

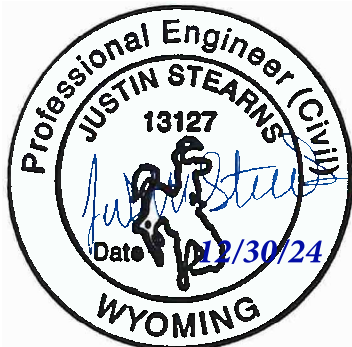
# CONSTRUCTION SPECIFICATIONS for

## CASPER COLLEGE 2025 ASPHALT REHAB

December, 2024

Prepared For:

Casper College  
Procurement Department



CASPER

RAWLINS

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## **MILL AND OVERLAY**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Milling existing asphaltic concrete.
  - 2. Placing asphalt overlay.
- B. Related Sections:
  - 1. Asphalt Paving Section.

#### **1.2 QUALITY ASSURANCE**

- A. Perform Work according to industry standards.

#### **1.3 QUALIFICATIONS**

- A. Asphalt Mill and Overlay: Company specializing in performing the Work of this section with minimum 3 years' experience.

### **PART 2 - PRODUCTS**

#### **2.1 EQUIPMENT**

- A. Milling Unit: Type for intended purpose as follows:
  - 1. Self-propelled; wheel base sufficient to maximize leveling action.
  - 2. Capable of removing pavement material to 1.5" inch depth.
- B. Overlay: Per Asphalt Paving Section.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Mechanically sweep pavement surfaces immediately prior to commencement of Work. Clean pavement surfaces of loose foreign matter. Verify surfaces are dry.
- B. Remove and store manhole covers and water valve box covers.

### 3.2 REMOVAL

- A. Do not disfigure adjacent Work.
- B. Execute removal to depth not less than 1-1/2 inch or greater than 2 inch at each point across full width of surface without detrimental aggregate degradation.

### 3.3 CRACK SEALING

- A. Seal remaining visible cracks in accordance with Plant Mix Pavement Crack Seal Section.

### 3.4 OVERLAY PLACING

- A. Provide hot mix asphalt overlay material in accordance with Asphalt Paving Section.
- B. Place hot mix asphalt overlay material to 2 inch thickness.
- C. Place in accordance with Asphalt Paving Section.

### 3.5 ROLLING AND COMPACTING

- A. Roll and compact pavement materials to elevations existing before commencing the Work.
- B. Reinstall manhole covers and water valve box covers.

### 3.6 PROTECTION OF FINISHED WORK

- A. Do not permit traffic over surface for 2 hours.

**END OF SECTION**

# PLANT MIX PAVEMENT CRACK SEALING

## 1. DESCRIPTION

- A. This section describes the requirements for sealing cracks in plant mix pavement after surface milling has been completed.

## 2. MATERIALS

- A. Provide and use sealant in accordance with ASTM D 6690.
- B. Provide and use backer rod in accordance with ASTM D 5249, type 1, with a melting temperature higher than the sealant's application temperature.
- C. Provide and use aggregate with a plasticity index of 3 or less and in accordance with the following gradation.

### Gradation Requirements: Blotter

Sieve	% Passing
$\frac{3}{8}$ in	100
No. 4	85 to 100
No. 200	0 to 20

- 1. Other materials may be used as blotter material, including portland cement, fly ash, sawdust, blotter paper, or biodegradable, non-toxic, non-hazardous compounds designed to form a temporary protective barrier over the sealant to prevent tracking.

## 3. EQUIPMENT

### 3.1 Removing Existing Sealant

- A. Provide a plow, ripping tooth, wire brush, saw, or other equipment to remove existing sealant from cracks. Use carbide-tipped blades or better.

### 3.2 Rout Crack

- A. Provide mechanical, power-driven routing equipment that produces a reservoir with vertical sides and a flat bottom to the required dimensions. Do not use star bit type routers or equipment designed to plow the cracks to size. Use carbide-tipped blades or better.

### 3.3 Clean and Dry Crack

- A. Provide an air compressor that produces clean, oil-free, compressed air with an output of at least 125 ft<sup>3</sup>/min; equip with a  $\frac{3}{4}$ -inch diameter or smaller nozzle. Do not use backpack blowers. Provide compressed air heat lances that produce clean, oil-free, compressed air at least 750 °F at a velocity of at least 650 ft/s. Do not use direct flame driers.

