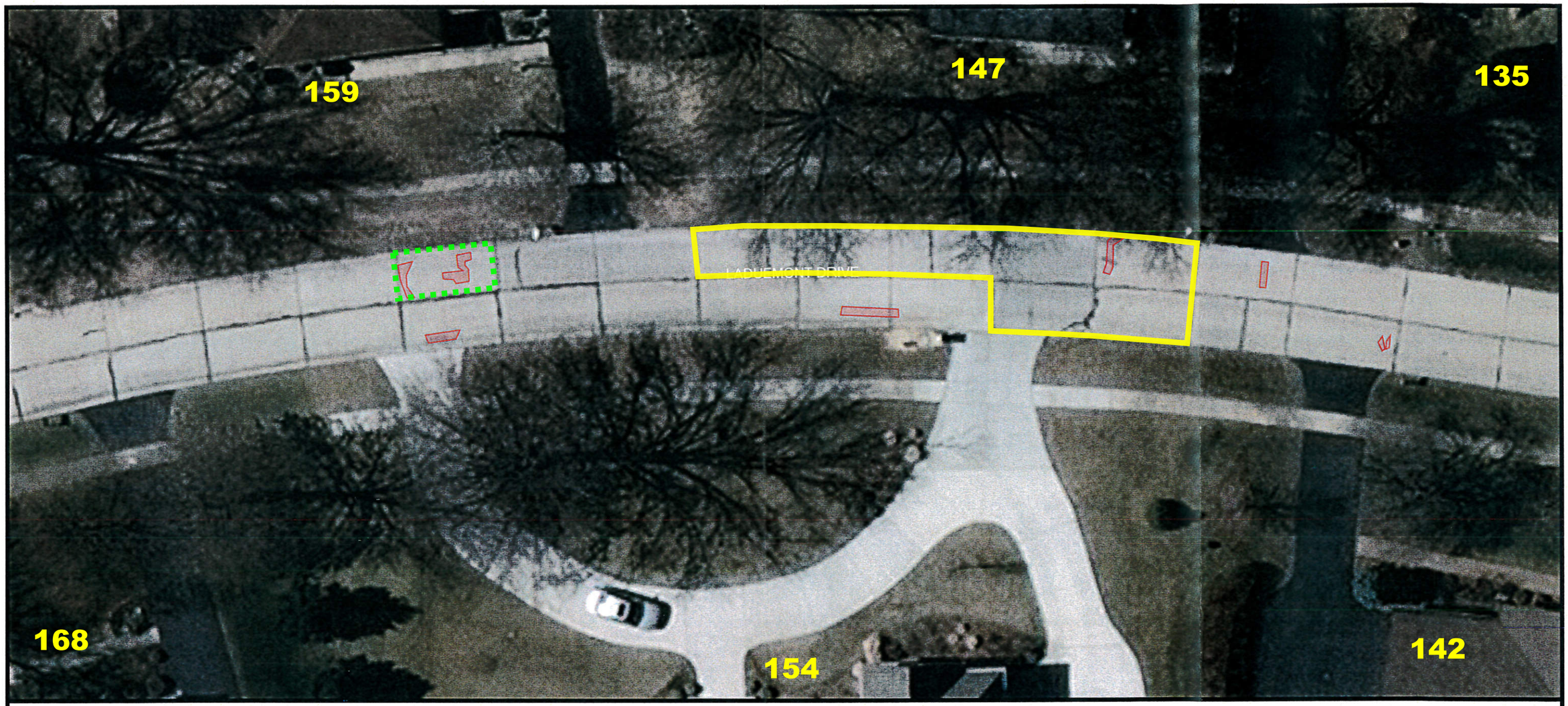
GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA G

Project Number
J025378.01

PLATE 6G



MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

Interpreted Void Beneath Pavement

N

0 10 20 40

SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MSR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

