

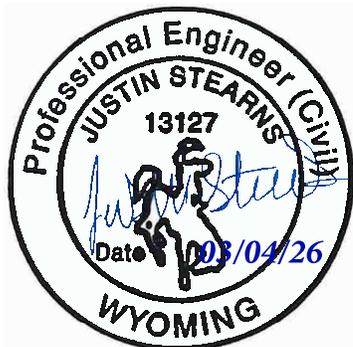
CONSTRUCTION SPECIFICATIONS for

CASPER COLLEGE 2026 ASPHALT REHAB

March, 2026

Prepared For:

Casper College
Procurement Department



CASPER

RAWLINS

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SITE DEMO

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Removing surface debris.
 - 2. Removing designated paving, curbs, and gravels.
 - 3. Removing designated trees, shrubs, and other plant life.
 - 4. Removing abandoned utilities.
 - 5. Excavating topsoil.

1.2 QUALITY ASSURANCE

- A. Conform to applicable code for environmental requirements, disposal of debris, and use of herbicides.

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Verify existing plant life designated to remain is tagged or identified.
- B. Identify waste area or salvage area for placing removed materials.

2.2 PREPARATION

- A. Call Local Utility Line Information service at 811 not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.

2.3 PROTECTION

- A. Locate, identify, and protect from damage surfacing and utilities indicated to remain.
- B. Protect trees, plant growth, and features designated to remain.
- C. Protect benchmarks, survey control points, and existing structures designated to remain from damage or displacement.

2.4 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. Partially remove paving, curbs, sidewalks, and base course as indicated on Drawings. Neatly saw cut edges at right angle to surface.
- C. Removed concrete and base course shall be hauled off and disposed of at a contractor designated location off site.

- D. Remove asphalt paving via milling. Haul mill tailings to Casper College Ranch at 468 Six Mile Road until directed otherwise by the owner. Total haul distance is approx. 8.3 miles one-way. Haul remaining mill tailings to a designated location on campus.
- E. Remove abandoned utilities. Indicated removal termination point for underground utilities on Record Documents.
- F. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.
- G. Do not burn or bury materials on site. Leave site in clean condition.

END OF SECTION

EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Excavating for paving, roads, and parking areas.

PART 2 - EXECUTION

2.1 PREPARATION

- A. Utility Service Locator:
 - 1. Call local utility service-line information at not less than three working days before performing Work.
 - 2. Request that underground utilities be located and marked within and immediately surrounding construction areas.
 - 3. Identify required lines, levels, contours, and data.
- B. Existing Utilities:
 - 1. Protect from damage utilities indicated to remain.
- C. Protect plant life, lawns, and other features designated to remain as portion of final landscaping.
- D. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

2.2 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation Work.
- B. Excavate subsoil to depths indicated on the drawings to accommodate paving.
- C. Trim excavation and remove loose matter.
- D. Removal of Deleterious Materials:
 - 1. Remove lumped subsoil, boulders, and rock up to 3 inches.
 - 2. Remove excess and unsuitable material from Site.
- E. Notify Engineer of unexpected subsurface conditions.
- F. Correct over-excavated areas with structural fill as approved by Engineer.
 - 1. Remove excavated material from Site.

- G. Repair or replace items indicated to remain that have been damaged by excavation.
- H. Scarify subgrade to a minimum of 6" depth, moisture condition excessively dry subgrade, and compact subgrade with a minimum of two passes of a steel drum roller.

2.3 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Request visual inspection of subgrade by Engineer before installing subsequent Work.
 - 2. Proof-roll subgrade with loaded dump truck or water truck not weighing less than 15 tons.

2.4 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation, and maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that may be created by earth operations.

END OF SECTION

AGGREGATE BASE COURSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aggregate subbase.
2. Aggregate base course.

B. Related Sections:

1. Trenching: Compacted fill under base course.
2. Asphalt Paving: Binder and finish asphalt courses.
3. Concrete Paving.

1.2 REFERENCES

A. ASTM International:

1. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
2. ASTM D2940 - Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.
3. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

- A. Samples: Submit, sample of each type of aggregate fill to testing laboratory.
- B. Materials Source: Submit name of aggregate materials suppliers.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements

1.4 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.
- B. Perform Work in accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.

PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Base Aggregate: Grading W Base Course.
 - 1. Percent Passing per Sieve Size:
 - a. 1-1/2 Inch: 100.
 - b. 1 Inch: 90 to 100.
 - c. 1/2 Inch: 60 to 85.
 - d. No. 4: 45 to 65.
 - e. No. 8: 33 to 53.
 - f. No. 200: 3 to 12.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted subgrade is dry and ready to support paving and imposed loads.
- B. Verify subgrade gradients and elevations are correct.

3.2 PREPARATION

- A. Correct irregularities in subgrade gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

- A. Place aggregate equal thickness layers to total compacted thickness as indicated on Drawings.
 - 1. Maximum Layer Compacted Thickness: 6 inches.
 - 2. Minimum Layer Compacted Thickness: 3 inches.
- B. Roller compact aggregate to 95 percent maximum density per ASTM D698 "Standard Proctor".
- C. Level and contour surfaces to elevations, profiles, and gradients indicated.
- D. Maintain +2%/-4% of optimum moisture content of base material to attain specified compaction density.
- E. Use mechanical tamping equipment only in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- A. Maximum Variation From Flat Surface: 1/4 inch measured with 10 foot straight edge.

- B. Maximum Variation From Thickness: 1/2 inch.
- C. Maximum Variation From Elevation: 1/2 inch

3.5 FIELD QUALITY CONTROL

- A. Compaction testing will be performed according to ASTM D698, ASTM D2922, and ASTM D3017.
- B. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- C. Frequency of Tests: One test for every 1,000 sq. yd. of each layer compacted aggregate or minimum of one test each day of placing base.
- D. Inform Architect/Engineer when base course under pavements has been prepared. Proof-roll base course below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll saturated subgrades.
 - 1. Proof-roll with loaded dump truck or water truck not weighing less than 15 tons.
- E. Excavate soft spots and areas of excess pumping or rutting as determined by engineer and replace with compacted base course as directed.

3.6 COMPACTION

Compact materials to 95 percent of maximum density

END OF SECTION

ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Asphalt materials.
 - 2. Aggregate materials.
 - 3. Aggregate subbase.
 - 4. Asphalt paving base course, binder course, and wearing course.
 - 5. Asphalt paving overlay for existing paving.

- B. Related Requirement:
 - 1. Aggregate Base Courses: Compacted subbase for paving.
 - 2. Pavement Markings: Painted pavement markings, lines, and legends.

1.2 REFERENCE STANDARDS

- A. Division 300, Section 304 of the City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements, 2006 Edition

1.3 SUBMITTALS

- A. Product Data:
 - 1. Submit product information for asphalt and aggregate materials.
 - 2. Submit mix design with laboratory test results supporting design.

- B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Mixing Plant: Conform to City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.

- B. Obtain materials from same source throughout.

- C. Perform Work in accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.

1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum 3 years documented experience.

1.6 AMBIENT CONDITIONS

- A. Do not place asphalt mixture when ambient air or base surface temperature is less than 35 degrees F for 2" or greater lifts or 40 degrees F for less than 2" lifts, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 ASPHALT PAVING

- A. Performance / Design Criteria:
 - 1. Paving: Paving section as indicated in Drawings.
- B. Asphalt Materials:
 - 1. Asphalt Binder: AASHTO M320; performance grade PG 64-22 or PG 64-28.
 - 2. Primer: In accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.
 - 3. Tack Coat: In accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.
 - 4. Oil: In accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.
- C. Aggregate Materials:
 - 1. Coarse Aggregate: In accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements
 - 2. Fine Aggregate: In accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.

2.2 MIXES

- A. Use dry material to avoid foaming. Mix uniformly.
- B. Asphalt Paving Mixtures: Designed in accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements with maximum 10 percent by weight reclaimed asphalt pavement.
 - 1. Bottom lift shall be ¾" mix per City of Casper Specifications
 - 2. Top lift shall be ½" mix per City of Casper Specifications

2.3 SOURCE QUALITY CONTROL

- A. Submit proposed mix design of each class of mix for review prior to beginning of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.