### 3.4 Install Sealant

- A. Provide a melting machine with a melting capacity of at least 100 gal/h while continuously maintaining the recommended sealant application temperature. Equip to continuously agitate and mix the sealant during application.
- B. Apply sealant with a pressure-type applicator equipped with a wand with the tip attached to a fixed-sized nozzle or an inside diameter cup of 2 in ± 0.25 in or an approved equal.
- C. Provide a compressed air heater if required by conditions.
- D. Provide a U-shaped squeegee for smoothing the sealant.

#### 4. CONSTRUCTION

##### 4.1 Removing Existing Sealant

- A. Remove existing sealant from cracks without damaging the pavement.

##### 4.2 Routing

- A. Rout no more than can be sealed each day, and in accordance with Table 4.2, Routing Dimensions.

**Table 4.2  
Routing Dimensions**

Crack Width	Sealant	
	AASHTO M 324	AASHTO M 324
< 1/8 in [3 mm]	does not need routing or sealing	
1/8 in to less than 1/2 in [3 mm to less than 12 mm]	rout to 1/2 in wide × 3/4 in deep [12 mm wide × 19 mm deep]	rout to 3/4 in wide × 3/4 in deep [19 mm wide × 19 mm deep]
1/2 in to 3/4 in [12 mm to 19 mm]	does not need routing	
> 3/4 in [19 mm]	does not need routing	

##### 4.3 Clean and Dry Crack

- A. Use compressed air to clean cracks and reservoirs of dust, dirt, and other deleterious materials. Prepare cracks by using compressed air heat lances, but do not overheat the pavement. Before applying sealant, clean and dry cracks exposed to precipitation. The engineer will inspect prepared cracks before sealing.
- B. Before reopening to traffic, remove debris using a power broom or other approved means. Remove swept material from curb and gutter areas.

#### 4.4 Certification

- A. Provide quality control data from sealant manufacturer/supplier for production run of crack sealant that meets project requirements.

#### 4.5 Install Sealant

##### 4.5.1 General

- A. Provide the engineer two copies of the sealant manufacturer's recommendations for preparation, handling, mixing, and application 14 calendar days before sealing.
- B. Seal cracks only in dry weather. Ensure that pavement inside the crack is at least 40 °F unless the manufacturer requires a higher temperature; if necessary, heat the pavement. Keep the sealant at the manufacturer recommended application temperature. Do not begin installing sealant until the equipment has stabilized for temperature and agitation/mixing.
- C. Seal cracks or portions of cracks greater than 1/8 in wide, unless otherwise approved by the engineer. Apply sealant from the bottom up. When using the cup attachment, hold it firmly against the roadway surface during application. When using squeegees, smooth sealant tightly against the pavement. Center the squeegeed band on the crack so that the width on either side of the crack is no more than 1 in.
- D. Seal cracks so that the finished, cured surface is to the configuration specified:
  - 1. **Flush Configuration.** Flush with the pavement and is not recessed into the crack by shrinkage.
  - 2. **Recessed Configuration.** Recess below the pavement 1/4 in. Do not use squeegees or wands with a 2 in inside diameter cup.
- E. If sealant flows out the end of the crack, plug or dike the end as approved by the engineer. Remove spilled sealant, and reseal properly. Remove excess sealant from roadway while it is still liquid. If sealant pulls out or tracking occurs, apply blotter material to minimize damage. Replace sealant damaged by tracking at no additional cost to the Owner.
- F. Do not mix sealant from different manufacturers in the sealing machine. Purge the machine (empty the kettle, hoses, etc.) of sealant before switching sealants. Follow manufacturer recommendations for mixing sealant from different production runs.

##### 4.5.2 Backer Rod

- A. Install backer rod only when
  - 1. AASHTO M 324 Type IV WY Modified sealant is specified;
  - 2. Final width of crack or reservoir exceeds d in [10 mm]; and
  - 3. Full depth of crack, including routed reservoir if applicable, exceeds 1 1/2 in [38 mm].

B. Install backer rod with the top edge recessed  $\frac{3}{4}$  in below the pavement. Install AASHTO M 324 Modified sealant.

