MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Design and Engineering Services – Central Region
Highway Design Section

To: Distribution (see below)

Date: June 26, 2020

Phone: 269-0641
E-mail: kevin.jackson@alaska.gov

From: Kevin Jackson, P.E.
Project Manager

Subject: **A St.: Northern Lights to 40th Pvmt. Pres. Plans-in-Hand and Draft DSR Review**

Attached for your review and comment is a Plans-in-Hand assembly for the above referenced project. Please e-mail your comments to me and Noah King (noah.king@alaska.gov) by COB on **Thursday, July 16**. A review meeting will be held on **Wednesday, July 22nd, at 9:00 a.m. in the Main Conference Room**, 4111 Aviation Avenue.

When possible, comments should be sent using the 'Cone Rating' Review Comment form, _RevCommentForm-Rating_for_Local_PIH_Only.docx, found at \\dot.soa.alaska.gov\shared\AVI\LIB\HighwayDesignMasters\SubmittalForms or http://www.dot.state.ak.us/creg/design/highways/Submittals/.

FEDERAL PROJECT NO.:	Federal #0527030
IRIS PROGRAM NO.:	IRIS Program # CFHWY00223
IRIS ACTIVITY TEMPLATE:	TPJ001
IRIS PHASE:	T02015
IRIS ACTIVITY CODE:	Use your appropriate Section activity code

Attachments: **Plans, Special Provisions, Draft DSR, Draft Railroad Crossing Certification, and Engineer's Estimate**

Files available on request: None.

Distribution:
John Linnell, P.E., Regional Preconstruction Engineer
Jim Amundsen, P.E., Chief, Highway Design
Clint Adler, P.E., Highway Design Peer Review Coordinator (2)
Kevin Jackson, P.E., Project Manager (5)
Mike Yerkes, P.E., Chief, Regional Materials Engineer (2)
Jeff Carleton, P.E., Electrical Engineer, Preconstruction
Charlie Wagner, P.E., Chief, Maintenance & Operations (Memo + EE only)
Burrell Nickeson, Manager, Maintenance & Operations (Memo + EE only)
Vacant, Maintenance & Operations (3)
Randy Vanderwood, P.E., Chief, Right-of-Way (2)
Louise Hooyer, P.L.S., ROW Engineering Supervisor
Bob Keiner, P.L.S., Survey Manager, Locations
Cindy Ferguson, P.E., Chief, Traffic, Safety, & Utilities (1 electronic copy)
Melanie Arnolds, P.E., Regional Utilities Engineer (2 + 1 electronic copy)
Scott Thomas, P.E., Regional Traffic Engineer, Traffic & Safety
Orion LeCroy, P.E., HSIP Coordinator, Traffic & Safety
Leisha Sweeney, P.E., Regional Traffic Design Engineer
Joel St. Aubin, P.E., Regional Construction Engineer
Tony Sprague, P.E., Construction Group Chief
Brian Schumacher, P.E.Project Manager, Construction (2)
Ryan Norkoli, P.E., Review Engineer, Contracts
Fred Park, P.E., Specifications/Estimating Engineer
Eric Miyashiro, P.E., Chief, Preliminary Design & Environmental
Paul Janke, P.E., Regional Hydrologist, Central Region
Brian Elliott, Regional Environmental Manager, Preliminary Design & Environmental
Planning Administrative Desk, Planning
Matt Murphy, Highway Data Supervisor, Planning, MS 2530
Katherine Hensley, M.S., Program Coordinator II, MSCVE, MS 2540 (1 electronic copy)

Plans and Specifications (no cost estimate)

Simons Latunde-Addey, Central Region Engineer, FHWA Alaska Division, simons.latunde-addey@dot.gov (1 electronic copy via ZendTo)

Marc Guzik, MOA Liaison, 4700 Elmore Road, Anchorage, AK 99507 (8 hardcopies + 1 CD)

Email Notification of Review
Carolyn Morehouse, P.E., Chief Engineer

MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Design and Engineering Services – Central Region
Highway Design

TO: Kevin Jackson
PIH Distribution

DATE: June 15, 2020

TELEPHONE NO: 907-269-0641
E-MAIL: Kevin.Jackson@alaska.gov

FROM: David Gamez, P.E.
Project Engineer

SUBJECT: PIH Specifications Memo
A Street: Northern Lights Blvd to 40th Ave Pavement Preservation
0527030/CFHWY00223

This memo was prepared to summarize the proposed project changes to the 2020 Standard Specifications for Highway Construction, the Standard Modifications, Statewide Specials, and Central Region Specials for the above listed project.

Please provide your comments with the PIH review comments.

Project specific specifications including 603, 608, 615, and 670 are attached to this memo for review.

To see the Standard Specifications for Highway Construction 2020 edition please see the DOT&PF website:

http://www.dot.state.ak.us/stwddes/dcsspecs/pop_hwyspecs_english.shtml

To see the Standard Modifications, Statewide Specials, and CR Specials please see the ftp site for the latest edition.

http://www.dot.state.ak.us/creg/design/highways/specs/

Project Provisions

DIVISION 100 GENERAL PROVISIONS		
101	Definitions and Terms	*
102	Bidding Requirements and Conditions	*
103	Award and Execution of Contract	*
104	Scope of Work	*
105	Control of Work	*
106	Control of Material	*
107	Legal Relations and Responsibility to Public	*
108	Prosecution and Progress	*
109	Measurement and Payment	*
120	Disadvantaged Business Enterprise (DBE) Program	*

DIVISION 200 EARTHWORK		
201	Clearing and Grubbing	*
202	Removal of Structures and Obstructions	*
203	Excavation and Embankment	*
204	Structure Excavation for Conduits and Minor Structures	*

DIVISION 300 BASES		
301	Aggregate Base and Surface Course	*
306	Asphalt Treated Base Course	*

DIVISION 400 ASPHALT PAVEMENTS AND SURFACE TREATMENTS		
401	Hot Mix Asphalt Pavement	*
402	Tack Coat	*
408	Hot Mix Asphalt Pavement - Type V	*

DIVISION 600 MISCELLANEOUS CONSTRUCTION		
603	Culverts and Storm Drains	Project provisions for CIPP Liner
604	Manholes and Inlets	*
608	Sidewalks	Project provisions for bike ramps
615	Standard Signs	Project provisions for bike signs
618	Seeding	*
619	Soil Stabilization	*

620	Topsoil	*
627	Water Systems	
630	Geotextile for Embankment and Roadway Separation, Stabilization and Reinforcement	*
640	Mobilization and Demobilization	*
641	Erosion, Sediment, and Pollution Control	*
642	Construction Surveying and Monuments	*
643	Traffic Maintenance	*
644	Services to be Furnished by the Contractor	* Construction please advise
645	Training Program	*
646	CPM Scheduling	*
649	Governor's Workforce Development	*
651	Control of Work – Supplemental Requirements	*
652	Prosecution and Progress – Supplemental Requirements	*
670	Traffic Markings	Project provisions for bike striping
682	Utility Potholing	*

DIVISION 700 MATERIALS		
702	Asphalt Materials	*
703	Aggregates	*
706	Concrete and Plastic Pipe	*
707	Metal Pipe	*
708	Paints	*
724	Seed	*
725	Fertilizer	*
726	Topsoil	*
727	Soil Stabilization Material	*
730	Sign Materials	*

* No anticipated changes to the 2020 Standard Specifications for Highway Construction, Standard Modifications, Statewide Specials, or the current CR Specials.

Pay Items

DIVISION 200 EARTHWORK		
201.0008.0000	Grubbing	*
202.0002.0000	Removal of Pavement	*
202.0003.0000	Removal of Sidewalk	*
202.0004.0000	Removal of Culvert Pipe	*
202.0009.0000	Removal of Curb and Gutter	*
202.2023.0000	Pavement Planing	*
203.0006.000A	Borrow, Type A	*
204.0001.0000	Structure Excavation	*

DIVISION 300 BASES		
301.0001.00D1	Aggregate Base Course, Grading D-1	*
306.0001.0000	ATB	*
306.0002.5834	Asphalt Binder, Grade PG 58-34	*

DIVISION 400 ASPHALT PAVEMENTS AND SURFACE TREATMENTS		
401.0001.002B	HMA, Type II; Class B	*
401.0004.5228	Asphalt Binder, Grade PG 52-28	*
402.0001.STE1	Ste-1 Asphalt For Tack Coat	*
408.2001.00VH	HMA, Type V	*
408.2004.5834	Asphalt Binder, Grade PG 58-34E	*
408.2014.0000	Joint Adhesive	*
408.2015.0000	Asphalt Material Price Adjustment	*

DIVISION 600 MISCELLANEOUS CONSTRUCTION		
603.2032.0024	24 Inch Corrugated HDPE Pipe	*
604.0003.0000	Reconstruct Existing Manhole	*
604.0004.0000	Adjust Existing Manhole	*
604.0010.0000	Reconstruct Inlet	*
608.0006.0000	Curb Ramp	*
615.0001.0000	Standard Sign	*
615.0002.0001	Remove and Relocate Sign	*
615.0006.0000	Salvage Sign	*
618.0005.0000	Seeding	*
620.0003.0000	Topsoil	

627.0010.0000	Adjustment of Valvebox	*
640.0001.0000	Mobilization and Demobilization	*
641.0001.0000	Erosion, Sediment and Pollution Control Administration	*
641.0002.0000	Temporary Erosion, Sediment and Pollution Control	*
641.0006.0000	Withholding	*
641.0007.0000	SWPPP Manager	*
642.0001.0000	Construction Surveying	*
642.0003.0000	Three Person Survey Party	*
643.0002.0000	Traffic Maintenance	*
643.0003.0000	Permanent Construction Signs	*
643.0023.0000	Traffic Price Adjustment	*
643.0025.0000	Traffic Control	*
643.0032.0000	Flagging	*
644.2004.0000	Engineering Communications	*
645.0001.0000	Training Program, 1 Trainees/Apprentices	*
646.0001.0001	CPM Scheduling	*
660.0001.0001	Traffic Signal System Complete "A Street and Benson Boulevard Intersection"	*
660.0001.0002	Traffic Signal System Complete "A Street and Northern Lights Boulevard Intersection"	*
660.2004.0000	Adjust Junction Box	*
661.0001.0000	Load Center, Type 1	*
670.2006.0000	MMA Pavement Markings, Longitudinal Inlaid	*
670.2007.0000	MMA Pavement Markings, Symbols and Arrow(S) Inlaid	*
670.2008.0000	MMA Pavement Markings, Transverse and Gore Inlaid	*
682.2000.0000	Vac-Truck Pothole	*

* No anticipated changes to the pay item set out by the Standard Modifications and Special Provisions for Central Region or the Standard Specifications for Highway Construction 2020 edition.

SECTION 603
CULVERT AND STORM DRAINS

Special Provisions

603-1.01 DESCRIPTION. Add the following:

Storm Drainpipe Rehabilitation

Rehabilitate existing storm drainpipes by the inversion and curing of a resin-impregnated tube. Plan and coordinate the rehabilitation. Bypass pump the storm drain flows around the drainpipes during rehabilitation. Clean, inspect, prepare, and line the existing pipe. Sample, test, inspect, and document the cured-in-place lining. Collect and dispose of water, steam condensate and other materials generated by the cleaning and lining operations.

This work shall also consist of cleaning (removing and disposing of) culvert fugitive materials as shown on the Plans, or as directed by the Engineer.

Attain all permits required to complete the work according to Section 107.

CFHWY00223

Add the following:

603-1.03 SUBMITTALS. Make submittals according to the General Provisions and as noted herein.

Storm Drainpipe Rehabilitation

Submit within ten days of the notice-to-proceed and at least five days prior to beginning related work:

1. A plan listing the required permits and detailing the means and methods for collecting and disposing of all debris, cleaning, construction, and testing materials, including water.

2. Lining thickness calculations, manufacturer specifications, industry specifications (ASTMs, etc.), and Materials Safety Data Sheets (MSDS)

3. The manufacturer certification letter for the installer, and a resume listing five local past projects.

4. Letters certifying each material meets the associate ASTM performance standard.

5. Letter certifying the lining system for “long term” (minimum of 50-year design life) integrity and effective life span. Submit certification for soil cell testing, chemical resistance, creep, and long-term structural loading.

6. Letters certifying all preparation, cleaning, and installation materials are complementary to the lining system. Include manufacturer’s installation procedure and equipment required for a complete and successful installation.

7. A plan for sampling and testing non-pressurized gravity pipe according to ASTM F1216.

8. Test sample results from five local projects meeting industry standards and the requirements of these Contract documents.

9. A plan for bypass pumping storm water around the pipe sections designated for rehabilitation.

10. Closed-circuit television (CCTV) operator resume. List five past projects using CCTV inspection to locate and identify obstacles inside existing pipe in preparation for pipe lining.

11. The CCTV DVD records and inspection logs from preparation and after installation.

12. A local third party independent certified test laboratory. If a local laboratory is not available, use a non-local laboratory.

13. The certified laboratory liner and water quality test results.

CFHWY00223

603-2.01 MATERIALS. Add the following:

Storm Drainpipe Rehabilitation

1. Fifty-year minimum service life for the complete system designed as a standalone pipe. The thickness determined as outlined in ASTM F1216 X1.2.2 *Fully Deteriorated Gravity Pipe Condition* with a safety factor of 2.0.

2. A Liner tube of one or more layers of flexible needled felt or an equivalent nonwoven or woven, or a combination of nonwoven and woven materials, capable of carrying a compatible resin, withstanding installation pressures, and curing temperatures. Coat the outer layer with a plastic material compatible with the resin.

3. The lining system (lined pipe) and materials shall:

    1. Meet or exceed the hydraulic capacity of the original unlined pipe,
    2. Withstand high temperatures retaining structural integrity and installed shape during periodic steam heating and thawing,
    3. Be chemically resistant and resistant to bacterial and other substances found in soils,
    4. Not require special training or equipment for repairs made by the Department,
    5. Have a light color interior to promote proper reflective light during closed-circuit television inspection,
    6. Have been installed successfully on five local projects.

4. Pipe Lining System Manufacturers

    - Inliner USA, Inc.
    - Insituform Technologies, Inc.
    - Masterliner, Inc.
    - National Liner
    - Approved Equal

All manufacturers submit documentation per Subsection 603-1.03 Submittals.

Culvert Fugitive Materials. Including but not limited to organic matter (peat, roots, sticks, sod or other), muck, rocks, gravel, sand, silts and debris (trash and similar) and as identified by the Engineer.

CFHWY00223

CONSTRUCTION REQUIREMENTS

Add the following:

Storm Drains Crossing a Water line: maintain 9 ft. minimum between storm drain joint and water line, 18 AAC 80.020.(f)(3)(D)(iii).

CFHWY00223

Add the following Sections 603-3.05, 3.06, 3.07:

603-3.05 CULVERT CLEANING, AND INLET AND OUTLET GRADING. Clean culverts, inlets and outlets, and grade as specified and directed.

Removed materials are the property of the Contractor. Do not reuse these materials within the project limits.

Dispose of removed materials as required dependent on the type of materials and as required by these specifications, and Federal, State, and Local regulations.

603-3.06 STORM WATER BYPASS PUMPING.

Submit a storm water bypass pumping plan. Include a detailed list of equipment (hoses, pumps, and other) and deployment schedule to maintain storm flows during construction including storm events. Provide for a minimum of 500-gpm normal flow and minimum storm event of 2700-gpm.

Provide primary bypass pump(s) and standby backup pump(s) of equal capacity connected into the bypass piping system available for immediate operation. Maintain the hydraulic gradient, both upstream and downstream, of the bypassed pipe, at an elevation to prevent damage to properties served. Do no discharge storm water onto the ground. During bypass pumping, maintain continuous monitoring and observation of the equipment.

Muffle the equipment to minimize the noise. Attain a noise permit where required by the local authorities. A limited operation time required by the local authority is not cause for additional time or compensation.

603-3.07 PIPE LINING. Clean, prepare the pipe and install the lining, including closed-circuit television (CCTV) inspection of the pipe condition before and after installation of the pipe lining. Do not excavate the pipe, joining manholes and other elements related to the pipe lining. Provide a continuous, without joints, watertight conduit from manhole to manhole fit tight against the inner surface of existing pipe.

1. Prepare the Pipe.

Prepare the pipe using remotely controlled equipment inside the pipe.

a. Remove all debris, from the pipe and prevent debris from entering the pipe. Remove protruding objects and obstructions (pipe ends, pipe materials, organic materials, etc.) that will interfere with installation of performance of a lining.

b. Clean the pipe consistent with the lining system manufacturer's requirements, industry standards and as noted herein. Submit the cleaning method and materials for approval, Subsection 603-1.03.

c. Capture all cleaning materials including water used in the cleaning process.