- B. Verify compacted aggregate base course is dry and ready to support paving and imposed loads.
 - 1. Excavate soft spots and areas of excess pumping or rutting as determined by engineer and replace with compacted backfill and base course as directed.
- C. Verify gradients and elevations of base are correct.
- D. Verify gutter drainage is installed in correct position and elevation.

3.2 PREPARATION

- A. Prepare base course according to Aggregate Base Course Specification Section.

3.3 EXISTING ASPHALT TIE INS

- A. Saw cut and notch existing paving as indicted on Drawings.
- B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.
- C. Repair surface defects in existing paving to provide uniform surface to receive new paving.

3.4 INSTALLATION

- A. Subbase:
 - 1. Aggregate Base Course: Install as specified in Aggregate Base Course Section.
- B. Tack Coat:
 - 1. Apply tack coat in accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.
 - 2. Apply tack coat to contact surfaces of curbs, gutters, and existing asphalt pavement.
- C. Double Course Asphalt Paving:
 - 1. Place asphalt bottom lift within 24 hours of applying primer or tack coat.
 - 2. Place bottom lift to 2 inch compacted thickness.
 - 3. Place top lift within 24 hours of placing and compacting bottom lift. When bottom lift is placed more than 24 hours before placing top lift, clean surface and apply tack coat before placing top lift.
 - 4. Place top lift to 2 inch compacted thickness.
 - 5. Compact each course by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
 - 6. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.
 - 7. All paving operations shall be in accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements

3.5 TOLERANCES

- A. Flatness: Maximum variation of **1/4** inch measured with 10 foot straight edge.
- B. Scheduled Compacted Thickness: Within **1/4** inch.
- C. Variation from Indicated Elevation: Within **1/2** inch.

3.6 FIELD QUALITY CONTROL

- A. Materials testing to be provided by owner.
- B. Take samples and perform tests in accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.
- C. Asphalt Paving Mix Temperature: Measure temperature at time of placement.
- D. Asphalt Mix Verification: Provide mix verification for each paving mixture.
- E. Asphalt Paving Density: ASTM D2950 nuclear method; test one location for every 1,000 sq. yds. compacted paving.

3.7 PROTECTION

- A. Immediately after placement, protect paving from mechanical injury for 8 hours or until surface temperature is less than 120 degrees F.

END OF SECTION

CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Concrete paving for:
 - a. Concrete parking areas and roads.
 - b. Concrete sidewalks.
 - c. Concrete curbs and gutters.
- B. Related Requirements:
 - 1. Aggregate Base Courses.
 - 2. Asphalt Paving.

1.2 REFERENCE STANDARDS

- A. American Concrete Institute:
 - 1. ACI 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- B. ASTM International:
 - 1. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 2. ASTM A775/A775M - S Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
 - 3. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
 - 4. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 5. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 6. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 7. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 8. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
 - 9. ASTM C150 - Standard Specification for Portland Cement.
 - 10. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
 - 11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 - 12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 - 13. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
 - 14. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
 - 15. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - 16. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.

17. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
18. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

1.3 SUBMITTALS

- A. Product Data:
 1. Submit data on concrete materials, joint filler, admixtures, curing compounds.
- B. Design Data:
 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 2. Identify mix ingredients and proportions, including admixtures.
 3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
- C. Source Quality Control Submittals: Indicate results of tests and inspections.

1.4 QUALITY ASSURANCE

- A. Obtain cementitious materials from same source throughout.
- B. Perform Work according to City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.

1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum 3 years' experience.

1.6 AMBIENT CONDITIONS

- A. Do not place concrete when base surface temperature is less than 35 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE COURSE

- A. Aggregate Base Course: As specified in Aggregate Base Course Specification Section.

2.2 CONCRETE PAVING

A. Performance / Design Criteria:

1. Paving: Pavement section as specified in the drawings.

B. Form Materials:

1. Wood or Steel form material, profiled to suit conditions.
2. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt, ¼ inch thick.