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.
- 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.
- 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 Grading A per City of Casper Specifications
  - 2. Top lift shall be Grading C 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 DEMOLITION**

- A. Saw cut and notch existing paving as indicated on Drawing.
- 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 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.
- F. Asphalt Paving Thickness: ASTM D3549; test one core sample from every 2,000 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 C<sub>3</sub>A-; 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: 4000 psi at 28 days.
  - b. Slump: 2 to 4 inches

- c. Minimum Cement Content: 6 sacks/cu yd.
  - d. Water/Cement Ratio: 4.5 to 5.5 gallon per sack
  - e. Air Entrainment: 4.5 to 7.5 percent.
3. Limit the following cementitious materials to maximum percentage by mass of all cementitious materials:
- a. Fly Ash: 15 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: 4000 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 28 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**

# TRENCHING

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section Includes:

1. Excavating trenches for utilities.
2. Compacted fill from top of utility bedding to subgrade elevations.
3. Backfilling and compaction.

B. Related Sections:

1. Stormwater Conveyance Section: Piping.

### 1.2 REFERENCES

A. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>).
2. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
3. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

### 1.3 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.

### 1.4 SUBMITTALS

- A. Materials Source: Submit name of imported fill materials suppliers.

### 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with City of Casper Standard Specifications for Public Works Constructions and Infrastructure Improvements.
- B. Maintain one copy of document on site.

### 1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

## 1.7 COORDINATION

- A. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

## PART 2 - PRODUCTS

### 2.1 FILL MATERIALS

- A. Subsoil Fill: Fill Type A-1-a, A-1-b, A-2-4, or A-3. Non-expansive onsite excavated soils may be acceptable as backfill.

## PART 3 - EXECUTION

### 3.1 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
  - 1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- B. Use laser-beam instrument with qualified operator to establish lines and grades.

### 3.2 PREPARATION

- A. Call Local Utility Line Information service at **811 (One Call of Wyoming)** not less than **three (3)** working days before performing Work.
  - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum locations.
- C. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- D. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Maintain and protect above and below grade utilities indicated to remain.
- F. Establish temporary traffic control when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

### 3.3 TRENCHING

- A. Excavate subsoil required for utilities to utility service.
- B. Remove lumped subsoil, boulders, and rock up to 4 cu. ft., measured by volume.

- C. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.
- D. Excavate bottom of trenches maximum 3 feet wider than outside diameter of pipe.
- E. Excavate trenches to depth indicated on Drawings or depth of existing utility. Provide uniform and continuous bearing and support for bedding material and pipe.
- F. Do not interfere with 45 degree bearing splay of foundations.
- G. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls cannot be sloped, provide trench box or sheeting and shoring to protect excavation as specified in this section.
- H. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by Architect/Engineer until suitable material is encountered
- I. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Fill Type Subsoil as specified above and compact to density equal to or greater than requirements for subsequent backfill material.
- J. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- K. Correct over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Architect/Engineer.
- L. Remove excess subsoil not intended for reuse, from site.

### **3.4 SHEETING AND SHORING**

- A. Sheet, shore, and brace excavations to prevent danger to persons, structures, and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- B. Support trenches more than **5** feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.
- C. Design sheeting and shoring to be removed at completion of excavation work.
- D. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.
- E. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

### **3.5 BACKFILLING**

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place material in continuous layers as follows:

1. Subsoil Fill: Maximum [6] inches compacted depth for material compacted by heavy compaction equipment and [4] inches for hand-operated tampers.
  2. Structural Fill: Maximum [6] inches compacted depth for material compacted by heavy compaction equipment and [4] inches for hand-operated tampers.
- D. Compact each layer of fill materials to 95% of standard proctor.
- E. Employ placement method that does not disturb or damage utilities in trench and existing structures.
- F. Maintain +2%/-4% optimum moisture content of fill materials to attain required compaction density.
- G. Protect open trench to prevent danger to the public.

### **3.6 TOLERANCES**

- A. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch from required elevations.

### **3.7 FIELD QUALITY CONTROL**

- A. Coordinate with owner engaged materials testing firm to perform laboratory material tests in accordance with ASTM D698.
- B. Perform in place compaction tests in accordance with the following:
1. Density Tests: ASTM D2922.
  2. Moisture Tests: ASTM D3017.
- C. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.
- D. Frequency of Tests: one compaction test per 100 lineal feet of pipe installed for each layer of trench backfill under paved surfaces. One test per 500 lineal feet of pipe installed for each layer or backfill under unimproved or landscaped areas.