2. Inspect the Pipe.

Inspect the pipe with a CCTV pan-tilt camera. Provide quality color images, meeting industry standards for resolution, clarity, and sharpness. Record the audio and video CCTV inspection on standard DVD format and index to written inspection logs. Provide DVD record and written inspection logs to the Engineer. Provide separate DVD and logs for the pre-liner installation and the post-liner installation.

Complete each CCTV video inspection supplemented with audio.

Record audio identifying the lining system, date of inspection, location of main, manholes, pipe type and size, and direction of travel through the pipe.

a. Pre-liner Installation.

(1) Document the condition of the pipe.
    a. Identify damage.

b. Identify protruding objects that interfere with the installation or performance of the lining.

(2) Identify areas of subsidence or potential subsidence of the surrounding materials and conditions that may undermine the roadway or pipe.

(3) Identify field conditions different from the Contract documents and notify the Engineer in writing. Include solutions recommended by the manufacturer.

(4) Identify pipe bends, joints, adverse grades, and irregularities.

Submit the pre-liner installation inspection for review and approval three days before planned lining installation. Do not begin liner installation until the pre-liner inspection is approved.

b. Post-liner Installation.

Perform the post-installation not less than 24 hours after the curing process. Allow the liner materials to cool and the thermal construction/expansion of the system to stabilize.

(1) Document the lining system installation.

(2) Identify defects including those noted in 603-3.07 3.

3. Line the Pipe.

Begin the pipe-liner installation after the pre-liner installation inspection, 603-3.07 2a, is complete and the preparation is approved. Install the pipe lining according to the manufacturer's instructions, the industry standards, and these specifications. Continuously monitor the installation recording temperature and pressure.

Install the lining free from defects. Bubbles, color changes, changes in roughness, wrinkles, delaminations, cracks, and voids between the liner and pipe wall are unacceptable.

It is not acceptable for the installed lining to cause a backwater, reduce the pipe's hydraulic capacity, stability, or structural integrity.

Pipes passing through a manhole without a sump shall not collect debris. Provide a smooth transition between manhole inverts and the invert of the pipe lining system.

4. Inspect and Test the Pipe Liner.

Complete the post-liner inspection after completing the installation, 603-3.07 2b.

Confirm the installed lining system meets the Manufacturer's parameters. Sample the lining system, without compromising the system, and test the samples. Sample and test water samples from the pipe outfall and confirm uncured resin (styrene) is not present.

Use a local independent third party certified laboratory to complete the sampling and testing.

If uncured resin is above non-detection levels, take immediate steps to prevent release into the environment. Capture the water and uncured resin, all contaminated materials.

5. Repair the Pipe Liner.

Propose manufacturer recommended repairs for all defects and receive approval from the Engineer before beginning the repairs.

Removed/captured materials are the property of the Contractor. Do not reuse these materials within the project limits.

Dispose of removed/captured materials as required dependent on the type of materials, and as required by these specifications, and Federal, State, and local environmental regulations.

CFHWY00223

603-4.01 METHOD OF MEASUREMENT. Add the following:

1. Liner Prepare Pipe measured by the linear foot of pipe from center of manhole to center of manhole.

2. Liner for Storm Drain __ Inch, CIPP measured by the linear foot of liner

3. Closed-Circuit Television (CCTV) Inspection Post Construction measured by the linear foot from center of manhole to center of manhole.

4. Culvert cleaning is measured as the length of each culvert cleaned as directed and accepted by the Engineer, whether cleaned the full length or partial length.

CFHWY00223

603-5.01 BASIS OF PAYMENT. Add the following:

CCTV inspection pre-liner installation is subsidiary to Liner – Prepare Pipe.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
603.2017.0000	Culvert Cleaning	LF
603.2019.0000	Liner for Storm Drain, CIPP - 18”, 21”, 24”, 30”, 36”	LF
603.2020.0000	Closed-Circuit Television (CCTV) Inspection Post Construction	LF
603.2034.0000	Liner, Prepare Pipe	LF

CFHWY00223

SECTION 608
SIDEWALKS

Special Provisions

608-1.01 DESCRIPTION. Add the following:

The work also includes installing bike ramps.

CFHWY00223

608-2.01 MATERIALS. Add the following:

Detectable Edge Delineator (for use at bike ramps)	Armor-Tile 4” x 24” Surface Applied Detectable/Tactile Warning Surface Guidance Tile, manufactured by Engineered Plastics Inc., 300 International Drive Suite 100, Williamsville, NY 14221, or approved equal

CFHWY00223

608-3.01 CONSTRUCTION. Add the following:

608-3.06 BIKE RAMPS. Construction requirements for bike ramps will follow the same requirements for curb ramps.

CFHWY00223

608-4.01 METHOD OF MEASUREMENT. Add the following

Bike ramps are measured by each installation.

CFHWY00223

608-5.01 BASIS OF PAYMENT. Add the following:

Detectable warning tiles for Bike Ramps are subsidiary.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
608.2022.0000	Bike Ramp	EACH

CFHWY00223

SECTION 615
STANDARD SIGNS

Special Provisions

615-1.01 DESCRIPTION. Add the following:

The work also includes installing bike lane signage.

CFHWY00223

615-2.01 MATERIALS. Add the following:

Material requirements for bike lane signage will follow the same requirements for standard signs.

CFHWY00223

CONSTRUCTION REQUIREMENTS. Add the following:

615-3.03 BIKE LANE SIGNAGE. Construction requirements for bike lane signs will follow the same requirements for curb ramps.

CFHWY00223

615-4.01 METHOD OF MEASUREMENT. Add the following

Bike Lane Signs are measured by the total area of legend-bearing sign panel erected in place. No deductions in quantity for corner rounding will be made. Nominal dimensions for sign sizes indicated on the Plans will be used to calculate sign pay quantities. Octagons and round signs will be measured as rectangles. Only one side of each double-faced sign will be measured for payment.

CFHWY00223

615-5.01 BASIS OF PAYMENT. Add the following:

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
615.2021.0000	Bike Lane Signage	SF

CFHWY00223

SECTION 670
TRAFFIC MARKINGS

Special Provisions

670-1.01 DESCRIPTION. Add the following:

The work also includes installing bike lane striping.

CFHWY00223

670-2.01 MATERIALS. Add the following:

Material requirements for bike lane striping will follow the same requirements for Methyl Methacrylate Pavement Markings.

CFHWY00223

CONSTRUCTION REQUIREMENTS. Add the following:

670-3.07 BIKE LANE STRIPING. Construction requirements for bike lane striping will follow the same requirements for Inlaid Methyl Methacrylate Pavement Markings.

CFHWY00223

670-4.01 METHOD OF MEASUREMENT. Add the following

MMA Pavement Markings, Inlaid Bike Symbols are measured by each installation.

CFHWY00223

670-5.01 BASIS OF PAYMENT. Add the following:

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
670.2027.0000	MMA Pavement Markings, Inlaid Bike Symbols	EACH

CFHWY00223

Plans In Hand Project Engineer's Estimate

State Project Number: CFHWY00223 **Federal Project Number: 0527030**

Project Description: A STREET, NORTHERN LIGHTS TO 40TH AVE PAVEMENT PRESERVATION

Project Line #	Proposal Line #	Item #	Description	Unit	Qty.	Price	Ext. Amount	Owner Furnished Material
Category: Basic Bid								
10		201.0002.0000	Grubbing	ACRE	1.00	8,000.00	8,000.00	
20		202.0002.0000	Removal of Pavement	SY	4,350.00	8.00	34,800.00	
30		202.0003.0000	Removal of Sidewalk	SY	430.00	15.00	6,450.00	
40		202.0004.0000	Removal of Culvert Pipe	LF	31.00	150.00	4,650.00	
50		202.0009.0000	Removal of Curb and Gutter	LF	490.00	15.00	7,350.00	
60		202.2023.0000	Pavement Planing	SY	23,520.00	3.50	82,320.00	
70		203.0006.000A	Borrow, Type A	TON	130.00	50.00	6,500.00	
80		204.0001.0000	Structure Excavation	CY	70.00	100.00	7,000.00	
90		301.0001.00D1	Aggregate Base Course, Grading D-1	TON	500.00	35.00	17,500.00	
100		306.0001.0000	ATB	TON	780.00	150.00	117,000.00	
110		306.0002.5834	Asphalt Binder, Grade PG 58-34	TON	42.00	500.00	21,000.00	
120		401.0001.002B	HMA, Type II; Class B	TON	200.00	200.00	40,000.00	
130		401.0004.5228	Asphalt Binder, Grade PG 52-28	TON	20.00	500.00	10,000.00	
140		401.0014.0000	Joint Adhesive	LF	13,100.00	1.00	13,100.00	
150		402.0001.STE1	STE-1 Asphalt for Tack Coat	TON	11.00	1,100.00	12,100.00	
160		408.2001.000V	HMA, Type V	TON	3,170.00	100.00	317,000.00	
170		408.2004.5834	Asphalt Binder, Grade PG 58-34	TON	169.00	500.00	84,500.00	
180		408.2008.000V	HMA Price Adjustment, Type V	CS	All Required			
190		603.2017.0000	Culvert Cleaning CORRUGATED HDPE	LF	90.00	60.00	5,400.00	
200		603.2019.0000	Liner for Storm Drain, CIPP - 18", 21", 24", 30", 36"	LF	620.00	500.00	310,000.00	
210		603.2020.0000	Closed-Circuit Television (CCTV) Inspection	LF	700.00	5.00	3,500.00	
220		603.2032.0024	Corrugated HDPE Pipe 24 Inch	LF	28.00	200.00	5,600.00	
230		603.2034.0000	Liner Prepare Pipe	LF	620.00	30.00	18,600.00	
240		604.0003.0000	Reconstruct Existing Manhole	EACH	6.00	3,000.00	18,000.00	

Plans In Hand Project Engineer's Estimate

State Project Number: CFHWY00223 **Federal Project Number: 0527030**

Project Description: A STREET, NORTHERN LIGHTS TO 40TH AVE PAVEMENT PRESERVATION

Project Line #	Proposal Line #	Item #	Description	Unit	Qty.	Price	Ext. Amount	Owner Furnished Material
250		604.0004.0000	Adjust Existing Manhole	EACH	5.00	1,500.00	7,500.00	
260		604.0010.0000	Reconstruct Inlet	EACH	16.00	2,500.00	40,000.00	
270		608.0006.0000	Curb Ramp	EACH	23.00	2,200.00	50,600.00	
280		608.2022.0000	Bike Ramp	EACH	5.00	3,800.00	19,000.00	
290		615.0001.0000	Standard Sign	SF	594.00	100.00	59,400.00	
300		615.0002.0000	Remove and Relocate Sign	EACH	10.00	500.00	5,000.00	
310		615.0006.0000	Salvage Sign	EACH	161.00	125.00	20,125.00	
320		615.2021.0000	Bike Lane Signage	SF	68.00	100.00	6,800.00	
330		618.0005.0000	Seeding	LS	All Required	1,000.00	1,000.00	
340		620.0003.0000	Topsoil	LS	All Required	7,000.00	7,000.00	
350		627.0010.0000	Adjustment of Valve Box	EACH	24.00	750.00	18,000.00	
360		640.0001.0000	Mobilization and Demobilization	LS	All Required	230,000.00	230,000.00	
370		641.0001.0000	Erosion, Sediment and Pollution Control Administration	LS	All Required	7,500.00	7,500.00	
380		641.0002.0000	Temporary Erosion, Sediment and Pollution Control	CS	All Required	230,000.00	230,000.00	
390		641.0006.0000	Withholding	CS	All Required			
400		641.0007.0000	SWPPP Manager	LS	All Required	2,500.00	2,500.00	
410		642.0001.0000	Construction Surveying	LS	All Required	345,000.00	345,000.00	
420		642.0003.0000	Three Person Survey Party	HR	50.00	300.00	15,000.00	
430		643.0002.0000	Traffic Maintenance	LS	All Required	180,000.00	180,000.00	
440		643.0003.0000	Permanent Construction Signs	LS	All Required	17,500.00	17,500.00	
450		643.0023.0000	Traffic Price Adjustment	CS	All Required			
460		643.0025.0000	Traffic Control	CS	All Required	345,000.00	345,000.00	
470		643.0032.0000	Flagging	CS	All Required	150,000.00	150,000.00	
480		644.2004.0000	Engineering Communications	CS	All Required	1,500.00	1,500.00	
490		645.0001.0000	Training Program, Trainees / Apprentices	LH	350.00	10.00	3,500.00	
500		646.0001.0000	CPM Scheduling	LS	All Required	2,000.00	2,000.00	

Plans In Hand Project Engineer's Estimate

State Project Number: CFHWY00223 **Federal Project Number: 0527030**

Project Description: A STREET, NORTHERN LIGHTS TO 40TH AVE PAVEMENT PRESERVATION

Project Line #	Proposal Line #	Item #	Description	Unit	Qty.	Price	Ext. Amount	Owner Furnished Material
510		660.0001.0000	Traffic Signal System Complete, A Street and Benson Boulevard Intersection	LS	All Required	350,000.00	350,000.00	
520		660.0001.0000	Traffic Signal System Complete, A Street and Northern Lights Boulevard Intersection	LS	All Required	300,000.00	300,000.00	
530		660.2004.0000	Adjust Junction Box	EACH	6.00	900.00	5,400.00	
540		661.0001.0000	Load Center, Type 1	EACH	2.00	30,000.00	60,000.00	
550		670.2006.0000	MMA Pavement Markings, Longitudinal Inlaid	LF	13,390.00	5.00	66,950.00	
560		670.2007.0000	MMA Pavement Markings, Symbols and Arrow(s) Inlaid	EACH	25.00	800.00	20,000.00	
570		670.2008.0000	MMA Pavement Markings, Transverse and Gore Inlaid	LF	1,570.00	8.00	12,560.00	
580		670.2016.0000	MMA Pavement Marking, Inlaid Bike Symbols	EACH	13.00	1,250.00	16,250.00	
590		682.2000.0000	Vac-Truck Pothole	CS	All Required	40,000.00	40,000.00	

Category Basic Bid Total:		**$3,785,455.00**
Minus Contractor Furnished CENG Items:		$1,500.00
Exc Subtotal:		$3,783,955.00
Construction Engineering Percent/Amount:	15%	$567,593.25
Minus Contractor Furnished CENG Items:		$1,500.00
State Forces CENG Amount:		**$566,093.25**
Basic Bid Owner Furnished Material Total:		**$0.00**
Category Subtotal (Pay Items + SF CENG + Furn Materials):		$4,351,548.25
Indirect Cost Allocation Plan (ICAP) Percent/Amount:	7.64%	**$332,458.29**
Category Basic Bid Estimate Total:		**$4,684,006.54**

Plans In Hand Project Engineer's Estimate

State Project Number: CFHWY00223 **Federal Project Number: 0527030**

Project Description: A STREET, NORTHERN LIGHTS TO 40TH AVE PAVEMENT PRESERVATION

Project Line #	Proposal Line #	Item #	Description	Unit	Qty.	Price	Ext. Amount	Owner Furnished Material
			Pay Item Total: CFHWY00223				**$3,785,455.00**	**59 Items**
			SF CENG Amount:				**$566,093.25**	
			Owner Furnished Materials (Not part of the Contract):				**$0.00**	
			ICAP Amount:				**$332,458.29**	
			Project Estimate Total:				**$4,684,006.54**	
			Estimate Bid Contingency Percent/Amount:	%			**$0.00**	
			Project Estimate Total + Estimate Bid Contingency:				**$4,684,006.54**	

State of Alaska
Department of Transportation and Public Facilities

RAILROAD CROSSING DEVICES CHECKLIST

RR MP	Road name	Road MP	Cross Street/Intersection	Dist From:
N/A	A Street	.0266	40th to Northern Lights	N/A

Federal Crossing #	Nearest Community	Max Train Speed	Roadway Posted Speed
N/A	Anchorage	N/A	45 MPH

Road Ownership	Location notes:
DOT&PF	Urban Arterial through midtown Anchorage

	Name	State#	Federal#
PROJECT	A Street: Northern Lights Blvd. to 40th Ave. Pavement Preservation	CFHWY00223	0527030

☑ **NO RAILROAD CROSSINGS ARE AFFECTED BY THIS ROAD PROJECT.**

☐ **ALL CROSSING DEVICES IN PLACE, CORRECT & SIGHT DISTANCE ADEQUATE.**

OR **SELECT THE SCHEDULE OF WORK FOR THE AFFECTED RAILROAD CROSSING:**

☐ **All crossing devices work will be completed before road work begins.**

☐ **Crossing devices work will be concurrent with road work. Railroad notified.**

CHECK FORMS APPLICABLE TO EACH CROSSING AND ATTACH THEM

A,B,C ☐ **SIGHT DISTANCE TRIANGLES: All Locations**
See SIGHT TRIANGLES pages. ALWAYS ATTACH. Forms A, B, C

2 ☐ **ADVANCE WARNING SIGNS: All Locations**
See ADVANCE WARNING SIGNS page. ALWAYS ATTACH. Form 2.