C. Reinforcement:

1. Deformed Reinforcing: Steel: ASTM A615/A615M, #4, 60 ksi yield grade, deformed billet bars galvanized finish.
2. Synthetic Macro-fiber: Synthetic macro-fibers engineered and designed for use in concrete, complying with ASTM C1116/C1116M, Type III, **1 to 2-1/4 inches** long.
 - a. Manufacturers:
 - 1) ABC Polymer Industries.
 - 2) Euclid Chemical Company (The); an RPM company.
 - 3) GCP Applied Technologies Inc.
 - 4) Propex Operating Company, LLC.
 - 5) Sika Corporation.

D. Concrete Materials:

1. Cement: ASTM C150 Type II modified, low C₃A-; gray color.
2. Fine and Coarse Aggregates: In accordance with City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
3. Concrete Reinforcing Fibers: ASTM C1116, high strength industrial-grade fibers specifically engineered for secondary reinforcement of concrete.
4. Water: In accordance with City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
5. Air Entrainment: In accordance with City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
6. Chemical Admixture: In accordance with City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
7. Fly Ash: In accordance with City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
8. Slag: In accordance with City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
9. Plasticizing: In accordance with City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements

2.3 MIXES

A. Concrete Mix - By Performance Criteria:

1. Mix and deliver concrete according to City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
2. Provide concrete to the following criteria:
 - a. Compressive Strength: 4500 psi at 28 days.
 - b. Slump: 0 to 4 inches

- c. Minimum Cement Content: 550 lb/yd³
 - d. Water/Cement Ratio: 0.45 max
 - e. Air Entrainment: 5 to 8 percent.
3. Limit the following cementitious materials to maximum percentage by mass of all cementitious materials:
- a. Fly Ash: minimum 20 percent of the total weight of fly ash plus cement.

2.4 FINISHES

- A. Shop Finishing - Reinforcement:
 - 1. Galvanized Finish for Steel Bars: ASTM A767/A767M, Class II, hot dip galvanized after fabrication.

2.5 ACCESSORIES

- A. Curing Compound: According to City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
- B. Joint Sealers: ASTM D6690, Type II; hot applied type.
- C. Epoxy Grout: Per Table 819.2-1 of the WYDOT Standard Specifications for Road and Bridge Construction.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted granular base course is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 PREPARATION

- A. Moisten substrate to minimize absorption of water from fresh concrete.
- B. Notify Engineer minimum 24 hours prior to commencement of concreting operations.

3.3 INSTALLATION

- A. Base Course:
 - 1. Aggregate Base Course: Install as specified in Aggregate Base Course Specification Section .
- B. Forms:

1. Place and secure forms and screeds to correct location, dimension, profile, and gradient.
2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Reinforcement:

1. Place reinforcing at mid-height of paving.
2. Refer to plans for concrete sections to receive reinforcement.
3. Interrupt reinforcing at expansion joints.
4. Repair damaged galvanizing to match shop finish.

D. Placing Concrete:

1. Place concrete according to City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.
2. Ensure reinforcing, inserts, embedded parts, formed joints are not disturbed during concrete placement.
3. Place concrete continuously over the full width of the panel and between predetermined construction joints.

E. Joints

1. Place contraction joints in concrete paving as indicated on drawings. Joint spacing shall not exceed 15' for vehicular pavement areas.
2. Place expansion joint as needed and in concrete walks every 60 lineal feet.
3. Provide keyed joints as indicated.
4. Seal joints as indicated on Drawings.
5. Contraction joints may be sawcut or tooled. Saw cut joints shall be installed as soon as possible without causing raveling of the joint.

F. Finishing:

1. Area Paving: Light broom.
2. Sidewalk Paving: Light broom and trowel joint edges.
3. Curb and Gutter: Light broom.
4. Place curing compound on exposed concrete surfaces immediately after finishing.

G. Curing and Protection

1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
3. Cure concrete according to City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements.

3.4 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.

3.5 FIELD QUALITY CONTROL

- A. Inspect reinforcement placement for size, spacing, location, support.

