MEMORANDUM

State of Alaska

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

TO: PIH Distribution

DATE: April 27, 2020

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SUBJECT: PIH Specifications Memo
Muldoon Road: Debarr Rd to E 36th Avenue Pavement Preservation
0544022 / CFHWY00406

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 202, 603, 608, 618 and 620 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 our 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	* Revised CR202.4 special provision for removal of fugitive materials on existing sidewalks.
203	Excavation and Embankment	*

DIVISION 300 BASES		
301	Aggregate Base and Surface Course	*

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

DIVISION 500 STRUCTURES		
501	Structural Concrete	*
503	Reinforcing Steel	*

DIVISION 600 MISCELLANEOUS CONSTRUCTION		
603	Culverts and Storm Drains	* Project special provision for pipe liner, preparing pipe for liner, and Closed-Circuit Television (CCTV) Inspection pay items.
604	Manholes and Inlets	*
608	Sidewalks	* Project special provision to clear up conflicting language in 2020 SSHC to CR608.1-040119R.
609	Curbing	*
615	Standard Signs	*
618	Seeding	* Project special provision to make Seeding and Water for Seeding required to establish vegetation on disturbed ground through Establishment Period, or as directed by Engineer, subsidiary.
619	Soil Stabilization	*
620	Topsoil	* Project special provision to make Topsoil required to establish vegetation on disturbed ground through Establishment Period, or as directed by Engineer, subsidiary.
627	Water System	*
639	Driveways	*
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	*
647	Equipment Rental	*
651	Control of Work – Supplemental Requirements	*
652	Prosecution and Progress – Supplemental Requirements	*

DIVISION 600 MISCELLANEOUS CONSTRUCTION (CONT.)		
660	Signals and Lighting	*
670	Traffic Markings	*
682	Utility Potholing	*

DIVISION 700 MATERIALS		
701	Hydraulic Cement and Supplementary Cementitious Materials	*
702	Asphalt Materials	*
703	Aggregates	*
705	Joint Materials	*
708	Paints	*
709	Reinforcing Steel and Wire Rope	*
711	Concrete Curing Materials and Admixtures	*
712	Miscellaneous	*
724	Seed	*
725	Fertilizer	*
726	Topsoil	*
727	Soil Stabilization Material	*
730	Sign Materials	*
740	Signals and Lighting Materials	*

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

SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Special Provisions

Add the following Subsection 202-3.08 Removal of Fugitive Materials:

202-3.08 REMOVAL OF FUGITIVE MATERIALS. Remove fugitive materials to reestablish the full width of the existing concrete sidewalk, as shown on the Plans.

Remove disturbed materials in the same work shift the disturbance occurred.

Removed materials are the property of the Contractor. Do not reuse these materials within the project limits without the written approval of the Engineer.

Dispose of removed materials at the Municipality of Anchorage Hazardous Materials Waste Disposal site or similar as required dependent on the type of materials and as required by the Federal, State, and Municipal environmental regulations.

202-4.01 METHOD OF MEASUREMENT. Add the following:

Removing and disposing fugitive materials is measured along the edge of the existing sidewalk by the linear foot.

CR202.4/CFHWY00406

Special Provision

Replace Section 603 with the following:

SECTION 603
CULVERTS AND STORM DRAINS

603-1.01 DESCRIPTION. Construct or reconstruct culvert and storm drain pipe. Install culvert marker posts, and strap plastic culvert ends.

CR603-010120/CFHWY00406

Storm Drain Pipe Rehabilitation

Rehabilitate existing storm drain pipes by the inversion and curing of a resin-impregnated tube. Plan and coordinate the rehabilitation. Bypass pump the storm drain flows around the drain pipes during rehabilitation. Clean, inspect, prepare, and line the existing pipeline. 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.

Clean culverts and grade culvert inlets and outlets

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

CFHWY00237

603-1.02 REFERENCES.

ASTM D3953 Standard Specification for Strapping, Flat Steel and Seals
ASTM D4675 Standard Guide for Selection and Use of Flat Strapping Materials

CR603-010120/CFHWY00406

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

Storm Drain Pipe 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 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.

CFHWY00406

603-2.01 MATERIALS. Use materials that conform to the following:

Bedding and Backfill	Subsection 204-2.01
Joint Mortar	Subsection 705-2.04
Flexible Watertight Gaskets	Subsection 705-2.05
Non-reinforced Concrete Pipe	Subsection 706-2.01
Reinforced Concrete Pipe	Subsection 706-2.02
Corrugated High Density Polyethylene (HDPE) Pipe	Subsection 706-2.07
Corrugated Steel Pipe and Pipe Arches	Subsection 707-2.01
Corrugated Aluminum Pipe	Subsection 707-2.03
Galvanize	Subsection 716-2.07
Culvert Marker Posts (Flexible Delineator Posts)	Subsection 730-2.05

Item 603.0017.____, Pipe, listed in the bid schedule, furnish either Corrugated Steel Pipe (CSP), Corrugated Aluminum Pipe, Reinforced Concrete Pipe, or Corrugated Dual Wall HDPE (plastic) Pipe. Select pipe for each installation that meets or exceeds the requirements shown on the Plans for height of cover.

