

FEASIBILITY REPORT

FOR IMPROVEMENT OF EAST AVENUE

INTRODUCTION

The purpose of this report is to determine the feasibility of improving the following described street, or portions thereof, by grading, base construction, curb and gutter construction, and surfacing:

EAST AVENUE from C.S.A.H. 5 to 580 feet east of the east right-of-way line of C.S.A.H. 5

The improvement of the street was petitioned for by owners of more than 35% of the property abutting the improvement therefore allowing the project to be considered as petition initiated. This report has been prepared pursuant to Council resolution of May 29, 2018. See Map A.

PROJECT NEED

As previously stated, the proposed improvement has been petitioned for. The property represented on the petition is the site of the Rising Sun Estate apartment complex. The subject street segment is a rural design gravel road included within the City as a result of 1972 annexation. Dust from traffic and wind in dry weather is a common concern of those living or conducting business along gravel streets or roads. Soft surface conditions, particularly in frost out conditions, is another typical problem associated with gravel roads. It is understood that these deficiency were cause for the Housing and Redevelopment Authority, owners of the Rising Sun Estate complex, to petition for the street improvement.

EXISTING CONDITIONS

The properties abutting the street segment are currently zoned Residential (apartment complex) or Transitional (south side). A purpose of the City's Comprehensive Plan (Plan) is to identify planned future urban uses. The future land use of those properties abutting the south side of the subject segment of East Avenue is identified as Medium Density Residential. The property abutting the south side of the street segment is former Rock Island Railroad right-of-way. The former right-of-way is only 100 feet in depth except the most easterly 100 feet, more or less, which abuts commonly owned property. The manner that the property south of the street segment will be developed is difficult to project at this time.

Originally the street segment was improved as TH 16 and later abandon as a highway when TH 16 was relocated to the current location of C.S.A.H. 35. The pavement was removed at some time after its abandonment as a highway and reverted to a rural section gravel road. The current gravel surface varies from about 24 feet to 27 feet in width. Although the slopes vary, it appears the road ditches were graded with 4 to 1 slopes. Unlike what frequently occurs with rural section roads within an urbanizing area, the road ditches along this rural roadway have not been intentionally filled and are generally able to continue to provide the roadbed drainage as originally intended. The 4.8 acre multi-family development on the north side of the street segment includes three drives onto East Avenue with culverts installed as part of the 2014 development. There are no drives to the property on the south side of the street segment.

DESIGN

The City's Assessment Ordinance provides that concrete curbing or curb and gutter shall be installed at the same time as street surfacing, except that where a permanent "rural street" (road or roadway) design is approved by the City Council, curbs will not be required. Curb and gutter provides the advantages of vehicle control, delineation of the edge of pavement, elimination of pavement edge break-up, presentation of a finished urban street appearance, and perhaps most importantly, drainage control without road ditches. The alternate rural road design includes the road ditches to provide for reliable drainage of the roadbed and adjacent property rather than the integrated street/storm sewer drainage inherent in the urban street design. A permanent rural road design should only be implemented in those locations where road ditches are suitable and can be sustained, where driveways constitute an insignificant length of frontage, and where there is no demand for parking along the roadway.

The City's Assessment Ordinance provides that residential streets "shall be of '5 ton' design, 36 feet in width, measured between faces of curbs." The Ordinance further establishes that collector streets (including commercial and industrial access streets) shall be of "9 ton" design, and shall normally be 44 feet in width measured between faces of curbs. The residential street width of 36 feet is intended to support on street parking but does not allow for two unrestricted through traffic lanes. The width of 44 feet reflects a street providing two 10 foot wide parking lanes and two 12 foot wide through lanes. Providing for parking on both sides of a street is common throughout the community; however, it may not be warranted in all locations. Although the terminology "5 ton" and "9 ton" design reflects what may be considered outdated pavement design methodology, the intent is to provide a pavement adequate to support the adjacent land use and that traffic which may collect on through routes.