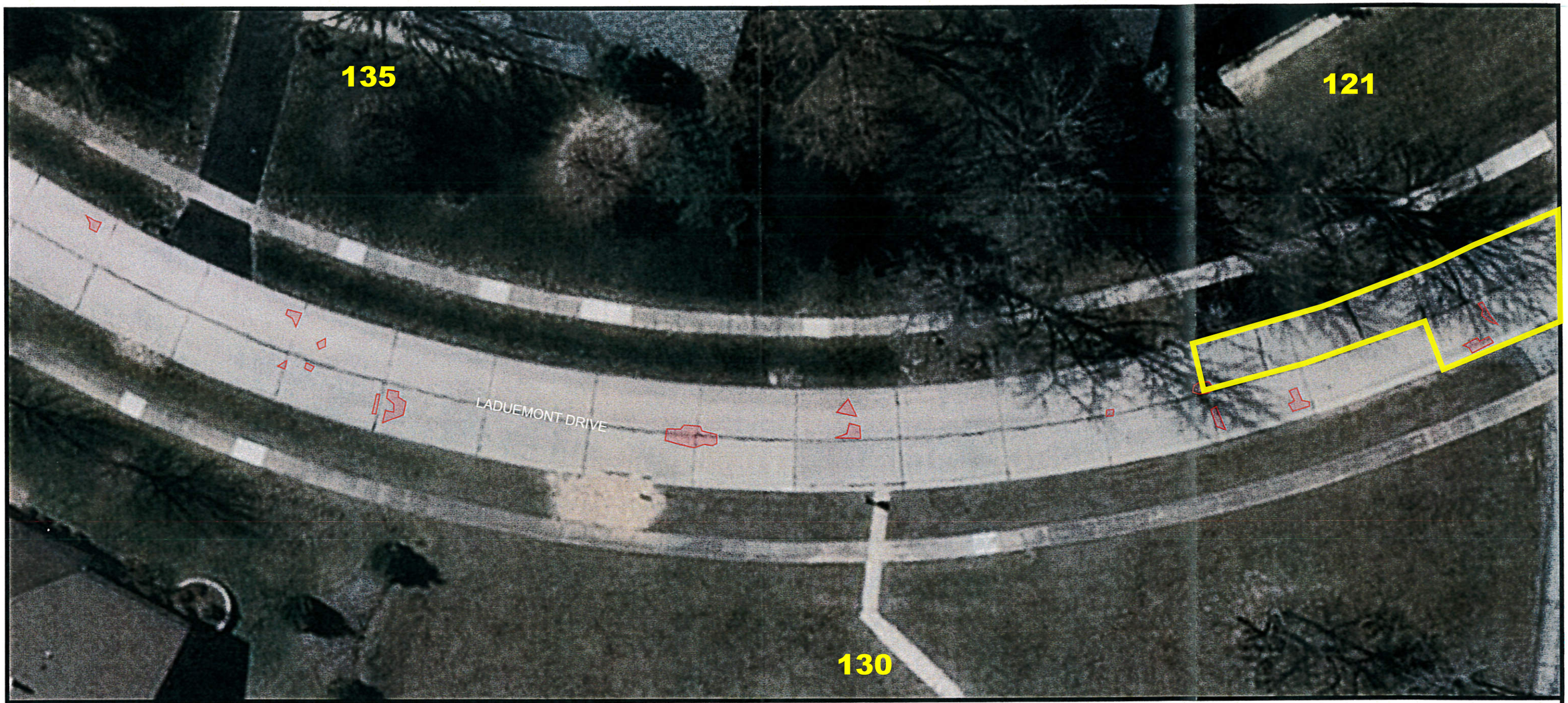
GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA H

Project Number J025378.01

PLATE 6H



MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

Interpreted Void Beneath Pavement

N

0 10 20 40
SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MSR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