3 ☐ **PASSIVE DEVICES: Signs & Markings Only**
See PASSIVE DEVICES page. Attach if no lights or gates at this crossing. Form 3.

4 ☐ **ACTIVE DEVICES: Flashing Lights & Gates**
See ACTIVE DEVICES page. Attach if there are lights or gates. Form 4.

5 ☐ **PAVEMENT MARKINGS: 40 MPH or greater**
See PAVEMENT MARKINGS page. Attach only where markings used. Form 5.

6 ☐ **PATHWAY SIGNS or MARKINGS**
See PATHWAY page. Attach if path signs and/or markings used. Form 6.

Field inspected by: _____

On this date: ____ / ____ / ____ (Month / Day / Year)

Registered Engineer's Approval: David Gamez, PE (Printed name)

X _____ Date: 6 / 15 / 2020

Notes: Provide a final copy to the Regional Traffic & Safety Engineer and Alaska Railroad Corporation Chief Engineer. This checklist is based upon the 2009 MUTCD and the 2016 Alaska Traffic Manual Supplement (ATMS). This list does not address Temporary Traffic Control.

A STREET: NORTHERN LIGHTS BOULEVARD TO 40TH AVENUE PAVEMENT PRESERVATION

Project No.: CFHWY00223

DRAFT DESIGN STUDY REPORT

ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

PREPARED BY: Lounsbury and Associates, Inc.
5300 A Street
Anchorage, AK 99518

June 15, 2020

Revised May 2019

ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
DESIGN AND ENGINEERING SERVICES – CENTRAL REGION

DESIGN STUDY REPORT

For

A Street: Northern Lights Blvd. to 40th Ave. Pavement Preservation

Project No.: CFHWY00223

Prepared by:

__DRAFT _____

Joseph Taylor, P.E. Date
Project Manager
Lounsbury & Associates, Inc.
5300 A St.
Anchorage, Alaska 99518
907-272-5451

Concur by:

_____

Kevin Jackson, P.E. Date
Project Manager

Concur by:

_____

James E. Amundsen, P.E. Date
Chief , Highway Design

Approved:

_____

John R. Linnell, P.E. Date
Preconstruction Engineer

NOTICE TO USERS

This report reflects the thinking and design decisions at the time of publication. Changes frequently occur during the evolution of the design process, so persons who may rely on information contained in this document should check with the Alaska Department of Transportation and Public Facilities for the most current design. Contact the Design Project Manager, Kevin Jackson, at 907-269-0641 for this information.

PLANNING CONSISTENCY

This document has been prepared by the Alaska Department of Transportation and Public Facilities according to currently acceptable design standards and Federal regulations, and with the input offered by the local government and public. The department's Planning Section has reviewed and approved this report as being consistent with present community planning.

CERTIFICATION

The Alaska Department of Transportation and Public Facilities hereby certify that this document was prepared in accordance with Section 520.4.1 of the current edition of the department's Highway Preconstruction Manual and CFR Title 23, Highway Section 771.111(h).

The department has considered the project's social and economic effects upon the community, its impacts on the environment and its consistency with planning goals and objectives as approved by the local community. All records are on file with Central Region - Design and Engineering Services Division, Highway Design Section, 4111 Aviation Avenue, Anchorage, AK 99502.

John R. Linnell, P.E. Preconstruction Engineer	Date	Todd Vanhove Chief, Planning	Date

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Figure 1 Location & Vicinity Map

LIST OF ACRONYMS

1R	Preventative Maintenance
AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disability Act
AHDM	Alaska Highway Drainage Manual
ANSI	American National Standards Institute
AMATS	Anchorage Metropolitan Area Transportation Solutions
APDES	Alaska Pollutant Discharge Elimination System
ARRC	Alaska Railroad Corporation
ATB	Asphalt Treated Base
ATM	Alaska Traffic Manual
ATMS	Alaska Traffic Manual Supplement
AWWU	Anchorage Water and Wastewater Utility
BMP	Best Management Practice
BLVD	Boulevard
CEA	Chugach Electric Corporation
CFR	Code of Federal Regulations
CGP	Alaska Construction General Permit
DEC	Alaska Department of Environmental Conservation
DOT	U.S. Department of Transportation
DOT&PF	Alaska Department of Transportation and Public Facilities
DOJ	U.S. Department of Justice
DR	Drive
ESCP	Erosion and Sediment Control Plan
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
HMA	Hot Mix Asphalt
HPCM	Alaska Highway Preconstruction Manual
HPS	High Pressure Sodium
HMCP	Hazardous Material Control Plan
HSIP	Highway Safety Improvement Program
IES	Illuminating Engineering Society
KPB	Kenai Peninsula Borough
LED	Light Emitting Diode
LOS	Level of Service
MADT	Monthly Average Daily Traffic
ML&P	Municipal Light and Power

MOA	Municipality of Anchorage
MP	Milepost
MPH	Miles per Hour
MS4	Municipal Separate Storm Sewer Systems
MSB	Matanuska-Susitna Borough
MUTCD	Manual on Uniform Traffic Control Devices
NPDES	National Pollutant Discharge Elimination System
PGDHS	A Policy on Geometric Design of Highways and Streets
PIP	Public Information Plan
PROWAG	Proposed Accessibility Standards for Pedestrian Facilities in the Public Right-of-Way
RDG	Roadside Design Guide
ROW	Right-of-Way
SWMM	Storm Water Management Model
SWMP	Storm Water Management Plan
ST	Street
SWPPP	Storm Water Pollution Prevention Plan
TCP	Temporary Construction Permit
TMP	Traffic Management Plan
TOP	Transportation Operations Plan
TRB	Transportation Research Board
USGS	United States Geological Survey
VPD	Vehicles per Day.

For Preventative Maintenance (1R) projects, the Alaska Department of Transportation and Public Facilities (DOT&PF) Highway Preconstruction Manual (HPCM) Table 450-1 modifies the Design Study Report (DSR) requirements included in Section 450.5.1. The table below denotes those sections, marked as "YES", that have been included in this document. Items marked as "NO" have been considered and found not to be relevant and/or pertinent to the design of this project and will not be discussed further.

Table 1 Modified DSR Requirements for 1R Projects

DSR Section	Section Title	Consider/Study	
		YES	NO
1	Project location, existing facilities, and purpose and need for project	✓	
2	Design standards	✓[1]	
3	Alternatives analysis	Not required	
4	Discussion of preferred alternative	Not required	
5	Typical sections	✓	
6	General horizontal and vertical alignment	Not required	
7	Erosion and sediment control	✓	
8	Drainage	✓	
9	Soil conditions	Not required	
10	Access control features	Not required	
11	Traffic analysis	Not required	
12	Safety improvements.	✓	
13	Right-of-Way requirements	✓	
14	Pedestrian and bike accommodations	✓	
15	Utility relocation and coordination	✓	
16	Preliminary work zone traffic control	✓	
17	Pavement design	✓[2]	
18	Cost estimate	✓	
19	Environmental commitments and mitigation	✓	
20	Preliminary bridge layout	Not required	
21	Design exceptions and design waivers	✓[3]	
22	Maintenance considerations	✓	
23	ITS features	Not required[4]	

Table 1 Modified DSR Requirements for 1R Projects (cont'd)

Appdx	Approved design designation and design criteria	Not required	
Appdx	Typical sections	✓	
Appdx	Material recommendations	✓	
Appdx	Approved environmental document	✓	
Appdx	Approved design exceptions and design waivers	✓[3]	
Appdx	Design memos	✓	
Appdx	Traffic analyses (signal warrants, capacity analysis, roundabout analysis, etc.) and speed studies	Not required	
Appdx	3R analysis	Not required	
Appdx	ITS systems engineering analysis	Not required[4]	
Appdx	FHWA concurrence documentation for non-significant ITS project determinations	Not required	
Appdx	VE consideration	Not required[5]	

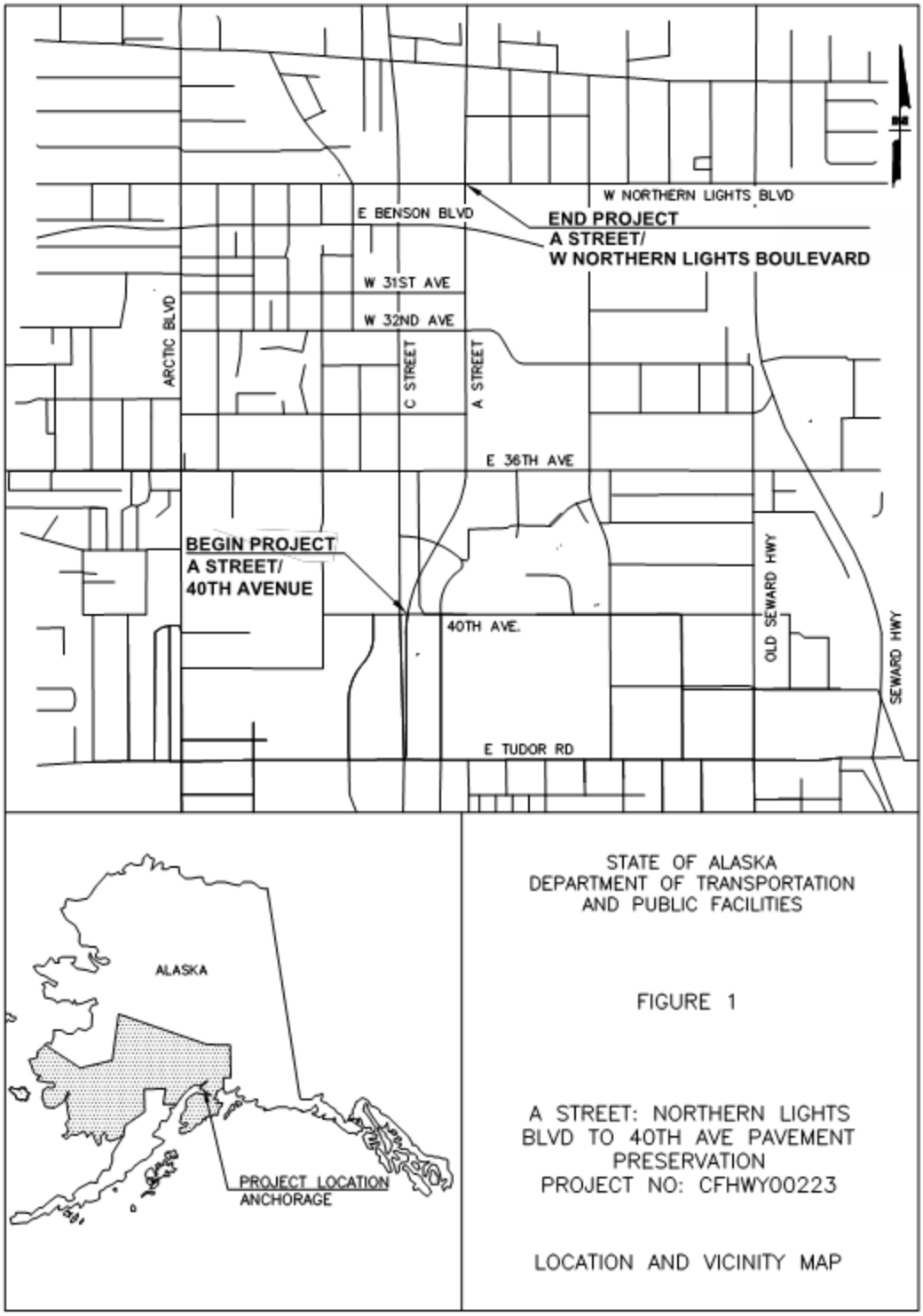


Figure 1 Location and Vicinity Map

1.0 PROJECT DESCRIPTION

This design study report has been prepared to document the basis of design and design decisions for the A Street: 40th Avenue to Northern Lights Pavement Preservation project. The project includes improvements to pavement, signing, striping, curb ramps, and storm drain. The corridor is a main arterial roadway through Midtown Anchorage that is showing signs of wear including weathered pavement, cracking, and rutting. Existing ADA facilities not meeting current standards along the project will be replaced and brought into compliance. Signing will be replaced to meet current retro-reflectivity standards and striping will be inlaid to eliminate the need for annual re-striping of the corridor. Storm drainpipes identified with significant defects will be either replaced or will be rehabilitated using trenchless pipe repair.

The project includes an HSIP element that will provide overhead signal indication upgrades at the intersections of A Street and Benson Boulevard and A Street and Northern Lights Boulevard. The signals at both intersections were constructed in 1986 and do not meet current standards outlined in the Alaska Traffic Manual (ATM) for the required number of overhead signal heads per through lane.

Central Region's 2019 High Crash Location Screening List identifies A Street, Northern Lights Blvd., and Benson Blvd all in the top 20 highest roadway segments when ranked by crash per mile. This project will address these safety issues by increasing signal visibility and clarifying lane assignments. This work will include updating the number of overhead signal heads to bring these intersections up to current standards and practices, replacing lighting to current standards, and provide updated signage and striping.

1.1 Project Location and Description

The project is located on A Street between the intersections at 40th Avenue and Northern Lights Blvd, and includes the intersections with Northern Lights Blvd and Benson Blvd. Improvements occur in Section 30, Township 13N, Range 3W, Seward Meridian, United States Geological Survey (USGS) topographical map, Anchorage A-8; latitude 61.1879°N, longitude 149.8827°W, within the Municipality of Anchorage (MOA), shown in Figure 1 on the previous page.

The proposed project will mill and pave existing pavement with localized digouts. Other improvements will include inlaying striping, replacing signage, drainage improvements, bringing ADA facilities into compliance and updating the signalized intersections at Northern Lights Blvd and Benson Blvd.

1.2 Existing Facilities and Land Use

This portion of A Street was built with the A-C Couplet: Tudor Road to 6th Avenue project in the early 1980's . The couplet project separated the northbound direction from C Street and constructed C Street and A Street as one-way roadways southbound and northbound, respectively between Tudor Road and 6th Avenue. The project constructed the grading, drainage, surfacing, striping, signalization, and illumination. Various projects that include signals, signing, striping, and pathway upgrades occurred in 1990, 1998, 2001, 2004, 2013, and 2015 at various intersections along the project corridor. The latest project to repair the pavement throughout the corridor was the Anchorage Asphalt Surface Repairs, 2013 – 54396, which occurred in 2013. This preleveled and overlaid the existing asphalt with 1" HMA, Type IV; Class B.

A Street: 40th Avenue to Northern Lights Boulevard is a Class III Major Arterial that serves as a northbound connection through the Anchorage Downtown/Central Business District. Zoning along the corridor is primarily business and commercial use, which is lined with banks, offices, restaurants, hotels, and retail stores. The corridor is also a major northbound bus route for People Mover route #25, with four stops between 40th Avenue and Northern Lights. The east side of the road has an 8-10 ft. wide separated

path throughout and the corridor has been designated as an on-street bicycle lane route in the Anchorage Bicycle Plan (2010), however bicycle lane signing and striping are not currently present.

Near the intersections with Northern Lights Blvd and Benson Blvd, A Street is a 3 lane, one-way roadway with auxiliary turn lanes at each intersection. Northern Lights Blvd and Benson Blvd each have four through lanes with auxiliary turn lanes at each intersection. The 2014 Average Annual Daily Traffic (AADT) for A Street was about 19,000 vehicles per day (vpd), about 22,500 vpd for Northern Lights Blvd and about 9,500 vpd on Benson Blvd. (FFY 2020 HSIP Candidate Description, 20CR01).

1.3 Purpose and Need

The purpose of the A Street: Northern Lights Blvd to 40th Ave Pavement Preservation is to extend the useful life of the corridor while also improving the level of safety and accessibility for all users. The project will also replace and repair storm drainpipe that were identified as having moderate and significant defects in the NHS Storm Drain Inspection Repair Recommendations Project (0A31055/Z591280000).

The purpose of the HSIP work for the signalized intersections at Northern Lights Blvd and Benson Blvd is to increase driver awareness of the traffic signal indications and reduce the number and severity of angle and rear end collisions. Specifically, these improvements are proposed to reduce the number of vehicles running red lights or suddenly stopping as the signal phase changes.

DOT&PF added the overhead signal indication upgrade work to the Preventative Maintenance project to align the advertisement and construction schedules of both projects. This will reduce construction costs and limit the negative impacts of replacing the traffic signals at these intersections as a standalone project.