Roadway Type

As previously indicated, an urban street meeting City standards typically becomes an integral part of an area's drainage system. To accomplish this, the street is graded lower than adjacent properties to collect runoff from those properties and the flow in the street's gutter is collected with water intakes (catch basins) at low points and intermediate locations as needed. Adequate grade both along and across the street is needed to prevent ponding on the street. The flow is then routed through storm sewers and, if applicable, through treatment facilities to a suitable discharge location. The urban street design relies on the availability of a storm sewer system of adequate size and depth to accommodate design flows from the area being served.

Extension of a storm sewer will be required to improve the street segment to urban design standards. The street segment is located in an area which is not currently served by a storm sewer system. The street segment and land abutting immediately north of the segment are to drain toward the drainage system extending from near the C.S.A.H. 35 and TH 59/60 intersection south to the former East Lake Okabena. See Map B. The area south of the street segment is to drain south. These drainage directions are based on natural drainage divisions and are also incorporated into the City's Master Drainage Plan and that used by MnDOT in the design of the TH 59/60 drainage system. Existing drainage follows these patterns via road ditches.

The multi-family residential complex along the north side of the street segment did develop with the adjacent road ditch integrated into its design. The southerly edge of the complex's site drains to the street segment road ditch and is then routed through the site's storm water treatment system (pond) located in the northwest corner of the site. This site drainage would need to be perpetuated by use of a swale between the development and an urban street or substitute treatment would need to be incorporated into a storm sewer improvement in order for the site to maintain compliance with storm water permitting requirements. Map B depicts the route for a storm sewer system needed to accommodate drainage from the street segment and properties within the same drainage area abutting the segment.

A storm sewer system to accommodate property south of the street segment would need to extend south of the City limits for the distance necessary to obtain adequate depth. Two alternatives to extending storm sewer for drainage of the property south of the street segment have been identified. Each involve perpetuating the existing road ditches on the south side of the street segment. First, the existing road ditch could be used as outlets for curb openings. While this alternate approach allows installation of curb and gutter and perpetuates current drainage, it fails to offer all the benefits of an urban street design until storm sewer is extended. A second alternative is to improve the street segment using an urban section (curb and guttered) on its north side and a rural section on its south side. This second alternative could be a long term interim improvement until development plans for the south side of the street segment are introduced.

An improvement project to improve East Avenue as petitioned for would need to include the storm sewer as shown in Map B together with an unidentified system draining to the south or one of the alternate approaches noted above. The estimate total cost for the storm sewer shown on Map B is \$315,000, including engineering and contingencies.

Given the considerations as summarized below, it is recommended that Council advance the proposed improvement to exclude installation of curb and gutter and necessary storm sewer extension:

Road ditches, including that abutting the recent housing development, have been perpetuated.

Without storm sewer improvements extending south of the existing corporate limits the south road ditch will be needed for drainage on the south side of the street segment.

A certain amount of drainage will need to be perpetuated north of a curb along the north side of the street segment or the residential storm water treatment basin will need to be modified to be a regional basin.

Inadequate surface drainage was not identified as a current infrastructure deficiency by the petitioner; however, the cost for the storm sewer necessary for the street segment and property to the north of it exceeds the cost of the rural roadway improvement.

Inability to identify the development needs of the property south of the street segment given its limited depth. It should be noted that if shallow lots are proposed they will likely require installation of multiple driveways which will not be compatible with perpetuating a rural road section. Inclusion of additional property to form a larger tract of land for residential development similar to that on the north side of the street segment may limit the need for street access and immediate storm sewer improvements. The nature of development on the south side of the street segment will also determine the need for/number of sewer and water services which will disrupt the roadbed, particularly sewer services. Disruption of the roadbed would include any curb and gutter installed at this time.

The rural section design as recommended is not necessarily proposed as the ultimate or “build out” design but rather as a long term interim improvement until the factors influencing the current recommendation change.