- B. Owner will engage testing firm to take cylinders and perform slump and air entrainment tests according to ACI 301.
- C. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, standard cured.
 - 3. Sample concrete and make one set of five cylinders for every 50 cu. yds. or less of concrete placed each day but not less than one test per day of concrete placement.
- D. Field Testing:
 - 1. Slump Test Method: ASTM C143/C143M.
 - 2. Air Content Test Method: ASTM C231.
 - 3. Temperature Test Method: ASTM C1064/C1064M.
 - 4. Measure slump and temperature for each compressive strength concrete sample.
 - 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- E. Cylinder Compressive Strength Testing:
 - 1. Test Method: ASTM C39/C39M.
 - 2. Test Acceptance: 4500 psi at 28 days.
 - 3. Test one cylinder at 7 days.
 - 4. Test three cylinders at 28 days.
 - 5. Retain one cylinder for testing when requested by Engineer.
 - 6. Dispose remaining cylinders when testing is not required.
- F. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.
- G. Materials testing lab does not require AASHTO accreditation.

3.6 PROTECTION

- A. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit vehicular traffic over paving for 7 days minimum after finishing and until 75 percent design strength of concrete has been achieved.

END OF SECTION

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Traffic lines and markings.
 - 2. Legends.
 - 3. Paint.

- B. Related Requirements:
 - 1. Asphalt Paving: Asphalt paving for roads, parking areas, and sidewalks.

1.2 REFERENCE STANDARDS

- A. ASTM International:
 - 1. ASTM D34 - Standard Guide for Chemical Analysis of White Pigments.
 - 2. ASTM D126 - Standard Test Methods for Analysis of Yellow, Orange, and Green Pigments Containing Lead Chromate and Chromium Oxide Green.
 - 3. ASTM D562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer.
 - 4. ASTM D711 - Standard Test Method for No-Pick-Up Time of Traffic Paint.
 - 5. ASTM D713 - Standard Practice for Conducting Road Service Tests on Fluid Traffic Marking Materials.
 - 6. ASTM D1301 - Standard Test Methods for Chemical Analysis of White Lead Pigments.
 - 7. ASTM D1394 - Standard Test Methods for Chemical Analysis of White Titanium Pigments.
 - 8. ASTM D1475 - Standard Test Method for Density of Liquid Coatings, Inks, and Related Products.
 - 9. ASTM D1640/D1640M - Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings.
 - 10. ASTM D2371 - Standard Test Method for Pigment Content of Solvent-Reducible Paints.
 - 11. ASTM D2621 - Standard Test Method for Infrared Identification of Vehicle Solids From Solvent-Reducible Paints.
 - 12. ASTM D2743 - Standard Practices for Uniformity of Traffic Paint Vehicle Solids by Spectroscopy and Gas Chromatography.

1.3 SUBMITTALS

- A. Product Data: Submit paint formulation for each type of paint.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Test and Evaluation Reports: Indicate source and acceptance test results according to AASHTO M247.

- D. Manufacturer Instructions:
 - 1. Submit instructions for application temperatures, eradication requirements, application rate, and line thickness.
 - 2. Submit detailed instructions on installation requirements, including storage and handling procedures.

1.4 QUALITY ASSURANCE

- A. Perform Work according to WYDOT Standards.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum **three years'** experience.
- B. Applicator: Company specializing in performing Work of this Section with minimum three years' experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Storage:
 - 1. According to manufacturer instructions.
 - 2. Paint:
 - a. Invert containers several days prior to use if paint has been stored more than two months.
 - b. Minimize exposure to air when transferring paint.
 - c. Seal drums and tanks when not in use.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.7 AMBIENT CONDITIONS

- A. Do not apply materials if surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow if relative humidity is outside range required by paint manufacturer, or if moisture content of surfaces exceeds that required by paint manufacturer.
- C. Minimum Conditions: Do not apply paint if temperatures are expected to fall below 40 deg. F within 24 hours after application.

- D. Thermoplastic Compound: Do not apply unless pavement surface temperature is minimum 40 deg. F and rising.
- E. Maximum VOCs: Do not exceed limit required by State or Environmental Protection Agency.

1.8 WARRANTY

- A. Furnish three-year manufacturer's warranty for pavement markings.