2.0 DESIGN STANDARDS AND GUIDELINES

Design standards and guidelines that apply to the A Street: Northern Lights Blvd to 40th Ave. Pavement Preservation are contained in the following publications. This project was developed per Section 1140 of the HPCM for 1R projects. Therefore, project design criteria or design designations have not been developed for this project.

Standards:

- A Policy on Geometric Design of Highways and Streets (PGDHS), 6th Edition, AASHTO, 2011.
- Roadside Design Guide (RDG), 4th Edition, AASHTO, 2011.
- Alaska Highway Preconstruction Manual (HPCM), DOT&PF, 2005 as amended.
- Alaska Highway Drainage Manual (AHDM), DOT&PF, 2006.
- The Alaska Traffic Manual (ATM), consisting of the Manual on Uniform Traffic Control Devices (MUTCD), 2009 as amended, U.S. DOT, FHWA) and the Alaska Traffic Manual Supplement (ATMS), DOT&PF, 2016.
- ADA Standards for Transportation Facilities, DOT, 2006.
- ADA Standards for Accessible Design, DOJ, 2010.
- Guide for the Development of Bicycle Facilities, 4th Edition, AASHTO, 2012.
- Recommended Practice for Roadway Lighting (RP-8-14), ANSI / IES, 2014.

- Highway Capacity Manual (HCM), 5th Edition, TRB, 2010.

Guidelines:

- Proposed Accessibility Standards for Pedestrian Facilities in the Public Right-of-Way (PROWAG), U.S. Access Board, 2011.
- Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1st Edition, AASHTO, 2004.

3.0 TYPICAL SECTION

The roadway typical section consists of three lanes which vary in width from 11' wide south of 36th Avenue to 12' wide north of 36th Avenue. There are auxiliary turn lanes at the intersections of 36th Avenue, Calais Dr., Benson Blvd, and Northern Lights Blvd.

North of 36th Avenue, A Street has variable shoulder widths ranging from four feet wide to eight feet wide on both sides of the road. South of 36th Avenue there is an eight-foot-wide shoulder on the right side from 40th Avenue to 38th Avenue.

The entire length of the corridor has mountable curb and gutter on both sides, with the exception of the segment from 40th Avenue to 38th Avenue, which has expressway curb and gutter on the left side and no curb on the right side. Behind the curb and gutter are grassed landscaped areas with other features including small bushes, trees, and boulders.

The typical sections are provided in Appendix A. These include assumed structural sections that will be updated with the project materials recommendations when they are available.

4.0 EROSION AND SEDIMENT CONTROL

The project includes temporary and permanent measures to control or prevent erosion and sedimentation during and after construction. The contractor will prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to construction that conforms to the DOT&PF Best Management Practices (BMPs) for erosion and sediment control. The SWPPP will be prepared in accordance with the DOT&PF contract specifications, following the guidelines of the Erosion and Sediment Control Plan (ESCP) provided to the contractor. The contractor will submit the SWPPP for approval to DOT&PF and conduct construction activities in accordance with the approved SWPPP. Erosion controls will be used and maintained in optimal condition during construction, and all other exposed soils/fills will be permanently stabilized. Temporary BMP's will remain in place until permanent erosion and sediment control measures are in place and soil is permanently stabilized.

5.0 DRAINAGE

Work will not change the existing road drainage patterns within the project. The project will replace sections of curb and gutter, damaged manholes and curb inlets, storm drainpipes, and complete additional drainage maintenance where necessary.

Damaged pipes along portions of this corridor were identified as part of a previous project and documented by DOT&PF in a 2017-2018 NHS Storm Drain Inspection Repair Recommendations Project (Project No. OA31055/Z591280000). The recommendations of that work were competed prior to southcentral Alaska's magnitude 7.1 earthquake that struck on November 30th, 2018.

This project revisited portions of the previous inspection work to assess damage caused by the earthquake and added new inspections that were not previously conducted along this corridor. Five pipes that were previously inspected were determined to have been damaged by the earthquake, requiring repairs that were not previously recommended. Approximately 40 new pipe segments were inspected with this work and six pipes were found to need repair.

Collectively, the storm drain condition inspection reports encompasses all storm drain pipe within the project limits from 40th Avenue to Northern Lights Blvd. The reports identify damaged pipes by severity, utilizing a ranking of 3, 4, or 5 to describe the type of damage. Recommendations for repair that include candidates for trenchless Cured-In-Place Pipe Lining are included. A total of 20 pipes and 22 storm drain structures require some form of repair. Both storm drain condition inspection reports can be found in Appendix E.

5.1 Drainage within the MOA and MS4 Permit Compliance

The National Pollutant Discharge Elimination System permit program originated under section 402 of the Clean Water Act (CWA, 33 USC §1251), and requires that storm water discharges to surface water be authorized by permit. In Alaska, the Alaska Department of Environmental Conservation (DEC) has primacy for issuing these permits via the Alaska Pollutant Discharge Elimination System (APDES). DEC has jointly authorized the Municipality of Anchorage (MOA) and the DOT&PF to discharge storm water from municipal separate storm sewer systems (MS4) to surface water and wetlands within the MOA through an individual MS4 permit. This permit, APDES Permit No. AKS052558, is effective from August 1, 2015 to July 31, 2020.

To comply with the permit; the project will incorporate, at a minimum, the pollution control measures and Best Management Practices (BMPs) as required by the DEC-approved Storm Water Management Program (SWMP) developed by the MOA. Essential requirements include but are not necessarily limited to:

- The project follows the criteria set forth in the DOT&PF's Alaska Highway Drainage Manual and the MOA's Drainage Design Guidelines as modified by DOT&PF.
- The contractor will develop a SWPPP prior to construction that follows the guidelines of the ESCP provided to the contractor. The SWPPP will comply with the APDES permitting program and the Alaska Construction General Permit (CGP).
- The contractor will describe how to minimize and reduce erosion in the contractor's SWPPP.
- The contractor will comply with all permit conditions with respect to installation and maintenance of control measures, inspections, monitoring (if necessary), corrective actions, reporting and recordkeeping.
- The contractor will address all discharge in the SWPPP. The contractor will prepare a Hazardous Material Control Plan (HMCP).
- The maintenance of the pipes, sewers, and other conveyances will remain the responsibility of the DOT&PF.

6.0 SAFETY IMPROVEMENTS

All signposts and panels that do not meet breakaway and retro-reflectivity standards will be replaced. Appropriate bicycle amenities will be installed according the AMATS – Bicycles Plan Implementation – On Street Bicycle Facility Treatments. Striping will be inlaid throughout the corridor. Bicycle on and Off Ramps and Bicycle detection are included at signalized intersections.

6.1 Traffic Signal Safety Improvements

The intersections at A Street with Benson Boulevard and Northern Lights Boulevard were identified in the Federal Fiscal Year 2020 Highway Safety Improvement Program (HSIP) candidate project. In the candidate description, the 2019 Central Region High Crash Location Screening lists A Street as the 20th highest roadway segment when ranked by crash cost per mile.

The existing traffic signals at Benson Blvd and Northern Lights Blvd, installed in 1986, both do not meet the overhead signal indication requirements of the Alaska Traffic Manual (ATM) section 4D.11 paragraph 1. The standard requires that intersections with four lanes on the approach have a minimum of 3-signal head indications over the through lanes. Additionally, the westbound approach at Northern Lights Blvd does not have a left far-side signal face.

The intersections have experienced supplemental crash patterns that are a result of lane confusion between through and left turns. The crashes have occurred from vehicles making left turns from the through lane conflicting with the adjacent through-left lane. These crashes have occurred at the eastbound approach to A St on Benson Blvd as well as the northbound approach to Northern Lights Blvd from A St.

The proposed improvements intend to reduce lane confusion, as well as reduce the number of vehicles running red lights or stopping suddenly while approaching the intersection. The improvements include adding overhead signal indications over each lane and a left far-side signal face where they do not currently exist, which will bring the intersection in compliance with the 2016 ATM.

Additionally, near-side signal heads will be installed on the approaches experiencing lane confusion crashes to provide supplemental indications prior to entering the intersection. FHWA-HRT-04-091 "Signalized Intersections: An Informational Guide" Section 11.1.2 recommends that supplemental pole-mounted near-side signal heads be installed at wide-intersections that experience higher than normal angle and rear-end crashes.

6.2 Load Centers

The existing signal load center at Benson Boulevard is located on the southwest quadrant. The load center was installed in 1984 and is a 120/240V Skyline-style enclosure. The Northern Lights Boulevard signal load center is located on the southeast quadrant and is the same type and age as the unit at Benson Boulevard. The load centers provide power to the intersection illumination and the nearby traffic controllers.

The existing load centers are recommended for replacements as Skyline load centers have been discontinued for more than twenty years and replacement parts are only available from salvaged units. Further, these installations are not Code compliant as utility and customer conductors are in the same raceway and there is no isolated utility section in the load center interior.

The proposed load centers will have 120/240V Type 1A. Both load centers will be placed on the northeast quadrants. The Benson Boulevard location was chosen to avoid obscuring the private sign on the southwest quadrant. The Northern Lights Boulevard location will be adjacent to the existing load center.

Both existing load centers are served by ML&P. ML&P will need to maintain power to the existing load centers until the contractor can transfer power to the traffic controller from the existing load center to the proposed load center. ML&P will then disconnect the existing load centers and remove the service feeder.

6.3 Intersection Lighting

Intersection illumination at Benson Boulevard is provided by signal pole-mounted luminaires and illumination at Northern Lights Boulevard is a combination of signal pole-mounted luminaires and streetlights. Existing luminaires are 400W high pressure sodium (HPS) with semi-cutoff optics. The luminaire lenses show considerable degradation by exhibiting a deep brown tint that blocks a significant amount of light emitted by the lamp. The existing intersection illumination was modeled in AGI32 and the results are shown in Table 2.

Table 2 Existing Intersection Illumination

EXISTING INTERSECTION ILLUMINATION			
Functional Classification	Roadway Luminaire Type	Average Illuminance (fc)	Maximum Uniformity Ratio (Ave/Min)
Major/Major with High Pedestrian Conflict	N/A	3.4	3.0
Benson Boulevard	HPS	1.87	1.70
Northern Lights Boulevard	HPS	1.78	1.45

The existing intersection illumination systems do not meet the current standards as recommended by IES-RP-8-14. Additionally, the Department has discontinued new installations of semi-cutoff luminaires due to the high amount of veiling luminance, or disability glare, produced by these luminaires.

Proposed intersection illumination will be accomplished using light emitting diode (LED) luminaires mounted to signal poles at Benson Boulevard and Northern Lights Boulevard. All luminaires will be 251W with full cutoff optics. Table 3 summarizes the AGI32 model:

Table 3 Proposed Intersection Illumination

PROPOSED INTERSECTION ILLUMINATION			
Functional Classification	Roadway Luminaire Type	Average Illuminance (fc)	Maximum Uniformity Ratio (Ave/Min)
Major/Major with High Pedestrian Conflict	N/A	3.4	3.0
Benson Boulevard	LED	3.88	2.59
Northern Lights Boulevard	LED	3.50	2.50

The proposed intersection illumination system meets all the IES-RP-8-14 recommended criteria. Using the LED luminaires will lower operating costs and the longer life, 75,000-100,000 hours versus 24,000 for HPS, will reduce replacement costs.

7.0 RIGHT-OF-WAY REQUIREMENTS

All work will be contained within the existing ROW.

Temporary Construction Easements and Permits may be required to construct the project.

8.0 PEDESTRIAN AND BICYCLE FACILITIES

A Street provides a key pedestrian and bicycle route connecting South Anchorage to midtown and downtown via a separated pathway along the east side of the corridor. The 2010 Anchorage Bicycle Plan identifies A Street from 40th Avenue to Northern Lights Boulevard as having a designated Bicycle Lane. Currently only striped shoulders are located throughout the corridor. Improvements to signing, striping, and entrance/exit ramps for bicycle lanes are proposed according to the AMATS – Bicycle Plan Implementation – On-Street Bicycle Facility Treatments.

Pedestrians and cyclist will continue to use the separated pathway along the east side of the corridor. Bicycle ramps will be added near intersections to accommodate entry and exit to the bicycle lane.

Pedestrian facilities are provided by a separated pathway that varies from eight to ten feet in width running along the east side for the length of the corridor. The project will install an inlaid MMA bicycle lane along the east side that will utilize the existing shoulder width. The lane will include bike lane symbols in the pavement, along with signing and entry/exit ramps from the lane to the separated pathway. The bike lane will start at 40th Avenue and terminate at Northern Lights Boulevard.

There are ADA curb ramps at all intersections with approaches and driveways that connect to sidewalk or pathways. The segment contains three bus pullouts and one on-street bus stop. The asphalt ramp that provides access to the on-street bus stop just north of 40th Avenue has grades more than 10%. The project will re-grade the ramp to provide an ADA accessible grade to the bus stop.

An ADA field inventory was conducted and determined that 23 of the 36 curb ramps located along the corridor are out of compliance with ADA design standards. 22 ramps will be replaced and brought into compliance with this project. A single ramp, on the northwest corner of 38th Ave is not connected to any sidewalk or pathway and will be removed.

9.0 UTILITY RELOCATION AND COORDINATION

Utility companies with facilities in the project limits include:

- Alaska Communications (AC)
- Anchorage Water and Wastewater Utility (AWWU)
- Chugach Electrical Association (CEA)
- ENSTAR Natural Gas Company (ENSTAR).
- General Communications Corp. (GCI)
- MOA Street Maintenance (storm sewer system)

Utilities that will require relocation and agreements will need to be developed, at select locations throughout the project, to address the following conflicts:

9.1 GCI

GCI owns and operates a fiber optic and coaxial cable network within the project area. The fiber optic lines connect vaults along A Street. A Fiber optic line on the east side of A Street at approximately STA 269+15 is puncturing a Storm Drainpipe. This utility will be relocated and protected prior to repairing the segment of the damaged storm drainpipe.

10.0 PRELIMINARY WORK ZONE TRAFFIC CONTROL

The HPCM Section 1400.2 sets forth the criteria for determining if a project is to be classified as a "Significant Project" for purposes of determining the level of effort required in developing a TMP. Though the project is classified as a Class III Major Arterial, the roadway AADTs are below 30,000 vpd, and in the event of a full closure, a practical alternate route is available. Therefore, the project is not considered a "Significant Project."

10.1 Traffic Control Plan (TCP)

The contractor will develop a TCP during construction, to safely guide and protect the traveling public in work zones, in accordance with the Alaska Traffic Manual (ATM) and the project specifications. The plan will be assessed and approved by the Construction Project Engineer and the Traffic Control Engineer.

The contractor is responsible for providing advance notice to the public, including local businesses, residents, and road travelers, of construction activities that could cause delays, detours, or affect access to adjacent properties.

10.2 Public Information Plan (PIP)

A PIP will be developed prior to beginning construction that will specify the ways and means that the contractor will use to inform the public of upcoming activities that will impact local stakeholders, the roadway users and public entities. The PIP will contain measures to inform stakeholders of project scope, expected work zone impacts, closure details, and recommended action to avoid impacts and changing conditions during construction. Measures to disseminate information include:

- Contractor's Worksite Traffic Supervisor
- Department's Construction section thru the department's 511 system
- Department's Navigator website
- Television, Radio, and/or newspaper
- Other location-specific communication tools

The traveling public should not be caught unaware by any closures, detours, delays, night work, or any potentially disruptive activity.

10.3 Transportation Operations Plan (TOP)

DOT&PF will coordinate with relevant public agencies and event organizers and incorporate means and methods for minimizing traffic impacts with the contractor not covered by the TCP or the PIP within the project plans.

11.0 STRUCTURAL SECTION AND PAVEMENT DESIGN

The existing pavement thickness for A Street from 40th Avenue to Northern Lights Boulevard is three inches of asphalt treated base overlaid by two to three inches of asphalt concrete. The pavement contains ruts at intersections and has potholing, longitudinal, and transverse cracking at multiple utility crossings.

The planned resurfacing improvements will include planing existing asphalt throughout and paving of 2 inches of Hot Mix Asphalt, Type VH.

In areas called out for structural section improvements, existing layers of Asphalt, ATB, and Aggregate Base Course will be removed and replaced with, 2 inches of Aggregate Base Course, Grading D-1, 3 inches of Asphalt Treated Base, and 2 inches of Hot Mix Asphalt, Type VH.

Pavement recommendations will be completed and included with the Final DSR.