Roadway Width

The surfacing of the rural section roadway is proposed to be 28 feet in width. This width does not provide for on street parking. From a motor vehicle perspective, this width may be considered to provide either two 11 foot driving lanes with 3 foot shoulders or two 12 foot driving lanes with 2 foot shoulders; however, it is recommended the street be managed as providing two Wide Outside Lanes. See Complete Streets policy discussion below.

Pavement Design

Pavement type may either be rigid (concrete) or flexible (bituminous). The selection of pavement type may be based on a thorough evaluation of life cycle costs utilizing projected traffic, projected maintenance costs and other factors, or on the basis of proven performance under certain traffic conditions. The pavement type may also be appropriately selected on the basis of suitability in a particular circumstance. The potential for eventual disruption of the roadbed within a 35 year concrete pavement design life is cause to recommend that a flexible pavement be utilized.

The recommended pavement section for the street segment constructed as a rural section roadway is 2.5" of bituminous surfacing and 9" of aggregate base. It is recommended that the 9" aggregate base be a drainable (Drainable Stable Base) material. Use of the drainable base material as the base with the base being “daylighted” will allow for free drainage of that base material, intercept free water rising from below that layer, allow for more rapid drainage of any excess moisture in the material above the drainable base, and provide a base layer that is less susceptible to loss of strength due to the presence of excess moisture. Geotextile reinforcement fabric would also be installed in conjunction with the aggregate base. The geotextile fabric will reduce the migration of the subgrade clay into the drainable base material and reinforce the subgrade material (clay) during the spring transitional period when frost is melting out of the soil and the subgrade’s bearing strength is the weakest.

Application of Complete Streets Policy

The City's Complete Street Policy (resolution) states: *"The City of Worthington will, whenever it is economically feasible, seek to enhance the safety, access, convenience and comfort of all users of all ages and abilities, including bicyclists, pedestrians (including people requiring mobility aids), motorists and freight drivers, through the design, operation and maintenance of the transportation network so as to create a connected network of facilities accommodating each mode of travel that is consistent with and supportive of the local community, recognizing that all streets are different and that the needs of various users will need to be balanced in a flexible manner."*

The proposed improvement is subject to the policy. The street segment is isolated from any existing path or walk. The nearest walk or path is the multi-use path located along TH 59/60. The ultimate long term pedestrian/bicycle infrastructure to serve the residential area east of TH 59/60, south of C.S.A.H. 35, and north of Nobles Street may involve extension of a multi-use path along and/or south of East Avenue to C.S.A.H. 5. Alternatively, East Avenue together with a parallel walk to C.S.A.H. 5 may also function adequately to serve to collect bicycle and pedestrian traffic from the adjacent residential area. At this time, the lack of bicycle/pedestrian infrastructure continuity together with the nature of the rural section improvement is cause to consider only the suitability of the roadway to accommodate bicycle traffic which may reasonably continue to travel west on East Avenue to the TH 59/60 path system.

The Bikeway Facility Design Manual currently available from the Minnesota Department of Transportation provides that Wide Outside Lanes having a width of 14 feet may be suitable for a bikeway on a rural roadway with up to 1,000 ADT and design speeds of 40 mph or less. Although traffic counts are not available on the street segment, ADT of 500 ADT or less would be expected. For comparison, the ADT on C.S.A.H. 35 north of the segment is 1650 and on C.S.A.H. 5 at the west end of the segment is 1450. The recommended pavement width of 28 feet provides the two 14 foot Wide Outside Lanes. Fog lines should not be striped.

Additional Considerations

To reduce tracking of gravel onto and prevent damage to the improved street segment, it is proposed to include a 15 foot transitional surface section east of the end of the street improvement. This transitional section will be constructed without full regrading of the existing roadway and is considered an integral maintenance reduction feature of the improvement but not within the assessable improvement length.