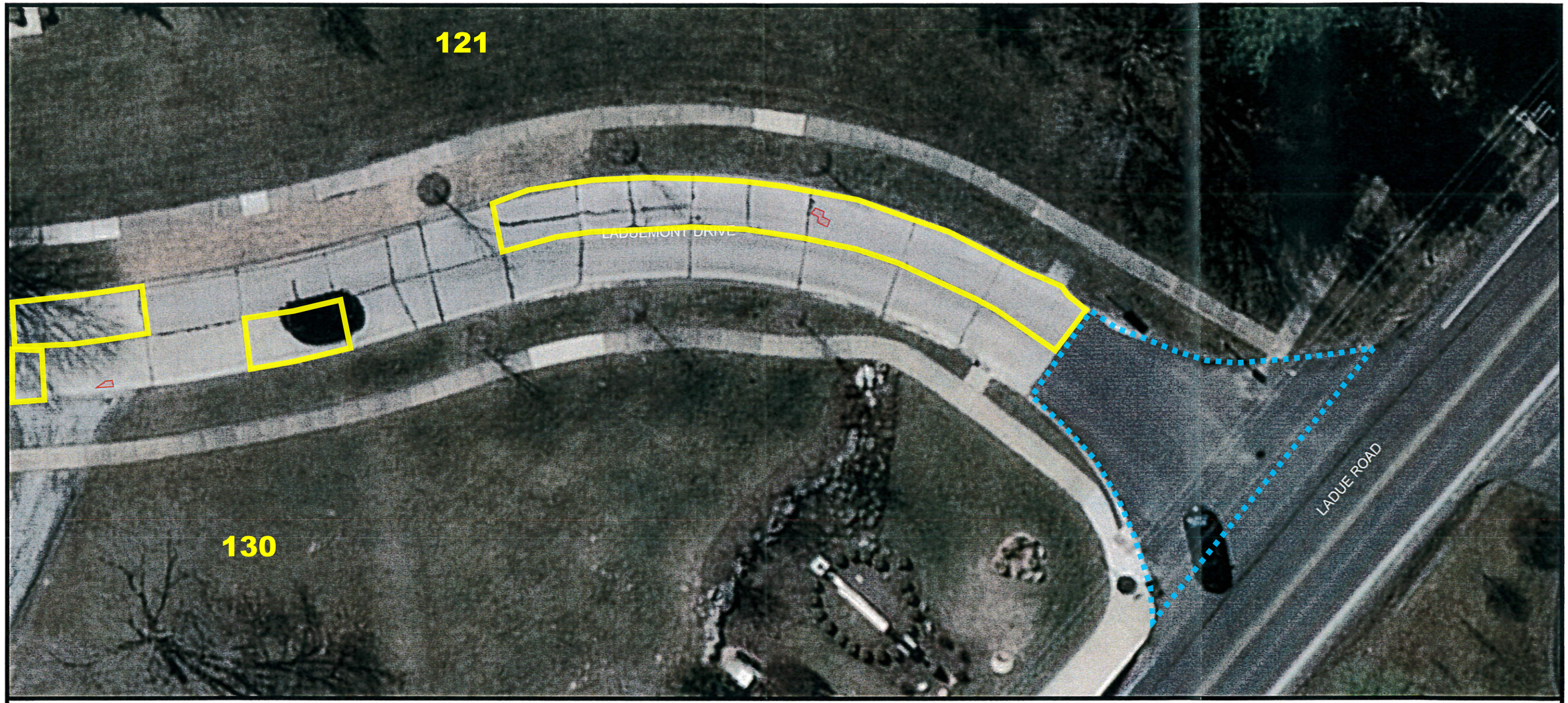
GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA I