12.0 COST ESTIMATE

The project cost estimate is as follows:

Preliminary Engineering	$	1,684,000
Right-of-Way	$	0
Utility Relocation	$	179,000
Construction	$	4,900,000
Total	$	6,763,000

13.0 ENVIRONMENTAL COMMITMENTS AND CONSIDERATIONS

The proposed project does not involve any unusual circumstances or significant environmental impacts; it meets the criteria for classification as a Categorical Exclusion per 23 CFR 771.117. A Categorical Exclusion will be provided and included in Appendix C.

The contractor will be required to prepare and implement a SWPPP in accordance with Section 7.
The contractor will be required to dispose of solid waste at a DEC approved landfill. The contractor will be responsible for obtaining all necessary permits and clearances for materials sites, disposal sites, and staging areas unless DOT&PF has obtained all necessary permits.

14.0 EXCEPTIONS TO DESIGN STANDARDS

There are no exceptions to design standards for this project.

15.0 MAINTENANCE CONSIDERATIONS

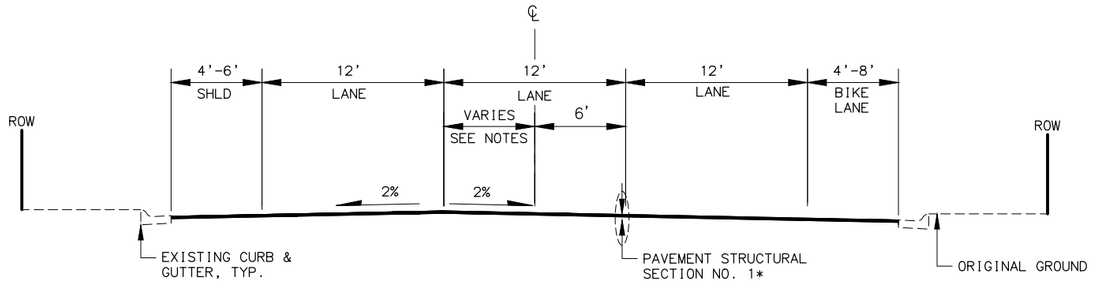
Maintenance of A Street will remain the responsibility of the State of Alaska and the local DOT&PF Maintenance and Operations station located at Tudor Road. The project is not anticipated to increase maintenance efforts. The use of inlaid striping will reduce the need for annual restriping along the corridor.

APPENDIX A

Typical Sections

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0527030/CFHWY00223	2020	B1	B1



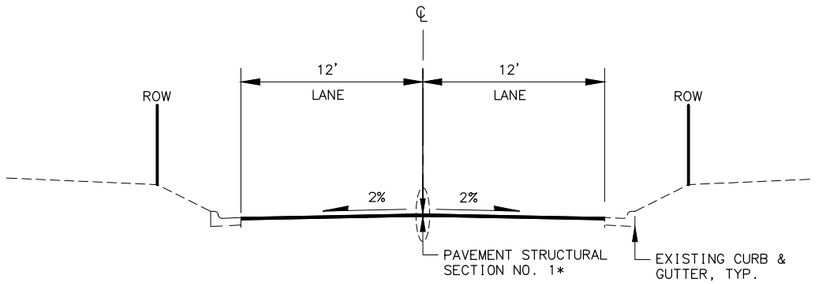
A STREET

STA. 246+91 TO STA. 287+86

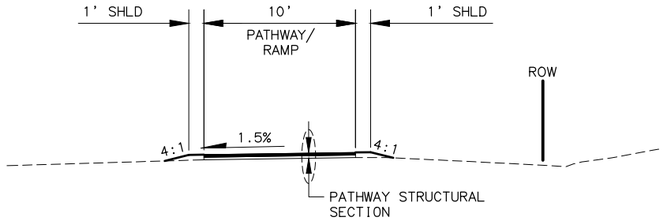
*CONSTRUCT PAVEMENT STRUCTURAL SECTION NO. 2 FROM STA. 251+35 TO 266+83

GENERAL NOTES:

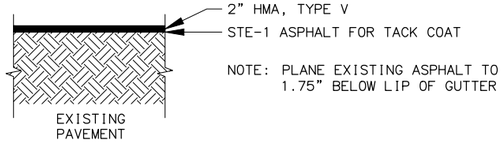
1. WITHIN TWO (2) DAYS AFTER PAVING, PLACE AGGREGATE BASE COURSE, GRADING D-1 AGAINST PAVEMENT EDGE TO ENSURE THERE IS NO VERTICAL DROP AT THE EDGE OF PAVEMENT. USE APPROVED TRAFFIC CONTROL DEVICES IN THE INTERIM.
2. LOCATE CROWN IN THE FIELD AND COMPLETE PLANING AND PAVING OPERATIONS TO RE-ESTABLISH CROWN IN PRESENT LOCATION.
3. FROM STA. 274+46 TO EOP, STRIPE LANES PER TYPICAL SECTION UNLESS DIMENSIONED OTHERWISE.
4. 4" TOPSOIL AND SEED ALL DISTURBED AREAS ADJACENT TO CURB RAMPS, PATHWAY, AND BUS STOP RAMP.



MINOR ROADWAYS

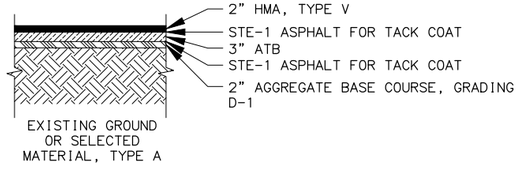


PATHWAY AND BUS STOP RAMP



PAVEMENT STRUCTURAL SECTION NO. 1

N.T.S



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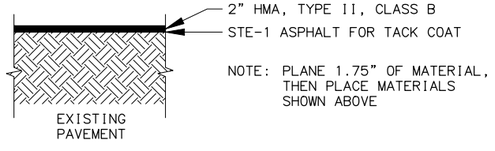

PAVEMENT STRUCTURAL SECTION NO. 3

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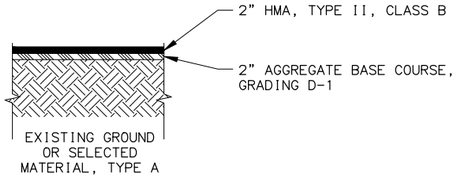


PATHWAY STRUCTURAL SECTION

N.T.S

LOUSBURY & ASSOCIATES INC.
5300 A STREET
ANCHORAGE, ALASKA 99518
(907) 272-5451
CERT. OF AUTH NO. AECC391

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

A STREET: NORTHERN LIGHTS BLVD TO 40TH AVE PAVEMENT PRESERVATION

TYPICAL SECTIONS

DATE/TIME 6/14/2020 6:04 PM | LAYOUT B1 | DESIGNED JK | CHECKED DG | DRAFTED JG

FILE D:\PWISEFILE\DMS01275

APPENDIX B

Material Recommendations – Not Included

APPENDIX C

Approved Environmental Document – Not Included

APPENDIX D

Design Memorandums

Alaska Department of Transportation and Public Facilities Central Region

NHS STORM DRAIN INSPECTION
REPAIR RECOMMENDATIONS
PROJECT NO. 0A31055 / Z591280000

A Street from 36th Avenue to Fireweed Lane
Old Seward Highway from International Airport Road to 46th Avenue
International Airport Road from Cambridge Way to Old Seward Highway
Dimond Boulevard from Jewel Lake Road to Old Seward Highway
Minnesota Drive from Tudor Road to Hillcrest Drive
C Street from Dimond Boulevard to 76th Avenue and Tudor Road to 40th Avenue

March 15, 2018

Prepared By:

Stephl Engineering LLC
3900 Arctic Blvd., Suite 204
Anchorage, AK 99503
907.562.1468

Table of Contents

1 Report Memorandum

2 Appendix A – Pipe and Manhole Recommendations
Pipe Repair Recommendation Tables
Manhole Repair Recommendation Tables

3 Appendix B – Project Area Maps

SECTION 1
PURPOSE AND BACKGROUND

Storm drain pipe inspections and manhole (structure) inspections were completed on storm drain systems that are located under National Highway System (NHS) streets and roads that are owned and maintained by the Alaska Department of Transportation and Public Facilities (AKDOT&PF). The work was completed by Stephl Engineering LLC and Construction Unlimited Inc. (CUI). The data developed during the inspections is compiled into the NHS Storm Drain Inspection Condition Assessment Report.

The purpose of this study is to provide study level recommendations for the repair or replacement of defects that were observed during the inspections and to provide site-specific, rough order of magnitude cost estimates for the recommended upgrades.

SECTION 2
PROJECT AREAS

The storm drain pipe project locations are shown in Figure No. 1. Storm drain pipes and structures that have been inspected to date (as of December 2017) are located in the following areas:

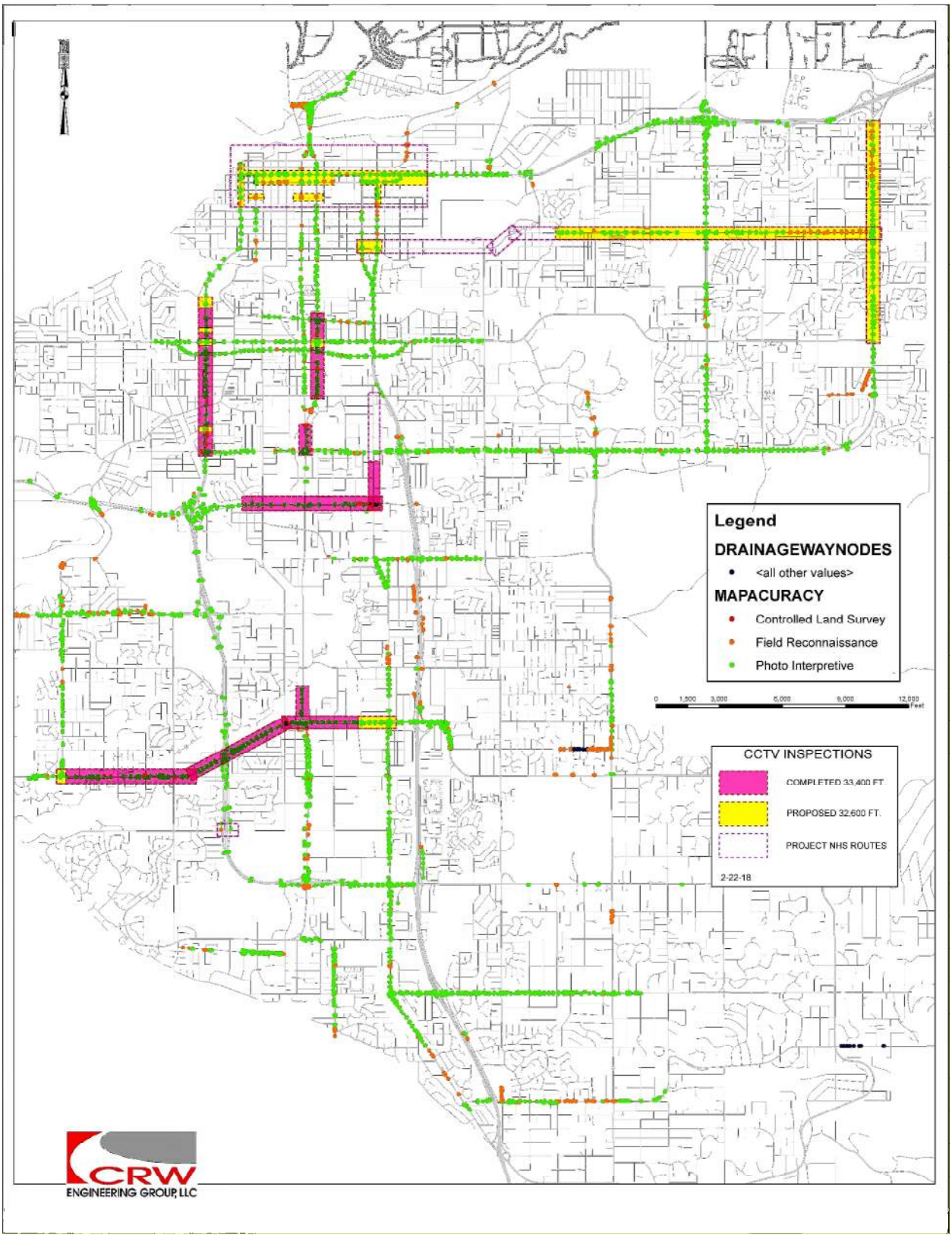
- A Street from 36th Avenue to Fireweed Lane
- Old Seward Highway from International Airport Road to 48th Avenue
- International Airport Road from Cambridge Way to Old Seward Highway
- Dimond Boulevard from Jewel Lake Road to Old Seward Highway
- Minnesota Drive from Tudor Road to Hillcrest Drive
- C Street from Dimond to 76th and Tudor to 40th

The total length of storm drain pipe inspected along these highways is approximately 33,400 feet. There are 227 storm drain pipe segments contained in the pipes that were inspected. The total number of manholes (structures) inspected is approximately 143.

More field work to inspect storm drain pipes is planned for the summer of 2018. Areas scheduled for inspection include the following:

- NHS routes in downtown Anchorage.
- Muldoon Road from Northern Lights Boulevard to Boundary Avenue
- Debarr Road from Gambell Street to Muldoon Road
- McHugh Creek culvert under Seward Highway and Railroad Tracks
- Selected pipes in Minnesota Drive and Dimond Blvd.

The total estimated length of storm drain pipe in the proposed inspection work for 2018 is approximately 32,600 feet.


Legend
DRAINAGEWAYNODES
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MAPACURACY
Controlled Land Survey
Field Reconnaissance
Photo Interpretive
0 1,500 3,000 6,000 9,000 12,000 Feet
CCTV INSPECTIONS
COMPLETED 33,400 FT.
PROPOSED 32,600 FT.
PROJECT NHS ROUTES
2-22-18
CRW
ENGINEERING GROUP, LLC

Figure No. 1

SECTION 3
PIPE AND MANHOLE REPAIR METHODS

Defects Observed

Significant deficiencies or defects found in the NHS storm drain pipes and manholes during the inspection work are listed below. Details on the specific defects can be found in the NHS Storm Drain Inspection Condition Assessment Report.

Defects observed in pipes and manholes included:

- Corrosion and metal loss in pipes
- Inverts in metal pipes corroded with metal loss and structural failure
- Debris accumulation
- Deformation (collapsing) of the pipe wall
- Separated joints
- Cracks and broken parts in manholes
- Grout missing in manholes

Recommended methods for repairing the defects observed in the NHS storm drain system include:

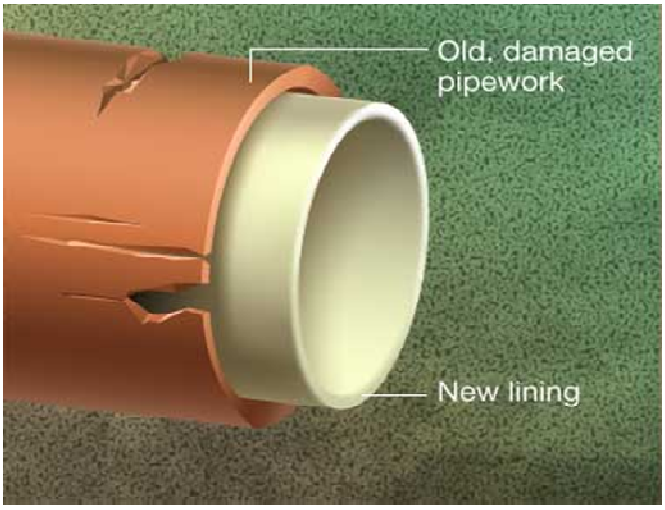
- Cured in place pipe (CIPP) lining
- Open-cut excavation remove and replace pipe
- Trenchless point repair
- Excavation point repair
- Storm pipe cleaning and inspection
- General manhole repairs
- New storm drain manhole installation
- Abandon storm drain pipe

Cured in Place Pipe (CIPP)

Description

The cured in place lining method is an economical and feasible trenchless solution for upgrading storm drain pipes. The benefits of CIPP include minimal impact to pipe capacity, installation without excavation, and competitive costs. It is a proven technology. In Alaska, there are contractors and equipment available locally to complete this work. A CIPP liner is estimated to have a minimum 50-year life. It was developed in 1974 and is the most popular pipe rehabilitation method in use in the world today. Hundreds of miles of CIPP liner are installed each year.

On this project, a CIPP liner would be designed for either the “partially deteriorated” or “fully deteriorated” condition. In most cases, the wall thickness of a new liner is thicker (and more expensive) for the fully deteriorated design condition. When designed for the fully deteriorated condition, a CIPP liner has the structural capacity to replace the deteriorated host pipe that is around it. The engineers who are responsible for the pipe rehabilitation design would decide which condition is applicable. In most cases the fully deteriorated condition is applied when metal host pipes are corroded or have metal loss occurring in the invert.