For steel and plastic pipe, match the end section material to the pipe material.

Separate dissimilar materials with an electrical insulating material. The insulating material must be at least 1/16 inch thick and approved by the Engineer.

Culvert marker post is 6-foot tall by 2.5 inches wide with reinforcing ribs, capable of a 9-inch minimum bending radius, and blue with no marking.

Culvert marker Strap and Seals according to ASTM D3953. 0.625 inch x 0.02 inch, dry Type 1 regular-duty (magnetic, ferritic), galvanized Finish B (hot-dipped Grade 2 moderate coating, 0.18 oz./ft^2 surface or 0.0002 inch thick minimum. Push type seals, Style III (overlap), regular duty, galvanized Finish B (hot-dipped coating) by 1.75-inch minimum length and matched to strapping width.

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Storm Drain Pipe 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 resin.

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

    a. meet or exceed the hydraulic capacity of the original unlined pipe,
    b. withistand high temperatures retaining structural integrity and installed shape during periodic steam heating and thawing,
    c. be chemically resistant and resistant to bacterial and other substances found in soils,
    d. not require special training or equipment for repairs made by the Department,
    e. have a light color interior to promote proper reflective light during CCTV inspection,
    f. 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.

CFHWY00406

CONSTRUCTION REQUIREMENTS

603-3.01. GENERAL. Excavate, bed, and backfill according to the requirements of Subsections 204-2.01 and 204-3.01, and the Plans.

603-3.02. LAYING PIPE. Begin the pipe laying at the downstream end of the pipe. Keep the lower segment of the pipe in contact with the bedding throughout its full length. Place bell or groove ends of rigid pipe and outside circumferential laps of flexible pipe facing upstream.

Lay paved or partially lined pipe so that the longitudinal centerline of the paved segment coincides with the flow line. Install elliptical conduit and circular conduit reinforced with other than a full circular cage or cages

so the orientation of a vertical plane through the longitudinal axis of the conduit does not vary more than 5 degrees from the design orientation.

Repair damaged metallic coating on metal pipe according to AASHTO M36.

603-3.03 JOINING PIPE Joints shall provide circumferential and longitudinal strength to preserve the pipe alignment, prevent separation of pipe sections, and provide a watertight joint between new sections of pipe and joints between new and existing sections of pipe of similar and dissimilar materials. Include a continuous gasket (seal) in all joints. Construct the watertight joint capable of passing a laboratory hydrostatic pressure and vacuum test of at least 4 psi for 10 minutes.

1. Rigid Pipe. Use either bell and spigot or tongue and groove joints. Join pipe sections with the ends fully entered and the inner surfaces reasonably flush and even.

   Use one or more of the following joint materials, or any other if approved:

   a. Portland cement mortar

   b. Portland cement grout

   c. Rubber gaskets

   d. Coupling bands

   e. Preformed plastic sealing compound

   Make mortar joints using an excess of mortar to form a bead around the outside of the pipe.

   For grouted joints, use molds or runners to retain the poured grout. Install rubber ring gaskets to form a flexible, watertight seal.

   When using portland cement mixtures, protect the completed joints against rapid drying using suitable covering material.

2. Metal Pipe. Join the metal pipe firmly using connecting bands conforming to ASTM B745 (Corrugated Aluminum Pipe) and ASTM A760 (Corrugated Steel Pipe) and as noted herein. Use bands that are no more than two nominal sheet thicknesses lighter than the pipe jointed, and in no case more than 0.052 inches lighter. Include a gasket each side of the gap.

   a. Primary Band. Furnish and install corrugated bands so that the band corrugations match and conform to the corrugations of the pipe. Conform to the following guidelines:

      (1) The gap between the pipes joined is in the center of the band and is no wider than one corrugation width.

      (2) Band for 12-inch through 30-inch diameter pipe are at least 12 inches wide.

      (3) Bands for pipe with diameters greater than 30 inches are at least 22 inches wide.

   b. Secondary Band. Use this band only where it is not physically possible to use primary bands, such as on field-cut pipe ends, joining new pipe to existing pipe, etc. Furnish and install deformed metal sheet bands (dimple bands) so that the projections match and are the same depth as the pipe corrugations. Form these projections in circumferential rows with one projection for each corrugation of the helical pipe.

Conform to the following guidelines:

(1) The gap between the pipes joined is in the center of the band and is no wider than 2 inches.

(2) Bands for 12-inch diameter pipe are at least 12 inches wide and have one circumferential row of projections for each pipe end joined.

(3) Bands for pipe with diameters greater than 12 inches are at least 24 inches wide and have two circumferential rows of projections for each pipe end joined.

3. Plastic Pipe. Use push-on or mechanical joints. Ensure that the plastic pipe couplings' corrugation matches the pipe corrugation and that their width is not less than one-half the nominal pipe diameter.