PROJECT COST AND FINANCE

Total project cost for the rural section improvements as recommended in the preceding is estimated to be \$181,000, including engineering and contingencies. This compares to an estimated cost for an urban section of \$275,000 less storm sewer improvements. The distribution of assessable costs of each of the improvement types is proposed as outlined in the City's Assessment Ordinance.

In general, the City’s Assessment Ordinance defines that the assessment rate for a street improvement is to equal the cost of the improvement divided by the sum of adjusted frontages abutting the improvement. The width of intersections and similar distances are added to the summation of adjusted frontages to yield assessment rates that are equitable, relatively consistent between similar projects, and best reflect benefit. The assessment as to any property is to be equal to the assessment rate multiplied by the adjusted frontage of that property. An adjusted frontage is defined to be the average width of the lot as it abuts the improvement. In the case of the housing development, the average width is greater than the length of improvement and therefore the assessable frontage is proposed to be based on improvement frontage. Certain lot allowances, which become a city share of the project, are provided for in the ordinance. A corner lot allowance applies to both properties (north and south side) abutting the improvement. Consistent with application of the side yard allowance on projects such as the 2010 improvement of Marine Avenue, the sideyard allowance would be limited to 150 feet.

The following provides the estimated costs, city share, assessments receivable, and assessment rates for the street improvement:

City share for non-assessable costs ¹	\$51,110.32	
City share of assessable costs	<u>\$0.00</u>	
Total city share	\$0.00	(28.2%)
Assessments receivable	<u>\$129,889.68</u>	(71.8%)
TOTAL COST	\$181,000.00	

The estimated assessment rate is: **\$163.14/ft**

¹ Includes East Avenue frontage within the C.S.A.H. 5 right-of-way

For comparison, the estimated assessment rate for an urban section street improvement is \$247.86 /ft.

It is proposed that the project be initially financed by PIR bonding. Revenues from special assessments levied as a result of the project along with the annual special tax levy required to recover the city share of the project will be utilized for bond repayment.

CONTRACT COMBINATION WITH OTHER IMPROVEMENTS

It is recommended that the street construction be undertaken through a stand alone contract unless another bidding opportunity involving similar work evolves.

CONCLUSION

This report recommends, based on current conditions, a rural section street improvement rather than the urban section street improvement defined in the description of the improvement petitioned for. The recommended improvement is also reduced in length to 565 feet with the additional 15