Cured in Place Liner

The CIPP process uses a flexible nonwoven or woven material liner and thermosetting epoxy resin to form a durable pipe within the old pipe. The liner is inserted through an existing manhole and may be inverted or winched into place. The resin impregnated lining is cured by circulating hot water, or with ultraviolet light. The CIPP lining will fit tightly against the host pipe, will follow the invert grade of the existing pipe and will conform to irregularities in the host pipe wall. The process is often accomplished in a 24-hour period for a typical segment from one manhole to the next.

Storm water flows would be bypassed around the pipe to be lined. Bypassing would be accomplished by installing pumps and a temporary bypass pipe between manholes that are upstream and downstream of the pipe being upgraded. Often CIPP lining of storm drains is scheduled during dry weather periods to minimize the amount of bypassing equipment needed.

On storm drain pipes 48-inch and larger, solutions other than CIPP should be evaluated on a case by case basis during design. Options may include sliplining, spiral-wound, or fiber reinforced polymer (FRP). For study purposes, the cost for these other methods would be similar to the CIPP estimate.

Estimated Unit Construction Cost

For this study, a unit cost of $15/inch-diameter/LF for 24-inch pipes and smaller and $12/inch-diameter/LF for pipes larger than 24-inch diameter will be used for the rough order of magnitude construction cost estimate of CIPP lining work. This estimated construction cost includes the materials and equipment to install a CIPP liner complete including flow controls and the additional cost of working overtime hours at night and during weekends. Traffic control can be a significant part of the cost to perform the repair work. Traffic costs were estimated separately for each site and added to the CIPP lining cost. This estimated cost does not include engineering design, project management, Owner fees and markups and engineer inspection/quality control.

Open-Cut Excavation Remove and Replace

Description

This storm drain pipe upgrade process includes the traditional construction method of excavating to remove the existing storm drain pipe and replace it with a new storm drain pipe. In most cases a new storm pipe is installed from one existing manhole to the next. The work would be performed according to the construction standards of the AKDOT&PF.

Estimated Unit Construction Cost

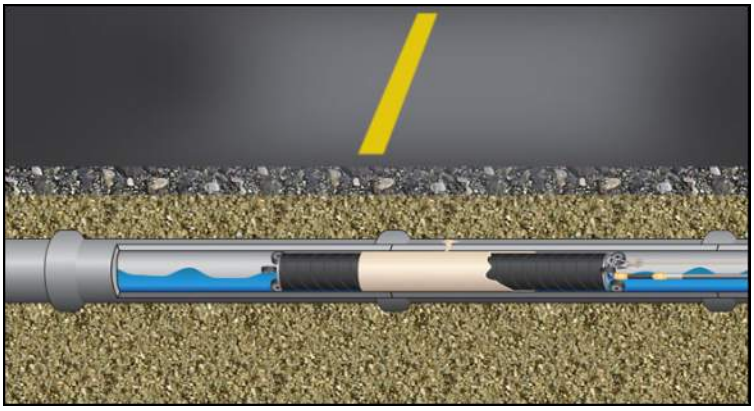
For this study, a unit cost of $35/inch-diameter/LF will be used for the rough order of magnitude construction cost estimate of the open cut pipe remove and replacement work. This estimated construction cost includes the materials and equipment to install a new storm pipe complete including the additional cost of working overtime hours at night and during weekends. Traffic control can be a significant part of the cost to perform the repair work. Traffic costs were estimated separately for each site and added to the CIPP lining work estimated cost. This estimated cost does not include engineering design, project management, Owner fees and markups and engineer inspection/quality control.

Trenchless Point Repair

Description

A trenchless point repair is described as a short section of CIPP liner that is installed inside of a host pipe to repair a single defect. No digging is required; the work can be accomplished from the manholes. The repair consists of a resin impregnated fabric tube (usually 2 feet to 8 feet long) that is positioned over the defective area and pressed against the host pipe with an inflatable bladder and then cured until hard. Some systems use hot water to cure the resin. Most trenchless point repair systems cure in ambient temperatures. Trenchless point repairs are very beneficial for repairing a single defect in a host pipe that is in overall good condition.

The technology has been in use for over 20 years and has been used in Alaska many times. There are a number of utilities and contractors in Alaska who own equipment to install trenchless point repairs.



Trenchless point repair (courtesy of Pipe Patch).

Estimated Unit Construction Cost

A unit cost of $450/inch-diameter/each will be used for the rough order of magnitude construction cost estimate of installing a trenchless point repair. This estimated construction cost includes the materials and equipment to install a new trenchless point repair complete including the additional cost of working overtime hours at night and during weekends. Traffic control can be a significant part of the cost to perform the repair work. Traffic costs were estimated separately for each site and added to the CIPP lining work estimated cost. This estimated cost does not include engineering design, project management, Owner fees and markups and engineer inspection/quality control.

Excavation Point Repair

Description

This includes the traditional construction method of excavating to perform a repair on an existing storm drain pipe. This method is used when the host pipe is collapsed or is damaged to the degree that a trenchless point repair cannot be installed. In most cases, a single excavation is needed at a specific location. The work would be performed according to the construction standards of the AKDOT&PF.

Estimated Unit Construction Cost

A unit cost of $32,000 each will be used for the rough order of magnitude construction cost estimate of completing an excavation point repair. This estimated construction cost includes the materials and equipment to repair a pipe defect complete including the additional cost of working overtime hours at night and during weekends. Traffic control can be a significant part of the cost to perform the repair work. Traffic costs were estimated separately for each site and added to the CIPP lining work estimated cost. This estimated cost does not include engineering design, project management, Owner fees and markups and engineer inspection/quality control.

Storm Pipe Cleaning and Inspection

Description

Storm drain pipes that contained a significant amount of debris and were not inspected during the condition assessment phase of this project will be designated for cleaning and inspection.

Estimated Unit Construction Cost

A unit cost of $20 per foot will be used for the rough order of magnitude construction cost estimate of cleaning a storm drain pipe and completing a CCTV camera inspection. This estimated construction cost includes the materials and equipment to complete the work and the additional cost of working overtime hours at night and during weekends. Traffic control costs were estimated for each location as added to the cleaning and inspection costs. This estimated cost does not include engineering design, project management, Owner fees and markups and engineer inspection/quality control.

General Manhole Repairs

Description

General manhole repairs include items such as cracked concrete repairs, frame and lid replacement, concrete riser replacement, manhole step replacement, pipe penetration, grout repair, etc. The work would be performed according to the construction standards of the AKDOT&PF.

Estimated Unit Construction Cost

A unit cost of $3,000 per each manhole will be used for the rough order of magnitude construction cost estimate of this work. This estimated construction cost includes the materials and equipment to complete the work including traffic controls. This estimated cost does not include engineering design, project management, Owner fees and markups and engineer inspection/quality control.

New Storm Drain Manhole Installation

Description

This upgrade includes the installation of a new storm drain manhole and also includes removal of an existing manhole where applicable. The work would be performed according to the construction standards of the AKDOT&PF.

Estimated Unit Construction Cost

The following rough order of magnitude construction costs would be applied for this item:

- New 48-inch diameter manhole - $30,000 each
- New 72-inch diameter manhole - $36,000 each
- New 120-inch diameter manhole - $46,000 each

This estimated construction cost includes the materials and equipment to complete the work including the additional cost of working overtime hours at night and during weekends. Traffic control costs were added to the manhole installation cost. This estimated cost does not include engineering design, project management, Owner fees and markups and engineer inspection/quality control.

Abandon Storm Drain Pipe

Description

This upgrade includes abandoning existing storm drain pipes by filling them completely with a flowable cement grout. Designers should perform a thorough investigation of each of the pipes designated for abandonment to confirm for sure that they no longer function.

Estimated Unit Construction Cost

A unit cost of $500 per cubic yard of flowable grout will be used for the rough order of magnitude construction cost estimate of this work. This estimated construction cost includes the materials and equipment to complete the work. Traffic control work was added on top of the pipe abandonment cost.

This estimated cost does not include engineering design, project management, Owner fees and markups and engineer inspection/quality control.

SECTION 4
REPAIR RECOMMENDATIONS AND ESTIMATED COSTS

Appendix A contains a list of the pipe and manhole upgrades and the rough order of magnitude construction costs for the recommended work. Appendix B contains maps that show the project areas and the pipes and manholes that are recommended for repairs.

The recommendations in this report are based on the pipe and manhole characteristics observed in the inspection data. Designers who are utilizing the study level recommendations in this report should review all available data when deciding how to repair the project pipes. Gathering additional information is recommended. Designers are urged to review all the CCTV video inspection data for those pipes being upgraded. Additionally, the CCTV video data may not provide a complete picture of how to repair a pipe or structure. Other factors that may affect the pipe upgrade design include vehicle traffic, geotechnical characteristics, and proposed repairs on nearby pipes, access to manholes, potential soil or groundwater contamination, nearby buried utilities, and other construction projects.

Metal loss and corrosion in the CMP pipe inverts were observed in the CCTV inspection work and in physical inspections of pipes in select manholes. There is a limitation in the accuracy of this work. The entire invert was not probed and often the invert is obscured with water during the CCTV work. It is very likely that the amount of corrosion in the pipe inverts is more widespread than what was observed in the CCTV inspections and physical inspections.

A summary of the estimated construction repair costs is shown in the table below:

NHS Storm Drain Inspection Project Areas	Rough Order of Magnitude Construction Repair Costs		
	Storm Pipes	Structures	Subtotal
A Street: 36th Avenue to Fireweed Lane	$492,000	$18,000	$510,000
Old Seward Highway: International Airport Road to 48th	$322,000	$0	$322,000
International Airport Road: Cambridge Way to Old Seward	$590,000	$3,000	$593,000
Dimond: Jewel Lake Road to Old Seward Highway	$2,112,000	$33,000	$2,145,000
Minnesota Drive: Tudor Road to Hillcrest Drive	$970,000	$15,000	$985,000
C Street: Dimond to 76th and Tudor to 40th	$482,000	$6,000	$488,000
TOTAL	$4,968,000	$75,000	$5,043,000

Appendix A

Pipe and Manhole Recommendations

CR NHS Storm Drain Condition Report
Proj. No. 0A31055 / Z591280000

	NHS Storm Drain Inspections A Street (36th Ave. to Fireweed Ln.)				Defect Grades: *0=No Defect, 1=Minor Defect, 2=Minor to Moderate Defect, 3=Moderate Defect, 4=Significant Defect, 5=Most Significant Defect*								Repair Recommendations and Costs					
Page # in Maps	**Upstream Structure No.**	**Downstream Structure No.**	**Location**	**Pipe Dia. (in.)**	**Material**	**CCTV Complete**	**CCTV Date**	**CCTV Length (ft.)**	**GIS Length (ft.)**	**CCTV Direction**	**General Condition Grade Score**	**Flow Depth (in.)**	**Additional Comments**	**Reviewed By**	**Repair Required**	**Repair Method: CIPP, Remove and Replace, Point Repair(s)**	**Repair Summary**	**ROM Estimated Construction Cost**
1	1287-1173	1287-1171	West side A Street south of 34th Ave.	28	FRP	Yes	7/7/2017	141	150	Downstream	4	1" to 2"	Multiple exterior point source impacts have broken the interior pipe surface. Joint leak Sta. 0+10.	KS	Y	CIPP	Leaking joint at Sta.0+10 & 8-plus impact punctures over the length of the pipe suggest CIPP as opposed to point repairs.	$55,000
2	1287-1181	1287-1178	East side A Street north of 34th Ave.	24	FRP	No	7/7/2017	66	150	Upstream	4	Minimal	≈ 6" dia. utility pipe penetration at invert, Sta. 0+66. 30% blockage of SD pipe. Soil entering pipe.	KS	Y	Excavation Point Repair and CIPP	Open Cut: determine ownership of the conduit & have it removed. Two impact punctures have been located between Sta. 0+00 to 0+66. CCTV remainder of pipe. CIPP pipe for repairing punctures & open cut repair.	$89,000
	1287-1184	1287-1181	East side A Street south of 32nd Ave.	24	FRP	Yes	7/7/2017	297	298	Downstream	3	Minimal	Two 4" dia. holes 12:00 to 1:00 position, Sta. 0+06. Soil visible.	KS	Y	Trenchless Point Repair	Two impact puncture hole in close proximity. . One or 2 point repairs will seal the holes.	$26,000
	1287-1186	1287-1184	East side A Street at 32nd Ave.	21	FRP	Yes	7/7/2017	108	116	Upstream	4	1"	Joints with root penetration. Circumferential & 6" dia. surface break with roots & soil visible	KS	Y	CIPP	Circumferential crack & puncture at Sta. 0+72. 5-6 joints with root penetrations. Some joints are in close proximity. Determine most economical way to repair the pipe: Point Repairs or CIPP.	$42,000
	1287-1194B	1287-1194A	West side A Street at 32nd Ave.	12	FRP	QuickView	7/11/2017	N/A - QuickView	13	Downstream	4	None	2-3" of debris in pipe, hole visible with root intrusion, possible pipe collapse viewed from upstream end	JM	Y	Remove and Replace	Pipe collapse and location below sidewalk warrants an open-cut to remove and replace pipe. Manhole structures should be rebuilt during pipe repair	$19,000
	1287-1194A	1287-1194	West side A Street at 32nd Ave.	12	FRP	QuickView	7/11/2017	N/A - QuickView	23	N/A	4	Minimal	Hole near upstream pipe connection in 5:00 position, pipe transitions from FRP to CMP at approximately midspan, soil infiltration at the material transition	JM	Y	Remove and Replace	Immediate upstream segment requires open cut repair, include this segment as part of same open cut pipe and structure repair.	$24,000
	1287-1197	1287-1186	East side A Street at 32nd Ave.	18	CMP	QuickView	7/12/2017	N/A - QuickView	37	Upstream/Downstream	3	Minimal	Pipe transitions to CPEP 15' from downstream manhole, appx. 5% ovality observed from upstream structure, service connection observed from downstream manhole, possible pipe fracturing due to service connection discoloration in 5:00 and 7:00 positions	JM	Y	CIPP	Appropriate sized liner pipe is acceptable as repair method due to the pipes ovality, recommend adding a manhole structure at service connection to repair pipe and adjust the connection	$52,000
	1287-1187	1287-1186	East side A Street at 32nd Ave.	21	FRP	Yes	7/15/2017	54	62	Downstream	4	Minimal	Structure penetration, pipe fractured . Sta. 0+00. Circumferential cracks, with root penetration, at Sta. 0+09, 0+12 & 0+49.	KS	Y	CIPP	Rebuild pipe penetration at Sta. 0+00. Point repair at Sta. Sta. 0+09 to 0+12 & Sta. 0+48. Determine most economical way to repair the pipe: Point Repairs or CIPP.	$25,000
3	1287-1190	1287-1188	East side A Street at 31st Ave.	21	FRP	Yes	7/15/2017	102	129	Downstream	3	Minimal	Two 2" dia. surface breaks 10:00 position, Sta. 0+52. Two 2" dia holes @ 10:00 & 7:00 position, Sta. 1+02, created by metal pipe.	KS	Y	Trenchless and Excavation Point Repairs	Trenchless point repair at Sta. 0+52 & excavation point repair at Sta.1+02 to remove bored pipe.	$45,000
4	654-91	654-84	West side A Street south of 26th Ave.	36	CMP	Yes	7/15/2017	55	67	Downstream	3	6" to 12"	Intermittent surface & spot corrosion with pin holes along 3:00 & 9:00 positions for total length of pipe. Lower half of pipe covered w/ water.	KS	Y	CIPP	Corrosion holes at springline warrant CIPP lining. Top two-thirds of the pipe were visible during inspection due to the depth of water.	$30,000
5	654-96	654-95	West side A Street south of Fireweed Lane	18	CMP	Yes	7/15/2017	280	281	Downstream	4	Minimal	Surface corrosion with metal loss, longitudinal fractures and holes mostly 4:00 to 5:00 & but also 7:00 to 9:00 position along length of pipe. Partial pipe collapse 10%, 12:00 position, Sta. 2+45.	KS	Y	CIPP	Corrosion with holes & fracture along the length of the pipe will require a CIPP solution. The partial pipe collapse at Sta. 2+45 should be re-visited but may not require a repair due to its small size.	$85,000
																	Total Estimated Construction Cost	**$492,000**