Project Number
J025378.01

PLATE 6I



MARKUP LEGEND

- Remove and replace
- Mudjack
- Pedestrian Limits of Work

NOTES

1. Plan adapted from "2012 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

LEGEND

Interpreted Void Beneath Pavement

0 10 20 40

SCALE IN FEET

Drawn By: WAH	Ck'd By: BGF	App'vd By: MSR
Date: 3-2-16	Date: 3/3/16	Date: 3/3/16

GEOTECHNOLOGY INC
FROM THE GROUND UP

Street Void Survey
Multiple Street Locations
Creve Coeur, Missouri

GPR SURVEY RESULTS
LADUEMONT DRIVE
DETAIL AREA J

Project Number J025378.01

PLATE 6J

BID TABULATION

2015 ROADWAY RECONSTRUCTION PROJECT

City of Creve Coeur, Missouri

Bids opened: 10:00 a.m. Tuesday, March 3, 2015

Item Number	Item	Unit	Contract Quantity	Gershenson Construction		M&H Concrete Contractors,		Pavement Solutions, LLC		Raineri Construction, LLC	
				Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal
109500A	SOFT SOILS FORCE ACCOUNT	DOLLAR	5,000	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00
402001A	PAVEMENT MILLING (0"-4" DEPTH)	SY	6,862	$ 2.25	$ 15,439.50	$ 3.15	$ 21,615.30	$ 3.47	$ 23,811.14	$ 3.65	$ 25,046.30
403002A	GEOSYNTHETIC INTERLAYER - SYSTEM C	SY	6,862	$ 2.50	$ 17,155.00	$ 3.60	$ 24,703.20	$ 4.26	$ 29,232.12	$ 3.25	$ 22,301.50
405001A	BITUMINOUS PAVEMENT	TON	938	$ 70.00	$ 65,660.00	$ 72.00	$ 67,536.00	$ 68.64	$ 64,384.32	$ 69.75	$ 65,425.50
502001A	CONCRETE PAVEMENT REMOVAL AND REPLACEMENT	SY	3,405	$ 46.00	$ 156,630.00	$ 50.20	$ 170,931.00	$ 58.15	$ 198,000.75	$ 53.25	$ 181,316.25
502002A	CONCRETE PAVEMENT REMOVAL AND REPLACEMENT (HIGH EARLY)	SY	356	$ 66.00	$ 23,496.00	$ 57.00	$ 20,292.00	$ 66.12	$ 23,538.72	$ 75.00	$ 26,700.00
604201A	ADJUST MANHOLE TO GRADE	EA	5	$ 200.00	$ 1,000.00	$ 320.00	$ 1,600.00	$ 475.60	$ 2,378.00	$ 400.00	$ 2,000.00
608004A	CONCRETE SIDEWALK	SY	16	$ 143.00	$ 2,288.00	$ 58.00	$ 928.00	$ 80.81	$ 1,292.96	$ 58.00	$ 928.00
608100A	CONCRETE DRIVEWAY	SY	80	$ 69.50	$ 5,560.00	$ 54.00	$ 4,320.00	$ 76.26	$ 6,100.80	$ 58.00	$ 4,640.00
608010A	ASPHALT DRIVEWAY	SY	300	$ 96.80	$ 29,040.00	$ 42.00	$ 12,600.00	$ 40.04	$ 12,012.00	$ 53.00	$ 15,900.00
609100A	TYPE "S" VERTICAL CURB	LF	60	$ 54.80	$ 3,288.00	$ 28.00	$ 1,680.00	$ 25.95	$ 1,557.00	$ 23.00	$ 1,380.00
609200A	INTEGRAL VERTICAL CURB	LF	105	$ 15.00	$ 1,575.00	$ 17.00	$ 1,785.00	$ 14.64	$ 1,537.20	$ 12.00	$ 1,260.00
612000A	TRAFFIC CONTROL	LS	1	$ 7,750.00	$ 7,750.00	$ 9,000.00	$ 9,000.00	$ 6,015.40	$ 6,015.40	$ 7,500.00	$ 7,500.00
619000A	MOBILIZATION	LS	1	$ 10,580.00	$ 10,580.00	$ 17,300.00	$ 17,300.00	$ 10,205.00	$ 10,205.00	$ 33,220.00	$ 33,220.00
				Gershenson Construction		M&H Concrete Contractors, Inc		Pavement Solutions, LLC		Raineri Construction, LLC	
	Total Bid:			**$ 344,461.50**		**$ 359,290.50**		**$ 385,065.41**		**$ 392,617.55**	