Furnish all bolted connections on coupling bands with cut washers placed between the nut and the angle bracket or use nuts with integral washers.

Take up any pipe that is out of alignment, unduly settled, or damaged and re-lay or replace it.

603-3.04 CULVERT MARKER.

a. Marker Post. Install a culvert marker on the approach side of storm drain outfalls 30 inches and smaller, field inlets not in paved parking lots, all end sections to cross culverts, or as directed. Drive to maintain forty-two inches of post above the ground after driving, and

b. Marker Strap. In addition to marker posts, install marker strap around the plastic pipe ends.

Position the strap in the valley of the first annular ring from the top end of the culvert. From the vertical centerline of the culvert, at the top, overlap the strap and extend the ends to approximately 30 degrees each side of the centerline. Place the strap loosely without twists in the valley, without compressing the pipe, and tight enough to keep the strap from moving out of the valley without deforming the pipe or pipe corrugation. Seal the strap at three locations, one at each of the ends, and one at the top of the culvert. Extend the strap ends beyond the end seals approximately 1/2-inch. Double crimp the seal, two pairs of crimps minimum each seal.

Repair the strap galvanizing where abraded and at cut ends according to ASTM A780. Prepare the surface with power tools per SSPC-SP11, hand tools per SSPC-SP2, and as required by the paint manufacturer. Apply paint, Type – paint containing zinc dust, to the prepared surfaces and allow enough time for curing as required by the manufacturer's printed instructions.

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603-3.05 PIPE CLEANING. Clean pipes as specified and directed.

Pipes: Clean pipes listed on the Pipe Lining summary tables in the Plans by removing all fugitive materials.

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 environmental 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 not discharge storm water onto the ground. During bypass pumping, maintain continuous monitoring and observation of the equipment.

Muffle the equipment to minimize 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 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 the 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 materials, organic materials, etc.) that will interfere with installation or performance of the 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 records 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 the 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.

CFHWY00406

603-4.01 METHOD OF MEASUREMENT. Section 109, and as follows:

1. Culvert Pipe. The length of pipe, measured in place, along the invert.

2. Pipes for Storm Drains. The length of pipe, measured in place, along the invert, from center to center of structures. The length through the inlets, catch basins, and manholes is included in the measured length.

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

4. Liner for Storm Drain _ Inch, CIPP measured by the linear foot of liner from center of manhole to center of manhole.

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

CFHWY00406

603-5.01 BASIS OF PAYMENT. Branch connections and elbows are subsidiary to the pipe unless included as a separate Pay Item.

Coupling bands, seals (gaskets), and other items necessary for the proper joining of the sections are subsidiary.

Culvert markers are subsidiary to the pipe.

Excavation, bedding, and backfill paid under Section 204.

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Culvert cleaning is subsidiary to pipe Pay Items.

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

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Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
603.0001.____	CSP ___ Inch	LF
603.0002.____	___ Inch CSP Arch	LF
603.0003.____	End Section for CSP ___ Inch	Each
603.0004.____	End Section for ___ Inch CSP Arch	Each
603.0009.____	Corrugated Aluminum Pipe ___ Inch	LF
603.0010.____	___ Inch Corrugated Aluminum Pipe Arch	LF
603.0011.____	End Section for Corrugated Aluminum Pipe ___ Inch	Each
603.0012.____	End Section for ___ Inch Corrugated Aluminum Pipe Arch	Each
603.0013.____	Reinforced Concrete Pipe, ___ Inch, Class ___	LF
603.0014.____	Reinforced Concrete End Section, ___ Inch	Each
603.0015.____	Elbow, (Type & Size)	Each
603.0016.____	Branch Connection (Type & Size)	Each
603.0017.____	Pipe ___ Inch	LF
603.2019.____	Liner for Storm Drain ___ Inch, CIPP	LF
603.2020.____	Closed-Circuit Television (CCTV) Inspection Post Construction	LF
603.2032.____	Corrugated HDPE Pipe ___ Inch	LF
603.2033.____	End Section for Corrugated HDPE Pipe ___ Inch	Each
603.2034.____	Liner – Prepare Pipe	LF

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SECTION 608
SIDEWALKS

Special Provisions

608-5.01 BASIS OF PAYMENT. Delete the first sentence and replace with the following:

Reinforcement, expansion joint material, and other related miscellaneous items are subsidiary.

Curb ramp concrete is paid for under 608.0001.0004 Concrete Sidewalk, 4 Inch Thick.

CFHWY00406

SECTION 618
SEEDING

Special Provisions

618-5.01 BASIS OF PAYMENT. Add the following:

When items 618.0001._____, 618.0002._____, and 618.0003.____ do not appear in the bid schedule, Seeding and Water for Seeding is subsidiary to all applicable items that disturb ground.

CFHWY00406

SECTION 620
TOPSOIL

Special Provisions

620-5.01 BASIS OF PAYMENT. Add the following:

When item 620.0001.____, 620.0002.____, and 620.0003.____ do not appear in the bid schedule, Topsoil is subsidiary to all applicable items that disturb ground.

CFHWY00406