### **3.8 PROTECTION OF FINISHED WORK**

- A. Reshape and re-compact fills subjected to vehicular traffic during construction.

**END OF SECTION**

## STORMWATER CONVEYANCE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Stormwater drainage piping.
  - 2. Cleanouts.
  - 3. Pile support systems.
  - 4. Concrete encasement and cradles.
  - 5. Bedding and cover materials.
  
- B. Related Requirements:
  - 1. Trenching: Execution requirements for trenching as required by this Section.

#### 1.2 DEFINITIONS

- A. ABS: Acrylonitrile butadiene styrene.

#### 1.3 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO M252 - Standard Specification for Corrugated Polyethylene Drainage Pipe.
  
- B. ASTM International:
  - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - 2. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
  - 3. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.
  - 4. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
  - 5. ASTM F405 - Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.
  - 6. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
  - 7. ASTM F667/F667M - Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings.

#### 1.4 COORDINATION

- A. Coordinate Work of this Section with reconstruction of Campus Drive.

## **1.5 SUBMITTALS**

- A. Product Data: Submit manufacturer information describing pipe, pipe accessories, catch basins, and manholes.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Manufacturer Instructions: Submit special procedures required to install specified products.
- D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

## **1.6 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record actual locations of pipe runs, connections, manholes, catch basins, cleanouts, and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

## **1.7 QUALITY ASSURANCE**

- A. Perform Work according to City of Casper Standard Specifications for Public Works Construction and Infrastructure Improvements, herein referred to as City of Casper Standards.

## **1.8 DELIVERY, STORAGE, AND HANDLING**

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Store materials according to manufacturer instructions.
- 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.

## **1.9 EXISTING CONDITIONS**

- A. Field Measurements:
  - 1. Verify field measurements prior to fabrication.
  - 2. Indicate field measurements on Shop Drawings.

## **PART 2 - PRODUCTS**

### **2.1 STORM DRAINAGE PIPING**

- A. PVC Piping:



1. Pipe:
  - a. Comply with ASTM D3034; SDR 35.
  - b. Style: Bell and spigot with rubber-ring sealed gasket joint.
2. Fittings: PVC.
3. Joints:
  - a. Comply with ASTM F477.
  - b. Gaskets: Elastomeric.

## **2.2 CLEANOUTS**

- A. Shaft and Top Section:
  1. Material: PVC pipe sections.
  2. Nominal Shaft Diameter: 4 inches.
- B. Cleanout Lids:
  1. Materials: PVC for landscape areas. Cast Iron for traffic areas.

## **2.3 MATERIALS**

- A. Bedding and Cover:
  1. Bedding: Fill Type A-1-a, A-1-b, A-2-4, or A-3. Non-expansive onsite excavated soils may be acceptable as bedding.
  2. Cover: Fill Type A-1-a, A-1-b, A-2-4, or A-3. Non-expansive onsite excavated soils may be acceptable as cover.
  3. Soil Backfill from above Pipe to Finish Grade: Non-expansive onsite soils.
  4. Subsoil: No rocks more than 6 inches in diameter, frozen earth, or foreign matter.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that trench cut is ready to receive Work of this Section.
- B. Verify that excavations, dimensions, and elevations are as indicated on Drawings.

### **3.2 PREPARATION**

- A. Correct over-excavation with fine aggregate.
- B. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

### **3.3 INSTALLATION**

#### **A. Excavation and Bedding:**

1. Excavate trench as specified in Trenching Section.
2. Hand trim excavation for accurate placement of piping to indicated elevations.
3. Place bedding material at trench bottom.
4. Maintain optimum moisture content of bedding material to attain required compaction density.
5. Level fill materials in continuous layers not exceeding **6** inches in depth, and compact to 90 percent maximum density.

#### **B. Piping:**

1. Installation Standards: Install Work according to City of Casper standards.
2. Connect to building storm drainage system as shown on the drawings.

#### **C. Catch Basins and Cleanouts:**

1. Installation Standards: Install Work according to City of Casper standards.

### **3.4 TOLERANCES**

- #### **A. Maximum Variation from Indicated Pipe Slope: $\frac{1}{8}$ inch in **10** feet.**

### **3.5 FIELD QUALITY CONTROL**

- #### **A. Testing: In accordance with City of Casper Standards.**

### **3.6 PROTECTION**

- #### **A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.**

**END OF SECTION**



CASPER

RAWLINS