CR NHS Storm Drain Condition Report
Proj. No. 0A31055 / Z591280000

	NHS Storm Drain Inspections C Street (Tudor to 40th Ave.)				Defect Grades: *0=No Defect, 1=Minor Defect, 2=Minor to Moderate Defect, 3=Moderate Defect, 4=Significant Defect, 5=Most significant Defect*								Repair Recommendations and Costs					
Page # in Appendix #	**Upstream Structure No.**	**Downstream Structure No.**	**Location**	**Pipe Dia. (in.)**	**Material**	**CCTV Complete**	**CCTV Date**	**CCTV Length (ft.)**	**GIS Length (ft.)**	**CCTV Direction**	**General Condition Grade Score**	**Flow Depth (in.)**	**Additional Comments**	**Reviewed By**	**Repair Required**	**Repair Method: CIPP, Remove and Replace, Point Repair(s)**	**Repair Summary**	**ROM Estimated Construction Cost**
1	1488-3	1488-2	West C Street north of Dimond	24	CMP	Yes	10/12/2017	114	142	Upstream	4	None	Upstream end abandoned, invert appears corroded	JM	Y	Abandon	Recommend further evaluation to determine if pipe is no longer in service.	$14,000
3	1287-1338A	1287-1338	C Street north of Tudor	36	CMP	Yes	7/5/2017	177	165	Upstream	4	Minimal	Ovality ranging from 10% to 25% throughout 90% of pipe. Upstream end of pipe buried or collapsed Sta. 1+77, physically inspected invert, metal appeared sound	KS	Y	Abandon	Structure 1287-1338A was not found on the surface. The pipe at Sta.1+77 has been buried or has collapsed. This pipe may be abandoned. Perform additional investigation to determine if pipe is no longer in service.	$9,000
	1287-1337	1287-1336	East side C Street	36	CMP	Yes	7/5/2017	284	290	Downstream	3	1"	Material loss & pitting with possible holes & corrosion fractures in invert. Water infiltration at joints. Physically inspected invert, evidence of corrosion, hole in invert at pipe penetration of 1287-1336.	KS	Y	CIPP	Corrosion holes observed. CIPP recommended.	$124,000
4	1287-1336	1287-1335	East side C Street	36	CMP	Yes	7/5/2017	285	275	Upstream	4	1" to 2"	Surface corrosion & material loss. Holes in invert Sta. 0+55, 1+43 & 2+41. Additional holes may be present but unseen due to debris & water, physically inspected invert, evidence of corrosion	KS	Y	CIPP	Several holes plus apparent corrosion fractures indicate Point Repairs will not be sufficient so CIPP Is the recommended repair.	$124,000
	1287-1335	1287-1333	East side C Street south of 40th	36	CMP	No	7/5/2017	23	310	Downstream/ Upstream	2	1"	Spot corrosion on sides of pipe. Unable to complete inspection downstream due to depth of debris. Camera'ed upstream also no success, debris.	KS	N	Clean/Inspect	Clean pipe to complete inspection.	$7,000
	1287-1347	1287-1332	C Street south of 40th	36	CMP	No	7/6/2017	93	182	Downstream	4	4"	Joints offset, soil entering pipe, Sta. 0+10 & 0+90 . Intermittent surface & spot corrosion with pin holes. Joints w/mineral buildup.	KS	Y	Clean/Inspect & CIPP	Two joint failures (Sta. 0+10 & 0+90), multiple joint leaks w/mineral buildup & only half of the pipe CCTV-ed. CCTV the remaining pipe. Most cost effect solution is probably to CIPP pipe not point repair.	$94,000
	1287-1333	1287-1332	East side C Street south of 40th	36	CMP	No	7/5/2017	1	26	Downstream	2	1"	Surface corrosion top pipe. Observed by zooming camera.	KS	N	Clean/Inspect	Clean pipe to complete inspection.	$4,000
																	Total Estimated Construction Cost	**$482,000**

CR NHS Storm Drain Condition Report
PROJECT NO. 0A310554 / Z591280000

	NHS Storm Drain Structure Repairs A Street (36th Ave. to Fireweed Ln.)			Defect Grades: *0=No Defect, 1=Minor Defect, 2=Minor to Moderate Defect, 3=Moderate Defect, 4=Significant Defect, 5=Most Significant Defect*												
		Avg. Height	Material	Condition of Components												ROM Estimated
Page # in Maps	Structure No.	Rim-Invert (in.)	Type	Overall	Cover	Frame	Chimney	Steps	Cone	Reducing Slab	Barrel	Base	Connections (Influent)	Connections (Effluent)	Storm Drain Structure Observations	Repair Cost
1	1287-1173	43	Pre-cast Concrete	3	1	2	N/A	1	N/A	2	N/A	2	5	5	Grout missing on effluent connection and north influent pipe	$3,000
2	1287-1194C	24	Pre-cast Concrete	3	2	2	3	N/A	N/A	N/A	N/A	3	N/A	4	Cracks in chimney and grout	$3,000
	1287-1194B	22	Pre-cast Concrete	4	2	2	4	N/A	N/A	N/A	N/A	3	3	3	4"x10" hole in chimney, cracks in base, cracked grout	$3,000
	1287-1194A	28	Pre-cast Concrete	3	2	2	4	N/A	N/A	N/A	N/A	3	1	3	Cracks present in base, cracked grout	$3,000
	1287-1194	42	Pre-cast Concrete	3	2	2	4	N/A	N/A	N/A	N/A	N/A	1	3	Multiple cracks and missing grout in chimney, broken frame on inlet, cracks in grout	$3,000
	1287-1187A	46	Pre-cast Concrete	3	2	4	5	N/A	N/A	N/A	N/A	2	2	2	Chimney in very poor condition, surface spalling on base concrete, broken frame, cracked grout	$3,000
															Total Estimated Construction Cost	**$18,000**

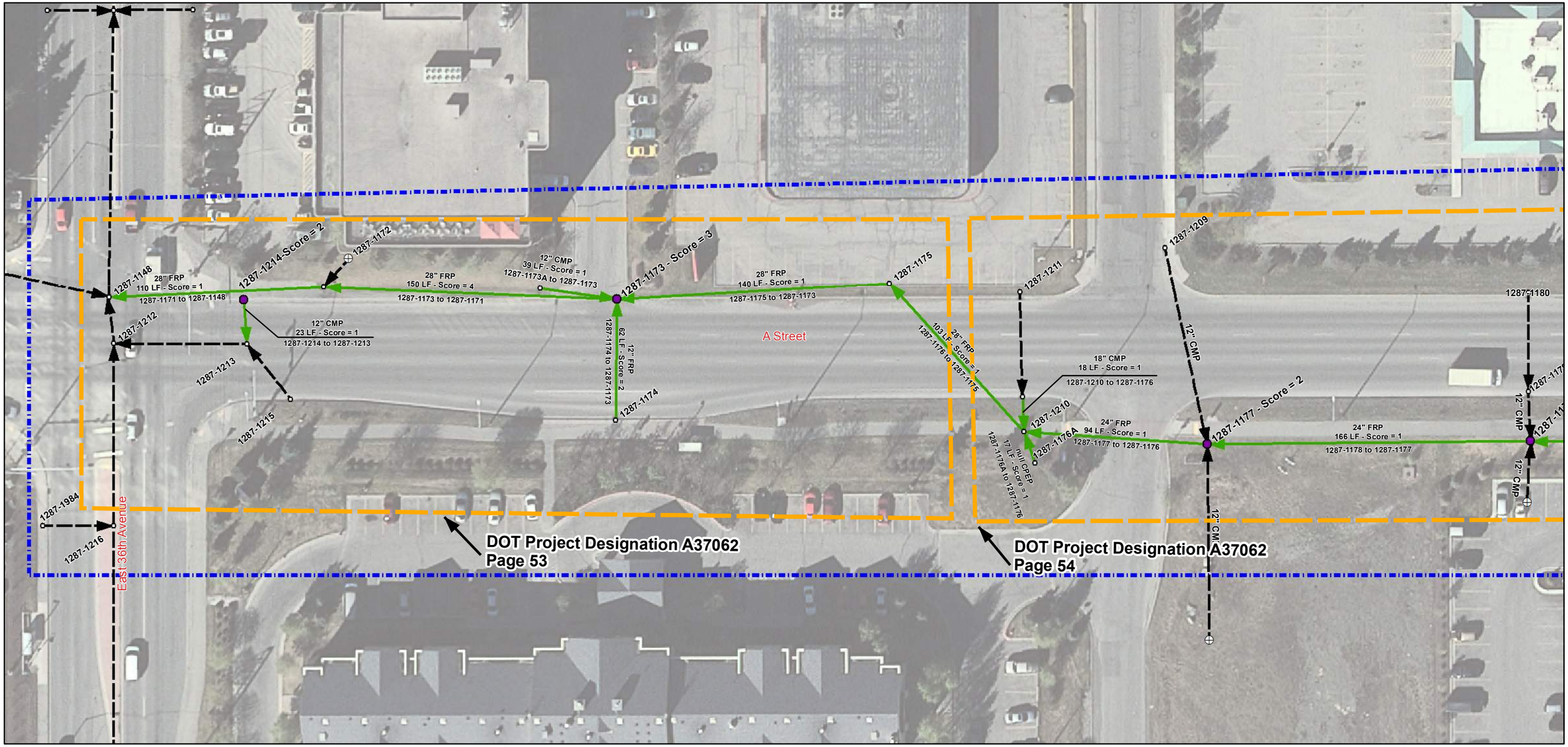
Appendix B

Project Area Maps

Date: 3/14/2018
Sheet 1 of 5

A Street: East 36th Avenue to West Fireweed Lane

N



Feet
0 25 50

Legend

Manhole/Catchbasin

- Not Inspected
- Inspected with Score
- Inspected without Score
- Not Located

Pipe Segment

- Not Inspected
- Inspected with Score

Score

0 - No Defect
1 - Minor Defect
2 - Minor to Moderate Defect
3 - Moderate Defect
4 - Significant Defect
5 - Most Significant Defect

Project Area

Asbuilt Designation

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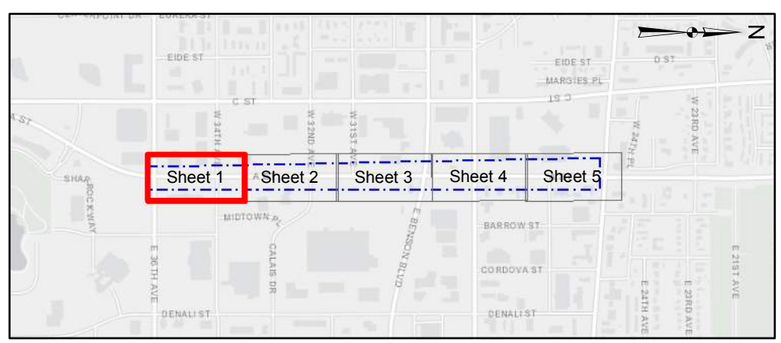
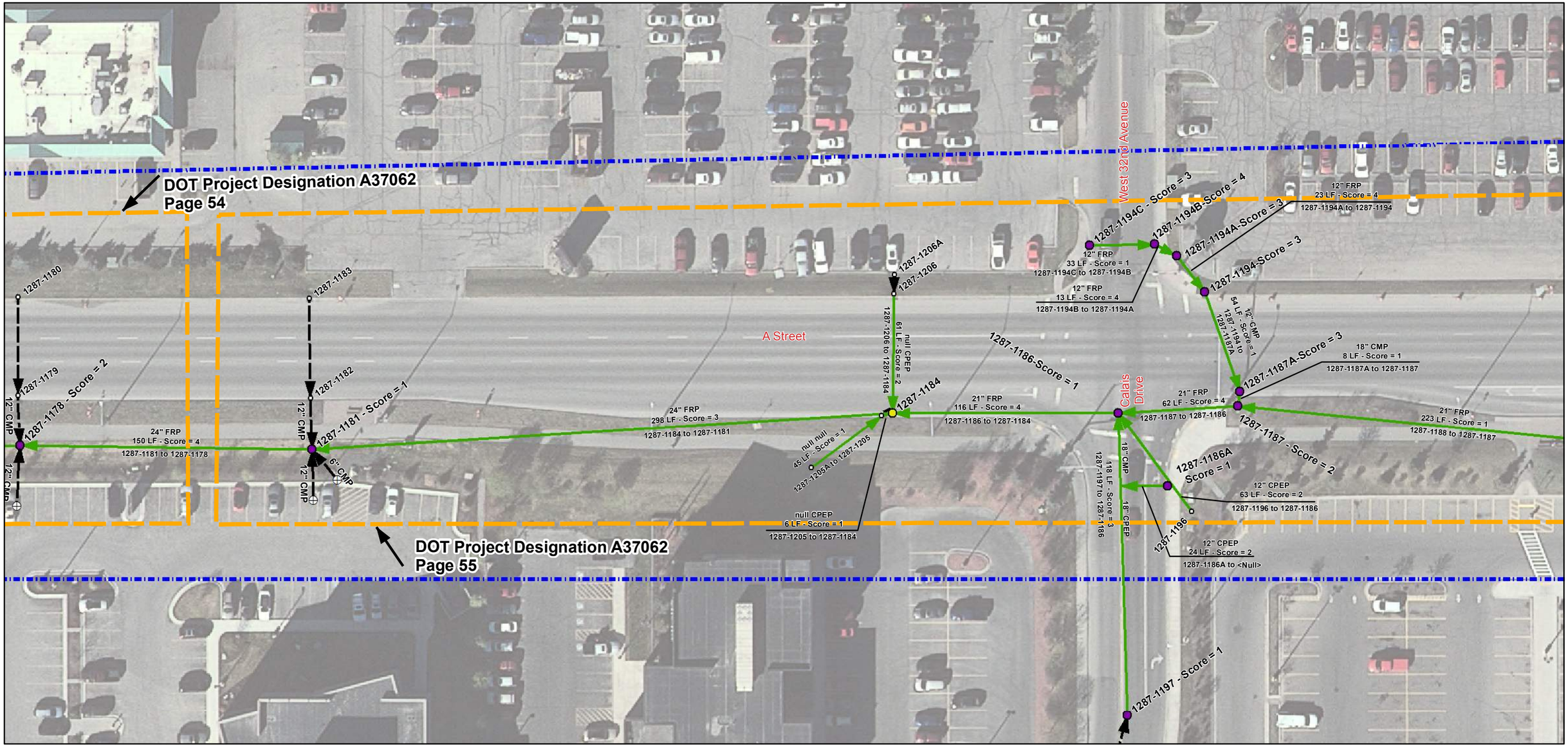