Denotes Calculation Error - Corrected Value Shown

BID TABULATION

2015 ROADWAY RECONSTRUCTION PROJECT

City of Creve Coeur, Missouri

Bids opened: 10:00 a.m. Tuesday, March 3, 2015

Item Number	Item	Unit	Contract Quantity	Spencer Contracting Co.		Krupp Construction		Byrne & Jones Construction	
				Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal
109500A	SOFT SOILS FORCE ACCOUNT	DOLLAR	5,000	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00
402001A	PAVEMENT MILLING (0"-4" DEPTH)	SY	6,862	$ 3.20	$ 21,958.40	$ 2.32	$ 15,919.84	$ 3.00	$ 20,586.00
403002A	GEOSYNTHETIC INTERLAYER - SYSTEM C	SY	6,862	$ 3.45	$ 23,673.90	$ 2.68	$ 18,390.16	$ 3.57	$ 24,497.34
405001A	BITUMINOUS PAVEMENT	TON	938	$ 79.42	$ 74,495.96	$ 66.25	$ 62,142.50	$ 69.30	$ 65,003.40
502001A	CONCRETE PAVEMENT REMOVAL AND REPLACEMENT	SY	3,405	$ 58.00	$ 197,490.00	$ 62.09	$ 211,416.45	$ 83.70	$ 284,998.50
502002A	CONCRETE PAVEMENT REMOVAL AND REPLACEMENT (HIGH EARLY)	SY	356	$ 62.00	$ 22,072.00	$ 146.03	$ 51,986.68	$ 125.84	$ 44,799.04
604201A	ADJUST MANHOLE TO GRADE	EA	5	$ 150.00	$ 750.00	$ 300.00	$ 1,500.00	$ 560.00	$ 2,800.00
608004A	CONCRETE SIDEWALK	SY	16	$ 63.00	$ 1,008.00	$ 214.41	$ 3,430.56	$ 125.00	$ 2,000.00
608100A	CONCRETE DRIVEWAY	SY	80	$ 75.00	$ 6,000.00	$ 106.23	$ 8,498.40	$ 106.25	$ 8,500.00
608010A	ASPHALT DRIVEWAY	SY	300	$ 83.00	$ 24,900.00	$ 87.02	$ 26,106.00	$ 33.34	$ 10,002.00
609100A	TYPE "S" VERTICAL CURB	LF	60	$ 35.00	$ 2,100.00	$ 55.51	$ 3,330.60	$ 100.00	$ 6,000.00
609200A	INTEGRAL VERTICAL CURB	LF	105	$ 10.00	$ 1,050.00	$ 17.29	$ 1,815.45	$ 66.67	$ 7,000.35
612000A	TRAFFIC CONTROL	LS	1	$ 8,500.00	$ 8,500.00	$ 5,096.21	$ 5,096.21	$ 2,500.00	$ 2,500.00
619000A	MOBILIZATION	LS	1	$ 22,000.00	$ 22,000.00	$ 19,000.00	$ 19,000.00	$ 15,000.00	$ 15,000.00

	Spencer Contracting Co.	Krupp Construction	Byrne & Jones Construction
Total Bid:	**$ 410,998.26**	**$ 433,632.85**	**$ 498,686.63**