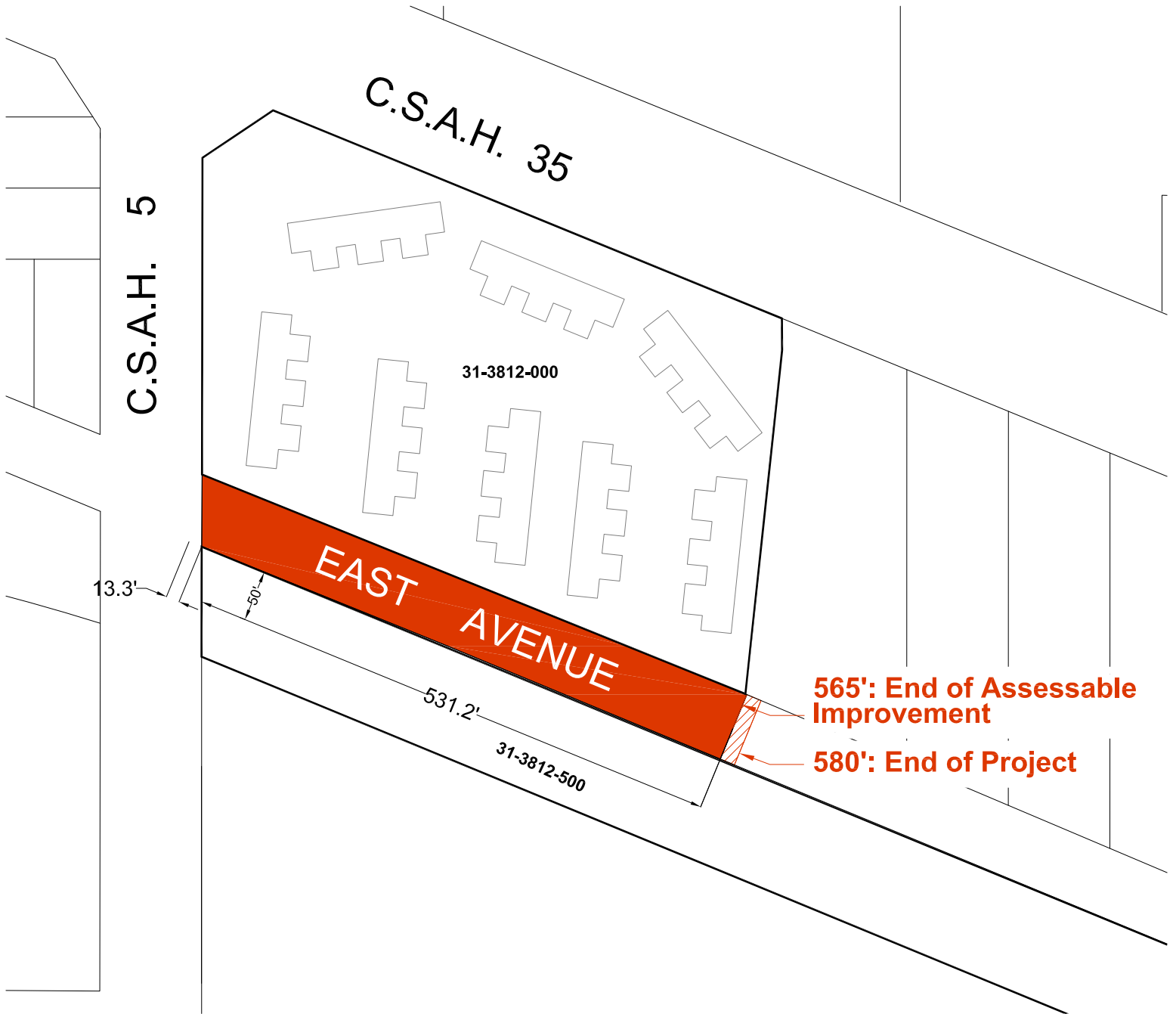
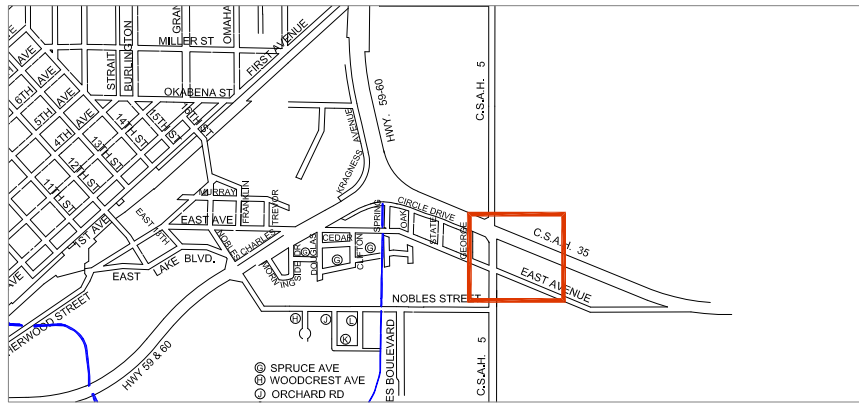
feet described in the petition being a transitional section included as an appurtenance but necessary cost of the improvement.