Date: 3/14/2018
Sheet 2 of 5

A Street: East 36th Avenue to West Fireweed Lane



Feet
0 25 50

Legend

Manhole/Catchbasin

- Not Inspected
- Inspected with Score
- Inspected without Score
- Not Located

Pipe Segment

- Not Inspected
- Inspected with Score

Project Area

Asbuilt Designation

"null" Unknown Parameter

Score

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1 - Minor Defect
2 - Minor to Moderate Defect
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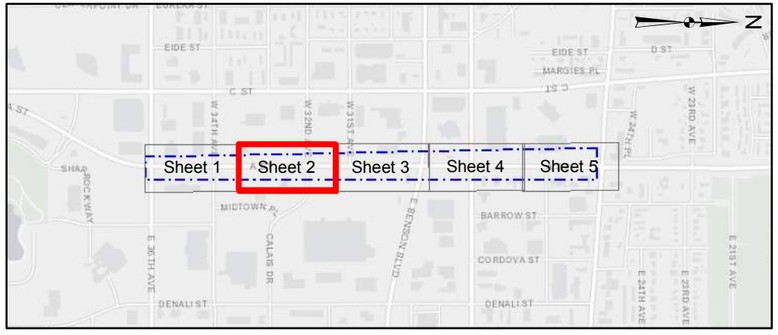
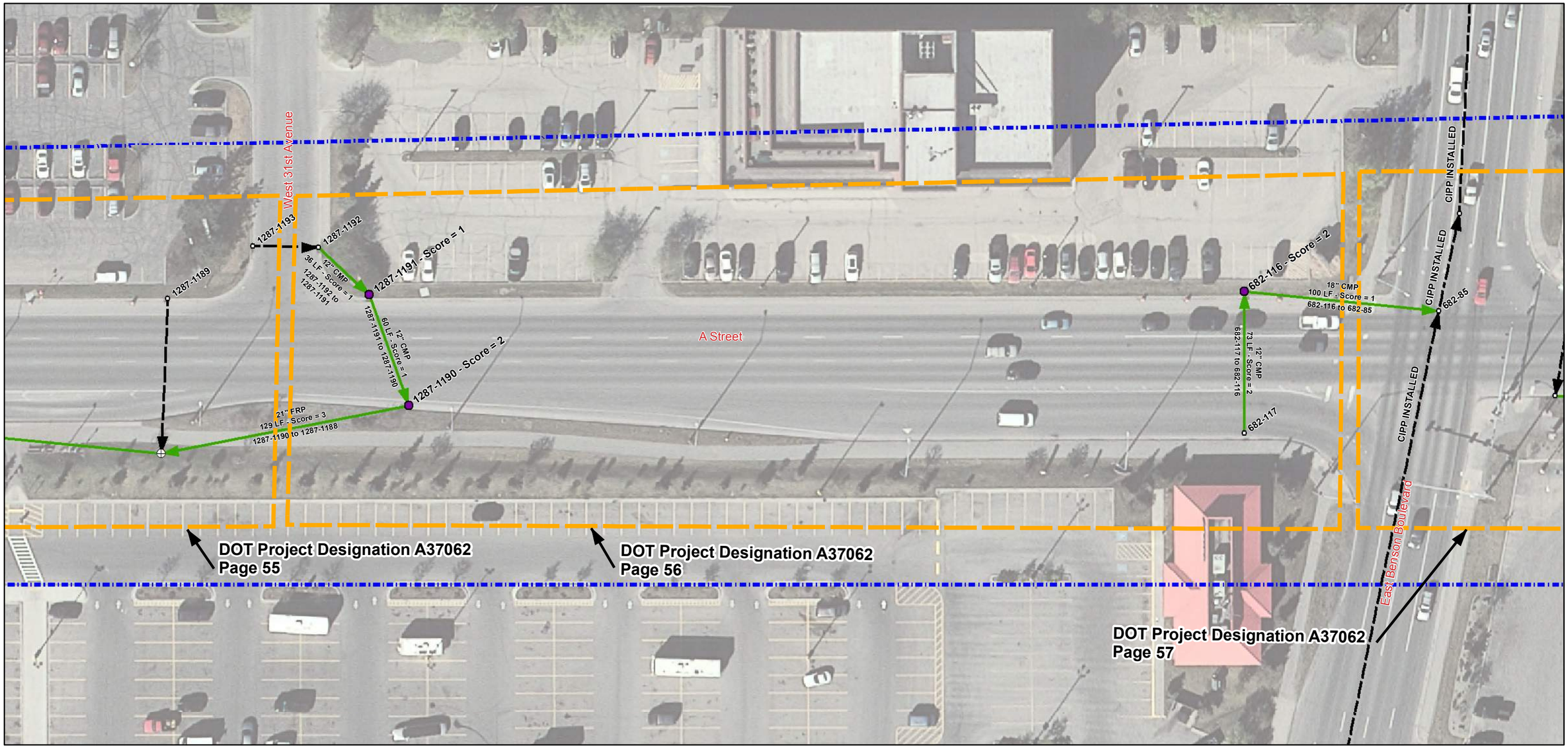
5 - Most Significant Defect



Date: 3/14/2018
Sheet 3 of 5

A Street: East 36th Avenue to West Fireweed Lane



Feet
0 25 50

Legend

- Project Area
- Asbuilt Designation
- "null" Unknown Parameter

Manhole/Catchbasin

- Not Inspected
- Inspected with Score
- Inspected without Score
- Not Located

Pipe Segment

- Not Inspected
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Score

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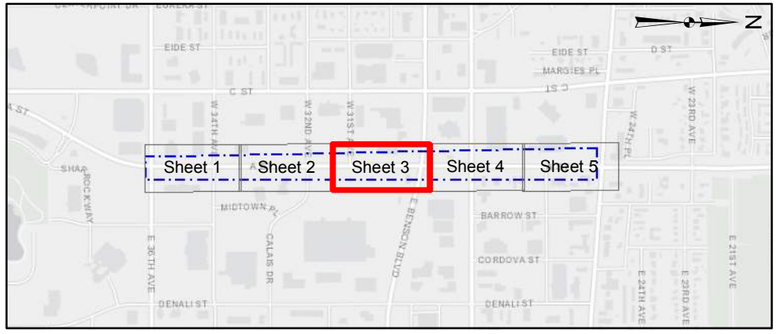
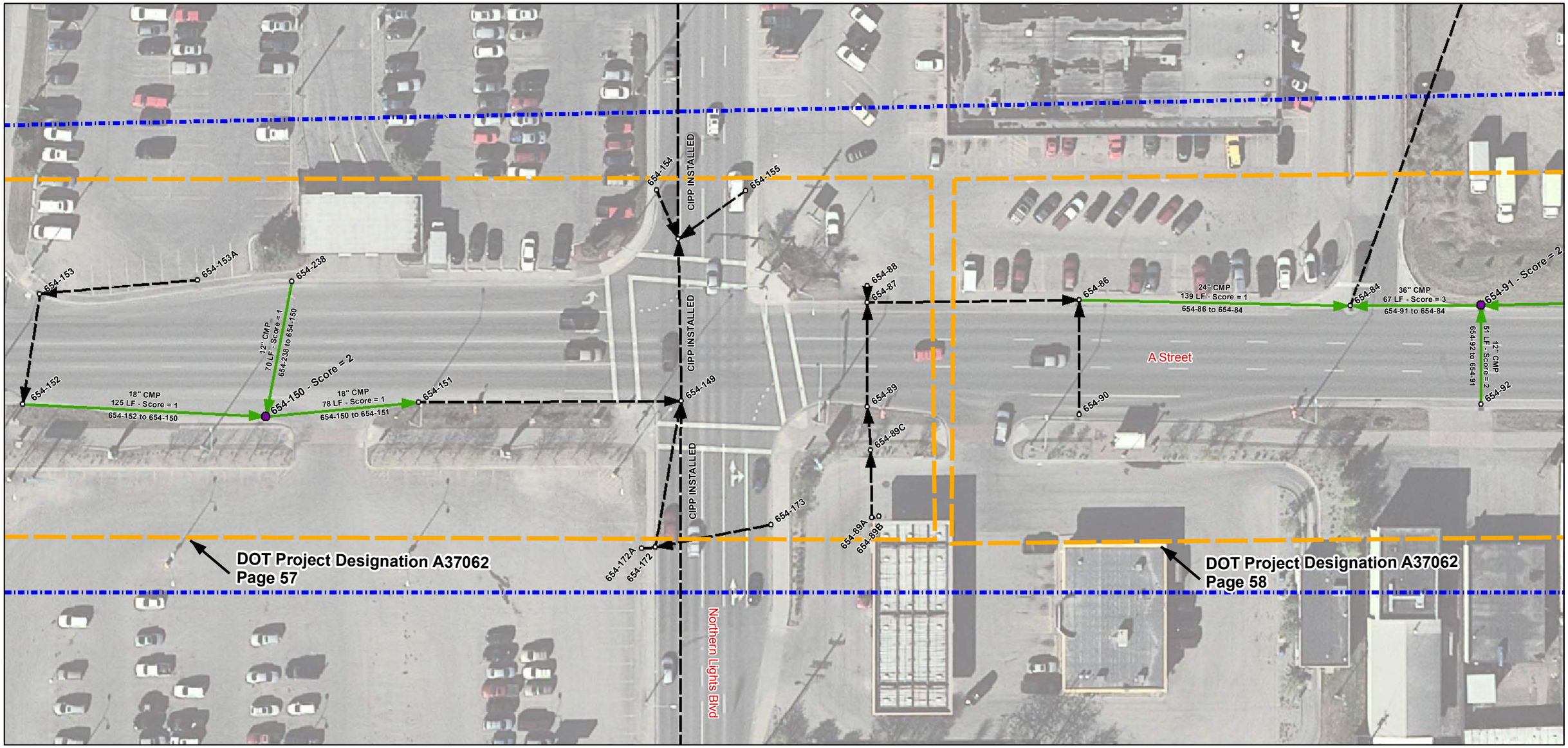


Date: 3/14/2018
Sheet 4 of 5

A Street: East 36th Avenue to West Fireweed Lane



Feet
0 25 50

Legend

Manhole/Catchbasin

- Not Inspected
- Inspected with Score
- Inspected without Score
- Not Located

Pipe Segment

- Not Inspected
- Inspected with Score

Project Area

Asbuilt Designation

"null" Unknown Parameter

Score

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2 - Minor to Moderate Defect
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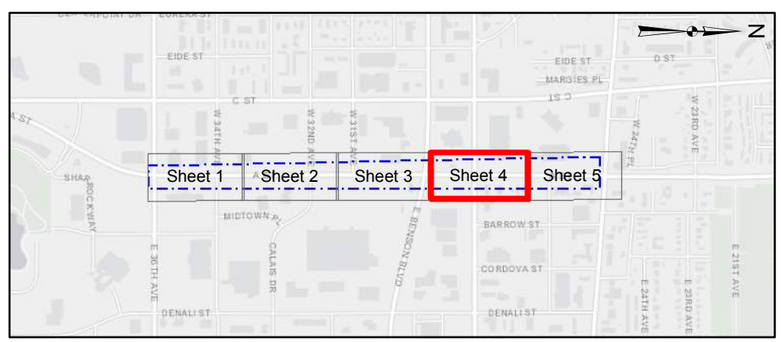
4 - Significant Defect
5 - Most Significant Defect



Date: 3/14/2018
Sheet 5 of 5

A Street: East 36th Avenue to West Fireweed Lane

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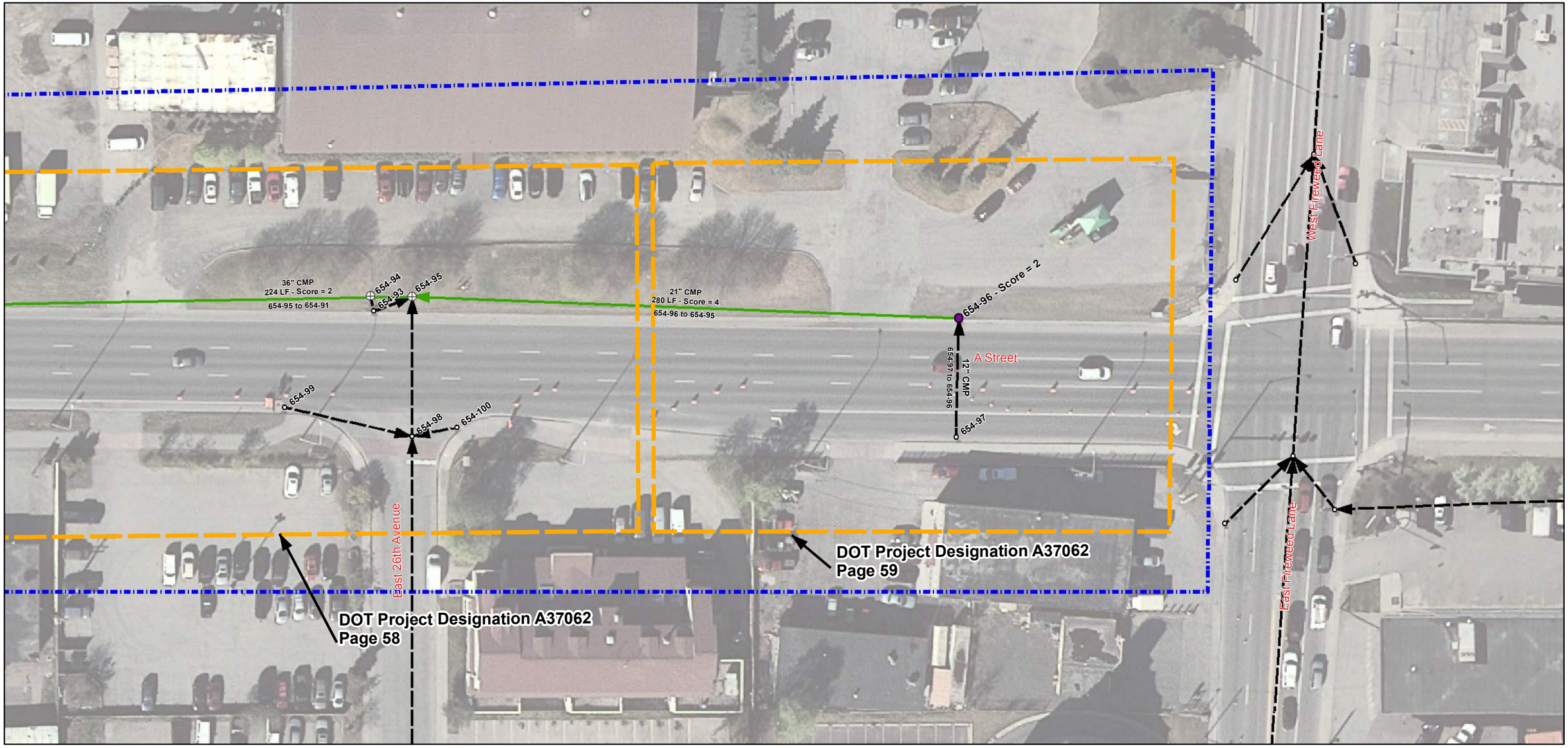

Feet
0 25 50

Legend

Manhole/Catchbasin

- Not Inspected
- Inspected with Score
- Inspected without Score
- Not Located

Pipe Segment

- Not Inspected
- Inspected with Score

Project Area

Asbuilt Designation

"null" Unknown Parameter

Score

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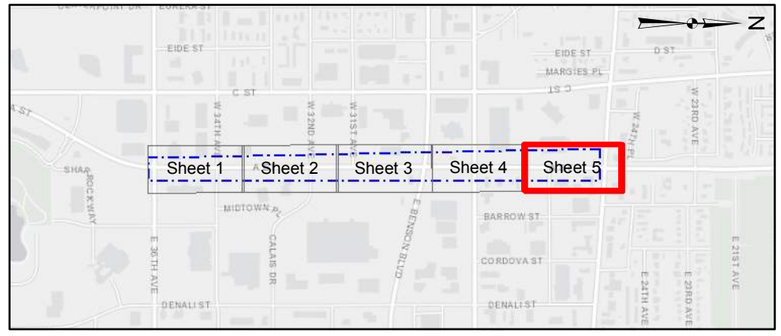

Date: 3/14/2018
Sheet 4 of 4

C Street: West Dimond Boulevard to West 40th Avenue

N

1287-1350
36" CMP
168 LF - Score = 2
1287-1350 to 1287-1349
West 40th Avenue
1287-1349
1287-1349A
1287-1443
1287-1442
P1
1287-1347
P2
1287-1348
1287-1330 - Score = 1
C Street
1287-1336 - Score = 1
36" CMP
275 LF - Score = 4
1287-1336 to 1287-1335
1287-1335 - Score = 1
36" CMP
310 LF - Score = 2
1287-1335 to 1287-1333
1287-1333 - Score = 1
P3
P4
P5
1287-1332 - Score = 2
1287-1331 - Score = 2
A Street
1287-1329
1287-1444
West 40th Avenue

P1 — 36" CMP, 35 LF - Score = 2, 1287-1349 to 1287-1347
P2 — 36" CMP, 182 LF - Score = 4, 1287-1347 to 1287-1332
P3 — 36" CMP, 26 LF - Score = 2, 1287-1333 to 1287-1332
P4 — 36" CMP, 29 LF - Score = 1, 1287-1332 to 1287-1331
P5 — 72" CPEP, 117 LF - Score = 1, 1287-1331 to 1287-1330

0 40 80 Feet

Legend

Pipe Segment
- Project Area
- Asbuilt Designation
- Not Inspected
- Inspected with Score

Manhole/Catchbasin
- Not Inspected
- Inspected with Score
- Not Located

Score
0 - No Defect
1 - Minor Defect
2 - Minor to Moderate Defect
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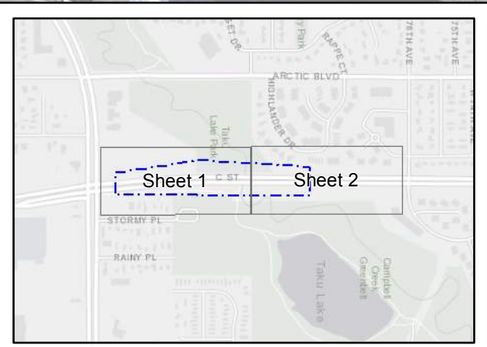

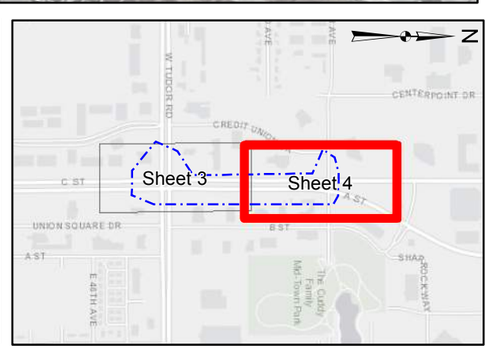

At this time, no significant design changes were made after the approval of this document. The final as-built plans for this project will be available in Central Files within the Highway Design Section (4111 Aviation Avenue, Anchorage, AK 99502).