Denotes Calculation Error - Corrected Value Shown

BID TABULATION

2016 ROADWAY RECONSTRUCTION PROJECT

City of Creve Coeur, Missouri

Bids opened: 10:00 a.m. Friday, January 29, 2016

Item Number	Item	Unit	Contract Quantity	M & H Concrete Contractors		Raineri Construction		L. Keeley Construction		Amcon Municipal Concrete	
				Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal
109500A	SOFT SOILS FORCE ACCOUNT	DOLLAR	5,000	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00
502001A	CONCRETE PAVEMENT REMOVAL AND REPLACEMENT	SY	4,900	$ 49.75	$ 243,775.00	$ 51.30	$ 251,370.00	$ 55.00	$ 269,500.00	$ 60.00	$ 294,000.00
502002A	CONCRETE PAVEMENT REMOVAL AND REPLACEMENT (HIGH E	SY	200	$ 54.00	$ 10,800.00	$ 60.00	$ 12,000.00	$ 70.00	$ 14,000.00	$ 65.00	$ 13,000.00
604200A	ADJUST MANHOLE TO GRADE	EA	2	$ 225.00	$ 450.00	$ 425.00	$ 850.00	$ 1,500.00	$ 3,000.00	$ 200.00	$ 400.00
604210A	ADJUST INLET TO GRADE	EA	7	$ 200.00	$ 1,400.00	$ 425.00	$ 2,975.00	$ 1,000.00	$ 7,000.00	$ 500.00	$ 3,500.00
608100A	CONCRETE DRIVEWAY	SY	50	$ 54.00	$ 2,700.00	$ 60.00	$ 3,000.00	$ 150.00	$ 7,500.00	$ 65.00	$ 3,250.00
608010A	ASPHALT DRIVEWAY	SY	200	$ 42.00	$ 8,400.00	$ 60.00	$ 12,000.00	$ 50.00	$ 10,000.00	$ 75.00	$ 15,000.00
608020A	CONCRETE SIDEWALK	SY	10	$ 56.25	$ 562.50	$ 86.00	$ 860.00	$ 150.00	$ 1,500.00	$ 100.00	$ 1,000.00
609100A	VERTICAL CURB (DOWELED ON)	LF	100	$ 11.00	$ 1,100.00	$ 8.00	$ 800.00	$ 25.00	$ 2,500.00	$ 11.50	$ 1,150.00
612000A	TRAFFIC CONTROL	LS	1	$ 6,000.00	$ 6,000.00	$ 2,000.00	$ 2,000.00	$ 7,000.00	$ 7,000.00	$ 1,500.00	$ 1,500.00
619000A	MOBILIZATION	LS	1	$ 6,000.00	$ 6,000.00	$ 20,630.00	$ 20,630.00	$ 6,000.00	$ 6,000.00	$ 4,500.00	$ 4,500.00
				M & H Concrete Contractors		Raineri Construction		L. Keeley Construction		Amcon Municipal Concrete	
	Total Bid:			**$ 286,187.50**		**$ 311,485.00**		**$ 333,000.00**		**$ 342,300.00**	

BID TABULATION

2016 ROADWAY RECONSTRUCTION PROJECT

City of Creve Coeur, Missouri

Bids opened: 10:00 a.m. Friday, January 29, 2016

Item Number	Item	Unit	Contract Quantity	K.J.U. Inc.		Spencer Contracting Co.		N.B. West Contracting	
				Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal	Unit Bid Price	Item Subtotal
109500A	SOFT SOILS FORCE ACCOUNT	DOLLAR	5,000	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00	$ 1.00	$ 5,000.00
502001A	CONCRETE PAVEMENT REMOVAL AND REPLACEMENT	SY	4,900	$ 60.75	$ 297,675.00	$ 61.25	$ 300,125.00	$ 80.00	$ 392,000.00
502002A	CONCRETE PAVEMENT REMOVAL AND REPLACEMENT (HIGH E	SY	200	$ 69.78	$ 13,956.00	$ 63.25	$ 12,650.00	$ 90.00	$ 18,000.00
604200A	ADJUST MANHOLE TO GRADE	EA	2	$ 500.00	$ 1,000.00	$ 300.00	$ 600.00	$ 600.00	$ 1,200.00
604210A	ADJUST INLET TO GRADE	EA	7	$ 600.00	$ 4,200.00	$ 500.00	$ 3,500.00	$ 800.00	$ 5,600.00
608100A	CONCRETE DRIVEWAY	SY	50	$ 58.00	$ 2,900.00	$ 78.00	$ 3,900.00	$ 120.00	$ 6,000.00
608010A	ASPHALT DRIVEWAY	SY	200	$ 75.00	$ 15,000.00	$ 51.00	$ 10,200.00	$ 50.00	$ 10,000.00
608020A	CONCRETE SIDEWALK	SY	10	$ 100.00	$ 1,000.00	$ 72.00	$ 720.00	$ 60.00	$ 600.00
609100A	VERTICAL CURB (DOWELED ON)	LF	100	$ 10.00	$ 1,000.00	$ 11.50	$ 1,150.00	$ 30.00	$ 3,000.00
612000A	TRAFFIC CONTROL	LS	1	$ 5,000.00	$ 5,000.00	$ 2,500.00	$ 2,500.00	$ 4,000.00	$ 4,000.00
619000A	MOBILIZATION	LS	1	$ 15,000.00	$ 15,000.00	$ 24,000.00	$ 24,000.00	$ 36,680.00	$ 36,680.00
		Total Bid:		**K.J.U. Inc.**	**$ 361,731.00**	**Spencer Contracting Co.**	**$ 364,345.00**	**N.B. West Contracting**	**$ 482,080.00**