The recommended improvement is to be described as:

Improving the following described street by grading, base construction, and surfacing:

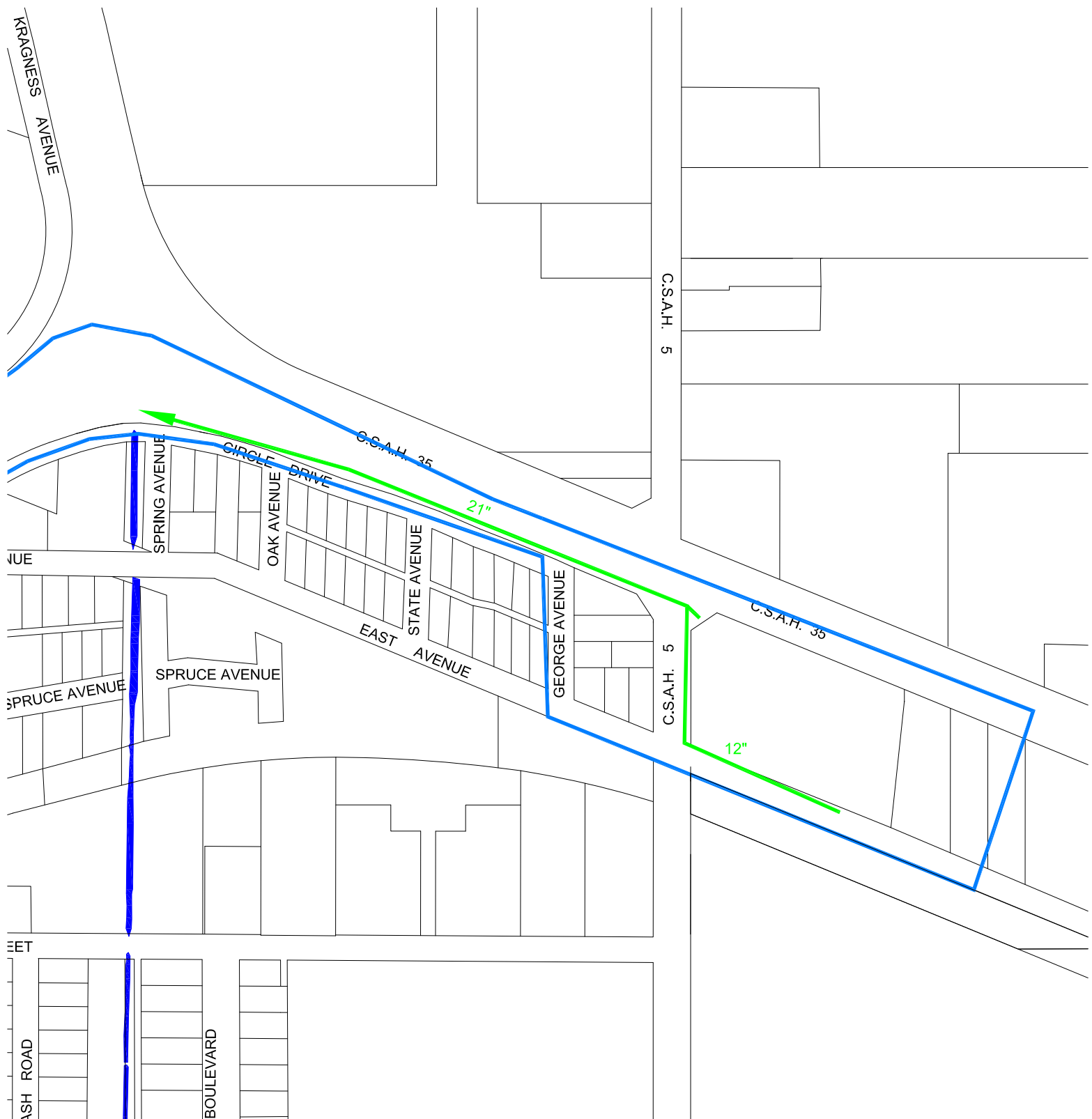
EAST AVENUE from C.S.A.H. 5 to 565 feet east of the east right-of-way line of C.S.A.H. 5.

The proposed street improvement is feasible and a cost effective means of improving the subject street segment.



 PROPOSED IMPROVEMENT

MAP A



—— REQUIRED STORM SEWER
—— DRAINAGE AREA BOUNDARY

MAP B