PART 2 - PRODUCTS

2.1 PAINTED PAVEMENT MARKINGS

- A. Manufacturers:
 - 1. Aexcel Inc.
 - 2. Color Wheel Paints & Coatings.
 - 3. Columbia Paint & Coatings, Inc.; a subsidiary of Sherwin-Williams Company (The).
 - 4. Conco Paints.
 - 5. Coronado Paint; Benjamin Moore & Co.
 - 6. Diamond Vogel Paints.
 - 7. Ennis-Flint.
 - 8. EZ-Liner Industries.
 - 9. Franklin Paint Company.
 - 10. McCormick Paints.
 - 11. Pathmark Traffic Products of Texas Inc.
 - 12. Safety Coatings, Inc.
 - 13. Sherwin Williams.
- B. Performance and Design Criteria:
 - 1. Paint Adhesion: Adhere to road surface, forming smooth continuous film one minute after application.
 - 2. Paint Drying: Tack free by touch as not to transfer by vehicle tires within five minutes after application.
- C. Paint:
 - 1. Description: Ready mixed, conventional, fast-dry, waterborne traffic paints.
 - 2. Lead-free and nontoxic.
 - 3. Minimum Retroreflectance: per WYDOT Standard.
 - 4. Durability Rating: 6 or more, after in place for nine months.

2.2 APPLICATION EQUIPMENT

- A. Paint Gun:
 - 1. Description: Simultaneously apply parallel lines of indicated width in solid or broken patterns or various combinations of those patterns.
 - 2. Type: Dual nozzle.

- B. Measuring Device: Automatically and continuously measure to nearest foot length of each line placed.
- C. Paint Heater: Capable of heating paint to 130 deg. F for fast-dry applications.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Do not apply paint to asphalt surfaces until asphalt has aged for minimum 7 days.
- B. Agitate paint for 1 to 15 minutes prior to application to ensure even distribution of pigment.
- C. Maintenance and Protection of Traffic:
 - 1. Prevent interference with marking operations and prevent traffic on newly applied markings before dry.
- D. Surface Preparation.
 - 1. Clean and dry paved surfaces prior to painting.
 - 2. Blow or sweep surface free of dirt, debris, oil, grease, or gasoline.
 - 3. Spot location of final pavement markings, as specified and as indicated on Drawings, by applying pavement spots 25 feet o.c.

3.2 APPLICATION

- A. Application Rate:
 - 1. Reflective Markings:
 - a. Paint: 100 sq. ft./gal.
- B. Painting:
 - 1. Apply paint pneumatically, using guidelines and templates as necessary to control application.
 - 2. Manually paint numbers, letters, and symbols.
 - 3. Prevent splattering and overspray when applying markings.
 - 4. Paint Guns: Simultaneously apply paint binder at uniform specified rates.
 - 5. Dispense at ambient temperature.
 - 6. Wet-Film Thickness:
 - a. 15 mils.
- C. Dimensions and Locations: As indicated on Drawings.
- D. Crosswalks, Intersections, Stop Lines, Legends:
 - 1. Use walk-behind stripers, hand spray, or stencil trucks.
 - 2. Do not use hand brushes or rollers.

3.3 TOLERANCES

- A. Maximum Variation from Wet Film Thickness: 1 mil.
- B. Maximum Variation from Wet Paint Line Width: Plus or minus 1/4 inch.

3.4 FIELD QUALITY CONTROL

- A. Inspect for incorrect location, insufficient thickness, line width, coverage, retention, uncured or discolored material, and insufficient bonding.
- B. Acceptance:
 - 1. Repair lines and markings which after application and curing do not meet following criteria:
 - a. Incorrect location.
 - b. Insufficient thickness, width, coverage, or retention.
 - c. Uncured or discolored material.
 - d. Insufficient bonding.

3.5 CLEANING

- A. Collect and legally dispose of residues from painting operations.

3.6 PROTECTION

- A. Protect painted pavement markings from vehicular and pedestrian traffic until paint is dry and track free.
- B. Unless material is track free at end of paint application convoy, use traffic cones to protect markings from traffic until track free.
- C. If vehicle crosses a marking and tracks it, or if splattering or overspray occurs, eradicate affected marking and resultant tracking and apply new markings.
- D. Follow manufacturer instructions or use minimum of 30 minutes of dry time.
- E. Barrier cones are satisfactory protection for materials being dried.

3.7 ATTACHMENTS

- A. Pavement Markings:
 - 1. Parking Stalls: 4-inch; yellow;
 - 2. ADA Symbol: Size per Standards; Blue and White

END OF SECTION



CASPER

RAWLINS